

**SELMA SPECIAL PLANNING COMMISSION
STAFF REPORT**

Meeting Date: February 13, 2023

TO: Selma Planning Commission

FROM: Community Development Department

SUBJECT: AGENDA ITEM NO. 1

Submittal No. 2021-0009 - Annexation, Prezone, and Minor Modification of Site Plan
Review No. 2006-0008: a request by Cliff Tutelian to modify Site Plan Review No.
2006-0008, annex and prezone the remaining area within the Selma Grove Project area.

Staff is recommending the recommendation of adoption of an Addendum to the Selma Grove certified Final Environmental Impact Report (EIR) SCH No. 2007061098.

Summary and Purpose

To consider the approval of Application No. 2021-0009, which consists of, an Annexation and Prezone of approximately 29 acres and the amendment of an approved Site Plan encompassing an approximately 63-acre property (including 36 acres annexed) located north of Floral Ave, east of DeWolf, and west of State Route 99 to allow for Regional Commercial development.

Application Information

Applicant: Clifford H. Tutelian
1401 Fresno Street, Suite 210, Fresno, CA 93721

Project Location: North of Floral Ave, east of DeWolf, and west of State Route 99
(APN: 348-19-7s, -10s, -11s, -32, -36s through 40s)

Applicant's Proposal: To annex and prezone approximately 29 acres for the development of regional commercial uses and amend an approved site plan for the development of regional commercial uses.

Land Use; General Plan; Zoning: Regional Commercial; no zoning designation (proposed zoning of CR)

Project Background

On February 1, 2010, the City of Selma certified a Final Environmental Impact Report (EIR) and approved a General Plan Amendment, pre-zoning, and site plan (Site Plan Review No. 2006-008), for the Rockwell Pond Commercial Project: a commercial center encompassing 94 acres with 973,100 square feet of development plus a 102-room hotel site. After these approvals, no further action toward developing the project occurred for several years.

The approved Project was subsequently renamed as the Selma Grove Project. In May 2016, the City approved Minor Modification (requested by the Fahrney Group) 2007-0148 to Site Plan 2006-008 to adopt a revised phasing plan for the development of the Project ("Selma Grove Phase I Annexation

Project"). The Selma Grove Phase I Annexation Project delineated 48,693 square feet of space for an auto dealership, a proposed 102-room hotel and an additional 317,300 square feet of commercial retail uses on approximately 36 acres of land. The 36 acres were subsequently annexed to the City of Selma pursuant to the DeWolf-Floral Reorganization (RO 16-4), approved by Fresno County LAFCO on June 8, 2016. The approval of the Phase I Annexation Project included environmental review and adoption of a Mitigated Negative Declaration ("MND") (MND No. 2016-0021), which was tiered from previously adopted Final EIRs in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15152.

The entire site is currently comprised of nine parcels denoted by Assessor's Parcel Numbers (Attachment 1). The applicant is proposing the annexation and prezone of 29 acres, which is the remaining area from the original project (SPR No. 2006-008) in 2010. The specific parcels being annexed are 348-191-07s, 10s, and 11s (Attachment 1 and 2). The property will be prezoned to be zoned CR, and amending an existing site plan for regional commercial development located north of Floral Ave and west of State Route 99 (Attachment 3). The site is adjacent to an existing regional commercial development to the east, open space to the north, vacant land to the west, and vacant land to the south. The proposed development includes a shopping center with retail stores, restaurants, and a movie theatre. An outdoor auditorium, family BBQ and picnic area is planned to connect with the City's planned Rockwell Pond Park. The original approved site plan is shown in Attachment 4.

Modifications to Site Plan

The proposed project is an amendment to an approved site plan (Site Plan Review No. 2006-0008) that reduces the overall total acreage of the Project and the total square footage of development from what was previously proposed. As proposed, the ultimate buildout of the Project would be reduced from approximately 94 acres to 65 acres (including approx. 36 acres from the previous annexation in 2016). The total square footage of the development would be effectively reduced from 973,100 square feet to approximately 620,000 square feet in addition to the 102-room hotel. The modified project proposes approximately 570,000 square feet of new retail businesses (Attachment 5). Related to the reductions in size and square footage, the Project as modified would also entail some reconfiguration of the layout of development within the project site.

Conditions of Approval are provided as an attachment to the Resolution (Attachment 6) approving the proposed project. Conditions were received from internal departments and external agencies to ensure the development is compatible with surrounding development and is constructed according to all plans, codes, and adopted regulations. The conditions also include all mitigation measures required according to the CEQA evaluation. Certain of the mitigation measures originally proposed as part of the certified Final EIR have been revised by the Addendum to take into account the modified project and changes in the circumstances under which the Project is to be developed.

Circulation

The Project proposes four separate ingress and egress drive approaches off of Floral Avenue. Floral Avenue provides the only public access points for the proposed project. The City of Selma General Plan depicts that Floral Avenue is planned as a 4-lane Arterial roadway (Engineering Standard Drawing St-12). Interior circulation will be accomplished by implementing a large private road that connects to Floral Avenue, traveling to the northernmost use. Smaller roads and connection points are made from this main roadway.

Utilities and Infrastructure

California Water Service Company (Cal Water) will provide domestic water by water mains located in Floral Avenue. Wastewater will be collected via an existing sewer line in Floral Avenue. The Selma-Kingsburg-Fowler (SKF) Sewage Treatment Plant, which is located west of Highway 99 and west of Kingsburg, will be used for the treatment and disposal of the sewage generated by the project. Stormwater runoff will be directed to the permanent storm drain facilities located within the Rockwell Pond area.

Environmental (CEQA)

On February 1, 2010, the City of Selma certified a Final EIR for the Selma Grove Project, which at the time was referred to as the Rockwell Pond Commercial Project. The Project was a commercial center encompassing 94 acres with 973,100 square feet of development plus a 102-room hotel site. The Project EIR included mitigation measures to avoid and/or reduce environmental impacts resulting from the project. The EIR also determined that, despite the incorporation of mitigation measures, the project would result in significant and unavoidable effects on Agricultural Resources, Air Quality and Greenhouse Gas Emissions, and Traffic. Pursuant to the DeWolf-Floral Fahrney Reorganization, approved by Fresno County LAFCO on June 8, 2016. The approval of the Phase I Annexation Project included environmental review and adoption of a Mitigated Negative Declaration ("MND") (MND No. 2016-0021), which was tiered from both the Final EIR for the Rockwell Pond Commercial Project and the Final EIR for the City of Selma 2035 General Plan Update in accordance with CEQA Guidelines Section 15152.

According to Section 15164(a) of the State CEQA Guidelines, an addendum to a previously certified EIR shall be prepared by a lead or responsible agency if changes or additions to the EIR are necessary but none of the conditions described in Section 15162 requiring the preparation of a subsequent or supplemental EIR are applicable. An addendum need not be circulated for public review but can be included in or attached to the EIR. An Addendum (Attachment 7) was prepared by Odell Planning. The Addendum proposed adjustments to certain of the mitigation measures originally proposed as part of the certified Final EIR have been revised by the Addendum to take into account the modified project and changes in the circumstances under which the Project is to be developed.

Notice of Public Hearing

The Public Hearing Notice was published one time in The Selma Enterprise on February 1, 2023. The adjacent property owners within 300 feet were notified of the hearing by the City via letter on February 1, 2023 (Attachment 8). During the January 23rd Planning Commission hearing, the Planning Commission agreed to continue the item to the next available Planning Commission hearing, which at the time had not been set, therefore, public notices were prepared and circulated prior to the February 13, 2023 Planning Commission meeting

Recommendation

That the Planning Commission recommend to the City Council to approve Application No. 2021-0009, for the proposed Annexation, Prezone, and Site Plan Review along with the Conditions of Approval, and CEQA EIR Addendum.

Trevor Stearns
Contract City Planner
Community Development Department

Fernando Santillan
City Manager

Attachments

1. Assessor's Parcel and Location Map
2. Annexation Map and Legal Description
3. Prezone Map
4. Original 2006-008 Site Plan
5. Proposed 2021-0009 Site Plan Modification
6. Resolution recommending Annexation, Pre-zone, and SPR conditions of approval
7. Selma Grove EIR CEQA Addendum
8. Public Hearing Notice
9. Selma Grove Traffic Impact Assessment
10. Selma Grove Traffic Count Comparison Analysis
11. CalTrans Selma Grove Comment Letter dated 8/16/2021
12. Supplemental CalTrans Selma Grove Letter dated 2/10/2023

Attachment 1

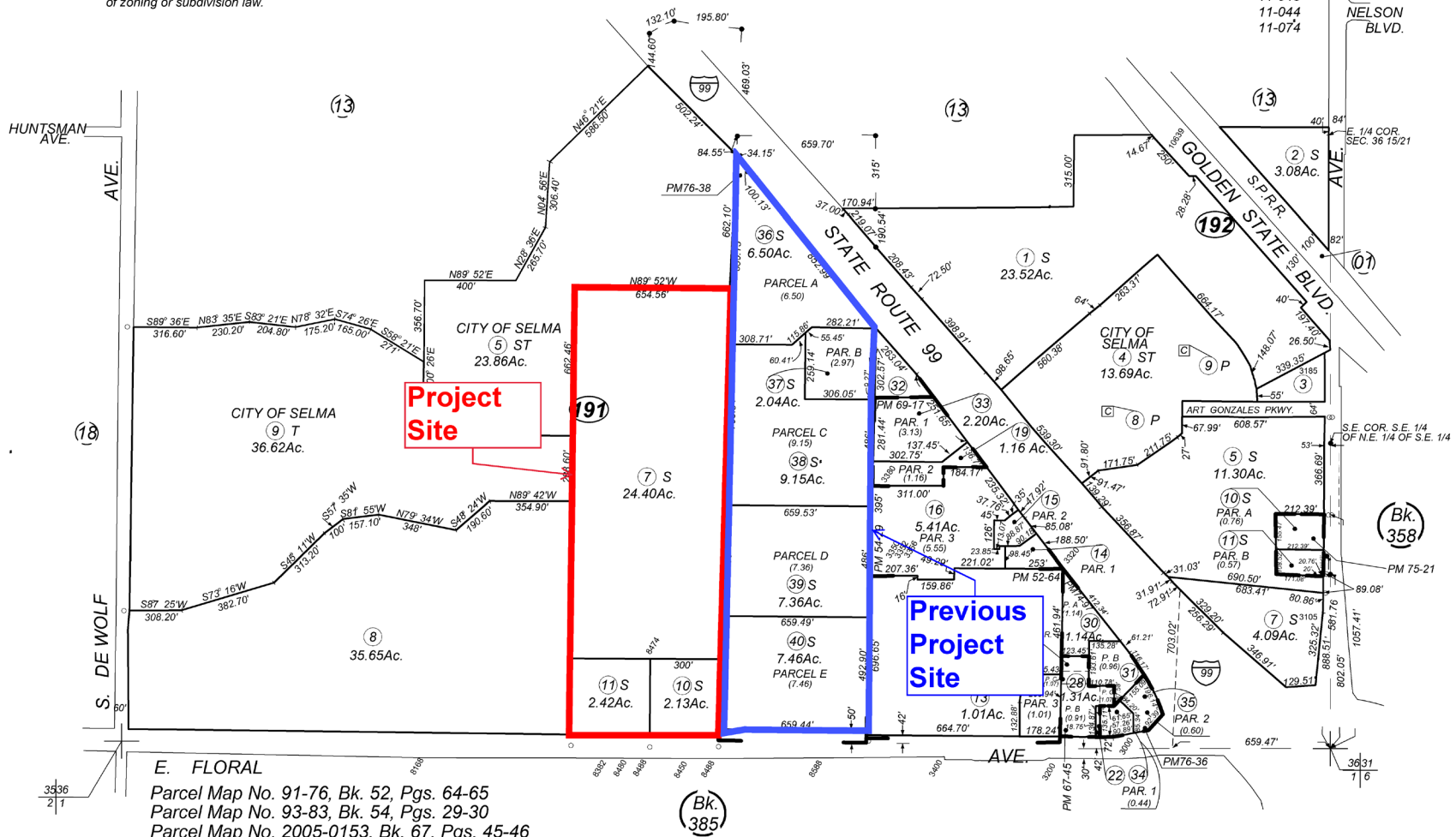
-NOTE-
This map is for Assessment purposes only.
It is not to be construed as portraying legal
ownership or divisions of land for purposes
of zoning or subdivision law.

SUBDIVIDED LAND IN POR. SEC. 36, T.15 S., R.21 E., M.D.B. & M.

Tax Rate Area
11-001 180-000
11-041
11-043
11-044
11-074

348-19

1"=400'



E. FLORAL

Parcel Map No. 91-76, Bk. 52, Pgs. 64-65
Parcel Map No. 93-83, Bk. 54, Pgs. 29-30
Parcel Map No. 2005-0153, Bk. 67, Pgs. 45-46
Parcel Map No. 2008-0051, Bk. 69, Pgs. 17-18
Parcel Map No. 2018-18, Bk. 74, Pg. 97
Parcel Map No. 2017-22, Bk. 75, Pgs. 21-22

Parcel Map No. 2018-28, Bk. 76, Pgs. 36-37
Parcel Map No. 2020-0006, Bk. 76, Pgs. 38-39

Note - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles

Assessor's Map Bk.348 - Pg.19
County of Fresno, Calif.

12/16/2020

Assessor's Parcel and Location Map

Attachment 2

EXHIBIT "A"

DEWOLF-FLORAL REORGANIZATION

Contains 66.28 Acres, more or less

October 10, 2014

Area to be detached from the Mid Valley Fire Protection District, the Consolidated Irrigation District and the Kings River Conservation District, and Annexed to the City of Selma.

All those portions of the South half of Section 36, Township 15 South, Range 21 East, and the North half of Section 1, Township 16 South, Range 21 East, Mount Diablo Base and Meridian, according to the Official United States Government Township Plat thereof, more particularly described as follows:

BEGINNING at a point on the existing line of the Limits of the City of Selma, said point being the Southeast corner of the West quarter of the Southeast quarter of said Section 36, said point being South 89°29'15" East, 1978.33 feet from the Southeast corner of said Section 36;

1) thence leaving said existing line of the City of Selma Limits, South 00°38'43" West, 30.00 feet to a point on a line 30.00 feet South of and parallel with the South line of the Southeast quarter of said Section 36;

2) thence North 89°29'15" West, 659.37 feet along said parallel line to a point on a line 30.00 feet South of and parallel with the South line of the Southwest quarter of said Section 36;

3) thence North 89°30'09" West, 659.44 feet along said parallel line to a point on the Southerly prolongation of the West line of the East half of the East half of the Southwest quarter of said Section 36;

4) thence North 00°46'43" East, 2016.66 feet along said Southerly prolongation and along said West line to the Southwest corner of the Northeast quarter of the Northeast quarter of said Southwest quarter;

5) thence South 89°23'21" East, 654.52 feet along the South line of the Northeast quarter of the Northeast quarter of said Southwest quarter to the Southeast corner of the Northeast quarter of the Northeast quarter of said Southwest quarter;

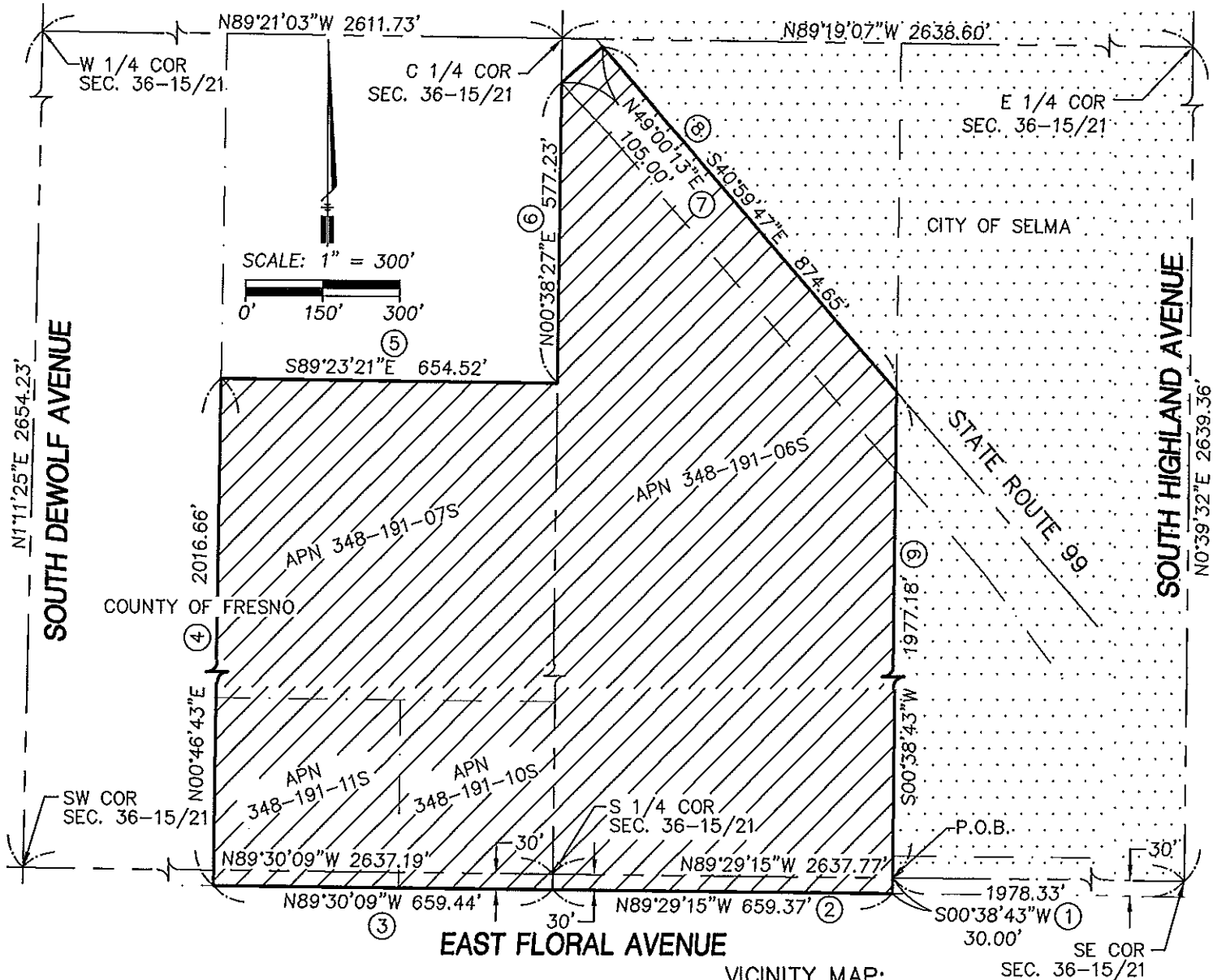
6) thence North 00°38'27" East, 577.23 feet along the East line of said Southwest quarter to a point on the Southwesterly right of way line of State Route 99, according to the map thereof recorded in Book 2 of State Highway Maps at Pages 1 through 21, Fresno County Records;

7) thence North 49°00'13" East, 105.00 feet to a point on the existing line of the Limits of the City of Selma, said point being a point on the centerline of said State Route 99;

8) thence along said existing line of the City of Selma Limits, South 40°59'47" East, 874.65 feet along said centerline of State Route 99 to a point on the East line of the West quarter of the Southeast quarter of said Section 36;

9) thence continuing along said existing line of the City of Selma Limits, South 00°38'43" West, 1977.18 feet along said East line to the **POINT OF BEGINNING**.

Containing an area of 66.28 acres, more or less.



RES. NO. _____ ADOPTED: _____

Ref. & Rev.

EXHIBIT "B"

EXHIBIT "B"
DEWOLF-FLORAL REORGANIZATION
 PROPOSED ANNEXATION TO THE CITY OF SELMA

PREPARED BY

YAMABE & HORN
 ENGINEERING, INC.
 2985 N. BURL AVENUE
 (559)244-3123

FILE NO. _____

ANNEX. NO. _____

ACRES 6628 ±

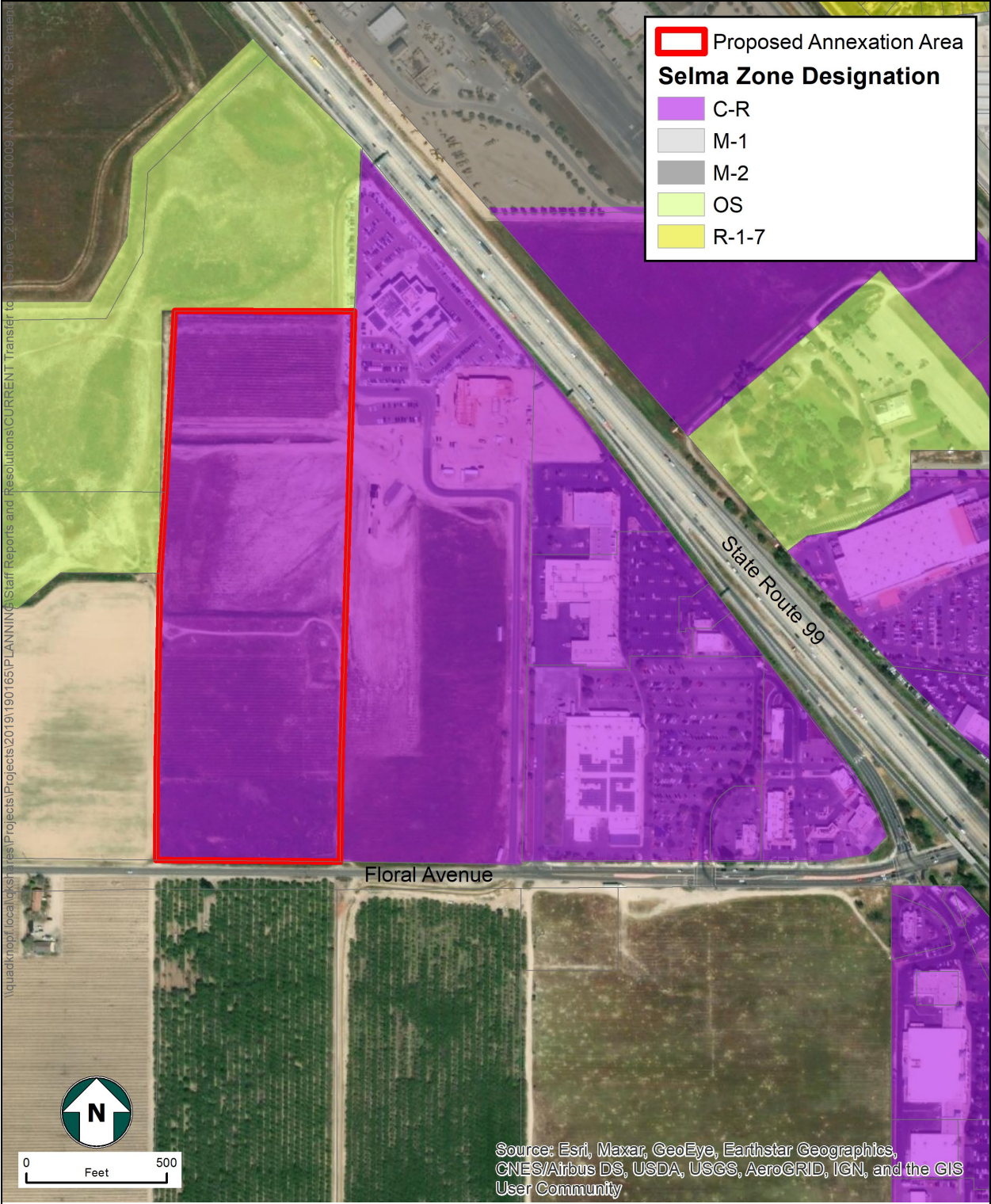
COUNCIL DIST. NO. _____

DRAWN BY JLS

CHECKED BY HDJ

DATE 10/10/14

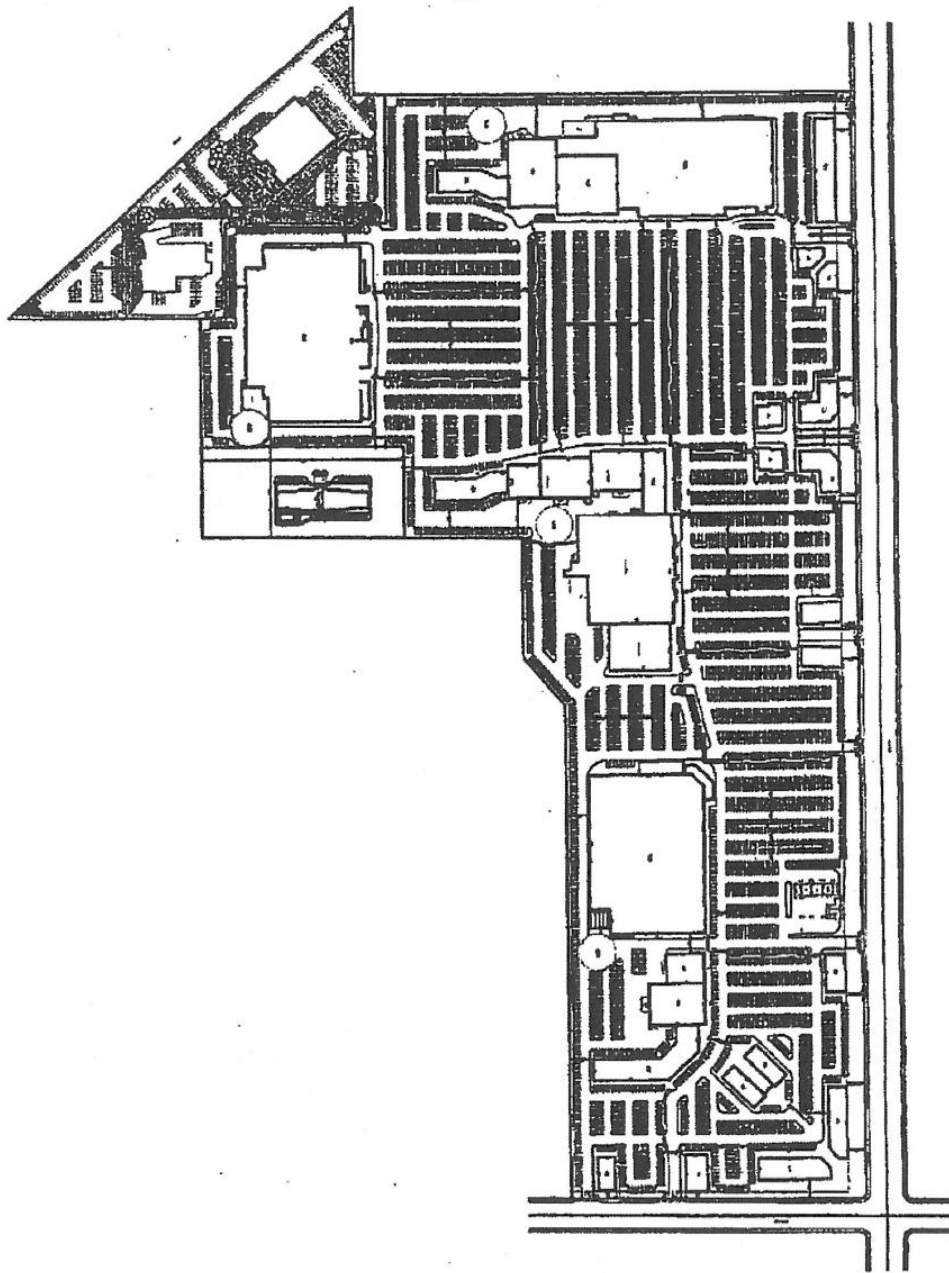
Attachment 3



Prezone Map

Attachment 4
2006-008 Original Approved Site Plan

Figure 15-2: Site Plan



SITE PLAN
Proposed Rockwell Pond Development
Selma, California

Modification of
Site Plan Review
No. 2006-08

Original Approved Site Plan

Attachment 5
2021-0009 Proposed Site Plan

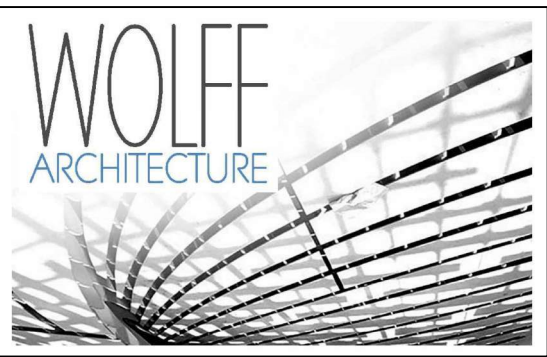


SELMA GROVE REGIONAL ENTERTAINMENT SHOPPING CENTER

Proposed tenant lease areas

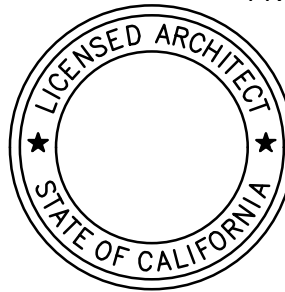
Date 07/30/2021

ANCHOR TENANTS	Area Sq.Ft.	Name	Comments
A1	Anchor Tenant 1	60,000	
A2	Anchor Tenant 2	35,000	
A3	Market	50,000	
A4	Anchor Tenant 4	40,000	
A5	Anchor Tenant 5	55,000	
Sub-Total	225,000		
MAJOR TENANTS	Area Sq.Ft.	Name	Comments
M1	Major Tenant 1	13,000	
M2	Major Tenant 2	13,000	
M3	Major Tenant 3	24,000	
M4	Major Tenant 4	15,000	
M5	Major Tenant 5	15,000	
M6	Major Tenant 6	15,000	
M7	Major Tenant 7	15,000	
M8	Major Tenant 8	25,000	
M9	Major Tenant 9	25,000	
M10	Major Tenant 10	25,000	
M11	Major Tenant 11	25,000	
M12	Major Tenant 12	10,000	
Sub-Total	220,000		
RESTAURANT	Area Sq.Ft.	Name	Comments
R1	Restaurant Tenant 1	12,000	
R2	Restaurant Tenant 2	12,000	
Sub-Total	24,000		
PAD TENANTS	Area Sq.Ft.	Name	Comments
P1	Pad Tenant 1	3,500	
P2	Pad Tenant 2	3,500	
P3	Pad Tenant 3	3,500	
Sub-Total	10,500		
SHOPS TENANTS	Area Sq.Ft.	Name	Comments
S1	Shop Tenant 1	11,900	
S2	Shop Tenant 2	6,800	
S3	Shop Tenant 3	10,900	
S4	Shop Tenant 4	13,000	
S5	Shop Tenant 5	6,000	
S7	Shop Tenant 7	7,500	
S8	Shop Tenant 8	6,300	
S9	Shop Tenant 9	12,600	
Sub-Total	75,000		
Grand Total Area	334,500		



WOLFF ARCHITECTURE
829 S. LAKE STREET
LOS ANGELES, CA 90057
T. 213.215.05630
Andrew@WolffArch.com
WWW.WOLFFARCH.COM

PROFESSIONAL STAMP(S):



PROJECT CONSULTANTS:



CLIENT/ OWNER:

TUTELIAN COMPANY
1401 FULTON STREET
SUITE 210
FRESNO, CA 93721

PROJECT TITLE:

SELMA GROVE
REGIONAL
ENTERTAINMENT &
SHOPPING CENTER
SELMA, CA

NOT FOR
CONSTRUCTION

REVISION HISTORY:

TITLE: DATE:

#/1#/2021

PAGE SCALE: NS

CURRENT ISSUE DATE: 04.30.2021

WOLFF #: 200501 DRAWING TITLE:

SITE PLAN

A0.01

RESOLUTION NO. 2023-__

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF SELMA, CALIFORNIA FINDING ANNEXATION NO. 2021-0009 FOR APPROXIMATELY 29 ACRES CONSISTENT WITH THE GENERAL PLAN AND RECOMMENDING PREZONING TO REGIONAL COMMERCIAL (CR) ALONG WITH MODIFICATIONS TO THE SITE PLAN TO ALLOW FOR A REGIONAL COMMERCIAL DEVELOPMENT LOCATED NORTH OF FLORAL AVE, EAST OF DEWOLF, AND WEST OF STATE ROUTE 99 INTO THE CITY OF SELMA

WHEREAS, on September 14, 2021, Cliff Tutelian (“Applicant”) filed an application requesting annexation of approximately 29 acres located north of Floral Avenue, east of DeWolf Avenue, and west of State Route 99 (APN: 348-19-7s, -10s, and 11s, -32, -36s-40s) (“Property”) into the City of Selma, Application No. 2021-0009 to prezone the Property as CR and amend an existing Site Plan (Site Plan Review No. 2006-0008 (“Application” or “Project”)); and,

WHEREAS, the Property is currently vacant/undeveloped, and the Applicant intends to develop the entire revised Project site (approx. 63-acre); and,

WHEREAS, the Project is located within the City of Selma’s Sphere of Influence and is adjacent to existing development, and is contiguous to the existing City limits, and therefore, annexation is appropriate to promote orderly urban development and growth; and,

WHEREAS, the Project is consistent with the General Plan, essential services can be provided, and the Project does not conflict with the established goals and objectives of the Land Use Element; and,

WHEREAS, the Land Use Element of the General Plan designates the Property for Regional Commercial Development which permits commercial development, pursuant to the Selma Municipal Code; and,

WHEREAS, the development will have vehicular and pedestrian access from Floral Avenue; and,

WHEREAS, the project was reviewed under the Environmental Impact Report (EIR) for the Rockwell Pond Commercial Project (SCH 2007061098) and attached Addendum; and,

WHEREAS, notice of the Planning Commission’s February 13, 2023, public hearing for the Project was published in *The Selma Enterprise* on February 1, 2023, in compliance with the City’s Code and Government Code Section 65091; and,

WHEREAS, notice of the Planning Commission’s February 13, 2023, public hearing on the Project was also mailed to property owners within 300 feet of the Property on February 1, 2023; and,

WHEREAS, Planning Commission, at its October 24, 2022 meeting, continued the public hearing on the Project until its regularly scheduled meeting held on November 28, 2022; and,

WHEREAS, Planning Commission, at its November 28, 2022 meeting, continued the public hearing on the Project until its regularly scheduled meeting held on November 28, 2022; and,

WHEREAS, Planning Commission, at its January 23, 2023 meeting, continued the public hearing on the Project until to a special Planning Commission meeting held on February 13, 2023; and,

WHEREAS, on February 13, 2022, the Planning Commission of the City of Selma conducted a duly noticed public hearing on the Project, and considered all testimony written and oral presented during the public hearing, as well as the facts detailed in the Updated November 28 staff report, which is hereby incorporated by reference; and,

WHEREAS, the Planning Commission deliberated and hereby is able to make the required findings and recommendations for this Project.

NOW THEREFORE, it is hereby found, determined and resolved by the Planning Commission of the City of Selma as follows:

SECTION 1. The Planning Commission finds that all of the facts set forth in the Recitals of this Resolution are true and correct and are incorporated herein by reference.

SECTION 2. All necessary public meetings and opportunities for public testimony and comment have been conducted in compliance with State Law and the Municipal Code of the City of Selma.

SECTION 3. That the Project is hereby recommended for approval subject to all statutes, regulations, and ordinances subject to the Conditions of Approval included as Exhibit A of Attachment 6.

SECTION 4. Upon independent review and consideration of all pertinent written information contained in the Staff Report and reflecting independent judgment and analysis, the Planning Commission hereby finds and determines that the proposed project, No. 2021-0009, was reviewed under the EIR for the Rockwell Pond Commercial Project (SCH 2007061098) and attached Addendum, in accordance with the California Environmental Quality Act Guidelines.

SECTION 5. Based upon substantial evidence presented to the Planning Commission during the February 13, 2023 public hearing, including public testimony and written and oral staff reports, the Planning Commission finds the annexation to be consistent with the General Plan, and recommends approval of the rezoning of the property to Regional Commercial (CR) with approval of the amended site plan of the property, approval of the Addendum to the Final EIR for the project (including the proposed modifications of the previously adopted Mitigation Measures recommended by the Addendum) and recommends forwarding said project to the Fresno Local Agency Formation Commission for consideration.

PASSED, APPROVED AND ADOPTED by the Planning Commission of the City of Selma at a special meeting held on February 13, 2023, by the following vote:

AYES: COMMISSIONER:

NOES: COMMISSIONER:

ABSTAIN: COMMISSIONER:

ABSENT: COMMISSIONER:

CHAIRPERSON OF
THE SELMA PLANNING COMMISSION

ATTEST:

Fernando Santillan, Secretary, Selma Planning Commission

CITY OF SELMA
CONDITIONS OF APPROVAL
Application 2021-0009
Proposed Selma Grove Commercial Development

The proposed project is an amendment to an approved site plan (Site Plan Review No. 2006-008) that reduces the overall total acreage of the Project and the total square footage of development from what was previously proposed. As proposed, the ultimate buildout of the Project would be reduced from approximately 94 acres to 65 acre (including approx. 36 acres from the previous annexation in 2016). The total square footage of the development would be effectively reduced from 973,100 square feet to approximately 620,000 square feet in addition to the 102-room hotel. The modified project proposes approximately 570,000 square feet of new retail businesses. Related to the reductions in size and square footage, the Project as modified would also entail some reconfiguration of the layout of development within the project site. In addition, the project proposes an annexation and prezone.

The entire site plan development is subject to the conditions outlined herein.

Failure to comply with these conditions of approval shall be grounds for revocation of this Site Plan approval and all other entitlements.

All final inspections to ensure compliance with the conditions shall be conducted prior to the issuance of a Certificate of Occupancy.

CONDITIONS:

Planning Division

1. The approval shall expire automatically within one (1) year on February 13, 2023 unless improvements have commenced. The site plan improvements shall be considered to have commenced when building permits are issued and 10% of the above ground construction has been completed. An extension of one (1) year may be granted by the Community Development Department.
2. The project shall be developed as shown on the Site Plan dated April 30, 2021, Floor Plans and Elevations including all notes as approved by the Community Development Department. Minor changes to the approved site plan that do not affect the intent or major design considerations may be approved administratively by the Community Development Department.
3. Developer shall comply with the Mitigation Monitoring and Reporting Program of the Rockwell Pond Commercial Project Final EIR and incorporated Addendum.
4. The applicant shall sign the "Acknowledgement and Acceptance of Conditions" form prior to issuance of the building permits.

5. Approval of this site plan does not exempt the project from compliance with all applicable sections of the Zoning Ordinance, Engineering, Public Works Improvement Standards and other City Ordinances or the payment of any fees.
6. The Developer or successor in interest shall be responsible for all actions of his contractors and subcontractors during the course of any work occurring on the site.
7. All construction debris must be removed from the site prior to opening the business to the public.
8. The Developer or successor in interest shall designate, in writing before starting work, an authorized representative who shall have complete authority to represent and to act for the Developer. Said authorized representative or his designee shall be present at the site of the work at all times while work is actually in progress on the development. During periods when work is suspended, arrangements acceptable to the City Building Official shall be made for any emergency work, which may be required.

Screening:

9. All roof-mounted mechanical equipment and any satellite dish shall be screened from ground-level view from the property lines by a parapet wall or shall be placed in equipment wells so that the equipment is not visible from the street.
10. The backflow device and/or electrical transformers must be screened with landscaping pursuant to Document No. 063422 Landscape Screen for Pad-Mounted Transformer (PG & E Electric and Gas Service Requirements – Green Book). The proposed screening shall be submitted and approved by the Community Development Department prior to the issuance of building permits. No above-ground transformer is permitted on the required sidewalk within the public right-of-way.
11. Downspouts shall not be highly visible. All pipes, gutters, and chases attached to the building wall shall be painted a similar or complementary color to the existing wall that the item is attached to.
12. All electrical boxes, control boxes, and other equipment boxes (excluding traffic control) located along the project's street frontage shall be painted consistent with the building's colors. Prior to painting, the boxes are to be treated with an etching primer (zinc chromate) or equivalent.

Signage:

13. All signage (including on-building, freestanding, and freeway signage) must be reviewed with a separate sign permit.

Architecture:

14. All exterior architectural elements not submitted must be reviewed and approved by the Community Development Department prior to issuance of the Building Permit. Details on the plans must be finished in a style and in materials which are in harmony with the approved exterior of the building.
15. The Developer shall maintain in good repair all building exterior walls, awnings, lighting, trash enclosure, drainage facilities, driveways and parking areas. The premises shall be kept clean and any graffiti painted on the property shall be reported to the Police Department and removed by the property owner within 72 hours of occurrence.
16. Outside storage and/or equipment enclosures are not permitted.
17. No surface shall be mirrored so as to cause glare and annoyance to other adjacent properties.

Lighting:

18. An on-site exterior lighting plan shall be reviewed and approved by the Selma Police Department and Community Development Department.
19. Lighting elements shall be recessed into their fixtures to prevent glare. Exterior lighting shall be designed so as to have a sharp cut-off feature near property lines and not to illuminate adjacent properties. On-site light standards shall not exceed twenty feet (20') in height.
20. Perimeter lighting shall include illumination of parking areas, loading areas, and driveways.

Landscaping:

21. The applicant shall submit a landscape plan for all landscaped areas at time of building permit submittal. The landscape plan shall be compliant with MWEL0, including but not limited to the following conditions:
 - a. Plan shall include square footages of landscaped area shown and water use calculations.
 - b. Turf shall be limited to no more than 25% of total landscape area.
 - c. No turf shall be permitted in any landscape area less than eight feet (8') in width.
 - d. The landscape plans shall include a regular maintenance schedule, per the Zoning Ordinance.
 - e. Water use classifications shall be based on WUCOLS IV.

22. Landscaping shall be maintained in a healthy, weed-free condition at all times and shall be designed with efficient irrigation practices to reduce runoff, promote surface filtration, and minimize the use of fertilizers and pesticides, which can contribute to runoff pollution. The owner's representative shall inspect the landscaping on a monthly basis and any dead or dying plants and trees shall be replaced within ten days of the inspection.
23. The irrigation system must be developed with the water conservation standards. The irrigation system must be maintained in an operational condition, including replacement of missing or damaged sprinkler heads and timing equipment is to be set in accordance with City watering policies. All landscaping and irrigation systems must be installed according to the approved landscape plans before the final certificate of occupancy issuance.
24. All future improvements and modifications to the grounds and the structures must be reviewed and approved by the Community Development Department prior to the commencement of these changes. Minor changes to the approved site plan that do not affect the intent or major design considerations may be approved administratively by the Community Development Director or designee.

Building Division:

25. The Developer or successor in interest shall comply with all applicable requirements and sections of the most recent State adopted Uniform Codes and regulations as required.
26. The Developer or successor in interest shall provide all necessary construction and building plans for review and approval by the Building Official and pay all required building fees. All required building permits and inspections shall be obtained prior to the issuance of a Certificate of Occupancy and commencement of operations.
27. Specific measures shall be incorporated into the building design to reduce energy consumption and indirect area source emissions. These measures must include the use of motion sensitive lighting fixtures, solar or low-emission water heaters, low flow water usage fixtures and building orientation to take advantage of solar heating and natural cooling.
28. No building or structure shall be used or occupied, and no future change in the occupancy classification of building or structure or portion thereof shall be made until the Building Official has issued a Certificate of Occupancy or Temporary Certificate of Occupancy.

Engineering Division:

29. Drainage, grading, on-site and utility improvements shall be in accordance with plans reviewed and approved by the City Engineer. The Developer or successor in interest shall be responsible for the preparation of plans. The Developer shall provide preliminary soils report and pay for compaction tests. A copy of the final soils report and compaction test results shall be provided to the Selma Engineering Division. The Developer shall construct storm drainage facilities on, adjacent to and as deemed necessary by the City Engineer to service the project site, and any future development on the property.
30. The Developer or successor in interest shall submit to the City Engineer, a set of construction plans on 24" x 36" sheets with City standard title block for all required improvements (the Improvement Plans'). The Improvement Plans shall be prepared by a registered civil engineer, and shall include a site grading and drainage plan and an overall site utility plan showing locations and sizes of sewer, water, irrigation, and storm drain mains, laterals, manholes, meters, valves, hydrants, other facilities, etc. These plans shall include a revised site plan with trash enclosure location, tanks, generators, per City of Selma requirements. Plan check and inspection fees per City of Selma shall be paid with the first submittal of said Improvement Plans. All Improvement Plans shall be approved by the City and all other involved agencies (SKF, Cal-Water, etc.) prior to the release of any development permits.
31. The drainage/site improvement plans for the development shall be prepared by a registered Civil Engineer for review and approval by the City Engineer prior to the issuance of permits. Storm water runoff shall be retained onsite per City of Selma Standards if there is no existing storm drain system in place.
32. Grade differentials between lots and adjacent properties shall be adequately shown on the grading plan and shall be treated in a manner in conformance with City of Selma standards. A header board or retaining wall shall be installed or constructed if grade differential is greater than twelve inches (12").
33. Upon approval of Improvement Plans, the Developer or successor in interest shall provide the City with three (3) original wet-signed copies of the improvement plans for City signatures.
34. The Developer or successor in interest shall provide the current filing fee, plan check and inspection fees, and development impact fees at the rate in effect at the time of payment or have the fees payable directly to the City through a separate escrow account. All fees are payable prior to issuance of building permits, unless approved otherwise by the City Engineer
35. Right-of-way and complete street improvements along frontage streets will be required. The Developer or successor in interest shall provide geometric

approval drawings for review and approval by the City Engineer prior to design of street improvements.

36. The design and construction of all off-site improvements shall be in accordance with City of Selma standards and construction specifications. The Developer or successor in interest shall be responsible for obtaining encroachment permits from the City of Selma for all work performed within the City's right-of-way and shall furnish to the City acceptable security to guarantee the construction of the off-site street improvements pursuant to determination by the City Engineer.
37. No above ground transformer is permitted on the required sidewalk within the public right-of-way.
38. Contractor shall verify all conditions in the field prior to commencing construction.
39. All existing overhead and new utility facilities located on-site, or within the street rights-of-way adjacent to this project site shall be undergrounded.
40. All underground public utilities installed under streets shall be installed, backfilled, compacted, tested and approved by the Engineer prior to placement of any aggregate base or asphalt concrete surfacing. Easements for utilities, including water, gas, telephone, electricity, sewage, pedestrian access, fire access, storm drainage, and irrigation facilities shall be provided, as required.
41. The Developer or successor in interest shall comply with the requirements of the Pacific, Gas and Electric Company (P.G. & E.). PG&E plans shall be submitted to the City Engineer for review prior to approval.
42. All new easements for public utilities shall be recorded, as necessary, prior to the issuance of the building permits for the proposed buildings. No portion of the buildings shall be located in a public utility easement. All easements of record shall be accurately plotted on the improvement plans clearly depicting the relationship of easements to proposed improvements.
43. All circulation areas on the site shall be paved with asphalt concrete to the satisfaction of the City Engineer. A Soils report shall be submitted that includes pavement sections.
44. All public and private improvements consisting of storm water systems, street medians, concrete curbs, gutters, sidewalks, wheelchair ramps, streetlights, site grading, striping and markings, signage, and pavement surfacing, and all other improvements shall be installed in accordance with City of Selma construction standards and specifications currently in effect and as approved by the City

Engineer. All sewer systems shall be approved by SKF and all water systems shall be approved by Cal-Water and approved plans submitted to the City Engineer.

45. The Developer or successor in interest shall install streetlights on metal poles to City of Selma and PG&E standards at the locations designated by the City Engineer. Street light locations shall be shown on the utility plans submitted for approval. Proof of PG&E approval shall be provided.
46. The design and details for the type and style of any block walls or fences shall be submitted to the Community Development Department and the City Engineer for review and approval prior to the issuance of building permits.
47. The Developer or successor in interest shall not install any fences, temporary or permanent, in the public right-of-way.
48. Within twenty (20) calendar days after all improvements have been constructed and accepted by the City, the Developer or successor in interest shall submit to the City of Selma Engineering Division two (2) copies of the approved set of construction plans revised to reflect all field revisions and marked "AS-BUILT" for review and approval.
49. Upon approval of the "AS-BUILTS" by the City, the Developer or successor in interest shall provide (1) full size copy and one digital copy of the "AS-BUILTS" to the City.
50. The Developer or successor in interest shall provide the City with original improvement plans and Auto CAD files of the Maps, improvement plans, and all drawings prepared in Auto CAD.
51. The Developer or successor in interest must comply with the City of Selma Engineering/Public Works Standards and Specification requirements. Any deviation from said standards and specifications must be approved by the City Engineer prior to construction.
52. The Developer or successor in interest shall require the surveyor/civil engineer for the development to notify, in writing, the City Engineer of any existing section corner, property corner or reference monuments damaged by the construction of improvements performed as part of the development. The applicant shall have all such monuments reset to the satisfaction of the City Engineer. A licensed land surveyor or civil engineer licensed to perform land surveying shall certify the placement of all required monumentation prior to final acceptance. Brass caps are required for installation of new monuments or replacement of prior installation. Within five days after the final setting or replacement of all monuments has been completed, the engineer or surveyor shall give written notice to the City Engineer certifying that the final monuments have been set

and that he has filed with the County Recorder all appropriate records of survey or corner records.

53. A Storm Water Pollution Prevention Plan will be required prior to approval of the grading plan.
54. The Developer or successor in interest shall contact the Regional Water Quality Board and comply with all requirements, pay all applicable fees required, obtain any required NPDES permit and implement Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology to reduce or eliminated storm water pollution during construction.
55. During construction, Developer or successor in interest is responsible to maintain a dust control program to prevent air pollution as well as discomfort or damage to adjacent and surrounding properties.
56. The Developer or successor in interest is responsible for pulling all permits and shall follow all rules, regulations and requirements of the San Joaquin Valley Air Pollution Control District for dust and emission reduction.
57. If the project site is outside the limits of the Cal-Water service area, a private well will be necessary to serve the project site for domestic water. This constitutes a public water system classified as a Transient Noncommunity Water System, which requires permitting by the California Department of Public Health, County of Fresno and or Division of Drinking Water. The Applicant shall submit a permit application, technical report, and application fee to the California Department of Public Health prior to construction of the proposed water system or provide documentation that a permit is already in place. The Applicant shall also demonstrate to the Department of Public Health and /or Division of Drinking Water that the well proposed to provide drinking water that meet drinking water standards.
58. All new wells shall also be approved and be constructed per the requirements of the Central Kings Groundwater Sustainability Plan (SKGSP).
59. This development shall comply with the California Code of Regulations Title 24 Fire Code. Fire system plans shall be submitted to the Fire Marshal for review and approval.
60. The Developer or successor in interest may be required to obtain an Underground Storage Tank Removal Permit from the Fresno County Department of Public Health, environmental Health Division, should any underground storage tank(s) be found during the project.
61. Prior to commencement of work, any existing wells that are not intended for use by the project shall be properly destroyed under permit(s) from the Fresno

County Department of Public Health, Environmental Health Division; and prior to destruction of any agricultural wells, a sample of the upper most fluid in the well column shall be sampled for lubricating oil, and any such oil found shall be removed from the well prior to placement of fill material for destruction and be handled in accordance with federal, state and local government requirements.

62. The Developer or successor in interest shall verify all existing improvements, along the frontage of the project, meets the American with Disabilities Act (ADA) requirements. Any existing improvements missing or not in compliance with current ADA requirements shall be replaced as necessary per current City and ADA standards.
63. The Developer or successor in interest shall submit a preliminary title report for the subject property.
64. The Developer or successor in interest shall submit a geotechnical soils report for the subject property.
65. All offsite and onsite sewer plans shall be submitted to Selma-Kingsburg-Fowler Sanitation District (SKF) and approved prior to the City of Selma approving the improvement plans. Applicant shall provide the City of Selma with a "Will Serve" letter from SKF indicating that they have capacity to serve the proposed development.
66. All offsite and onsite water plans shall be submitted to Cal-Water and approved prior to the City of Selma approving the improvement plans. Applicant shall provide the City of Selma with a "Will Serve" letter from SKF indicating that they have capacity to serve the proposed development.
67. All damage to existing curb, gutter, sidewalk and pavement along any frontage shall be replaced in kind per City of Selma standards.

Engineering Division – Site Specific Conditions

68. The proposed project shall connect to the existing sewer main as required by SKF and plans shall be submitted to SKF for review and approval and SKF approved plans shall be submitted to the City of Selma.
69. The proposed project shall connect to the existing water main as required by Cal-Water and Cal-Water approved plans shall be submitted to the City of Selma. A proposed water service(s) with water meter(s) and backflow preventer(s) shall be installed per Cal-Water specifications.
70. All site drainage shall be directed to the permanent storm drain facilities in place at Rockwell Pond.

71. All onsite parking and drive aisles shall be a minimum of 2" thick asphalt concrete pavement. A soils report shall be submitted showing pavement thicknesses.
72. All ADA path of travels shall be per California Building Code and shown on the plans.
73. All improvements along Floral Avenue shall be constructed for an arterial street that includes a median island.
74. CalTrans proposals detailed in item 93 shall be required in regard to the CalTrans Letter dated August 16, 2021 (Attachment 11) and supplemental CalTrans Letter dated February 10, 2023 (Attachment 12).
75. All requirements listed in the Traffic Impact Analysis (TIS) prepared by JLB Traffic Engineering, Inc., dated March 13, 2019 (Project No. 001-005) shall be applicable, more specifically as follows:

[NOTE: The Traffic Mitigation Measures to be imposed on the Project, as detailed in the TIS, incorporates the arrangements stated in the TIS at page 93, under the heading: Project Buildout's Equitable Fair Share of Future Transportation Improvements. (The Fair Share Principles"). In addition, all Mitigation Measures that require CalTrans approvals or cooperation assume that such approvals or cooperation will be timely and effectively provided.]

Highland Avenue / Golden State Boulevard:

1. Modify the traffic signal to implement overlap phasing of the southeast bound right-turn phase with the northbound left-turn phase.
2. Prohibit northbound to southbound U-turn improvements.
3. Increase southeast bound right turn storage length to 150' per Queue Analysis Table XXVII which will be sufficient until 2030 Plus Project Buildout.

Consistent with the Fair Share Principles, the Project's mitigation obligation is to provide the Fair Share contribution to the improvements listed in items 1 and 3 above, consistent with the EIR Addendum Mitigation Measures T-1 and T-2, as applicable and the determinations in TIS Tables XXVII and XXVIX. The requirements of item 2 shall be a Project improvement requirement.

Note regarding improvement item 3 above: For Near Term Year 2025 Plus Project Buildout, the TIA suggests modifying the northbound and southbound right-turn lanes to become through-right lanes. Further clarification on these mitigations is needed because the existing right turn "lanes" are very short NB RT and SB RT slip lanes with little storage. These slip lanes were constructed to allow for adequate right-turn movement due to the skew of the road.

DeWolf Avenue / Floral Avenue

1. Implement all-stop control.
2. Add a westbound left-turn lane.
3. Modify the westbound left-through-right lane to a through-right lane.
4. Modify the intersection to accommodate the added lane.

Note: Suggest matching the improvements for the EB approach (adding a dedicated left turn lane and modifying the left-through-right lane to a through-right). Confirm and coordinate with County of Fresno.

Consistent with the Fair Share Principles, the Project's mitigation obligation is to provide the Fair Share contribution to the improvements listed in items 2 through 4 above, consistent with the EIR Addendum Mitigation Measures T-1 and T-2, as applicable and the determinations in TIS Tables XXVII and XXVIX. The improvement requirements in item 1 shall be a Project improvement requirement.

Project Driveway 3 / Floral Avenue

1. Modify the westbound through-right lane to a through lane.
2. Add a westbound right-turn lane with 350 feet storage.
3. Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3 with 375 feet storage.
4. Add an eastbound left-turn lane with 275 feet storage.
5. Signalize the intersection with protective left-turn phasing on all approaches.
6. On an Interim basis, prohibit pedestrians across the west leg of Floral Avenue.
7. Modify the intersection to accommodate the added lanes.
8. Project Driveway 3 shall have a minimum throat of 375 feet before any vehicular openings to the adjacent parking lots.

The requirements of the above improvement items be Project improvement requirements.

State Route 99 Southbound Off-Ramp / Floral Avenue

1. Modify the southbound through lane to a through-right lane.

Note: Will need to confirm with Caltrans to implement modifying signage and existing pavement arrows.

Consistent with the Fair Share Principles, the Project's mitigation obligation is to provide the Fair Share contribution to the improvement referred to above, consistent with the EIR Addendum Mitigation Measures T-1 and T-2, as applicable and the determinations in TIS Tables XXVII and XXVIX.

State Route 99 Northbound Off-Ramp / Floral Avenue

1. Increase the storage capacity of the northbound right-turn lane to 350'. Based on currently geometrics this would essentially mean adding a dedicated right turn lane to the NB off ramp due to the added trips on the thru-left turn lane. This would likely be a Caltrans decision to implement.

Highland Avenue / Floral Avenue

Note: See TIS for improvements (Attachment 9 and 10). Highland Avenue and Floral Avenue will be highly impacted as a majority of the project trips will pass through this intersection. However, any of the above mitigations will be challenging to implement due to existing hardscape, businesses, and right-of-way constraints. Caltrans coordination will likely be required for many of the improvements.

Consistent with the Fair Share Principles, the Project's mitigation obligation is to provide the Fair Share contribution to the improvements referred to above, consistent with the EIR Addendum Mitigation Measures T-1 and T-2, as applicable and the determinations in TIS Tables XXVII and XXVIX.

Whitson Street / Floral Avenue

1. Increase the storage capacity of the eastbound left-turn lane to 125 feet. This will result in closing the raised median gap just west of the existing east bound left-turn pocket.
2. Increase the storage capacity of the westbound left-turn lane to 175 feet.

McCall Avenue / Floral Avenue

1. Increase the storage capacity of the westbound left-turn lane to 125 feet.
2. Increase the storage capacity of the westbound right-turn lane to 125 feet.
3. Increase the storage capacity of the northbound left-turn lane to 175 feet.

Highland Avenue / Rose Avenue

1. Add an eastbound left-turn lane with 150 feet storage.
2. Modify the eastbound left-through lane to a through-right lane.

3. Remove the eastbound right-turn lane.
4. Add a westbound left-turn lane with 150 feet storage.
5. Modify the westbound left-through-right lane to a through-right lane.
6. Signalize the intersection with protective left-turn phasing on all approaches.
7. Modify the intersection to accommodate the added lanes.

Fire Department:

76. An approved KnoxBox shall be installed in approved locations at a height of 6-8 feet above grade, on the right side of building entrances. The key box shall contain labeled keys to gain access into all portions of the building. Applications are available online at KnoxBox.com.
77. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 13.5 feet. South side of project allows for only 17' of access. The minimum widths and clearances shall be maintained at all times (CFC 503). Where required by the fire code official, approved signs or other approved notices or markings that include the words NO PARKING – FIRE LANE shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof.
78. Portable fire extinguishers shall be selected, installed and maintained in accordance with the California Fire Code, NFPA Standard 10 and Chapter 3, Title 19 California Code of Regulations. All fire extinguishers, including new extinguishers, shall have a current California State Fire Marshal service tag attached to the extinguisher. Fire extinguishers shall be mounted on the wall at no more than 5 feet above the floor. (Gross weight not to exceed 40 pounds.) Fire extinguisher type and placement locations shall be shown on the plans and coordinated with Selma Fire Prevention Bureau.
79. Provide exterior electrical shunt trip with break-a-way lock, so in the event of a fire, all electrical to the buildings can be shut off from the exterior. Exterior electrical main labeled as 'Main Shut Off' with 4" minimum lettering.
80. Provide addresses clearly visible from the driveway approach. Address letters minimum of 8" in height, 3/4" stroke and contrasting with background.
81. Construction documents (plans and cut sheets) and calculations for all fire protection and notification systems shall be provided in an approved format to Selma Fire Prevention Bureau (SFPB) for review. Installation or modification of

any fire protection or notification system shall be started without first receiving a permit from SFPB.

82. Plans submitted to Selma Fire Prevention Bureau shall include the governing codes used for the project, type of occupancy and construction. Provide a "Fire Protection" page in your general construction plans that include a depiction of all fire protection systems applicable to the project. Please include project notes indicating any applicable requirements that are not included on the page. List any submittals to be deferred in the project notes, such as; fire sprinklers, fire alarms, fire pumps, underground water supply, kitchen hood suppression systems, etc.

Police Department:

83. The Developer or successor in interest shall provide security cameras on the site with the design specifications and placement location approved by the Selma Police Department. The Developer or successor in interest shall provide additional storage capacity in the amount of one Terabyte for data to be stored that is generated by the project.
84. In addition to the review of the on-site exterior lighting plan, potential access to the roof, anti-graffiti measures and required on-site enforcement signage shall be reviewed and approved by the Selma Police Department and Community Development Department.

Selma Unified School District

85. Developer or successor in interest must contact Selma Unified School District and pay all applicable fees if any at the time of building permit issuance.

Solid Waste Disposal and Recycling

86. Refuse/trash/recycling enclosures shall be provided in locations shown on the site plan in accordance with the City standards listed and detailed in the City of Selma Commercial and Industrial Development Manual. The enclosure is to be architecturally compatible with the approved buildings and approved by the Community Development Department. The refuse enclosure gates must be kept closed and remain closed unless in use.
87. The proposed development on the site shall participate in the City's recycling program and shall locate recycling bins within the proposed enclosures.

88. Nothing other than the City refuse/recycling bins shall be stored or kept in said enclosures. The Developer or successor in interest shall provide additional enclosure space if on-site enclosures are determined to be insufficient. Additional enclosure locations shall be reviewed and approved by the Community Development Department.
89. The Developer or successor in interest shall contract with the city of Selma's Disposal and Recycling service provider for solid waste disposal service.
90. Minor changes to the approved trash/recycling enclosure locations that do not affect the intent or major design considerations may be approved administratively by the Community Development Department.

Consolidated Mosquito Abatement District

91. The Developer or successor in interest shall refer to the Consolidated Mosquito Abatement District suggested rules and mitigation measures to reduce the incidence of mosquito.

San Joaquin Valley Unified Air Pollution Control District

92. The Developer or successor in interest shall comply with all District rules, regulations and mitigation measures to reduce pollutants.

Caltrans

93. The Developer or successor of interest shall comply with the following requirements recommended by the State of California Department of Transportation (CalTrans) as described in the attached letter dated August 16, 2021 (Attachment 11) and supplemental CalTrans Letter dated February 10, 2023 (Attachment 12), where there is a conflict between both letters, the supplemental letter dated February 10, 2023 applies. The proposed project shall be responsible for the Fair Share contributions to the proposed improvements, consistent with the analysis of updated Project Traffic Impact Analysis, as detailed in Mitigation Measure T-1 of the EIR Addendum and as detailed in item 94.
94. The Developer or successor in interest shall be responsible for their fair share contributions to the proposed improvements recommended by the State of California Department of Transportation (CalTrans) in the attached letters and mentioned below (Attachment 11 and supplemental letter Attachment 12). The developer or successor in interest shall be responsible for their fair share contributions consistent with the analysis of the updated Project Traffic Impact Analysis Mitigation Measure MM T-1 and CalTrans recommendations regarding

the improvements detailed in Items 2 and 3 of Attachment 11 and further clarified in Attachment 12. The specific improvements are outlined as follows:

- Provide dual eastbound left turn lanes within the existing geometric constraints at the Floral and Highland Avenue intersection.
- Any related intersection widening, signal relocation/modification and reconstruction of the existing raised median island if needed due to the above-mentioned improvement.
- Eliminate the Floral Avenue and State Route 99 Southbound off-ramp intersection crosswalk at the west leg of the intersection and construct a paved pedestrian walking path along the south side of Floral Avenue from the aforementioned intersection to the Floral Avenue and WalMart Driveway intersection.

The timing in which these improvements must be constructed shall be no later than when 75% of total development is completed (measured by Square footage). Improvements constructed by the developer described above shall also be subject to a reimbursement agreement with CalTrans to the extent the costs of such improvements exceed the developer's fair share contribution requirements.

County of Fresno Human Health System - Environmental Health

95. All construction equipment must be maintained according to the manufacturers' specifications, and noise generating construction equipment must be equipped with mufflers. Noise-generation construction activities shall be limited to daytime hours as specified in the City's Municipal Code.
96. All construction materials deemed hazardous as identified in any demolition process must be characterized and disposed of in accordance with current federal, State, and local requirements.

California Regional Water Quality Control Board

97. The Developer or successor in interest is required to comply with the State of California Water Resource Control Board requirements specifically related to the National Pollution Elimination System permit process.

Cal Water

98. The 12" water main will need to be extended west along Floral Ave to the end of the property. There are two options that can be considered:
 1. Cal Water can provide large water services in the right-of-way along Floral Ave to where the owner can install their onsite plumbing and connect to our water service.

2. Cal Water can run water main onsite and install water services to individual buildings but this would require the owner to provide Cal Water with the necessary easements since the water main they would be installed on private property, versus installed in the City right-of-way. There would be no reimbursement for any infrastructure installed on private property.

99. All domestic, irrigation, and fire services will require backflow devices. When the owner is ready to start the water process, call Stuart Skoglund, Operations Manager at California Water Service (559) 896-3417.

SKF Sanitation District

100. Complete and submit a commercial sewer connection application prior to the issuance of the sewer connection permit.
101. Provide a final set of detailed floor and plumbing plans for sewer evaluation (electronic format only).
102. Install sewer service later cleanout w/boxes at the property line as required.
103. Install grease traps as required.
104. Applicant to pay for the sewer connection permit prior to issuance of the building permit.
105. Call SKF for an inspection for all sewer installation. (48-hour notice required)
106. Buildings shall be metered separately from the landscaping, if applicable.
107. Modifications to the building, plumbing or occupant usage will require a re-evaluation of the sewer connection permit. Connection to the sewer collection system shall be in accordance with the City and District's Standards.

City Attorney - Defense and Indemnification Provisions:

108. The City shall not be liable to the Developer/successor in interest or to any other person, firm, or corporation whatsoever, for any injury or damage that may result to any person or property by or from any cause whatsoever in, on, or about the project of said land covered by this Agreement, or any part thereof. The preceding sentence shall not apply to any liability, loss, cost of damages caused solely by the negligence (active or passive) or willful misconduct of the City or its agents.
109. The Developer/successor in interest hereby releases and agrees to indemnify and hold the City, and its officers, agents, employees and volunteers harmless

from and against any and all injuries to and deaths of persons or injuries to property, and all claims, demands, costs, loss, damage and liability, howsoever the same may be caused and whensoever the same may appear, resulting directly or indirectly from the performance or nonperformance of any or all work to be done in said project including but not limited to the street lights of way in said Project and upon the premises adjacent thereto pursuant to this Agreement, and also from any and all injuries to and deaths of persons and injuries to property or other interests, and all claims, demands, costs, loss, damage, and liability, howsoever same may be caused and whensoever same may appear, either directly or indirectly made or suffered by the Developer/successor in interest, the Developer's agents, employees, and subcontractors, while engaged in the performance of said work. The preceding sentence shall not apply to any liability, loss, cost, damage and liability caused solely by the negligence (active or passive) or willful misconduct of the City or its agents.

Acknowledgement and Acceptance of Conditions

ACKNOWLEDGEMENT AND ACCEPTANCE OF CONDITIONS
Project Applications 2021-0009
Proposed Selma Grove Commercial Development

I, _____, developer(s) of Site Plan 2021-0009 listed above, hereby state, that I have read, understand and accept Conditions of Approval numbered 1 through 109 and do, hereby, agree to abide by said conditions.

Our signature below certifies that we are fully aware that all conditions shall be fully complied with prior to issuance of any applicable licenses and/or permits unless other arrangements have been made in writing with the Community Development Department, City Engineer and/or Building Official.

APPLICANT/OWNER/DEVELOPER SIGNATURE:

TITLE: _____

COMPANY: _____

COMMUNITY DEVELOPMENT DIRECTOR/STAFF

DATE

Attachment 7

Addendum
to the
Environmental Impact Report
for the
City of Selma
Selma Grove Project
(formerly Rockwell Pond Commercial Project)
(State Clearinghouse No. 2007061098)

Prepared for:

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June 2022

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SECTION 1

Introduction

1.1 OVERVIEW

This document is an Addendum to the certified Environmental Impact Report (EIR) prepared by the City of Selma (City) for the Selma Grove Project (approved Project), formerly known as the Rockwell Pond Commercial Project, State Clearinghouse No. 2007016098. The Addendum has been prepared in order to determine whether modifications proposed for the Project would result in an increase in the severity of the impacts identified in the Project EIR or any new impacts not previously considered in the Project EIR.

On February 1, 2010, the City of Selma certified a Final EIR and approved the Rockwell Pond Commercial Project – a commercial center encompassing 94 acres with 973,100 square feet of development plus a 102-room hotel site. The certified EIR included mitigation measures to avoid and/or reduce environmental impacts resulting from the approved Project. The certified EIR also determined that, despite the incorporation of mitigation measures, the approved Project would result in significant and unavoidable effects on Agricultural Resources, Air Quality and Greenhouse Gas Emissions, and Traffic. At the time the EIR was certified, a General Plan Amendment, pre-zoning, and site plan (City of Selma Site Plan 2006-008) were also approved, but no further action toward developing the Project occurred at that time.

The approved Project was subsequently renamed the Selma Grove Project. In May 2016, the City approved Minor Modification 2007-0148 to Site Plan 2006-008 and subsequent environmental review (Mitigated Negative Declaration) to adopt a revised phasing for development of Site Plan 2006-008. This Project delineated 48,693 square feet of retail space intended for a car dealership, as well as a proposed 102-room hotel and an additional 317,300 square feet of retail uses on approximately 35.88 acres of land, which were subsequently annexed to the City.

The developer of Site Plan 2006-008 is now seeking to change the approved Project to reduce the ultimate buildout evaluated in the previously certified EIR to include a new total of 62.9 acres (including the 35.88 acres annexed) and reduce the square footage of development to a total of 619,093 square feet (which includes the existing 48,693 square-foot car dealership, 515,400 square feet of retail land uses, and a 55,000 square foot movie theater) plus a 102-room hotel. (See Section 2 for a more detailed project description.) Additionally, the reduced-sized buildout would entail modifications to the mitigation measures for traffic impacts, which are based on a Traffic Impact Analysis prepared for the modified Project.

This Addendum EIR determines, based on substantial evidence, that minor changes or clarifications to the EIR are necessary but none of the conditions requiring the preparation of the subsequent or supplemental EIR are applicable. This Addendum also shows that, based on changes in the modified Project and circumstances in which the modified Project will be developed, revisions to the previously adopted traffic impact mitigation measures are appropriate to address the traffic conditions resulting from the changes in the Project and the circumstances of its development.

1.2 CEQA GUIDELINES AUTHORITY AND PROCEDURES FOR ADDENDUM

Under Section 15164(a) of the State CEQA Guidelines, an addendum to a previously certified EIR shall be prepared by a lead or responsible agency if changes or additions to the EIR are necessary but none of the conditions described in Section 15162 requiring the preparation of a subsequent or supplemental EIR are applicable.

Section 15162 of the State CEQA Guidelines states that, for a project covered by a certified EIR, preparation of a subsequent or supplemental EIR rather than an addendum is required only if one or more of the following conditions occur:

1. Substantial changes are proposed in the project that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
2. Substantial changes occur with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
 - a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - d. Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Per CEQA Guidelines Section 15164(c), an addendum need not be circulated for public review but can be included in or attached to the EIR. The CEQA Guidelines further provide that the decision-making shall body consider the addendum with the EIR prior to making a decision on the project. Additionally, a brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162, supported by substantial evidence, should be included in an addendum to an EIR, the lead agency's findings on the project, or elsewhere in the record. This Addendum has been prepared to be considered alongside the original EIR, and the content of this Addendum includes a requisite explanation supported by substantial evidence in satisfaction of the requirements of the CEQA Guidelines.

1.3 SCOPE AND CONTENT OF ADDENDUM

This Addendum has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14 California Code of Regulations Section 15000 et seq.). The Addendum considers each of the environmental impacts that were analyzed in the EIR and focuses on determining whether the modified project would result in an increase in the severity of the impacts identified in the prior EIR or would result in any new impacts not previously considered in the prior EIR. The criteria for determining the significance of environmental impacts in this Addendum analysis are the same as those contained within the previous EIR.

Section 1: Introduction

The topic areas considered in the prior EIR were as follows:

- Aesthetics
- Agricultural Resources
- Air Quality and Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources
- Geology, Soils, and Minerals
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services, Recreation, and Utilities Service Systems
- Traffic
- Cumulative Impacts

This Addendum also includes as appendices the following documents prepared by JLB Traffic Engineering, Inc.:

- Appendix A-1: Traffic Impact Analysis
- Appendix A-2: March 2022 Addendum to the Traffic Impact Analysis

For additional reference, the original Rockwell Pond EIR is available to view on the City of Selma's website:

https://cityofselma.com/departments/community_development/projects_and_studies.php#outer-50

SECTION 2

Project Background and Proposed Modification

2.1 PROJECT BACKGROUND

The Selma Grove Project is a regional commercial center development located on the north side of Floral Avenue southwest of State Route 99. At present, a portion of the Project is operational and has been annexed to the City of Selma, while the remainder of the Project is undeveloped and not yet annexed to the City. This EIR Addendum coincides with a proposal by the Project's developer to reduce the total acreage and square footage of the Project from what was originally contemplated and approved.

The approved Project, originally named "Rockwell Pond Commercial Project," was initially reviewed and approved by the City in 2010 with the certification of the Rockwell Pond Commercial Project EIR and approval of Site Plan 2006-008. At the time the EIR was certified, the Project encompassed 94 acres and included 973,100 square feet of commercial development plus a 102-room hotel site. A General Plan Amendment, pre-zoning, and site plan were adopted as part of the Project's approval, but no further actions toward development of the Project were carried out at that time.

The certified EIR included mitigation measures to avoid and/or reduce potentially significant environmental impacts resulting from the Project. The certified EIR determined that impacts resulting from the Project would be less than significant or could be mitigated to a less than significant level, except for the following impacts which were determined to be significant and unavoidable: Agricultural Resources (conversion of Prime Farmland, conflict with existing zoning for agricultural use, and contribution to a cumulative loss of agricultural lands on adjacent property), Air Quality (violation of air quality standards or substantial contribution to existing or projected air quality violations for ROG and NOx emissions), and Traffic (opening day and cumulative traffic conditions, in the event traffic mitigation measures are not feasible).

The certified EIR included evaluation of three alternatives to the approved Project – a No Project Alternative (Alternative 1); an Alternative Site Plan (Alternative 2), which included one auto dealership site (rather than two dealership sites as proposed in the Project), reduced retail square footage by approximately 40,000 square feet, and reconfigured the arrangement of some commercial uses and drainage facilities; and an Alternative for Development of Phase I Only, which included 50.2 acres and about 572,000 square feet of commercial/retail uses (Alternative 3). The No Project Alternative was found to result in lesser impacts than the proposed Project for all of the categories of environmental impacts evaluated, but it would also not accomplish any of the Project objectives. The Alternative Site Plan was found to have lesser impacts on hydrology, public services and utilities, and traffic, while having otherwise similar impacts. However, the EIR concluded that the Alternative Site Plan would not result in a substantial reduction to significant impacts of agricultural land conversion and air quality and would only result in a minor reduction in overall traffic. Development of Phase I Only was found to have lesser impacts on those same categories as Alternative 2 as well as agricultural resources, air quality, biological resources, cultural resources, hazards, and noise. Similarly, however, the certified EIR concluded this alternative would not reduce potential impacts to agricultural resources, air quality, or traffic to less than significant levels.

Following certification of the EIR and related approvals for Site Plan 2006-008, the Project was renamed the "Selma Grove Project." In May 2016, the City approved Minor Modification 2007-0148 to Site Plan 2006-008 to adopt a revised phasing for development of the Project (Selma Grove Phase I Annexation Project). The Selma Grove Phase I Annexation Project delineated 48,693

square feet for an auto dealership, a proposed 102-room hotel and an additional 317,300 square feet of commercial retail uses on approximately 35.88 acres of land. The 35.88 acres were subsequently annexed to the City of Selma pursuant to the DeWolf-Floral Fahrney Reorganization, approved by Fresno County LAFCO on June 8, 2016. The approval of the Phase I Annexation Project included environmental review and adoption of a Mitigated Negative Declaration (MND) (MND No. 2016-0021), which was tiered from both the Final EIR for the Rockwell Pond Commercial Project and the Final EIR for the City of Selma 2035 General Plan Update in accordance with CEQA Guidelines Section 15152.

2.2 PROPOSED MODIFICATIONS TO THE PROJECT

The proposed Project modifications evaluated in this Addendum involve reducing the total acreage of the Project and the total square footage of development from what was previously contemplated in the certified EIR. As modified, the ultimate buildout of the Project would be reduced from 94 acres to 62.9 acres (including the 35.88 acres from the Phase I Annexation), and the total square footage of development would be reduced from 973,100 square feet to 619,093 square feet, plus a 102-room hotel. The modified project includes the existing 48,693 square feet Toyota Dealership, plus a 465,400 square feet shopping center, a 50,000square feet supermarket, a 14,500 square feet pharmacy, a 3,000 square-foot fast-food restaurant, and a 55,000 square-foot movie theater, plus a 102-room hotel. Related to the reductions in size and square footage, the Project as modified would also entail some reconfiguration of the layout of development within the project site.

Figures A and B on the following pages present for comparison the original site plan from the certified EIR/Site Plan 2006-008 and the modified Selma Grove Project site plan that is to be incorporated into an updated Application for a Minor Site Plan Amendment. (It is noted that, compared to the alternatives that were considered as part of the certified EIR, the size and square footage of the Project as modified would fit between the reduced size “Alternative Site Plan” and “Phase 1 Only” Alternatives)

As discussed in more detail in Section 3 of this Addendum, the modified Project would result in a reduction in the overall trip generation. An updated Project Traffic Impact Analysis was conducted that evaluated the impacts of the modified Project on the intersections previously evaluated in the EIR.

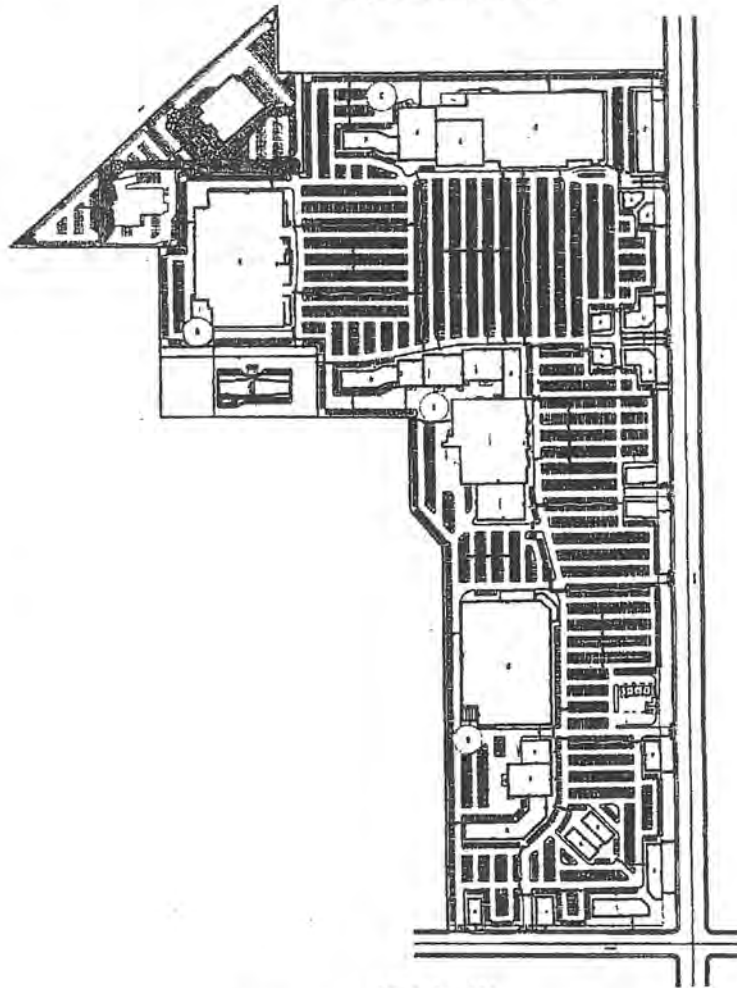
The updated Project Traffic Impact Analysis was based upon a slightly different version of the layout of improvements on the reduced Project parcel. The total square footages of the improvements assumed in the updated Project Traffic Impact Analysis were slightly more than the current intended site plan. There were, however, no differences in the square footages assumed for the movie theater, auto dealership, supermarket, or the room count for the hotel. There are no presently known specific tenant uses for the balance of the site, but the assumptions made in the updated Project Traffic Impact Analysis remain a fair representative sample of potential site users.

That analysis has resulted in a revisions to the previously adopted traffic mitigation measures for street system improvements. However, the location and nature of the street system improvements are substantially similar to those incorporated in the original EIR’s mitigation measures. Further, the updated Project Traffic Impact Analysis confirms that the revised listing of proposed street system improvements will reduce the impacts to a less than significant level. The updated Traffic Impact Analysis further details the Project's fair share contributions to those improvements.

Figure A: Original Site Plan – 2008 Rockwell Pond Commercial Project

000226
City of Selma
Draft EIR – Rockwell Pond Commercial Project

Figure 15-2: Site Plan



SITE PLAN
Proposed Rockwell Pond Development
Selma, California

Not to Scale

15-3

2-4



SECTION 3

Environmental Review

3.1 INTRODUCTION

This section includes a summary of each of the environmental impact topics previously evaluated in the Rockwell Pond Commercial certified EIR (February 2010) and a determination as to whether the modified Project would result in an increase in the severity of the impacts identified or any new impacts not previously considered. The evaluation in this Addendum follows the order that each topic appears in the certified EIR.

In the time since the EIR was certified, a portion of the commercial development included in the approved Project has been built and is operational. Aside from this progression of development, no substantial changes in circumstances have occurred at the approved Project site. No substantial changes in circumstances have occurred in the vicinity of the approved Project site, as the land use designations, zoning, and overall development patterns remain consistent with what was evaluated in the Project EIR.

In addition, except as discussed in the Traffic section to follow, the mitigation measures from the Project EIR remain in effect.

3.2 AESTHETICS

The certified EIR determined that impacts to aesthetics would be less than significant. No scenic vistas or scenic resources were identified as being present at the Project site or its vicinity, and the proposed commercial development was determined to be consistent with the character of existing and planned development in the area. In discussing potential impacts of the Project to the existing visual character or quality of the site and its surroundings, the EIR notes that the City of Selma considers the aesthetic quality of proposed projects during the processing of development entitlements in order to protect the visual character of the Selma area. Developers are required to submit detailed site plans and elevations, color renderings and/or a color and materials board, landscaping plan, sign program and all other required plans, and documentation to the City for review and approval before building permits are issued. Similarly, the City has adopted policies and development standards that regulate light and glare from proposed projects, and developers are required to submit a lighting plan for approval in conjunction with development applications.

The proposed Project modifications would reduce the total acreage and total square footage of development while maintaining the same character of development and the same uses (i.e., a commercial center with retail uses, 102-room hotel, and movie theater). There would be no change in the approved Project's general street configurations or relationship to the surrounding community. Additionally, the modified Project would continue to be regulated through the City's adopted policies and development standards, and it will still be subject to the City's development review processes before building permits are issued. Based on these factors, the modified Project would not result in any additional significant adverse aesthetic impacts or a substantial increase in the severity of the impacts identified in the EIR.

Conclusion: *The modified Project would not result in any additional significant adverse aesthetic impacts or a substantial increase in the severity of the impacts identified in the certified EIR.*

3.3 AGRICULTURAL RESOURCES

The certified EIR determined that impacts to Agricultural Resources would be significant and unavoidable due to the conversion of Prime Farmland to nonagricultural uses. As evaluated in the certified EIR, implementation of the approved Project entailed the loss of approximately 94 acres of Prime Farmland at full buildout, and the loss of productive agricultural land resulting from implementation of the Project would be irreversible. The certified EIR also noted the presence of new urban development could influence the conversion of agricultural lands surrounding the approved Project site to nonagricultural use. Mitigation measures were included requiring the approved Project to undertake actions mitigating the loss of agricultural land, maintain a minimum 100-foot buffer/transition area from adjacent agricultural areas, and provide a right-to-farm deed restriction recognizing the right to farm on adjacent agricultural properties. While the adopted mitigation measures were found to be sufficient in reducing the potential for conversion of surrounding agricultural lands to a less than significant impact, the impact of converting Prime Farmland to nonagricultural use remained significant and unavoidable. Other potential impacts pertaining to conflicts with existing zoning for agricultural use or Williamson Act contracts were determined to be less than significant.

The proposed Project modifications would reduce the amount of total acreage and square footage of development at the commercial center while maintaining the same character of development and the same uses as were evaluated in the EIR. As the land within the original 94-acre project site is now either vacant or has been developed with commercial uses, the Project's significant and unavoidable impact of converting Prime Farmland to nonagricultural use has already occurred. However, the modified Project will not result in the conversion of any additional Farmland, and the reduction of the approved Project's acreage and square footage would entail lesser impacts upon agricultural uses in the vicinity. Further, the mitigation measures adopted to reduce impacts to agricultural resources would remain in effect and applicable to the Project. Therefore, the modifications to the approved Project would not result in any additional significant adverse impacts or a substantial increase in the severity of the impacts identified in the certified EIR.

Conclusion: *Although impacts related to agricultural resources identified in the Project EIR will remain significant and unavoidable, the modified Project would not result in any additional significant adverse impacts related to agricultural resources, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.4 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

The certified EIR included an evaluation of the approved Project's potential short-term and long-term impacts related to air quality and greenhouse gas emissions. Short-term emissions impacts were determined to be less than significant given compliance with the San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII and the local municipal code. Long-term emissions from the Project were considered potentially significant, particularly based on the approved Project's projected emission levels of Reactive Organic Gases (ROG) and Nitrogen Oxide (NOx), which would exceed SJVAPCD's thresholds for ROG and NOx, and due to potential impacts from fugitive particulate emissions. While the certified EIR determined implementation of mitigation measures would reduce impacts from fugitive dust emissions to a less than significant level, impacts from operational emissions of ROG and NOx were determined to remain significant and unavoidable. The certified EIR also determined the approved Project would have less than significant impacts regarding either exposure of sensitive receptors to substantial pollutant concentrations or creation of objectionable odors affecting a substantial number of people. Regarding greenhouse gas emissions, the certified EIR determined the approved Project would generate greenhouse gas emissions that would cumulatively contribute to global warming and climate change. Per the certified EIR, even with incorporation of mitigation, greenhouse gas

emissions would remain potentially significant and constitute a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

The modifications to the Project would reduce the total acreage and square footage of development from what was originally contemplated and reviewed in the certified EIR, and the overall effect of the reduction in buildout is that the modified Project would result in lesser impacts related to air quality and greenhouse gas emissions. As discussed in more detail under the Traffic section, the modified Project's reduced buildout would result in fewer total daily trips, AM peak hour and PM peak hour trips during a weekday, and Mid-Day peak hour trips during a Saturday – all of which would result in a reduction in the modified Project's mobile source emissions in comparison to the approved Project as analyzed in the certified EIR. As the character of development and types of uses included in the modified Project would be the same as what was originally contemplated in the certified EIR, the modified Project's long-term operational air quality and greenhouse gas emissions would be less than what was analyzed and contemplated in the certified EIR.

Regarding short-term emissions, with the modified Project's reduced acreage and square footage, emissions resulting from the equipment mix and the respective operating hours for each of the various phases of construction (e.g., demolition, site preparation, grading and earthwork, building construction, asphalt paving, and architectural coatings) would be less than what was analyzed and contemplated in the certified EIR. Similarly, because construction and operational activities and uses would be substantially the same, the modified Project would not create new or additional objectionable odors or expose sensitive receptors to substantial pollutant concentrations. Additionally, due to the reduced acreage and square footage and subsequent reduction in vehicle trips, the modified Project's impact regarding greenhouse gas emissions would be less than what was contemplated in the certified EIR.

While the modified Project would have a lesser impact than the project due to its substantially reduced size, it is still large enough to result in significant unavoidable impacts with respect to air quality and GHG emissions. However, based on the information provided above, the modified Project would not result in any additional significant adverse impacts or substantially increase the severity of impacts from what was identified in the certified EIR. Further, the modified Project would remain subject to the certified EIR's adopted mitigation measures and applicable regulations governing air quality and greenhouse gas emissions.

Conclusion: *Although impacts related to air quality and greenhouse gas emissions identified in the Project EIR would remain significant and unavoidable, the modified Project would not result in any additional significant adverse impacts related to air quality or greenhouse gas emissions, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.5 BIOLOGICAL RESOURCES

The certified EIR determined that impacts to biological resources would be less than significant with incorporation of mitigation measures. The certified EIR discussed how the approved Project may result in direct and indirect effects on sensitive wildlife species and/or habitat during construction activities. As such, the Project will implement mitigation measures requiring preconstruction wildlife surveys and a wetland delineation, which would reduce these impacts to a less than significant level. No impacts were identified in the certified EIR regarding conflicts with local policies or ordinances protecting biological resources.

The Project as modified would not result in a change from the conditions that were evaluated in the certified EIR, except that the Project's total acreage and square footage would be reduced. With continued implementation of the adopted mitigation measures the modified Project would not result

in any additional significant adverse biological resource impacts or a substantial increase in the severity of the impacts identified in the certified EIR.

Conclusion: *The modified Project would not result in any additional significant adverse biological resource impacts, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.6 CULTURAL RESOURCES

The certified EIR determined that impacts to cultural resources would be less than significant with incorporation of mitigation measures to protect previously undetected resources in the event any are encountered. Preparation of the certified EIR included field survey and a review of structures 50 years of age or older on the site. It was determined no cultural or historic resources were identified at the site. The certified EIR noted that excavation activities during construction could reveal subsurface resources, thus mitigation measures were included which outline procedures for stopping work and investigating resources in the event any subsurface resources are encountered.

The Project as modified would not result in a change from the conditions that were evaluated in the certified EIR, except that the modified Project would be smaller in total acreage and square footage. Implementation of the adopted mitigation measures will reduce potential impacts to undiscovered subsurface cultural resources to a less than significant level. Accordingly, the modified Project would not result in any additional significant adverse cultural resource impacts or a substantial increase in the severity of the impacts identified in the certified EIR.

Conclusion: *The modified Project would not result in any additional significant adverse cultural resource impacts, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.7 GEOLOGY, SOILS, AND MINERALS

The certified EIR combined the evaluation of impacts to geology, soils, and minerals into a single section. The EIR determined the approved Project would result in less than significant impacts regarding the exposure people or structures to potential substantial adverse effects involving rupture of a known earthquake fault or based on other substantial evidence of a known fault, strong seismic ground shaking, and seismic-related ground failure, including liquefaction or landslides. Impacts regarding geological unit and soil stability were also determined to be less than significant. Potential impacts regarding substantial soil erosion or the loss of topsoil were determined to be less than significant with the incorporation of a mitigation measure requiring preparation of a grading plan for all proposed development in the approved Project area that is in compliance with City of Selma construction standards and the International Building Code. No impacts were identified regarding either mineral resources or the capability of soils to adequately support the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

The proposed Project modifications would not change the geologic conditions at the approved Project site, as the modifications would reduce the overall acreage and square footage while remaining within the physical footprint and maintaining the same overall mix of commercial uses as were previously evaluated. The mitigation measure requiring preparation and submittal of grading plans to the City would remain in effect and continue to mitigate potential impacts related to soil erosion and/or loss of topsoil. Therefore, no new impacts related to geology, soils, or minerals would result from implementation of the modified Project.

Conclusion: *The modified Project would not result in any additional significant adverse geology, soils, or minerals impacts, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.8 HAZARDS AND HAZARDOUS MATERIALS

The certified EIR identified a potentially significant impact related to hazards and/or hazardous materials involving the proximity of the Selma Aerodrome to the approved Project site. The entire site is located within the horizontal zone of the airport, and the immediate northeast corner of Floral and DeWolf Avenues on the Project site is located within the inner approach zone. However, the certified EIR determined this impact would be less than significant with implementation of the mitigation measures requiring referral of the Project to the Fresno County Airport Land Use Commission for review as well as the provision of a "buyer notification statement" for the transfer of title of any property location with the Project site. The certified EIR also determined the Project would result less than significant impacts regarding routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset and accident conditions involving hazardous materials. Additionally, the certified EIR determined there would be no impacts from the Project regarding hazardous emissions and/or materials near schools, locations of hazardous materials sites, implementation of an emergency response plan or emergency evacuation plan, exposure to wildland fires, or proximity to a private airstrip.

The modifications proposed for the Project would reduce the size and scale of the approved Project, and no new land uses are proposed that could create different hazardous materials impacts. The modified Project would also remain subject to applicable federal, State, and local laws related to hazards and hazardous materials, including regulations governing the use, transport, and disposal of hazardous materials. The mitigation measures pertaining to airport safety would remain in effect and continue to mitigate potential airport safety impacts to a less than significant level. Thus, no new impacts related to hazards and hazardous materials would result from implementation of the Project with the proposed modifications.

Conclusion: *The modified Project would not result in any additional significant adverse impacts related to hazards and/or hazardous materials, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.9 HYDROLOGY AND WATER QUALITY

The certified EIR determined that impacts from the approved Project related to Hydrology and Water Quality would overall be less than significant with mitigation measures incorporated. Impacts related to flood hazards were determined to be less than significant. In evaluating water supply and groundwater recharge (which included a Water Supply Assessment prepared for the approved Project), the EIR determined potential impacts could be mitigated to a less than significant level through one of the following methods: payment of an annual assessment to Consolidated Irrigation District for additional consumptive water use, funding and development of "recharge enhancement Project 11" (Recharge pond off Kingsburg Branch Canal north of Huntsman), or funding and development of "recharge enhancement Project 12" (Ward Drainage Canal Capacity Enlargement). In evaluating potential impacts related to drainage and runoff, the certified EIR determined potential impacts could be reduced to a less than significant level through mitigation measures that would accomplish the following:

- Construct on-site retention basins designed to accommodate up to 44.6 acre-feet of runoff (26.6 acre-feet for Phase 1 and 18.0 acre-feet for Phase 2 as determined by Yamabe & Horn, Project engineers) and to not discharge into facilities of the Consolidated Irrigation District, including but not limited to Rockwell Pond.

- Require the Project's developers be responsible for paying for required improvements to the surface water runoff facilities.
- Require the Project to comply with applicable regulations regarding surface water runoff, erosion control, and the protection of domestic water quality.
- Require improvements made to Consolidated Irrigation District facilities to be developed in conformance with the District's Standard Details and Development Standards, and require fencing of the Rockwell Pond area to be consistent with criteria acceptable to the District.

The proposed modifications to the Project would reduce its total acreage and square footage while maintaining the same character and uses (i.e., commercial development), thus it would not involve additional water use beyond what was previously anticipated in the certified EIR. The modified Project would remain within the spatial footprint previously contemplated for development and not cause any significant alteration of drainage or contribution to additional runoff, nor would it expose people or structures to flood hazards or inundation by dam failure, seiche, tsunami, or mudflow. Thus, no new impacts related to hydrology and water quality would result from implementation of the Project with the proposed modifications.

Conclusion: *The modified Project would not result in any additional significant adverse impacts related to hydrology and water quality, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.10 LAND USE AND PLANNING

The certified EIR determined that impacts regarding Land Use and Planning would be less than significant with the incorporation of a mitigation measure to amend the land use designation of the approved Project site. At the time the certified EIR was prepared, the Project site was designated in both the City's 1997 General Plan and the Northwest Specific Plan as Open Space. As noted in the draft EIR, the City was in the process of updating its General Plan and had preliminarily designated the Project site for regional commercial uses, but this update had not been completed at the time the Project's Draft EIR was released. Following certification of the EIR, the City adopted a General Plan Amendment that changed the land use designation of the Project site from Open Space to Regional Commercial. Additionally, the EIR determined that the Project's location on the edge of the urbanized area of Selma would not physically divide an established community.

The proposed modifications to the Project will not change the proposed land use of the reduced project site. With the proposed modifications, the character of the development would remain the same and there would be no change in the approved Project's relationship to the surrounding community. Therefore, the modified Project would neither cause a new land use conflict nor create new or additional impacts to Land Use and related ordinances.

Conclusion: *The modified Project would not result in any additional significant adverse impacts related to land use and planning, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.11 NOISE

The Project EIR determined that impacts related to noise would be less than significant with incorporation of mitigation measures addressing potential noise impacts from the proximity of the Selma Aerodrome, a privately-owned public use airport located to the west of the Project site. The mitigation measures included referral of the Project to the Fresno County Airport Land Use Commission for review as well as the provision of a "buyer notification statement" for the transfer of title of any property location with the Project site. The EIR also determined that the Project

would result in less than significant impacts regarding exposure of persons to or generation of noise levels in excess of standards established in the Selma Noise Ordinance; exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels; or a substantial permanent, temporary, or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project. These determinations were based in part on a noise study prepared for the Project (included in the Technical Appendix for the EIR).

The Project as modified would entail buildout of a commercial center of the same character and locational footprint as evaluated in the Project EIR except at a reduced scale. Therefore, with regard to construction noise, the equipment mix and their respective operating hours for each of the various phases of construction (demolition, site preparation, grading, building construction, asphalt paving, and architectural coatings) would remain the same or be reduced from what was contemplated in the Project EIR. Additionally, the modified Project would reduce its proximity to the Selma Aerodrome by approximately 1,900 feet and would not impact the efficacy of the previously adopted mitigation measures. Based on these factors, the modified Project would not result in any additional significant adverse noise impacts or a substantial increase in the severity of the impacts identified in the Project EIR.

Conclusion: *The modified Project would not result in any additional significant adverse noise impacts, or a substantial increase in the severity of the impacts, from what was identified in the Project EIR.*

3.12 POPULATION AND HOUSING

The certified EIR determined impacts to Population and Housing would be less than significant. As stated in the certified EIR, the Project arose “in response to an expanding market created by existing and forecasted new housing” and would have no impact on creating a demand for additional housing that had not already been considered as part of the City’s planning activities. It was noted that five residential units located on the Project site and their residents would be displaced by development of the Project, but this limited number of units was not considered substantial.

The proposed modifications to reduce the size and square footage of the Project would not substantially change population and housing conditions from what was contemplated in the Project EIR. If anything, the reduction in the Project’s size and square footage would reduce estimated employee generation from the Project. Therefore, the modified Project would not result in any new significant with respect to population and housing.

Conclusion: *The modified Project would not result in any additional significant adverse impacts related to population and housing, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

3.13 PUBLIC SERVICES, RECREATION, AND UTILITIES SERVICE SYSTEMS

The certified EIR combined its evaluation of potential impacts affecting public services, recreation, and utilities service systems into a single section. Impacts identified in this section were determined to be less than significant, with some potential impacts requiring mitigation measures to be less than significant. As mitigation measures for potential impacts, the certified EIR included requirements for payment of various impact fees (e.g. Public Facilities Impact Fees, school fees, sewer connection fees; see the adopted MMRP), compliance with applicable building codes and City Standards, consultation with the Selma Police Department to ensure adequate provisions for crime prevention, contributions to the extension of infrastructure necessary to serve the Project, collaboration with PG&E to ensure that development of electrical and natural gas infrastructure is located and provided concurrently with roadway construction and in accordance with PUC

regulations, and determinations for each phase of the Project by the Selma-Kingsburg-Fowler County Sanitation District (SKF) that there is sufficient capacity in the wastewater treatment plant to serve the proposed development.

The modifications to the Project would not increase the demand for, or potential impacts to, public services, recreation, and/or utilities service systems. As the modifications would reduce the total acreage and square footage of development from what was originally contemplated for the Project, the modified Project would not result in an increase in the demand for water or the generation of wastewater or solid waste. Similarly, the character of the proposed modifications would not create a need for additional public services (e.g., police and fire) or additional recreation. Regarding the public services, recreational facilities, and utilities service systems which would serve the Project, these services and systems remain capable of serving the Project with the proposed modifications. Further, the modified Project will continue to be subject to prior Mitigation Measures identified in the Project EIR. Therefore, the modified Project would not result in any additional significant adverse impacts or increase in the severity of the impacts from those identified in the Project EIR.

The City previously solicited comments from Cal Water, the City's water service provider, concerning impacts of the updates to the Project. The response provided by Cal Water is set forth below. Also set forth below is an analysis of those comments.

The 12" water main will need to be extended west along Floral Ave to the end of the property. There are two options that can be considered:

- 1. We can provide large water services in the right-of-way along Floral Ave to where the owner can install their onsite plumbing and connect to our water service.*
- 2. We can run water main onsite and install water services to individual buildings but this would require the owner to provide Cal Water with the necessary easements since the water main they own would be installed on private property, versus installed in the City right-of-way. There would be no reimbursement for any infrastructure installed on private property.*

All domestic, irrigation, and fire services will require backflow devices. When the owner is ready to start the water process, call Stuart Skoglund, Operations Manager at California Water Service (559) 896-3417.

The above stated design requirements of Cal Water are addressed by existing Mitigation Measure 14.11 in the certified EIR, which imposes a requirement that the Developer prepare a water piping plan for review and approval by Cal Water. Therefore, this comment does not raise new environmental impacts of the revised Project.

Conclusion: *The modified Project would not result in any additional significant adverse impacts related to public services, recreation, and utilities service systems, or a substantial increase in the severity of the impacts, from what was identified in the certified EIR.*

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3.14 TRAFFIC¹

An updated Traffic Impact Analysis (updated Project TIA; JLB Traffic Engineering, Inc. 2022), was prepared for the modified Project (Appendix A-1 of the Addendum EIR). The updated Project TIA analyzes the traffic impacts of the modified Project, which is based upon a slightly different version of the layout of improvements on the modified Project parcel (found in Appendix 2-A of this Addendum EIR). The total square footages of the improvements assumed in the original Traffic Impact Analysis were slightly more than the current intended site plan for the modified Project. There were, however, no differences in the square footages assumed for the movie theater, car dealership, supermarket or the room count of the hotel. There are no presently known specific tenant uses for the balance of the site, but the assumptions made in the original TIA remain a fair representative sample of potential site users.

Additionally, JLB subsequently prepared an Addendum to the TIA (“2022 TIA Addendum”), which compared traffic counts obtained during 2022 to the traffic volume data forecasted in the updated TIA, to ensure the accuracy and applicability the analysis and recommendations of the updated Project TIA. The 2022 TIA Addendum is included as Appendix A-2. Based on the new data collected and analyzed, the updated Project TIA includes recommendations for revised mitigation measures to address traffic impacts of the modified Project.

The certified EIR determined the Project would generate potentially significant impacts regarding traffic load and capacity of the street system, as the Project was projected to generate new traffic in excess of the applicable level of service (LOS) standards for both opening day and cumulative conditions. The traffic impact analysis of the certified EIR for the original Project scope, evaluated traffic conditions at nine intersections in the vicinity of the Project site under the following scenarios: Existing Conditions (i.e., at the time the EIR was prepared, with no project developed), Existing Plus Project Phase 1 Conditions, Existing Plus Project Phases 1 and 2 Conditions, Year 2010 No-Project Conditions, Year 2010 With Project Phase 1 Conditions, Year 2015 No-Project Conditions, Year 2015 With Project Phases 1 and 2 Conditions, Cumulative Year 2030 No Project Conditions, and Cumulative Year 2030 With Project Phases 1 and 2 Conditions.

Based on that analysis it was determined that mitigation measures involving several improvements to the road system (e.g., lane additions, signalization) would need to be implemented, both initially and over time, in order to maintain an acceptable LOS and thus reduce traffic impacts to a less than significant level. As stated in the certified EIR, if the required mitigation measures were not feasible to implement, the impact of traffic conditions exceeding the applicable LOS standard would be considered significant and unavoidable.

In addition to its evaluation of potential traffic system impacts, the certified EIR determined potential impacts regarding hazards due to design features or incompatible uses would be less than significant. The certified EIR also determined no impacts would occur from the approved Project regarding inadequate emergency access, inadequate parking capacity, conflicts with adopted policies supporting alternative transportation.

¹ As discussed in Section 1.3, the criteria for determining the significance of environmental impacts in this Addendum are the same as those contained within the previously certified EIR. It is noted that while the CEQA Guidelines were updated to require analysis of Vehicle Miles Traveled (“VMT”) beginning in July 2020, the requirement does not apply in the context of an Addendum to an EIR that was certified prior to the effective date of the CEQA Guidelines update concerning VMT analysis. Moreover, because the proposed Project modifications would reduce the total acreage and square footage of development while maintaining the same character of development and types of uses, the modified Project would not cause an increase in vehicle trips or other changes that would result in an increase in VMT.

TIA Discussion of Project Access and Internal Layout- Modified Project

In addition to providing an updated assessment of the modified Project's impacts on specified study intersections (discussed below), the updated Project TIA also provides recommendations about certain elements of the modified Project design. It specifically recommends that the location of the primary driveway access to the property be shifted to be aligned with a potential future Leonard Avenue alignment south of Floral Avenue. This recommendation is not being adopted as part of the intended mitigation measures. Such a relocated design for the access is not necessary to address any identified impacts, other than a desire to potentially avoid the potential of a second intersection in proximity to the driveway. That concern can be addressed when a future Leonard Avenue alignment is ultimately determined and developed, and it need not be the alignment that the TIA assumes. In addition, the option that the TIA suggests will have negative impacts on the overall revised site plans traffic and parking flow.

The TIA also recommends certain standards for the conceptual roadways within the proposed Project. While those standards may be beneficial, there is no substantial impact of the Project that is identified as needing to be mitigated through those recommendations. The suggestions are referred to the project developer for evaluation of their benefits.

Study Facilities and Scenarios

The updated Project TIA for the modified Project studied the same intersections previously evaluated in the certified EIR. It also includes additional analysis of the Highland Avenue (SR-43) / Rose Avenue intersection, the Walmart Driveway / Floral Avenue intersection and the State Route 99 / Dinuba Avenue future interchange. The updated Project TIA evaluated the following scenarios: Existing Traffic Conditions, Existing plus Dealership Traffic Conditions, Existing plus Project Buildout Traffic Conditions, Near Term 2025 plus Project Buildout Traffic Conditions, Cumulative Year 2030 No Project Traffic Conditions, Cumulative Year 2030 plus Project Traffic Conditions, Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout².

Internal Capture and Pass-By Trip Reductions

The updated Project TIA takes into account reductions in trip generation as a result of internal capture, which account for the interaction between various individual land uses assumed for the trip generation of the Project Buildout. For example, in a mixed-use development containing offices and shops, trips made by the office workers to the shops within the site are defined as internal, or captured, trips within the site. The TIA also applies pass-by trip reductions, which refers to trips that would have traveled on a street adjacent to the Project even if the retail was not constructed (i.e., travelers already on the road who the retail businesses hope to draw into their site as they are driving by).

Trip Generation

Based on the TIA, buildout of the modified Project is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 mid-day peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). The original Rockwell Pond Project, upon buildout, was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 mid-day peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). Compared to the Rockwell Pond Project, the modified Project is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM

² The Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario, except it assumes that the State Route 99 / Dinuba Avenue interchange has been constructed. See Appendix A-1 for more details.

peak hour trips during a weekday, and 1,410 mid-day peak hour trips during a Saturday. With internal capture and pass-by trip reductions, the modified Project's estimated trips are further reduced to 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 mid-day peak hour trips during a Saturday.

Street and Intersection Impacts

The updated Project TIA includes a detailed level of service impact analysis for each of the study scenarios. As done in the previous traffic study included as part of the Project EIR, the TIA presents LOS levels that would occur under "unmitigated" circumstances (i.e., without additional traffic system improvements) and LOS levels that would occur with mitigation (i.e., with additional traffic system improvements implemented). Based on the analysis presented in the TIA, and with implementation of recommended mitigation measures, the Project as modified would not result in any of the intersections exceeding the acceptable LOS level. Further, the TIA shows an acceptable LOS level can be achieved either with or without development of the State Route 99 / Dinuba Avenue interchange.

No new substantial adverse impacts would occur to the nine intersections previously studied. Regarding the Highland Avenue / Rose Avenue intersection, which was not analyzed in the original EIR, there is sufficient information to reasonably determine that the modified Project would have equal or fewer trips assignable to this intersection (in both current and future scenarios) than the originally approved Project if it had been fully built out. This is due to the fact that the modified Project retains the same overall character and types of uses, within the same overall site footprint, while reducing the total area and square footage of development.

Queuing Analysis

At the request of Caltrans, the updated Project TIA included a queuing analysis for state route study intersections, based on the cumulative impacts of the Project at the 2030 time horizon. The queuing analysis does contain some design recommendations and constraints for expanding storage capacities in certain locations. However, there is no threshold of significance presently adopted by the City with respect to queuing matters, and therefore no significant impact was identified for any failure of the City to incorporate the recommended design elements to facilitate recommended storage capacities. Therefore, no mitigation measures are proposed with respect to this element of the updated Project TIA. This is also consistent with the fact that no mitigation measures associated with a queuing analysis are included in the previously adopted traffic mitigation measures for the original Project (other than those otherwise accounted for in the LOS designations of the interchange operations).

Mitigation Measure Principles

The updated Project TIA identifies specific roadway improvements required to assure maintenance of LOS standards in various scenarios, including the Project's impacts upon full buildout, and cumulative impacts in the 2025 and 2030 time horizons. For the 2030 time horizon, the updated Project TIA includes an evaluation of two alternative scenarios – one incorporating the assumption that a new interchange at Dinuba Avenue and State Route 99 is developed, and another assuming the interchange is not developed. The updated Project TIA also separately analyzes the contribution of the existing dealership to trips generated at the various study intersections. This analysis was provided to address certain obligations of the dealership project that the City had imposed as part of the development of that phase of the Project.

The updated Project TIA acknowledges that the recommended improvements to the study intersections are not presently part of any existing fee mitigation program. However, it identifies the Project's contributive "fair share" of such improvements calculated in accordance with the methodology identified in the *Guide for the Preparation of Traffic Impact Studies*, version dated

2002, prepared by Caltrans, in its Appendix B entitled *Methodology for Calculating Equitable Mitigation Measures*.

The updated Project TIA recommends that payment of the identified fair share contribution to the specified facility improvements would satisfy the mitigation obligations of the Project. The "fair share" payment arrangement is a permissible mitigation for cumulative impacts of a project where the requirements of the CEQA Guidelines Section 15130(a)(3) are applicable. Those provisions confirm that a project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

With respect to the Dealership project, payment of fair share contributions to the specified facility improvements required for the Cumulative Year 2030 plus Project Traffic Conditions scenario satisfies full mitigation. This is supported by the fact that the updated Project TIA confirms that none of the studied intersections violate the applicable LOS standards based solely on the trip generation associated with the Dealership project. This is confirmed comparing Tables I and II in the updated Project TIA with Tables V and VI. Therefore, all impacts of the Dealership are based on cumulative impacts. Further, the fair share contributions of the Dealership project to each of those facilities is less than two percent, as is shown in Table XXVIII.

With respect to the additional elements of the modified Project, there are elements of the improvements to the specified facilities that relate to direct Project impacts which would therefore not be suitable for mitigation under a fair share contribution analysis. However, there are also elements of improvements to those facilities that the updated Project TIA identifies as needed solely to address the cumulative impacts analysis in the 2025 and 2030 scenarios. With respect to the improvements identified in the Cumulative Year 2025 plus Project scenario, and the improvements identified in the Cumulative Year 2030 plus Project scenario, it is recommended that, in full satisfaction of the required mitigations, those improvements be addressed through payment of fair share contributions to the specified facility improvements. This is supported by the fact that the updated Project is otherwise to be directly responsible to assure installation of the most significant portion of the improvements of those facilities. In addition, it is proposed that in instances where the Project developer holds reimbursement rights for improvements it has made to the facilities, that such reimbursement credits ("Fair Share Credits") may be applied to satisfy any fair share contribution requirements that are imposed as mitigation measures.

Revised Traffic Impact Mitigation Measures

Based on the above stated principles, the intended mitigation measures for the facilities are detailed below and incorporated into a listing of all of the improvements to various facilities identified by the TIA (other than those recommended to address the existing deficiency at Highland Avenue and Rose Avenue). Where the text is plain, the improvement is identified as required to address the project's direct impacts. Where the text is *italicized and underlined*, that element of a facility improvement relates to a cumulative impact in the 2025 timeframe. Where the text is ***italicized, underlined, and bold***, that element of a facility improvement relates to a cumulative impact in the 2030 timeframe.

For the 2030 time horizon, the mitigation measures address future conditions both with and without the development of the Dinuba Avenue interchange. As indicated in the updated Project TIA, many of the required traffic facility improvements are the same under either scenario. The differences in facility improvements between the two scenarios mostly concern the DeWolf Avenue / Floral Avenue intersection, but there is also a difference in lane configuration at the Highland Avenue / Golden State Boulevard intersection.

In MM T-1, the fair share contribution calculated for the Dealership project (sourced from Table XXVIII of the updated Project TIA) is identified next to each facility. Where a facility is associated with a cumulative impact in 2025 or 2030, the modified Project's fair share contribution of that element of the facility is stated adjacent to element. Where plain text is used, that element is to be developed by the modified Project and that requirement is stated adjacent to that element. MM T-2 utilizes the same formatting scheme to denote the timing of improvements, but for the fair share calculation it employs a requirement for a subsequent future Project fair share analysis in the event the Dinuba Avenue interchange is approved to begin construction within the 2030 time horizon.

MM T-1: The following traffic facility improvements (which reflect the Cumulative Year 2030 Plus Project Traffic Conditions Scenario from the TIA) shall be implemented, toward which the Project shall make fair share contributions.

- a. Highland Avenue / Golden State Boulevard [Dealership Fair Share 0.46%]
 - i. Add a second northbound left-turn lane. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]
 - ii. Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]. However, in the event the Dinuba Avenue interchange on State Route 99 is approved for construction prior to the end of the year 2025, this improvement will not be required.
 - iii. Add a southbound left-turn lane. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]
 - iv. Modify the southbound left-through lane to a through lane. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]
 - v. Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]
 - vi. Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase. [Project Improvement Requirement]
 - vii. Prohibit northbound to southbound U-turn movements. [Project Improvement Requirement]
 - viii. Modify the traffic signals to accommodate the added lanes. [Project Fair Share 28.84%, but with credit provided for the costs of the facility components to be completed by the Project]
- b. DeWolf Avenue / Floral Avenue [Dealership Fair Share 1.37%]
 - i. Add a westbound left-turn lane. [Project Fair Share 67.38%, but with credit provided for the costs of the facility components to be completed by the Project]
 - ii. Modify the westbound left-through-right lane to a through-right lane. [Project Fair Share 67.38%, but with credit provided for the costs of the facility components to be completed by the Project]
 - iii. Implement all-way stop controls. [Project Improvement Requirement]
 - iv. Modify the intersection to accommodate the added lane. [Project Fair Share 67.38%, but with credit provided for the costs of the facility components to be completed by the Project]

- c. Project Driveway 3 / Floral Avenue [All elements are a Project Improvement Requirement]
 - i. Modify the westbound through-right lane to a through lane.
 - ii. Add a westbound right-turn lane.
 - iii. Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3.
 - iv. Signalize the intersection with protective left-turn phasing on all approaches.
 - v. On an Interim basis prohibit pedestrians across the west leg of Floral Avenue.
 - vi. Modify the intersection to accommodate the added lanes.
- d. Highland Avenue / Floral Avenue [Dealership Fair Share 0.82%]
 - i. Add a second eastbound left-turn lane. [Project Improvement Requirement]
 - ii. Add a third eastbound through lane. [Project Fair Share 44.94%, but with credit provided for the costs of the facility components to be completed by the Project]
 - iii. Modify the westbound through-right lane to a through lane. [Project Improvement Requirement]
 - iv. Add a westbound right-turn lane. [Project Improvement Requirement]
 - v. Extend the receiving northbound through lanes on Highland Avenue. [Project Improvement Requirement]
 - vi. Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet. [Project Fair Share 44.94%, but with credit provided for the costs of the facility components to be completed by the Project]
 - vii. Modify the traffic signals to accommodate the added lanes. Project Fair Share 44.94%, but with credit provided for the costs of the facility components to be completed by the Project]
- e. State Route 99 Southbound Off-Ramp / Floral Avenue
 - i. Modify the southbound through lane to a through-right lane. [Project Improvement Requirement]

MM T-2: In the event that the Dinuba Avenue interchange on State Route 99 begins construction prior to the year 2030, the following traffic facility improvements (which reflect the Cumulative Year 2030 with Dinuba Avenue Interchange Plus Project Traffic Conditions Scenario from the updated Project TIA) shall be implemented in addition to the improvements set forth in MM T-1, toward which the modified Project shall make fair share contributions based on a subsequent fair share analysis completed prior to the start of construction on the interchange:

- a. DeWolf Avenue / Floral Avenue
 - i. Add an eastbound left-turn lane.
 - ii. Modify the eastbound left-through-right lane to a through-right lane.
 - iii. Add a westbound right-turn lane.
 - iv. Add a northbound left-turn lane.
 - v. Modify the northbound left-through-right lane to a through lane.
 - vi. Add a northbound right-turn lane.
 - vii. Add a southbound left-turn lane.
 - viii. Modify the southbound left-through-right lane to a through-right lane.
 - ix. Signalize the intersection with protective left-turn phasing on all approaches.

- x. **Implement overlap phasing of the northbound right-turn phase with the westbound left-turn phase.**
- xi. **Prohibit westbound to eastbound U-turn movements.**
- xii. **Modify the intersection to accommodate the added lanes.**

Regarding the above-identified improvements to State Route 99 Southbound Off-Ramp / Floral Avenue, it is further acknowledged that the completion of such improvements is within the responsibility and jurisdiction of another public agency, namely Caltrans. Nevertheless, the City should find that such measures can and should be adopted by Caltrans.

The updated Project TIA also identified an existing deficiency at Highland Avenue and Rose Avenue, a facility that is a component of State Route 43 and is within the jurisdiction of Caltrans. The improvements recommended to address that deficiency are detailed below. The updated Project TIA also identified that the Dealership's fair share percentage of those specified improvements to that facility is 0.13%, and that the remainder of the Project's fair share percentage of those specified improvements to that facility is 5.9%. Because this facility is experiencing an existing deficiency, is within the responsibility and jurisdiction of Caltrans, and the Project has a relatively small fair share allocation, the City should find that a fair share contribution payment to this facility is full mitigation of the Project's impact, and should further find that such measures can and should be adopted by Caltrans.

Determination and Collection of Fair Share Payments

The updated Project TIA notes that the costs of the improvements identified above have not yet been determined and therefore no fair share payments can be currently calculated or collected. Because the Dealership project is already developed, the payment of the allocated fair share payment responsibility should be imposed with respect to that element of the Project within 90 days after the costs of the relevant facility improvements are determined.

With respect to other elements of the Project, the City may allow a phased imposition of the fair share payments. Phasing the imposition of payments would link the fair share payments to future project development that is determined to contribute trip generation to the study intersections in the Saturday MD Peak Hour scenario (which is the scenario used in the TIA to confirm the trip generations that resulted in the fair share allocation percentages). Each trip contribution will carry with it a payment amount that is based on the total Project costs and the total trips used in the denominator of the relevant fair share allocation percentage. Such amount shall be paid at the time of building permit.

As noted previously in the discussion of mitigation measure principles, any such fair share payment obligation may be reduced to the extent of Fair Share Credits that the Project generates from its traffic facility improvements. More specifically, the Fair Share Credits will total the costs of each of the facilities identified above as a Project Improvement Requirement that are completed by the Project developer, multiplied by the a percentage that is 100% minus the Project's Fair Share for the relevant facility (e.g., for DeWolf Avenue / Floral Avenue, the Project's Fair Share Credits would total the costs of the Project Improvement Requirement multiplied by 32.62% [100% - 67.38%]).

Bike Path

The updated Project TIA noted that the City of Selma's 2003 Bicycle Transportation Plan recommends Class II Bike Lanes be implemented, among other locations, on Floral Avenue between DeWolf Avenue and Amber Avenue. In furtherance of that policy, it is recommended that, as a project condition, the updated Project accommodate a Class II Bike Lane along its Floral Avenue frontage.

Other Transportation and Traffic Impacts

The modified Project will not generate any additional need for parking, does not involve hazardous road designs or incompatible uses, and will not impact emergency access. This is due to the fact that the modified Project retains the same overall character and types of uses included in the original Project while reducing the total area and square footage of development within the same overall site footprint of the approved Project. Further, buildout of the modified Project would remain subject to the City's Standards and Specifications plus other applicable regulations which would ensure such impacts are avoided.

Conclusion: *The modified Project would not result in any additional significant adverse traffic impacts, or a substantial increase in the severity of the impacts, from what was identified in the Project EIR.*

3.15 CUMULATIVE IMPACTS

The certified EIR found that cumulative impacts associated with the originally approved Project were found to be less than significant in all environmental impact topic areas, with the exception of agricultural resources (loss of farmland), air quality and greenhouse gas emissions (projected ROG and NOx emissions above SJVAPCD thresholds, and cumulative GHG emissions) and traffic (congestion/level of service). As previously discussed in this section, the modified Project does not involve additional loss of farmland, additional air quality or greenhouse gas emissions, or additional traffic generation or congestion conditions in comparison to the original Project. In fact, all of these impacts would be less with the modified Project. The TIA indicates that acceptable LOS would be achieved with mitigation specified above. While the cumulative impacts related to agricultural resources, air quality and greenhouse gas emissions may remain significant and unavoidable, since the foregoing analysis in each of the subject areas in this Addendum indicates that none of these impacts would be increased due to the modified Project, the proposal would not result in an increase in cumulative impacts.

Conclusion: *The potential cumulative impacts of the modified Project related to agricultural resources, air quality and greenhouse gas emissions would remain significant and unavoidable, but the modified Project would not result in an increase in cumulative impacts previously identified in the Project EIR.*

3.16 CONCLUSION

Based on the foregoing analysis, the City has determined that the potential environmental impacts associated with modified Project have been analyzed and addressed in the certified EIR and this Addendum, and the proposed modifications to the Project would not result in conditions outlined in State CEQA Guidelines Section 15162 that would require preparation of a subsequent or supplemental EIR. The modified Project will not result in new significant environmental impacts or a substantial increase in the severity of previously identified significant impacts. The revisions that are proposed to the Traffic mitigation measures from the certified EIR will continue to assure that the traffic impacts of the Project will be mitigated to a less than significant level.

Appendix A-1:
Traffic Impact Analysis

Draft Traffic Impact Analysis

Selma Grove Commercial Development

Located North of Floral Avenue between DeWolf
Avenue and State Route 99

In the City of Selma, California

Prepared for:

City of Selma
1710 Tucker Street
Selma, CA 93662

March 13, 2019

Project No. 001-005



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Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

Draft Traffic Impact Analysis

**For the Selma Grove Commercial Development located north of Floral Avenue
between DeWolf Avenue and State Route 99**

In the City of Selma, CA

March 13, 2019

This Draft Traffic Impact Analysis has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions and decisions are based.

Prepared by:

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Introduction and Summary

Introduction

This report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Selma Grove Commercial Development (Selma Grove Project) located in the City of Selma. The Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the TIA includes the analysis of the existing Automobile Dealership (Dealership Project), which covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond) is submitting an amendment to the site plan to reduce the ultimate buildout of the development evaluated by the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Figure 1 shows the location of the existing Dealership Project and proposed Selma Grove Project site relative to the surrounding roadway network. In this TIA, the Project Buildout refers to the existing Dealership Project and proposed Selma Grove Project.

The purpose of this TIA is to evaluate the potential changes to onsite and offsite traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project site that will be part of an amended Environmental Impact Report (EIR) No. 2007061098 and its associated Mitigation Monitoring and Reporting Program (MMRP). This TIA has been prepared to identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The scope of work was prepared via consultation with City of Selma, the County of Fresno and Caltrans staff.

Summary

The potential traffic impacts of the existing Dealership Project and proposed Selma Grove Project were evaluated in accordance with the standards set forth by the level of service (LOS) policy of the City of Selma, County of Fresno and Caltrans.

Existing Traffic Conditions

- At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 Transportation Concept Report (TCR)) are recommended to be considered for implementation. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Existing plus Dealership Traffic Conditions

- At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Existing plus Project Buildout Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.
- JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.
- The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday.



- In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. After internal capture and pass-by trip reductions are taken into account, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.
- It is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Near Term Year 2025 plus Project Buildout Traffic Conditions

- The total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Cumulative Year 2030 No Project Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Cumulative Year 2030 plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project Buildout's Equitable Fair Share

- It is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable Fair Share or conas presented in Tables XXVIII and XXIX, respectively.



Scope of Work

The study focused on evaluating traffic conditions at the existing study intersections that may potentially be impacted by the proposed modification of the Selma Grove Project. On July 24, 2018, a Draft Scope of Work for the preparation of a Traffic Impact Analysis for the Selma Grove Project was provided to the City of Selma, County of Fresno and Caltrans for their review and comment. Any comments to the Draft Scope of Work were to be provided by August 14, 2018.

On Wednesday, August 8, 2018, Caltrans responded to the Draft Scope of Work. Caltrans emphasized that a Queuing Analysis be prepared for all State Route study intersections. On Monday, August 13, 2018, the County of Fresno responded to the Draft Scope of Work. The County of Fresno requested that the intersection of Fowler Avenue and Floral Avenue be included in the analysis. Furthermore, the County of Fresno expressed concern regarding the proposed Selma Grove Project's access points and advised that access control for the development be discussed. In addition, the County of Fresno stated that both sides of Floral Avenue should be annexed by the City and that the preferred planning horizon for the study scenarios be 20 years. On Tuesday, August 28, 2018, the City of Selma approved the Draft Scope of Work as presented.

While the County of Fresno requested that the intersection of Fowler Avenue and Floral Avenue be included in the analysis, JLB determined that this intersection should not be included in the analysis as the main reason for the preparation of this TIA is to update the findings of the traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project. Regarding the proposed Selma Grove Project's access points to Floral Avenue, JLB has included in this TIA recommendations regarding access control for the proposed Selma Grove Project site. Details regarding the assumed access control and recommendations for the Selma Grove Project site are provided in the "Project Buildout Access" section presented later this Report. Finally, while JLB recognizes that the preferred planning horizon for the study scenarios is typically 20 years, the purpose of this TIA is to provide an update to the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009 and evaluate the potential changes to onsite and offsite traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project. Since the planning horizon for the aforementioned EIR was the year 2030, this TIA will use the same year (2030) as the planning horizon. The Draft Scope of Work that was presented and the comments received from the lead agency and responsible agencies are included in Appendix A.



Study Facilities

The existing peak hour turning movement volume counts were conducted at the study intersections in June 2016, while schools in the vicinity of the existing Dealership Project and proposed Selma Grove Project were in session. The intersection turning movement counts included pedestrian volumes. The traffic counts for the existing study intersections are contained in Appendix B. Figures 2 and 3 illustrate the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively.

Study Intersections:

1. Highland Avenue / Golden State Boulevard
2. DeWolf Avenue / Floral Avenue
3. Project Driveway 3 / Floral Avenue
4. State Route 99 Southbound Off-Ramp / Floral Avenue
5. Highland Avenue (State Route 43) / Floral Avenue
6. State Route 99 Northbound Off-Ramp / Floral Avenue
7. Whitson Street / Floral Avenue
8. McCall Avenue / Floral Avenue
9. Highland Avenue (State Route 43) / State Route 99 Southbound Ramps
10. Highland Avenue (State Route 43) / Rose Avenue

Project Trip Assignment to City Facilities:

11. Walmart Driveway / Floral Avenue (Signalized)

Project Trip Assignment to State Facilities:

1. State Route 99 / Dinuba Avenue (Future)

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in the year 2016.

Existing plus Dealership Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Dealership Traffic Conditions. The Existing plus Dealership traffic volumes were obtained by adding the Dealership Trips to the Existing Traffic Conditions scenario. The Dealership Trips to the study intersections were developed based on the Fresno Council of Governments (COG) Dealership Select Zone, data obtained from the seven-day count that was collected for the existing Dealership Project, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.



Existing plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Buildout Traffic Conditions. The Existing plus Project Buildout traffic volumes were obtained by adding the Net New Project Buildout Trips to the Existing Traffic Conditions scenario. The Net New Project Buildout Trips to the study intersections were developed based on the Fresno COG Dealership and Selma Grove Select Zones, data provided by the developer, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.

Near Term Year 2025 plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term Year 2025 plus Project Buildout Traffic Conditions. The Near Term Year 2025 plus Project Buildout traffic volumes were obtained by adding the Near Term Project related trips to the Existing plus Project Buildout Traffic Conditions scenario. The Near Term Project related trips to the study intersections were based on the Fresno COG Near Term Select Zones, data provided by the City of Selma, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.

Cumulative Year 2030 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 No Project Traffic Conditions. The Cumulative Year 2030 No Project traffic volumes were obtained by subtracting the Net New Project Buildout Trips from the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario.

Cumulative Year 2030 plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 plus Project Buildout Traffic Conditions. The Cumulative Year 2030 plus Project Buildout traffic volumes were obtained from the Fresno COG traffic model runs (Base Year 2016 and Cumulative Year 2030) and existing traffic counts. Under this scenario, the Increment Method, as recommended by the Model Steering Committee, was utilized to determine the Cumulative Year 2030 plus Project Buildout traffic volumes. The Fresno COG models are provided in Appendix C.

Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions. Under this scenario, it is assumed that the State Route 99 and Dinuba Avenue interchange has been constructed. As a result, the Net New Project Buildout Trips with Dinuba Avenue Interchange to the study facilities were developed based on this change in the roadway network.



Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from “A” to “F”, with “A” indicating no congestion of any kind and “F” indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *Highway Capacity Manual* (HCM) 6th Edition is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. State Route study intersections were analyzed using HCM 2000 methodologies for the reason that HCM 6th Edition does not support non-NEMA phasing. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix D.

Criteria of Significance

The City of Selma 2035 General Plan has established LOS D as the acceptable level of traffic congestion on intersections and road segments for minor collectors, collectors, arterials, major arterials, and highways within the City’s jurisdiction. Where other jurisdictions control and manage roadways, their respective level of service standards shall prevail on applicable segments. In order to avoid using local streets for excessive through traffic, the LOS B threshold was established for local streets. Therefore, the City of Selma LOS D threshold is used to evaluate the potential significance of LOS impacts to study facilities within the City of Selma SOI.

The County of Fresno has established LOS C as the acceptable level of traffic congestion on county roads and streets that fall entirely outside the Sphere of Influence (SOI) of a City. For those areas that fall within the SOI of a City, the LOS criteria of the City are the criteria of significance used in this report. Therefore, LOS C is used to evaluate the potential significance of LOS impacts to Fresno County intersections that fall outside the City of Selma SOI. In this case, however, all study facilities fall within the City of Selma SOI. Therefore, the City of Selma LOS D threshold is used to evaluate the potential significance of LOS impacts to study facilities within the City of Selma SOI.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the Caltrans Guide for the Preparation of Traffic Impact Studies dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS threshold, then the existing measures of effectiveness (MOE) should be maintained. In this case, one of the study intersections is currently operating at LOS E. At locations where the existing LOS has dropped below the Caltrans LOS C to D transition, the existing MOEs should be maintained. Furthermore, the addition of an average delay of less than five (5) seconds is often not considered a significant impact. The existing MOEs are described in the Existing Traffic Conditions scenario.



Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- Yellow time:
 - per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - consistent with the California Manual on Uniform Traffic Control Devices (CA MUTCD) based on approach speeds at the remaining study intersections
- Yellow time for left-turn phases;
 - per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - of 3.2 seconds at the remaining study intersections
- All-red clearance intervals:
 - as per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - of 1.0 second for all phases at the remaining study intersections
- Walk intervals of 7.0 seconds
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- All new or modified signals utilize protective left-turn phasing
- A 3 percent heavy vehicle factor
- An average of 3 pedestrian calls per hour at signalized intersections
- The number of observed pedestrians at existing intersections was utilized under all study scenarios
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Existing plus Dealership, Existing plus Project Buildout, and Near Term Year 2025 plus Project Buildout scenarios
- A PHF of 0.92, or the existing PHF if higher, is utilized in all Cumulative Year 2030 scenarios



Existing Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

DeWolf Avenue is an existing north-south two-lane undivided arterial in the vicinity of the proposed Project. In this area, DeWolf Avenue extends north of Golden State Boulevard and south of Dinuba Avenue through the City of Selma. The City of Selma 2035 General Plan Circulation Element designates DeWolf Avenue as an arterial through the City of Selma SOI.

Highland Avenue is an existing north-south two-lane collector in the vicinity of the proposed Project. In this area, Highland Avenue extends between Dinuba Avenue and Floral Avenue. South of Floral Avenue, Highland Avenue is known as State Route 43. The City of Selma 2035 General Plan Circulation Element designates Highland Avenue as a major arterial between Golden State Boulevard and Nebraska Avenue and a State Highway south of Nebraska Avenue.

McCall Avenue is an existing north-south two- to four-lane major roadway in the vicinity of the proposed Project. In this area, McCall Avenue is a two-lane undivided arterial north of Dinuba Avenue, a four-lane undivided arterial between Dinuba Avenue and Floral Avenue, a two-lane arterial divided by a two-way left-turn lane between Floral Avenue and Arrants Street, a four-lane divided arterial between Arrants Street and High Street/Mill Street, and a two-lane undivided arterial south of Front Street. The City of Selma 2035 General Plan Circulation Element designates McCall Avenue as an arterial through the City of Selma SOI.

Floral Avenue is an existing east-west two-lane major roadway adjacent to the proposed Project. In this area, Floral Avenue is a two-lane undivided arterial west of the existing Walmart Shopping Center, a four-lane divided arterial between the western limits of the Walmart Shopping Center and Wright Street, and a two-lane undivided arterial east of Wright Street. The City of Selma 2035 General Plan Circulation Element designates Floral Avenue as a four-lane arterial through the City of Selma SOI.

Rose Avenue is an existing east-west two- to four-lane roadway in the vicinity of the proposed Project. In this area, Rose Avenue is a two-lane undivided collector west of Thompson Avenue and a four-lane undivided collector between McCall Avenue and the eastern City limits. The City of Selma 2035 General Plan Circulation Element designates Rose Avenue as a two-lane collector between Armstrong Avenue Highland Avenue and McCall Avenue and Bethel Avenue.

Golden State Boulevard is an existing northwest-southeast (diagonal) four-lane divided arterial in the vicinity of the proposed Project. In this area, Golden State Boulevard extends northwest of Highland Avenue and southeast of Park Street. The City of Selma 2035 General Plan Circulation Element designates Golden State Boulevard as a four-lane divided arterial through the City of Selma SOI.



Whitson Street is an existing northwest-southeast (diagonal) four-lane divided arterial in the vicinity of the proposed Project. In this area, Whitson Street extends between Highland Avenue and Park Street. The City of Selma 2035 General Plan Circulation Element identifies Whitson Street as a major arterial.

State Route (SR) 99 is an existing seven-lane freeway in the vicinity of the proposed Project. In this area, State Route 99 traverses the City of Selma in a northwest-south-east direction and serves as the principal connection to various metropolitan areas within the Central San Joaquin Valley.

State Route (SR) 43 is an existing north-south two- to four-lane conventional highway in the vicinity of the proposed Project. In this area, State Route 43 is a four-lane divided conventional highway between Floral Avenue and Rose Avenue, a four-lane conventional highway divided by a two-way left-turn lane between Rose Avenue and Nebraska Avenue, and a two-lane undivided conventional highway south of Nebraska Avenue. North of Floral Avenue, State Route 43 is known as Highland Avenue. For purposes of this TIA, State Route 43 is called Highland Avenue though the City of Selma SOI. The City of Selma 2035 General Plan Circulation Element designates State Route 43 as a major arterial between Floral Avenue and Nebraska Avenue and a State Highway south of Nebraska Avenue. The Caltrans Department of Transportation District 6 Transportation Concept Report (TCR) for State Route 43 designates State Route 43 as a four-lane conventional highway between State Route 99 and Nebraska Avenue.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday only. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Existing Level of Service Analysis

Figures 2 and 3 illustrate the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing Traffic Conditions scenario are provided in Appendix E. Tables I and II present a summary of the Existing peak hour LOS at the study intersections during a weekday and Saturday, respectively.

At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.



- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table I: Existing (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	18.2	B	42.3	D
2	DeWolf Avenue / Floral Avenue	TWSC	9.7	A	11.2	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	14.7	B	18.2	B
5	Highland Avenue / Floral Avenue	Signalized	17.3	B	23.2	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.1	A	6.2	A
7	Whitson Street / Floral Avenue	Signalized	14.5	B	19.4	B
8	McCall Avenue / Floral Avenue	Signalized	25.9	C	19.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.2	A	8.0	A
10	Highland Avenue / Rose Avenue	TWSC	35.8	E	40.5	E
		Signalized (Improved)	14.7	B	14.4	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Table II: Existing (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	14.9	B
2	DeWolf Avenue / Floral Avenue	TWSC	10.3	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.4	B
5	Highland Avenue / Floral Avenue	Signalized	21.9	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A
7	Whitson Street / Floral Avenue	Signalized	16.8	B
8	McCall Avenue / Floral Avenue	Signalized	15.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	9.3	A
10	Highland Avenue / Rose Avenue	TWSC	23.8	C
		Signalized (Improved)	33.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



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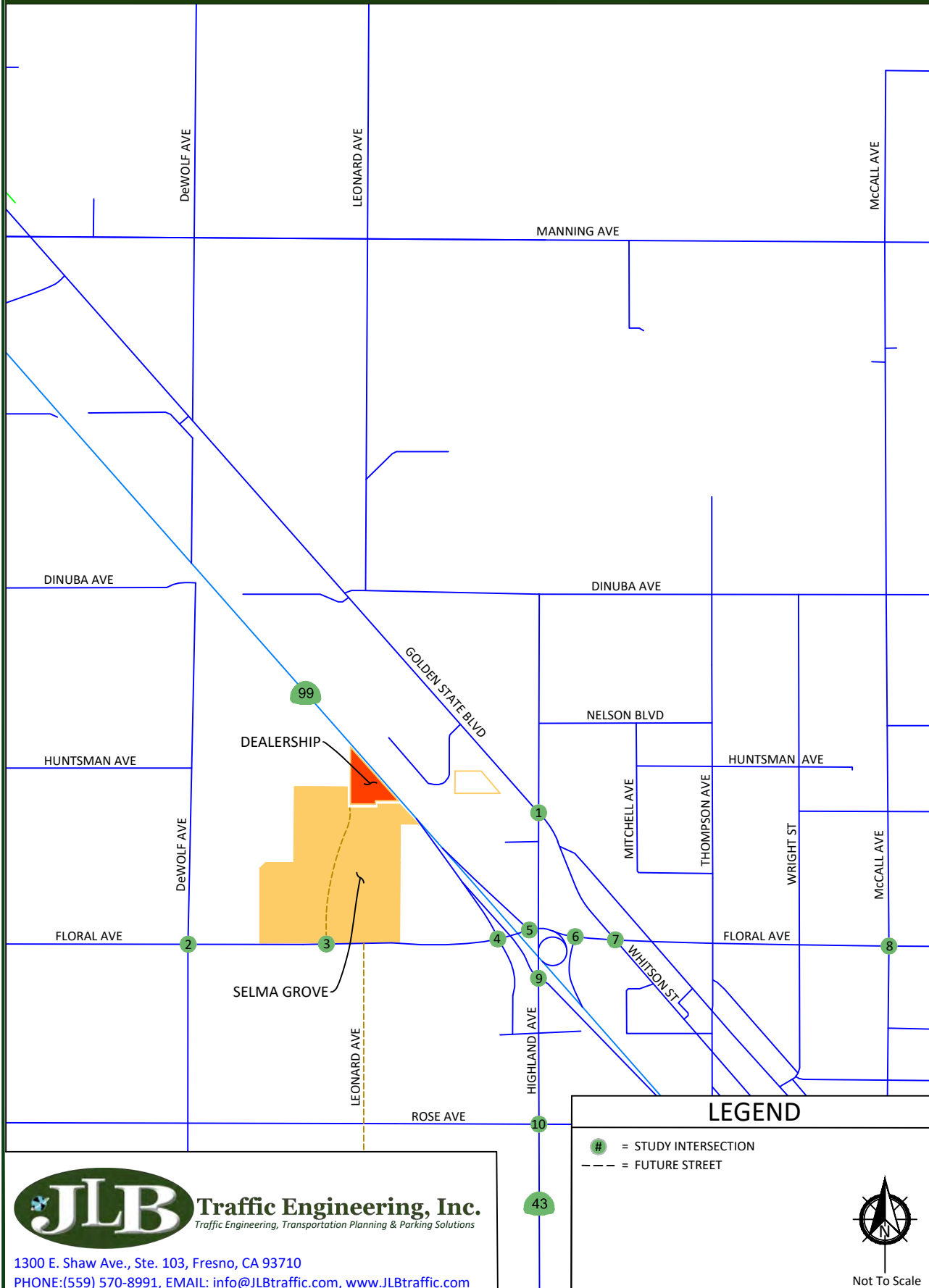
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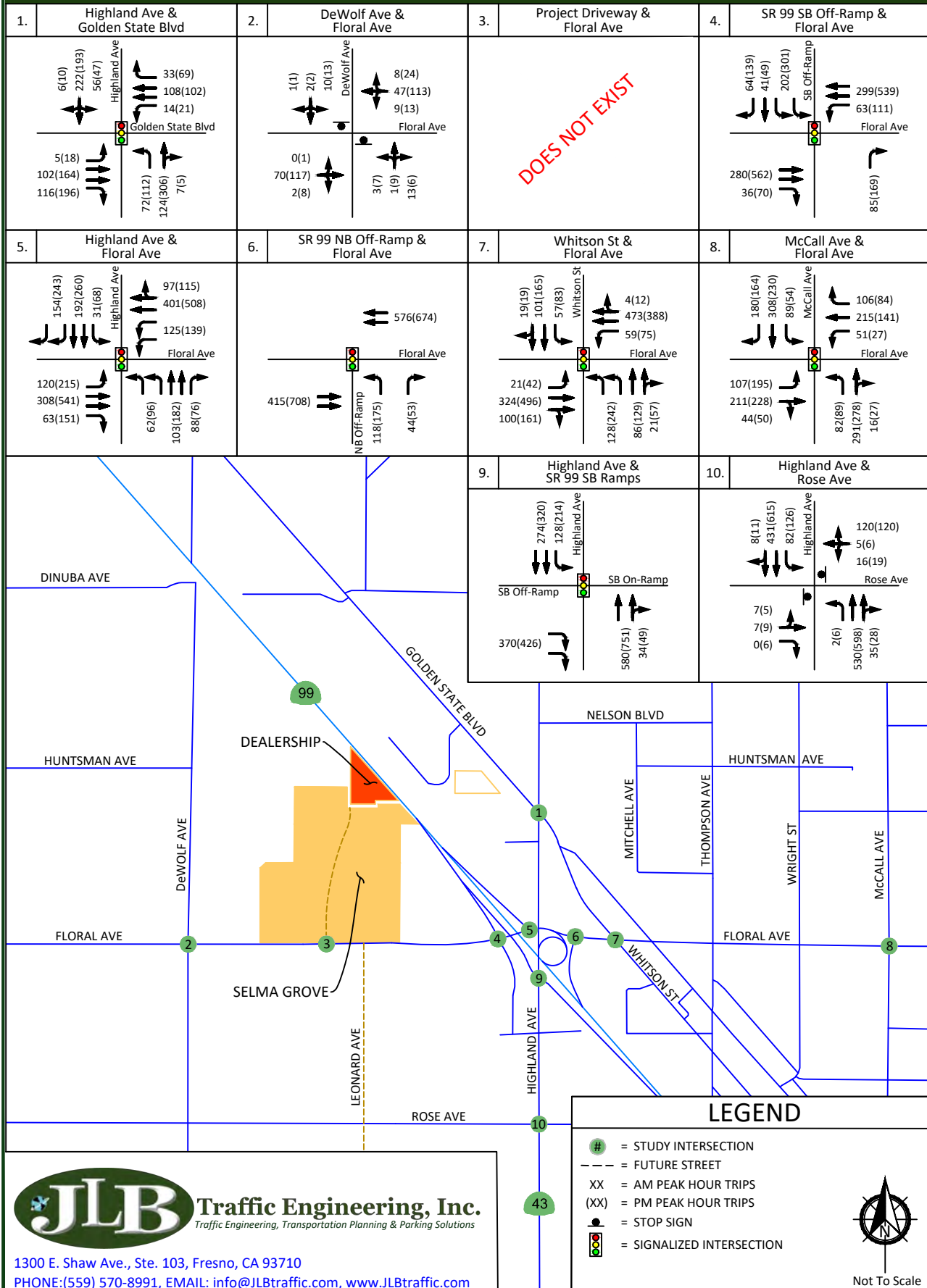
Selma Grove Project - City of Selma Vicinity Map

Figure
1



Selma Grove Project - City of Selma Existing (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
2



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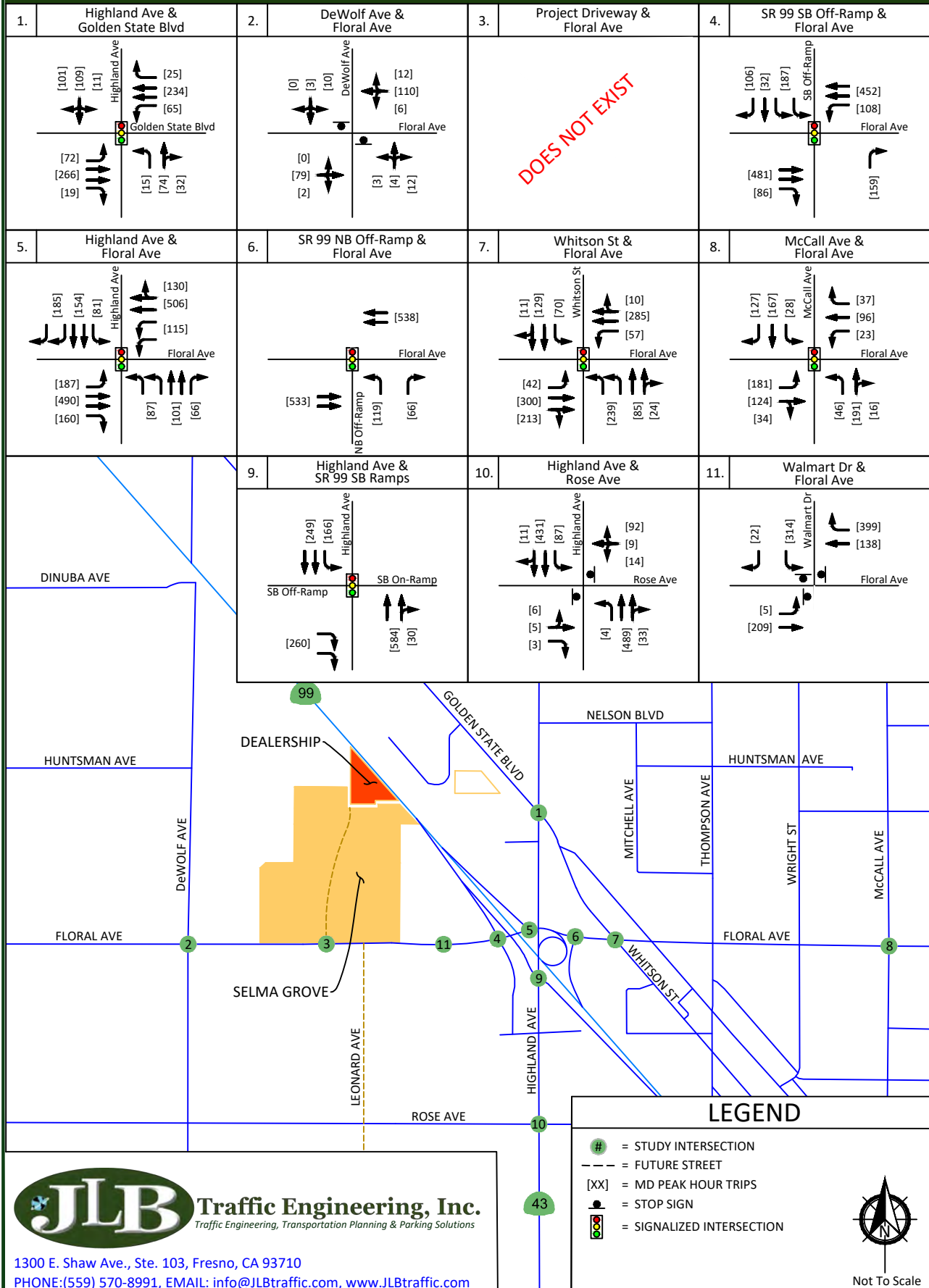
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Selma Grove Project - City of Selma

Existing (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
3



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Existing plus Dealership Traffic Conditions

Dealership Description

The existing Dealership Project covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Figure 4 illustrates the Dealership Site Plan.

Dealership Access

At present, access to and from the existing Dealership Project is from one (1) access point located on the north side of Floral Avenue approximately 1,425 feet west of the State Route 99 southbound off-ramp and is a full access.

Dealership Trip Generation

Trip generation rates for the existing Dealership Project were obtained from volume counts collected in July 2018. Tables III and IV present the trip generation for the existing Dealership Project with trip generation rates for Automobile Sales during a weekday and Saturday, respectively. At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.

Table III: Dealership (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Automobile Sales (New) (840)	48.693	k.s.f.	13.35	650	2.12	83	17	86	17	103	2.12	28	72	29	74	103
Total Project Trips				650				86	17	103				29	74	103

Note: k.s.f. = Thousand Square Feet

Table IV: Dealership (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Automobile Sales (New) (840)	48.693	k.s.f.	1.09	43	57	23	30	53
Total Project Trips						23	30	53

Note: k.s.f. = Thousand Square Feet

Dealership Trip Distribution

The existing Dealership Project trip distribution assumptions were developed based on the Fresno COG Dealership Select Zone, the existing roadway network, existing travel patterns, existing residential and commercial densities, engineering judgement, knowledge of the study area and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project. Figures 5 and 6 illustrate the Dealership Trips to the study intersections during a weekday and Saturday, respectively.



Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Dealership Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday only. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Existing plus Dealership Level of Service Analysis

The Existing plus Dealership Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figures 7 and 8 illustrate the Existing plus Dealership Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing plus Dealership Traffic Conditions scenario are provided in Appendix F. Tables V and VI present a summary of the Existing plus Dealership peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Table V: Existing plus Dealership (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	19.6	B	40.6	D
2	DeWolf Avenue / Floral Avenue	TWSC	9.7	A	11.6	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	14.5	B	18.5	B
5	Highland Avenue / Floral Avenue	Signalized	17.8	B	25.5	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A	6.2	A
7	Whitson Street / Floral Avenue	Signalized	14.5	B	19.5	B
8	McCall Avenue / Floral Avenue	Signalized	26.0	C	19.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.3	A	8.2	A
10	Highland Avenue / Rose Avenue	TWSC	36.1	E	41.0	E
		Signalized (Improved)	14.4	B	14.4	B

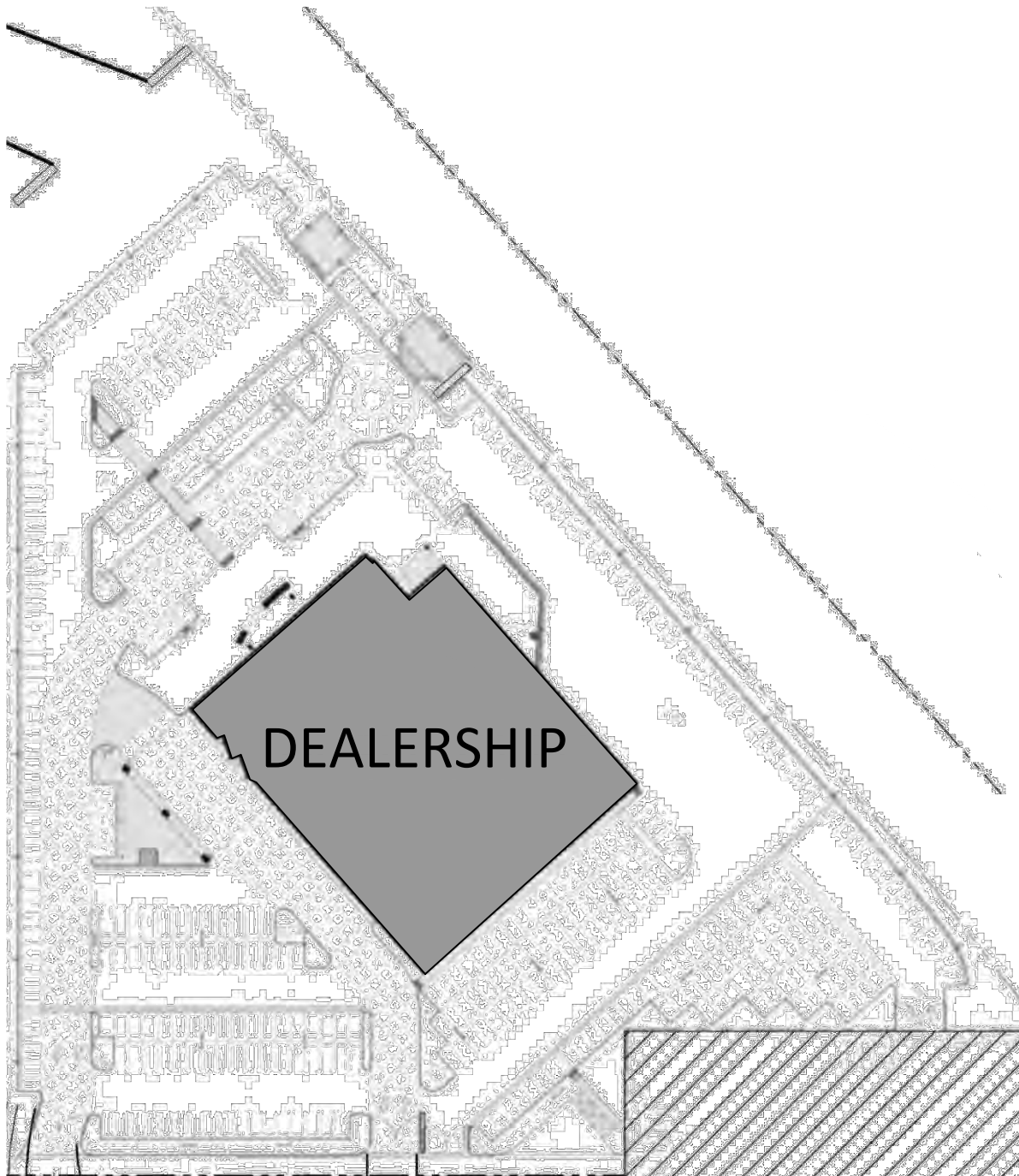
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Table VI: Existing plus Dealership (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	15.0	B
2	DeWolf Avenue / Floral Avenue	TWSC	10.4	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.5	B
5	Highland Avenue / Floral Avenue	Signalized	22.4	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A
7	Whitson Street / Floral Avenue	Signalized	16.8	B
8	McCall Avenue / Floral Avenue	Signalized	15.9	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	9.3	A
10	Highland Avenue / Rose Avenue	TWSC	24.0	C
		Signalized (Improved)	33.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.





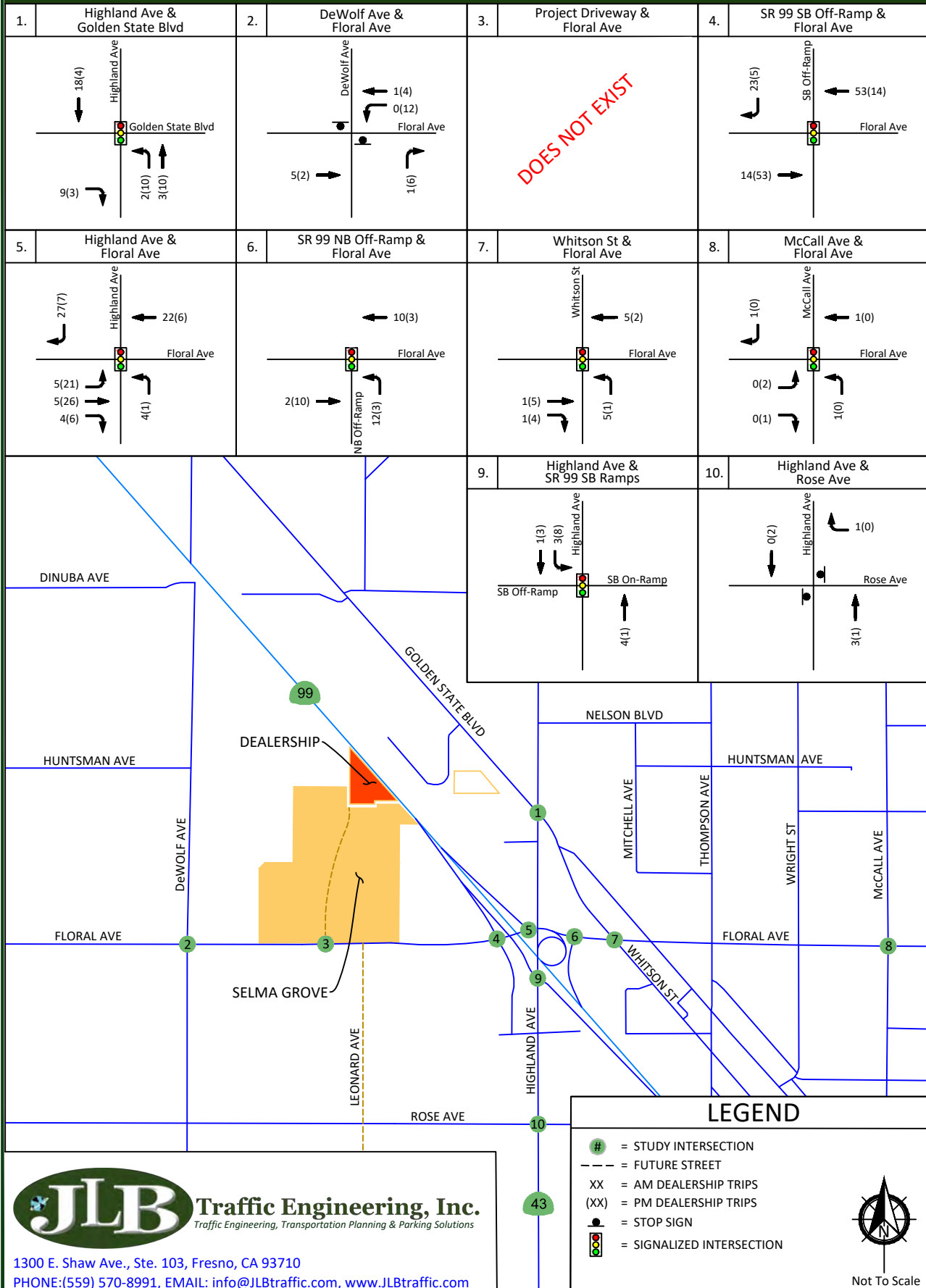
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Not To Scale

Selma Grove Project - City of Selma Dealership Trips (Weekday)

Figure
5



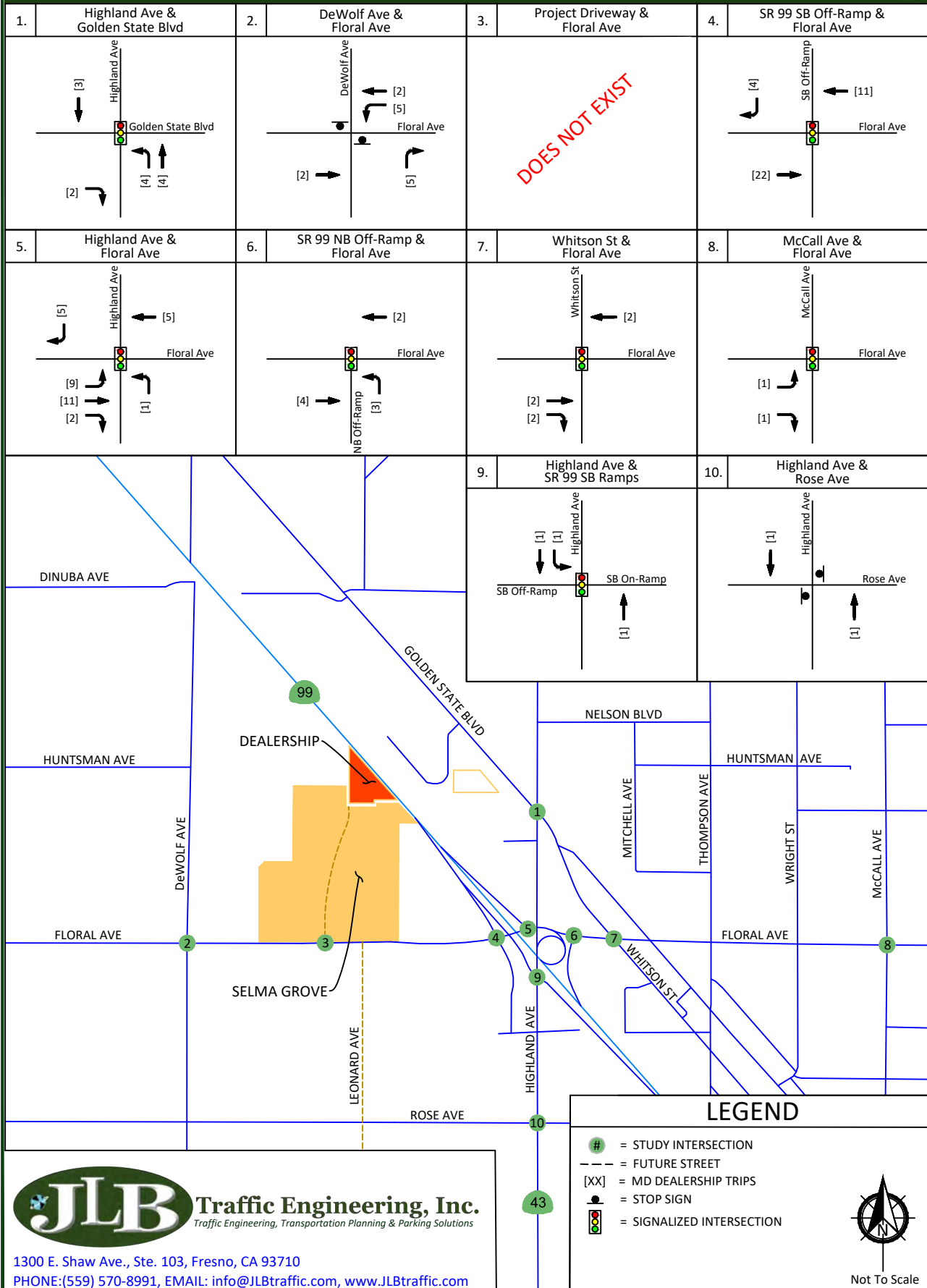
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Selma Grove Project - City of Selma Dealership Trips (Saturday)

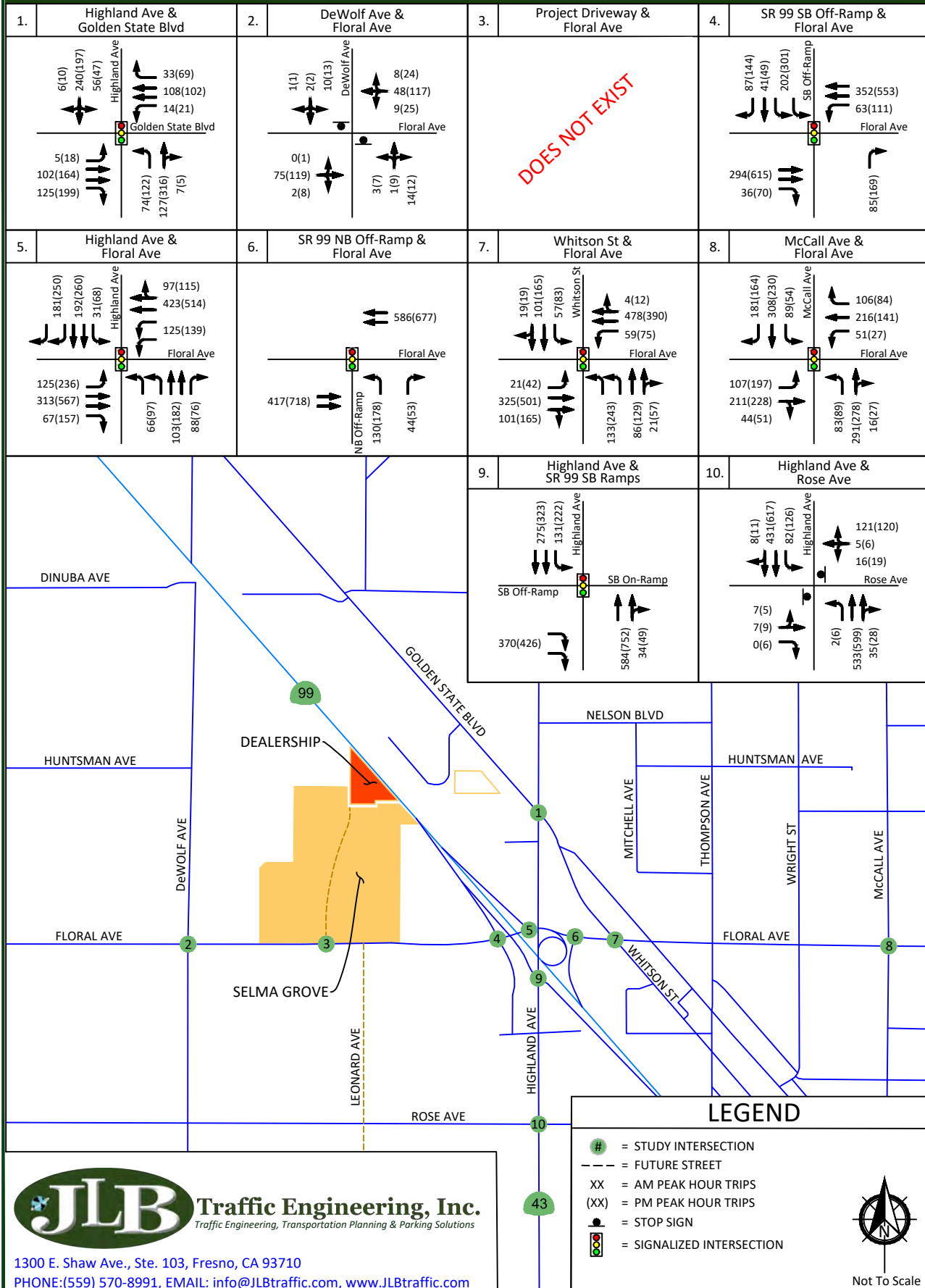
Figure
6



Selma Grove Project - City of Selma

Existing plus Dealership (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
7



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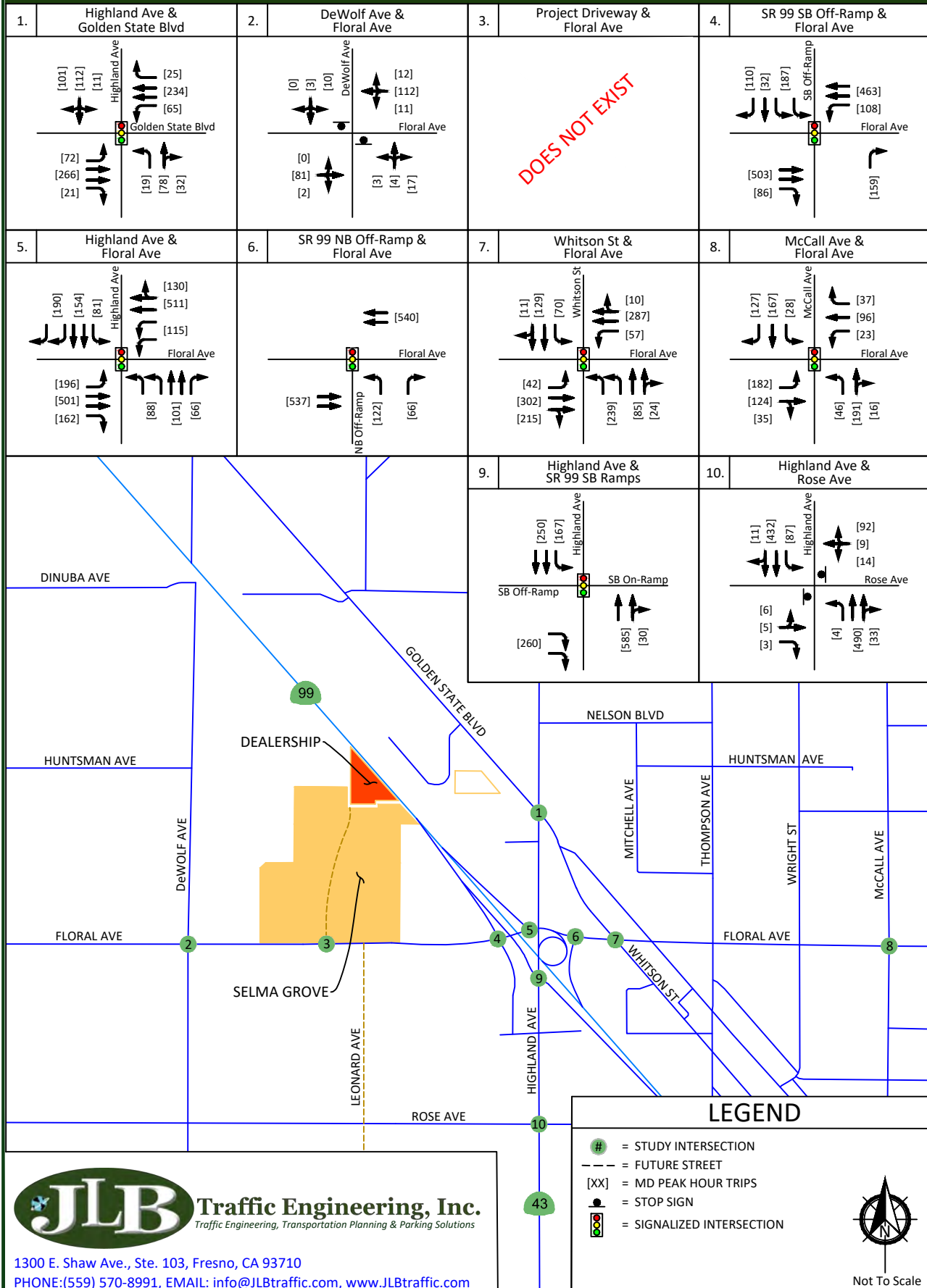
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Selma Grove Project - City of Selma

Existing plus Dealership (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
8



Existing plus Project Buildout Traffic Conditions

Project Buildout Description

At buildout, the Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the TIA includes the analysis of the existing Dealership Project, which covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond Project) is submitting an amendment to the site plan to reduce the ultimate buildout of the development evaluated by the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Figure 9 illustrates the latest Selma Grove Project Site Plan.

Project Buildout Access

Based on the latest Project Buildout Site Plan, access to and from the existing Dealership Project and proposed Selma Grove Project site at buildout will be from a total of five (5) points located along the north side of Floral Avenue approximately 3,050 feet (Driveway 1), 2,860 feet (Driveway 2), 2,280 feet (Driveway 3), 1,790 feet (Driveway 4) and 1,425 feet (Driveway 5) west of the State Route 99 southbound off-ramp. While Driveway 3 is proposed to have a full access, Driveways 1 and 5 are proposed to be limited to left-in, right-in and right-out access only, and Driveways 2 and 4 are proposed to be limited to right-in and right-out access only. To control access, it is recommended that a raised median with westbound left-turn pockets at Driveways 1 and 5 to the proposed Selma Grove Project site be implemented.

JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.



JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. Namely, it is recommended that Driveway 3 accommodate dual southbound left-turn lanes with a storage capacity of 375 feet and maintain a minimum throat depth of 375 feet before any vehicular openings to the adjacent parking lots. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. The proposed Selma Grove Project shall ensure that the appropriate corner sight distance is provided pursuant to Chapter 200 of the Caltrans Highway Design Manual. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.

Project Buildout Trip Generation

Trip generation rates for the existing Dealership Project were obtained from volume counts collected in July 2018. Trip generation rates for the proposed Selma Grove Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Tables VII and VIII present the trip generation for the proposed Project Buildout with trip generation rates for Hotel, Movie Theater, Shopping Center, Automobile Sales (New), Supermarket, Pharmacy/Drugstore with Drive-Through Window, and Fast-Food Restaurant with Drive-Through Window during a weekday and Saturday, respectively. The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account).

Trip generation rates for the Rockwell Pond Project were obtained from the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Tables IX and X present the trip generation for the Rockwell Pond Project with trips generation rates for Hotel, Home Improvement Store, Shopping Center, Automobile Sales (New), Discount Club, and Gasoline/Service Station with 16 fueling positions during a weekday and Saturday, respectively. At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account).

Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday. The difference in trip generation is summarized in Table XI.



The study takes into account reductions in trip generation as a result of internal capture. Internal capture rates were prepared pursuant to the NCHRP 684 Internal Trip Capture procedure. Internal capture trip reductions are applied to account for the interaction between various individual land uses assumed for the trip generation of the Project Buildout. For example, in a mixed-use development containing offices and shops, trips made by the office workers to the shops within the site are defined as internal, or captured, trips within the site. Table XII presents the results of the internal trip capture analysis for the existing Dealership Project and proposed Selma Grove Project. Captured trips are presented as negative numbers because they are deducted from the total number of trips calculated in Tables VII and VIII. Table XIII presents the adjusted trip generation resulting from the internal capture trip reductions for the existing Dealership Project and proposed Selma Grove Project.

In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. Table XIV presents the results of the pass-by trip reduction analysis for the existing Dealership Project and proposed Selma Grove Project. Pass-by trips are presented as negative numbers because they are deducted from the total number of trips calculated in Table XIII. Table XV presents the adjusted trip generation resulting from the pass-by trip reductions for the existing Dealership Project and proposed Selma Grove Project. As can be seen from Table XV, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.

Project Buildout Trip Distribution

The Project Buildout trip distribution assumptions were developed based on the Fresno COG Dealership and Selma Grove Select Zones, the existing roadway network, existing travel patterns, existing residential and commercial densities, engineering judgement, knowledge of the study area and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project. Figures 10 and 11 illustrate the Dealership Trips to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions), and Figures 12 and 13 illustrate the Selma Grove Trips to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions). Furthermore, Figures 14 and 15 illustrate the Dealership Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively, Figures 16 and 17 illustrate the Selma Grove Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively, and Figures 18 and 19 illustrate the Project Buildout Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively. Finally, Figures 20 and 21 illustrate the Net New Dealership Trips to the study intersections during a weekday and Saturday, respectively, Figures 22 and 23 illustrate the Net New Selma Grove Trips to the study intersections during a weekday and Saturday, respectively, and Figures 24 and 25 illustrate the Net New Project Buildout Trips to the study intersections during a weekday and Saturday, respectively.



Table VII: Project Buildout (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Hotel (310)	102	o.r.	8.36	853	0.47	59	41	28	20	48	0.60	51	49	31	30	61
Movie Theater (444)	54.240	k.s.f.	78.09	4,236	0.22	50	50	6	6	12	6.17	94	6	315	20	335
Shopping Center (820)	467.500	k.s.f.	37.75	17,648	0.94	62	38	272	167	439	3.81	48	52	855	926	1,781
Automobile Sales (New) (840)	48.693	k.s.f.	13.35	650	2.12	83	17	86	17	103	2.12	28	72	29	74	103
Supermarket (850)	50.000	k.s.f.	106.78	5,339	3.82	60	40	115	76	191	9.24	51	49	236	226	462
Pharmacy/Drugstore with Drive-Through Window (881)	14.500	k.s.f.	109.16	1,583	3.84	53	47	30	26	56	10.29	50	50	75	74	149
Fast-Food Restaurant with Drive-Through Window (934)	3.700	k.s.f.	470.95	1,743	40.19	51	49	76	73	149	32.67	52	48	63	58	121
Total Project Trips				32,052				613	385	998				1,604	1,408	3,012

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet

Table VIII: Project Buildout (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Hotel (310)	102	o.r.	0.60	51	49	31	30	61
Movie Theater (444)	54.240	k.s.f.	6.17	56	44	188	147	335
Shopping Center (820)	467.500	k.s.f.	4.50	52	48	1,094	1,010	2,104
Automobile Sales (New) (840)	48.693	k.s.f.	1.09	43	57	23	30	53
Supermarket (850)	50.000	k.s.f.	10.34	51	49	264	253	517
Pharmacy/Drugstore with Drive-Through Window (881)	14.500	k.s.f.	8.75	49	51	62	65	127
Fast-Food Restaurant with Drive-Through Window (934)	3.700	k.s.f.	54.86	51	49	104	99	203
Total Project Trips						1,766	1,634	3,400

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet



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Table IX: Rockwell Pond Project (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Hotel (310)	102	o.r.	8.92	910	0.67	58	42	40	29	69	0.70	49	51	35	37	72
Home Improvement Store (862)	171.178	k.s.f.	29.80	5,102	1.20	54	46	111	95	206	2.45	47	53	197	223	420
Shopping Center (820)	596.100	k.s.f.	42.94	25,598	1.03	61	39	375	240	615	3.75	48	52	1,073	1,163	2,236
Automobile Sales (New) (840)	77.000	k.s.f.	33.34	2,568	2.05	74	26	117	41	158	2.64	39	61	80	124	204
Discount Club (861)	160.000	k.s.f.	41.80	6,688	0.56	71	29	64	26	90	4.24	50	50	340	339	679
Gasoline/Service Station (944)	16	f.p.	168.56	2,697	12.07	50	50	97	97	194	13.86	50	50	111	111	222
Total Project Trips				43,563				804	528	1,332				1,836	1,997	3,833

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet
f.p. = Fueling Positions

Table X: Rockwell Pond Project (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Hotel (310)	102	o.r.	0.60	51	49	31	30	61
Home Improvement Store (862)	171.178	k.s.f.	4.44	51	49	388	372	760
Shopping Center (820)	596.100	k.s.f.	4.50	52	48	1,395	1,287	2,682
Automobile Sales (New) (840)	77.000	k.s.f.	1.09	43	57	36	48	84
Discount Club (861)	160.000	k.s.f.	6.37	49	51	499	520	1,019
Gasoline/Service Station (944)	16	f.p.	12.77	50	50	102	102	204
Total Project Trips						2,451	2,359	4,810

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet
f.p. = Fueling Positions



Table XI: Difference in Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Proposed Project Buildout Trip Generation	32,052	613	385	998	1,604	1,408	3,012	1,766	1,634	3,400
Rockwell Pond Project Trip Generation	43,563	804	528	1,332	1,836	1,997	3,833	2,451	2,359	4,810
Change in Trip Generation	-11,511	-191	-143	-334	-232	-589	-821	-685	-725	-1,410

Table XII: Internal Capture Trip Reductions

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	-90	-6	-6	-12	-8	-16	-24	-1	-2	-3
Selma Grove	-2,314	-50	-47	-97	-112	-105	-217	-130	-139	-269
Total Internal Trip Capture Reductions	-2,404	-56	-53	-109	-120	-121	-241	-131	-141	-272

Table XIII: Adjusted Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	560	80	11	91	21	58	79	22	28	50
Selma Grove	29,088	477	321	798	1,463	1,229	2,692	1,613	1,465	3,078
Adjusted Trip Generation	29,648	557	332	889	1,484	1,287	2,771	1,635	1,493	3,128

Table XIV: Pass-By Trip Reductions

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	-5	-1	0	-1	0	-1	-1	0	0	0
Selma Grove	-291	-5	-3	-8	-15	-12	-27	-16	-15	-31
Total Pass-By Trip Reductions	-296	-6	-3	-9	-15	-13	-28	-16	-15	-31

Table XV: Net New Project Buildout Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	555	79	11	90	21	57	78	22	28	50
Selma Grove	28,797	472	318	790	1,448	1,217	2,665	1,597	1,450	3,047
Net New Project Trips	29,352	551	329	880	1,469	1,274	2,743	1,619	1,478	3,097



Bikeways

Currently, bike facilities do not exist in the vicinity of the proposed Project site. The City of Selma 2003 Bicycle Transportation Plan recommends that Class II Bike Lanes be implemented on: 1) DeWolf Avenue between Dinuba Avenue and Mountain View Avenue, 2) Floral Avenue between DeWolf Avenue and Amber Avenue and 3) Golden State Boulevard/Whitson Street between Manning Avenue and Mountain View Avenue. Therefore, it is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.

Transit

The Selma Transit Division operates under MV Transportation, Monday through Friday from 7:00 AM to 5:30 PM. The Selma Transit Division operates five (5) compressed natural gas vehicles. The natural gas vans operate on an “on call basis” and will pick up and drop off at the requested destination within the City’s SOI. One (1) vehicle operates on Saturdays from 8:00 AM to 5:00 PM.

Fresno County Rural Transit Agency (FCRTA) is the transit operator in the County of Fresno. At present, there are two (2) Transit Routes that serve the City of Selma. These include Kingsburg-Reedley Inter-City Transit and Southeast Inter-City Transit. Kingsburg-Reedley Transit runs in the vicinity of the proposed Project via Whitson Street. This route provides a direct connection to the cities of Reedley, Parlier, Fowler, Selma and Kingsburg. The closest stop is located approximately 0.87 miles to the east of the proposed Project near the Selma Plaza Shopping Center. Southeast Transit runs in the vicinity of the proposed Project via Whitson Street. This Route provides a direct connection to the cities of Fresno, Fowler, Selma and Kingsburg. The closest stop is located approximately 0.87 miles to the east of the proposed Project near the Selma Plaza Shopping Center.

Kings Area Rural Transit (KART) is the transit operator in the County of Kings. KART Route 17 runs in the vicinity of the proposed Project via Highland Avenue. The closest stop is located approximately 0.67 miles to the southeast of the proposed Project near Selma Kaiser Hospital. This Route provides a direct connection to Valley Children’s Hospital, Fresno Kaiser Hospital, Fresno Veterans Hospital, Community Regional Center, Fresno Fulton Mall, and Selma Kaiser Hospital. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Project Driveway 3 and Floral Avenue satisfies the peak hour signal warrant during all peak periods on a weekday and Saturday, while the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the AM and PM peak periods on a weekday only. Based on the signal warrants and engineering judgement, signalization of these intersections is recommended.



Results of Existing plus Project Buildout Level of Service Analysis

The Existing plus Project Buildout Traffic Conditions scenario assumes that the proposed Selma Grove Project will construct its frontage improvements to Floral Avenue. Figures 26 and 27 illustrate the Existing plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing plus Project Buildout Traffic Conditions scenario are provided in Appendix G. Tables XVI and XVII present a summary of the Existing plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase; and
 - Prohibit northbound to southbound U-turn movements.
- DeWolf Avenue / Floral Avenue
 - Implement all-way stop controls.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue approximately 1,000 feet north of Floral Avenue; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XVI: Existing plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	28.7	C	>120.0	F
		Signalized (Mitigated)	18.1	B	29.4	C
2	DeWolf Avenue / Floral Avenue	TWSC	10.3	B	65.9	F
		AWSC (Mitigated)	7.7	A	19.1	C
3	Project Driveway 3 / Floral Avenue	OWSC	24.9	C	>120.0	F
		Signalized (Mitigated)	26.1	C	28.4	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	15.3	B	41.6	D
		Signalized (Mitigated)	14.3	B	23.1	C
5	Highland Avenue / Floral Avenue	Signalized	22.9	C	>120.0	F
		Signalized (Mitigated)	16.9	B	34.4	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.6	A	8.1	A
7	Whitson Street / Floral Avenue	Signalized	14.7	B	43.7	D
8	McCall Avenue / Floral Avenue	Signalized	26.5	C	21.7	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.5	A	9.0	A
10	Highland Avenue / Rose Avenue	TWSC	38.1	E	44.2	E
		Signalized (Mitigated)	14.6	B	14.7	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XVII: Existing plus Project Buildout (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	26.6	C
		Signalized (Mitigated)	22.2	C
2	DeWolf Avenue / Floral Avenue	TWSC	45.0	E
		AWSC (Mitigated)	15.6	C
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	31.9	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	47.3	D
		Signalized (Mitigated)	21.5	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	43.8	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.9	A
7	Whitson Street / Floral Avenue	Signalized	18.9	B
8	McCall Avenue / Floral Avenue	Signalized	16.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.6	A
10	Highland Avenue / Rose Avenue	TWSC	25.4	D
		Signalized (Mitigated)	33.2	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.





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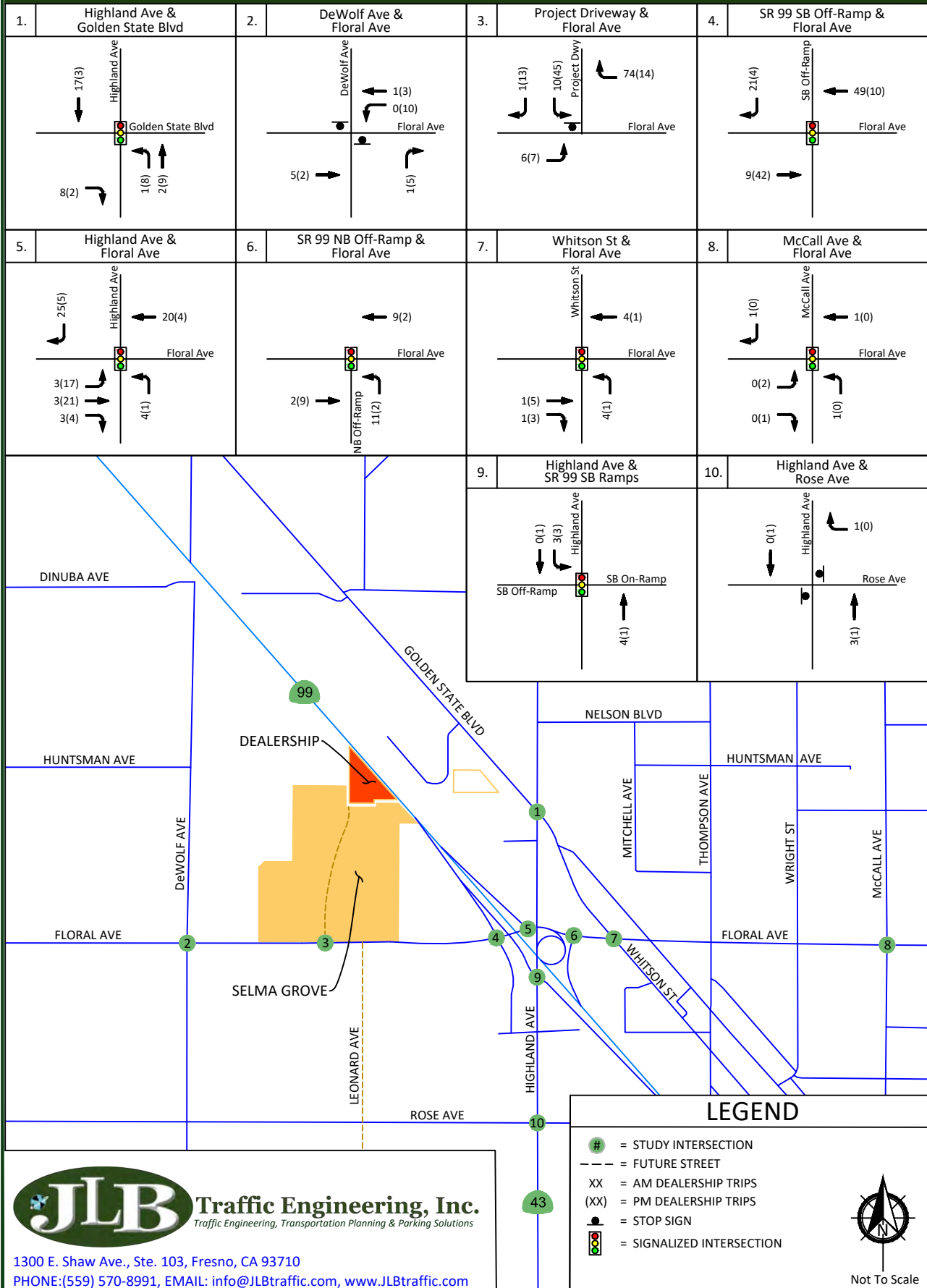
001-005 - 12/11/2018 - JR/JA



Not To Scale

Selma Grove Project - City of Selma Dealership Trips (Weekday)

Figure
10



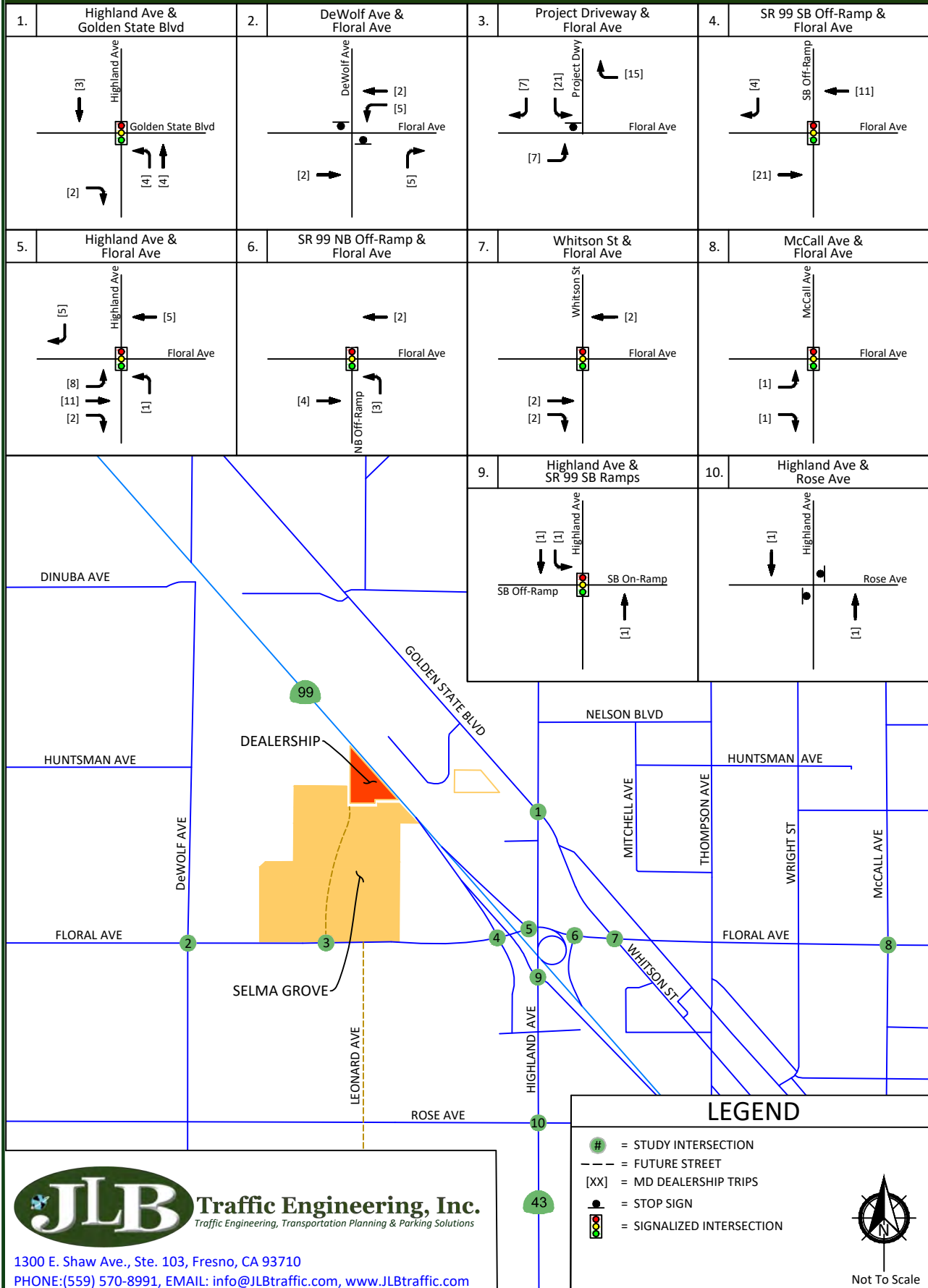
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Selma Grove Project - City of Selma Dealership Trips (Saturday)

Figure
11



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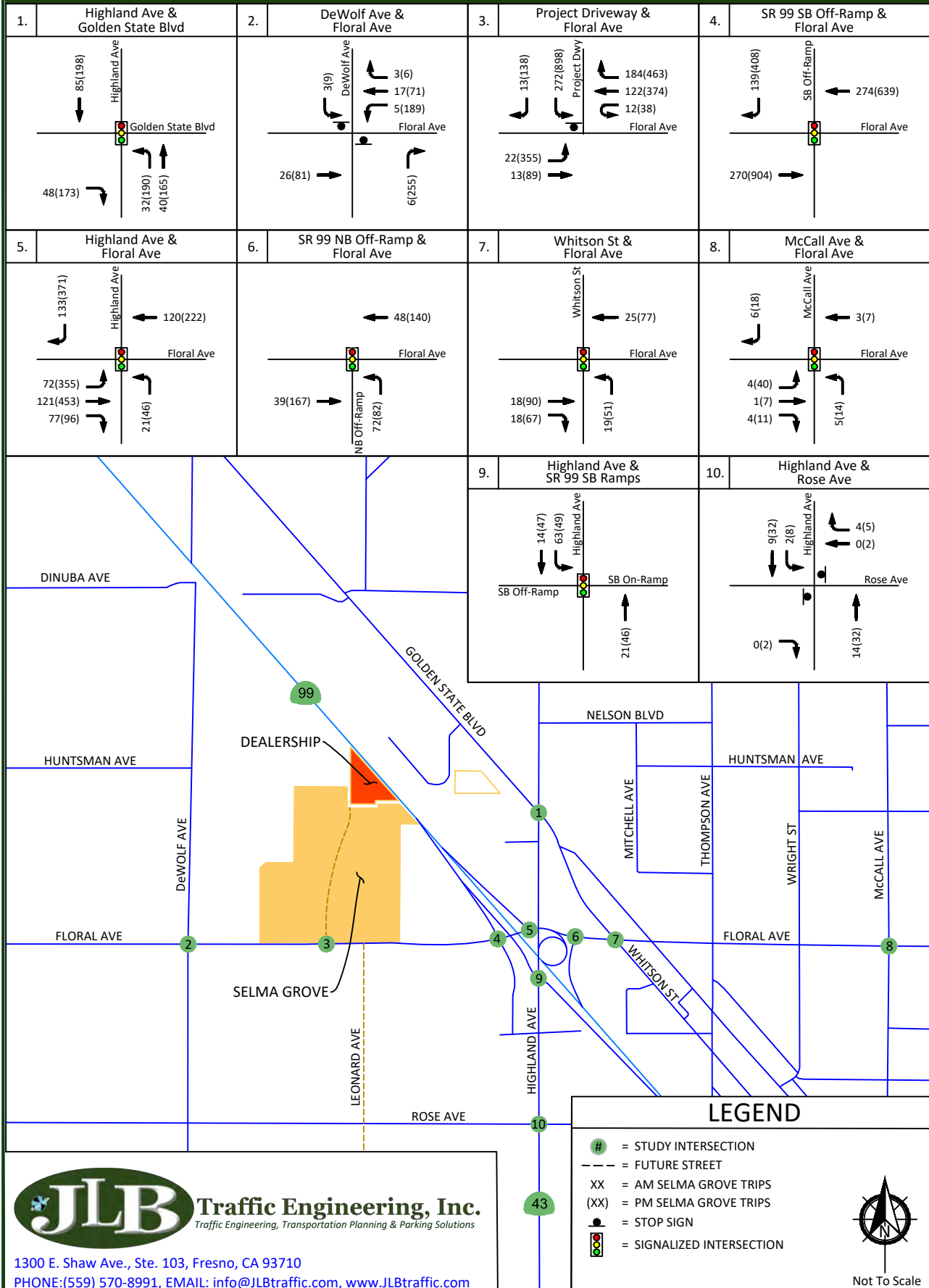
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Selma Grove Project - City of Selma

Selma Grove Trips (Weekday)

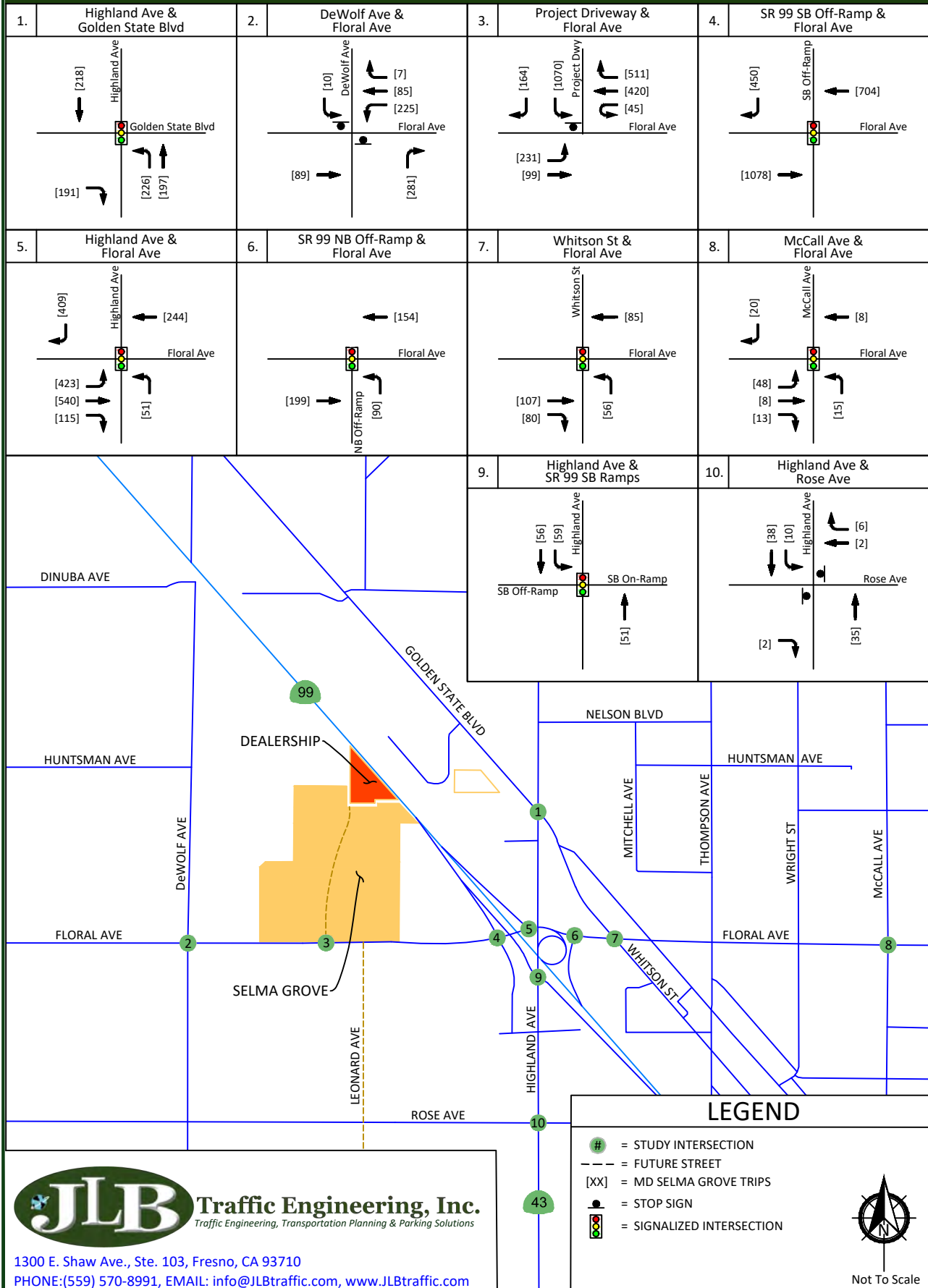
Figure
12



Selma Grove Project - City of Selma

Selma Grove Trips (Saturday)

Figure
13



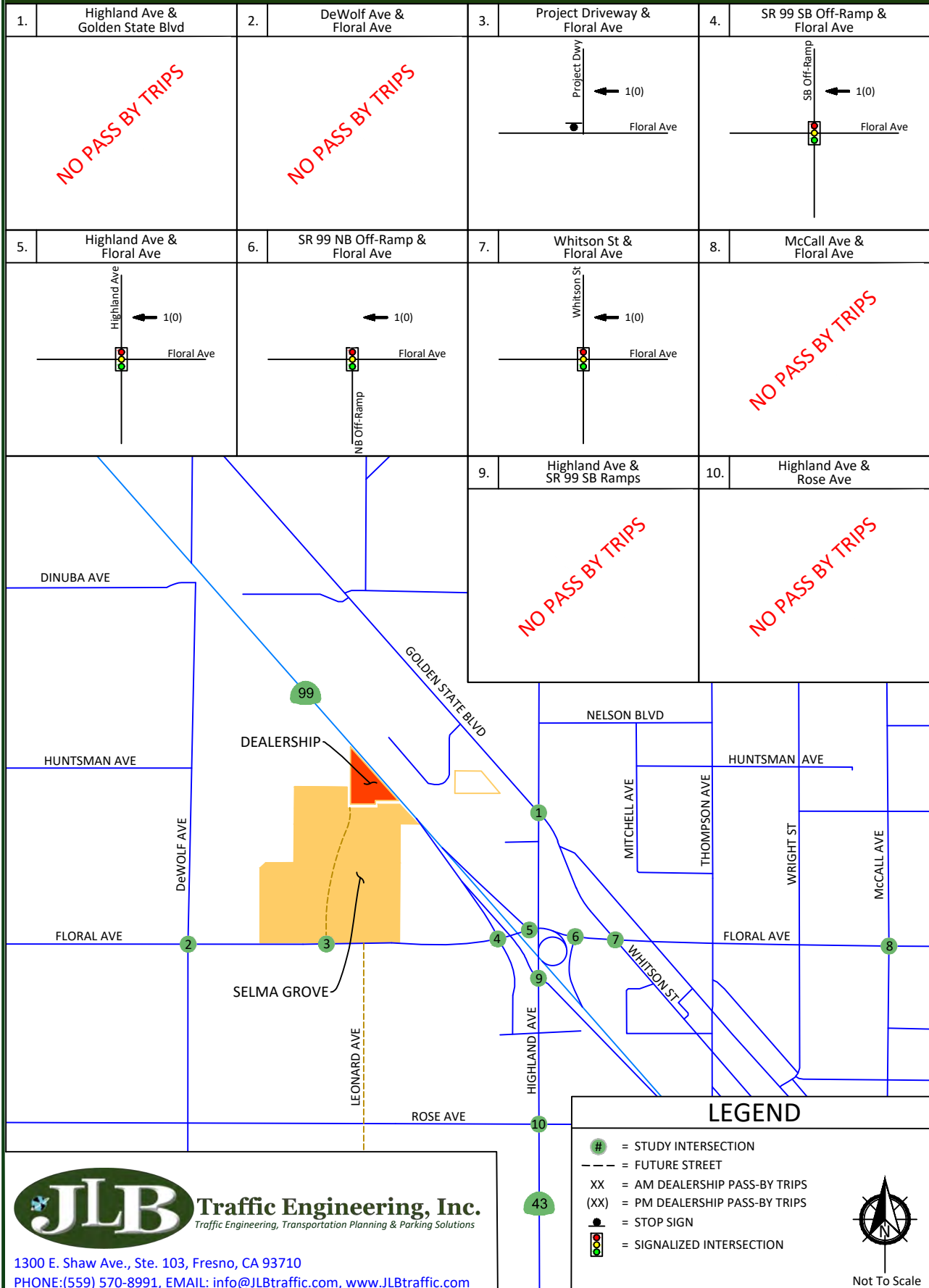
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Selma Grove Project - City of Selma Dealership Pass-By Trip Reductions (Weekday)

Figure
14



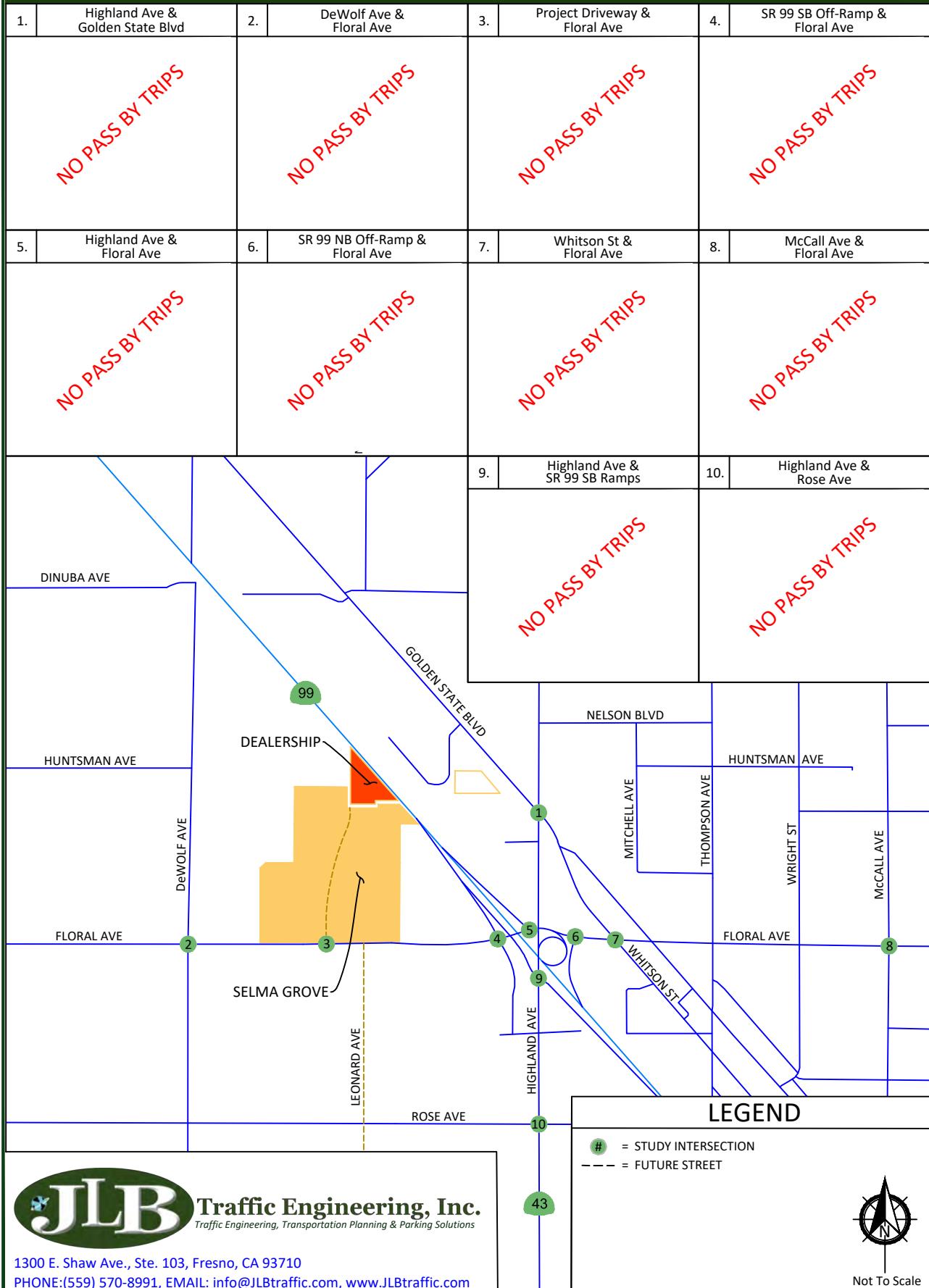
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Selma Grove Project - City of Selma Dealership Pass-By Trip Reductions (Saturday)

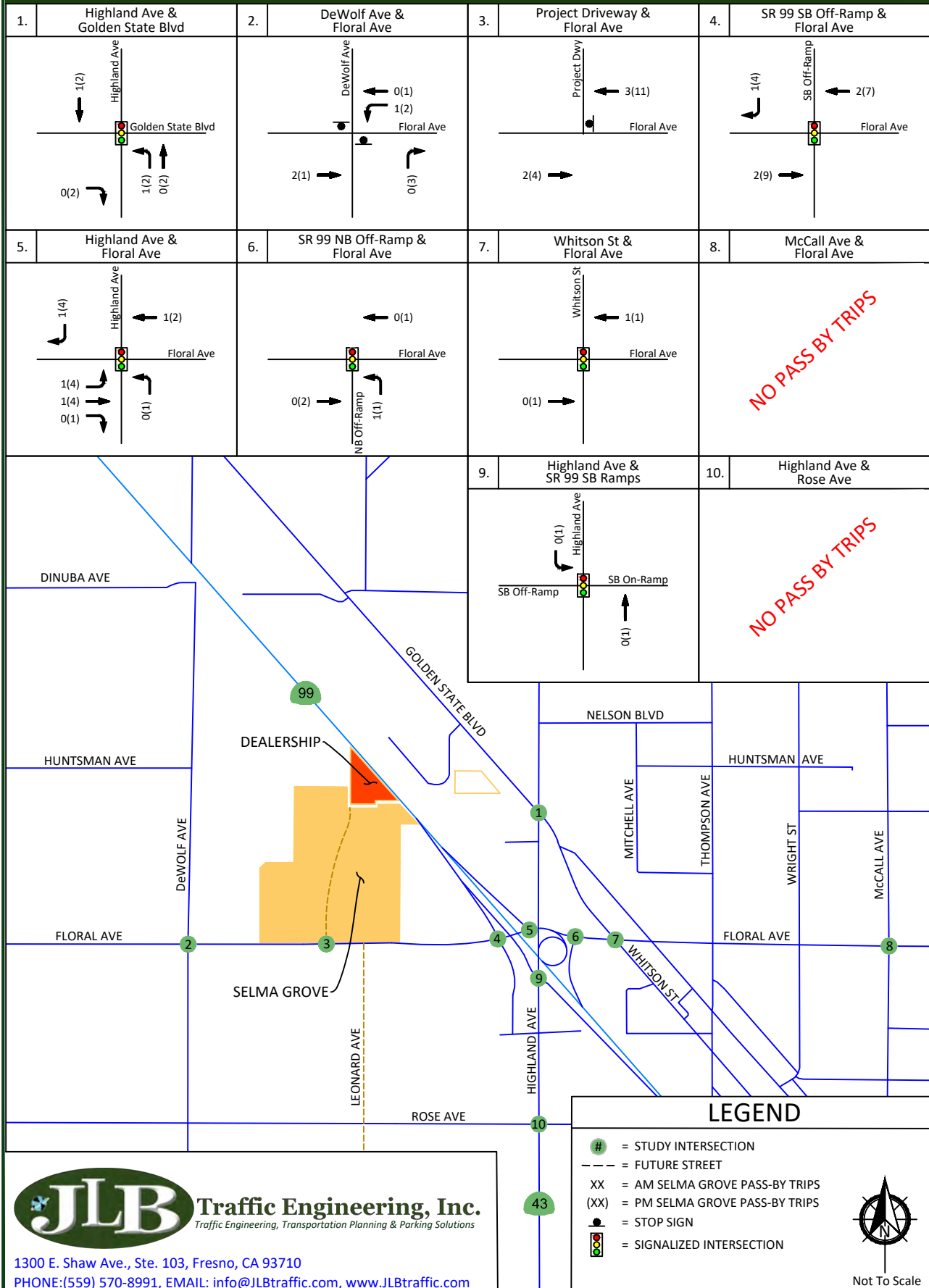
Figure
15



Selma Grove Project - City of Selma

Selma Grove Pass-By Trip Reductions (Weekday)

Figure
16



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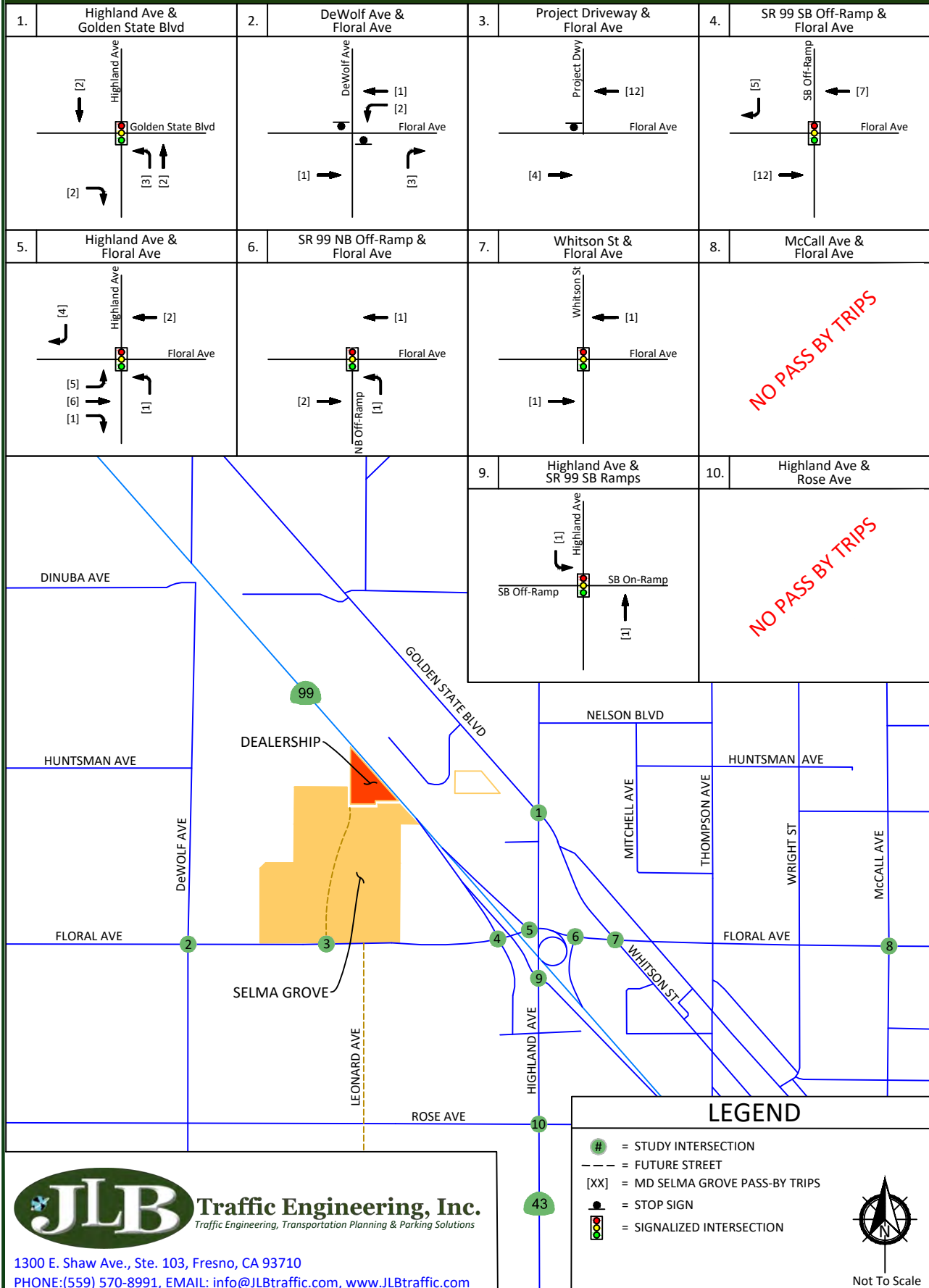
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Selma Grove Project - City of Selma

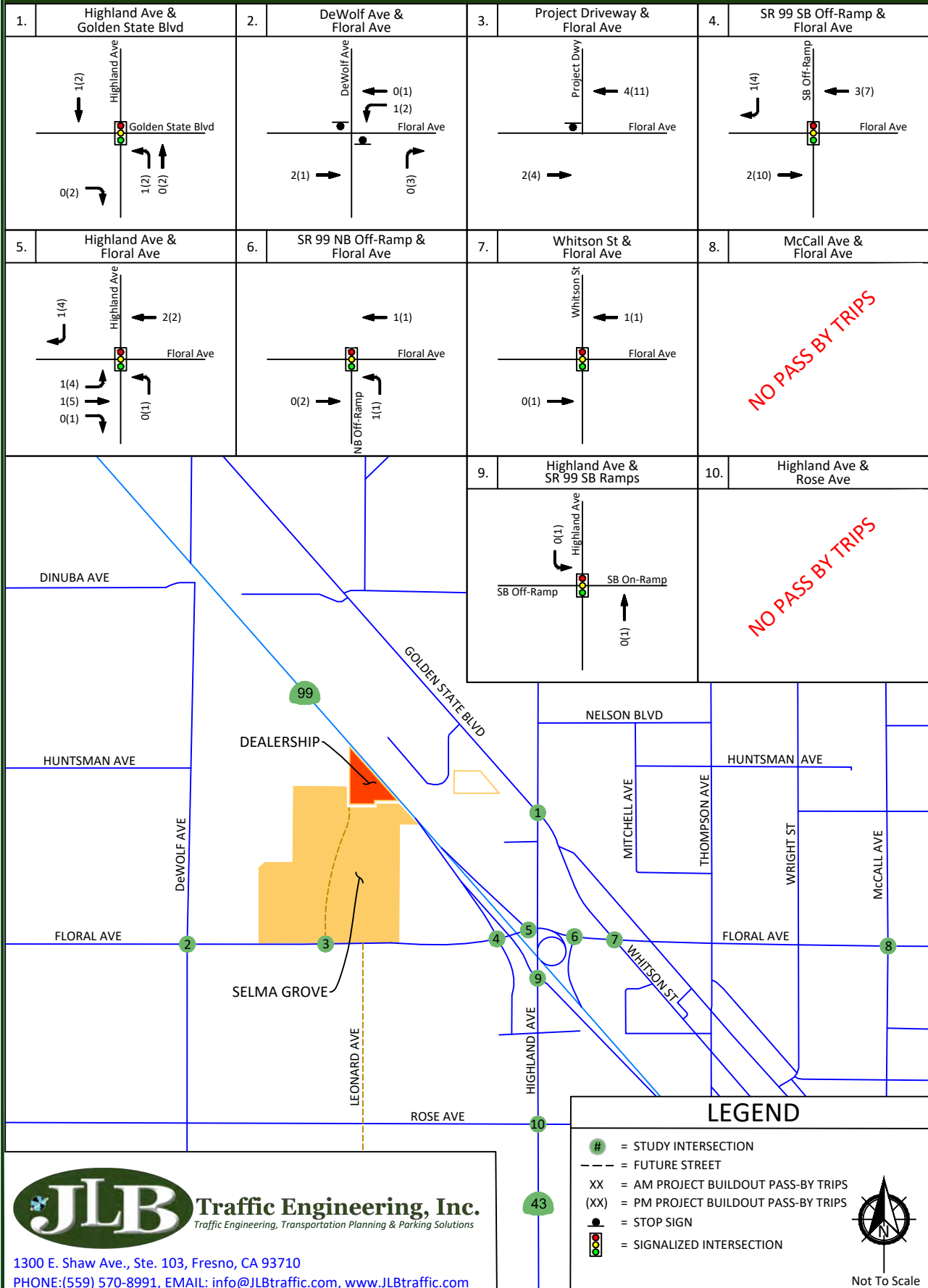
Selma Grove Pass-By Trip Reductions (Saturday)

Figure
17



Selma Grove Project - City of Selma Project Buildout Pass-By Trip Reductions (Weekday)

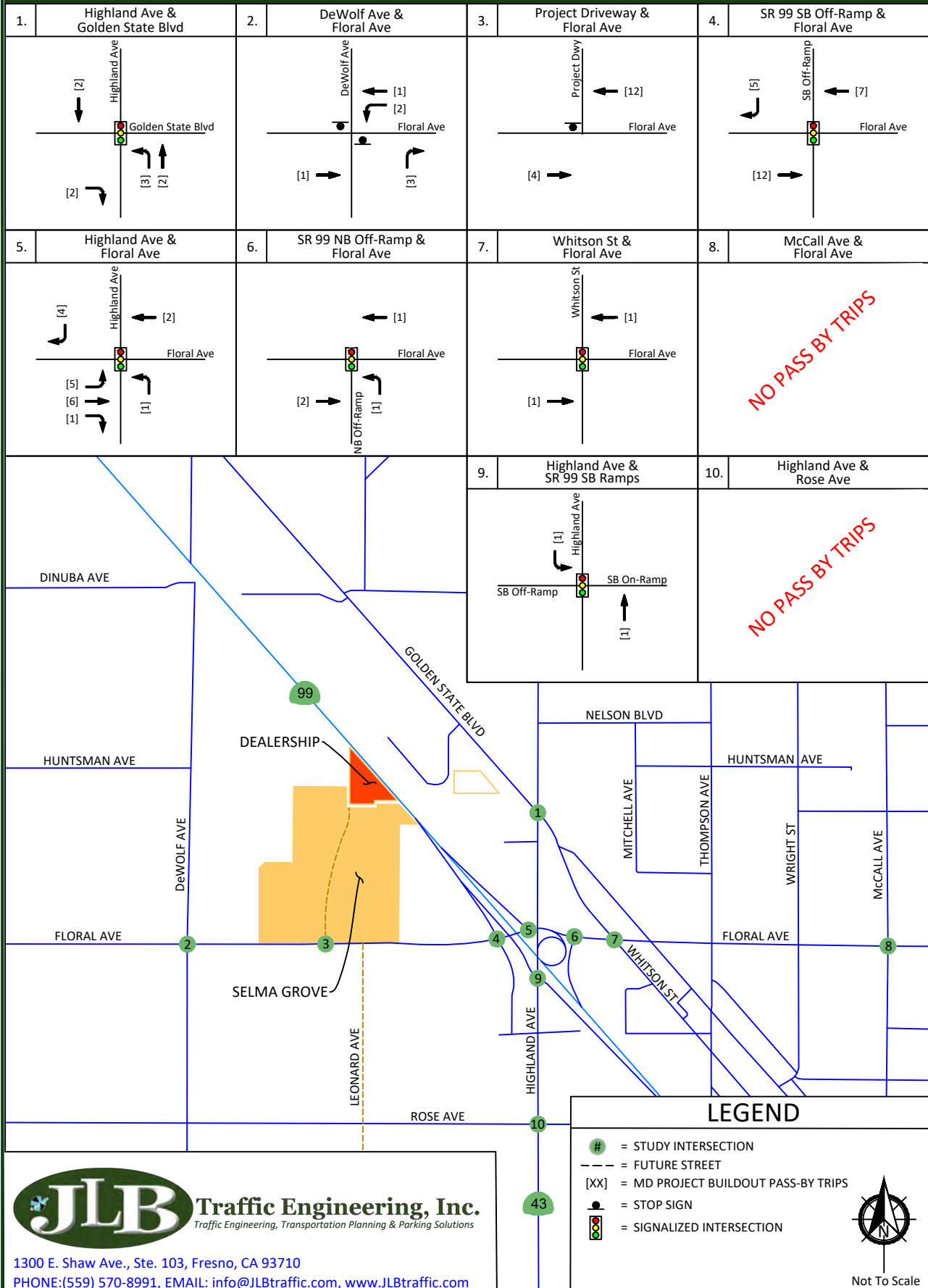
Figure
18



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Selma Grove Project - City of Selma Project Buildout Pass-By Reductions (Saturday)

Figure
19



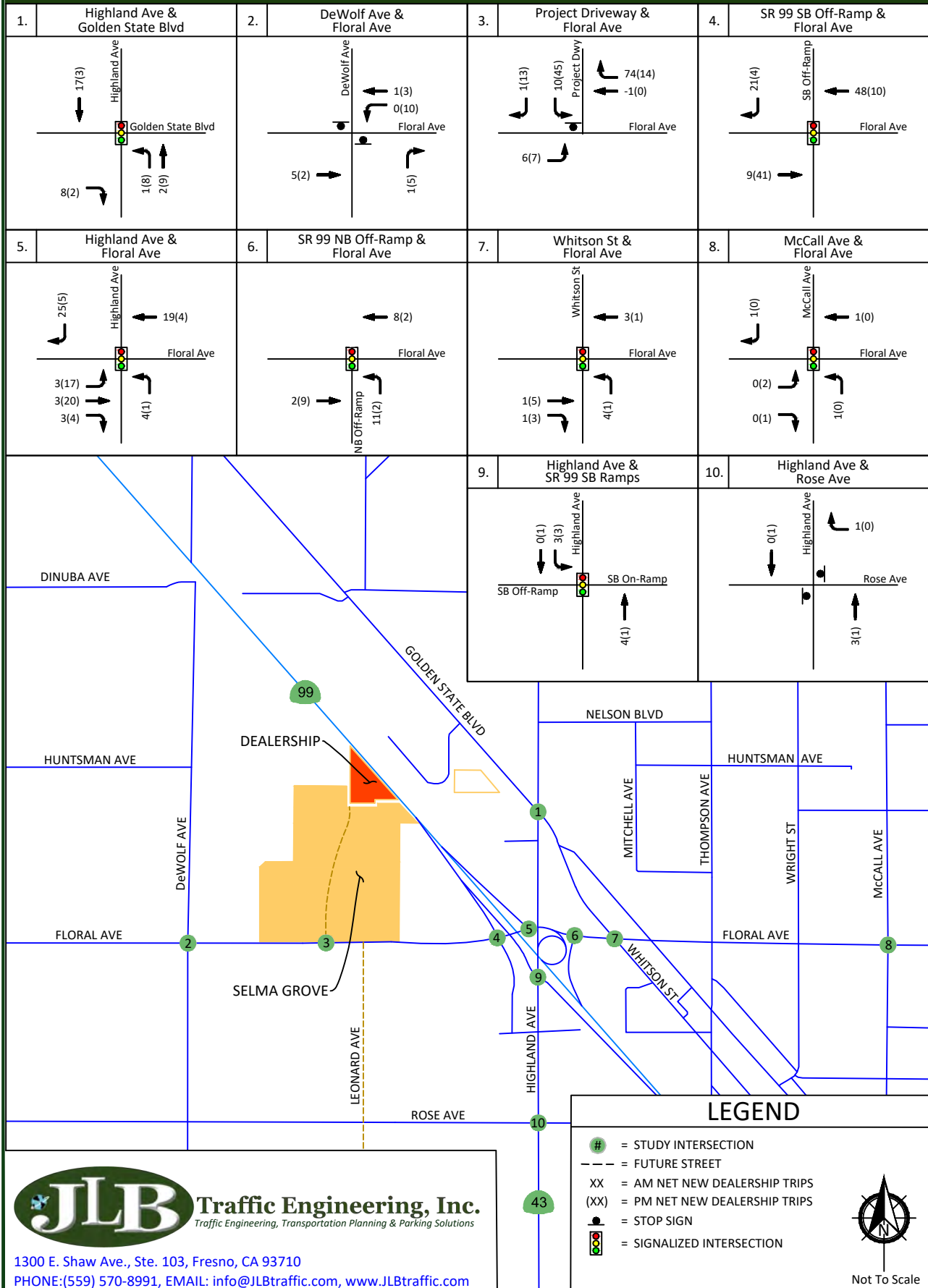
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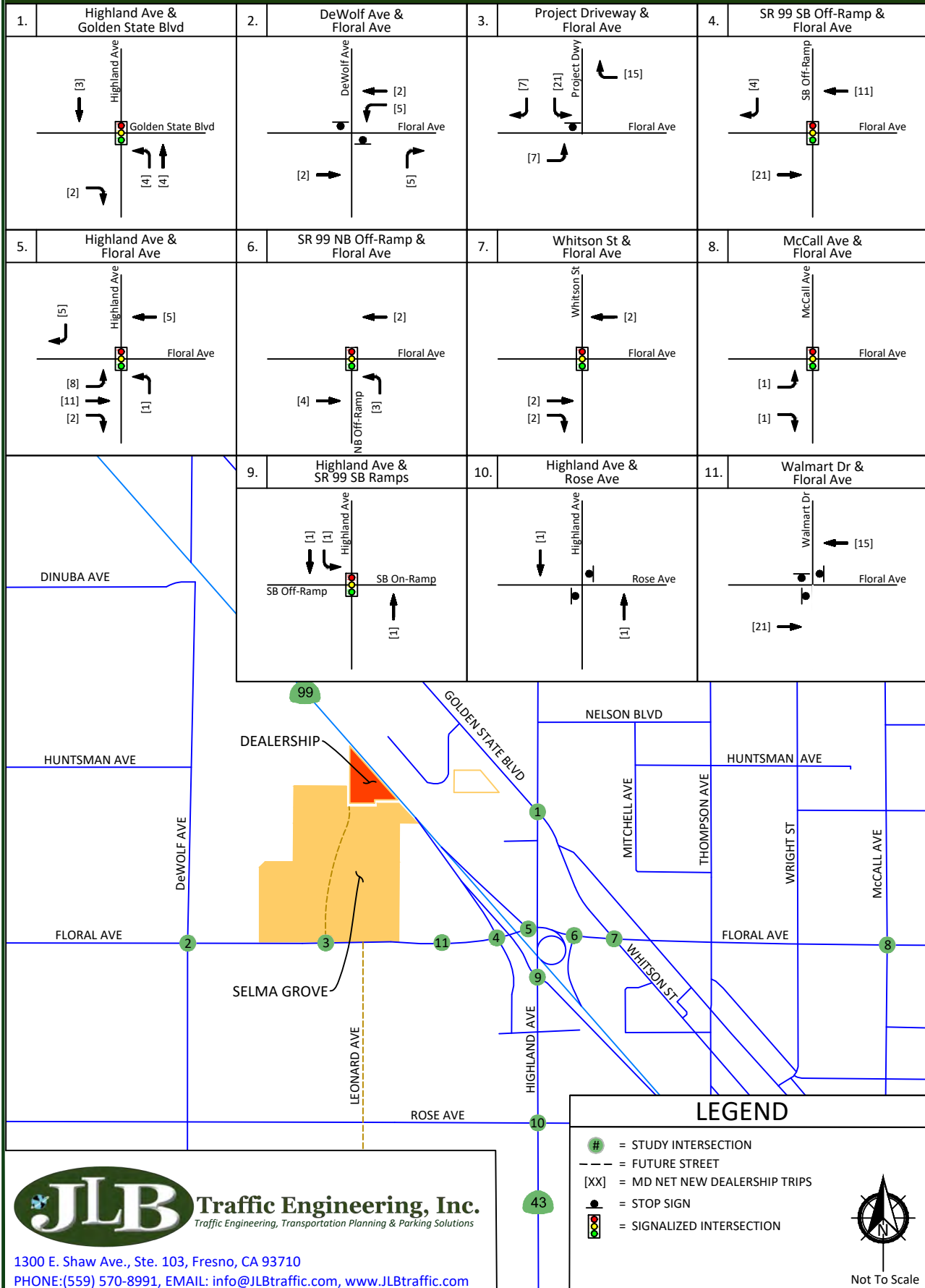
Selma Grove Project - City of Selma Net New Dealership Trips (Weekday)

Figure
20



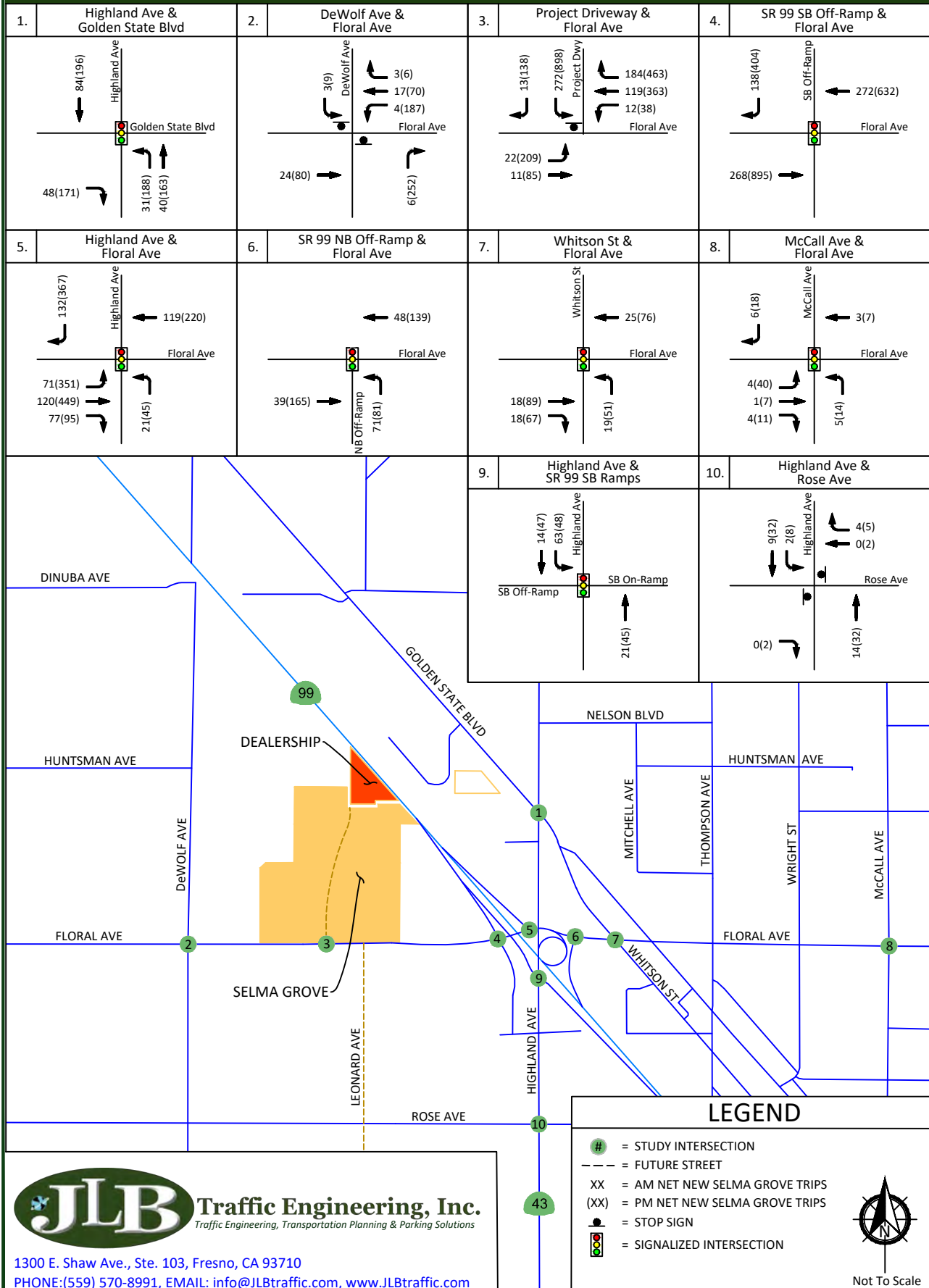
Selma Grove Project - City of Selma Net New Dealership Trips (Saturday)

Figure
21



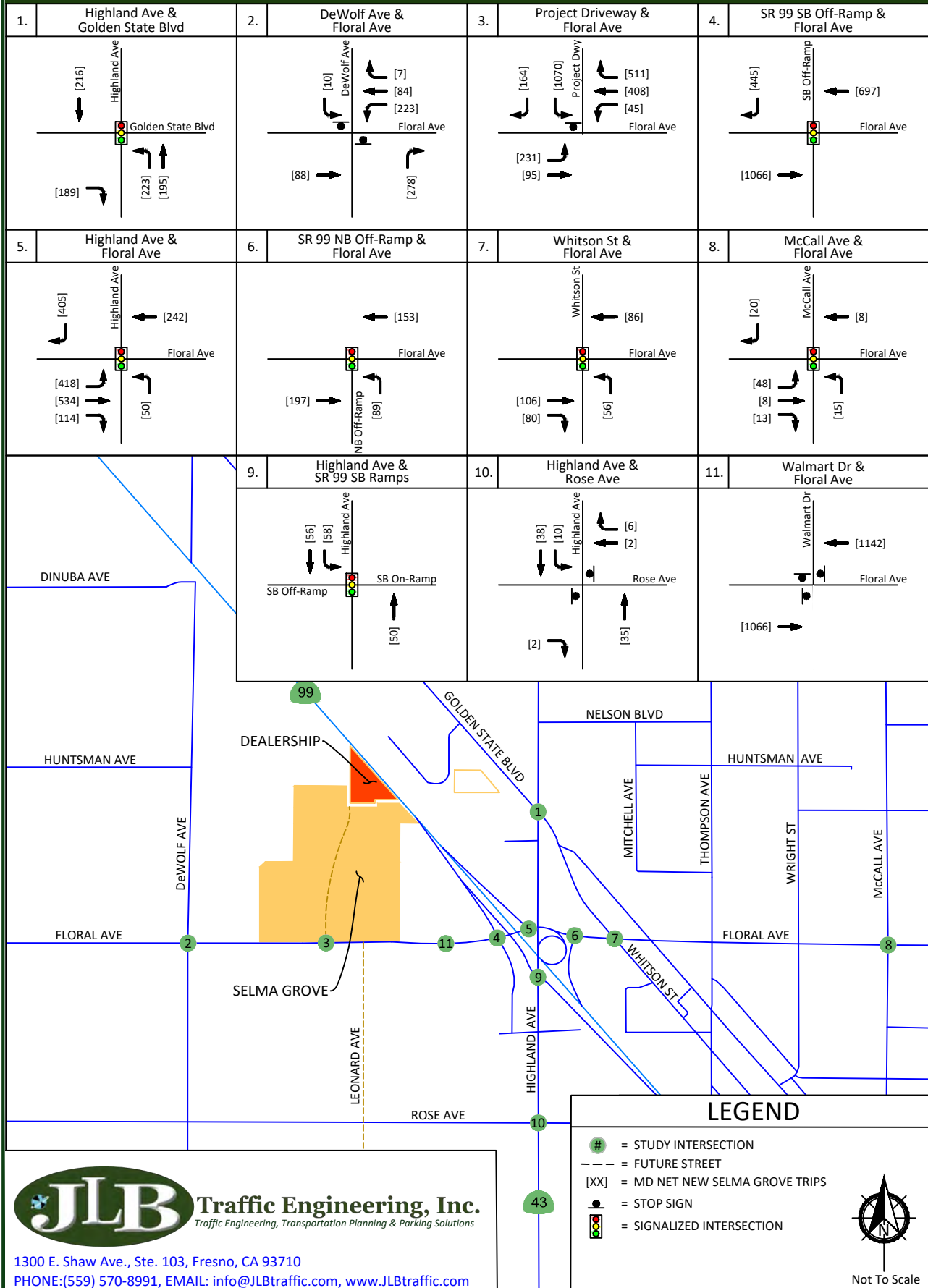
Selma Grove Project - City of Selma Net New Selma Grove Trips (Weekday)

Figure
22



Selma Grove Project - City of Selma Net New Selma Grove Trips (Saturday)

Figure
23



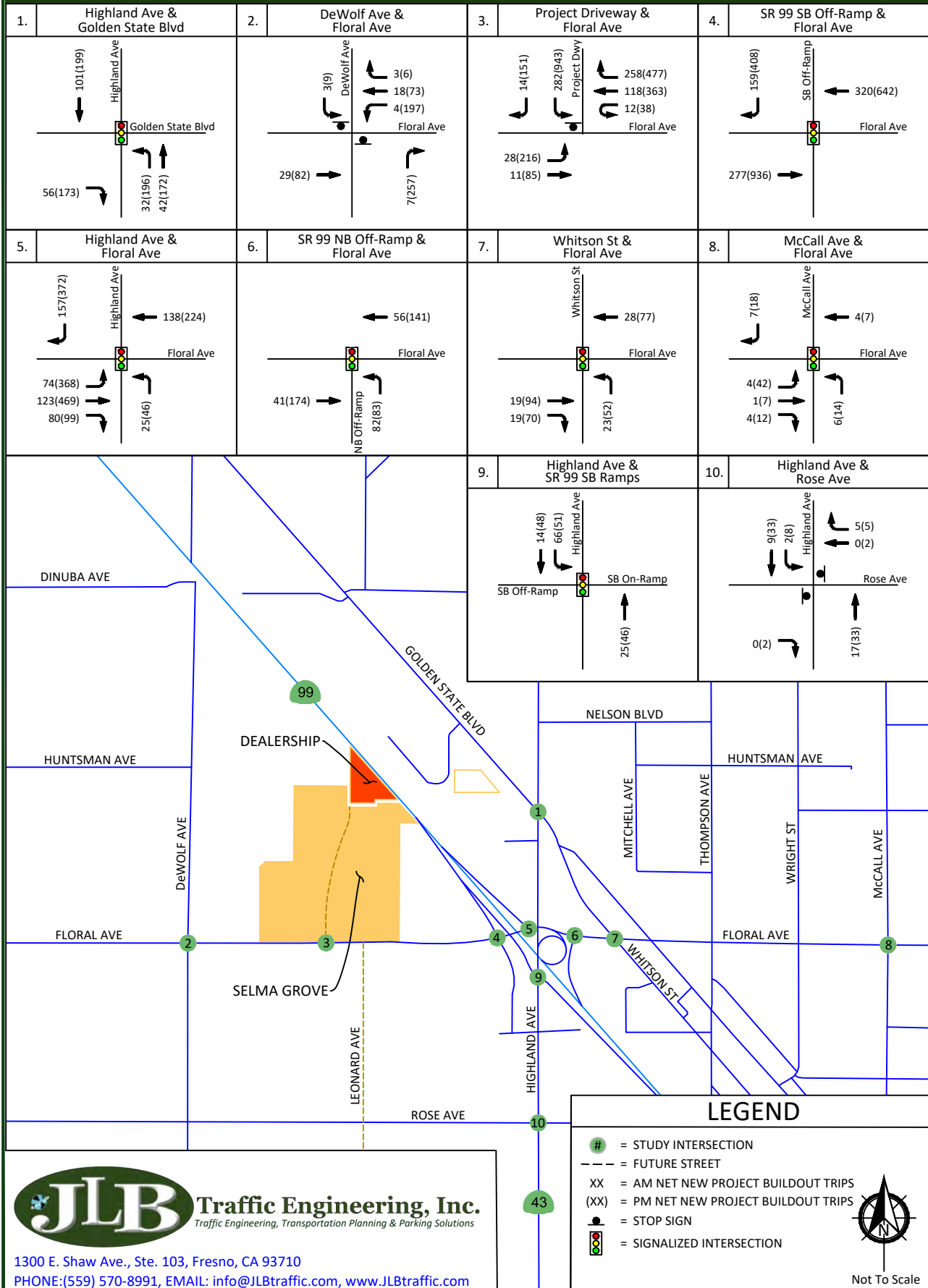
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Selma Grove Project - City of Selma Net New Project Buildout Trips (Weekday)

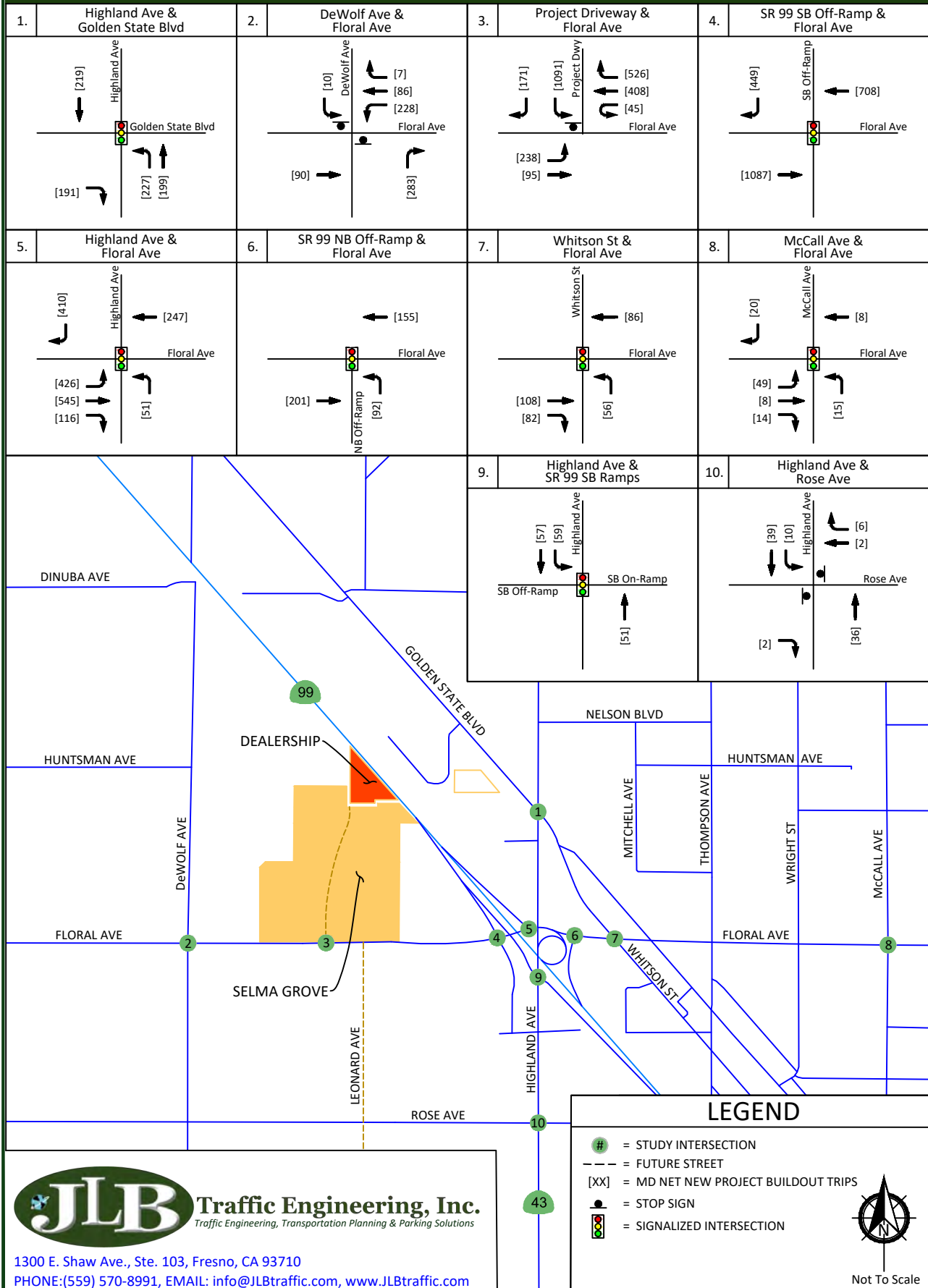
Figure
24



Selma Grove Project - City of Selma

Net Project New Project Buildout Trips (Saturday)

Figure
25



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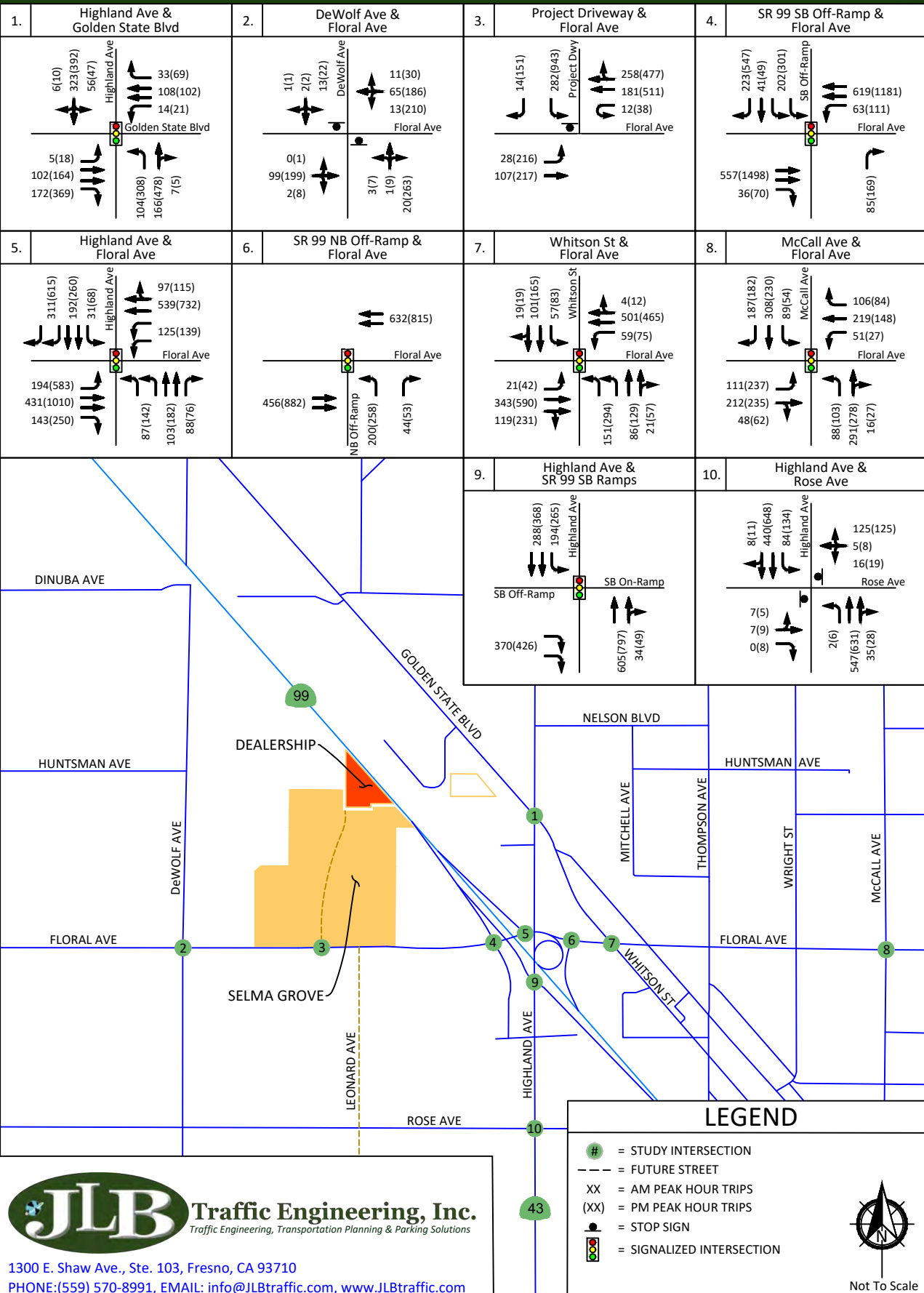
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Selma Grove Project - City of Selma

Existing plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure

26

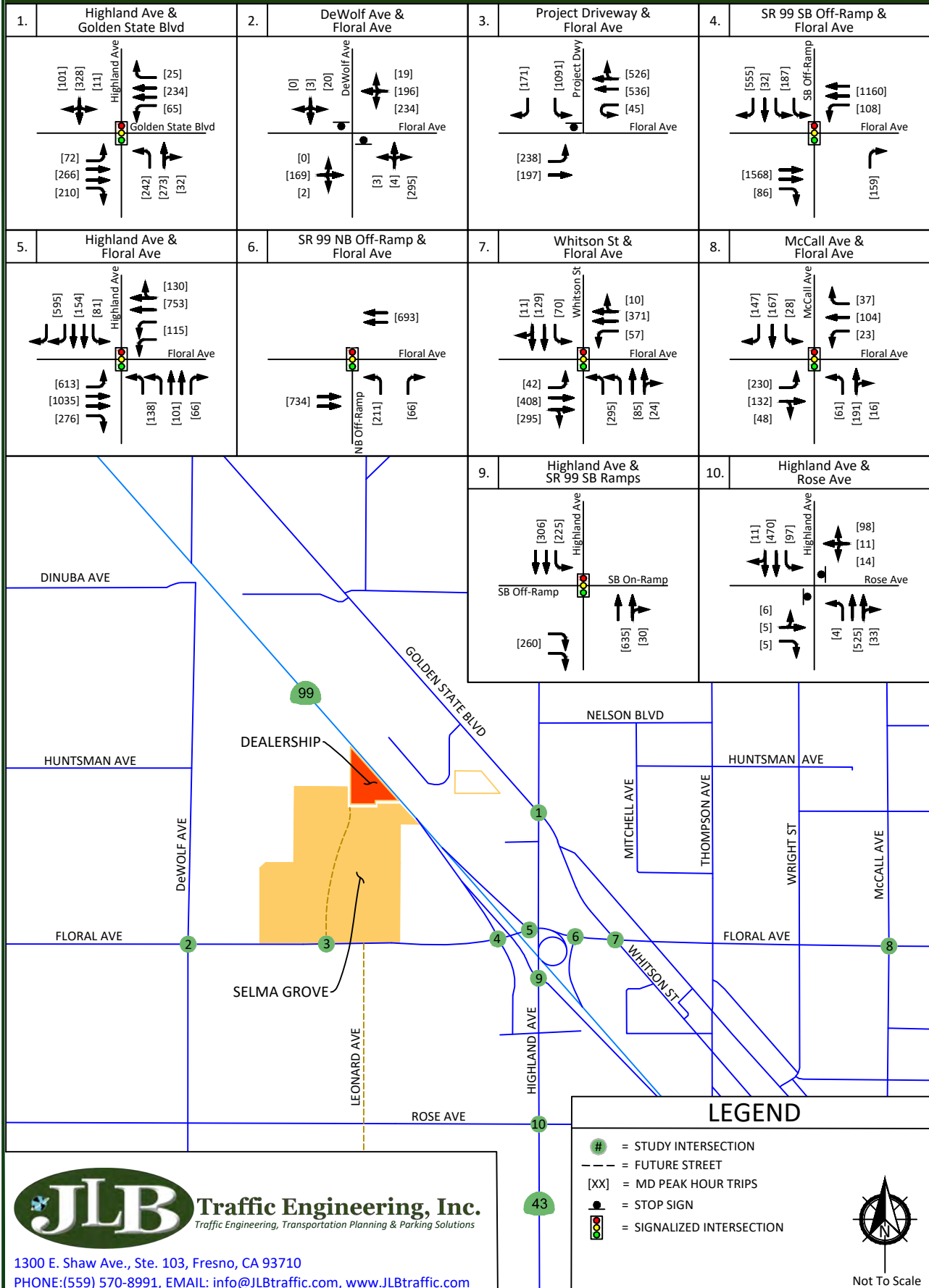


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Selma Grove Project - City of Selma

Existing plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
27



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Near Term Year 2025 plus Project Buildout Traffic Conditions

Description of Approved and Pipeline Projects

Approved and Pipeline Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. The City of Selma, County of Fresno and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the projects listed in Table XVIII were approved, near approval, or in the pipeline within the proximity of the existing Dealership Project and proposed Selma Grove Project.

The trip generation listed in Table XVIII is that which is anticipated to be added to the streets and highways by these projects between the time of the preparation of this report and 5 years after buildout of the existing Dealership Project and proposed Selma Grove Project. As shown in Table XVIII, the total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday. Figures 28 and 29 illustrate the location of the approved, near approval, or pipeline projects and their combined trip assignment to the study intersections during a weekday and Saturday, respectively, under the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue is recommended, while signalization of the intersection of DeWolf Avenue and Floral Avenue is not recommended. It is worth noting that the CA MUTCD states that "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal." Therefore, it is recommended that prior to the installation of a traffic signal, investigation of CA MUTCD warrants 1, 4, and 7, as applicable, be conducted for the intersection of DeWolf Avenue and Floral Avenue.



Table XVIII: Near Term Projects' Trip Generation

<i>Approved Project Location</i>	<i>Approved or Pipeline Project Name</i>	<i>Weekday</i>			<i>Saturday</i>
		<i>Daily Trips</i>	<i>AM Peak Hour</i>	<i>PM Peak Hour</i>	<i>MD Peak Hour</i>
A	Commercial Development (Surf Thru Car Wash & The Habit) ¹	2,194	185	162	300
B	Canales ²	9,931	286	938	780
C	Graham Commercial ¹	5,848	431	456	661
D	Amberwood ³	26,351	1,947	2,422	2,570
E	Selma Crossings ⁴	109,165	3,925	9,694	11,934
F	V5 Commercial ⁴	2,552	68	221	132
G	TT 6019 ¹	906	71	95	89
H	Nagro Apartments ¹	37	2	3	5
I	Stillman/Cinema Apartments ¹	285	18	22	27
J	TT 5361 ⁴	1,493	117	158	145
K	TT 5183 (Country Rose Estates 2) ¹	312	24	33	31
L	TT 5640 (Merigian) ¹	217	17	23	21
M	TT 5563 (Heritage Park) ⁴	373	29	39	36
N	TT 5519 (Synergy) ¹	642	50	67	63
O	TT 5540 ⁵	986	77	104	96
P	TT 5568 (Hinesley) ¹	1,359	107	143	134
Q	American Tire Depot ¹	171	16	24	30
R	United Health Center ¹	153	15	13	13
Total Approved and Pipeline Project Trips		162,975	7,385	14,617	17,067

Note: 1 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information
2 = Trip Generation based VRPA Technologies Traffic Impact Analysis Report
3 = Trip Generation based Dowling Associates, Inc. Traffic Impact Analysis Report
4 = Trip Generation based Peters Engineering Traffic Impact Analysis Report
5 = Trip Generation based TJKM Traffic Impact Analysis Report

Results of Near Term Year 2025 plus Project Buildout Level of Service Analysis

The Near Term Year 2025 plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario. Figures 30 and 31 illustrate the Near Term Year 2025 plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario are provided in Appendix H. Tables XIX and XX present a summary of the Near Term Year 2025 plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.



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Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XIX: Near Term Year 2025 plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	70.4	E	>120.0	F
		Signalized (Mitigated)	16.3	B	25.7	C
2	DeWolf Avenue / Floral Avenue	TWSC	11.0	B	>120.0	F
		AWSC (Mitigated)	8.1	A	16.7	C
3	Project Driveway 3 / Floral Avenue	OWSC	40.4	E	>120.0	F
		Signalized (Mitigated)	24.2	C	29.6	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.1	B	56.4	E
		Signalized (Mitigated)	16.1	B	32.3	C
5	Highland Avenue / Floral Avenue	Signalized	44.0	D	>120.0	F
		Signalized (Mitigated)	24.6	C	52.3	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	12.5	B
7	Whitson Street / Floral Avenue	Signalized	15.6	B	33.1	C
8	McCall Avenue / Floral Avenue	Signalized	37.3	D	46.2	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	10.5	B	18.0	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	24.7	C	23.9	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XX: Near Term Year 2025 plus Project Buildout (Saturday) Intersection LOS Results

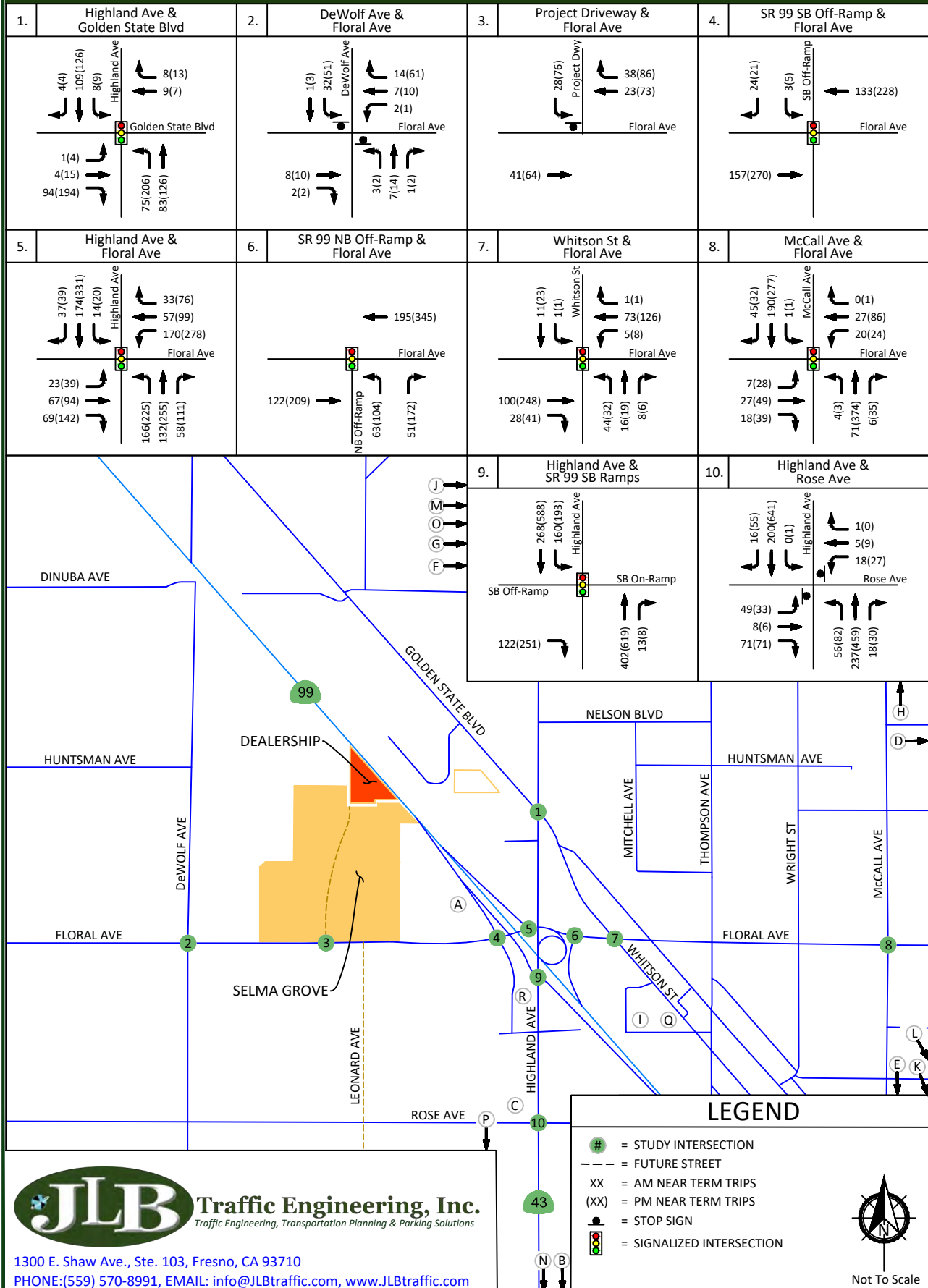
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	85.8	F
		Signalized (Mitigated)	26.9	C
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		AWSC (Mitigated)	14.5	B
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	35.6	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	79.5	E
		Signalized (Mitigated)	34.6	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.4	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	11.8	B
7	Whitson Street / Floral Avenue	Signalized	49.2	D
8	McCall Avenue / Floral Avenue	Signalized	27.5	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	15.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	23.2	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



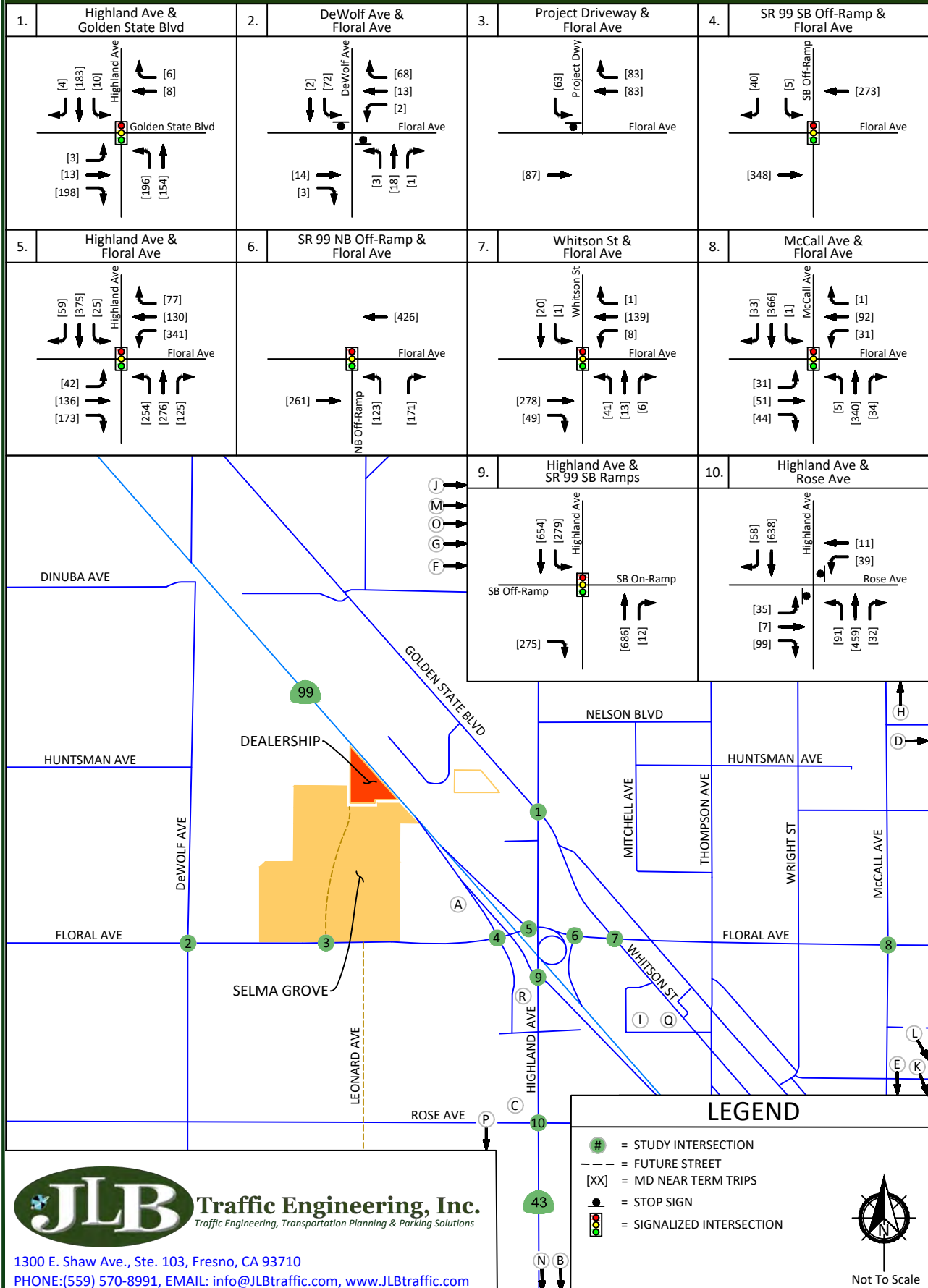
Selma Grove Project - City of Selma Near Term Projects' Trip Assignment (Weekday)

Figure
28



Selma Grove Project - City of Selma Near Term Projects' Trip Assignment (Saturday)

Figure
29

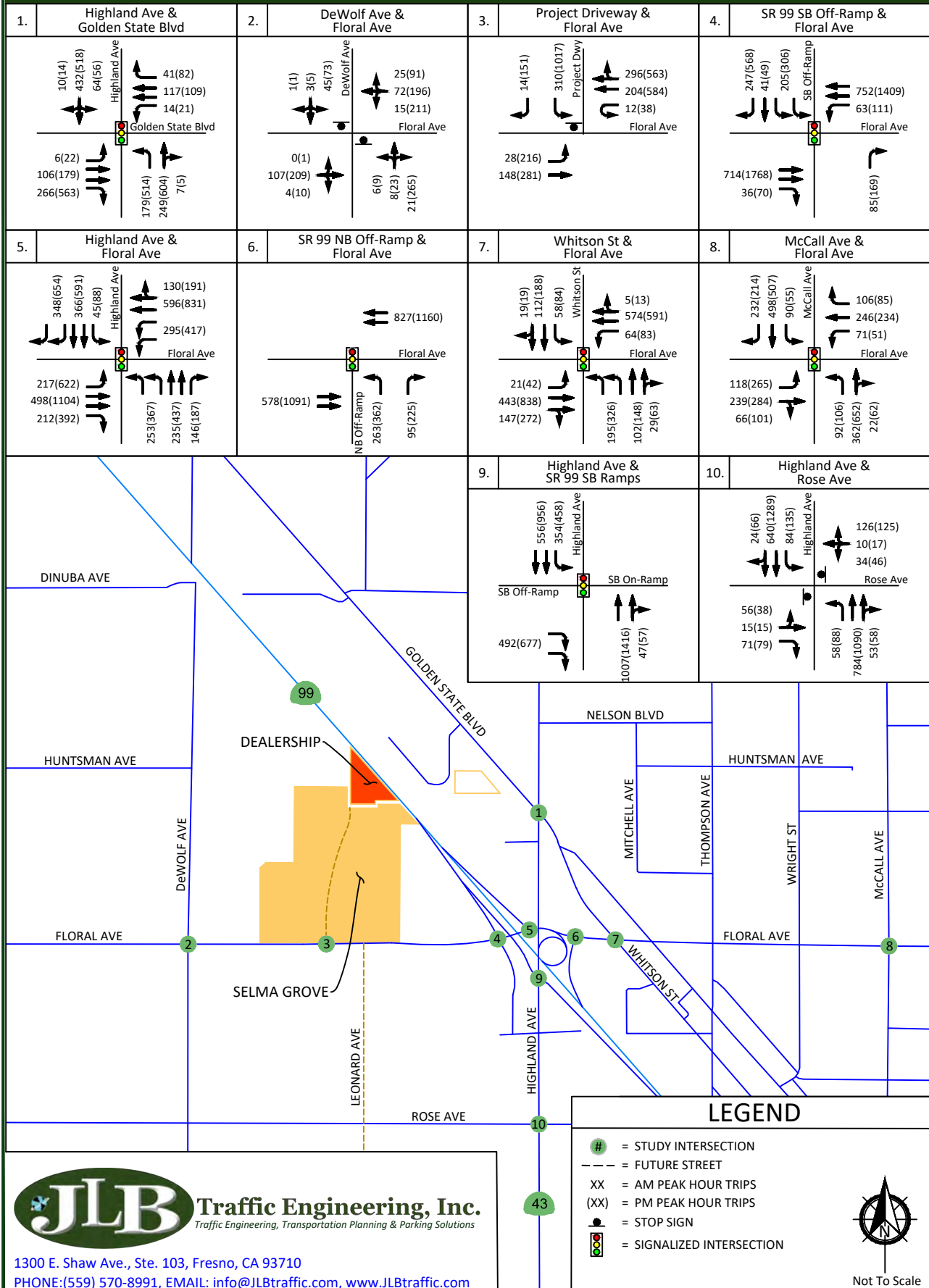


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Selma Grove Project - City of Selma

Near Term Year 2025 plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

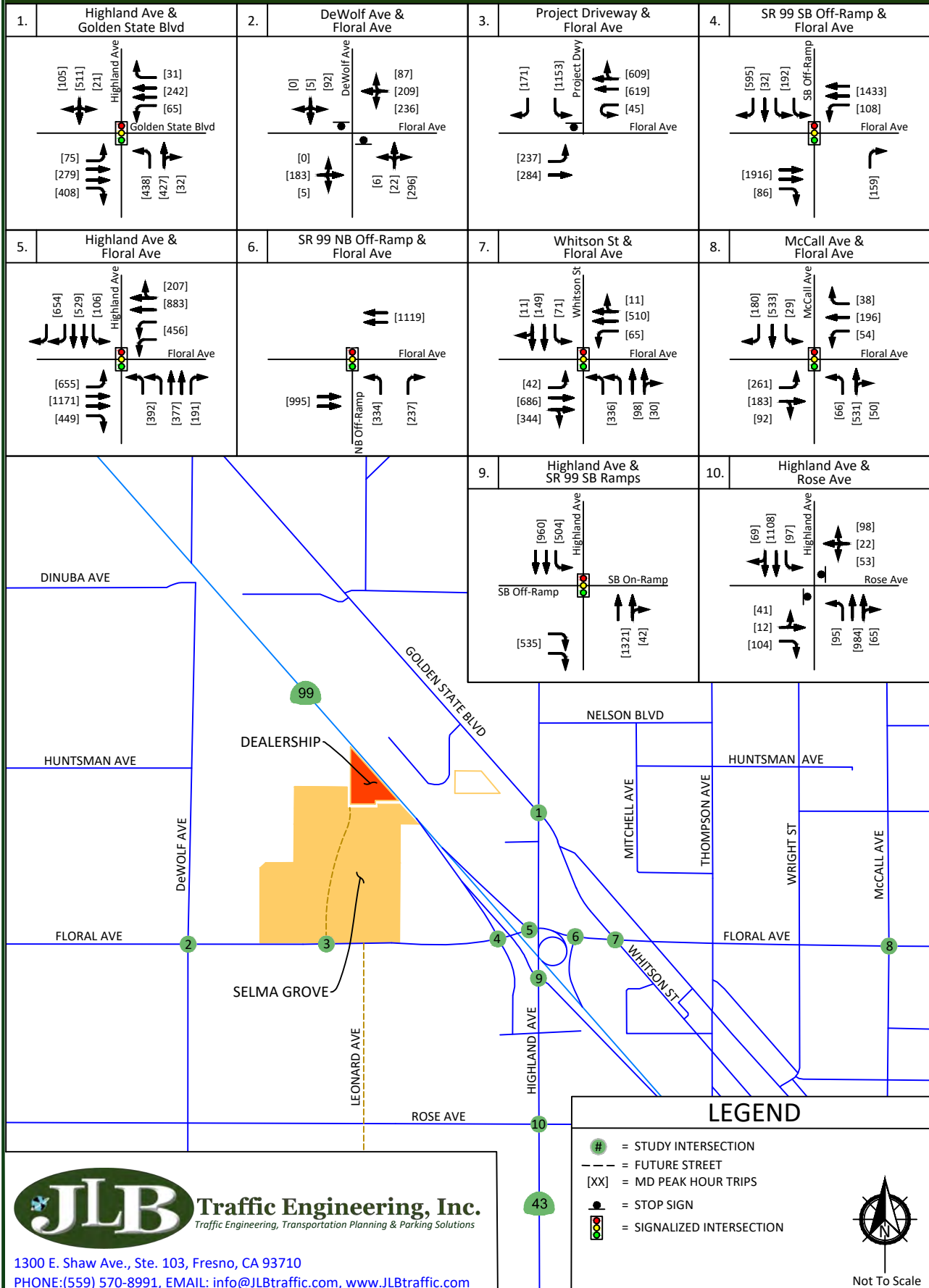
Figure
30



Selma Grove Project - City of Selma

Near Term Year 2025 plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
31



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Cumulative Year 2030 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 No Project Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Cumulative Year 2030 No Project Level of Service Analysis

The Cumulative Year 2030 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figures 32 and 33 illustrate the Cumulative Year 2030 No Project Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 No Project Traffic Conditions scenario are provided in Appendix I. Tables XXI and XXII present a summary of the Cumulative Year 2030 No Project peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be considered for implementation.

- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue; and
 - Modify the traffic signals to accommodate the added lane.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XXI: Cumulative Year 2030 No Project (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	48.9	D	>120.0	F
		Signalized (Improved)	24.8	C	53.1	D
2	DeWolf Avenue / Floral Avenue	TWSC	10.6	B	15.0	C
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	15.2	B	19.9	B
5	Highland Avenue / Floral Avenue	Signalized	33.2	C	74.9	E
		Signalized (Improved)	24.6	C	44.1	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.5	A	12.3	B
7	Whitson Street / Floral Avenue	Signalized	17.7	B	46.3	D
8	McCall Avenue / Floral Avenue	Signalized	27.7	C	41.2	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	10.5	B	15.7	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Improved)	23.2	C	21.7	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXII: Cumulative Year 2030 No Project (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	54.9	D
		Signalized (Improved)	49.1	D
2	DeWolf Avenue / Floral Avenue	TWSC	13.7	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	18.9	B
5	Highland Avenue / Floral Avenue	Signalized	64.0	E
		Signalized (Improved)	43.3	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	11.5	B
7	Whitson Street / Floral Avenue	Signalized	48.5	D
8	McCall Avenue / Floral Avenue	Signalized	25.0	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	13.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Improved)	24.0	C

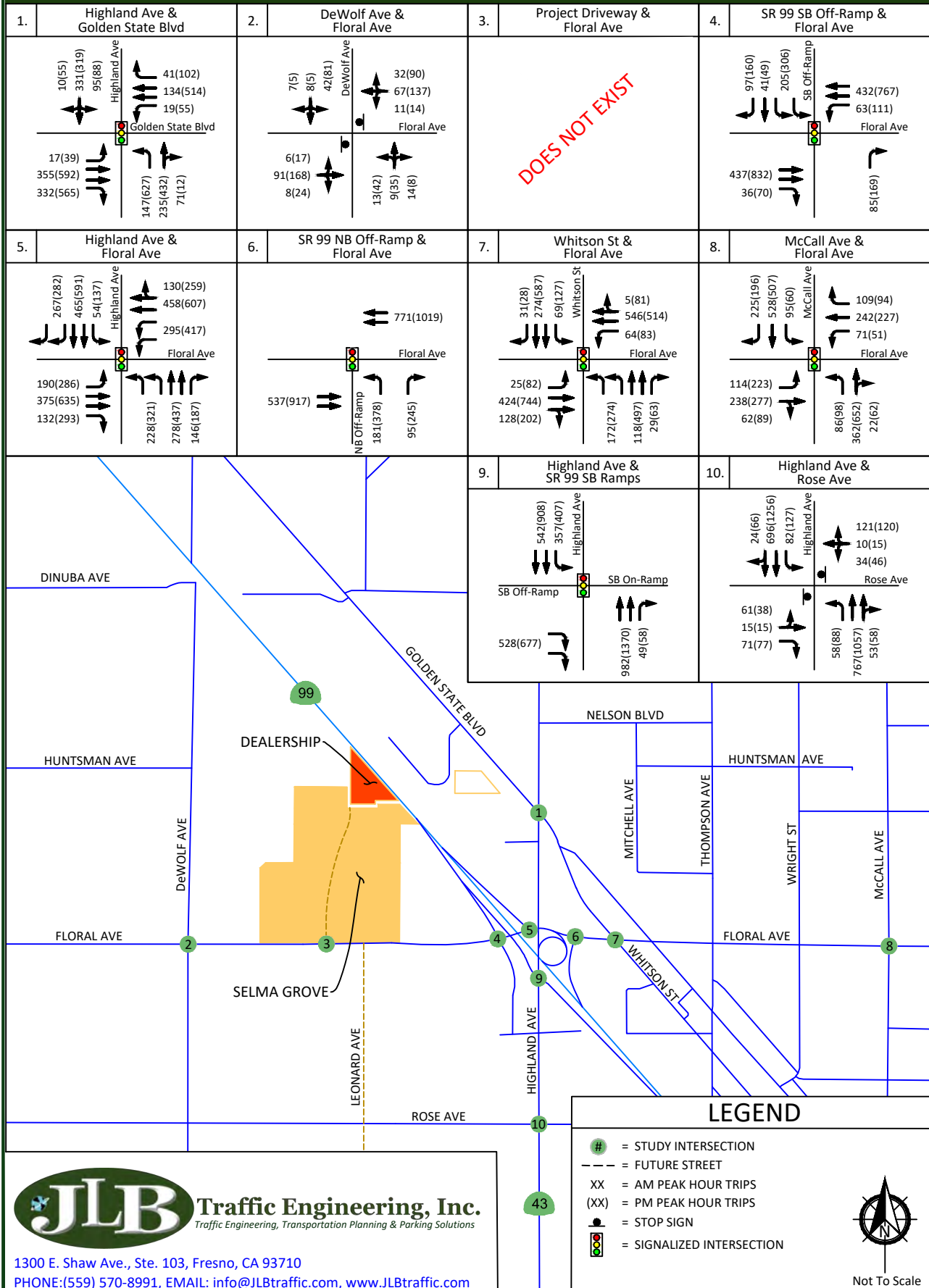
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Selma Grove Project - City of Selma

Cumulative Year 2030 No Project (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
32



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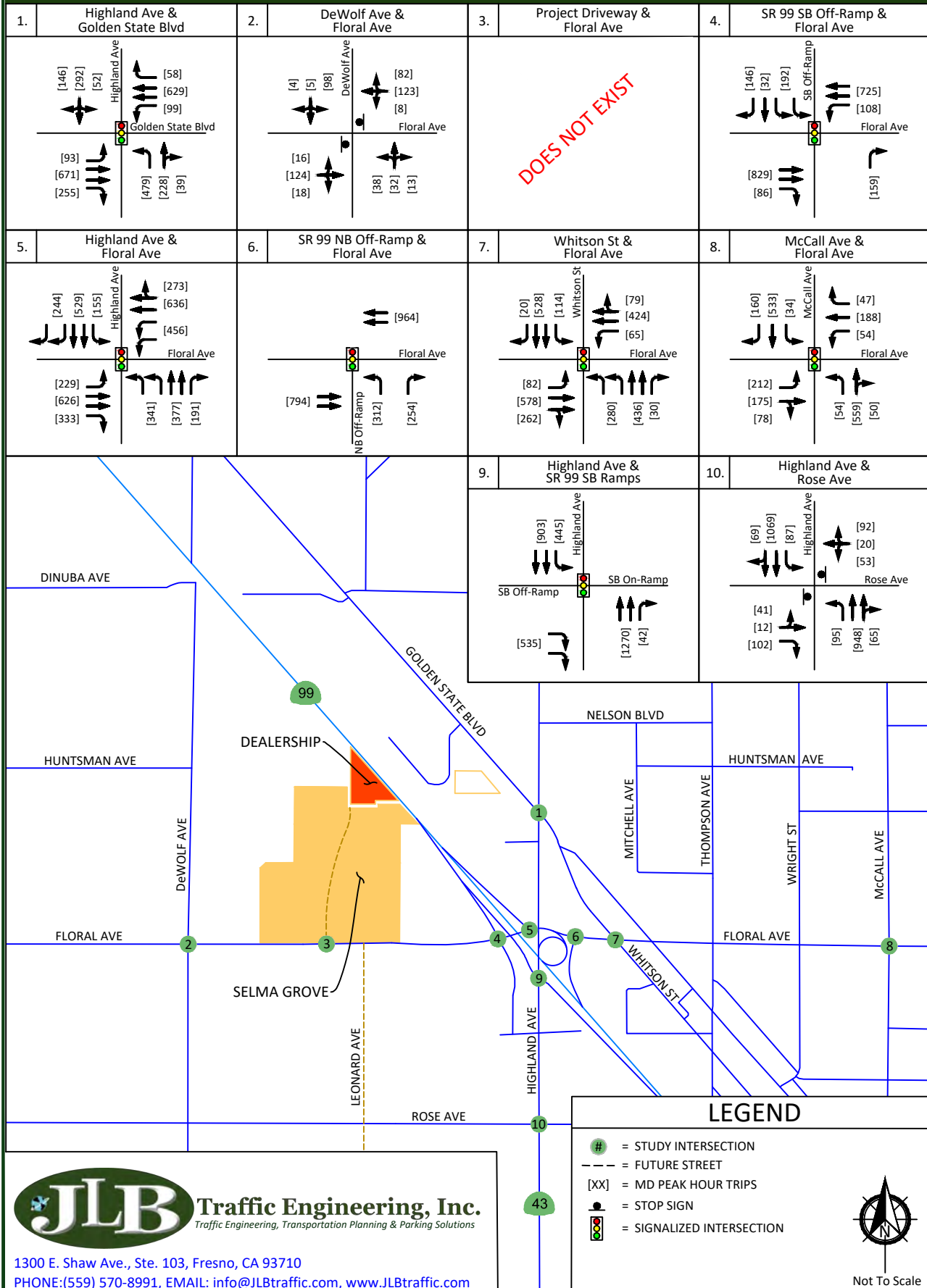
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Selma Grove Project - City of Selma

Cumulative Year 2030 No Project (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
33



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Cumulative Year 2030 plus Project Buildout Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue is recommended, while signalization of the intersection of DeWolf Avenue and Floral Avenue is not recommended. It is worth noting that the CA MUTCD states that "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal." Therefore, it is recommended that prior to the installation of a traffic signal, investigation of CA MUTCD warrants 1, 4, and 7, as applicable, be conducted for the intersection of DeWolf Avenue and Floral Avenue.

Results of Cumulative Year 2030 plus Project Buildout Level of Service Analysis

The Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario. Figures 34 and 35 illustrate the Cumulative Year 2030 plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario are provided in Appendix J. Tables XXIII and XXIV present a summary of the Cumulative Year 2030 plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.



- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XXIII: Cumulative Year 2030 plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	86.6	F	>120.0	F
		Signalized (Mitigated)	19.4	B	52.7	D
2	DeWolf Avenue / Floral Avenue	TWSC	11.3	B	>120.0	F
		AWSC (Mitigated)	8.3	A	18.4	C
3	Project Driveway 3 / Floral Avenue	OWSC	47.5	E	>120.0	F
		Signalized (Mitigated)	23.8	C	29.6	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.1	B	56.2	E
		Signalized (Mitigated)	15.6	B	32.8	C
5	Highland Avenue / Floral Avenue	Signalized	61.2	E	>120.0	F
		Signalized (Mitigated)	29.3	C	52.1	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	13.0	B
7	Whitson Street / Floral Avenue	Signalized	18.1	B	46.7	D
8	McCall Avenue / Floral Avenue	Signalized	28.4	C	47.0	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	11.9	B	18.1	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	22.9	C	23.9	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXIV: Cumulative Year 2030 plus Project Buildout (Saturday) Intersection LOS Results

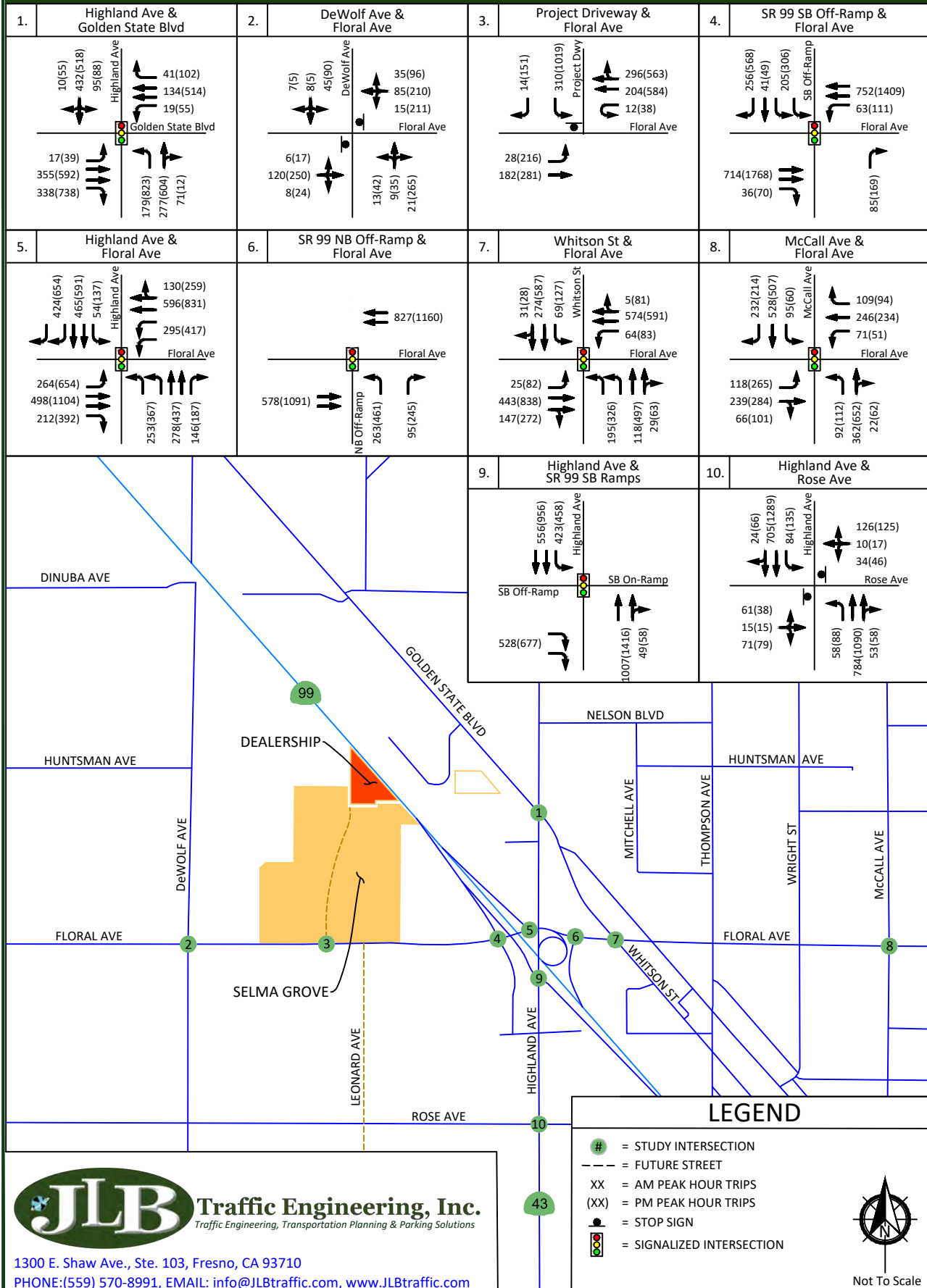
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	96.3	F
		Signalized (Mitigated)	49.0	D
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		AWSC (Mitigated)	18.0	C
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	35.6	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	79.5	E
		Signalized (Mitigated)	34.8	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.4	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	16.0	B
7	Whitson Street / Floral Avenue	Signalized	54.0	D
8	McCall Avenue / Floral Avenue	Signalized	29.0	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	15.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	31.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



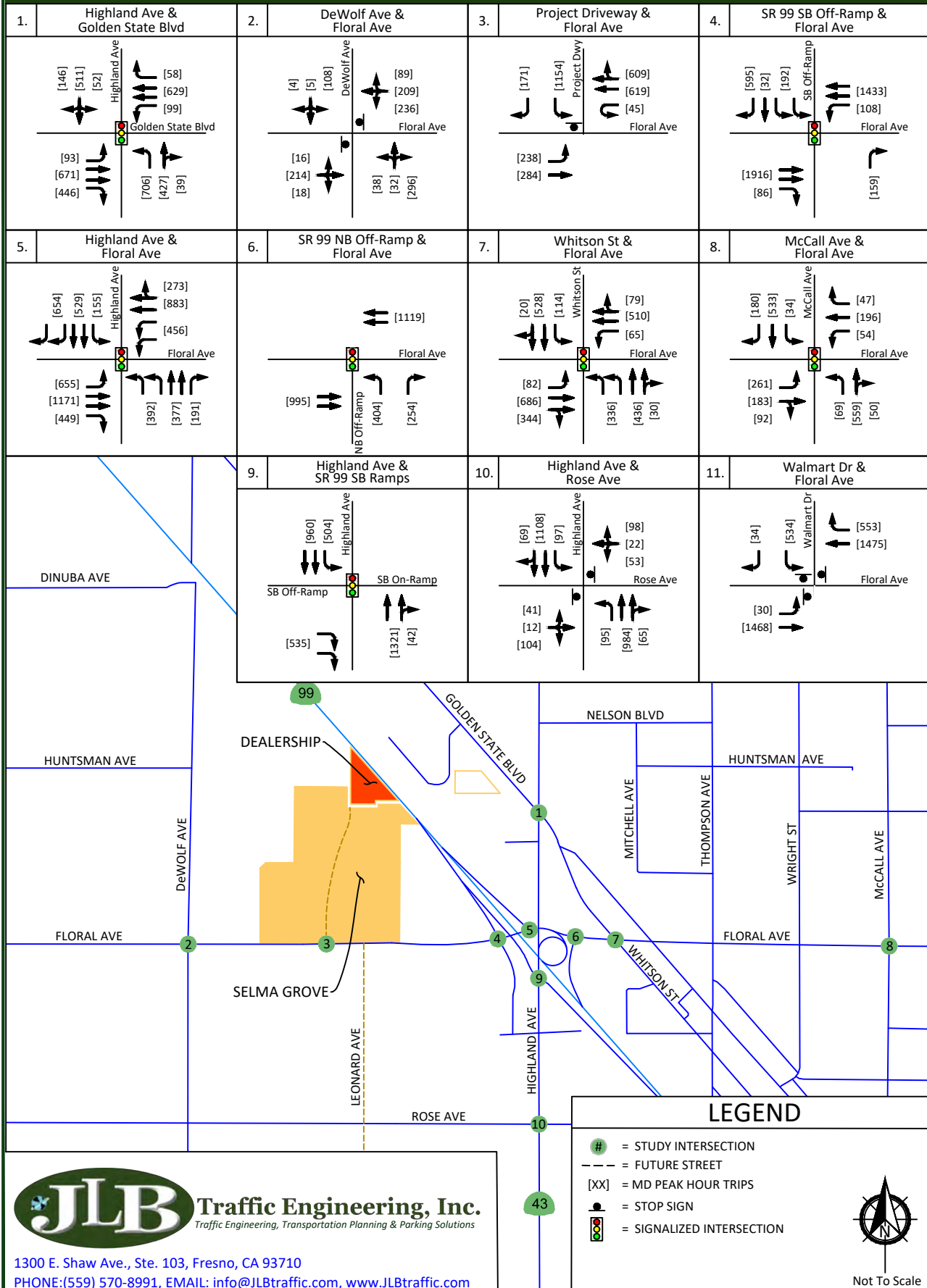
Selma Grove Project - City of Selma Cumulative Year 2030 plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
34



Selma Grove Project - City of Selma Cumulative Year 2030 plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
35



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Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

The Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario with one exception. For purposes of this TIA, it is assumed that the State Route 99 and Dinuba Avenue interchange has been constructed. Considering the potential changes in the existing roadway network, it is projected that travel patterns and volumes may differ from what is anticipated for the immediate Project Buildout.

Figures 36 and 37 illustrate the Dealership Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions), and Figures 38 and 39 illustrate the Selma Grove Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions). Additionally, Figures 40 and 41 illustrate the Net New Project Buildout Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively. It is worth noting that the Net New Project Buildout Trips with Dinuba Avenue Interchange take into account the same pass-by trip reductions at the study intersections during a weekday and Saturday, respectively, as those presented in Figures 14 through 19.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of these intersections is recommended.

Results of Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Level of Service Analysis

The Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario assumes the State Route 99 and Dinuba Avenue interchange has been constructed. Figures 42 and 43 illustrate the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario are provided in Appendix K. Tables XXV and XXVI present a summary of the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.



Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through-right lane to a through-right lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a northbound left-turn lane;
 - Modify the northbound left-through-right lane to a through lane;
 - Add a northbound right-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - Implement overlap phasing of the northbound right-turn phase with the westbound left-turn phase;
 - Prohibit westbound to eastbound U-turn movements; and
 - Modify the intersection to accommodate the added lanes.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.



- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.

Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Project's Trip Assignment to Caltrans Facilities

Figures 44 and 45 illustrate the Dealership Trips and Selma Grove Trips to the interchange of State Route 99 at Dinuba Avenue, respectively.



Table XXV: Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	53.8	D	>120.0	F
		Signalized (Mitigated)	20.2	C	47.7	D
2	DeWolf Avenue / Floral Avenue	TWSC	15.2	C	>120.0	F
		Signalized (Mitigated)	47.4	D	42.0	D
3	Project Driveway 3 / Floral Avenue	OWSC	59.0	F	>120.0	F
		Signalized (Mitigated)	18.8	B	40.3	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.0	B	40.5	D
		Signalized (Mitigated)	15.5	B	27.0	C
5	Highland Avenue / Floral Avenue	Signalized	41.5	D	107.4	F
		Signalized (Mitigated)	24.4	C	47.9	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	16.7	B
7	Whitson Street / Floral Avenue	Signalized	18.0	B	32.9	C
8	McCall Avenue / Floral Avenue	Signalized	28.0	C	43.8	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	11.9	B	17.9	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	22.7	C	24.0	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXVI: Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Saturday) Intersection LOS Results

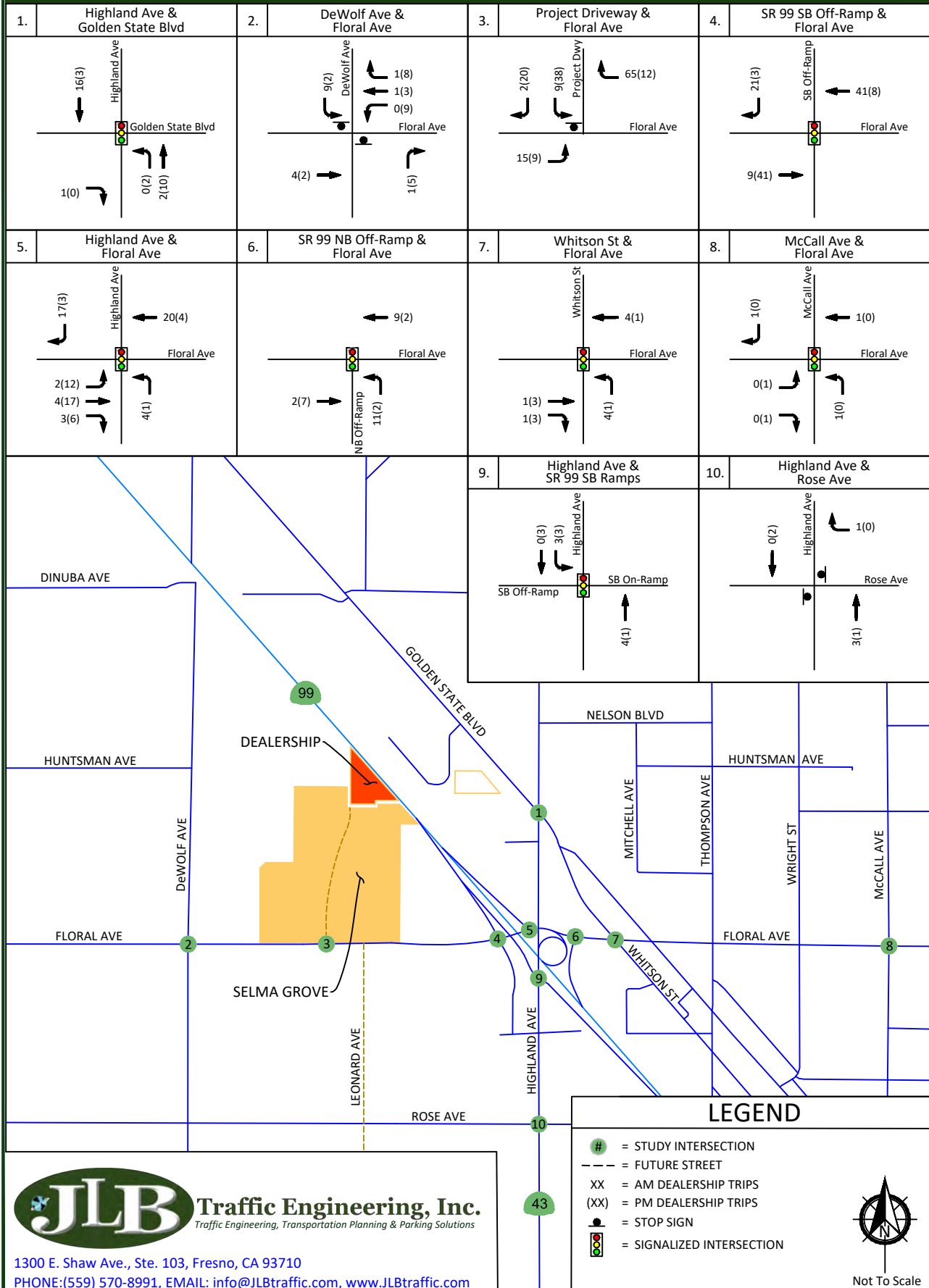
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	84.0	F
		Signalized (Mitigated)	51.9	D
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	41.2	D
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	46.1	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	51.1	D
		Signalized (Mitigated)	24.4	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.6	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	17.2	B
7	Whitson Street / Floral Avenue	Signalized	50.3	D
8	McCall Avenue / Floral Avenue	Signalized	25.7	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	16.8	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	31.6	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Selma Grove Project - City of Selma Dealership Trips with Dinuba Avenue Interchange (Weekday)

Figure
36



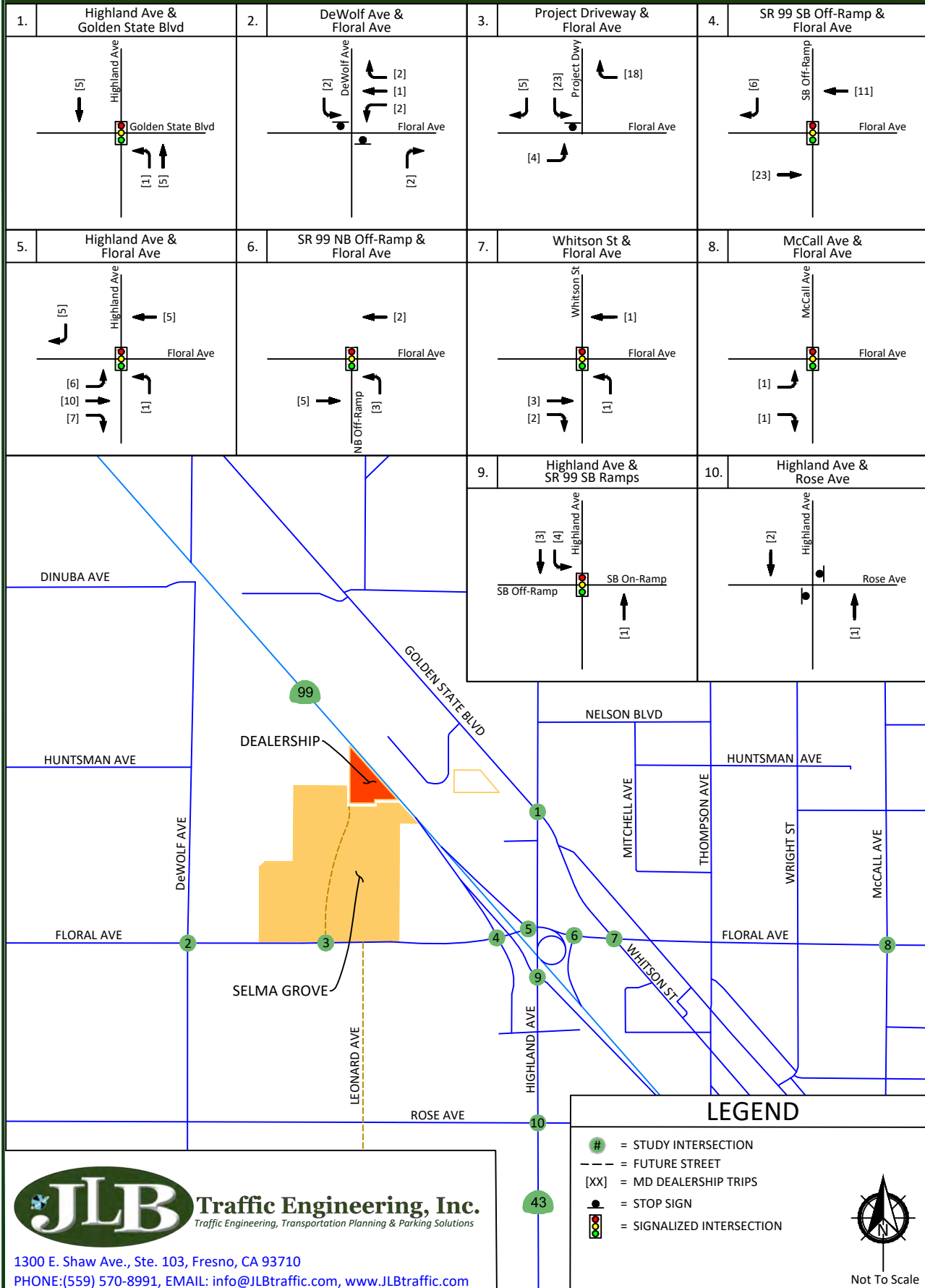
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Selma Grove Project - City of Selma Dealership Trips with Dinuba Avenue Interchange (Saturday)

Figure
37



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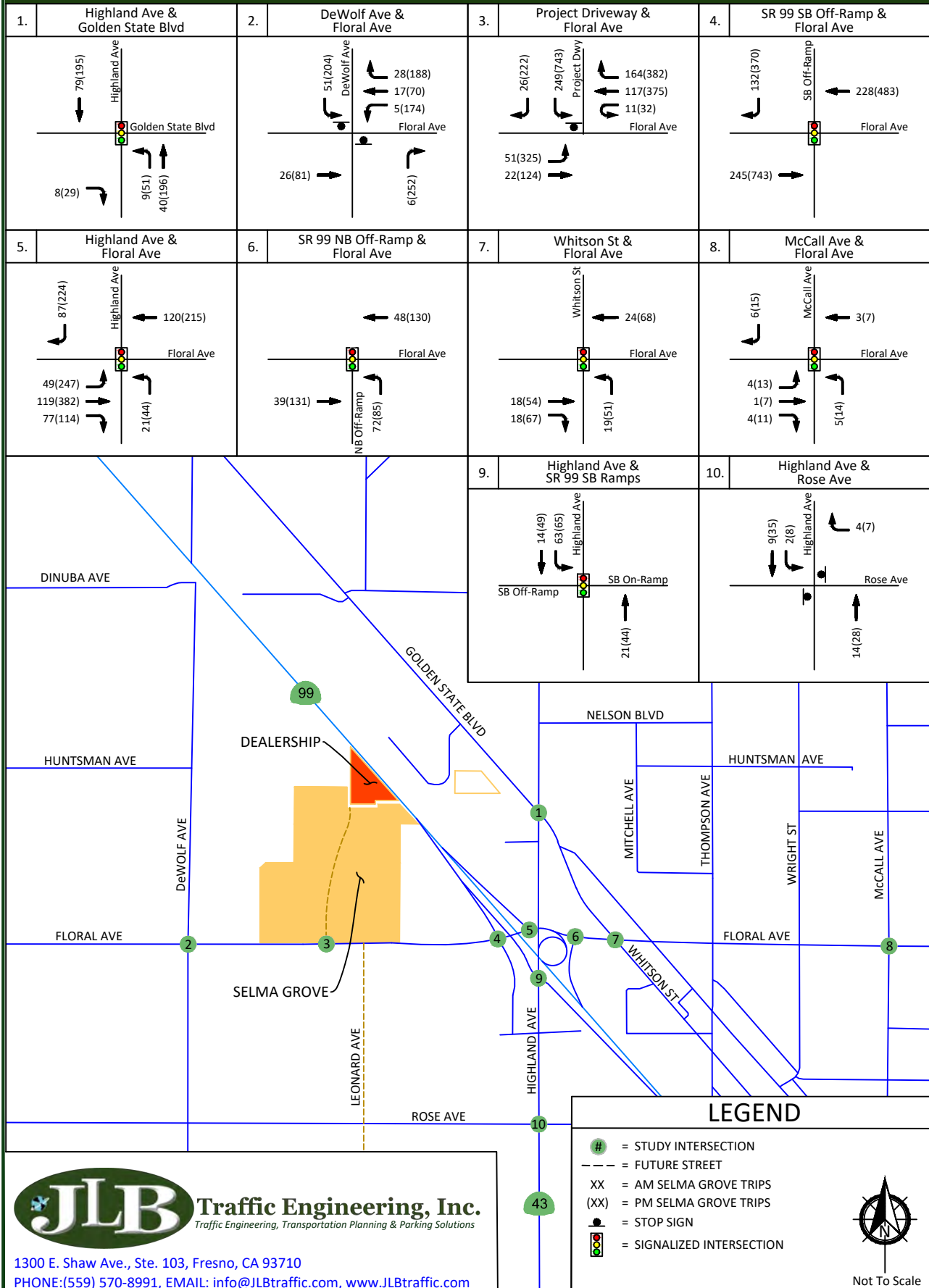
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Selma Grove Project - City of Selma

Selma Grove Trips with Dinuba Avenue Interchange (Weekday)

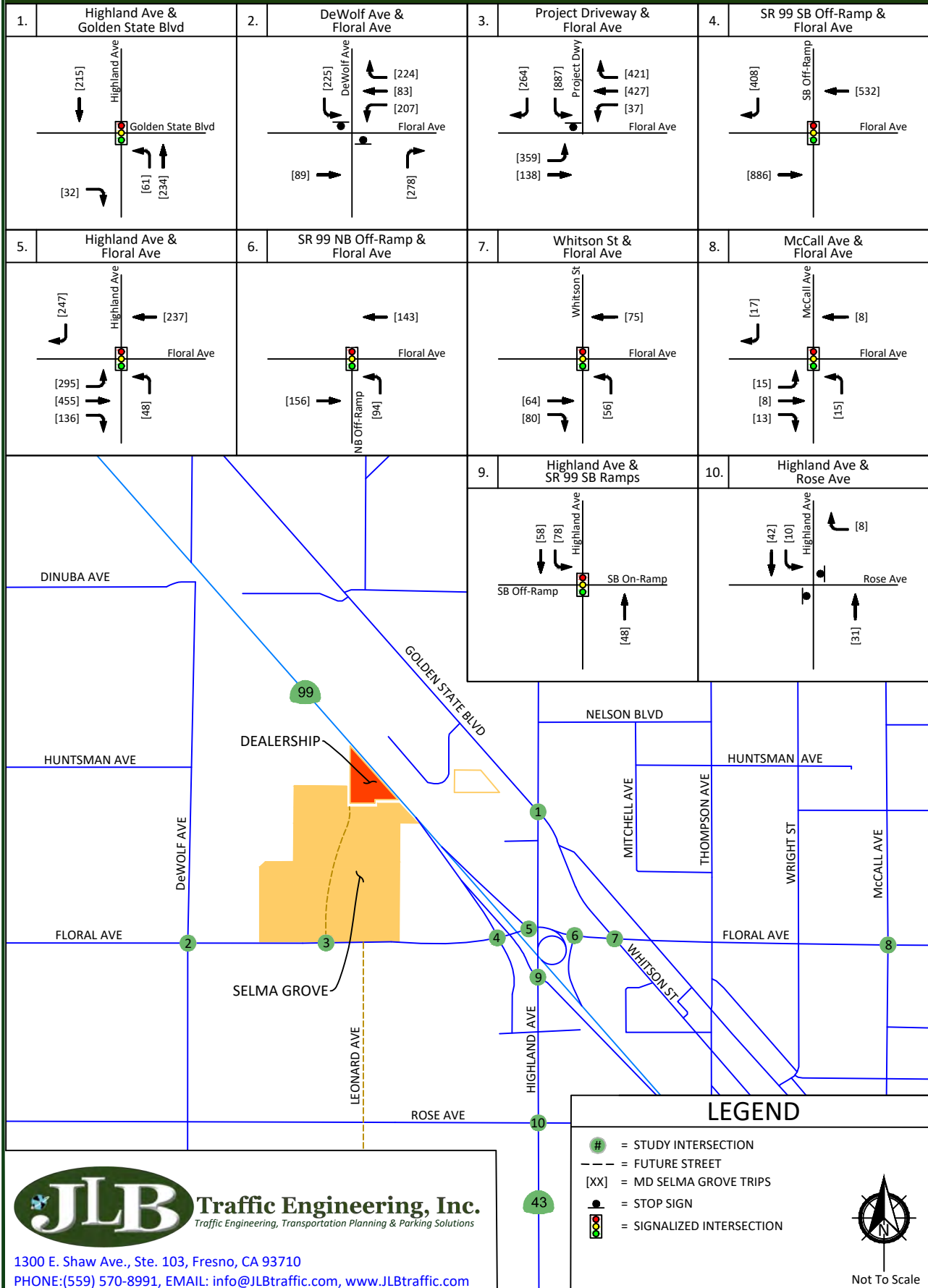
Figure
38



Selma Grove Project - City of Selma

Selma Grove Trips with Dinuba Avenue Interchange (Saturday)

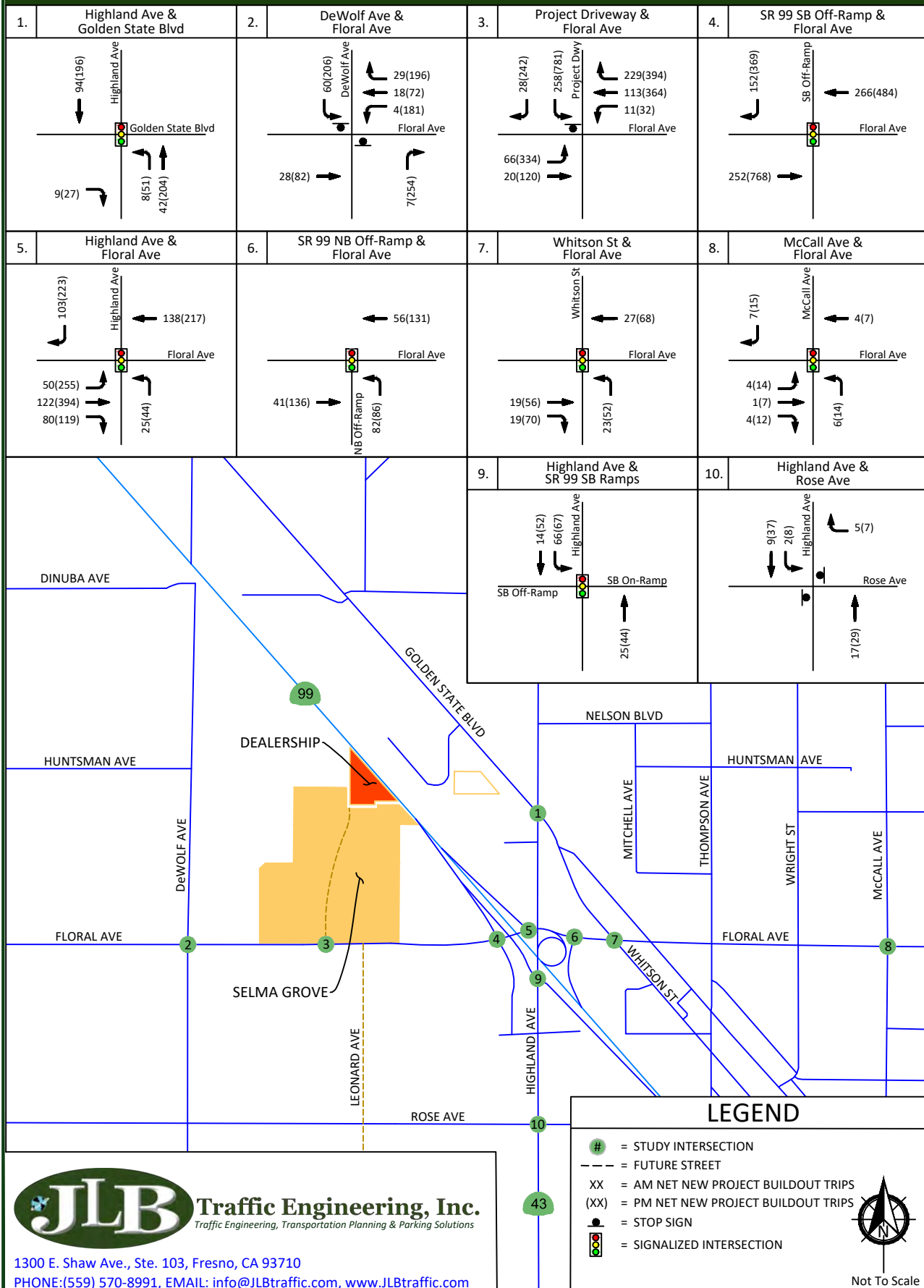
Figure
39



Selma Grove Project - City of Selma

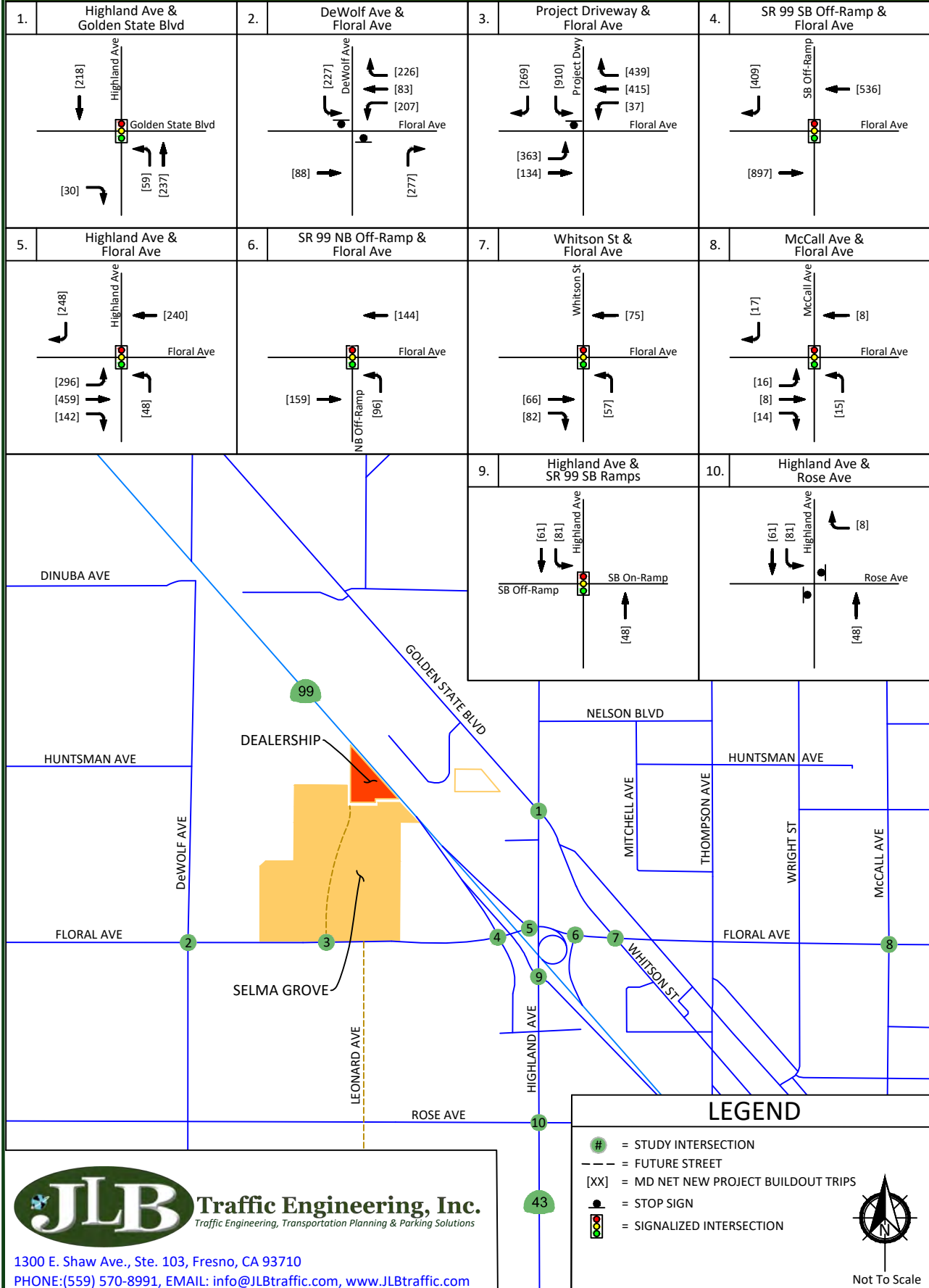
Net New Project Buildout Trips with Dinuba Avenue Interchange (Weekday)

Figure
40



Selma Grove Project - City of Selma Net New Project Buildout Trips with Dinuba Avenue Interchange (Saturday)

Figure
41



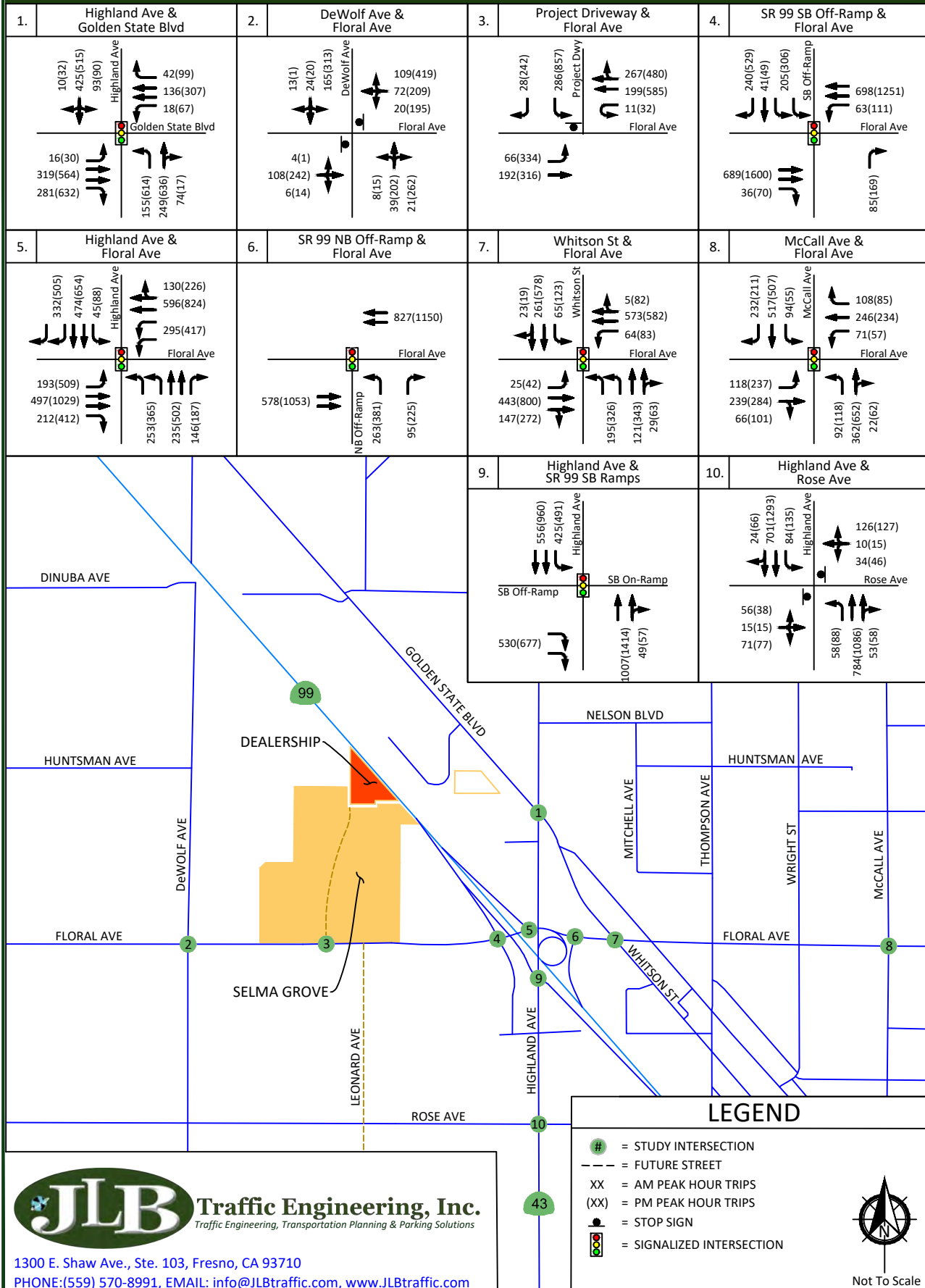
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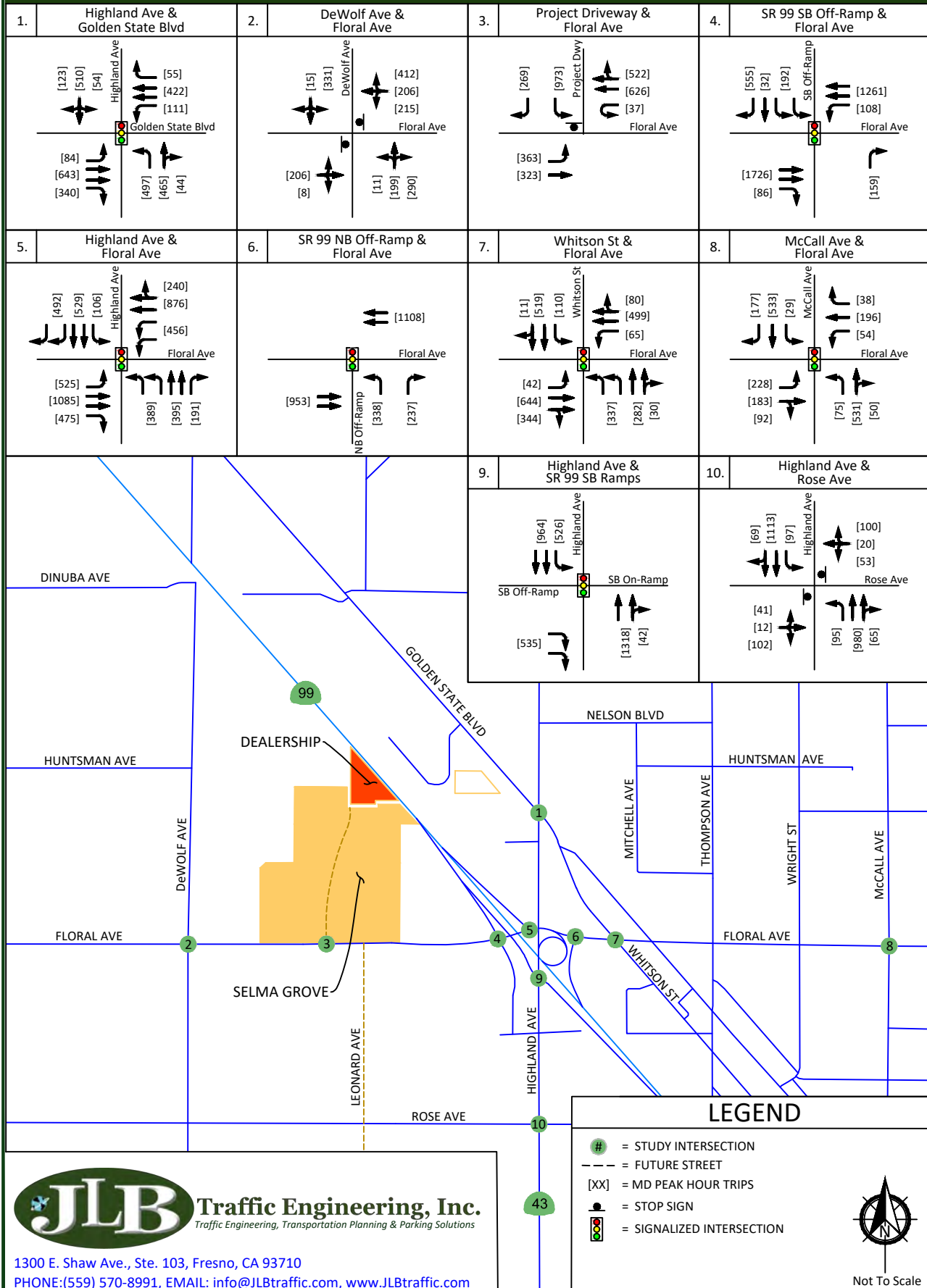
Selma Grove Project - City of Selma Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
42



Selma Grove Project - City of Selma Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

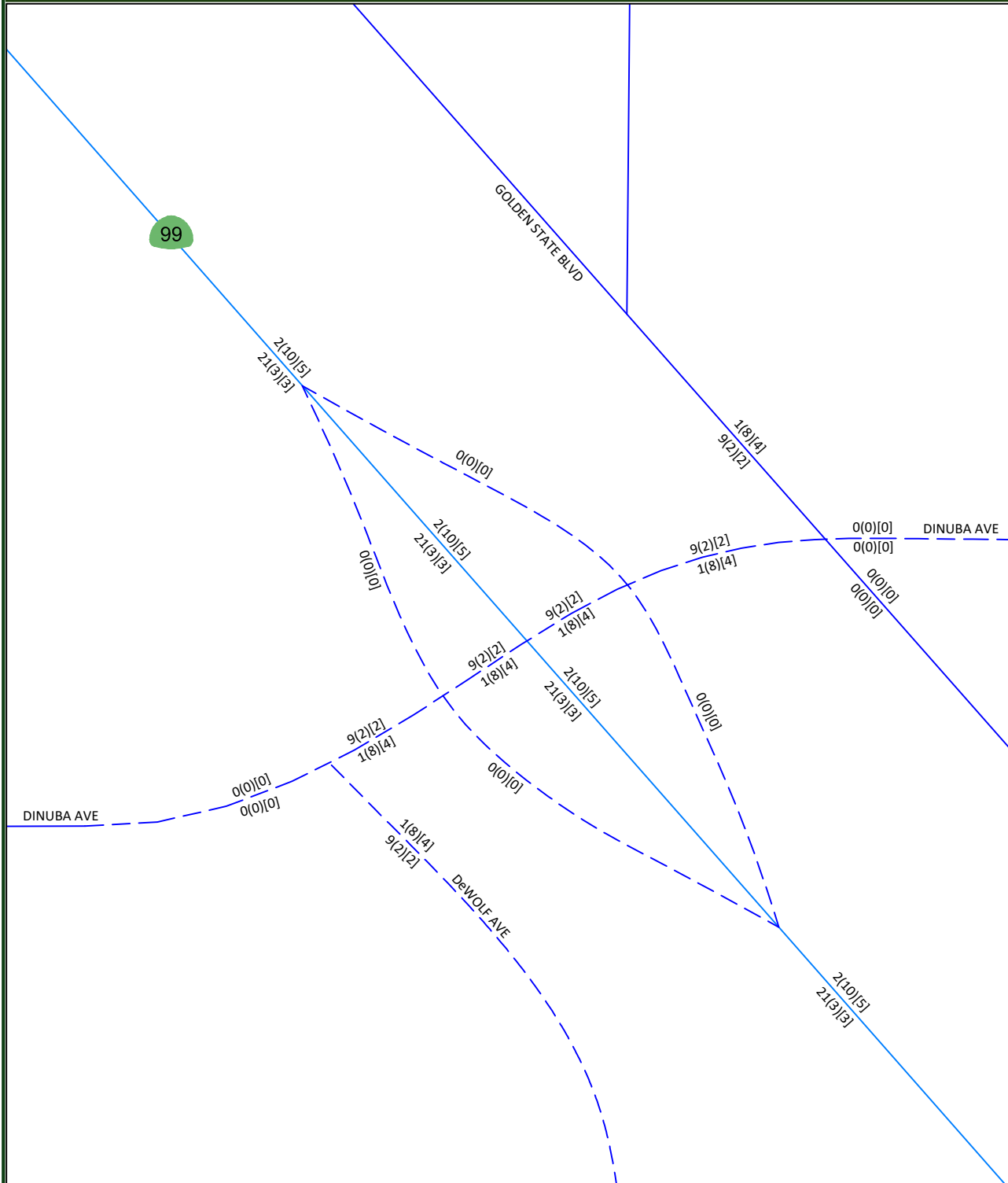
Figure
43



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LEGEND

XX = AM DEALERSHIP TRIPS
(XX) = PM DEALERSHIP TRIPS
[XX] = MD DEALERSHIP TRIPS



Not To Scale



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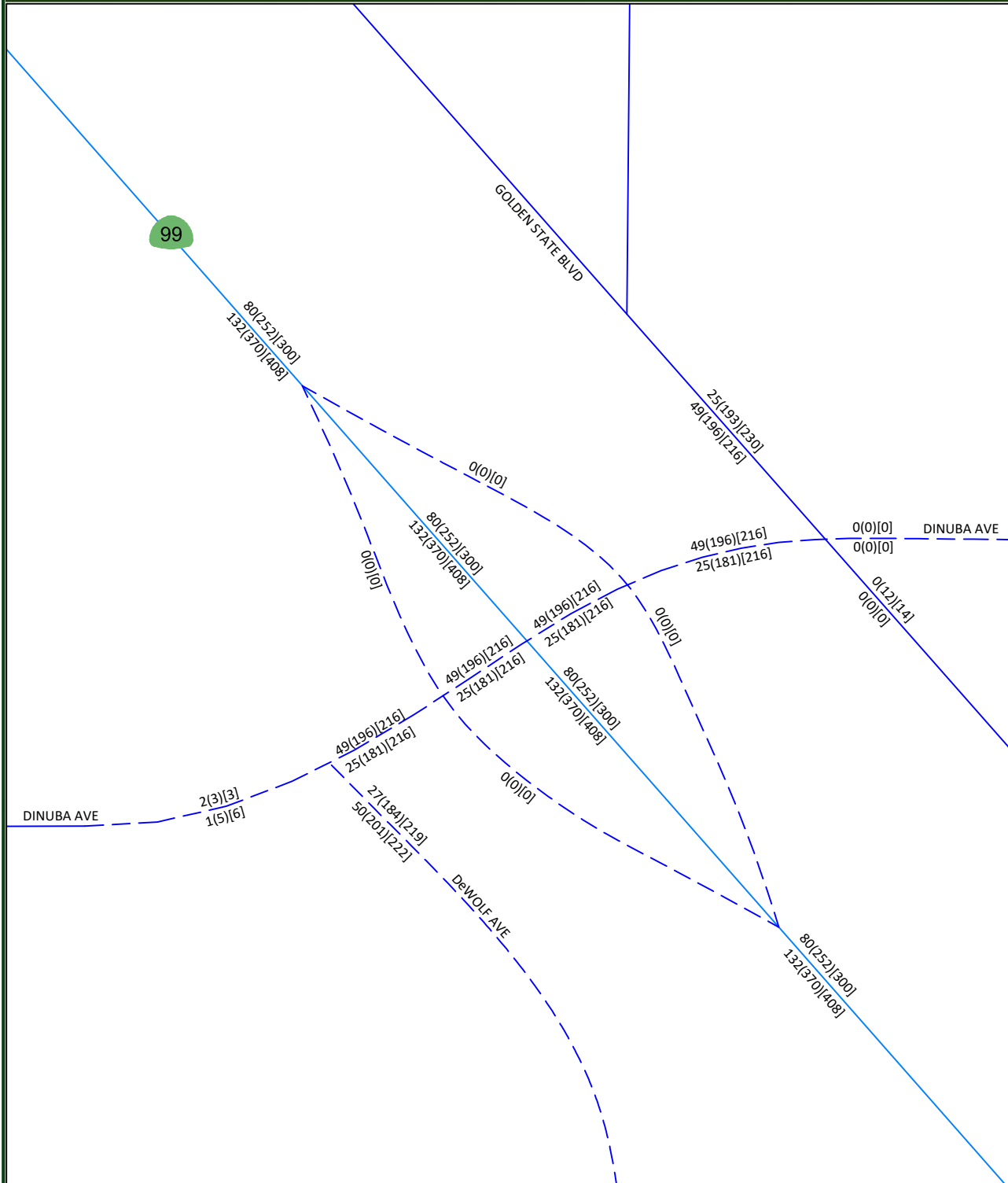
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Selma Grove Project - City of Selma

State Route 99 at Dinuba Avenue Interchange - Selma Grove Trips

Figure
45



LEGEND

- XX = AM DEALERSHIP TRIPS
- (XX) = PM DEALERSHIP TRIPS
- [XX] = MD DEALERSHIP TRIPS



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Queuing Analysis

Table XXVII provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the LOS worksheets for the respective scenarios. Appendix D contains the methodologies used to evaluate these intersections. Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, “the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes.” The queues shown on Table XXVII are the 95th percentile queue lengths for the respective lane movements.

The Highway Design Manual (HDM) provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, “tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane.” Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table XXVII.

Based on the SimTraffic output files and engineering judgement, it is recommended that the storage capacity for the following be considered for the Cumulative Year 2030 plus Project Traffic Conditions scenario. While the City of Selma does not have minimum storage length requirements for left-turn and right-turn lanes on major streets, it is recommended that these be set at 200 feet for left-turns and 75 feet for right-turns. At the remaining approaches of the study intersections, the greater of the existing storage capacity or the 200-foot left-turn lanes and 75-foot right-turn lanes will be sufficient to accommodate the maximum queue.

- Highland Avenue / Golden State Boulevard
 - Consider increasing the storage capacity of the southeastbound right-turn lane to 250 feet.
 - Consider increasing the storage capacity of the northwestbound left-turn lane to 150 feet.
 - Consider setting the storage capacity of the northbound dual left-turn lanes to 300 feet.
 - Consider setting the storage capacity of the southbound left-turn lane to 275 feet.
- Project Driveway 3 / Floral Avenue
 - Consider setting the storage capacity of the eastbound left-turn lane to 275 feet.
 - Consider setting the storage capacity of the westbound right-turn lane to 350 feet.
 - Consider setting the storage capacity of the southbound dual left-turn lanes to 375 feet.
 - In an effort to improve onsite and offsite traffic operations and circulations, it is recommended that Project Driveway 3 have a minimum throat depth of 375 feet before any vehicular openings to the adjacent parking lots.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - The existing storage capacity of the eastbound right-turn lane is projected to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. While there are no constraints to increasing the storage capacity of this movement, it is recommended that this movement be monitored.



- The existing storage capacity of the westbound left-turn lane is projected to exceed that available during the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. However, the storage capacity of this left-turn lane cannot be increased without reducing the storage capacity of the eastbound left-turn lane at the intersection of Highland Avenue and Floral Avenue or increasing the width of the State Route 99 overpass. Therefore, it is recommended that this movement be monitored.
- Highland Avenue / Floral Avenue
 - Consider setting the storage capacity of the eastbound dual left-turn lanes to 150 feet. While the projected queueing demand for this movement is anticipated to be 204 feet, increasing the storage capacity is not possible without impacting the existing storage capacity of the westbound left-turn lane at the intersection of State Route 99 Southbound Off-Ramp and Floral Avenue.
 - Consider increasing the storage capacity of the eastbound right-turn lane to 100 feet. While the projected queueing demand for this movement is anticipated to be 201 feet, increasing the storage capacity is not possible without modifying the State Route 99 overpass.
 - The existing storage capacity of the westbound dual left-turn lanes is projected to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the existing eastbound left-turn pocket immediately to the east. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider setting the storage capacity of the westbound right-turn lane to 150 feet. While the projected queueing demand for this movement is anticipated to be 314 feet, increasing the storage capacity is not possible without impacting the businesses and driveways immediately to the north. Therefore, this cumulative impact would be considered significant but unavoidable.
 - While the projected queueing demand for the northbound dual left-turn lanes is anticipated to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the State Route 99 overpass. Therefore, this cumulative impact would be considered significant but unavoidable.
 - While the projected queueing demand for the northbound right-turn lane is anticipated to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible due to the State Route 99 Northbound On-Ramp immediately to the south. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider increasing the storage capacity of the southbound left-turn lane to 250 feet.
 - Consider increasing the storage capacity of the southbound dual right-turn lanes to 225 feet.
- State Route 99 Northbound Off-Ramp / Floral Avenue
 - Consider increasing the storage capacity of the northbound right-turn lane to 350 feet.



- Whitson Street / Floral Avenue
 - Consider increasing the storage capacity of the eastbound left-turn lane to 125 feet.
 - Consider increasing the storage capacity of the westbound left-turn lane to 175 feet.
 - While the projected queueing demand for the northwestbound dual left-turn lanes is anticipated to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the southeastbound left-turn lane immediately to the south. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider increasing the storage capacity of the northwestbound right-turn lane to 150 feet.
 - Consider increasing the storage capacity of the southeastbound left-turn lane 225 feet.
 - Consider increasing the storage capacity of the southeastbound right-turn lane to 125 feet.
- McCall Avenue / Floral Avenue
 - Consider increasing the storage capacity of the eastbound left-turn lane to 250 feet.
 - Consider increasing the storage capacity of the westbound left-turn lane to 125 feet.
 - Consider increasing the storage capacity of the westbound right-turn lane to 125 feet.
 - Consider increasing the storage capacity of the northbound left-turn lane to 175 feet.
 - Consider increasing the storage capacity of the southbound left-turn lane to 200 feet.
- Highland Avenue / State Route 99 Southbound Ramps
 - Consider increasing the storage capacity of the eastbound dual right-turn lanes to 300 feet.
 - While the projected queueing demand for the southbound left-turn lane is anticipated to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the State Route 99 overpass. Therefore, this cumulative impact would be considered significant but unavoidable.



Table XXVII: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing			Existing plus Dealership			Existing plus Project Buildout			Near Term Year 2025 plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
1	Highland Avenue / Golden State Boulevard	SE Left	200	0	9	40	0	6	36	0	23	62	0	9	30
		SE Right	100	11	35	0	19	22	0	46	113	42	6	132	57
		NW Left	75	11	15	21	3	6	24	5	9	62	5	0	86
		NW Right	120	8	0	0	0	4	0	2	29	0	0	0	0
		NB Left	140	57	77	27	52	123	32	88	183	167	80	230	222
		NB Dual Lefts	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Right	50	0	0	0	0	0	31	23	0	59	*	*	*
		SB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		SB Right	35	0	41	65	25	0	0	0	0	116	*	*	*
2	DeWolf Avenue / Floral Avenue	EB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		WB Left	*	*	*	*	*	*	*	*	*	*	24	79	80
		WB Right	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Right	*	*	*	*	*	*	*	*	*	*	*	*	*
		SB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
3	Project Driveway 3 / Floral Avenue	EB Left	*	*	*	*	*	*	*	37	226	220	42	205	386
		WB U/Left	*	*	*	*	*	*	*	29	73	65	38	146	97
		WB Right	*	*	*	*	*	*	*	62	198	230	76	212	288
		SB Dual Lefts	*	*	*	*	*	*	*	74	315	335	87	278	335
		SB Right	>300	*	*	*	*	*	*	19	168	265	17	54	50
4	SR 99 SB Off-Ramp / Floral Avenue	EB Right	100	22	27	30	28	28	33	22	295	296	14	254	232
		WB Left	160	54	106	113	69	129	75	78	202	198	86	188	125
		NB Right	>300	46	97	74	43	113	89	47	171	143	61	159	163
		SB Dual Lefts	380	73	127	75	79	113	110	85	236	153	104	624	192
		SB Right	380	48	66	69	69	58	60	69	190	161	71	403	292

Note: * = Does not exist or is not projected to exist



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Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing			Existing plus Dealership			Existing plus Project Buildout			Near Term Year 2025 plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
5	Highland Avenue / Floral Avenue	EB Left	105	113	260	179	127	251	145	*	*	*	*	*	*
		EB Dual Lefts	*	*	*	*	*	*	*	109	208	209	104	205	242
		EB Right	40	28	130	112	38	175	93	89	216	221	85	200	208
		WB Dual Lefts	150	88	75	78	67	84	57	68	148	121	153	256	241
		WB Right	*	*	*	*	*	*	*	42	55	52	123	303	285
		NB Dual Lefts	170	52	86	55	58	73	61	55	117	108	179	274	284
		NB Right	80	47	42	51	41	59	45	42	72	55	99	149	119
		SB Left	100	54	73	80	53	105	97	68	85	104	68	219	226
		SB Dual Rights	100	61	71	60	60	82	80	85	183	171	124	204	204
6	SR 99 NB Off-Ramp / Floral Avenue	NB Left	>500	97	98	72	79	98	120	101	504	388	125	485	413
		NB Right	25	70	68	64	65	65	62	68	75	66	61	282	279
7	Whitson Street / Floral Avenue	EB Left	80	22	41	60	33	72	46	23	90	67	36	110	73
		WB Left	100	41	106	37	72	64	60	44	102	53	89	148	131
		NW Dual Lefts	120	26	82	65	40	99	59	39	155	95	58	184	206
		NW Right	100	0	0	0	0	0	0	0	25	0	0	0	0
		SE Left	120	46	53	38	53	83	66	54	78	51	38	103	79
		SE Right	70	0	0	0	0	0	0	0	0	0	0	0	0
8	McCall Avenue / Floral Avenue	EB Left	100	135	142	137	113	183	149	113	207	169	122	249	217
		WB Left	100	82	59	48	70	57	40	66	49	45	109	86	113
		WB Right	100	100	70	54	101	66	43	67	99	49	105	154	99
		NB Left	65	140	105	58	125	140	69	126	112	71	139	152	152
		SB Left	120	148	70	44	113	101	47	87	87	45	162	164	118
		SB Right	>500	78	70	56	98	55	47	69	85	47	98	108	68
9	Highland Avenue / SR 99 SB Ramps	EB Dual Rights	175	91	121	124	146	162	102	112	134	114	251	222	204
		NB Right	300	0	0	0	0	0	0	0	0	0	0	250	0
		SB Left	65	97	126	104	97	129	106	114	135	131	155	150	157
10	Highland Avenue / Rose Avenue	EB Left	*	15	19	14	16	12	21	23	16	23	75	70	58
		WB Left	*	41	42	36	46	49	44	45	53	45	78	84	58
		NB Left	250	14	35	13	0	25	10	8	17	24	97	110	99
		SB Left	250	79	108	94	71	91	117	90	101	136	111	180	84

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Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Cumulative Year 2030 No Project Buildout			Cumulative Year 2030 plus Project Buildout			Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD
1	Highland Avenue / Golden State Boulevard	SE Left	200	8	35	176	6	20	102	0	101	67
		SE Right	100	91	246	246	60	255	202	10	236	174
		NW Left	75	1	59	134	0	46	135	2	74	119
		NW Right	120	12	74	0	0	17	72	0	4	0
		NB Left	140	*	*	*	*	*	*	*	*	*
		NB Dual Lefts	*	77	214	206	45	287	238	55	306	163
		NB Right	50	58	48	35	*	*	*	70	38	122
		SB Left	*	*	*	*	62	271	63	73	110	194
		SB Right	35	78	105	121	*	*	*	*	*	*
2	DeWolf Avenue / Floral Avenue	EB Left	*	*	*	*	*	*	*	19	10	*
		WB Left	*	*	*	*	27	92	92	46	185	253
		WB Right	*	*	*	*	*	*	*	28	223	194
		NB Left	*	*	*	*	*	*	*	27	39	35
		NB Right	*	*	*	*	*	*	*	33	178	136
		SB Left	*	*	*	*	*	*	*	187	278	326
3	Project Driveway 3 / Floral Avenue	EB Left	*	*	*	*	47	222	265	96	360	363
		WB U/Left	*	*	*	*	26	70	150	39	70	441
		WB Right	*	*	*	*	75	225	353	92	208	477
		SB Dual Lefts	*	*	*	*	80	330	372	136	368	417
		SB Right	>300	*	*	*	20	53	67	32	87	99
4	SR 99 SB Off-Ramp / Floral Avenue	EB Right	100	22	24	28	15	203	296	28	255	270
		WB Left	160	66	104	91	65	160	177	87	142	190
		NB Right	>300	45	105	97	31	151	158	58	191	145
		SB Dual Lefts	380	80	111	82	75	341	195	77	438	192
		SB Right	380	63	94	68	71	243	237	60	205	315

Note: * = Does not exist or is not projected to exist



Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Cumulative Year 2030 No Project Buildout			Cumulative Year 2030 plus Project Buildout			Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD
5	Highland Avenue / Floral Avenue	EB Left	105	*	*	*	*	*	*	*	*	*
		EB Dual Lefts	*	108	206	200	137	200	204	130	201	229
		EB Right	40	81	204	199	67	201	185	88	193	210
		WB Dual Lefts	150	138	234	252	172	251	232	142	251	231
		WB Right	*	*	*	*	162	314	292	121	239	286
		NB Dual Lefts	170	120	307	263	163	309	268	151	295	278
		NB Right	80	84	109	150	108	142	141	87	139	124
		SB Left	100	102	246	185	94	253	226	121	227	145
		SB Dual Rights	100	98	137	125	146	216	197	88	192	164
6	SR 99 NB Off-Ramp / Floral Avenue	NB Left	>500	80	241	204	139	583	897	122	404	302
		NB Right	25	59	120	107	65	341	351	57	260	218
7	Whitson Street / Floral Avenue	EB Left	80	61	132	117	35	81	115	36	103	88
		WB Left	100	80	128	126	106	152	156	61	136	115
		NW Dual Lefts	120	61	194	195	57	268	218	52	156	202
		NW Right	100	0	89	16	0	147	72	0	49	0
		SE Left	120	50	140	128	70	210	123	64	172	201
		SE Right	70	0	46	67	0	108	46	0	67	46
8	McCall Avenue / Floral Avenue	EB Left	100	183	232	209	190	249	202	183	234	211
		WB Left	100	91	70	79	98	114	87	90	122	79
		WB Right	100	154	117	59	106	111	128	114	123	49
		NB Left	65	132	157	120	145	155	127	126	149	130
		SB Left	120	132	140	97	205	160	59	205	193	46
		SB Right	>500	79	99	76	153	98	60	102	89	58
9	Highland Avenue / SR 99 SB Ramps	EB Dual Rights	175	236	228	302	263	240	203	423	200	195
		NB Right	300	0	467	0	0	0	0	0	328	0
		SB Left	65	157	160	152	171	150	152	168	144	156
10	Highland Avenue / Rose Avenue	EB Left	*	119	61	66	93	68	62	80	66	67
		WB Left	*	63	74	108	61	65	75	60	79	79
		NB Left	250	76	107	187	68	112	129	90	116	92
		SB Left	250	133	232	132	105	129	132	106	157	137

Note: * = Does not exist or is not projected to exist



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Project Buildout's Equitable Fair Share of Future Transportation Improvements

The existing Dealership Project and Selma Grove Project's fair share percentage impacts to study intersections projected to fall below their LOS threshold and that are not covered by an existing impact fee program are provided in Tables XXVIII and XXIX for the existing Dealership Project and proposed Selma Grove Project, respectively. The existing Dealership Project and proposed Selma Grove Project's fair share percentage impacts were calculated pursuant to the Caltrans Guide for the Preparation of Traffic Impact Studies. The existing Dealership Project and proposed Selma Grove Project's pro-rata fair shares were calculated utilizing the Existing volumes, Net New Dealership Trips, Net New Selma Grove Trips, and Cumulative Year 2030 plus Project Buildout volumes. Figures 2 and 3 illustrate the Existing traffic volumes during a weekday and Saturday, respectively, Figures 20 and 21 illustrate the Net New Dealership Trips during a weekday and Saturday, respectively, Figures 22 and 23 illustrate the Net New Selma Grove Trips during a weekday and Saturday, respectively, and Figures 34 and 35 illustrate the Cumulative Year 2030 plus Project Buildout traffic volumes during a weekday and Saturday, respectively. Since the critical peak period for the study facilities was determined to be during the MD peak period on a Saturday, the MD peak volumes are utilized to determine the existing Dealership Project and proposed Selma Grove Project's pro-rata fair share.

It is recommended that the existing Dealership Project and proposed Selma Grove Project's contribute their equitable fair share as listed in Tables XXVIII and XXIX, respectively, for the future improvements necessary to maintain an acceptable LOS. However, fair share contributions should only be made for those facilities or portion thereof currently not funded by the responsible agencies roadway impact fee program(s), as appropriate. For those improvements not presently covered by local and regional roadway impact fee programs, it is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable fair share. Payment of the existing Dealership Project and proposed Selma Grove Project's equitable fair share in addition to the local and regional impact fee programs would satisfy the existing Dealership Project and proposed Selma Grove Project's traffic mitigation measures.

This study does not provide construction costs for the recommended mitigation measures; therefore, it is recommended that the developer work with the City of Selma to develop the estimated construction costs for each of the study facilities that are impacted by the proposed Project. It is also recommended that the construction costs include an annual rate increase to account for current trends in construction cost increases. While the City may elect to collect a fair share contribution for some study facilities, it may require that the Project construct the necessary improvements to achieve an acceptable LOS at others.



Table XXVIII: Dealership's Fair Share of Future Roadway Improvements

<i>ID</i>	<i>Intersection</i>	<i>Existing Traffic Volumes (MD Peak)</i>	<i>Cumulative Year 2030 plus Project Buildout Traffic Volumes (MD Peak)</i>	<i>Net New Dealership Trips (MD Peak)</i>	<i>Project's Fair Share (%)</i>
1	Highland Avenue / Golden State Boulevard	1,023	3,877	13	0.46%
2	DeWolf Avenue / Floral Avenue	241	1,265	14	1.37%
4	SR 99 SB Off-Ramp / Floral Avenue	1,611	4,521	36	1.24%
5	Highland Avenue / Floral Avenue	2,262	6,185	32	0.82%
10	Highland Avenue / Rose Avenue	1,184	2,748	2	0.13%
11	Walmart Driveway / Floral Avenue	1,087	4,094	36	1.20%

Note: Project Fair Share = (Net New Dealerships Trips) / (Cumulative Year 2030 plus Project Buildout Traffic Volumes - Existing Traffic Volumes) x 100

Table XXIX: Selma Grove's Fair Share of Future Roadway Improvements

<i>ID</i>	<i>Intersection</i>	<i>Existing Traffic Volumes (MD Peak)</i>	<i>Cumulative Year 2030 plus Project Buildout Traffic Volumes (MD Peak)</i>	<i>Net New Selma Grove Trips (MD Peak)</i>	<i>Project's Fair Share (%)</i>
1	Highland Avenue / Golden State Boulevard	1,023	3,877	823	28.84%
2	DeWolf Avenue / Floral Avenue	241	1,265	690	67.38%
4	SR 99 SB Off-Ramp / Floral Avenue	1,611	4,521	2,208	75.88%
5	Highland Avenue / Floral Avenue	2,262	6,185	1,763	44.94%
10	Highland Avenue / Rose Avenue	1,184	2,748	93	5.95%
11	Walmart Driveway / Floral Avenue	1,087	4,094	2,208	73.43%

Note: Project Fair Share = (Net New Selma Grove Trips) / (Cumulative Year 2030 plus Project Buildout Traffic Volumes - Existing Traffic Volumes) x 100



Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Existing plus Dealership Traffic Conditions

- At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Existing plus Project Buildout Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.
- JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.
- The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday.
- In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. After internal capture and pass-by trip reductions are taken into account, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.
- It is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.



- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase; and
 - Prohibit northbound to southbound U-turn movements.
 - DeWolf Avenue / Floral Avenue
 - Implement all-way stop controls.
 - Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
 - State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
 - Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue approximately 1,000 feet north of Floral Avenue; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.



- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Near Term Year 2025 plus Project Buildout Traffic Conditions

- The total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
 - Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
 - State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.



- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Cumulative Year 2030 No Project Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be considered for implementation.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue; and
 - Modify the traffic signals to accommodate the added lane.



- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Cumulative Year 2030 plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.



- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through-right lane to a through-right lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a northbound left-turn lane;
 - Modify the northbound left-through-right lane to a through lane;
 - Add a northbound right-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - Implement overlap phasing of the northbound right-turn phase with the westbound left-turn phase;
 - Prohibit westbound to eastbound U-turn movements; and
 - Modify the intersection to accommodate the added lanes.



- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project Buildout's Equitable Fair Share

- It is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable Fair Share as presented in Tables XXVIII and XXIX, respectively.



Study Participants

JLB Traffic Engineering, Inc. Personnel:

Jose Luis Benavides, PE, TE	Project Manager
Susana Maciel, EIT	Engineer I/II
Javier Rios	Engineer I/II
Jove Alcazar	Engineer I/II
Dennis Wynn	Sr. Engineering Technician

Persons Consulted:

Joey Daggett	City of Selma
Daniel K. Bond	City of Selma
Isaac Moreno	City of Selma
Bryant Hemby	City of Selma
Harpreet Kooner	County of Fresno
David Padilla	Caltrans

References

1. City of Selma, *2035 General Plan*.
2. County of Fresno, *2000 General Plan*.
3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation*, 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. Transportation Concept Report, State Route 43, Caltrans, District 6, dated April 2015.



Appendix A-2:
March 2022 Addendum to the Traffic Impact Analysis

March 28, 2022

Brandon A. Broussard, P.E.
City Engineer
City of Selma
1710 Tucker Street
Selma, CA 93662

Via Email Only: bbroussard@ytmail.com

Subject: Addendum 1 to the Traffic Impact Analysis Report for the Selma Grove Commercial Development Project located in the City of Selma (JLB Project No. 001-005)

Dear Mr. Broussard,

JLB Traffic Engineering, Inc. (JLB) has completed Addendum 1 which includes a **Traffic Count Comparison Analysis** for the three selected intersections analyzed as part of the Selma Grove Commercial Development Project (Selma Grove) Traffic Impact Analysis (TIA). The latest version of the Selma Grove TIA is dated March 13, 2019. The Project desires to move forward to obtain City Council approval; however, there is concern that the TIA, dated March 13, 2019, may underestimate near term and cumulative year traffic impacts. As a result, JLB collected new year 2022 traffic counts at three of the study intersections and compared these counts with forecasted year 2022 traffic volumes based on data contained within the March 13, 2019 Selma Grove TIA.

The purpose of Addendum 1 is to compare the newly collected 2022 traffic counts to the forecasted 2022 traffic volumes based on data contained within the March 13, 2019 Selma Grove TIA. This analysis compares the new traffic counts collected in March 2022 to the traffic counts used in the Selma Grove TIA by expanding the TIA volumes by the average annual growth rate, as projected in the Selma Grove TIA, to the year 2022.

Newly Collected 2022 Traffic Volumes

The first step in the comparison analysis was to collect new intersection turning movement counts for the weekday AM and PM peaks as well as the Saturday midday peak at three of the study intersections. These intersections include 1) State Route 99 Southbound Off Ramp at Floral Avenue, 2) Whitson Avenue at Floral Avenue and 3) Highland Avenue at Rose Avenue. The existing weekday AM and PM intersection peak hour turning movement counts were conducted at the three study intersections on Thursday, March 3, 2022, while schools in the vicinity of the Project site were in session. The existing Saturday midday intersection peak hour turning movement counts were conducted at the three study intersections on Saturday, March 5, 2022. The intersection turning movement counts included pedestrian and bicycle volumes. The newly collected 2022 traffic counts are contained in Appendix I.



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According to Vehicle Miles Travelled (VMT) data on the Berkely TIMS database, VMT has normalized to pre-Covid numbers. As a result of the VMT data normalizing and schools being in session with in-person instruction, JLB proposes that no escalation be applied to the newly collected 2022 traffic counts due to Covid.

Existing Selma Grove TIA Volumes

The existing conditions peak hour turning movement volume counts utilized in the Selma Grove TIA were collected at the study intersections in June 2016, while schools in the vicinity of the Project site were in session. A summary of the existing volumes for the three intersections and peak periods can be found in Table I.

Table I: Existing Selma Grove TIA Volumes

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Existing Intersection Volumes in Selma Grove TIA (VPH)	1,070	1,940	1,611	1,393	1,869	1,465	1,243	1,549	1,184

Selma Grove TIA Volume Forecasting

In order to arrive at the forecasted year 2022 traffic volumes, JLB derived an average annual growth rate between the existing 2016 counts and the Cumulative Year 2030 No Project forecasted traffic volumes contained in the Selma Grove TIA. The methodologies used to derive at the Cumulative Year 2030 No Project forecasted traffic volumes are explained in the Selma Grove TIA. The growth rate of each approach and peak periods for the three selected intersections can be found in Table II. These growth rates were then used to expand the 2016 counts for six (6) years to arrive at the forecasted year 2022 volumes. A summary of the forecasted year 2022 volumes for each of these three intersections and peak periods can be found in Table III, while the forecasted year 2022 volumes by movement can be found in Appendix II.

Table II: Selma Grove TIA Forecasted Average Annual Traffic Growth Rate

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Eastbound	2.92%	2.57%	3.48%	1.87%	2.79%	3.69%	18.29%	14.31%	18.74%
Westbound	2.26%	2.17%	2.88%	0.99%	2.57%	3.48%	1.13%	1.60%	2.61%
Northbound	0.00%	0.00%	0.00%	2.21%	4.88%	5.60%	3.17%	4.71%	5.47%
Southbound	0.80%	0.37%	0.93%	5.49%	7.57%	8.55%	3.13%	4.80%	6.18%

Table III: Collected and Forecast Year 2022 Volume Comparison

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Year 2022 Forecast Intersection Volumes (VPH)	1,197	2,144	1,864	1,578	2,362	1,948	1,499	2,034	1,656
Newly Collected Year 2022 Intersection Volumes (VPH)	1,109	1,921	2,000	1,343	1,893	1,795	1,268	1,643	1,383
Intersection Volume Difference (VPH)	88	223	-136	235	469	153	231	391	273
Percent Difference	7.9%	11.6%	-6.8%	17.5%	24.8%	8.5%	18.2%	23.8%	19.7%

Volume Comparison

The year 2022 forecast volumes were then compared to the newly collected year 2022 volumes. The volume and percent difference for each intersection per peak period can be found in Table III. In most cases, the forecast year 2022 volumes were found to be higher than the newly collected 2022 volumes. As a result, the level of traffic volume growth assumed in the Selma Grove TIA, dated March 13, 2019, is higher than that which has taken place. This would indicate that the projected traffic impacts included in the Selma Grove TIA could be lower, and therefore, those presented in the TIA would be considered a worst-case scenario. The current lower volumes when compared to the TIA projections are also a result of many of the Near Term Cumulative projects not being built as fast as previously anticipated by the City. The intersection of State Route 99 Southbound Off Ramp at Floral Avenue during the weekend MD peak period was the only study scenario in which the forecast 2022 volumes were less than the newly collected 2022 volumes, by 6.8 percent. However, it is of JLB's opinion that any projected traffic volumes which are less than ten (10) percent lower than actual counts would be considered reasonable and normal.

Conclusions and Recommendations

Conclusions and recommendations regarding the Traffic Count Comparison are provided below:

- The expanded 2016 traffic counts to the year 2022 were, on average, higher than the newly collected year 2022 traffic counts.
- Thus, the volume forecasting within the Selma Grove TIA is higher than that which has taken place in the last five years.
- The traffic operational impacts presented in the Selma Grove TIA could likely be lesser, and as a result be considered conservative findings.
- The Selma Grove TIA more than adequately projects traffic forecasting and, as a result, it should not be necessary to redo the TIA.

If you have any questions or require additional information, please contact me via phone at (559) 570-8991, or via email at jbenavides@jlbtraffic.com.

Sincerely,



Jose Luis Benavides, P.E., T.E.
President

Z:\01 Projects\001 Selma\001-005 Selma Grove TIA\Count Comparison Letter\L03282022 Selma Grove Count Comparison.docx



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Appendix I: March 2022 Traffic Counts





Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Floral Ave @ SR 99 SB Offramp / Shopping Center Driveway

LATITUDE 36.5764

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Thursday, March 3, 2022

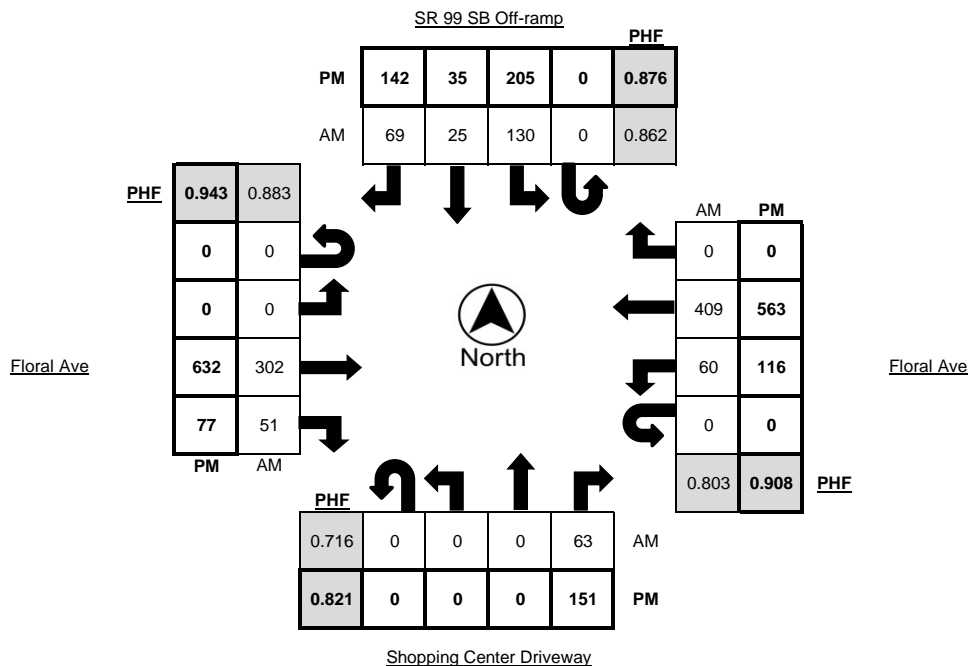
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	0	7	0	0	33	3	23	7	0	0	59	8	2	0	11	45	0	1
7:15 AM - 7:30 AM	0	0	0	8	0	0	45	5	17	2	0	0	45	3	1	0	10	47	0	1
7:30 AM - 7:45 AM	0	0	0	18	0	0	56	3	13	2	0	0	60	4	1	0	12	68	0	2
7:45 AM - 8:00 AM	0	0	0	16	0	0	47	8	22	4	0	0	66	9	2	0	8	93	0	1
8:00 AM - 8:15 AM	0	0	0	15	0	0	36	4	16	2	0	0	63	9	2	0	7	109	0	1
8:15 AM - 8:30 AM	0	0	0	12	0	0	43	6	16	4	0	0	70	16	3	0	12	104	0	1
8:30 AM - 8:45 AM	0	0	0	22	0	0	31	10	18	5	0	0	87	13	3	0	14	77	0	0
8:45 AM - 9:00 AM	0	0	0	14	0	0	20	5	19	1	0	0	82	13	1	0	27	119	0	3
TOTAL	0	0	0	112	0	0	311	44	144	27	0	0	532	75	15	0	101	662	0	10

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	0	47	0	0	41	9	28	2	0	0	153	14	0	0	38	159	0	2
4:15 PM - 4:30 PM	0	0	0	56	0	0	69	13	30	2	0	0	126	19	0	0	29	128	0	1
4:30 PM - 4:45 PM	0	0	0	34	0	0	53	5	29	1	0	0	145	18	1	0	20	147	0	3
4:45 PM - 5:00 PM	0	0	0	40	0	0	49	11	33	1	0	0	128	22	3	0	27	128	0	1
5:00 PM - 5:15 PM	0	0	0	30	0	0	45	13	26	0	0	0	154	16	2	0	33	140	0	3
5:15 PM - 5:30 PM	0	0	0	45	0	0	53	9	35	1	0	0	167	21	2	0	30	149	0	1
5:30 PM - 5:45 PM	0	0	0	46	0	0	60	9	40	1	0	0	154	12	2	0	27	160	0	1
5:45 PM - 6:00 PM	0	0	0	30	0	0	47	4	41	2	0	0	157	28	2	0	26	114	0	1
TOTAL	0	0	0	328	0	0	417	73	262	10	0	0	1184	150	12	0	230	1125	0	13

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
8:00 AM - 9:00 AM	0	0	0	63	0	0	130	25	69	12	0	0	302	51	9	0	60	409	0	5
5:00 PM - 6:00 PM	0	0	0	151	0	0	205	35	142	4	0	0	632	77	8	0	116	563	0	6

	PHF	Trucks
AM	0.927	2.3%
PM	0.944	0.9%





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 Hanford, CA 93230
 800-975-6938 Phone/Fax
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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION al Ave @ SR 99 SB Offramp / Shopping Center Drive

LATITUDE 36.5764

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Thursday, March 3, 2022

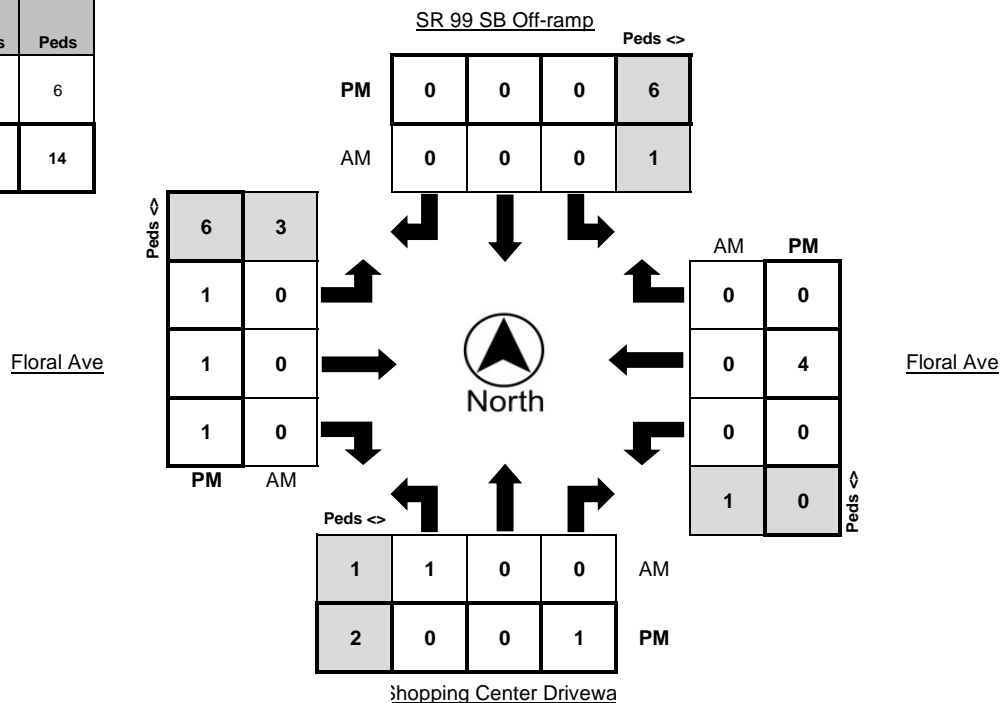
WEATHER Clear

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	2	0	0	1	0	0	0	1	0	1	0	1	0	0	0	3

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	7	0	0	0	1	0	1	0	0	0	0	0	4
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	2	0	0	0	1	0	1	0	0	0	3	0	2
5:15 PM - 5:30 PM	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	2
5:30 PM - 5:45 PM	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	0	0	1	14	0	0	0	3	1	2	1	0	0	4	0	11

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
8:00 AM - 9:00 AM	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3
5:00 PM - 6:00 PM	0	0	1	6	0	0	0	2	1	1	1	0	0	4	0	6

	Bikes	Peds
AM Peak Total	1	6
PM Peak Total	8	14



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION al Ave @ SR 99 SB Offramp / Shopping Center Drive

LATITUDE al Ave @ SR 99 SB Offramp / Shopping Center Drive

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Saturday, March 5, 2022

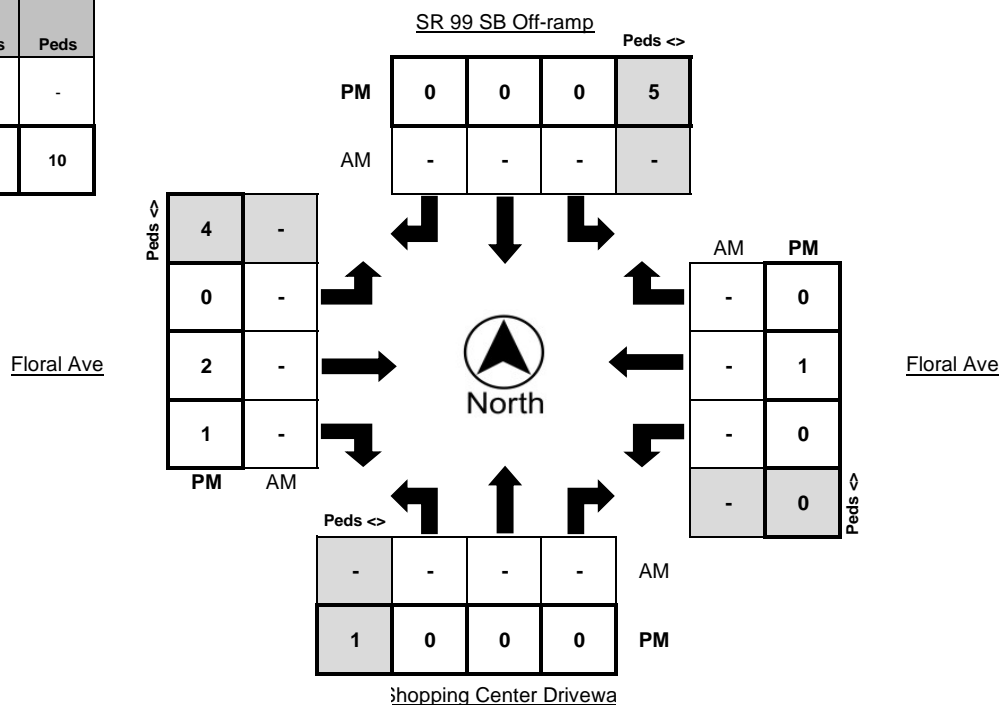
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
1:30 PM - 1:45 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3
2:00 PM - 2:15 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	6
2:15 PM - 2:30 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
TOTAL	0	0	0	7	0	0	0	3	0	3	1	0	0	2	0	14

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 PM - 2:00 PM	0	0	0	5	0	0	0	1	0	2	1	0	0	1	0	4

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	4	10



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION	Floral Ave @ Whitson St
COUNTY	Fresno
COLLECTION DATE	Thursday, March 3, 2022

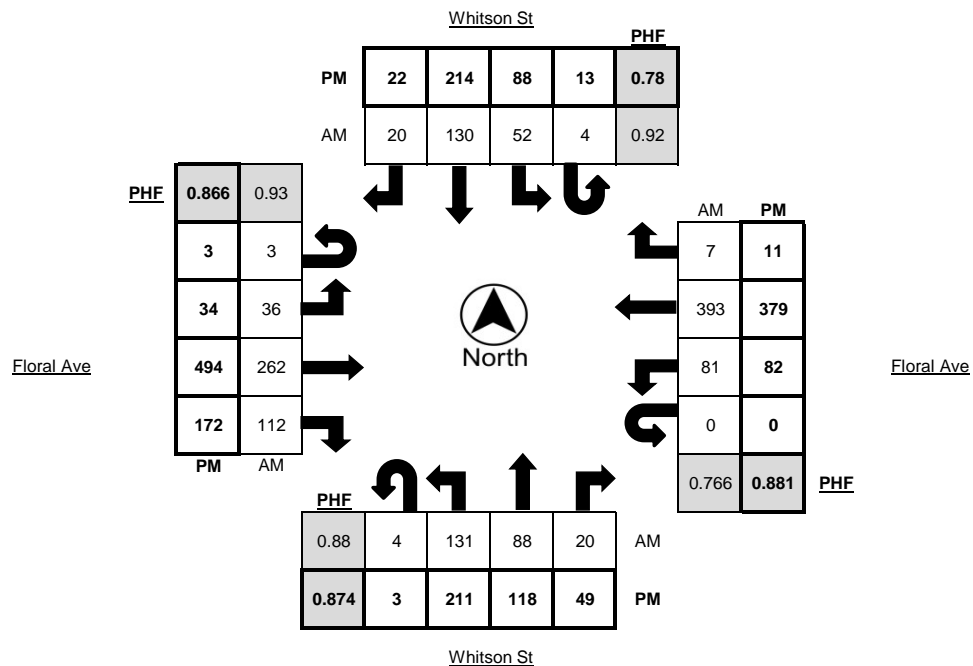
LATITUDE	36.5763
LONGITUDE	-119.6246
WEATHER	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	1	16	18	5	1	0	7	18	0	0	0	12	42	16	5	0	2	53	1	0
7:15 AM - 7:30 AM	0	22	24	0	4	0	4	13	0	0	3	7	44	24	5	0	3	75	1	2
7:30 AM - 7:45 AM	1	20	27	0	1	1	9	14	0	0	1	10	76	20	5	0	11	94	3	0
7:45 AM - 8:00 AM	3	27	24	5	0	2	11	32	3	4	0	9	78	21	0	0	20	102	1	2
8:00 AM - 8:15 AM	1	35	27	6	2	1	14	34	4	1	1	9	53	26	5	0	29	126	2	1
8:15 AM - 8:30 AM	0	38	19	4	4	1	15	31	9	2	0	10	69	32	6	0	16	92	0	2
8:30 AM - 8:45 AM	0	31	18	5	2	0	12	33	4	4	2	8	62	33	6	0	16	73	4	1
8:45 AM - 9:00 AM	0	34	23	3	2	1	13	27	5	3	3	10	55	28	4	0	21	77	3	3
TOTAL	6	223	180	28	16	6	85	202	25	14	10	75	479	200	36	0	118	692	15	11

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	35	29	13	1	2	16	52	8	1	2	13	118	44	3	0	23	116	1	0
4:15 PM - 4:30 PM	0	38	19	7	3	1	27	54	5	2	2	13	127	72	2	0	18	73	2	0
4:30 PM - 4:45 PM	0	32	17	13	3	0	16	52	4	3	1	8	119	31	4	0	18	80	3	1
4:45 PM - 5:00 PM	0	37	22	9	2	1	26	48	6	2	6	14	130	30	4	0	9	93	1	0
5:00 PM - 5:15 PM	0	59	30	14	3	6	32	66	4	1	1	9	95	30	3	0	24	88	2	0
5:15 PM - 5:30 PM	2	57	36	14	1	4	13	55	7	3	0	7	123	46	2	0	22	109	3	0
5:30 PM - 5:45 PM	1	55	17	13	0	1	26	54	7	7	0	6	151	46	3	0	16	88	3	0
5:45 PM - 6:00 PM	0	40	35	8	1	2	17	39	4	1	2	12	125	50	0	0	20	94	3	0
TOTAL	4	353	205	91	14	17	173	420	45	20	14	82	988	349	21	0	150	741	18	1

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	4	131	88	20	8	4	52	130	20	11	3	36	262	112	17	0	81	393	7	6
5:00 PM - 6:00 PM	3	211	118	49	5	13	88	214	22	12	3	34	494	172	8	0	82	379	11	0

	PHF	Trucks
AM	0.912	3.1%
PM	0.950	1.3%





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 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION Floral Ave @ Whitson St
COUNTY Fresno
COLLECTION DATE Thursday, March 3, 2022

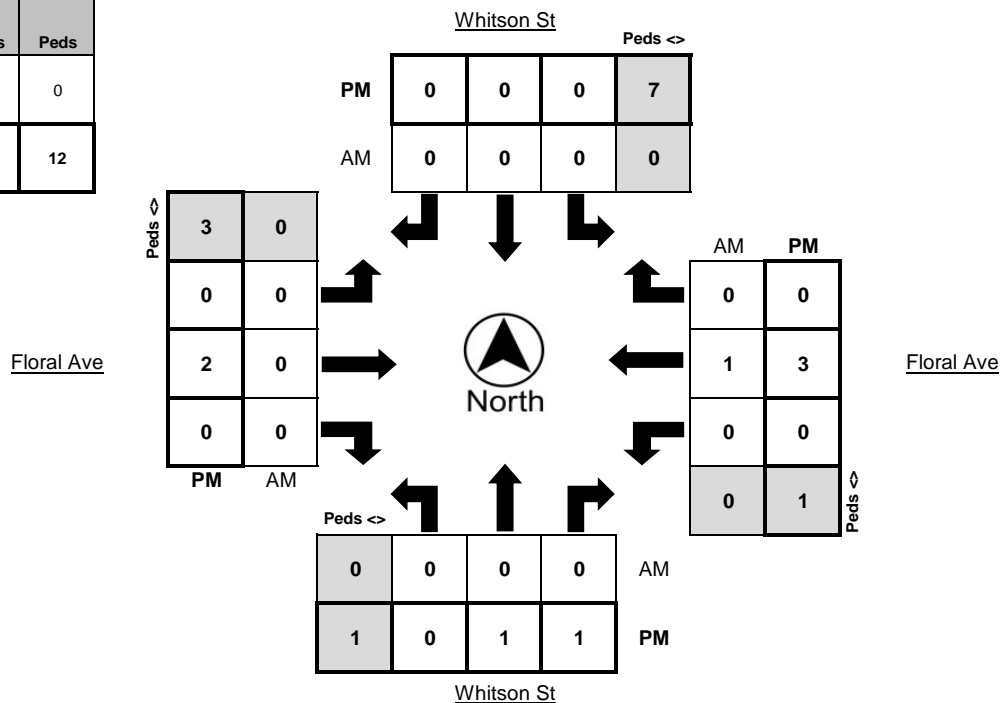
LATITUDE 36.5763
LONGITUDE -119.6246
WEATHER Clear

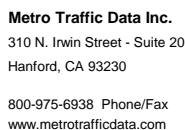
Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	2	0	0	0	0	0	1	0	0	0	1	0	1

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	2	0	0	0	2	0	1	0	0	0	0	0	2
5:00 PM - 5:15 PM	0	0	0	4	0	0	0	1	0	1	0	1	0	1	0	0
5:15 PM - 5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	0
5:30 PM - 5:45 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	0	1	1	12	0	0	0	3	0	4	0	2	0	3	0	5

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:45 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
5:00 PM - 6:00 PM	0	1	1	7	0	0	0	1	0	2	0	1	0	3	0	3

	Bikes	Peds
AM Peak Total	1	0
PM Peak Total	7	12





Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION	Floral Ave @ Whitson St
COUNTY	Fresno
COLLECTION DATE	Saturday, March 5, 2022

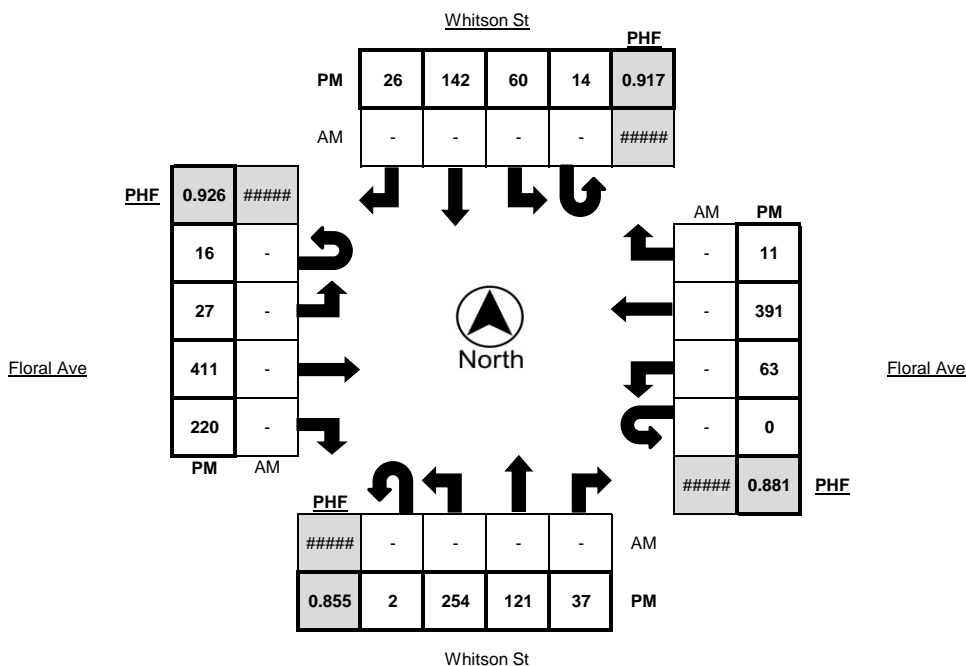
LATITUDE	Floral Ave @ Whitson St
LONGITUDE	-119.6246
WEATHER	Clear

[illegible]

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
1:00 PM - 1:15 PM	0	53	34	8	1	4	12	40	6	0	4	6	95	46	3	0	24	88	1	2
1:15 PM - 1:30 PM	2	78	28	13	0	3	13	38	9	0	4	6	90	57	1	0	13	102	2	0
1:30 PM - 1:45 PM	0	68	34	6	1	4	16	27	7	0	2	12	108	60	3	0	22	107	3	1
1:45 PM - 2:00 PM	0	47	27	7	2	3	17	41	5	2	3	2	108	55	1	0	11	91	4	0
2:00 PM - 2:15 PM	0	61	32	11	0	4	14	36	5	0	7	7	105	48	1	0	17	91	2	2
2:15 PM - 2:30 PM	2	60	30	5	2	8	6	29	6	2	2	2	89	49	2	0	12	84	1	0
2:30 PM - 2:45 PM	0	69	29	5	1	5	10	26	7	0	2	10	92	43	0	0	14	81	4	0
2:45 PM - 3:00 PM	0	49	25	9	1	2	12	38	3	0	5	12	99	46	2	0	16	95	2	0
TOTAL	4	485	239	64	8	33	100	275	48	4	29	57	786	404	13	0	129	739	19	5

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:15 PM - 2:15 PM	2	254	121	37	3	14	60	142	26	2	16	27	411	220	6	0	63	391	11	3

	PHF	Trucks
AM	-	-
PM	0.943	0.8%



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Floral Ave @ Whitson St

LATITUDE Floral Ave @ Whitson St

COUNTY Fresno

LONGITUDE -119.6246

COLLECTION DATE Saturday, March 5, 2022

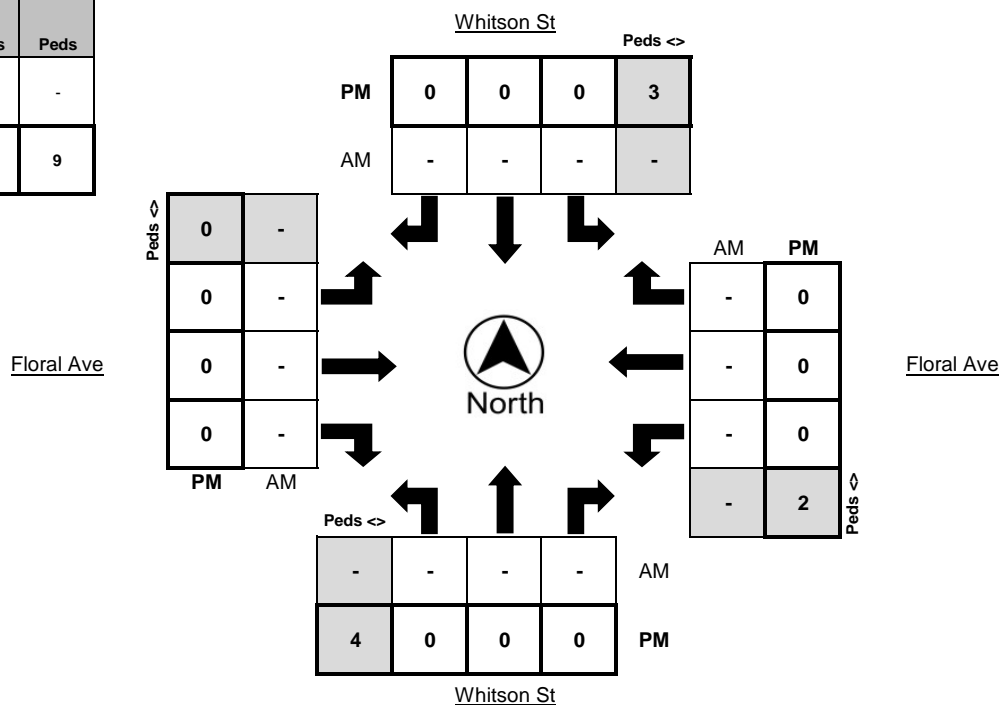
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
1:30 PM - 1:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:30 PM - 2:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	3	0	1	0	5	0	0	0	2	0	0	1	2

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:15 PM - 2:15 PM	0	0	0	3	0	0	0	4	0	0	0	2	0	0	0	0

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	0	9





Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave
COUNTY Fresno
COLLECTION DATE Thursday, March 3, 2022

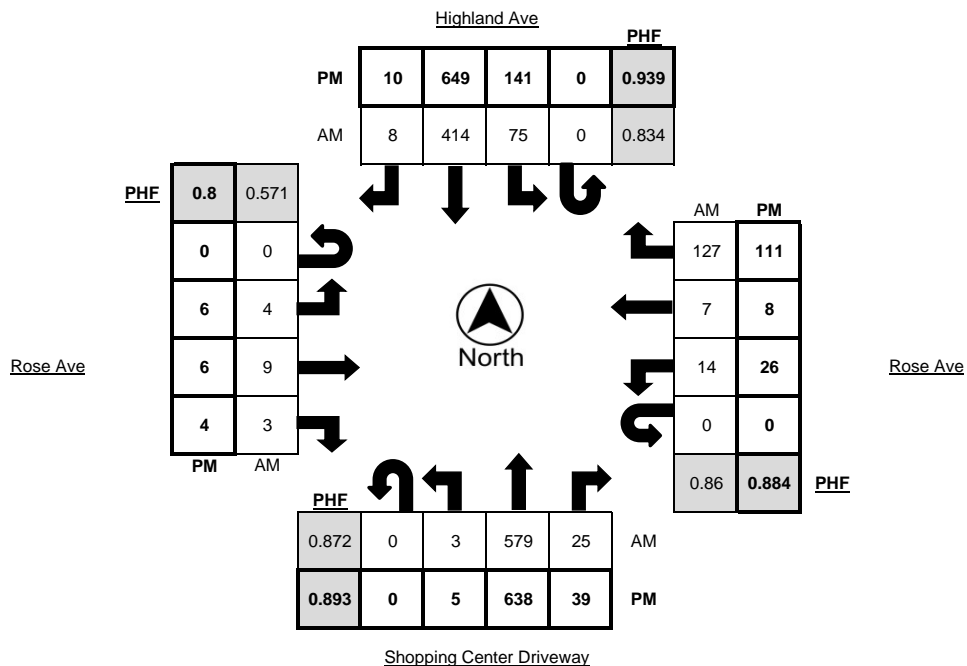
LATITUDE 36.5688
LONGITUDE -119.6288
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	114	3	3	0	14	118	2	18	0	2	2	1	0	0	4	1	24	0
7:15 AM - 7:30 AM	0	2	167	5	11	0	18	126	5	14	0	1	0	0	0	0	1	1	27	0
7:30 AM - 7:45 AM	0	0	147	4	7	0	13	109	0	19	0	1	3	3	0	0	6	1	31	1
7:45 AM - 8:00 AM	0	0	130	8	15	0	24	81	2	8	0	1	6	0	0	0	3	3	37	0
8:00 AM - 8:15 AM	0	1	135	8	9	0	20	98	1	16	0	1	0	0	0	0	4	2	32	0
8:15 AM - 8:30 AM	0	1	134	7	8	0	8	88	0	16	0	2	1	0	0	0	6	1	31	0
8:30 AM - 8:45 AM	0	1	124	3	11	0	9	97	2	16	0	2	0	2	1	0	4	1	35	0
8:45 AM - 9:00 AM	0	2	121	6	8	0	6	97	3	11	0	1	1	1	0	0	3	1	28	0
TOTAL	0	7	1072	44	72	0	112	814	15	118	0	11	13	7	1	0	31	11	245	1

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	1	157	12	7	0	45	168	3	9	0	2	3	0	0	0	6	3	37	0
4:15 PM - 4:30 PM	0	2	135	8	8	0	42	149	2	6	0	3	1	0	0	0	3	2	22	0
4:30 PM - 4:45 PM	0	2	166	7	4	0	32	157	2	4	0	0	2	1	0	0	5	1	35	0
4:45 PM - 5:00 PM	0	0	145	10	3	0	37	152	4	1	0	1	1	2	1	0	6	3	22	0
5:00 PM - 5:15 PM	0	1	151	9	10	0	43	170	0	4	0	3	1	1	0	0	7	3	22	0
5:15 PM - 5:30 PM	0	2	176	13	7	0	29	170	4	2	0	2	2	0	0	0	8	1	32	0
5:30 PM - 5:45 PM	0	0	130	9	5	0	35	175	5	6	0	1	1	4	0	0	7	4	25	0
5:45 PM - 6:00 PM	0	2	138	11	4	0	48	159	2	1	0	2	2	0	0	0	4	1	25	0
TOTAL	0	10	1198	79	48	0	311	1300	22	33	0	14	13	8	1	0	46	18	220	0

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	3	579	25	42	0	75	414	8	57	0	4	9	3	0	0	14	7	127	1
4:30 PM - 5:30 PM	0	5	638	39	24	0	141	649	10	11	0	6	6	4	1	0	26	8	111	0

	PHF	Trucks
AM	0.898	7.9%
PM	0.936	2.2%





Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave

LATITUDE 36.5688

COUNTY Fresno

LONGITUDE -119.6288

COLLECTION DATE Thursday, March 3, 2022

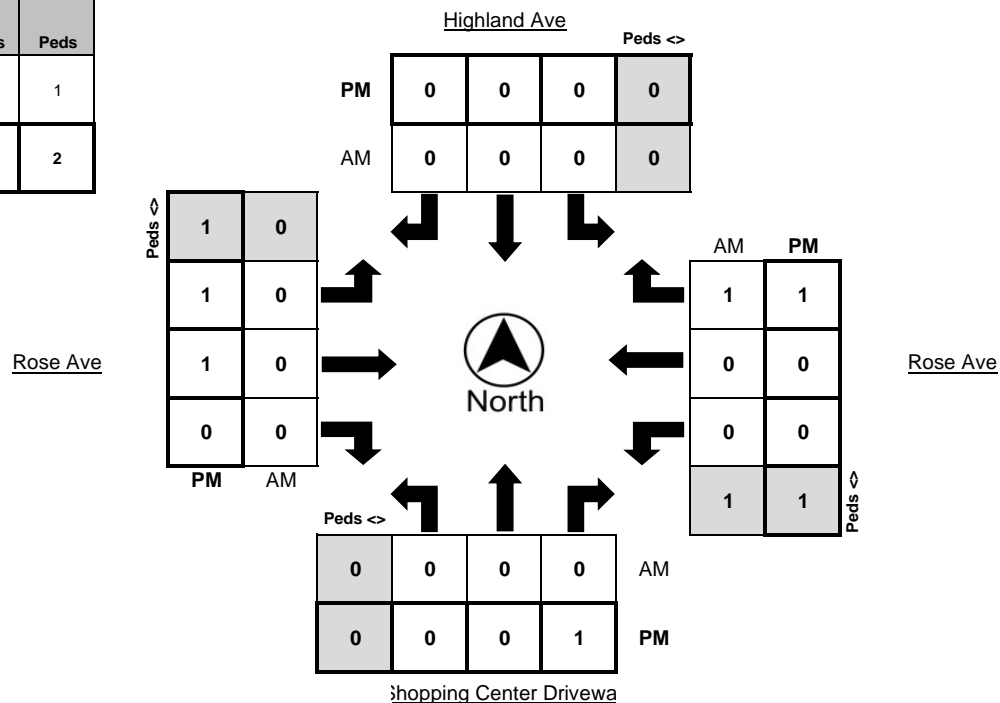
WEATHER Clear

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM - 5:45 PM	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
TOTAL	0	0	7	0	1	1	0	0	1	1	0	2	0	0	1	1

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:30 PM - 5:30 PM	0	0	1	0	0	0	0	0	1	1	0	1	0	0	1	1

	Bikes	Peds
AM Peak Total	1	1
PM Peak Total	4	2



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION	Highland Ave @ Rose Ave
COUNTY	Fresno
COLLECTION DATE	Saturday, March 5, 2022

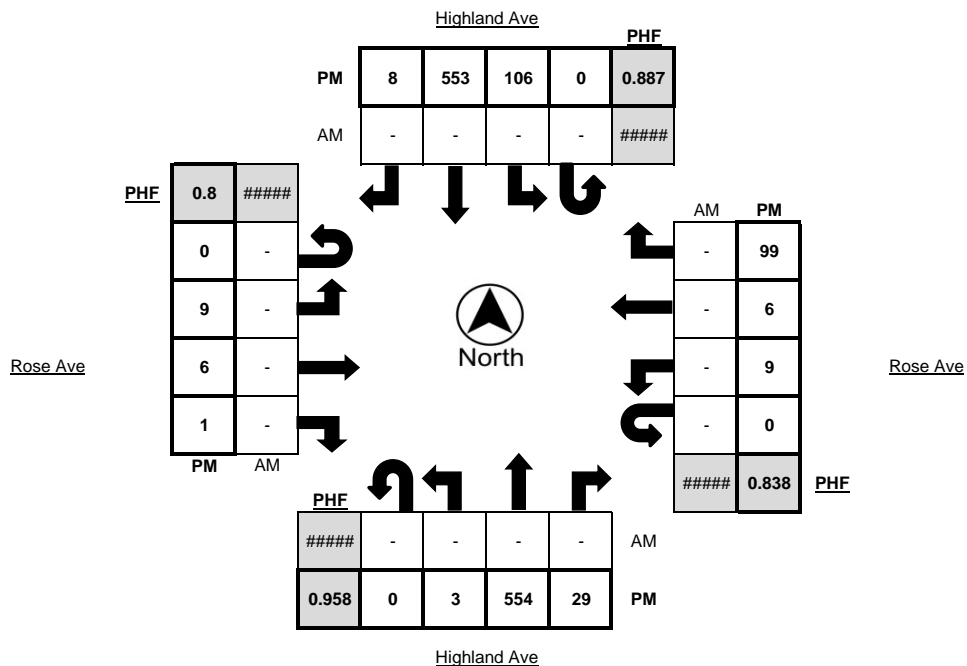
LATITUDE	Highland Ave @ Rose Ave
LONGITUDE	-119.6288
WEATHER	Clear

[illegible]

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
1:00 PM - 1:15 PM	0	1	111	8	0	0	23	110	2	1	0	3	1	0	0	0	3	2	23	0
1:15 PM - 1:30 PM	0	1	120	4	2	0	23	99	1	4	0	0	3	3	0	0	9	2	22	1
1:30 PM - 1:45 PM	0	1	128	5	4	1	26	111	5	2	0	0	0	2	0	0	5	0	31	0
1:45 PM - 2:00 PM	0	2	107	7	0	0	21	125	4	0	0	0	0	0	0	0	7	2	25	0
2:00 PM - 2:15 PM	0	1	137	7	1	0	26	134	2	1	0	3	2	0	0	0	2	2	20	0
2:15 PM - 2:30 PM	0	1	130	9	2	0	22	132	3	3	0	3	0	0	0	0	2	0	24	1
2:30 PM - 2:45 PM	0	0	142	6	5	0	33	126	1	4	0	1	1	1	0	0	2	1	31	0
2:45 PM - 3:00 PM	0	1	145	7	4	0	25	161	2	2	0	2	3	0	0	0	3	3	24	0
TOTAL	0	8	1020	53	18	1	199	998	20	17	0	12	10	6	0	0	33	12	200	2

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM - 3:00 PM	0	3	554	29	12	0	106	553	8	10	0	9	6	1	0	0	9	6	99	1

	PHF	Trucks
AM	-	-
PM	0.920	1.7%



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave

LATITUDE Highland Ave @ Rose Ave

COUNTY Fresno

LONGITUDE -119.6288

COLLECTION DATE Saturday, March 5, 2022

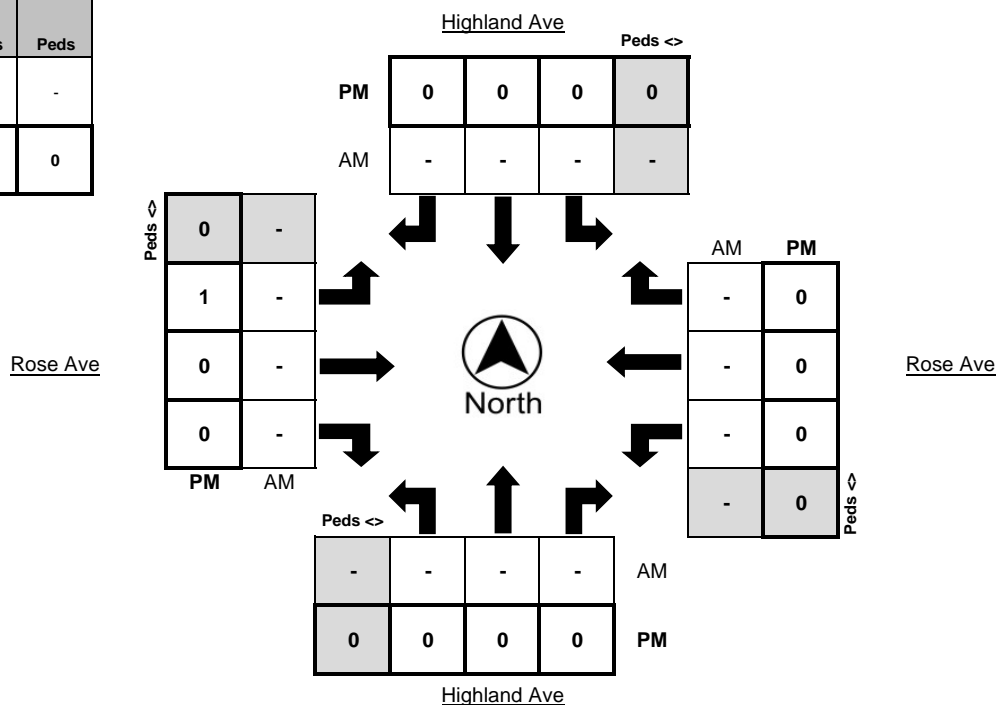
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM - 1:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	1	0	0	2	0	0	1	0

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	1	0



Appendix II: Expanded 2016 Traffic Counts



Selma Grove TIA Turning Movement Volumes

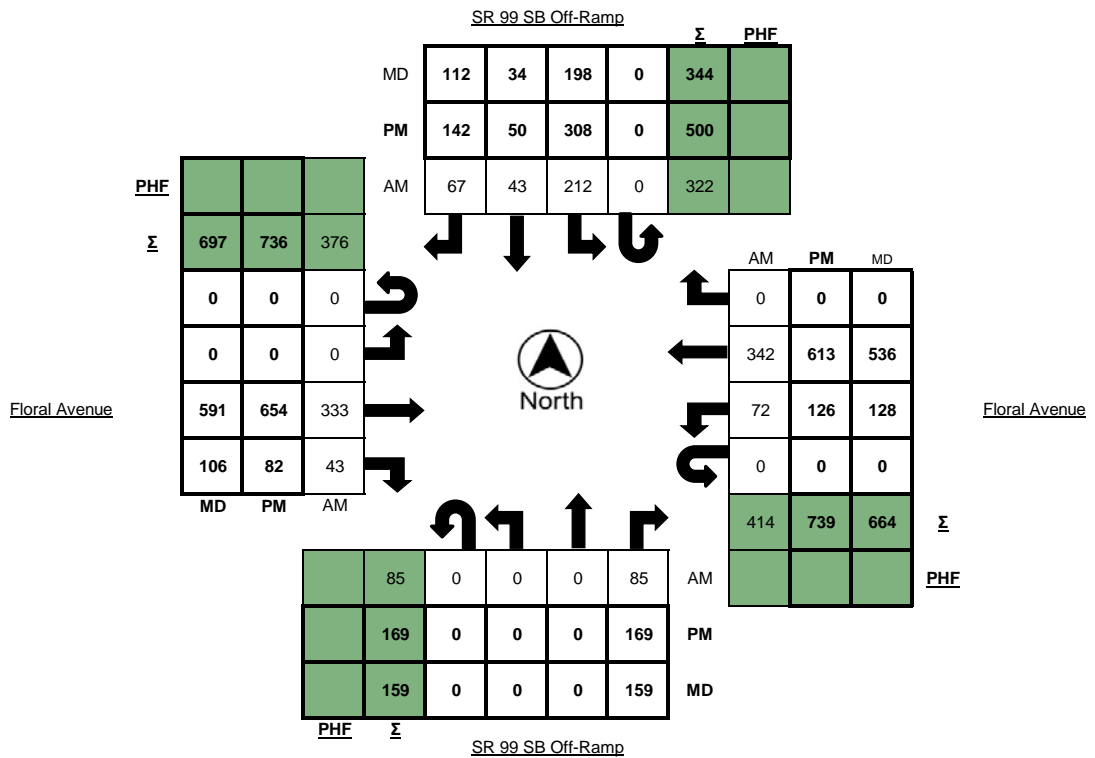
LOCATION SR 99 SB Off-Ramp at Floral Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 0.00%	AM Growth Rate 0.80%	AM Growth Rate 2.92%	AM Growth Rate 2.26%
# of Years 6	PM Growth Rate 0.00%	PM Growth Rate 0.37%	PM Growth Rate 2.57%	PM Growth Rate 2.17%
	MD Growth Rate 0.00%	MD Growth Rate 0.93%	MD Growth Rate 3.48%	MD Growth Rate 2.88%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	0	0	0	85		0	202	41	64		0	0	280	36		0	63	299	0	
4:45 PM - 5:45 PM	0	0	0	169		0	301	49	139		0	0	562	70		0	111	539	0	
1:00 PM - 2:00 PM	0	0	0	159		0	187	32	106		0	0	481	86		0	108	452	0	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	0	0	0	85		0	212	43	67		0	0	333	43		0	72	342	0	
4:45 PM - 5:45 PM	0	0	0	169		0	308	50	142		0	0	654	82		0	126	613	0	
1:00 PM - 2:00 PM	0	0	0	159		0	198	34	112		0	0	591	106		0	128	536	0	



Selma Grove TIA Turning Movement Volumes

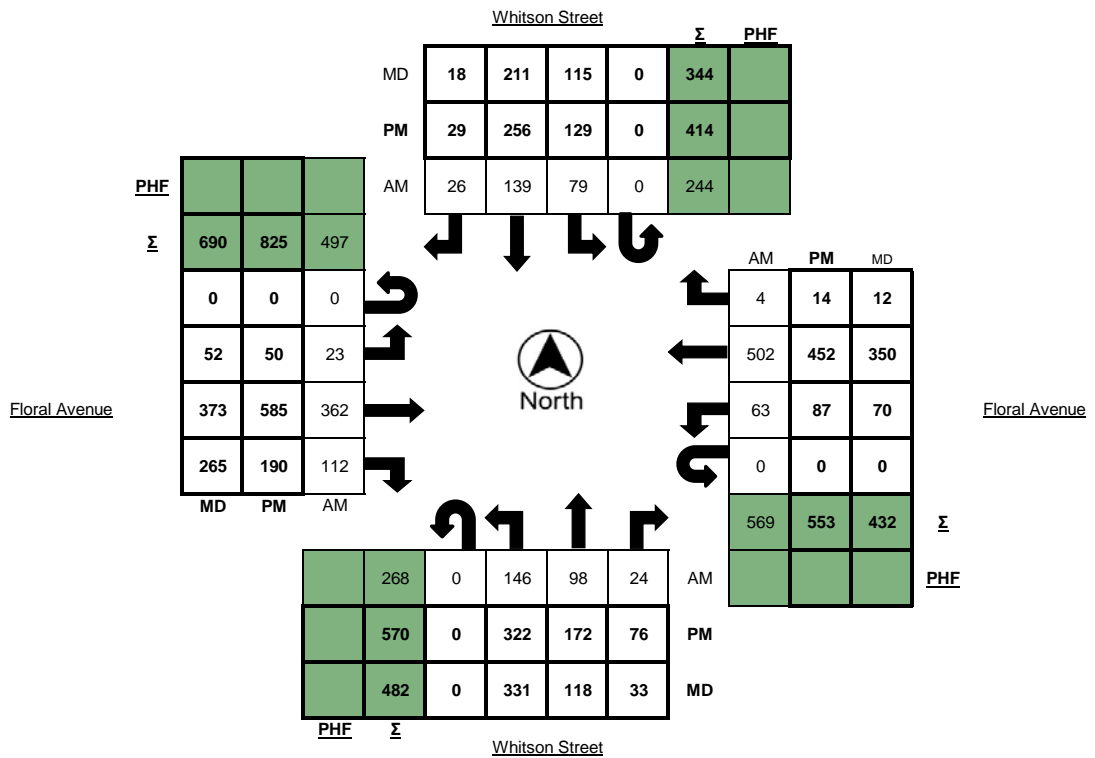
LOCATION Whitson Street at Floral Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 2.21%	AM Growth Rate 5.49%	AM Growth Rate 1.87%	AM Growth Rate 0.99%
# of Years 6	PM Growth Rate 4.88%	PM Growth Rate 7.57%	PM Growth Rate 2.79%	PM Growth Rate 2.57%
	MD Growth Rate 5.60%	MD Growth Rate 8.55%	MD Growth Rate 3.69%	MD Growth Rate 3.48%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	128	86	21		0	57	101	19		0	21	324	100		0	59	473	4	
4:00 PM - 5:00 PM	0	242	129	57		0	83	165	19		0	42	496	161		0	75	388	12	
1:00 PM - 2:00 PM	0	239	85	24		0	70	129	11		0	42	300	213		0	57	285	10	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	146	98	24		0	79	139	26		0	23	362	112		0	63	502	4	
4:00 PM - 5:00 PM	0	322	172	76		0	129	256	29		0	50	585	190		0	87	452	14	
1:00 PM - 2:00 PM	0	331	118	33		0	115	211	18		0	52	373	265		0	70	350	12	



Selma Grove TIA Turning Movement Volumes

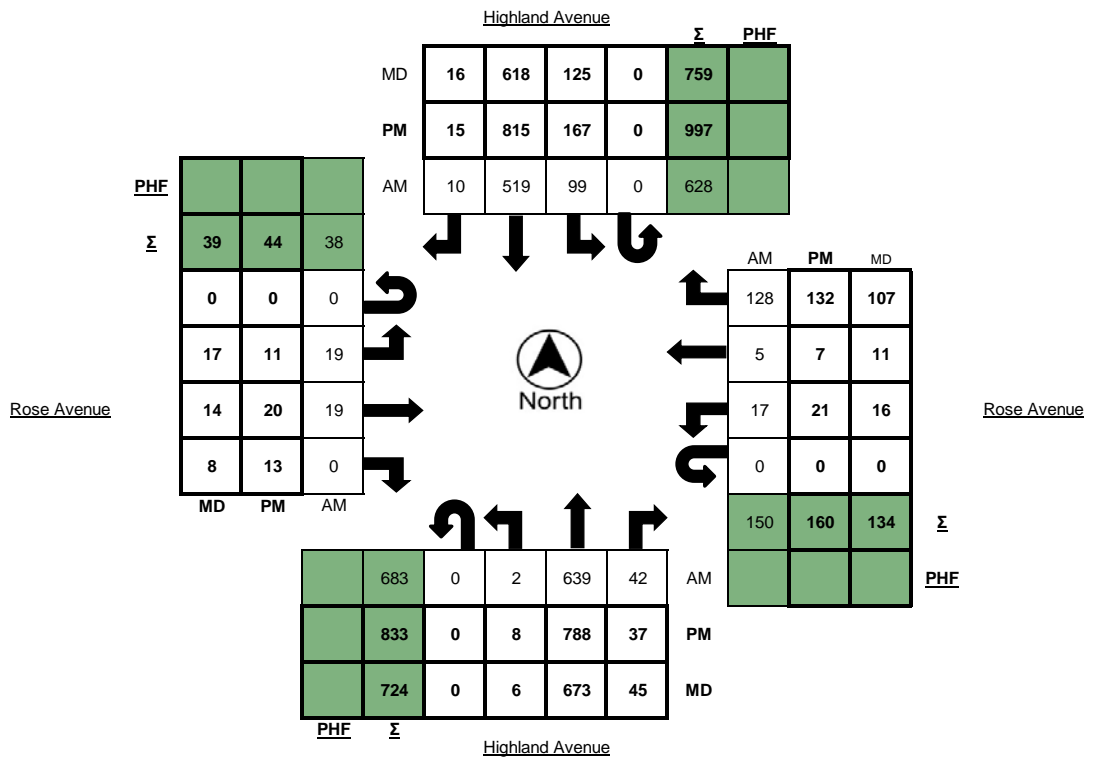
LOCATION Highland Avenue at Rose Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 3.17%	AM Growth Rate 3.13%	AM Growth Rate 18.29%	AM Growth Rate 1.13%
# of Years 6	PM Growth Rate 4.71%	PM Growth Rate 4.80%	PM Growth Rate 14.31%	PM Growth Rate 1.60%
	MD Growth Rate 5.47%	MD Growth Rate 6.18%	MD Growth Rate 18.74%	MD Growth Rate 2.61%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	2	530	35		0	82	431	8		0	7	7	0		0	16	5	120	
4:15 PM - 5:15 PM	0	6	598	28		0	126	615	11		0	5	9	6		0	19	6	120	
2:00 PM - 3:00 PM	0	4	489	33		0	87	431	11		0	6	5	3		0	14	9	92	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	2	639	42		0	99	519	10		0	19	19	0		0	17	5	128	
4:15 PM - 5:15 PM	0	8	788	37		0	167	815	15		0	11	20	13		0	21	7	132	
2:00 PM - 3:00 PM	0	6	673	45		0	125	618	16		0	17	14	8		0	16	11	107	



Attachment 8

**CITY OF SELMA
SPECIAL PLANNING COMMISSION MEETING
NOTICE OF PUBLIC HEARING**

NOTICE IS HEREBY GIVEN that the Planning Commission of the City of Selma will hold a special public hearing on Monday, February 13, 2023 at 6:00 p.m., or as soon thereafter as the matter may be heard in the Council Chambers of the City Hall, 1710 Tucker Street, Selma, California, to consider the following matters:

1. ANNEXATION, PREZONE AND AMENDMENT TO A SITE PLAN REVIEW NO. 2021-0009, which consists of, an annexation, pre-zone, and amended site plan review for a 62.9-acre property located north of Floral Ave, east of DeWolf and south of State Route 99 to allow for the Regional Commercial development of the following properties: APN: 348-19-7s, -10s, -11s, -32, and -36s-40s. The project was evaluated in accordance with the California Environmental Quality Act via the preparation of an addendum to the Rockwell Pond Commercial Project Final EIR.

A copy of all relevant materials regarding the proposed actions is on file in the Development Services Department at Selma City Hall, 1710 Tucker Street, Selma, California. Specific questions can be directed to the City's Planning Division at (559) 891-2208. *Si necesita información en Español, comuníquese con Lupe Macias al teléfono (559) 891-2208 o por correo electrónico lmacias@cityofselma.com.*

Due to the COVID-19 pandemic public health orders, members of the public may attend either in person or access the meeting by using Teleconference Phone Number +1 301 715 8592 Webinar ID: 843 0301 0898 as specified in the meeting agenda. Written comments may be sent via U.S. Mail or by hand delivery to the City of Selma, at City Hall, at the address listed above.

If you challenge the nature of the proposed items in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Selma at, or prior to, the public hearing.

Lupe Macias, Planning Commission Secretary
Publish Date: 2/1/2023

Attachment 9

Draft Traffic Impact Analysis

Selma Grove Commercial Development

Located North of Floral Avenue between DeWolf
Avenue and State Route 99

In the City of Selma, California

Prepared for:

City of Selma
1710 Tucker Street
Selma, CA 93662

March 13, 2019

Project No. 001-005



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Draft Traffic Impact Analysis

**For the Selma Grove Commercial Development located north of Floral Avenue
between DeWolf Avenue and State Route 99**

In the City of Selma, CA

March 13, 2019

This Draft Traffic Impact Analysis has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions and decisions are based.

Prepared by:

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President



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Introduction and Summary

Introduction

This report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Selma Grove Commercial Development (Selma Grove Project) located in the City of Selma. The Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the TIA includes the analysis of the existing Automobile Dealership (Dealership Project), which covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond) is submitting an amendment to the site plan to reduce the ultimate buildout of the development evaluated by the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Figure 1 shows the location of the existing Dealership Project and proposed Selma Grove Project site relative to the surrounding roadway network. In this TIA, the Project Buildout refers to the existing Dealership Project and proposed Selma Grove Project.

The purpose of this TIA is to evaluate the potential changes to onsite and offsite traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project site that will be part of an amended Environmental Impact Report (EIR) No. 2007061098 and its associated Mitigation Monitoring and Reporting Program (MMRP). This TIA has been prepared to identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The scope of work was prepared via consultation with City of Selma, the County of Fresno and Caltrans staff.

Summary

The potential traffic impacts of the existing Dealership Project and proposed Selma Grove Project were evaluated in accordance with the standards set forth by the level of service (LOS) policy of the City of Selma, County of Fresno and Caltrans.

Existing Traffic Conditions

- At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 Transportation Concept Report (TCR)) are recommended to be considered for implementation. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Existing plus Dealership Traffic Conditions

- At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Existing plus Project Buildout Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.
- JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.
- The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday.



- In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. After internal capture and pass-by trip reductions are taken into account, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.
- It is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Near Term Year 2025 plus Project Buildout Traffic Conditions

- The total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Cumulative Year 2030 No Project Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.



Cumulative Year 2030 plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, the addition of lanes and modification of traffic control mechanisms are recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, the addition of lanes and modification of traffic control mechanisms (consistent with the State Route 43 TCR) are recommended. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project Buildout's Equitable Fair Share

- It is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable Fair Share or conas presented in Tables XXVIII and XXIX, respectively.



Scope of Work

The study focused on evaluating traffic conditions at the existing study intersections that may potentially be impacted by the proposed modification of the Selma Grove Project. On July 24, 2018, a Draft Scope of Work for the preparation of a Traffic Impact Analysis for the Selma Grove Project was provided to the City of Selma, County of Fresno and Caltrans for their review and comment. Any comments to the Draft Scope of Work were to be provided by August 14, 2018.

On Wednesday, August 8, 2018, Caltrans responded to the Draft Scope of Work. Caltrans emphasized that a Queuing Analysis be prepared for all State Route study intersections. On Monday, August 13, 2018, the County of Fresno responded to the Draft Scope of Work. The County of Fresno requested that the intersection of Fowler Avenue and Floral Avenue be included in the analysis. Furthermore, the County of Fresno expressed concern regarding the proposed Selma Grove Project's access points and advised that access control for the development be discussed. In addition, the County of Fresno stated that both sides of Floral Avenue should be annexed by the City and that the preferred planning horizon for the study scenarios be 20 years. On Tuesday, August 28, 2018, the City of Selma approved the Draft Scope of Work as presented.

While the County of Fresno requested that the intersection of Fowler Avenue and Floral Avenue be included in the analysis, JLB determined that this intersection should not be included in the analysis as the main reason for the preparation of this TIA is to update the findings of the traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project. Regarding the proposed Selma Grove Project's access points to Floral Avenue, JLB has included in this TIA recommendations regarding access control for the proposed Selma Grove Project site. Details regarding the assumed access control and recommendations for the Selma Grove Project site are provided in the "Project Buildout Access" section presented later this Report. Finally, while JLB recognizes that the preferred planning horizon for the study scenarios is typically 20 years, the purpose of this TIA is to provide an update to the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009 and evaluate the potential changes to onsite and offsite traffic impacts associated with the existing Dealership Project and proposed Selma Grove Project. Since the planning horizon for the aforementioned EIR was the year 2030, this TIA will use the same year (2030) as the planning horizon. The Draft Scope of Work that was presented and the comments received from the lead agency and responsible agencies are included in Appendix A.



Study Facilities

The existing peak hour turning movement volume counts were conducted at the study intersections in June 2016, while schools in the vicinity of the existing Dealership Project and proposed Selma Grove Project were in session. The intersection turning movement counts included pedestrian volumes. The traffic counts for the existing study intersections are contained in Appendix B. Figures 2 and 3 illustrate the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively.

Study Intersections:

1. Highland Avenue / Golden State Boulevard
2. DeWolf Avenue / Floral Avenue
3. Project Driveway 3 / Floral Avenue
4. State Route 99 Southbound Off-Ramp / Floral Avenue
5. Highland Avenue (State Route 43) / Floral Avenue
6. State Route 99 Northbound Off-Ramp / Floral Avenue
7. Whitson Street / Floral Avenue
8. McCall Avenue / Floral Avenue
9. Highland Avenue (State Route 43) / State Route 99 Southbound Ramps
10. Highland Avenue (State Route 43) / Rose Avenue

Project Trip Assignment to City Facilities:

11. Walmart Driveway / Floral Avenue (Signalized)

Project Trip Assignment to State Facilities:

1. State Route 99 / Dinuba Avenue (Future)

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in the year 2016.

Existing plus Dealership Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Dealership Traffic Conditions. The Existing plus Dealership traffic volumes were obtained by adding the Dealership Trips to the Existing Traffic Conditions scenario. The Dealership Trips to the study intersections were developed based on the Fresno Council of Governments (COG) Dealership Select Zone, data obtained from the seven-day count that was collected for the existing Dealership Project, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.



Existing plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Buildout Traffic Conditions. The Existing plus Project Buildout traffic volumes were obtained by adding the Net New Project Buildout Trips to the Existing Traffic Conditions scenario. The Net New Project Buildout Trips to the study intersections were developed based on the Fresno COG Dealership and Selma Grove Select Zones, data provided by the developer, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.

Near Term Year 2025 plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term Year 2025 plus Project Buildout Traffic Conditions. The Near Term Year 2025 plus Project Buildout traffic volumes were obtained by adding the Near Term Project related trips to the Existing plus Project Buildout Traffic Conditions scenario. The Near Term Project related trips to the study intersections were based on the Fresno COG Near Term Select Zones, data provided by the City of Selma, the existing roadway network, existing travel patterns, knowledge of the study area, engineering judgement, residential and commercial densities and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project.

Cumulative Year 2030 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 No Project Traffic Conditions. The Cumulative Year 2030 No Project traffic volumes were obtained by subtracting the Net New Project Buildout Trips from the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario.

Cumulative Year 2030 plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 plus Project Buildout Traffic Conditions. The Cumulative Year 2030 plus Project Buildout traffic volumes were obtained from the Fresno COG traffic model runs (Base Year 2016 and Cumulative Year 2030) and existing traffic counts. Under this scenario, the Increment Method, as recommended by the Model Steering Committee, was utilized to determine the Cumulative Year 2030 plus Project Buildout traffic volumes. The Fresno COG models are provided in Appendix C.

Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions. Under this scenario, it is assumed that the State Route 99 and Dinuba Avenue interchange has been constructed. As a result, the Net New Project Buildout Trips with Dinuba Avenue Interchange to the study facilities were developed based on this change in the roadway network.



Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from “A” to “F”, with “A” indicating no congestion of any kind and “F” indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *Highway Capacity Manual* (HCM) 6th Edition is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. State Route study intersections were analyzed using HCM 2000 methodologies for the reason that HCM 6th Edition does not support non-NEMA phasing. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix D.

Criteria of Significance

The City of Selma 2035 General Plan has established LOS D as the acceptable level of traffic congestion on intersections and road segments for minor collectors, collectors, arterials, major arterials, and highways within the City’s jurisdiction. Where other jurisdictions control and manage roadways, their respective level of service standards shall prevail on applicable segments. In order to avoid using local streets for excessive through traffic, the LOS B threshold was established for local streets. Therefore, the City of Selma LOS D threshold is used to evaluate the potential significance of LOS impacts to study facilities within the City of Selma SOI.

The County of Fresno has established LOS C as the acceptable level of traffic congestion on county roads and streets that fall entirely outside the Sphere of Influence (SOI) of a City. For those areas that fall within the SOI of a City, the LOS criteria of the City are the criteria of significance used in this report. Therefore, LOS C is used to evaluate the potential significance of LOS impacts to Fresno County intersections that fall outside the City of Selma SOI. In this case, however, all study facilities fall within the City of Selma SOI. Therefore, the City of Selma LOS D threshold is used to evaluate the potential significance of LOS impacts to study facilities within the City of Selma SOI.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the Caltrans Guide for the Preparation of Traffic Impact Studies dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS threshold, then the existing measures of effectiveness (MOE) should be maintained. In this case, one of the study intersections is currently operating at LOS E. At locations where the existing LOS has dropped below the Caltrans LOS C to D transition, the existing MOEs should be maintained. Furthermore, the addition of an average delay of less than five (5) seconds is often not considered a significant impact. The existing MOEs are described in the Existing Traffic Conditions scenario.



Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- Yellow time:
 - per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - consistent with the California Manual on Uniform Traffic Control Devices (CA MUTCD) based on approach speeds at the remaining study intersections
- Yellow time for left-turn phases;
 - per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - of 3.2 seconds at the remaining study intersections
- All-red clearance intervals:
 - as per Caltrans signal timing sheets for the intersections of State Route 99 Southbound Off-Ramp and Floral Avenue, Highland Avenue and Floral Avenue, State Route 99 Northbound Off-Ramp and Floral Avenue, and Highland Avenue and State Route 99 Southbound Ramps
 - of 1.0 second for all phases at the remaining study intersections
- Walk intervals of 7.0 seconds
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- All new or modified signals utilize protective left-turn phasing
- A 3 percent heavy vehicle factor
- An average of 3 pedestrian calls per hour at signalized intersections
- The number of observed pedestrians at existing intersections was utilized under all study scenarios
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Existing plus Dealership, Existing plus Project Buildout, and Near Term Year 2025 plus Project Buildout scenarios
- A PHF of 0.92, or the existing PHF if higher, is utilized in all Cumulative Year 2030 scenarios



Existing Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

DeWolf Avenue is an existing north-south two-lane undivided arterial in the vicinity of the proposed Project. In this area, DeWolf Avenue extends north of Golden State Boulevard and south of Dinuba Avenue through the City of Selma. The City of Selma 2035 General Plan Circulation Element designates DeWolf Avenue as an arterial through the City of Selma SOI.

Highland Avenue is an existing north-south two-lane collector in the vicinity of the proposed Project. In this area, Highland Avenue extends between Dinuba Avenue and Floral Avenue. South of Floral Avenue, Highland Avenue is known as State Route 43. The City of Selma 2035 General Plan Circulation Element designates Highland Avenue as a major arterial between Golden State Boulevard and Nebraska Avenue and a State Highway south of Nebraska Avenue.

McCall Avenue is an existing north-south two- to four-lane major roadway in the vicinity of the proposed Project. In this area, McCall Avenue is a two-lane undivided arterial north of Dinuba Avenue, a four-lane undivided arterial between Dinuba Avenue and Floral Avenue, a two-lane arterial divided by a two-way left-turn lane between Floral Avenue and Arrants Street, a four-lane divided arterial between Arrants Street and High Street/Mill Street, and a two-lane undivided arterial south of Front Street. The City of Selma 2035 General Plan Circulation Element designates McCall Avenue as an arterial through the City of Selma SOI.

Floral Avenue is an existing east-west two-lane major roadway adjacent to the proposed Project. In this area, Floral Avenue is a two-lane undivided arterial west of the existing Walmart Shopping Center, a four-lane divided arterial between the western limits of the Walmart Shopping Center and Wright Street, and a two-lane undivided arterial east of Wright Street. The City of Selma 2035 General Plan Circulation Element designates Floral Avenue as a four-lane arterial through the City of Selma SOI.

Rose Avenue is an existing east-west two- to four-lane roadway in the vicinity of the proposed Project. In this area, Rose Avenue is a two-lane undivided collector west of Thompson Avenue and a four-lane undivided collector between McCall Avenue and the eastern City limits. The City of Selma 2035 General Plan Circulation Element designates Rose Avenue as a two-lane collector between Armstrong Avenue Highland Avenue and McCall Avenue and Bethel Avenue.

Golden State Boulevard is an existing northwest-southeast (diagonal) four-lane divided arterial in the vicinity of the proposed Project. In this area, Golden State Boulevard extends northwest of Highland Avenue and southeast of Park Street. The City of Selma 2035 General Plan Circulation Element designates Golden State Boulevard as a four-lane divided arterial through the City of Selma SOI.



Whitson Street is an existing northwest-southeast (diagonal) four-lane divided arterial in the vicinity of the proposed Project. In this area, Whitson Street extends between Highland Avenue and Park Street. The City of Selma 2035 General Plan Circulation Element identifies Whitson Street as a major arterial.

State Route (SR) 99 is an existing seven-lane freeway in the vicinity of the proposed Project. In this area, State Route 99 traverses the City of Selma in a northwest-south-east direction and serves as the principal connection to various metropolitan areas within the Central San Joaquin Valley.

State Route (SR) 43 is an existing north-south two- to four-lane conventional highway in the vicinity of the proposed Project. In this area, State Route 43 is a four-lane divided conventional highway between Floral Avenue and Rose Avenue, a four-lane conventional highway divided by a two-way left-turn lane between Rose Avenue and Nebraska Avenue, and a two-lane undivided conventional highway south of Nebraska Avenue. North of Floral Avenue, State Route 43 is known as Highland Avenue. For purposes of this TIA, State Route 43 is called Highland Avenue though the City of Selma SOI. The City of Selma 2035 General Plan Circulation Element designates State Route 43 as a major arterial between Floral Avenue and Nebraska Avenue and a State Highway south of Nebraska Avenue. The Caltrans Department of Transportation District 6 Transportation Concept Report (TCR) for State Route 43 designates State Route 43 as a four-lane conventional highway between State Route 99 and Nebraska Avenue.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday only. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Existing Level of Service Analysis

Figures 2 and 3 illustrate the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing Traffic Conditions scenario are provided in Appendix E. Tables I and II present a summary of the Existing peak hour LOS at the study intersections during a weekday and Saturday, respectively.

At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.



- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table I: Existing (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	18.2	B	42.3	D
2	DeWolf Avenue / Floral Avenue	TWSC	9.7	A	11.2	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	14.7	B	18.2	B
5	Highland Avenue / Floral Avenue	Signalized	17.3	B	23.2	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.1	A	6.2	A
7	Whitson Street / Floral Avenue	Signalized	14.5	B	19.4	B
8	McCall Avenue / Floral Avenue	Signalized	25.9	C	19.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.2	A	8.0	A
10	Highland Avenue / Rose Avenue	TWSC	35.8	E	40.5	E
		Signalized (Improved)	14.7	B	14.4	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Table II: Existing (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	14.9	B
2	DeWolf Avenue / Floral Avenue	TWSC	10.3	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.4	B
5	Highland Avenue / Floral Avenue	Signalized	21.9	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A
7	Whitson Street / Floral Avenue	Signalized	16.8	B
8	McCall Avenue / Floral Avenue	Signalized	15.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	9.3	A
10	Highland Avenue / Rose Avenue	TWSC	23.8	C
		Signalized (Improved)	33.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



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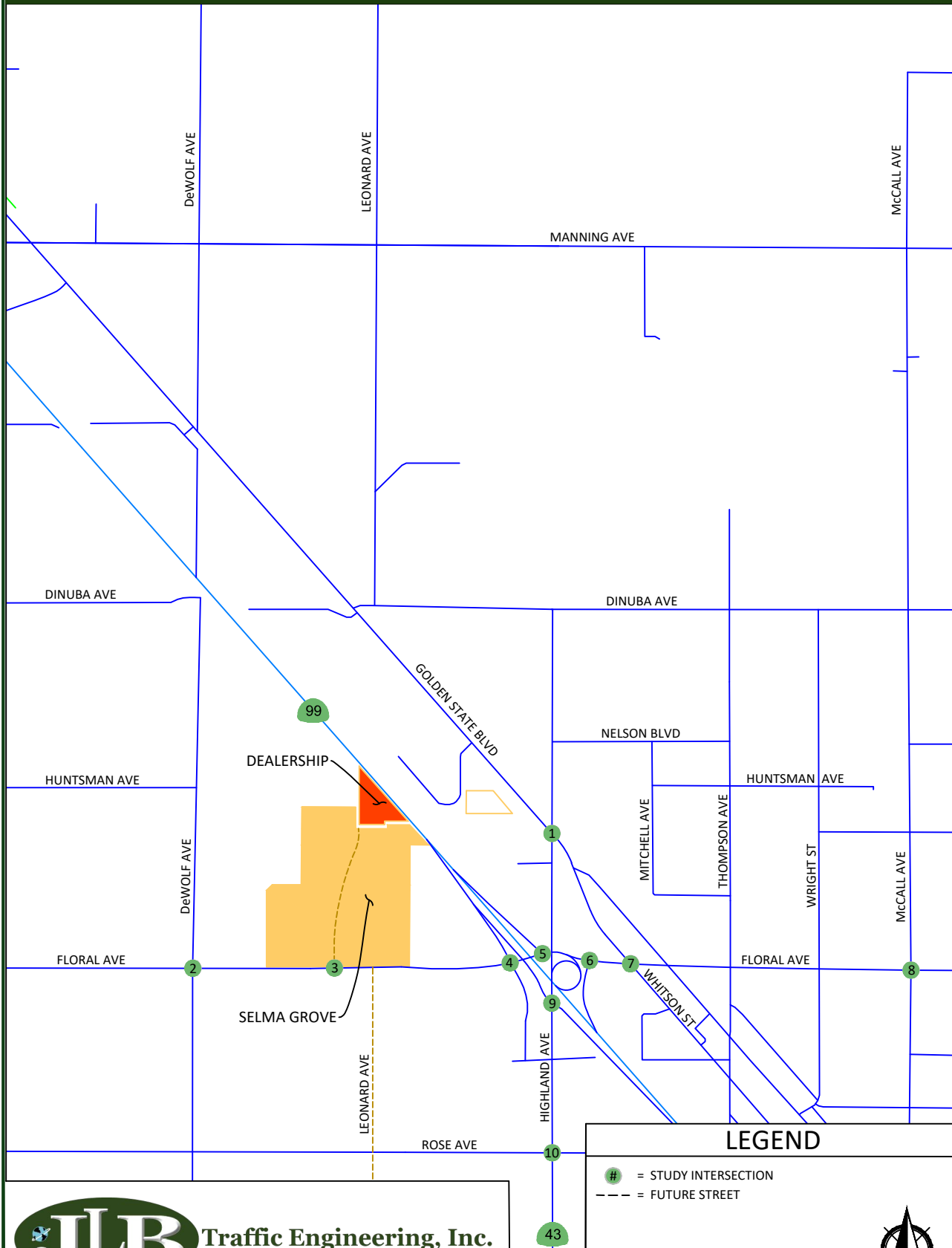
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Selma Grove Project - City of Selma Vicinity Map

Figure
1



LEGEND

- # = STUDY INTERSECTION
- = FUTURE STREET



Not To Scale



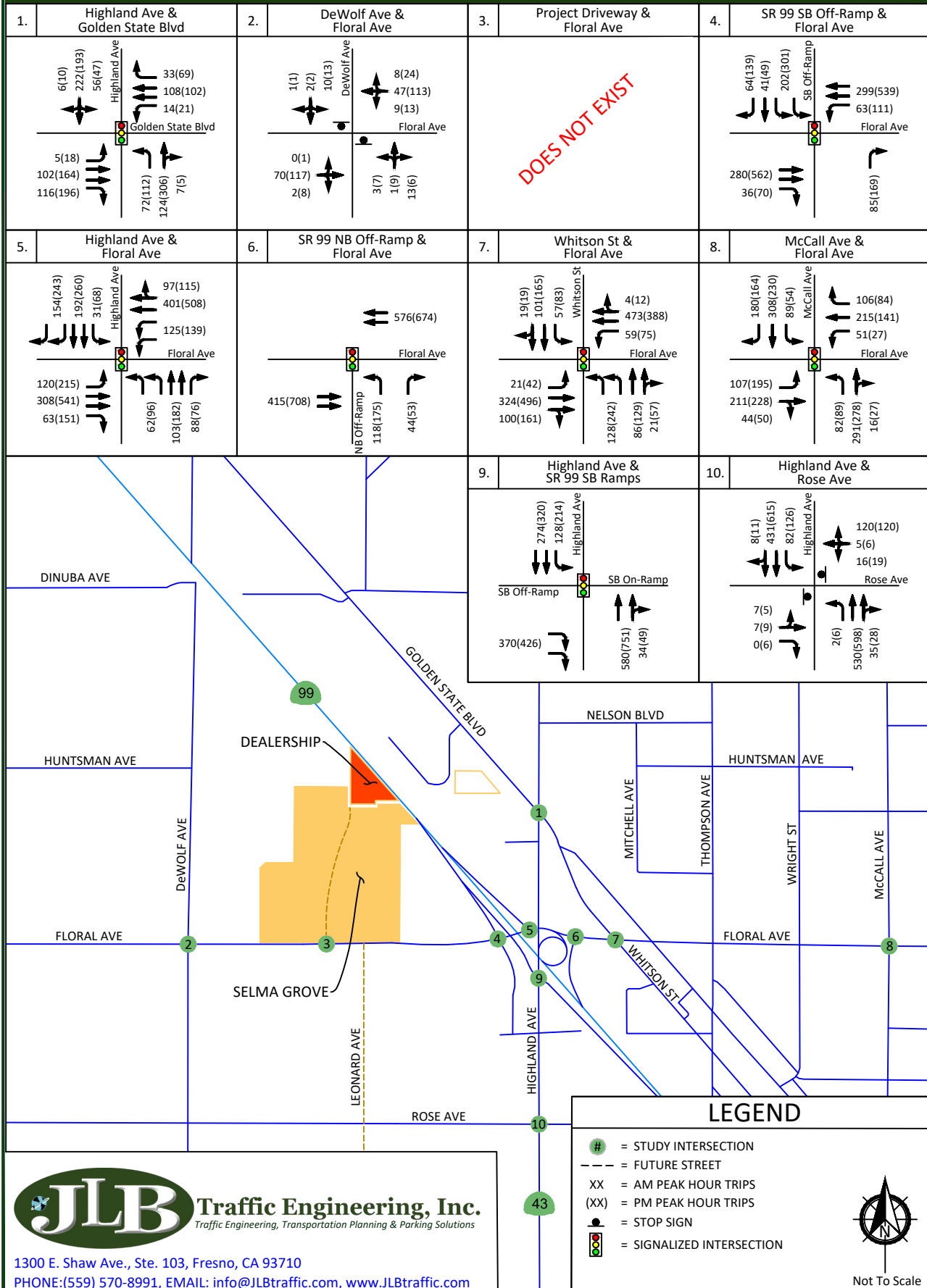
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Selma Grove Project - City of Selma Existing (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
2



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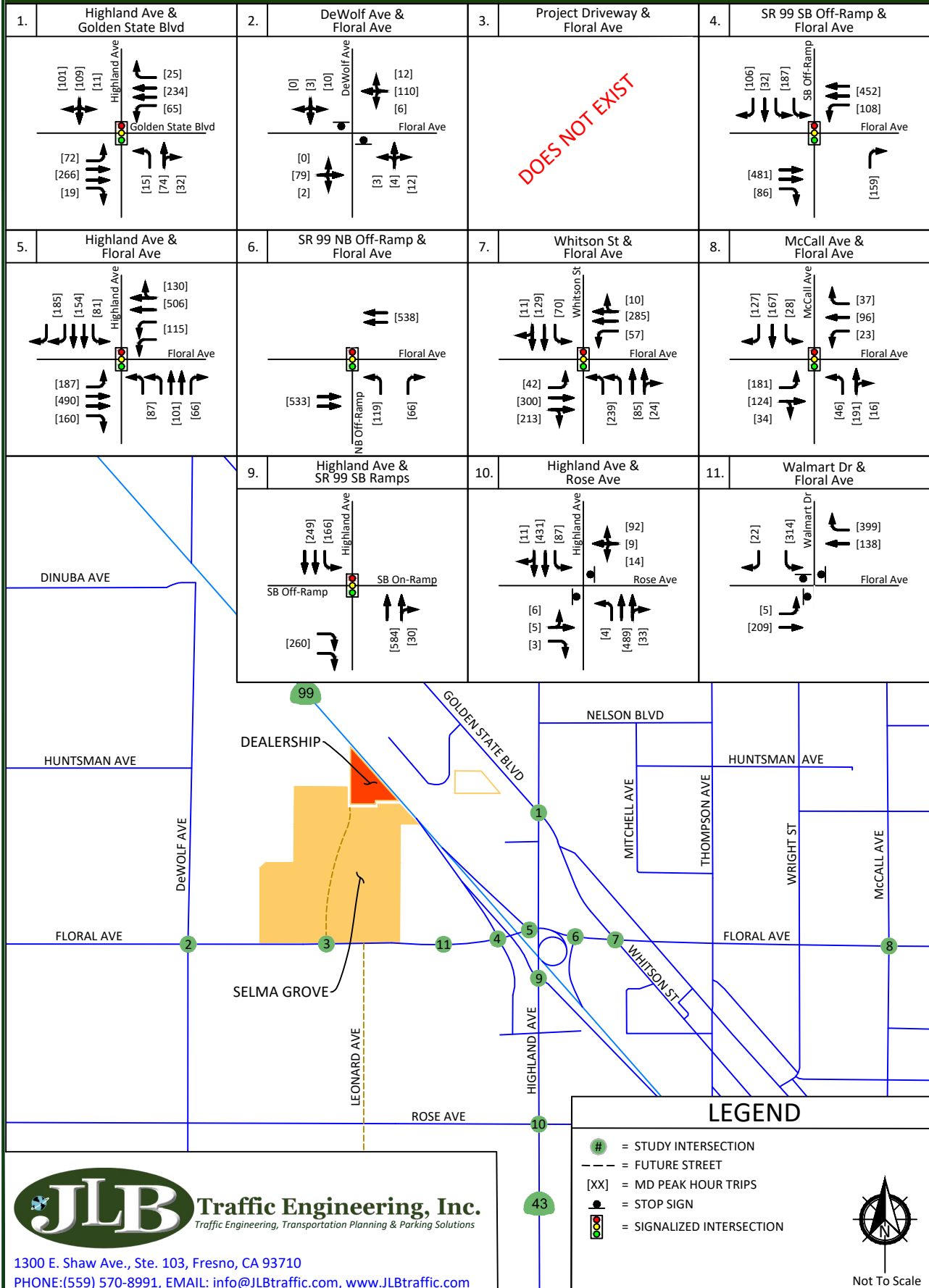
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Selma Grove Project - City of Selma

Existing (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
3



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LEGEND

- # = STUDY INTERSECTION
- - - = FUTURE STREET
- [XX] = MD PEAK HOUR TRIPS
- STOP SIGN = STOP SIGN
- SIGNALIZED INTERSECTION = SIGNALIZED INTERSECTION



Not To Scale

Existing plus Dealership Traffic Conditions

Dealership Description

The existing Dealership Project covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Figure 4 illustrates the Dealership Site Plan.

Dealership Access

At present, access to and from the existing Dealership Project is from one (1) access point located on the north side of Floral Avenue approximately 1,425 feet west of the State Route 99 southbound off-ramp and is a full access.

Dealership Trip Generation

Trip generation rates for the existing Dealership Project were obtained from volume counts collected in July 2018. Tables III and IV present the trip generation for the existing Dealership Project with trip generation rates for Automobile Sales during a weekday and Saturday, respectively. At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.

Table III: Dealership (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Automobile Sales (New) (840)	48.693	k.s.f.	13.35	650	2.12	83	17	86	17	103	2.12	28	72	29	74	103
Total Project Trips				650				86	17	103				29	74	103

Note: k.s.f. = Thousand Square Feet

Table IV: Dealership (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Automobile Sales (New) (840)	48.693	k.s.f.	1.09	43	57	23	30	53
Total Project Trips						23	30	53

Note: k.s.f. = Thousand Square Feet

Dealership Trip Distribution

The existing Dealership Project trip distribution assumptions were developed based on the Fresno COG Dealership Select Zone, the existing roadway network, existing travel patterns, existing residential and commercial densities, engineering judgement, knowledge of the study area and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project. Figures 5 and 6 illustrate the Dealership Trips to the study intersections during a weekday and Saturday, respectively.



Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Dealership Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday only. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Existing plus Dealership Level of Service Analysis

The Existing plus Dealership Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figures 7 and 8 illustrate the Existing plus Dealership Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing plus Dealership Traffic Conditions scenario are provided in Appendix F. Tables V and VI present a summary of the Existing plus Dealership peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Table V: Existing plus Dealership (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	19.6	B	40.6	D
2	DeWolf Avenue / Floral Avenue	TWSC	9.7	A	11.6	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	14.5	B	18.5	B
5	Highland Avenue / Floral Avenue	Signalized	17.8	B	25.5	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A	6.2	A
7	Whitson Street / Floral Avenue	Signalized	14.5	B	19.5	B
8	McCall Avenue / Floral Avenue	Signalized	26.0	C	19.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.3	A	8.2	A
10	Highland Avenue / Rose Avenue	TWSC	36.1	E	41.0	E
		Signalized (Improved)	14.4	B	14.4	B

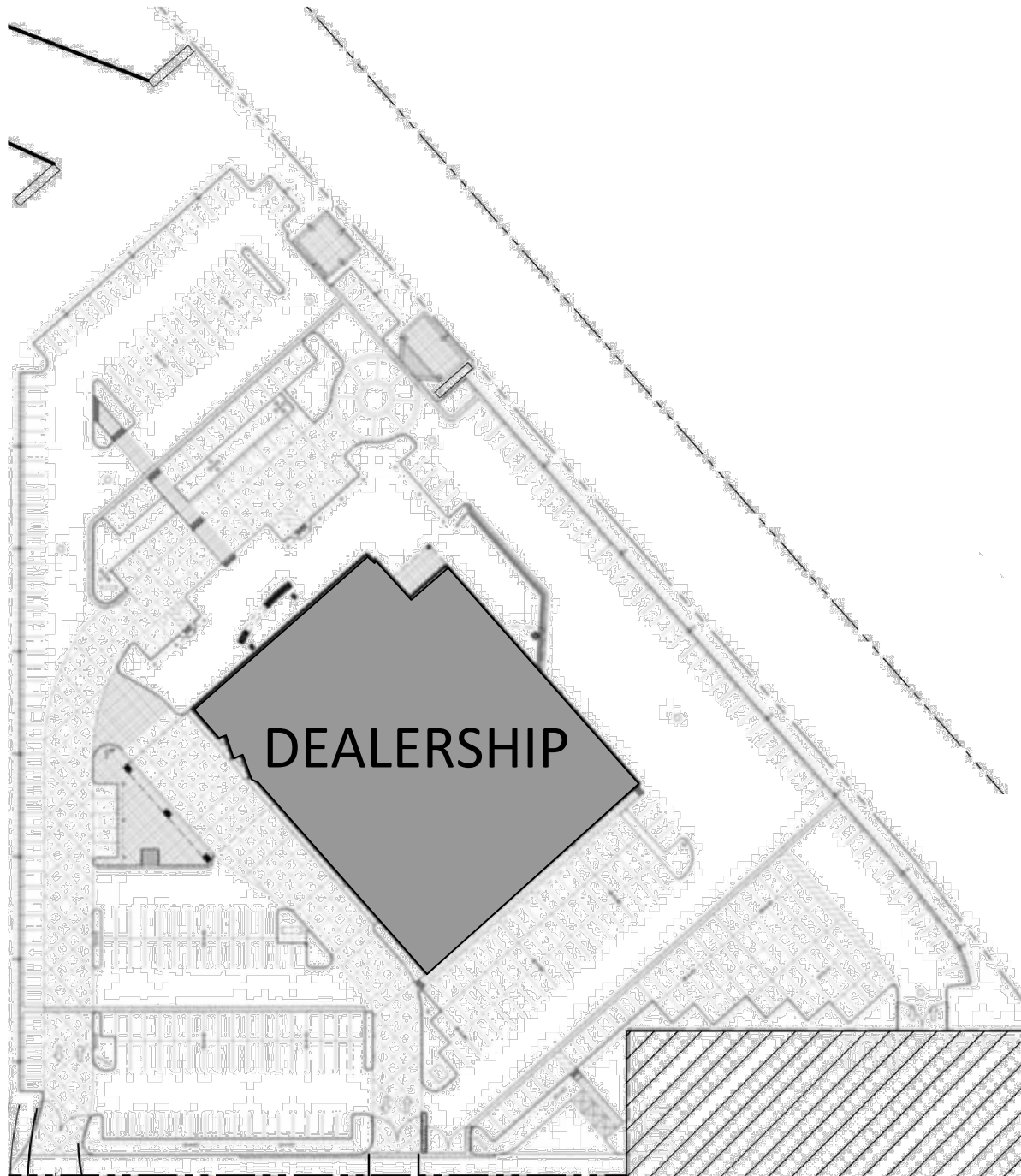
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Table VI: Existing plus Dealership (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	15.0	B
2	DeWolf Avenue / Floral Avenue	TWSC	10.4	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.5	B
5	Highland Avenue / Floral Avenue	Signalized	22.4	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	5.6	A
7	Whitson Street / Floral Avenue	Signalized	16.8	B
8	McCall Avenue / Floral Avenue	Signalized	15.9	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	9.3	A
10	Highland Avenue / Rose Avenue	TWSC	24.0	C
		Signalized (Improved)	33.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.





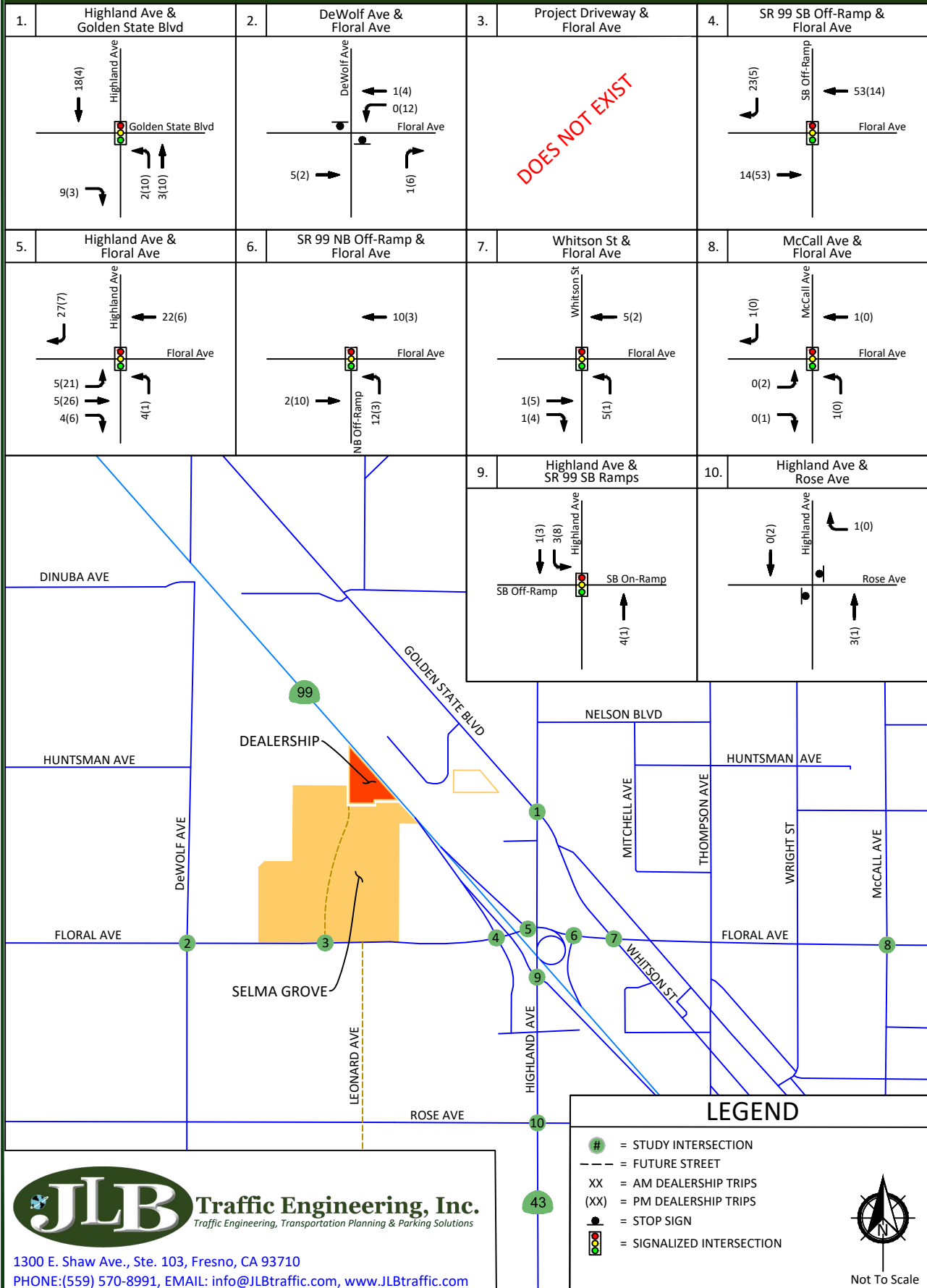
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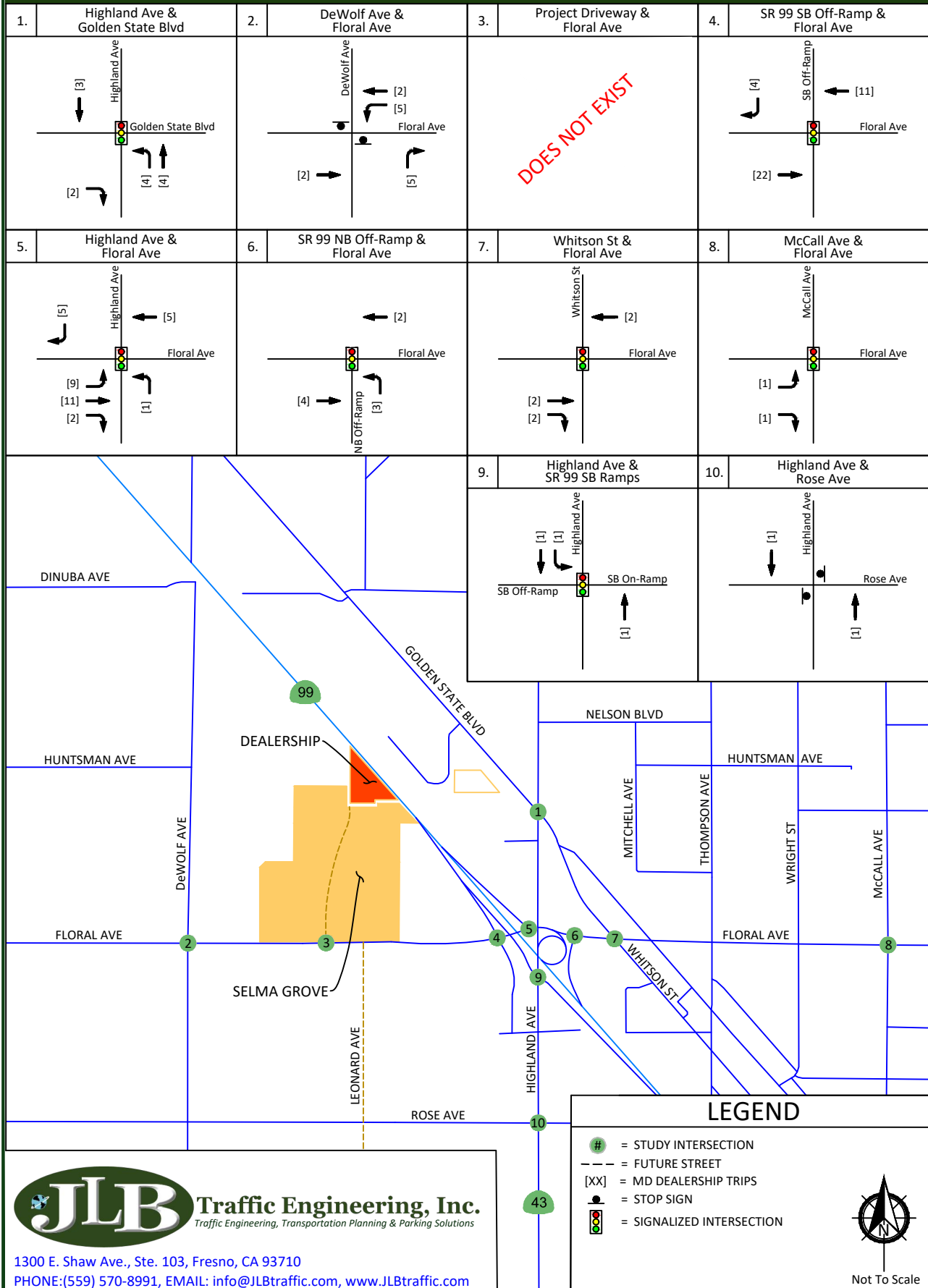
Selma Grove Project - City of Selma Dealership Trips (Weekday)

Figure
5



Selma Grove Project - City of Selma Dealership Trips (Saturday)

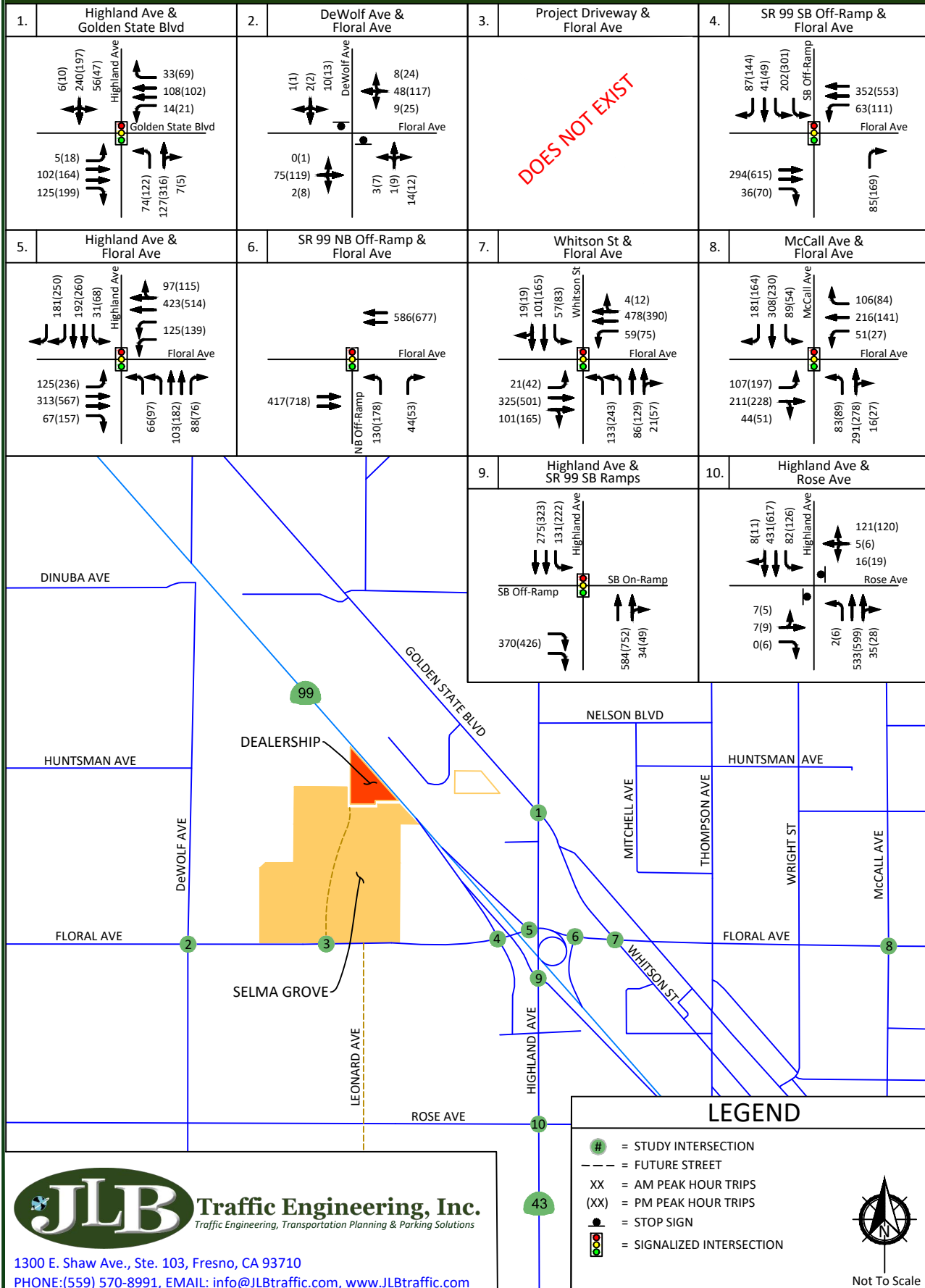
Figure
6



Selma Grove Project - City of Selma

Existing plus Dealership (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
7



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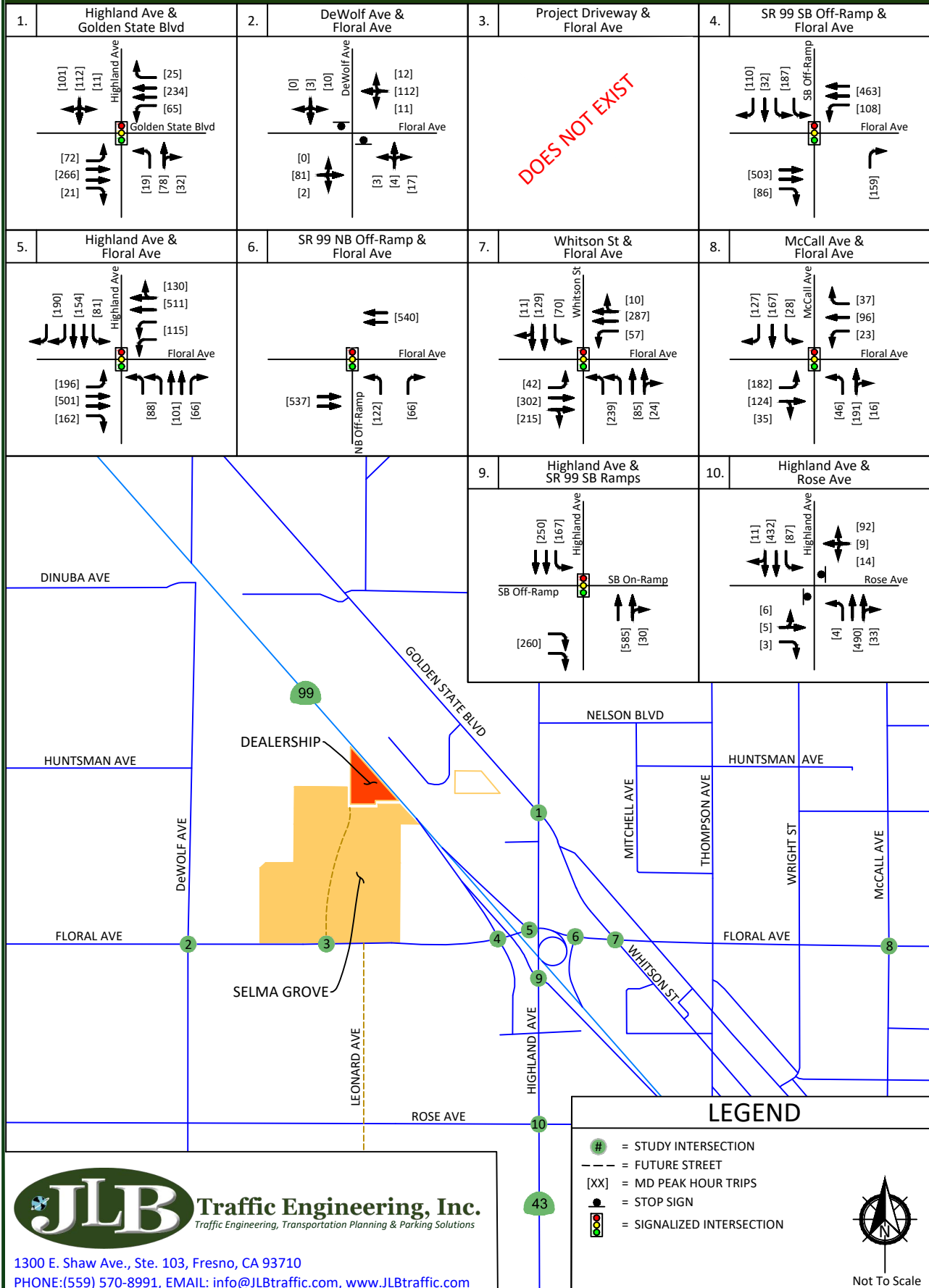
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Selma Grove Project - City of Selma

Existing plus Dealership (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
8



Existing plus Project Buildout Traffic Conditions

Project Buildout Description

At buildout, the Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the TIA includes the analysis of the existing Dealership Project, which covers approximately 48,693 square feet and is located west of State Route 99 approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond Project) is submitting an amendment to the site plan to reduce the ultimate buildout of the development evaluated by the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Figure 9 illustrates the latest Selma Grove Project Site Plan.

Project Buildout Access

Based on the latest Project Buildout Site Plan, access to and from the existing Dealership Project and proposed Selma Grove Project site at buildout will be from a total of five (5) points located along the north side of Floral Avenue approximately 3,050 feet (Driveway 1), 2,860 feet (Driveway 2), 2,280 feet (Driveway 3), 1,790 feet (Driveway 4) and 1,425 feet (Driveway 5) west of the State Route 99 southbound off-ramp. While Driveway 3 is proposed to have a full access, Driveways 1 and 5 are proposed to be limited to left-in, right-in and right-out access only, and Driveways 2 and 4 are proposed to be limited to right-in and right-out access only. To control access, it is recommended that a raised median with westbound left-turn pockets at Driveways 1 and 5 to the proposed Selma Grove Project site be implemented.

JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.



JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. Namely, it is recommended that Driveway 3 accommodate dual southbound left-turn lanes with a storage capacity of 375 feet and maintain a minimum throat depth of 375 feet before any vehicular openings to the adjacent parking lots. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. The proposed Selma Grove Project shall ensure that the appropriate corner sight distance is provided pursuant to Chapter 200 of the Caltrans Highway Design Manual. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.

Project Buildout Trip Generation

Trip generation rates for the existing Dealership Project were obtained from volume counts collected in July 2018. Trip generation rates for the proposed Selma Grove Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Tables VII and VIII present the trip generation for the proposed Project Buildout with trip generation rates for Hotel, Movie Theater, Shopping Center, Automobile Sales (New), Supermarket, Pharmacy/Drugstore with Drive-Through Window, and Fast-Food Restaurant with Drive-Through Window during a weekday and Saturday, respectively. The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account).

Trip generation rates for the Rockwell Pond Project were obtained from the previously certified Environmental Impact Report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. Tables IX and X present the trip generation for the Rockwell Pond Project with trips generation rates for Hotel, Home Improvement Store, Shopping Center, Automobile Sales (New), Discount Club, and Gasoline/Service Station with 16 fueling positions during a weekday and Saturday, respectively. At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account).

Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday. The difference in trip generation is summarized in Table XI.



The study takes into account reductions in trip generation as a result of internal capture. Internal capture rates were prepared pursuant to the NCHRP 684 Internal Trip Capture procedure. Internal capture trip reductions are applied to account for the interaction between various individual land uses assumed for the trip generation of the Project Buildout. For example, in a mixed-use development containing offices and shops, trips made by the office workers to the shops within the site are defined as internal, or captured, trips within the site. Table XII presents the results of the internal trip capture analysis for the existing Dealership Project and proposed Selma Grove Project. Captured trips are presented as negative numbers because they are deducted from the total number of trips calculated in Tables VII and VIII. Table XIII presents the adjusted trip generation resulting from the internal capture trip reductions for the existing Dealership Project and proposed Selma Grove Project.

In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. Table XIV presents the results of the pass-by trip reduction analysis for the existing Dealership Project and proposed Selma Grove Project. Pass-by trips are presented as negative numbers because they are deducted from the total number of trips calculated in Table XIII. Table XV presents the adjusted trip generation resulting from the pass-by trip reductions for the existing Dealership Project and proposed Selma Grove Project. As can be seen from Table XV, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.

Project Buildout Trip Distribution

The Project Buildout trip distribution assumptions were developed based on the Fresno COG Dealership and Selma Grove Select Zones, the existing roadway network, existing travel patterns, existing residential and commercial densities, engineering judgement, knowledge of the study area and the City of Selma 2035 General Plan in the vicinity of the existing Dealership Project and proposed Selma Grove Project. Figures 10 and 11 illustrate the Dealership Trips to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions), and Figures 12 and 13 illustrate the Selma Grove Trips to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions). Furthermore, Figures 14 and 15 illustrate the Dealership Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively, Figures 16 and 17 illustrate the Selma Grove Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively, and Figures 18 and 19 illustrate the Project Buildout Pass-By Trip Reductions to the study intersections during a weekday and Saturday, respectively. Finally, Figures 20 and 21 illustrate the Net New Dealership Trips to the study intersections during a weekday and Saturday, respectively, Figures 22 and 23 illustrate the Net New Selma Grove Trips to the study intersections during a weekday and Saturday, respectively, and Figures 24 and 25 illustrate the Net New Project Buildout Trips to the study intersections during a weekday and Saturday, respectively.



Table VII: Project Buildout (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Hotel (310)	102	o.r.	8.36	853	0.47	59	41	28	20	48	0.60	51	49	31	30	61
Movie Theater (444)	54.240	k.s.f.	78.09	4,236	0.22	50	50	6	6	12	6.17	94	6	315	20	335
Shopping Center (820)	467.500	k.s.f.	37.75	17,648	0.94	62	38	272	167	439	3.81	48	52	855	926	1,781
Automobile Sales (New) (840)	48.693	k.s.f.	13.35	650	2.12	83	17	86	17	103	2.12	28	72	29	74	103
Supermarket (850)	50.000	k.s.f.	106.78	5,339	3.82	60	40	115	76	191	9.24	51	49	236	226	462
Pharmacy/Drugstore with Drive-Through Window (881)	14.500	k.s.f.	109.16	1,583	3.84	53	47	30	26	56	10.29	50	50	75	74	149
Fast-Food Restaurant with Drive-Through Window (934)	3.700	k.s.f.	470.95	1,743	40.19	51	49	76	73	149	32.67	52	48	63	58	121
Total Project Trips				32,052				613	385	998				1,604	1,408	3,012

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet

Table VIII: Project Buildout (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Hotel (310)	102	o.r.	0.60	51	49	31	30	61
Movie Theater (444)	54.240	k.s.f.	6.17	56	44	188	147	335
Shopping Center (820)	467.500	k.s.f.	4.50	52	48	1,094	1,010	2,104
Automobile Sales (New) (840)	48.693	k.s.f.	1.09	43	57	23	30	53
Supermarket (850)	50.000	k.s.f.	10.34	51	49	264	253	517
Pharmacy/Drugstore with Drive-Through Window (881)	14.500	k.s.f.	8.75	49	51	62	65	127
Fast-Food Restaurant with Drive-Through Window (934)	3.700	k.s.f.	54.86	51	49	104	99	203
Total Project Trips						1,766	1,634	3,400

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet



Table IX: Rockwell Pond Project (Weekday) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Hotel (310)	102	o.r.	8.92	910	0.67	58	42	40	29	69	0.70	49	51	35	37	72
Home Improvement Store (862)	171.178	k.s.f.	29.80	5,102	1.20	54	46	111	95	206	2.45	47	53	197	223	420
Shopping Center (820)	596.100	k.s.f.	42.94	25,598	1.03	61	39	375	240	615	3.75	48	52	1,073	1,163	2,236
Automobile Sales (New) (840)	77.000	k.s.f.	33.34	2,568	2.05	74	26	117	41	158	2.64	39	61	80	124	204
Discount Club (861)	160.000	k.s.f.	41.80	6,688	0.56	71	29	64	26	90	4.24	50	50	340	339	679
Gasoline/Service Station (944)	16	f.p.	168.56	2,697	12.07	50	50	97	97	194	13.86	50	50	111	111	222
Total Project Trips				43,563				804	528	1,332				1,836	1,997	3,833

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet
f.p. = Fueling Positions

Table X: Rockwell Pond Project (Saturday) Trip Generation

Land Use (ITE Code)	Size	Unit	MD Peak Hour					
			Trip Rate	In	Out	In	Out	Total
				%				
Hotel (310)	102	o.r.	0.60	51	49	31	30	61
Home Improvement Store (862)	171.178	k.s.f.	4.44	51	49	388	372	760
Shopping Center (820)	596.100	k.s.f.	4.50	52	48	1,395	1,287	2,682
Automobile Sales (New) (840)	77.000	k.s.f.	1.09	43	57	36	48	84
Discount Club (861)	160.000	k.s.f.	6.37	49	51	499	520	1,019
Gasoline/Service Station (944)	16	f.p.	12.77	50	50	102	102	204
Total Project Trips						2,451	2,359	4,810

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet
f.p. = Fueling Positions



Table XI: Difference in Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Proposed Project Buildout Trip Generation	32,052	613	385	998	1,604	1,408	3,012	1,766	1,634	3,400
Rockwell Pond Project Trip Generation	43,563	804	528	1,332	1,836	1,997	3,833	2,451	2,359	4,810
Change in Trip Generation	-11,511	-191	-143	-334	-232	-589	-821	-685	-725	-1,410

Table XII: Internal Capture Trip Reductions

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	-90	-6	-6	-12	-8	-16	-24	-1	-2	-3
Selma Grove	-2,314	-50	-47	-97	-112	-105	-217	-130	-139	-269
Total Internal Trip Capture Reductions	-2,404	-56	-53	-109	-120	-121	-241	-131	-141	-272

Table XIII: Adjusted Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	560	80	11	91	21	58	79	22	28	50
Selma Grove	29,088	477	321	798	1,463	1,229	2,692	1,613	1,465	3,078
Adjusted Trip Generation	29,648	557	332	889	1,484	1,287	2,771	1,635	1,493	3,128

Table XIV: Pass-By Trip Reductions

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	-5	-1	0	-1	0	-1	-1	0	0	0
Selma Grove	-291	-5	-3	-8	-15	-12	-27	-16	-15	-31
Total Pass-By Trip Reductions	-296	-6	-3	-9	-15	-13	-28	-16	-15	-31

Table XV: Net New Project Buildout Trip Generation

	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday MD Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Dealership	555	79	11	90	21	57	78	22	28	50
Selma Grove	28,797	472	318	790	1,448	1,217	2,665	1,597	1,450	3,047
Net New Project Trips	29,352	551	329	880	1,469	1,274	2,743	1,619	1,478	3,097



Bikeways

Currently, bike facilities do not exist in the vicinity of the proposed Project site. The City of Selma 2003 Bicycle Transportation Plan recommends that Class II Bike Lanes be implemented on: 1) DeWolf Avenue between Dinuba Avenue and Mountain View Avenue, 2) Floral Avenue between DeWolf Avenue and Amber Avenue and 3) Golden State Boulevard/Whitson Street between Manning Avenue and Mountain View Avenue. Therefore, it is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.

Transit

The Selma Transit Division operates under MV Transportation, Monday through Friday from 7:00 AM to 5:30 PM. The Selma Transit Division operates five (5) compressed natural gas vehicles. The natural gas vans operate on an “on call basis” and will pick up and drop off at the requested destination within the City’s SOI. One (1) vehicle operates on Saturdays from 8:00 AM to 5:00 PM.

Fresno County Rural Transit Agency (FCRTA) is the transit operator in the County of Fresno. At present, there are two (2) Transit Routes that serve the City of Selma. These include Kingsburg-Reedley Inter-City Transit and Southeast Inter-City Transit. Kingsburg-Reedley Transit runs in the vicinity of the proposed Project via Whitson Street. This route provides a direct connection to the cities of Reedley, Parlier, Fowler, Selma and Kingsburg. The closest stop is located approximately 0.87 miles to the east of the proposed Project near the Selma Plaza Shopping Center. Southeast Transit runs in the vicinity of the proposed Project via Whitson Street. This Route provides a direct connection to the cities of Fresno, Fowler, Selma and Kingsburg. The closest stop is located approximately 0.87 miles to the east of the proposed Project near the Selma Plaza Shopping Center.

Kings Area Rural Transit (KART) is the transit operator in the County of Kings. KART Route 17 runs in the vicinity of the proposed Project via Highland Avenue. The closest stop is located approximately 0.67 miles to the southeast of the proposed Project near Selma Kaiser Hospital. This Route provides a direct connection to Valley Children’s Hospital, Fresno Kaiser Hospital, Fresno Veterans Hospital, Community Regional Center, Fresno Fulton Mall, and Selma Kaiser Hospital. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Project Driveway 3 and Floral Avenue satisfies the peak hour signal warrant during all peak periods on a weekday and Saturday, while the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during the AM and PM peak periods on a weekday only. Based on the signal warrants and engineering judgement, signalization of these intersections is recommended.



Results of Existing plus Project Buildout Level of Service Analysis

The Existing plus Project Buildout Traffic Conditions scenario assumes that the proposed Selma Grove Project will construct its frontage improvements to Floral Avenue. Figures 26 and 27 illustrate the Existing plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Existing plus Project Buildout Traffic Conditions scenario are provided in Appendix G. Tables XVI and XVII present a summary of the Existing plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase; and
 - Prohibit northbound to southbound U-turn movements.
- DeWolf Avenue / Floral Avenue
 - Implement all-way stop controls.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue approximately 1,000 feet north of Floral Avenue; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XVI: Existing plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	28.7	C	>120.0	F
		Signalized (Mitigated)	18.1	B	29.4	C
2	DeWolf Avenue / Floral Avenue	TWSC	10.3	B	65.9	F
		AWSC (Mitigated)	7.7	A	19.1	C
3	Project Driveway 3 / Floral Avenue	OWSC	24.9	C	>120.0	F
		Signalized (Mitigated)	26.1	C	28.4	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	15.3	B	41.6	D
		Signalized (Mitigated)	14.3	B	23.1	C
5	Highland Avenue / Floral Avenue	Signalized	22.9	C	>120.0	F
		Signalized (Mitigated)	16.9	B	34.4	C
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.6	A	8.1	A
7	Whitson Street / Floral Avenue	Signalized	14.7	B	43.7	D
8	McCall Avenue / Floral Avenue	Signalized	26.5	C	21.7	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.5	A	9.0	A
10	Highland Avenue / Rose Avenue	TWSC	38.1	E	44.2	E
		Signalized (Mitigated)	14.6	B	14.7	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XVII: Existing plus Project Buildout (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	26.6	C
		Signalized (Mitigated)	22.2	C
2	DeWolf Avenue / Floral Avenue	TWSC	45.0	E
		AWSC (Mitigated)	15.6	C
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	31.9	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	47.3	D
		Signalized (Mitigated)	21.5	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	43.8	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.9	A
7	Whitson Street / Floral Avenue	Signalized	18.9	B
8	McCall Avenue / Floral Avenue	Signalized	16.8	B
9	Highland Avenue / SR 99 SB Ramps	Signalized	7.6	A
10	Highland Avenue / Rose Avenue	TWSC	25.4	D
		Signalized (Mitigated)	33.2	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.





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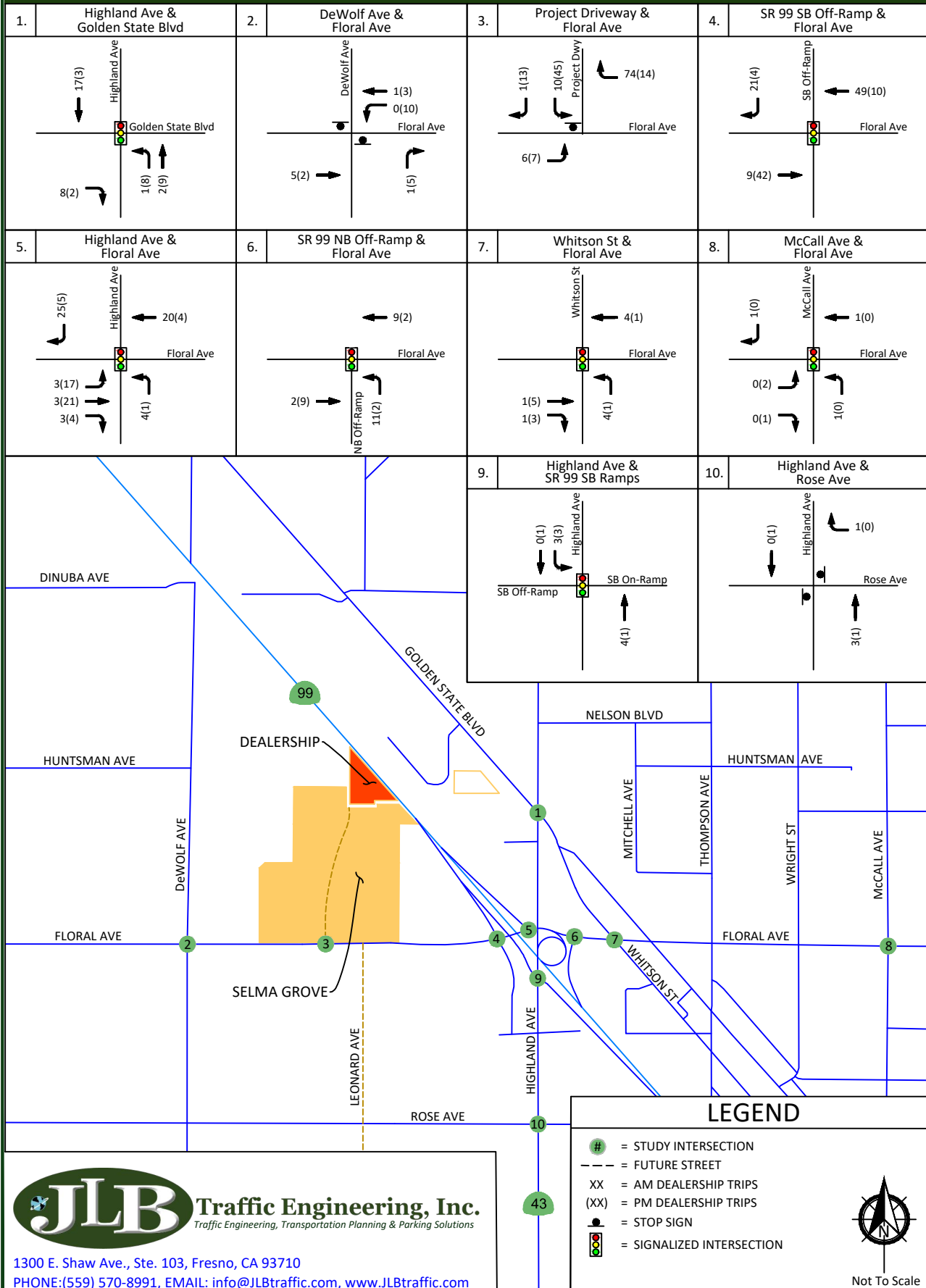
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Not To Scale

Selma Grove Project - City of Selma Dealership Trips (Weekday)

Figure
10

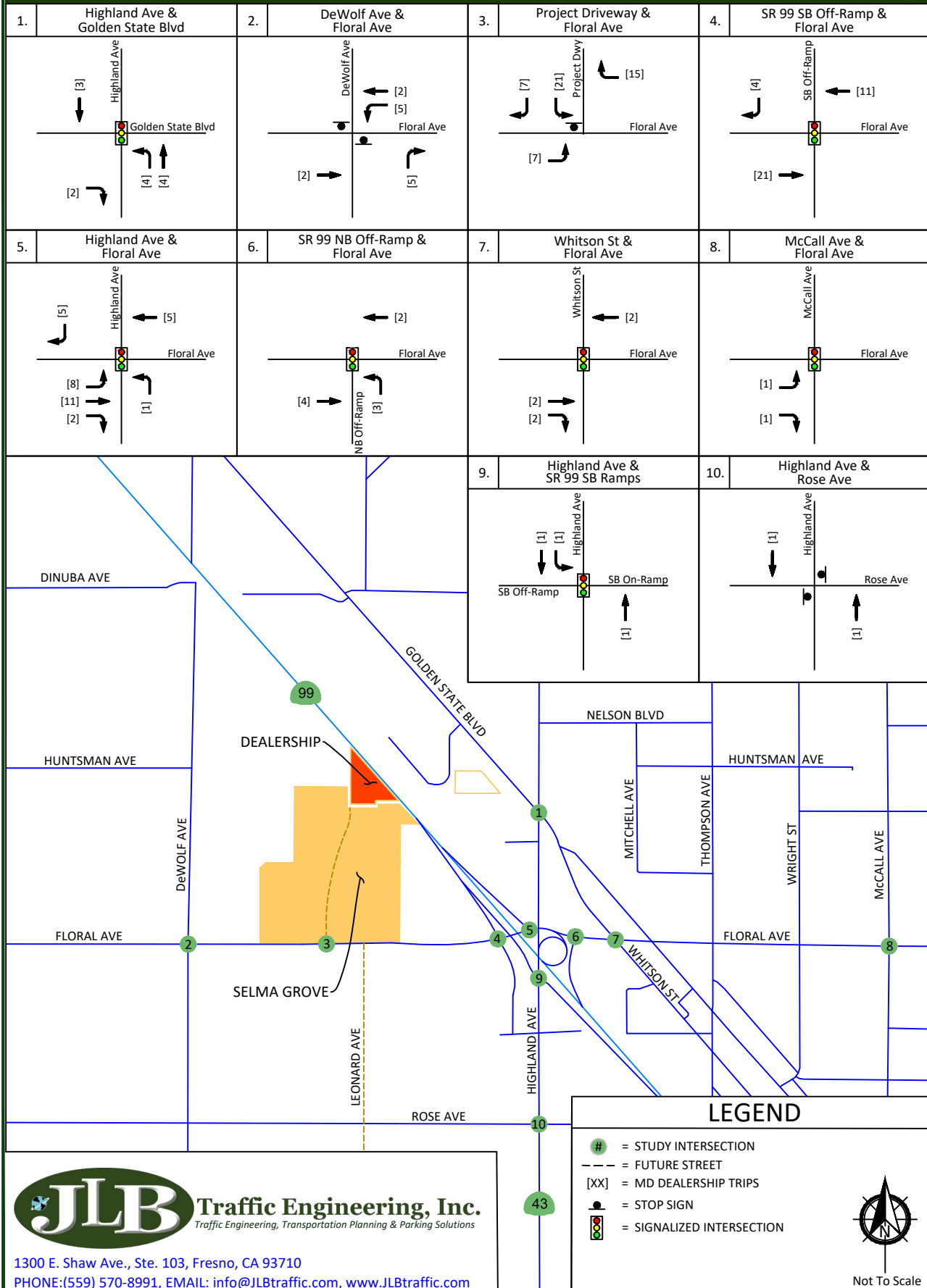


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Selma Grove Project - City of Selma Dealership Trips (Saturday)

Figure
11

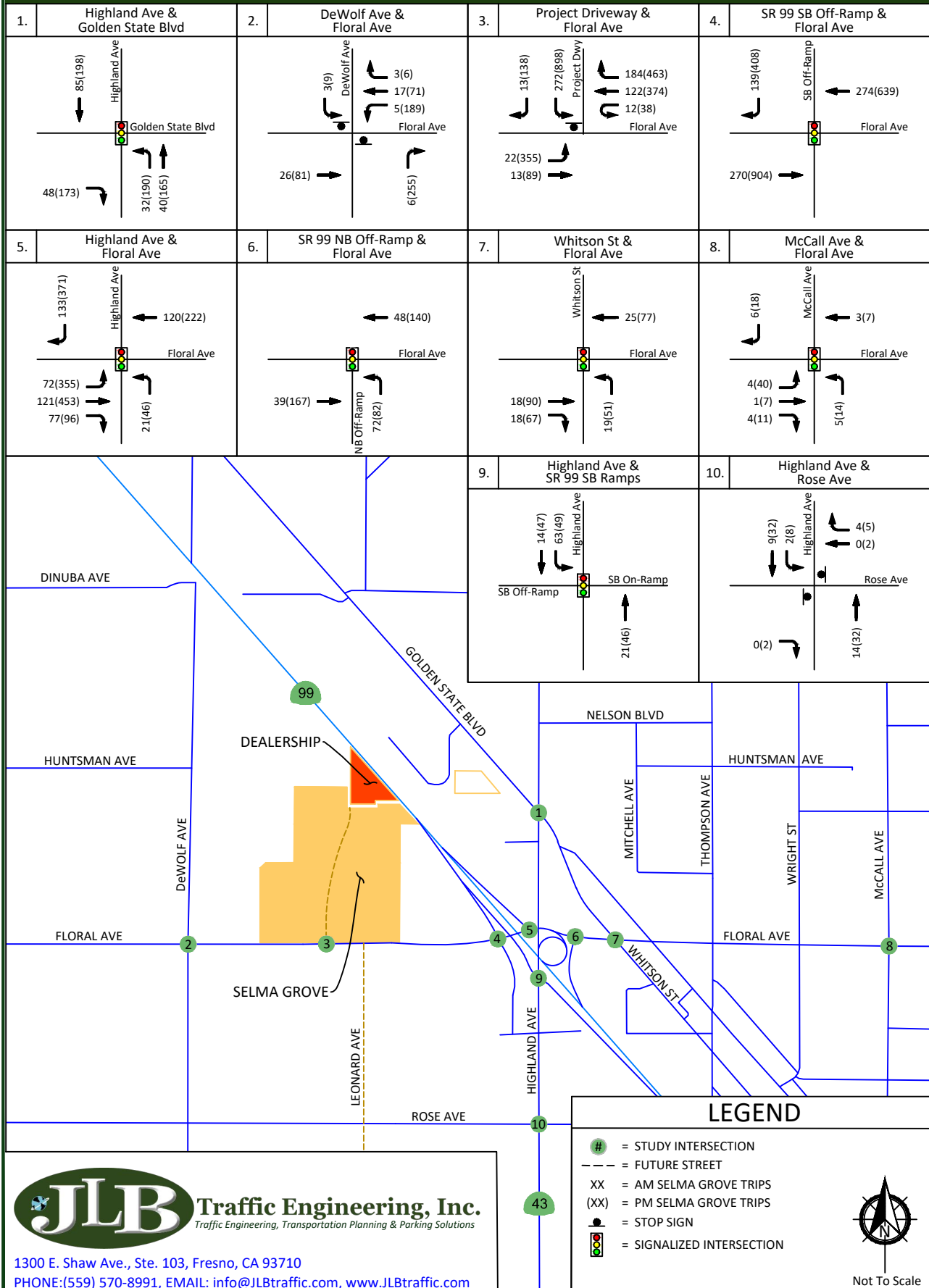


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Selma Grove Project - City of Selma

Selma Grove Trips (Weekday)

Figure
12



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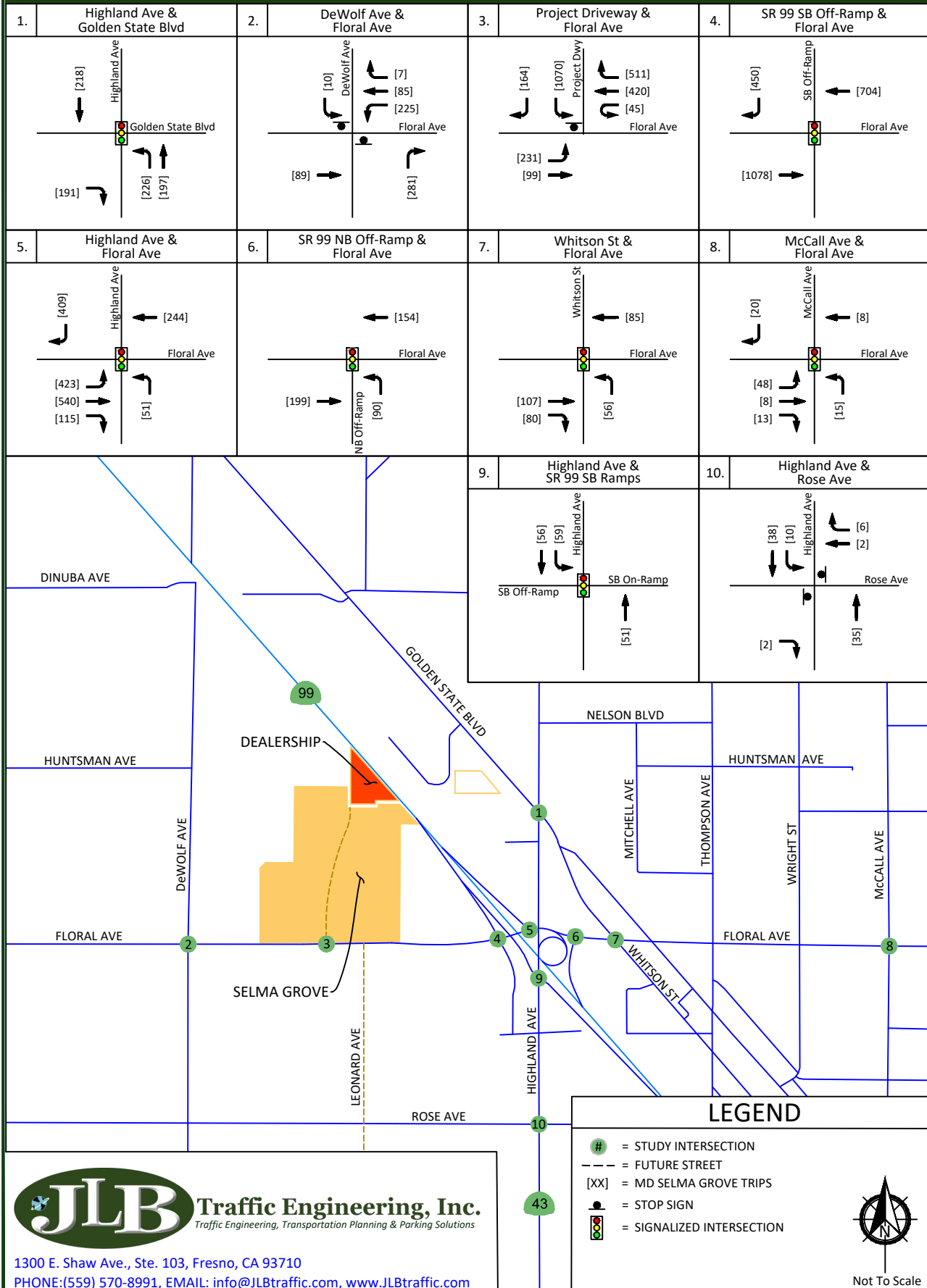
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Selma Grove Project - City of Selma

Selma Grove Trips (Saturday)

Figure
13



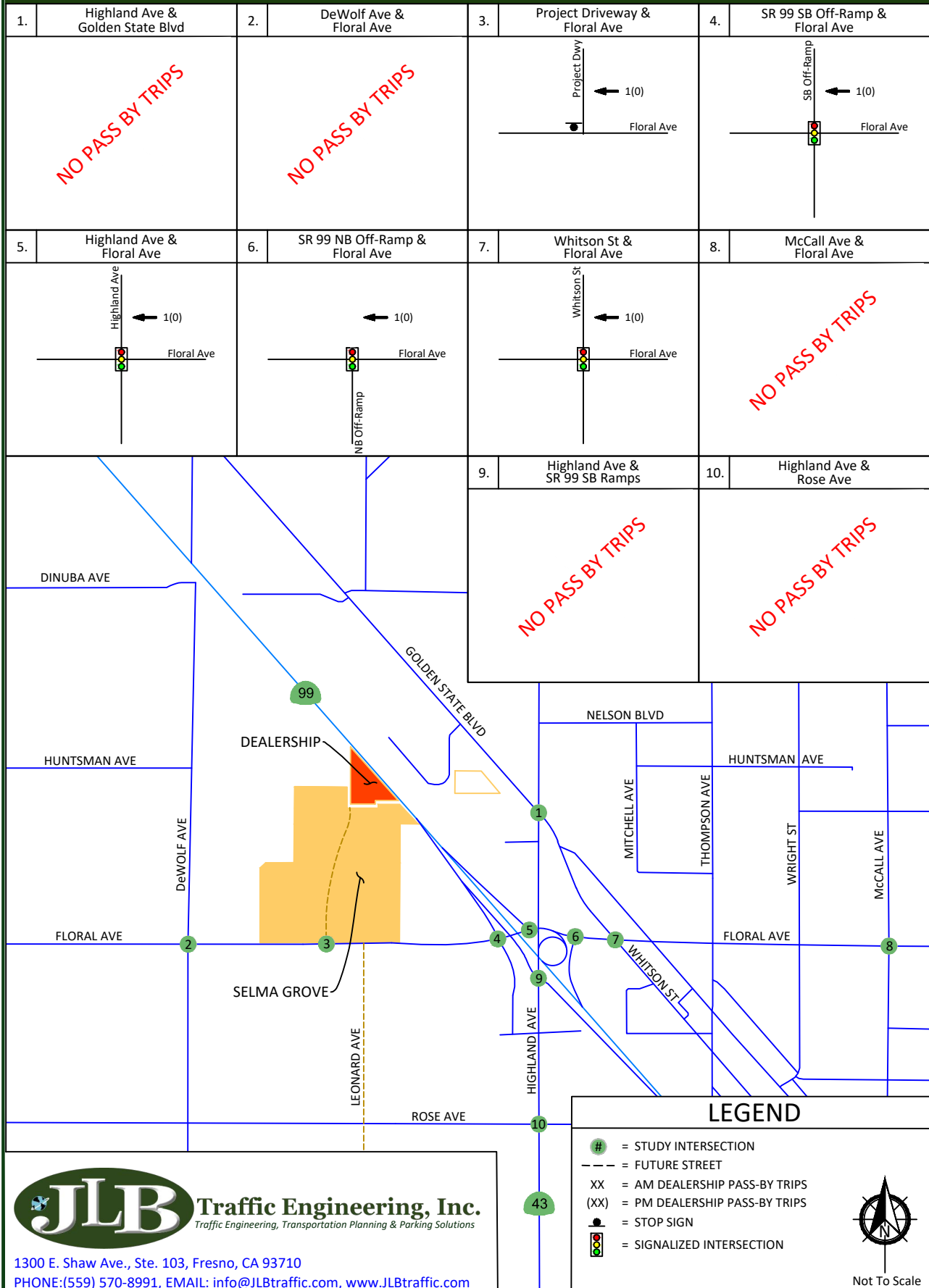
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Selma Grove Project - City of Selma Dealership Pass-By Trip Reductions (Weekday)

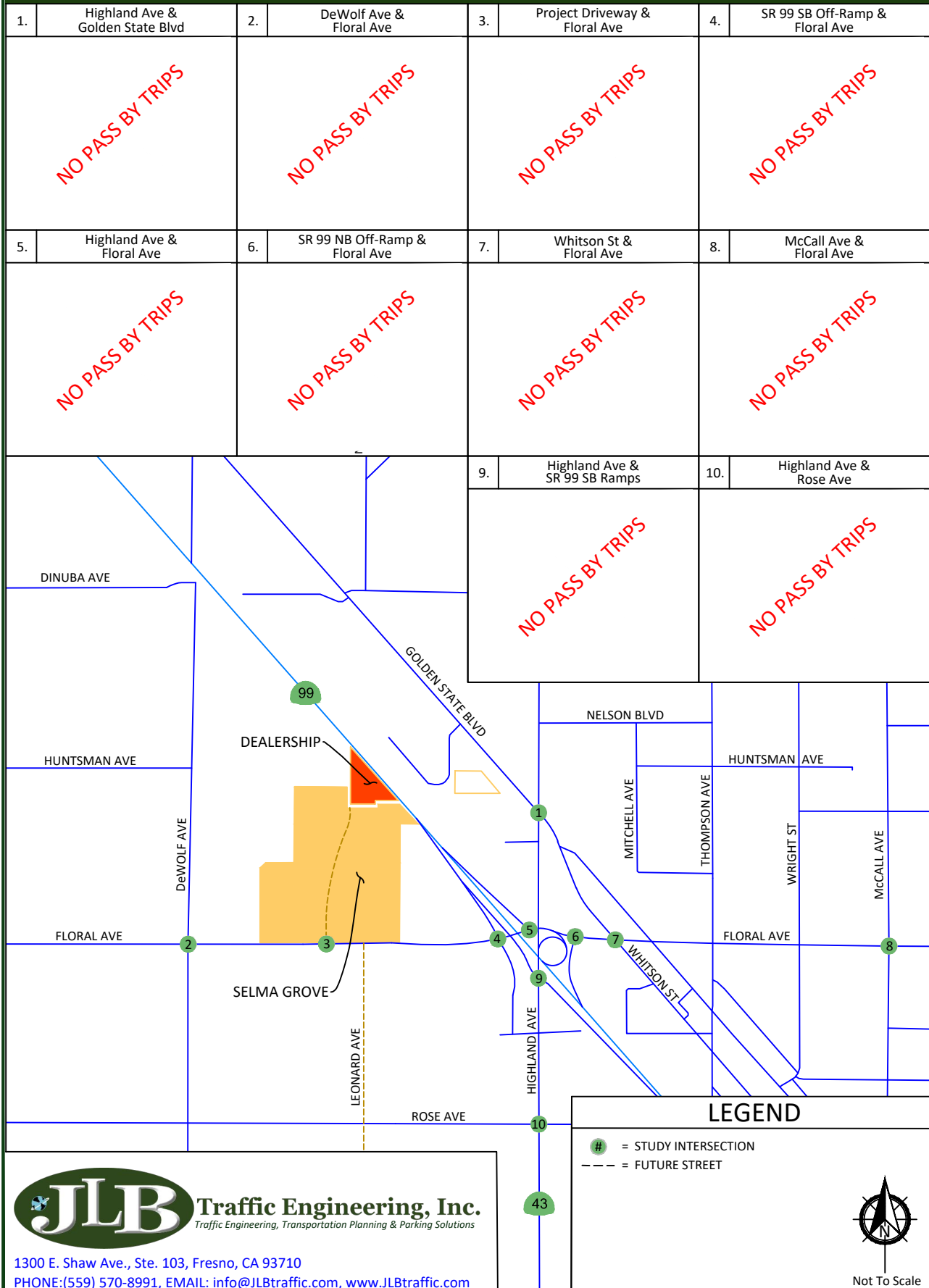
Figure
14



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Selma Grove Project - City of Selma Dealership Pass-By Trip Reductions (Saturday)

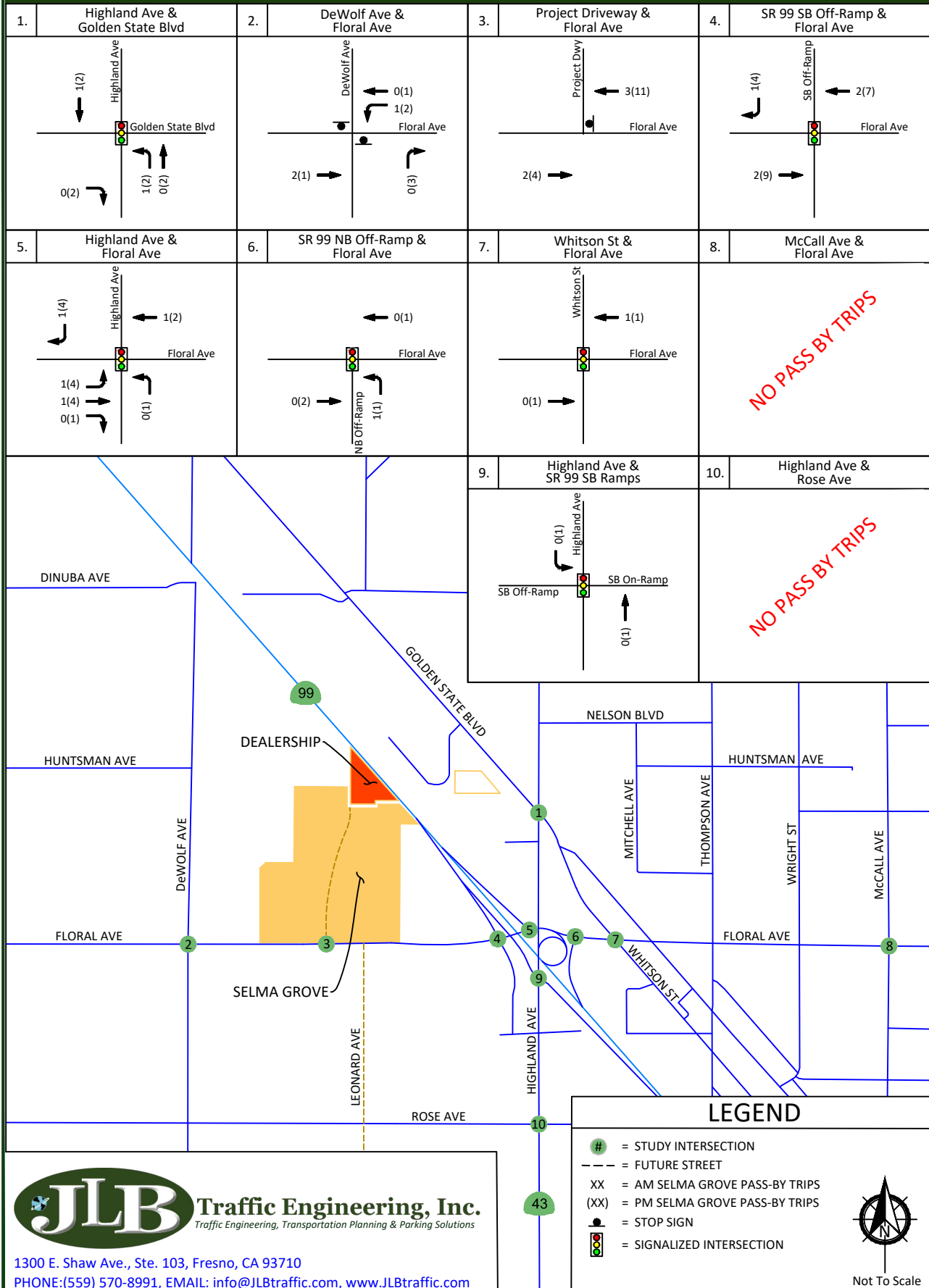
Figure
15



Selma Grove Project - City of Selma

Selma Grove Pass-By Trip Reductions (Weekday)

Figure
16

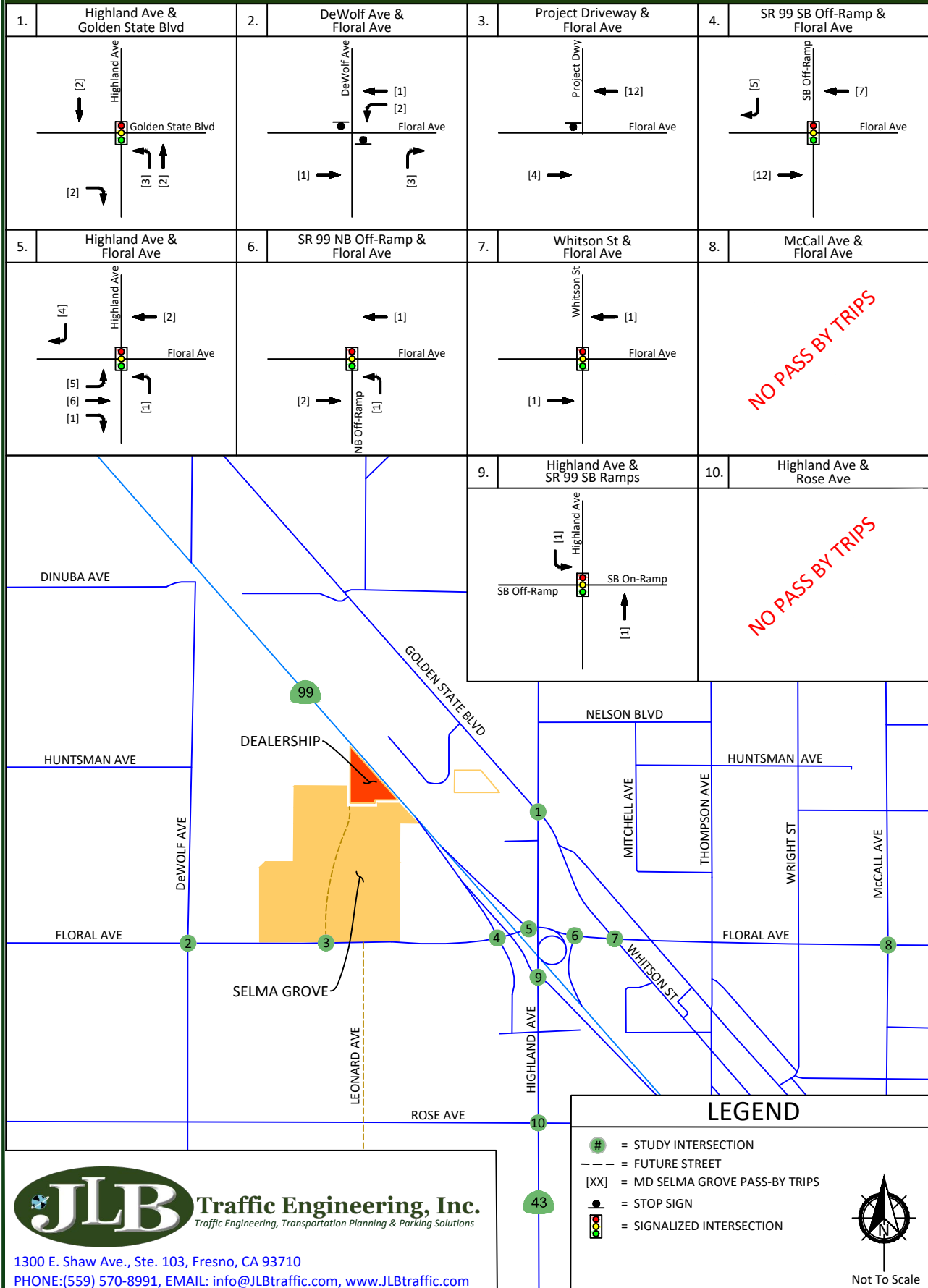


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Selma Grove Project - City of Selma

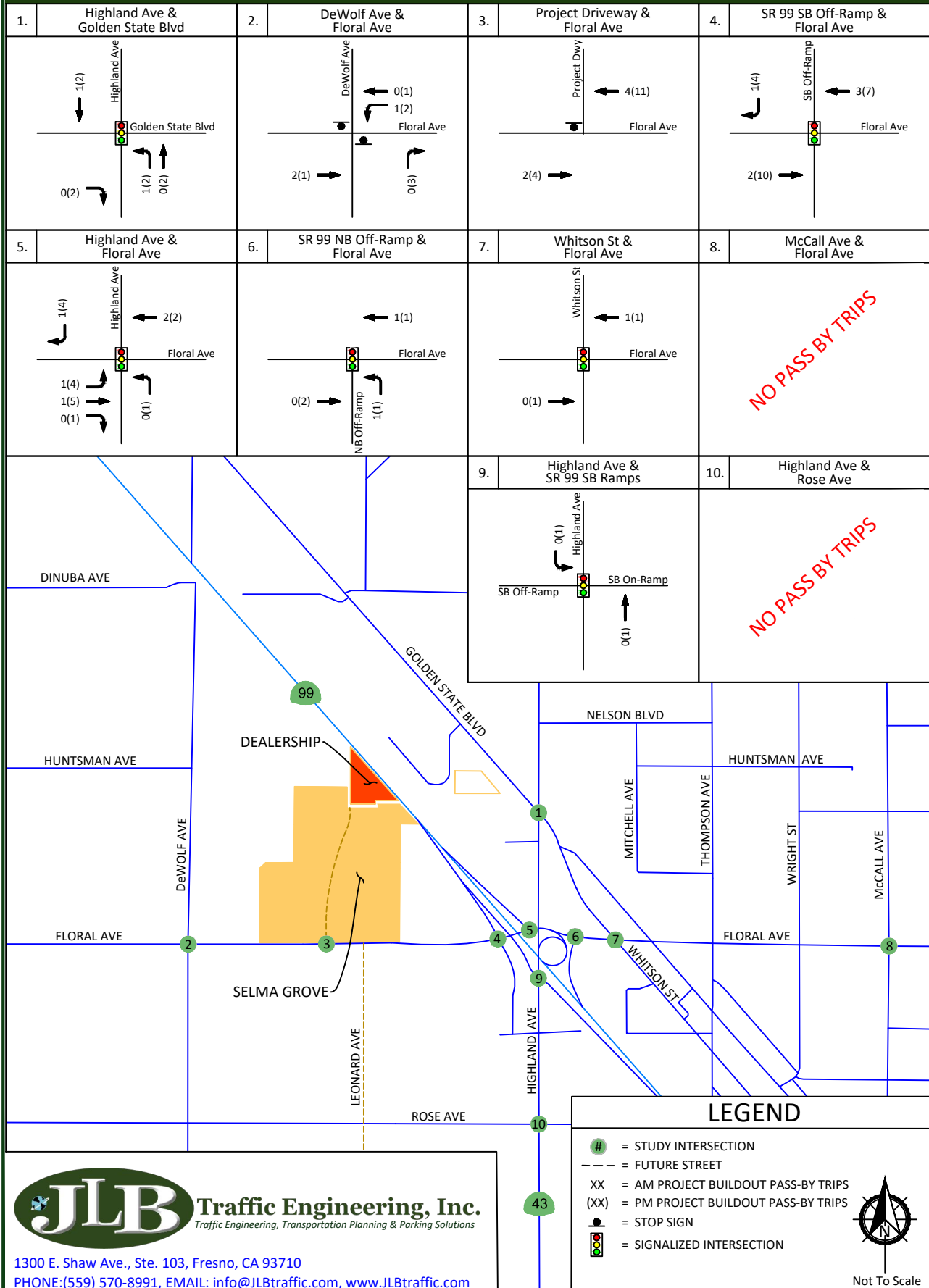
Selma Grove Pass-By Trip Reductions (Saturday)

Figure
17



Selma Grove Project - City of Selma Project Buildout Pass-By Trip Reductions (Weekday)

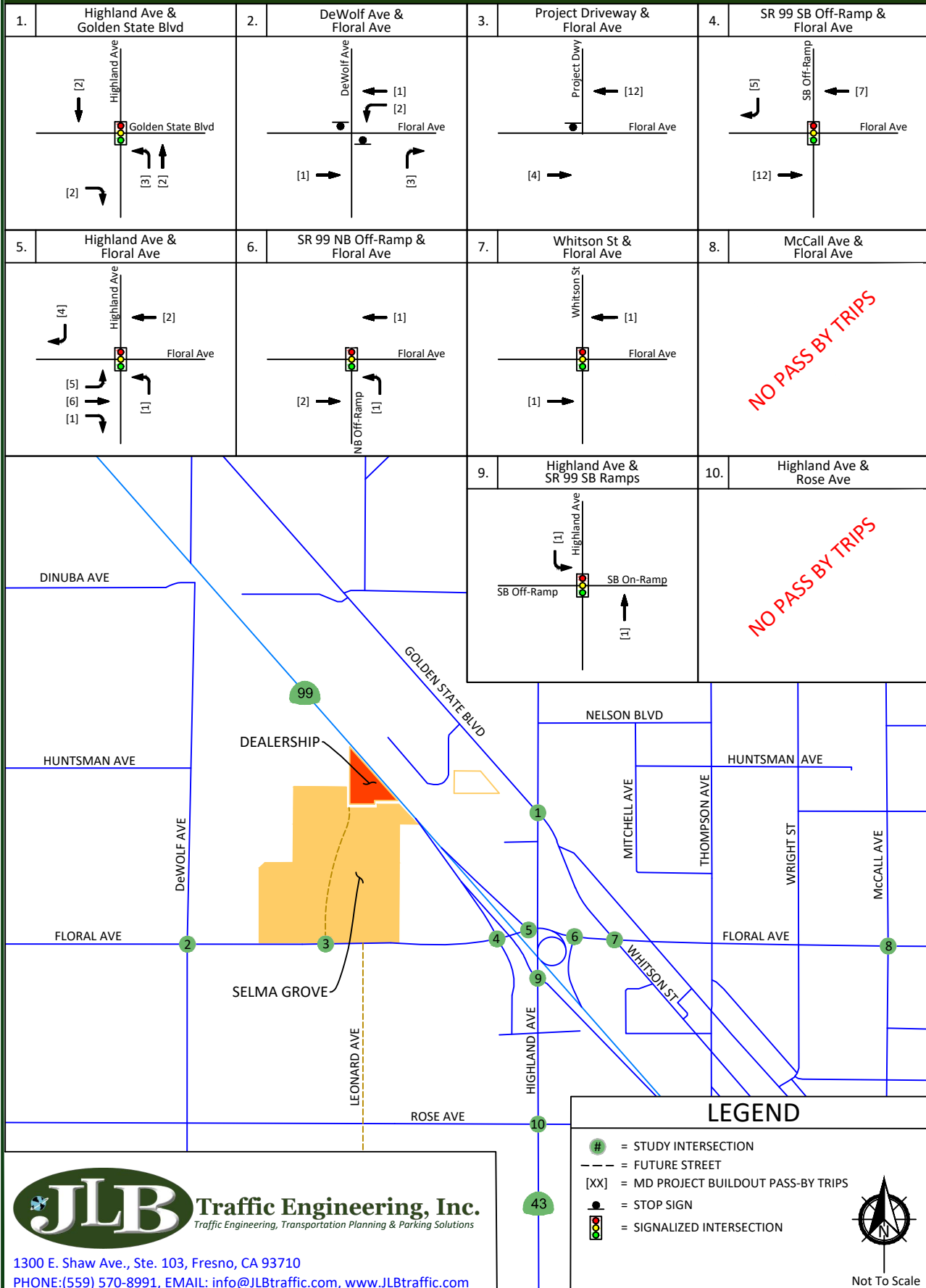
Figure
18



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Selma Grove Project - City of Selma Project Buildout Pass-By Reductions (Saturday)

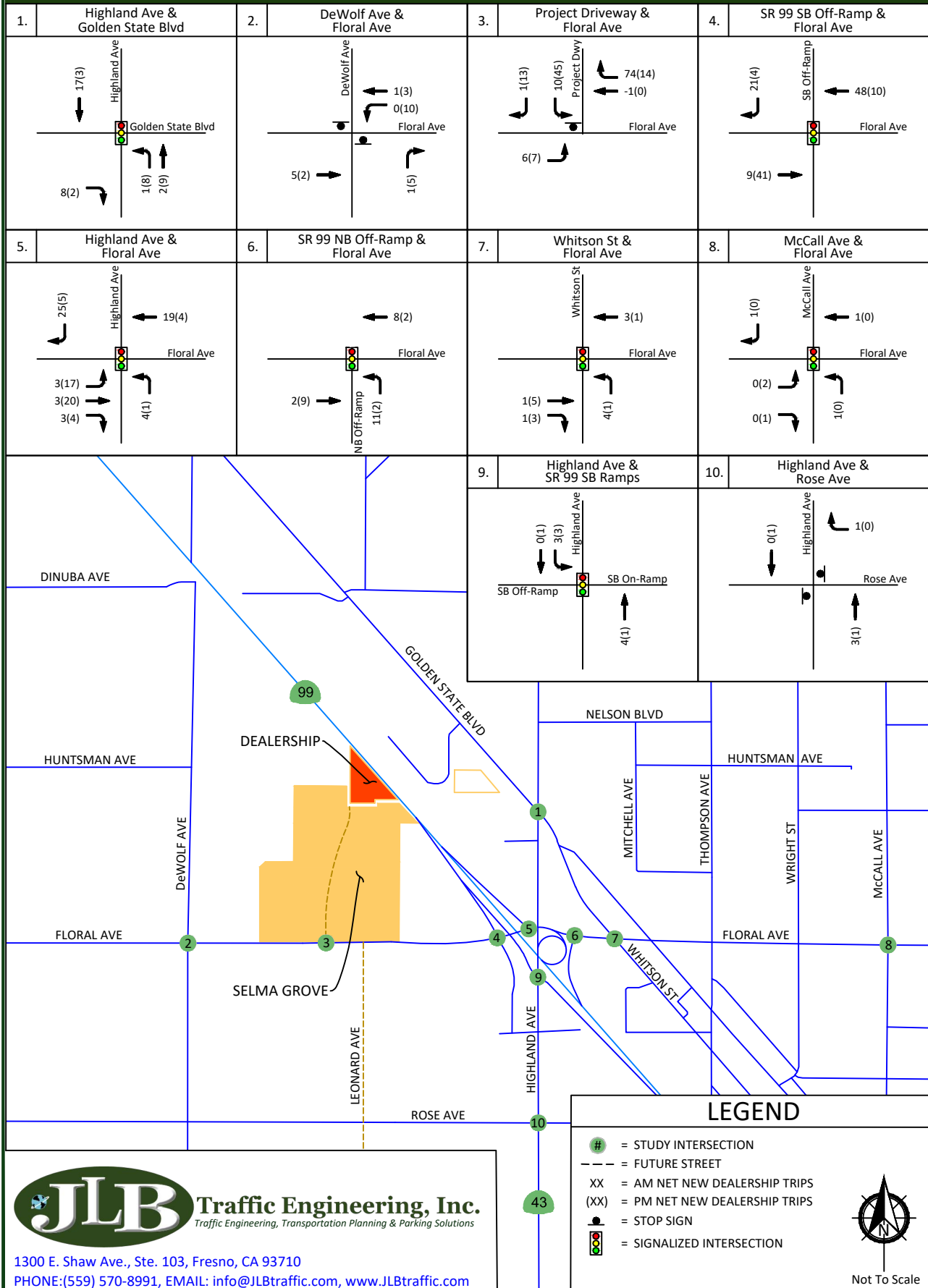
Figure
19



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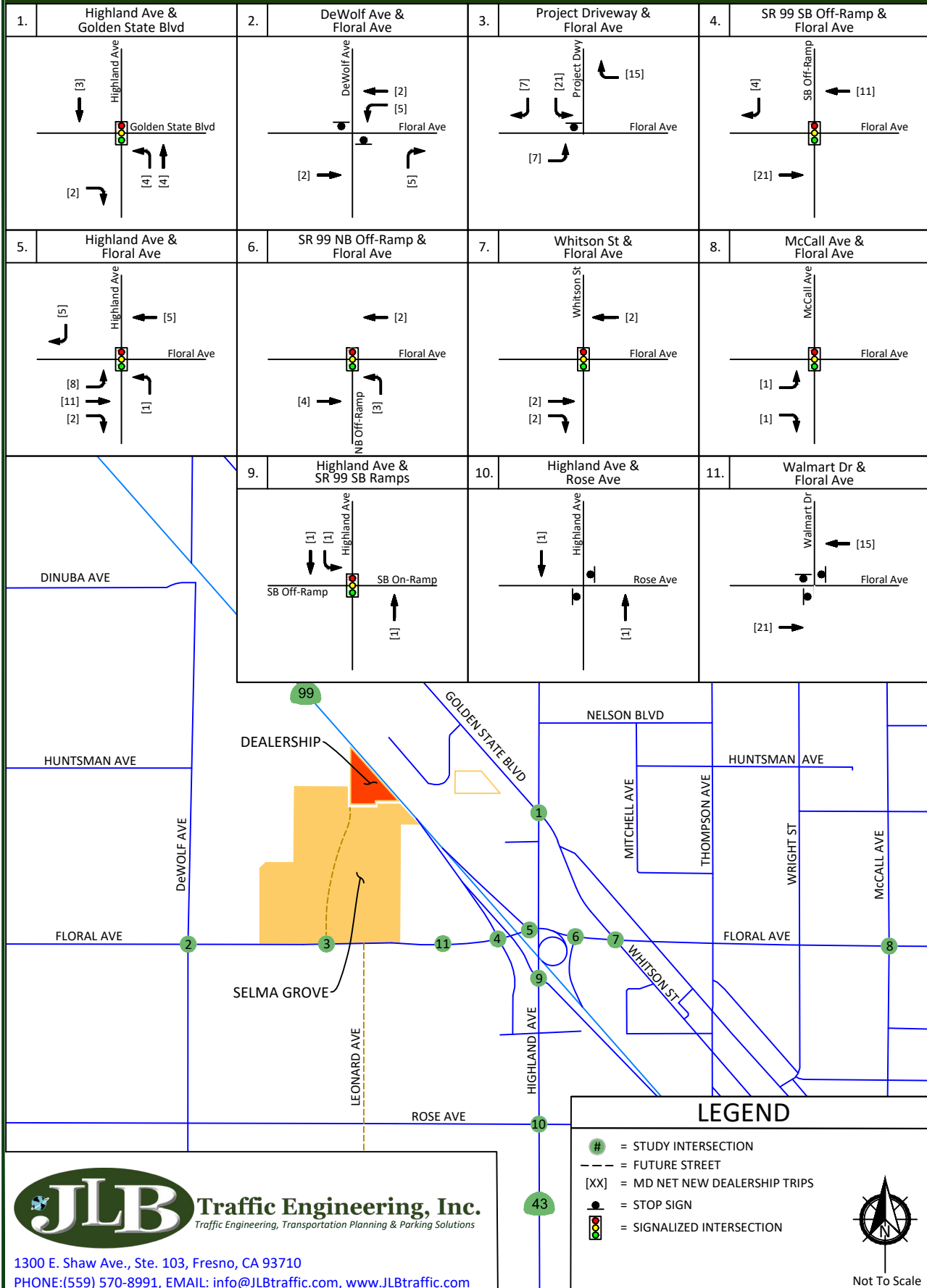
Selma Grove Project - City of Selma Net New Dealership Trips (Weekday)

Figure
20



Selma Grove Project - City of Selma Net New Dealership Trips (Saturday)

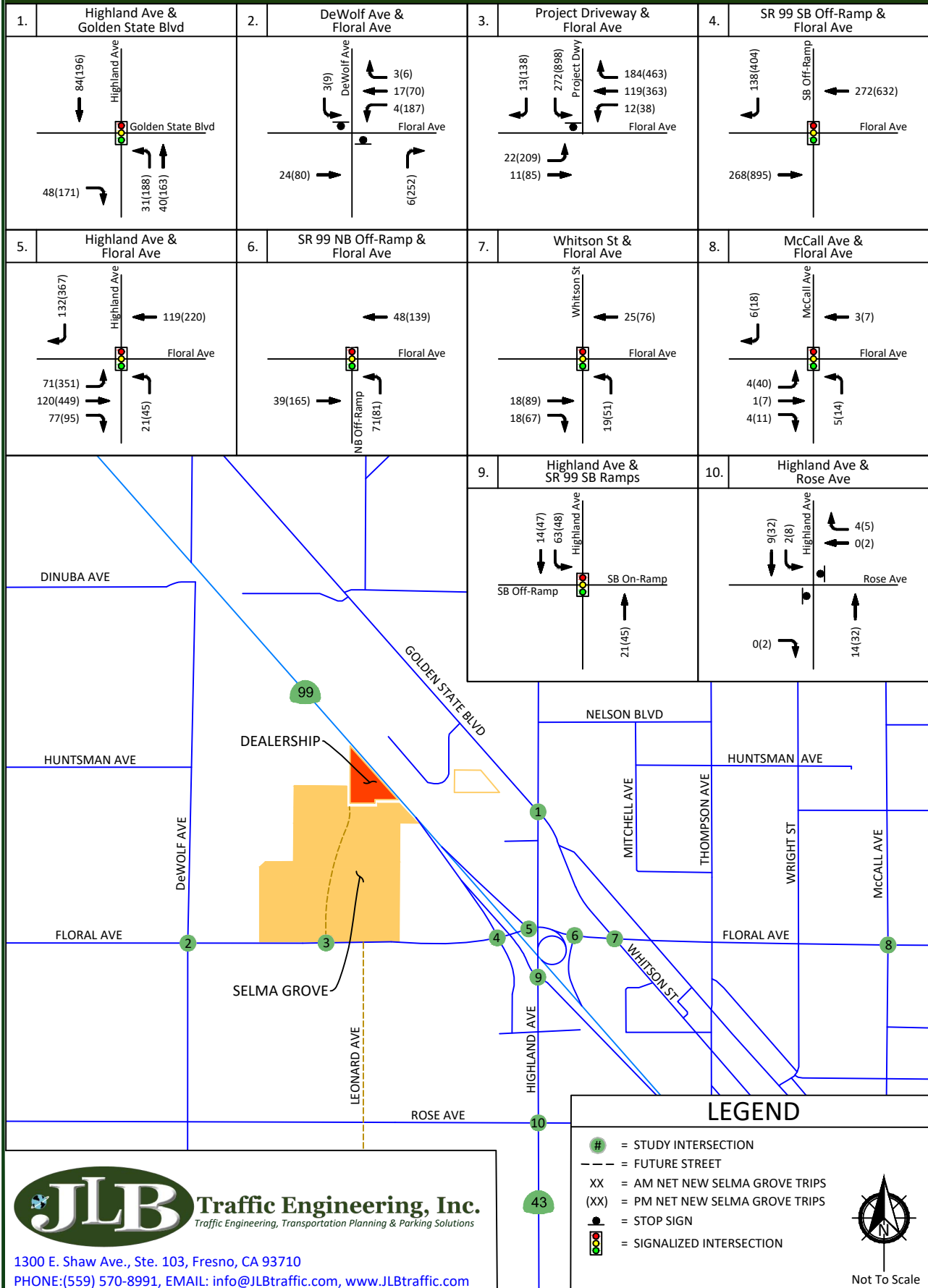
Figure
21



Selma Grove Project - City of Selma

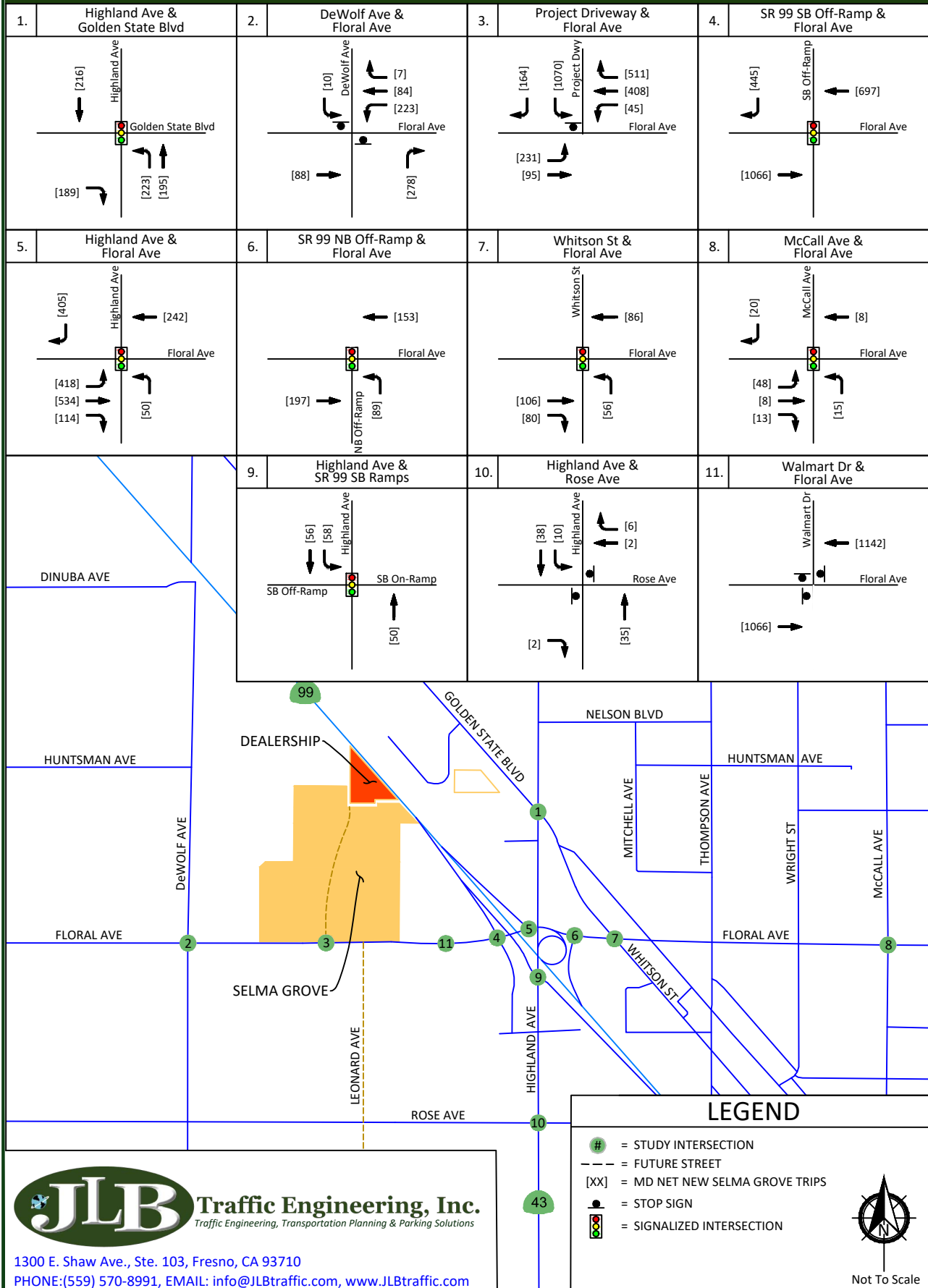
Net New Selma Grove Trips (Weekday)

Figure
22



Selma Grove Project - City of Selma Net New Selma Grove Trips (Saturday)

Figure
23



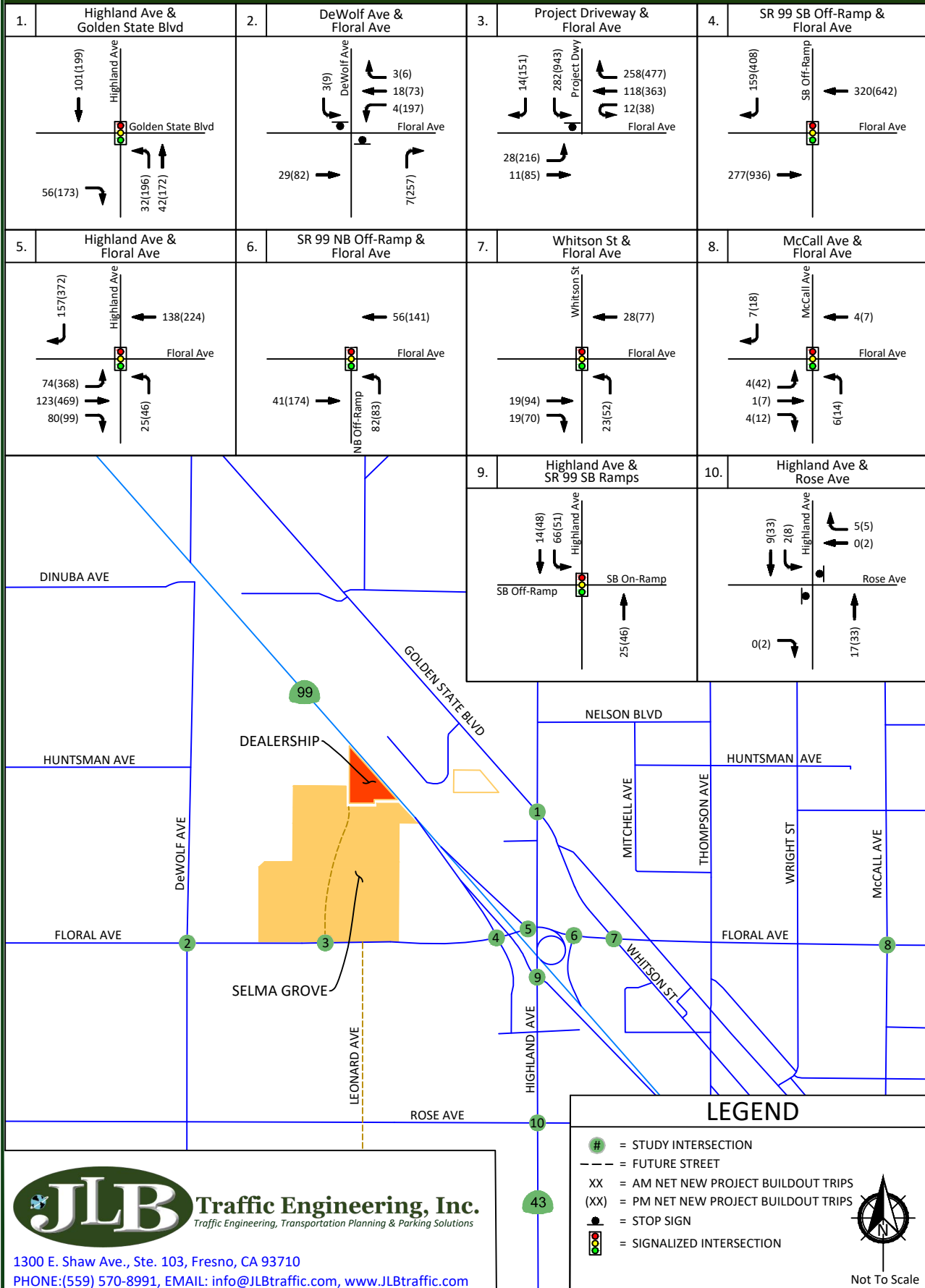
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Selma Grove Project - City of Selma Net New Project Buildout Trips (Weekday)

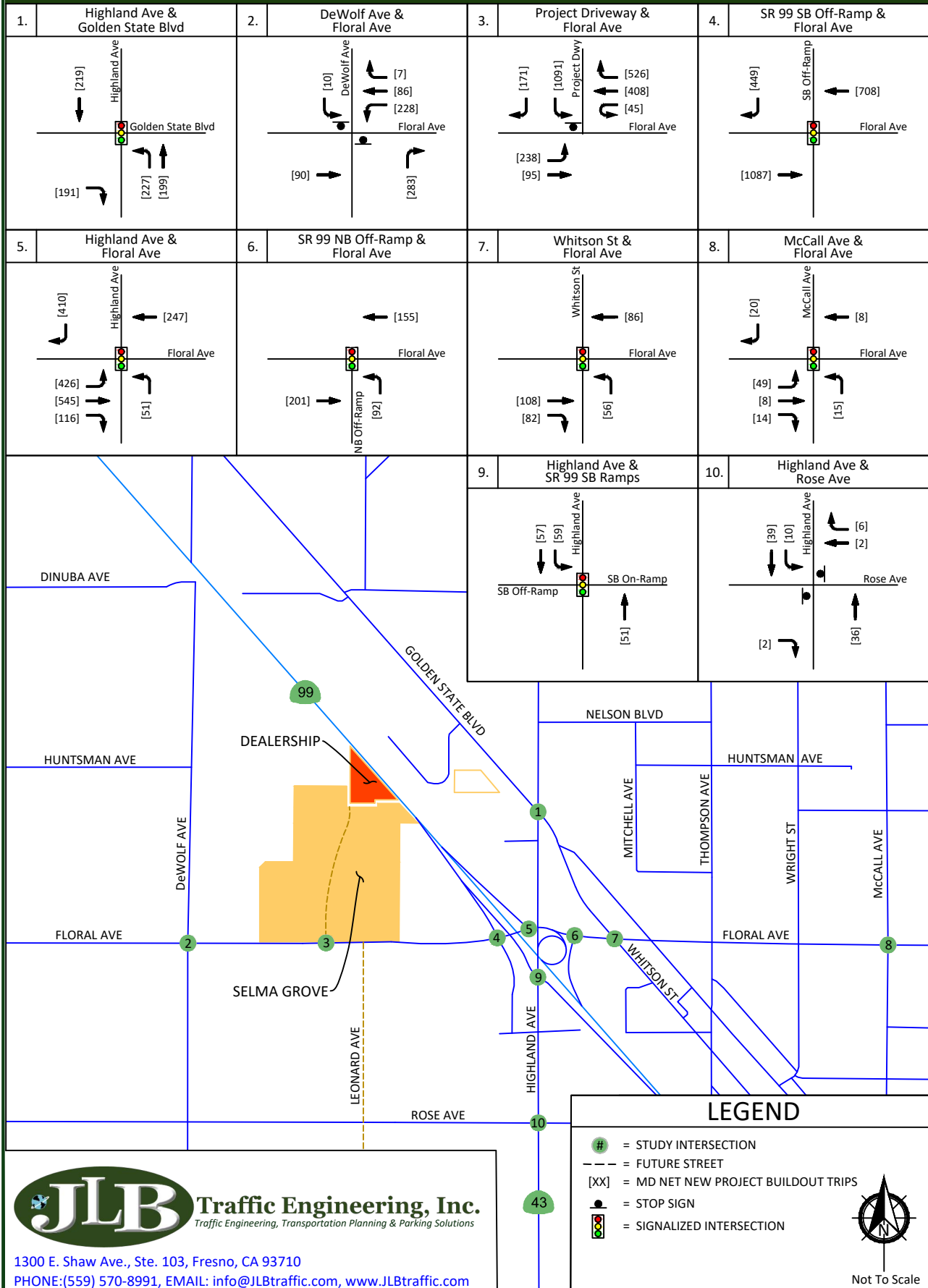
Figure
24



Selma Grove Project - City of Selma

Net Project New Project Buildout Trips (Saturday)

Figure
25



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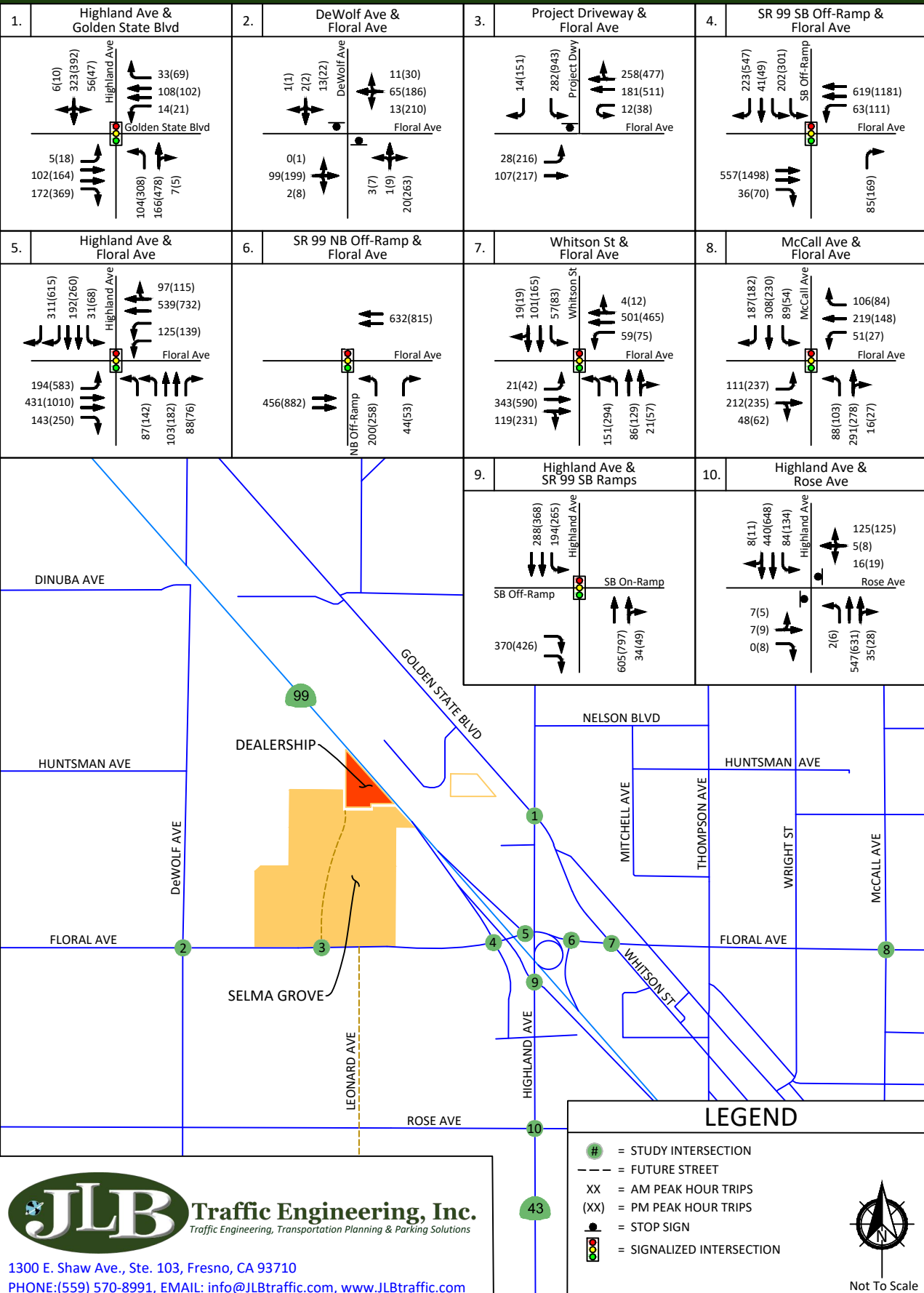
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Selma Grove Project - City of Selma

Existing plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure

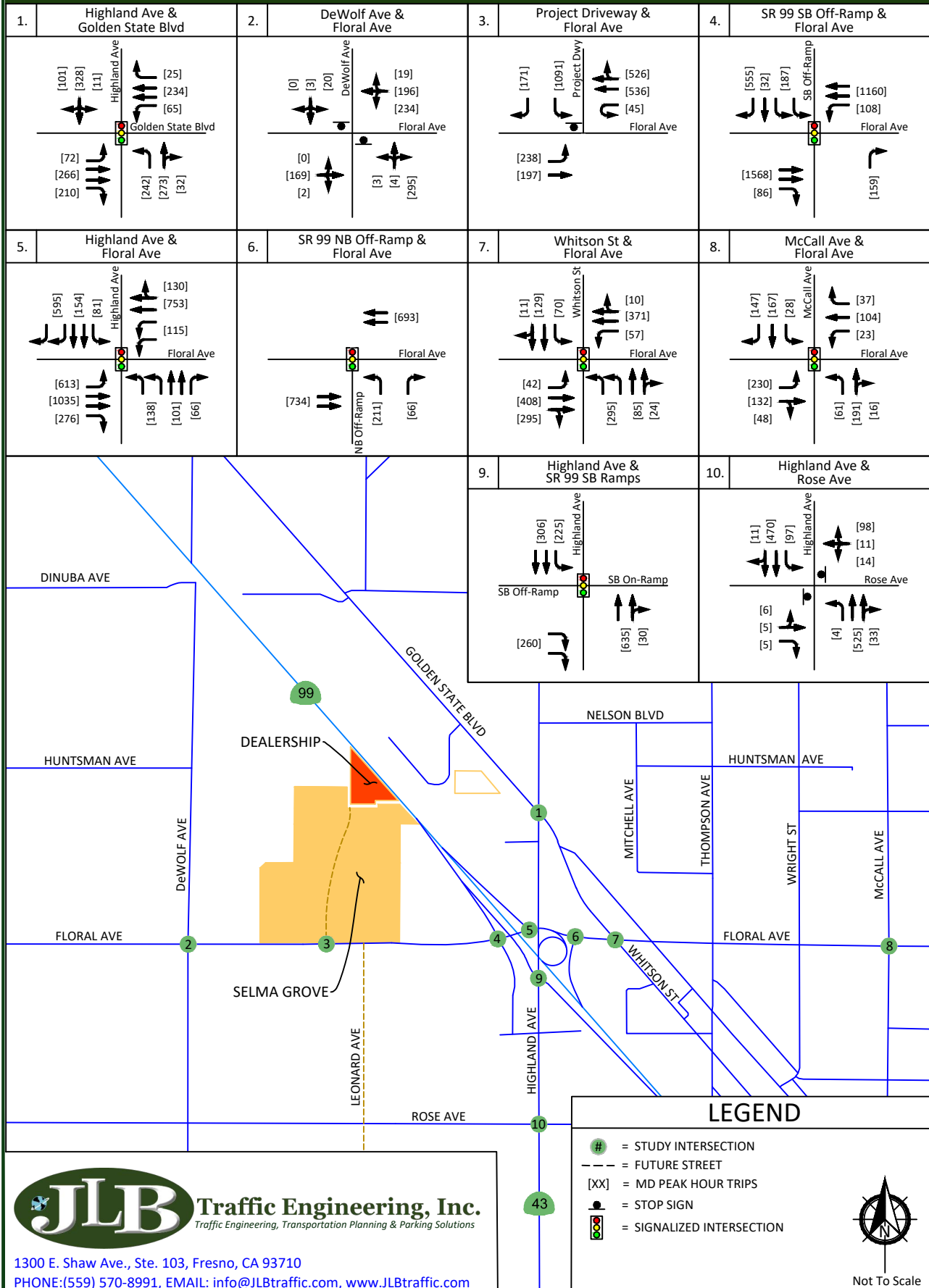
26



Selma Grove Project - City of Selma

Existing plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
27



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Near Term Year 2025 plus Project Buildout Traffic Conditions

Description of Approved and Pipeline Projects

Approved and Pipeline Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. The City of Selma, County of Fresno and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the projects listed in Table XVIII were approved, near approval, or in the pipeline within the proximity of the existing Dealership Project and proposed Selma Grove Project.

The trip generation listed in Table XVIII is that which is anticipated to be added to the streets and highways by these projects between the time of the preparation of this report and 5 years after buildout of the existing Dealership Project and proposed Selma Grove Project. As shown in Table XVIII, the total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday. Figures 28 and 29 illustrate the location of the approved, near approval, or pipeline projects and their combined trip assignment to the study intersections during a weekday and Saturday, respectively, under the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue is recommended, while signalization of the intersection of DeWolf Avenue and Floral Avenue is not recommended. It is worth noting that the CA MUTCD states that "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal." Therefore, it is recommended that prior to the installation of a traffic signal, investigation of CA MUTCD warrants 1, 4, and 7, as applicable, be conducted for the intersection of DeWolf Avenue and Floral Avenue.



Table XVIII: Near Term Projects' Trip Generation

<i>Approved Project Location</i>	<i>Approved or Pipeline Project Name</i>	<i>Weekday</i>			<i>Saturday</i>
		<i>Daily Trips</i>	<i>AM Peak Hour</i>	<i>PM Peak Hour</i>	<i>MD Peak Hour</i>
A	Commercial Development (Surf Thru Car Wash & The Habit) ¹	2,194	185	162	300
B	Canales ²	9,931	286	938	780
C	Graham Commercial ¹	5,848	431	456	661
D	Amberwood ³	26,351	1,947	2,422	2,570
E	Selma Crossings ⁴	109,165	3,925	9,694	11,934
F	V5 Commercial ⁴	2,552	68	221	132
G	TT 6019 ¹	906	71	95	89
H	Nagro Apartments ¹	37	2	3	5
I	Stillman/Cinema Apartments ¹	285	18	22	27
J	TT 5361 ⁴	1,493	117	158	145
K	TT 5183 (Country Rose Estates 2) ¹	312	24	33	31
L	TT 5640 (Merigian) ¹	217	17	23	21
M	TT 5563 (Heritage Park) ⁴	373	29	39	36
N	TT 5519 (Synergy) ¹	642	50	67	63
O	TT 5540 ⁵	986	77	104	96
P	TT 5568 (Hinesley) ¹	1,359	107	143	134
Q	American Tire Depot ¹	171	16	24	30
R	United Health Center ¹	153	15	13	13
Total Approved and Pipeline Project Trips		162,975	7,385	14,617	17,067

Note: 1 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information
2 = Trip Generation based VRPA Technologies Traffic Impact Analysis Report
3 = Trip Generation based Dowling Associates, Inc. Traffic Impact Analysis Report
4 = Trip Generation based Peters Engineering Traffic Impact Analysis Report
5 = Trip Generation based TJKM Traffic Impact Analysis Report

Results of Near Term Year 2025 plus Project Buildout Level of Service Analysis

The Near Term Year 2025 plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario. Figures 30 and 31 illustrate the Near Term Year 2025 plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Near Term Year 2025 plus Project Buildout Traffic Conditions scenario are provided in Appendix H. Tables XIX and XX present a summary of the Near Term Year 2025 plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.



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Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XIX: Near Term Year 2025 plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	70.4	E	>120.0	F
		Signalized (Mitigated)	16.3	B	25.7	C
2	DeWolf Avenue / Floral Avenue	TWSC	11.0	B	>120.0	F
		AWSC (Mitigated)	8.1	A	16.7	C
3	Project Driveway 3 / Floral Avenue	OWSC	40.4	E	>120.0	F
		Signalized (Mitigated)	24.2	C	29.6	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.1	B	56.4	E
		Signalized (Mitigated)	16.1	B	32.3	C
5	Highland Avenue / Floral Avenue	Signalized	44.0	D	>120.0	F
		Signalized (Mitigated)	24.6	C	52.3	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	12.5	B
7	Whitson Street / Floral Avenue	Signalized	15.6	B	33.1	C
8	McCall Avenue / Floral Avenue	Signalized	37.3	D	46.2	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	10.5	B	18.0	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	24.7	C	23.9	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XX: Near Term Year 2025 plus Project Buildout (Saturday) Intersection LOS Results

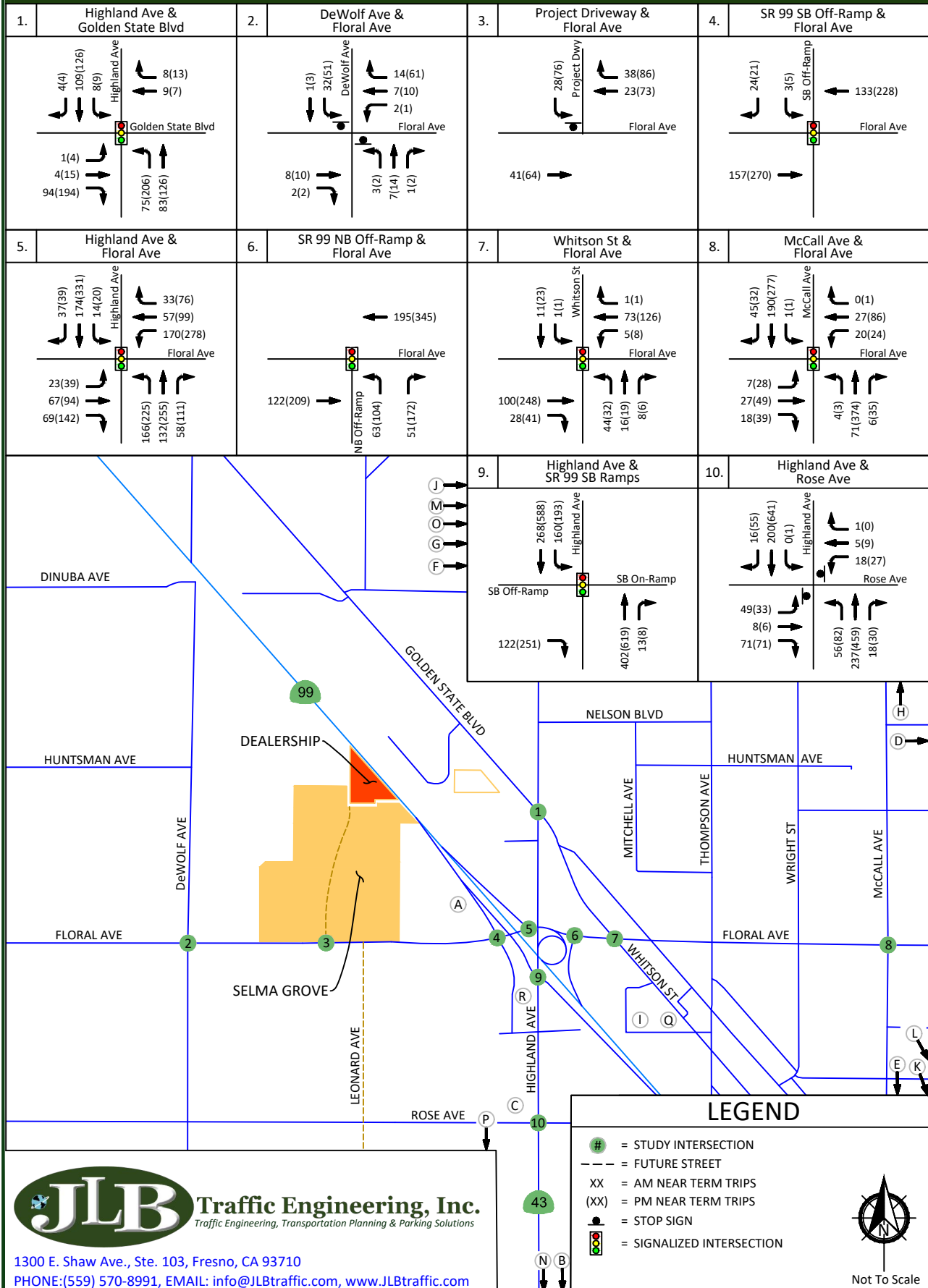
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	85.8	F
		Signalized (Mitigated)	26.9	C
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		AWSC (Mitigated)	14.5	B
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	35.6	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	79.5	E
		Signalized (Mitigated)	34.6	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.4	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	11.8	B
7	Whitson Street / Floral Avenue	Signalized	49.2	D
8	McCall Avenue / Floral Avenue	Signalized	27.5	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	15.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	23.2	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



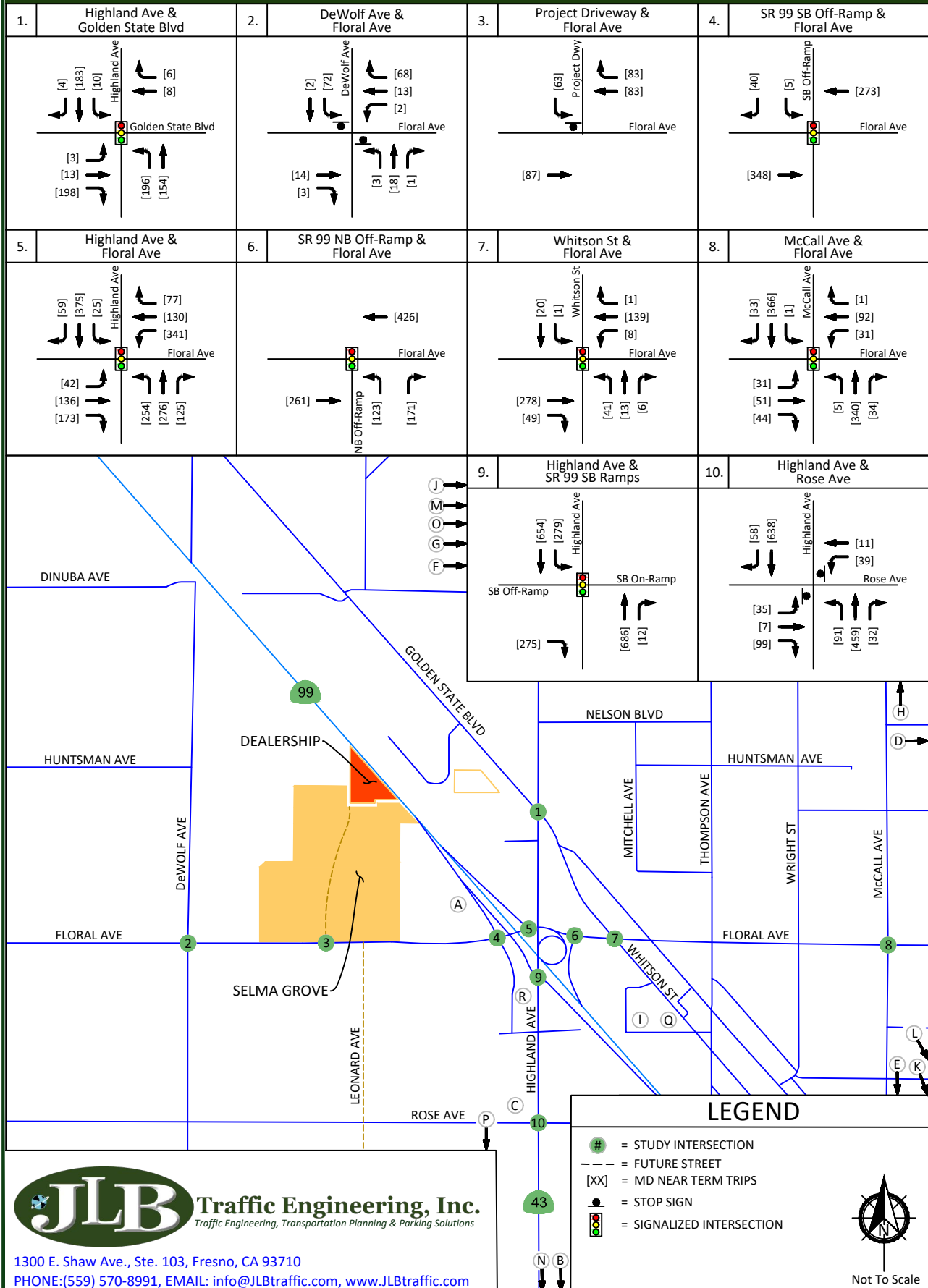
Selma Grove Project - City of Selma Near Term Projects' Trip Assignment (Weekday)

Figure
28



Selma Grove Project - City of Selma Near Term Projects' Trip Assignment (Saturday)

Figure
29



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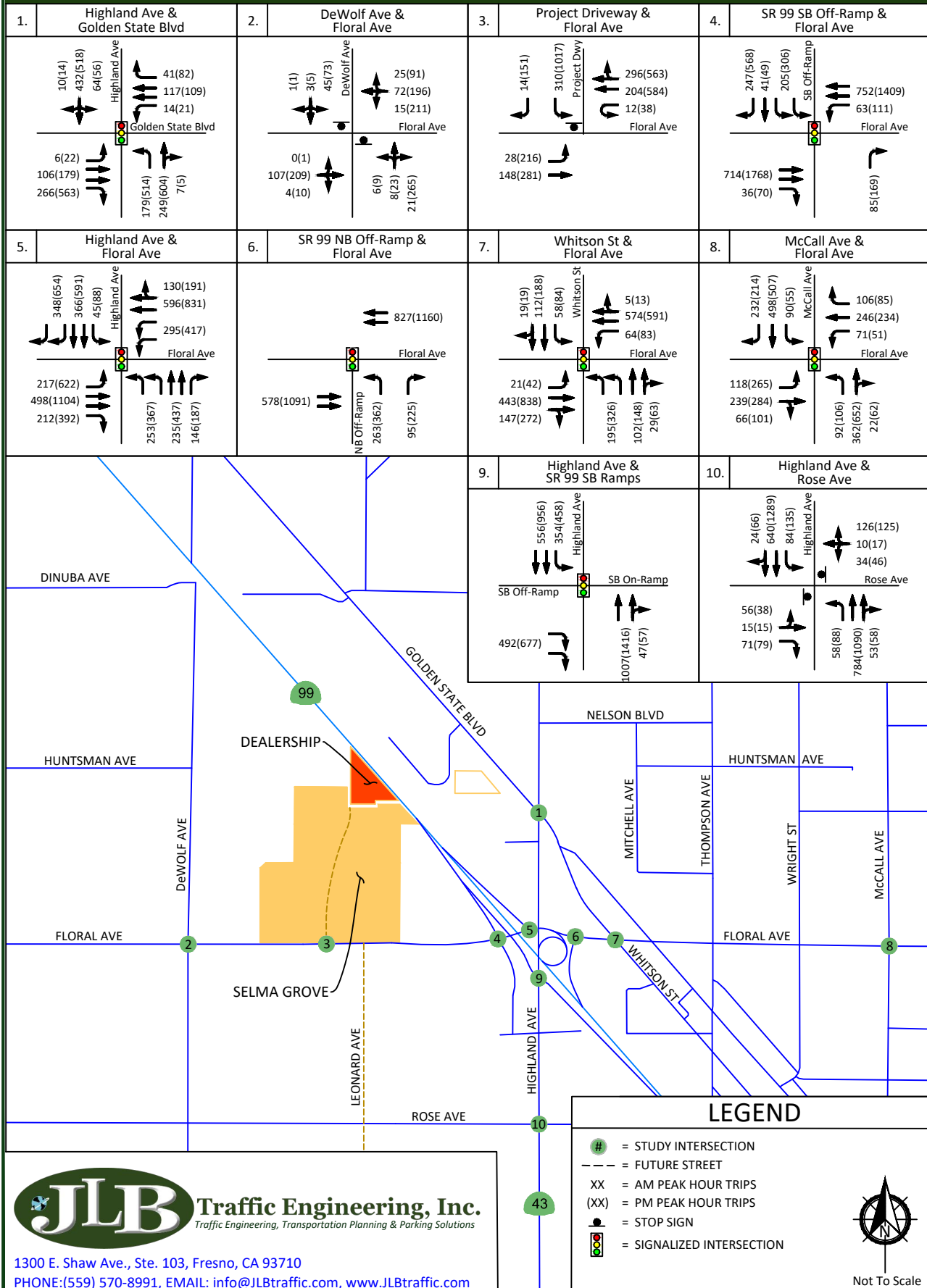
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Selma Grove Project - City of Selma

Near Term Year 2025 plus Project Buildout (Weekday) - Traffic

Volumes, Geometrics and Controls

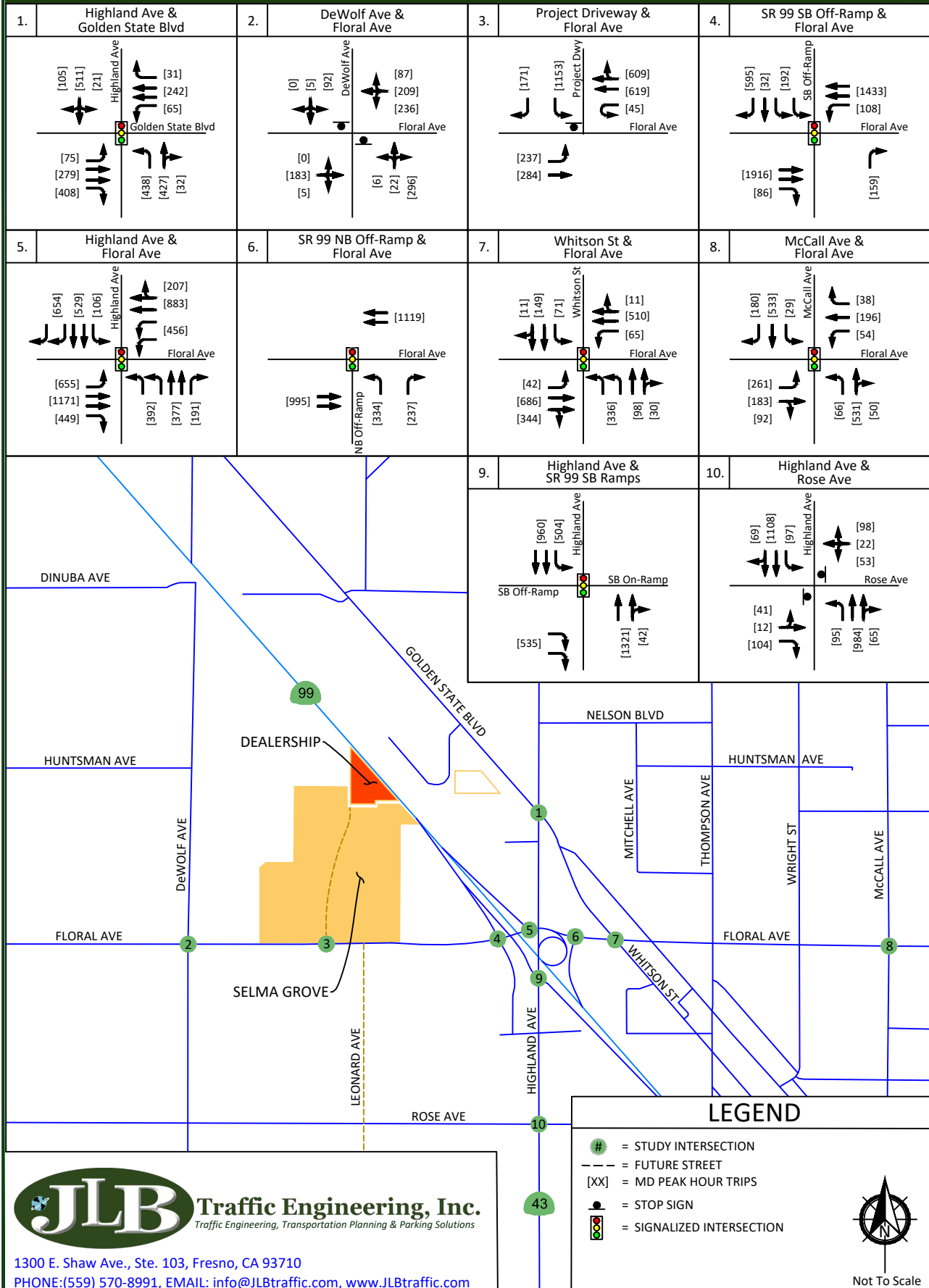
Figure
30



Selma Grove Project - City of Selma

Near Term Year 2025 plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
31



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Cumulative Year 2030 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 No Project Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of Highland Avenue and Rose Avenue satisfies the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrant and engineering judgement, signalization of this intersection is recommended.

Results of Cumulative Year 2030 No Project Level of Service Analysis

The Cumulative Year 2030 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figures 32 and 33 illustrate the Cumulative Year 2030 No Project Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 No Project Traffic Conditions scenario are provided in Appendix I. Tables XXI and XXII present a summary of the Cumulative Year 2030 No Project peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be considered for implementation.

- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue; and
 - Modify the traffic signals to accommodate the added lane.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XXI: Cumulative Year 2030 No Project (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	48.9	D	>120.0	F
		Signalized (Improved)	24.8	C	53.1	D
2	DeWolf Avenue / Floral Avenue	TWSC	10.6	B	15.0	C
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	15.2	B	19.9	B
5	Highland Avenue / Floral Avenue	Signalized	33.2	C	74.9	E
		Signalized (Improved)	24.6	C	44.1	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	6.5	A	12.3	B
7	Whitson Street / Floral Avenue	Signalized	17.7	B	46.3	D
8	McCall Avenue / Floral Avenue	Signalized	27.7	C	41.2	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	10.5	B	15.7	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Improved)	23.2	C	21.7	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXII: Cumulative Year 2030 No Project (Saturday) Intersection LOS Results

ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	54.9	D
		Signalized (Improved)	49.1	D
2	DeWolf Avenue / Floral Avenue	TWSC	13.7	B
3	Project Driveway 3 / Floral Avenue	Does Not Exist	N/A	N/A
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	18.9	B
5	Highland Avenue / Floral Avenue	Signalized	64.0	E
		Signalized (Improved)	43.3	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	11.5	B
7	Whitson Street / Floral Avenue	Signalized	48.5	D
8	McCall Avenue / Floral Avenue	Signalized	25.0	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	13.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Improved)	24.0	C

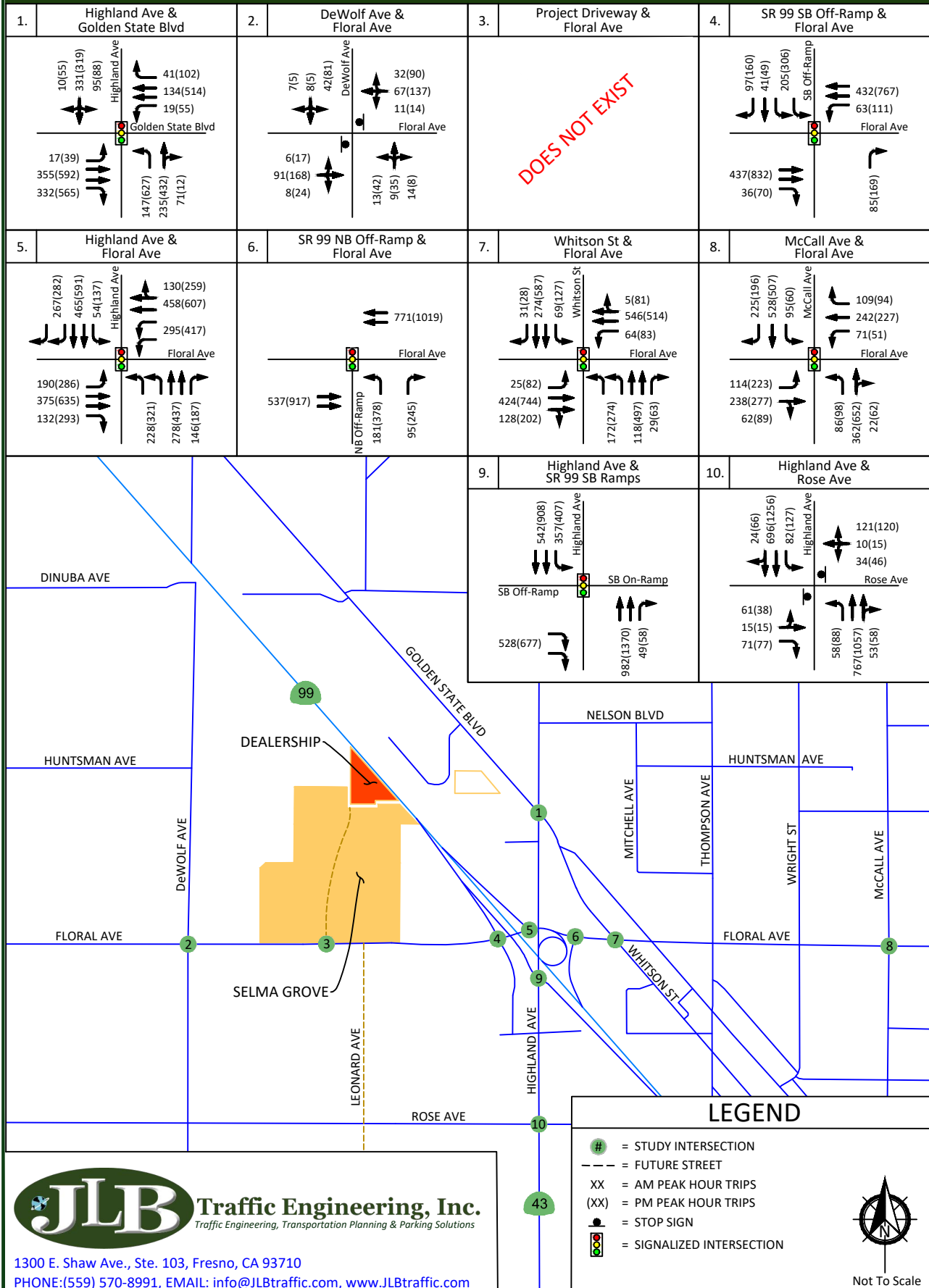
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Selma Grove Project - City of Selma

Cumulative Year 2030 No Project (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
32

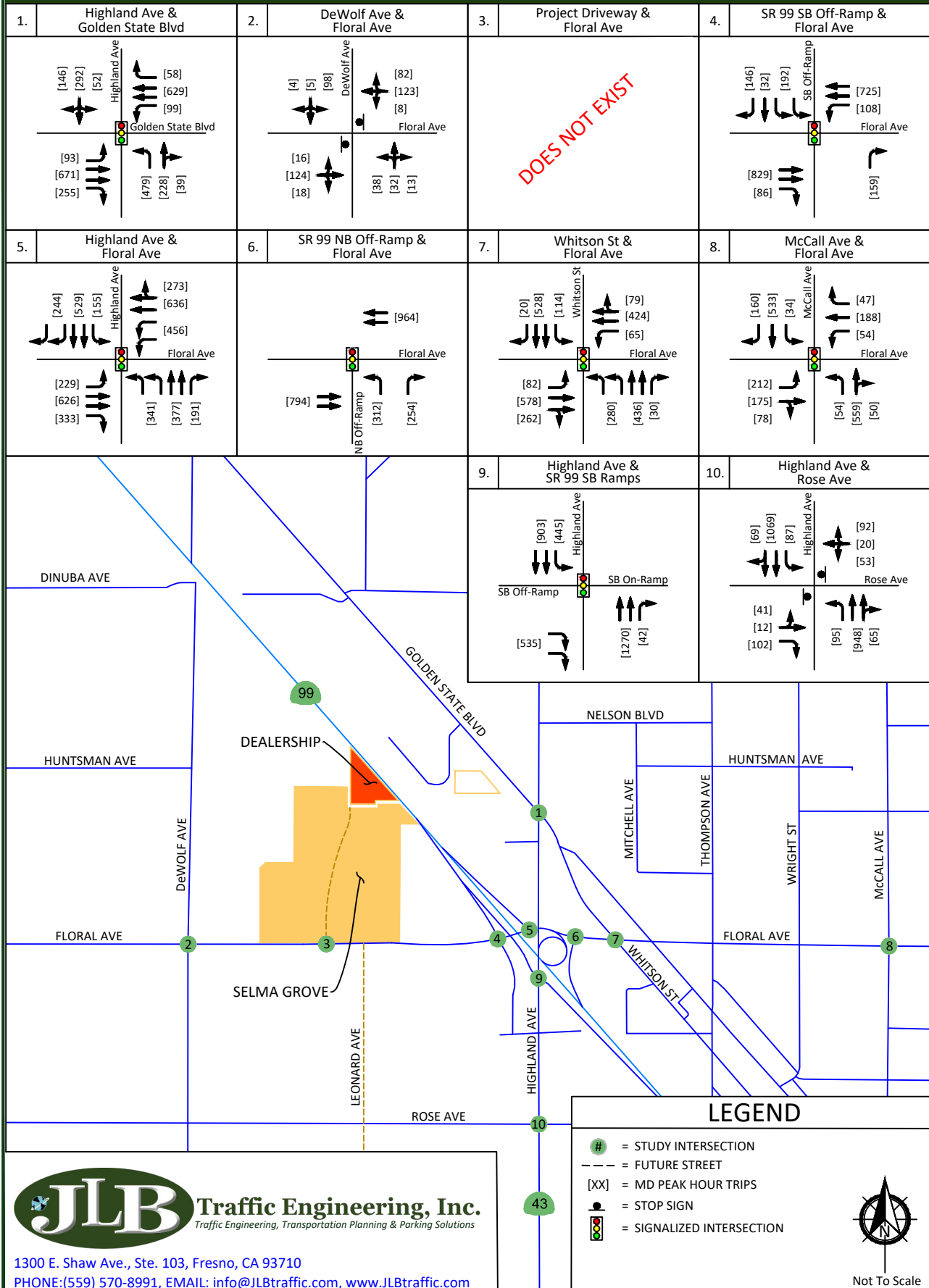


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Selma Grove Project - City of Selma

Cumulative Year 2030 No Project (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
33



Cumulative Year 2030 plus Project Buildout Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue is recommended, while signalization of the intersection of DeWolf Avenue and Floral Avenue is not recommended. It is worth noting that the CA MUTCD states that "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal." Therefore, it is recommended that prior to the installation of a traffic signal, investigation of CA MUTCD warrants 1, 4, and 7, as applicable, be conducted for the intersection of DeWolf Avenue and Floral Avenue.

Results of Cumulative Year 2030 plus Project Buildout Level of Service Analysis

The Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario. Figures 34 and 35 illustrate the Cumulative Year 2030 plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario are provided in Appendix J. Tables XXIII and XXIV present a summary of the Cumulative Year 2030 plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.

Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.



- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.



Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Table XXIII: Cumulative Year 2030 plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	86.6	F	>120.0	F
		Signalized (Mitigated)	19.4	B	52.7	D
2	DeWolf Avenue / Floral Avenue	TWSC	11.3	B	>120.0	F
		AWSC (Mitigated)	8.3	A	18.4	C
3	Project Driveway 3 / Floral Avenue	OWSC	47.5	E	>120.0	F
		Signalized (Mitigated)	23.8	C	29.6	C
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.1	B	56.2	E
		Signalized (Mitigated)	15.6	B	32.8	C
5	Highland Avenue / Floral Avenue	Signalized	61.2	E	>120.0	F
		Signalized (Mitigated)	29.3	C	52.1	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	13.0	B
7	Whitson Street / Floral Avenue	Signalized	18.1	B	46.7	D
8	McCall Avenue / Floral Avenue	Signalized	28.4	C	47.0	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	11.9	B	18.1	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	22.9	C	23.9	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXIV: Cumulative Year 2030 plus Project Buildout (Saturday) Intersection LOS Results

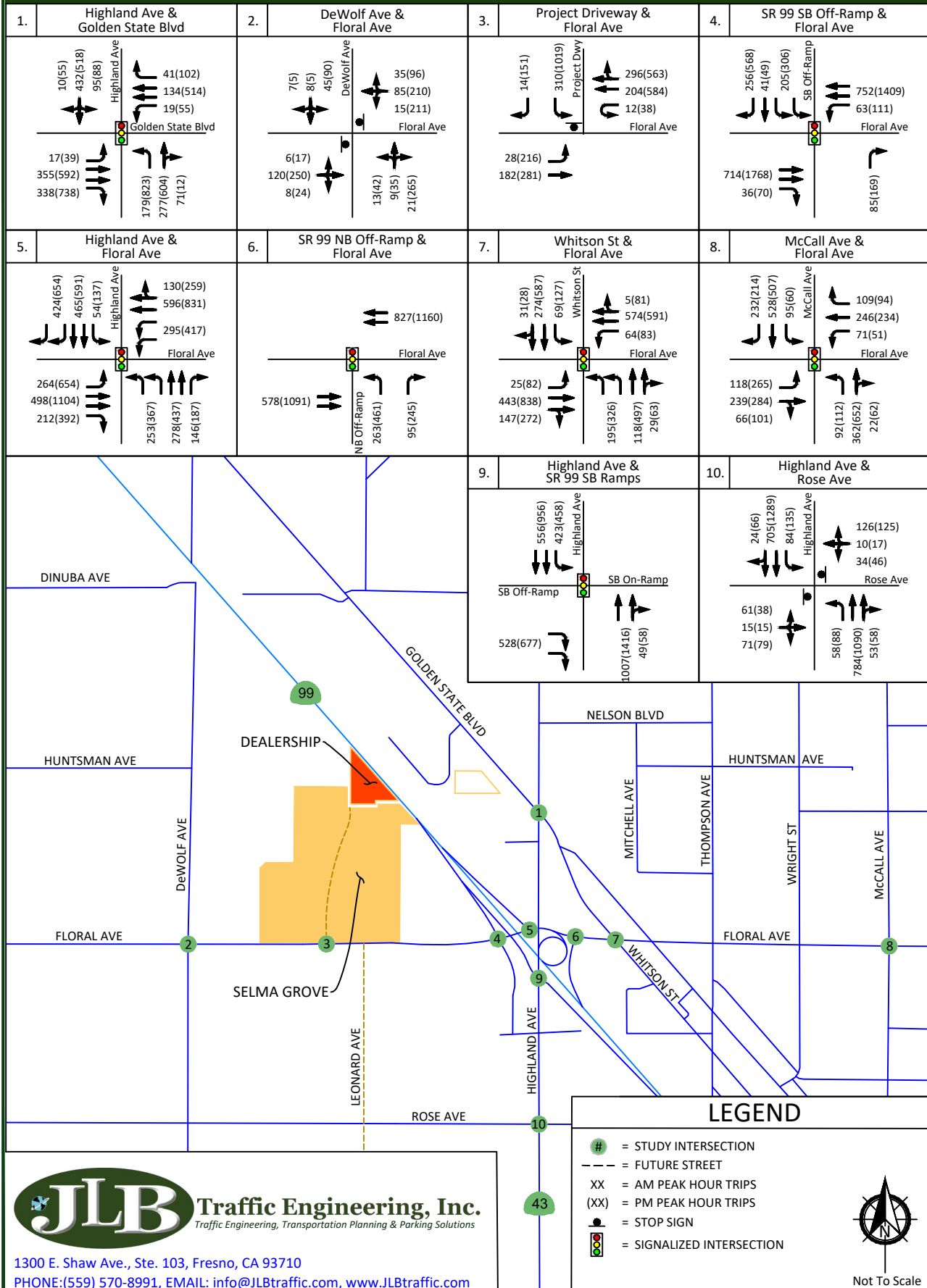
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	96.3	F
		Signalized (Mitigated)	49.0	D
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		AWSC (Mitigated)	18.0	C
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	35.6	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	79.5	E
		Signalized (Mitigated)	34.8	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.4	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	16.0	B
7	Whitson Street / Floral Avenue	Signalized	54.0	D
8	McCall Avenue / Floral Avenue	Signalized	29.0	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	15.3	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	31.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



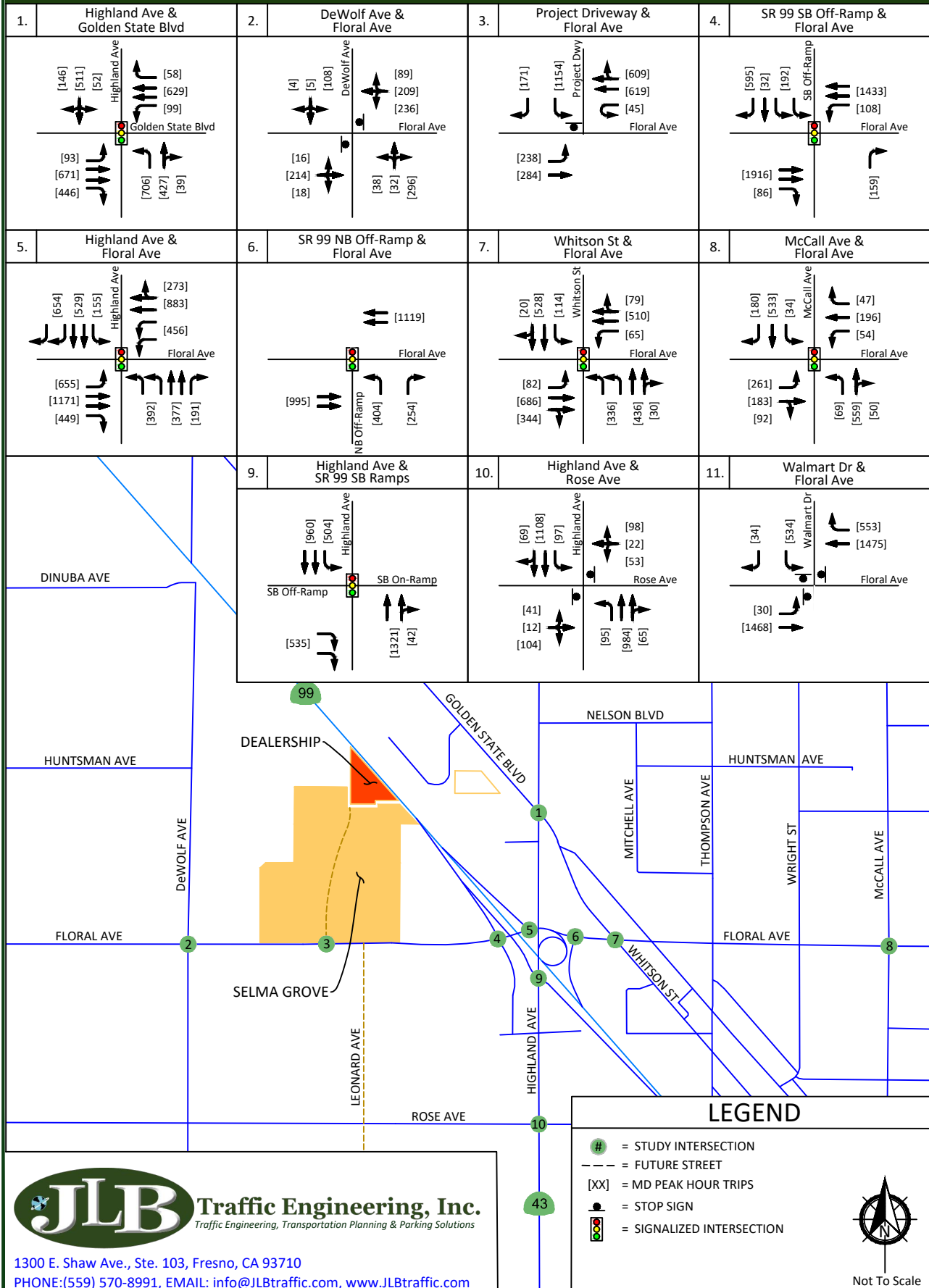
Selma Grove Project - City of Selma Cumulative Year 2030 plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
34



Selma Grove Project - City of Selma Cumulative Year 2030 plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
35



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Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

The Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project Buildout Traffic Conditions scenario with one exception. For purposes of this TIA, it is assumed that the State Route 99 and Dinuba Avenue interchange has been constructed. Considering the potential changes in the existing roadway network, it is projected that travel patterns and volumes may differ from what is anticipated for the immediate Project Buildout.

Figures 36 and 37 illustrate the Dealership Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions), and Figures 38 and 39 illustrate the Selma Grove Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively (after internal capture trip reductions). Additionally, Figures 40 and 41 illustrate the Net New Project Buildout Trips with Dinuba Avenue Interchange to the study intersections during a weekday and Saturday, respectively. It is worth noting that the Net New Project Buildout Trips with Dinuba Avenue Interchange take into account the same pass-by trip reductions at the study intersections during a weekday and Saturday, respectively, as those presented in Figures 14 through 19.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario. These warrants are found in Appendix L. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of DeWolf Avenue and Floral Avenue satisfies the peak hour signal warrant during the PM peak period on a weekday and during the MD peak period on a Saturday only, while the intersections of Project Driveway 3 and Floral Avenue and Highland Avenue and Rose Avenue satisfy the peak hour signal warrant during all peak periods on a weekday and Saturday. Based on the signal warrants and engineering judgement, signalization of these intersections is recommended.

Results of Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Level of Service Analysis

The Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario assumes the State Route 99 and Dinuba Avenue interchange has been constructed. Figures 42 and 43 illustrate the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions turning movement volumes, intersection geometrics and traffic controls during a weekday and Saturday, respectively. LOS worksheets for the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions scenario are provided in Appendix K. Tables XXV and XXVI present a summary of the Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout peak hour LOS at the study intersections during a weekday and Saturday, respectively.



Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.

- Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
- DeWolf Avenue / Floral Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through-right lane to a through-right lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a northbound left-turn lane;
 - Modify the northbound left-through-right lane to a through lane;
 - Add a northbound right-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - Implement overlap phasing of the northbound right-turn phase with the westbound left-turn phase;
 - Prohibit westbound to eastbound U-turn movements; and
 - Modify the intersection to accommodate the added lanes.
- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.



- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.

Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.

- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Project's Trip Assignment to Caltrans Facilities

Figures 44 and 45 illustrate the Dealership Trips and Selma Grove Trips to the interchange of State Route 99 at Dinuba Avenue, respectively.



Table XXV: Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Weekday) Intersection LOS Results

ID	Intersection	Intersection Control	AM Peak Hour		PM Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	53.8	D	>120.0	F
		Signalized (Mitigated)	20.2	C	47.7	D
2	DeWolf Avenue / Floral Avenue	TWSC	15.2	C	>120.0	F
		Signalized (Mitigated)	47.4	D	42.0	D
3	Project Driveway 3 / Floral Avenue	OWSC	59.0	F	>120.0	F
		Signalized (Mitigated)	18.8	B	40.3	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	16.0	B	40.5	D
		Signalized (Mitigated)	15.5	B	27.0	C
5	Highland Avenue / Floral Avenue	Signalized	41.5	D	107.4	F
		Signalized (Mitigated)	24.4	C	47.9	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	7.8	A	16.7	B
7	Whitson Street / Floral Avenue	Signalized	18.0	B	32.9	C
8	McCall Avenue / Floral Avenue	Signalized	28.0	C	43.8	D
9	Highland Avenue / SR 99 SB Ramps	Signalized	11.9	B	17.9	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F	>120.0	F
		Signalized (Mitigated)	22.7	C	24.0	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Table XXVI: Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Saturday) Intersection LOS Results

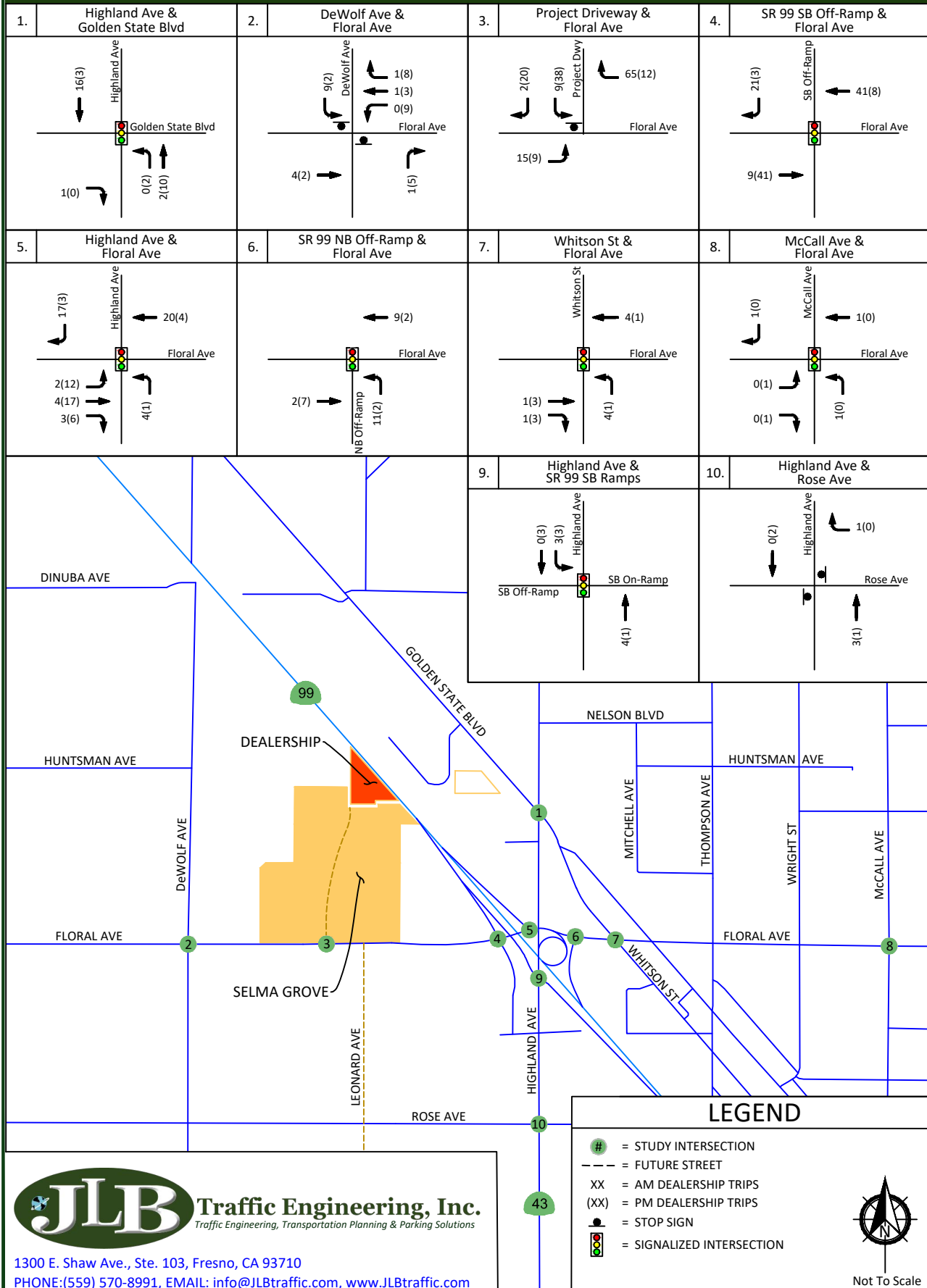
ID	Intersection	Intersection Control	MD Peak Hour	
			Average Delay (sec/veh)	LOS
1	Highland Avenue / Golden State Boulevard	Signalized	84.0	F
		Signalized (Mitigated)	51.9	D
2	DeWolf Avenue / Floral Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	41.2	D
3	Project Driveway 3 / Floral Avenue	OWSC	>120.0	F
		Signalized (Mitigated)	46.1	D
4	SR 99 SB Off-Ramp / Floral Avenue	Signalized	51.1	D
		Signalized (Mitigated)	24.4	C
5	Highland Avenue / Floral Avenue	Signalized	>120.0	F
		Signalized (Mitigated)	52.6	D
6	SR 99 NB Off-Ramp / Floral Avenue	Signalized	17.2	B
7	Whitson Street / Floral Avenue	Signalized	50.3	D
8	McCall Avenue / Floral Avenue	Signalized	25.7	C
9	Highland Avenue / SR 99 SB Ramps	Signalized	16.8	B
10	Highland Avenue / Rose Avenue	TWSC	>120.0	F
		Signalized (Mitigated)	31.6	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Selma Grove Project - City of Selma Dealership Trips with Dinuba Avenue Interchange (Weekday)

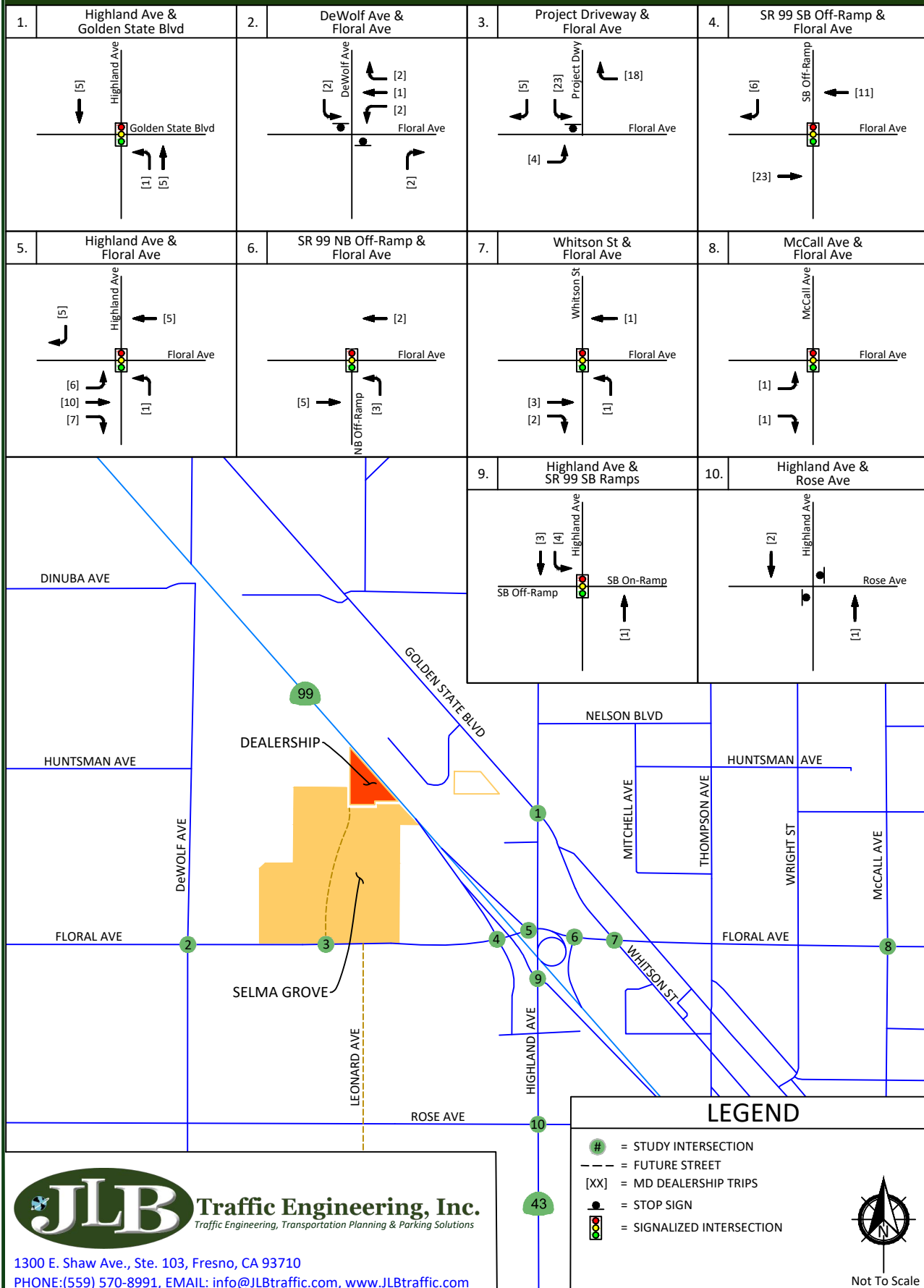
Figure
36



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Selma Grove Project - City of Selma Dealership Trips with Dinuba Avenue Interchange (Saturday)

Figure
37



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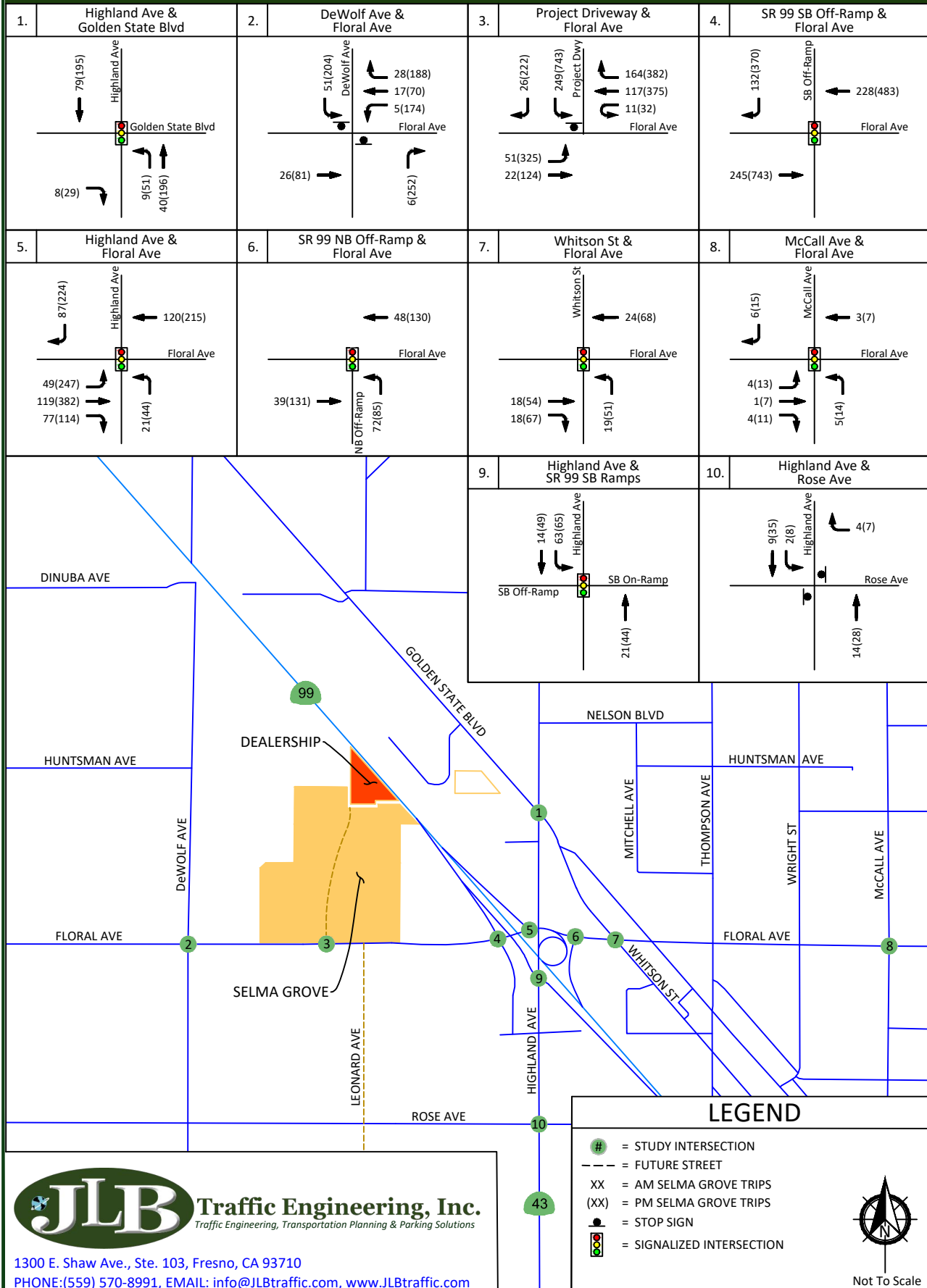
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Selma Grove Project - City of Selma

Selma Grove Trips with Dinuba Avenue Interchange (Weekday)

Figure
38



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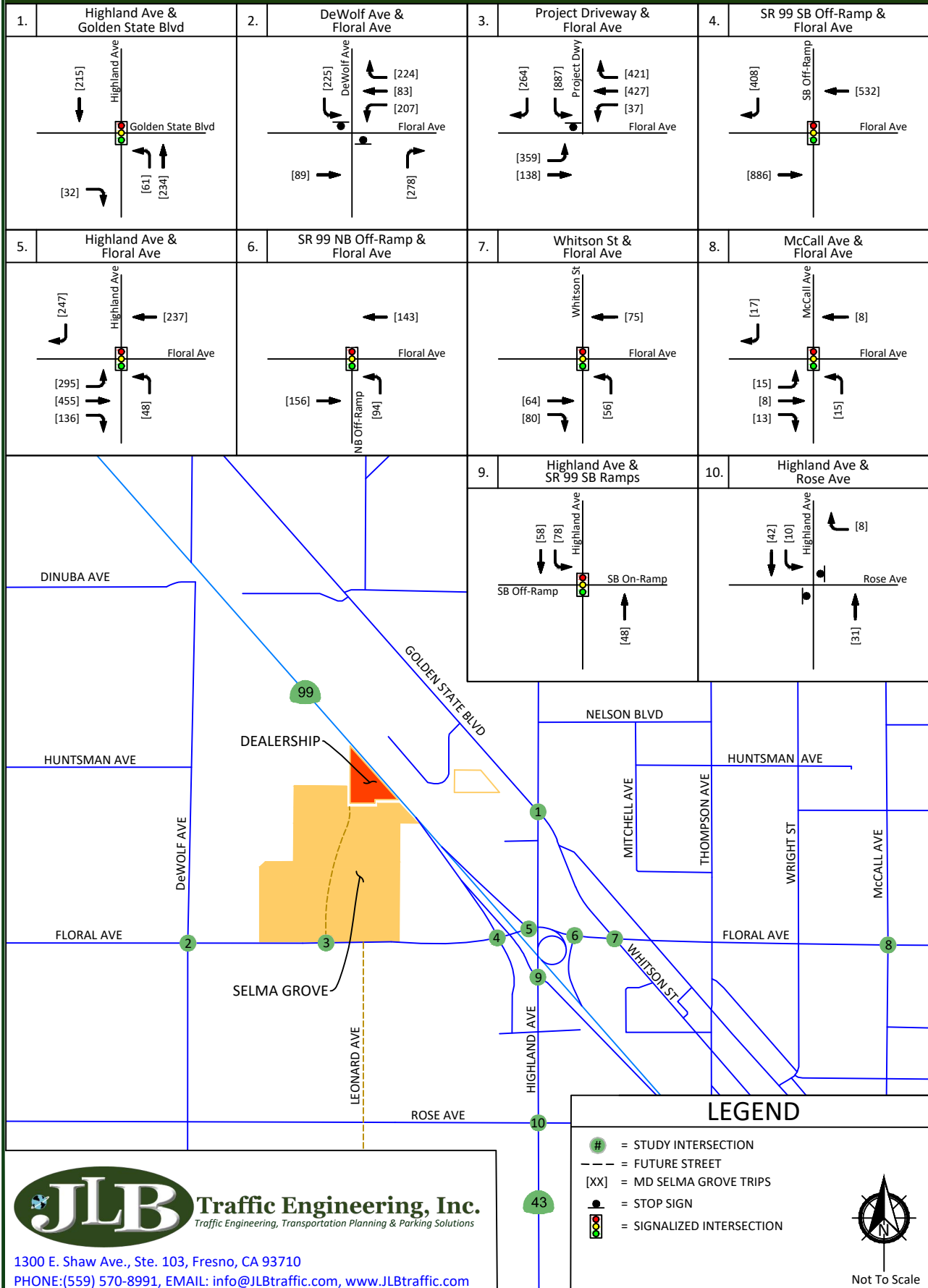
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Selma Grove Project - City of Selma

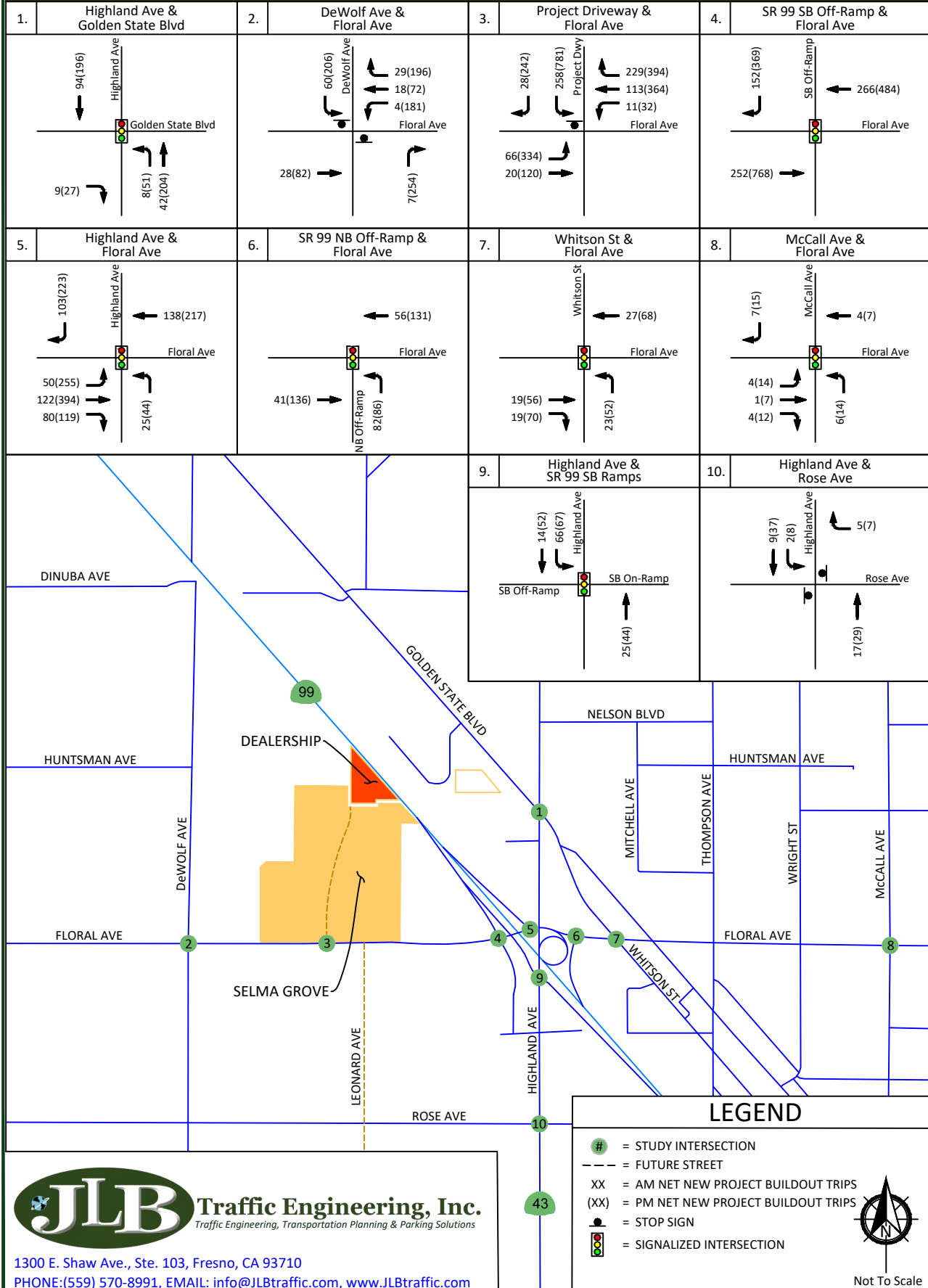
Selma Grove Trips with Dinuba Avenue Interchange (Saturday)

Figure
39



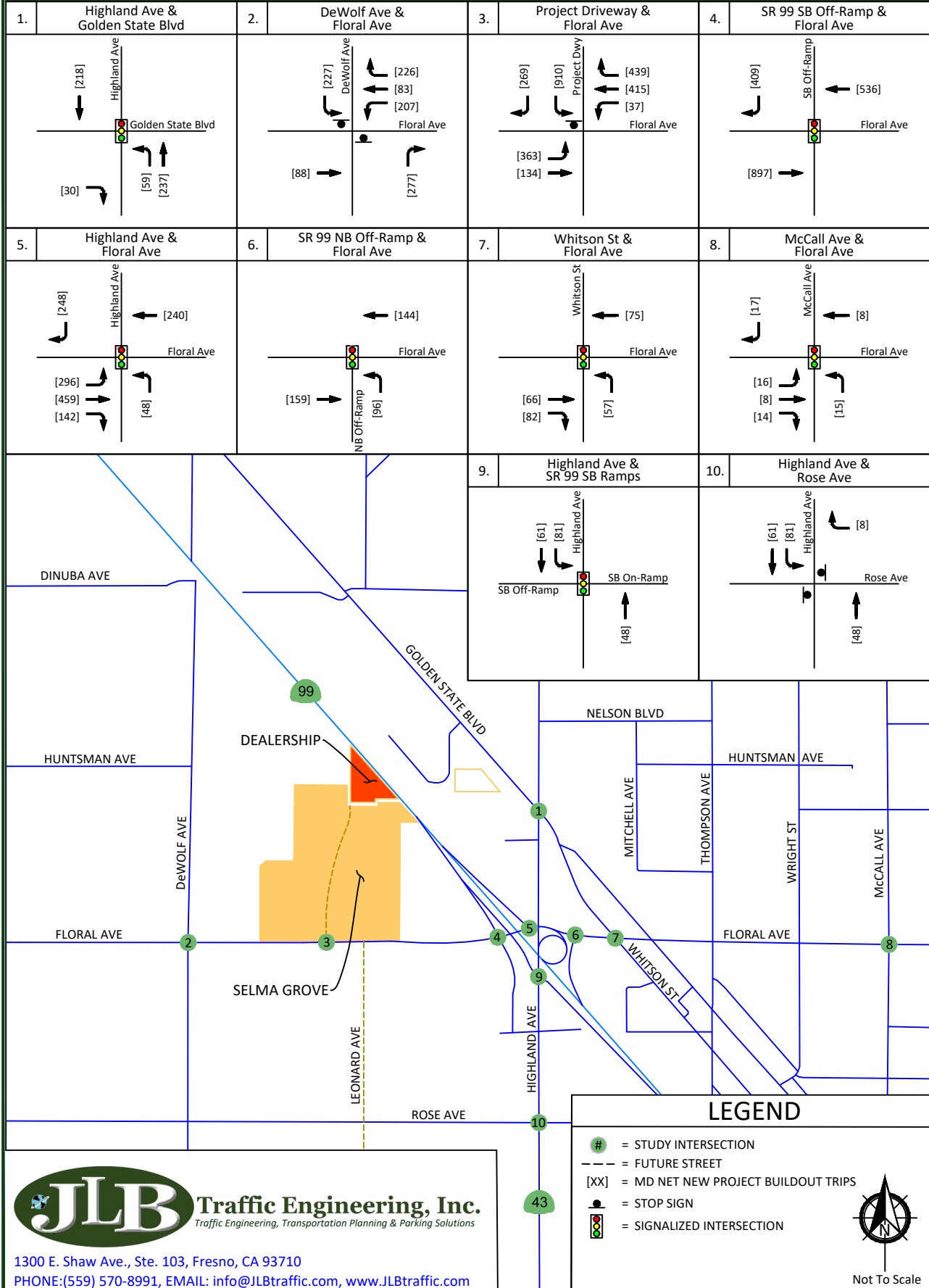
Selma Grove Project - City of Selma Net New Project Buildout Trips with Dinuba Avenue Interchange (Weekday)

Figure
40



Selma Grove Project - City of Selma Net New Project Buildout Trips with Dinuba Avenue Interchange (Saturday)

Figure
41



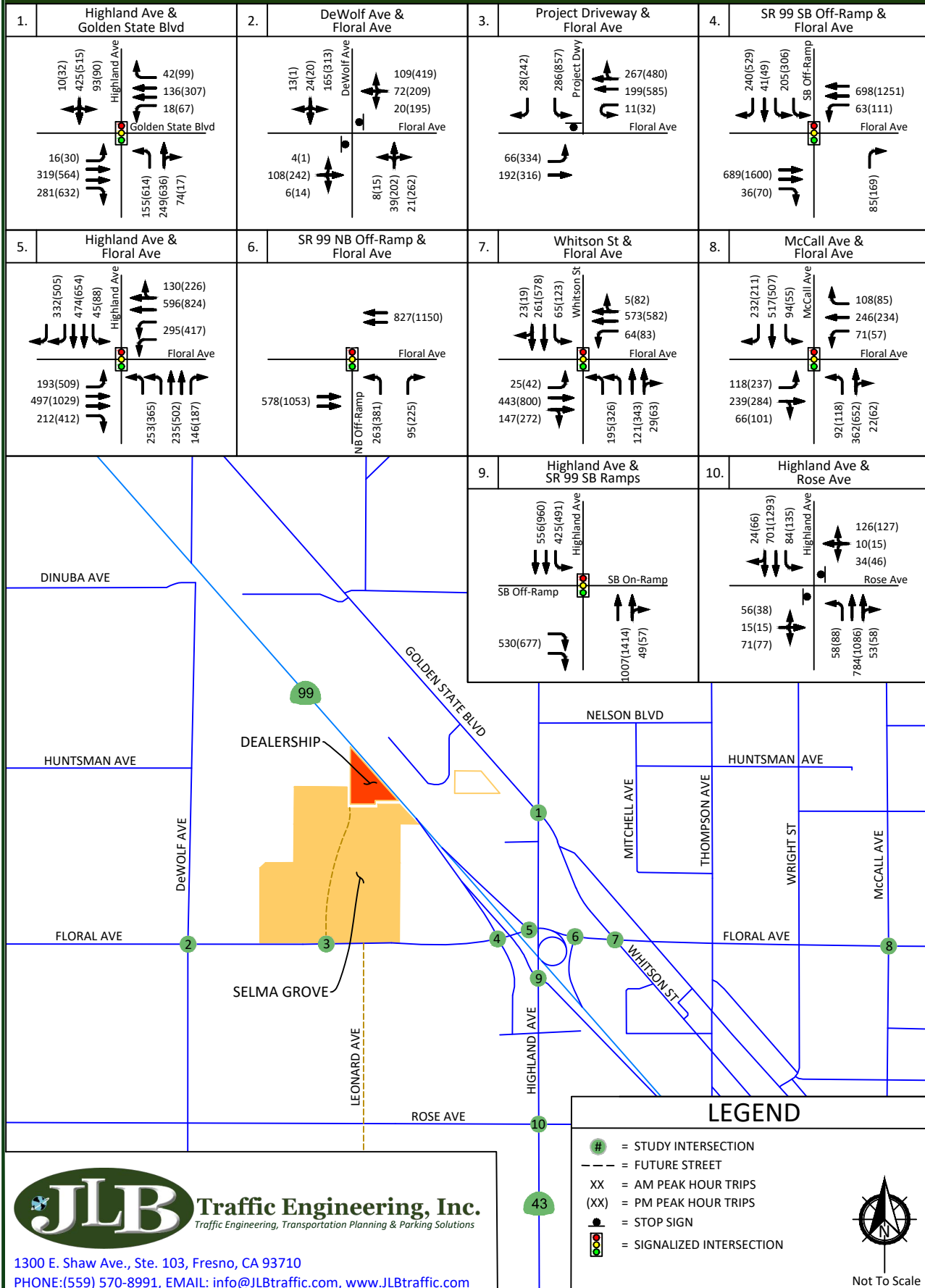
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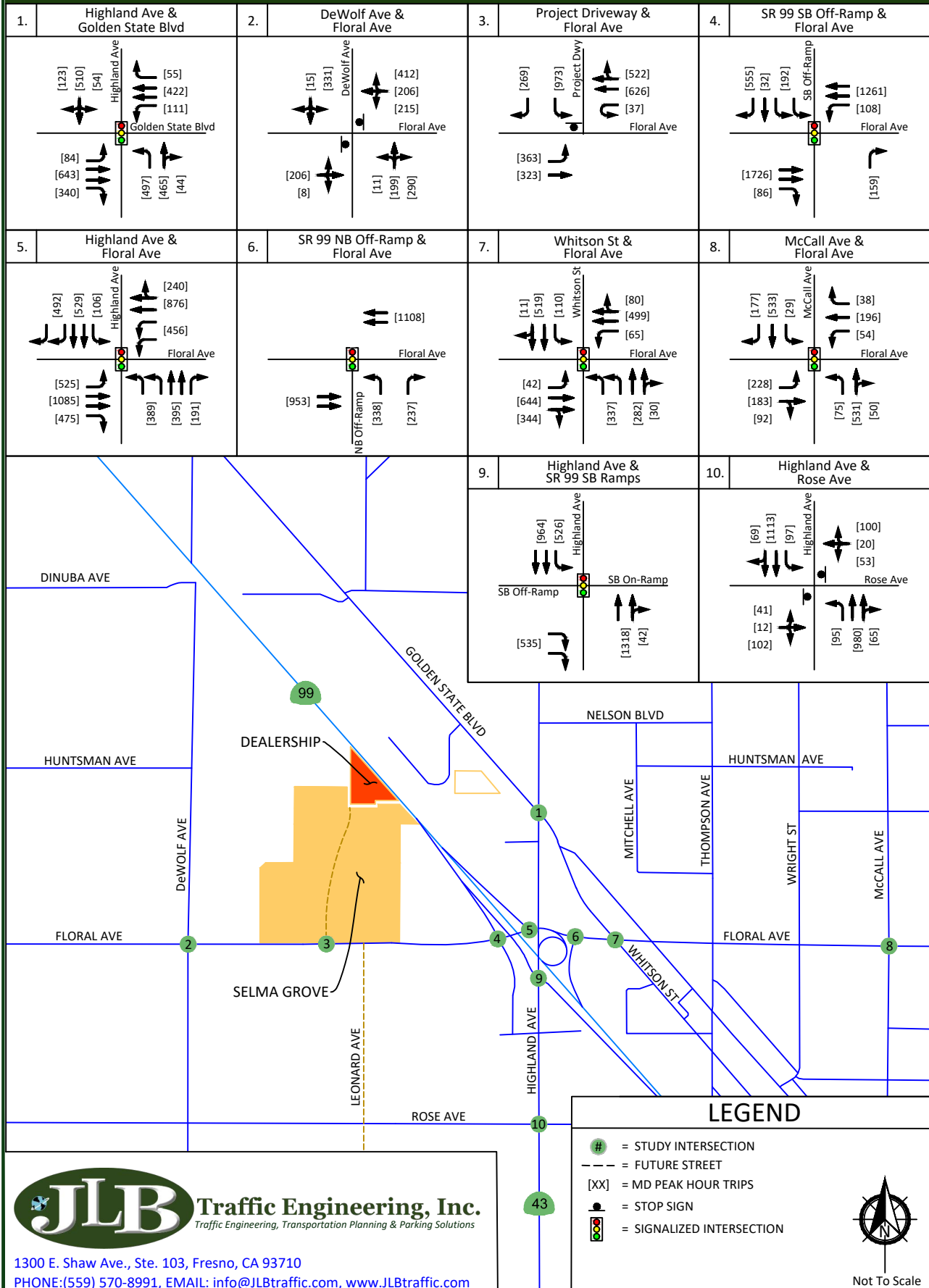
Selma Grove Project - City of Selma Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Weekday) - Traffic Volumes, Geometrics and Controls

Figure
42

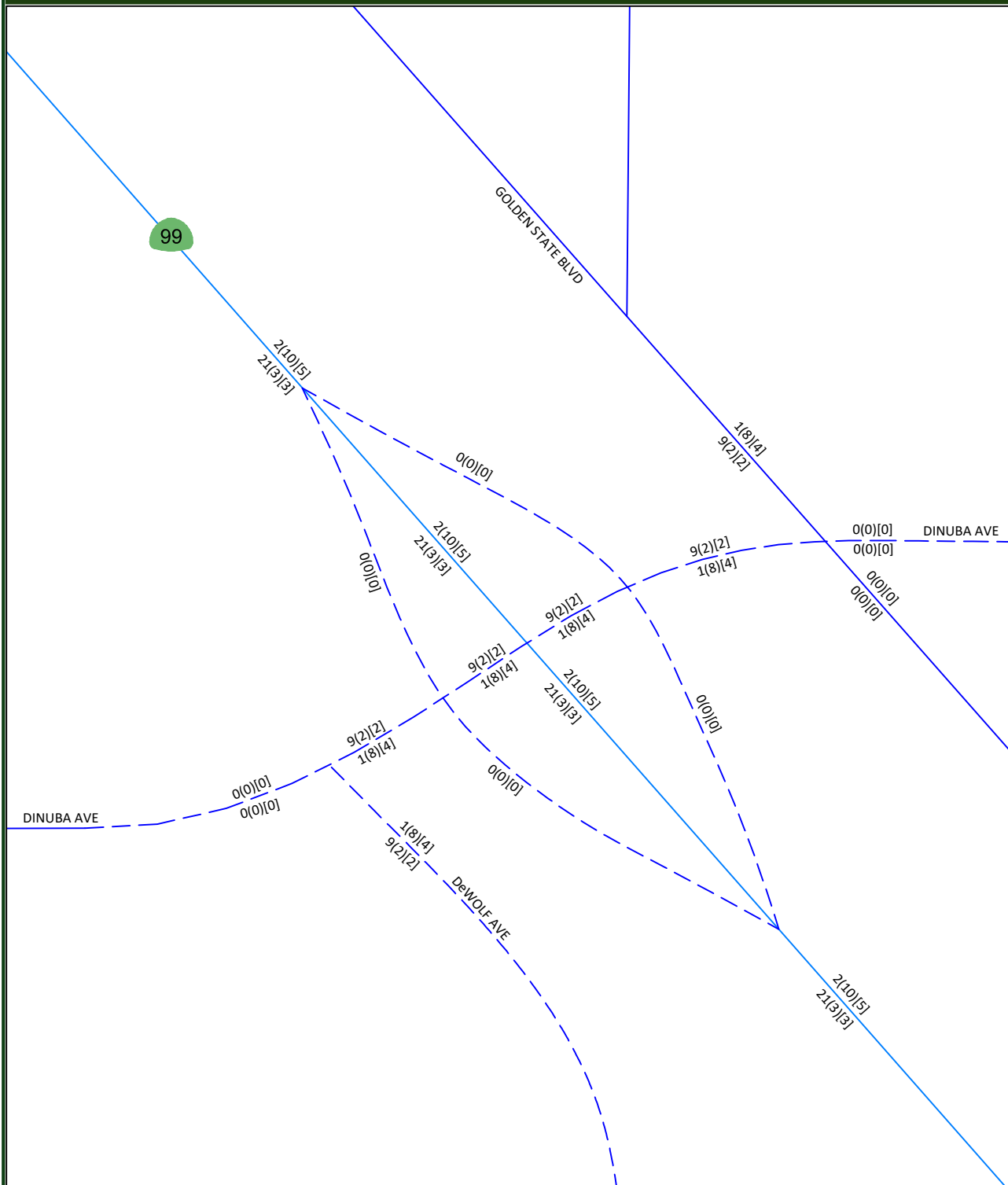


Selma Grove Project - City of Selma Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout (Saturday) - Traffic Volumes, Geometrics and Controls

Figure
43



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LEGEND

XX = AM DEALERSHIP TRIPS
(XX) = PM DEALERSHIP TRIPS
[XX] = MD DEALERSHIP TRIPS



Not To Scale

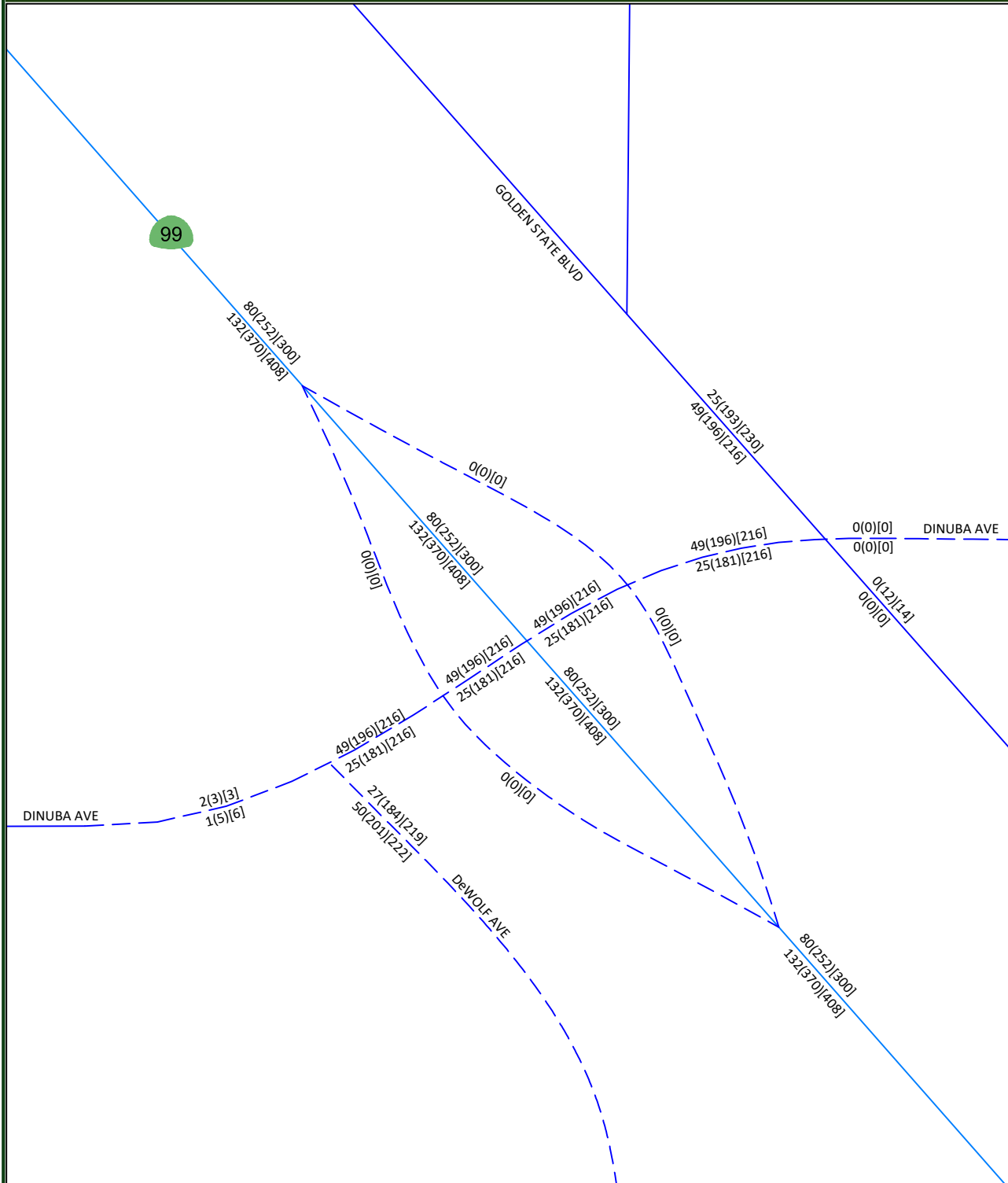


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Selma Grove Project - City of Selma

State Route 99 at Dinuba Avenue Interchange - Selma Grove Trips

Figure
45



LEGEND

XX = AM DEALERSHIP TRIPS
(XX) = PM DEALERSHIP TRIPS
[XX] = MD DEALERSHIP TRIPS



Not To Scale



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Queuing Analysis

Table XXVII provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the LOS worksheets for the respective scenarios. Appendix D contains the methodologies used to evaluate these intersections. Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, “the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes.” The queues shown on Table XXVII are the 95th percentile queue lengths for the respective lane movements.

The Highway Design Manual (HDM) provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, “tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane.” Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table XXVII.

Based on the SimTraffic output files and engineering judgement, it is recommended that the storage capacity for the following be considered for the Cumulative Year 2030 plus Project Traffic Conditions scenario. While the City of Selma does not have minimum storage length requirements for left-turn and right-turn lanes on major streets, it is recommended that these be set at 200 feet for left-turns and 75 feet for right-turns. At the remaining approaches of the study intersections, the greater of the existing storage capacity or the 200-foot left-turn lanes and 75-foot right-turn lanes will be sufficient to accommodate the maximum queue.

- Highland Avenue / Golden State Boulevard
 - Consider increasing the storage capacity of the southeastbound right-turn lane to 250 feet.
 - Consider increasing the storage capacity of the northwestbound left-turn lane to 150 feet.
 - Consider setting the storage capacity of the northbound dual left-turn lanes to 300 feet.
 - Consider setting the storage capacity of the southbound left-turn lane to 275 feet.
- Project Driveway 3 / Floral Avenue
 - Consider setting the storage capacity of the eastbound left-turn lane to 275 feet.
 - Consider setting the storage capacity of the westbound right-turn lane to 350 feet.
 - Consider setting the storage capacity of the southbound dual left-turn lanes to 375 feet.
 - In an effort to improve onsite and offsite traffic operations and circulations, it is recommended that Project Driveway 3 have a minimum throat depth of 375 feet before any vehicular openings to the adjacent parking lots.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - The existing storage capacity of the eastbound right-turn lane is projected to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. While there are no constraints to increasing the storage capacity of this movement, it is recommended that this movement be monitored.



- The existing storage capacity of the westbound left-turn lane is projected to exceed that available during the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. However, the storage capacity of this left-turn lane cannot be increased without reducing the storage capacity of the eastbound left-turn lane at the intersection of Highland Avenue and Floral Avenue or increasing the width of the State Route 99 overpass. Therefore, it is recommended that this movement be monitored.
- Highland Avenue / Floral Avenue
 - Consider setting the storage capacity of the eastbound dual left-turn lanes to 150 feet. While the projected queueing demand for this movement is anticipated to be 204 feet, increasing the storage capacity is not possible without impacting the existing storage capacity of the westbound left-turn lane at the intersection of State Route 99 Southbound Off-Ramp and Floral Avenue.
 - Consider increasing the storage capacity of the eastbound right-turn lane to 100 feet. While the projected queueing demand for this movement is anticipated to be 201 feet, increasing the storage capacity is not possible without modifying the State Route 99 overpass.
 - The existing storage capacity of the westbound dual left-turn lanes is projected to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the existing eastbound left-turn pocket immediately to the east. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider setting the storage capacity of the westbound right-turn lane to 150 feet. While the projected queueing demand for this movement is anticipated to be 314 feet, increasing the storage capacity is not possible without impacting the businesses and driveways immediately to the north. Therefore, this cumulative impact would be considered significant but unavoidable.
 - While the projected queueing demand for the northbound dual left-turn lanes is anticipated to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the State Route 99 overpass. Therefore, this cumulative impact would be considered significant but unavoidable.
 - While the projected queueing demand for the northbound right-turn lane is anticipated to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible due to the State Route 99 Northbound On-Ramp immediately to the south. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider increasing the storage capacity of the southbound left-turn lane to 250 feet.
 - Consider increasing the storage capacity of the southbound dual right-turn lanes to 225 feet.
- State Route 99 Northbound Off-Ramp / Floral Avenue
 - Consider increasing the storage capacity of the northbound right-turn lane to 350 feet.



- Whitson Street / Floral Avenue
 - Consider increasing the storage capacity of the eastbound left-turn lane to 125 feet.
 - Consider increasing the storage capacity of the westbound left-turn lane to 175 feet.
 - While the projected queueing demand for the northwestbound dual left-turn lanes is anticipated to exceed that available during the PM peak period on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the southeastbound left-turn lane immediately to the south. Therefore, this cumulative impact would be considered significant but unavoidable.
 - Consider increasing the storage capacity of the northwestbound right-turn lane to 150 feet.
 - Consider increasing the storage capacity of the southeastbound left-turn lane 225 feet.
 - Consider increasing the storage capacity of the southeastbound right-turn lane to 125 feet.
- McCall Avenue / Floral Avenue
 - Consider increasing the storage capacity of the eastbound left-turn lane to 250 feet.
 - Consider increasing the storage capacity of the westbound left-turn lane to 125 feet.
 - Consider increasing the storage capacity of the westbound right-turn lane to 125 feet.
 - Consider increasing the storage capacity of the northbound left-turn lane to 175 feet.
 - Consider increasing the storage capacity of the southbound left-turn lane to 200 feet.
- Highland Avenue / State Route 99 Southbound Ramps
 - Consider increasing the storage capacity of the eastbound dual right-turn lanes to 300 feet.
 - While the projected queueing demand for the southbound left-turn lane is anticipated to exceed that available during the AM and PM peak periods on a weekday and the MD peak period on a Saturday under the Cumulative Year 2030 plus Project Buildout Traffic Conditions scenario, increasing the storage capacity of this movement is not possible without impacting the State Route 99 overpass. Therefore, this cumulative impact would be considered significant but unavoidable.



Table XXVII: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing			Existing plus Dealership			Existing plus Project Buildout			Near Term Year 2025 plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
1	Highland Avenue / Golden State Boulevard	SE Left	200	0	9	40	0	6	36	0	23	62	0	9	30
		SE Right	100	11	35	0	19	22	0	46	113	42	6	132	57
		NW Left	75	11	15	21	3	6	24	5	9	62	5	0	86
		NW Right	120	8	0	0	0	4	0	2	29	0	0	0	0
		NB Left	140	57	77	27	52	123	32	88	183	167	80	230	222
		NB Dual Lefts	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Right	50	0	0	0	0	0	31	23	0	59	*	*	*
		SB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		SB Right	35	0	41	65	25	0	0	0	0	116	*	*	*
2	DeWolf Avenue / Floral Avenue	EB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		WB Left	*	*	*	*	*	*	*	*	*	*	24	79	80
		WB Right	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
		NB Right	*	*	*	*	*	*	*	*	*	*	*	*	*
		SB Left	*	*	*	*	*	*	*	*	*	*	*	*	*
3	Project Driveway 3 / Floral Avenue	EB Left	*	*	*	*	*	*	*	37	226	220	42	205	386
		WB U/Left	*	*	*	*	*	*	*	29	73	65	38	146	97
		WB Right	*	*	*	*	*	*	*	62	198	230	76	212	288
		SB Dual Lefts	*	*	*	*	*	*	*	74	315	335	87	278	335
		SB Right	>300	*	*	*	*	*	*	19	168	265	17	54	50
4	SR 99 SB Off-Ramp / Floral Avenue	EB Right	100	22	27	30	28	28	33	22	295	296	14	254	232
		WB Left	160	54	106	113	69	129	75	78	202	198	86	188	125
		NB Right	>300	46	97	74	43	113	89	47	171	143	61	159	163
		SB Dual Lefts	380	73	127	75	79	113	110	85	236	153	104	624	192
		SB Right	380	48	66	69	69	58	60	69	190	161	71	403	292

Note: * = Does not exist or is not projected to exist



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Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing			Existing plus Dealership			Existing plus Project Buildout			Near Term Year 2025 plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
5	Highland Avenue / Floral Avenue	EB Left	105	113	260	179	127	251	145	*	*	*	*	*	*
		EB Dual Lefts	*	*	*	*	*	*	*	109	208	209	104	205	242
		EB Right	40	28	130	112	38	175	93	89	216	221	85	200	208
		WB Dual Lefts	150	88	75	78	67	84	57	68	148	121	153	256	241
		WB Right	*	*	*	*	*	*	*	42	55	52	123	303	285
		NB Dual Lefts	170	52	86	55	58	73	61	55	117	108	179	274	284
		NB Right	80	47	42	51	41	59	45	42	72	55	99	149	119
		SB Left	100	54	73	80	53	105	97	68	85	104	68	219	226
		SB Dual Rights	100	61	71	60	60	82	80	85	183	171	124	204	204
6	SR 99 NB Off-Ramp / Floral Avenue	NB Left	>500	97	98	72	79	98	120	101	504	388	125	485	413
		NB Right	25	70	68	64	65	65	62	68	75	66	61	282	279
7	Whitson Street / Floral Avenue	EB Left	80	22	41	60	33	72	46	23	90	67	36	110	73
		WB Left	100	41	106	37	72	64	60	44	102	53	89	148	131
		NW Dual Lefts	120	26	82	65	40	99	59	39	155	95	58	184	206
		NW Right	100	0	0	0	0	0	0	0	25	0	0	0	0
		SE Left	120	46	53	38	53	83	66	54	78	51	38	103	79
		SE Right	70	0	0	0	0	0	0	0	0	0	0	0	0
8	McCall Avenue / Floral Avenue	EB Left	100	135	142	137	113	183	149	113	207	169	122	249	217
		WB Left	100	82	59	48	70	57	40	66	49	45	109	86	113
		WB Right	100	100	70	54	101	66	43	67	99	49	105	154	99
		NB Left	65	140	105	58	125	140	69	126	112	71	139	152	152
		SB Left	120	148	70	44	113	101	47	87	87	45	162	164	118
		SB Right	>500	78	70	56	98	55	47	69	85	47	98	108	68
9	Highland Avenue / SR 99 SB Ramps	EB Dual Rights	175	91	121	124	146	162	102	112	134	114	251	222	204
		NB Right	300	0	0	0	0	0	0	0	0	0	0	250	0
		SB Left	65	97	126	104	97	129	106	114	135	131	155	150	157
10	Highland Avenue / Rose Avenue	EB Left	*	15	19	14	16	12	21	23	16	23	75	70	58
		WB Left	*	41	42	36	46	49	44	45	53	45	78	84	58
		NB Left	250	14	35	13	0	25	10	8	17	24	97	110	99
		SB Left	250	79	108	94	71	91	117	90	101	136	111	180	84

Note: * = Does not exist or is not projected to exist



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Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Cumulative Year 2030 No Project Buildout			Cumulative Year 2030 plus Project Buildout			Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD
1	Highland Avenue / Golden State Boulevard	SE Left	200	8	35	176	6	20	102	0	101	67
		SE Right	100	91	246	246	60	255	202	10	236	174
		NW Left	75	1	59	134	0	46	135	2	74	119
		NW Right	120	12	74	0	0	17	72	0	4	0
		NB Left	140	*	*	*	*	*	*	*	*	*
		NB Dual Lefts	*	77	214	206	45	287	238	55	306	163
		NB Right	50	58	48	35	*	*	*	70	38	122
		SB Left	*	*	*	*	62	271	63	73	110	194
		SB Right	35	78	105	121	*	*	*	*	*	*
2	DeWolf Avenue / Floral Avenue	EB Left	*	*	*	*	*	*	*	19	10	*
		WB Left	*	*	*	*	27	92	92	46	185	253
		WB Right	*	*	*	*	*	*	*	28	223	194
		NB Left	*	*	*	*	*	*	*	27	39	35
		NB Right	*	*	*	*	*	*	*	33	178	136
		SB Left	*	*	*	*	*	*	*	187	278	326
3	Project Driveway 3 / Floral Avenue	EB Left	*	*	*	*	47	222	265	96	360	363
		WB U/Left	*	*	*	*	26	70	150	39	70	441
		WB Right	*	*	*	*	75	225	353	92	208	477
		SB Dual Lefts	*	*	*	*	80	330	372	136	368	417
		SB Right	>300	*	*	*	20	53	67	32	87	99
4	SR 99 SB Off-Ramp / Floral Avenue	EB Right	100	22	24	28	15	203	296	28	255	270
		WB Left	160	66	104	91	65	160	177	87	142	190
		NB Right	>300	45	105	97	31	151	158	58	191	145
		SB Dual Lefts	380	80	111	82	75	341	195	77	438	192
		SB Right	380	63	94	68	71	243	237	60	205	315

Note: * = Does not exist or is not projected to exist



Table XXVII: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Cumulative Year 2030 No Project Buildout			Cumulative Year 2030 plus Project Buildout			Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout		
				AM	PM	MD	AM	PM	MD	AM	PM	MD
5	Highland Avenue / Floral Avenue	EB Left	105	*	*	*	*	*	*	*	*	*
		EB Dual Lefts	*	108	206	200	137	200	204	130	201	229
		EB Right	40	81	204	199	67	201	185	88	193	210
		WB Dual Lefts	150	138	234	252	172	251	232	142	251	231
		WB Right	*	*	*	*	162	314	292	121	239	286
		NB Dual Lefts	170	120	307	263	163	309	268	151	295	278
		NB Right	80	84	109	150	108	142	141	87	139	124
		SB Left	100	102	246	185	94	253	226	121	227	145
		SB Dual Rights	100	98	137	125	146	216	197	88	192	164
6	SR 99 NB Off-Ramp / Floral Avenue	NB Left	>500	80	241	204	139	583	897	122	404	302
		NB Right	25	59	120	107	65	341	351	57	260	218
7	Whitson Street / Floral Avenue	EB Left	80	61	132	117	35	81	115	36	103	88
		WB Left	100	80	128	126	106	152	156	61	136	115
		NW Dual Lefts	120	61	194	195	57	268	218	52	156	202
		NW Right	100	0	89	16	0	147	72	0	49	0
		SE Left	120	50	140	128	70	210	123	64	172	201
		SE Right	70	0	46	67	0	108	46	0	67	46
8	McCall Avenue / Floral Avenue	EB Left	100	183	232	209	190	249	202	183	234	211
		WB Left	100	91	70	79	98	114	87	90	122	79
		WB Right	100	154	117	59	106	111	128	114	123	49
		NB Left	65	132	157	120	145	155	127	126	149	130
		SB Left	120	132	140	97	205	160	59	205	193	46
		SB Right	>500	79	99	76	153	98	60	102	89	58
9	Highland Avenue / SR 99 SB Ramps	EB Dual Rights	175	236	228	302	263	240	203	423	200	195
		NB Right	300	0	467	0	0	0	0	0	328	0
		SB Left	65	157	160	152	171	150	152	168	144	156
10	Highland Avenue / Rose Avenue	EB Left	*	119	61	66	93	68	62	80	66	67
		WB Left	*	63	74	108	61	65	75	60	79	79
		NB Left	250	76	107	187	68	112	129	90	116	92
		SB Left	250	133	232	132	105	129	132	106	157	137

Note: * = Does not exist or is not projected to exist



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Project Buildout's Equitable Fair Share of Future Transportation Improvements

The existing Dealership Project and Selma Grove Project's fair share percentage impacts to study intersections projected to fall below their LOS threshold and that are not covered by an existing impact fee program are provided in Tables XXVIII and XXIX for the existing Dealership Project and proposed Selma Grove Project, respectively. The existing Dealership Project and proposed Selma Grove Project's fair share percentage impacts were calculated pursuant to the Caltrans Guide for the Preparation of Traffic Impact Studies. The existing Dealership Project and proposed Selma Grove Project's pro-rata fair shares were calculated utilizing the Existing volumes, Net New Dealership Trips, Net New Selma Grove Trips, and Cumulative Year 2030 plus Project Buildout volumes. Figures 2 and 3 illustrate the Existing traffic volumes during a weekday and Saturday, respectively, Figures 20 and 21 illustrate the Net New Dealership Trips during a weekday and Saturday, respectively, Figures 22 and 23 illustrate the Net New Selma Grove Trips during a weekday and Saturday, respectively, and Figures 34 and 35 illustrate the Cumulative Year 2030 plus Project Buildout traffic volumes during a weekday and Saturday, respectively. Since the critical peak period for the study facilities was determined to be during the MD peak period on a Saturday, the MD peak volumes are utilized to determine the existing Dealership Project and proposed Selma Grove Project's pro-rata fair share.

It is recommended that the existing Dealership Project and proposed Selma Grove Project's contribute their equitable fair share as listed in Tables XXVIII and XXIX, respectively, for the future improvements necessary to maintain an acceptable LOS. However, fair share contributions should only be made for those facilities or portion thereof currently not funded by the responsible agencies roadway impact fee program(s), as appropriate. For those improvements not presently covered by local and regional roadway impact fee programs, it is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable fair share. Payment of the existing Dealership Project and proposed Selma Grove Project's equitable fair share in addition to the local and regional impact fee programs would satisfy the existing Dealership Project and proposed Selma Grove Project's traffic mitigation measures.

This study does not provide construction costs for the recommended mitigation measures; therefore, it is recommended that the developer work with the City of Selma to develop the estimated construction costs for each of the study facilities that are impacted by the proposed Project. It is also recommended that the construction costs include an annual rate increase to account for current trends in construction cost increases. While the City may elect to collect a fair share contribution for some study facilities, it may require that the Project construct the necessary improvements to achieve an acceptable LOS at others.



Table XXVIII: Dealership's Fair Share of Future Roadway Improvements

<i>ID</i>	<i>Intersection</i>	<i>Existing Traffic Volumes (MD Peak)</i>	<i>Cumulative Year 2030 plus Project Buildout Traffic Volumes (MD Peak)</i>	<i>Net New Dealership Trips (MD Peak)</i>	<i>Project's Fair Share (%)</i>
1	Highland Avenue / Golden State Boulevard	1,023	3,877	13	0.46%
2	DeWolf Avenue / Floral Avenue	241	1,265	14	1.37%
4	SR 99 SB Off-Ramp / Floral Avenue	1,611	4,521	36	1.24%
5	Highland Avenue / Floral Avenue	2,262	6,185	32	0.82%
10	Highland Avenue / Rose Avenue	1,184	2,748	2	0.13%
11	Walmart Driveway / Floral Avenue	1,087	4,094	36	1.20%

Note: Project Fair Share = (Net New Dealerships Trips) / (Cumulative Year 2030 plus Project Buildout Traffic Volumes - Existing Traffic Volumes) x 100

Table XXIX: Selma Grove's Fair Share of Future Roadway Improvements

<i>ID</i>	<i>Intersection</i>	<i>Existing Traffic Volumes (MD Peak)</i>	<i>Cumulative Year 2030 plus Project Buildout Traffic Volumes (MD Peak)</i>	<i>Net New Selma Grove Trips (MD Peak)</i>	<i>Project's Fair Share (%)</i>
1	Highland Avenue / Golden State Boulevard	1,023	3,877	823	28.84%
2	DeWolf Avenue / Floral Avenue	241	1,265	690	67.38%
4	SR 99 SB Off-Ramp / Floral Avenue	1,611	4,521	2,208	75.88%
5	Highland Avenue / Floral Avenue	2,262	6,185	1,763	44.94%
10	Highland Avenue / Rose Avenue	1,184	2,748	93	5.95%
11	Walmart Driveway / Floral Avenue	1,087	4,094	2,208	73.43%

Note: Project Fair Share = (Net New Selma Grove Trips) / (Cumulative Year 2030 plus Project Buildout Traffic Volumes - Existing Traffic Volumes) x 100



Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- At present, the intersection of Highland Avenue and Rose Avenue operates below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Existing plus Dealership Traffic Conditions

- At present, the existing Dealership Project generates a maximum of 650 daily trips, 103 AM peak hour trips and 103 PM peak hour trips during a weekday and 53 MD peak hour trips during a Saturday.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during the AM and PM peak periods on a weekday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Existing plus Project Buildout Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the existing Dealership Project and proposed Selma Grove Project's vicinity. Based on this review, it is recommended that the location of Driveway 3 be aligned with the future Leonard Avenue alignment south of Floral Avenue as a means to avoid creating an offset intersection. By incorporating this recommendation, the placement of the driveways would be located at points that minimize the traffic operational impacts to the existing roadway network.
- JLB also analyzed the conceptual roadways within the proposed Selma Grove Project. Based on this review, it is recommended that the proposed Selma Grove Project maintain a minimum throat depth of 20 feet before any vehicular openings to the adjacent parking lots at Driveways 2 and 4 and a minimum throat depth of 40 feet before any vehicular openings to the adjacent parking lots at Driveways 1 and 5. Furthermore, it is recommended that the proposed Selma Grove Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersection of Project Driveway 3 and Floral Avenue. In addition, it is recommended that the proposed Selma Grove Project ensure that the appropriate corner sight distance is not obstructed for traffic on the driveways wishing to enter Floral Avenue. By incorporating these recommendations, on-site and off-site traffic operations and circulation should be improved to less than significant.
- The Project Buildout is estimated to generate a maximum of 32,052 daily trips, 998 AM peak hour trips and 3,012 PM peak hour trips during a weekday, and 3,400 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). At buildout, the Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips during a weekday, and 4,810 MD peak hour trips during a Saturday (before internal capture and pass-by trip reductions are taken into account). Compared to the Rockwell Pond Project, the proposed Project Buildout is estimated to yield less traffic by 11,511 daily trips, 334 AM peak hour trips and 821 PM peak hour trips during a weekday, and 1,410 MD peak hour trips during a Saturday.
- In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation Handbook published by ITE. A pass-by reduction of one (1) percent was applied as a reasonable percentage considering the background traffic on the adjacent street, Floral Avenue. Since the Project Buildout generates a high volume of traffic, a greater pass-by reduction would represent an unreasonably high percentage of background traffic. After internal capture and pass-by trip reductions are taken into account, the maximum net new trips that the Project Buildout is estimated to generate are 29,352 daily trips, 880 AM peak hour trips and 2,743 PM peak hour trips during a weekday, and 3,097 MD peak hour trips during a Saturday.
- It is recommended that the proposed Selma Grove Project accommodate a Class II Bike Lane along its frontage to Floral Avenue.



- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase; and
 - Prohibit northbound to southbound U-turn movements.
 - DeWolf Avenue / Floral Avenue
 - Implement all-way stop controls.
 - Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
 - State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
 - Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue approximately 1,000 feet north of Floral Avenue; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.



- Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Near Term Year 2025 plus Project Buildout Traffic Conditions

- The total trip generation for the Near Term Projects is 162,975 daily trips, 7,385 AM peak hour trips and 14,617 PM peak hour trips on a weekday, and 17,067 MD peak hour trips on a Saturday.
- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.
 - Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
 - State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.



- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Cumulative Year 2030 No Project Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be considered for implementation.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue; and
 - Modify the traffic signals to accommodate the added lane.



- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be considered for implementation.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Cumulative Year 2030 plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Modify the northbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue north of Golden State Boulevard;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Implement all-way stop controls; and
 - Modify the intersection to accommodate the added lane.



- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.



Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions

- Under this scenario, the intersections of Highland Avenue and Golden State Boulevard, DeWolf Avenue and Floral Avenue, Project Driveway 3 and Floral Avenue, State Route 99 Southbound Off-Ramp and Floral Avenue, and Highland Avenue and Floral Avenue are projected to operate below their respective LOS thresholds during one or both peak periods on a weekday and/or the MD peak period on a Saturday. To improve the LOS at the intersections projected to exceed their LOS threshold, it is recommended that the following improvements be implemented.
 - Highland Avenue / Golden State Boulevard
 - Add a second northbound left-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through lane to a through lane;
 - Modify the southbound right-turn lane to a through-right lane with a receiving lane on Highland Avenue south of Golden State Boulevard;
 - Modify the traffic signal to implement overlap phasing of the southeastbound right-turn phase with the northbound left-turn phase;
 - Prohibit northbound to southbound U-turn movements; and
 - Modify the traffic signals to accommodate the added lanes.
 - DeWolf Avenue / Floral Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through-right lane to a through-right lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a northbound left-turn lane;
 - Modify the northbound left-through-right lane to a through lane;
 - Add a northbound right-turn lane;
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - Implement overlap phasing of the northbound right-turn phase with the westbound left-turn phase;
 - Prohibit westbound to eastbound U-turn movements; and
 - Modify the intersection to accommodate the added lanes.



- Project Driveway 3 / Floral Avenue
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Add a second southbound left-turn lane with a receiving lane on Floral Avenue east of Project Driveway 3;
 - Signalize the intersection with protective left-turn phasing on all approaches;
 - On an Interim basis prohibit pedestrians across the west leg of Floral Avenue; and
 - Modify the intersection to accommodate the added lanes.
- State Route 99 Southbound Off-Ramp / Floral Avenue
 - Modify the southbound through lane to a through-right lane.
- Highland Avenue / Floral Avenue
 - Add a second eastbound left-turn lane;
 - Add a third eastbound through lane;
 - Modify the westbound through-right lane to a through lane;
 - Add a westbound right-turn lane;
 - Extend the receiving northbound through lanes on Highland Avenue;
 - Modify the widths of lanes on the north leg of Highland Avenue to reduce the total length of the north leg to approximately 100 feet; and
 - Modify the traffic signals to accommodate the added lanes.
- Under this scenario, the intersection of Highland Avenue and Rose Avenue is projected to operate below its respective LOS threshold (LOS C) during both peak periods on a weekday and the MD peak period on a Saturday. For state intersections that currently operate below the Caltrans target LOS C threshold, the existing LOS operations would be the existing MOEs that would need to be maintained. However, to improve the LOS at the intersection of Highland Avenue and Rose Avenue, it is recommended that the following improvements (consistent with the State Route 43 TCR) be implemented.
 - Highland Avenue / Rose Avenue
 - Add an eastbound left-turn lane;
 - Modify the eastbound left-through lane to a through-right lane;
 - Remove the eastbound right-turn lane;
 - Add a westbound left-turn lane;
 - Modify the westbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing on all approaches; and
 - Modify the intersection to accommodate the added lanes.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project Buildout's Equitable Fair Share

- It is recommended that the existing Dealership Project and proposed Selma Grove Projects contribute their equitable Fair Share as presented in Tables XXVIII and XXIX, respectively.



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3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation*, 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. Transportation Concept Report, State Route 43, Caltrans, District 6, dated April 2015.



Appendix A: Scope of Work



Traffic Engineering, Inc.

<http://www.JLBtraffic.com>

Traffic Engineering, Transportation Planning, & Parking Solutions

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991

Page / A

July 24, 2018

Bryant Hemby
Assistant Planner
City of Selma
1710 Tucker Street
Selma, CA 93662

Via Email Only: bryanth@cityofselma.com

Subject: *Proposed Draft Scope of Work for the Preparation of a Traffic Impact Analysis for the Selma Grove Commercial Development Located North of Floral Avenue between DeWolf Avenue and State Route 99 in the City of Selma (JLB Project 001-005)*

Dear Mr. Hemby,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Selma Grove Commercial Development (Selma Grove Project) located in the City of Selma. The Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the Selma Grove Project will also include the analysis of the Dealership Project, which covers approximately 48,693 square feet and is located west of State Route 99, approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond) is submitting an amendment to the Site Plan to reduce the ultimate buildout of the development evaluated by the previously certified environmental impact report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. An aerial of the Project vicinity is shown in Exhibit A, while the Project Site Plan is shown in Exhibit B.

The purpose of this TIA is to evaluate the potential changes to on-site and off-site traffic impacts associated with the modified Project, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. In order to evaluate the on-site and off-site traffic impacts of the proposed Selma Grove Project, JLB proposes the following Draft Scope of Work, which would be used to update the traffic impacts associated with the modified Project.



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Scope of Work

- To arrive at the future year forecast volumes, JLB will request a Fresno Council of Governments (Fresno COG) traffic forecast model run for the Dealership Project and the Selma Grove Project (Select Zone Analysis), which will include the Projects and the streets to be analyzed. The Fresno COG traffic forecasting model will be used to forecast traffic volumes for the Base Year 2018 and Cumulative Year 2030 scenarios. The Cumulative Year 2030 is being used as it is the planning horizon utilized in the Rockwell Pond EIR.
- JLB will evaluate existing and forecast future levels of service (LOS) at the study intersection(s). JLB will use HCM 6 or HCM 2000 methodologies, as appropriate, within Synchro software to perform this analysis for the weekday and Saturday peak periods. JLB will identify the causes of poor LOS and propose improvements to improve the LOS to acceptable levels.
- JLB will evaluate on-site circulation and provide recommendations, as necessary, to improve circulation to and within the Projects. Particular attention will be paid to conflicting traffic movements, the location of local roadways relative to the major streets, and on-site vehicular ingress and egress routes.
- JLB will, as necessary, obtain recent or schedule and conduct new traffic counts at the study facility(ies).
- JLB will perform a site visit to observe existing traffic conditions, especially during the AM and PM peak hours. Existing roadway conditions, including geometrics and traffic controls, will be verified.
- JLB will forecast trip distribution based on turn count information and knowledge of the existing and planned circulation network in the vicinity of the Projects.
- JLB will prepare California Manual on Uniform Traffic Control Devices (CA MUTCD) peak hour signal warrants for un-signalized study intersections during weekday and weekend peak periods.
- JLB will prepare a table with the Project's pro-rata fair share allocation to improvement measures identified (if any) that are not currently funded by an existing funding source.

Study Scenarios:

1. Existing Traffic Conditions with proposed improvement measures (if any);
2. Existing plus Dealership Project Traffic Conditions with proposed mitigation measures (if any);
3. Existing plus Dealership Project plus Selma Grove Project Traffic Conditions with proposed mitigation measures (if any);
4. Near Term Year 2025 plus Dealership Project plus Selma Grove Project Traffic Conditions with proposed mitigation measures (if any);
5. Cumulative Year 2030 No Project Traffic Conditions with proposed improvement measures (if any);
6. Cumulative Year 2030 plus Dealership Project plus Selma Grove Project Traffic Conditions with proposed mitigation measures (if any); and
7. Cumulative Year 2030 plus Dealership Project plus Selma Grove Project and State Route 99 at Dinuba Avenue Interchange Traffic Conditions with proposed mitigation measures (if any).



Weekday peak hours to be analyzed (Tuesday through Thursday only):

1. 7-9 AM peak period
2. 4-6 PM peak period

Saturday Mid-Day peak hour to be analyzed:

1. 1-3 PM peak period

Study Intersections:

1. Highland Avenue / Golden State Boulevard
2. DeWolf Avenue / Floral Avenue
3. Project Driveway 3 / Floral Avenue
4. State Route 99 Southbound Off-Ramp / Floral Avenue
5. Highland Avenue (State Route 43) / Floral Avenue
6. State Route 99 Northbound Off-Ramp / Floral Avenue
7. Whitson Street / Floral Avenue
8. McCall Avenue / Floral Avenue
9. Highland Avenue (State Route 43) / State Route 99 Southbound Ramps
10. Highland Avenue (State Route 43) / Rose Avenue

Queuing analysis is included in the proposed scope of work for the study intersections listed above under all study scenarios. This analysis will be utilized to recommend minimum storage lengths for left-turn and right-turn lanes at all study intersections.

Study Segments:

1. None

Project Only Trip Assignment to the Following State Facilities:

1. State Route 99 at Future Dinuba Avenue Interchange
2. State Route 99 at Floral Avenue Interchange
3. State Route 99 at Highland Avenue (State Route 43) Interchange

Trip Generation

The trip generation rates for the proposed Selma Grove Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). While the trip generation rate for the Automobile Sales (New) is presently calculated pursuant to the 10th Edition of the ITE Trip Generation Manual, this trip generation rate will be ultimately based on data obtain from the Project-specific seven-day count to be performed for the Auto Dealership. The trip generation rates for the Rockwell Pond Project were obtained from the previously certified environmental impact report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009.

Table I presents the trip generation for the proposed Selma Grove Project with trip generation rates for Hotel, Movie Theater, Shopping Center, Automobile Sales (New), Supermarket, Pharmacy/Drugstore with Drive-Through Window, and Fast-Food Restaurant with Drive-Through Window. The Selma Grove Project is estimated to generate a maximum of 32,758 daily trips, 986 AM peak hour trips and 3,027 PM peak hour trips on a weekday and 3,543 PM peak hour trips on a Saturday before internal capture and pass-by trip reductions are taken into account.



Mr. Hemby
Selma Grove TIA - Draft Scope of Work
July 24, 2018

Table II presents the trip generation for the Rockwell Pond Project with trip generation rates for Hotel, Home Improvement Store, Shopping Center, Automobile Sales (New), Discount Club, and Gasoline/Service Station with 16 fueling positions. The Rockwell Pond Project was anticipated to generate a maximum of 43,563 daily trips, 1,332 AM peak hour trips and 3,833 PM peak hour trips on a weekday and 5,036 PM peak hour trips on a Saturday before internal capture and pass-by trip reductions were taken into account. Compared to the Rockwell Pond Project, the proposed Selma Grove Project is estimated to reduce traffic generation by 10,805 daily trips, 346 AM peak hour trips and 806 PM peak hour trips on a weekday and 1,493 PM peak hour trips on a Saturday. The difference in trip generation is summarized in Table III.

As part of the trip generation for the Dealership Project and the Selma Grove Project, the TIA will be implementing a reduction in trip generation as a result of internal capture. Internal capture rates will be prepared pursuant to the NCHRP 684 Internal Trip Capture procedure. Additionally, JLB will apply pass-by trip reductions pursuant to ITE's Trip Generation Handbook 3rd Edition. Pass-by rates for the Project are likely to be capped at a maximum of five (5) percent.

Table I: Selma Grove Project Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	%	In	Out	%	In	Out	%	Trip Rate	In	Out	%	In	Out	%	Total
Hotel (310)	102	o.r.	8.36	853	0.47	59	41	28	20	48	0.60	51	49	31	30	61	0.60	51	49	31	30	61
Movie Theater (444)	54,240	k.s.f.	78.09	4,236	0.22	50	50	6	6	12	6.17	94	6	315	20	335	6.17	56	44	188	147	335
Shopping Center (820)	467,500	k.s.f.	37.75	17,648	0.94	62	38	272	167	439	3.81	48	52	855	926	1,781	4.50	52	48	1,094	1,010	2,104
Automobile Sales (New) (840)	48,693	k.s.f.	27.84	1,356	1.87	73	27	66	25	91	2.43	40	60	47	71	118	4.02	50	50	98	98	196
Supermarket (850)	50,000	k.s.f.	106.78	5,339	3.82	60	40	115	76	191	9.24	51	49	236	226	462	10.34	51	49	264	253	517
Pharmacy/Drugstore with Drive-Through Window	14,500	k.s.f.	109.16	1,583	3.84	53	47	30	26	56	10.29	50	50	75	74	149	8.75	49	51	62	65	127
Fast-Food Restaurant with Drive-Through Window	3,700	k.s.f.	470.95	1,743	40.19	51	49	76	73	149	32.67	52	48	63	58	121	54.86	51	49	104	99	203
Total Project Trips				32,758				593	393	986				1,622	1,405	3,027				1,841	1,702	3,543

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet



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Table II: Rockwell Pond Project Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total	Trip Rate ¹	In	Out	Total				
																			%	%	%	%
Hotel (310)	102	o.r.	8.92	910	0.67	58	42	40	29	69	0.70	49	51	35	37	72	0.60	51	49	31	30	61
Home Improvement Store (862)	171.178	k.s.f.	29.80	5,102	1.20	54	46	111	95	206	2.45	47	53	197	223	420	4.44	51	49	388	372	760
Shopping Center (820)	596.100	k.s.f.	42.94	25,598	1.03	61	39	375	240	615	3.75	48	52	1,073	1,163	2,236	4.50	52	48	1,395	1,287	2,682
Automobile Sales (New) (840)	77.000	k.s.f.	33.34	2,568	2.05	74	26	117	41	158	2.64	39	61	80	124	204	4.02	50	50	155	155	310
Discount Club (861)	160.000	k.s.f.	41.80	6,688	0.56	71	29	64	26	90	4.24	50	50	340	339	679	6.37	49	51	499	520	1,019
Gasoline / Service Station (944)	16	f.p.	168.56	2,697	12.07	50	50	97	97	194	13.86	50	50	111	111	222	12.77	50	50	102	102	204
Total Project Trips				43,563				804	528	1,332				1,836	1,997	3,833			2,570	2,466	5,036	

Note: o.r. = Occupied Rooms

k.s.f. = Thousand Square Feet

f.p. = Fueling Positions

¹ = JLB utilized trip generation rates from ITE's 10th Edition for the Saturday peak period.

Table III: Difference in Trip Generation

	Weekday Daily		Weekday (7-9) AM Peak Hour			Weekday (4-6) PM Peak Hour			Saturday (1-3) PM Peak Hour		
	In	Out	In	Out	Total	In	Out	Total	In	Out	Total
Selma Grove Project Land Use Trip Generation	593	393			986	1,622	1,405	3,027	1,841	1,702	3,543
Rockwell Pond Project Land Use Trip Generation	804	528			1,332	1,836	1,997	3,833	2,570	2,466	5,036
Change in Trip Generation	-211	-135			-346	-214	-592	-806	-729	-764	-1,493



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Access to the Project

Access to and from the Selma Grove Project site is from five (5) points located approximately 3,050 feet (Driveway 1), 2,860 feet (Driveway 2), 2,280 feet (Driveway 3), 1,790 feet (Driveway 4), and 1,420 feet (Driveway 5) west of the State Route 99 southbound off-ramp along the north side of Floral Avenue. While Driveway 3 is proposed to have full access, Driveways 1 and 5 are proposed to have left-in, right-in, and right-out access only, and Driveways 2 and 4 are proposed to have right-in, right-out access only. Additional Project details can be found in Exhibit B.

Near Term Projects to be Included

Based on our local knowledge of the study area, consultation with the City of Selma Planning and Development staff, JLB proposes to include near term projects located in the vicinity of the proposed Selma Grove Project under the Near Term Year 2025 plus Dealership Project plus Selma Grove Project Analysis. The Near Term Projects proposed to be included in the Near Term scenario are the following:

<u>Project Name</u>	<u>General Location</u>
1. Surf Thru Car Wash	NWQ of State Route 99 and Floral Avenue
2. The Habit	NWQ of State Route 99 and Floral Avenue
3. Canales	SWQ of Highland Avenue and Nebraska Avenue
4. Graham Commercial	NWQ of State Route 99 and Rose Avenue
5. Raven Commercial	Manning Avenue east of McCall Avenue
6. Amberwood	East of Orange Avenue
7. 3-MD Industrial Park	Nebraska Avenue east of Dockery Avenue
8. Selma Crossings	State Route 99 and Mountain View Avenue
9. V5 (Mini-Storage and Commercial)	NEC McCall Avenue and Dinuba Avenue
10. Comfort Suites	NWC of Highland Avenue and Rose Avenue
11. TT 6019	NEQ of Highland Avenue and Dinuba Avenue
12. Nagro Apartments	McCall Avenue and Nebraska Avenue
13. Cinema Way Apartments	NEC of Cinema Way and Stillman Street
14. TT 5765	SWC of Highland Avenue and Rose Avenue
15. TT 5361	Dockery Avenue North of Dinuba Avenue
16. TT 5183 (Country Rose Estates)	NWQ of Rose Avenue and Amber Avenue
17. Heritage	NEQ of Duke Avenue and Dinuba Avenue
18. TT 5519	NEC of Highland Avenue and Nebraska Avenue
19. TT 5540	NWQ of Dinuba Avenue and Ditch Road
20. Hinesley	SEC of Leonard and Nebraska Avenue
21. TT 5460	NWQ of Rorden Avenue and Amber Avenue
22. American Tire Depot	NWC Whitson Street and Stillman Street
23. United Health Center	NWC Highland Avenue and Stillman Street



Mr. Hemby
Selma Grove TIA - Draft Scope of Work
July 24, 2018

Other Near Term Projects the City of Selma, County of Fresno or Caltrans has knowledge of and for which it is anticipated that said project(s) is/are projected to be whole or partially built by the Near Term Project Year 2025, the City of Selma, County of Fresno or Caltrans would need to provide JLB with Near Term Project details. Near Term Project details include project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The above scope of work is based on our understanding of this Project and our experience with similar Traffic Impact Analysis Projects. In the absence of comments by August 14, 2018, it will be assumed that the above scope of work is acceptable to the agency(ies) that have not submitted any comments to the proposed TIA Scope of Work.

If you have any questions or require additional information, please do not hesitate to contact me. I can be reached by phone at (559) 570-8991 or by e-mail at smaciel@JLBtraffic.com.

Sincerely,



Susana Maciel, EIT
Engineer I/II

cc: Harpreet Kooner, County of Fresno
Tong Xiong, County of Fresno
David Padilla, Caltrans
Jose Luis Benavides, JLB Traffic Engineering, Inc.

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Traffic Engineering, Inc.

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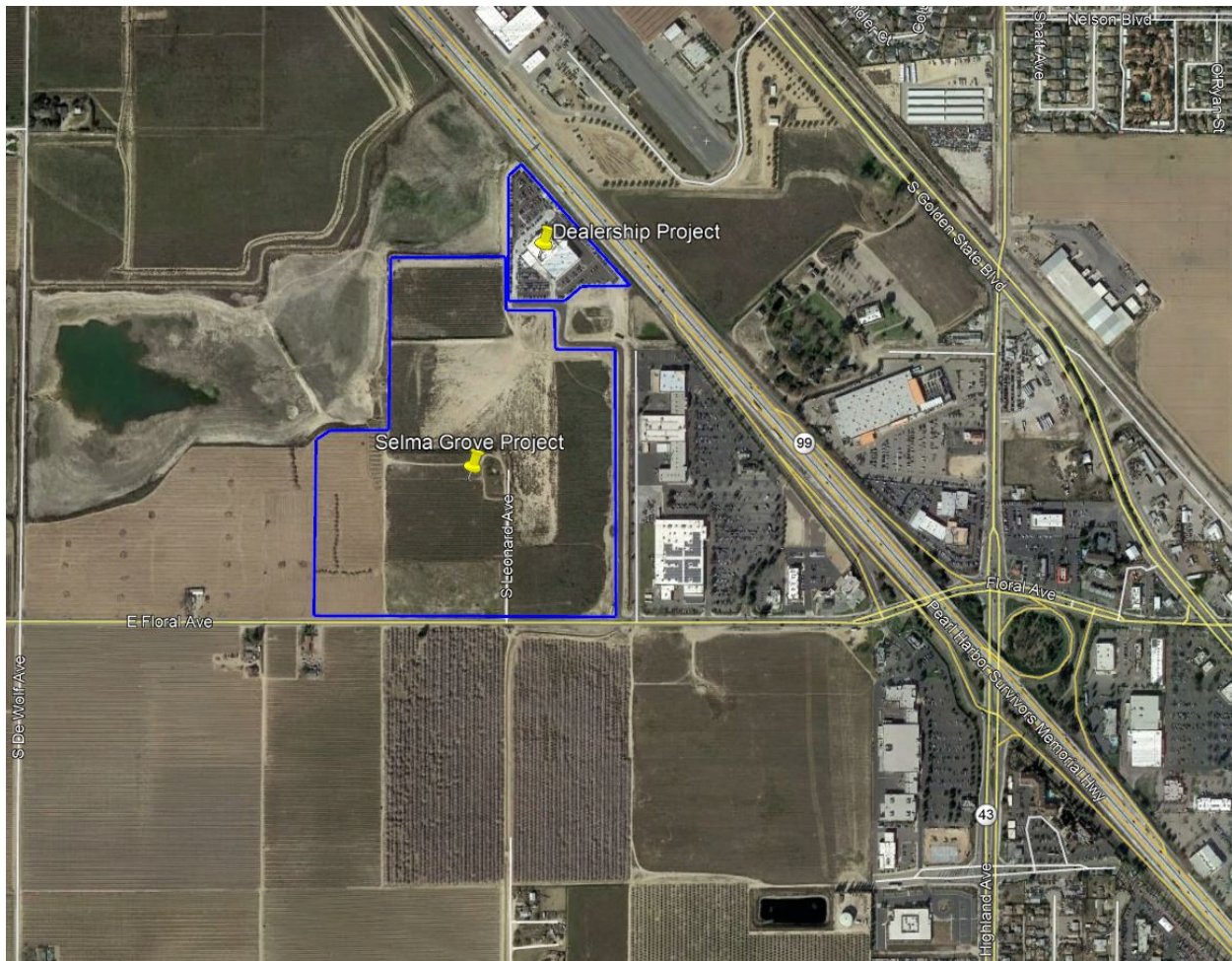
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Exhibit A – Aerial



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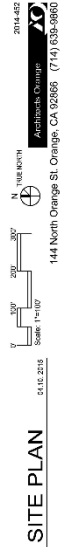
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Exhibit B – Selma Grove Site Plan

SELMA GROVE	
PROJECT SUMMARY:	
Site Area	+/- 62.9 ac
Total Building Land/Building Ratio	589,900 sf 4.65/1
Coverage	21.53 %
Parking Required:	
Retail (505.7k @ $\frac{1}{200}$)	2,529 stalls
Restaurant (30k @ $\frac{1}{100}$)	300 stalls
Cinema (Assume 2550 seats @ $\frac{1}{100}$ and 30 employees @ $\frac{1}{3}$ seats)	520 stalls
Total Parking Required	3,349 stalls
Parking Provided	3,581 stalls
Parking Ratio	6/1000



SITE PLAN

SELMA GROVE

TUTELIAN & COMPANY
1401 Fulton Street, Suite 210
Fresno, CA 93721 (213) 553-2200



Susana Maciel

From: Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Sent: Wednesday, August 08, 2018 2:59 PM
To: Susana Maciel
Subject: RE: Selma Grove TIA: Draft Scope of Work

Hello Susana,

Upon review of the draft SOW we just have one comment, could you please include a queuing analysis for all State study intersections. We look forward in reviewing the draft TIA once completed.

Thank you

David Padilla, Associate Transportation Planner
Office of Planning & Local Assistance
1352 W. Olive Avenue
Fresno, CA 93778-2616
Office: (559) 444-2493, Fax: (559) 445-5875



District 6

From: Susana Maciel [mailto:smaciel@jlbtraffic.com]
Sent: Tuesday, August 07, 2018 2:16 PM
To: Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Subject: RE: Selma Grove TIA: Draft Scope of Work

That's perfect! Thank you so much!!

Best,

Susana Maciel, EIT
Engineer I/II
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Office: 559.570.8991
Cell: 559.232.9474
E-mail: smaciel@JLBtraffic.com
Web: www.JLBtraffic.com

From: Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Sent: Tuesday, August 07, 2018 2:15 PM
To: Susana Maciel <smaciel@jlbtraffic.com>
Subject: Re: Selma Grove TIA: Draft Scope of Work

Hi Susana,

We should have comments to you by tomorrow afternoon.

Thank you

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From: Susana Maciel <smaciel@jlbtraffic.com>

Sent: Tuesday, August 7, 2018 2:11:10 PM

To: Isaac Moreno; engineering@cityofselma.com

Cc: hkooner (HKooner@co.fresno.ca.us); Tong Xiong (tonxiong@co.fresno.ca.us); Padilla, Dave@DOT; Jose Benavides

Subject: RE: Selma Grove TIA: Draft Scope of Work

Good afternoon Everyone,

I hope you are all having an amazing day.

I just wanted to take a moment to reach out all of you to see how your review of the Draft Scope of Work for this Project moving along. (I have attached a copy of the Draft Scope of Work for those who may not have had it prior to this email.)

I would be happy to help answer any questions or concerns you may have regarding the proposed Scope of Work. Please feel welcome to contact me if I can be of any assistance.

I appreciate your time and attention to this matter and look forward to hearing from you soon.

Best,

Susana Maciel, EIT
Engineer I/II
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Office: 559.570.8991
Cell: 559.232.9474
E-mail: smaciel@JLBtraffic.com
Web: www.JLBtraffic.com

From: Susana Maciel

Sent: Tuesday, July 24, 2018 3:15 PM

To: 'Bryant Hemby' <BryantH@cityofselma.com>

Cc: hkooner (HKooner@co.fresno.ca.us) <HKooner@co.fresno.ca.us>; Tong Xiong (tonxiong@co.fresno.ca.us) <tonxiong@co.fresno.ca.us>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>

Subject: Selma Grove TIA: Draft Scope of Work

Good afternoon Mr. Hemby,

I hope you are having a wonderful day.

Attached, you will find a Draft Scope of Work for the preparation of a Traffic Impact Analysis for a Project in the City of Selma. I kindly ask that you take a moment to review and comment on the proposed Scope of Work.

In the absence of comments by August 14, 2018, it will be assumed that the Scope of Work presented is acceptable to the agency(ies) that have not submitted any comments.

Please feel welcome to contact me if you have any questions or require any additional information. I can be reached by phone at 559.570.8991 or by email at smaciel@jlbtraffic.com.

Have a great rest of your day!

Best,

Susana Maciel, EIT
Engineer I/II
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Web: www.JLBtraffic.com

Susana Maciel

From: Kooner, Harpreet <HKooner@fresnocountyca.gov>
Sent: Monday, August 13, 2018 3:17 PM
To: Jose Benavides; 'Isaac Moreno'
Cc: David Padilla (dave_padilla@dot.ca.gov); Susana Maciel; Daniele, Frank; Alimi, Mohammad
Subject: RE: Selma Grove TIA: Draft Scope of Work

Jose,

PROJECT OVERVIEW:

Fresno County Transportation Engineering has completed our review of the Draft Scope Document prepared for the proposed Selma Grove Project. JLB Traffic Engineering proposes the preparation of a Traffic Impact Study for the Selma Grove Commercial Development Project located north of Floral Ave between DeWolf Ave and SR99 in the County of Fresno and within the sphere of influence of the City of Selma. The project consists of developing a 62.9-acre site that includes a 102-room hotel, a 54,240 square-foot cinema, 330,600 square feet of shopping center, 186,000 square feet of supermarket, 14,500 square feet of pharmacy with a drive-through window, and a 3,000 square feet fast-food restaurant with a drive-through window. The analysis will also include the 48,693 square feet Dealership Project located northeast of the Selma Grove Project. The Selma Grove Project and Dealership Project are projected to generate 32,758 weekday daily trips, 986 weekday A.M. peak hour trips, 3,027 weekday P.M. peak hour trips, and 3,543 Saturday P.M. peak hour trips.

PROJECT COMMENTS/CONCERNS:

Include intersection of Fowler and Floral

Consideration for City:

- Concern: The site plan shows 5 drive approaches for the development over about a 3/8-mile frontage. There should be some discussion about access control for the development. Also, if the main drive is signalized, that would likely lead to a concentration of movements to that signalized site.
- Both sides of Floral should be annexed into City.
- The preferred planning horizon for Study Scenarios shall be 20 years. In addition, the County shall be included in the review process of the Traffic Impact Study



Harpreet Kooner | Senior Engineer

Department of Public Works and Planning | Design Division

2220 Tulare St. 6th Floor Fresno, CA 93721

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Email: hkooner@FresnoCountyCa.gov

[Your input matters! Customer Service Survey](#)

From: Jose Benavides <jbenavides@jlbtraffic.com>

Sent: Monday, August 13, 2018 9:55 AM

To: Kooner, Harpreet <HKooner@fresnocountyca.gov>

Cc: David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>; Daniele, Frank <FDaniele@fresnocountyca.gov>

Subject: RE: Selma Grove TIA: Draft Scope of Work

Hi Harpreet,

At this point we don't have a project trip distribution yet. Can you inform us which intersection and segment the County would like included into the study.

As far as we know the project as we presented is accurate and at this point we don't anticipate revisions to the project description or site plan. If and when they become available we will share this info with the County and Caltrans.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President



Traffic Engineering, Transportation Planning and Parking Solutions

Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

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From: Kooner, Harpreet <HKooner@fresnocountyca.gov>

Sent: Monday, August 13, 2018 9:45 AM

To: Jose Benavides <jbenavides@jlbtraffic.com>

Cc: David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>;

Daniele, Frank <FDaniele@fresnocountyca.gov>

Subject: RE: Selma Grove TIA: Draft Scope of Work

Good Morning Jose,

Do you have the trip distribution for this project? And do I have revised project description? I am looking to add at least one intersection and roadway segment.



Harpreet Kooner | Senior Engineer

Department of Public Works and Planning | Design Division

2220 Tulare St. 6th Floor Fresno, CA 93721

Main Office: (559) 600-4109 | Direct: (559) 600-4533

Email: hkooner@FresnoCountyCa.gov

[Your input matters! Customer Service Survey](#)

From: Planning Department <PlanningDept@cityofselma.com>
Sent: Monday, August 13, 2018 8:23 AM
To: Jose Benavides <jbenavides@jlbtraffic.com>; Isaac Moreno <IsaacM@cityofselma.com>; Engineering <engineering@cityofselma.com>
Cc: Kooner, Harpreet <HKooner@fresnocountyca.gov>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: Selma Grove TIA: Draft Scope of Work

Hello Jose,

Isaac Moreno and I met with Cliff Tutelian on Thursday 8/9/18 to discuss the revised project. The Selma city planning department, as CEQA lead agency, will prepare the appropriate CEQA document for the revised project once the revised site plan and project description have been reviewed. It is recommended that your firm utilize the revised site plan and project description to complete the scope of work for the preparation of the TIA. Please contact me with questions.

Richard Walker, Selma City Planner

From: Jose Benavides [<mailto:jbenavides@jlbtraffic.com>]
Sent: Friday, August 10, 2018 4:46 PM
To: Isaac Moreno <IsaacM@cityofselma.com>; Engineering <engineering@cityofselma.com>; Planning Department <PlanningDept@cityofselma.com>
Cc: hkooner (HKooner@co.fresno.ca.us) <HKooner@co.fresno.ca.us>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: Selma Grove TIA: Draft Scope of Work

Good afternoon,

We are following up with this group for the third time in inquire if your respective agencies have any comments it would like to contribute on the attached a Draft Scope of Work for the preparation of a Traffic Impact Analysis for a Project in the City of Selma. I kindly ask that you take a moment to review and comment on the proposed Scope of Work.

In the absence of comments by August 14, 2018, it will be assumed that the Scope of Work presented is acceptable to the agency(ies) that have not submitted any comments.

Please feel welcome to contact me if you have any questions or require any additional information. I can be reached by phone at 559.570.8991 or by email at jbenavides@jlbtraffic.com.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President



Traffic Engineering, Transportation Planning and Parking Solutions
Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Office: (559) 570-8991
Cell: (559) 694-6000
www.JLBtraffic.com

From: Susana Maciel
Sent: Tuesday, August 7, 2018 2:11 PM
To: Isaac Moreno <IsaacM@cityofselma.com>; engineering@cityofselma.com
Cc: hkooner (HKooner@co.fresno.ca.us) <HKooner@co.fresno.ca.us>; Tong Xiong (tonxiong@co.fresno.ca.us) <tonxiong@co.fresno.ca.us>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: Selma Grove TIA: Draft Scope of Work

Good afternoon Everyone,

I hope you are all having an amazing day.

I just wanted to take a moment to reach out all of you to see how your review of the Draft Scope of Work for this Project moving along. (I have attached a copy of the Draft Scope of Work for those who may not have had it prior to this email.)

I would be happy to help answer any questions or concerns you may have regarding the proposed Scope of Work. Please feel welcome to contact me if I can be of any assistance.

I appreciate your time and attention to this matter and look forward to hearing from you soon.

Best,

Susana Maciel, EIT
Engineer I/II
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Office: 559.570.8991
Cell: 559.232.9474
E-mail: smaciel@JLBtraffic.com
Web: www.JLBtraffic.com

From: Susana Maciel
Sent: Tuesday, July 24, 2018 3:15 PM
To: 'Bryant Hemby' <BryantH@cityofselma.com>
Cc: hkooner (HKooner@co.fresno.ca.us) <HKooner@co.fresno.ca.us>; Tong Xiong (tonxiong@co.fresno.ca.us) <tonxiong@co.fresno.ca.us>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>
Subject: Selma Grove TIA: Draft Scope of Work

Good afternoon Mr. Hemby,

I hope you are having a wonderful day.

Attached, you will find a Draft Scope of Work for the preparation of a Traffic Impact Analysis for a Project in the City of Selma. I kindly ask that you take a moment to review and comment on the proposed Scope of Work.

In the absence of comments by August 14, 2018, it will be assumed that the Scope of Work presented is acceptable to the agency(ies) that have not submitted any comments.

Please feel welcome to contact me if you have any questions or require any additional information. I can be reached by phone at 559.570.8991 or by email at smaciel@jlbtraffic.com.

Have a great rest of your day!

Best,

Susana Maciel, EIT
Engineer I/II
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Office: 559.570.8991
Cell: 559.232.9474
E-mail: smaciel@JLBtraffic.com
Web: www.JLBtraffic.com

Jose Benavides

From: Joey Daggett <joey@gatewayeng.com>
Sent: Tuesday, August 28, 2018 10:16 AM
To: Jose Benavides
Cc: Planning Department; Isaac Moreno; Engineering
Subject: RE: Selma Grove TIA Draft Scope of Work & Modeling Request

Good Morning Jose,

The draft scope of work as provided is acceptable to the City of Selma. Please proceed with your modeling.

Thanks

Joey

Joseph D. Daggett, PE, PLS

GATEWAY ENGINEERING, INC.
5811 E. Princeton Ave, Fresno, CA 93727
Office: 559.320.0344 ext. 12 | Fax: 559.320.0345
email: joey@gatewayeng.com

From: Jose Benavides [<mailto:jbenavides@jlbtraffic.com>]
Sent: Tuesday, August 28, 2018 9:46 AM
To: Engineering <engineering@cityofselma.com>
Cc: Isaac Moreno <IsaacM@cityofselma.com>; Planning Department <PlanningDept@cityofselma.com>
Subject: Selma Grove TIA Draft Scope of Work & Modeling Request

Good morning Joey,

When we had a conference about two week ago with you, Isaac and Richard I believe that you indicated that you were going to send me an email that the Draft Scope of Work and the Modeling request were acceptable to the City of Selma. Can you send me an email on these when you get a chance as we need this info to move forward with the submittal of the modeling request to Fresno COG.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President



Traffic Engineering, Transportation Planning and Parking Solutions
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Appendix B: Traffic Counts



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Page | B

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JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 200

Fresno, CA 93704

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File Name : 08 Highland at Golden State

Site Code : 00000008

Start Date : 6/7/2016

Page No : 1

Groups Printed- Unshifted

	Highland Ave Southbound					Golden State Blvd Westbound					Highland Ave Northbound					Golden State Blvd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	5	90	14	1	110	0	19	7	0	26	16	28	0	0	44	24	13	10	0	47	227
07:15 AM	10	61	6	0	77	0	27	2	0	29	14	20	1	0	35	6	13	12	0	31	172
07:30 AM	9	68	5	0	82	2	22	4	0	28	21	21	2	0	44	0	8	24	0	32	186
07:45 AM	16	56	2	0	74	3	34	7	0	44	28	30	3	0	61	1	31	31	0	63	242
Total	40	275	27	1	343	5	102	20	0	127	79	99	6	0	184	31	65	77	0	173	827
08:00 AM	16	59	0	0	75	6	24	11	0	41	17	26	1	0	44	0	22	27	0	49	209
08:15 AM	12	56	3	0	71	2	27	9	0	38	14	32	3	1	50	2	29	32	0	63	222
08:30 AM	12	51	1	0	64	3	23	6	0	32	13	36	0	2	51	2	20	26	0	48	195
08:45 AM	11	47	2	0	60	3	25	5	0	33	19	36	5	1	61	3	22	23	0	48	202
Total	51	213	6	0	270	14	99	31	0	144	63	130	9	4	206	7	93	108	0	208	828

04:00 PM	11	46	1	1	59	3	24	14	0	41	18	60	3	0	81	1	45	31	0	77	258
04:15 PM	16	37	1	0	54	5	26	19	0	50	32	73	2	2	109	6	37	35	1	79	292
04:30 PM	9	59	2	1	71	4	18	16	0	38	34	75	1	1	111	4	47	60	0	111	331
04:45 PM	6	45	4	0	55	6	29	17	0	52	18	63	2	0	83	4	35	47	0	86	276
Total	42	187	8	2	239	18	97	66	0	181	102	271	8	3	384	15	164	173	1	353	1157
05:00 PM	16	52	3	0	71	6	29	17	0	52	28	95	0	0	123	4	45	54	0	103	349
05:15 PM	5	62	2	0	69	3	17	10	0	30	37	66	1	0	104	5	42	40	0	87	290
05:30 PM	11	58	2	0	71	2	23	17	0	42	24	64	1	0	89	1	41	25	0	67	269
05:45 PM	18	62	2	1	83	8	29	25	0	62	19	67	0	0	86	5	47	26	0	78	309
Total	50	234	9	1	294	19	98	69	0	186	108	292	2	0	402	15	175	145	0	335	1217
Grand Total	183	909	50	4	1146	56	396	186	0	638	352	792	25	7	1176	68	497	503	1	1069	4029
Apprch %	16	79.3	4.4	0.3		8.8	62.1	29.2	0		29.9	67.3	2.1	0.6		6.4	46.5	47.1	0.1		
Total %	4.5	22.6	1.2	0.1	28.4	1.4	9.8	4.6	0	15.8	8.7	19.7	0.6	0.2	29.2	1.7	12.3	12.5	0	26.5	

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File Name : 08 Highland at Golden State

Site Code : 00000008

Start Date : 6/7/2016

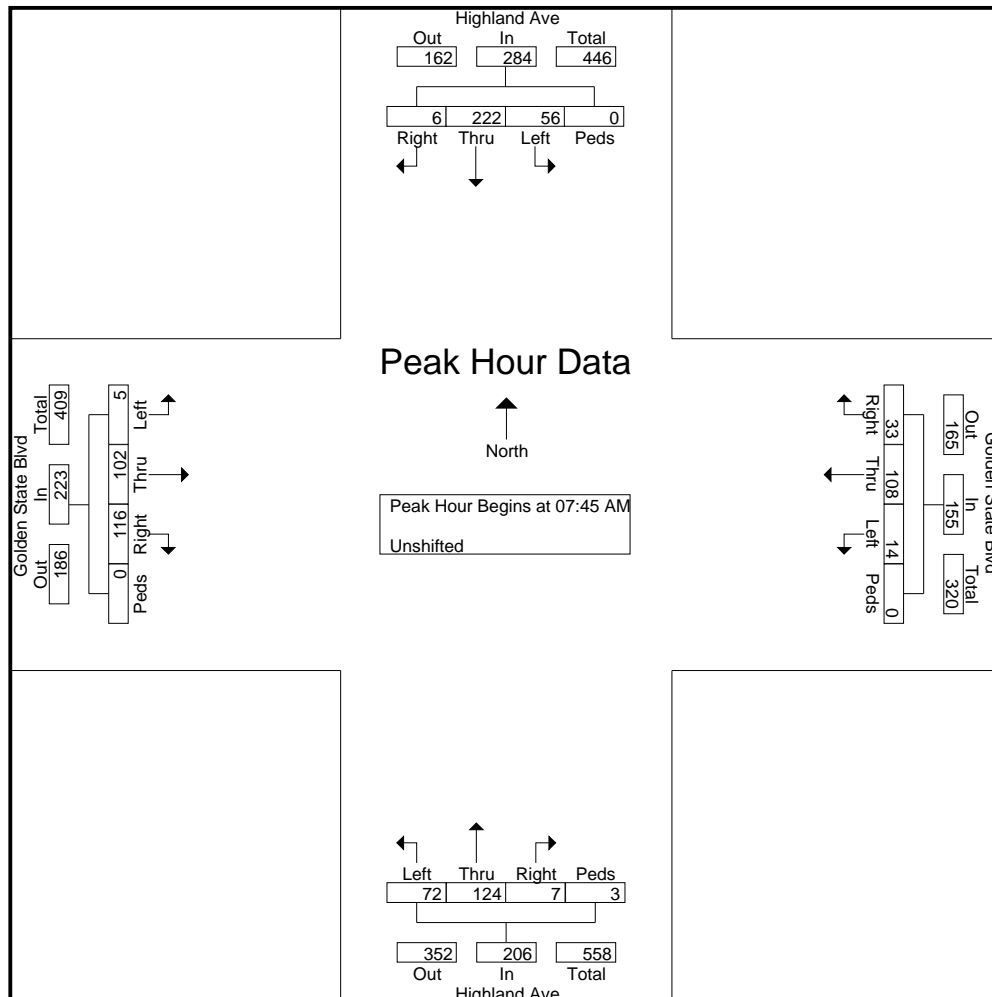
Page No : 2

	Highland Ave Southbound					Golden State Blvd Westbound					Highland Ave Northbound					Golden State Blvd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	16	56	2	0	74	3	34	7	0	44	28	30	3	0	61	1	31	31	0	63	242
08:00 AM	16	59	0	0	75	6	24	11	0	41	17	26	1	0	44	0	22	27	0	49	209
08:15 AM	12	56	3	0	71	2	27	9	0	38	14	32	3	1	50	2	29	32	0	63	222
08:30 AM	12	51	1	0	64	3	23	6	0	32	13	36	0	2	51	2	20	26	0	48	195
Total Volume	56	222	6	0	284	14	108	33	0	155	72	124	7	3	206	5	102	116	0	223	868
% App. Total	19.7	78.2	2.1	0		9	69.7	21.3	0		35	60.2	3.4	1.5		2.2	45.7	52	0		
PHF	.875	.941	.500	.000	.947	.583	.794	.750	.000	.881	.643	.861	.583	.375	.844	.625	.823	.906	.000	.885	.897



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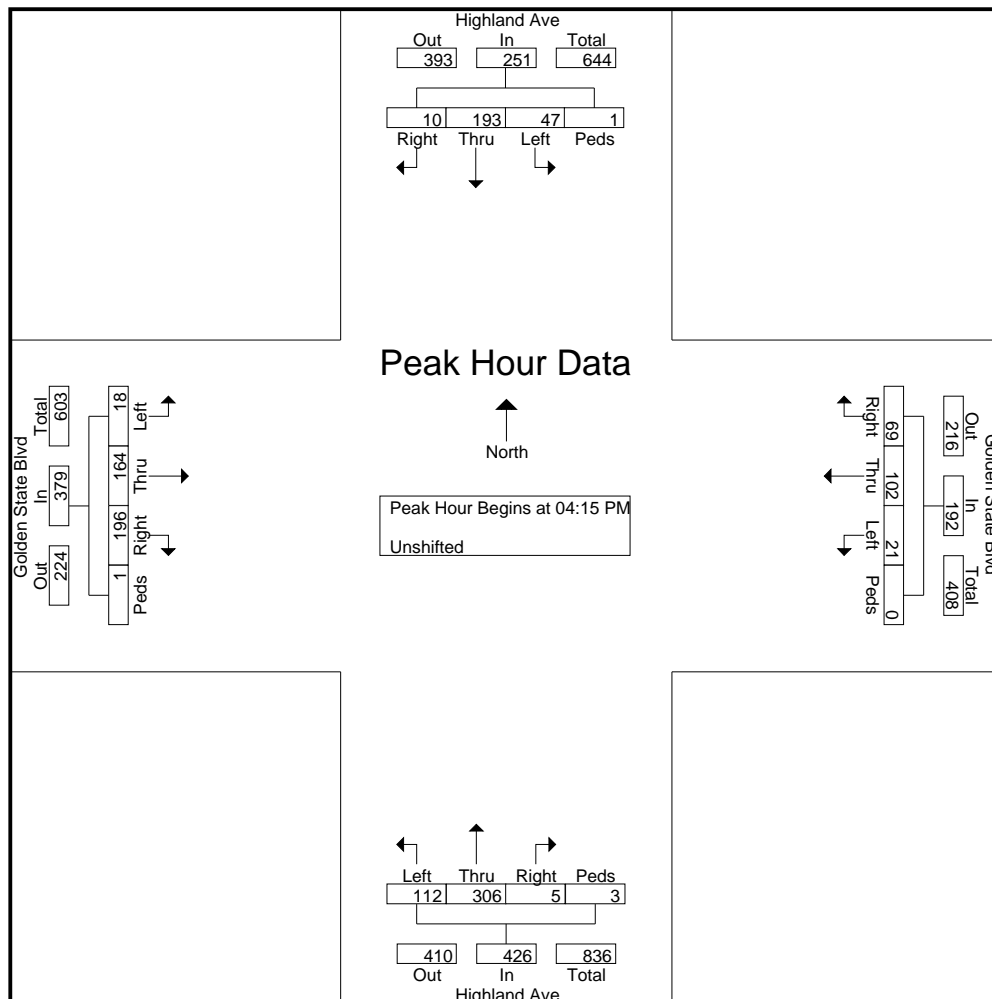
File Name : 08 Highland at Golden State

Site Code : 00000008

Start Date : 6/7/2016

Page No : 3

	Highland Ave Southbound					Golden State Blvd Westbound					Highland Ave Northbound					Golden State Blvd Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	16	37	1	0	54	5	26	19	0	50	32	73	2	2	109	6	37	35	1	79	292
04:30 PM	9	59	2	1	71	4	18	16	0	38	34	75	1	1	111	4	47	60	0	111	331
04:45 PM	6	45	4	0	55	6	29	17	0	52	18	63	2	0	83	4	35	47	0	86	276
05:00 PM	16	52	3	0	71	6	29	17	0	52	28	95	0	0	123	4	45	54	0	103	349
Total Volume	47	193	10	1	251	21	102	69	0	192	112	306	5	3	426	18	164	196	1	379	1248
% App. Total	18.7	76.9	4	0.4		10.9	53.1	35.9	0		26.3	71.8	1.2	0.7		4.7	43.3	51.7	0.3		
PHF	.734	.818	.625	.250	.884	.875	.879	.908	.000	.923	.824	.805	.625	.375	.866	.750	.872	.817	.250	.854	.894



ITM Peak Hour Summary

Prepared by:

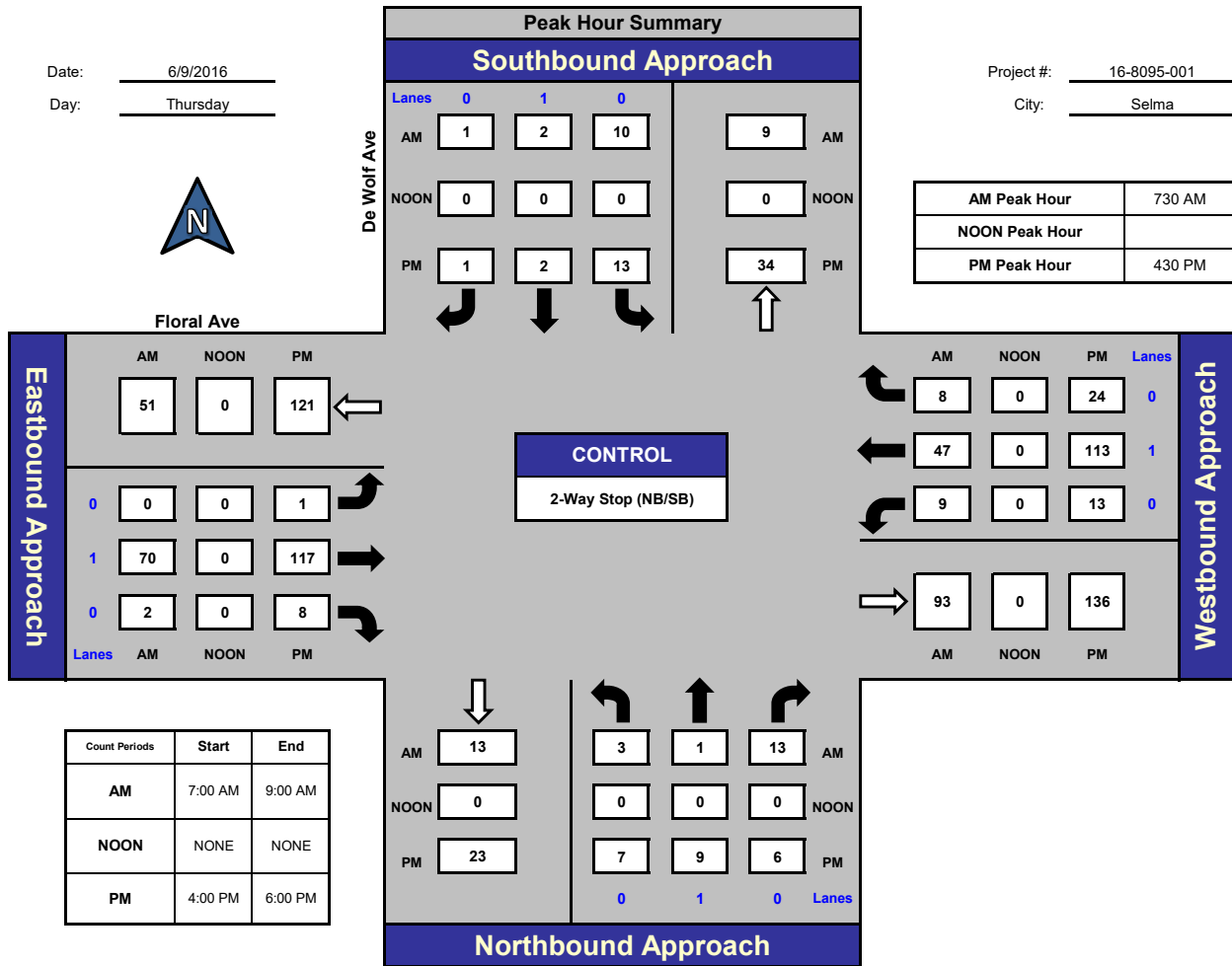


National Data & Surveying Services

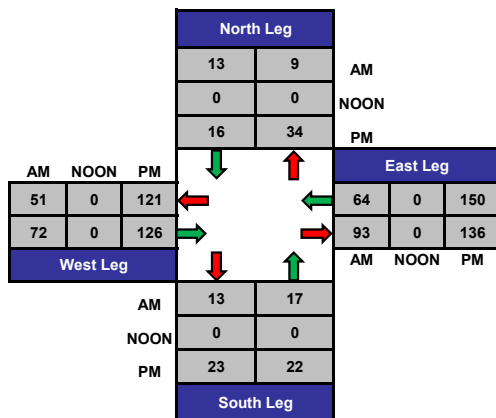
De Wolf Ave and Floral Ave, Selma

Date: 6/9/2016
Day: Thursday

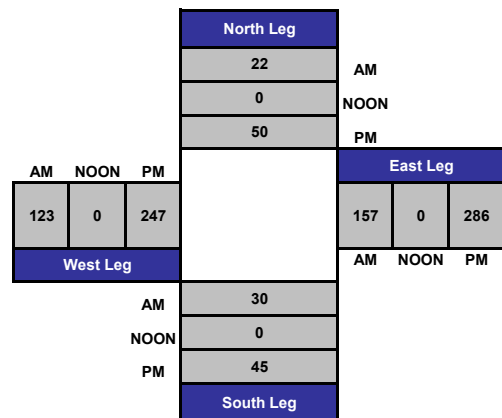
Project #: 16-8095-001
City: Selma



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-001

Day: Thursday

City: Selma

Date: 6/9/2016

AM													
NS/EW Streets:	De Wolf Ave			De Wolf Ave			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
7:00 AM	0	1	2	3	0	0	0	15	1	1	9	0	32
7:15 AM	0	0	2	2	1	0	0	14	0	0	14	2	35
7:30 AM	0	1	3	3	1	1	0	19	1	3	14	1	47
7:45 AM	1	0	5	1	1	0	0	17	0	2	12	2	41
8:00 AM	0	0	2	4	0	0	0	19	1	2	11	2	41
8:15 AM	2	0	3	2	0	0	0	15	0	2	10	3	37
8:30 AM	2	0	2	1	0	1	0	18	0	1	16	0	41
8:45 AM	1	0	1	0	0	0	0	13	4	1	14	1	35
TOTAL VOLUMES :	NL 6	NT 2	NR 20	SL 16	ST 3	SR 2	EL 0	ET 130	ER 7	WL 12	WT 100	WR 11	TOTAL 309
APPROACH %'s :	21.43%	7.14%	71.43%	76.19%	14.29%	9.52%	0.00%	94.89%	5.11%	9.76%	81.30%	8.94%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	3	1	13	10	2	1	0	70	2	9	47	8	166
PEAK HR FACTOR :	0.708			0.650			0.900			0.889			0.883

CONTROL : 2-Way Stop (NB/SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-001

Day: Thursday

City: Selma

Date: 6/9/2016

PM													
NS/EW Streets:	De Wolf Ave			De Wolf Ave			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 1	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
4:00 PM	4	0	5	1	4	0	0	20	1	4	19	8	66
4:15 PM	0	2	2	2	2	2	0	23	0	3	29	1	66
4:30 PM	2	3	2	4	1	0	0	35	3	2	32	11	95
4:45 PM	2	3	2	3	0	0	0	25	4	5	24	2	70
5:00 PM	1	1	2	4	0	1	1	31	0	4	29	4	78
5:15 PM	2	2	0	2	1	0	0	26	1	2	28	7	71
5:30 PM	0	0	3	4	2	0	0	20	1	2	27	3	62
5:45 PM	2	2	1	3	0	0	0	30	1	4	17	7	67
TOTAL VOLUMES :	NL 13	NT 13	NR 17	SL 23	ST 10	SR 3	EL 1	ET 210	ER 11	WL 26	WT 205	WR 43	TOTAL 575
APPROACH %'s :	30.23%	30.23%	39.53%	63.89%	27.78%	8.33%	0.45%	94.59%	4.95%	9.49%	74.82%	15.69%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	7	9	6	13	2	1	1	117	8	13	113	24	314
PEAK HR FACTOR :	0.786			0.800			0.829			0.833			0.826

CONTROL : 2-Way Stop (NB/SB)

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File Name : SR 99 at Floral

Site Code : 00000000

Start Date : 6/9/2016

Page No : 1

Groups Printed- Unshifted

	SR 99 SB OFF Southbound					FLORAL Westbound				SR 99 SB OFF Northbound			FLORAL Eastbound			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Right	Peds	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	25	7	7	0	39	14	42	1	57	13	0	13	52	2	54	163
07:15 AM	36	3	15	0	54	11	39	0	50	13	0	13	57	4	61	178
07:30 AM	47	12	15	0	74	21	50	0	71	17	0	17	59	2	61	223
07:45 AM	72	6	11	2	91	17	67	0	84	22	0	22	70	9	79	276
Total	180	28	48	2	258	63	198	1	262	65	0	65	238	17	255	840
08:00 AM	37	14	21	2	74	20	80	2	102	21	0	21	75	4	79	276
08:15 AM	46	13	15	0	74	11	79	1	91	16	0	16	67	12	79	260
08:30 AM	47	8	17	0	72	15	73	0	88	26	0	26	68	11	79	265
08:45 AM	35	13	15	0	63	13	79	0	92	15	0	15	56	13	69	239
Total	165	48	68	2	283	59	311	3	373	78	0	78	266	40	306	1040

04:00 PM	74	12	30	0	116	33	103	0	136	39	0	39	126	18	144	435
04:15 PM	66	10	24	0	100	29	131	0	160	51	0	51	115	21	136	447
04:30 PM	81	10	22	0	113	26	116	4	146	58	0	58	91	17	108	425
04:45 PM	67	10	43	2	122	28	146	3	177	42	0	42	148	21	169	510
Total	288	42	119	2	451	116	496	7	619	190	0	190	480	77	557	1817
05:00 PM	81	12	23	3	119	24	136	6	166	33	0	33	137	15	152	470
05:15 PM	76	11	40	0	127	31	134	1	166	60	0	60	131	17	148	501
05:30 PM	77	16	33	1	127	28	123	3	154	34	0	34	146	17	163	478
05:45 PM	74	14	26	0	114	16	101	1	118	52	0	52	135	26	161	445
Total	308	53	122	4	487	99	494	11	604	179	0	179	549	75	624	1894
06:00 PM	77	13	27	0	117	31	148	0	179	53	0	53	129	19	148	497
Grand Total	1018	184	384	10	1596	368	1647	22	2037	565	0	565	1662	228	1890	6088
Apprch %	63.8	11.5	24.1	0.6		18.1	80.9	1.1		100	0		87.9	12.1		
Total %	16.7	3	6.3	0.2	26.2	6	27.1	0.4	33.5	9.3	0	9.3	27.3	3.7	31	

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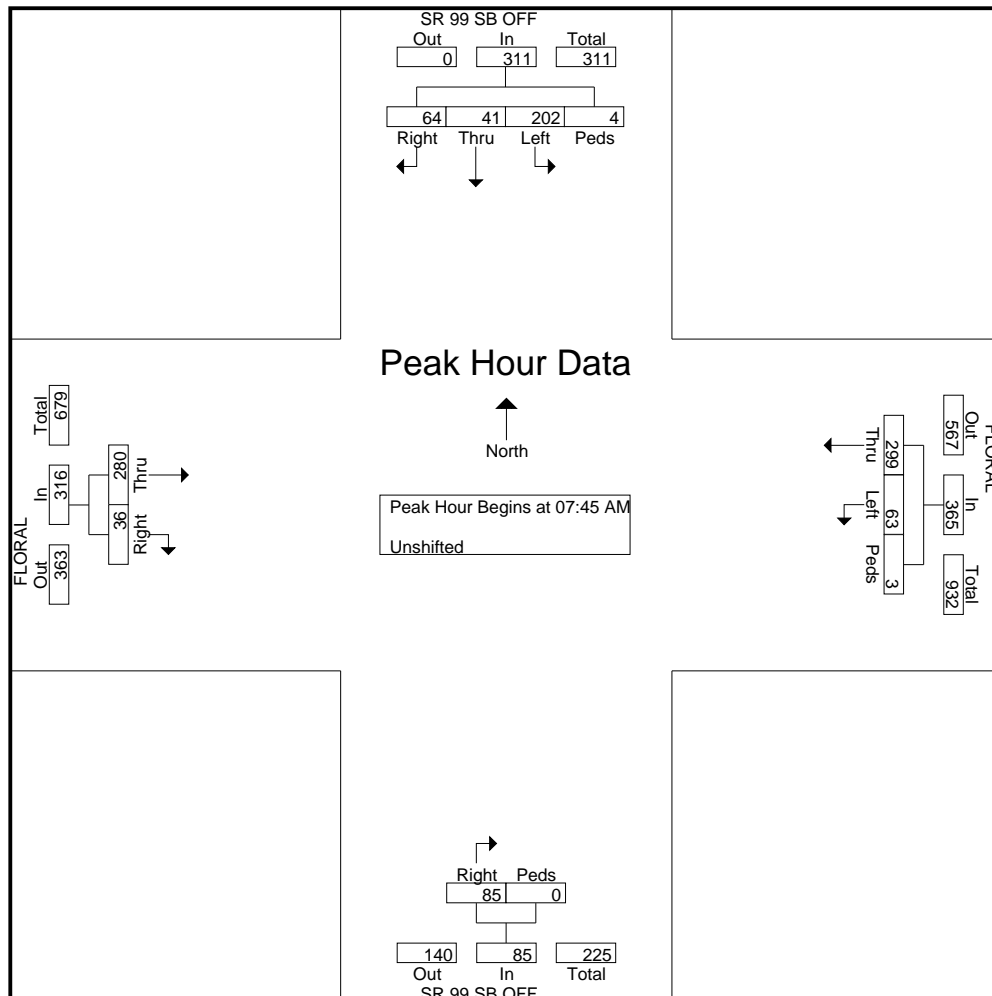
File Name : SR 99 at Floral

Site Code : 00000000

Start Date : 6/9/2016

Page No : 2

	SR 99 SB OFF Southbound					FLORAL Westbound				SR 99 SB OFF Northbound			FLORAL Eastbound			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Right	Peds	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:45 AM																
07:45 AM	72	6	11	2	91	17	67	0	84	22	0	22	70	9	79	276
08:00 AM	37	14	21	2	74	20	80	2	102	21	0	21	75	4	79	276
08:15 AM	46	13	15	0	74	11	79	1	91	16	0	16	67	12	79	260
08:30 AM	47	8	17	0	72	15	73	0	88	26	0	26	68	11	79	265
Total Volume	202	41	64	4	311	63	299	3	365	85	0	85	280	36	316	1077
% App. Total	65	13.2	20.6	1.3		17.3	81.9	0.8		100	0		88.6	11.4		
PHF	.701	.732	.762	.500	.854	.788	.934	.375	.895	.817	.000	.817	.933	.750	1.00	.976



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Fresno, CA 93704

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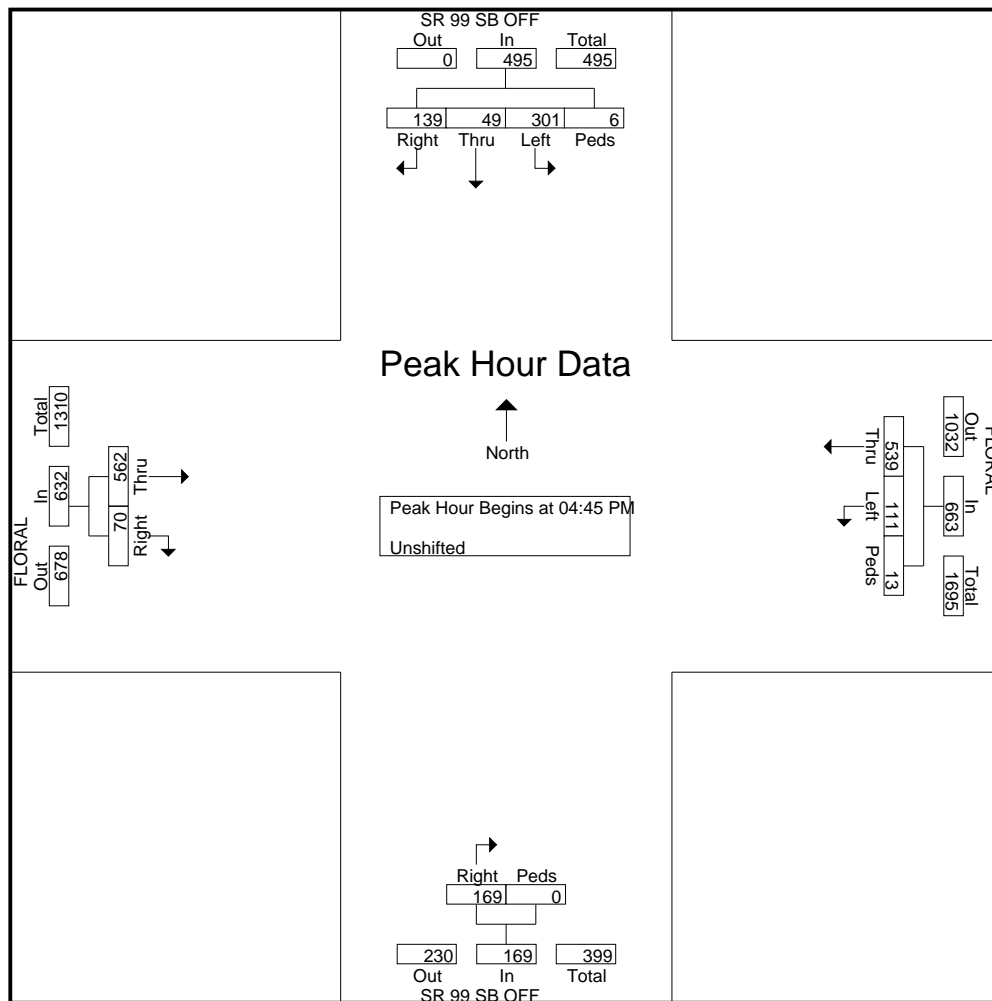
File Name : SR 99 at Floral

Site Code : 00000000

Start Date : 6/9/2016

Page No : 3

	SR 99 SB OFF Southbound					FLORAL Westbound				SR 99 SB OFF Northbound			FLORAL Eastbound			
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Right	Peds	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:00 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:45 PM																
04:45 PM	67	10	43	2	122	28	146	3	177	42	0	42	148	21	169	510
05:00 PM	81	12	23	3	119	24	136	6	166	33	0	33	137	15	152	470
05:15 PM	76	11	40	0	127	31	134	1	166	60	0	60	131	17	148	501
05:30 PM	77	16	33	1	127	28	123	3	154	34	0	34	146	17	163	478
Total Volume	301	49	139	6	495	111	539	13	663	169	0	169	562	70	632	1959
% App. Total	60.8	9.9	28.1	1.2		16.7	81.3	2		100	0		88.9	11.1		
PHF	.929	.766	.808	.500	.974	.895	.923	.542	.936	.704	.000	.704	.949	.833	.935	.960



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File Name : Highland at Floral

Site Code : 00000000

Start Date : 6/8/2016

Page No : 1

Groups Printed- Unshifted

	HIGHLAND Southbound					FLORAL Westbound					HIGHLAND Northbound					FLORAL Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	1	30	27	0	58	17	82	21	0	120	10	11	15	0	36	23	46	18	0	87	301
07:15 AM	5	40	27	0	72	26	63	31	1	121	5	22	17	0	44	21	70	9	0	100	337
07:30 AM	6	44	50	0	100	24	105	24	1	154	17	27	18	0	62	25	71	15	0	111	427
07:45 AM	8	53	33	0	94	35	80	23	0	138	11	28	32	0	71	32	96	21	0	149	452
Total	20	167	137	0	324	102	330	99	2	533	43	88	82	0	213	101	283	63	0	447	1517
08:00 AM	11	53	40	0	104	36	127	28	1	192	17	19	21	0	57	28	76	15	0	119	472
08:15 AM	6	42	31	1	80	30	89	22	2	143	17	29	17	0	63	35	65	12	0	112	398
08:30 AM	12	45	35	0	92	31	96	19	2	148	9	26	12	0	47	29	61	14	0	104	391
08:45 AM	7	40	39	0	86	28	84	25	0	137	16	26	9	0	51	34	67	17	0	118	392
Total	36	180	145	1	362	125	396	94	5	620	59	100	59	0	218	126	269	58	0	453	1653

04:00 PM	16	58	54	0	128	45	126	23	1	195	28	40	9	0	77	55	166	37	0	258	658
04:15 PM	18	49	82	0	149	35	131	24	0	190	23	44	24	0	91	53	115	32	0	200	630
04:30 PM	13	62	40	0	115	36	126	40	0	202	20	46	12	0	78	67	140	35	0	242	637
04:45 PM	16	70	56	0	142	35	121	26	0	182	29	51	19	0	99	42	162	37	0	241	664
Total	63	239	232	0	534	151	504	113	1	769	100	181	64	0	345	217	583	141	0	941	2589
05:00 PM	21	79	65	0	165	33	130	25	0	188	24	41	21	0	86	53	124	47	0	224	663
05:15 PM	19	67	55	0	141	33	110	37	1	181	25	41	15	0	81	45	132	43	0	220	623
05:30 PM	18	62	56	1	137	21	107	31	2	161	23	48	31	0	102	46	123	45	0	214	614
05:45 PM	18	72	52	0	142	34	96	27	2	159	23	23	23	0	69	41	127	39	0	207	577
Total	76	280	228	1	585	121	443	120	5	689	95	153	90	0	338	185	506	174	0	865	2477
Grand Total	195	866	742	2	1805	499	1673	426	13	2611	297	522	295	0	1114	629	1641	436	0	2706	8236
Apprch %	10.8	48	41.1	0.1		19.1	64.1	16.3	0.5		26.7	46.9	26.5	0		23.2	60.6	16.1	0		
Total %	2.4	10.5	9	0	21.9	6.1	20.3	5.2	0.2	31.7	3.6	6.3	3.6	0	13.5	7.6	19.9	5.3	0	32.9	

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File Name : Highland at Floral

Site Code : 00000000

Start Date : 6/8/2016

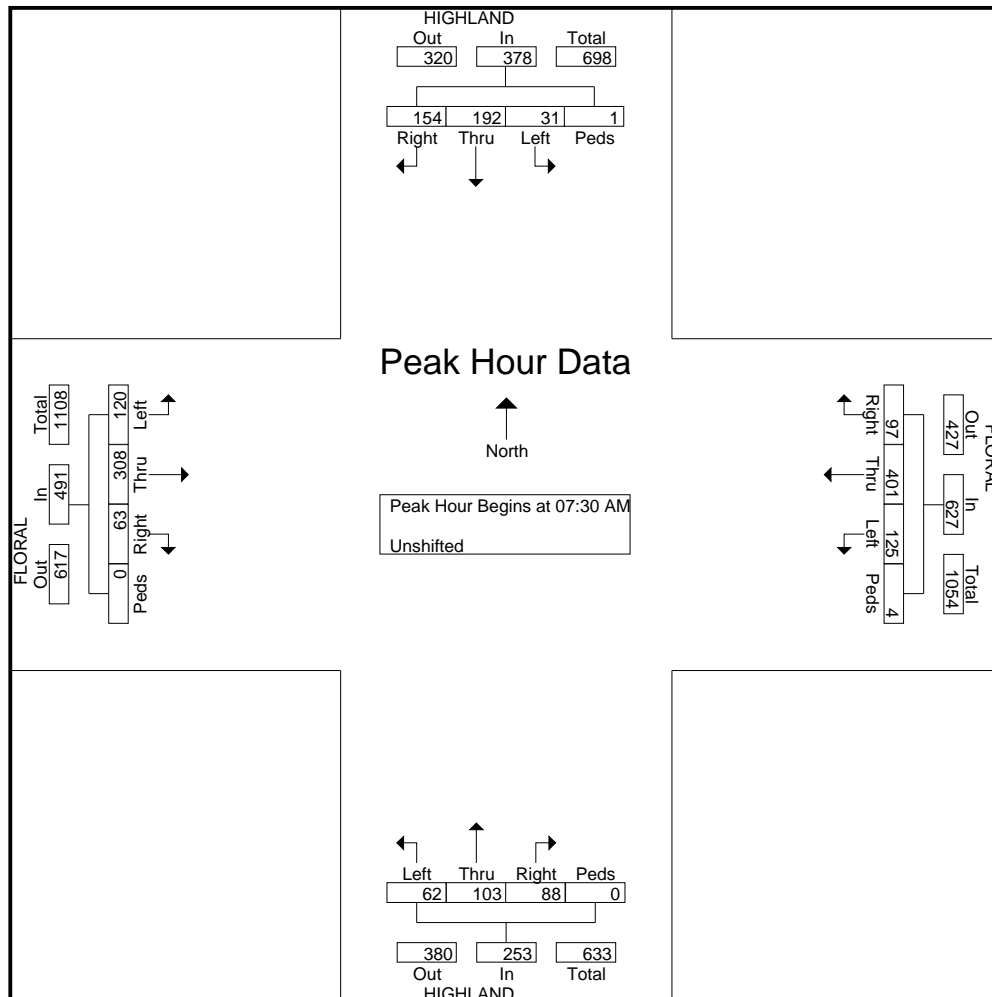
Page No : 2

	HIGHLAND Southbound					FLORAL Westbound					HIGHLAND Northbound					FLORAL Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	6	44	50	0	100	24	105	24	1	154	17	27	18	0	62	25	71	15	0	111	427
07:45 AM	8	53	33	0	94	35	80	23	0	138	11	28	32	0	71	32	96	21	0	149	452
08:00 AM	11	53	40	0	104	36	127	28	1	192	17	19	21	0	57	28	76	15	0	119	472
08:15 AM	6	42	31	1	80	30	89	22	2	143	17	29	17	0	63	35	65	12	0	112	398
Total Volume	31	192	154	1	378	125	401	97	4	627	62	103	88	0	253	120	308	63	0	491	1749
% App. Total	8.2	50.8	40.7	0.3		19.9	64	15.5	0.6		24.5	40.7	34.8	0		24.4	62.7	12.8	0		
PHF	.705	.906	.770	.250	.909	.868	.789	.866	.500	.816	.912	.888	.688	.000	.891	.857	.802	.750	.000	.824	.926



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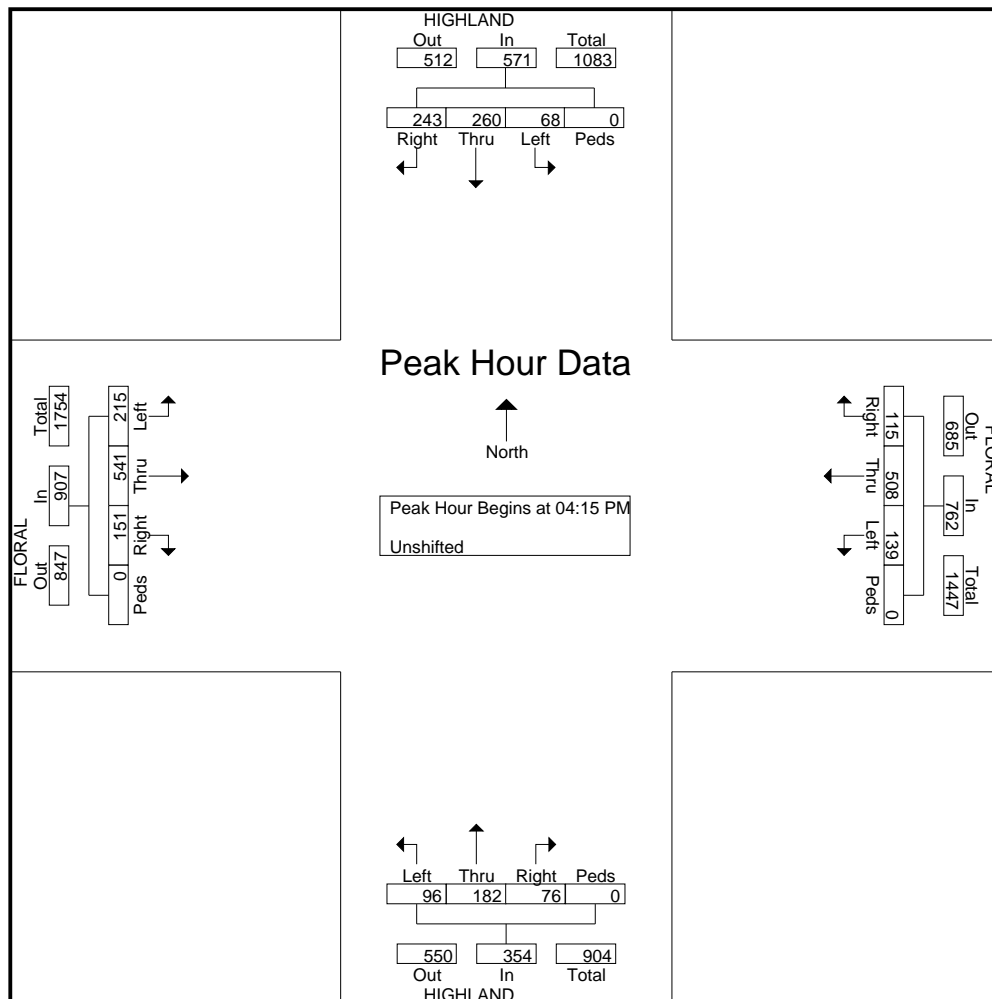
File Name : Highland at Floral

Site Code : 00000000

Start Date : 6/8/2016

Page No : 3

	HIGHLAND Southbound					FLORAL Westbound					HIGHLAND Northbound					FLORAL Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	18	49	82	0	149	35	131	24	0	190	23	44	24	0	91	53	115	32	0	200	630
04:30 PM	13	62	40	0	115	36	126	40	0	202	20	46	12	0	78	67	140	35	0	242	637
04:45 PM	16	70	56	0	142	35	121	26	0	182	29	51	19	0	99	42	162	37	0	241	664
05:00 PM	21	79	65	0	165	33	130	25	0	188	24	41	21	0	86	53	124	47	0	224	663
Total Volume	68	260	243	0	571	139	508	115	0	762	96	182	76	0	354	215	541	151	0	907	2594
% App. Total	11.9	45.5	42.6	0		18.2	66.7	15.1	0		27.1	51.4	21.5	0		23.7	59.6	16.6	0		
PHF	.810	.823	.741	.000	.865	.965	.969	.719	.000	.943	.828	.892	.792	.000	.894	.802	.835	.803	.000	.937	.977



National Data & Surveying Services

SR 99 NB Off Ramp and Floral Ave , Selma

Date: 6/9/2016

Day: Thursday

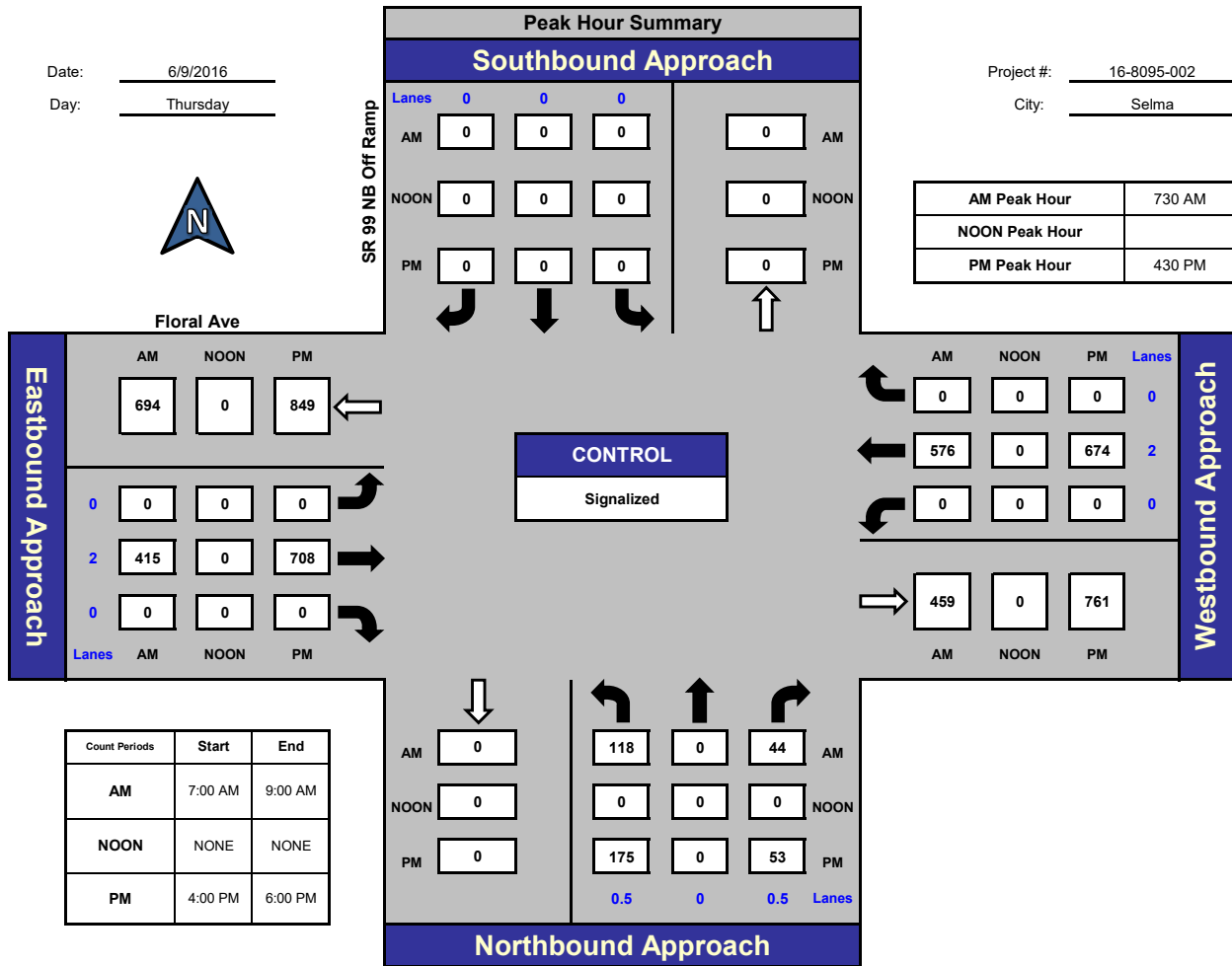


Floral Ave

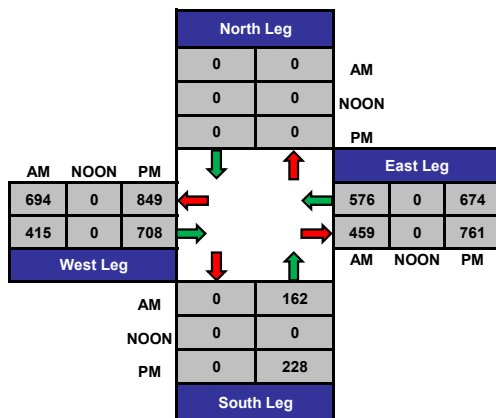
Project #: 16-8095-002

City: Selma

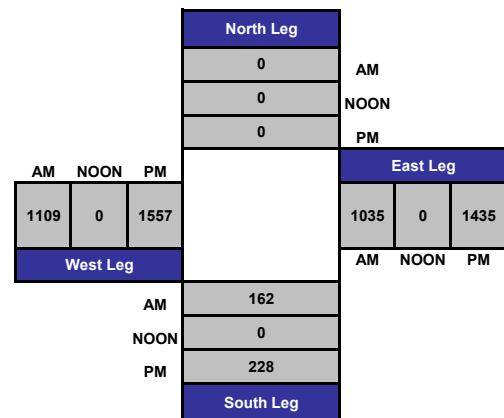
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-002

Day: Thursday

City: Selma

Date: 6/9/2016

AM													
NS/EW Streets:	SR 99 NB Off Ramp			SR 99 NB Off Ramp			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0.5	NT 0	NR 0.5	SL 0	ST 0	SR 0	EL 0	ET 2	ER 0	WL 0	WT 2	WR 0	TOTAL
7:00 AM	28	0	10	0	0	0	0	52	0	0	94	0	184
7:15 AM	25	0	9	0	0	0	0	80	0	0	118	0	232
7:30 AM	36	0	9	0	0	0	0	108	0	0	128	0	281
7:45 AM	31	0	17	0	0	0	0	120	0	0	134	0	302
8:00 AM	33	0	10	0	0	0	0	94	0	0	169	0	306
8:15 AM	18	0	8	0	0	0	0	93	0	0	145	0	264
8:30 AM	29	0	16	0	0	0	0	106	0	0	118	0	269
8:45 AM	32	0	11	0	0	0	0	92	0	0	109	0	244
TOTAL VOLUMES :	NL 232	NT 0	NR 90	SL 0	ST 0	SR 0	EL 0	ET 745	ER 0	WL 0	WT 1015	WR 0	TOTAL 2082
APPROACH %'s :	72.05%	0.00%	27.95%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	118	0	44	0	0	0	0	415	0	0	576	0	1153
PEAK HR FACTOR :	0.844			0.000			0.865			0.852			0.942

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-002

Day: Thursday

City: Selma

Date: 6/9/2016

PM													
NS/EW Streets:	SR 99 NB Off Ramp			SR 99 NB Off Ramp			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0.5	NT 0	NR 0.5	SL 0	ST 0	SR 0	EL 0	ET 2	ER 0	WL 0	WT 2	WR 0	TOTAL
4:00 PM	29	0	16	0	0	0	0	154	0	0	190	0	389
4:15 PM	37	0	13	0	0	0	0	165	0	0	130	0	345
4:30 PM	53	0	11	0	0	0	0	182	0	0	181	0	427
4:45 PM	41	0	15	0	0	0	0	185	0	0	151	0	392
5:00 PM	40	0	12	0	0	0	0	161	0	0	172	0	385
5:15 PM	41	0	15	0	0	0	0	180	0	0	170	0	406
5:30 PM	32	0	15	0	0	0	0	169	0	0	132	0	348
5:45 PM	39	0	10	0	0	0	0	188	0	0	147	0	384
TOTAL VOLUMES :	NL 312	NT 0	NR 107	SL 0	ST 0	SR 0	EL 0	ET 1384	ER 0	WL 0	WT 1273	WR 0	TOTAL 3076
APPROACH %'s :	74.46%	0.00%	25.54%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	175	0	53	0	0	0	0	708	0	0	674	0	1610
PEAK HR FACTOR :	0.891			0.000			0.957			0.931			0.943

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 16-8095-002
N/S Street: SR 99 NB Off-Ramp
E/W Street: Floral Ave
DATE: 6/9/2016
CITY: Selma

DAY: Thursday

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0
TOTALS	0	0	0	1	0	0	0	0

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	3	0	0	2	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	1	0	0	2	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	5	0	0	6	0

P M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0
TOTALS	0	0	0	2	0	0	0	0

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	2	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	5	0	0	4	0

ITM Peak Hour Summary

Prepared by:

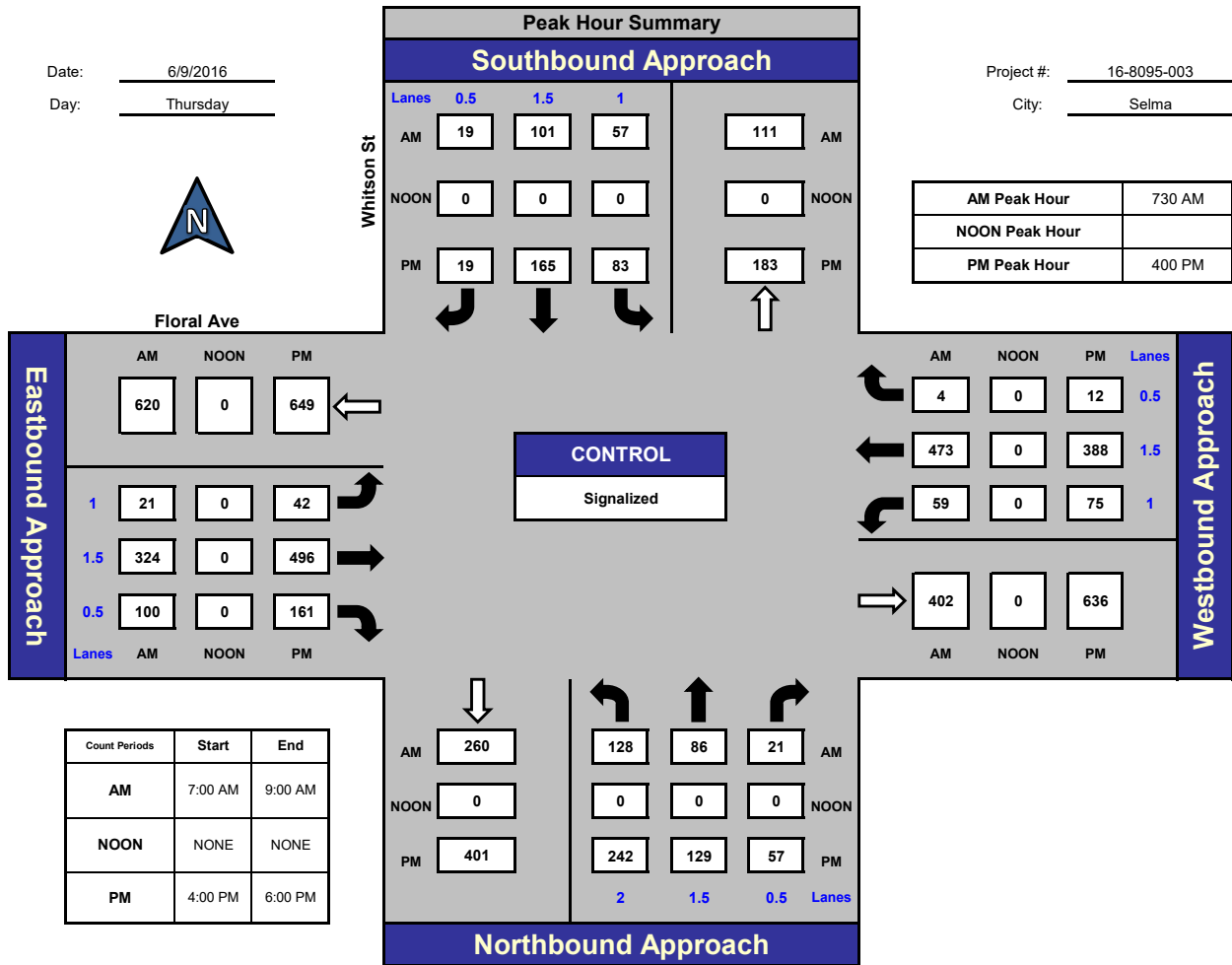


National Data & Surveying Services

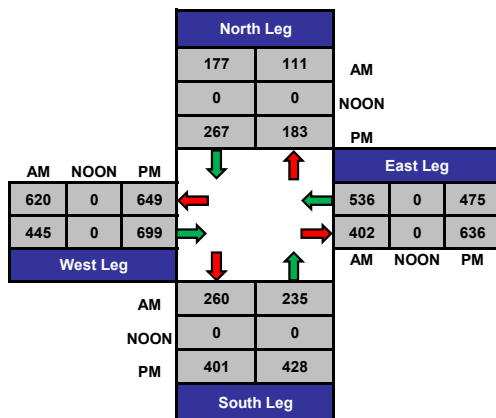
Whitson St and Floral Ave, Selma

Date: 6/9/2016
Day: Thursday

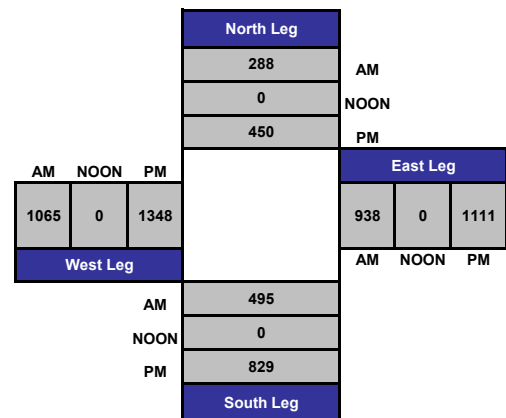
Project #: 16-8095-003
City: Selma



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:
National Data & Surveying Services

Project ID: 16-8095-003

Day: Thursday

City: Selma

Date: 6/9/2016

AM														
NS/EW Streets:	Whitson St			Whitson St			Floral Ave			Floral Ave				
LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL	
	NL 2	NT 1.5	NR 0.5	SL 1	ST 1.5	SR 0.5	EL 1	ET 1.5	ER 0.5	WL 1	WT 1.5	WR 0.5		
7:00 AM	19	8	4	7	19	2	1	47	10	8	65	1	191	
7:15 AM	22	14	1	7	12	2	4	53	24	8	86	2	235	
7:30 AM	31	23	2	11	15	2	5	92	21	10	107	0	319	
7:45 AM	24	15	7	11	28	3	3	104	25	20	125	2	367	
8:00 AM	38	25	8	19	30	8	6	65	25	18	134	1	377	
8:15 AM	35	23	4	16	28	6	7	63	29	11	107	1	330	
8:30 AM	37	19	9	18	26	7	7	77	30	12	70	6	318	
8:45 AM	37	15	6	18	25	9	8	65	28	11	65	6	293	
TOTAL VOLUMES : APPROACH %'s :	NL 243 57.04%	NT 142 33.33%	NR 41 9.62%	SL 107 32.52%	ST 183 55.62%	SR 39 11.85%	EL 41 5.13%	ET 566 70.84%	ER 192 24.03%	WL 98 11.19%	WT 759 86.64%	WR 19 2.17%	TOTAL 2430	
PEAK HR START TIME :	730 AM													TOTAL
PEAK HR VOL :	128	86	21	57	101	19	21	324	100	59	473	4	1393	
PEAK HR FACTOR :	0.827			0.776			0.843			0.876			0.924	

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
0	1	0	0
0	2	1	0
2	1	1	0
2	0	0	0
0	4	2	0
0	2	0	0
0	2	1	0
1	3	2	0
NB 5	SB 15	EB 7	WB 0

Intersection Turning Movement

Prepared by:
National Data & Surveying Services

Project ID: 16-8095-003

Day: Thursday

City: Selma

Date: 6/9/2016

PM													
NS/EW Streets:	Whitson St			Whitson St			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 1.5	NR 0.5	SL 1	ST 1.5	SR 0.5	EL 1	ET 1.5	ER 0.5	WL 1	WT 1.5	WR 0.5	TOTAL
4:00 PM	69	33	15	19	50	4	7	121	46	19	117	3	503
4:15 PM	55	42	12	19	38	9	12	110	37	17	80	3	434
4:30 PM	59	31	18	27	39	3	14	128	33	13	97	5	467
4:45 PM	59	23	12	18	38	3	9	137	45	26	94	1	465
5:00 PM	77	30	13	24	51	9	13	116	39	11	93	3	479
5:15 PM	51	24	7	32	27	1	11	136	41	14	111	2	457
5:30 PM	46	26	11	28	34	4	6	119	47	19	82	4	426
5:45 PM	53	28	14	21	38	6	12	143	46	20	102	2	485
TOTAL VOLUMES :	469	237	102	188	315	39	84	1010	334	139	776	23	3716
APPROACH %'s :	58.04%	29.33%	12.62%	34.69%	58.12%	7.20%	5.88%	70.73%	23.39%	14.82%	82.73%	2.45%	
PEAK HR START TIME :	400 PM												
PEAK HR VOL :	242	129	57	83	165	19	42	496	161	75	388	12	1869
PEAK HR FACTOR :	0.915			0.914			0.915			0.854			0.929

CONTROL : Signalized

UTURNS			
NB	SB	EB	WB
0	1	3	0
0	2	5	0
2	2	2	0
0	1	2	0
1	2	1	0
0	5	3	0
1	2	2	0
1	4	4	0
NB	SB	EB	WB
5	19	22	0

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 16-8095-003
N/S Street: Whitson Street
E/W Street: Floral Avenue
DATE: 6/9/2016
CITY: Selma

DAY: Thursday

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	2	0	0	0	0	0	0
7:30 AM	2	0	0	0	0	0	0	0
7:45 AM	1	2	0	0	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	0
8:45 AM	2	0	0	1	0	0	0	0
TOTALS	5	5	2	1	1	0	0	0

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	1	0	1	1	0	0	2	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	1	0	0	1	0	1	1	0	0	3	1

P M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	0	0	3	0	3	0	0
4:15 PM	0	3	0	0	0	0	0	0
4:30 PM	1	2	0	0	0	0	0	0
4:45 PM	1	0	1	0	0	0	0	0
5:00 PM	2	0	0	0	0	0	0	3
5:15 PM	1	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	0	0	0	0
TOTALS	6	5	1	3	0	3	0	3

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	1	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	1	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	1	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	1	0	0	0	1	0	0	2	1	0	2	0

ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

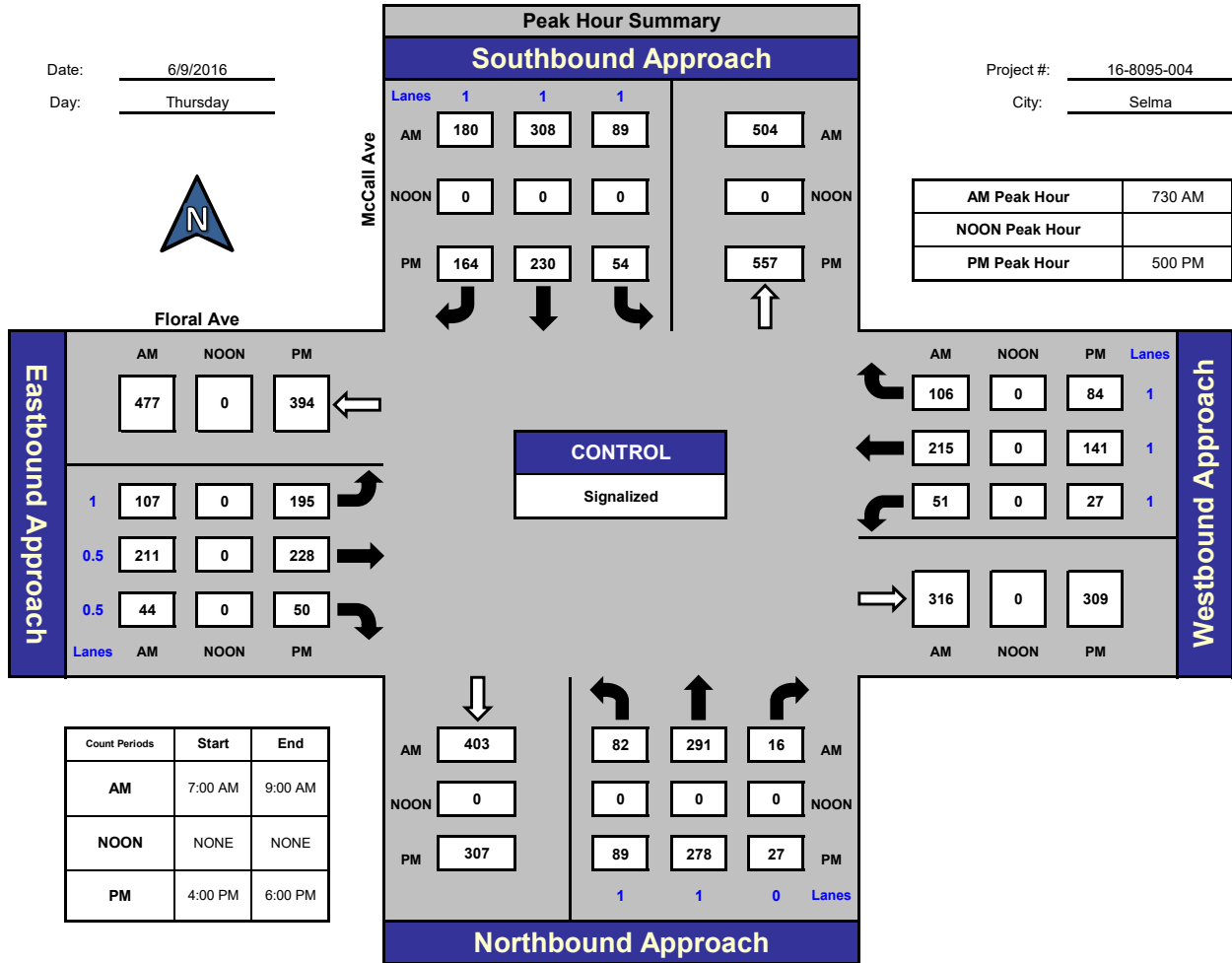
McCall Ave and Floral Ave, Selma

Date: 6/9/2016

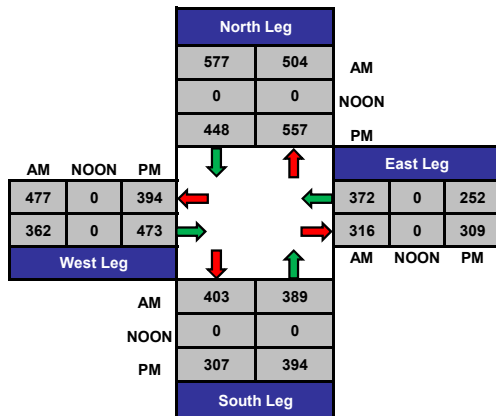
Day: Thursday

Project #: 16-8095-004

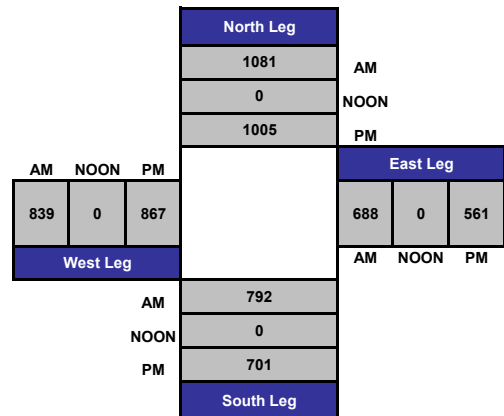
City: Selma



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-004

Day: Thursday

City: Selma

Date: 6/9/2016

AM													
NS/EW Streets:	McCall Ave			McCall Ave			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 1	EL 1	ET 0.5	ER 0.5	WL 1	WT 1	WR 1	TOTAL
7:00 AM	8	15	2	6	29	21	21	15	6	7	24	7	161
7:15 AM	10	41	3	8	46	33	14	36	12	3	36	11	253
7:30 AM	21	74	6	18	70	36	20	51	9	12	43	19	379
7:45 AM	24	95	5	33	106	55	31	69	16	14	59	29	536
8:00 AM	18	75	3	27	77	57	38	57	12	14	67	45	490
8:15 AM	19	47	2	11	55	32	18	34	7	11	46	13	295
8:30 AM	10	32	10	14	47	25	22	40	7	2	24	10	243
8:45 AM	4	36	6	7	46	23	19	39	6	4	19	4	213
TOTAL VOLUMES :	NL 114	NT 415	NR 37	SL 124	ST 476	SR 282	EL 183	ET 341	ER 75	WL 67	WT 318	WR 138	TOTAL 2570
APPROACH %'s :	20.14%	73.32%	6.54%	14.06%	53.97%	31.97%	30.55%	56.93%	12.52%	12.81%	60.80%	26.39%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	82	291	16	89	308	180	107	211	44	51	215	106	1700
PEAK HR FACTOR :	0.784			0.744			0.780			0.738			0.793

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-004

Day: Thursday

City: Selma

Date: 6/9/2016

PM													
NS/EW Streets:	McCall Ave			McCall Ave			Floral Ave			Floral Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 1	EL 1	ET 0.5	ER 0.5	WL 1	WT 1	WR 1	TOTAL
4:00 PM	23	60	9	4	63	44	58	35	9	8	35	9	357
4:15 PM	16	70	4	5	48	27	55	40	9	11	38	16	339
4:30 PM	8	66	7	7	53	37	56	42	11	9	32	10	338
4:45 PM	7	58	11	7	57	37	49	46	11	8	29	15	335
5:00 PM	24	79	9	12	51	44	45	68	13	6	43	22	416
5:15 PM	17	56	9	16	66	44	53	61	17	9	40	20	408
5:30 PM	25	81	3	15	56	36	52	57	11	6	30	26	398
5:45 PM	23	62	6	11	57	40	45	42	9	6	28	16	345
TOTAL VOLUMES :	NL 143	NT 532	NR 58	SL 77	ST 451	SR 309	EL 413	ET 391	ER 90	WL 63	WT 275	WR 134	TOTAL 2936
APPROACH %'s :	19.51%	72.58%	7.91%	9.20%	53.88%	36.92%	46.20%	43.74%	10.07%	13.35%	58.26%	28.39%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	89	278	27	54	230	164	195	228	50	27	141	84	1567
PEAK HR FACTOR :	0.879			0.889			0.903			0.887			0.942

CONTROL : Signalized

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 16-8095-004
N/S Street: McCall Ave
E/W Street: Floral Avenue
DATE: 6/9/2016
CITY: Selma

DAY: Thursday

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	1	0	0	0	0	0	0
7:15 AM	4	0	7	1	0	0	1	1
7:30 AM	0	0	1	3	1	3	3	3
7:45 AM	0	1	18	4	0	4	0	0
8:00 AM	4	1	3	1	0	0	7	0
8:15 AM	0	0	0	4	0	0	1	0
8:30 AM	2	0	0	0	1	0	0	0
8:45 AM	0	0	2	0	1	1	0	0
TOTALS	10	3	31	13	3	8	12	4

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	1	0	0	0	0	0	1	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	1	0	1	0	0	0	1	0	1	0

P M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	0	1	0	2	0	0	0
4:15 PM	0	0	0	1	0	0	0	0
4:30 PM	0	1	0	0	0	0	0	0
4:45 PM	1	0	2	0	1	0	0	0
5:00 PM	0	0	0	1	0	0	1	1
5:15 PM	0	1	2	0	1	0	0	0
5:30 PM	2	0	3	1	0	0	1	1
5:45 PM	1	1	2	0	0	2	3	0
TOTALS	4	3	10	3	4	2	5	2

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	1	0	0	1	0
4:15 PM	1	1	0	0	0	0	1	0	0	0	0	0
4:30 PM	0	1	0	0	2	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	0	1	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	1	0	0	0	1	0	0	0
TOTALS	1	3	0	0	5	0	1	1	2	0	1	0

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991

Traffic Engineering, Transportation Planning & Parking Solutions

www.JLBtraffic.com

File Name : Highland at SR 99 Ramps

Site Code : 00000000

Start Date : 6/7/2016

Page No : 1

Groups Printed- Unshifted

	HIGHLAND Southbound					SR 99 RAMPS Westbound					HIGHLAND Northbound					SR 99 RAMPS Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	50	27	0	77	0	0	0	0	0	2	105	0	0	107	69	0	0	0	69	253
07:15 AM	0	55	32	0	87	0	0	0	0	0	8	158	0	1	167	79	0	0	0	79	333
07:30 AM	0	64	34	0	98	0	0	0	0	0	6	167	0	0	173	94	0	0	0	94	365
07:45 AM	0	68	27	0	95	0	0	0	0	0	8	151	0	0	159	96	0	0	0	96	350
Total	0	237	120	0	357	0	0	0	0	0	24	581	0	1	606	338	0	0	0	338	1301
08:00 AM	0	60	28	0	88	0	0	0	0	0	8	131	0	0	139	85	0	0	0	85	312
08:15 AM	0	82	39	0	121	0	0	0	0	0	12	131	0	1	144	95	0	0	0	95	360
08:30 AM	0	44	27	1	72	0	0	0	0	0	2	119	0	1	122	93	0	0	0	93	287
08:45 AM	0	58	28	0	86	0	0	0	0	0	6	121	0	1	128	76	0	0	0	76	290
Total	0	244	122	1	367	0	0	0	0	0	28	502	0	3	533	349	0	0	0	349	1249

04:00 PM	0	75	26	0	101	0	0	0	0	0	13	198	0	0	211	77	0	0	0	77	389
04:15 PM	0	72	45	0	117	0	0	0	0	0	10	183	0	0	193	92	0	0	0	92	402
04:30 PM	0	81	56	0	137	0	0	0	0	0	7	172	0	0	179	84	0	0	0	84	400
04:45 PM	0	66	56	0	122	0	0	0	0	0	10	186	0	0	196	102	0	0	0	102	420
Total	0	294	183	0	477	0	0	0	0	0	40	739	0	0	779	355	0	0	0	355	1611
05:00 PM	0	85	53	0	138	0	0	0	0	0	16	187	0	0	203	108	0	0	0	108	449
05:15 PM	0	99	57	0	156	0	0	0	0	0	12	195	0	0	207	114	0	0	0	114	477
05:30 PM	0	70	48	0	118	0	0	0	0	0	11	183	0	1	195	102	0	0	0	102	415
05:45 PM	0	61	47	0	108	0	0	0	0	0	13	147	0	0	160	76	0	0	0	76	344
Total	0	315	205	0	520	0	0	0	0	0	52	712	0	1	765	400	0	0	0	400	1685
Grand Total	0	1090	630	1	1721	0	0	0	0	0	144	2534	0	5	2683	1442	0	0	0	1442	5846
Apprch %	0	63.3	36.6	0.1		0	0	0	0		5.4	94.4	0	0.2		100	0	0	0		
Total %	0	18.6	10.8	0	29.4	0	0	0	0	0	2.5	43.3	0	0.1	45.9	24.7	0	0	0	24.7	

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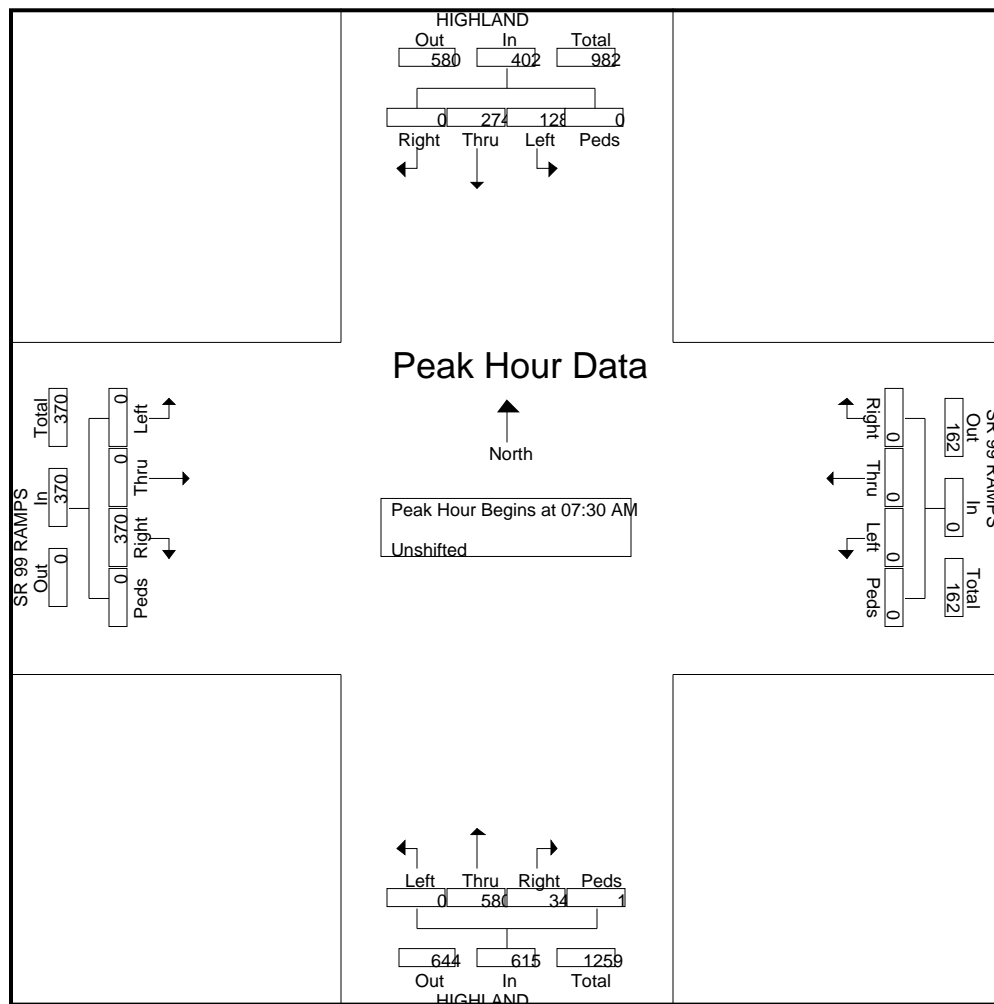
File Name : Highland at SR 99 Ramps

Site Code : 00000000

Start Date : 6/7/2016

Page No : 2

	HIGHLAND Southbound					SR 99 RAMPS Westbound					HIGHLAND Northbound					SR 99 RAMPS Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	64	34	0	98	0	0	0	0	0	6	167	0	0	173	94	0	0	0	94	365
07:45 AM	0	68	27	0	95	0	0	0	0	0	8	151	0	0	159	96	0	0	0	96	350
08:00 AM	0	60	28	0	88	0	0	0	0	0	8	131	0	0	139	85	0	0	0	85	312
08:15 AM	0	82	39	0	121	0	0	0	0	0	12	131	0	1	144	95	0	0	0	95	360
Total Volume	0	274	128	0	402	0	0	0	0	0	34	580	0	1	615	370	0	0	0	370	1387
% App. Total	0	68.2	31.8	0		0	0	0	0	0	5.5	94.3	0	0.2		100	0	0	0		
PHF	.000	.835	.821	.000	.831	.000	.000	.000	.000	.000	.708	.868	.000	.250	.889	.964	.000	.000	.000	.964	.950



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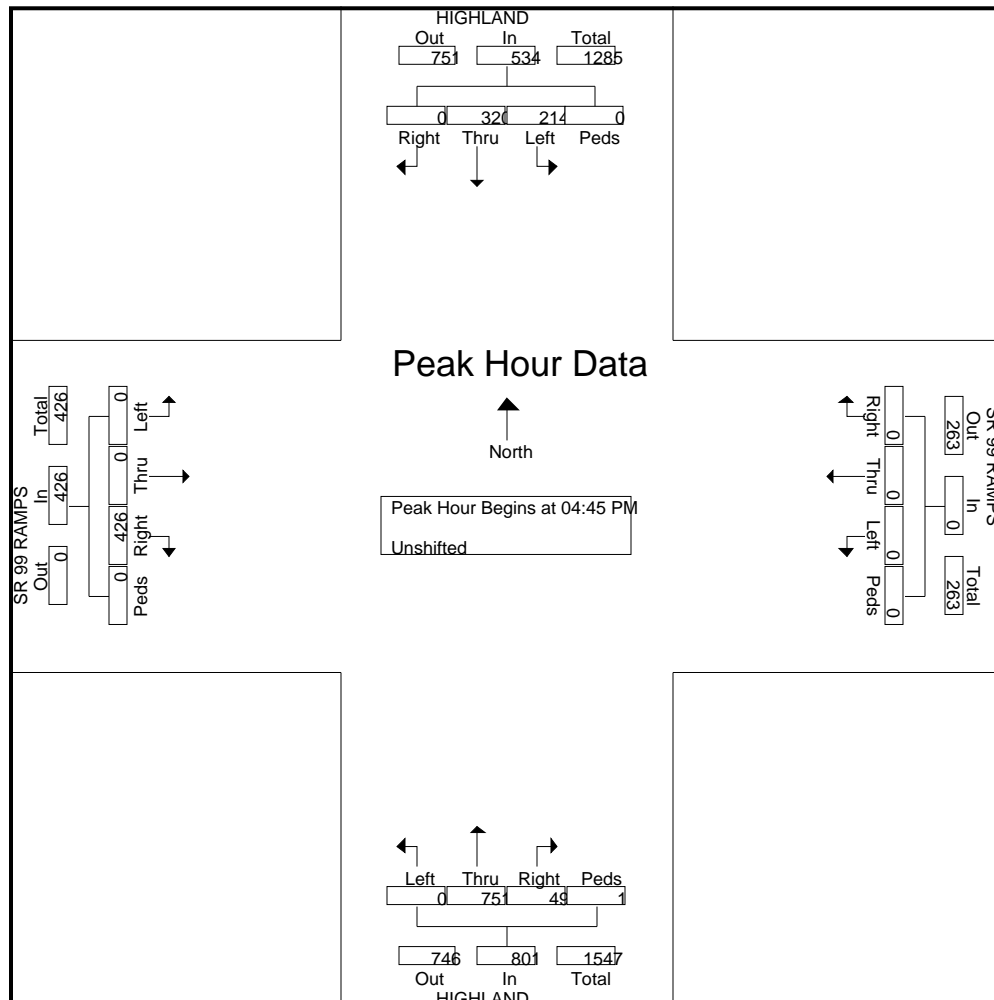
File Name : Highland at SR 99 Ramps

Site Code : 00000000

Start Date : 6/7/2016

Page No : 3

	HIGHLAND Southbound					SR 99 RAMPS Westbound					HIGHLAND Northbound					SR 99 RAMPS Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	66	56	0	122	0	0	0	0	0	10	186	0	0	196	102	0	0	0	102	420
05:00 PM	0	85	53	0	138	0	0	0	0	0	16	187	0	0	203	108	0	0	0	108	449
05:15 PM	0	99	57	0	156	0	0	0	0	0	12	195	0	0	207	114	0	0	0	114	477
05:30 PM	0	70	48	0	118	0	0	0	0	0	11	183	0	1	195	102	0	0	0	102	415
Total Volume	0	320	214	0	534	0	0	0	0	0	49	751	0	1	801	426	0	0	0	426	1761
% App. Total	0	59.9	40.1	0		0	0	0	0		6.1	93.8	0	0.1		100	0	0	0		
PHF	.000	.808	.939	.000	.856	.000	.000	.000	.000	.000	.766	.963	.000	.250	.967	.934	.000	.000	.000	.934	.923



ITM Peak Hour Summary

Prepared by:

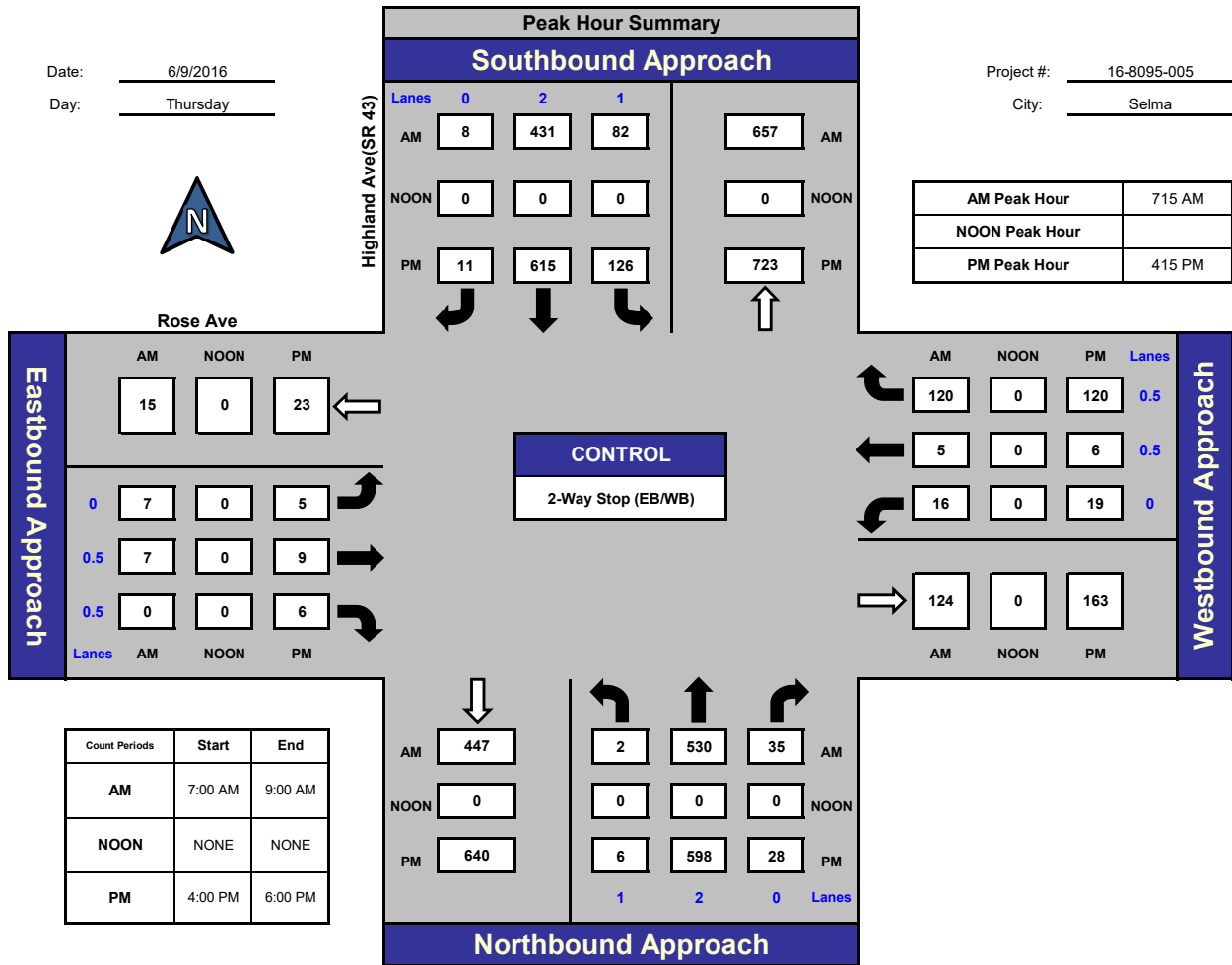


National Data & Surveying Services

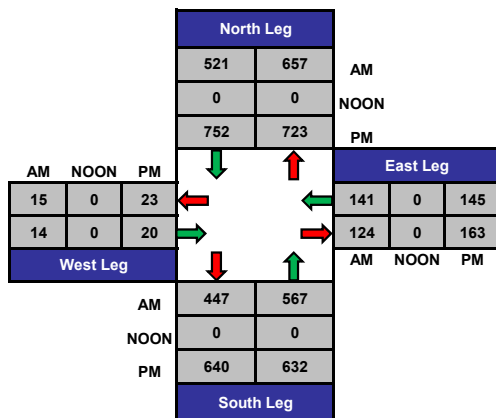
Highland Ave(SR 43) and Rose Ave , Selma

Date: 6/9/2016
Day: Thursday

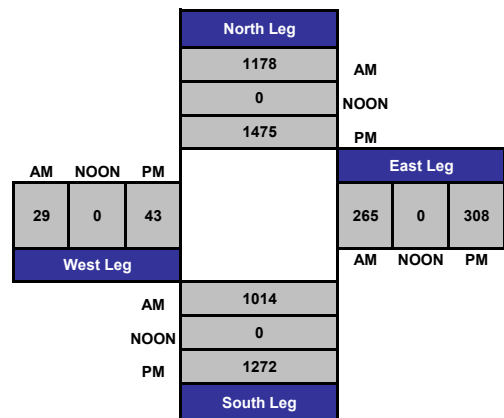
Project #: 16-8095-005
City: Selma



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-005

Day: Thursday

City: Selma

Date: 6/9/2016

AM													
NS/EW Streets:	Highland Ave(SR 43)			Highland Ave(SR 43)			Rose Ave			Rose Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 0.5	ER 0.5	WL 0	WT 0.5	WR 0.5	TOTAL
7:00 AM	1	102	5	4	90	1	1	0	0	3	0	14	221
7:15 AM	1	115	7	14	110	1	1	2	0	5	1	23	280
7:30 AM	0	155	7	19	128	3	2	3	0	3	2	40	362
7:45 AM	1	128	13	25	102	2	3	1	0	4	2	28	309
8:00 AM	0	132	8	24	91	2	1	1	0	4	0	29	292
8:15 AM	0	107	6	21	108	2	0	1	0	3	1	30	279
8:30 AM	0	107	3	15	104	2	3	1	0	7	0	15	257
8:45 AM	1	100	7	13	91	4	0	1	0	2	1	27	247
TOTAL VOLUMES :	NL 4	NT 946	NR 56	SL 135	ST 824	SR 17	EL 11	ET 10	ER 0	WL 31	WT 7	WR 206	TOTAL 2247
APPROACH %'s :	0.40%	94.04%	5.57%	13.83%	84.43%	1.74%	52.38%	47.62%	0.00%	12.70%	2.87%	84.43%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	2	530	35	82	431	8	7	7	0	16	5	120	1243
PEAK HR FACTOR :	0.875			0.868			0.700			0.783			0.858

CONTROL : 2-Way Stop (EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-8095-005

Day: Thursday

City: Selma

Date: 6/9/2016

PM													
NS/EW Streets:	Highland Ave(SR 43)			Highland Ave(SR 43)			Rose Ave			Rose Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 0.5	ER 0.5	WL 0	WT 0.5	WR 0.5	TOTAL
4:00 PM	1	165	2	30	145	1	0	2	0	8	1	18	373
4:15 PM	1	168	13	28	157	1	0	4	1	7	1	29	410
4:30 PM	3	161	7	25	136	1	1	1	2	8	1	36	382
4:45 PM	1	146	2	37	149	3	2	1	1	2	2	33	379
5:00 PM	1	123	6	36	173	6	2	3	2	2	2	22	378
5:15 PM	0	146	10	28	162	3	0	1	1	4	1	29	385
5:30 PM	0	118	4	29	146	1	2	1	0	5	0	36	342
5:45 PM	1	104	9	27	116	2	1	2	1	3	1	19	286
TOTAL VOLUMES :	NL 8	NT 1131	NR 53	SL 240	ST 1184	SR 18	EL 8	ET 15	ER 8	WL 39	WT 9	WR 222	TOTAL 2935
APPROACH %'s :	0.67%	94.88%	4.45%	16.64%	82.11%	1.25%	25.81%	48.39%	25.81%	14.44%	3.33%	82.22%	
PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	6	598	28	126	615	11	5	9	6	19	6	120	1549
PEAK HR FACTOR :	0.868			0.874			0.714			0.806			0.945

CONTROL : 2-Way Stop (EB/WB)

PREPARED BY NATIONAL DATA & SURVEYING SERVICES

PROJECT#: 16-8095-005
N/S Street: Highland Ave
E/W Street: Rose Ave
DATE: 6/9/2016
CITY: Selma

DAY: Thursday

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:00 AM	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	1	0	0	0
TOTALS	0	0	0	0	1	0	0	0

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0

P M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0	0

BIKES

T I M E	NB			SB			EB			WB		
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	2	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	2	0	0	2	0	0	0	0	2	0	0

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Fresno, CA 93704

(559) 570-8991

Traffic Engineering, Transportation Planning & Parking Solutions

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File Name : High at Golden

Site Code : 00000000

Start Date : 7/23/2016

Page No : 1

Groups Printed- Unshifted

	HIGH Southbound					GOLDEN Westbound					HIGH Northbound					GOLDEN Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
01:00 PM	12	54	1	0	67	5	23	9	1	38	11	55	5	0	71	0	23	27	0	50	226
01:15 PM	9	52	1	0	62	10	19	12	0	41	17	59	8	0	84	1	28	29	0	58	245
01:30 PM	13	48	7	0	68	5	20	10	1	36	16	70	11	0	97	2	27	28	0	57	258
01:45 PM	11	45	2	0	58	8	19	13	0	40	19	63	9	0	91	1	26	23	0	50	239
Total	45	199	11	0	255	28	81	44	2	155	63	247	33	0	343	4	104	107	0	215	968
02:00 PM	2	26	20	0	48	23	56	13	1	93	1	9	6	0	16	21	69	6	0	96	253
02:15 PM	3	28	25	0	56	17	59	2	0	78	5	21	10	0	36	14	67	4	0	85	255
02:30 PM	3	17	30	0	50	11	61	5	0	77	5	22	8	0	35	22	63	5	0	90	252
02:45 PM	3	38	26	0	67	14	58	5	1	78	4	22	8	0	34	15	67	4	0	86	265
Total	11	109	101	0	221	65	234	25	2	326	15	74	32	0	121	72	266	19	0	357	1025
Grand Total	56	308	112	0	476	93	315	69	4	481	78	321	65	0	464	76	370	126	0	572	1993
Apprch %	11.8	64.7	23.5	0		19.3	65.5	14.3	0.8		16.8	69.2	14	0		13.3	64.7	22	0		
Total %	2.8	15.5	5.6	0	23.9	4.7	15.8	3.5	0.2	24.1	3.9	16.1	3.3	0	23.3	3.8	18.6	6.3	0	28.7	

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Site Code : 00000000

Start Date : 7/23/2016

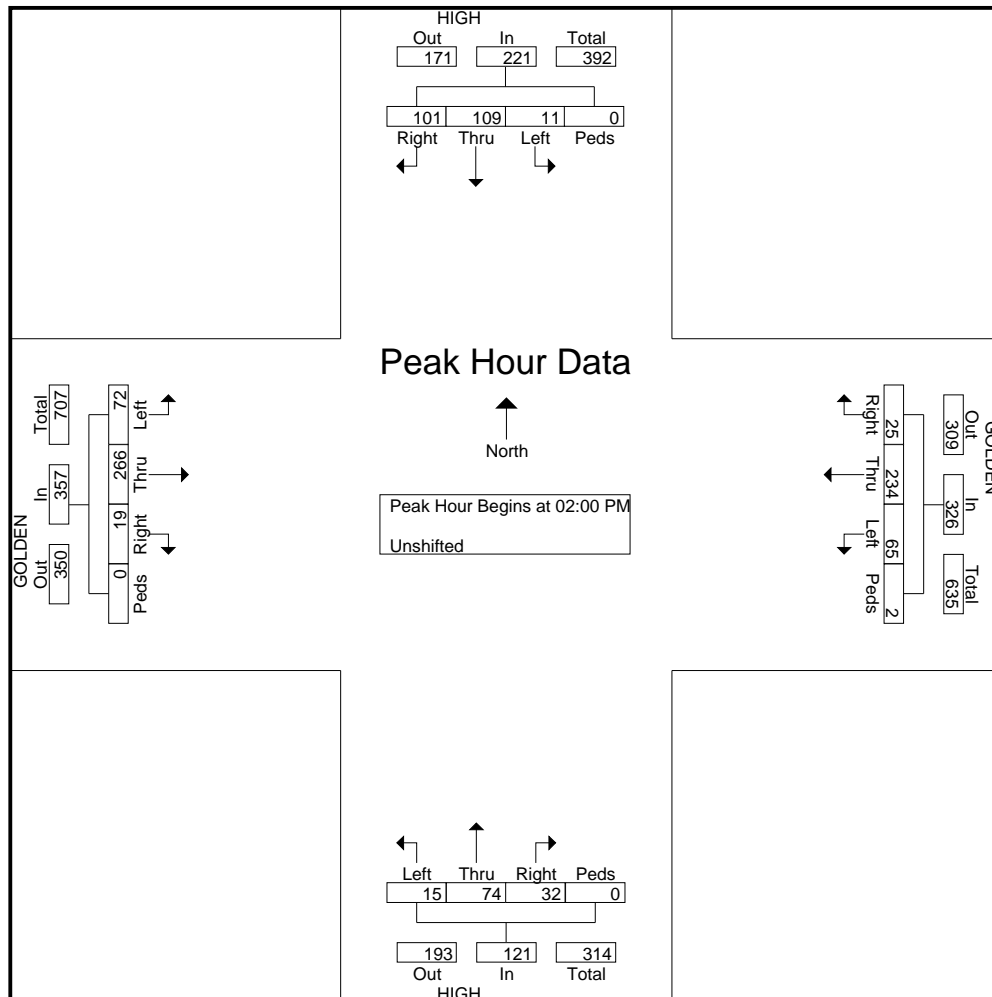
Page No : 2

	HIGH Southbound					GOLDEN Westbound					HIGH Northbound					GOLDEN Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 02:00 PM

02:00 PM	2	26	20	0	48	23	56	13	1	93	1	9	6	0	16	21	69	6	0	96	253
02:15 PM	3	28	25	0	56	17	59	2	0	78	5	21	10	0	36	14	67	4	0	85	255
02:30 PM	3	17	30	0	50	11	61	5	0	77	5	22	8	0	35	22	63	5	0	90	252
02:45 PM	3	38	26	0	67	14	58	5	1	78	4	22	8	0	34	15	67	4	0	86	265
Total Volume	11	109	101	0	221	65	234	25	2	326	15	74	32	0	121	72	266	19	0	357	1025
% App. Total	5	49.3	45.7	0		19.9	71.8	7.7	0.6		12.4	61.2	26.4	0		20.2	74.5	5.3	0		
PHF	.917	.717	.842	.000	.825	.707	.959	.481	.500	.876	.750	.841	.800	.000	.840	.818	.964	.792	.000	.930	.967



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File Name : DeWolf at Floral

Site Code : 00000000

Start Date : 7/23/2016

Page No : 1

Groups Printed- Unshifted

	DEWOLF Southbound					FLORAL Westbound					DEWOLF Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	0	2	11	0	13	1	17	4	0	22	2	2	0	0	4	0	18	0	0	18	57
01:15 PM	0	1	3	0	4	4	19	1	0	24	3	0	2	0	5	0	21	0	0	21	54
01:30 PM	0	1	4	0	5	2	29	1	0	32	3	2	0	0	5	1	20	0	0	21	63
01:45 PM	0	0	2	0	2	1	24	1	0	26	6	0	1	0	7	1	24	0	0	25	60
Total	0	4	20	0	24	8	89	7	0	104	14	4	3	0	21	2	83	0	0	85	234
02:00 PM	0	1	1	0	2	5	38	3	0	46	0	2	0	0	2	0	14	0	0	14	64
02:15 PM	0	0	0	0	0	2	19	1	0	22	2	1	1	0	4	0	19	1	0	20	46
02:30 PM	0	1	1	0	2	2	18	2	0	22	5	2	2	0	9	1	24	0	0	25	58
02:45 PM	0	2	1	0	3	3	24	2	0	29	1	0	0	0	1	1	27	0	0	28	61
Total	0	4	3	0	7	12	99	8	0	119	8	5	3	0	16	2	84	1	0	87	229
Grand Total	0	8	23	0	31	20	188	15	0	223	22	9	6	0	37	4	167	1	0	172	463
Apprch %	0	25.8	74.2	0		9	84.3	6.7	0		59.5	24.3	16.2	0		2.3	97.1	0.6	0		
Total %	0	1.7	5	0	6.7	4.3	40.6	3.2	0	48.2	4.8	1.9	1.3	0	8	0.9	36.1	0.2	0	37.1	

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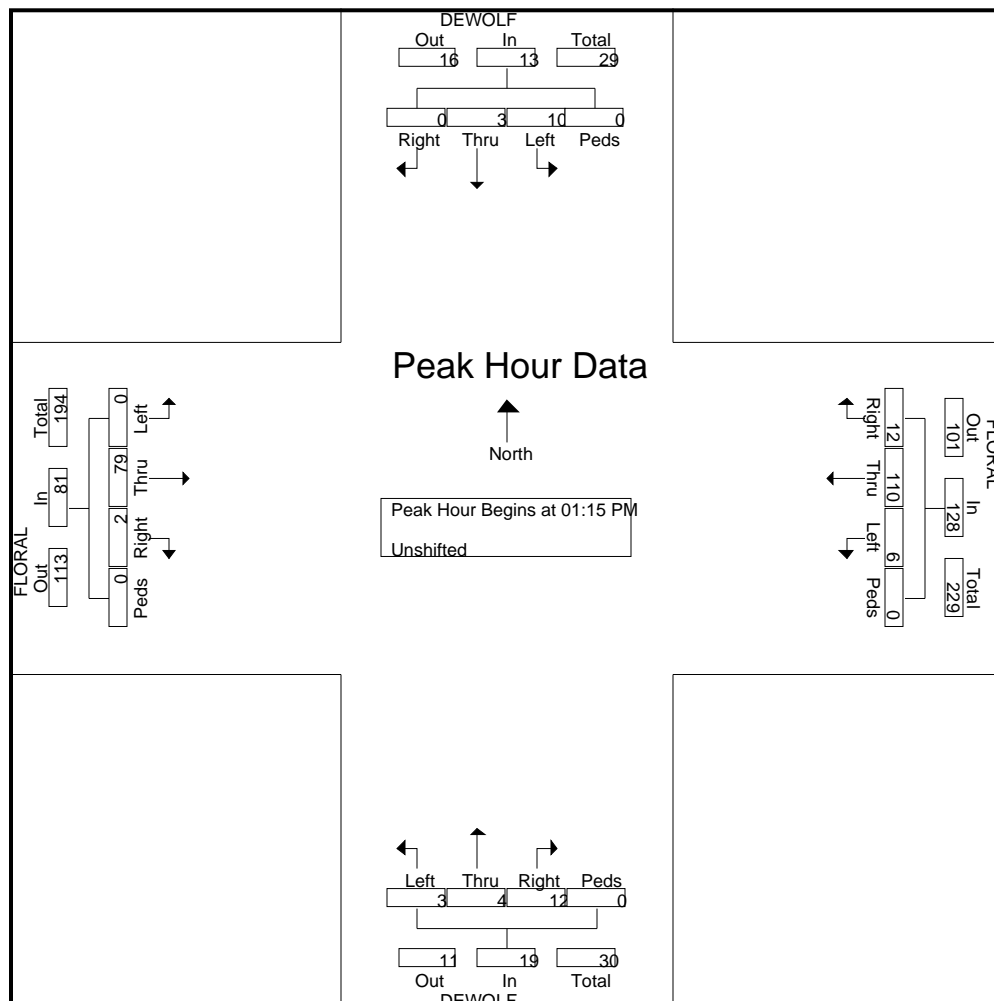
File Name : DeWolf at Floral

Site Code : 00000000

Start Date : 7/23/2016

Page No : 2

	DEWOLF Southbound					FLORAL Westbound					DEWOLF Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:15 PM																					
01:15 PM	0	1	3	0	4	4	19	1	0	24	3	0	2	0	5	0	21	0	0	21	54
01:30 PM	0	1	4	0	5	2	29	1	0	32	3	2	0	0	5	1	20	0	0	21	63
01:45 PM	0	0	2	0	2	1	24	1	0	26	6	0	1	0	7	1	24	0	0	25	60
02:00 PM	0	1	1	0	2	5	38	3	0	46	0	2	0	0	2	0	14	0	0	14	64
Total Volume	0	3	10	0	13	12	110	6	0	128	12	4	3	0	19	2	79	0	0	81	241
% App. Total	0	23.1	76.9	0		9.4	85.9	4.7	0		63.2	21.1	15.8	0		2.5	97.5	0	0		
PHF	.000	.750	.625	.000	.650	.600	.724	.500	.000	.696	.500	.500	.375	.000	.679	.500	.823	.000	.000	.810	.941



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File Name : SR 99 SB Off-Ramp at Floral (Saturday)

Site Code : 00000000

Start Date : 7/16/2016

Page No : 1

Groups Printed- Unshifted

	SR 99 SB OFF Southbound					FLORAL Westbound					SR 99 SB OFF Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	35	8	51	1	95	0	117	29	1	147	38	0	0	0	38	24	109	0	0	133	413
01:15 PM	27	7	40	0	74	0	103	23	0	126	41	0	0	0	41	17	121	0	0	138	379
01:30 PM	22	6	45	0	73	0	113	32	0	145	33	0	0	0	33	23	130	0	0	153	404
01:45 PM	22	11	51	0	84	0	119	24	2	145	47	0	0	0	47	22	121	0	0	143	419
Total	106	32	187	1	326	0	452	108	3	563	159	0	0	0	159	86	481	0	0	567	1615
02:00 PM	22	10	39	0	71	0	91	13	1	105	34	0	0	0	34	22	107	0	0	129	339
02:15 PM	20	8	42	3	73	0	107	32	0	139	42	0	0	0	42	8	102	0	0	110	364
02:30 PM	21	13	58	0	92	0	102	22	1	125	35	0	0	0	35	13	104	0	0	117	369
02:45 PM	17	6	47	0	70	0	125	20	1	146	30	0	0	0	30	14	118	0	0	132	378
Total	80	37	186	3	306	0	425	87	3	515	141	0	0	0	141	57	431	0	0	488	1450
Grand Total	186	69	373	4	632	0	877	195	6	1078	300	0	0	0	300	143	912	0	0	1055	3065
Apprch %	29.4	10.9	59	0.6		0	81.4	18.1	0.6		100	0	0	0		13.6	86.4	0	0		
Total %	6.1	2.3	12.2	0.1	20.6	0	28.6	6.4	0.2	35.2	9.8	0	0	0	9.8	4.7	29.8	0	0	34.4	

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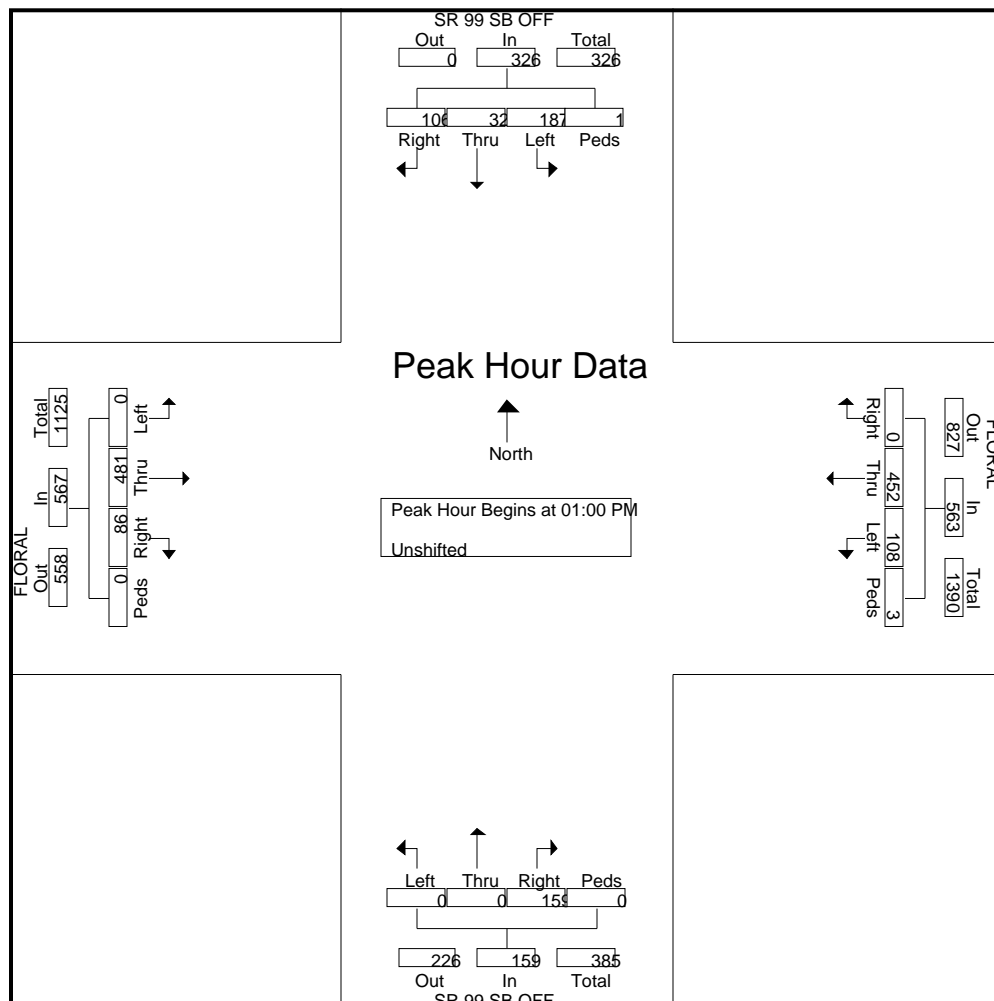
File Name : SR 99 SB Off-Ramp at Floral (Saturday)

Site Code : 00000000

Start Date : 7/16/2016

Page No : 2

	SR 99 SB OFF Southbound					FLORAL Westbound					SR 99 SB OFF Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	35	8	51	1	95	0	117	29	1	147	38	0	0	0	38	24	109	0	0	133	413
01:15 PM	27	7	40	0	74	0	103	23	0	126	41	0	0	0	41	17	121	0	0	138	379
01:30 PM	22	6	45	0	73	0	113	32	0	145	33	0	0	0	33	23	130	0	0	153	404
01:45 PM	22	11	51	0	84	0	119	24	2	145	47	0	0	0	47	22	121	0	0	143	419
Total Volume	106	32	187	1	326	0	452	108	3	563	159	0	0	0	159	86	481	0	0	567	1615
% App. Total	32.5	9.8	57.4	0.3		0	80.3	19.2	0.5		100	0	0	0		15.2	84.8	0	0		
PHF	.757	.727	.917	.250	.858	.000	.950	.844	.375	.957	.846	.000	.000	.000	.846	.896	.925	.000	.000	.926	.964



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File Name : 07162016

Site Code : 00000000

Start Date : 7/16/2016

Page No : 1

Groups Printed- Unshifted

	HIGHLAND Southbound					FLORAL Westbound					HIGHLAND Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	46	35	27	0	108	46	121	27	5	199	15	24	27	0	66	40	126	43	0	209	582
01:15 PM	42	35	21	0	98	29	118	37	1	185	17	22	19	0	58	38	121	42	0	201	542
01:30 PM	52	37	20	0	109	25	130	23	1	179	12	27	19	0	58	38	119	57	0	214	560
01:45 PM	45	47	13	0	105	30	137	28	3	198	22	28	22	0	72	44	124	45	0	213	588
Total	185	154	81	0	420	130	506	115	10	761	66	101	87	0	254	160	490	187	0	837	2272
02:00 PM	33	29	19	0	81	25	116	32	4	177	22	23	16	0	61	24	114	51	0	189	508
02:15 PM	50	41	10	0	101	25	121	19	2	167	18	20	20	0	58	30	107	44	0	181	507
02:30 PM	53	37	19	0	109	36	105	26	0	167	19	24	18	0	61	22	136	51	0	209	546
02:45 PM	51	38	17	1	107	25	115	35	2	177	17	24	27	0	68	30	112	55	0	197	549
Total	187	145	65	1	398	111	457	112	8	688	76	91	81	0	248	106	469	201	0	776	2110
Grand Total	372	299	146	1	818	241	963	227	18	1449	142	192	168	0	502	266	959	388	0	1613	4382
Apprch %	45.5	36.6	17.8	0.1		16.6	66.5	15.7	1.2		28.3	38.2	33.5	0		16.5	59.5	24.1	0		
Total %	8.5	6.8	3.3	0	18.7	5.5	22	5.2	0.4	33.1	3.2	4.4	3.8	0	11.5	6.1	21.9	8.9	0	36.8	

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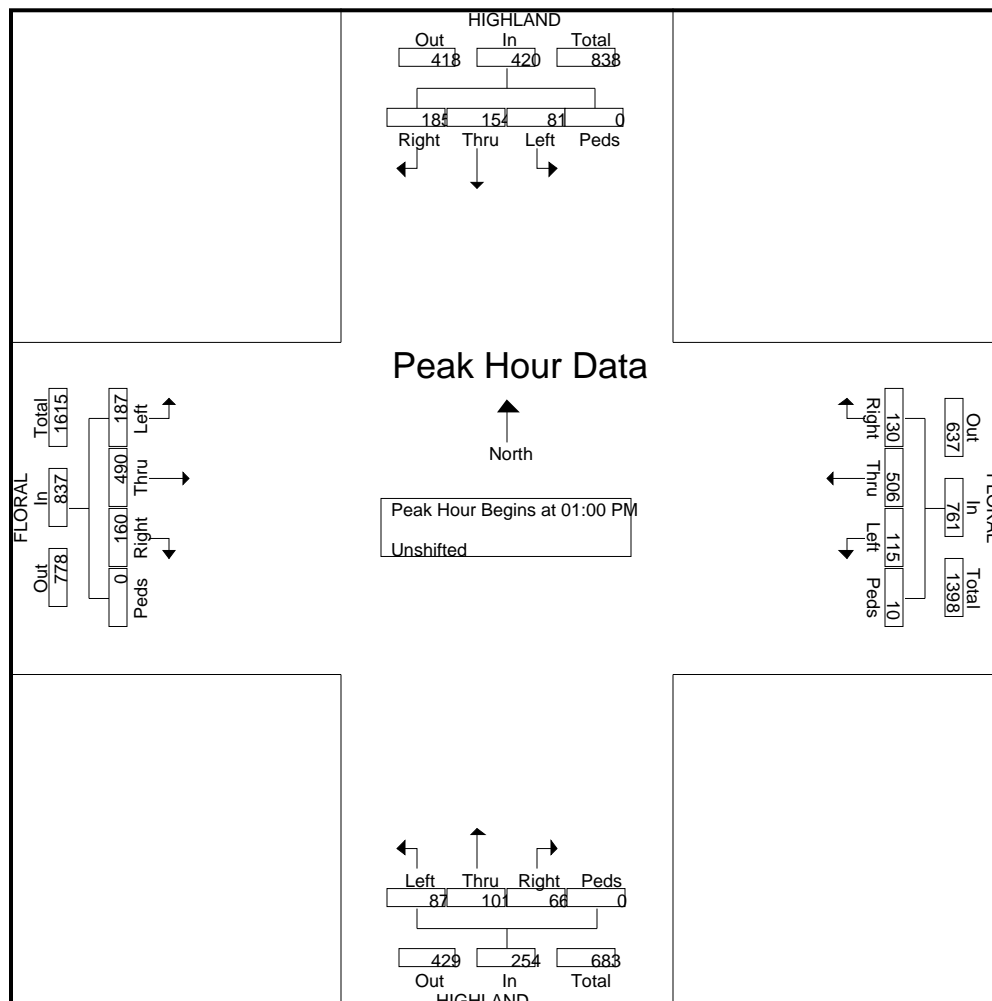
File Name : 07162016

Site Code : 00000000

Start Date : 7/16/2016

Page No : 2

	HIGHLAND Southbound					FLORAL Westbound					HIGHLAND Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	46	35	27	0	108	46	121	27	5	199	15	24	27	0	66	40	126	43	0	209	582
01:15 PM	42	35	21	0	98	29	118	37	1	185	17	22	19	0	58	38	121	42	0	201	542
01:30 PM	52	37	20	0	109	25	130	23	1	179	12	27	19	0	58	38	119	57	0	214	560
01:45 PM	45	47	13	0	105	30	137	28	3	198	22	28	22	0	72	44	124	45	0	213	588
Total Volume	185	154	81	0	420	130	506	115	10	761	66	101	87	0	254	160	490	187	0	837	2272
% App. Total	44	36.7	19.3	0		17.1	66.5	15.1	1.3		26	39.8	34.3	0		19.1	58.5	22.3	0		
PHF	.889	.819	.750	.000	.963	.707	.923	.777	.500	.956	.750	.902	.806	.000	.882	.909	.972	.820	.000	.978	.966



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File Name : Floral at SR 99 NB Off-Ramp

Site Code : 00000005

Start Date : 7/30/2016

Page No : 1

Groups Printed- Unshifted

	Southbound					Floral Ave Westbound				SR 99 NB Off-Ramp Northbound				Floral Ave Eastbound				
Start Time	Right	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
01:00 PM	0	0	0	0	0	165	0	0	165	12	26	0	38	0	143	0	143	346
01:15 PM	0	0	0	0	0	118	0	0	118	20	33	0	53	0	155	0	155	326
01:30 PM	0	0	0	0	0	148	0	0	148	24	33	0	57	0	112	0	112	317
01:45 PM	0	0	0	0	0	107	0	0	107	10	27	0	37	0	123	1	124	268
Total	0	0	0	0	0	538	0	0	538	66	119	0	185	0	533	1	534	1257
02:00 PM	0	0	0	0	0	118	0	0	118	13	30	0	43	0	148	0	148	309
02:15 PM	0	0	0	0	0	119	0	0	119	18	43	0	61	0	151	0	151	331
02:30 PM	0	0	0	0	0	123	0	0	123	8	26	0	34	0	127	0	127	284
02:45 PM	0	0	0	0	0	129	0	0	129	18	25	0	43	0	126	0	126	298
Total	0	0	0	0	0	489	0	0	489	57	124	0	181	0	552	0	552	1222
Grand Total	0	0	0	0	0	1027	0	0	1027	123	243	0	366	0	1085	1	1086	2479
Apprch %	0	0	0	0		100	0	0		33.6	66.4	0		0	99.9	0.1		
Total %	0	0	0	0	0	41.4	0	0	41.4	5	9.8	0	14.8	0	43.8	0	43.8	

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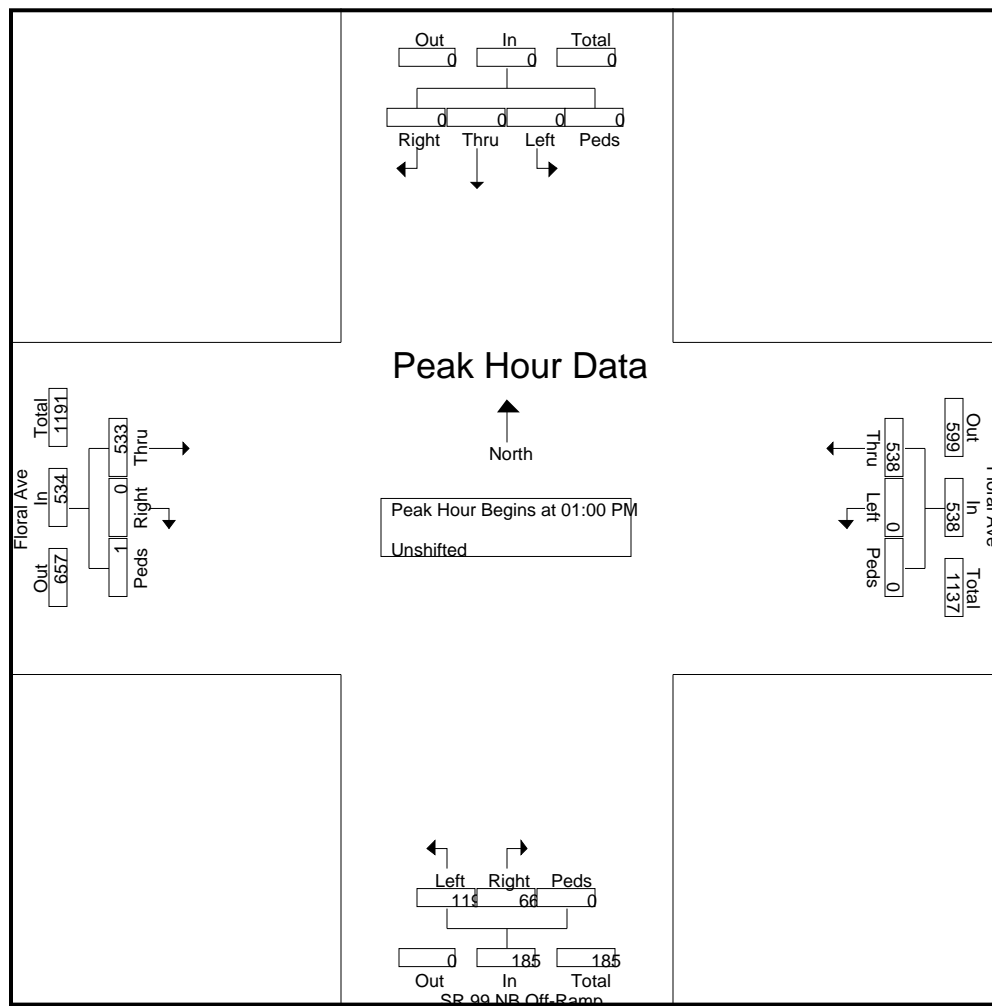
File Name : Floral at SR 99 NB Off-Ramp

Site Code : 00000005

Start Date : 7/30/2016

Page No : 2

	Southbound					Floral Ave Westbound				SR 99 NB Off-Ramp Northbound				Floral Ave Eastbound				
Start Time	Right	Thru	Left	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 01:00 PM																		
01:00 PM	0	0	0	0	0	165	0	0	165	12	26	0	38	0	143	0	143	346
01:15 PM	0	0	0	0	0	118	0	0	118	20	33	0	53	0	155	0	155	326
01:30 PM	0	0	0	0	0	148	0	0	148	24	33	0	57	0	112	0	112	317
01:45 PM	0	0	0	0	0	107	0	0	107	10	27	0	37	0	123	1	124	268
Total Volume	0	0	0	0	0	538	0	0	538	66	119	0	185	0	533	1	534	1257
% App. Total	0	0	0	0	0	100	0	0	100	35.7	64.3	0	100	0	99.8	0.2	100	100
PHF	.000	.000	.000	.000	.000	.815	.000	.000	.815	.688	.902	.000	.811	.000	.860	.250	.861	.908



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File Name : Floral at Whitson (Saturday)

Site Code : 00000000

Start Date : 7/30/2016

Page No : 1

Groups Printed- Unshifted

	WHITSON Southbound					FLORAL Westbound					WHITSON Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	4	25	18	0	47	2	81	12	0	95	8	21	71	2	102	59	71	7	1	138	382
01:15 PM	1	43	17	0	61	3	62	19	0	84	5	15	59	0	79	57	89	13	0	159	383
01:30 PM	5	23	14	0	42	4	82	14	0	100	5	27	57	0	89	51	64	14	0	129	360
01:45 PM	1	38	21	0	60	1	60	12	0	73	6	22	52	0	80	46	76	8	0	130	343
Total	11	129	70	0	210	10	285	57	0	352	24	85	239	2	350	213	300	42	1	556	1468
02:00 PM	1	34	14	1	50	3	55	11	1	70	8	22	69	0	99	54	79	14	0	147	366
02:15 PM	1	40	13	0	54	1	75	20	0	96	4	18	49	0	71	35	105	14	0	154	375
02:30 PM	2	30	4	0	36	1	85	13	0	99	9	24	56	0	89	46	85	9	0	140	364
02:45 PM	0	34	18	1	53	1	57	16	0	74	4	26	49	0	79	38	86	10	1	135	341
Total	4	138	49	2	193	6	272	60	1	339	25	90	223	0	338	173	355	47	1	576	1446
Grand Total	15	267	119	2	403	16	557	117	1	691	49	175	462	2	688	386	655	89	2	1132	2914
Apprch %	3.7	66.3	29.5	0.5		2.3	80.6	16.9	0.1		7.1	25.4	67.2	0.3		34.1	57.9	7.9	0.2		
Total %	0.5	9.2	4.1	0.1	13.8	0.5	19.1	4	0	23.7	1.7	6	15.9	0.1	23.6	13.2	22.5	3.1	0.1	38.8	

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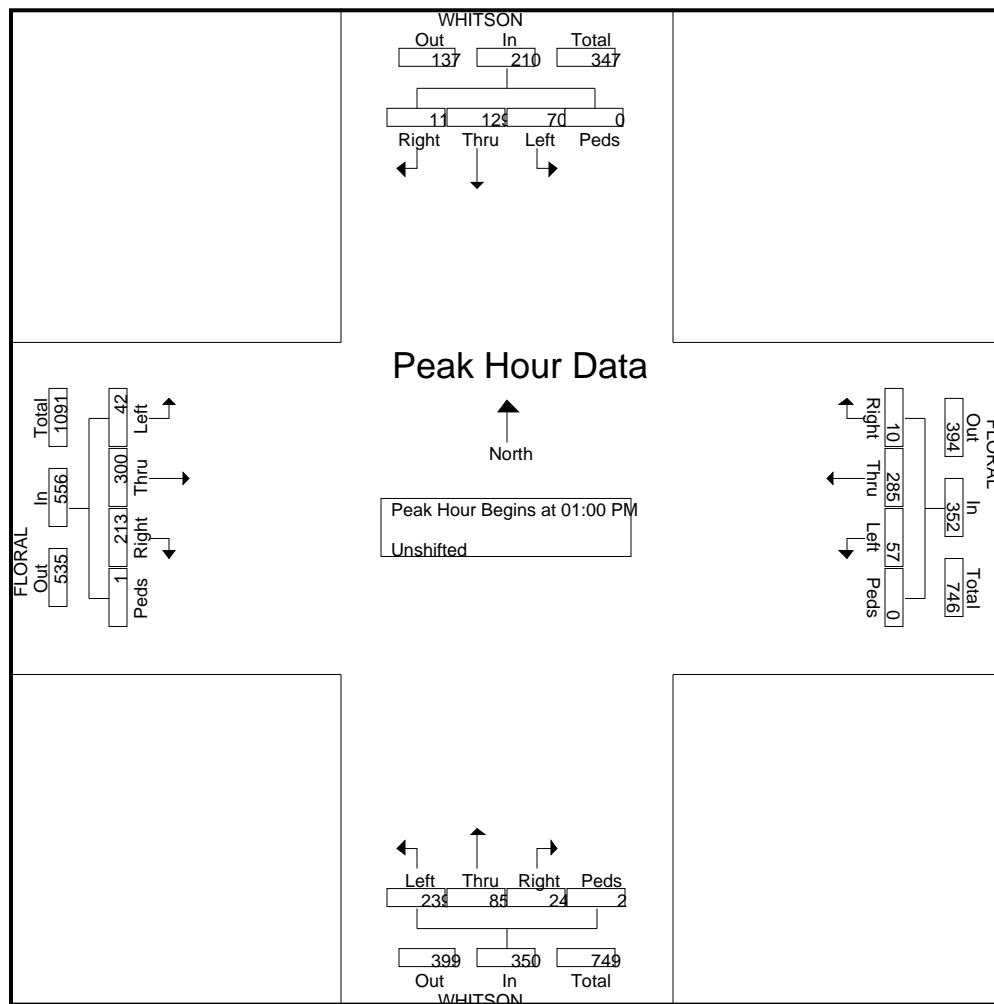
File Name : Floral at Whitson (Saturday)

Site Code : 00000000

Start Date : 7/30/2016

Page No : 2

	WHITSON Southbound					FLORAL Westbound					WHITSON Northbound					FLORAL Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 01:00 PM																					
01:00 PM	4	25	18	0	47	2	81	12	0	95	8	21	71	2	102	59	71	7	1	138	382
01:15 PM	1	43	17	0	61	3	62	19	0	84	5	15	59	0	79	57	89	13	0	159	383
01:30 PM	5	23	14	0	42	4	82	14	0	100	5	27	57	0	89	51	64	14	0	129	360
01:45 PM	1	38	21	0	60	1	60	12	0	73	6	22	52	0	80	46	76	8	0	130	343
Total Volume	11	129	70	0	210	10	285	57	0	352	24	85	239	2	350	213	300	42	1	556	1468
% App. Total	5.2	61.4	33.3	0		2.8	81	16.2	0		6.9	24.3	68.3	0.6		38.3	54	7.6	0.2		
PHF	.550	.750	.833	.000	.861	.625	.869	.750	.000	.880	.750	.787	.842	.250	.858	.903	.843	.750	.250	.874	.958



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File Name : McCall at F

Site Code : 00000000

Start Date : 7/23/2016

Page No : 1

Groups Printed- Unshifted

	MCCALL Southbound					F Westbound					MCCALL Northbound					F Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
01:00 PM	6	42	36	3	87	3	18	5	2	28	14	51	6	0	71	34	30	10	2	76	262
01:15 PM	10	32	27	1	70	7	17	7	0	31	14	48	8	1	71	48	38	15	1	102	274
01:30 PM	7	45	30	1	83	10	24	9	0	43	13	49	4	0	66	47	23	6	1	77	269
01:45 PM	4	45	44	1	94	5	24	10	2	41	7	51	2	2	62	38	33	6	0	77	274
Total	27	164	137	6	334	25	83	31	4	143	48	199	20	3	270	167	124	37	4	332	1079
02:00 PM	7	45	26	1	79	1	31	11	0	43	12	43	2	3	60	48	30	7	0	85	267
02:15 PM	6	44	30	1	81	4	20	7	0	31	13	57	2	2	74	33	33	8	0	74	260
02:30 PM	9	32	25	0	66	2	28	7	0	37	6	35	1	0	42	31	26	13	0	70	215
02:45 PM	8	43	20	0	71	6	21	5	1	33	14	50	5	0	69	31	26	11	0	68	241
Total	30	164	101	2	297	13	100	30	1	144	45	185	10	5	245	143	115	39	0	297	983
Grand Total	57	328	238	8	631	38	183	61	5	287	93	384	30	8	515	310	239	76	4	629	2062
Apprch %	9	52	37.7	1.3		13.2	63.8	21.3	1.7		18.1	74.6	5.8	1.6		49.3	38	12.1	0.6		
Total %	2.8	15.9	11.5	0.4	30.6	1.8	8.9	3	0.2	13.9	4.5	18.6	1.5	0.4	25	15	11.6	3.7	0.2	30.5	

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File Name : McCall at F

Site Code : 00000000

Start Date : 7/23/2016

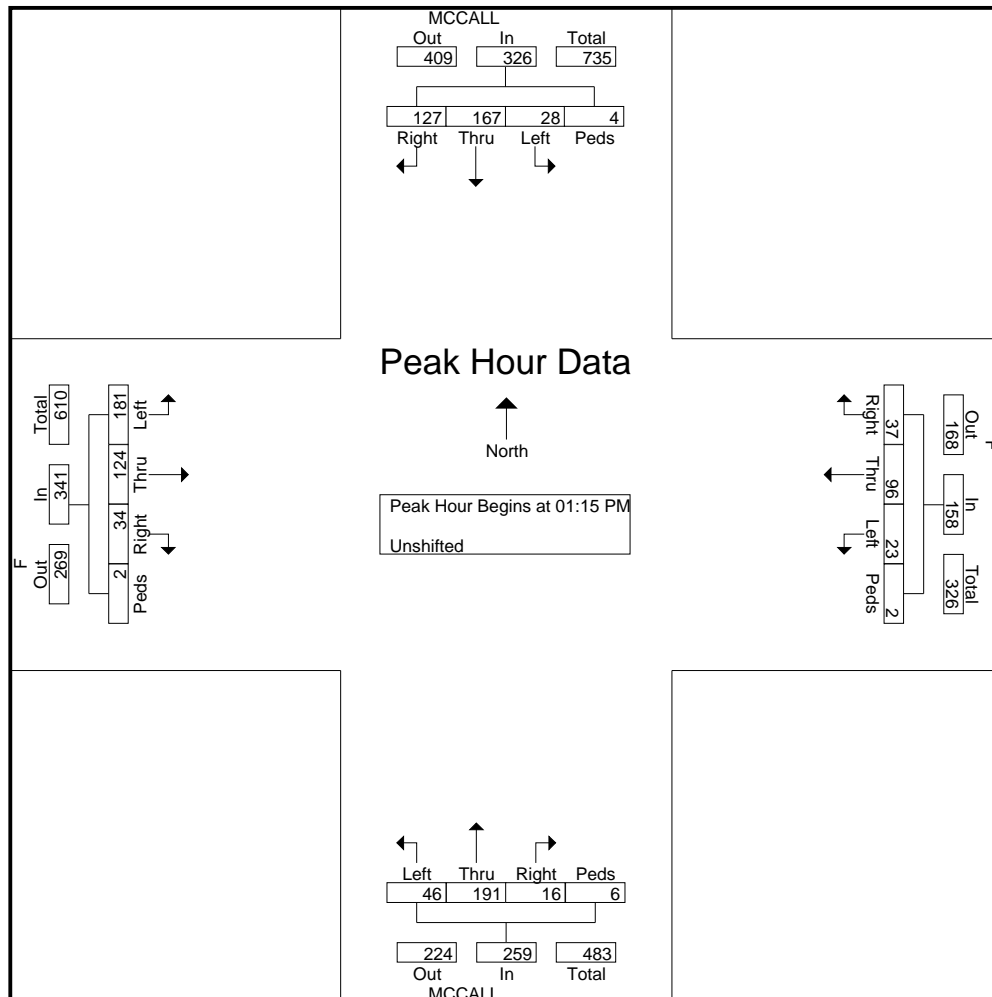
Page No : 2

	MCCALL Southbound					F Westbound					MCCALL Northbound					F Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 01:15 PM

01:15 PM	10	32	27	1	70	7	17	7	0	31	14	48	8	1	71	48	38	15	1	102	274
01:30 PM	7	45	30	1	83	10	24	9	0	43	13	49	4	0	66	47	23	6	1	77	269
01:45 PM	4	45	44	1	94	5	24	10	2	41	7	51	2	2	62	38	33	6	0	77	274
02:00 PM	7	45	26	1	79	1	31	11	0	43	12	43	2	3	60	48	30	7	0	85	267
Total Volume	28	167	127	4	326	23	96	37	2	158	46	191	16	6	259	181	124	34	2	341	1084
% App. Total	8.6	51.2	39	1.2		14.6	60.8	23.4	1.3		17.8	73.7	6.2	2.3		53.1	36.4	10	0.6		
PHF	.700	.928	.722	1.00	.867	.575	.774	.841	.250	.919	.821	.936	.500	.500	.912	.943	.816	.567	.500	.836	.989



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File Name : SR 99 SB Off-Ramp at Highland (Raw)

Site Code : 00000009

Start Date : 7/23/2016

Page No : 1

Groups Printed- Unshifted

Start Time	Highland Southbound				Highland Northbound				SR 99 SB Off-Ramp Eastbound				Int. Total
	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	
01:00 PM	35	34	0	69	3	76	1	80	38	0	0	38	187
01:15 PM	57	53	0	110	7	149	0	156	66	0	0	66	332
01:30 PM	64	36	0	100	7	142	2	151	60	0	0	60	311
01:45 PM	57	42	0	99	8	138	0	146	50	0	0	50	295
Total	213	165	0	378	25	505	3	533	214	0	0	214	1125
02:00 PM	67	45	0	112	5	149	0	154	62	0	0	62	328
02:15 PM	50	41	1	92	9	148	1	158	69	0	0	69	319
02:30 PM	74	37	0	111	8	152	0	160	59	0	0	59	330
02:45 PM	58	43	0	101	8	135	1	144	70	0	0	70	315
Total	249	166	1	416	30	584	2	616	260	0	0	260	1292
Grand Total	462	331	1	794	55	1089	5	1149	474	0	0	474	2417
Apprch %	58.2	41.7	0.1		4.8	94.8	0.4		100	0	0		
Total %	19.1	13.7	0	32.9	2.3	45.1	0.2	47.5	19.6	0	0	19.6	

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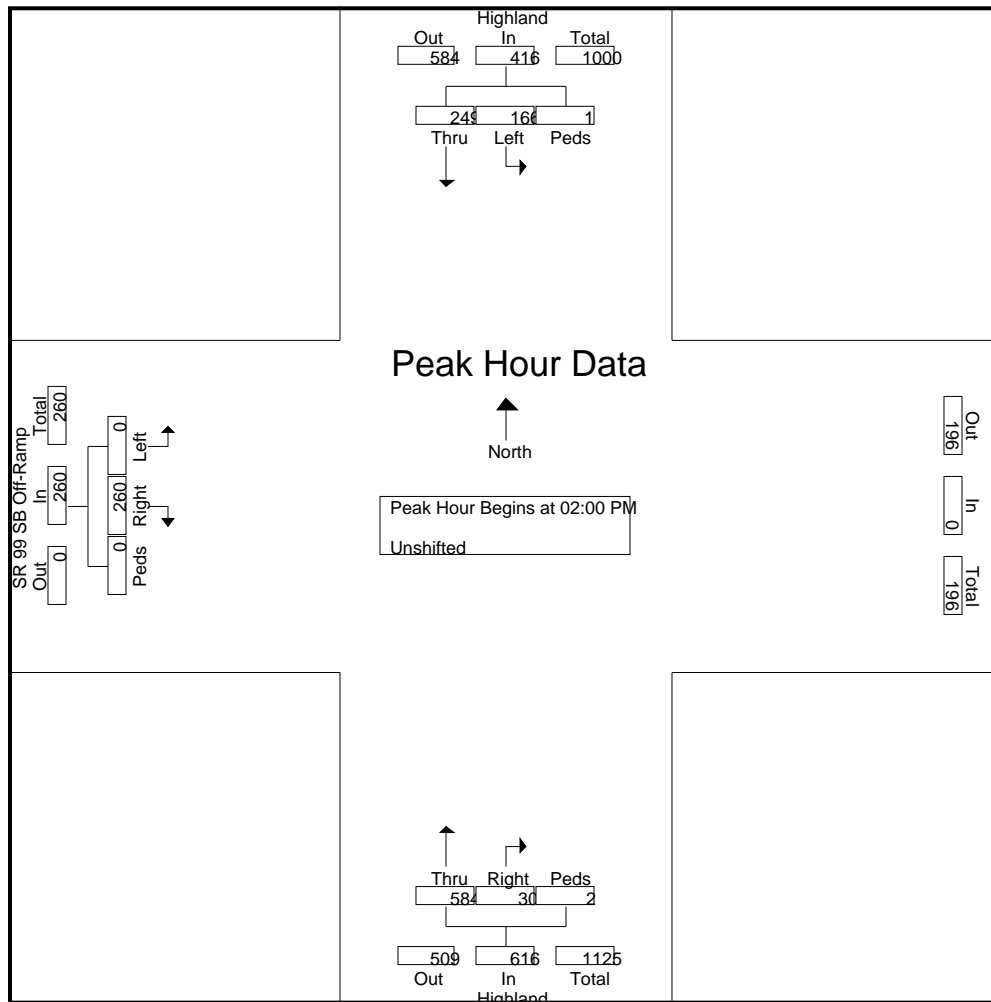
File Name : SR 99 SB Off-Ramp at Highland (Raw)

Site Code : 00000009

Start Date : 7/23/2016

Page No : 2

	Highland Southbound				Highland Northbound				SR 99 SB Off-Ramp Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:00 PM													
02:00 PM	67	45	0	112	5	149	0	154	62	0	0	62	328
02:15 PM	50	41	1	92	9	148	1	158	69	0	0	69	319
02:30 PM	74	37	0	111	8	152	0	160	59	0	0	59	330
02:45 PM	58	43	0	101	8	135	1	144	70	0	0	70	315
Total Volume	249	166	1	416	30	584	2	616	260	0	0	260	1292
% App. Total	59.9	39.9	0.2		4.9	94.8	0.3		100	0	0		
PHF	.841	.922	.250	.929	.833	.961	.500	.963	.929	.000	.000	.929	.979



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File Name : Highland at Rose (Saturday)

Site Code : 00000000

Start Date : 7/23/2016

Page No : 1

Groups Printed- Unshifted

	HIGHLAND Southbound					ROSE Westbound					HIGHLAND Northbound					ROSE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	5	113	25	0	143	15	4	4	0	23	4	103	2	0	109	2	2	3	0	7	282
01:15 PM	0	100	20	0	120	22	2	4	0	28	9	124	1	0	134	1	1	2	0	4	286
01:30 PM	2	111	15	0	128	18	1	4	0	23	2	145	2	0	149	0	2	0	0	2	302
01:45 PM	2	100	16	0	118	20	0	6	0	26	6	125	2	0	133	2	4	0	0	6	283
Total	9	424	76	0	509	75	7	18	0	100	21	497	7	0	525	5	9	5	0	19	1153
02:00 PM	4	105	21	0	130	23	2	3	0	28	5	108	2	0	115	0	2	2	0	4	277
02:15 PM	4	115	20	0	139	24	2	5	0	31	14	125	0	0	139	1	0	2	0	3	312
02:30 PM	1	96	22	0	119	21	1	4	0	26	6	138	2	0	146	0	2	1	0	3	294
02:45 PM	2	115	24	0	141	24	4	2	0	30	8	118	0	0	126	2	1	1	0	4	301
Total	11	431	87	0	529	92	9	14	0	115	33	489	4	0	526	3	5	6	0	14	1184
Grand Total	20	855	163	0	1038	167	16	32	0	215	54	986	11	0	1051	8	14	11	0	33	2337
Apprch %	1.9	82.4	15.7	0		77.7	7.4	14.9	0		5.1	93.8	1	0		24.2	42.4	33.3	0		
Total %	0.9	36.6	7	0	44.4	7.1	0.7	1.4	0	9.2	2.3	42.2	0.5	0	45	0.3	0.6	0.5	0	1.4	

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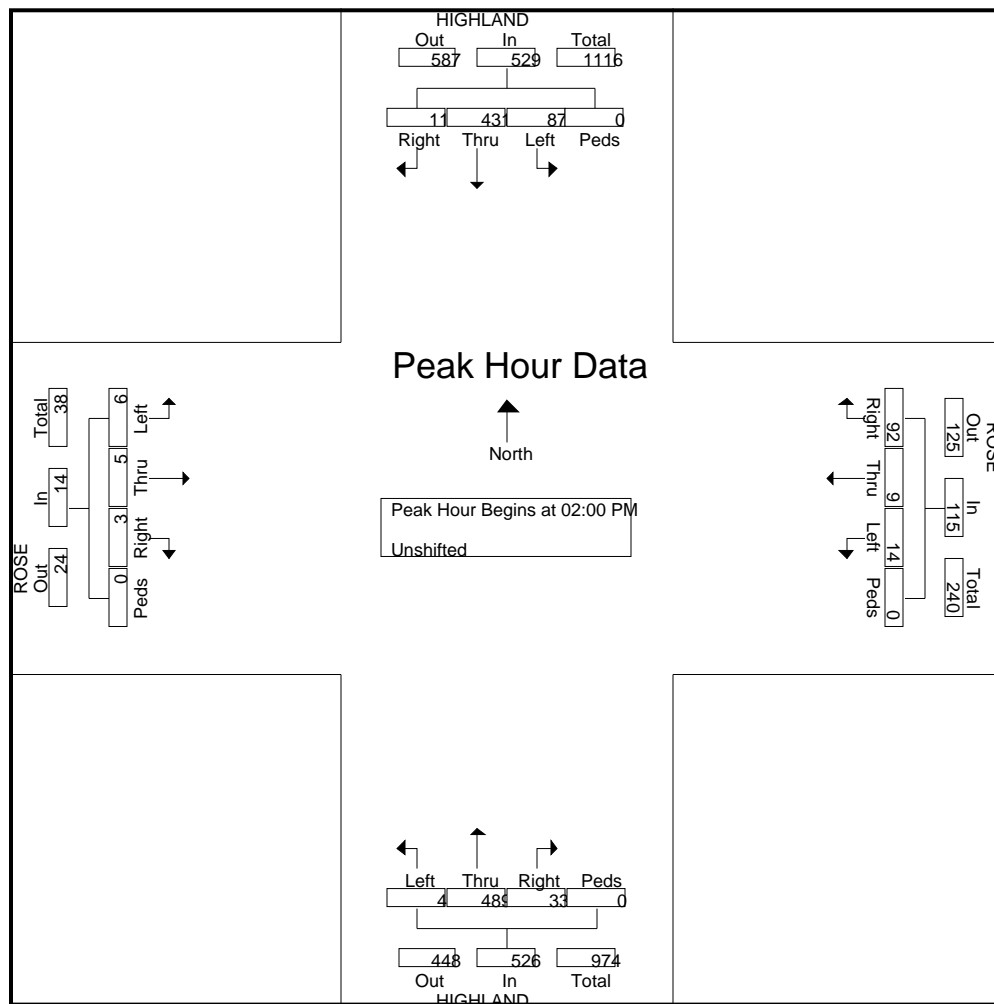
File Name : Highland at Rose (Saturday)

Site Code : 00000000

Start Date : 7/23/2016

Page No : 2

	HIGHLAND Southbound					ROSE Westbound					HIGHLAND Northbound					ROSE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	4	105	21	0	130	23	2	3	0	28	5	108	2	0	115	0	2	2	0	4	277
02:15 PM	4	115	20	0	139	24	2	5	0	31	14	125	0	0	139	1	0	2	0	3	312
02:30 PM	1	96	22	0	119	21	1	4	0	26	6	138	2	0	146	0	2	1	0	3	294
02:45 PM	2	115	24	0	141	24	4	2	0	30	8	118	0	0	126	2	1	1	0	4	301
Total Volume	11	431	87	0	529	92	9	14	0	115	33	489	4	0	526	3	5	6	0	14	1184
% App. Total	2.1	81.5	16.4	0		80	7.8	12.2	0		6.3	93	0.8	0		21.4	35.7	42.9	0		
PHF	.688	.937	.906	.000	.938	.958	.563	.700	.000	.927	.589	.886	.500	.000	.901	.375	.625	.750	.000	.875	.949



Appendix C: Traffic Modeling



Traffic Engineering, Inc.

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Page | C

September 7, 2018

Kai Han, TE
Council of Fresno County Governments
2035 Tulare Street, Suite 201
Fresno, CA 93721

Via E-mail Only: khan@fresnocog.org

Subject: Traffic Modeling Request for the Preparation of a Traffic Impact Analysis for the Selma Grove Shopping Center Located in the City of Selma (JLB Project 001-005)

Dear Mr. Han,

JLB Traffic Engineering, Inc. (JLB) hereby requests traffic modeling for the Selma Grove Commercial Development (Selma Grove Project) located in the City of Selma. The Selma Grove Project proposes to develop a 62.9-acre site north of Floral Avenue between DeWolf Avenue and State Route 99 with a 102-room hotel, a 54,240 square-foot cinema, 532,000 square feet of retail land uses including 330,600 square feet of shopping center, 186,900 square feet of supermarket and 14,500 square feet of pharmacy with drive-through window, and 3,000 square feet of fast-food restaurant with drive-through window. In addition, the Selma Grove Project will also include the analysis of the existing Dealership Project, which covers approximately 48,693 square feet and is located west of State Route 99, approximately 2,000 feet north of Floral Avenue. Per information provided to JLB, the developer of the original site (Rockwell Pond) is submitting an amendment to the Site Plan to reduce the ultimate buildout of the development evaluated by the previously certified environmental impact report prepared by Land Use Associates for the City of Selma Community Development Department dated September 9, 2009. An aerial of the Project vicinity is shown in Exhibit A, while the Project Site Plan is shown in Exhibit B.

Scenarios

The following scenarios are requested:

1. Base Year 2016 (with Link and TAZ modifications)
2. Cumulative Year 2030 No Project (with Link and TAZ modifications)
3. Cumulative Year 2030 plus Project (with Select Zone Link and TAZ modifications)
4. Cumulative Year 2030 plus Project with Dinuba/SR 99 Interchange (with Select Zone Link and TAZ modifications)
5. Differences between model runs 2 & 1, 3 & 1, and 4 & 1 above

Changes and/or additions to the Model Network or TAZ's

JLB reviewed the Fresno COG model network for the base year 2016 and cumulative year 2030. Based on this review, JLB requests the following Link and TAZ network modifications. Details on the requested Link and TAZ modifications for base year 2016, cumulative year 2030, and cumulative year 2030 with Dinuba/SR 99 Interchange are illustrated in Exhibits C, D, and E respectively.



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Page | 1

LINK and TAZ ZONE MODIFICATIONS (For Base Year 2016 and All Cumulative Year 2030

Scenarios):

1. Create Springfield Avenue as follows:
 - a. Two-lane collector between Fowler Avenue and Temperance Avenue (Speed 40 MPH)
 - b. Two-lane collector between Temperance Avenue to connect to Locan Avenue (Speed 35 MPH)
2. Create Huntsman Avenue as follows:
 - a. Two-lane collector between Fowler Avenue and Temperance Avenue (Speed 40 MPH)
 - b. Two-lane collector between Temperance Avenue and DeWolf Avenue (Speed 35 MPH)
3. Create Rose Avenue as follows:
 - a. Two-lane collector between Fowler Avenue and DeWolf Avenue (Speed 40 MPH)
 - b. Two-lane collector between DeWolf Avenue and Thompson Avenue (Speed 35 MPH)
4. Create Temperance Avenue as a two-lane collector between Nebraska Avenue and Mountain View Avenue (Speed 50 MPH)
5. Create Leonard Avenue as a two-lane collector between Manning Avenue and Dinuba Avenue (Speed 40 MPH)
6. Create Dinuba Avenue as a two-lane arterial between Golden State Boulevard and Bethel Avenue (Speed 40 MPH)
7. Create Highland Avenue as a two-lane collector between Dinuba Avenue and Golden State Boulevard (Speed 45 MPH)
8. Create Thompson Avenue as a two-lane collector between Nebraska Avenue and Mountain View Avenue (Speed 40 MPH)
9. Modify TAZ 409 to create three (3) TAZ's:
 - a. Create TAZ 409A bounded by Manning Avenue, State Route 99, Dinuba Avenue, and Fowler Avenue. TAZ 409A shall have TAZ connectors to Manning Avenue, Dinuba Avenue, and Fowler Avenue.
 - b. Create TAZ 409B bounded by Dinuba Avenue, DeWolf Avenue, Floral Avenue, and Fowler Avenue. TAZ 409B shall have TAZ connectors to Dinuba Avenue and Floral Avenue.
 - c. Create TAZ 409C bounded by Floral Avenue, DeWolf Avenue, Mountain View Avenue, and Fowler Avenue. TAZ 409C shall have TAZ connectors to Floral Avenue, DeWolf Avenue, Mountain View Avenue, and Fowler Avenue.
10. Modify TAZ 411 to add two (2) TAZ connectors to Dinuba Avenue. One between Leonard Avenue and Highland Avenue and another between Highland Avenue and Thompson Avenue.
11. Modify TAZ 413 to create seven (7) TAZ's:
 - a. Create TAZ 413A1 and 413A2 bounded by State Route 99, Floral Avenue, and DeWolf Avenue. TAZ 413A1 shall have one TAZ Connector to DeWolf Avenue. TAZ 413A2 shall have one TAZ connector to Floral Avenue.
 - b. Create TAZ 413B1 and 413B2 bounded by Floral Avenue, State Route 43, Rose Avenue, and DeWolf Avenue. TAZ 413B1 shall have TAZ connectors to Floral Avenue, Rose Avenue, and DeWolf Avenue. TAZ 413B2 shall have TAZ connectors to Floral Avenue, State Route 43, and Rose Avenue.
 - c. Create TAZ 413C1 and 413C2 bounded by Rose Avenue, State Route 43, Nebraska Avenue, and DeWolf Avenue. TAZ 413C1 shall have TAZ connectors Rose Avenue, Nebraska Avenue, and DeWolf Avenue. TAZ 413C2 shall have TAZ connectors to Rose Avenue, State Route 43, and Nebraska Avenue.



- d. Create TAZ 413D bounded by Nebraska Avenue, State Route 43, Mountain View Avenue, and DeWolf Avenue. TAZ 413D shall have TAZ connectors to Nebraska Avenue, Mountain View Avenue, and DeWolf Avenue.
12. Modify TAZ 412 to relocate the TAZ connector from Node 4855 to Golden State Boulevard
13. Modify TAZ 430 as follows:
 - a. Relocate centroid to a point approximately 2,000 feet south of Dinuba Avenue
 - b. Eliminate the TAZ connectors to Nodes 4855 and 4190
 - c. Add TAZ connectors to Dinuba Avenue, Thompson Avenue, and Highland Avenue
14. Modify TAZ 431 to add a TAZ connector to Dinuba Avenue
15. Modify McCall Avenue to increase the lanes between Dinuba Avenue and Floral Avenue to two lanes in each direction
16. Modify Floral Avenue to increase eastbound lanes between Floral Avenue/State Route 99 Southbound Ramp and Node 4565 to two lanes
17. Modify State Route 43 to increase lanes between Floral Avenue and Node 9082 to two lanes in each direction
18. Modify TAZ 435 to relocate the TAZ connector from Node 4193 to Thompson Avenue
19. Modify TAZ 436 to eliminate the TAZ connector to Node 4193
20. Modify TAZ 414 to create two TAZ's:
 - a. Remove the TAZ connectors to Nodes 4183 and 4571
 - b. Create TAZ 414A bounded by State Route 99, Rose Avenue, and State Route 43. TAZ 414A shall have TAZ connectors to Rose Avenue and State Route 43.
 - c. Create TAZ 414B bounded by Rose Avenue, State Route 99, 2nd Street, Nebraska Avenue, and State Route 43. TAZ 414B shall have TAZ connectors to Rose Avenue and Nebraska Avenue.
21. Modify 2nd Street to increase the lanes between Nebraska Avenue and McCall Avenue to two lanes in each direction

LINK and TAZ ZONE MODIFICATIONS (For Base Year 2016 Scenario Only):

1. Create Temperance Avenue as a two-lane arterial between Manning Avenue and Huntsman Avenue and between Floral Avenue and Nebraska Avenue (Speed 50 MPH)
2. Create Thompson Avenue as a two-lane collector between Floral Avenue and Rose Avenue (Speed 25 MPH)
3. Create Nebraska Avenue as a two-lane arterial between Fowler Avenue and State Route 43 (Speed 40 MPH)

LINK and TAZ ZONE MODIFICATIONS (For All Cumulative Year 2030 plus Project Select Zone Scenarios Only):

1. Create Armstrong Avenue as a two-lane collector between Manning Avenue and Nebraska Avenue (Speed 50 MPH)
2. Create Temperance Avenue as a two-lane arterial between Manning Avenue and Huntsman Avenue and between Floral Avenue and Nebraska Avenue (Speed 50 MPH)
3. Create Locan Avenue as a two-lane collector between its connection with Springfield Avenue and Huntsman Avenue and between Floral Avenue and Nebraska Avenue (Speed 35 MPH)
4. Create Project Driveway Main Access Road approximately 2,280 feet west of the State Route 99 southbound off-ramp (see Exhibit D). The Project Driveway shall have two lanes on each direction with a speed limit of 15 MPH.
5. Create Project TAZ A generally located northwest of State Route 99 and Floral Avenue (see Exhibit D). TAZ A shall have one (1) TAZ connector to the northern end of the Project Driveway.



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6. Create Project TAZ B generally located northeast of DeWolf Avenue and Floral Avenue (see Exhibit D). TAZ B shall have one (1) TAZ connector to the Project Driveway.
7. Create Leonard Avenue as a two-lane collector between Floral Avenue and Nebraska Avenue (Speed 35 MPH)
8. Create Thompson Avenue as a four-lane collector between Floral Avenue and Rose Avenue (Speed 25 MPH)
9. Create Nebraska Avenue as follows:
 - a. Two-lane arterial between Fowler Avenue and Armstrong Avenue (Speed 50 MPH)
 - b. Four-lane arterial between Armstrong Avenue and DeWolf Avenue (Speed 50 MPH)
 - c. Four-lane arterial between DeWolf Avenue and State Route 43 (Speed 40 MPH)
 - d. Increase lanes between State Route 43 and Thompson Avenue to two lanes in each direction
10. Modify Manning Avenue to increase lanes between Fowler Avenue and State Route 99 to two lanes in each direction
11. Modify Dinuba Avenue to increase lanes between Fowler Avenue and DeWolf Avenue to two lanes in each direction
12. Modify Highland Avenue to increase lanes between Golden State Boulevard and Floral Avenue to two lanes in each direction
13. Modify Floral Avenue as follows:
 - a. Increase lanes between Fowler Avenue and State Route 99 and east of McCall Avenue to two lanes in each direction
 - b. Reduce the speed limit between DeWolf Avenue and State Route 99 from 50 MPH to 30 MPH
14. Modify Mountain View Avenue to increase lanes east of DeWolf Avenue to two lanes in each direction
15. Create Near Term Project TAZ C generally located northwest of State Route 99 and Floral Avenue (see Exhibit F). TAZ C shall have one (1) TAZ connector to Floral Avenue.
16. Create Near Term Project TAZ D generally located southeast of State Route 43 and Nebraska Avenue (see Exhibit F). TAZ D shall have one (1) TAZ connector to State Route 43.
17. Create Near Term Project TAZ E generally located northeast of Highland Avenue and Dinuba Avenue (see Exhibit F). TAZ E shall have one (1) TAZ connector to Dinuba Avenue.
18. Create Near Term Project TAZ F generally located northwest of State Route 43 and Rose Avenue (see Exhibit F). TAZ F shall have one (1) TAZ connector to State Route 43 and One (1) TAZ connector to Rose Avenue.
19. Create Near Term Project TAZ G generally located north of Dockery Avenue and Dinuba Avenue (see Exhibit F). TAZ G shall have one (1) TAZ connector to Dinuba Avenue.
20. Create Near Term Project TAZ H generally located northwest of State Route 99 and Mountain View Avenue (see Exhibit F). TAZ H shall have one (1) TAZ connector to Mountain View Avenue.
21. Create Near Term Project TAZ I generally located northeast of Dockery Avenue and Dinuba Avenue (see Exhibit F). TAZ I shall have one (1) TAZ connector to Dinuba Avenue.
22. Create Near Term Project TAZ J generally located northeast of Dockery Avenue and Rose Avenue (see Exhibit F). TAZ J shall have one (1) TAZ connector to Rose Avenue.
23. Create Near Term Project TAZ K generally located southeast of Dockery Avenue and Rose Avenue (see Exhibit F). TAZ K shall have one (1) TAZ connector to Rose Avenue.
24. Create Near Term Project TAZ L generally located northeast of McCall Avenue and Dinuba Avenue (see Exhibit F). TAZ L shall have one (1) TAZ connector to Dinuba Avenue.
25. Create Near Term Project TAZ M generally located northeast of State Route 43 and Nebraska Avenue (see Exhibit F). TAZ M shall have one (1) TAZ connector to State Route 43.



26. Create Near Term Project TAZ N generally located southwest of State Route 43 and Nebraska Avenue (see Exhibit F). TAZ N shall have one (1) TAZ connector to Nebraska Avenue.
27. Create Near Term Project TAZ O generally located southwest of Thompson Avenue and Front Street (see Exhibit F). TAZ O shall have one (1) TAZ connector to Thompson Avenue.
28. Create Near Term Project TAZ P generally located northwest of Dockery Avenue and Dinuba Avenue (see Exhibit F). TAZ P shall have one (1) TAZ connector to Dinuba Avenue.
29. Create Near Term Project TAZ Q generally located southwest of Thompson Avenue and Front Street (see Exhibit F). TAZ Q shall have one (1) TAZ connector to Thompson Avenue.
30. Create Near Term Project TAZ R generally located southwest of State Route 43 and Floral Avenue (see Exhibit F). TAZ R shall have one (1) TAZ connector to State Route 43.

LINK and TAZ ZONE MODIFICATIONS (For Cumulative Year 2030 plus Project Select Zone with Dinuba/State Route 99 Interchange Scenario Only):

1. Create Dinuba/State Route 99 Northbound and Southbound Ramps (One-lane; Speed 30 MPH)
2. Create Future Dinuba Avenue as a four-lane arterial between DeWolf Avenue and McCall Avenue (Speed 50 MPH)
3. Create Thompson Avenue as a four-lane collector between Future Dinuba Avenue and Dinuba Avenue (Speed 25 MPH)
4. Modify DeWolf Avenue to connect to Dinuba Avenue at least 300 feet before the Dinuba/State Route 99 Southbound Ramps

Project Only Trip Generation (For Cumulative Year 2030 plus Project Scenarios Only)

The trip generation rates for the existing Dealership Project were obtained from volume counts collected in July 2018. The trip generation rates for the proposed Selma Grove Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table I presents the trip generation for the Auto Dealership (TAZ A). The Auto Dealership generates a maximum of 650 daily trips, 103 AM peak hour trips, 103 PM peak hour trips on a weekday, and 65 PM peak hour on a Saturday before internal capture and pass-by trip reductions are considered. Table II presents the trip generation for the proposed Selma Grove Project (TAZ B) with trip generation rates for Hotel, Movie Theater, Shopping Center, Supermarket, Pharmacy/Drugstore with Drive-Through Window, and Fast-Food Restaurant with Drive-Through Window. The Selma Grove Project is estimated to generate a maximum of 31,402 daily trips, 895 AM peak hour trips and 2,909 PM peak hour trips on a weekday, and 3,347 PM peak hour trips on a Saturday before internal capture and pass-by trip reductions are considered.

As part of the trip generation for the Dealership Project and the Selma Grove Project, the TIA will be implementing a reduction in trip generation as a result of internal capture. Internal capture rates are prepared pursuant to the NCHRP 684 Internal Trip Capture procedure. Table III presents the results of the internal trip capture analysis. Captured trips are presented as negative numbers because they are deducted from the total number of trips calculated in Tables I and II. Table IV presents the net new project trips once the internal capture trips have been reduced. At buildout, the Dealership Project is estimated to generate a maximum of 606 daily trips, 98 AM peak hour trips, 95 PM peak hour trips on a weekday, and 61 PM peak hour on a Saturday. At buildout, the Selma Grove Project is estimated to generate a maximum of 29,042 daily trips, 790 AM peak hour trips and 2,676 PM peak hour trips on a weekday, and 3,078 PM peak hour trips on a Saturday.



Table I: TAZ A (Dealership Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total	Trip Rate	In	Out	In	Out	Total
Automobile Sales (New) (840)	48,693	k.s.f.	13.35	650	2.12	83	17	86	17	103	2.12	28	71	99	1.33	34	66	22	43	65
Total Project Trips				650				86	17	103				73				22	43	65

Note: k.s.f. = Thousand Square Feet

Table II: TAZ B (Selma Grove Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total	Trip Rate	In	Out	In	Out	Total
Hotel (310)	102	o.r.	8.36	853	0.47	59	41	28	20	48	0.60	51	49	100	0.60	51	49	31	30	61
Movie Theater (444)	54,240	k.s.f.	78.09	4,236	0.22	50	50	6	6	12	6.17	94	6	100	6.17	56	44	188	147	335
Shopping Center (820)	467,500	k.s.f.	37.75	17,648	0.94	62	38	272	167	439	3.81	48	52	100	4.50	52	48	1,094	1,010	2,104
Supermarket (850)	50,000	k.s.f.	106.78	5,339	3.82	60	40	115	76	191	9.24	51	49	100	10.34	51	49	264	253	517
Pharmacy/Drugstore with Drive-Through Window (881)	14,500	k.s.f.	109.16	1,583	3.84	53	47	30	26	56	10.29	50	50	75	8.75	49	51	62	65	127
Fast-Food Restaurant with Drive-Through Window (934)	3,700	k.s.f.	470.95	1,743	40.19	51	49	76	73	149	32.67	52	48	63	54.86	51	49	104	99	203
Total Project Trips				31,402				527	368	895				1,575			1,743	1,604	3,347	

Note: o.r. = Occupied Rooms
k.s.f. = Thousand Square Feet



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Table III: Internal Capture Trip Reductions

	Weekday Daily	Weekday (7-9) AM Peak Hour		Weekday (4-6) PM Peak Hour		Saturday (1-3) PM Peak Hour	
		In	Out	Total	In	Out	Total
TAZ A (Dealership Project) Trip Reduction	-44	-1	-4	-5	-3	-5	-8
TAZ B (Selma Grove Project) Trip Reduction	-2,360	-55	-49	-105	-117	-117	-233
Total Trip Reduction	-2,404	-56	-53	-110	-120	-122	-241

Table IV: Net New Trip Generation

	Weekday Daily	Weekday (7-9) AM Peak Hour		Weekday (4-6) PM Peak Hour		Saturday (1-3) PM Peak Hour	
		In	Out	Total	In	Out	Total
TAZ A (Dealership Project) Trip Generation	606	85	13	98	26	68	95
TAZ B (Selma Grove Project) Trip Generation	29,042	472	319	790	1,458	1,217	2,676
Total Trip Generation	29,648	557	332	888	1,484	1,285	2,771



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Access to the Project

Access to and from the Selma Grove Project site is from five (5) points located approximately 3,050 feet (Driveway 1), 2,860 feet (Driveway 2), 2,280 feet (Driveway 3), 1,790 feet (Driveway 4), and 1,420 feet (Driveway 5) west of the State Route 99 southbound off-ramp along the north side of Floral Avenue. While Driveway 3 is proposed to have full access, Driveways 1 and 5 are proposed to have left-in, right-in, and right-out access only, and Driveways 2 and 4 are proposed to have right-in, right-out access only. Additional Project details can be found in Exhibit B.

Near Term Projects' Trip Generation (For Cumulative Year 2030 plus Project Scenario Only)

Tables V through XXI present the trip generation for proposed Near Term Projects. The trip generation rates for the Near Term Projects were obtained based on data provided by City of Selma staff and the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). The locations of the Near Term Projects can be found in Exhibit F.



Table V: TAZ C (Commercial Development - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour			Weekday (4-6) PM Peak Hour			Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out		In	Out		Trip Rate	In	Out		Total
							%	%		%	%			%	%	
Automated Car Wash (948)	4.257	k.s.f.	170.40	725	14.2	50	50	30	30	30	60	14.20	50	50	30	60
Fast-Food Restaurant with Drive-Through Window (934)	3.120	k.s.f.	470.95	1,469	40.19	51	49	64	61	53	125	32.67	52	48	49	102
Total Project Trips				2,194					94		185				83	162

Note: k.s.f. = Thousand Square Feet

Table VI: TAZ D (Canales - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour			Weekday (4-6) PM Peak Hour			Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out		In	Out		Trip Rate	In	Out		Total
							%	%		%	%			%	%	
Single-Family Detached Housing (210)	113	d.u.	9.57	1,081	0.75	25	75	21	62	73	83	1.06	64	36	41	114
Shopping Center (820)	150.000	k.s.f.	59.00	8,850	0.23	60	40	122	81	412	203	0.93	50	50	412	824
Total Project Trips				9,931					143		286				485	938

Note: d.u. = Dwelling Units
k.s.f. = Thousand Square Feet

Table VII: TAZ E (TT 6019 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour			Weekday (4-6) PM Peak Hour			Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out		In	Out		Trip Rate	In	Out		Total
							%	%		%	%			%	%	
Single-Family Detached Housing (210)	96	d.u.	9.44	906	0.74	25	75	18	53	60	71	0.99	63	37	35	95
Total Project Trips				906					18		71				60	95

Note: d.u. = Dwelling Units



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Table VIII: TAZ F (Graham Commercial - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour						
			Rate	Total	Trip Rate	In		Out	In	Out	Total	Trip Rate	In		Out	In	Out	Total	Trip Rate	In		Out	Total
						%	%						%	%						%	%		
General Office Building (710)	7.200	k.s.f.	9.74	70	1.16	86	14	7	1	8	1.15	16	84	1	7	8	0.53	54	46	2	2	4	
Shopping Center (820)	20.022	k.s.f.	37.75	756	0.94	62	38	12	7	19	3.81	48	52	36	40	76	4.50	52	48	47	43	90	
High-Turnover (Sit-Down) Restaurant (932)	6.048	k.s.f.	112.18	678	9.94	55	45	33	27	60	9.77	62	38	37	22	59	11.19	51	49	35	33	68	
Gasoline/Service Station with Convenience Market (945)	8	f.p.	205.36	1,643	12.47	51	49	51	49	100	13.99	51	49	57	55	112	19.28	50	50	77	77	154	
Fast-Food Restaurant with Drive-Through Window (934)	5.704	k.s.f.	470.95	2,686	40.19	51	49	117	112	229	32.67	52	48	97	89	186	54.86	51	49	160	153	313	
Car Wash	1.069	k.s.f.	14.20	15	14.2	50	50	7	8	15	14.20	50	50	8	7	15	30.40	50	50	16	16	32	
Net New Project Trips				5,848				227	204	431				236	220	456			337	324	661		

Note: k.s.f. = Thousand Square Feet
f.p. = Fueling Positions

Table IX: TAZ G (TT 5361 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour					
			Rate	Total	Trip Rate	In		Out	In	Out		Trip Rate	In	Out	Total	Trip Rate	In		Out	Total		
						%	%			%	%						%	%			%	%
Single-Family Detached Housing (210)	156	d.u.	9.57	1,493	0.75	25	75	29	88	117	1.00	63	37	100	58	158	0.93	54	46	78	67	145
Total Project Trips				1,493				29	88	117				100	58	158				78	67	145

Note: d.u. = Dwelling Units



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Table X: TAZ H (Selma Crossings - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour							
			Rate	Total	Trip Rate	In	Out		Total	Trip Rate	In	Out		Total	Trip Rate	In	Out		Total			
							%					%					%					
Shopping Center (820)	2,092.203	k.s.f.	42.94	89,841	1.00	61	39	1,276	817	2,093	3.73	49	51	3,824	3,981	7,805	4.89	52	48	5,321	4,911	10,232
Hotel (310)	166	o.r.	8.17	1,357	0.56	61	39	57	36	93	0.59	53	47	52	46	98	0.72	56	44	67	53	120
Water Slide Park (414)	200	Stalls	2.27	454	0.08	70	30	11	5	16	0.28	21	79	12	44	56	0.39	13	87	10	68	78
Office Park (710)	540.000	k.s.f.	11.01	5,946	1.55	88	12	737	100	837	1.49	17	83	137	669	806	0.41	54	46	120	102	222
New Car Sales (841)	400.000	k.s.f.	33.34	13,336	2.03	74	26	6001	211	812	2.59	39	61	404	632	1,036	2.97	51	49	606	582	1,188
Multi-Family Housing (220)	250	d.u.	6.65	1,663	0.51	20	80	26	102	128	0.62	65	35	101	54	155	0.52	61	39	79	51	130
Internal Capture Trip Reductions				-3,432				-27	-27	-54				-131	-131	-262				-18	-18	-36
Net New Project Trips				109,165					2,681	1,244	3,925			4,399	5,295	9,694				6,185	5,749	11,934

Note: k.s.f. = Thousand Square Feet
o.r. = Occupied Rooms
d.u. = Dwelling Units

Table XI: TAZ I (TT 5540 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour							
			Rate	Total	Trip Rate	In	Out		In	Out	Total	Trip Rate	In	Out		In	Out	Total				
							%							%					%			
Single-Family Detached Housing (210)	103	d.u.	9.57	986	0.75	25	75	19	58	77	1.01	63	37	66	38	104	0.93	54	46	52	44	96
Total Project Trips				986				19	58	77				66	38	104				52	44	96

Note: d.u. = Dwelling Units



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September 7, 2018

Table XII: TAZ J (TT 5183 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total
Single-Family Detached Housing (210)	33	d.u.	9.44	312	0.74	25	75	6	18	24	0.99	63	37	21	12	33	0.93	54	46	31
Total Project Trips				312				6	18	24				21	12	33		17	14	31

Note: d.u. = Dwelling Units

Table XIII: TAZ K (TT 5640 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total
Single-Family Detached Housing (210)	23	d.u.	9.44	217	0.74	25	75	4	13	17	0.99	63	37	14	9	23	0.93	54	46	21
Total Project Trips				217				4	13	17				14	9	23		11	10	21

Note: d.u. = Dwelling Units

Table XIV: TAZ L (V5 Commercial - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily			Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour				
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total
Mini-Warehouse (151)	124.146	k.s.f.	35.43	102	2.58	45	55	4	4	8	3.57	50	50	6	5	11	0.31	59	41	38
Shopping Center (820)	20.833	k.s.f.	59.00	2,450		62	38	37	23	60		48	52	101	109	210	4.50	52	48	94
Total Project Trips				2,552				41	27	68				107	114	221		71	61	132

Note: k.s.f. = Thousand Square Feet



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Table XV: TAZ M (TT 5519 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour								
			Rate	Total	Trip Rate	In	In Out		In	Out	Total	Trip Rate	In	In Out		In	Out	Total	Trip Rate	In	In Out		In	Out	Total
							%	%						%	%						%	%			
Single-Family Detached Housing (210)	68	d.u.	9.44	642	0.74	25	75		12	38	50	0.99	63	37	42	25	67	0.93	54	46	34	29	63		
Total Project Trips				642					12	38	50				42	25	67				34	29	63		

Note: d.u. = Dwelling Units

Table XVI: TAZ N (TT 5568 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour						
			Rate	Total	Trip Rate	In	Out		In	Out	Total	Trip Rate	In	Out		In	Out	Total			
							%	%						%	%						
Single-Family Detached Housing (210)	144	d.u.	9.44	1,359	0.74	25	75		27	80	107	0.99	63	37	90	53	143	0.93	54	46	134
Total Project Trips				1,359					27	80	107				90	53	143				134

Note: d.u. = Dwelling Units

Table XVII: TAZ O (Stillman/Cinema Apartments - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour						Weekday (4-6) PM Peak Hour						Saturday (1-3) PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	Total	Trip Rate	In	Out	Total				
																			%	%	%	%
Multi-Family Housing (220)	39	d.u.	7.32	285	0.46	23	77		4	14	18	0.56	63	37		14	8	22	0.70	50	50	27
Total Project Trips				285					4	14	18					14	8	22		14	13	27

Note: d.u. = Dwelling Units



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Table XVIII: TAZ P (TT 5563 - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour							
			Rate	Total	Trip Rate	In	Out		In	Out	Total	Trip Rate	In	Out		In	Out	Total				
							%							%								
Single-Family Detached Housing (210)	39	d.u.	9.57	373	0.75	25	75	7	22	29	1.01	63	37	25	14	39	0.93	54	46	19	17	36
Total Project Trips				373				7	22	29				25	14	39				19	17	36

Note: d.u. = Dwelling Units

Table XIX: TAZ Q (American Tire Depot - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour							
			Rate	Total	Trip Rate	In	Out		In	Out	Total	Trip Rate	In	Out		In	Out	Total				
							%							%								
Tire Store (848)	6,000	k.s.f.	28.52	171	2.72	64	36	10	6	16	3.98	43	57	10	14	24	5.05	47	53	14	16	30
Total Project Trips				171				10	6	16				10	14	24				14	16	30

Note: k.s.f. = Thousand Square Feet

Table XX: TAZ R (United Health Center - Near Term Project) Land Use Trip Generation

Land Use (ITE Code)	Size	Unit	Weekday Daily		Weekday (7-9) AM Peak Hour					Weekday (4-6) PM Peak Hour					Saturday (1-3) PM Peak Hour							
			Rate	Total	Trip Rate	In	Out		In	Out	Total	Trip Rate	In	Out		In	Out	Total				
							%							%								
Clinic (630)	4,000	k.s.f.	38.16	153	3.69	78	22	12	3	15	3.28	29	71	4	9	13	3.28	29	71	4	9	13
Total Project Trips				153				12	3	15				4	9	13				4	9	13

Note: k.s.f. = Thousand Square Feet



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Fresno COG Modeling Request (JLB Project 001-005)
September 7, 2018

If you have any questions or require additional information, please contact me by phone at (559) 317-6273 or by e-mail at smaciel@JLBtraffic.com.

Sincerely,

Susana Maciel

Susana Maciel, EIT
Engineer I/II

cc: Jose Luis Benavides, JLB Traffic Engineering, Inc.
Lang Yu, Fresno Council of Governments

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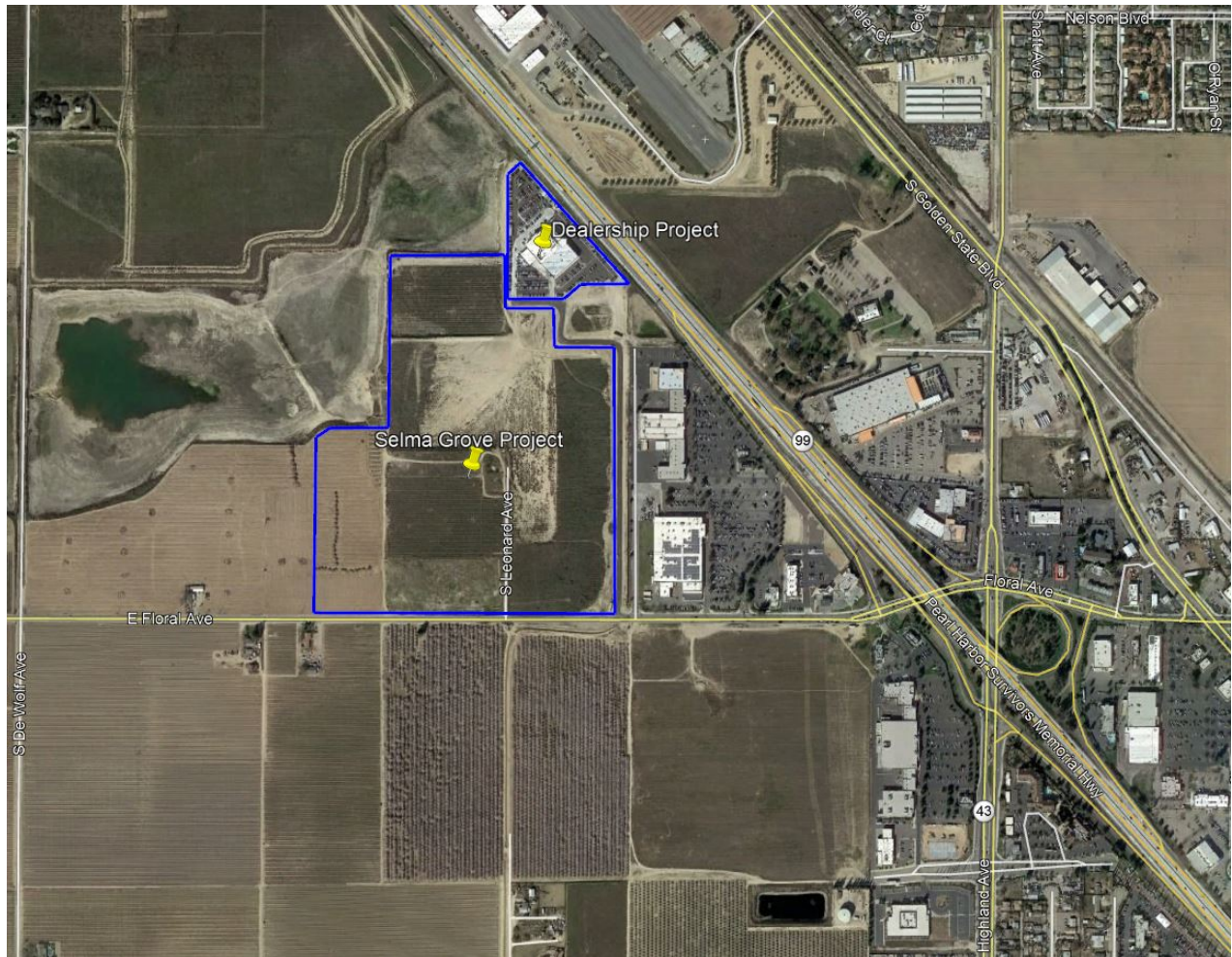
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Exhibit A – Project Vicinity



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Exhibit B – Project Site Plan



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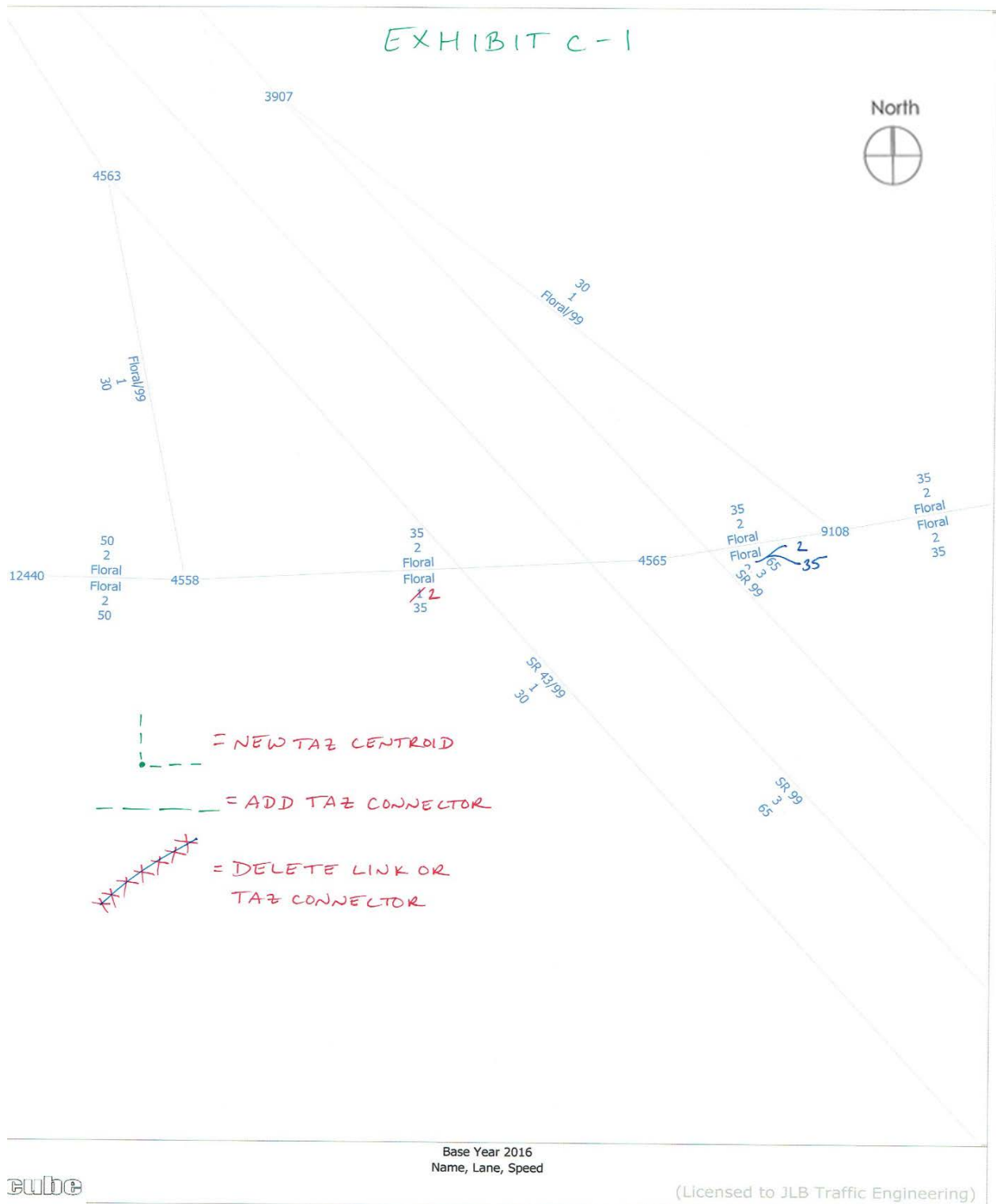
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Exhibit C – Base Year 2016 (Model Link and TAZ Modifications)



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Mr. Han

Fresno COG Modeling Request (JLB Project 001-005)

September 7, 2018



North



Base Year 2016
Name, Lane, Speed

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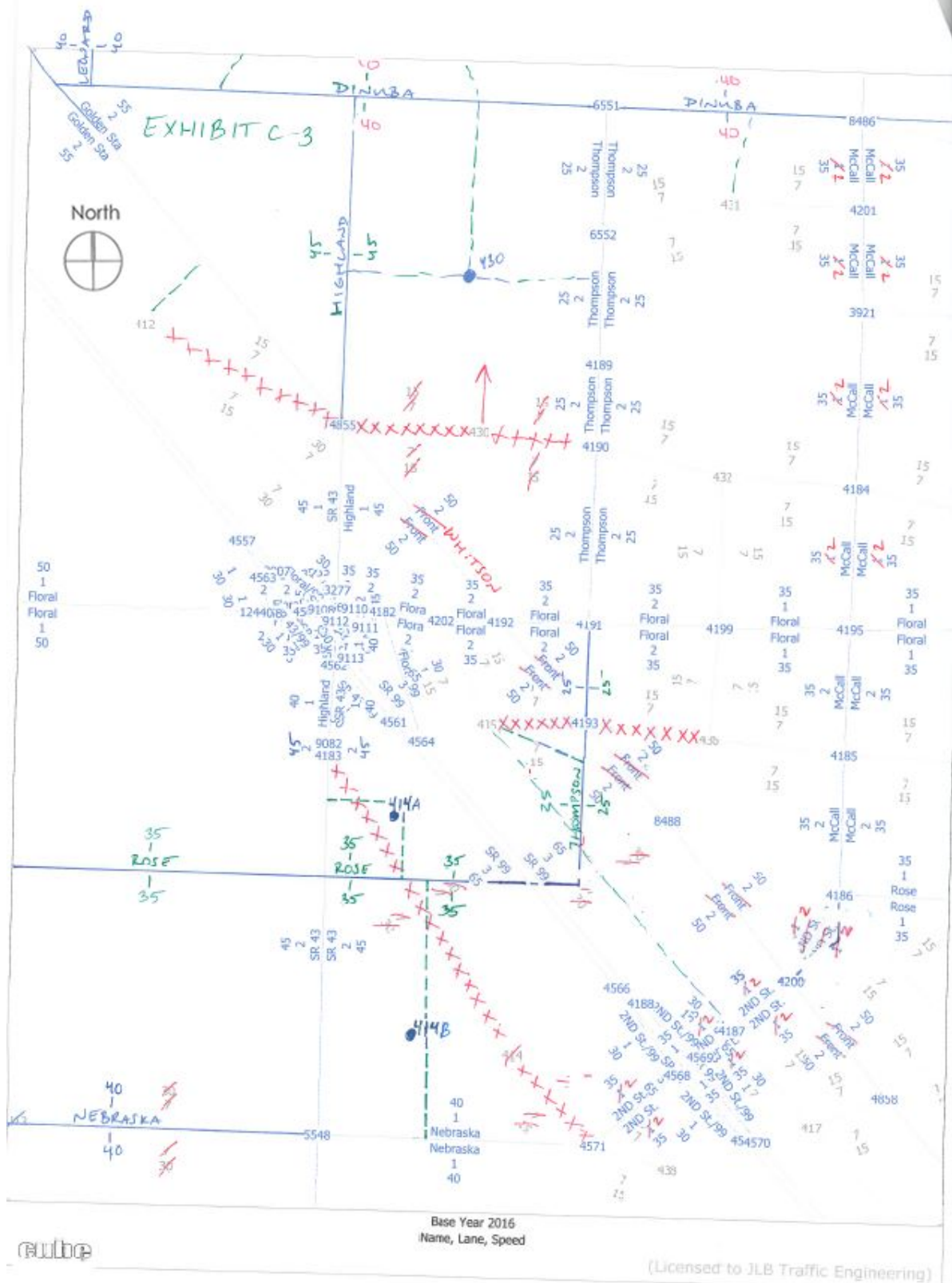
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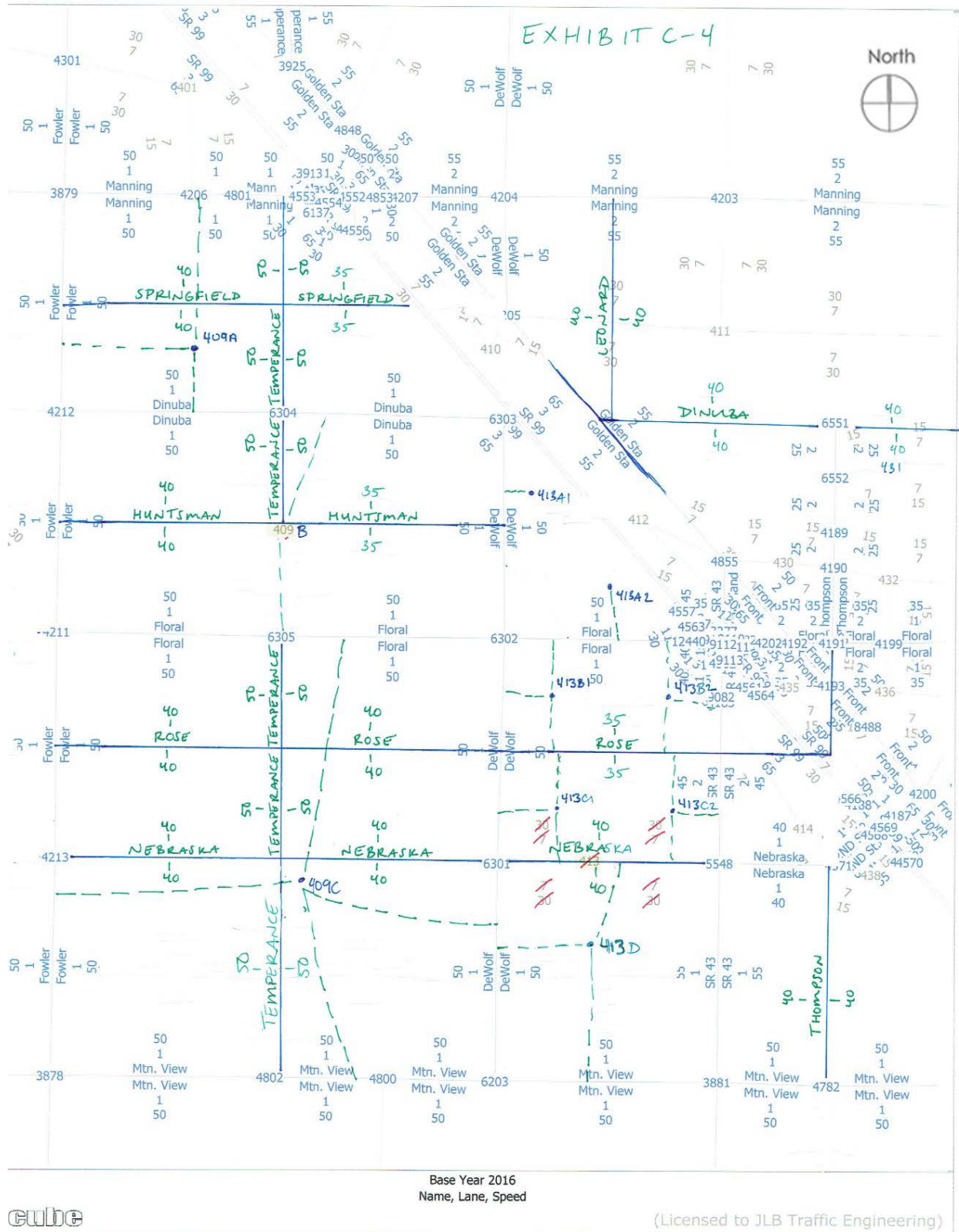
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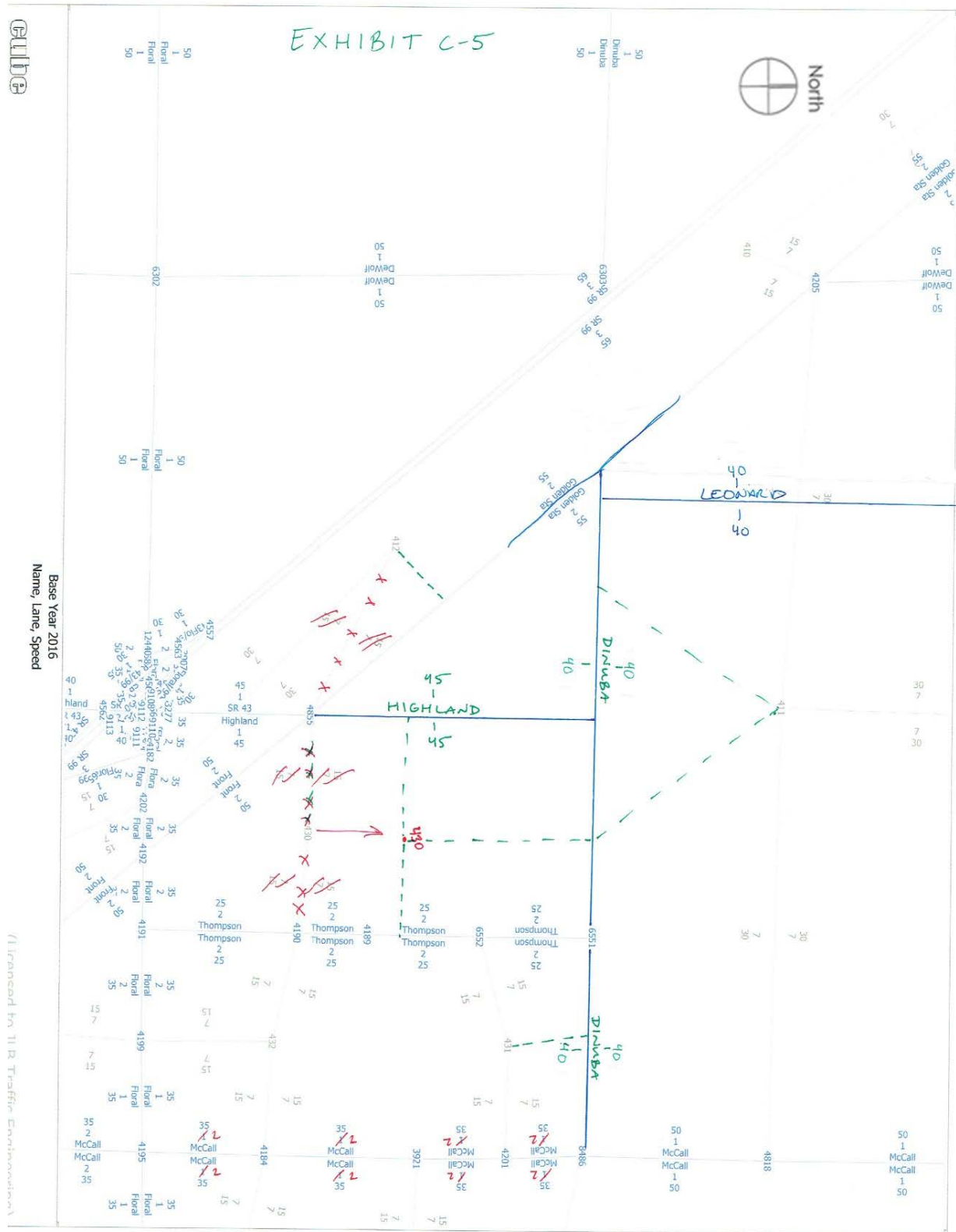
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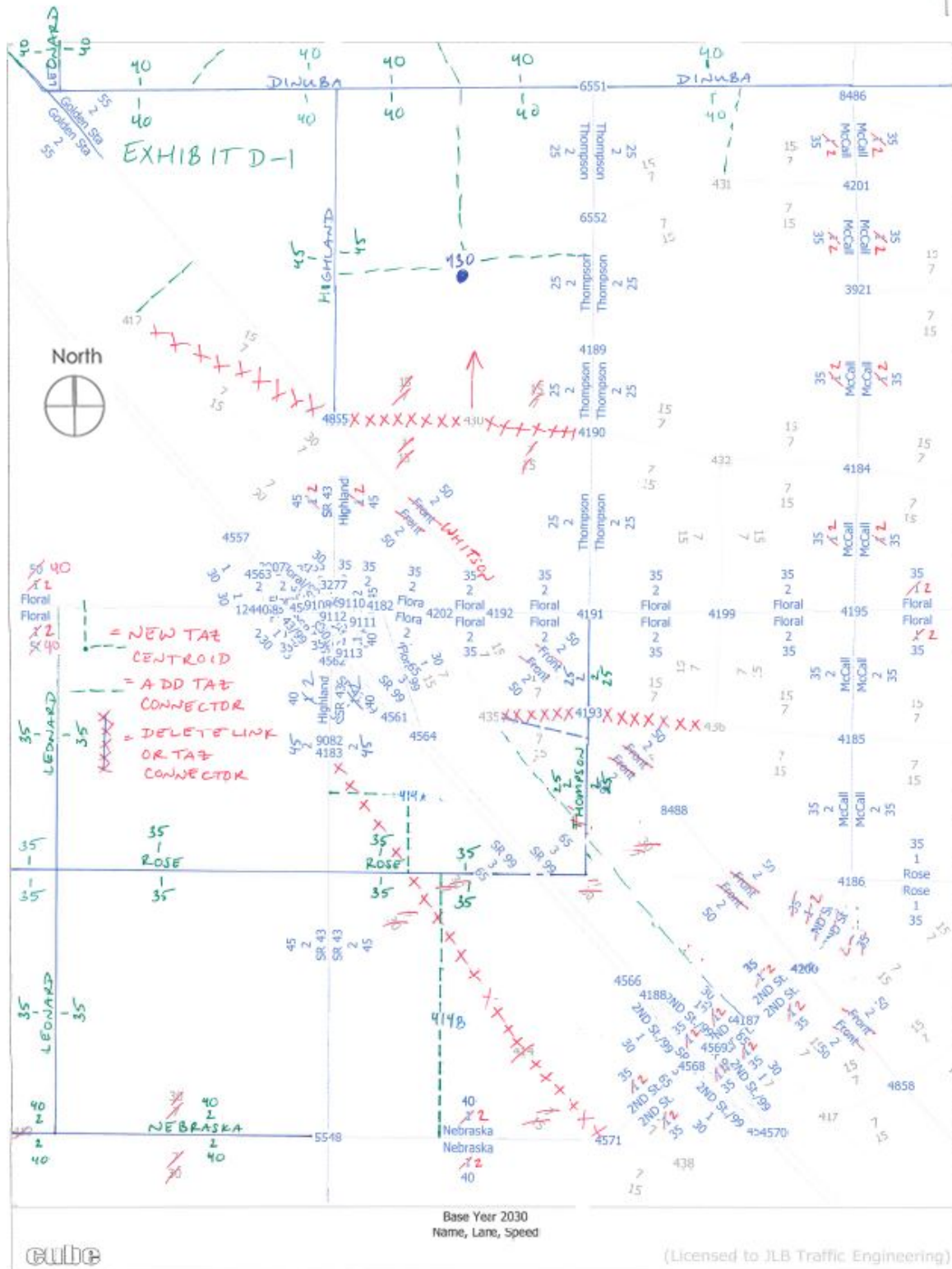
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Exhibit D – Cumulative Year 2035 (Model Link and TAZ Modifications)



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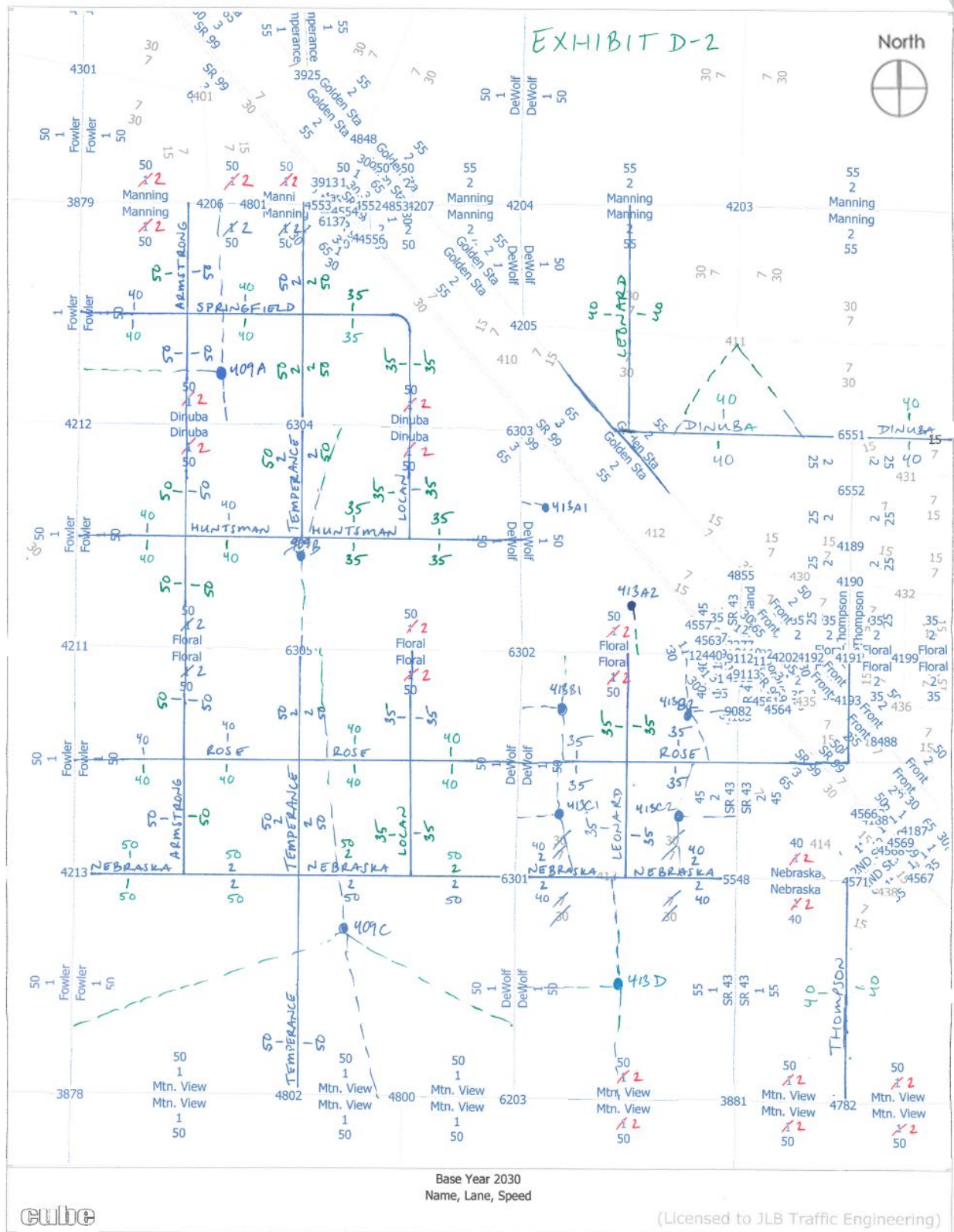
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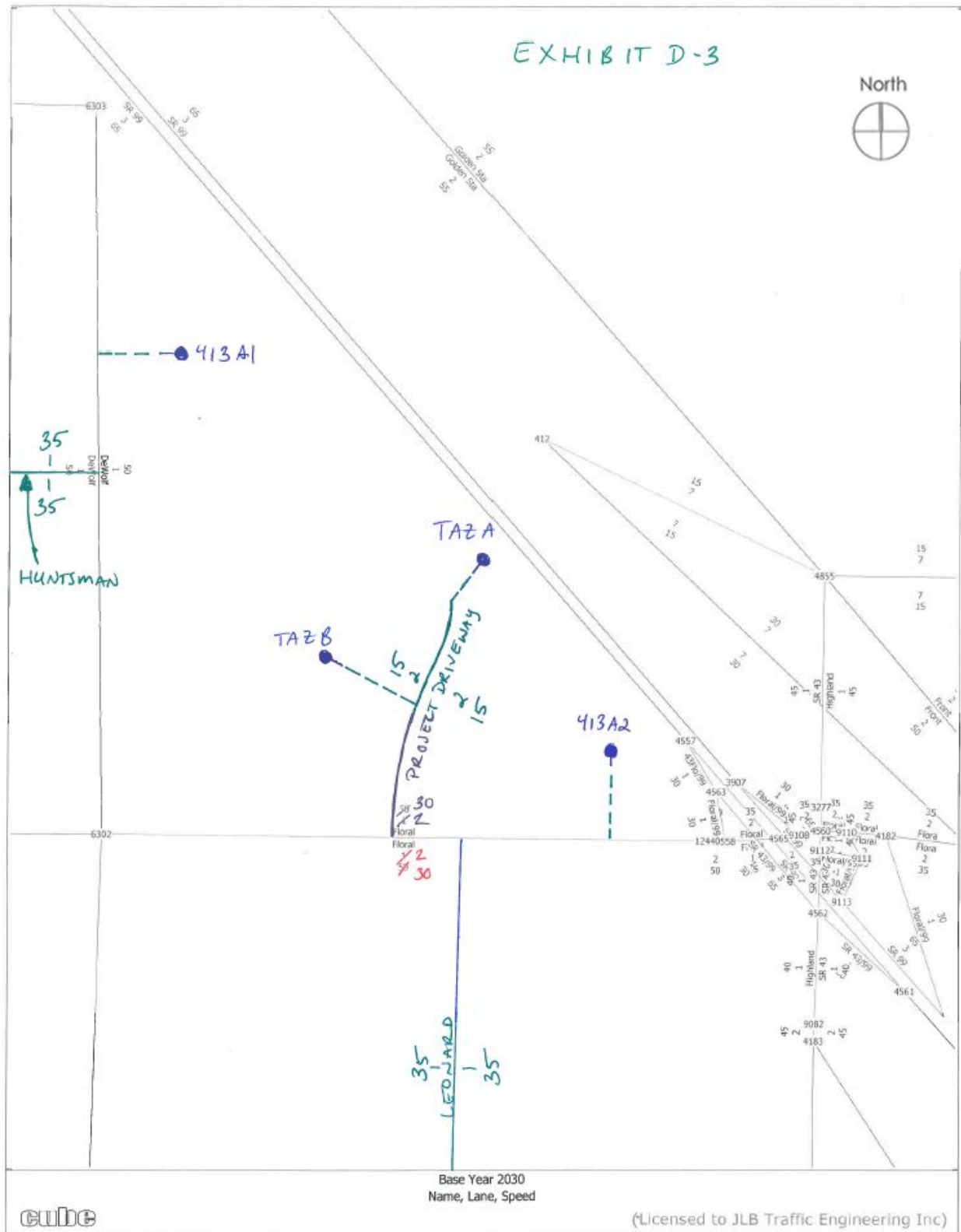
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Exhibit E – Cumulative Year 2035 with Dinuba/SR 99 Interchange (Link and TAZ Modifications)

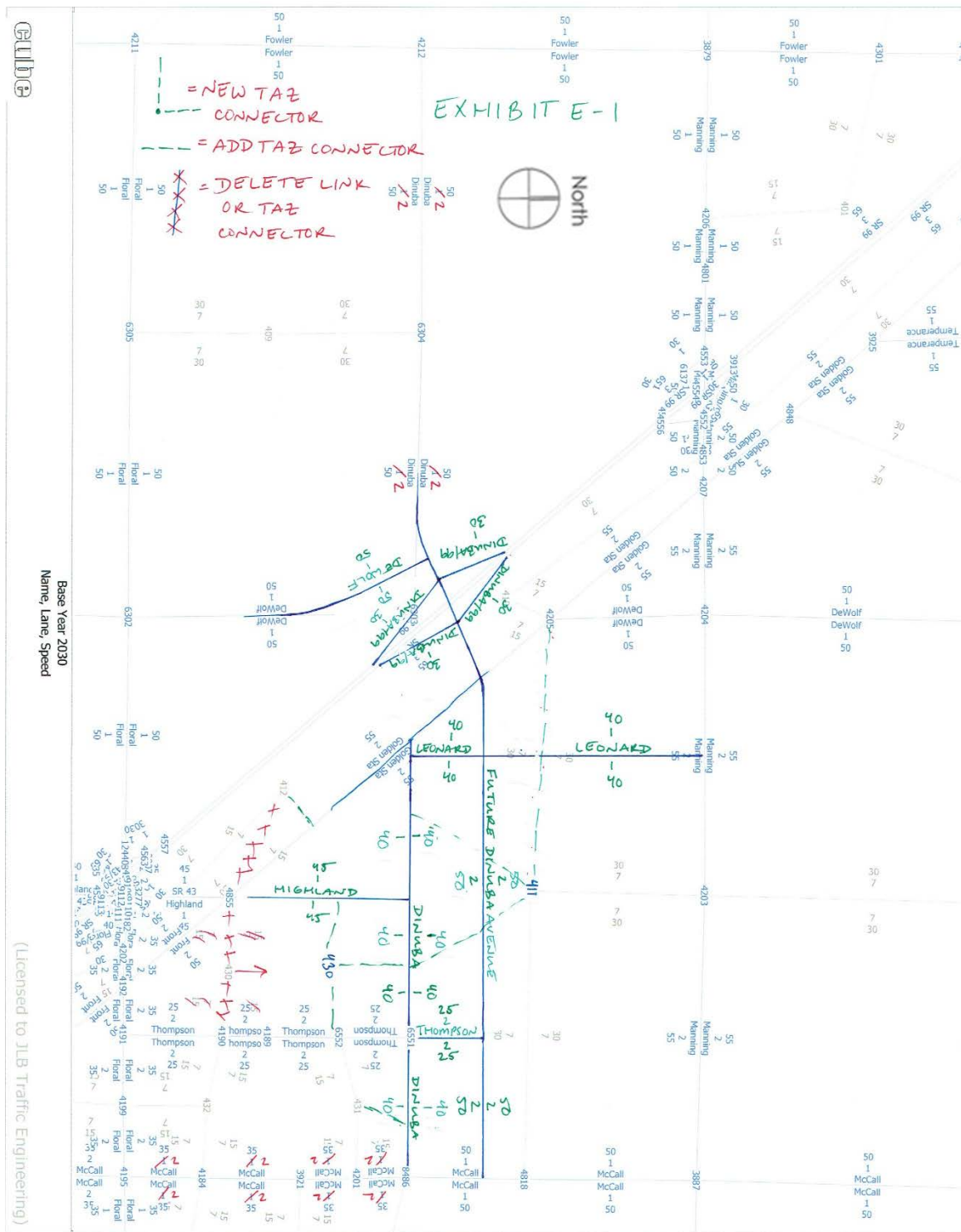
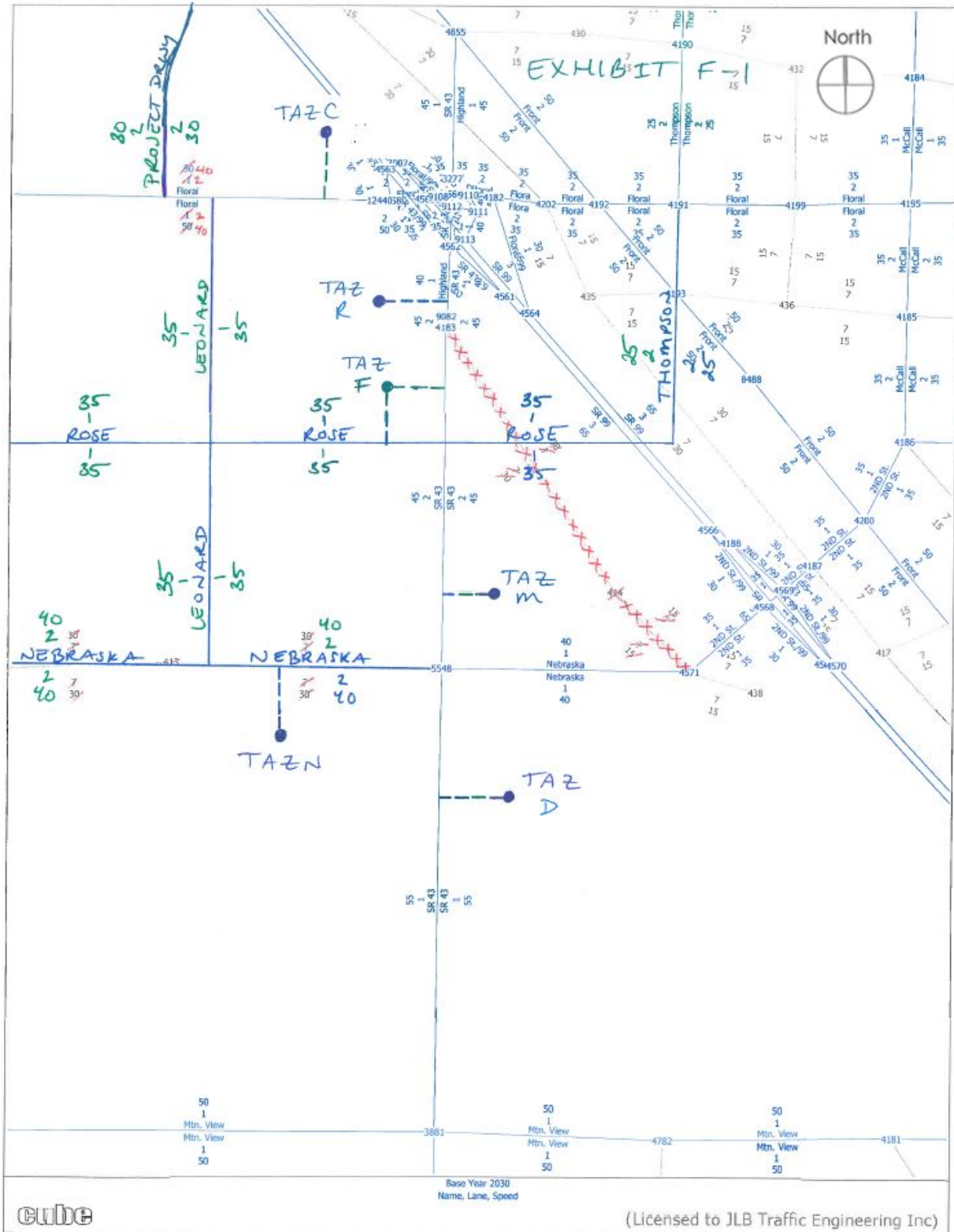


Exhibit F – Near Term Project Locations



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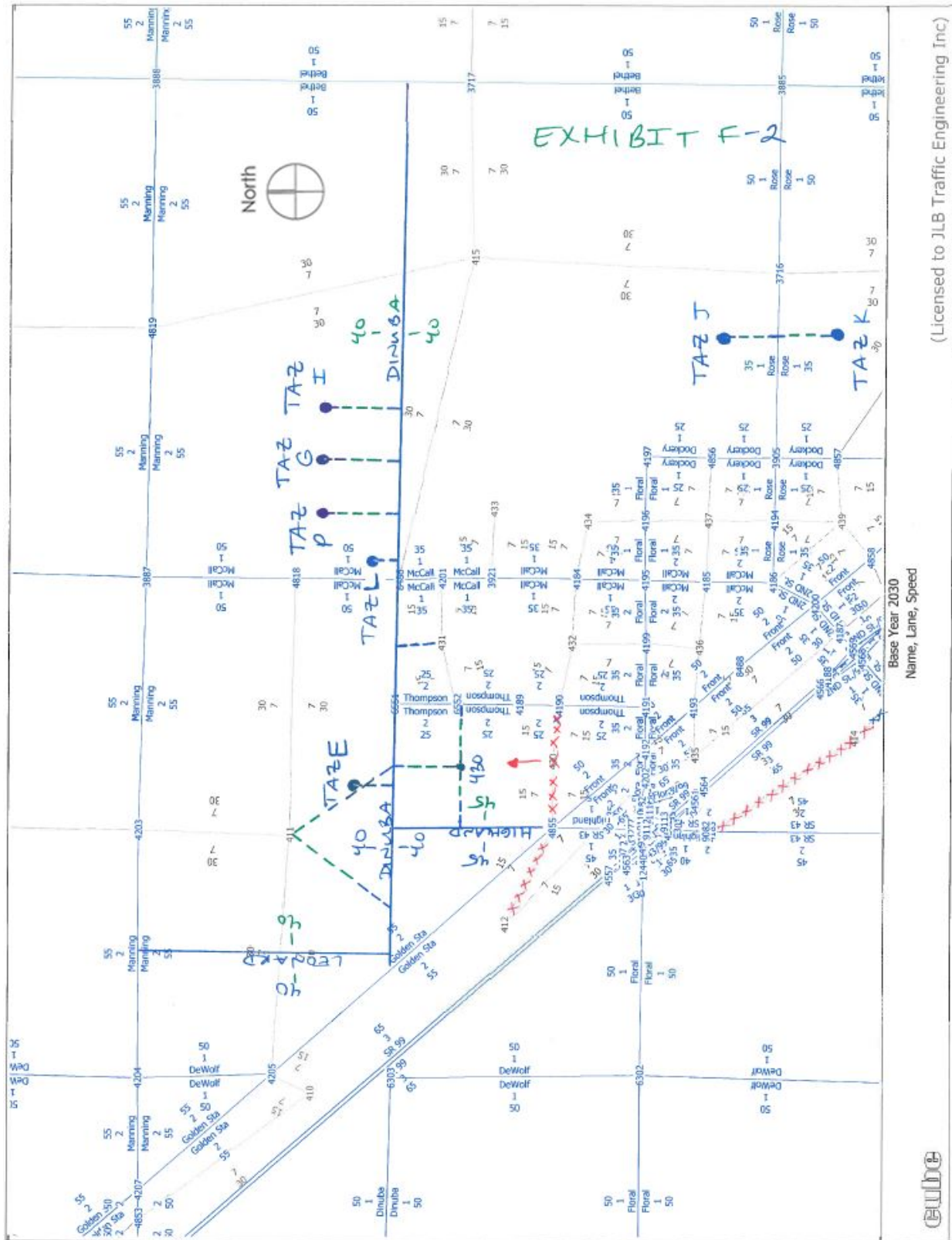
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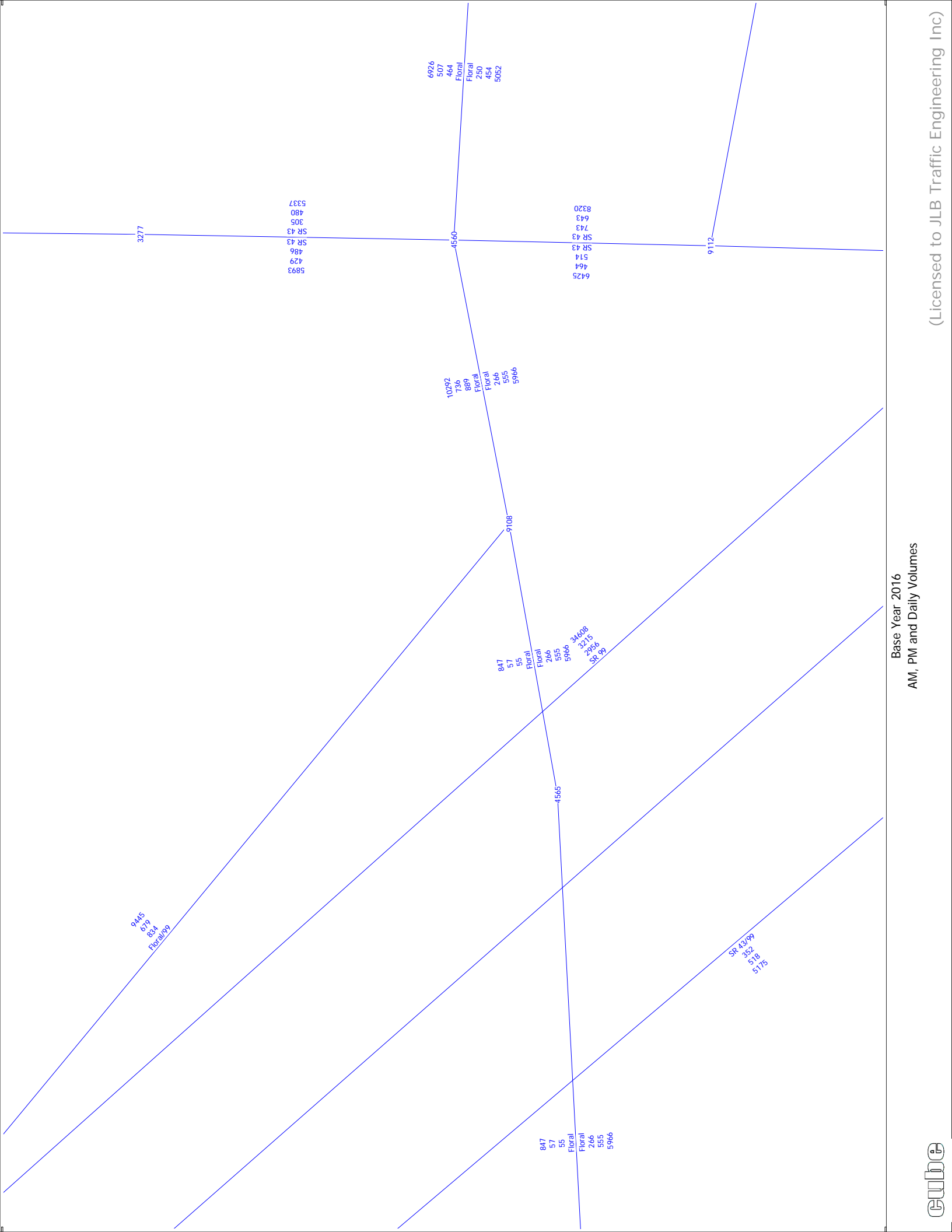
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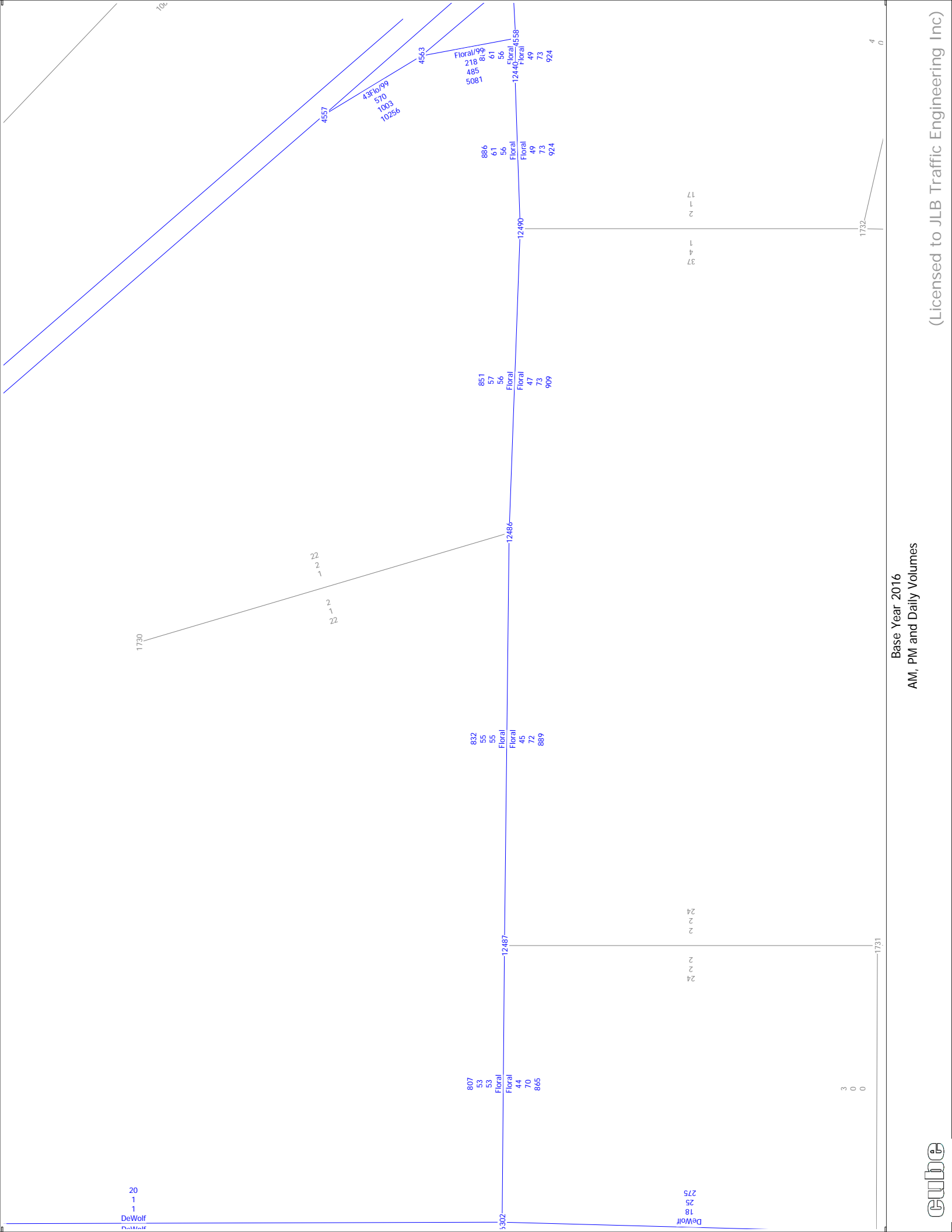
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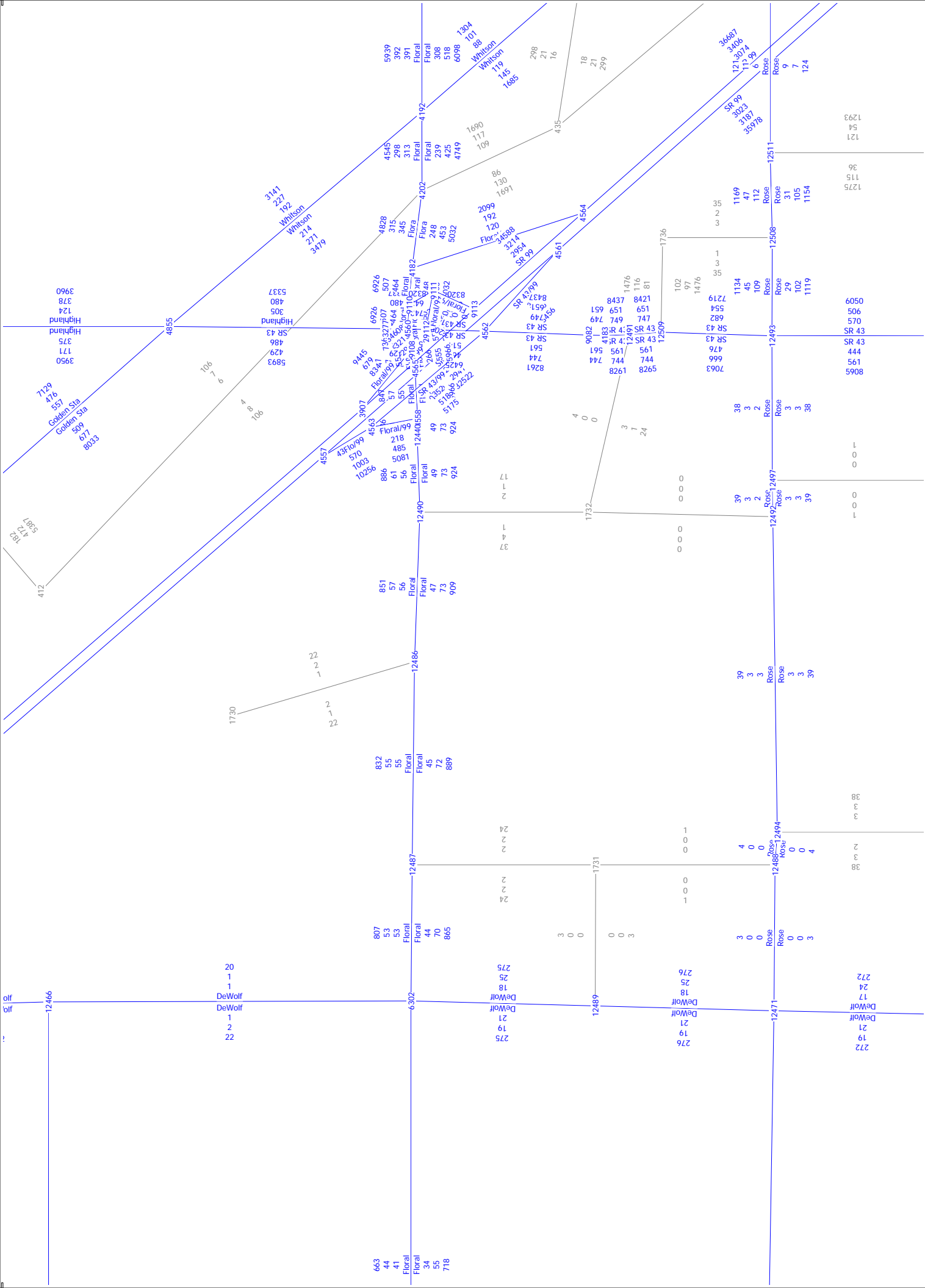






Base Year 2016
AM, PM and Daily Volumes

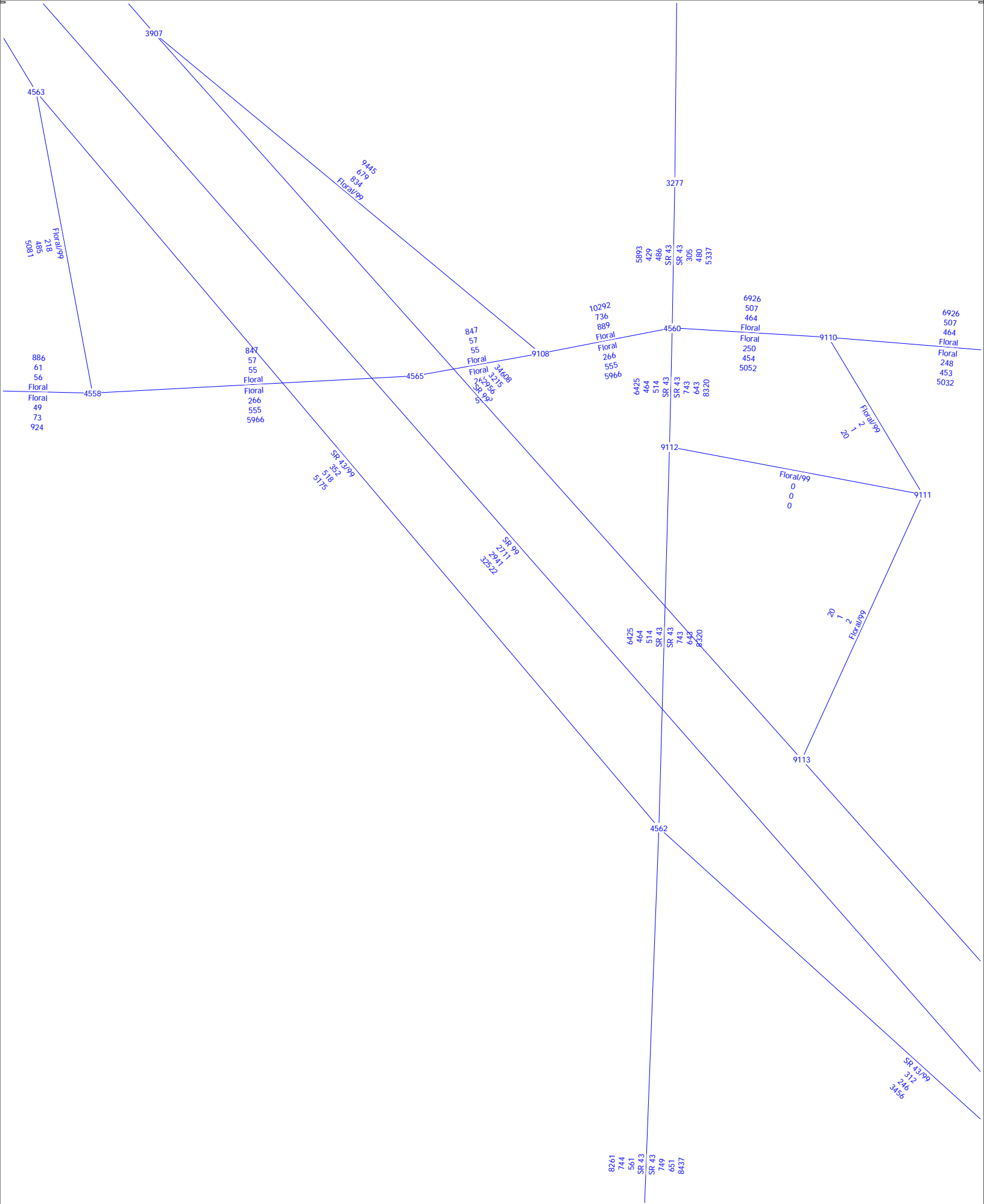




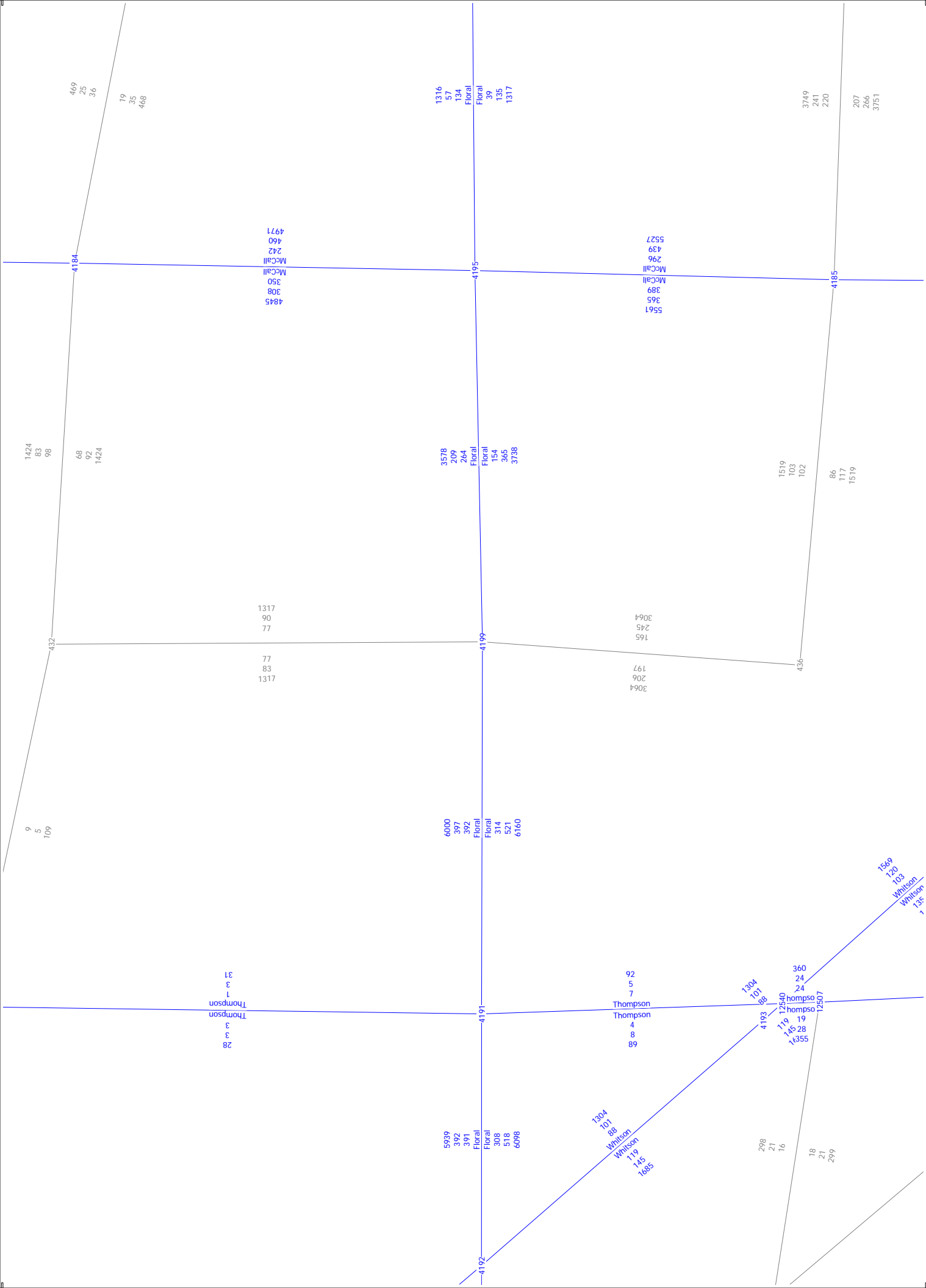
Base Year 2016
AM, PM and Daily Volumes

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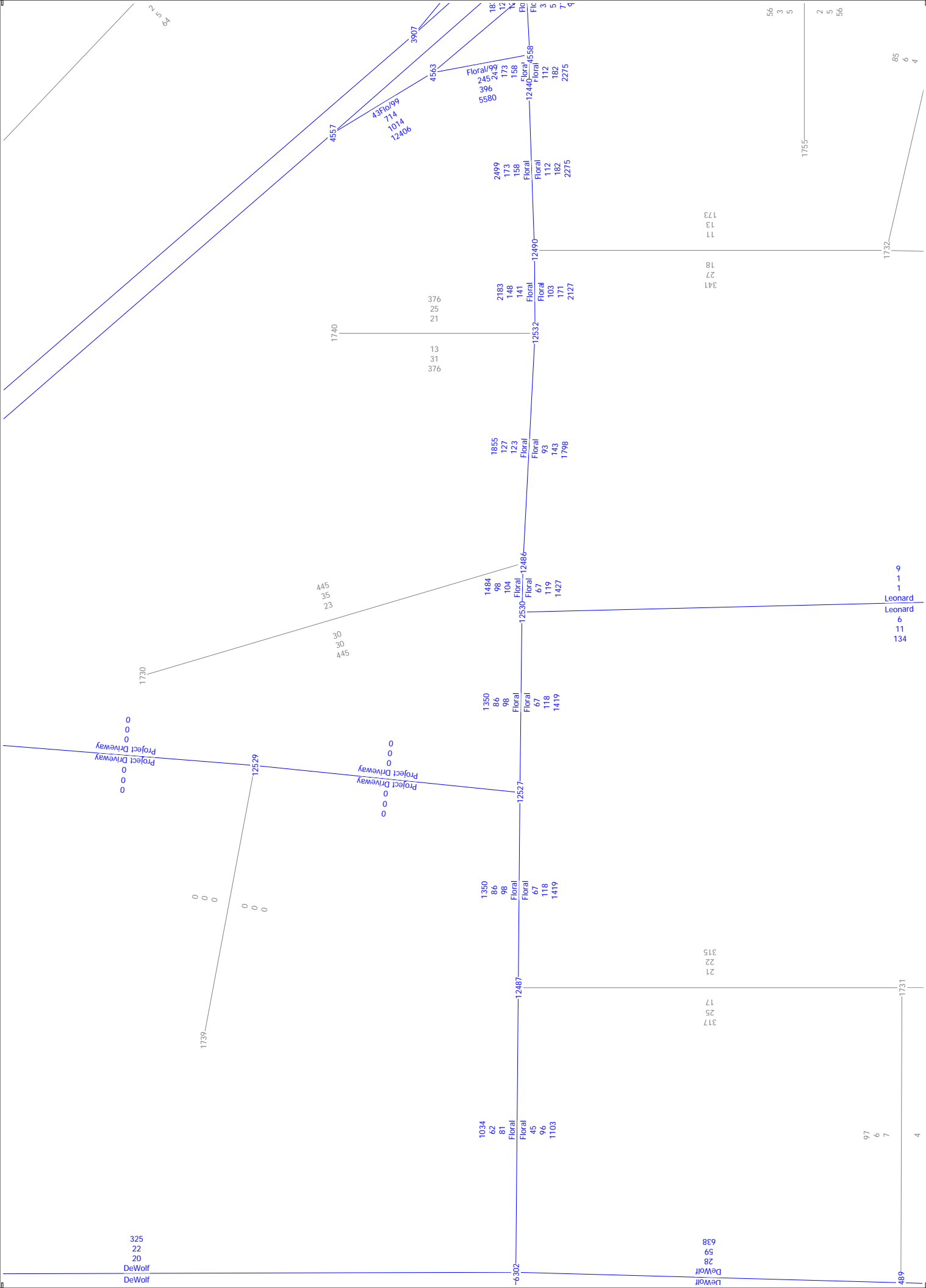
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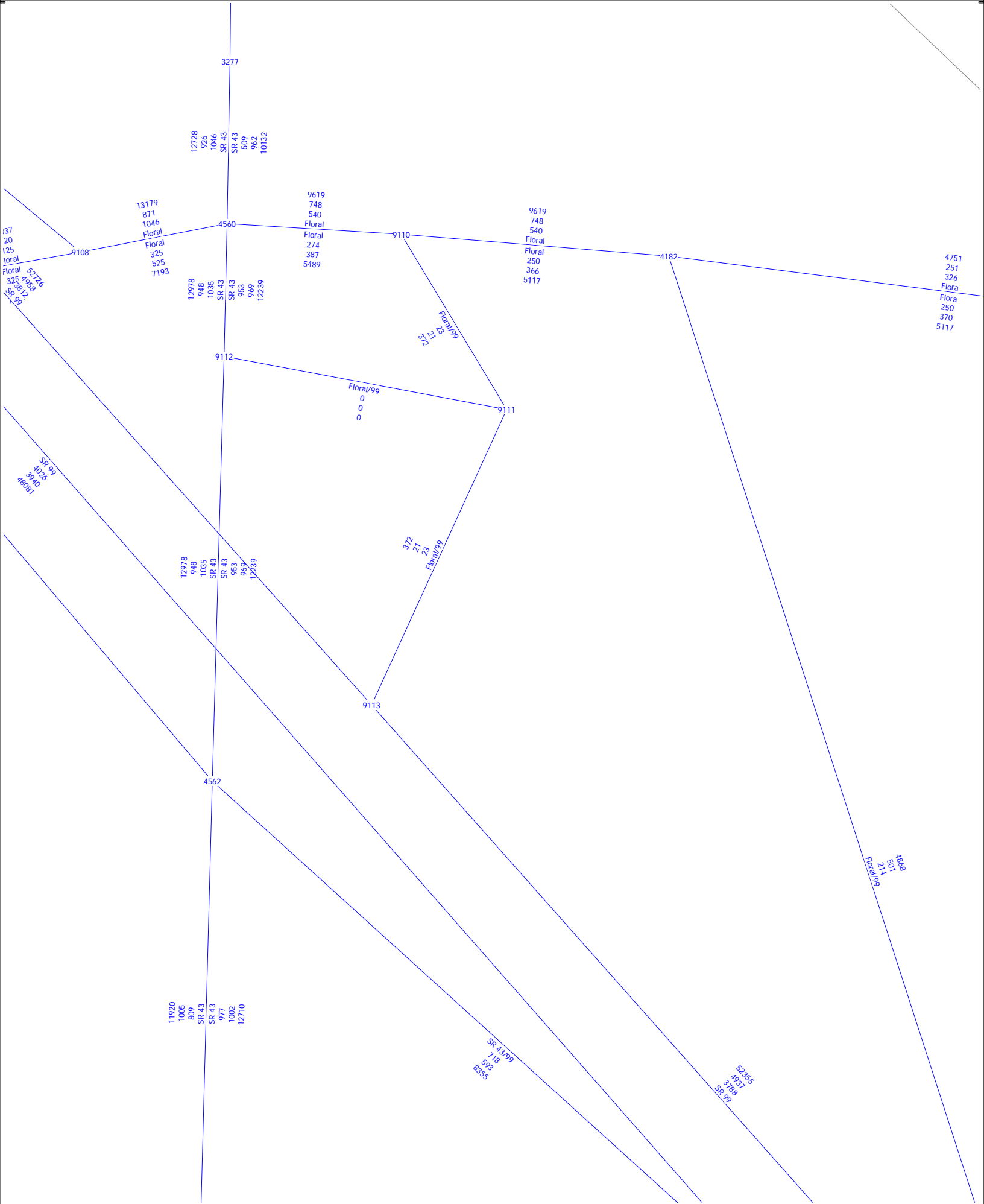


Base Year 2016
AM, PM and Daily Volumes

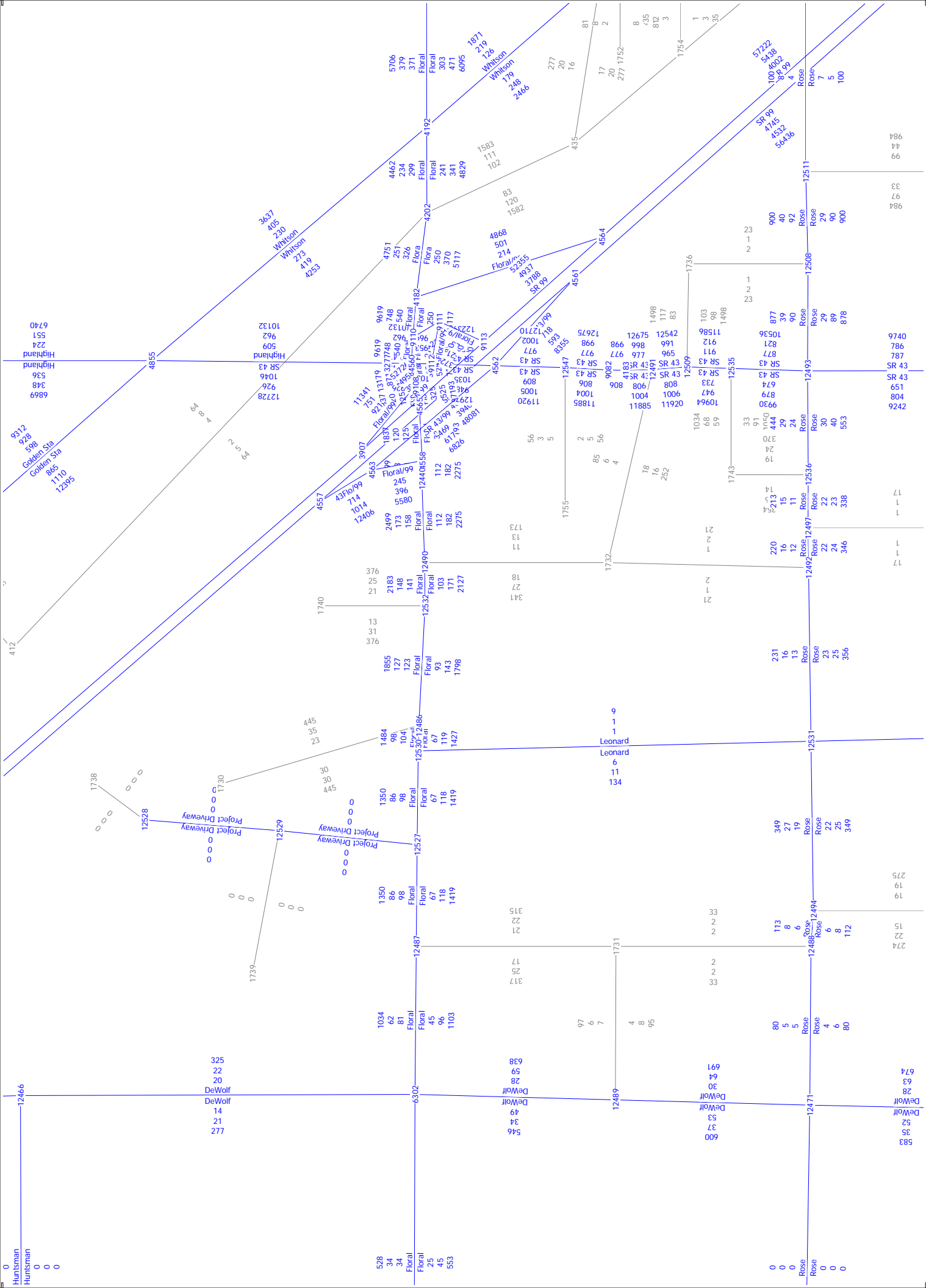


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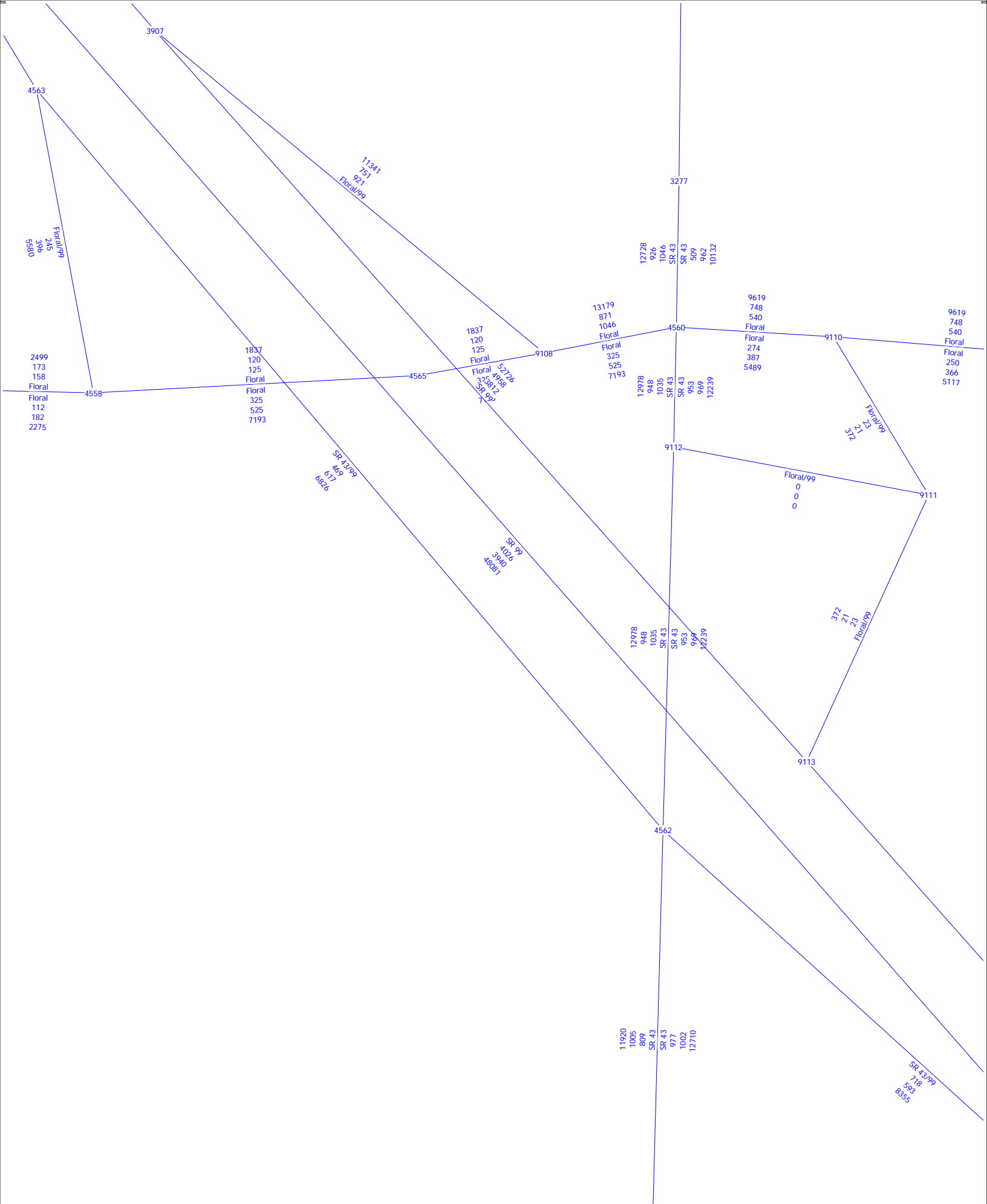


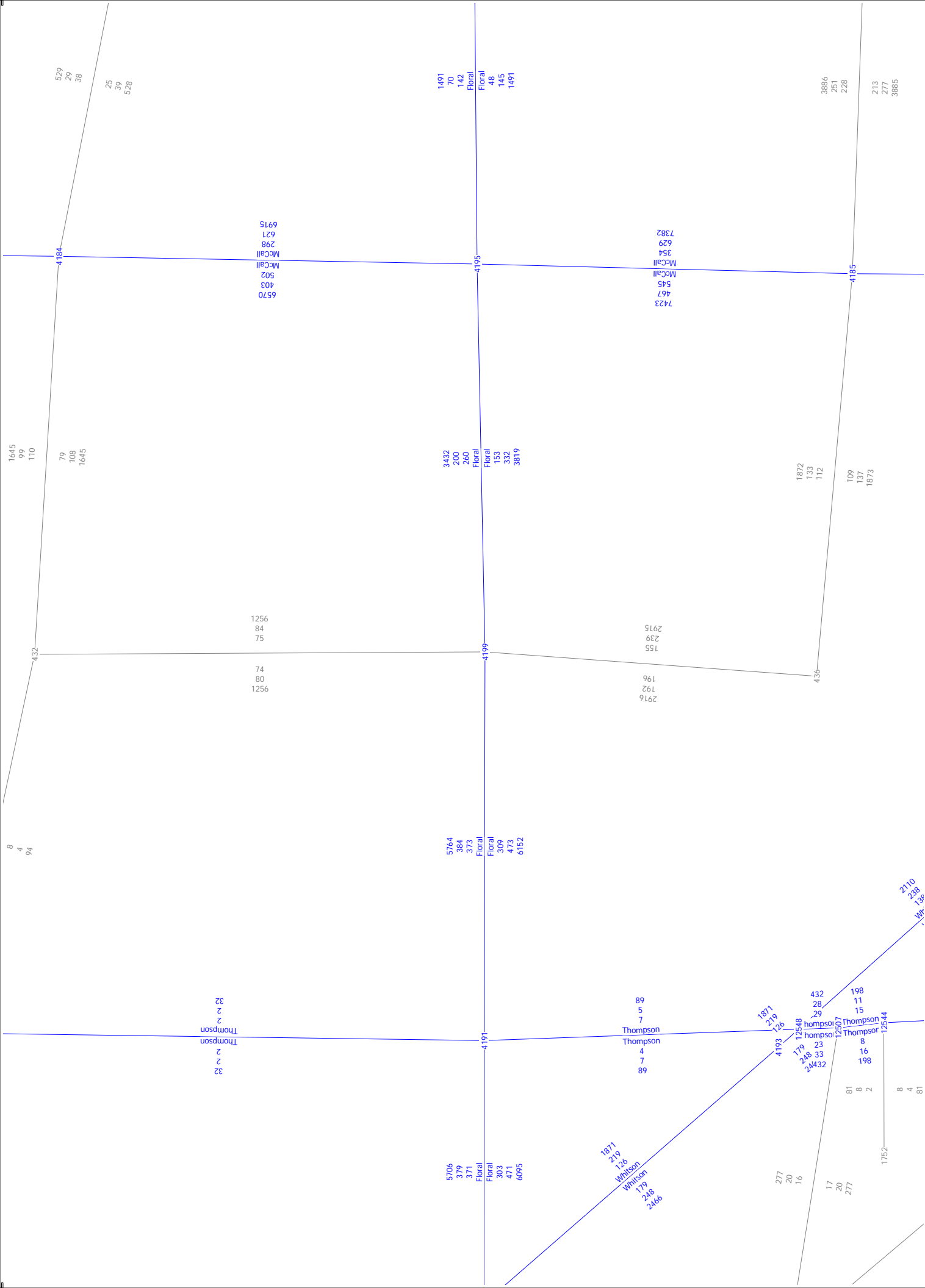


Cumulative Year 2030 No Project
AM, PM and Daily Volumes



Cumulative Year 2030 No Project
AM, PM and Daily Volumes

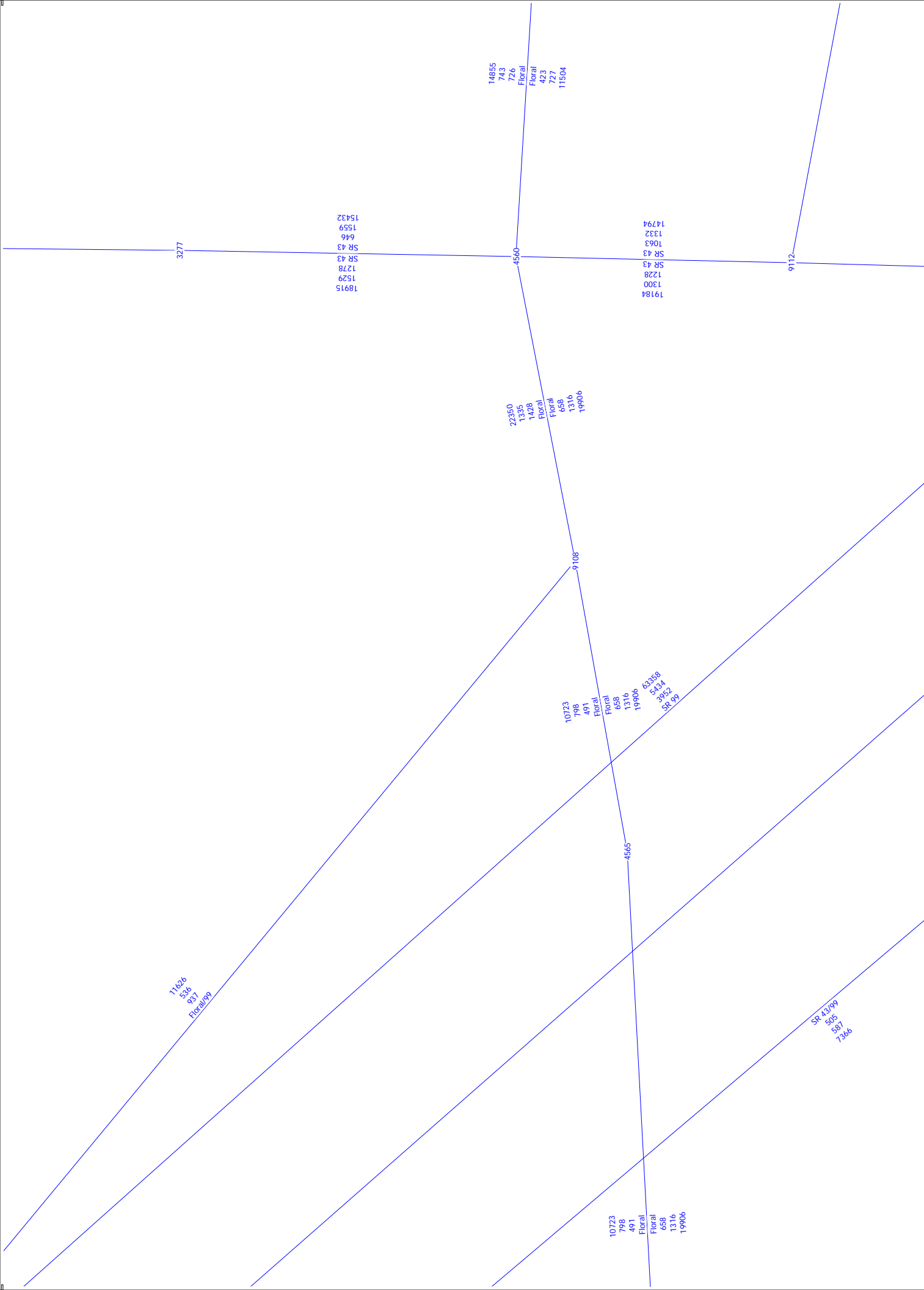




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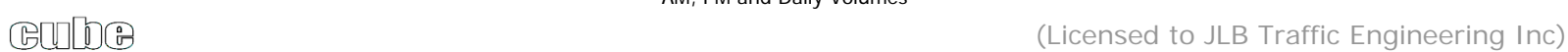
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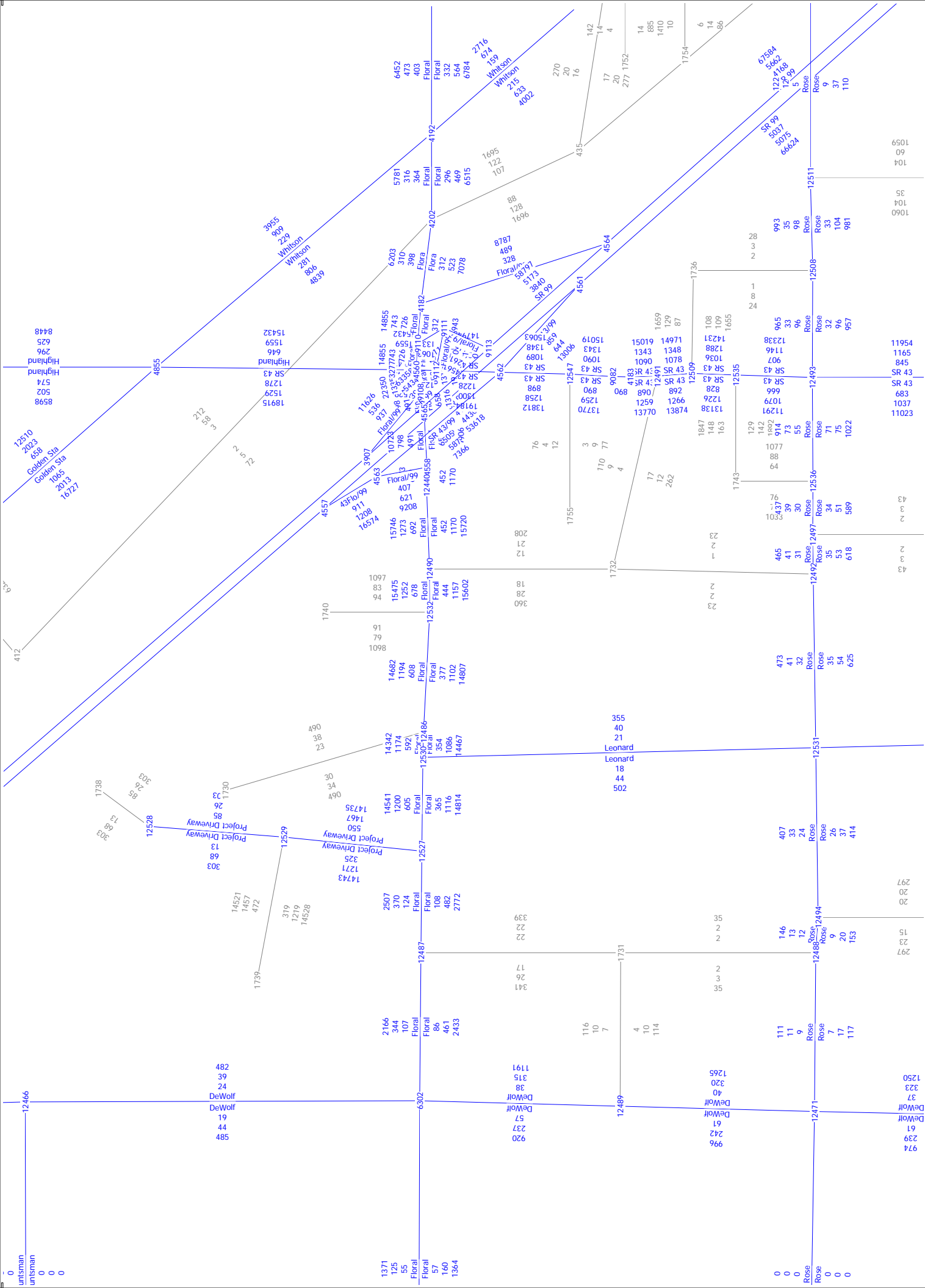
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Cumulative Year 2030 plus Project
AM, PM and Daily Volumes

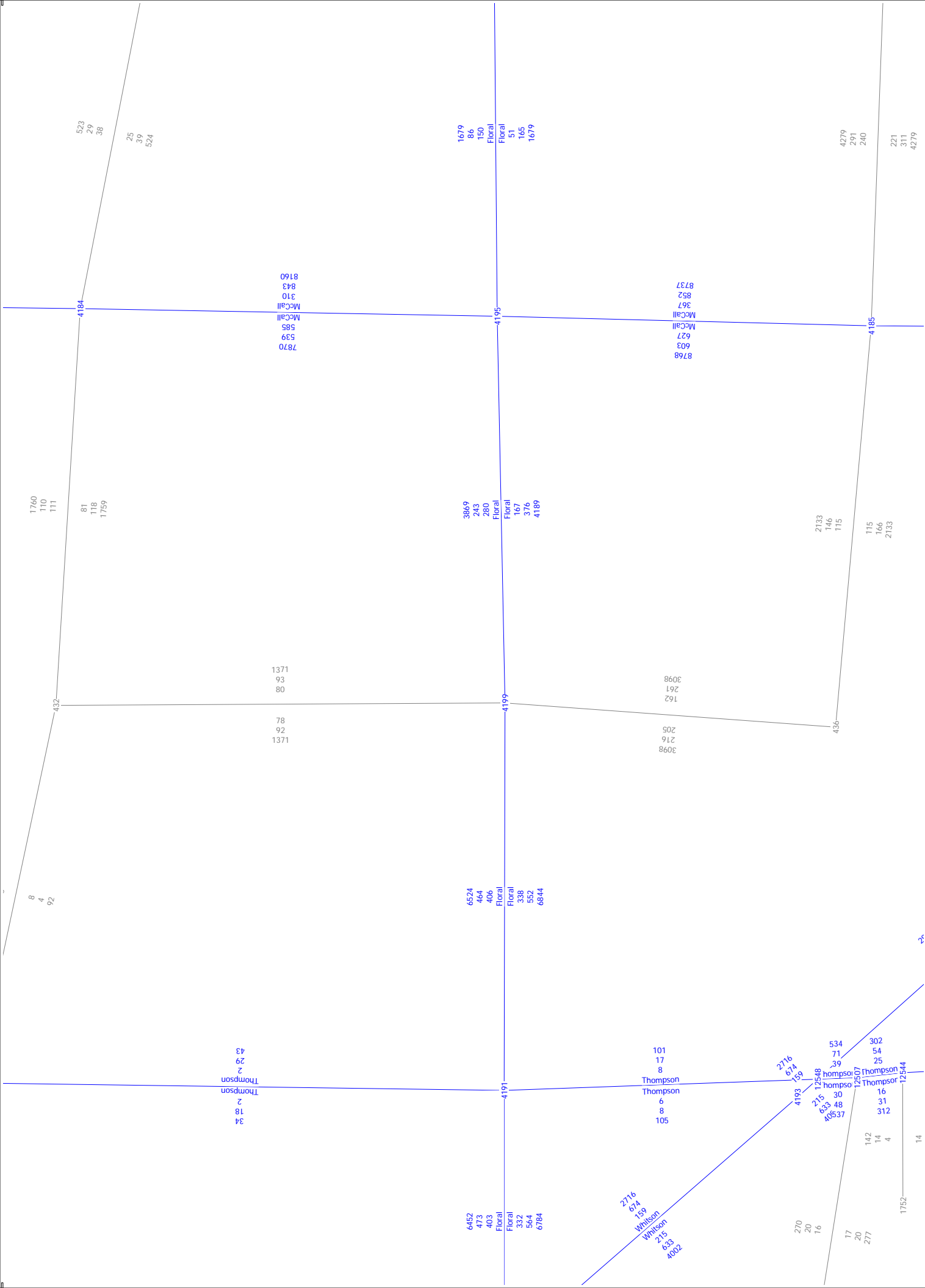
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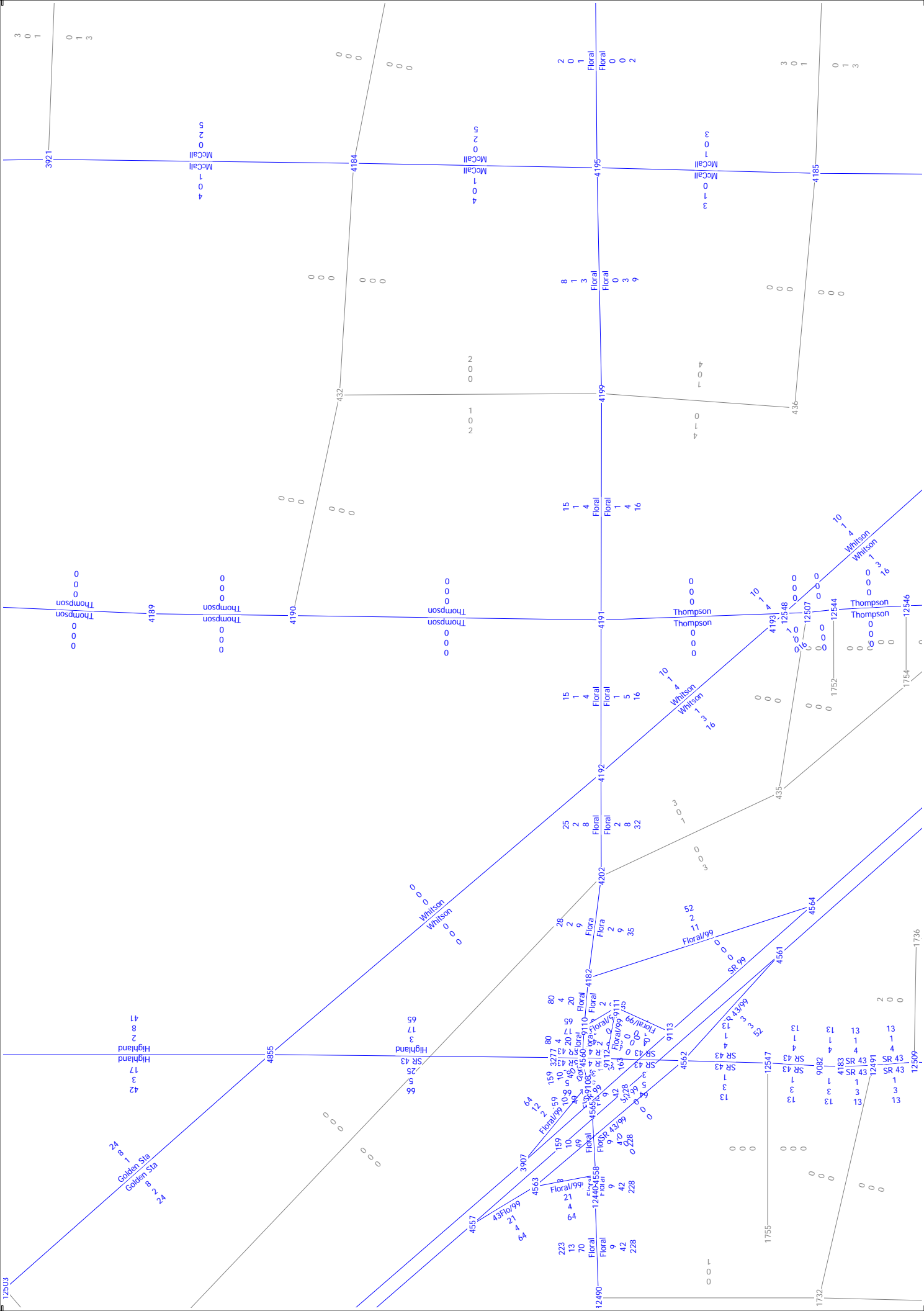








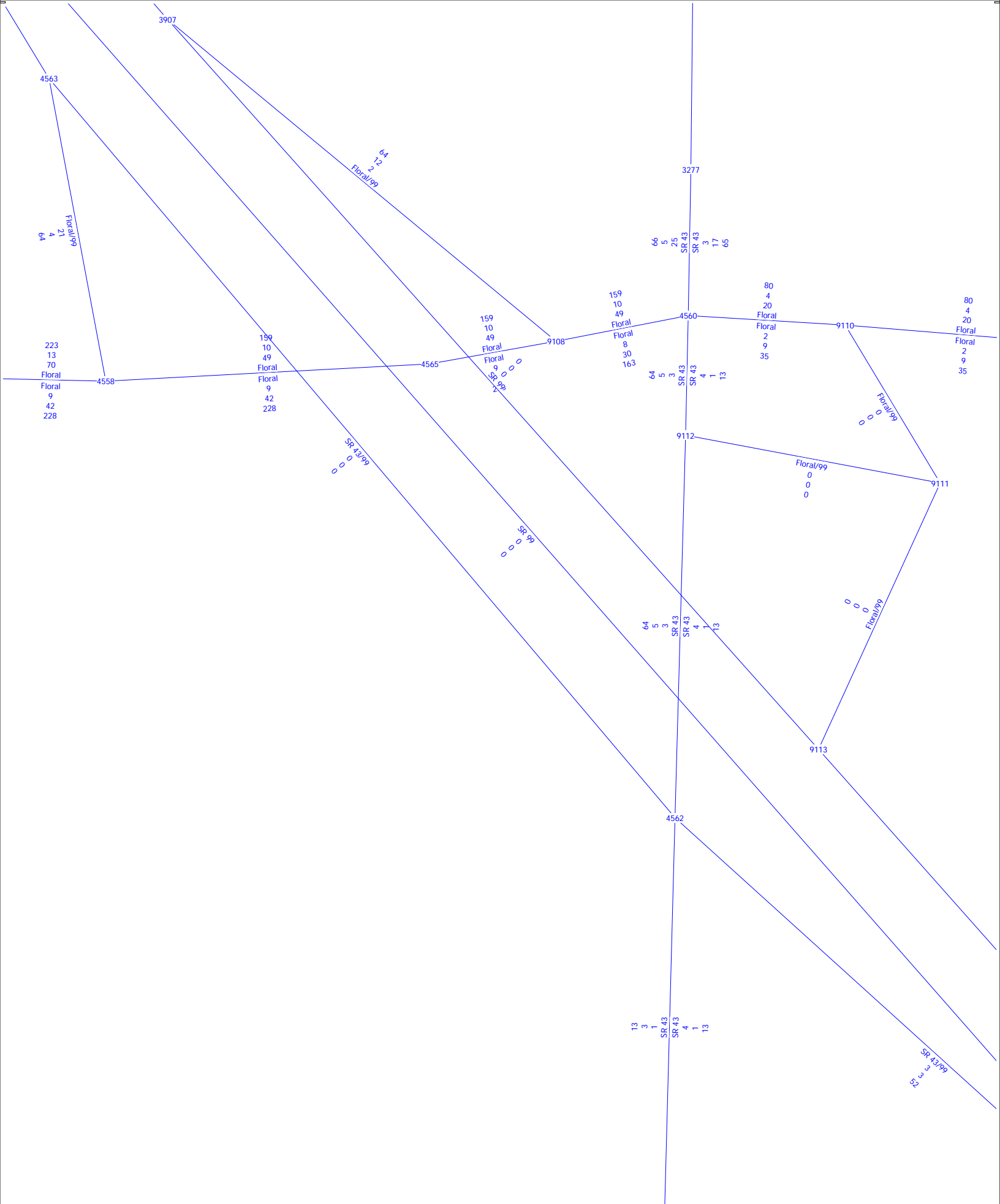




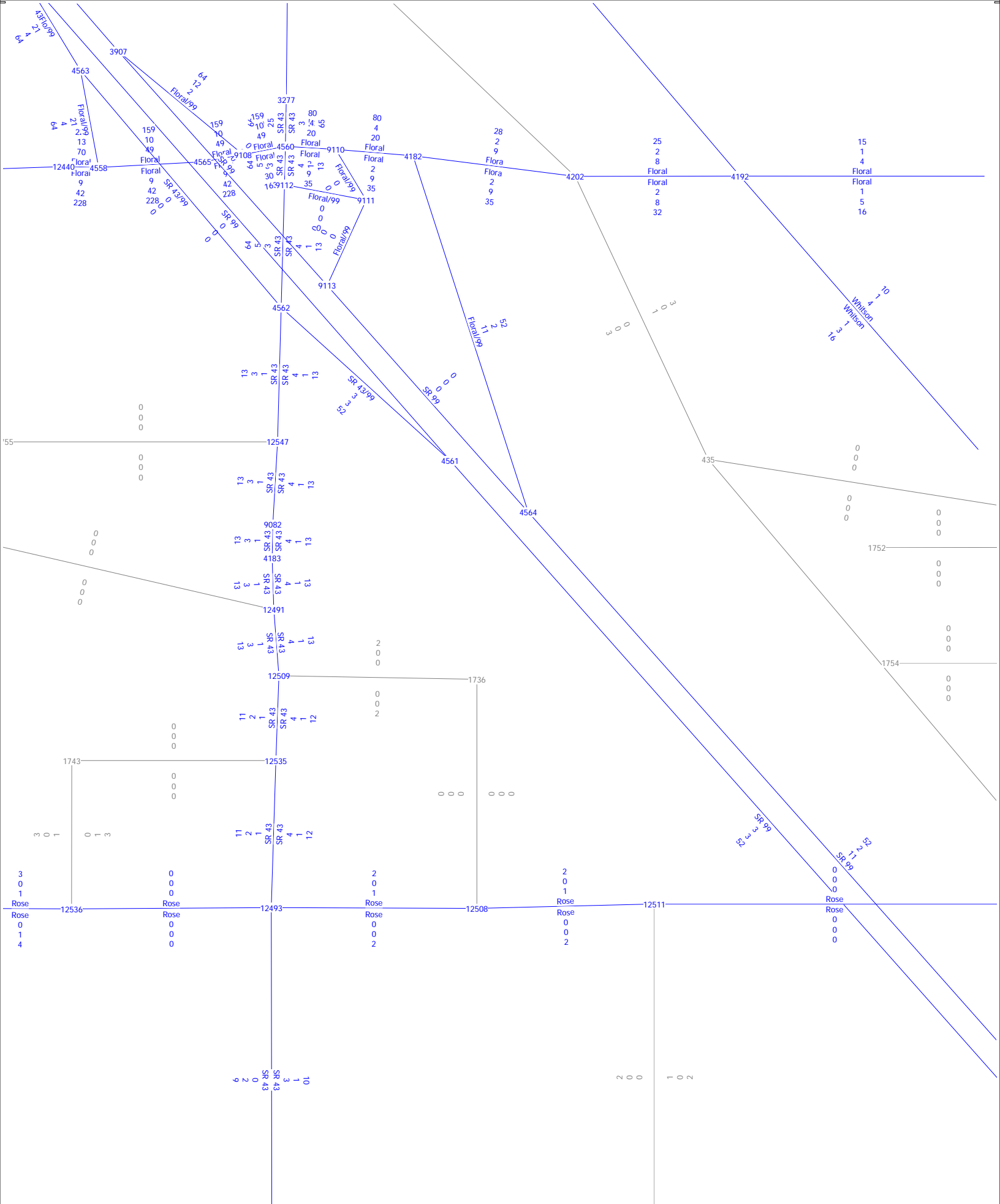
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Project Select Zone

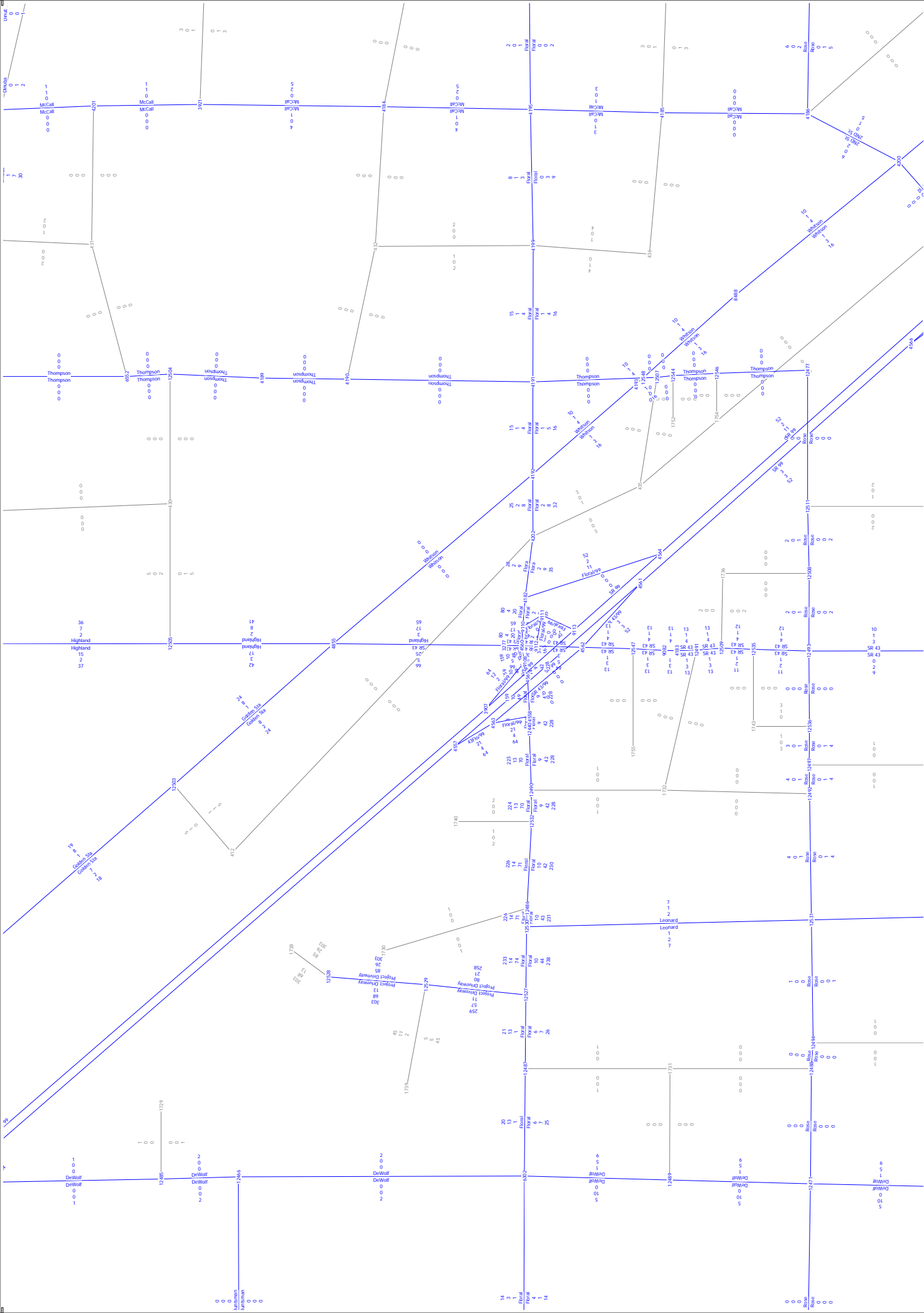
AM, PM and Daily Volumes



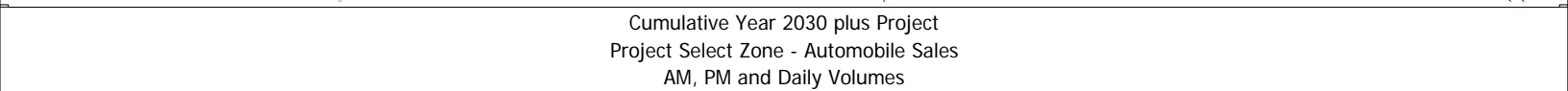
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Project Select Zone
AM, PM and Daily Volumes

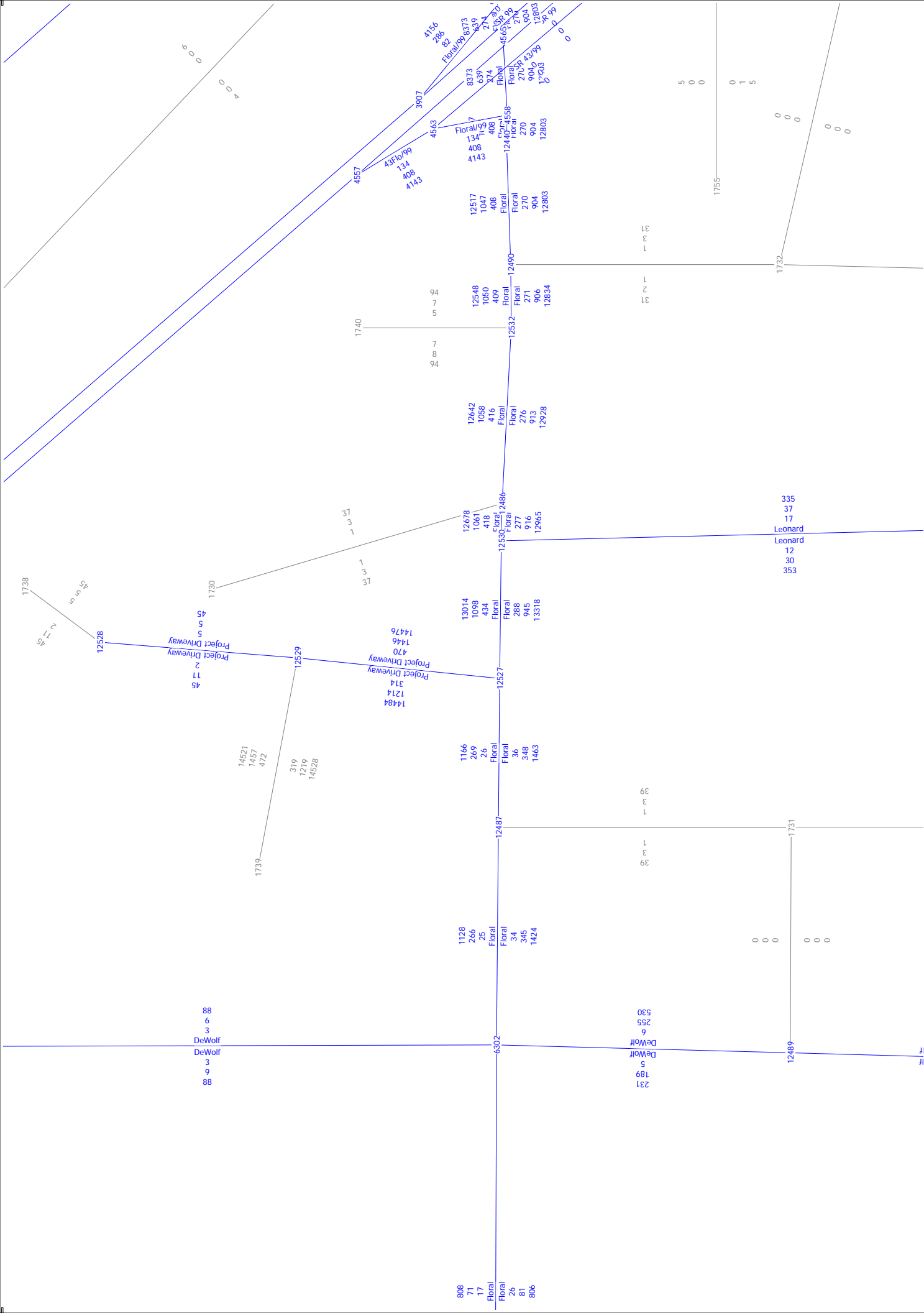


Cumulative Year 2030 plus Project
Project Select Zone
AM, PM and Daily Volumes

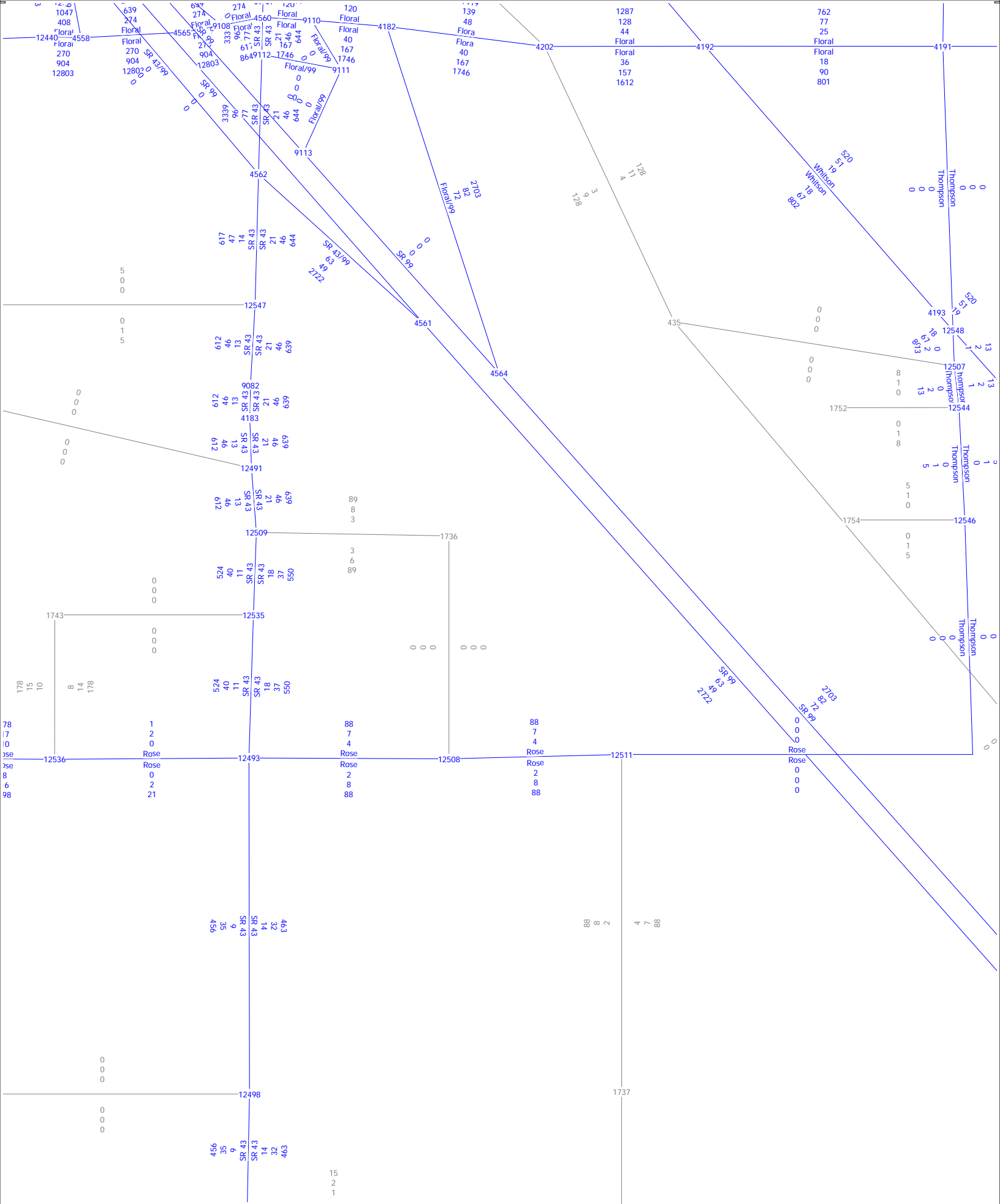


Cumulative Year 2030 plus Project
Project Select Zone - Automobile Sales
AM, PM and Daily Volumes

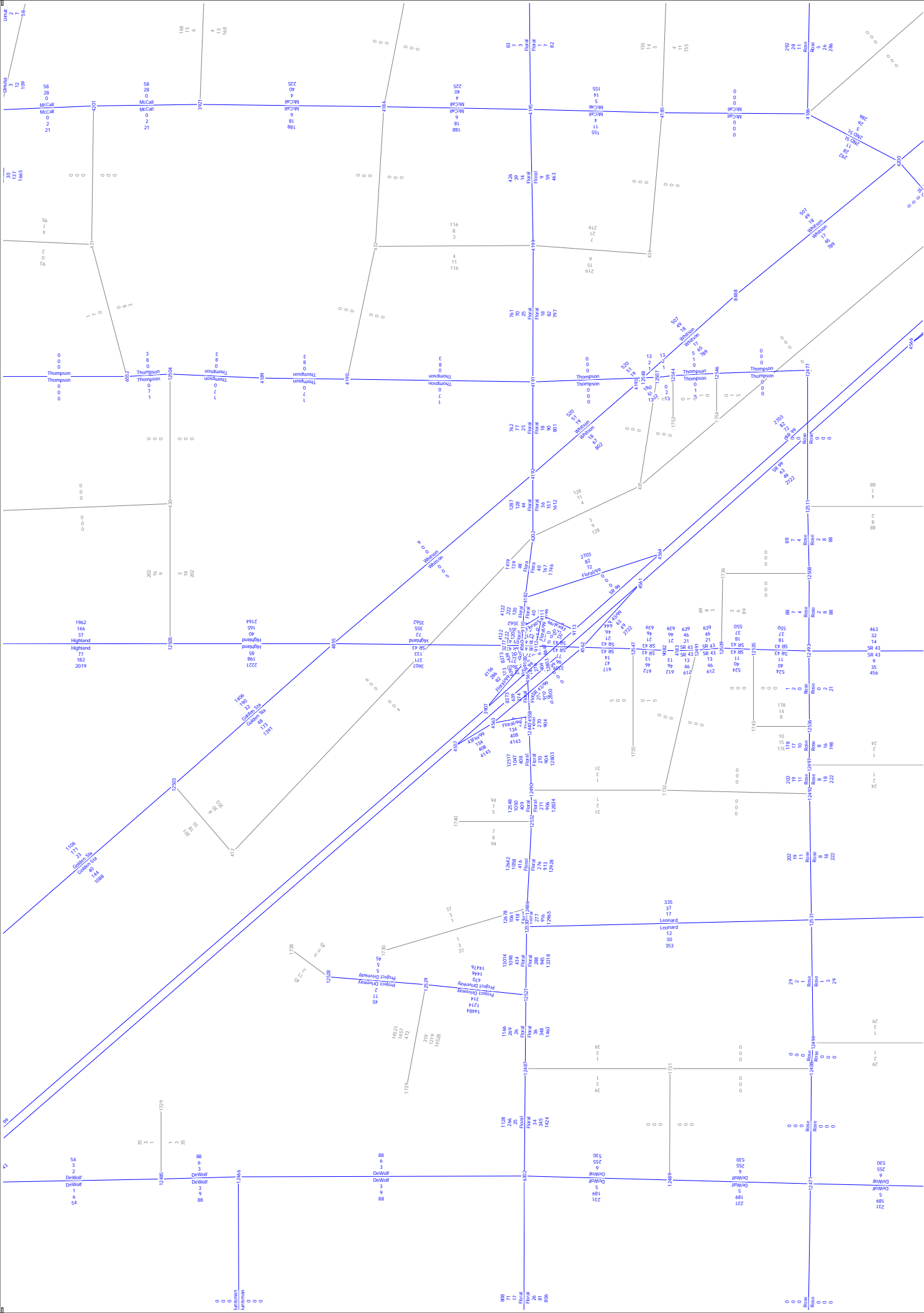




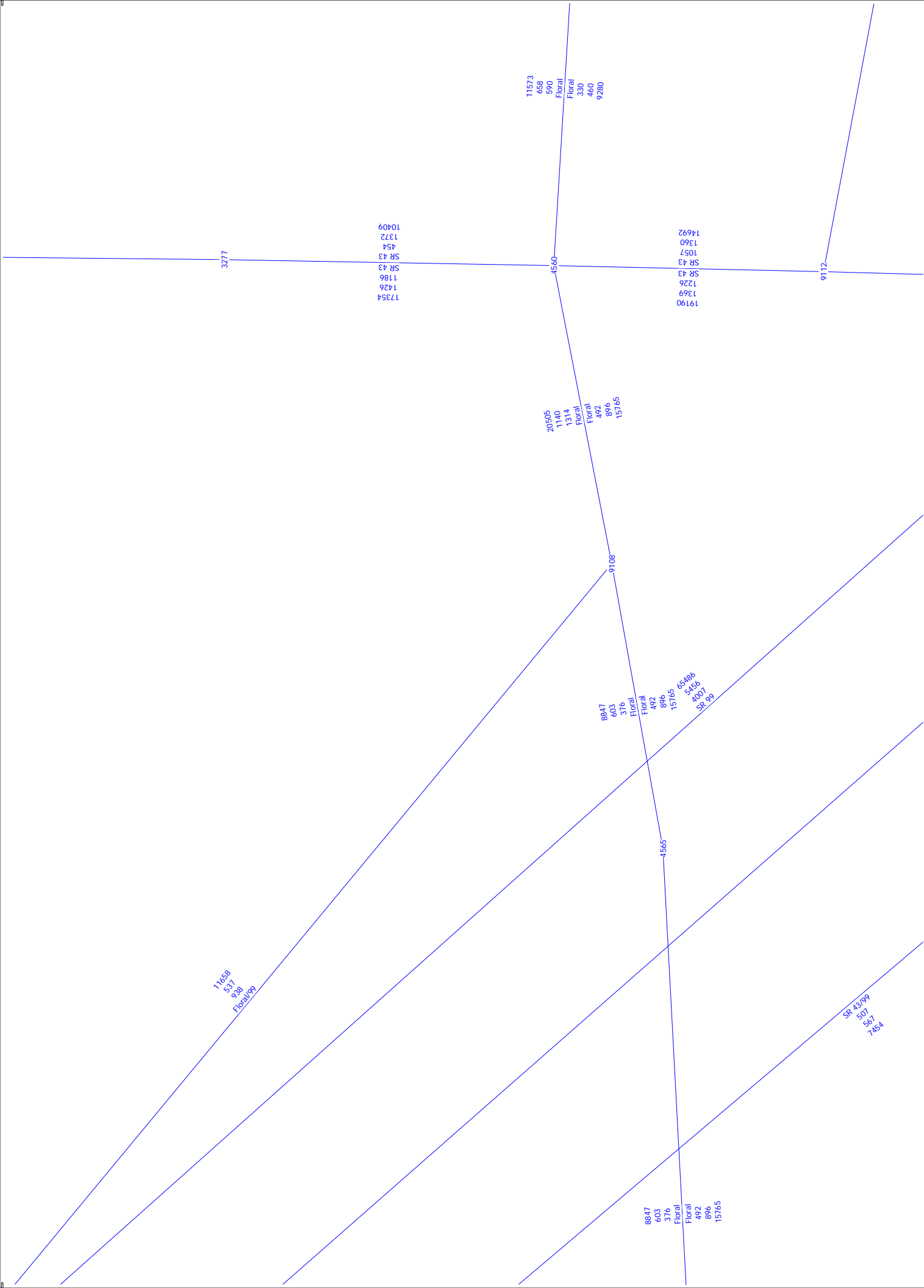
Cumulative Year 2030 plus Project
Project Select Zone - Selma Grove
AM, PM and Daily Volumes



Cumulative Year 2030 plus Project
 Project Select Zone - Selma Grove
 AM, PM and Daily Volumes

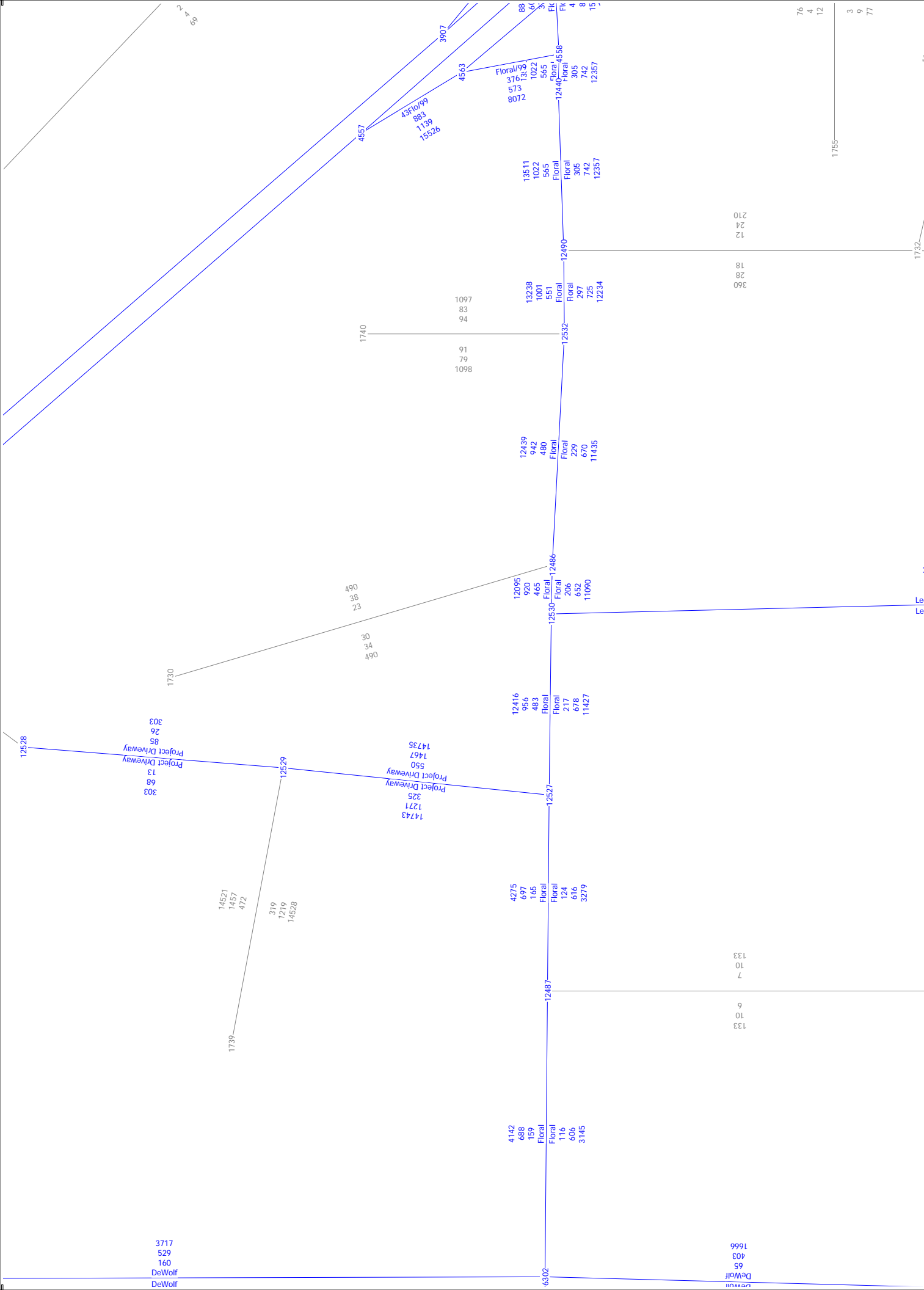


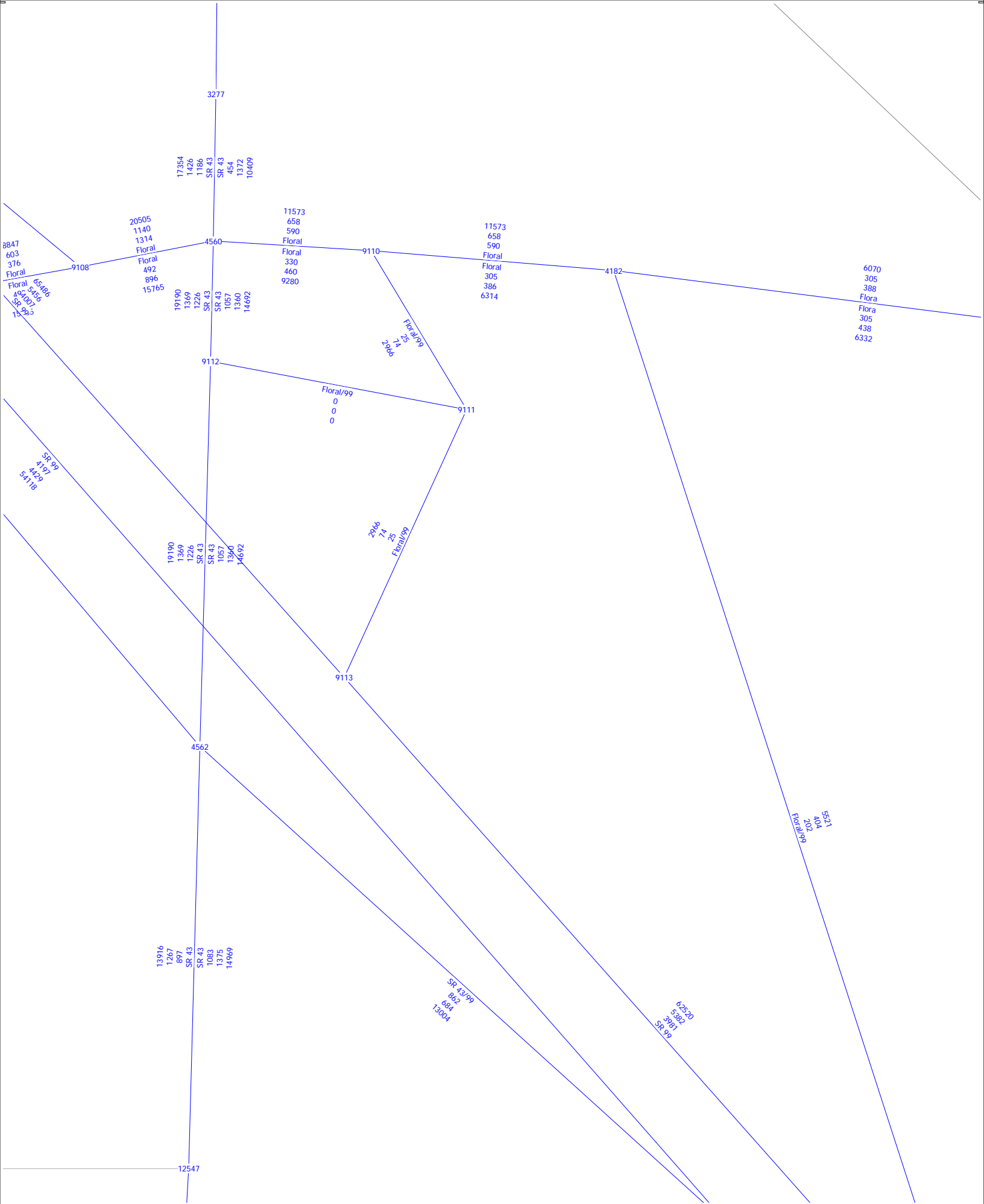
Cumulative Year 2030 plus Project
Project Select Zone - Selma Grove
AM, PM and Daily Volumes



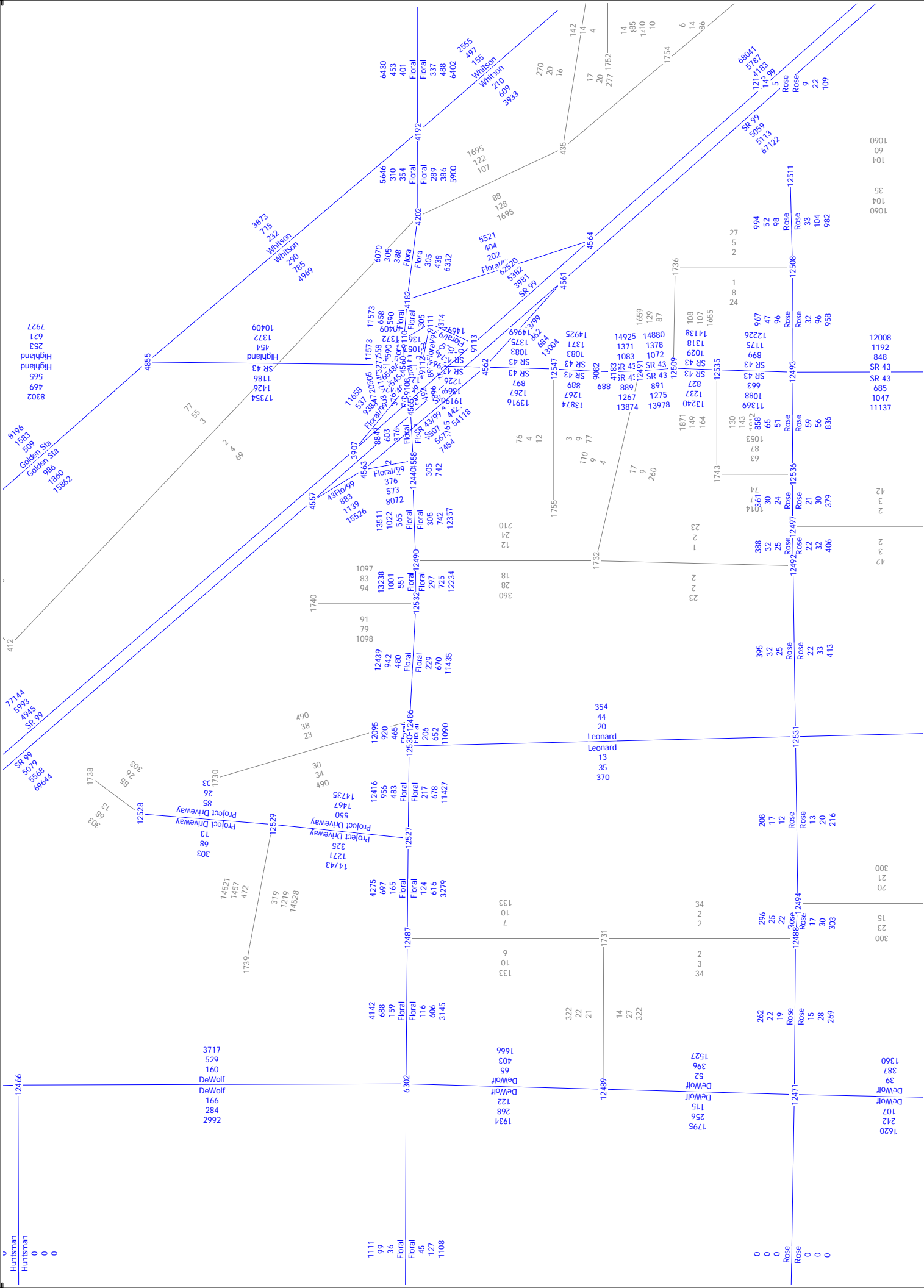
Cumulative Year 2030 with Dinuba Interchange plus Project
AM, PM and Daily Volumes

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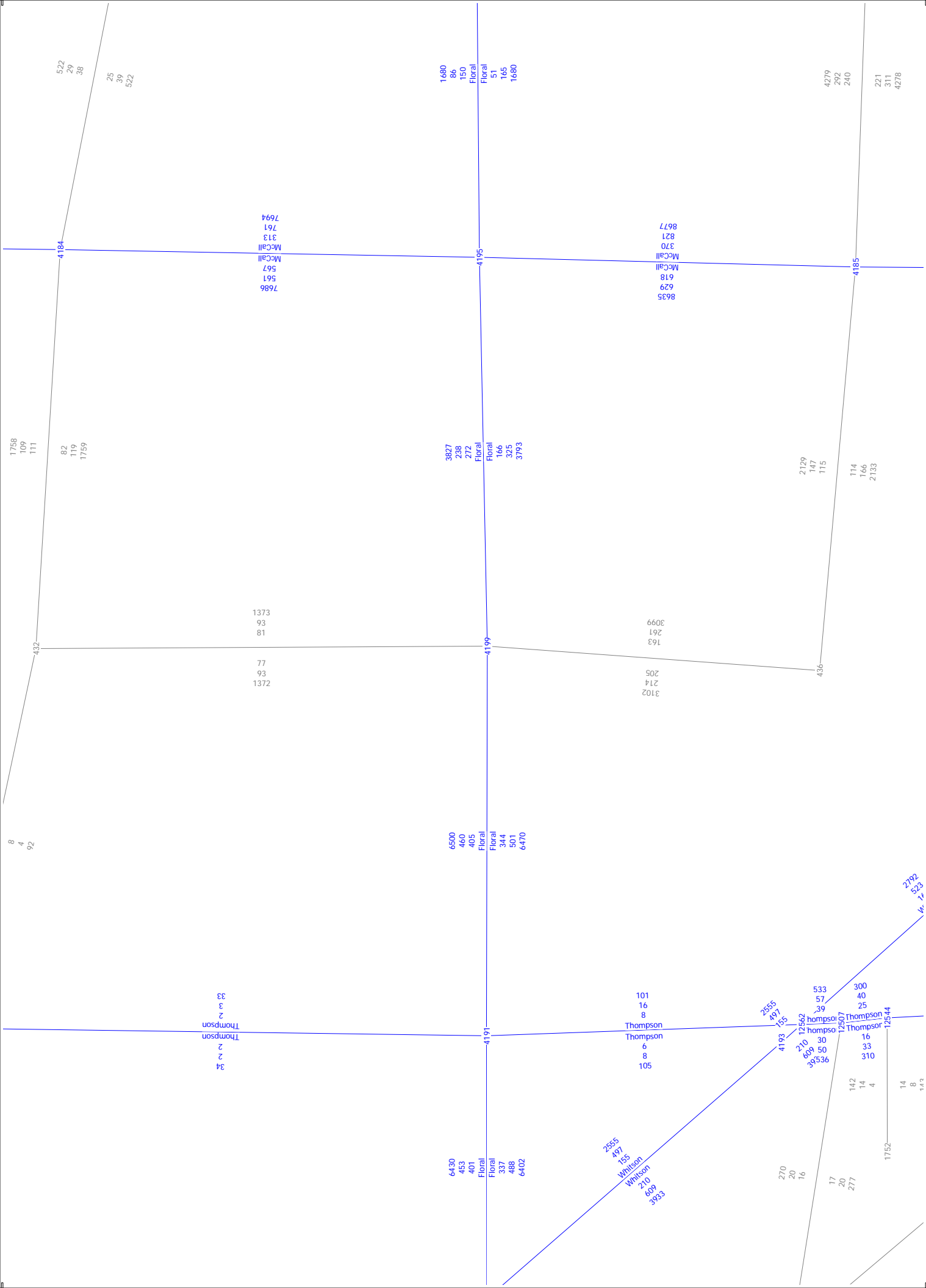


Cumulative Year 2030 with Dinuba Interchange plus Project
AM, PM and Daily Volumes

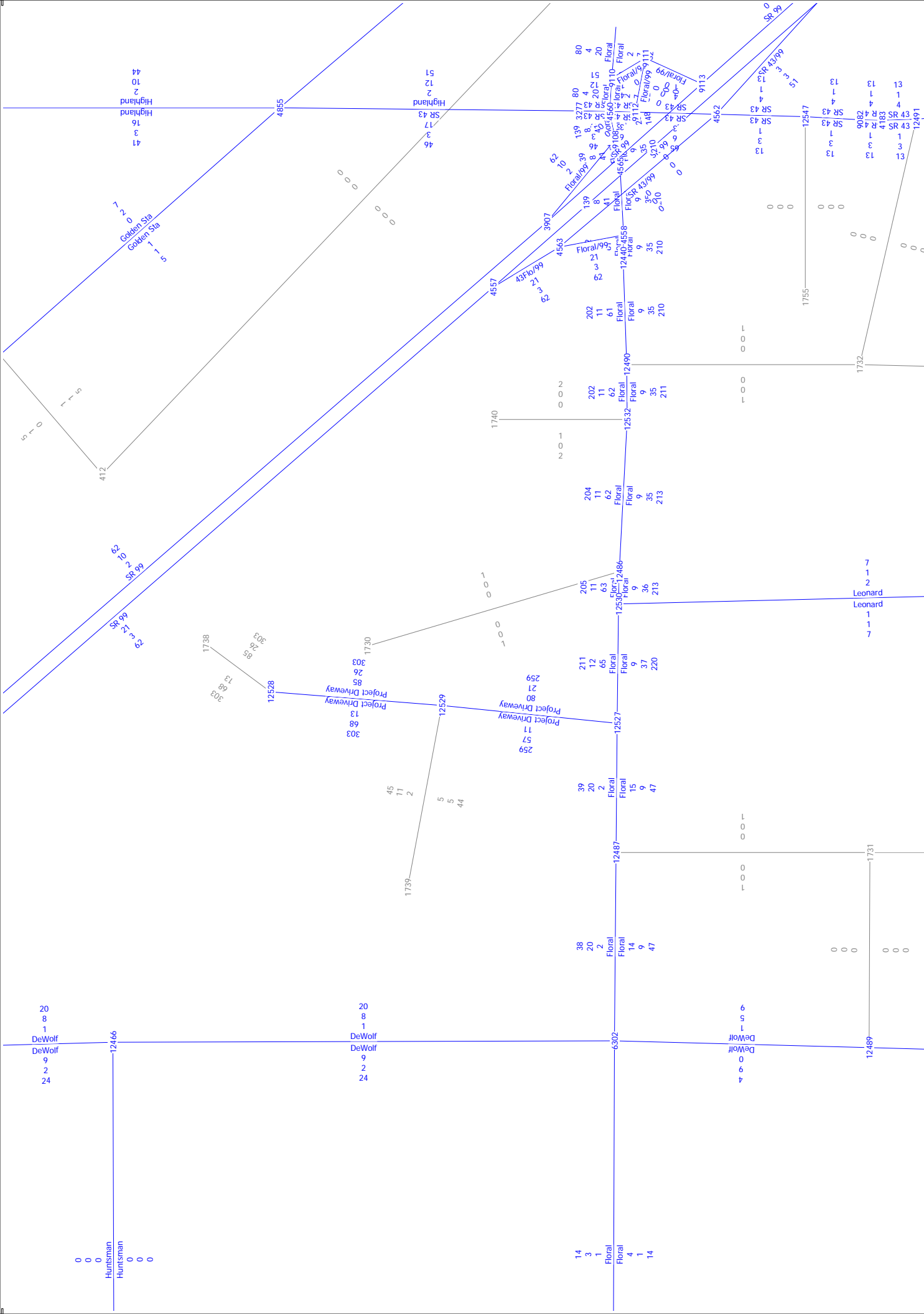


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AM, PM and Daily Volumes

Cumulative Year 2030 with Dinuba Interchange plus Project
AM, PM and Daily Volumes



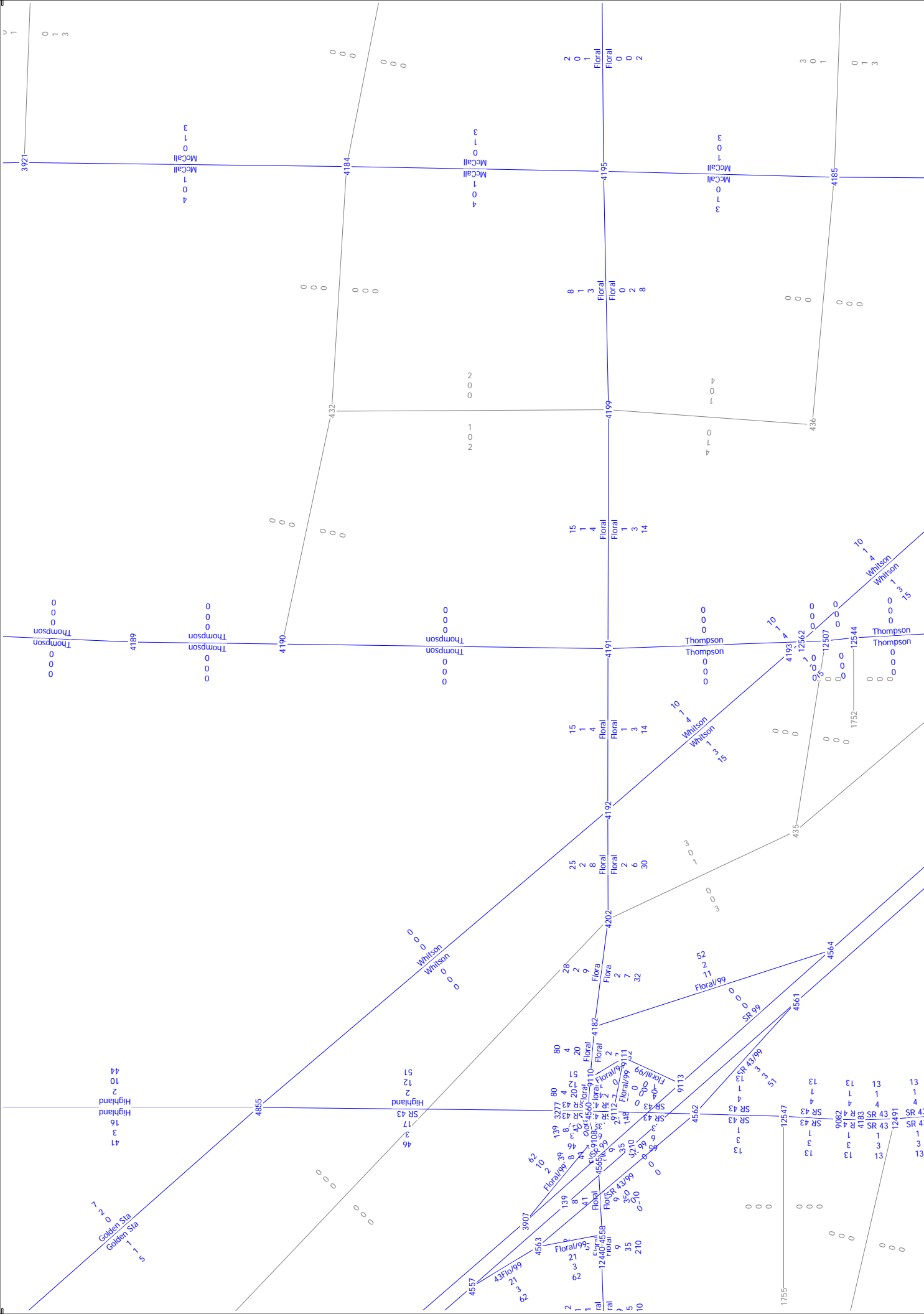
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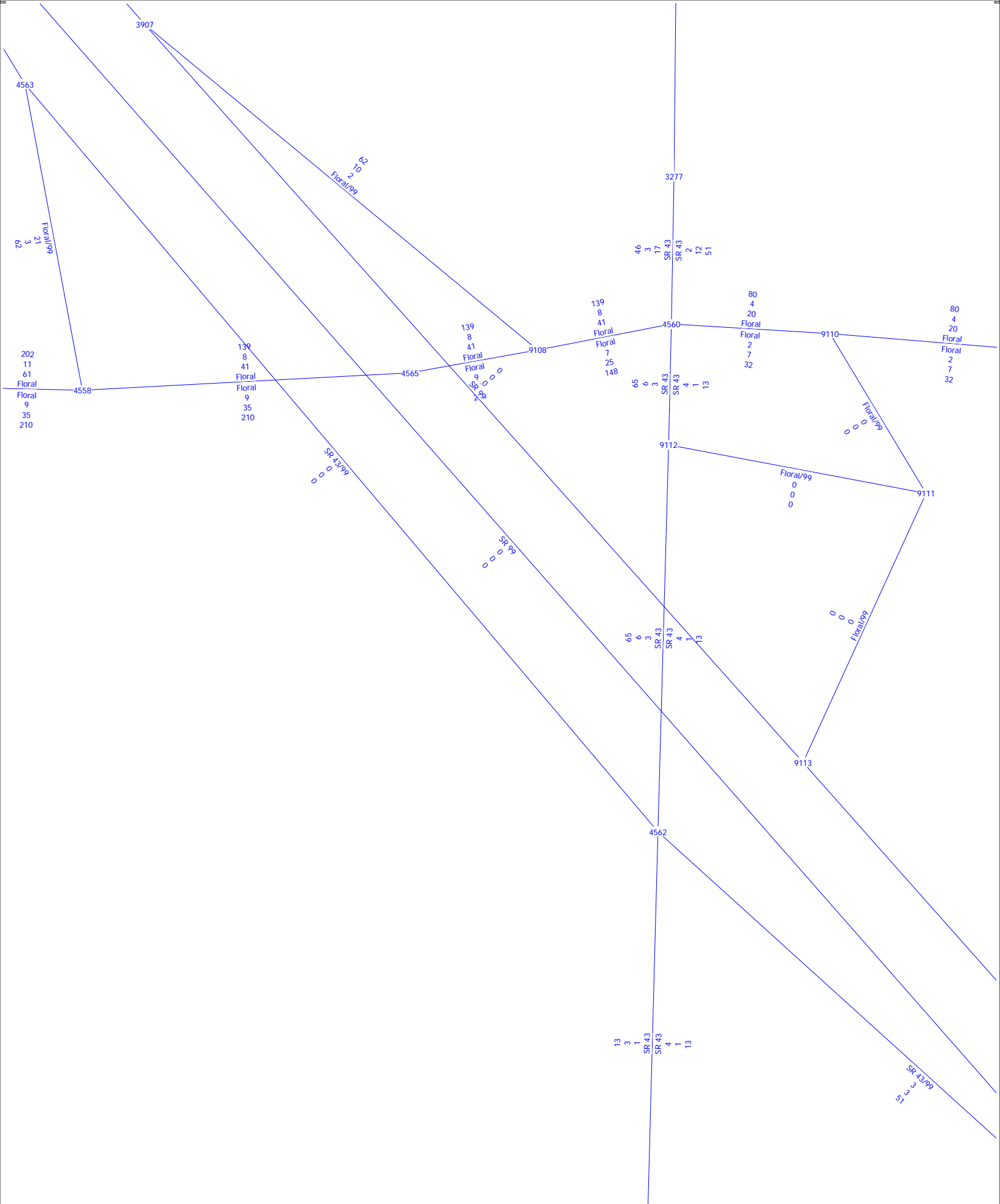


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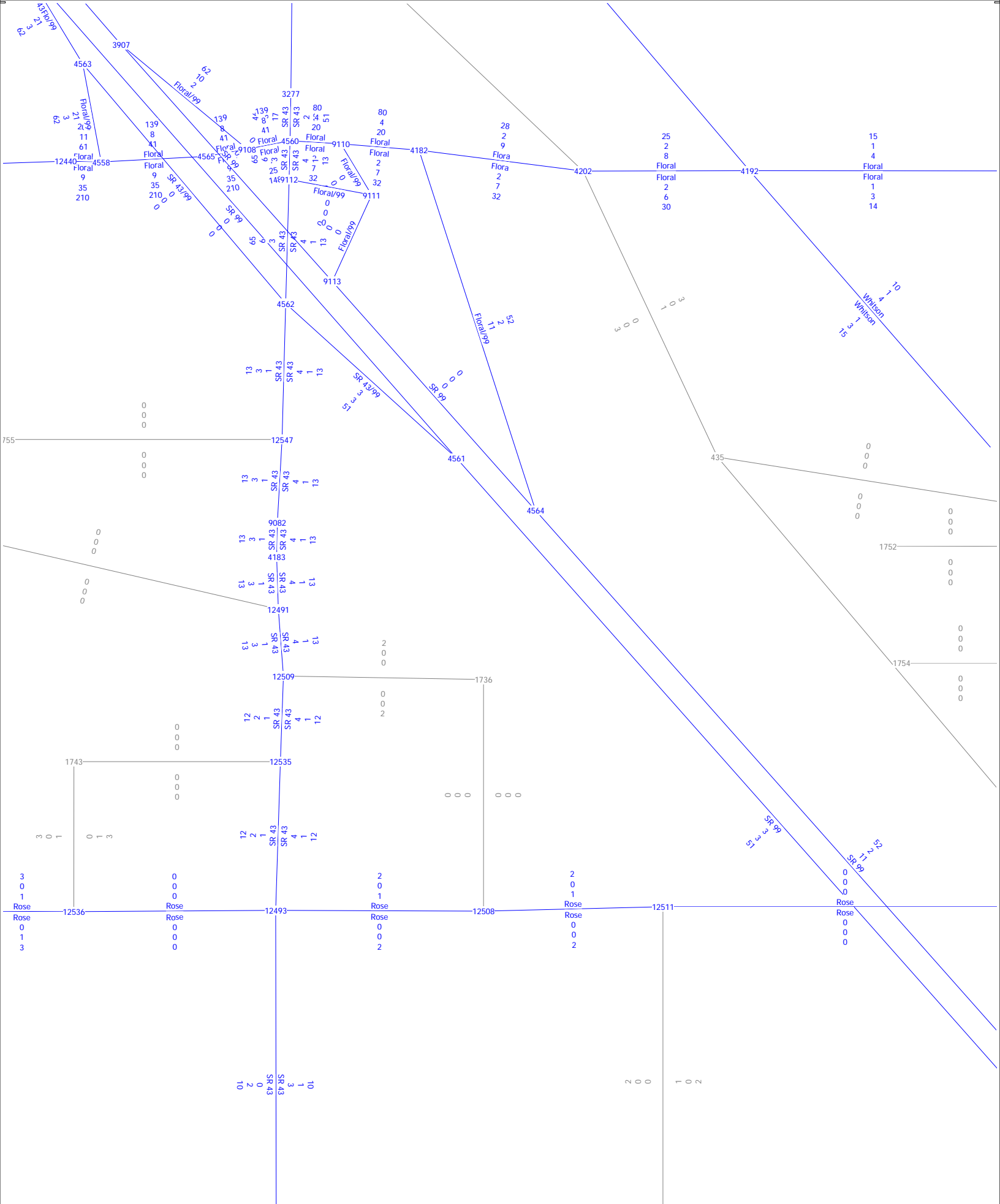
Project Select Zone

AM, PM and Daily Volumes

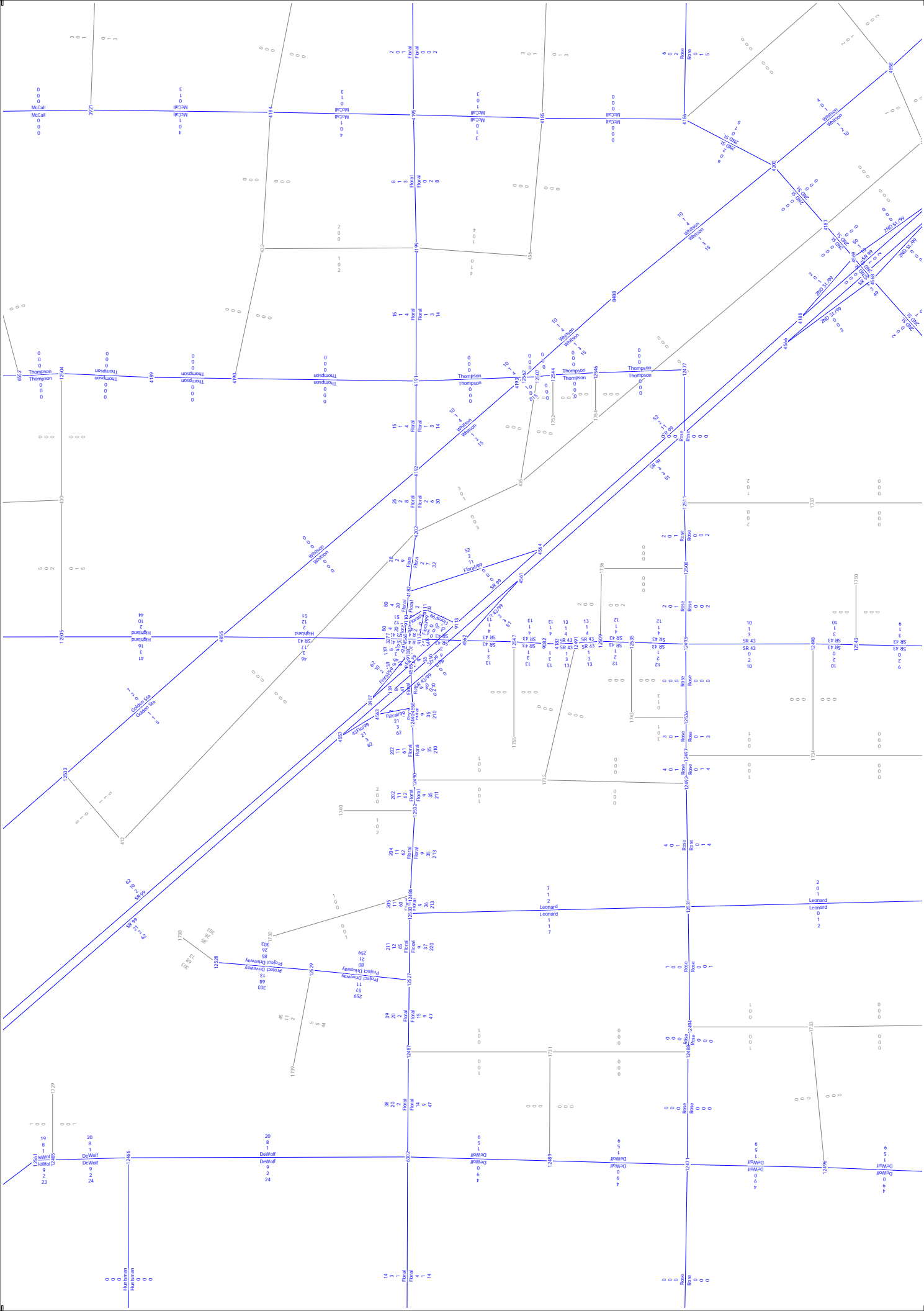




Cumulative Year 2030 with Dinuba Interchange plus Project
Project Select Zone
AM, PM and Daily Volumes



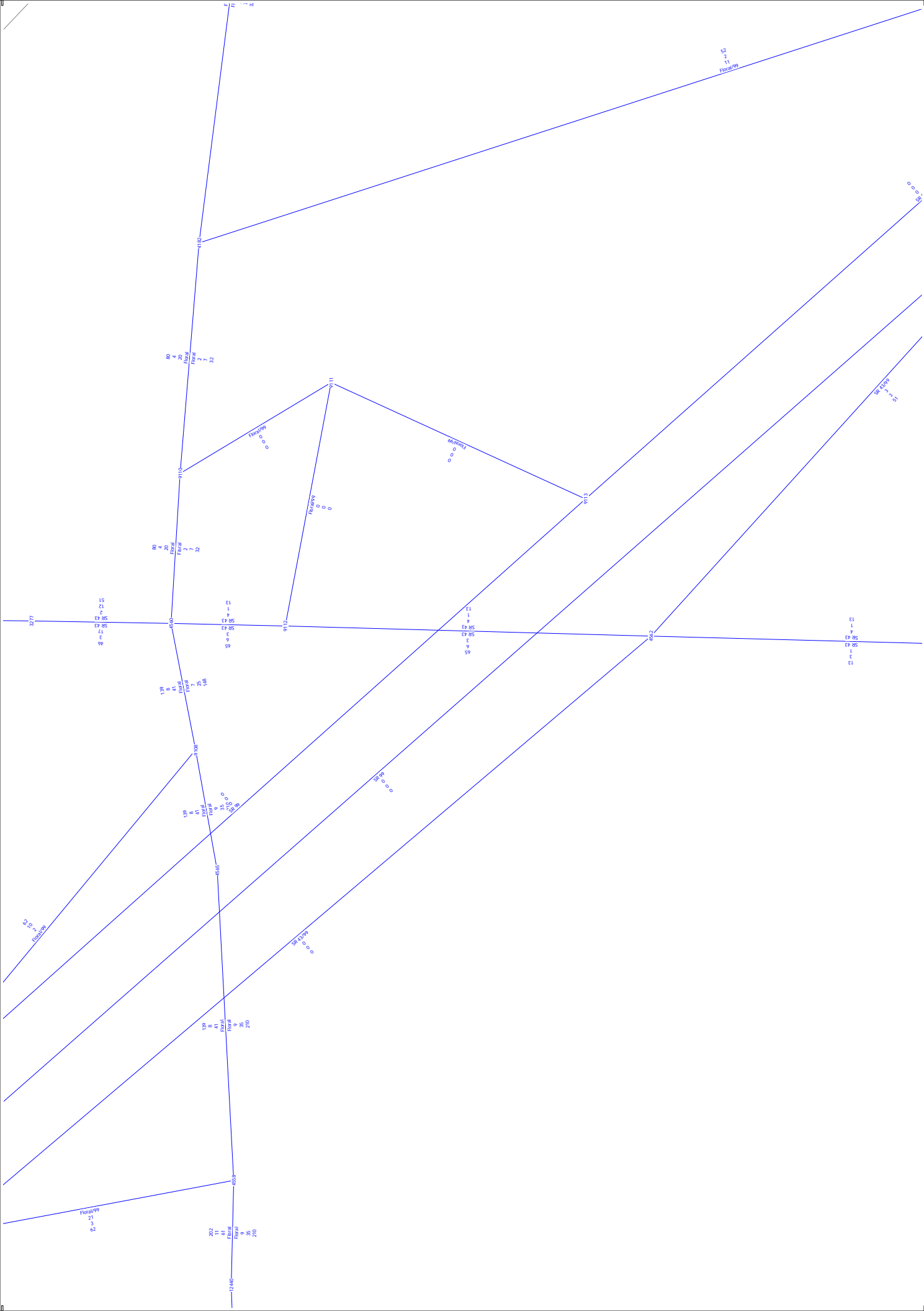
Cumulative Year 2030 with Dinuba Interchange plus Project
Project Select Zone
AM, PM and Daily Volumes



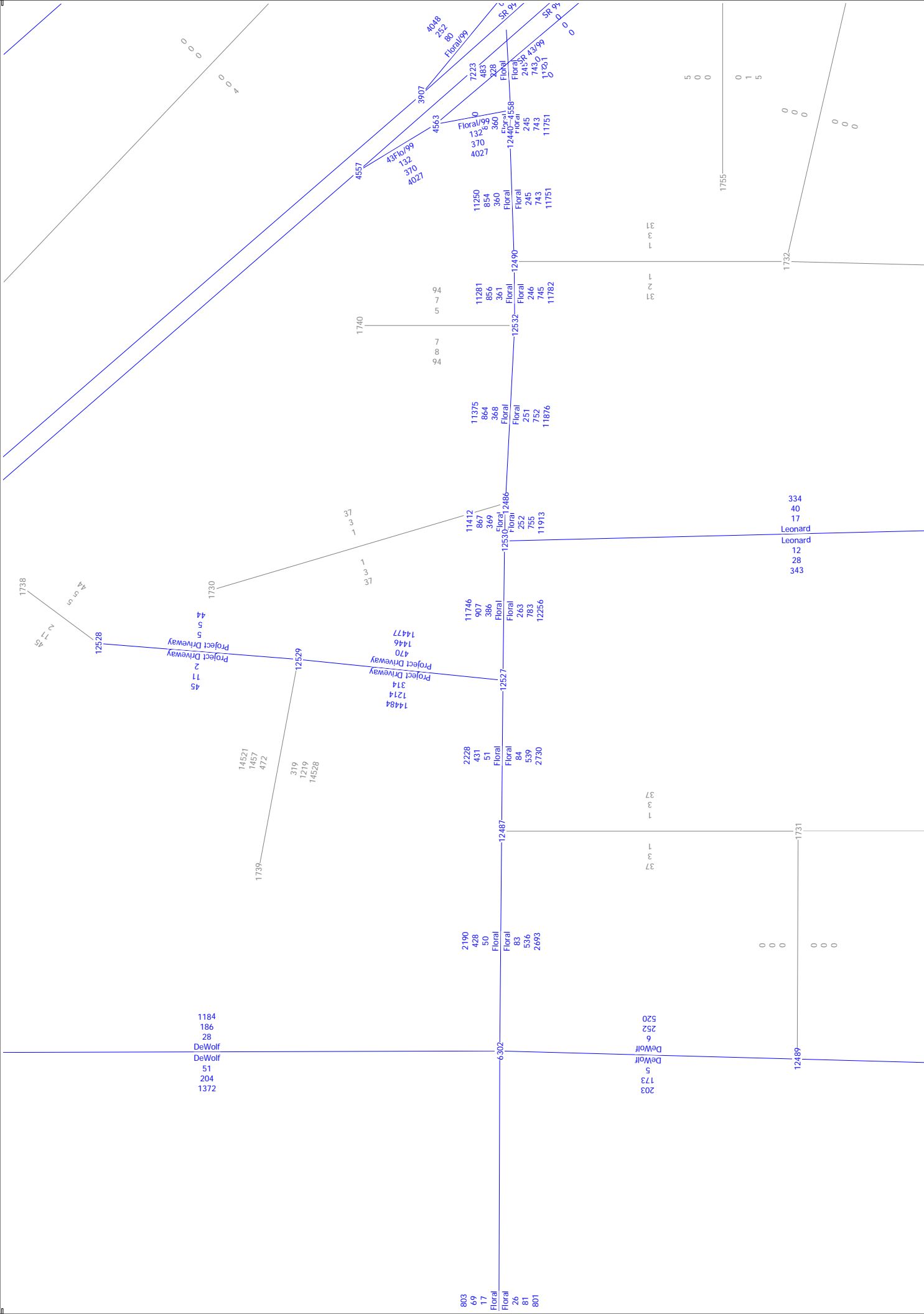
Cumulative Year 2030 with Dinuba Avenue Interchange plus Project

Project Select Zone - Automobile Store

AM, PM and Daily Volumes



Cumulative Year 2030 with Dinuba Avenue Interchange plus Project
Project Select Zone - Automobile Store
AM, PM and Daily Volumes



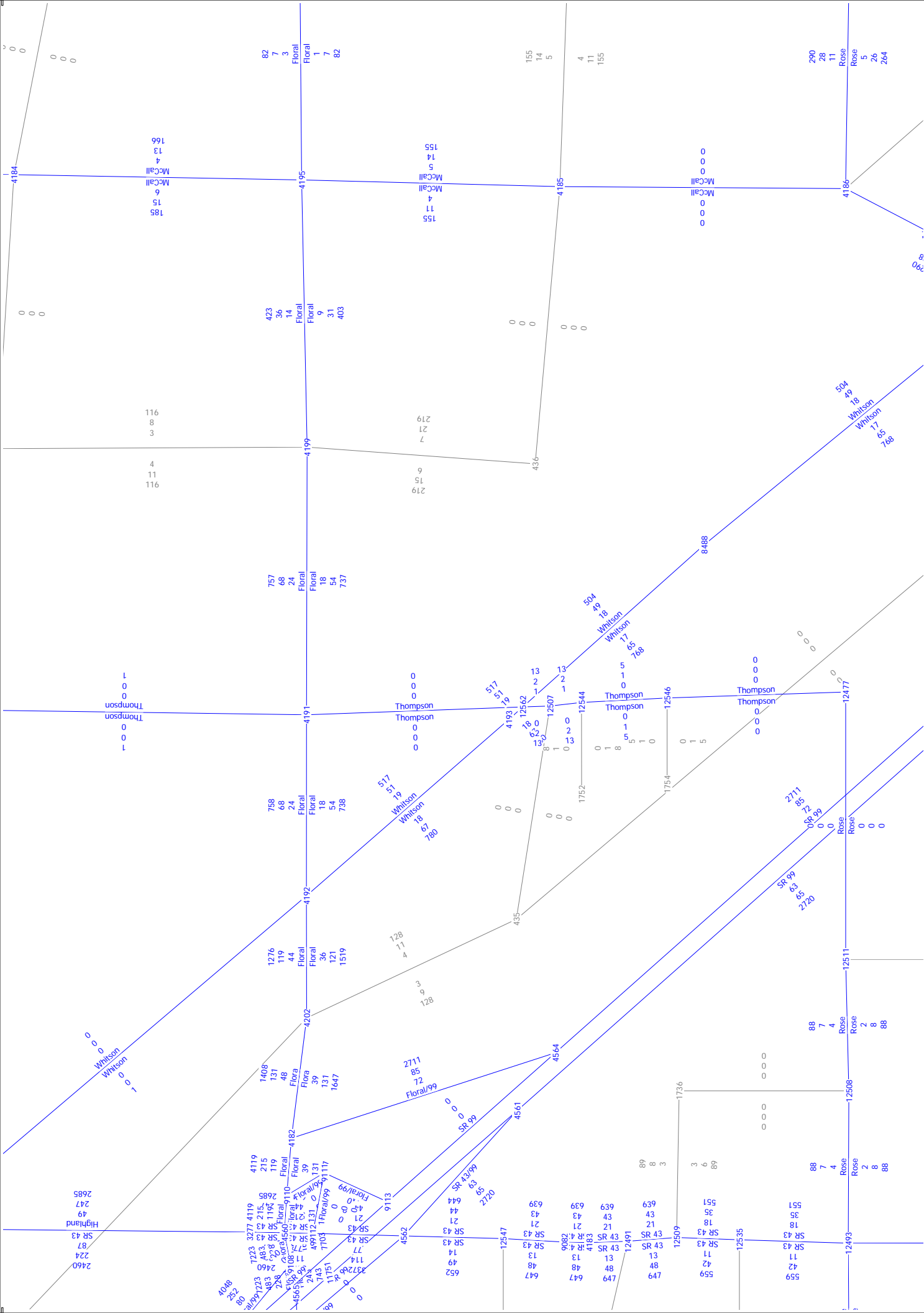
Cumulative Year 2030 with Dinuba Interchange plus Project

Project Select Zone - Selma Grove

AM, PM and Daily Volumes

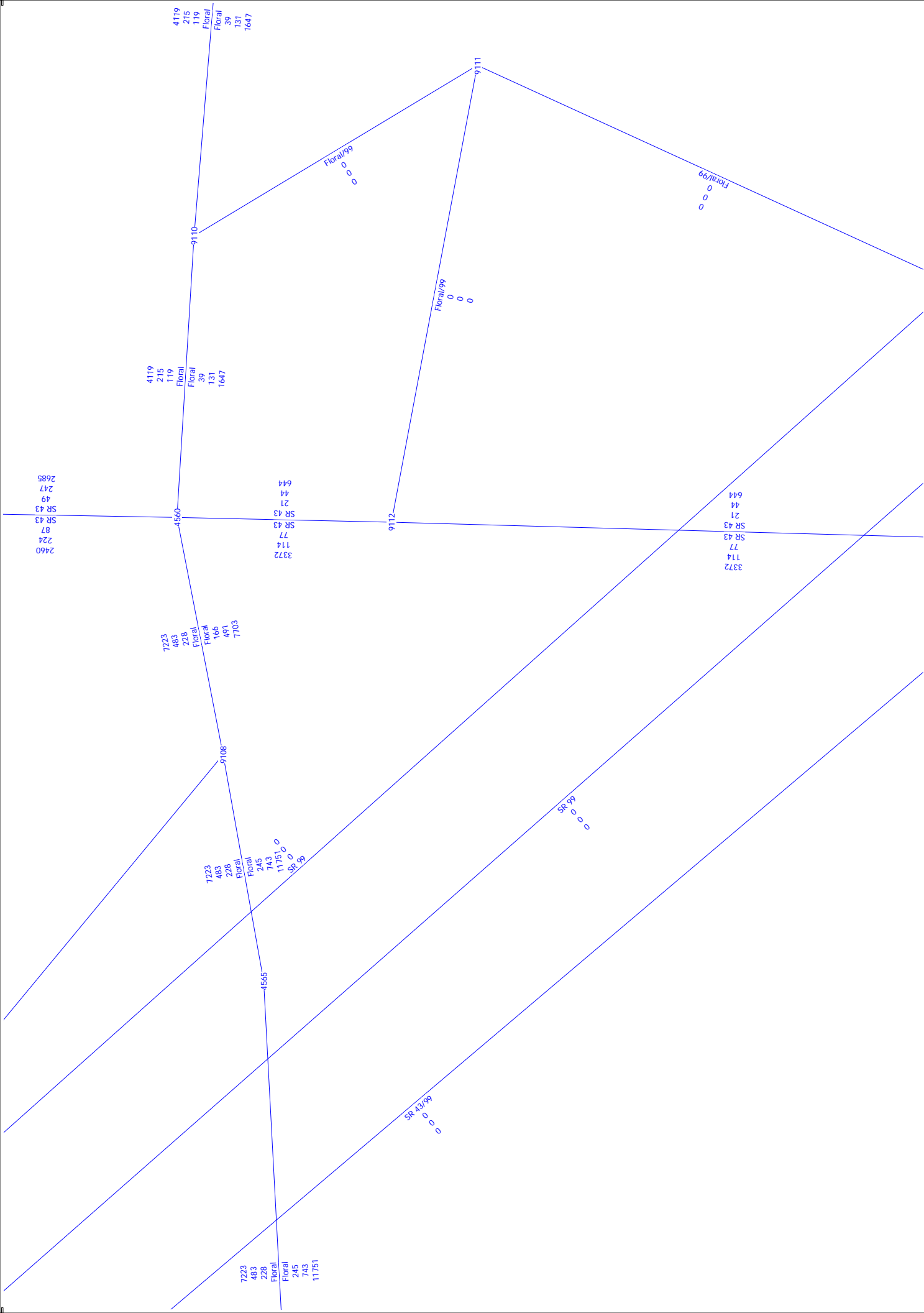
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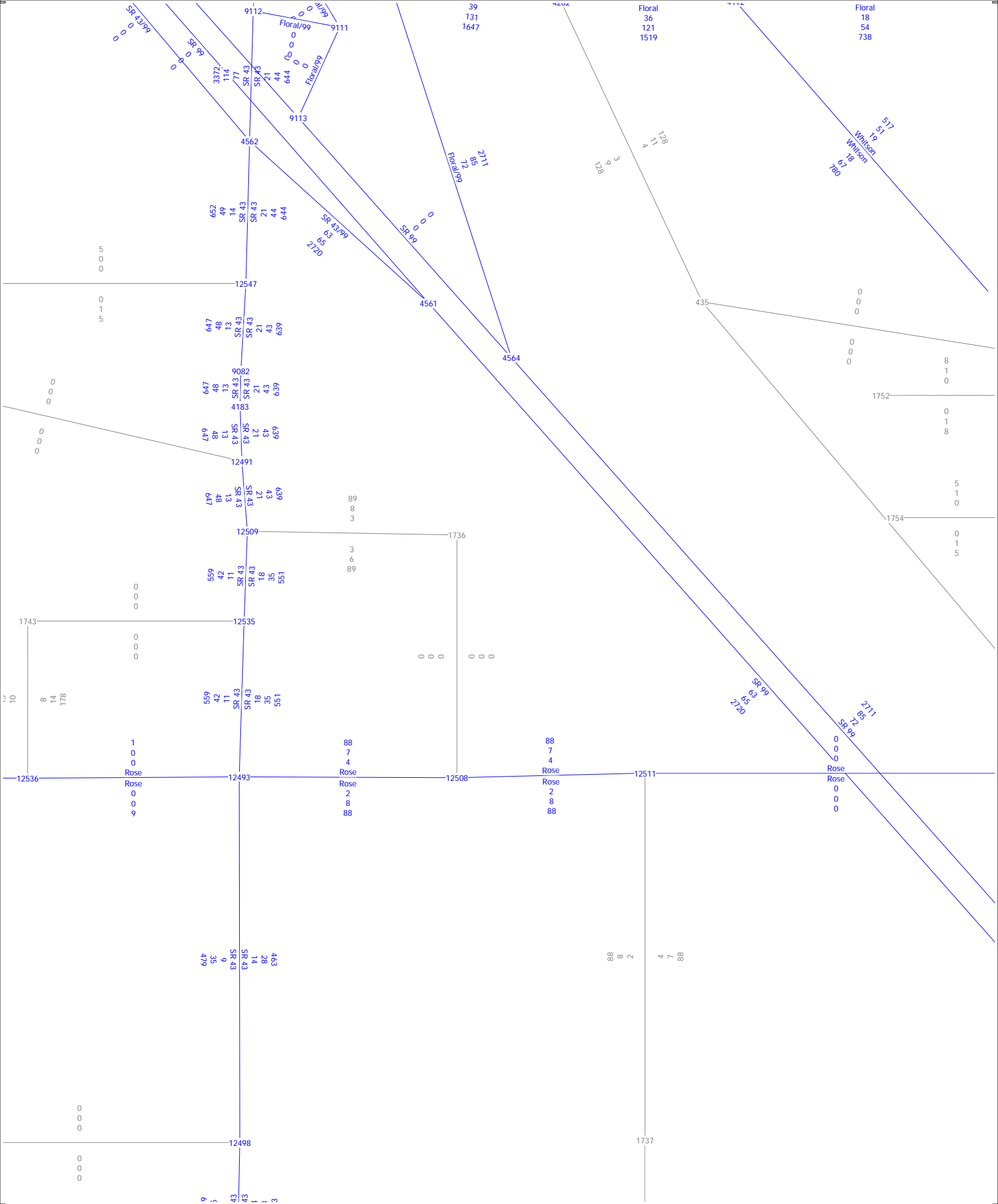
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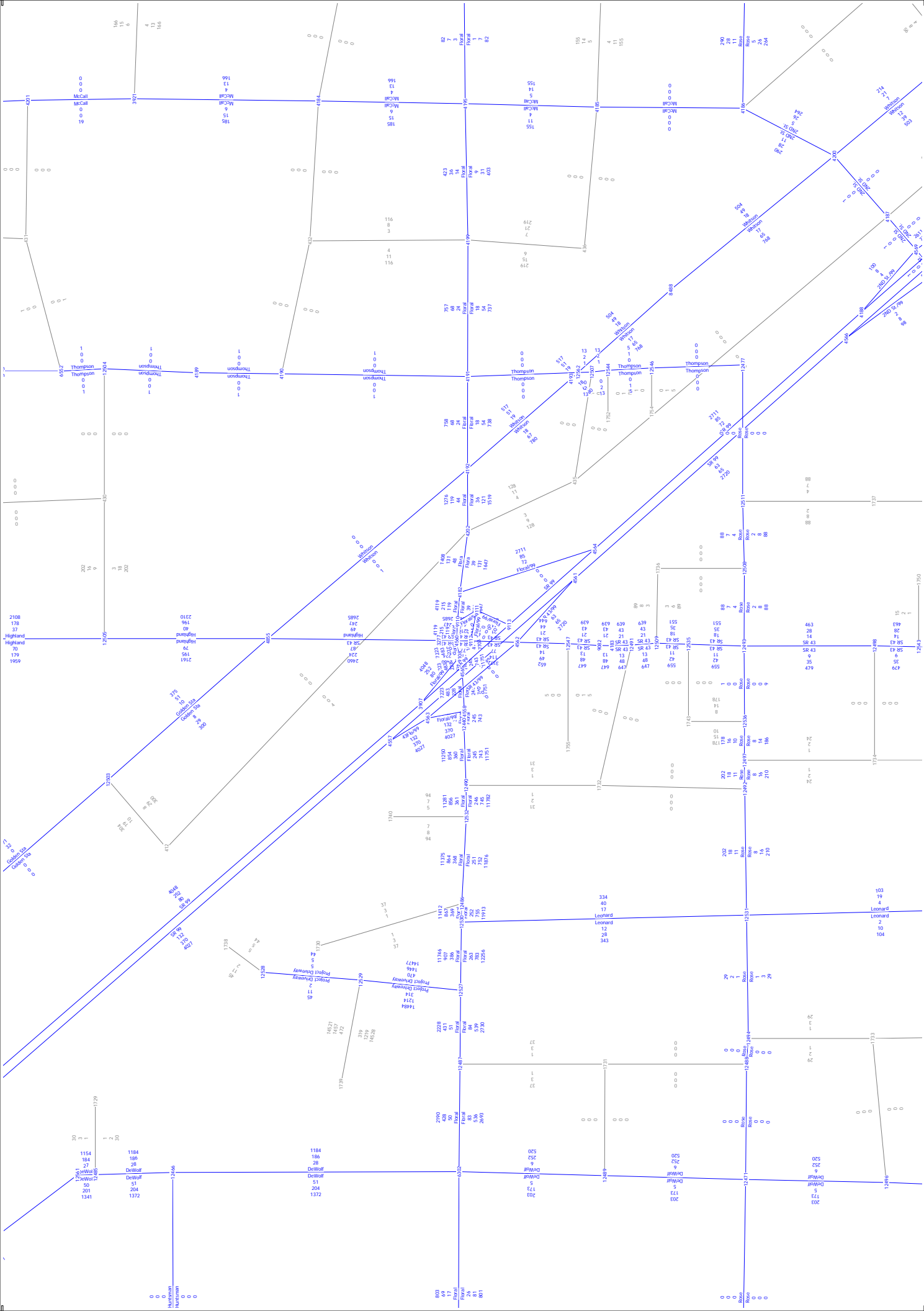
Cumulative Year 2030 with Dinuba Interchange plus Project

Project Select Zone - Selma Grove
AM, PM and Daily Volumes





Cumulative Year 2030 with Dinuba Interchange plus Project
Project Select Zone - Selma Grove
AM, PM and Daily Volumes



Cumulative Year 2030 with Dinuba Avenue Interchange plus Project

Project Select Zone - Selma Grove
AM, PM and Daily Volumes

Appendix D: Methodology



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Levels of Service Methodology

The description and procedures for calculating capacity and level of service (LOS) are found in the Transportation Research Board, Highway Capacity Manual (HCM). The HCM 2010 represents the research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level of service (LOS), from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish a LOS.

Urban Streets (Automobile Mode)

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas. Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials. Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals. Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing taxicabs, buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

Flow Characteristics

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control.

The street environment includes the geometric characteristics of the facility, the character of roadside activity, and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway/access point density, spacing between signalized intersections, existence of parking, level of pedestrian and bicyclist activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic controls (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds; however, such controls are needed to establish right-of-way.



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Levels of Service (automobile Mode)

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal. Travel speeds exceed 85 of the base free flow speed (FFS).

LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 and 85 percent of the base FFS.

LOS C describes stable operations. The ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 and 67 percent of the base FFS.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volumes, inappropriate signal timing, at the boundary intersections. The travel speed is between 40 and 50 percent of the base FFS.

LOS E is characterized unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 and 40 percent of the base FFS.

LOS F is characterized by street flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base FFS.

Table A-1: Urban Street Levels of Service (Automobile Mode)

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio ^a	
	≤1.0	>1.0
>85	A	F
>67 to 85	B	F
>50 to 67	C	F
>40 to 50	D	F
>30 to 40	E	F
≤30	F	F

a = The Critical volume-to-capacity ratio is based on consideration of the through movement-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.

Source: Highway Capacity Manual 2010, Exhibit 16-4. Urban Street LOS Criteria (Automobile Mode)

Intersection Levels of Service

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs.

Signalized Intersections – Performance Measures

For signalized intersections the performance measures include automobile volume-to-capacity ratio, automobile delay, queue storage length, ratio of pedestrian delay, pedestrian circulation area, pedestrian perception score, bicycle delay, and bicycle perception score. LOS is also considered a performance measure. For the automobile mode average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the weighted average control delay to better describe the level of operation. A description of LOS for signalized intersections is found in Table A-2.

Table A-2: Signalized Intersection Level of Service Description (Automobile Mode)

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with a control delay of 10 seconds/vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is and either progression is exceptionally favorable or the cycle length is very short. If it's due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Operations with control delay between 10.1 to 20.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10.0 to 20.0
C	Operations with average control delays between 20.1 to 35.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Operations with control delay between 35.1 to 55.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop, and individual cycle failures are noticeable.	>35 to 55
E	Operations with control delay between 55.1 to 80.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Operations with unacceptable control delay exceeding 80.0 seconds/vehicle and a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: Highway Capacity Manual 2010

Unsignalized Intersections

The HCM 2010 procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, i. e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.



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All-Way Stop Controlled Intersections

All-way stop controlled intersections is a form of traffic controls in which all approaches to an intersection are required to stop. Similar to signalized intersections, at all-way stop controlled intersections the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection as a whole. In other words the delay measured for all-way stop controlled intersections is a measure of the average delay for all vehicles passing through the intersection during the peak hour. A LOS designation is given to the weighted average control delay to better describe the level of operation.

Two-Way Stop Controlled Intersections

Two-way stop controlled (TWSC) intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At TWSC intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS for TWSC intersection is determined by the computed or measured control delay for each minor movement. LOS is not defined for the intersection as a whole for three main reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at the typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay from all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. Table A-3 provides a description of LOS at unsignalized intersections.

Table A-3: Unsignalized Intersection Level of Service Description (Automobile Mode)

Control Delay (seconds per vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	A	F
>10 to 15	B	F
>15 to 25	C	F
>25 to 35	D	F
>35 to 50	E	F
>50	F	F

Source: HCM 2010 Exhibit 19-1.



Appendix E: Existing Traffic Conditions



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







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HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing AM Peak (Weekday)

11/14/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	72	124	7	56	222	6	5	102	116	14	108	33
Future Volume (veh/h)	72	124	7	56	222	6	5	102	116	14	108	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	138	0	62	247	0	6	113	129	16	120	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	261	274		82	327		19	398	178	29	379	169
Arrive On Green	0.15	0.15	0.00	0.22	0.22	0.00	0.01	0.11	0.11	0.02	0.11	0.11
Sat Flow, veh/h	1767	1856	1572	369	1468	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	80	138	0	309	0	0	6	113	129	16	120	37
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1837	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.5	2.5	0.0	5.8	0.0	0.0	0.1	1.1	2.9	0.3	1.2	0.8
Cycle Q Clear(g_c), s	1.5	2.5	0.0	5.8	0.0	0.0	0.1	1.1	2.9	0.3	1.2	0.8
Prop In Lane	1.00		1.00	0.20		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	274		409	0		19	398	178	29	379	169
V/C Ratio(X)	0.31	0.50		0.76	0.00		0.31	0.28	0.73	0.55	0.32	0.22
Avail Cap(c_a), veh/h	1902	1997		652	0		190	398	178	190	398	178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.1	14.6	0.0	13.5	0.0	0.0	18.2	15.1	15.9	18.1	15.3	15.2
Incr Delay (d2), s/veh	0.7	1.4	0.0	2.9	0.0	0.0	8.7	0.4	13.8	15.4	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.0	0.0	2.2	0.0	0.0	0.1	0.4	1.5	0.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	16.0	0.0	16.4	0.0	0.0	26.9	15.5	29.7	33.5	15.8	15.8
LnGrp LOS	B	B		B	A		C	B	C	C	B	B
Approach Vol, veh/h		218	A		309	A		248			173	
Approach Delay, s/veh		15.6			16.4			23.2			17.4	
Approach LOS		B			B			C			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.4	4.8	8.8		13.2	5.0	8.6				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	4.2		13.2	4.0	* 4.2				
Max Q Clear Time (g_c+I1), s		4.5	2.3	4.9		7.8	2.1	3.2				
Green Ext Time (p_c), s		1.0	0.0	0.0		0.8	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018


Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	70	2	9	47	8	3	1	13	10	2	1
Future Vol, veh/h	0	70	2	9	47	8	3	1	13	10	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	80	2	10	53	9	3	1	15	11	2	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	62	0	0	82	0	0	160	163	81	167	160	58
Stage 1	-	-	-	-	-	-	81	81	-	78	78	-
Stage 2	-	-	-	-	-	-	79	82	-	89	82	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1535	-	-	1509	-	-	803	728	976	795	730	1005
Stage 1	-	-	-	-	-	-	925	826	-	928	828	-
Stage 2	-	-	-	-	-	-	927	825	-	916	825	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1535	-	-	1509	-	-	796	723	976	778	725	1005
Mov Cap-2 Maneuver	-	-	-	-	-	-	796	723	-	778	725	-
Stage 1	-	-	-	-	-	-	925	826	-	928	822	-
Stage 2	-	-	-	-	-	-	917	819	-	901	825	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1			9			9.7		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	920	1535	-	-	1509	-	-	783				
HCM Lane V/C Ratio	0.021	-	-	-	0.007	-	-	0.019				
HCM Control Delay (s)	9	0	-	-	7.4	0	-	9.7				
HCM Lane LOS	A	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↑	↗
Traffic Volume (vph)	0	280	36	63	299	0	0	0	85	202	41	64
Future Volume (vph)	0	280	36	63	299	0	0	0	85	202	41	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	286	37	64	305	0	0	0	87	206	42	65
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	63	0	0	43
Lane Group Flow (vph)	0	286	10	64	305	0	0	0	24	206	42	22
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		13.6	13.6	5.3	23.6				14.7	8.2	17.6	17.6
Effective Green, g (s)		13.6	13.6	5.3	23.6				14.7	8.2	17.6	17.6
Actuated g/C Ratio		0.26	0.26	0.10	0.45				0.28	0.16	0.33	0.33
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		904	404	176	1569				445	529	616	516
v/s Ratio Prot		c0.08		c0.04	0.09				0.02	c0.06	c0.02	
v/s Ratio Perm			0.01									0.01
v/c Ratio		0.32	0.02	0.36	0.19				0.05	0.39	0.07	0.04
Uniform Delay, d1		15.8	14.6	22.1	8.8				13.9	20.0	12.0	11.9
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2	0.0	1.3	0.1				0.1	0.5	0.0	0.0
Delay (s)		16.0	14.6	23.4	8.9				14.0	20.5	12.0	11.9
Level of Service		B	B	C	A				B	C	B	B
Approach Delay (s)		15.8			11.4			14.0			17.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			52.7			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			32.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	308	63	125	401	97	62	103	88	31	192	154
Future Volume (veh/h)	120	308	63	125	401	97	62	103	88	31	192	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	331	68	134	431	104	67	111	95	33	206	166
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	167	1055	471	243	777	186	171	613	273	53	512	401
Arrive On Green	0.09	0.30	0.30	0.07	0.28	0.28	0.05	0.17	0.17	0.03	0.15	0.15
Sat Flow, veh/h	1767	3526	1572	3428	2819	674	3428	3526	1572	1767	3526	2758
Grp Volume(v), veh/h	129	331	68	134	268	267	67	111	95	33	206	166
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1731	1714	1763	1572	1767	1763	1379
Q Serve(g_s), s	3.3	3.4	0.9	1.8	6.0	6.1	0.9	1.2	2.5	0.9	2.5	2.5
Cycle Q Clear(g_c), s	3.3	3.4	0.9	1.8	6.0	6.1	0.9	1.2	2.5	0.9	2.5	2.5
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	167	1055	471	243	486	477	171	613	273	53	512	401
V/C Ratio(X)	0.77	0.31	0.14	0.55	0.55	0.56	0.39	0.18	0.35	0.63	0.40	0.41
Avail Cap(c_a), veh/h	335	3695	1648	671	1897	1862	295	2769	1235	247	2883	2256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	12.6	4.4	20.9	14.4	14.4	21.4	16.4	16.9	22.3	18.0	18.1
Incr Delay (d2), s/veh	7.4	0.2	0.1	2.0	1.0	1.0	1.5	0.1	0.8	11.5	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	1.2	0.4	0.7	2.2	2.2	0.3	0.4	0.8	0.5	0.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	12.8	4.6	22.8	15.4	15.4	22.9	16.5	17.6	33.8	18.5	18.7
LnGrp LOS	C	B	A	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		528			669			273			405	
Approach Delay, s/veh		15.4			16.9			18.5			19.9	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	19.1	7.5	11.4	9.6	18.0	5.6	13.3				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.1	* 49	4.0	* 38	* 8.8	* 50	* 6.5	* 37				
Max Q Clear Time (g_c+I1), s	3.8	5.4	2.9	4.5	5.3	8.1	2.9	4.5				
Green Ext Time (p_c), s	0.2	2.6	0.0	2.0	0.1	3.7	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	17.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	415	0	0	576	118	44
Future Volume (vph)	415	0	0	576	118	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	441	0	0	613	126	47
RTOR Reduction (vph)	0	0	0	0	0	40
Lane Group Flow (vph)	441	0	0	613	126	7
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.9			21.9	5.0	5.0
Effective Green, g (s)	21.9			21.9	5.0	5.0
Actuated g/C Ratio	0.61			0.61	0.14	0.14
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2126			2126	242	217
v/s Ratio Prot	0.13			c0.17	c0.07	
v/s Ratio Perm						0.00
v/c Ratio	0.21			0.29	0.52	0.03
Uniform Delay, d1	3.2			3.4	14.4	13.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.0			0.1	2.0	0.1
Delay (s)	3.2			3.5	16.5	13.5
Level of Service	A			A	B	B
Approach Delay (s)	3.2			3.5	15.7	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	5.1			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.33					
Actuated Cycle Length (s)	36.1			Sum of lost time (s)		9.2
Intersection Capacity Utilization	30.1%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	21	324	100	59	473	4	57	101	19	128	86	21
Future Volume (veh/h)	21	324	100	59	473	4	57	101	19	128	86	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	352	109	64	514	4	62	110	0	139	93	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	40	784	239	90	1160	9	88	354		273	521	
Arrive On Green	0.02	0.29	0.29	0.05	0.32	0.32	0.05	0.10	0.00	0.08	0.15	0.00
Sat Flow, veh/h	1767	2658	811	1767	3585	28	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	23	232	229	64	253	265	62	110	0	139	93	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1707	1767	1763	1850	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.5	4.2	4.3	1.4	4.4	4.4	1.4	1.1	0.0	1.5	0.9	0.0
Cycle Q Clear(g_c), s	0.5	4.2	4.3	1.4	4.4	4.4	1.4	1.1	0.0	1.5	0.9	0.0
Prop In Lane	1.00		0.48	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	40	520	503	90	570	598	88	354		273	521	
V/C Ratio(X)	0.58	0.45	0.46	0.71	0.44	0.44	0.70	0.31		0.51	0.18	
Avail Cap(c_a), veh/h	180	1855	1796	297	1954	2051	419	2965		577	2722	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.0	11.2	11.3	18.3	10.5	10.5	18.3	16.4	0.0	17.3	14.6	0.0
Incr Delay (d2), s/veh	12.4	0.6	0.6	9.7	0.5	0.5	9.6	0.5	0.0	1.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.4	1.4	0.7	1.3	1.4	0.7	0.4	0.0	0.5	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	11.8	11.9	28.0	11.0	11.0	27.9	16.9	0.0	18.8	14.8	0.0
LnGrp LOS	C	B	B	C	B	B	C	B		B	B	
Approach Vol, veh/h	484			582			172			232		
Approach Delay, s/veh	12.8			12.9			20.9			17.2		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	10.7	6.2	16.2	8.0	8.8	5.1	17.3				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.3	30.3	* 6.6	* 41	6.6	* 33	* 4	43.5				
Max Q Clear Time (g_c+I1), s	3.4	2.9	3.4	6.3	3.5	3.1	2.5	6.4				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.1	0.1	0.6	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 14.5

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing AM Peak (Weekday)

11/14/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	211	44	51	215	106	82	291	16	89	308	180
Future Volume (veh/h)	107	211	44	51	215	106	82	291	16	89	308	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	135	267	56	65	272	134	104	368	20	113	390	228
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	447	94	82	472	390	133	475	26	145	519	432
Arrive On Green	0.10	0.30	0.30	0.05	0.25	0.25	0.08	0.27	0.27	0.08	0.28	0.28
Sat Flow, veh/h	1767	1465	307	1767	1856	1532	1767	1741	95	1767	1856	1542
Grp Volume(v), veh/h	135	0	323	65	272	134	104	0	388	113	390	228
Grp Sat Flow(s),veh/h/ln	1767	0	1772	1767	1856	1532	1767	0	1835	1767	1856	1542
Q Serve(g_s), s	4.6	0.0	9.4	2.2	7.8	4.4	3.5	0.0	11.9	3.8	11.7	7.6
Cycle Q Clear(g_c), s	4.6	0.0	9.4	2.2	7.8	4.4	3.5	0.0	11.9	3.8	11.7	7.6
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	171	0	540	82	472	390	133	0	501	145	519	432
V/C Ratio(X)	0.79	0.00	0.60	0.80	0.58	0.34	0.78	0.00	0.77	0.78	0.75	0.53
Avail Cap(c_a), veh/h	197	0	721	116	670	553	162	0	648	218	691	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	18.0	28.8	19.8	18.6	27.7	0.0	20.4	27.4	20.0	18.5
Incr Delay (d2), s/veh	17.0	0.0	1.1	21.6	1.1	0.5	18.1	0.0	4.4	9.9	3.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.6	1.4	3.2	1.4	2.1	0.0	5.2	1.9	4.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	0.0	19.1	50.4	21.0	19.1	45.8	0.0	24.8	37.3	23.2	19.5
LnGrp LOS	D	A	B	D	C	B	D	A	C	D	C	B
Approach Vol, veh/h		458			471			492			731	
Approach Delay, s/veh		26.4			24.5			29.2			24.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	21.5	7.0	23.2	8.8	22.0	10.1	20.1				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 7.5	* 22	* 4	24.8	* 5.6	22.7	* 6.8	22.0				
Max Q Clear Time (g_c+I1), s	5.8	13.9	4.2	11.4	5.5	13.7	6.6	9.8				
Green Ext Time (p_c), s	0.0	1.4	0.0	1.5	0.0	2.1	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

Existing AM Peak (Weekday)

11/14/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	370	0	0	0	0	580	34	128	274	0
Future Volume (vph)	0	0	370	0	0	0	0	580	34	128	274	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1536	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1536	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	389	0	0	0	0	611	36	135	288	0
RTOR Reduction (vph)	0	0	327	0	0	0	0	0	16	0	0	0
Lane Group Flow (vph)	0	0	62	0	0	0	0	611	20	135	288	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			4.8					17.2	17.2	3.5	16.0	
Effective Green, g (s)			4.8					17.2	17.2	3.5	16.0	
Actuated g/C Ratio			0.16					0.57	0.57	0.12	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			437					1989	871	202	1850	
v/s Ratio Prot			0.02					c0.17		c0.08	0.08	
v/s Ratio Perm									0.01			
v/c Ratio			0.14					0.31	0.02	0.67	0.16	
Uniform Delay, d1			11.0					3.4	2.9	12.8	3.7	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.1					0.1	0.0	8.1	0.0	
Delay (s)			11.1					3.5	2.9	20.9	3.7	
Level of Service			B					A	A	C	A	
Approach Delay (s)		11.1			0.0			3.5			9.2	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.2									
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			30.3							9.6		
Intersection Capacity Utilization			31.3%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing AM Peak (Weekday)

11/14/2018

Intersection

Int Delay, s/veh 3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	7	0	16	5	120	2	530	35	82	431	8
Future Vol, veh/h	7	7	0	16	5	120	2	530	35	82	431	8
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	8	0	19	6	140	2	616	41	95	501	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1012	1358	256	1086	1342	329	511	0	0	657	0	0
Stage 1	697	697	-	641	641	-	-	-	-	-	-	-
Stage 2	315	661	-	445	701	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	192	146	740	169	150	664	1043	-	-	920	-	-
Stage 1	395	438	-	427	465	-	-	-	-	-	-	-
Stage 2	668	455	-	559	437	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	135	131	740	148	134	664	1042	-	-	920	-	-
Mov Cap-2 Maneuver	135	131	-	148	134	-	-	-	-	-	-	-
Stage 1	394	392	-	426	464	-	-	-	-	-	-	-
Stage 2	520	454	-	491	392	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	35.8		18.3		0		1.5	
HCM LOS	E		C					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	133	-	432	920	-	-
HCM Lane V/C Ratio	0.002	-	-	0.122	-	0.38	0.104	-	-
HCM Control Delay (s)	8.5	-	-	35.8	0	18.3	9.4	-	-
HCM Lane LOS	A	-	-	E	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	1.7	0.3	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing PM Peak (Weekday)

11/15/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	112	306	5	47	193	10	18	164	196	21	102	69
Future Volume (veh/h)	112	306	5	47	193	10	18	164	196	21	102	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	126	344	0	53	217	0	20	184	220	24	115	78
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	482	506		68	277		64	404	179	41	326	145
Arrive On Green	0.27	0.27	0.00	0.19	0.19	0.00	0.04	0.11	0.11	0.02	0.09	0.09
Sat Flow, veh/h	1767	1856	1572	361	1477	1572	1767	3526	1566	1767	3526	1572
Grp Volume(v), veh/h	126	344	0	270	0	0	20	184	220	24	115	78
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1838	0	1572	1767	1763	1566	1767	1763	1572
Q Serve(g_s), s	2.6	7.7	0.0	6.5	0.0	0.0	0.5	2.3	5.3	0.6	1.4	2.2
Cycle Q Clear(g_c), s	2.6	7.7	0.0	6.5	0.0	0.0	0.5	2.3	5.3	0.6	1.4	2.2
Prop In Lane	1.00		1.00	0.20		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	482	506		344	0		64	404	179	41	326	145
V/C Ratio(X)	0.26	0.68		0.78	0.00		0.31	0.46	1.23	0.59	0.35	0.54
Avail Cap(c_a), veh/h	1528	1605		481	0		153	404	179	153	404	180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	15.0	0.0	17.9	0.0	0.0	21.7	19.1	20.5	22.4	19.7	20.0
Incr Delay (d2), s/veh	0.3	1.6	0.0	5.6	0.0	0.0	2.7	0.8	141.1	13.0	0.6	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.9	0.0	2.9	0.0	0.0	0.2	0.8	8.7	0.4	0.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	16.6	0.0	23.5	0.0	0.0	24.4	19.9	161.6	35.4	20.3	23.1
LnGrp LOS	B	B		C	A		C	B	F	D	C	C
Approach Vol, veh/h		470	A		270	A		424			217	
Approach Delay, s/veh		15.8			23.5			93.7			23.0	
Approach LOS		B			C			F			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.5	5.3	9.9		13.6	6.3	8.9				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	5.3		12.1	4.0	* 5.3				
Max Q Clear Time (g_c+I1), s		9.7	2.6	7.3		8.5	2.5	4.2				
Green Ext Time (p_c), s		2.5	0.0	0.0		0.5	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			42.3									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing PM Peak (Weekday)

11/15/2018


Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	117	8	13	113	24	7	9	6	13	2	1
Future Vol, veh/h	1	117	8	13	113	24	7	9	6	13	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	141	10	16	136	29	8	11	7	16	2	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	151	0	0	332	345	146	340	336	151
Stage 1	-	-	-	-	-	-	148	148	-	183	183	-
Stage 2	-	-	-	-	-	-	184	197	-	157	153	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1407	-	-	1424	-	-	620	576	898	612	583	893
Stage 1	-	-	-	-	-	-	852	773	-	816	746	-
Stage 2	-	-	-	-	-	-	815	736	-	843	769	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1407	-	-	1424	-	-	611	569	898	592	575	893
Mov Cap-2 Maneuver	-	-	-	-	-	-	611	569	-	592	575	-
Stage 1	-	-	-	-	-	-	851	772	-	815	737	-
Stage 2	-	-	-	-	-	-	802	727	-	824	768	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.7			10.8			11.2		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	648	1407	-	-	1424	-	-	602				
HCM Lane V/C Ratio	0.041	0.001	-	-	0.011	-	-	0.032				
HCM Control Delay (s)	10.8	7.6	0	-	7.6	0	-	11.2				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM Signalized Intersection Capacity Analysis

4: Floral Avenue & SR-99 SB Off-Ramp

Existing PM Peak (Weekday)

11/15/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	562	70	111	539	0	0	0	169	301	49	139
Future Volume (vph)	0	562	70	111	539	0	0	0	169	301	49	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1544
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1544
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	585	73	116	561	0	0	0	176	314	51	145
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	93	0	0	91
Lane Group Flow (vph)	0	585	17	116	561	0	0	0	83	314	51	54
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		14.2	14.2	7.3	26.2				17.7	11.7	22.1	22.1
Effective Green, g (s)		14.2	14.2	7.3	26.2				17.7	11.7	22.1	22.1
Actuated g/C Ratio		0.24	0.24	0.12	0.44				0.30	0.20	0.37	0.37
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		832	372	213	1535				472	665	681	570
v/s Ratio Prot		c0.17		c0.07	0.16				c0.05	c0.09	0.03	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.70	0.05	0.54	0.37				0.18	0.47	0.07	0.09
Uniform Delay, d1		20.9	17.6	24.7	11.2				15.6	21.3	12.2	12.3
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	0.1	2.8	0.1				0.2	0.5	0.0	0.1
Delay (s)		23.6	17.6	27.5	11.4				15.8	21.8	12.3	12.4
Level of Service		C	B	C	B				B	C	B	B
Approach Delay (s)		22.9			14.2			15.8			18.2	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			59.8			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			48.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	541	151	139	508	115	96	182	76	68	260	243
Future Volume (veh/h)	215	541	151	139	508	115	96	182	76	68	260	243
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	219	552	154	142	518	117	98	186	78	69	265	248
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	246	913	407	539	792	178	192	637	284	88	589	463
Arrive On Green	0.14	0.26	0.26	0.16	0.28	0.28	0.06	0.18	0.18	0.05	0.17	0.17
Sat Flow, veh/h	1767	3526	1572	3428	2860	643	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	219	552	154	142	318	317	98	186	78	69	265	248
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1740	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.8	7.7	4.5	2.0	8.9	9.0	1.6	2.6	1.4	2.2	3.8	4.6
Cycle Q Clear(g_c), s	6.8	7.7	4.5	2.0	8.9	9.0	1.6	2.6	1.4	2.2	3.8	4.6
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	913	407	539	488	482	192	637	284	88	589	463
V/C Ratio(X)	0.89	0.60	0.38	0.26	0.65	0.66	0.51	0.29	0.27	0.79	0.45	0.54
Avail Cap(c_a), veh/h	246	3021	1348	600	1605	1584	245	2058	918	325	2392	1878
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	18.2	17.0	20.8	17.9	17.9	25.7	19.8	6.7	26.3	21.0	21.3
Incr Delay (d2), s/veh	30.3	0.6	0.6	0.3	1.5	1.5	2.1	0.3	0.5	14.3	0.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	2.9	1.4	0.8	3.4	3.4	0.6	0.9	0.8	1.2	1.5	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	18.9	17.6	21.0	19.3	19.4	27.8	20.1	7.2	40.6	21.5	22.3
LnGrp LOS	D	B	B	C	B	B	C	C	A	D	C	C
Approach Vol, veh/h		925			777			362			582	
Approach Delay, s/veh		27.0			19.7			19.4			24.1	
Approach LOS		C			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	19.7	8.3	14.0	13.0	20.7	7.0	15.3				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.8	* 48	4.0	* 38	* 7.8	* 51	* 10	* 33				
Max Q Clear Time (g_c+I1), s	4.0	9.7	3.6	6.6	8.8	11.0	4.2	4.6				
Green Ext Time (p_c), s	0.2	4.8	0.0	2.8	0.0	4.5	0.1	1.3				

Intersection Summary

HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR-99 NB Off-Ramp & Floral Avenue

Existing PM Peak (Weekday)

11/15/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	708	0	0	674	175	53
Future Volume (vph)	708	0	0	674	175	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	753	0	0	717	186	56
RTOR Reduction (vph)	0	0	0	0	0	45
Lane Group Flow (vph)	753	0	0	717	186	11
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.8			21.8	7.7	7.7
Effective Green, g (s)	21.8			21.8	7.7	7.7
Actuated g/C Ratio	0.56			0.56	0.20	0.20
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1974			1974	348	311
v/s Ratio Prot	c0.21			0.20	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.38			0.36	0.53	0.04
Uniform Delay, d1	4.7			4.6	13.9	12.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.6	0.0
Delay (s)	4.8			4.8	15.5	12.6
Level of Service	A			A	B	B
Approach Delay (s)	4.8			4.8	14.8	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay		6.2		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.42				
Actuated Cycle Length (s)		38.7		Sum of lost time (s)		9.2
Intersection Capacity Utilization		36.9%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	496	161	75	388	12	83	165	19	242	129	57
Future Volume (veh/h)	42	496	161	75	388	12	83	165	19	242	129	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	533	173	81	417	13	89	177	0	260	139	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	259	924	299	102	896	28	114	448		380	658	
Arrive On Green	0.15	0.35	0.35	0.06	0.26	0.26	0.06	0.13	0.00	0.11	0.19	0.00
Sat Flow, veh/h	1767	2617	846	1767	3489	109	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	45	358	348	81	210	220	89	177	0	260	139	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1700	1767	1763	1834	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	1.2	8.6	8.6	2.3	5.2	5.2	2.6	2.4	0.0	3.8	1.7	0.0
Cycle Q Clear(g_c), s	1.2	8.6	8.6	2.3	5.2	5.2	2.6	2.4	0.0	3.8	1.7	0.0
Prop In Lane	1.00		0.50	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	622	600	102	453	471	114	448		380	658	
V/C Ratio(X)	0.17	0.58	0.58	0.79	0.46	0.47	0.78	0.40		0.68	0.21	
Avail Cap(c_a), veh/h	259	1422	1371	201	1473	1533	286	2245		450	2136	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	13.6	13.6	24.1	16.2	16.3	23.9	20.8	0.0	22.2	17.8	0.0
Incr Delay (d2), s/veh	0.3	0.8	0.9	12.6	0.7	0.7	11.0	0.6	0.0	3.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.0	3.0	1.2	1.9	2.0	1.3	0.9	0.0	1.5	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	14.5	14.5	36.7	17.0	17.0	34.8	21.4	0.0	25.6	18.0	0.0
LnGrp LOS	B	B	B	D	B	B	C	C		C	B	
Approach Vol, veh/h		751			511			266	A		399	A
Approach Delay, s/veh		14.8			20.1			25.9			22.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	14.6	7.2	22.5	10.6	11.5	11.8	17.9				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 8.4	31.4	* 5.9	* 42	6.8	* 33	4.0	* 43				
Max Q Clear Time (g_c+I1), s	4.6	3.7	4.3	10.6	5.8	4.4	3.2	7.2				
Green Ext Time (p_c), s	0.1	0.8	0.0	5.0	0.1	1.0	0.0	2.6				

Intersection Summary

HCM 6th Ctrl Delay 19.4

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing PM Peak (Weekday)

11/15/2018


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	228	50	27	141	84	89	278	27	54	230	164
Future Volume (veh/h)	195	228	50	27	141	84	89	278	27	54	230	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	207	243	53	29	150	89	95	296	29	57	245	174
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	264	438	96	47	326	271	121	419	41	79	425	354
Arrive On Green	0.15	0.30	0.30	0.03	0.18	0.18	0.07	0.25	0.25	0.04	0.23	0.23
Sat Flow, veh/h	1767	1469	320	1767	1856	1541	1767	1661	163	1767	1856	1548
Grp Volume(v), veh/h	207	0	296	29	150	89	95	0	325	57	245	174
Grp Sat Flow(s),veh/h/ln	1767	0	1789	1767	1856	1541	1767	0	1824	1767	1856	1548
Q Serve(g_s), s	5.3	0.0	6.6	0.8	3.4	2.4	2.5	0.0	7.7	1.5	5.6	4.6
Cycle Q Clear(g_c), s	5.3	0.0	6.6	0.8	3.4	2.4	2.5	0.0	7.7	1.5	5.6	4.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	264	0	534	47	326	271	121	0	461	79	425	354
V/C Ratio(X)	0.78	0.00	0.55	0.61	0.46	0.33	0.79	0.00	0.71	0.72	0.58	0.49
Avail Cap(c_a), veh/h	440	0	1065	209	862	716	216	0	928	183	881	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	14.0	22.8	17.5	17.1	21.7	0.0	16.1	22.3	16.2	15.9
Incr Delay (d2), s/veh	5.1	0.0	0.9	12.1	1.0	0.7	10.8	0.0	2.0	11.8	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	2.3	0.4	1.4	0.8	1.3	0.0	3.0	0.8	2.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	0.0	14.9	35.0	18.5	17.8	32.5	0.0	18.1	34.2	17.5	16.9
LnGrp LOS	C	A	B	C	B	B	C	A	B	C	B	B
Approach Vol, veh/h		503			268			420			476	
Approach Delay, s/veh		18.8			20.1			21.4			19.3	
Approach LOS		B			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.3	16.9	5.5	18.7	7.4	15.7	11.3	12.9				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.9	* 24	* 5.6	28.2	* 5.8	22.5	* 12	22.0				
Max Q Clear Time (g_c+I1), s	3.5	9.7	2.8	8.6	4.5	7.6	7.3	5.4				
Green Ext Time (p_c), s	0.0	1.6	0.0	1.6	0.0	1.6	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			19.8									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR-99 SB Off-Ramp

Existing PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	426	0	0	0	0	751	49	214	320	0
Future Volume (vph)	0	0	426	0	0	0	0	751	49	214	320	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1536	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1536	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	463	0	0	0	0	816	53	233	348	0
RTOR Reduction (vph)	0	0	382	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	0	81	0	0	0	0	816	27	233	348	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			6.0					17.2	17.2	7.4	18.7	
Effective Green, g (s)			6.0					17.2	17.2	7.4	18.7	
Actuated g/C Ratio			0.18					0.50	0.50	0.22	0.55	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			484					1762	772	379	1916	
v/s Ratio Prot			0.03					c0.23		c0.13	0.10	
v/s Ratio Perm									0.02			
v/c Ratio			0.17					0.46	0.03	0.61	0.18	
Uniform Delay, d1			12.0					5.5	4.3	12.1	3.9	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					0.2	0.0	3.0	0.0	
Delay (s)			12.1					5.7	4.3	15.1	3.9	
Level of Service			B					A	A	B	A	
Approach Delay (s)		12.1			0.0			5.6			8.4	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.0									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			34.2							9.6		
Intersection Capacity Utilization			40.6%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing PM Peak (Weekday)

11/15/2018

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	5	9	6	19	6	120	6	598	28	126	615	11
Future Vol, veh/h	5	9	6	19	6	120	6	598	28	126	615	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	9	6	20	6	126	6	629	29	133	647	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1249	1589	330	1250	1581	329	659	0	0	658	0	0
Stage 1	919	919	-	656	656	-	-	-	-	-	-	-
Stage 2	330	670	-	594	925	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	128	106	663	128	107	664	918	-	-	919	-	-
Stage 1	290	346	-	418	458	-	-	-	-	-	-	-
Stage 2	654	451	-	456	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	90	663	103	91	664	918	-	-	919	-	-
Mov Cap-2 Maneuver	87	90	-	103	91	-	-	-	-	-	-	-
Stage 1	288	296	-	415	455	-	-	-	-	-	-	-
Stage 2	519	448	-	374	294	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	40.5		24.3		0.1		1.6	
HCM LOS	E		C					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	918	-	-	89	663	336	919	-	-
HCM Lane V/C Ratio	0.007	-	-	0.166	0.01	0.454	0.144	-	-
HCM Control Delay (s)	8.9	-	-	53.3	10.5	24.3	9.6	-	-
HCM Lane LOS	A	-	-	F	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	2.3	0.5	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing MD Peak (Saturday)

11/15/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	15	74	32	11	109	101	72	266	19	65	234	25
Future Volume (veh/h)	15	74	32	11	109	101	72	266	19	65	234	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	15	76	0	11	112	0	74	274	20	67	241	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	125	132		14	147		109	571	255	101	556	246
Arrive On Green	0.07	0.07	0.00	0.09	0.09	0.00	0.06	0.16	0.16	0.06	0.16	0.16
Sat Flow, veh/h	1767	1856	1572	165	1682	1572	1767	3526	1572	1767	3526	1563
Grp Volume(v), veh/h	15	76	0	123	0	0	74	274	20	67	241	26
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1847	0	1572	1767	1763	1572	1767	1763	1563
Q Serve(g_s), s	0.2	1.2	0.0	1.9	0.0	0.0	1.2	2.1	0.3	1.1	1.8	0.4
Cycle Q Clear(g_c), s	0.2	1.2	0.0	1.9	0.0	0.0	1.2	2.1	0.3	1.1	1.8	0.4
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	125	132		161	0		109	571	255	101	556	246
V/C Ratio(X)	0.12	0.58		0.76	0.00		0.68	0.48	0.08	0.66	0.43	0.11
Avail Cap(c_a), veh/h	2366	2484		439	0		284	1121	500	284	1121	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	13.4	0.0	13.3	0.0	0.0	13.7	11.4	10.6	13.8	11.4	10.8
Incr Delay (d2), s/veh	0.4	3.9	0.0	7.2	0.0	0.0	7.3	0.6	0.1	7.3	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.0	0.9	0.0	0.0	0.6	0.6	0.1	0.5	0.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	17.4	0.0	20.6	0.0	0.0	21.0	12.0	10.8	21.1	11.9	11.0
LnGrp LOS	B	B		C	A		C	B	B	C	B	B
Approach Vol, veh/h		91	A		123	A		368			334	
Approach Delay, s/veh		16.7			20.6			13.7			13.7	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.0	5.9	9.4		7.5	6.0	9.3				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		40.0	* 4.8	9.5		7.1	* 4.8	9.5				
Max Q Clear Time (g_c+I1), s		3.2	3.1	4.1		3.9	3.2	3.8				
Green Ext Time (p_c), s		0.4	0.0	0.7		0.1	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	79	2	6	110	12	3	4	12	10	3	0
Future Vol, veh/h	0	79	2	6	110	12	3	4	12	10	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	84	2	6	117	13	3	4	13	11	3	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	130	0	0	86	0	0	222	227	85	230	222	124
Stage 1	-	-	-	-	-	-	85	85	-	136	136	-
Stage 2	-	-	-	-	-	-	137	142	-	94	86	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1449	-	-	1504	-	-	732	671	971	723	675	924
Stage 1	-	-	-	-	-	-	920	822	-	865	782	-
Stage 2	-	-	-	-	-	-	864	777	-	910	822	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1449	-	-	1504	-	-	727	668	971	708	672	924
Mov Cap-2 Maneuver	-	-	-	-	-	-	727	668	-	708	672	-
Stage 1	-	-	-	-	-	-	920	822	-	865	779	-
Stage 2	-	-	-	-	-	-	857	774	-	893	822	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			9.4			10.3		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	845	1449	-	-	1504	-	-	699				
HCM Lane V/C Ratio	0.024	-	-	-	0.004	-	-	0.02				
HCM Control Delay (s)	9.4	0	-	-	7.4	0	-	10.3				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↑	↗
Traffic Volume (vph)	0	481	86	108	452	0	0	0	159	187	32	106
Future Volume (vph)	0	481	86	108	452	0	0	0	159	187	32	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1548
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	501	90	112	471	0	0	0	166	195	33	110
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	89	0	0	72
Lane Group Flow (vph)	0	501	22	113	471	0	0	0	77	195	33	38
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		14.0	14.0	7.2	25.9				18.7	8.0	19.5	19.5
Effective Green, g (s)		14.0	14.0	7.2	25.9				18.7	8.0	19.5	19.5
Actuated g/C Ratio		0.25	0.25	0.13	0.46				0.33	0.14	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		862	385	221	1595				524	478	632	530
v/s Ratio Prot		c0.14		c0.06	0.13				c0.05	c0.06	0.02	
v/s Ratio Perm			0.01									0.02
v/c Ratio		0.58	0.06	0.51	0.30				0.15	0.41	0.05	0.07
Uniform Delay, d1		18.9	16.4	23.2	9.8				13.5	22.3	12.5	12.6
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.0	0.1	2.0	0.1				0.1	0.6	0.0	0.1
Delay (s)		19.9	16.5	25.2	9.9				13.6	22.9	12.5	12.7
Level of Service		B	B	C	A				B	C	B	B
Approach Delay (s)		19.4			12.8			13.6			18.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			56.9			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			42.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	490	160	115	506	130	87	101	66	81	154	185
Future Volume (veh/h)	187	490	160	115	506	130	87	101	66	81	154	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	193	505	165	119	522	134	90	104	68	84	159	191
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	239	844	377	745	893	228	182	455	203	109	460	361
Arrive On Green	0.14	0.24	0.24	0.22	0.32	0.32	0.05	0.13	0.13	0.06	0.13	0.13
Sat Flow, veh/h	1767	3526	1572	3428	2774	709	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	193	505	165	119	331	325	90	104	68	84	159	191
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1720	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.1	7.3	5.1	1.6	9.0	9.1	1.5	1.5	1.2	2.7	2.4	3.7
Cycle Q Clear(g_c), s	6.1	7.3	5.1	1.6	9.0	9.1	1.5	1.5	1.2	2.7	2.4	3.7
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	844	377	745	567	553	182	455	203	109	460	361
V/C Ratio(X)	0.81	0.60	0.44	0.16	0.58	0.59	0.49	0.23	0.34	0.77	0.35	0.53
Avail Cap(c_a), veh/h	271	3028	1351	745	1539	1501	239	1822	813	383	2339	1836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	19.3	18.5	18.2	16.2	16.2	26.4	22.4	6.5	26.5	22.7	23.3
Incr Delay (d2), s/veh	14.8	0.7	0.8	0.1	1.0	1.0	2.1	0.3	1.0	11.0	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.8	1.7	0.6	3.4	3.3	0.6	0.6	0.8	1.4	0.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	20.0	19.3	18.3	17.2	17.2	28.4	22.6	7.4	37.5	23.1	24.5
LnGrp LOS	D	C	B	B	B	B	C	C	A	D	C	C
Approach Vol, veh/h		863			775			262			434	
Approach Delay, s/veh		24.1			17.4			20.7			26.5	
Approach LOS		C			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.6	18.9	8.6	12.1	12.9	23.6	7.7	13.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 8.6	* 49	4.0	* 38	* 8.8	* 50	* 12	29.6				
Max Q Clear Time (g_c+I1), s	3.6	9.3	3.5	5.7	8.1	11.1	4.7	3.5				
Green Ext Time (p_c), s	0.1	4.4	0.0	1.8	0.0	4.7	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	533	0	0	538	119	66
Future Volume (vph)	533	0	0	538	119	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	586	0	0	591	131	73
RTOR Reduction (vph)	0	0	0	0	0	60
Lane Group Flow (vph)	586	0	0	591	131	13
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	22.0			22.0	6.7	6.7
Effective Green, g (s)	22.0			22.0	6.7	6.7
Actuated g/C Ratio	0.58			0.58	0.18	0.18
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2034			2034	309	277
v/s Ratio Prot	0.17			c0.17	c0.07	
v/s Ratio Perm						0.01
v/c Ratio	0.29			0.29	0.42	0.05
Uniform Delay, d1	4.0			4.0	13.9	12.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	0.9	0.1
Delay (s)	4.1			4.1	14.8	13.0
Level of Service	A			A	B	B
Approach Delay (s)	4.1			4.1	14.2	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	5.6			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	37.9			Sum of lost time (s)		9.2
Intersection Capacity Utilization	29.1%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	300	213	57	285	10	70	129	11	239	85	24
Future Volume (veh/h)	42	300	213	57	285	10	70	129	11	239	85	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	312	222	59	297	10	73	134	0	249	89	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	256	562	390	85	612	21	98	378		395	650	
Arrive On Green	0.14	0.28	0.28	0.05	0.18	0.18	0.06	0.11	0.00	0.12	0.18	0.00
Sat Flow, veh/h	1767	1988	1380	1767	3480	117	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	44	276	258	59	150	157	73	134	0	249	89	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1605	1767	1763	1835	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.9	5.4	5.6	1.3	3.1	3.1	1.7	1.4	0.0	2.8	0.9	0.0
Cycle Q Clear(g_c), s	0.9	5.4	5.6	1.3	3.1	3.1	1.7	1.4	0.0	2.8	0.9	0.0
Prop In Lane	1.00		0.86	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	498	454	85	310	322	98	378		395	650	
V/C Ratio(X)	0.17	0.55	0.57	0.70	0.48	0.49	0.75	0.35		0.63	0.14	
Avail Cap(c_a), veh/h	256	1841	1677	226	1876	1952	308	2859		573	2833	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	12.4	12.5	19.1	15.1	15.1	18.9	16.9	0.0	17.2	13.9	0.0
Incr Delay (d2), s/veh	0.3	1.0	1.1	9.9	1.2	1.1	10.8	0.6	0.0	1.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.8	1.7	0.7	1.1	1.2	0.9	0.5	0.0	1.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	13.4	13.6	29.0	16.3	16.3	29.7	17.4	0.0	18.8	14.0	0.0
LnGrp LOS	B	B	B	C	B	B	C	B		B	B	
Approach Vol, veh/h	578			366			207			A		
Approach Delay, s/veh	13.6			18.3			21.8			17.6		
Approach LOS	B			B			C			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	12.4	6.1	15.7	9.6	9.3	10.1	11.8				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 7.1	32.7	* 5.2	* 43	6.8	* 33	4.0	* 43				
Max Q Clear Time (g_c+I1), s	3.7	2.9	3.3	7.6	4.8	3.4	2.9	5.1				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.7	0.2	0.7	0.0	1.8				

Intersection Summary

HCM 6th Ctrl Delay 16.8

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	124	34	23	96	37	46	191	16	28	167	127
Future Volume (veh/h)	181	124	34	23	96	37	46	191	16	28	167	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	183	125	34	23	97	37	46	193	16	28	169	128
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	237	330	90	40	230	193	73	348	29	48	357	300
Arrive On Green	0.13	0.24	0.24	0.02	0.12	0.12	0.04	0.21	0.21	0.03	0.19	0.19
Sat Flow, veh/h	1767	1403	382	1767	1856	1560	1767	1688	140	1767	1856	1556
Grp Volume(v), veh/h	183	0	159	23	97	37	46	0	209	28	169	128
Grp Sat Flow(s),veh/h/ln	1767	0	1785	1767	1856	1560	1767	0	1828	1767	1856	1556
Q Serve(g_s), s	3.5	0.0	2.6	0.5	1.7	0.7	0.9	0.0	3.6	0.6	2.8	2.5
Cycle Q Clear(g_c), s	3.5	0.0	2.6	0.5	1.7	0.7	0.9	0.0	3.6	0.6	2.8	2.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	237	0	420	40	230	193	73	0	377	48	357	300
V/C Ratio(X)	0.77	0.00	0.38	0.57	0.42	0.19	0.63	0.00	0.55	0.58	0.47	0.43
Avail Cap(c_a), veh/h	442	0	1359	201	1159	975	201	0	1116	276	1175	986
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	0.0	11.3	17.0	14.3	13.8	16.6	0.0	12.5	16.9	12.6	12.5
Incr Delay (d2), s/veh	5.3	0.0	0.6	11.9	1.2	0.5	8.7	0.0	1.3	10.7	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.8	0.3	0.6	0.2	0.5	0.0	1.3	0.3	0.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	0.0	11.9	29.0	15.5	14.3	25.4	0.0	13.8	27.6	13.6	13.5
LnGrp LOS	C	A	B	C	B	B	C	A	B	C	B	B
Approach Vol, veh/h		342			157			255			325	
Approach Delay, s/veh		16.2			17.2			15.9			14.8	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.2	12.2	5.0	12.9	5.6	11.7	8.9	9.0				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 5.5	* 22	* 4	26.8	* 4	22.3	* 8.8	22.0				
Max Q Clear Time (g_c+I1), s	2.6	5.6	2.5	4.6	2.9	4.8	5.5	3.7				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.8	0.0	1.1	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay 15.8

HCM 6th LOS B

Notes


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

Existing MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	260	0	0	0	0	584	30	166	249	0
Future Volume (vph)	0	0	260	0	0	0	0	584	30	166	249	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	265	0	0	0	0	596	31	169	254	0
RTOR Reduction (vph)	0	0	235	0	0	0	0	0	14	0	0	0
Lane Group Flow (vph)	0	0	30	0	0	0	0	596	17	169	254	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			3.4					16.8	16.8	3.5	17.0	
Effective Green, g (s)			3.4					16.8	16.8	3.5	17.0	
Actuated g/C Ratio			0.11					0.56	0.56	0.12	0.57	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			313					1969	862	205	1992	
v/s Ratio Prot			0.01					c0.17		c0.10	0.07	
v/s Ratio Perm									0.01			
v/c Ratio			0.10					0.30	0.02	0.82	0.13	
Uniform Delay, d1			11.9					3.5	2.9	12.9	3.0	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.1					0.1	0.0	22.8	0.0	
Delay (s)			12.0					3.5	2.9	35.7	3.0	
Level of Service			B					A	A	D	A	
Approach Delay (s)		12.0			0.0			3.5			16.1	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.3									
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			29.9									
Intersection Capacity Utilization			33.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing MD Peak (Saturday)

11/15/2018

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱	↱		↱		↱	↱		↱	↱	
Traffic Vol, veh/h	6	5	3	14	9	92	4	489	33	87	431	11
Future Vol, veh/h	6	5	3	14	9	92	4	489	33	87	431	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	5	3	15	9	97	4	515	35	92	454	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	914	1202	233	955	1191	275	466	0	0	550	0	0
Stage 1	644	644	-	541	541	-	-	-	-	-	-	-
Stage 2	270	558	-	414	650	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	227	182	766	211	185	719	1085	-	-	1009	-	-
Stage 1	425	464	-	490	516	-	-	-	-	-	-	-
Stage 2	710	507	-	584	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	174	165	766	190	167	719	1085	-	-	1009	-	-
Mov Cap-2 Maneuver	174	165	-	190	167	-	-	-	-	-	-	-
Stage 1	423	422	-	488	514	-	-	-	-	-	-	-
Stage 2	601	505	-	522	419	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	23.8		15.9		0.1		1.5	
HCM LOS	C		C					






















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1085	-	-	170	766	450	1009	-	-
HCM Lane V/C Ratio	0.004	-	-	0.068	0.004	0.269	0.091	-	-
HCM Control Delay (s)	8.3	-	-	27.7	9.7	15.9	8.9	-	-
HCM Lane LOS	A	-	-	D	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	1.1	0.3	-	-

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing AM Peak (Weekday)

11/15/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	7	0	16	5	120	2	530	35	82	431	8
Future Volume (veh/h)	7	7	0	16	5	120	2	530	35	82	431	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	8	8	0	19	6	140	2	616	41	95	501	9
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	158	0	146	9	206	4	981	65	121	1270	23
Arrive On Green	0.03	0.08	0.00	0.08	0.14	0.14	0.00	0.29	0.29	0.07	0.36	0.36
Sat Flow, veh/h	1767	1856	0	1767	65	1517	1767	3355	223	1767	3543	64
Grp Volume(v), veh/h	8	8	0	19	0	146	2	323	334	95	249	261
Grp Sat Flow(s),veh/h/ln	1767	1856	0	1767	0	1582	1767	1763	1815	1767	1763	1844
Q Serve(g_s), s	0.2	0.2	0.0	0.4	0.0	3.7	0.0	6.6	6.7	2.2	4.4	4.4
Cycle Q Clear(g_c), s	0.2	0.2	0.0	0.4	0.0	3.7	0.0	6.6	6.7	2.2	4.4	4.4
Prop In Lane	1.00		0.00	1.00		0.96	1.00		0.12	1.00		0.03
Lane Grp Cap(c), veh/h	56	158	0	146	0	215	4	515	531	121	632	661
V/C Ratio(X)	0.14	0.05	0.00	0.13	0.00	0.68	0.47	0.63	0.63	0.79	0.39	0.39
Avail Cap(c_a), veh/h	169	1599	0	169	0	1416	169	1118	1151	372	1320	1381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	17.6	0.0	17.8	0.0	17.2	20.8	12.8	12.8	19.2	10.0	10.0
Incr Delay (d2), s/veh	1.1	0.1	0.0	0.4	0.0	3.7	64.8	1.3	1.2	10.6	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.2	0.0	1.3	0.1	2.0	2.1	1.1	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	17.7	0.0	18.2	0.0	20.9	85.6	14.1	14.1	29.8	10.4	10.4
LnGrp LOS	C	B	A	B	A	C	F	B	B	C	B	B
Approach Vol, veh/h	16			165			659			605		
Approach Delay, s/veh	19.3			20.6			14.3			13.4		
Approach LOS	B			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	17.5	7.7	9.5	4.3	20.3	5.5	11.7				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	4.2	8.7	2.4	2.2	2.0	6.4	2.2	5.7				
Green Ext Time (p_c), s	0.1	3.4	0.0	0.0	0.0	2.7	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	14.7											
HCM 6th LOS	B											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing PM Peak (Weekday)

11/15/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	9	6	19	6	120	6	598	28	126	615	11
Future Volume (veh/h)	5	9	6	19	6	120	6	598	28	126	615	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	9	6	20	6	126	6	629	29	133	647	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	115	77	35	9	190	11	999	46	172	1352	25
Arrive On Green	0.01	0.11	0.11	0.02	0.13	0.13	0.01	0.29	0.29	0.10	0.38	0.38
Sat Flow, veh/h	1767	1039	692	1767	72	1511	1767	3432	158	1767	3541	66
Grp Volume(v), veh/h	5	0	15	20	0	132	6	323	335	133	322	337
Grp Sat Flow(s),veh/h/ln	1767	0	1731	1767	0	1583	1767	1763	1827	1767	1763	1844
Q Serve(g_s), s	0.1	0.0	0.3	0.5	0.0	3.3	0.1	6.5	6.5	3.0	5.7	5.7
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.5	0.0	3.3	0.1	6.5	6.5	3.0	5.7	5.7
Prop In Lane	1.00		0.40	1.00		0.95	1.00		0.09	1.00		0.04
Lane Grp Cap(c), veh/h	10	0	192	35	0	199	11	513	532	172	673	704
V/C Ratio(X)	0.52	0.00	0.08	0.57	0.00	0.66	0.53	0.63	0.63	0.77	0.48	0.48
Avail Cap(c_a), veh/h	173	0	1521	173	0	1446	173	1140	1182	380	1347	1409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	16.3	19.9	0.0	17.1	20.3	12.6	12.6	18.1	9.6	9.6
Incr Delay (d2), s/veh	38.1	0.0	0.2	13.7	0.0	3.8	32.9	1.3	1.2	7.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.3	0.0	1.2	0.2	2.0	2.0	1.3	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	0.0	16.5	33.6	0.0	20.9	53.2	13.9	13.8	25.3	10.1	10.1
LnGrp LOS	E	A	B	C	A	C	D	B	B	C	B	B
Approach Vol, veh/h		20			152			664			792	
Approach Delay, s/veh		27.0			22.5			14.2			12.6	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	17.2	5.0	10.6	4.5	20.9	4.4	11.1				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	5.0	8.5	2.5	2.3	2.1	7.7	2.1	5.3				
Green Ext Time (p_c), s	0.1	3.4	0.0	0.0	0.0	3.7	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			14.4									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	5	3	14	9	92	4	489	33	87	431	11
Future Volume (veh/h)	6	5	3	14	9	92	4	489	33	87	431	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	6	5	3	15	9	97	4	515	35	92	454	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	88	53	24	12	130	7	639	43	879	2441	64
Arrive On Green	0.01	0.08	0.08	0.01	0.09	0.09	0.00	0.19	0.19	0.50	0.70	0.70
Sat Flow, veh/h	1767	1086	652	1767	135	1458	1767	3350	227	1767	3509	93
Grp Volume(v), veh/h	6	0	8	15	0	106	4	270	280	92	228	238
Grp Sat Flow(s),veh/h/ln	1767	0	1738	1767	0	1593	1767	1763	1815	1767	1763	1839
Q Serve(g_s), s	0.3	0.0	0.4	0.8	0.0	6.2	0.2	14.1	14.1	2.6	4.3	4.4
Cycle Q Clear(g_c), s	0.3	0.0	0.4	0.8	0.0	6.2	0.2	14.1	14.1	2.6	4.3	4.4
Prop In Lane	1.00		0.38	1.00		0.92	1.00		0.13	1.00		0.05
Lane Grp Cap(c), veh/h	11	0	141	24	0	142	7	336	346	879	1226	1279
V/C Ratio(X)	0.55	0.00	0.06	0.62	0.00	0.75	0.54	0.80	0.81	0.10	0.19	0.19
Avail Cap(c_a), veh/h	74	0	652	74	0	621	74	487	501	879	1226	1279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	40.7	47.1	0.0	42.7	47.7	37.1	37.2	12.8	5.1	5.1
Incr Delay (d2), s/veh	37.1	0.0	0.2	22.9	0.0	7.7	49.0	18.2	18.1	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.5	0.0	2.7	0.2	7.4	7.7	1.0	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.6	0.0	40.9	70.0	0.0	50.3	96.7	55.4	55.2	12.8	5.4	5.4
LnGrp LOS	F	A	D	E	A	D	F	E	E	B	A	A
Approach Vol, veh/h	14			121			554			558		
Approach Delay, s/veh	59.6			52.8			55.6			6.7		
Approach LOS	E			D			E			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	53.1	23.6	5.5	13.8	4.6	72.1	4.8	14.5				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.8	* 27	* 4	36.0	* 4	32.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	4.6	16.1	2.8	2.4	2.2	6.4	2.3	8.2				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.0	0.0	2.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	33.5											
HCM 6th LOS	C											
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SE	SE	SE	NW	NW	NW	NW
Directions Served	L	T	LT	T	T	R	L	T	T	R
Maximum Queue (ft)	88	131	185	34	6	22	32	42	20	26
Average Queue (ft)	24	46	97	3	1	2	1	2	1	1
95th Queue (ft)	57	89	158	15	3	11	11	14	7	8
Link Distance (ft)		1170	1310	2543	2543			1054	1054	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140					100	75			120
Storage Blk Time (%)		8	38							
Queuing Penalty (veh)		7	2							

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	26	31
Average Queue (ft)	9	7
95th Queue (ft)	28	26
Link Distance (ft)	2752	2624
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	83	172	33	53	120	73	69	55	94	98	54
Average Queue (ft)	49	31	8	33	57	25	11	35	53	25	25
95th Queue (ft)	81	83	22	54	93	61	46	63	83	61	48
Link Distance (ft)	1267	1267			546	546	229			1842	1842
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		
Storage Blk Time (%)		0									
Queuing Penalty (veh)		0									

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	124	85	119	51	85	237	215	208	50	71	90	40
Average Queue (ft)	64	37	58	9	33	38	66	82	16	27	45	4
95th Queue (ft)	113	77	99	28	69	107	135	147	43	60	88	23
Link Distance (ft)		546	546				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	2		15	0			1					
Queuing Penalty (veh)	3		9	0			1					

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	51	54	139	111	71	79
Average Queue (ft)	25	26	57	38	38	34
95th Queue (ft)	47	54	103	78	58	63
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)			3	0		
Queuing Penalty (veh)			1	0		

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	93	115	119	174	156	76
Average Queue (ft)	26	38	40	46	50	31
95th Queue (ft)	72	90	89	109	97	70
Link Distance (ft)	467	467	558	558	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					15	1
Queuing Penalty (veh)					7	1

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	32	109	105	55	84	82	70	37	88	16	44	60
Average Queue (ft)	7	30	45	19	29	27	15	20	21	5	11	20
95th Queue (ft)	22	78	97	41	66	66	46	39	57	16	35	48
Link Distance (ft)		558	558		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		1			0				0			
Queuing Penalty (veh)		0			0				0			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	82
Average Queue (ft)	18
95th Queue (ft)	59
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	186	218	103	250	210	129	480	194	259	103
Average Queue (ft)	75	94	35	88	44	72	171	75	116	43
95th Queue (ft)	135	182	82	165	100	140	341	148	206	78
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	3	7	1	8		11	31	3	6	
Queuing Penalty (veh)	8	7	4	12		33	25	8	5	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	134	86	66	71	137	49	54
Average Queue (ft)	83	38	18	21	53	15	19
95th Queue (ft)	117	64	52	49	97	41	52
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)					6	0	
Queuing Penalty (veh)					8	0	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	29	30	55	91	30	153	157	114	93	90
Average Queue (ft)	3	7	11	39	2	63	60	40	32	47
95th Queue (ft)	15	26	41	74	14	115	110	79	77	80
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 142

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	LT	R	L	T	T	R	L	T
Maximum Queue (ft)	93	128	224	85	19	52	27	62	32	1
Average Queue (ft)	42	86	85	6	1	12	2	8	3	0
95th Queue (ft)	77	125	158	41	9	35	10	35	15	0
Link Distance (ft)		1176	1310			2543	2543			1164
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			35	200			100	75	
Storage Blk Time (%)		19	28							
Queuing Penalty (veh)		22	3							

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	22	31	29
Average Queue (ft)	1	14	11
95th Queue (ft)	7	35	31
Link Distance (ft)	2312	2752	2624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	168	164	42	112	159	140	114	176	141	54	90
Average Queue (ft)	93	70	9	54	80	42	44	66	66	18	39
95th Queue (ft)	162	133	27	106	129	99	97	142	111	43	66
Link Distance (ft)	1267	1267			538	538	243			1840	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		3			0						
Queuing Penalty (veh)		2			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	225	444	461	160	135	63	273	270	116	133	178	56
Average Queue (ft)	143	178	151	39	48	28	112	116	34	46	79	10
95th Queue (ft)	260	394	319	130	94	56	192	195	79	93	154	39
Link Distance (ft)		538	538				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	40	6	31	1	0		3				1	
Queuing Penalty (veh)	109	12	46	4	0		4				1	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	47	87	162	129	90	76
Average Queue (ft)	22	44	82	40	54	33
95th Queue (ft)	42	73	137	89	80	62
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)		0	5	1	0	
Queuing Penalty (veh)		0	3	3	0	

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	145	182	176	199	118	55
Average Queue (ft)	55	77	61	69	60	35
95th Queue (ft)	115	152	135	142	98	68
Link Distance (ft)	467	467	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					26	1
Queuing Penalty (veh)					14	1

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	52	154	167	133	147	144	94	79	71	96	112	84
Average Queue (ft)	16	73	100	48	48	39	18	26	31	25	50	29
95th Queue (ft)	41	141	167	106	109	101	53	55	62	68	96	65
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		5		5	1				1		0	0
Queuing Penalty (veh)		2		10	1				0		0	0

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	93
Average Queue (ft)	31
95th Queue (ft)	64
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	190	210	76	179	95	129	268	90	220	102
Average Queue (ft)	86	92	26	71	39	57	122	34	86	37
95th Queue (ft)	142	173	59	122	70	105	218	70	158	70
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	3	5		3	0	5	22		4	
Queuing Penalty (veh)	8	10		3	0	15	20		2	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	149	156	88	109	136	88	118
Average Queue (ft)	93	57	46	41	71	21	38
95th Queue (ft)	133	109	85	82	126	60	75
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)		0			12	0	
Queuing Penalty (veh)		0			19	1	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	72	50	90	50	179	159	160	120	141
Average Queue (ft)	4	9	14	44	11	85	69	58	46	62
95th Queue (ft)	19	38	42	79	35	151	132	108	111	117
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 317

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	LT	R	L	T	T	L	T	T
Maximum Queue (ft)	25	92	116	84	82	72	68	37	32	22
Average Queue (ft)	8	33	49	15	10	11	7	5	6	1
95th Queue (ft)	27	68	90	65	40	41	38	21	22	9
Link Distance (ft)		1176	1310			2543	2543		1164	1164
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			35	200			75		
Storage Blk Time (%)		4	13	0						
Queuing Penalty (veh)		2	13	0						

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	30	30
Average Queue (ft)	16	8
95th Queue (ft)	36	27
Link Distance (ft)	2752	2624
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	148	120	30	169	174	128	76	93	76	66	92
Average Queue (ft)	72	45	11	58	72	37	26	42	47	18	37
95th Queue (ft)	129	92	30	113	150	97	74	72	78	46	69
Link Distance (ft)	1267	1267			538	538	243			1840	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		0		0	0						
Queuing Penalty (veh)		0		1	0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	220	144	209	160	111	104	237	271	50	71	135	40
Average Queue (ft)	107	72	86	35	38	36	97	85	22	35	64	5
95th Queue (ft)	179	132	161	112	76	79	176	174	51	58	117	26
Link Distance (ft)		538	538				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	20	3	27	1			2					
Queuing Penalty (veh)	48	6	43	3			3					

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	66	95	163	102	74	68
Average Queue (ft)	23	45	73	24	46	17
95th Queue (ft)	51	80	122	67	71	48
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)	0	0	4	0		
Queuing Penalty (veh)	0	0	4	0		

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	139	138	127	140	74	55
Average Queue (ft)	35	51	36	48	46	39
95th Queue (ft)	95	115	87	98	72	64
Link Distance (ft)	467	467	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					17	1
Queuing Penalty (veh)					11	1

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	75	125	186	34	91	142	44	57	88	59	92	55
Average Queue (ft)	22	37	62	16	38	28	17	21	29	17	38	17
95th Queue (ft)	60	91	143	37	78	83	38	48	59	51	78	41
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	1	2			0				1			
Queuing Penalty (veh)	2	1			0				0			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	48
Average Queue (ft)	10
95th Queue (ft)	34
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	168	132	50	74	54	74	159	68	124	78
Average Queue (ft)	74	59	18	48	24	26	73	19	51	25
95th Queue (ft)	137	110	48	83	54	58	133	44	96	56
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	4	1				0	9		0	
Queuing Penalty (veh)	7	1				1	4		0	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	180	174	127	114	129	121	97
Average Queue (ft)	80	41	32	27	60	21	22
95th Queue (ft)	140	108	89	68	104	69	60
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	0	0			7	0	
Queuing Penalty (veh)	0	0			9	1	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	25	48	52	77	26	172	170	97	96	114
Average Queue (ft)	2	7	11	39	2	66	57	57	16	28
95th Queue (ft)	14	29	36	68	13	142	138	94	59	79
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 160

Appendix F: Existing plus Dealership Traffic Conditions



Traffic Engineering, Inc.

<http://www.JLBtraffic.com>

Traffic Engineering, Transportation Planning, & Parking Solutions

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991
























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HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Dealership AM Peak (Weekday)

11/15/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	74	127	7	56	240	6	5	102	125	14	108	33
Future Volume (veh/h)	74	127	7	56	240	6	5	102	125	14	108	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	82	141	0	62	267	0	6	113	139	16	120	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	264	277		81	347		24	398	178	29	370	165
Arrive On Green	0.15	0.15	0.00	0.23	0.23	0.00	0.01	0.11	0.11	0.02	0.11	0.11
Sat Flow, veh/h	1767	1856	1572	346	1492	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	82	141	0	329	0	0	6	113	139	16	120	37
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1838	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.6	2.7	0.0	6.4	0.0	0.0	0.1	1.1	3.3	0.3	1.2	0.8
Cycle Q Clear(g_c), s	1.6	2.7	0.0	6.4	0.0	0.0	0.1	1.1	3.3	0.3	1.2	0.8
Prop In Lane	1.00		1.00	0.19		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	277		428	0		24	398	178	29	370	165
V/C Ratio(X)	0.31	0.51		0.77	0.00		0.25	0.28	0.78	0.55	0.32	0.22
Avail Cap(c_a), veh/h	1857	1950		633	0		186	398	178	186	398	178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.4	14.9	0.0	13.7	0.0	0.0	18.6	15.5	16.4	18.6	15.8	15.6
Incr Delay (d2), s/veh	0.7	1.4	0.0	3.4	0.0	0.0	5.2	0.4	20.0	15.5	0.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.0	0.0	2.4	0.0	0.0	0.1	0.4	1.9	0.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	16.3	0.0	17.0	0.0	0.0	23.8	15.9	36.4	34.1	16.3	16.3
LnGrp LOS	B	B		B	A		C	B	D	C	B	B
Approach Vol, veh/h			A			A			258			173
Approach Delay, s/veh			15.9			17.0			27.1			17.9
Approach LOS			B			B			C			B
Timer - Assigned Phs	2		3	4		6	7		8			
Phs Duration (G+Y+Rc), s	10.6		4.8	8.9		13.8	5.1		8.6			
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6		* 4.6			
Max Green Setting (Gmax), s	40.0		* 4	4.3		13.1	4.0		* 4.3			
Max Q Clear Time (g_c+I1), s	4.7		2.3	5.3		8.4	2.1		3.2			
Green Ext Time (p_c), s	1.0		0.0	0.0		0.8	0.0		0.1			

Intersection Summary

HCM 6th Ctrl Delay	19.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018

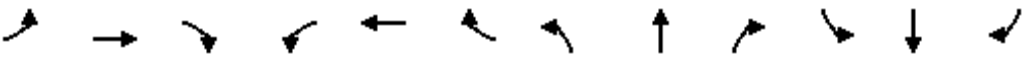
Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	75	2	9	48	8	3	1	14	10	2	1
Future Vol, veh/h	0	75	2	9	48	8	3	1	14	10	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	85	2	10	55	9	3	1	16	11	2	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	64	0	0	87	0	0	167	170	86	175	167	60
Stage 1	-	-	-	-	-	-	86	86	-	80	80	-
Stage 2	-	-	-	-	-	-	81	84	-	95	87	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1532	-	-	1503	-	-	795	721	970	785	724	1003
Stage 1	-	-	-	-	-	-	919	822	-	926	826	-
Stage 2	-	-	-	-	-	-	925	823	-	909	821	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1532	-	-	1503	-	-	788	716	970	767	719	1003
Mov Cap-2 Maneuver	-	-	-	-	-	-	788	716	-	767	719	-
Stage 1	-	-	-	-	-	-	919	822	-	926	820	-
Stage 2	-	-	-	-	-	-	915	817	-	893	821	-
Approach	EB		WB				NB			SB		
HCM Control Delay, s	0		1				9			9.7		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	917	1532	-	-	1503	-	-	773				
HCM Lane V/C Ratio	0.022	-	-	-	0.007	-	-	0.019				
HCM Control Delay (s)	9	0	-	-	7.4	0	-	9.7				
HCM Lane LOS	A	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↑	↗
Traffic Volume (vph)	0	294	36	63	352	0	0	0	85	202	41	87
Future Volume (vph)	0	294	36	63	352	0	0	0	85	202	41	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	300	37	64	359	0	0	0	87	206	42	89
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	63	0	0	59
Lane Group Flow (vph)	0	300	10	64	359	0	0	0	24	206	42	30
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		13.8	13.8	5.3	23.8				14.7	8.2	17.6	17.6
Effective Green, g (s)		13.8	13.8	5.3	23.8				14.7	8.2	17.6	17.6
Actuated g/C Ratio		0.26	0.26	0.10	0.45				0.28	0.16	0.33	0.33
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		914	409	175	1576				443	527	613	514
v/s Ratio Prot		c0.09		c0.04	0.10				0.02	c0.06	c0.02	
v/s Ratio Perm			0.01									0.02
v/c Ratio		0.33	0.02	0.37	0.23				0.05	0.39	0.07	0.06
Uniform Delay, d1		15.8	14.5	22.2	8.9				14.0	20.1	12.1	12.0
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2	0.0	1.3	0.1				0.1	0.5	0.0	0.0
Delay (s)		16.0	14.6	23.5	9.0				14.1	20.6	12.1	12.1
Level of Service		B	B	C	A				B	C	B	B
Approach Delay (s)		15.9			11.2			14.1			17.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			52.9			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			32.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	313	67	125	423	97	66	103	88	31	192	181
Future Volume (veh/h)	125	313	67	125	423	97	66	103	88	31	192	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	134	337	72	134	455	104	71	111	95	33	206	195
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	173	1089	486	237	799	181	174	647	288	52	543	425
Arrive On Green	0.10	0.31	0.31	0.07	0.28	0.28	0.05	0.18	0.18	0.03	0.15	0.15
Sat Flow, veh/h	1767	3526	1572	3428	2851	647	3428	3526	1572	1767	3526	2759
Grp Volume(v), veh/h	134	337	72	134	280	279	71	111	95	33	206	195
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1736	1714	1763	1572	1767	1763	1379
Q Serve(g_s), s	3.6	3.5	1.0	1.8	6.6	6.7	1.0	1.3	2.5	0.9	2.5	3.1
Cycle Q Clear(g_c), s	3.6	3.5	1.0	1.8	6.6	6.7	1.0	1.3	2.5	0.9	2.5	3.1
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	173	1089	486	237	494	486	174	647	288	52	543	425
V/C Ratio(X)	0.77	0.31	0.15	0.57	0.57	0.57	0.41	0.17	0.33	0.63	0.38	0.46
Avail Cap(c_a), veh/h	321	3546	1582	644	1820	1793	283	2658	1185	237	2767	2165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	12.8	4.6	21.8	14.9	14.9	22.3	16.7	17.2	23.2	18.4	18.6
Incr Delay (d2), s/veh	7.2	0.2	0.1	2.1	1.0	1.1	1.5	0.1	0.7	11.8	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.2	0.4	0.7	2.4	2.4	0.4	0.4	0.8	0.5	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	12.9	4.7	24.0	15.9	16.0	23.8	16.8	17.8	35.1	18.8	19.4
LnGrp LOS	C	B	A	C	B	B	C	B	B	D	B	B
Approach Vol, veh/h		543			693			277			434	
Approach Delay, s/veh		15.7			17.5			18.9			20.3	
Approach LOS		B			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	20.2	7.7	12.1	9.9	18.8	5.6	14.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.1	* 49	4.0	* 38	* 8.8	* 50	* 6.5	* 37				
Max Q Clear Time (g_c+I1), s	3.8	5.5	3.0	5.1	5.6	8.7	2.9	4.5				
Green Ext Time (p_c), s	0.2	2.7	0.0	2.1	0.1	3.9	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018























						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	417	0	0	586	130	44
Future Volume (vph)	417	0	0	586	130	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	444	0	0	623	138	47
RTOR Reduction (vph)	0	0	0	0	0	38
Lane Group Flow (vph)	444	0	0	623	138	9
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.4			21.4	6.8	6.8
Effective Green, g (s)	21.4			21.4	6.8	6.8
Actuated g/C Ratio	0.57			0.57	0.18	0.18
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2005			2005	318	285
v/s Ratio Prot	0.13			c0.18	c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.22			0.31	0.43	0.03
Uniform Delay, d1	3.9			4.2	13.6	12.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.0	0.0
Delay (s)	4.0			4.3	14.5	12.6
Level of Service	A			A	B	B
Approach Delay (s)	4.0			4.3	14.1	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	5.6			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.34					
Actuated Cycle Length (s)	37.4			Sum of lost time (s)		9.2
Intersection Capacity Utilization	31.1%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR		
Lane Configurations														
Traffic Volume (veh/h)	21	325	101	59	478	4	57	101	19	133	86	21		
Future Volume (veh/h)	21	325	101	59	478	4	57	101	19	133	86	21		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No			No			No			No				
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	23	353	110	64	520	4	62	110	0	145	93	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3		
Cap, veh/h	40	784	241	90	1161	9	88	353		277	524			
Arrive On Green	0.02	0.30	0.30	0.05	0.32	0.32	0.05	0.10	0.00	0.08	0.15	0.00		
Sat Flow, veh/h	1767	2654	815	1767	3585	28	1767	3526	1572	3428	3526	1572		
Grp Volume(v), veh/h	23	233	230	64	256	268	62	110	0	145	93	0		
Grp Sat Flow(s),veh/h/ln	1767	1763	1706	1767	1763	1850	1767	1763	1572	1714	1763	1572		
Q Serve(g_s), s	0.5	4.2	4.3	1.4	4.5	4.5	1.4	1.1	0.0	1.6	0.9	0.0		
Cycle Q Clear(g_c), s	0.5	4.2	4.3	1.4	4.5	4.5	1.4	1.1	0.0	1.6	0.9	0.0		
Prop In Lane	1.00		0.48	1.00		0.01	1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	40	520	504	90	571	599	88	353		277	524			
V/C Ratio(X)	0.58	0.45	0.46	0.71	0.45	0.45	0.70	0.31		0.52	0.18			
Avail Cap(c_a), veh/h	180	1845	1786	296	1944	2040	418	2956		584	2723			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.0	11.3	11.3	18.4	10.5	10.5	18.4	16.4	0.0	17.4	14.6	0.0		
Incr Delay (d2), s/veh	12.4	0.6	0.6	9.7	0.6	0.5	9.6	0.5	0.0	1.5	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.3	1.4	1.4	0.7	1.4	1.4	0.7	0.4	0.0	0.6	0.3	0.0		
Unsig. Movement Delay, s/veh														
LnGrp Delay(d),s/veh	31.5	11.9	11.9	28.1	11.1	11.0	28.0	16.9	0.0	18.9	14.8	0.0		
LnGrp LOS	C	B	B	C	B	B	C	B		B	B			
Approach Vol, veh/h	486			588			172			A			238	A
Approach Delay, s/veh	12.8			12.9			20.9			17.3				
Approach LOS	B			B			C			B				
Timer - Assigned Phs	1	2	3	4	5	6	7	8						
Phs Duration (G+Y+Rc), s	6.2	10.8	6.2	16.2	8.1	8.8	5.1	17.3						
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6						
Max Green Setting (Gmax), s	* 9.3	30.4	* 6.6	* 41	6.7	* 33	* 4	43.4						
Max Q Clear Time (g_c+I1), s	3.4	2.9	3.4	6.3	3.6	3.1	2.5	6.5						
Green Ext Time (p_c), s	0.0	0.5	0.0	3.1	0.1	0.6	0.0	3.3						

Intersection Summary

HCM 6th Ctrl Delay 14.5

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	211	44	51	216	106	83	291	16	89	308	181
Future Volume (veh/h)	107	211	44	51	216	106	83	291	16	89	308	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	135	267	56	65	273	134	105	368	20	113	390	229
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	447	94	82	472	390	134	476	26	145	519	431
Arrive On Green	0.10	0.31	0.31	0.05	0.25	0.25	0.08	0.27	0.27	0.08	0.28	0.28
Sat Flow, veh/h	1767	1465	307	1767	1856	1532	1767	1741	95	1767	1856	1542
Grp Volume(v), veh/h	135	0	323	65	273	134	105	0	388	113	390	229
Grp Sat Flow(s),veh/h/ln	1767	0	1772	1767	1856	1532	1767	0	1835	1767	1856	1542
Q Serve(g_s), s	4.6	0.0	9.5	2.2	7.9	4.4	3.6	0.0	11.9	3.8	11.7	7.7
Cycle Q Clear(g_c), s	4.6	0.0	9.5	2.2	7.9	4.4	3.6	0.0	11.9	3.8	11.7	7.7
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	171	0	541	82	472	390	134	0	502	145	519	431
V/C Ratio(X)	0.79	0.00	0.60	0.80	0.58	0.34	0.78	0.00	0.77	0.78	0.75	0.53
Avail Cap(c_a), veh/h	197	0	720	116	669	552	162	0	646	217	690	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	18.0	28.8	19.9	18.6	27.7	0.0	20.4	27.5	20.0	18.6
Incr Delay (d2), s/veh	17.0	0.0	1.1	21.7	1.1	0.5	18.4	0.0	4.4	10.0	3.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.6	1.4	3.2	1.5	2.1	0.0	5.3	1.9	4.8	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	0.0	19.1	50.6	21.0	19.1	46.1	0.0	24.8	37.4	23.3	19.6
LnGrp LOS	D	A	B	D	C	B	D	A	C	D	C	B
Approach Vol, veh/h		458			472			493			732	
Approach Delay, s/veh		26.4			24.5			29.3			24.3	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	21.6	7.0	23.2	8.8	22.0	10.1	20.1				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 7.5	* 22	* 4	24.8	* 5.6	22.7	* 6.8	22.0				
Max Q Clear Time (g_c+I1), s	5.8	13.9	4.2	11.5	5.6	13.7	6.6	9.9				
Green Ext Time (p_c), s	0.0	1.4	0.0	1.5	0.0	2.1	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C

Notes


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

Existing + Dealership AM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	370	0	0	0	0	584	34	131	275	0
Future Volume (vph)	0	0	370	0	0	0	0	584	34	131	275	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1536	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1536	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	389	0	0	0	0	615	36	138	289	0
RTOR Reduction (vph)	0	0	328	0	0	0	0	0	16	0	0	0
Lane Group Flow (vph)	0	0	61	0	0	0	0	615	20	138	289	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			4.8					17.3	17.3	3.5	16.1	
Effective Green, g (s)			4.8					17.3	17.3	3.5	16.1	
Actuated g/C Ratio			0.16					0.57	0.57	0.12	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			435					1994	874	201	1856	
v/s Ratio Prot			0.02					c0.18		c0.08	0.08	
v/s Ratio Perm									0.01			
v/c Ratio			0.14					0.31	0.02	0.69	0.16	
Uniform Delay, d1			11.0					3.4	2.9	12.9	3.7	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.1					0.1	0.0	9.3	0.0	
Delay (s)			11.2					3.5	2.9	22.3	3.7	
Level of Service			B					A	A	C	A	
Approach Delay (s)		11.2			0.0			3.5			9.7	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.3									
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			30.4							9.6		
Intersection Capacity Utilization			31.5%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	7	0	16	5	121	2	533	35	82	431	8
Future Vol, veh/h	7	7	0	16	5	121	2	533	35	82	431	8
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	8	0	19	6	141	2	620	41	95	501	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1014	1362	256	1090	1346	331	511	0	0	661	0	0
Stage 1	697	697	-	645	645	-	-	-	-	-	-	-
Stage 2	317	665	-	445	701	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	191	146	740	168	149	662	1043	-	-	917	-	-
Stage 1	395	438	-	425	463	-	-	-	-	-	-	-
Stage 2	666	454	-	559	437	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	134	130	740	147	133	662	1042	-	-	917	-	-
Mov Cap-2 Maneuver	134	130	-	147	133	-	-	-	-	-	-	-
Stage 1	394	392	-	424	462	-	-	-	-	-	-	-
Stage 2	517	453	-	491	391	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	36.1		18.4		0		1.5	
HCM LOS	E		C					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1042	-	-	132	-	431	917	-	-
HCM Lane V/C Ratio	0.002	-	-	0.123	-	0.383	0.104	-	-
HCM Control Delay (s)	8.5	-	-	36.1	0	18.4	9.4	-	-
HCM Lane LOS	A	-	-	E	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	1.8	0.3	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Dealership PM Peak (Weekday)

11/15/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	122	316	5	47	197	10	18	164	199	21	102	69
Future Volume (veh/h)	122	316	5	47	197	10	18	164	199	21	102	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	137	355	0	53	221	0	20	184	224	24	115	78
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	491	516		67	278		75	423	188	40	324	144
Arrive On Green	0.28	0.28	0.00	0.19	0.19	0.00	0.04	0.12	0.12	0.02	0.09	0.09
Sat Flow, veh/h	1767	1856	1572	355	1482	1572	1767	3526	1566	1767	3526	1572
Grp Volume(v), veh/h	137	355	0	274	0	0	20	184	224	24	115	78
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1838	0	1572	1767	1763	1566	1767	1763	1572
Q Serve(g_s), s	2.9	8.1	0.0	6.8	0.0	0.0	0.5	2.3	5.7	0.6	1.5	2.3
Cycle Q Clear(g_c), s	2.9	8.1	0.0	6.8	0.0	0.0	0.5	2.3	5.7	0.6	1.5	2.3
Prop In Lane	1.00		1.00	0.19		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	491	516		345	0		75	423	188	40	324	144
V/C Ratio(X)	0.28	0.69		0.79	0.00		0.27	0.44	1.19	0.59	0.36	0.54
Avail Cap(c_a), veh/h	1488	1562		453	0		149	423	188	149	423	189
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	15.3	0.0	18.4	0.0	0.0	22.0	19.4	20.9	23.0	20.3	20.6
Incr Delay (d2), s/veh	0.3	1.6	0.0	7.1	0.0	0.0	1.9	0.7	127.1	13.2	0.7	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.1	0.0	3.1	0.0	0.0	0.2	0.8	8.4	0.4	0.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	17.0	0.0	25.6	0.0	0.0	23.9	20.1	148.0	36.1	20.9	23.7
LnGrp LOS	B	B		C	A		C	C	F	D	C	C
Approach Vol, veh/h		492	A		274	A		428			217	
Approach Delay, s/veh		16.1			25.6			87.2			23.6	
Approach LOS		B			C			F			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.1	5.3	10.3		13.8	6.6	9.0				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	5.7		11.7	4.0	* 5.7				
Max Q Clear Time (g_c+I1), s		10.1	2.6	7.7		8.8	2.5	4.3				
Green Ext Time (p_c), s		2.6	0.0	0.0		0.4	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			40.6									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	119	8	25	117	24	7	9	12	13	2	1
Future Vol, veh/h	1	119	8	25	117	24	7	9	12	13	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	143	10	30	141	29	8	11	14	16	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	170	0	0	153	0	0	367	380	148	379	371	156
Stage 1	-	-	-	-	-	-	150	150	-	216	216	-
Stage 2	-	-	-	-	-	-	217	230	-	163	155	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1401	-	-	1421	-	-	587	551	896	577	557	887
Stage 1	-	-	-	-	-	-	850	771	-	784	722	-
Stage 2	-	-	-	-	-	-	783	712	-	837	767	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1401	-	-	1421	-	-	573	538	896	549	544	887
Mov Cap-2 Maneuver	-	-	-	-	-	-	573	538	-	549	544	-
Stage 1	-	-	-	-	-	-	849	770	-	783	705	-
Stage 2	-	-	-	-	-	-	761	696	-	811	766	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.1	10.7	11.6
HCM LOS			B	B













Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	661	1401	-	-	1421	-	-	562
HCM Lane V/C Ratio	0.051	0.001	-	-	0.021	-	-	0.034
HCM Control Delay (s)	10.7	7.6	0	-	7.6	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

HCM Signalized Intersection Capacity Analysis

4: Floral Avenue & SR-99 SB Off-Ramp

Existing + Dealership PM Peak (Weekday)

11/15/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↗	↑↑				↗	↗↑	↑	↗
Traffic Volume (vph)	0	615	70	111	553	0	0	0	169	301	49	144
Future Volume (vph)	0	615	70	111	553	0	0	0	169	301	49	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1544
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1544
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	641	73	116	576	0	0	0	176	314	51	150
RTOR Reduction (vph)	0	0	54	0	0	0	0	0	95	0	0	95
Lane Group Flow (vph)	0	641	19	116	576	0	0	0	81	314	51	55
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		15.2	15.2	6.4	26.3				17.0	11.5	22.1	22.1
Effective Green, g (s)		15.2	15.2	6.4	26.3				17.0	11.5	22.1	22.1
Actuated g/C Ratio		0.25	0.25	0.11	0.44				0.28	0.19	0.37	0.37
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		889	397	187	1538				452	652	680	569
v/s Ratio Prot		c0.18		c0.07	0.16				c0.05	c0.09	0.03	
v/s Ratio Perm			0.01									0.04
v/c Ratio		0.72	0.05	0.62	0.37				0.18	0.48	0.07	0.10
Uniform Delay, d1		20.4	16.9	25.6	11.3				16.2	21.5	12.3	12.4
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		2.9	0.0	6.3	0.2				0.2	0.6	0.0	0.1
Delay (s)		23.3	16.9	31.8	11.4				16.4	22.1	12.3	12.4
Level of Service		C	B	C	B				B	C	B	B
Approach Delay (s)		22.7			14.9			16.4			18.3	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			59.9			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			49.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	567	157	139	514	115	97	182	76	68	260	250
Future Volume (veh/h)	236	567	157	139	514	115	97	182	76	68	260	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	241	579	160	142	524	117	99	186	78	69	265	255
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	244	949	423	506	798	177	192	644	287	88	597	469
Arrive On Green	0.14	0.27	0.27	0.15	0.28	0.28	0.06	0.18	0.18	0.05	0.17	0.17
Sat Flow, veh/h	1767	3526	1572	3428	2866	637	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	241	579	160	142	321	320	99	186	78	69	265	255
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1741	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	7.7	8.1	4.7	2.1	9.1	9.2	1.6	2.6	1.4	2.2	3.8	4.8
Cycle Q Clear(g_c), s	7.7	8.1	4.7	2.1	9.1	9.2	1.6	2.6	1.4	2.2	3.8	4.8
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	244	949	423	506	491	485	192	644	287	88	597	469
V/C Ratio(X)	0.99	0.61	0.38	0.28	0.65	0.66	0.52	0.29	0.27	0.79	0.44	0.54
Avail Cap(c_a), veh/h	244	2999	1338	595	1593	1573	243	2043	911	323	2374	1864
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	18.0	16.8	21.4	18.0	18.0	25.9	19.9	7.0	26.5	21.0	21.4
Incr Delay (d2), s/veh	53.6	0.6	0.6	0.3	1.5	1.5	2.2	0.2	0.5	14.3	0.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	3.1	1.5	0.8	3.5	3.5	0.6	0.9	0.8	1.2	1.5	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.9	18.7	17.3	21.7	19.4	19.5	28.0	20.1	7.5	40.8	21.6	22.4
LnGrp LOS	E	B	B	C	B	B	C	C	A	D	C	C
Approach Vol, veh/h		980			783			363			589	
Approach Delay, s/veh		33.0			19.9			19.6			24.2	
Approach LOS		C			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	20.4	8.4	14.2	13.0	20.9	7.0	15.5				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.8	* 48	4.0	* 38	* 7.8	* 51	* 10	* 33				
Max Q Clear Time (g_c+I1), s	4.1	10.1	3.6	6.8	9.7	11.2	4.2	4.6				
Green Ext Time (p_c), s	0.2	5.1	0.0	2.8	0.0	4.6	0.1	1.3				

Intersection Summary

HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C

Notes







* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR-99 NB Off-Ramp & Floral Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018























						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↲
Traffic Volume (vph)	718	0	0	677	178	53
Future Volume (vph)	718	0	0	677	178	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	764	0	0	720	189	56
RTOR Reduction (vph)	0	0	0	0	0	45
Lane Group Flow (vph)	764	0	0	720	189	11
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.7			21.7	7.7	7.7
Effective Green, g (s)	21.7			21.7	7.7	7.7
Actuated g/C Ratio	0.56			0.56	0.20	0.20
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1970			1970	349	312
v/s Ratio Prot	c0.22			0.21	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.39			0.37	0.54	0.04
Uniform Delay, d1	4.7			4.7	13.9	12.5
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.7	0.0
Delay (s)	4.9			4.8	15.6	12.5
Level of Service	A			A	B	B
Approach Delay (s)	4.9			4.8	14.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	6.2			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.43					
Actuated Cycle Length (s)	38.6			Sum of lost time (s)		9.2
Intersection Capacity Utilization	37.4%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	501	165	75	390	12	83	165	19	243	129	57
Future Volume (veh/h)	42	501	165	75	390	12	83	165	19	243	129	57
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	539	177	81	419	13	89	177	0	261	139	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	263	927	303	103	896	28	114	446		380	657	
Arrive On Green	0.15	0.36	0.36	0.06	0.26	0.26	0.06	0.13	0.00	0.11	0.19	0.00
Sat Flow, veh/h	1767	2608	853	1767	3489	108	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	45	364	352	81	211	221	89	177	0	261	139	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1699	1767	1763	1834	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	1.2	8.7	8.8	2.4	5.3	5.3	2.6	2.4	0.0	3.8	1.7	0.0
Cycle Q Clear(g_c), s	1.2	8.7	8.8	2.4	5.3	5.3	2.6	2.4	0.0	3.8	1.7	0.0
Prop In Lane	1.00		0.50	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	627	604	103	453	471	114	446		380	657	
V/C Ratio(X)	0.17	0.58	0.58	0.79	0.47	0.47	0.78	0.40		0.69	0.21	
Avail Cap(c_a), veh/h	263	1413	1361	200	1463	1523	285	2231		447	2123	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.4	13.6	13.7	24.3	16.4	16.4	24.0	20.9	0.0	22.3	18.0	0.0
Incr Delay (d2), s/veh	0.3	0.9	0.9	12.6	0.7	0.7	11.0	0.6	0.0	3.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.1	3.0	1.3	1.9	2.0	1.3	0.9	0.0	1.5	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	14.5	14.6	36.9	17.1	17.1	35.0	21.5	0.0	25.8	18.1	0.0
LnGrp LOS	B	B	B	D	B	B	C	C		C	B	
Approach Vol, veh/h		761			513			266	A		400	A
Approach Delay, s/veh		14.8			20.2			26.0			23.2	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.6	14.6	7.2	22.7	10.7	11.5	12.0	18.0				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 8.4	31.4	* 5.9	* 42	6.8	* 33	4.0	* 43				
Max Q Clear Time (g_c+I1), s	4.6	3.7	4.4	10.8	5.8	4.4	3.2	7.3				
Green Ext Time (p_c), s	0.1	0.8	0.0	5.1	0.1	1.0	0.0	2.6				

Intersection Summary

HCM 6th Ctrl Delay 19.5

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	228	51	27	141	84	89	278	27	54	230	164
Future Volume (veh/h)	197	228	51	27	141	84	89	278	27	54	230	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	210	243	54	29	150	89	95	296	29	57	245	174
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	267	439	98	47	326	270	121	419	41	79	424	354
Arrive On Green	0.15	0.30	0.30	0.03	0.18	0.18	0.07	0.25	0.25	0.04	0.23	0.23
Sat Flow, veh/h	1767	1463	325	1767	1856	1541	1767	1661	163	1767	1856	1548
Grp Volume(v), veh/h	210	0	297	29	150	89	95	0	325	57	245	174
Grp Sat Flow(s),veh/h/ln	1767	0	1789	1767	1856	1541	1767	0	1824	1767	1856	1548
Q Serve(g_s), s	5.4	0.0	6.6	0.8	3.4	2.4	2.5	0.0	7.7	1.5	5.6	4.6
Cycle Q Clear(g_c), s	5.4	0.0	6.6	0.8	3.4	2.4	2.5	0.0	7.7	1.5	5.6	4.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	267	0	536	47	326	270	121	0	460	79	424	354
V/C Ratio(X)	0.79	0.00	0.55	0.61	0.46	0.33	0.79	0.00	0.71	0.72	0.58	0.49
Avail Cap(c_a), veh/h	439	0	1061	208	859	713	216	0	925	182	878	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	0.0	14.0	22.9	17.6	17.1	21.8	0.0	16.2	22.4	16.3	15.9
Incr Delay (d2), s/veh	5.1	0.0	0.9	12.2	1.0	0.7	10.8	0.0	2.0	11.9	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	2.3	0.4	1.4	0.8	1.3	0.0	3.0	0.8	2.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	0.0	14.9	35.1	18.6	17.8	32.6	0.0	18.2	34.3	17.5	17.0
LnGrp LOS	C	A	B	D	B	B	C	A	B	C	B	B
Approach Vol, veh/h		507			268			420			476	
Approach Delay, s/veh		18.9			20.1			21.4			19.4	
Approach LOS		B			C			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.3	16.9	5.5	18.9	7.4	15.8	11.4	12.9				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.9	* 24	* 5.6	28.2	* 5.8	22.5	* 12	22.0				
Max Q Clear Time (g_c+I1), s	3.5	9.7	2.8	8.6	4.5	7.6	7.4	5.4				
Green Ext Time (p_c), s	0.0	1.6	0.0	1.6	0.0	1.6	0.2	0.9				

Intersection Summary

HCM 6th Ctrl Delay 19.8

HCM 6th LOS B

Notes


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR-99 SB Off-Ramp

Existing + Dealership PM Peak (Weekday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘					↗↘	↗	↘	↗↘	
Traffic Volume (vph)	0	0	426	0	0	0	0	752	49	222	323	0
Future Volume (vph)	0	0	426	0	0	0	0	752	49	222	323	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1536	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1536	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	463	0	0	0	0	817	53	241	351	0
RTOR Reduction (vph)	0	0	382	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	0	81	0	0	0	0	817	27	241	351	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			6.0					17.3	17.3	7.4	18.8	
Effective Green, g (s)			6.0					17.3	17.3	7.4	18.8	
Actuated g/C Ratio			0.17					0.50	0.50	0.22	0.55	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			482					1767	774	377	1921	
v/s Ratio Prot			0.03					c0.23		c0.14	0.10	
v/s Ratio Perm									0.02			
v/c Ratio			0.17					0.46	0.03	0.64	0.18	
Uniform Delay, d1			12.0					5.5	4.3	12.2	3.9	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					0.2	0.0	3.5	0.0	
Delay (s)			12.2					5.7	4.3	15.8	3.9	
Level of Service			B					A	A	B	A	
Approach Delay (s)		12.2			0.0			5.6			8.8	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.2									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			34.3							9.6		
Intersection Capacity Utilization			41.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	5	9	6	19	6	120	6	599	28	126	617	11
Future Vol, veh/h	5	9	6	19	6	120	6	599	28	126	617	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	9	6	20	6	126	6	631	29	133	649	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1252	1593	331	1253	1585	330	661	0	0	660	0	0
Stage 1	921	921	-	658	658	-	-	-	-	-	-	-
Stage 2	331	672	-	595	927	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	128	105	662	128	106	663	917	-	-	917	-	-
Stage 1	289	345	-	417	457	-	-	-	-	-	-	-
Stage 2	653	450	-	455	343	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	87	89	662	103	90	663	917	-	-	917	-	-
Mov Cap-2 Maneuver	87	89	-	103	90	-	-	-	-	-	-	-
Stage 1	287	295	-	414	454	-	-	-	-	-	-	-
Stage 2	518	447	-	373	293	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41	24.3	0.1	1.6
HCM LOS	E	C		
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	917	-	-	88	662	336	917	-	-
HCM Lane V/C Ratio	0.007	-	-	0.167	0.01	0.454	0.145	-	-
HCM Control Delay (s)	9	-	-	54	10.5	24.3	9.6	-	-
HCM Lane LOS	A	-	-	F	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	2.3	0.5	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	19	78	32	11	112	101	72	266	21	65	234	25
Future Volume (veh/h)	19	78	32	11	112	101	72	266	21	65	234	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	80	0	11	115	0	74	274	22	67	241	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	133	140		14	151		108	569	254	101	554	245
Arrive On Green	0.08	0.08	0.00	0.09	0.09	0.00	0.06	0.16	0.16	0.06	0.16	0.16
Sat Flow, veh/h	1767	1856	1572	161	1686	1572	1767	3526	1572	1767	3526	1562
Grp Volume(v), veh/h	20	80	0	126	0	0	74	274	22	67	241	26
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1847	0	1572	1767	1763	1572	1767	1763	1562
Q Serve(g_s), s	0.3	1.3	0.0	2.0	0.0	0.0	1.2	2.1	0.4	1.1	1.9	0.4
Cycle Q Clear(g_c), s	0.3	1.3	0.0	2.0	0.0	0.0	1.2	2.1	0.4	1.1	1.9	0.4
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	133	140		166	0		108	569	254	101	554	245
V/C Ratio(X)	0.15	0.57		0.76	0.00		0.68	0.48	0.09	0.67	0.44	0.11
Avail Cap(c_a), veh/h	2344	2461		435	0		281	1111	495	281	1111	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	13.5	0.0	13.4	0.0	0.0	13.9	11.5	10.8	13.9	11.5	10.9
Incr Delay (d2), s/veh	0.5	3.7	0.0	7.0	0.0	0.0	7.4	0.6	0.1	7.3	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.5	0.0	0.9	0.0	0.0	0.6	0.6	0.1	0.5	0.5	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	17.1	0.0	20.4	0.0	0.0	21.2	12.1	10.9	21.3	12.0	11.1
LnGrp LOS	B	B		C	A		C	B	B	C	B	B
Approach Vol, veh/h		100	A		126	A		370			334	
Approach Delay, s/veh		16.4			20.4			13.9			13.8	
Approach LOS		B			C			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		7.2	5.9	9.5		7.6	6.0	9.3				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		40.0	* 4.8	9.5		7.1	* 4.8	9.5				
Max Q Clear Time (g_c+I1), s		3.3	3.1	4.1		4.0	3.2	3.9				
Green Ext Time (p_c), s		0.5	0.0	0.7		0.1	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018













Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	81	2	11	112	12	3	4	17	10	3	0
Future Vol, veh/h	0	81	2	11	112	12	3	4	17	10	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	86	2	12	119	13	3	4	18	11	3	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	132	0	0	88	0	0	238	243	87	248	238	126
Stage 1	-	-	-	-	-	-	87	87	-	150	150	-
Stage 2	-	-	-	-	-	-	151	156	-	98	88	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1447	-	-	1501	-	-	714	657	969	704	661	922
Stage 1	-	-	-	-	-	-	918	821	-	850	771	-
Stage 2	-	-	-	-	-	-	849	767	-	906	820	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1447	-	-	1501	-	-	706	651	969	683	655	922
Mov Cap-2 Maneuver	-	-	-	-	-	-	706	651	-	683	655	-
Stage 1	-	-	-	-	-	-	918	821	-	850	764	-
Stage 2	-	-	-	-	-	-	838	760	-	884	820	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.6			9.3			10.4		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	859	1447	-	-	1501	-	-	676				
HCM Lane V/C Ratio	0.03	-	-	-	0.008	-	-	0.02				
HCM Control Delay (s)	9.3	0	-	-	7.4	0	-	10.4				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	503	86	108	463	0	0	0	159	187	32	110
Future Volume (vph)	0	503	86	108	463	0	0	0	159	187	32	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1548
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	524	90	112	482	0	0	0	166	195	33	115
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	89	0	0	76
Lane Group Flow (vph)	0	524	22	113	482	0	0	0	77	195	33	39
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		14.2	14.2	7.2	26.1				18.7	8.0	19.5	19.5
Effective Green, g (s)		14.2	14.2	7.2	26.1				18.7	8.0	19.5	19.5
Actuated g/C Ratio		0.25	0.25	0.13	0.46				0.33	0.14	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		871	389	220	1602				522	476	630	528
v/s Ratio Prot		c0.15		c0.06	0.14				c0.05	c0.06	0.02	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.60	0.06	0.51	0.30				0.15	0.41	0.05	0.07
Uniform Delay, d1		19.0	16.3	23.3	9.8				13.6	22.4	12.6	12.7
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.1	2.0	0.1				0.1	0.6	0.0	0.1
Delay (s)		20.1	16.4	25.3	9.9				13.7	23.0	12.6	12.8
Level of Service		C	B	C	A				B	C	B	B
Approach Delay (s)		19.6			12.8			13.7			18.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			57.1			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			42.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	501	162	115	511	130	88	101	66	81	154	190
Future Volume (veh/h)	196	501	162	115	511	130	88	101	66	81	154	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	202	516	167	119	527	134	91	104	68	84	159	196
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	248	854	381	752	894	226	181	457	204	109	463	364
Arrive On Green	0.14	0.24	0.24	0.22	0.32	0.32	0.05	0.13	0.13	0.06	0.13	0.13
Sat Flow, veh/h	1767	3526	1572	3428	2780	704	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	202	516	167	119	333	328	91	104	68	84	159	196
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1721	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.5	7.6	5.2	1.6	9.2	9.3	1.5	1.5	1.2	2.7	2.4	3.9
Cycle Q Clear(g_c), s	6.5	7.6	5.2	1.6	9.2	9.3	1.5	1.5	1.2	2.7	2.4	3.9
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	248	854	381	752	567	554	181	457	204	109	463	364
V/C Ratio(X)	0.82	0.60	0.44	0.16	0.59	0.59	0.50	0.23	0.33	0.77	0.34	0.54
Avail Cap(c_a), veh/h	267	2980	1329	752	1514	1478	236	1793	800	376	2301	1807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	19.6	18.7	18.4	16.5	16.5	26.8	22.7	6.6	26.9	23.0	23.6
Incr Delay (d2), s/veh	16.6	0.7	0.8	0.1	1.0	1.0	2.1	0.2	0.9	11.0	0.4	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.9	1.7	0.6	3.5	3.4	0.6	0.6	0.8	1.4	0.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	20.3	19.5	18.5	17.5	17.6	29.0	23.0	7.5	37.9	23.4	24.9
LnGrp LOS	D	C	B	B	B	B	C	C	A	D	C	C
Approach Vol, veh/h		885			780			263			439	
Approach Delay, s/veh		24.8			17.7			21.0			26.9	
Approach LOS		C			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	19.3	8.7	12.3	13.4	23.9	7.8	13.2				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 8.6	* 49	4.0	* 38	* 8.8	* 50	* 12	29.6				
Max Q Clear Time (g_c+I1), s	3.6	9.6	3.5	5.9	8.5	11.3	4.7	3.5				
Green Ext Time (p_c), s	0.1	4.5	0.0	1.8	0.0	4.7	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	22.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	537	0	0	540	122	66
Future Volume (vph)	537	0	0	540	122	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	590	0	0	593	134	73
RTOR Reduction (vph)	0	0	0	0	0	60
Lane Group Flow (vph)	590	0	0	593	134	13
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.9			21.9	6.7	6.7
Effective Green, g (s)	21.9			21.9	6.7	6.7
Actuated g/C Ratio	0.58			0.58	0.18	0.18
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2030			2030	310	277
v/s Ratio Prot	0.17			c0.17	c0.08	
v/s Ratio Perm						0.01
v/c Ratio	0.29			0.29	0.43	0.05
Uniform Delay, d1	4.0			4.0	13.9	12.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.0	0.1
Delay (s)	4.1			4.1	14.8	13.0
Level of Service	A			A	B	B
Approach Delay (s)	4.1			4.1	14.2	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	5.6			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.32					
Actuated Cycle Length (s)	37.8			Sum of lost time (s)		9.2
Intersection Capacity Utilization	29.4%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	302	215	57	287	10	70	129	11	239	85	24
Future Volume (veh/h)	42	302	215	57	287	10	70	129	11	239	85	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	315	224	59	299	10	73	134	0	249	89	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	258	565	392	84	614	20	97	377		394	649	
Arrive On Green	0.15	0.28	0.28	0.05	0.18	0.18	0.06	0.11	0.00	0.12	0.18	0.00
Sat Flow, veh/h	1767	1988	1380	1767	3481	116	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	44	278	261	59	151	158	73	134	0	249	89	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1605	1767	1763	1835	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.9	5.5	5.7	1.3	3.2	3.2	1.7	1.4	0.0	2.8	0.9	0.0
Cycle Q Clear(g_c), s	0.9	5.5	5.7	1.3	3.2	3.2	1.7	1.4	0.0	2.8	0.9	0.0
Prop In Lane	1.00		0.86	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	501	456	84	311	323	97	377		394	649	
V/C Ratio(X)	0.17	0.56	0.57	0.70	0.49	0.49	0.75	0.36		0.63	0.14	
Avail Cap(c_a), veh/h	258	1835	1671	225	1870	1946	307	2850		571	2824	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	12.4	12.5	19.1	15.1	15.2	19.0	16.9	0.0	17.2	13.9	0.0
Incr Delay (d2), s/veh	0.3	1.0	1.1	9.9	1.2	1.1	10.9	0.6	0.0	1.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.9	1.8	0.7	1.1	1.2	0.9	0.5	0.0	1.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	13.4	13.6	29.1	16.3	16.3	29.9	17.5	0.0	18.9	14.0	0.0
LnGrp LOS	B	B	B	C	B	B	C	B		B	B	
Approach Vol, veh/h		583			368			207	A		338	A
Approach Delay, s/veh		13.7			18.4			21.8			17.6	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	12.4	6.2	15.8	9.6	9.3	10.2	11.8				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 7.1	32.7	* 5.2	* 43	6.8	* 33	4.0	* 43				
Max Q Clear Time (g_c+I1), s	3.7	2.9	3.3	7.7	4.8	3.4	2.9	5.2				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.8	0.2	0.7	0.0	1.8				

Intersection Summary

HCM 6th Ctrl Delay 16.8

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	124	35	23	96	37	46	191	16	28	167	127
Future Volume (veh/h)	182	124	35	23	96	37	46	191	16	28	167	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	184	125	35	23	97	37	46	193	16	28	169	128
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	238	329	92	40	230	193	73	348	29	48	357	299
Arrive On Green	0.13	0.24	0.24	0.02	0.12	0.12	0.04	0.21	0.21	0.03	0.19	0.19
Sat Flow, veh/h	1767	1393	390	1767	1856	1560	1767	1688	140	1767	1856	1556
Grp Volume(v), veh/h	184	0	160	23	97	37	46	0	209	28	169	128
Grp Sat Flow(s),veh/h/ln	1767	0	1783	1767	1856	1560	1767	0	1828	1767	1856	1556
Q Serve(g_s), s	3.5	0.0	2.7	0.5	1.7	0.8	0.9	0.0	3.6	0.6	2.9	2.6
Cycle Q Clear(g_c), s	3.5	0.0	2.7	0.5	1.7	0.8	0.9	0.0	3.6	0.6	2.9	2.6
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	238	0	421	40	230	193	73	0	377	48	357	299
V/C Ratio(X)	0.77	0.00	0.38	0.57	0.42	0.19	0.63	0.00	0.55	0.58	0.47	0.43
Avail Cap(c_a), veh/h	446	0	1361	201	1158	973	201	0	1110	276	1169	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	0.0	11.3	17.0	14.3	13.9	16.6	0.0	12.5	16.9	12.6	12.5
Incr Delay (d2), s/veh	5.3	0.0	0.6	11.9	1.2	0.5	8.7	0.0	1.3	10.7	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.8	0.3	0.6	0.2	0.5	0.0	1.3	0.3	0.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	0.0	11.9	29.0	15.5	14.3	25.4	0.0	13.8	27.6	13.6	13.5
LnGrp LOS	B	A	B	C	B	B	C	A	B	C	B	B
Approach Vol, veh/h		344			157			255			325	
Approach Delay, s/veh		16.2			17.2			15.9			14.8	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.2	12.2	5.0	12.9	5.7	11.7	9.0	9.0				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 5.5	* 21	* 4	26.9	* 4	22.2	* 8.9	22.0				
Max Q Clear Time (g_c+I1), s	2.6	5.6	2.5	4.7	2.9	4.9	5.5	3.7				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.8	0.0	1.1	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Notes


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↗					↖↖	↗	↖	↖↖	
Traffic Volume (vph)	0	0	260	0	0	0	0	585	30	167	250	0
Future Volume (vph)	0	0	260	0	0	0	0	585	30	167	250	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	265	0	0	0	0	597	31	170	255	0
RTOR Reduction (vph)	0	0	235	0	0	0	0	0	14	0	0	0
Lane Group Flow (vph)	0	0	30	0	0	0	0	597	17	170	255	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			3.4					16.8	16.8	3.5	17.0	
Effective Green, g (s)			3.4					16.8	16.8	3.5	17.0	
Actuated g/C Ratio			0.11					0.56	0.56	0.12	0.57	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			313					1969	862	205	1992	
v/s Ratio Prot			0.01					c0.17		c0.10	0.07	
v/s Ratio Perm									0.01			
v/c Ratio			0.10					0.30	0.02	0.83	0.13	
Uniform Delay, d1			11.9					3.5	2.9	12.9	3.0	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.1					0.1	0.0	23.3	0.0	
Delay (s)			12.0					3.5	2.9	36.2	3.0	
Level of Service			B					A	A	D	A	
Approach Delay (s)		12.0			0.0			3.5			16.3	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.3									
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			29.9									
Intersection Capacity Utilization			33.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱	↱		↱		↱	↱		↱	↱	
Traffic Vol, veh/h	6	5	3	14	9	92	4	490	33	87	432	11
Future Vol, veh/h	6	5	3	14	9	92	4	490	33	87	432	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	5	3	15	9	97	4	516	35	92	455	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	916	1204	234	956	1193	276	467	0	0	551	0	0
Stage 1	645	645	-	542	542	-	-	-	-	-	-	-
Stage 2	271	559	-	414	651	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	226	181	765	211	184	718	1084	-	-	1008	-	-
Stage 1	425	463	-	490	516	-	-	-	-	-	-	-
Stage 2	709	507	-	584	460	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	174	164	765	190	167	718	1084	-	-	1008	-	-
Mov Cap-2 Maneuver	174	164	-	190	167	-	-	-	-	-	-	-
Stage 1	423	421	-	488	514	-	-	-	-	-	-	-
Stage 2	600	505	-	522	418	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	24		15.9		0.1		1.5	
HCM LOS	C		C					






















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1084	-	-	169	765	450	1008	-	-
HCM Lane V/C Ratio	0.004	-	-	0.069	0.004	0.269	0.091	-	-
HCM Control Delay (s)	8.3	-	-	27.9	9.7	15.9	8.9	-	-
HCM Lane LOS	A	-	-	D	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	1.1	0.3	-	-

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Dealership AM Peak (Weekday)

11/15/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	7	0	16	5	121	2	533	35	82	431	8
Future Volume (veh/h)	7	7	0	16	5	121	2	533	35	82	431	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	8	8	0	19	6	141	2	620	41	95	501	9
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	15	235	0	34	9	208	4	1000	66	121	1289	23
Arrive On Green	0.01	0.13	0.00	0.02	0.14	0.14	0.00	0.30	0.30	0.07	0.36	0.36
Sat Flow, veh/h	1767	1856	0	1767	65	1518	1767	3356	222	1767	3543	64
Grp Volume(v), veh/h	8	8	0	19	0	147	2	325	336	95	249	261
Grp Sat Flow(s),veh/h/ln	1767	1856	0	1767	0	1582	1767	1763	1815	1767	1763	1844
Q Serve(g_s), s	0.2	0.2	0.0	0.4	0.0	3.6	0.0	6.4	6.4	2.1	4.2	4.2
Cycle Q Clear(g_c), s	0.2	0.2	0.0	0.4	0.0	3.6	0.0	6.4	6.4	2.1	4.2	4.2
Prop In Lane	1.00		0.00	1.00		0.96	1.00		0.12	1.00		0.03
Lane Grp Cap(c), veh/h	15	235	0	34	0	217	4	525	541	121	642	671
V/C Ratio(X)	0.53	0.03	0.00	0.57	0.00	0.68	0.46	0.62	0.62	0.79	0.39	0.39
Avail Cap(c_a), veh/h	175	1655	0	175	0	1466	175	1157	1192	385	1367	1430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	15.5	0.0	19.6	0.0	16.6	20.1	12.2	12.2	18.5	9.5	9.5
Incr Delay (d2), s/veh	26.2	0.1	0.0	14.1	0.0	3.7	60.0	1.2	1.2	10.7	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	0.3	0.0	1.3	0.1	1.9	1.9	1.1	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	15.5	0.0	33.7	0.0	20.2	80.1	13.4	13.4	29.2	9.9	9.9
LnGrp LOS	D	B	A	C	A	C	F	B	B	C	A	A
Approach Vol, veh/h	16		166			663			605			
Approach Delay, s/veh	30.8		21.8			13.6			12.9			
Approach LOS	C		C			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	17.3	5.0	11.1	4.3	20.0	4.5	11.5				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	4.1	8.4	2.4	2.2	2.0	6.2	2.2	5.6				
Green Ext Time (p_c), s	0.1	3.4	0.0	0.0	0.0	2.7	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	14.4											
HCM 6th LOS	B											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Dealership PM Peak (Weekday)

11/15/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	9	6	19	6	120	6	599	28	126	617	11
Future Volume (veh/h)	5	9	6	19	6	120	6	599	28	126	617	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	9	6	20	6	126	6	631	29	133	649	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	115	77	35	9	190	11	1001	46	172	1354	25
Arrive On Green	0.01	0.11	0.11	0.02	0.13	0.13	0.01	0.29	0.29	0.10	0.38	0.38
Sat Flow, veh/h	1767	1039	692	1767	72	1511	1767	3432	158	1767	3541	65
Grp Volume(v), veh/h	5	0	15	20	0	132	6	324	336	133	323	338
Grp Sat Flow(s),veh/h/ln	1767	0	1731	1767	0	1583	1767	1763	1827	1767	1763	1844
Q Serve(g_s), s	0.1	0.0	0.3	0.5	0.0	3.3	0.1	6.5	6.6	3.0	5.7	5.7
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.5	0.0	3.3	0.1	6.5	6.6	3.0	5.7	5.7
Prop In Lane	1.00		0.40	1.00		0.95	1.00		0.09	1.00		0.04
Lane Grp Cap(c), veh/h	10	0	192	35	0	199	11	514	533	172	674	705
V/C Ratio(X)	0.52	0.00	0.08	0.57	0.00	0.66	0.53	0.63	0.63	0.77	0.48	0.48
Avail Cap(c_a), veh/h	172	0	1519	172	0	1444	172	1139	1181	379	1345	1407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	16.3	19.9	0.0	17.1	20.3	12.6	12.6	18.1	9.6	9.6
Incr Delay (d2), s/veh	38.1	0.0	0.2	13.7	0.0	3.8	32.9	1.3	1.2	7.2	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.3	0.0	1.2	0.2	2.0	2.0	1.3	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	0.0	16.5	33.6	0.0	20.9	53.3	13.9	13.9	25.3	10.1	10.1
LnGrp LOS	E	A	B	C	A	C	D	B	B	C	B	B
Approach Vol, veh/h	20			152			666			794		
Approach Delay, s/veh	27.0			22.6			14.2			12.6		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	17.3	5.0	10.6	4.5	21.0	4.4	11.1				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	5.0	8.6	2.5	2.3	2.1	7.7	2.1	5.3				
Green Ext Time (p_c), s	0.1	3.4	0.0	0.0	0.0	3.7	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	14.4											
HCM 6th LOS	B											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Dealership MD Peak (Saturday)

11/15/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	5	3	14	9	92	4	490	33	87	432	11
Future Volume (veh/h)	6	5	3	14	9	92	4	490	33	87	432	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	6	5	3	15	9	97	4	516	35	92	455	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	88	53	24	12	130	7	640	43	879	2441	64
Arrive On Green	0.01	0.08	0.08	0.01	0.09	0.09	0.00	0.19	0.19	0.50	0.70	0.70
Sat Flow, veh/h	1767	1086	652	1767	135	1458	1767	3351	227	1767	3509	92
Grp Volume(v), veh/h	6	0	8	15	0	106	4	271	280	92	228	239
Grp Sat Flow(s),veh/h/ln	1767	0	1738	1767	0	1593	1767	1763	1815	1767	1763	1839
Q Serve(g_s), s	0.3	0.0	0.4	0.8	0.0	6.2	0.2	14.1	14.2	2.7	4.3	4.4
Cycle Q Clear(g_c), s	0.3	0.0	0.4	0.8	0.0	6.2	0.2	14.1	14.2	2.7	4.3	4.4
Prop In Lane	1.00		0.38	1.00		0.92	1.00		0.12	1.00		0.05
Lane Grp Cap(c), veh/h	11	0	141	24	0	142	7	337	347	879	1226	1279
V/C Ratio(X)	0.55	0.00	0.06	0.62	0.00	0.75	0.54	0.80	0.81	0.10	0.19	0.19
Avail Cap(c_a), veh/h	74	0	652	74	0	621	74	487	501	879	1226	1279
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	40.7	47.1	0.0	42.7	47.7	37.1	37.1	12.8	5.1	5.1
Incr Delay (d2), s/veh	37.1	0.0	0.2	22.9	0.0	7.7	49.0	18.2	18.1	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.5	0.0	2.7	0.2	7.5	7.7	1.0	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.6	0.0	40.9	70.0	0.0	50.3	96.7	55.4	55.2	12.9	5.4	5.4
LnGrp LOS	F	A	D	E	A	D	F	E	E	B	A	A
Approach Vol, veh/h	14			121			555			559		
Approach Delay, s/veh	59.6			52.8			55.6			6.7		
Approach LOS	E			D			E			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	53.0	23.6	5.5	13.8	4.6	72.1	4.8	14.5				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.8	* 27	* 4	36.0	* 4	32.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	4.7	16.2	2.8	2.4	2.2	6.4	2.3	8.2				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.0	0.0	2.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	33.5											
HCM 6th LOS	C											
Notes												

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	LT	R	T	T	R	L	T	T
Maximum Queue (ft)	65	104	260	77	54	6	44	9	43	38
Average Queue (ft)	25	53	103	3	7	0	3	0	3	3
95th Queue (ft)	52	94	171	25	28	2	19	3	19	17
Link Distance (ft)		1170	1310		2543	2543			1054	1054
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			35			100	75		
Storage Blk Time (%)		11	37							
Queuing Penalty (veh)		9	2							

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	24	30	30
Average Queue (ft)	1	12	9
95th Queue (ft)	8	33	28
Link Distance (ft)	2306	2752	2624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	84	83	60	78	175	131	56	77	76	53	90
Average Queue (ft)	43	28	8	37	66	41	10	42	52	22	41
95th Queue (ft)	74	67	28	69	122	91	43	81	76	52	69
Link Distance (ft)	1267	1267			546	546	229			1842	1842
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		
Storage Blk Time (%)		0			1						
Queuing Penalty (veh)		0			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	166	92	74	74	91	82	148	184	97	89	112	147
Average Queue (ft)	62	34	46	11	35	33	68	84	20	30	47	9
95th Queue (ft)	127	76	74	38	71	62	121	145	54	62	91	58
Link Distance (ft)		546	546				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	3	0	11	1			0					0
Queuing Penalty (veh)	5	0	7	1			0					0

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	48	56	150	96	75	70
Average Queue (ft)	20	27	69	39	40	31
95th Queue (ft)	41	53	123	82	62	57
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)			3	1		
Queuing Penalty (veh)			1	2		

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	90	116	157	160	118	55
Average Queue (ft)	27	40	53	61	46	34
95th Queue (ft)	70	88	118	122	79	65
Link Distance (ft)	467	467	558	558	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					21	1
Queuing Penalty (veh)					9	1

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	53	91	122	100	156	146	92	35	46	60	72	55
Average Queue (ft)	11	28	43	31	38	33	16	16	14	6	20	18
95th Queue (ft)	33	67	98	72	89	88	53	32	35	27	53	39
Link Distance (ft)		558	558		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		0		1	1							
Queuing Penalty (veh)		0		1	0							

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	49
Average Queue (ft)	20
95th Queue (ft)	46
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	199	238	72	223	210	129	228	175	195	136
Average Queue (ft)	56	87	40	106	42	63	121	54	101	46
95th Queue (ft)	113	161	70	178	101	125	196	113	175	98
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	0	8		12	0	5	31	3	4	
Queuing Penalty (veh)	0	8		19	0	17	26	10	3	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	196	172	64	67	109	103	53
Average Queue (ft)	106	59	20	24	55	21	27
95th Queue (ft)	167	124	52	59	97	59	58
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	0	0			7	0	
Queuing Penalty (veh)	1	0			10	0	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	T	TR	L	T	TR
Maximum Queue (ft)	24	30	52	72	127	140	94	118	116
Average Queue (ft)	3	6	18	42	67	53	38	25	42
95th Queue (ft)	16	25	46	66	111	101	71	68	89
Link Distance (ft)		2562		2527	2437	2437		605	605
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	150		150				250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Zone Summary

Zone wide Queuing Penalty: 134

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SE	SE	SE	SE	NW	NW	NW	NW
Directions Served	L	T	LT	L	T	T	R	L	T	T	R
Maximum Queue (ft)	204	295	178	19	74	22	37	13	26	21	13
Average Queue (ft)	50	95	84	1	17	1	5	1	2	1	0
95th Queue (ft)	123	175	152	6	52	8	22	6	12	10	4
Link Distance (ft)		1176	1310		2543	2543			1164	1164	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			200			100	75			120
Storage Blk Time (%)		23	31								
Queuing Penalty (veh)		29	3								

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	24	31	31
Average Queue (ft)	1	14	8
95th Queue (ft)	8	33	27
Link Distance (ft)	2306	2752	2624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	146	163	52	194	161	122	149	94	193	73	74
Average Queue (ft)	92	71	8	61	76	40	48	57	77	25	35
95th Queue (ft)	141	131	28	129	143	97	113	92	133	60	58
Link Distance (ft)	1267	1267			538	538	243			1840	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		2		0	0						
Queuing Penalty (veh)		1		1	0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	224	392	363	160	152	86	193	206	84	87	197	186
Average Queue (ft)	144	172	154	67	52	39	115	129	33	40	93	23
95th Queue (ft)	251	323	277	175	96	72	191	197	72	73	163	85
Link Distance (ft)		538	538				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	38	9	37	1	1		4				1	0
Queuing Penalty (veh)	108	22	59	3	1		6				1	0

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	69	130	205	129	100	93
Average Queue (ft)	27	50	89	36	52	40
95th Queue (ft)	59	105	149	82	89	75
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)	0	4	6	0	1	0
Queuing Penalty (veh)	0	5	4	0	1	0

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	276	280	144	138	97	55
Average Queue (ft)	77	99	61	69	61	39
95th Queue (ft)	169	206	117	125	98	65
Link Distance (ft)	467	467	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					25	1
Queuing Penalty (veh)					13	2

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	144	264	300	77	106	107	110	113	120	104	205	216
Average Queue (ft)	23	84	110	31	45	33	36	27	29	37	55	36
95th Queue (ft)	72	184	222	64	92	81	83	64	69	78	119	109
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	0	6			1		0	0	1	0	0	2
Queuing Penalty (veh)	1	3			0		0	0	0	0	0	6

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	179
Average Queue (ft)	36
95th Queue (ft)	96
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	325	71	177	77	130	355	194	196	61
Average Queue (ft)	103	110	25	70	38	81	151	52	88	31
95th Queue (ft)	183	238	57	138	66	140	274	101	150	55
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	10	9		6		21	22		3	
Queuing Penalty (veh)	28	18		6		65	20		1	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	194	176	174	152	140	233	70
Average Queue (ft)	113	66	55	44	77	45	28
95th Queue (ft)	170	153	120	99	129	152	60
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	1	0			12	1	
Queuing Penalty (veh)	1	0			19	1	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	30	53	94	30	177	142	100	186	202
Average Queue (ft)	2	11	18	44	7	73	67	56	48	59
95th Queue (ft)	12	33	49	77	25	135	127	91	124	129
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 433

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	R	LT	L	T	T	L	T	T
Maximum Queue (ft)	45	71	71	104	41	76	42	34	48	21
Average Queue (ft)	10	38	4	48	12	10	5	7	6	1
95th Queue (ft)	32	63	31	80	36	40	21	24	25	7
Link Distance (ft)	1176			1310		2543	2543		1164	1164
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140		50		200			75		
Storage Blk Time (%)		6	0	15						
Queuing Penalty (veh)		3	0	15						

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	51	31	26
Average Queue (ft)	3	15	6
95th Queue (ft)	19	36	23
Link Distance (ft)	2306	2752	2624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	162	120	64	88	150	147	106	124	159	51	90
Average Queue (ft)	66	49	11	43	69	47	32	48	63	16	34
95th Queue (ft)	127	100	33	75	129	108	89	102	118	43	60
Link Distance (ft)	1267	1267			538	538	243			1840	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		1			0						
Queuing Penalty (veh)		1			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	L	T	T
Maximum Queue (ft)	172	141	140	156	85	64	171	177	51	74	99	45
Average Queue (ft)	93	71	93	29	28	25	95	101	28	36	45	8
95th Queue (ft)	145	125	144	93	63	50	156	157	55	67	80	35
Link Distance (ft)		538	538				467	467			577	577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105			40	150	150			170	170		
Storage Blk Time (%)	12	3	24	2			2					
Queuing Penalty (veh)	30	5	40	4			2					

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	R	R
Maximum Queue (ft)	61	132	140	74	124	140
Average Queue (ft)	20	51	66	22	50	24
95th Queue (ft)	45	97	119	59	91	68
Link Distance (ft)			315	315		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	80	100			100	100
Storage Blk Time (%)	0	2	2		1	
Queuing Penalty (veh)	0	1	1		1	

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	94	145	117	98	141	55
Average Queue (ft)	34	56	40	44	64	40
95th Queue (ft)	82	125	94	91	120	62
Link Distance (ft)	467	467	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					25	1
Queuing Penalty (veh)					17	2

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	54	112	167	76	73	70	91	136	149	81	90	37
Average Queue (ft)	17	36	71	24	31	22	22	33	40	17	33	14
95th Queue (ft)	46	94	156	60	67	54	66	82	86	49	69	29
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		1						0	4			
Queuing Penalty (veh)		1						0	0			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	48
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	198	235	50	94	54	116	116	66	67	60
Average Queue (ft)	83	55	14	44	18	34	65	20	41	23
95th Queue (ft)	149	143	40	81	43	69	110	47	71	47
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	6	0		0		1	6			
Queuing Penalty (veh)	10	0		0		2	3			

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	158	114	104	113	139	165	52
Average Queue (ft)	84	29	34	37	56	22	22
95th Queue (ft)	131	72	77	77	106	91	47
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	0				5	0	
Queuing Penalty (veh)	0				6	0	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	29	30	52	76	30	155	156	140	114	118
Average Queue (ft)	5	7	18	37	1	57	52	59	27	41
95th Queue (ft)	21	25	44	66	10	126	129	117	84	103
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 144

Appendix G: Existing plus Project Buildout Traffic Conditions



Traffic Engineering, Inc.

<http://www.JLBtraffic.com>

Traffic Engineering, Transportation Planning, & Parking Solutions

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1300 E. Shaw Ave., Ste. 103

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HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout AM Peak (Weekday)

11/16/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	104	166	7	56	323	6	5	102	172	14	108	33
Future Volume (veh/h)	104	166	7	56	323	6	5	102	172	14	108	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	116	184	0	62	359	0	6	113	191	16	120	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	306	322		78	454		81	437	195	28	301	134
Arrive On Green	0.17	0.17	0.00	0.29	0.29	0.00	0.05	0.12	0.12	0.02	0.09	0.09
Sat Flow, veh/h	1767	1856	1572	271	1571	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	116	184	0	421	0	0	6	113	191	16	120	37
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1842	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.7	4.3	0.0	9.9	0.0	0.0	0.2	1.4	5.7	0.4	1.5	1.0
Cycle Q Clear(g_c), s	2.7	4.3	0.0	9.9	0.0	0.0	0.2	1.4	5.7	0.4	1.5	1.0
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	322		533	0		81	437	195	28	301	134
V/C Ratio(X)	0.38	0.57		0.79	0.00		0.07	0.26	0.98	0.56	0.40	0.28
Avail Cap(c_a), veh/h	1510	1586		850	0		151	437	195	151	437	195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	17.8	0.0	15.3	0.0	0.0	21.4	18.6	20.4	22.9	20.3	20.0
Incr Delay (d2), s/veh	0.8	1.6	0.0	2.7	0.0	0.0	0.4	0.3	58.5	16.4	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.7	0.0	3.7	0.0	0.0	0.1	0.5	4.9	0.3	0.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	19.4	0.0	18.0	0.0	0.0	21.8	18.9	79.0	39.2	21.1	21.1
LnGrp LOS	B	B		B	A		C	B	E	D	C	C
Approach Vol, veh/h		300	A		421	A		310			173	
Approach Delay, s/veh		18.8			18.0			56.0			22.8	
Approach LOS		B			B			E			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.0	5.0	10.4		18.4	6.8	8.6				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	5.8		21.6	4.0	* 5.8				
Max Q Clear Time (g_c+I1), s		6.3	2.4	7.7		11.9	2.2	3.5				
Green Ext Time (p_c), s		1.4	0.0	0.0		1.7	0.0	0.1				

Intersection Summary

HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Project Buildout AM Peak (Weekday)







11/16/2018

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	99	2	13	65	11	3	1	20	13	2	1
Future Vol, veh/h	0	99	2	13	65	11	3	1	20	13	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	113	2	15	74	13	3	1	23	15	2	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	87	0	0	115	0	0	226	231	114	237	226	81
Stage 1	-	-	-	-	-	-	114	114	-	111	111	-
Stage 2	-	-	-	-	-	-	112	117	-	126	115	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1503	-	-	1468	-	-	727	667	936	715	671	976
Stage 1	-	-	-	-	-	-	888	799	-	892	802	-
Stage 2	-	-	-	-	-	-	891	797	-	875	798	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1503	-	-	1468	-	-	718	660	936	691	664	976
Mov Cap-2 Maneuver	-	-	-	-	-	-	718	660	-	691	664	-
Stage 1	-	-	-	-	-	-	888	799	-	892	793	-
Stage 2	-	-	-	-	-	-	878	788	-	853	798	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.1			9.2			10.3		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	887	1503	-	-	1468	-	-	700				
HCM Lane V/C Ratio	0.031	-	-	-	0.01	-	-	0.026				
HCM Control Delay (s)	9.2	0	-	-	7.5	0	-	10.3				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1				

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Existing + Project Buildout AM Peak (Weekday)


11/16/2018

Intersection							
Int Delay, s/veh	8.6						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	28	107	12	181	258	282	14
Future Vol, veh/h	28	107	12	181	258	282	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	30	116	13	197	280	307	15
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	477	0	-	-	0	539	239
Stage 1	-	-	-	-	-	363	-
Stage 2	-	-	-	-	-	176	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	1077	-	-	-	-	486	760
Stage 1	-	-	-	-	-	673	-
Stage 2	-	-	-	-	-	851	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1077	-	-	-	-	472	760
Mov Cap-2 Maneuver	-	-	-	-	-	472	-
Stage 1	-	-	-	-	-	654	-
Stage 2	-	-	-	-	-	851	-
Approach	EB	WB		SB			
HCM Control Delay, s	1.8			24.9			
HCM LOS				C			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1077	-	-	-	-	472	760
HCM Lane V/C Ratio	0.028	-	-	-	-	0.649	0.02
HCM Control Delay (s)	8.4	-	-	-	-	25.7	9.8
HCM Lane LOS	A	-	-	-	-	D	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	4.6	0.1

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/16/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	557	36	63	619	0	0	0	85	202	41	223
Future Volume (vph)	0	557	36	63	619	0	0	0	85	202	41	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	568	37	64	632	0	0	0	87	206	42	228
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	60	0	0	85
Lane Group Flow (vph)	0	568	10	64	632	0	0	0	27	206	42	143
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		15.4	15.4	3.8	23.9				16.6	6.1	18.9	18.9
Effective Green, g (s)		15.4	15.4	3.8	23.9				16.6	6.1	18.9	18.9
Actuated g/C Ratio		0.28	0.28	0.07	0.44				0.31	0.11	0.35	0.35
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		994	444	122	1542				487	381	642	538
v/s Ratio Prot		c0.16		0.04	c0.18				0.02	c0.06	0.02	
v/s Ratio Perm			0.01									c0.09
v/c Ratio		0.57	0.02	0.52	0.41				0.05	0.54	0.07	0.27
Uniform Delay, d1		16.6	14.0	24.4	10.4				13.3	22.8	11.8	12.7
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.0	4.0	0.2				0.0	1.6	0.0	0.3
Delay (s)		17.5	14.0	28.4	10.6				13.4	24.3	11.9	13.0
Level of Service		B	B	C	B				B	C	B	B
Approach Delay (s)		17.3			12.2			13.4			17.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			54.3			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			42.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout AM Peak (Weekday)

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	431	143	125	539	97	87	103	88	31	192	311
Future Volume (veh/h)	194	431	143	125	539	97	87	103	88	31	192	311
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	209	463	154	134	580	104	94	111	95	33	206	334
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	1312	585	224	888	159	176	776	346	49	671	525
Arrive On Green	0.14	0.37	0.37	0.07	0.30	0.30	0.05	0.22	0.22	0.03	0.19	0.19
Sat Flow, veh/h	1767	3526	1572	3428	2986	534	3428	3526	1572	1767	3526	2760
Grp Volume(v), veh/h	209	463	154	134	342	342	94	111	95	33	206	334
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1757	1714	1763	1572	1767	1763	1380
Q Serve(g_s), s	7.3	6.0	2.8	2.4	10.6	10.7	1.7	1.6	3.2	1.2	3.2	7.0
Cycle Q Clear(g_c), s	7.3	6.0	2.8	2.4	10.6	10.7	1.7	1.6	3.2	1.2	3.2	7.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	247	1312	585	224	524	523	176	776	346	49	671	525
V/C Ratio(X)	0.85	0.35	0.26	0.60	0.65	0.65	0.53	0.14	0.27	0.67	0.31	0.64
Avail Cap(c_a), veh/h	247	2729	1217	496	1401	1396	218	2045	912	183	2130	1667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	14.3	5.9	28.6	19.3	19.3	29.1	19.8	20.4	30.3	21.9	23.5
Incr Delay (d2), s/veh	22.7	0.2	0.2	2.6	1.4	1.4	2.5	0.1	0.4	14.6	0.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.2	1.2	1.0	4.2	4.2	0.7	0.6	1.1	0.7	1.2	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.1	14.4	6.1	31.2	20.6	20.7	31.6	19.8	20.8	44.9	22.2	24.7
LnGrp LOS	D	B	A	C	C	C	C	B	C	D	C	C
Approach Vol, veh/h		826			818			300			573	
Approach Delay, s/veh		21.7			22.4			23.8			25.0	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	28.6	8.4	16.6	14.0	23.9	6.0	19.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.1	* 49	4.0	* 38	* 8.8	* 50	* 6.5	* 37				
Max Q Clear Time (g_c+l1), s	4.4	8.0	3.7	9.0	9.3	12.7	3.2	5.2				
Green Ext Time (p_c), s	0.1	4.0	0.0	2.7	0.0	4.9	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout AM Peak (Weekday)

6: SR 99 NB Off-Ramp & Floral Avenue

11/16/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	456	0	0	632	200	44
Future Volume (vph)	456	0	0	632	200	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	485	0	0	672	213	47
RTOR Reduction (vph)	0	0	0	0	0	37
Lane Group Flow (vph)	485	0	0	672	213	10
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	19.5			19.5	7.9	7.9
Effective Green, g (s)	19.5			19.5	7.9	7.9
Actuated g/C Ratio	0.53			0.53	0.22	0.22
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1867			1867	378	338
v/s Ratio Prot	0.14			0.19	0.12	
v/s Ratio Perm						0.01
v/c Ratio	0.26			0.36	0.56	0.03
Uniform Delay, d1	4.6			4.9	12.8	11.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.9	0.0
Delay (s)	4.7			5.1	14.7	11.4
Level of Service	A			A	B	B
Approach Delay (s)	4.7			5.1	14.1	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay		6.6		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.42				
Actuated Cycle Length (s)		36.6		Sum of lost time (s)		9.2
Intersection Capacity Utilization		36.2%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing + Project Buildout AM Peak (Weekday)

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	21	343	119	59	501	4	57	101	19	151	86	21
Future Volume (veh/h)	21	343	119	59	501	4	57	101	19	151	86	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	373	129	64	545	4	62	110	0	164	93	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	40	792	270	90	1203	9	88	346		286	526	
Arrive On Green	0.02	0.31	0.31	0.05	0.34	0.34	0.05	0.10	0.00	0.08	0.15	0.00
Sat Flow, veh/h	1767	2578	879	1767	3587	26	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	23	253	249	64	268	281	62	110	0	164	93	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1694	1767	1763	1851	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.5	4.7	4.8	1.4	4.8	4.8	1.4	1.2	0.0	1.9	0.9	0.0
Cycle Q Clear(g_c), s	0.5	4.7	4.8	1.4	4.8	4.8	1.4	1.2	0.0	1.9	0.9	0.0
Prop In Lane	1.00		0.52	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	40	542	521	90	591	621	88	346		286	526	
V/C Ratio(X)	0.58	0.47	0.48	0.71	0.45	0.45	0.71	0.32		0.57	0.18	
Avail Cap(c_a), veh/h	175	1811	1741	271	1890	1984	407	2881		577	2662	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.5	11.3	11.4	18.9	10.5	10.5	18.9	17.0	0.0	17.8	15.0	0.0
Incr Delay (d2), s/veh	12.5	0.6	0.7	10.0	0.5	0.5	9.9	0.5	0.0	1.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	1.5	0.8	1.5	1.5	0.7	0.4	0.0	0.7	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	11.9	12.0	28.9	11.1	11.0	28.8	17.5	0.0	19.6	15.2	0.0
LnGrp LOS	C	B	B	C	B	B	C	B		B	B	
Approach Vol, veh/h		525			613			172	A		257	A
Approach Delay, s/veh		12.9			12.9			21.6			18.0	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	10.9	6.2	17.0	8.3	8.9	5.1	18.2				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.3	30.5	* 6.2	* 42	6.8	* 33	* 4	43.3				
Max Q Clear Time (g_c+I1), s	3.4	2.9	3.4	6.8	3.9	3.2	2.5	6.8				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.4	0.1	0.6	0.0	3.5				

Intersection Summary

HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

Existing + Project Buildout AM Peak (Weekday)

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	212	48	51	219	106	88	291	16	89	308	187
Future Volume (veh/h)	111	212	48	51	219	106	88	291	16	89	308	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.97	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	141	268	61	65	277	134	111	368	20	113	390	237
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	178	443	101	82	471	389	141	480	26	145	515	428
Arrive On Green	0.10	0.31	0.31	0.05	0.25	0.25	0.08	0.28	0.28	0.08	0.28	0.28
Sat Flow, veh/h	1767	1439	328	1767	1856	1532	1767	1741	95	1767	1856	1541
Grp Volume(v), veh/h	141	0	329	65	277	134	111	0	388	113	390	237
Grp Sat Flow(s),veh/h/ln	1767	0	1767	1767	1856	1532	1767	0	1835	1767	1856	1541
Q Serve(g_s), s	4.8	0.0	9.8	2.3	8.1	4.4	3.8	0.0	12.1	3.9	11.9	8.2
Cycle Q Clear(g_c), s	4.8	0.0	9.8	2.3	8.1	4.4	3.8	0.0	12.1	3.9	11.9	8.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	178	0	544	82	471	389	141	0	506	145	515	428
V/C Ratio(X)	0.79	0.00	0.60	0.79	0.59	0.34	0.78	0.00	0.77	0.78	0.76	0.55
Avail Cap(c_a), veh/h	199	0	682	142	657	543	165	0	629	213	666	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	18.3	29.3	20.3	19.0	28.1	0.0	20.7	28.0	20.5	19.2
Incr Delay (d2), s/veh	17.7	0.0	1.1	15.6	1.2	0.5	18.9	0.0	4.5	10.5	3.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	3.7	1.3	3.3	1.5	2.3	0.0	5.4	1.9	5.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	0.0	19.4	45.0	21.5	19.5	47.0	0.0	25.2	38.5	24.2	20.3
LnGrp LOS	D	A	B	D	C	B	D	A	C	D	C	C
Approach Vol, veh/h		470			476			499			740	
Approach Delay, s/veh		27.1			24.1			30.0			25.1	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.3	22.0	7.1	23.7	9.2	22.1	10.4	20.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 7.5	* 21	* 5	24.0	* 5.8	22.3	* 7	22.0				
Max Q Clear Time (g_c+I1), s	5.9	14.1	4.3	11.8	5.8	13.9	6.8	10.1				
Green Ext Time (p_c), s	0.0	1.4	0.0	1.5	0.0	2.0	0.0	1.6				

Intersection Summary

HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C


Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout AM Peak (Weekday)

9: Highland Avenue & SR 99 SB Ramps

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘					↗↘	↗	↘	↗↘	
Traffic Volume (vph)	0	0	370	0	0	0	0	605	34	194	288	0
Future Volume (vph)	0	0	370	0	0	0	0	605	34	194	288	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1536	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1536	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	389	0	0	0	0	637	36	204	303	0
RTOR Reduction (vph)	0	0	323	0	0	0	0	0	19	0	0	0
Lane Group Flow (vph)	0	0	66	0	0	0	0	637	17	204	303	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			5.5					15.5	15.5	7.1	17.2	
Effective Green, g (s)			5.5					15.5	15.5	7.1	17.2	
Actuated g/C Ratio			0.17					0.48	0.48	0.22	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			471					1687	739	386	1872	
v/s Ratio Prot			0.02					c0.18		c0.12	0.09	
v/s Ratio Perm									0.01			
v/c Ratio			0.14					0.38	0.02	0.53	0.16	
Uniform Delay, d1			11.3					5.3	4.4	11.1	3.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.1					0.1	0.0	1.3	0.0	
Delay (s)			11.5					5.4	4.4	12.4	3.9	
Level of Service			B					A	A	B	A	
Approach Delay (s)		11.5			0.0			5.4			7.3	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.5									
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			32.2							9.6		
Intersection Capacity Utilization			35.6%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Project Buildout AM Peak (Weekday)

11/16/2018

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	7	0	16	5	125	2	547	35	84	440	8
Future Vol, veh/h	7	7	0	16	5	125	2	547	35	84	440	8
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	8	0	19	6	145	2	636	41	98	512	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1039	1395	262	1117	1379	339	522	0	0	677	0	0
Stage 1	714	714	-	661	661	-	-	-	-	-	-	-
Stage 2	325	681	-	456	718	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	183	139	734	161	142	654	1034	-	-	904	-	-
Stage 1	386	431	-	416	455	-	-	-	-	-	-	-
Stage 2	659	446	-	551	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	126	124	734	140	126	654	1033	-	-	904	-	-
Mov Cap-2 Maneuver	126	124	-	140	126	-	-	-	-	-	-	-
Stage 1	385	384	-	415	454	-	-	-	-	-	-	-
Stage 2	505	445	-	481	382	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.1		19.1		0		1.5	
HCM LOS	E		C					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1033	-	-	125	-	423	904	-	-
HCM Lane V/C Ratio	0.002	-	-	0.13	-	0.401	0.108	-	-
HCM Control Delay (s)	8.5	-	-	38.1	0	19.1	9.5	-	-
HCM Lane LOS	A	-	-	E	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	1.9	0.4	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout PM Peak (Weekday)

11/16/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	308	478	5	47	392	10	18	164	369	21	102	69
Future Volume (veh/h)	308	478	5	47	392	10	18	164	369	21	102	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	346	537	0	53	440	0	20	184	415	24	115	78
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	627	658		51	427		89	397	176	37	275	123
Arrive On Green	0.35	0.35	0.00	0.26	0.26	0.00	0.05	0.11	0.11	0.02	0.08	0.08
Sat Flow, veh/h	1767	1856	1572	198	1647	1572	1767	3526	1566	1767	3526	1572
Grp Volume(v), veh/h	346	537	0	493	0	0	20	184	415	24	115	78
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1846	0	1572	1767	1763	1566	1767	1763	1572
Q Serve(g_s), s	11.6	19.4	0.0	19.1	0.0	0.0	0.8	3.6	8.3	1.0	2.3	3.5
Cycle Q Clear(g_c), s	11.6	19.4	0.0	19.1	0.0	0.0	0.8	3.6	8.3	1.0	2.3	3.5
Prop In Lane	1.00		1.00	0.11		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	627	658		478	0		89	397	176	37	275	123
V/C Ratio(X)	0.55	0.82		1.03	0.00		0.22	0.46	2.35	0.64	0.42	0.64
Avail Cap(c_a), veh/h	959	1007		478	0		98	397	176	96	392	175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	21.6	0.0	27.3	0.0	0.0	33.6	30.6	32.7	35.8	32.4	33.0
Incr Delay (d2), s/veh	0.8	3.1	0.0	49.2	0.0	0.0	1.3	0.8	626.3	17.1	1.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	8.2	0.0	14.3	0.0	0.0	0.4	1.5	33.6	0.6	1.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	24.7	0.0	76.5	0.0	0.0	34.9	31.5	659.0	52.9	33.4	38.3
LnGrp LOS	B	C		F	A		C	C	F	D	C	D
Approach Vol, veh/h		883	A		493	A		619			217	
Approach Delay, s/veh		22.8			76.5			452.3			37.3	
Approach LOS		C			E			F			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		31.0	5.8	12.9		24.0	8.3	10.3				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	8.3		19.1	4.1	* 8.2				
Max Q Clear Time (g_c+I1), s		21.4	3.0	10.3		21.1	2.8	5.5				
Green Ext Time (p_c), s		4.3	0.0	0.0		0.0	0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay 156.4

HCM 6th LOS F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Project Buildout PM Peak (Weekday)

11/16/2018

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	199	8	210	186	30	7	9	263	22	2	1
Future Vol, veh/h	1	199	8	210	186	30	7	9	263	22	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	240	10	253	224	36	8	11	317	27	2	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	260	0	0	250	0	0	997	1013	245	1159	1000	242
Stage 1	-	-	-	-	-	-	247	247	-	748	748	-
Stage 2	-	-	-	-	-	-	750	766	-	411	252	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1299	-	-	1310	-	-	222	238	791	172	242	794
Stage 1	-	-	-	-	-	-	755	700	-	403	418	-
Stage 2	-	-	-	-	-	-	402	410	-	616	697	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1299	-	-	1310	-	-	181	184	791	81	187	794
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	184	-	81	187	-
Stage 1	-	-	-	-	-	-	754	699	-	403	323	-
Stage 2	-	-	-	-	-	-	308	317	-	363	696	-







Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.1	15.8	65.9
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	664	1299	-	-	1310	-	-	88
HCM Lane V/C Ratio	0.506	0.001	-	-	0.193	-	-	0.342
HCM Control Delay (s)	15.8	7.8	0	-	8.4	0	-	65.9
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	2.9	0	-	-	0.7	-	-	1.3

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Existing + Project Buildout PM Peak (Weekday)


11/16/2018

Intersection							
Int Delay, s/veh	2421.5						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	216	217	38	511	477	943	151
Future Vol, veh/h	216	217	38	511	477	943	151
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	235	236	41	555	518	1025	164
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	1073	0	-	-	0	1602	537
Stage 1	-	-	-	-	-	896	-
Stage 2	-	-	-	-	-	706	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	643	-	-	-	-	~ 105	487
Stage 1	-	-	-	-	-	~ 358	-
Stage 2	-	-	-	-	-	~ 486	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	643	-	-	-	-	~ 67	487
Mov Cap-2 Maneuver	-	-	-	-	-	~ 67	-
Stage 1	-	-	-	-	-	~ 227	-
Stage 2	-	-	-	-	-	~ 486	-
Approach	EB		WB		SB		
HCM Control Delay, s	6.9				\$ 5648.2		
HCM LOS					F		
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	643	-	-	-	-	67	487
HCM Lane V/C Ratio	0.365	-	-	-	-	15.299	0.337
HCM Control Delay (s)	13.8	-	-	-	-	\$ 6550	16.1
HCM Lane LOS	B	-	-	-	-	F	C
HCM 95th %tile Q(veh)	1.7	-	-	-	-	122.9	1.5
Notes							
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon							

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

11/16/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1498	70	111	1181	0	0	0	169	301	49	547
Future Volume (vph)	0	1498	70	111	1181	0	0	0	169	301	49	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1539
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1539
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1560	73	116	1230	0	0	0	176	314	51	570
RTOR Reduction (vph)	0	0	39	0	0	0	0	0	69	0	0	65
Lane Group Flow (vph)	0	1560	34	116	1230	0	0	0	107	314	51	505
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		50.8	50.8	8.0	63.5				19.6	23.4	35.0	35.0
Effective Green, g (s)		50.8	50.8	8.0	63.5				19.6	23.4	35.0	35.0
Actuated g/C Ratio		0.46	0.46	0.07	0.58				0.18	0.21	0.32	0.32
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1618	724	127	2023				284	723	587	489
v/s Ratio Prot		c0.45		c0.07	0.35				0.07	0.09	0.03	
v/s Ratio Perm			0.02									c0.33
v/c Ratio		0.96	0.05	0.91	0.61				0.38	0.43	0.09	1.03
Uniform Delay, d1		28.7	16.3	50.7	15.1				39.8	37.6	26.3	37.5
Progression Factor		1.00	0.83	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		14.7	0.0	53.8	0.5				0.8	0.4	0.1	49.5
Delay (s)		43.4	13.5	104.4	15.7				40.7	38.0	26.4	87.0
Level of Service		D	B	F	B				D	D	C	F
Approach Delay (s)		42.0			23.3			40.7			67.2	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			76.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout PM Peak (Weekday)

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	583	1010	250	139	732	115	142	182	76	68	260	615
Future Volume (veh/h)	583	1010	250	139	732	115	142	182	76	68	260	615
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	595	1031	255	142	747	117	145	186	78	69	265	628
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	228	1348	601	215	965	151	155	987	440	89	989	776
Arrive On Green	0.13	0.38	0.38	0.06	0.32	0.32	0.05	0.28	0.28	0.05	0.28	0.28
Sat Flow, veh/h	1767	3526	1572	3428	3054	478	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	595	1031	255	142	431	433	145	186	78	69	265	628
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1769	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	11.4	22.5	10.5	3.6	19.5	19.6	3.7	3.5	2.5	3.4	5.2	18.6
Cycle Q Clear(g_c), s	11.4	22.5	10.5	3.6	19.5	19.6	3.7	3.5	2.5	3.4	5.2	18.6
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1348	601	215	557	559	155	987	440	89	989	776
V/C Ratio(X)	2.61	0.76	0.42	0.66	0.77	0.77	0.93	0.19	0.18	0.77	0.27	0.81
Avail Cap(c_a), veh/h	228	1918	855	381	1019	1023	155	1306	583	206	1518	1192
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	23.8	20.1	40.4	27.3	27.3	42.0	24.1	13.5	41.4	24.7	29.5
Incr Delay (d2), s/veh	735.3	1.2	0.5	3.4	2.3	2.3	52.6	0.1	0.2	13.3	0.1	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	51.5	9.2	3.6	1.6	8.3	8.3	2.6	1.4	1.2	1.8	2.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	773.7	25.0	20.6	43.8	29.7	29.7	94.6	24.2	13.7	54.7	24.8	32.0
LnGrp LOS	F	C	C	D	C	C	F	C	B	D	C	C
Approach Vol, veh/h	1881				1006				409			
Approach Delay, s/veh	261.2				31.7				47.2			
Approach LOS	F				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	38.9	9.2	29.4	16.6	33.1	8.6	29.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.8	* 48	4.0	* 38	* 7.8	* 51	* 10	* 33				
Max Q Clear Time (g_c+I1), s	5.6	24.5	5.7	20.6	13.4	21.6	5.4	5.5				
Green Ext Time (p_c), s	0.1	9.2	0.0	4.1	0.0	6.3	0.0	1.3				

Intersection Summary

HCM 6th Ctrl Delay 134.6

HCM 6th LOS F







Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout PM Peak (Weekday)

6: SR-99 NB Off-Ramp & Floral Avenue























11/16/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↵	↵
Traffic Volume (vph)	882	0	0	815	258	53
Future Volume (vph)	882	0	0	815	258	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	938	0	0	867	274	56
RTOR Reduction (vph)	0	0	0	0	0	35
Lane Group Flow (vph)	938	0	0	867	274	21
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	30.4			30.4	13.4	13.4
Effective Green, g (s)	30.4			30.4	13.4	13.4
Actuated g/C Ratio	0.57			0.57	0.25	0.25
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2010			2010	442	396
v/s Ratio Prot	c0.27			0.25	c0.16	
v/s Ratio Perm						0.01
v/c Ratio	0.47			0.43	0.62	0.05
Uniform Delay, d1	6.6			6.4	17.5	15.0
Progression Factor	1.00			0.64	1.00	1.00
Incremental Delay, d2	0.8			0.6	2.6	0.1
Delay (s)	7.4			4.7	20.1	15.0
Level of Service	A			A	C	B
Approach Delay (s)	7.4			4.7	19.3	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	8.1			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.51					
Actuated Cycle Length (s)	53.0			Sum of lost time (s)		9.2
Intersection Capacity Utilization	46.3%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary 7: Whitson Street & Floral Avenue

Existing + Project Buildout PM Peak (Weekday)

11/16/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR		
Lane Configurations														
Traffic Volume (veh/h)	42	590	231	75	465	12	83	165	19	294	129	57		
Future Volume (veh/h)	42	590	231	75	465	12	83	165	19	294	129	57		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Work Zone On Approach	No			No			No			No				
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856		
Adj Flow Rate, veh/h	45	634	248	81	500	13	89	177	0	316	139	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3		
Cap, veh/h	57	1499	586	98	2208	57	113	339		252	374			
Arrive On Green	0.06	1.00	1.00	0.06	0.63	0.63	0.06	0.10	0.00	0.07	0.11	0.00		
Sat Flow, veh/h	1767	2475	967	1767	3510	91	1767	3526	1572	3428	3526	1572		
Grp Volume(v), veh/h	45	452	430	81	251	262	89	177	0	316	139	0		
Grp Sat Flow(s),veh/h/ln	1767	1763	1679	1767	1763	1839	1767	1763	1572	1714	1763	1572		
Q Serve(g_s), s	2.7	0.0	0.0	4.8	6.5	6.5	5.3	5.1	0.0	7.8	3.9	0.0		
Cycle Q Clear(g_c), s	2.7	0.0	0.0	4.8	6.5	6.5	5.3	5.1	0.0	7.8	3.9	0.0		
Prop In Lane	1.00		0.58	1.00		0.05	1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	57	1068	1017	98	1109	1157	113	339		252	374			
V/C Ratio(X)	0.79	0.42	0.42	0.82	0.23	0.23	0.79	0.52		1.25	0.37			
Avail Cap(c_a), veh/h	67	1068	1017	98	1109	1157	142	1098		252	1074			
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	49.2	0.0	0.0	49.5	8.5	8.5	48.9	45.6	0.0	49.1	44.1	0.0		
Incr Delay (d2), s/veh	37.0	1.1	1.2	40.8	0.5	0.5	20.6	1.2	0.0	142.0	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.3	3.2	2.4	2.5	2.9	2.2	0.0	8.2	1.7	0.0		
Unsig. Movement Delay, s/veh														
LnGrp Delay(d),s/veh	86.2	1.1	1.2	90.3	9.0	9.0	69.6	46.8	0.0	191.1	44.7	0.0		
LnGrp LOS	F	A	A	F	A	A	E	D		F	D			
Approach Vol, veh/h	927			594			266			A			455	A
Approach Delay, s/veh	5.3			20.1			54.4			146.4				
Approach LOS	A			C			D			F				
Timer - Assigned Phs	1	2	3	4	5	6	7	8						
Phs Duration (G+Y+Rc), s	11.0	16.1	10.1	68.8	12.0	15.1	7.6	71.3						
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	* 4.2	4.9	* 4.2	4.6						
Max Green Setting (Gmax), s	* 8.5	32.3	* 5.9	* 42	* 7.8	33.0	* 4	43.3						
Max Q Clear Time (g_c+I1), s	7.3	5.9	6.8	2.0	9.8	7.1	4.7	8.5						
Green Ext Time (p_c), s	0.0	0.7	0.0	7.0	0.0	1.0	0.0	3.2						

Intersection Summary

HCM 6th Ctrl Delay 43.7

HCM 6th LOS D

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

Existing + Project Buildout PM Peak (Weekday)


11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	235	62	27	148	84	103	278	27	54	230	182
Future Volume (veh/h)	237	235	62	27	148	84	103	278	27	54	230	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	252	250	66	29	157	89	110	296	29	57	245	194
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	311	457	121	47	325	270	140	416	41	77	398	332
Arrive On Green	0.18	0.32	0.32	0.03	0.18	0.18	0.08	0.25	0.25	0.04	0.21	0.21
Sat Flow, veh/h	1767	1408	372	1767	1856	1541	1767	1661	163	1767	1856	1547
Grp Volume(v), veh/h	252	0	316	29	157	89	110	0	325	57	245	194
Grp Sat Flow(s),veh/h/ln	1767	0	1780	1767	1856	1541	1767	0	1824	1767	1856	1547
Q Serve(g_s), s	6.9	0.0	7.3	0.8	3.8	2.5	3.1	0.0	8.2	1.6	6.0	5.7
Cycle Q Clear(g_c), s	6.9	0.0	7.3	0.8	3.8	2.5	3.1	0.0	8.2	1.6	6.0	5.7
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	311	0	577	47	325	270	140	0	456	77	398	332
V/C Ratio(X)	0.81	0.00	0.55	0.62	0.48	0.33	0.78	0.00	0.71	0.74	0.62	0.59
Avail Cap(c_a), veh/h	418	0	1000	196	810	673	203	0	869	172	825	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	0.0	14.0	24.3	18.7	18.2	22.8	0.0	17.2	23.8	17.9	17.8
Incr Delay (d2), s/veh	8.6	0.0	0.8	12.6	1.1	0.7	11.6	0.0	2.1	12.9	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.6	0.5	1.5	0.8	1.6	0.0	3.3	0.9	2.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	0.0	14.8	36.9	19.8	18.9	34.4	0.0	19.3	36.7	19.5	19.4
LnGrp LOS	C	A	B	D	B	B	C	A	B	D	B	B
Approach Vol, veh/h	568			275			435			496		
Approach Delay, s/veh	20.9			21.3			23.1			21.4		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	17.5	5.5	20.9	8.2	15.7	13.1	13.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.9	* 24	* 5.6	28.3	* 5.8	22.4	* 12	22.0				
Max Q Clear Time (g_c+I1), s	3.6	10.2	2.8	9.3	5.1	8.0	8.9	5.8				
Green Ext Time (p_c), s	0.0	1.6	0.0	1.7	0.0	1.7	0.2	1.0				
Intersection Summary												
HCM 6th Ctrl Delay	21.7											
HCM 6th LOS	C											
Notes												

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout PM Peak (Weekday)

9: Highland Avenue & SR-99 SB Off-Ramp

11/16/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘					↗↘	↗	↘	↗↘	
Traffic Volume (vph)	0	0	426	0	0	0	0	797	49	265	368	0
Future Volume (vph)	0	0	426	0	0	0	0	797	49	265	368	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	463	0	0	0	0	866	53	288	400	0
RTOR Reduction (vph)	0	0	385	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	0	78	0	0	0	0	866	27	288	400	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			6.0					18.0	18.0	7.9	20.0	
Effective Green, g (s)			6.0					18.0	18.0	7.9	20.0	
Actuated g/C Ratio			0.17					0.51	0.51	0.22	0.56	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			466					1777	778	389	1974	
v/s Ratio Prot			0.03					c0.25		c0.16	0.11	
v/s Ratio Perm									0.02			
v/c Ratio			0.17					0.49	0.03	0.74	0.20	
Uniform Delay, d1			12.6					5.7	4.4	12.8	3.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					0.2	0.0	7.4	0.1	
Delay (s)			12.8					5.9	4.4	20.2	3.9	
Level of Service			B					A	A	C	A	
Approach Delay (s)		12.8			0.0			5.9			10.7	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			9.0									
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			35.5									
Intersection Capacity Utilization			44.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Project Buildout PM Peak (Weekday)

11/16/2018

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	5	9	8	19	8	125	6	631	28	134	648	11
Future Vol, veh/h	5	9	8	19	8	125	6	631	28	134	648	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	5	9	8	20	8	132	6	664	29	141	682	12

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1318	1675	347	1319	1667	347	694	0	0	693	0	0
Stage 1	970	970	-	691	691	-	-	-	-	-	-	-
Stage 2	348	705	-	628	976	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	114	93	646	114	95	646	891	-	-	891	-	-
Stage 1	270	327	-	399	441	-	-	-	-	-	-	-
Stage 2	638	435	-	435	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	73	78	646	89	79	646	891	-	-	891	-	-
Mov Cap-2 Maneuver	73	78	-	89	79	-	-	-	-	-	-	-
Stage 1	268	275	-	396	438	-	-	-	-	-	-	-
Stage 2	495	432	-	349	274	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	44.2		30.1		0.1		1.7	
HCM LOS	E		D					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	891	-	-	76	646	299	891	-	-
HCM Lane V/C Ratio	0.007	-	-	0.194	0.013	0.535	0.158	-	-
HCM Control Delay (s)	9.1	-	-	63.4	10.6	30.1	9.8	-	-
HCM Lane LOS	A	-	-	F	B	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	3	0.6	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout MD Peak (Saturday)





11/19/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	242	273	32	11	328	101	72	266	210	65	234	25
Future Volume (veh/h)	242	273	32	11	328	101	72	266	210	65	234	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	249	281	0	11	338	0	74	274	216	67	241	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	388	407		14	417		93	571	255	84	553	245
Arrive On Green	0.22	0.22	0.00	0.23	0.23	0.00	0.05	0.16	0.16	0.05	0.16	0.16
Sat Flow, veh/h	1767	1856	1572	58	1794	1572	1767	3526	1572	1767	3526	1562
Grp Volume(v), veh/h	249	281	0	349	0	0	74	274	216	67	241	26
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1853	0	1572	1767	1763	1572	1767	1763	1562
Q Serve(g_s), s	7.0	7.6	0.0	9.8	0.0	0.0	2.3	3.9	7.3	2.1	3.4	0.8
Cycle Q Clear(g_c), s	7.0	7.6	0.0	9.8	0.0	0.0	2.3	3.9	7.3	2.1	3.4	0.8
Prop In Lane	1.00		1.00	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	388	407		430	0		93	571	255	84	553	245
V/C Ratio(X)	0.64	0.69		0.81	0.00		0.79	0.48	0.85	0.80	0.44	0.11
Avail Cap(c_a), veh/h	1287	1352		611	0		154	571	255	142	553	245
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	19.7	0.0	19.9	0.0	0.0	25.7	20.9	22.3	25.9	21.0	19.9
Incr Delay (d2), s/veh	1.8	2.1	0.0	5.5	0.0	0.0	14.0	0.6	22.5	15.8	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.1	0.0	4.4	0.0	0.0	1.2	1.5	4.0	1.1	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	21.8	0.0	25.5	0.0	0.0	39.7	21.5	44.8	41.7	21.5	20.0
LnGrp LOS	C	C		C	A		D	C	D	D	C	C
Approach Vol, veh/h	530		A	349		A	564		334			
Approach Delay, s/veh	21.5			25.5			32.8		25.4			
Approach LOS	C			C			C		C			
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	17.0		6.8	13.5		17.6	7.1	13.2				
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	40.0		* 4.4	8.9		18.1	* 4.8	8.5				
Max Q Clear Time (g_c+I1), s	9.6		4.1	9.3		11.8	4.3	5.4				
Green Ext Time (p_c), s	2.4		0.0	0.0		1.0	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			26.6									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Existing + Project Buildout MD Peak (Saturday)







11/19/2018

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	169	2	234	196	19	3	4	295	20	3	0
Future Vol, veh/h	0	169	2	234	196	19	3	4	295	20	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	180	2	249	209	20	3	4	314	21	3	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	182	0	0	900	908	181	1057	899	219
Stage 1	-	-	-	-	-	-	181	181	-	717	717	-
Stage 2	-	-	-	-	-	-	719	727	-	340	182	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1333	-	-	1387	-	-	258	274	859	202	278	818
Stage 1	-	-	-	-	-	-	818	748	-	419	432	-
Stage 2	-	-	-	-	-	-	418	428	-	673	747	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1333	-	-	1387	-	-	215	218	859	106	221	818
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	218	-	106	221	-
Stage 1	-	-	-	-	-	-	818	748	-	419	343	-
Stage 2	-	-	-	-	-	-	329	340	-	425	747	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			4.3			12.4			45		
HCM LOS							B			E		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	804	1333	-	-	1387	-	-	114				
HCM Lane V/C Ratio	0.4	-	-	-	0.179	-	-	0.215				
HCM Control Delay (s)	12.4	0	-	-	8.2	0	-	45				
HCM Lane LOS	B	A	-	-	A	A	-	E				
HCM 95th %tile Q(veh)	1.9	0	-	-	0.7	-	-	0.8				

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Existing + Project Buildout MD Peak (Saturday)


11/19/2018

Intersection							
Int Delay, s/veh	3877.1						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	238	197	45	536	526	1091	171
Future Vol, veh/h	238	197	45	536	526	1091	171
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	259	214	49	583	572	1186	186
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1155	0	-	-	0	1699	578
Stage 1	-	-	-	-	-	967	-
Stage 2	-	-	-	-	-	732	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	598	-	-	-	-	~ 91	458
Stage 1	-	-	-	-	-	~ 328	-
Stage 2	-	-	-	-	-	~ 473	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	598	-	-	-	-	~ 52	458
Mov Cap-2 Maneuver	-	-	-	-	-	~ 52	-
Stage 1	-	-	-	-	-	~ 186	-
Stage 2	-	-	-	-	-	~ 473	-
Approach	EB	WB		SB			
HCM Control Delay, s	8.5			\$ 8611.5			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	598	-	-	-	-	52	458
HCM Lane V/C Ratio	0.433	-	-	-	-	22.805	0.406
HCM Control Delay (s)	15.5	-	-	-	-	\$ 9958.4	18.1
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	2.2	-	-	-	-	144.8	1.9
Notes							
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon							

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/19/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1568	86	108	1160	0	0	0	159	187	32	555
Future Volume (vph)	0	1568	86	108	1160	0	0	0	159	187	32	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1548
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1633	90	112	1208	0	0	0	166	195	33	578
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	67	0	0	60
Lane Group Flow (vph)	0	1633	41	113	1208	0	0	0	99	195	33	518
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		45.9	45.9	6.9	57.5				28.0	9.9	31.0	31.0
Effective Green, g (s)		45.9	45.9	6.9	57.5				28.0	9.9	31.0	31.0
Actuated g/C Ratio		0.46	0.46	0.07	0.58				0.28	0.10	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1608	719	120	2015				446	336	571	479
v/s Ratio Prot		c0.47		c0.06	0.34				0.06	0.06	0.02	
v/s Ratio Perm			0.03									c0.33
v/c Ratio		1.02	0.06	0.94	0.60				0.22	0.58	0.06	1.08
Uniform Delay, d1		27.1	15.0	46.3	13.8				27.6	43.1	24.2	34.5
Progression Factor		1.00	0.97	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		26.4	0.0	63.8	0.5				0.3	2.5	0.0	64.8
Delay (s)		53.5	14.6	110.2	14.3				27.9	45.6	24.3	99.3
Level of Service		D	B	F	B				C	D	C	F
Approach Delay (s)		51.5			22.5			27.9			83.3	
Approach LOS		D			C			C			F	
Intersection Summary												
HCM 2000 Control Delay			47.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			76.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout MD Peak (Saturday)

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	613	1035	276	115	753	130	138	101	66	81	154	595
Future Volume (veh/h)	613	1035	276	115	753	130	138	101	66	81	154	595
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	632	1067	285	119	776	134	142	104	68	84	159	613
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	176	1406	627	185	1060	183	155	907	405	108	948	744
Arrive On Green	0.10	0.40	0.40	0.05	0.35	0.35	0.05	0.26	0.26	0.06	0.27	0.27
Sat Flow, veh/h	1767	3526	1572	3428	3002	518	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	632	1067	285	119	456	454	142	104	68	84	159	613
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1757	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	8.8	23.1	11.8	3.0	19.9	19.9	3.6	2.0	2.3	4.1	3.1	18.4
Cycle Q Clear(g_c), s	8.8	23.1	11.8	3.0	19.9	19.9	3.6	2.0	2.3	4.1	3.1	18.4
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	176	1406	627	185	623	621	155	907	405	108	948	744
V/C Ratio(X)	3.59	0.76	0.45	0.64	0.73	0.73	0.92	0.11	0.17	0.77	0.17	0.82
Avail Cap(c_a), veh/h	176	2042	911	256	1017	1014	155	1180	526	248	1515	1190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	22.9	19.5	41.0	24.9	24.9	42.0	25.1	14.8	40.9	24.7	30.3
Incr Delay (d2), s/veh	1180.7	1.0	0.5	3.7	1.7	1.7	48.1	0.1	0.2	11.1	0.1	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	61.5	9.3	4.0	1.3	8.3	8.3	2.5	0.8	1.0	2.1	1.2	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1220.5	23.9	20.0	44.6	26.6	26.6	90.2	25.2	15.0	52.0	24.8	33.0
LnGrp LOS	F	C	C	D	C	C	F	C	B	D	C	C
Approach Vol, veh/h		1984			1029			314			856	
Approach Delay, s/veh		404.5			28.7			52.4			33.3	
Approach LOS		F			C			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	40.4	9.6	28.4	14.0	36.4	9.6	28.4				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 6.6	* 51	4.0	* 38	* 7.8	* 51	* 12	29.6				
Max Q Clear Time (g_c+I1), s	5.0	25.1	5.6	20.4	10.8	21.9	6.1	4.3				
Green Ext Time (p_c), s	0.0	10.2	0.0	3.4	0.0	6.8	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	209.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout MD Peak (Saturday)

6: SR 99 NB Off-Ramp & Floral Avenue

11/19/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	734	0	0	693	211	66
Future Volume (vph)	734	0	0	693	211	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	807	0	0	762	232	73
RTOR Reduction (vph)	0	0	0	0	0	57
Lane Group Flow (vph)	807	0	0	762	232	16
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.0			21.0	8.2	8.2
Effective Green, g (s)	21.0			21.0	8.2	8.2
Actuated g/C Ratio	0.55			0.55	0.21	0.21
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1916			1916	374	334
v/s Ratio Prot	c0.23			0.22	c0.13	
v/s Ratio Perm						0.01
v/c Ratio	0.42			0.40	0.62	0.05
Uniform Delay, d1	5.1			5.0	13.7	12.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.2			0.1	3.2	0.1
Delay (s)	5.3			5.2	16.9	12.1
Level of Service	A			A	B	B
Approach Delay (s)	5.3			5.2	15.7	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay		6.9		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.48				
Actuated Cycle Length (s)		38.4		Sum of lost time (s)		9.2
Intersection Capacity Utilization		39.6%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

Existing + Project Buildout MD Peak (Saturday)

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	408	295	57	371	10	70	129	11	295	85	24
Future Volume (veh/h)	42	408	295	57	371	10	70	129	11	295	85	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	425	307	59	386	10	73	134	0	307	89	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	325	673	482	81	690	18	92	351		437	669	
Arrive On Green	0.18	0.34	0.34	0.05	0.20	0.20	0.05	0.10	0.00	0.13	0.19	0.00
Sat Flow, veh/h	1767	1959	1405	1767	3511	91	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	44	382	350	59	193	203	73	134	0	307	89	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1601	1767	1763	1839	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	1.0	8.6	8.7	1.6	4.7	4.7	1.9	1.7	0.0	4.1	1.0	0.0
Cycle Q Clear(g_c), s	1.0	8.6	8.7	1.6	4.7	4.7	1.9	1.7	0.0	4.1	1.0	0.0
Prop In Lane	1.00		0.88	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	605	550	81	347	362	92	351		437	669	
V/C Ratio(X)	0.14	0.63	0.64	0.73	0.56	0.56	0.79	0.38		0.70	0.13	
Avail Cap(c_a), veh/h	325	1580	1435	194	1610	1680	265	2454		492	2432	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.2	13.0	13.1	22.3	17.2	17.2	22.2	20.0	0.0	19.8	16.0	0.0
Incr Delay (d2), s/veh	0.2	1.1	1.2	12.0	1.4	1.4	14.0	0.7	0.0	3.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.0	2.8	0.8	1.8	1.8	1.1	0.6	0.0	1.6	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	14.1	14.3	34.4	18.6	18.6	36.3	20.7	0.0	23.7	16.1	0.0
LnGrp LOS	B	B	B	C	B	B	D	C		C	B	
Approach Vol, veh/h		776			455			207	A		396	A
Approach Delay, s/veh		14.3			20.6			26.2			22.0	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	13.9	6.4	20.5	10.9	9.6	12.9	13.9				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 7.1	32.7	* 5.2	* 43	6.8	* 33	4.0	* 43				
Max Q Clear Time (g_c+I1), s	3.9	3.0	3.6	10.7	6.1	3.7	3.0	6.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	5.4	0.1	0.7	0.0	2.4				

Intersection Summary

HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

Existing + Project Buildout MD Peak (Saturday)

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	132	48	23	104	37	61	191	16	28	167	147
Future Volume (veh/h)	230	132	48	23	104	37	61	191	16	28	167	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	232	133	48	23	105	37	62	193	16	28	169	148
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	301	354	128	40	232	195	89	361	30	47	353	296
Arrive On Green	0.17	0.27	0.27	0.02	0.13	0.13	0.05	0.21	0.21	0.03	0.19	0.19
Sat Flow, veh/h	1767	1300	469	1767	1856	1560	1767	1688	140	1767	1856	1556
Grp Volume(v), veh/h	232	0	181	23	105	37	62	0	209	28	169	148
Grp Sat Flow(s),veh/h/ln	1767	0	1769	1767	1856	1560	1767	0	1828	1767	1856	1556
Q Serve(g_s), s	4.8	0.0	3.2	0.5	2.0	0.8	1.3	0.0	3.9	0.6	3.1	3.3
Cycle Q Clear(g_c), s	4.8	0.0	3.2	0.5	2.0	0.8	1.3	0.0	3.9	0.6	3.1	3.3
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	301	0	482	40	232	195	89	0	391	47	353	296
V/C Ratio(X)	0.77	0.00	0.38	0.57	0.45	0.19	0.70	0.00	0.53	0.59	0.48	0.50
Avail Cap(c_a), veh/h	586	0	1353	243	1058	890	183	0	1062	257	1121	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	11.4	18.7	15.6	15.1	18.0	0.0	13.5	18.6	13.9	14.0
Incr Delay (d2), s/veh	4.2	0.0	0.5	12.3	1.4	0.5	9.4	0.0	1.1	11.1	1.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	1.0	0.3	0.8	0.3	0.7	0.0	1.4	0.3	1.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	0.0	11.8	31.0	17.0	15.6	27.4	0.0	14.6	29.6	14.9	15.3
LnGrp LOS	B	A	B	C	B	B	C	A	B	C	B	B
Approach Vol, veh/h	413			165			271			345		
Approach Delay, s/veh	16.1			18.7			17.5			16.3		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.2	13.1	5.1	15.1	6.1	12.2	10.8	9.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 5.6	* 22	* 5.3	29.5	* 4	23.3	* 13	22.0				
Max Q Clear Time (g_c+I1), s	2.6	5.9	2.5	5.2	3.3	5.3	6.8	4.0				
Green Ext Time (p_c), s	0.0	1.0	0.0	1.0	0.0	1.2	0.3	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	16.8											
HCM 6th LOS	B											
Notes												

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout MD Peak (Saturday)

9: Highland Avenue & SR 99 SB Ramps

11/19/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↶↶					↷↷	↶	↶	↷↷	
Traffic Volume (vph)	0	0	260	0	0	0	0	635	30	225	306	0
Future Volume (vph)	0	0	260	0	0	0	0	635	30	225	306	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1534	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1534	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	265	0	0	0	0	648	31	230	312	0
RTOR Reduction (vph)	0	0	239	0	0	0	0	0	16	0	0	0
Lane Group Flow (vph)	0	0	26	0	0	0	0	648	15	230	312	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			3.3					16.0	16.0	7.5	20.3	
Effective Green, g (s)			3.3					16.0	16.0	7.5	20.3	
Actuated g/C Ratio			0.10					0.48	0.48	0.23	0.61	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			275					1694	741	396	2149	
v/s Ratio Prot			0.01					c0.18		c0.13	c0.09	
v/s Ratio Perm									0.01			
v/c Ratio			0.10					0.38	0.02	0.58	0.15	
Uniform Delay, d1			13.5					5.4	4.5	11.4	2.7	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					0.1	0.0	2.2	0.0	
Delay (s)			13.7					5.6	4.5	13.6	2.7	
Level of Service			B					A	A	B	A	
Approach Delay (s)		13.7			0.0			5.5			7.3	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.6									
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			33.1							9.6		
Intersection Capacity Utilization			38.2%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Existing + Project Buildout MD Peak (Saturday)

11/19/2018

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱	↱		↱		↱	↱		↱	↱	
Traffic Vol, veh/h	6	5	5	14	11	98	4	525	33	97	470	11
Future Vol, veh/h	6	5	5	14	11	98	4	525	33	97	470	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	5	5	15	12	103	4	553	35	102	495	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	996	1301	254	1033	1290	294	507	0	0	588	0	0
Stage 1	705	705	-	579	579	-	-	-	-	-	-	-
Stage 2	291	596	-	454	711	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	197	158	742	185	161	699	1047	-	-	976	-	-
Stage 1	391	435	-	465	496	-	-	-	-	-	-	-
Stage 2	690	488	-	552	432	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	145	141	742	164	143	699	1047	-	-	976	-	-
Mov Cap-2 Maneuver	145	141	-	164	143	-	-	-	-	-	-	-
Stage 1	389	389	-	463	494	-	-	-	-	-	-	-
Stage 2	572	486	-	484	387	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	25.4		17.9		0.1		1.5	
HCM LOS	D		C					
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1047	-	-	143	742	407	976	-	-
HCM Lane V/C Ratio	0.004	-	-	0.081	0.007	0.318	0.105	-	-
HCM Control Delay (s)	8.5	-	-	32.4	9.9	17.9	9.1	-	-
HCM Lane LOS	A	-	-	D	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	1.3	0.3	-	-

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout AM Peak (Weekday)





11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	104	166	7	56	323	6	5	102	172	14	108	33
Future Volume (veh/h)	104	166	7	56	323	6	5	102	172	14	108	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	116	184	0	62	359	0	6	113	191	16	120	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	308	323		79	458		63	405	455	28	306	136
Arrive On Green	0.17	0.17	0.00	0.29	0.29	0.00	0.04	0.11	0.11	0.02	0.09	0.09
Sat Flow, veh/h	1767	1856	1572	271	1571	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	116	184	0	421	0	0	6	113	191	16	120	37
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1842	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.7	4.2	0.0	9.7	0.0	0.0	0.2	1.4	4.5	0.4	1.5	1.0
Cycle Q Clear(g_c), s	2.7	4.2	0.0	9.7	0.0	0.0	0.2	1.4	4.5	0.4	1.5	1.0
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	323		537	0		63	405	455	28	306	136
V/C Ratio(X)	0.38	0.57		0.78	0.00		0.10	0.28	0.42	0.56	0.39	0.27
Avail Cap(c_a), veh/h	1533	1610		883	0		153	405	455	153	405	181
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	17.5	0.0	15.0	0.0	0.0	21.5	18.7	13.3	22.5	19.9	19.7
Incr Delay (d2), s/veh	0.8	1.6	0.0	2.6	0.0	0.0	0.7	0.4	0.6	16.3	0.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.7	0.0	3.6	0.0	0.0	0.1	0.5	1.8	0.3	0.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	19.0	0.0	17.6	0.0	0.0	22.2	19.0	13.9	38.8	20.7	20.7
LnGrp LOS	B	B		B	A		C	B	B	D	C	C
Approach Vol, veh/h		300	A		421	A		310			173	
Approach Delay, s/veh		18.5			17.6			15.9			22.4	
Approach LOS		B			B			B			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.9	4.9	9.9		18.3	6.2	8.6				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	5.3		22.1	4.0	* 5.3				
Max Q Clear Time (g_c+I1), s		6.2	2.4	6.5		11.7	2.2	3.5				
Green Ext Time (p_c), s		1.4	0.0	0.0		1.8	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	99	2	13	65	11	3	1	20	13	2	1
Future Vol, veh/h	0	99	2	13	65	11	3	1	20	13	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	113	2	15	74	13	3	1	23	15	2	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

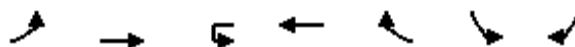
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.7	7.1	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	0%	15%	81%
Vol Thru, %	4%	98%	73%	12%
Vol Right, %	83%	2%	12%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	101	89	16
LT Vol	3	0	13	13
Through Vol	1	99	65	2
RT Vol	20	2	11	1
Lane Flow Rate	27	115	101	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.03	0.131	0.114	0.023
Departure Headway (Hd)	3.966	4.094	4.071	4.574
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	908	871	875	787
Service Time	1.966	2.14	2.122	2.575
HCM Lane V/C Ratio	0.03	0.132	0.115	0.023
HCM Control Delay	7.1	7.8	7.7	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4	0.1

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout AM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/20/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	28	107	12	181	258	282	14
Future Volume (vph)	28	107	12	181	258	282	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	116	13	197	280	307	15
RTOR Reduction (vph)	0	0	0	0	191	0	11
Lane Group Flow (vph)	30	116	13	197	89	307	4
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	0.4	12.2	0.4	12.2	12.2	10.8	10.8
Effective Green, g (s)	0.4	12.2	0.4	12.2	12.2	10.8	10.8
Actuated g/C Ratio	0.01	0.32	0.01	0.32	0.32	0.28	0.28
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	18	589	18	1119	500	961	443
v/s Ratio Prot	c0.02	c0.06	0.01	0.06		c0.09	
v/s Ratio Perm					0.06		0.00
v/c Ratio	1.67	0.20	0.72	0.18	0.18	0.32	0.01
Uniform Delay, d1	18.9	9.4	18.8	9.4	9.4	10.8	9.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	462.2	0.2	87.1	0.1	0.2	0.2	0.0
Delay (s)	481.1	9.6	105.9	9.5	9.6	11.0	9.9
Level of Service	F	A	F	A	A	B	A
Approach Delay (s)		106.5		12.1		10.9	
Approach LOS		F		B		B	
Intersection Summary							
HCM 2000 Control Delay			26.1		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.28				
Actuated Cycle Length (s)			38.2		Sum of lost time (s)		14.8
Intersection Capacity Utilization			29.3%		ICU Level of Service		A
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/20/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	557	36	63	619	0	0	0	85	202	41	223
Future Volume (vph)	0	557	36	63	619	0	0	0	85	202	41	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.90	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1554	1469
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1554	1469
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	568	37	64	632	0	0	0	87	206	42	228
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	65	0	68	92
Lane Group Flow (vph)	0	568	13	64	632	0	0	0	22	206	70	40
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		19.5	19.5	3.8	28.0				14.3	6.1	16.6	16.6
Effective Green, g (s)		19.5	19.5	3.8	28.0				14.3	6.1	16.6	16.6
Actuated g/C Ratio		0.35	0.35	0.07	0.50				0.25	0.11	0.30	0.30
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1218	545	118	1749				406	369	459	434
v/s Ratio Prot		c0.16		0.04	c0.18				0.01	c0.06	c0.05	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.47	0.02	0.54	0.36				0.05	0.56	0.15	0.09
Uniform Delay, d1		14.2	12.0	25.3	8.6				15.8	23.7	14.6	14.3
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.0	5.0	0.1				0.1	1.8	0.2	0.1
Delay (s)		14.5	12.1	30.3	8.7				15.8	25.6	14.7	14.4
Level of Service		B	B	C	A				B	C	B	B
Approach Delay (s)		14.4			10.7			15.8			19.3	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			56.1			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			41.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout AM Peak (Weekday)

11/20/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	431	143	125	539	97	87	103	88	31	192	311
Future Volume (veh/h)	194	431	143	125	539	97	87	103	88	31	192	311
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	209	463	154	134	580	104	94	111	95	33	206	334
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	332	825	368	472	1038	461	198	742	331	52	614	480
Arrive On Green	0.10	0.23	0.23	0.14	0.29	0.29	0.06	0.21	0.21	0.03	0.17	0.17
Sat Flow, veh/h	3428	3526	1572	3428	3526	1566	3428	3526	1572	1767	3526	2760
Grp Volume(v), veh/h	209	463	154	134	580	104	94	111	95	33	206	334
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1566	1714	1763	1572	1767	1763	1380
Q Serve(g_s), s	3.0	5.9	4.2	1.8	7.1	2.6	1.4	1.3	1.5	0.9	2.6	3.9
Cycle Q Clear(g_c), s	3.0	5.9	4.2	1.8	7.1	2.6	1.4	1.3	1.5	0.9	2.6	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	332	825	368	472	1038	461	198	742	331	52	614	480
V/C Ratio(X)	0.63	0.56	0.42	0.28	0.56	0.23	0.47	0.15	0.29	0.64	0.34	0.70
Avail Cap(c_a), veh/h	565	3349	1494	612	3467	1540	289	2547	1136	225	2630	2058
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.1	17.2	16.6	19.7	15.2	13.6	23.3	16.4	5.4	24.5	18.5	9.0
Incr Delay (d2), s/veh	2.0	0.6	0.8	0.3	0.5	0.2	1.8	0.1	0.5	12.3	0.3	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.2	1.3	0.7	2.5	0.7	0.5	0.4	0.8	0.5	1.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	17.8	17.3	20.0	15.6	13.8	25.0	16.5	5.9	36.7	18.8	10.8
LnGrp LOS	C	B	B	C	B	B	C	B	A	D	B	B
Approach Vol, veh/h	826			818			300			573		
Approach Delay, s/veh	19.3			16.1			15.8			15.2		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	17.1	8.1	13.5	9.1	20.2	5.7	15.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 4.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 9.1	* 48	4.3	* 38	* 8.4	* 50	* 6.5	* 37				
Max Q Clear Time (g_c+I1), s	3.8	7.9	3.4	5.9	5.0	9.1	2.9	3.5				
Green Ext Time (p_c), s	0.2	4.0	0.0	2.8	0.2	4.9	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	16.9											
HCM 6th LOS	B											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Project Buildout AM Peak (Weekday)

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	7	0	16	5	125	2	547	35	84	440	8
Future Volume (veh/h)	7	7	0	16	5	125	2	547	35	84	440	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	8	8	0	19	6	145	2	636	41	98	512	9
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	15	241	0	34	9	214	4	1012	65	125	1310	23
Arrive On Green	0.01	0.13	0.00	0.02	0.14	0.14	0.00	0.30	0.30	0.07	0.37	0.37
Sat Flow, veh/h	1767	1856	0	1767	63	1519	1767	3362	217	1767	3545	62
Grp Volume(v), veh/h	8	8	0	19	0	151	2	333	344	98	254	267
Grp Sat Flow(s),veh/h/ln	1767	1856	0	1767	0	1582	1767	1763	1816	1767	1763	1844
Q Serve(g_s), s	0.2	0.2	0.0	0.4	0.0	3.7	0.0	6.7	6.7	2.2	4.4	4.4
Cycle Q Clear(g_c), s	0.2	0.2	0.0	0.4	0.0	3.7	0.0	6.7	6.7	2.2	4.4	4.4
Prop In Lane	1.00		0.00	1.00		0.96	1.00		0.12	1.00		0.03
Lane Grp Cap(c), veh/h	15	241	0	34	0	222	4	531	547	125	651	682
V/C Ratio(X)	0.53	0.03	0.00	0.57	0.00	0.68	0.47	0.63	0.63	0.78	0.39	0.39
Avail Cap(c_a), veh/h	172	1625	0	172	0	1439	172	1136	1171	378	1342	1404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	15.6	0.0	20.0	0.0	16.8	20.5	12.4	12.4	18.8	9.5	9.6
Incr Delay (d2), s/veh	26.3	0.1	0.0	14.1	0.0	3.6	62.5	1.2	1.2	10.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	0.3	0.0	1.3	0.1	2.0	2.1	1.1	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	15.7	0.0	34.1	0.0	20.4	83.0	13.6	13.6	29.1	9.9	9.9
LnGrp LOS	D	B	A	C	A	C	F	B	B	C	A	A
Approach Vol, veh/h	16			170			679			619		
Approach Delay, s/veh	31.1			21.9			13.8			13.0		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	17.7	5.0	11.3	4.3	20.5	4.5	11.8				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	4.2	8.7	2.4	2.2	2.0	6.4	2.2	5.7				
Green Ext Time (p_c), s	0.1	3.5	0.0	0.0	0.0	2.8	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			14.6									
HCM 6th LOS			B									
Notes												
























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout PM Peak (Weekday)

11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	308	478	5	47	392	10	18	164	369	21	102	69
Future Volume (veh/h)	308	478	5	47	392	10	18	164	369	21	102	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	346	537	0	53	440	0	20	184	415	24	115	78
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	629	660		58	480		32	266	678	37	257	115
Arrive On Green	0.36	0.36	0.00	0.29	0.29	0.00	0.02	0.08	0.08	0.02	0.07	0.07
Sat Flow, veh/h	1767	1856	1572	198	1647	1572	1767	3526	1562	1767	3526	1572
Grp Volume(v), veh/h	346	537	0	493	0	0	20	184	415	24	115	78
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1846	0	1572	1767	1763	1562	1767	1763	1572
Q Serve(g_s), s	11.4	19.1	0.0	18.8	0.0	0.0	0.8	3.7	5.5	1.0	2.3	3.5
Cycle Q Clear(g_c), s	11.4	19.1	0.0	18.8	0.0	0.0	0.8	3.7	5.5	1.0	2.3	3.5
Prop In Lane	1.00		1.00	0.11		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	629	660		538	0		32	266	678	37	257	115
V/C Ratio(X)	0.55	0.81		0.92	0.00		0.62	0.69	0.61	0.64	0.45	0.68
Avail Cap(c_a), veh/h	973	1021		561	0		97	266	678	97	257	115
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	21.2	0.0	24.9	0.0	0.0	35.4	32.8	13.3	35.3	32.3	32.9
Incr Delay (d2), s/veh	0.8	2.9	0.0	19.5	0.0	0.0	17.7	7.4	1.6	16.9	1.2	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	8.0	0.0	10.4	0.0	0.0	0.5	1.8	7.3	0.6	1.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	24.2	0.0	44.4	0.0	0.0	53.1	40.1	14.9	52.2	33.5	47.9
LnGrp LOS	B	C		D	A		D	D	B	D	C	D
Approach Vol, veh/h		883	A		493	A		619			217	
Approach Delay, s/veh		22.3			44.4			23.7			40.8	
Approach LOS		C			D			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		30.8	5.7	10.1		26.1	5.9	9.9				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	5.3		22.1	4.0	* 5.3				
Max Q Clear Time (g_c+I1), s		21.1	3.0	7.5		20.8	2.8	5.5				
Green Ext Time (p_c), s		4.3	0.0	0.0		0.4	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Intersection Delay, s/veh19.1

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	199	8	210	186	30	7	9	263	22	2	1
Future Vol, veh/h	1	199	8	210	186	30	7	9	263	22	2	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	240	10	253	224	36	8	11	317	27	2	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

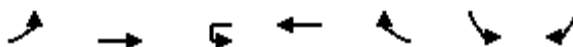
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.9	25.8	14.4	10.5
HCM LOS	B	D	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	0%	49%	88%
Vol Thru, %	3%	96%	44%	8%
Vol Right, %	94%	4%	7%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	279	208	426	25
LT Vol	7	1	210	22
Through Vol	9	199	186	2
RT Vol	263	8	30	1
Lane Flow Rate	336	251	513	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.515	0.406	0.785	0.059
Departure Headway (Hd)	5.517	5.831	5.505	7.077
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	649	614	657	509
Service Time	3.592	3.907	3.565	5.077
HCM Lane V/C Ratio	0.518	0.409	0.781	0.059
HCM Control Delay	14.4	12.9	25.8	10.5
HCM Lane LOS	B	B	D	B
HCM 95th-tile Q	3	2	7.6	0.2

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout PM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/20/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	216	217	38	511	477	943	151
Future Volume (vph)	216	217	38	511	477	943	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	236	41	555	518	1025	164
RTOR Reduction (vph)	0	0	0	0	349	0	107
Lane Group Flow (vph)	235	236	41	555	169	1025	57
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	17.6	46.0	4.2	32.6	32.6	35.0	35.0
Effective Green, g (s)	17.6	46.0	4.2	32.6	32.6	35.0	35.0
Actuated g/C Ratio	0.18	0.46	0.04	0.33	0.33	0.35	0.35
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	308	848	73	1142	511	1190	548
v/s Ratio Prot	c0.13	0.13	0.02	c0.16		c0.30	
v/s Ratio Perm					0.11		0.04
v/c Ratio	0.76	0.28	0.56	0.49	0.33	0.86	0.10
Uniform Delay, d1	39.2	16.7	47.0	27.0	25.5	30.2	21.9
Progression Factor	1.00	1.00	1.04	0.79	0.46	1.00	1.00
Incremental Delay, d2	10.7	0.8	7.9	1.2	1.4	6.6	0.1
Delay (s)	49.9	17.5	56.9	22.5	13.1	36.8	22.0
Level of Service	D	B	E	C	B	D	C
Approach Delay (s)		33.7		19.4		34.8	
Approach LOS		C		B		C	
Intersection Summary							
HCM 2000 Control Delay			28.4		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.70				
Actuated Cycle Length (s)			100.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			65.3%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

11/20/2018

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1498	70	111	1181	0	0	0	169	301	49	547
Future Volume (vph)	0	1498	70	111	1181	0	0	0	169	301	49	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1510	1463
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1510	1463
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1560	73	116	1230	0	0	0	176	314	51	570
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	79	0	46	78
Lane Group Flow (vph)	0	1560	37	116	1230	0	0	0	97	314	267	230
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		50.7	50.7	7.3	62.7				14.7	13.7	25.8	25.8
Effective Green, g (s)		50.7	50.7	7.3	62.7				14.7	13.7	25.8	25.8
Actuated g/C Ratio		0.51	0.51	0.07	0.63				0.15	0.14	0.26	0.26
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1777	794	127	2197				234	465	389	377
v/s Ratio Prot		c0.45		c0.07	0.35				0.06	0.09	c0.18	
v/s Ratio Perm			0.02									0.16
v/c Ratio		0.88	0.05	0.91	0.56				0.41	0.68	0.69	0.61
Uniform Delay, d1		21.9	12.4	46.0	10.7				38.7	41.0	33.5	32.7
Progression Factor		0.44	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		5.6	0.1	53.8	1.0				1.2	3.9	5.0	2.9
Delay (s)		15.1	12.5	99.8	11.8				39.9	44.9	38.4	35.6
Level of Service		B	B	F	B				D	D	D	D
Approach Delay (s)		15.0			19.3			39.9			39.7	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			23.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			77.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout PM Peak (Weekday)

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	583	1010	250	139	732	115	142	182	76	68	260	615
Future Volume (veh/h)	583	1010	250	139	732	115	142	182	76	68	260	615
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	595	1031	255	142	747	117	145	186	78	69	265	628
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	674	1345	600	285	980	437	201	1026	458	89	962	755
Arrive On Green	0.20	0.38	0.38	0.08	0.28	0.28	0.06	0.29	0.29	0.05	0.27	0.27
Sat Flow, veh/h	3428	3526	1572	3428	3526	1572	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	595	1031	255	142	747	117	145	186	78	69	265	628
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1572	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	16.7	25.3	8.7	3.9	19.2	5.7	4.1	3.9	2.7	3.8	5.9	21.1
Cycle Q Clear(g_c), s	16.7	25.3	8.7	3.9	19.2	5.7	4.1	3.9	2.7	3.8	5.9	21.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	674	1345	600	285	980	437	201	1026	458	89	962	755
V/C Ratio(X)	0.88	0.77	0.43	0.50	0.76	0.27	0.72	0.18	0.17	0.77	0.28	0.83
Avail Cap(c_a), veh/h	755	2158	963	360	1788	797	201	1172	523	212	1353	1062
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.6	26.8	12.2	43.4	32.8	27.9	45.8	26.3	14.5	46.4	28.3	33.8
Incr Delay (d2), s/veh	11.0	0.9	0.5	1.3	1.3	0.3	12.0	0.1	0.2	13.2	0.2	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	10.5	3.9	1.7	8.2	2.1	2.0	1.6	1.3	2.0	2.4	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.7	27.7	12.7	44.8	34.0	28.2	57.8	26.3	14.6	59.7	28.4	37.9
LnGrp LOS	D	C	B	D	C	C	E	C	B	E	C	D
Approach Vol, veh/h	1881			1006			409			962		
Approach Delay, s/veh	32.6			34.9			35.3			36.8		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	43.0	11.0	31.6	23.7	32.7	9.2	33.4				
Change Period (Y+Rc), s	* 5.2	* 5.2	* 5.2	4.6	* 4.2	* 5.2	* 4.2	4.6				
Max Green Setting (Gmax), s	* 10	* 61	* 5.8	38.0	* 22	* 50	* 12	32.9				
Max Q Clear Time (g_c+I1), s	5.9	27.3	6.1	23.1	18.7	21.2	5.8	5.9				
Green Ext Time (p_c), s	0.2	10.4	0.0	3.9	0.8	6.3	0.1	1.3				

Intersection Summary

HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes






















* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Project Buildout PM Peak (Weekday)

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	9	8	19	8	125	6	631	28	134	648	11
Future Volume (veh/h)	5	9	8	19	8	125	6	631	28	134	648	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	9	8	20	8	132	6	664	29	141	682	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	107	95	35	12	198	11	1026	45	182	1400	25
Arrive On Green	0.01	0.12	0.12	0.02	0.13	0.13	0.01	0.30	0.30	0.10	0.39	0.39
Sat Flow, veh/h	1767	906	805	1767	91	1496	1767	3441	150	1767	3545	62
Grp Volume(v), veh/h	5	0	17	20	0	140	6	340	353	141	339	355
Grp Sat Flow(s),veh/h/ln	1767	0	1711	1767	0	1586	1767	1763	1829	1767	1763	1844
Q Serve(g_s), s	0.1	0.0	0.4	0.5	0.0	3.6	0.1	7.2	7.2	3.3	6.2	6.2
Cycle Q Clear(g_c), s	0.1	0.0	0.4	0.5	0.0	3.6	0.1	7.2	7.2	3.3	6.2	6.2
Prop In Lane	1.00		0.47	1.00		0.94	1.00		0.08	1.00		0.03
Lane Grp Cap(c), veh/h	10	0	201	35	0	210	11	526	545	182	696	728
V/C Ratio(X)	0.52	0.00	0.08	0.57	0.00	0.67	0.53	0.65	0.65	0.77	0.49	0.49
Avail Cap(c_a), veh/h	165	0	1442	165	0	1389	165	1094	1134	364	1292	1352
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.2	0.0	16.8	20.8	0.0	17.6	21.2	13.0	13.0	18.7	9.7	9.7
Incr Delay (d2), s/veh	38.2	0.0	0.2	13.9	0.0	3.6	33.1	1.3	1.3	6.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.1	0.3	0.0	1.3	0.2	2.2	2.3	1.4	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	0.0	17.0	34.6	0.0	21.3	54.2	14.4	14.3	25.5	10.2	10.2
LnGrp LOS	E	A	B	C	A	C	D	B	B	C	B	B
Approach Vol, veh/h	22			160			699			835		
Approach Delay, s/veh	26.6			23.0			14.7			12.8		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	18.0	5.0	11.0	4.5	22.2	4.4	11.6				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 8.8	26.5	* 4	36.0	* 4	31.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	5.3	9.2	2.5	2.4	2.1	8.2	2.1	5.6				
Green Ext Time (p_c), s	0.1	3.6	0.0	0.0	0.0	3.9	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 14.7

HCM 6th LOS B

Notes
























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

Existing + Project Buildout MD Peak (Saturday)





11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	242	273	32	11	328	101	72	266	210	65	234	25
Future Volume (veh/h)	242	273	32	11	328	101	72	266	210	65	234	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	249	281	0	11	338	0	74	274	216	67	241	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	392	412		14	420		93	515	579	84	496	220
Arrive On Green	0.22	0.22	0.00	0.23	0.23	0.00	0.05	0.15	0.15	0.05	0.14	0.14
Sat Flow, veh/h	1767	1856	1572	58	1794	1572	1767	3526	1572	1767	3526	1561
Grp Volume(v), veh/h	249	281	0	349	0	0	74	274	216	67	241	26
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1853	0	1572	1767	1763	1572	1767	1763	1561
Q Serve(g_s), s	6.8	7.4	0.0	9.4	0.0	0.0	2.2	3.8	5.3	2.0	3.3	0.8
Cycle Q Clear(g_c), s	6.8	7.4	0.0	9.4	0.0	0.0	2.2	3.8	5.3	2.0	3.3	0.8
Prop In Lane	1.00		1.00	0.03		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	392	412		434	0		93	515	579	84	496	220
V/C Ratio(X)	0.63	0.68		0.80	0.00		0.80	0.53	0.37	0.80	0.49	0.12
Avail Cap(c_a), veh/h	1332	1399		632	0		160	591	613	147	565	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	18.9	0.0	19.2	0.0	0.0	24.9	21.0	12.3	25.0	21.0	19.9
Incr Delay (d2), s/veh	1.7	2.0	0.0	4.8	0.0	0.0	14.1	0.9	0.4	15.9	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	3.0	0.0	4.1	0.0	0.0	1.2	1.4	2.4	1.1	1.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	20.9	0.0	24.0	0.0	0.0	39.0	21.8	12.7	41.0	21.8	20.2
LnGrp LOS	C	C		C	A		D	C	B	D	C	C
Approach Vol, veh/h		530	A		349	A		564			334	
Approach Delay, s/veh		20.7			24.0			20.6			25.5	
Approach LOS		C			C			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.7	6.7	12.3		17.3	7.0	12.1				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		40.0	* 4.4	8.9		18.1	* 4.8	8.5				
Max Q Clear Time (g_c+I1), s		9.4	4.0	7.3		11.4	4.2	5.3				
Green Ext Time (p_c), s		2.4	0.0	0.4		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.2									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection

Intersection Delay, s/veh 15.6

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	169	2	234	196	19	3	4	295	20	3	0
Future Vol, veh/h	0	169	2	234	196	19	3	4	295	20	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	180	2	249	209	20	3	4	314	21	3	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

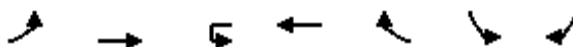
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.9	19.7	12.6	9.9
HCM LOS	B	C	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	52%	87%
Vol Thru, %	1%	99%	44%	13%
Vol Right, %	98%	1%	4%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	302	171	449	23
LT Vol	3	0	234	20
Through Vol	4	169	196	3
RT Vol	295	2	19	0
Lane Flow Rate	321	182	478	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.461	0.284	0.7	0.044
Departure Headway (Hd)	5.167	5.623	5.277	6.52
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	694	637	683	547
Service Time	3.213	3.671	3.312	4.591
HCM Lane V/C Ratio	0.463	0.286	0.7	0.044
HCM Control Delay	12.6	10.9	19.7	9.9
HCM Lane LOS	B	B	C	A
HCM 95th-tile Q	2.4	1.2	5.7	0.1

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout MD Peak (Saturday)

3: Floral Avenue & Project Driveway

11/20/2018



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	238	197	45	536	526	1091	171
Future Volume (vph)	238	197	45	536	526	1091	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	214	49	583	572	1186	186
RTOR Reduction (vph)	0	0	0	0	409	0	115
Lane Group Flow (vph)	259	214	49	583	163	1186	71
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	17.0	40.1	4.2	27.3	27.3	36.9	36.9
Effective Green, g (s)	17.0	40.1	4.2	27.3	27.3	36.9	36.9
Actuated g/C Ratio	0.18	0.42	0.04	0.28	0.28	0.38	0.38
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310	770	76	996	445	1306	602
v/s Ratio Prot	c0.15	0.12	0.03	c0.17		c0.35	
v/s Ratio Perm					0.10		0.05
v/c Ratio	0.84	0.28	0.64	0.59	0.37	0.91	0.12
Uniform Delay, d1	38.1	18.4	45.2	29.5	27.4	27.9	19.1
Progression Factor	1.00	1.00	1.03	0.82	0.74	1.00	1.00
Incremental Delay, d2	17.4	0.9	14.7	2.1	1.9	9.3	0.1
Delay (s)	55.5	19.3	61.1	26.3	22.2	37.3	19.2
Level of Service	E	B	E	C	C	D	B
Approach Delay (s)		39.1		25.7		34.8	
Approach LOS		D		C		C	
Intersection Summary							
HCM 2000 Control Delay			31.9		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.78				
Actuated Cycle Length (s)			96.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			71.5%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Existing + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/20/2018

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1568	86	108	1160	0	0	0	159	187	32	555
Future Volume (vph)	0	1568	86	108	1160	0	0	0	159	187	32	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1500	1470
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1500	1470
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1633	90	112	1208	0	0	0	166	195	33	578
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	82	0	45	68
Lane Group Flow (vph)	0	1633	46	113	1208	0	0	0	84	195	265	233
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		49.1	49.1	6.6	60.4				15.2	10.8	24.1	24.1
Effective Green, g (s)		49.1	49.1	6.6	60.4				15.2	10.8	24.1	24.1
Actuated g/C Ratio		0.51	0.51	0.07	0.63				0.16	0.11	0.25	0.25
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1792	801	120	2205				252	382	376	369
v/s Ratio Prot		c0.47		c0.06	0.34				0.05	0.06	c0.18	
v/s Ratio Perm			0.03									0.16
v/c Ratio		0.91	0.06	0.94	0.55				0.33	0.51	0.70	0.63
Uniform Delay, d1		21.5	11.8	44.5	10.1				35.9	40.1	32.7	32.0
Progression Factor		0.38	0.03	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		6.7	0.1	63.8	1.0				0.8	1.2	5.9	3.5
Delay (s)		14.8	0.4	108.3	11.1				36.7	41.3	38.6	35.5
Level of Service		B	A	F	B				D	D	D	D
Approach Delay (s)		14.0			19.4			36.7			38.1	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			21.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			96.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			76.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

Existing + Project Buildout MD Peak (Saturday)

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	613	1035	276	115	753	130	138	101	66	81	154	595
Future Volume (veh/h)	613	1035	276	115	753	130	138	101	66	81	154	595
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	632	1067	285	119	776	134	142	104	68	84	159	613
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	736	1461	652	397	1154	510	194	260	116	258	618	485
Arrive On Green	0.21	0.41	0.41	0.12	0.33	0.33	0.06	0.07	0.07	0.15	0.18	0.18
Sat Flow, veh/h	3428	3526	1572	3428	3526	1558	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	632	1067	285	119	776	134	142	104	68	84	159	613
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1558	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	15.1	21.6	11.0	2.7	16.1	3.2	3.5	2.4	3.6	3.6	3.3	9.1
Cycle Q Clear(g_c), s	15.1	21.6	11.0	2.7	16.1	3.2	3.5	2.4	3.6	3.6	3.3	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	736	1461	652	397	1154	510	194	260	116	258	618	485
V/C Ratio(X)	0.86	0.73	0.44	0.30	0.67	0.26	0.73	0.40	0.59	0.33	0.26	1.26
Avail Cap(c_a), veh/h	880	2612	1165	397	2126	940	194	1234	550	273	1578	1239
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	20.9	17.8	34.4	24.6	7.6	39.4	37.5	38.0	32.5	30.2	13.2
Incr Delay (d2), s/veh	7.4	0.7	0.5	0.4	0.7	0.3	13.3	1.0	4.6	0.7	0.2	122.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	8.5	3.6	1.1	6.6	1.8	1.7	1.0	1.4	1.6	1.4	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	21.6	18.2	34.8	25.3	7.8	52.7	38.5	42.7	33.2	30.5	135.9
LnGrp LOS	D	C	B	C	C	A	D	D	D	C	C	F
Approach Vol, veh/h	1984			1029			314			856		
Approach Delay, s/veh	26.8			24.1			45.8			106.2		
Approach LOS	C			C			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	40.4	10.0	19.5	22.4	33.0	17.6	11.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 4.2	* 5.2	5.2	* 5.6				
Max Green Setting (Gmax), s	* 9.1	* 63	4.8	* 38	* 22	* 51	13.1	* 30				
Max Q Clear Time (g_c+I1), s	4.7	23.6	5.5	11.1	17.1	18.1	5.6	5.6				
Green Ext Time (p_c), s	0.1	11.6	0.0	3.7	1.2	6.8	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Notes






















* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

Existing + Project Buildout MD Peak (Saturday)

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	5	5	14	11	98	4	525	33	97	470	11
Future Volume (veh/h)	6	5	5	14	11	98	4	525	33	97	470	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	6	5	5	15	12	103	4	553	35	102	495	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	75	75	24	16	136	7	677	43	850	2424	59
Arrive On Green	0.01	0.09	0.09	0.01	0.10	0.10	0.00	0.20	0.20	0.48	0.69	0.69
Sat Flow, veh/h	1767	851	851	1767	167	1431	1767	3367	213	1767	3518	85
Grp Volume(v), veh/h	6	0	10	15	0	115	4	289	299	102	248	259
Grp Sat Flow(s),veh/h/ln	1767	0	1702	1767	0	1598	1767	1763	1817	1767	1763	1840
Q Serve(g_s), s	0.3	0.0	0.5	0.8	0.0	6.7	0.2	15.0	15.1	3.1	4.9	4.9
Cycle Q Clear(g_c), s	0.3	0.0	0.5	0.8	0.0	6.7	0.2	15.0	15.1	3.1	4.9	4.9
Prop In Lane	1.00		0.50	1.00		0.90	1.00		0.12	1.00		0.05
Lane Grp Cap(c), veh/h	11	0	149	24	0	152	7	355	366	850	1215	1268
V/C Ratio(X)	0.55	0.00	0.07	0.62	0.00	0.76	0.54	0.82	0.82	0.12	0.20	0.20
Avail Cap(c_a), veh/h	74	0	638	74	0	623	74	487	502	850	1215	1268
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	40.2	47.1	0.0	42.3	47.7	36.6	36.7	13.7	5.4	5.4
Incr Delay (d2), s/veh	37.1	0.0	0.2	22.9	0.0	7.4	49.0	18.3	18.1	0.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.5	0.0	2.9	0.2	7.9	8.2	1.1	1.5	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.6	0.0	40.4	70.0	0.0	49.7	96.7	55.0	54.8	13.8	5.8	5.8
LnGrp LOS	F	A	D	E	A	D	F	D	D	B	A	A
Approach Vol, veh/h	16			130			592			609		
Approach Delay, s/veh	57.0			52.0			55.2			7.1		
Approach LOS	E			D			E			A		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51.4	24.6	5.5	14.4	4.6	71.5	4.8	15.1				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.8	* 27	* 4	36.0	* 4	32.3	* 4	* 37				
Max Q Clear Time (g_c+I1), s	5.1	17.1	2.8	2.5	2.2	6.9	2.3	8.7				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.0	0.0	2.7	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			33.2									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SE	SE	SE	NW	NW	NW	NW
Directions Served	L	T	R	LT	T	T	R	L	T	T	R
Maximum Queue (ft)	94	118	71	268	36	11	98	10	44	31	5
Average Queue (ft)	42	62	2	140	5	1	9	1	2	1	0
95th Queue (ft)	88	95	23	228	20	5	46	5	16	10	2
Link Distance (ft)		547		1310	2543	2543			1055	1055	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140		50				100	75			120
Storage Blk Time (%)		16	0	46			0				
Queuing Penalty (veh)		18	0	3			0				

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	50	54	49	28
Average Queue (ft)	29	32	13	13
95th Queue (ft)	40	44	37	33
Link Distance (ft)	2669	1487	2752	2624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	31	74	31	75	53	76	70	146	18
Average Queue (ft)	15	21	9	33	2	38	28	49	6
95th Queue (ft)	37	52	29	77	17	62	62	86	19
Link Distance (ft)		745		874	874				1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250	250	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	105	166	35	105	123	138	70	77	137	94	78
Average Queue (ft)	63	58	7	37	61	79	11	39	58	45	38
95th Queue (ft)	106	124	22	78	111	129	47	74	96	75	69
Link Distance (ft)	1267	1267			544	544	223			1836	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		2									
Queuing Penalty (veh)		1									

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	127	122	216	229	159	80	86	193	186	59	68	73
Average Queue (ft)	64	47	78	96	25	31	30	74	95	20	20	29
95th Queue (ft)	116	101	153	176	89	65	71	132	155	42	50	60
Link Distance (ft)			544	544				468	468			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105	105			40	150	150			250	170	170
Storage Blk Time (%)	2	0	5	27	1			1				
Queuing Penalty (veh)	3	0	10	39	2			1				

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	R
Maximum Queue (ft)	94	45	46	100	114	108	94	85
Average Queue (ft)	45	8	21	27	54	33	51	46
95th Queue (ft)	85	29	42	68	94	74	89	80
Link Distance (ft)	577	577			931	931		
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	100			100	100
Storage Blk Time (%)				1	1	0	0	0
Queuing Penalty (veh)				1	0	1	0	0

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	78	159	152	135	120	65
Average Queue (ft)	26	41	48	51	56	42
95th Queue (ft)	74	100	104	99	101	68
Link Distance (ft)	468	468	558	558	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					25	1
Queuing Penalty (veh)					11	2

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	36	134	144	56	91	126	68	59	69	38	67	37
Average Queue (ft)	8	39	60	21	33	35	19	15	29	5	26	14
95th Queue (ft)	23	98	128	44	74	84	54	36	59	21	56	30
Link Distance (ft)		558	558		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		1			0				1			
Queuing Penalty (veh)		0			0				0			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	66
Average Queue (ft)	15
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	132	212	75	180	91	129	226	103	189	86
Average Queue (ft)	66	108	36	90	42	66	129	54	100	40
95th Queue (ft)	113	183	66	153	67	126	210	87	166	69
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	3	8		5	0	8	26	0	5	
Queuing Penalty (veh)	8	9		8	0	25	23	0	4	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	153	113	89	94	132	86	118
Average Queue (ft)	94	39	32	36	64	17	30
95th Queue (ft)	141	83	77	84	114	51	81
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)					9	0	
Queuing Penalty (veh)					13	0	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	28	53	77	23	167	182	156	74	97
Average Queue (ft)	7	2	17	42	1	70	70	39	30	40
95th Queue (ft)	23	12	45	67	8	127	147	90	70	81
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 182

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	SB	SE	SE	SE	SE	NW	NW	NW	NW
Directions Served	L	T	LT	L	T	T	R	L	T	T	R
Maximum Queue (ft)	204	444	481	60	93	48	128	16	46	26	52
Average Queue (ft)	94	156	273	4	25	9	46	2	6	2	6
95th Queue (ft)	183	309	440	23	57	29	113	9	25	14	29
Link Distance (ft)		548	1310		2543	2543			1165	1165	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140			200			100	75			120
Storage Blk Time (%)	2	28	62				1				
Queuing Penalty (veh)	9	88	6				1				

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	B34	NB	SB
Directions Served	LTR	LTR	T	LTR	LTR
Maximum Queue (ft)	96	167	804	76	48
Average Queue (ft)	45	87	27	45	16
95th Queue (ft)	73	145	265	73	42
Link Distance (ft)	2669	1488	744	2752	2624
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	283	140	92	286	228	224	309	369	447
Average Queue (ft)	139	76	37	192	125	115	213	232	40
95th Queue (ft)	226	136	73	274	209	198	305	325	168
Link Distance (ft)		744		875	875				1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250	250	
Storage Blk Time (%)	1			2			3	6	
Queuing Penalty (veh)	1			1			5	9	

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	B28	B28	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	L	T	T	R	L	L	TR
Maximum Queue (ft)	1338	1357	220	66	103	260	317	363	222	275	283	212
Average Queue (ft)	826	822	120	4	6	98	161	169	99	130	139	119
95th Queue (ft)	1306	1316	295	31	44	202	297	318	171	235	237	180
Link Distance (ft)	1266	1266		875	875		534	534	236			1836
Upstream Blk Time (%)	4	4							0			
Queuing Penalty (veh)	21	26							0			
Storage Bay Dist (ft)			100			160				380	380	
Storage Blk Time (%)		57				0	7					
Queuing Penalty (veh)		40				1	8					

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	SB
Directions Served	R
Maximum Queue (ft)	201
Average Queue (ft)	112
95th Queue (ft)	190
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	380
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	165	225	557	589	160	105	250	339	366	78	116	161
Average Queue (ft)	162	220	522	527	97	46	75	178	194	23	52	73
95th Queue (ft)	173	242	647	669	216	90	205	298	323	55	102	132
Link Distance (ft)			534	534				468	468			
Upstream Blk Time (%)			20	17								
Queuing Penalty (veh)			195	170								
Storage Bay Dist (ft)	105	105			40	150	150			250	170	170
Storage Blk Time (%)	79	65	27	47	2			13	4			0
Queuing Penalty (veh)	397	326	157	119	10			17	5			0

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	R
Maximum Queue (ft)	134	117	73	96	176	307	200	150
Average Queue (ft)	77	46	33	49	105	100	127	110
95th Queue (ft)	124	99	72	85	168	235	204	162
Link Distance (ft)	577	577			935	935		
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	100			100	100
Storage Blk Time (%)		1	1	0	11	2	11	9
Queuing Penalty (veh)		0	0	0	8	11	15	11

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	251	328	156	179	916	65
Average Queue (ft)	79	107	74	85	206	37
95th Queue (ft)	169	207	149	164	504	75
Link Distance (ft)	468	468	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					50	12
Queuing Penalty (veh)					27	32

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	144	282	296	134	154	197	106	117	134	193	194	256
Average Queue (ft)	32	92	120	49	58	62	35	46	52	64	89	43
95th Queue (ft)	90	231	270	102	120	133	78	93	102	150	159	127
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		8		1	3		0	0	8	4	6	0
Queuing Penalty (veh)		3		2	2		0	0	1	7	11	1

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW
Directions Served	T	R
Maximum Queue (ft)	151	75
Average Queue (ft)	39	2
95th Queue (ft)	81	25
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	100	100
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	283	68	208	208	129	289	114	124	126
Average Queue (ft)	118	131	20	83	38	60	127	44	70	41
95th Queue (ft)	207	271	49	160	99	112	221	87	111	85
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	17	7		7		5	21	0	0	
Queuing Penalty (veh)	51	17		8		16	21	0	0	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	161	155	88	112	135	109	74
Average Queue (ft)	100	51	49	52	89	23	38
95th Queue (ft)	145	122	94	98	135	63	75
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	0				17	0	
Queuing Penalty (veh)	0				31	0	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	25	30	75	94	30	157	137	118	80	128
Average Queue (ft)	3	9	22	42	3	67	60	59	28	49
95th Queue (ft)	16	30	53	73	17	118	115	101	63	94
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 1892

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW	NW
Directions Served	L	T	R	LT	R	L	T	T	R	L	T	T
Maximum Queue (ft)	198	221	72	376	85	85	79	57	85	79	90	64
Average Queue (ft)	101	99	14	209	49	20	32	15	10	23	23	12
95th Queue (ft)	167	177	59	356	116	62	64	41	42	62	61	43
Link Distance (ft)		551		1310			2543	2543			1166	1166
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140		50		35	200			100	75		
Storage Blk Time (%)	2	20	0	54	0				0	1	1	
Queuing Penalty (veh)	5	56	1	55	0				0	1	0	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	68	142	99	28
Average Queue (ft)	41	74	54	15
95th Queue (ft)	61	126	89	35
Link Distance (ft)	2669	1493	2752	2624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	276	240	75	319	263	272	310	369	564
Average Queue (ft)	146	79	30	194	133	136	229	248	63
95th Queue (ft)	220	163	65	268	227	230	324	345	265
Link Distance (ft)		739		874	874				1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250	250	
Storage Blk Time (%)	1	0		2	0	0	2	7	
Queuing Penalty (veh)	1	0		1	0	1	3	13	

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	B28	B28	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	L	T	T	R	L	L	TR
Maximum Queue (ft)	1387	1358	220	416	394	191	259	265	183	160	177	220
Average Queue (ft)	977	976	118	53	55	107	134	146	79	83	89	104
95th Queue (ft)	1645	1691	296	223	227	198	231	246	143	146	160	166
Link Distance (ft)	1267	1267		874	874		535	535	236			1836
Upstream Blk Time (%)	20	22										
Queuing Penalty (veh)	133	144										
Storage Bay Dist (ft)			100			160				380	380	
Storage Blk Time (%)		55				5	3					
Queuing Penalty (veh)		48				31	3					

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	208
Average Queue (ft)	104
95th Queue (ft)	161
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	380
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	T	R	L	L
Maximum Queue (ft)	165	225	560	575	160	106	249	274	269	58	118	135
Average Queue (ft)	163	221	513	493	110	43	58	162	173	24	52	67
95th Queue (ft)	170	248	660	687	221	87	155	243	261	52	97	118
Link Distance (ft)			535	535				468	468			
Upstream Blk Time (%)			17	13								
Queuing Penalty (veh)			164	124								
Storage Bay Dist (ft)	105	105			40	150	150			250	170	170
Storage Blk Time (%)	79	65	20	43	1		0	12	1			
Queuing Penalty (veh)	407	338	124	117	8		0	14	1			

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	R
Maximum Queue (ft)	124	115	67	112	133	273	200	150
Average Queue (ft)	54	24	27	52	71	52	107	97
95th Queue (ft)	106	80	55	104	118	148	186	156
Link Distance (ft)	577	577			933	933		
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	100			100	100
Storage Blk Time (%)		2	0	1	3	0	8	6
Queuing Penalty (veh)		1	0	1	2	1	6	4

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	133	174	177	223	715	65
Average Queue (ft)	53	73	56	77	124	41
95th Queue (ft)	107	152	131	171	388	66
Link Distance (ft)	468	468	554	554	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						30
Storage Blk Time (%)					23	14
Queuing Penalty (veh)					15	30

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	144	155	210	75	112	103	71	75	92	139	148	100
Average Queue (ft)	21	46	90	22	30	31	16	24	35	29	58	21
95th Queue (ft)	67	108	188	53	74	77	51	58	73	78	112	56
Link Distance (ft)		554	554		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		1			0			2		0	2	0
Queuing Penalty (veh)		1			0			0		0	2	0

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	66
Average Queue (ft)	17
95th Queue (ft)	44
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	189	202	53	74	54	97	161	66	109	67
Average Queue (ft)	94	53	17	49	22	36	75	17	42	23
95th Queue (ft)	169	129	45	73	49	71	130	45	87	47
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	6	1				2	9		0	
Queuing Penalty (veh)	11	2				4	5		0	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	155	127	156	94	138	189	75
Average Queue (ft)	86	35	47	41	86	40	21
95th Queue (ft)	139	88	116	90	131	123	55
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	0				18	1	
Queuing Penalty (veh)	0				27	2	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	30	52	52	137	30	163	180	185	140	158
Average Queue (ft)	6	10	19	52	6	68	59	70	23	42
95th Queue (ft)	23	33	45	109	24	139	143	136	79	112
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				0						
Queuing Penalty (veh)				0						

Network Summary

Network wide Queuing Penalty: 1908

Appendix H: Near Term Year 2025 plus Project Buildout Traffic Conditions



Traffic Engineering, Inc.

<http://www.JLBtraffic.com>

Traffic Engineering, Transportation Planning, & Parking Solutions

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710
























(559) 570-8991

Page | H

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard

11/19/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	179	249	7	64	432	10	6	106	266	14	117	41
Future Volume (veh/h)	179	249	7	64	432	10	6	106	266	14	117	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	199	277	0	71	480	0	7	118	296	16	130	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	381	400		83	559		114	446	199	27	251	112
Arrive On Green	0.22	0.22	0.00	0.35	0.35	0.00	0.06	0.13	0.13	0.02	0.07	0.07
Sat Flow, veh/h	1767	1856	1572	238	1606	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	199	277	0	551	0	0	7	118	296	16	130	46
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1844	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	6.3	8.7	0.0	17.6	0.0	0.0	0.2	1.9	8.0	0.6	2.2	1.8
Cycle Q Clear(g_c), s	6.3	8.7	0.0	17.6	0.0	0.0	0.2	1.9	8.0	0.6	2.2	1.8
Prop In Lane	1.00		1.00	0.13		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	381	400		642	0		114	446	199	27	251	112
V/C Ratio(X)	0.52	0.69		0.86	0.00		0.06	0.26	1.49	0.58	0.52	0.41
Avail Cap(c_a), veh/h	1118	1174		857	0		114	446	199	112	446	199
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	22.9	0.0	19.2	0.0	0.0	27.8	25.0	27.6	30.9	28.3	28.1
Incr Delay (d2), s/veh	1.1	2.2	0.0	6.7	0.0	0.0	0.2	0.3	244.2	18.2	1.7	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	3.7	0.0	7.8	0.0	0.0	0.1	0.8	16.2	0.4	0.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.0	25.0	0.0	25.9	0.0	0.0	28.0	25.3	271.8	49.1	30.0	30.5
LnGrp LOS	C	C		C	A		C	C	F	D	C	C
Approach Vol, veh/h		476	A		551	A		421			192	
Approach Delay, s/veh		24.2			25.9			198.7			31.7	
Approach LOS		C			C			F			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.5	5.2	12.6		26.9	8.7	9.1				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	8.0		29.4	4.0	* 8				
Max Q Clear Time (g_c+I1), s		10.7	2.6	10.0		19.6	2.2	4.2				
Green Ext Time (p_c), s		2.2	0.0	0.0		2.5	0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay 70.4

HCM 6th LOS E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Near Term + Project Buildout AM Peak (Weekday)







11/19/2018

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	107	4	15	72	25	6	8	21	45	3	1
Future Vol, veh/h	0	107	4	15	72	25	6	8	21	45	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	122	5	17	82	28	7	9	24	51	3	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	110	0	0	127	0	0	257	269	125	271	257	96
Stage 1	-	-	-	-	-	-	125	125	-	130	130	-
Stage 2	-	-	-	-	-	-	132	144	-	141	127	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1474	-	-	1453	-	-	694	636	923	679	645	958
Stage 1	-	-	-	-	-	-	877	791	-	871	787	-
Stage 2	-	-	-	-	-	-	869	776	-	860	789	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1474	-	-	1453	-	-	684	628	923	648	637	958
Mov Cap-2 Maneuver	-	-	-	-	-	-	684	628	-	648	637	-
Stage 1	-	-	-	-	-	-	877	791	-	871	777	-
Stage 2	-	-	-	-	-	-	853	766	-	828	789	-
Approach	EB		WB				NB			SB		
HCM Control Delay, s	0		1				9.8			11		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	791	1474	-	-	1453	-	-	652				
HCM Lane V/C Ratio	0.05	-	-	-	0.012	-	-	0.085				
HCM Control Delay (s)	9.8	0	-	-	7.5	0	-	11				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3				

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Near Term + Project Buildout AM Peak (Weekday)

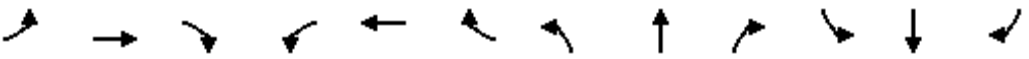
11/19/2018

Intersection							
Int Delay, s/veh	13.2						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	28	148	12	204	296	310	14
Future Vol, veh/h	28	148	12	204	296	310	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	30	161	13	222	322	337	15
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	544	0	-	-	0	630	272
Stage 1	-	-	-	-	-	409	-
Stage 2	-	-	-	-	-	221	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	1017	-	-	-	-	427	724
Stage 1	-	-	-	-	-	637	-
Stage 2	-	-	-	-	-	812	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1017	-	-	-	-	415	724
Mov Cap-2 Maneuver	-	-	-	-	-	415	-
Stage 1	-	-	-	-	-	619	-
Stage 2	-	-	-	-	-	812	-
Approach	EB		WB		SB		
HCM Control Delay, s	1.4				40.4		
HCM LOS					E		
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1017	-	-	-	-	415	724
HCM Lane V/C Ratio	0.03	-	-	-	-	0.812	0.021
HCM Control Delay (s)	8.6	-	-	-	-	41.8	10.1
HCM Lane LOS	A	-	-	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	7.4	0.1

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue
























11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↑	↗
Traffic Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	247
Future Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	729	37	64	767	0	0	0	87	209	42	252
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	62	0	0	83
Lane Group Flow (vph)	0	729	11	64	767	0	0	0	25	209	42	169
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		17.3	17.3	3.5	25.5				16.3	6.1	18.9	18.9
Effective Green, g (s)		17.3	17.3	3.5	25.5				16.3	6.1	18.9	18.9
Actuated g/C Ratio		0.31	0.31	0.06	0.46				0.29	0.11	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1084	485	109	1598				465	371	623	522
v/s Ratio Prot		c0.21		0.04	c0.22				0.02	c0.06	0.02	
v/s Ratio Perm			0.01									c0.11
v/c Ratio		0.67	0.02	0.59	0.48				0.05	0.56	0.07	0.32
Uniform Delay, d1		16.8	13.4	25.5	10.6				14.3	23.6	12.5	13.8
Progression Factor		1.01	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0	7.8	0.2				0.0	2.0	0.0	0.4
Delay (s)		18.6	13.4	33.3	10.8				14.3	25.6	12.6	14.1
Level of Service		B	B	C	B				B	C	B	B
Approach Delay (s)		18.4			12.5			14.3			18.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			55.9			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			47.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

5: Highland Avenue & Floral Avenue

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	498	212	295	596	130	253	235	146	45	366	348
Future Volume (veh/h)	217	498	212	295	596	130	253	235	146	45	366	348
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	233	535	228	317	641	140	272	253	157	48	394	374
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	174	1032	460	441	929	203	238	907	405	62	765	599
Arrive On Green	0.10	0.29	0.29	0.13	0.32	0.32	0.07	0.26	0.26	0.03	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	3428	2876	627	3428	3526	1572	1767	3526	2761
Grp Volume(v), veh/h	233	535	228	317	393	388	272	253	157	48	394	374
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1740	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	6.8	8.8	5.7	6.1	13.4	13.5	4.8	4.0	5.7	1.9	6.8	8.5
Cycle Q Clear(g_c), s	6.8	8.8	5.7	6.1	13.4	13.5	4.8	4.0	5.7	1.9	6.8	8.5
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	1032	460	441	570	562	238	907	405	62	765	599
V/C Ratio(X)	1.34	0.52	0.50	0.72	0.69	0.69	1.14	0.28	0.39	0.78	0.51	0.62
Avail Cap(c_a), veh/h	174	1998	891	882	1305	1288	238	1779	794	227	1937	1517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	20.4	9.6	28.9	20.4	20.4	32.2	20.5	21.2	33.1	23.9	24.5
Incr Delay (d2), s/veh	186.8	0.4	0.8	2.2	1.5	1.5	102.4	0.2	0.6	18.8	0.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	3.4	2.6	2.6	5.4	5.3	5.2	1.5	1.9	1.1	2.7	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	218.0	20.8	10.4	31.1	21.9	21.9	134.5	20.7	21.8	51.9	24.4	25.6
LnGrp LOS	F	C	B	C	C	C	F	C	C	D	C	C
Approach Vol, veh/h		996			1098			682			816	
Approach Delay, s/veh		64.6			24.6			66.4			26.6	
Approach LOS		E			C			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	25.4	10.0	19.6	12.0	27.5	6.6	23.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 18	* 39	4.8	* 38	* 6.8	* 51	* 8.9	* 35				
Max Q Clear Time (g_c+I1), s	8.1	10.8	6.8	10.5	8.8	15.5	3.9	7.7				
Green Ext Time (p_c), s	0.8	4.8	0.0	4.3	0.0	5.8	0.0	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			44.0									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis Near Term + Project Buildout AM Peak (Weekday) 6: SR 99 NB Off-Ramp & Floral Avenue























11/19/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	578	0	0	827	263	95
Future Volume (vph)	578	0	0	827	263	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	615	0	0	880	280	101
RTOR Reduction (vph)	0	0	0	0	0	77
Lane Group Flow (vph)	615	0	0	880	280	24
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	19.7			19.7	8.9	8.9
Effective Green, g (s)	19.7			19.7	8.9	8.9
Actuated g/C Ratio	0.52			0.52	0.24	0.24
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1826			1826	412	369
v/s Ratio Prot	0.18			0.25	0.16	
v/s Ratio Perm						0.02
v/c Ratio	0.34			0.48	0.68	0.06
Uniform Delay, d1	5.3			5.8	13.2	11.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.2	4.4	0.1
Delay (s)	5.4			6.0	17.6	11.3
Level of Service	A			A	B	B
Approach Delay (s)	5.4			6.0	15.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			37.8		Sum of lost time (s)	9.2
Intersection Capacity Utilization			45.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

7: Whitson Street & Floral Avenue























11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	21	443	147	64	574	5	58	112	19	195	102	29
Future Volume (veh/h)	21	443	147	64	574	5	58	112	19	195	102	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	23	482	160	70	624	5	63	122	0	212	111	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	39	895	295	91	1338	11	85	329		341	564	
Arrive On Green	0.02	0.34	0.34	0.05	0.37	0.37	0.05	0.09	0.00	0.10	0.16	0.00
Sat Flow, veh/h	1767	2603	858	1767	3584	29	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	23	325	317	70	307	322	63	122	0	212	111	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1698	1767	1763	1850	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.6	6.7	6.8	1.8	6.0	6.0	1.6	1.5	0.0	2.7	1.2	0.0
Cycle Q Clear(g_c), s	0.6	6.7	6.8	1.8	6.0	6.0	1.6	1.5	0.0	2.7	1.2	0.0
Prop In Lane	1.00		0.51	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	606	584	91	658	690	85	329		341	564	
V/C Ratio(X)	0.59	0.54	0.54	0.77	0.47	0.47	0.74	0.37		0.62	0.20	
Avail Cap(c_a), veh/h	156	1646	1586	203	1678	1761	368	2575		539	2395	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.9	11.9	12.0	21.2	10.7	10.7	21.2	19.2	0.0	19.5	16.5	0.0
Incr Delay (d2), s/veh	13.1	0.7	0.8	12.4	0.5	0.5	11.6	0.7	0.0	1.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.3	2.2	1.0	1.9	2.0	0.8	0.5	0.0	1.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	12.7	12.7	33.6	11.3	11.2	32.8	19.9	0.0	21.4	16.6	0.0
LnGrp LOS	D	B	B	C	B	B	C	B		C	B	
Approach Vol, veh/h		665			699			185	A		323	A
Approach Delay, s/veh		13.5			13.5			24.3			19.7	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	12.1	6.5	20.1	9.4	9.1	5.2	21.5				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.4	30.7	* 5.2	* 42	7.1	* 33	* 4	43.0				
Max Q Clear Time (g_c+I1), s	3.6	3.2	3.8	8.8	4.7	3.5	2.6	8.0				
Green Ext Time (p_c), s	0.0	0.6	0.0	4.5	0.2	0.7	0.0	4.1				
Intersection Summary												
HCM 6th Ctrl Delay			15.6									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

8: McCall Avenue & Floral Avenue

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	239	66	71	246	106	92	362	22	90	498	232
Future Volume (veh/h)	118	239	66	71	246	106	92	362	22	90	498	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.97	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	149	303	84	90	311	134	116	458	28	114	630	294
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	182	364	101	115	423	348	146	647	40	144	693	579
Arrive On Green	0.10	0.27	0.27	0.06	0.23	0.23	0.08	0.37	0.37	0.08	0.37	0.37
Sat Flow, veh/h	1767	1368	379	1767	1856	1528	1767	1728	106	1767	1856	1549
Grp Volume(v), veh/h	149	0	387	90	311	134	116	0	486	114	630	294
Grp Sat Flow(s),veh/h/ln	1767	0	1747	1767	1856	1528	1767	0	1834	1767	1856	1549
Q Serve(g_s), s	6.9	0.0	17.5	4.2	13.1	6.2	5.4	0.0	18.9	5.3	27.0	12.3
Cycle Q Clear(g_c), s	6.9	0.0	17.5	4.2	13.1	6.2	5.4	0.0	18.9	5.3	27.0	12.3
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	182	0	465	115	423	348	146	0	687	144	693	579
V/C Ratio(X)	0.82	0.00	0.83	0.78	0.74	0.39	0.80	0.00	0.71	0.79	0.91	0.51
Avail Cap(c_a), veh/h	185	0	520	122	486	400	147	0	716	194	758	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	0.0	29.1	38.7	30.1	27.4	37.8	0.0	22.4	37.9	24.9	20.3
Incr Delay (d2), s/veh	23.8	0.0	10.2	26.4	5.0	0.7	25.3	0.0	3.1	14.6	14.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	8.3	2.6	6.2	2.3	3.3	0.0	8.3	2.8	13.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	0.0	39.3	65.1	35.0	28.1	63.2	0.0	25.4	52.4	39.1	21.0
LnGrp LOS	E	A	D	E	D	C	E	A	C	D	D	C
Approach Vol, veh/h		536			535			602			1038	
Approach Delay, s/veh		45.2			38.4			32.7			35.4	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	36.3	9.7	26.9	11.1	36.3	12.9	23.7				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.2	* 33	* 5.8	25.0	* 7	34.3	* 8.8	22.0				
Max Q Clear Time (g_c+I1), s	7.3	20.9	6.2	19.5	7.4	29.0	8.9	15.1				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.1	0.0	2.3	0.0	1.3				
Intersection Summary												
HCM 6th Ctrl Delay			37.3									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout AM Peak (Weekday)

9: Highland Avenue & SR 99 SB Ramps

11/19/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↶↶					↷↷	↶	↶	↷↷	
Traffic Volume (vph)	0	0	492	0	0	0	0	1007	47	354	556	0
Future Volume (vph)	0	0	492	0	0	0	0	1007	47	354	556	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	518	0	0	0	0	1060	49	373	585	0
RTOR Reduction (vph)	0	0	435	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	0	83	0	0	0	0	1060	23	373	585	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			6.8					19.5	19.5	13.3	26.1	
Effective Green, g (s)			6.8					19.5	19.5	13.3	26.1	
Actuated g/C Ratio			0.16					0.46	0.46	0.31	0.62	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			442					1611	705	549	2157	
v/s Ratio Prot			0.03					c0.30		c0.21	0.17	
v/s Ratio Perm									0.01			
v/c Ratio			0.19					0.66	0.03	0.68	0.27	
Uniform Delay, d1			15.4					8.9	6.3	12.7	3.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					1.0	0.0	3.3	0.1	
Delay (s)			15.6					9.8	6.3	16.0	3.8	
Level of Service			B					A	A	B	A	
Approach Delay (s)		15.6			0.0			9.7			8.6	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.5									
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			42.4							9.6		
Intersection Capacity Utilization			55.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Near Term + Project Buildout AM Peak (Weekday)

11/19/2018

Intersection												
Int Delay, s/veh	68.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	56	15	71	34	10	126	58	784	53	84	640	24
Future Vol, veh/h	56	15	71	34	10	126	58	784	53	84	640	24
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	65	17	83	40	12	147	67	912	62	98	744	28

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1551	2063	387	1654	2046	487	773	0	0	974	0	0
Stage 1	955	955	-	1077	1077	-	-	-	-	-	-	-
Stage 2	596	1108	-	577	969	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	76	53	609	64	55	524	832	-	-	698	-	-
Stage 1	276	333	-	232	291	-	-	-	-	-	-	-
Stage 2	455	282	-	467	328	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 37	42	609	~ 32	43	524	831	-	-	698	-	-
Mov Cap-2 Maneuver	~ 37	42	-	~ 32	43	-	-	-	-	-	-	-
Stage 1	254	286	-	213	267	-	-	-	-	-	-	-
Stage 2	288	259	-	326	282	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s\$	389.1	451.6	0.6	1.2
HCM LOS	F	F		
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	831	-	-	38	609	111	698	-	-
HCM Lane V/C Ratio	0.081	-	-	2.173	0.136	1.781	0.14	-	-
HCM Control Delay (s)	9.7	-	-	\$ 766.3	11.8	\$ 451.6	11	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	9	0.5	15.6	0.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard

11/19/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	514	604	5	56	518	14	22	179	563	21	109	82
Future Volume (veh/h)	514	604	5	56	518	14	22	179	563	21	109	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	578	679	0	63	582	0	25	201	633	24	122	92
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	605	636		59	543		33	558	248	32	556	248
Arrive On Green	0.34	0.34	0.00	0.33	0.33	0.00	0.02	0.16	0.16	0.02	0.16	0.16
Sat Flow, veh/h	1767	1856	1572	180	1666	1572	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	578	679	0	645	0	0	25	201	633	24	122	92
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1847	0	1572	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	38.3	41.1	0.0	39.1	0.0	0.0	1.7	6.1	19.0	1.6	3.6	6.3
Cycle Q Clear(g_c), s	38.3	41.1	0.0	39.1	0.0	0.0	1.7	6.1	19.0	1.6	3.6	6.3
Prop In Lane	1.00		1.00	0.10		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	605	636		602	0		33	558	248	32	556	248
V/C Ratio(X)	0.95	1.07		1.07	0.00		0.75	0.36	2.55	0.74	0.22	0.37
Avail Cap(c_a), veh/h	605	636		602	0		88	558	248	59	556	248
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	39.5	0.0	40.5	0.0	0.0	58.6	45.1	50.5	58.6	44.1	45.2
Incr Delay (d2), s/veh	25.8	55.4	0.0	57.5	0.0	0.0	28.1	1.8	709.6	27.6	0.9	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.5	27.9	0.0	26.9	0.0	0.0	1.0	2.8	56.2	1.0	1.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	94.8	0.0	98.0	0.0	0.0	86.7	46.9	760.1	86.2	45.0	49.4
LnGrp LOS	E	F		F	A		F	D	F	F	D	D
Approach Vol, veh/h		1257	A		645	A		859			238	
Approach Delay, s/veh		80.8			98.0			573.6			50.9	
Approach LOS		F			F			F			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		46.0	6.4	23.6		44.0	6.5	23.5				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		41.1	* 4	17.2		39.1	* 6	15.2				
Max Q Clear Time (g_c+I1), s		43.1	3.6	21.0		41.1	3.7	8.3				
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay 223.3

HCM 6th LOS F

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Near Term + Project Buildout PM Peak (Weekday)







11/19/2018

Intersection												
Int Delay, s/veh	34.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	209	10	211	196	91	9	23	265	73	5	1
Future Vol, veh/h	1	209	10	211	196	91	9	23	265	73	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	252	12	254	236	110	11	28	319	88	6	1
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	346	0	0	264	0	0	1063	1114	258	1233	1065	291
Stage 1	-	-	-	-	-	-	260	260	-	799	799	-
Stage 2	-	-	-	-	-	-	803	854	-	434	266	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1207	-	-	1294	-	-	200	207	778	153	222	746
Stage 1	-	-	-	-	-	-	743	691	-	378	396	-
Stage 2	-	-	-	-	-	-	376	374	-	598	687	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1207	-	-	1294	-	-	157	156	778	~ 63	167	746
Mov Cap-2 Maneuver	-	-	-	-	-	-	157	156	-	~ 63	167	-
Stage 1	-	-	-	-	-	-	742	690	-	378	298	-
Stage 2	-	-	-	-	-	-	277	282	-	338	686	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.6			23.3			\$ 371.8		
HCM LOS							C			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	545	1207	-	-	1294	-	-	66				
HCM Lane V/C Ratio	0.657	0.001	-	-	0.196	-	-	1.442				
HCM Control Delay (s)	23.3	8	0	-	8.5	0	-	\$ 371.8				
HCM Lane LOS	C	A	A	-	A	A	-	F				
HCM 95th %tile Q(veh)	4.8	0	-	-	0.7	-	-	8.1				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Near Term + Project Buildout PM Peak (Weekday)


11/19/2018

Intersection							
Int Delay, s/veh	3858.8						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	216	281	38	584	563	1019	151
Future Vol, veh/h	216	281	38	584	563	1019	151
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	235	305	41	635	612	1108	164
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	1247	0	-	-	0	1798	624
Stage 1	-	-	-	-	-	1023	-
Stage 2	-	-	-	-	-	775	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	552	-	-	-	-	~ 79	427
Stage 1	-	-	-	-	-	~ 307	-
Stage 2	-	-	-	-	-	~ 451	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	552	-	-	-	-	~ 45	427
Mov Cap-2 Maneuver	-	-	-	-	-	~ 45	-
Stage 1	-	-	-	-	-	~ 176	-
Stage 2	-	-	-	-	-	~ 451	-
Approach	EB	WB			SB		
HCM Control Delay, s	7.1				\$ 9403.2		
HCM LOS					F		
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	552	-	-	-	-	45	427
HCM Lane V/C Ratio	0.425	-	-	-	-	24.614	0.384
HCM Control Delay (s)	16.3	-	-	-	-	10793.8	18.6
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	2.1	-	-	-	-	135.9	1.8
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined		*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis Near Term + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp
























11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Future Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1538
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1842	73	116	1468	0	0	0	176	319	51	592
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	64	0	0	60
Lane Group Flow (vph)	0	1842	35	116	1468	0	0	0	112	319	51	532
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.3	58.3	8.3	71.3				20.3	25.2	37.2	37.2
Effective Green, g (s)		58.3	58.3	8.3	71.3				20.3	25.2	37.2	37.2
Actuated g/C Ratio		0.49	0.49	0.07	0.59				0.17	0.21	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1702	761	121	2082				269	714	571	476
v/s Ratio Prot		c0.53		c0.07	0.42				0.07	0.09	0.03	
v/s Ratio Perm			0.02									c0.35
v/c Ratio		1.08	0.05	0.96	0.71				0.42	0.45	0.09	1.12
Uniform Delay, d1		30.9	16.2	55.7	17.0				44.6	41.3	29.4	41.4
Progression Factor		1.00	0.95	0.82	0.59				1.00	1.00	1.00	1.00
Incremental Delay, d2		47.8	0.1	15.6	0.2				1.0	0.4	0.1	77.5
Delay (s)		78.7	15.5	61.3	10.3				45.6	41.8	29.4	118.9
Level of Service		E	B	E	B				D	D	C	F
Approach Delay (s)		76.3			14.0			45.6			88.6	
Approach LOS		E			B			D			F	
Intersection Summary												
HCM 2000 Control Delay			56.4			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			84.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

5: Highland Avenue & Floral Avenue

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	622	1104	392	417	831	191	367	437	187	88	591	654
Future Volume (veh/h)	622	1104	392	417	831	191	367	437	187	88	591	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	635	1127	400	426	848	195	374	446	191	90	603	667
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	323	1197	534	586	932	214	137	559	249	288	992	779
Arrive On Green	0.12	0.23	0.23	0.34	0.65	0.65	0.07	0.26	0.26	0.16	0.28	0.28
Sat Flow, veh/h	1767	3526	1572	3428	2846	654	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	635	1127	400	426	525	518	374	446	191	90	603	667
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1738	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	21.9	37.7	28.4	13.1	30.5	30.5	4.8	14.1	13.4	5.4	17.8	27.4
Cycle Q Clear(g_c), s	21.9	37.7	28.4	13.1	30.5	30.5	4.8	14.1	13.4	5.4	17.8	27.4
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	1197	534	586	577	569	137	559	249	288	992	779
V/C Ratio(X)	1.97	0.94	0.75	0.73	0.91	0.91	2.73	0.80	0.77	0.31	0.61	0.86
Avail Cap(c_a), veh/h	323	1205	537	586	737	727	137	911	406	288	1116	876
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.20	0.20	0.20	0.76	0.76	0.76	0.41	0.41	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	45.2	41.6	37.1	19.2	19.2	56.0	42.3	42.1	44.3	37.4	40.8
Incr Delay (d2), s/veh	436.9	4.2	2.0	3.5	16.9	17.1	785.7	1.1	2.1	0.6	0.8	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	49.3	17.8	11.6	4.9	10.2	10.0	16.9	5.4	4.7	2.4	7.7	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	489.5	49.4	43.6	40.5	36.1	36.3	841.7	43.4	44.1	44.9	38.2	48.5
LnGrp LOS	F	D	D	D	D	D	F	D	D	D	D	D
Approach Vol, veh/h		2162			1469			1011			1360	
Approach Delay, s/veh		177.6			37.4			338.9			43.7	
Approach LOS		F			D			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.7	45.9	10.0	38.4	27.1	44.5	24.7	23.6				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	5.2	* 4.6				
Max Green Setting (Gmax), s	* 16	* 41	4.8	* 38	* 7.8	* 50	12.8	* 31				
Max Q Clear Time (g_c+I1), s	15.1	39.7	6.8	29.4	23.9	32.5	7.4	16.1				
Green Ext Time (p_c), s	0.2	1.0	0.0	4.4	0.0	6.8	0.1	2.9				
Intersection Summary												
HCM 6th Ctrl Delay			140.1									
HCM 6th LOS			F									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis Near Term + Project Buildout PM Peak (Weekday) 6: SR-99 NB Off-Ramp & Floral Avenue























11/19/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	1091	0	0	1160	362	225
Future Volume (vph)	1091	0	0	1160	362	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1161	0	0	1234	385	239
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	1161	0	0	1234	385	195
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	78.3			78.3	32.5	32.5
Effective Green, g (s)	78.3			78.3	32.5	32.5
Actuated g/C Ratio	0.65			0.65	0.27	0.27
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2287			2287	474	424
v/s Ratio Prot	0.33			c0.35	c0.22	
v/s Ratio Perm						0.12
v/c Ratio	0.51			0.54	0.81	0.46
Uniform Delay, d1	10.8			11.2	40.9	36.4
Progression Factor	0.20			0.35	1.00	1.00
Incremental Delay, d2	0.6			0.9	10.2	0.8
Delay (s)	2.7			4.8	51.1	37.2
Level of Service	A			A	D	D
Approach Delay (s)	2.7			4.8	45.8	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay	12.5			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.62					
Actuated Cycle Length (s)	120.0			Sum of lost time (s)		9.2
Intersection Capacity Utilization	59.8%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

7: Whitson Street & Floral Avenue























11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	838	272	83	591	13	84	188	19	326	148	63
Future Volume (veh/h)	42	838	272	83	591	13	84	188	19	326	148	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	901	292	89	635	14	90	202	0	351	159	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	682	1501	485	111	872	19	235	351		405	300	
Arrive On Green	0.77	1.00	1.00	0.06	0.25	0.25	0.13	0.10	0.00	0.12	0.09	0.00
Sat Flow, veh/h	1767	2618	846	1767	3525	78	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	45	606	587	89	317	332	90	202	0	351	159	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1701	1767	1763	1840	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.7	0.0	0.0	6.0	19.8	19.9	5.6	6.6	0.0	12.1	5.2	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	6.0	19.8	19.9	5.6	6.6	0.0	12.1	5.2	0.0
Prop In Lane	1.00		0.50	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	682	1011	976	111	436	455	235	351		405	300	
V/C Ratio(X)	0.07	0.60	0.60	0.80	0.73	0.73	0.38	0.58		0.87	0.53	
Avail Cap(c_a), veh/h	682	1011	976	115	671	701	235	970		423	1028	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.5	0.0	0.0	55.5	41.5	41.5	47.5	51.6	0.0	52.0	52.6	0.0
Incr Delay (d2), s/veh	0.0	2.2	2.3	31.1	10.2	9.8	1.0	1.5	0.0	16.6	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.6	0.6	3.6	9.7	10.1	2.5	2.9	0.0	6.0	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.5	2.2	2.3	86.6	51.7	51.3	48.6	53.1	0.0	68.6	54.1	0.0
LnGrp LOS	A	A	A	F	D	D	D	D		E	D	
Approach Vol, veh/h		1238			738			292	A		510	A
Approach Delay, s/veh		2.5			55.7			51.7			64.1	
Approach LOS		A			E			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.1	15.1	11.8	73.0	18.4	16.9	50.5	34.3				
Change Period (Y+Rc), s	4.2	* 4.9	* 4.2	* 4.2	4.2	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	12.8	* 35	* 7.8	* 47	14.8	* 33	8.6	* 46				
Max Q Clear Time (g_c+I1), s	7.6	7.2	8.0	2.0	14.1	8.6	2.7	21.9				
Green Ext Time (p_c), s	0.1	0.9	0.0	11.2	0.1	1.1	0.0	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

8: McCall Avenue & Floral Avenue


11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	284	101	51	234	85	106	652	62	55	507	214
Future Volume (veh/h)	265	284	101	51	234	85	106	652	62	55	507	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	282	302	107	54	249	90	113	694	66	59	539	228
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	292	393	139	69	327	271	137	714	68	75	730	613
Arrive On Green	0.17	0.30	0.30	0.04	0.18	0.18	0.08	0.43	0.43	0.04	0.39	0.39
Sat Flow, veh/h	1767	1300	461	1767	1856	1541	1767	1667	159	1767	1856	1559
Grp Volume(v), veh/h	282	0	409	54	249	90	113	0	760	59	539	228
Grp Sat Flow(s),veh/h/ln	1767	0	1761	1767	1856	1541	1767	0	1826	1767	1856	1559
Q Serve(g_s), s	15.1	0.0	20.2	2.9	12.2	4.9	6.0	0.0	38.9	3.2	23.7	9.9
Cycle Q Clear(g_c), s	15.1	0.0	20.2	2.9	12.2	4.9	6.0	0.0	38.9	3.2	23.7	9.9
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	292	0	533	69	327	271	137	0	782	75	730	613
V/C Ratio(X)	0.96	0.00	0.77	0.78	0.76	0.33	0.83	0.00	0.97	0.78	0.74	0.37
Avail Cap(c_a), veh/h	292	0	586	111	427	355	137	0	782	76	730	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	0.0	30.3	45.5	37.4	34.4	43.4	0.0	26.7	45.3	24.8	20.6
Incr Delay (d2), s/veh	42.9	0.0	5.6	17.2	5.8	0.7	32.0	0.0	25.3	39.6	4.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	9.0	1.6	5.9	1.8	3.8	0.0	21.5	2.2	10.5	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.4	0.0	35.8	62.7	43.2	35.1	75.4	0.0	52.1	84.9	28.7	20.9
LnGrp LOS	F	A	D	E	D	D	E	A	D	F	C	C
Approach Vol, veh/h		691			393			873			826	
Approach Delay, s/veh		54.9			44.0			55.1			30.6	
Approach LOS		D			D			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	45.8	7.9	33.5	11.6	42.5	20.0	21.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.1	* 41	* 6	31.8	* 7.4	36.9	* 16	22.0				
Max Q Clear Time (g_c+I1), s	5.2	40.9	4.9	22.2	8.0	25.7	17.1	14.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.7	0.0	3.1	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			46.2									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout PM Peak (Weekday)

9: Highland Avenue & SR-99 SB Off-Ramp

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	677	0	0	0	0	1416	57	458	956	0
Future Volume (vph)	0	0	677	0	0	0	0	1416	57	458	956	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	736	0	0	0	0	1539	62	498	1039	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	0	645	0	0	0	0	1539	32	498	1039	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			18.5					31.0	31.0	19.4	32.0	
Effective Green, g (s)			18.5					31.0	31.0	19.4	32.0	
Actuated g/C Ratio			0.31					0.52	0.52	0.32	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			851					1810	793	566	1869	
v/s Ratio Prot			0.23					c0.44		c0.28	0.30	
v/s Ratio Perm									0.02			
v/c Ratio			0.76					0.85	0.04	0.88	0.56	
Uniform Delay, d1			18.7					12.5	7.2	19.2	9.3	
Progression Factor			1.00					1.00	1.00	1.21	0.69	
Incremental Delay, d2			3.9					5.2	0.1	11.9	0.9	
Delay (s)			22.6					17.7	7.3	35.3	7.4	
Level of Service			C					B	A	D	A	
Approach Delay (s)		22.6			0.0			17.3			16.4	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.0									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			60.0							9.6		
Intersection Capacity Utilization			72.5%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Near Term + Project Buildout PM Peak (Weekday)

11/19/2018

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	15	79	46	17	125	88	1090	58	135	1289	66
Future Vol, veh/h	38	15	79	46	17	125	88	1090	58	135	1289	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	16	83	48	18	132	93	1147	61	142	1357	69

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2445	3070	713	2335	3074	604	1426	0	0	1208	0	0
Stage 1	1676	1676	-	1364	1364	-	-	-	-	-	-	-
Stage 2	769	1394	-	971	1710	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 16	~ 12	372	~ 19	~ 12	439	468	-	-	568	-	-
Stage 1	98	149	-	154	212	-	-	-	-	-	-	-
Stage 2	358	205	-	270	143	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 7	372	-	~ 7	439	468	-	-	568	-	-
Mov Cap-2 Maneuver	-	~ 7	-	-	~ 7	-	-	-	-	-	-	-
Stage 1	78	112	-	123	170	-	-	-	-	-	-	-
Stage 2	180	164	-	135	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	1.2
HCM LOS	-	-		
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	468	-	-	-	372	-	568	-	-
HCM Lane V/C Ratio	0.198	-	-	-	0.224	-	0.25	-	-
HCM Control Delay (s)	14.6	-	-	-	17.4	-	13.4	-	-
HCM Lane LOS	B	-	-	-	C	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0.8	-	1	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

1: Highland Avenue & Golden State Boulevard

11/19/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	438	427	32	21	511	105	75	279	408	65	242	31
Future Volume (veh/h)	438	427	32	21	511	105	75	279	408	65	242	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	452	440	0	22	527	0	77	288	421	67	249	32
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	519	545		22	522		254	677	302	80	317	140
Arrive On Green	0.29	0.29	0.00	0.29	0.29	0.00	0.14	0.19	0.19	0.05	0.09	0.09
Sat Flow, veh/h	1767	1856	1572	74	1778	1572	1767	3526	1572	1767	3526	1555
Grp Volume(v), veh/h	452	440	0	549	0	0	77	288	421	67	249	32
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1852	0	1572	1767	1763	1572	1767	1763	1555
Q Serve(g_s), s	25.7	23.3	0.0	31.1	0.0	0.0	4.1	7.6	20.4	4.0	7.3	2.0
Cycle Q Clear(g_c), s	25.7	23.3	0.0	31.1	0.0	0.0	4.1	7.6	20.4	4.0	7.3	2.0
Prop In Lane	1.00		1.00	0.04		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	519	545		543	0		254	677	302	80	317	140
V/C Ratio(X)	0.87	0.81		1.01	0.00		0.30	0.43	1.39	0.84	0.79	0.23
Avail Cap(c_a), veh/h	667	700		543	0		254	677	302	80	356	157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	34.7	0.0	37.5	0.0	0.0	40.6	37.7	42.8	50.2	47.2	44.8
Incr Delay (d2), s/veh	9.9	5.4	0.0	41.2	0.0	0.0	0.7	2.0	196.3	50.9	17.5	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	11.0	0.0	19.8	0.0	0.0	1.8	3.4	24.1	2.9	3.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	40.1	0.0	78.7	0.0	0.0	41.3	39.6	239.1	101.1	64.8	48.6
LnGrp LOS	D	D		F	A		D	D	F	F	E	D
Approach Vol, veh/h		892	A		549	A		786			348	
Approach Delay, s/veh		42.8			78.7			146.6			70.3	
Approach LOS		D			E			F			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		36.0	9.0	25.0		36.0	19.8	14.1				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4.8	11.5		31.1	5.6	* 11				
Max Q Clear Time (g_c+I1), s		27.7	6.0	22.4		33.1	6.1	9.3				
Green Ext Time (p_c), s		3.4	0.0	0.0		0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			85.8									
HCM 6th LOS			F									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

Near Term + Project Buildout MD Peak (Saturday)







11/19/2018

Intersection												
Int Delay, s/veh	27.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	183	5	236	209	87	6	22	296	92	5	0
Future Vol, veh/h	0	183	5	236	209	87	6	22	296	92	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	195	5	251	222	93	6	23	315	98	5	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	315	0	0	200	0	0	971	1015	198	1138	971	269
Stage 1	-	-	-	-	-	-	198	198	-	771	771	-
Stage 2	-	-	-	-	-	-	773	817	-	367	200	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1240	-	-	1366	-	-	231	237	841	178	252	767
Stage 1	-	-	-	-	-	-	802	735	-	391	408	-
Stage 2	-	-	-	-	-	-	390	389	-	650	734	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1240	-	-	1366	-	-	187	183	841	~ 83	195	767
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	183	-	~ 83	195	-
Stage 1	-	-	-	-	-	-	802	735	-	391	316	-
Stage 2	-	-	-	-	-	-	297	301	-	394	734	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.7			16.9			248.8		
HCM LOS							C			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	643	1240	-	-	1366	-	-	86				
HCM Lane V/C Ratio	0.536	-	-	-	0.184	-	-	1.2				
HCM Control Delay (s)	16.9	0	-	-	8.2	0	-	248.8				
HCM Lane LOS	C	A	-	-	A	A	-	F				
HCM 95th %tile Q(veh)	3.2	0	-	-	0.7	-	-	7.4				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM 6th TWSC
3: Floral Avenue & Project Driveway

Near Term + Project Buildout MD Peak (Saturday)

11/19/2018

Intersection							
Int Delay, s/veh	6446.3						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	238	284	45	619	609	1154	171
Future Vol, veh/h	238	284	45	619	609	1154	171
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	259	309	49	673	662	1254	186
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1335	0	-	-	0	1929	668
Stage 1	-	-	-	-	-	1102	-
Stage 2	-	-	-	-	-	827	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	510	-	-	-	-	~ 65	400
Stage 1	-	-	-	-	-	~ 279	-
Stage 2	-	-	-	-	-	~ 426	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	510	-	-	-	-	~ 32	400
Mov Cap-2 Maneuver	-	-	-	-	-	~ 32	-
Stage 1	-	-	-	-	-	~ 137	-
Stage 2	-	-	-	-	-	~ 426	-
Approach	EB	WB		SB			
HCM Control Delay, s	8.7			\$ 15175.8			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	510	-	-	-	-	32	400
HCM Lane V/C Ratio	0.507	-	-	-	-	39.198	0.465
HCM Control Delay (s)	19.1	-	-	-	-	\$ 17421.4	21.6
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	2.8	-	-	-	-	155.8	2.4
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined		*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/19/2018


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Future Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1547
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1547
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1996	90	112	1493	0	0	0	166	200	33	620
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	55	0	0	50
Lane Group Flow (vph)	0	1996	44	113	1493	0	0	0	111	200	33	570
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.7	58.7	7.3	70.7				33.7	11.4	37.8	37.8
Effective Green, g (s)		58.7	58.7	7.3	70.7				33.7	11.4	37.8	37.8
Actuated g/C Ratio		0.49	0.49	0.06	0.59				0.28	0.10	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1714	767	106	2065				448	323	581	487
v/s Ratio Prot		c0.57		c0.06	0.43				0.07	0.06	0.02	
v/s Ratio Perm			0.03									c0.37
v/c Ratio		1.16	0.06	1.07	0.72				0.25	0.62	0.06	1.17
Uniform Delay, d1		30.6	16.1	56.4	17.6				33.3	52.2	28.7	41.1
Progression Factor		1.01	1.01	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		80.8	0.0	106.3	1.3				0.3	3.5	0.0	96.8
Delay (s)		111.8	16.4	162.7	18.9				33.6	55.7	28.7	137.9
Level of Service		F	B	F	B				C	E	C	F
Approach Delay (s)		107.7			29.0			33.6			114.4	
Approach LOS		F			C			C			F	
Intersection Summary												
HCM 2000 Control Delay			79.5			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			86.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

5: Highland Avenue & Floral Avenue

11/19/2018







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	655	1171	449	456	883	207	392	377	191	106	529	654
Future Volume (veh/h)	655	1171	449	456	883	207	392	377	191	106	529	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	675	1207	463	470	910	213	404	389	197	109	545	674
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	203	1255	560	473	1072	251	143	897	400	135	1008	791
Arrive On Green	0.12	0.36	0.36	0.14	0.38	0.38	0.04	0.25	0.25	0.08	0.29	0.29
Sat Flow, veh/h	1767	3526	1572	3428	2831	662	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	675	1207	463	470	566	557	404	389	197	109	545	674
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1730	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	13.3	38.7	31.0	15.8	33.9	34.0	4.8	10.7	8.5	7.0	15.1	26.5
Cycle Q Clear(g_c), s	13.3	38.7	31.0	15.8	33.9	34.0	4.8	10.7	8.5	7.0	15.1	26.5
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1255	560	473	668	655	143	897	400	135	1008	791
V/C Ratio(X)	3.32	0.96	0.83	0.99	0.85	0.85	2.83	0.43	0.49	0.81	0.54	0.85
Avail Cap(c_a), veh/h	203	1257	561	473	767	753	143	897	400	230	1162	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	36.4	33.9	49.7	32.8	32.8	55.3	36.0	17.4	52.4	34.8	38.9
Incr Delay (d2), s/veh	1056.3	17.1	9.9	39.8	8.0	8.2	842.9	0.3	0.9	10.6	0.5	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	65.5	19.3	12.7	9.3	15.7	15.5	18.7	4.5	3.0	3.5	6.4	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1107.3	53.4	43.8	89.4	40.7	41.0	898.2	36.4	18.4	63.0	35.2	45.8
LnGrp LOS	F	D	D	F	D	D	F	D	B	E	D	D
Approach Vol, veh/h	2345				1593				990			
Approach Delay, s/veh	354.9				55.2				384.5			
Approach LOS	F				E				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.1	46.2	10.4	37.6	18.5	48.9	13.0	34.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 16	* 41	4.8	* 38	* 7.8	* 50	* 15	27.8				
Max Q Clear Time (g_c+I1), s	17.8	40.7	6.8	28.5	15.3	36.0	9.0	12.7				
Green Ext Time (p_c), s	0.0	0.4	0.0	4.5	0.0	6.6	0.1	2.6				
Intersection Summary												
HCM 6th Ctrl Delay			217.0									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Near Term + Project Buildout MD Peak (Saturday)

6: SR 99 NB Off-Ramp & Floral Avenue























11/19/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↱
Traffic Volume (vph)	995	0	0	1119	334	237
Future Volume (vph)	995	0	0	1119	334	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1093	0	0	1230	367	260
RTOR Reduction (vph)	0	0	0	0	0	42
Lane Group Flow (vph)	1093	0	0	1230	367	218
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	28.9			28.9	14.9	14.9
Effective Green, g (s)	28.9			28.9	14.9	14.9
Actuated g/C Ratio	0.55			0.55	0.28	0.28
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1911			1911	492	440
v/s Ratio Prot	0.31			0.35	0.21	
v/s Ratio Perm						0.14
v/c Ratio	0.57			0.64	0.75	0.50
Uniform Delay, d1	8.0			8.4	17.3	15.9
Progression Factor	1.00			0.95	1.00	1.00
Incremental Delay, d2	1.3			1.6	6.1	0.9
Delay (s)	9.2			9.7	23.4	16.8
Level of Service	A			A	C	B
Approach Delay (s)	9.2			9.7	20.7	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay	11.8			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.68					
Actuated Cycle Length (s)	53.0			Sum of lost time (s)		9.2
Intersection Capacity Utilization	57.1%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

7: Whitson Street & Floral Avenue























11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	686	344	65	510	11	71	149	11	336	98	30
Future Volume (veh/h)	42	686	344	65	510	11	71	149	11	336	98	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	715	358	68	531	11	74	155	0	350	102	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	1440	720	85	2294	47	95	270		252	340	
Arrive On Green	0.06	1.00	1.00	0.05	0.65	0.65	0.05	0.08	0.00	0.07	0.10	0.00
Sat Flow, veh/h	1767	2275	1138	1767	3532	73	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	44	554	519	68	265	277	74	155	0	350	102	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1650	1767	1763	1842	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	2.6	0.0	0.0	4.0	6.6	6.6	4.4	4.5	0.0	7.8	2.9	0.0
Cycle Q Clear(g_c), s	2.6	0.0	0.0	4.0	6.6	6.6	4.4	4.5	0.0	7.8	2.9	0.0
Prop In Lane	1.00		0.69	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	56	1116	1044	85	1145	1197	95	270		252	340	
V/C Ratio(X)	0.79	0.50	0.50	0.80	0.23	0.23	0.78	0.57		1.39	0.30	
Avail Cap(c_a), veh/h	67	1116	1044	85	1145	1197	168	1098		252	1021	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.3	0.0	0.0	49.9	7.7	7.7	49.5	47.3	0.0	49.1	44.6	0.0
Incr Delay (d2), s/veh	33.4	1.3	1.4	40.1	0.5	0.5	12.8	1.9	0.0	196.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.4	0.4	2.7	2.4	2.5	2.2	2.0	0.0	10.2	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.8	1.3	1.4	90.1	8.1	8.1	62.3	49.2	0.0	246.0	45.1	0.0
LnGrp LOS	F	A	A	F	A	A	E	D		F	D	
Approach Vol, veh/h	1117			610			229			A		
Approach Delay, s/veh	4.5			17.3			53.4			200.7		
Approach LOS	A			B			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	15.1	9.3	71.7	12.0	13.0	7.5	73.4				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 10	30.7	* 5.1	* 43	* 7.8	33.0	* 4	43.3				
Max Q Clear Time (g_c+I1), s	6.4	4.9	6.0	2.0	9.8	6.5	4.6	8.6				
Green Ext Time (p_c), s	0.0	0.5	0.0	9.4	0.0	0.9	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay	49.2											
HCM 6th LOS	D											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

8: McCall Avenue & Floral Avenue


11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	183	92	54	196	38	66	531	50	29	533	180
Future Volume (veh/h)	261	183	92	54	196	38	66	531	50	29	533	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	264	185	93	55	198	38	67	536	51	29	538	182
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	313	338	170	69	283	238	85	620	59	44	648	546
Arrive On Green	0.18	0.29	0.29	0.04	0.15	0.15	0.05	0.37	0.37	0.03	0.35	0.35
Sat Flow, veh/h	1767	1163	585	1767	1856	1562	1767	1667	159	1767	1856	1563
Grp Volume(v), veh/h	264	0	278	55	198	38	67	0	587	29	538	182
Grp Sat Flow(s),veh/h/ln	1767	0	1748	1767	1856	1562	1767	0	1825	1767	1856	1563
Q Serve(g_s), s	9.5	0.0	8.8	2.0	6.6	1.4	2.5	0.0	19.5	1.1	17.4	5.6
Cycle Q Clear(g_c), s	9.5	0.0	8.8	2.0	6.6	1.4	2.5	0.0	19.5	1.1	17.4	5.6
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	313	0	509	69	283	238	85	0	679	44	648	546
V/C Ratio(X)	0.84	0.00	0.55	0.80	0.70	0.16	0.79	0.00	0.86	0.66	0.83	0.33
Avail Cap(c_a), veh/h	399	0	792	191	623	524	129	0	888	110	863	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	19.6	31.2	26.4	24.1	30.9	0.0	19.1	31.7	19.6	15.7
Incr Delay (d2), s/veh	12.3	0.0	0.9	18.4	3.1	0.3	16.6	0.0	7.1	15.2	5.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	3.4	1.2	3.0	0.5	1.4	0.0	8.7	0.6	7.4	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	0.0	20.5	49.7	29.5	24.4	47.5	0.0	26.1	46.9	24.8	16.1
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		542			291			654			749	
Approach Delay, s/veh		29.2			32.6			28.3			23.5	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	29.3	6.8	23.7	7.3	27.8	15.8	14.6				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.1	* 32	* 7.1	29.7	* 4.8	30.5	* 15	22.0				
Max Q Clear Time (g_c+I1), s	3.1	21.5	4.0	10.8	4.5	19.4	11.5	8.6				
Green Ext Time (p_c), s	0.0	2.9	0.0	1.5	0.0	3.0	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			27.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout MD Peak (Saturday)

9: Highland Avenue & SR 99 SB Ramps

11/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↶↶					↷↷	↶	↶	↷↷	
Traffic Volume (vph)	0	0	535	0	0	0	0	1321	42	504	960	0
Future Volume (vph)	0	0	535	0	0	0	0	1321	42	504	960	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1533	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1533	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	546	0	0	0	0	1348	43	514	980	0
RTOR Reduction (vph)	0	0	163	0	0	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	0	383	0	0	0	0	1348	20	514	980	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			12.1					26.1	26.1	19.7	33.8	
Effective Green, g (s)			12.1					26.1	26.1	19.7	33.8	
Actuated g/C Ratio			0.22					0.47	0.47	0.36	0.61	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			602					1651	722	623	2138	
v/s Ratio Prot			0.14					c0.38		c0.29	0.28	
v/s Ratio Perm									0.01			
v/c Ratio			0.64					0.82	0.03	0.83	0.46	
Uniform Delay, d1			19.7					12.6	7.9	16.3	5.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			2.2					3.2	0.0	8.7	0.2	
Delay (s)			21.9					15.8	7.9	25.0	6.0	
Level of Service			C					B	A	C	A	
Approach Delay (s)		21.9			0.0			15.6			12.5	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.3									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			55.4									
Intersection Capacity Utilization			72.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

Near Term + Project Buildout MD Peak (Saturday)

11/19/2018

Intersection												
Int Delay, s/veh	441											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	41	12	104	53	22	98	95	984	65	97	1108	69
Future Vol, veh/h	41	12	104	53	22	98	95	984	65	97	1108	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	43	13	109	56	23	103	100	1036	68	102	1166	73

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2137	2711	620	2064	2713	552	1239	0	0	1104	0	0
Stage 1	1407	1407	-	1270	1270	-	-	-	-	-	-	-
Stage 2	730	1304	-	794	1443	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 27	20	428	~ 31	~ 20	475	552	-	-	622	-	-
Stage 1	145	202	-	176	235	-	-	-	-	-	-	-
Stage 2	378	227	-	345	194	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	14	428	~ 4	~ 14	475	552	-	-	622	-	-
Mov Cap-2 Maneuver	-	14	-	~ 4	~ 14	-	-	-	-	-	-	-
Stage 1	119	169	-	144	192	-	-	-	-	-	-	-
Stage 2	213	186	-	199	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 6990.4	1.1	0.9
HCM LOS	-	F		






















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	552	-	-	-	428	12	622	-	-
HCM Lane V/C Ratio	0.181	-	-	-	0.256	15.175	0.164	-	-
HCM Control Delay (s)	13	-	-	-	16.3	6990.4	11.9	-	-
HCM Lane LOS	B	-	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	1	24.1	0.6	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard

11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	179	249	7	64	432	10	6	106	266	14	117	41
Future Volume (veh/h)	179	249	7	64	432	10	6	106	266	14	117	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	199	277	8	71	480	11	7	118	296	16	130	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	376	744	21	101	721	17	24	359	495	29	334	149
Arrive On Green	0.21	0.21	0.21	0.23	0.23	0.23	0.01	0.10	0.10	0.02	0.09	0.09
Sat Flow, veh/h	1767	3499	101	443	3157	76	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	199	139	146	294	0	268	7	118	296	16	130	46
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1833	0	1842	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	4.2	2.8	2.9	6.2	0.0	5.6	0.2	1.3	4.3	0.4	1.5	1.2
Cycle Q Clear(g_c), s	4.2	2.8	2.9	6.2	0.0	5.6	0.2	1.3	4.3	0.4	1.5	1.2
Prop In Lane	1.00		0.05	0.24		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	376	375	391	419	0	420	24	359	495	29	334	149
V/C Ratio(X)	0.53	0.37	0.37	0.70	0.00	0.64	0.29	0.33	0.60	0.56	0.39	0.31
Avail Cap(c_a), veh/h	1675	1671	1742	569	0	572	168	359	495	168	359	160
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	14.2	14.2	15.0	0.0	14.7	20.6	17.6	11.4	20.6	17.9	17.8
Incr Delay (d2), s/veh	1.2	0.6	0.6	2.4	0.0	1.6	6.3	0.5	2.0	15.9	0.7	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.0	1.0	2.4	0.0	2.1	0.1	0.5	2.7	0.3	0.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	14.8	14.8	17.4	0.0	16.3	26.9	18.1	13.4	36.5	18.7	19.0
LnGrp LOS	B	B	B	B	A	B	C	B	B	D	B	B
Approach Vol, veh/h		484			562			421			192	
Approach Delay, s/veh		15.2			16.9			14.9			20.2	
Approach LOS		B			B			B			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.9	4.9	8.9		14.5	5.2	8.6				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	4.3		13.1	4.0	* 4.3				
Max Q Clear Time (g_c+I1), s		6.2	2.4	6.3		8.2	2.2	3.5				
Green Ext Time (p_c), s		2.2	0.0	0.0		1.4	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			16.3									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection

Intersection Delay, s/veh 8.1

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	0	107	4	15	72	25	6	8	21	45	3	1
Future Vol, veh/h	0	107	4	15	72	25	6	8	21	45	3	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	122	5	17	82	28	7	9	24	51	3	1
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8.2	8.2	7.5	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	17%	0%	100%	0%	92%
Vol Thru, %	23%	96%	0%	74%	6%
Vol Right, %	60%	4%	0%	26%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	111	15	97	49
LT Vol	6	0	15	0	45
Through Vol	8	107	0	72	3
RT Vol	21	4	0	25	1
Lane Flow Rate	40	126	17	110	56
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.047	0.154	0.026	0.144	0.074
Departure Headway (Hd)	4.284	4.399	5.386	4.703	4.757
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	838	817	669	767	755
Service Time	2.301	2.412	3.086	2.403	2.774
HCM Lane V/C Ratio	0.048	0.154	0.025	0.143	0.074
HCM Control Delay	7.5	8.2	8.2	8.2	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.5	0.1	0.5	0.2

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout AM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/20/2018



Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	28	148	12	204	296	310	14
Future Volume (vph)	28	148	12	204	296	310	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	161	13	222	322	337	15
RTOR Reduction (vph)	0	0	0	0	222	0	11
Lane Group Flow (vph)	30	161	13	222	100	337	4
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	0.4	11.8	0.4	11.8	11.8	11.0	11.0
Effective Green, g (s)	0.4	11.8	0.4	11.8	11.8	11.0	11.0
Actuated g/C Ratio	0.01	0.31	0.01	0.31	0.31	0.29	0.29
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	18	572	18	1088	486	984	453
v/s Ratio Prot	c0.02	c0.09	0.01	0.06		c0.10	
v/s Ratio Perm					0.06		0.00
v/c Ratio	1.67	0.28	0.72	0.20	0.21	0.34	0.01
Uniform Delay, d1	18.8	9.9	18.7	9.6	9.6	10.6	9.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	462.2	0.3	87.1	0.1	0.2	0.2	0.0
Delay (s)	481.0	10.2	105.8	9.7	9.9	10.9	9.6
Level of Service	F	B	F	A	A	B	A
Approach Delay (s)		84.1		12.0		10.8	
Approach LOS		F		B		B	
Intersection Summary							
HCM 2000 Control Delay			24.2		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.33				
Actuated Cycle Length (s)			38.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			32.3%		ICU Level of Service		A
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

























11/20/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	247
Future Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1547	1468
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1547	1468
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	729	37	64	767	0	0	0	87	209	42	252
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	73	0	74	99
Lane Group Flow (vph)	0	729	13	64	767	0	0	0	14	209	76	45
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		21.7	21.7	6.2	32.6				10.5	10.9	19.9	19.9
Effective Green, g (s)		21.7	21.7	6.2	32.6				10.5	10.9	19.9	19.9
Actuated g/C Ratio		0.34	0.34	0.10	0.51				0.16	0.17	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1188	531	169	1785				261	579	481	456
v/s Ratio Prot		c0.21		0.04	c0.22				0.01	c0.06	c0.05	
v/s Ratio Perm			0.01									0.03
v/c Ratio		0.61	0.02	0.38	0.43				0.05	0.36	0.16	0.10
Uniform Delay, d1		17.7	14.1	27.1	9.9				22.6	23.5	16.0	15.7
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.9	0.0	1.4	0.2				0.1	0.4	0.2	0.1
Delay (s)		18.6	14.1	28.5	10.0				22.7	23.9	16.1	15.8
Level of Service		B	B	C	B				C	C	B	B
Approach Delay (s)		18.4			11.5			22.7			19.2	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			16.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			64.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			46.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

5: Highland Avenue & Floral Avenue

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	498	212	295	596	130	253	235	146	45	366	348
Future Volume (veh/h)	217	498	212	295	596	130	253	235	146	45	366	348
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	233	535	228	317	641	140	272	253	157	48	394	374
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	310	1220	379	447	990	440	310	1002	447	63	788	617
Arrive On Green	0.09	0.24	0.24	0.13	0.28	0.28	0.09	0.28	0.28	0.04	0.22	0.22
Sat Flow, veh/h	3428	5066	1572	3428	3526	1566	3428	3526	1572	1767	3526	2761
Grp Volume(v), veh/h	233	535	228	317	641	140	272	253	157	48	394	374
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1566	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	4.3	5.8	5.5	5.7	10.3	3.4	5.0	3.5	5.1	1.7	6.3	7.8
Cycle Q Clear(g_c), s	4.3	5.8	5.5	5.7	10.3	3.4	5.0	3.5	5.1	1.7	6.3	7.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	310	1220	379	447	990	440	310	1002	447	63	788	617
V/C Ratio(X)	0.75	0.44	0.60	0.71	0.65	0.32	0.88	0.25	0.35	0.76	0.50	0.61
Avail Cap(c_a), veh/h	310	1982	615	850	1989	884	310	2066	922	198	2088	1636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	20.7	9.6	26.7	20.3	10.2	28.8	17.7	18.3	30.7	21.8	22.4
Incr Delay (d2), s/veh	9.9	0.2	1.5	2.1	0.7	0.4	23.6	0.1	0.5	16.7	0.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.2	2.6	2.3	4.0	1.4	2.9	1.3	1.7	1.0	2.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	20.9	11.2	28.8	21.0	10.6	52.4	17.8	18.7	47.3	22.3	23.3
LnGrp LOS	D	C	B	C	C	B	D	B	B	D	C	C
Approach Vol, veh/h		996			1098			682			816	
Approach Delay, s/veh		22.8			21.9			31.8			24.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	20.6	11.0	18.9	11.0	23.2	6.5	23.4				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 16	* 25	5.8	* 38	* 5.8	* 36	* 7.2	* 38				
Max Q Clear Time (g_c+I1), s	7.7	7.8	7.0	9.8	6.3	12.3	3.7	7.1				
Green Ext Time (p_c), s	0.7	4.2	0.0	4.3	0.0	5.1	0.0	2.0				

Intersection Summary

HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C






















Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary Near Term + Project Buildout AM Peak (Weekday)

10: Highland Avenue & Rose Avenue

11/20/2018






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	15	71	34	10	126	58	784	53	84	640	24
Future Volume (veh/h)	56	15	71	34	10	126	58	784	53	84	640	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	65	17	83	40	12	147	67	912	62	98	744	28
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	83	40	195	50	15	187	86	1844	125	124	1981	75
Arrive On Green	0.05	0.15	0.15	0.03	0.13	0.13	0.05	0.55	0.55	0.07	0.57	0.57
Sat Flow, veh/h	1767	274	1340	1767	120	1471	1767	3349	228	1767	3464	130
Grp Volume(v), veh/h	65	0	100	40	0	159	67	480	494	98	378	394
Grp Sat Flow(s),veh/h/ln	1767	0	1614	1767	0	1591	1767	1763	1814	1767	1763	1832
Q Serve(g_s), s	3.5	0.0	5.4	2.2	0.0	9.3	3.6	16.1	16.1	5.2	11.2	11.2
Cycle Q Clear(g_c), s	3.5	0.0	5.4	2.2	0.0	9.3	3.6	16.1	16.1	5.2	11.2	11.2
Prop In Lane	1.00		0.83	1.00		0.92	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	83	0	236	50	0	202	86	971	999	124	1008	1048
V/C Ratio(X)	0.78	0.00	0.42	0.80	0.00	0.79	0.78	0.49	0.49	0.79	0.38	0.38
Avail Cap(c_a), veh/h	88	0	605	74	0	606	88	971	999	125	1008	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	37.3	46.4	0.0	40.6	45.2	13.3	13.3	44.0	11.2	11.2
Incr Delay (d2), s/veh	33.6	0.0	1.2	30.0	0.0	6.6	34.4	1.8	1.7	28.3	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	2.1	1.4	0.0	3.9	2.3	6.0	6.2	3.2	4.1	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.9	0.0	38.5	76.3	0.0	47.2	79.6	15.1	15.1	72.2	12.3	12.2
LnGrp LOS	E	A	D	E	A	D	E	B	B	E	B	B
Approach Vol, veh/h	165					199		1041		870		
Approach Delay, s/veh	54.4					53.1		19.2		19.0		
Approach LOS	D					D		B		B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.9	58.2	6.9	20.0	8.9	60.2	8.7	18.2				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 6.8	29.5	* 4	36.0	* 4.8	31.5	* 4.8	* 37				
Max Q Clear Time (g_c+I1), s	7.2	18.1	4.2	7.4	5.6	13.2	5.5	11.3				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.5	0.0	4.1	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			24.7									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard

11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	514	604	5	56	518	14	22	179	563	21	109	82
Future Volume (veh/h)	514	604	5	56	518	14	22	179	563	21	109	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	578	679	6	63	582	16	25	201	633	24	122	92
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	704	1427	13	75	728	21	79	384	798	37	302	135
Arrive On Green	0.40	0.40	0.40	0.22	0.22	0.22	0.04	0.11	0.11	0.02	0.09	0.09
Sat Flow, veh/h	1767	3581	32	335	3249	93	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	578	334	351	346	0	315	25	201	633	24	122	92
Grp Sat Flow(s),veh/h/ln	1767	1763	1850	1839	0	1839	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	22.0	10.6	10.6	13.5	0.0	12.1	1.0	4.1	8.2	1.0	2.5	4.3
Cycle Q Clear(g_c), s	22.0	10.6	10.6	13.5	0.0	12.1	1.0	4.1	8.2	1.0	2.5	4.3
Prop In Lane	1.00		0.02	0.18		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	704	703	737	412	0	412	79	384	798	37	302	135
V/C Ratio(X)	0.82	0.48	0.48	0.84	0.00	0.76	0.32	0.52	0.79	0.65	0.40	0.68
Avail Cap(c_a), veh/h	942	940	986	467	0	467	96	384	798	94	380	169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	16.8	16.8	27.9	0.0	27.3	34.8	31.7	11.1	36.5	32.6	33.4
Incr Delay (d2), s/veh	4.4	0.5	0.5	11.7	0.0	6.5	2.3	1.3	5.5	17.4	0.9	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	4.0	4.2	6.9	0.0	5.7	0.5	1.7	12.3	0.6	1.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	17.3	17.3	39.6	0.0	33.8	37.1	32.9	16.7	53.9	33.5	41.2
LnGrp LOS	C	B	B	D	A	C	D	C	B	D	C	D
Approach Vol, veh/h	1263				661				859			
Approach Delay, s/veh	20.6				36.9				21.1			
Approach LOS	C				D				C			
Timer - Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	34.9		5.8	12.8	21.8		7.5	11.0				
Change Period (Y+Rc), s	4.9		4.2	* 4.6	4.9		4.2	* 4.6				
Max Green Setting (Gmax), s	40.1		4.0	* 8.2	19.1		4.1	* 8.1				
Max Q Clear Time (g_c+I1), s	24.0		3.0	10.2	15.5		3.0	6.3				
Green Ext Time (p_c), s	5.7		0.0	0.0	1.3		0.0	0.2				

Intersection Summary

HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 16.7

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	1	209	10	211	196	91	9	23	265	73	5	1
Future Vol, veh/h	1	209	10	211	196	91	9	23	265	73	5	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	252	12	254	236	110	11	28	319	88	6	1
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

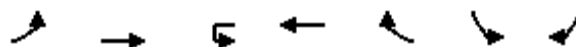
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	15.4	17.6	17.4	12.2
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	3%	0%	100%	0%	92%
Vol Thru, %	8%	95%	0%	68%	6%
Vol Right, %	89%	5%	0%	32%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	220	211	287	79
LT Vol	9	1	211	0	73
Through Vol	23	209	0	196	5
RT Vol	265	10	0	91	1
Lane Flow Rate	358	265	254	346	95
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.594	0.478	0.498	0.607	0.195
Departure Headway (Hd)	5.973	6.488	7.054	6.318	7.364
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	605	554	511	574	486
Service Time	3.989	4.537	4.781	4.045	5.421
HCM Lane V/C Ratio	0.592	0.478	0.497	0.603	0.195
HCM Control Delay	17.4	15.4	16.6	18.4	12.2
HCM Lane LOS	C	C	C	C	B
HCM 95th-tile Q	3.9	2.6	2.7	4	0.7

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout PM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/20/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	216	281	38	584	563	1019	151
Future Volume (vph)	216	281	38	584	563	1019	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	305	41	635	612	1108	164
RTOR Reduction (vph)	0	0	0	0	427	0	107
Lane Group Flow (vph)	235	305	41	635	185	1108	57
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	11.9	31.5	3.5	23.1	23.1	26.8	26.8
Effective Green, g (s)	11.9	31.5	3.5	23.1	23.1	26.8	26.8
Actuated g/C Ratio	0.16	0.41	0.05	0.30	0.30	0.35	0.35
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	758	80	1056	472	1189	548
v/s Ratio Prot	c0.13	0.17	0.02	c0.18		c0.33	
v/s Ratio Perm					0.12		0.04
v/c Ratio	0.86	0.40	0.51	0.60	0.39	0.93	0.10
Uniform Delay, d1	31.6	15.9	35.7	22.8	21.2	24.0	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.6	0.4	5.4	1.0	0.5	12.9	0.1
Delay (s)	55.1	16.3	41.2	23.8	21.7	37.0	16.9
Level of Service	E	B	D	C	C	D	B
Approach Delay (s)		33.2		23.4		34.4	
Approach LOS		C		C		C	
Intersection Summary							
HCM 2000 Control Delay			29.6		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.79				
Actuated Cycle Length (s)			76.6		Sum of lost time (s)		14.8
Intersection Capacity Utilization			69.5%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

























11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Future Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.98	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1506	1460
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1506	1460
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1842	73	116	1468	0	0	0	176	319	51	592
RTOR Reduction (vph)	0	0	31	0	0	0	0	0	61	0	47	52
Lane Group Flow (vph)	0	1842	42	116	1468	0	0	0	115	319	276	268
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		76.6	76.6	10.3	91.6				17.2	17.3	28.9	28.9
Effective Green, g (s)		76.6	76.6	10.3	91.6				17.2	17.3	28.9	28.9
Actuated g/C Ratio		0.58	0.58	0.08	0.69				0.13	0.13	0.22	0.22
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2033	909	136	2432				207	445	329	319
v/s Ratio Prot		c0.53		c0.07	0.42				0.07	0.09	0.18	
v/s Ratio Perm			0.03									c0.18
v/c Ratio		0.91	0.05	0.85	0.60				0.56	0.72	0.84	0.84
Uniform Delay, d1		24.5	11.9	60.1	10.6				53.8	55.0	49.3	49.4
Progression Factor		1.00	1.00	1.19	0.35				1.00	1.00	1.00	1.00
Incremental Delay, d2		7.3	0.1	28.5	0.8				3.2	5.4	16.9	17.8
Delay (s)		31.8	12.0	100.0	4.5				57.0	60.4	66.2	67.2
Level of Service		C	B	F	A				E	E	E	E
Approach Delay (s)		31.0			11.5			57.0			64.6	
Approach LOS		C			B			E			E	
Intersection Summary												
HCM 2000 Control Delay			32.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			132.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			85.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

5: Highland Avenue & Floral Avenue






















11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	622	1104	392	417	831	191	367	437	187	88	591	654
Future Volume (veh/h)	622	1104	392	417	831	191	367	437	187	88	591	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	635	1127	400	426	848	195	374	446	191	90	603	667
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	631	1385	608	760	1123	501	387	581	259	339	843	1171
Arrive On Green	0.06	0.09	0.09	0.22	0.32	0.32	0.04	0.05	0.05	0.19	0.24	0.24
Sat Flow, veh/h	3428	5066	1572	3428	3526	1572	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	635	1127	400	426	848	195	374	446	191	90	603	667
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1572	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	24.3	28.8	13.5	14.6	28.5	7.8	14.4	16.5	15.8	5.7	20.7	24.2
Cycle Q Clear(g_c), s	24.3	28.8	13.5	14.6	28.5	7.8	14.4	16.5	15.8	5.7	20.7	24.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	631	1385	608	760	1123	501	387	581	259	339	843	1171
V/C Ratio(X)	1.01	0.81	0.66	0.56	0.76	0.39	0.97	0.77	0.74	0.27	0.72	0.57
Avail Cap(c_a), veh/h	631	1489	640	760	1123	501	387	1082	482	339	1015	1306
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.39	0.39	0.39	1.00	1.00	1.00	0.44	0.44	0.44	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.0	56.7	17.8	45.7	40.4	13.0	63.3	59.9	59.6	45.4	46.1	28.9
Incr Delay (d2), s/veh	23.9	2.2	2.2	0.9	4.7	2.3	22.5	1.0	1.8	0.4	1.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.3	13.4	5.7	6.3	13.1	4.8	7.8	7.9	6.8	2.6	9.2	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.9	58.9	20.0	46.6	45.1	15.3	85.7	60.9	61.4	45.8	48.0	29.4
LnGrp LOS	F	E	B	D	D	B	F	E	E	D	D	C
Approach Vol, veh/h	2162			1469			1011			1360		
Approach Delay, s/veh	59.6			41.6			70.2			38.7		
Approach LOS	E			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.4	41.3	20.1	36.2	28.5	47.2	29.9	26.3				
Change Period (Y+Rc), s	* 5.2	* 5.2	* 5.2	4.6	* 4.2	* 5.2	4.6	* 4.6				
Max Green Setting (Gmax), s	* 20	* 39	* 15	38.0	* 24	* 36	13.4	* 41				
Max Q Clear Time (g_c+I1), s	16.6	30.8	16.4	26.2	26.3	30.5	7.7	18.5				
Green Ext Time (p_c), s	0.6	5.3	0.0	5.4	0.0	2.8	0.1	3.3				
Intersection Summary												
HCM 6th Ctrl Delay			52.3									
HCM 6th LOS			D									
Notes												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout PM Peak (Weekday)

10: Highland Avenue & Rose Avenue






















11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	15	79	46	17	125	88	1090	58	135	1289	66
Future Volume (veh/h)	38	15	79	46	17	125	88	1090	58	135	1289	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	16	83	48	18	132	93	1147	61	142	1357	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	33	172	62	25	185	119	1418	75	207	1648	84
Arrive On Green	0.03	0.13	0.13	0.03	0.13	0.13	0.07	0.42	0.42	0.12	0.48	0.48
Sat Flow, veh/h	1767	261	1352	1767	192	1410	1767	3405	181	1767	3414	173
Grp Volume(v), veh/h	40	0	99	48	0	150	93	594	614	142	699	727
Grp Sat Flow(s),veh/h/ln	1767	0	1612	1767	0	1602	1767	1763	1823	1767	1763	1824
Q Serve(g_s), s	1.5	0.0	3.9	1.8	0.0	6.1	3.5	20.3	20.3	5.3	23.3	23.4
Cycle Q Clear(g_c), s	1.5	0.0	3.9	1.8	0.0	6.1	3.5	20.3	20.3	5.3	23.3	23.4
Prop In Lane	1.00		0.84	1.00		0.88	1.00		0.10	1.00		0.09
Lane Grp Cap(c), veh/h	55	0	205	62	0	210	119	734	759	207	851	880
V/C Ratio(X)	0.73	0.00	0.48	0.78	0.00	0.71	0.78	0.81	0.81	0.69	0.82	0.83
Avail Cap(c_a), veh/h	124	0	848	103	0	856	150	929	961	237	1017	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	0.0	27.8	32.8	0.0	28.5	31.4	17.6	17.6	29.0	15.2	15.2
Incr Delay (d2), s/veh	16.6	0.0	1.7	18.5	0.0	4.4	18.6	4.3	4.2	6.7	4.7	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	1.1	0.0	2.5	2.0	7.6	7.9	2.4	8.4	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	29.5	51.3	0.0	32.9	50.0	21.8	21.7	35.7	19.9	19.9
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	B	B
Approach Vol, veh/h		139			198			1301			1568	
Approach Delay, s/veh		35.3			37.4			23.8			21.3	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	33.8	6.6	14.7	8.8	38.3	6.3	15.0				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.2	* 36	* 4	36.0	* 5.8	39.5	* 4.8	* 37				
Max Q Clear Time (g_c+I1), s	7.3	22.3	3.8	5.9	5.5	25.4	3.5	8.1				
Green Ext Time (p_c), s	0.1	6.2	0.0	0.5	0.0	7.6	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

1: Highland Avenue & Golden State Boulevard

11/20/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	438	427	32	21	511	105	75	279	408	65	242	31
Future Volume (veh/h)	438	427	32	21	511	105	75	279	408	65	242	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	452	440	33	22	527	108	77	288	421	67	249	32
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	570	1073	80	26	649	140	143	473	718	85	357	158
Arrive On Green	0.32	0.32	0.32	0.23	0.23	0.23	0.08	0.13	0.13	0.05	0.10	0.10
Sat Flow, veh/h	1767	3325	249	115	2860	619	1767	3526	1572	1767	3526	1563
Grp Volume(v), veh/h	452	233	240	353	0	304	77	288	421	67	249	32
Grp Sat Flow(s),veh/h/ln	1767	1763	1811	1850	0	1744	1767	1763	1572	1767	1763	1563
Q Serve(g_s), s	16.1	7.1	7.2	12.6	0.0	11.3	2.9	5.3	9.3	2.6	4.7	1.3
Cycle Q Clear(g_c), s	16.1	7.1	7.2	12.6	0.0	11.3	2.9	5.3	9.3	2.6	4.7	1.3
Prop In Lane	1.00		0.14	0.06		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	570	569	585	420	0	396	143	473	718	85	357	158
V/C Ratio(X)	0.79	0.41	0.41	0.84	0.00	0.77	0.54	0.61	0.59	0.79	0.70	0.20
Avail Cap(c_a), veh/h	1019	1016	1044	467	0	440	143	473	718	117	442	196
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	18.3	18.3	25.6	0.0	25.1	30.6	28.3	12.8	32.7	30.1	28.6
Incr Delay (d2), s/veh	2.5	0.5	0.5	11.9	0.0	7.3	4.0	2.3	1.2	21.2	3.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	2.7	2.8	6.5	0.0	5.2	1.3	2.2	6.9	1.5	2.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	18.8	18.8	37.5	0.0	32.4	34.6	30.6	14.0	53.9	33.7	29.2
LnGrp LOS	C	B	B	D	A	C	C	C	B	D	C	C
Approach Vol, veh/h		925			657			786			348	
Approach Delay, s/veh		21.3			35.2			22.1			37.2	
Approach LOS		C			D			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.3	7.5	13.9		20.6	9.8	11.6				
Change Period (Y+Rc), s		4.9	4.2	* 4.6		4.9	4.2	* 4.6				
Max Green Setting (Gmax), s		40.0	4.6	* 9.3		17.5	5.2	* 8.7				
Max Q Clear Time (g_c+I1), s		18.1	4.6	11.3		14.6	4.9	6.7				
Green Ext Time (p_c), s		4.2	0.0	0.0		1.1	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			26.9									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh14.5

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↗	↘			↔			↔	
Traffic Vol, veh/h	0	183	5	236	209	87	6	22	296	92	5	0
Future Vol, veh/h	0	183	5	236	209	87	6	22	296	92	5	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	195	5	251	222	93	6	23	315	98	5	0
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	12.7	15.4	15	11.7
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	2%	0%	100%	0%	95%
Vol Thru, %	7%	97%	0%	71%	5%
Vol Right, %	91%	3%	0%	29%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	324	188	236	296	97
LT Vol	6	0	236	0	92
Through Vol	22	183	0	209	5
RT Vol	296	5	0	87	0
Lane Flow Rate	345	200	251	315	103
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.535	0.348	0.47	0.527	0.199
Departure Headway (Hd)	5.587	6.26	6.738	6.021	6.947
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	641	570	532	595	520
Service Time	3.667	4.351	4.515	3.797	4.947
HCM Lane V/C Ratio	0.538	0.351	0.472	0.529	0.198
HCM Control Delay	15	12.7	15.4	15.4	11.7
HCM Lane LOS	B	B	C	C	B
HCM 95th-tile Q	3.2	1.5	2.5	3.1	0.7

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout MD Peak (Saturday)

3: Floral Avenue & Project Driveway

11/20/2018



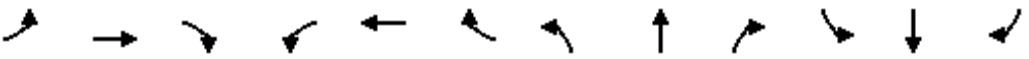
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	238	284	45	619	609	1154	171
Future Volume (vph)	238	284	45	619	609	1154	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	309	49	673	662	1254	186
RTOR Reduction (vph)	0	0	0	0	473	0	115
Lane Group Flow (vph)	259	309	49	673	189	1254	71
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	14.6	36.0	3.9	25.3	25.3	34.0	34.0
Effective Green, g (s)	14.6	36.0	3.9	25.3	25.3	34.0	34.0
Actuated g/C Ratio	0.16	0.41	0.04	0.29	0.29	0.38	0.38
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	748	77	999	447	1303	601
v/s Ratio Prot	c0.15	0.17	0.03	c0.19		c0.37	
v/s Ratio Perm					0.12		0.05
v/c Ratio	0.90	0.41	0.64	0.67	0.42	0.96	0.12
Uniform Delay, d1	36.3	18.8	41.7	28.0	25.8	26.7	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.3	0.4	16.0	1.8	0.6	16.7	0.1
Delay (s)	64.6	19.2	57.7	29.9	26.4	43.4	17.8
Level of Service	E	B	E	C	C	D	B
Approach Delay (s)		39.9		29.2		40.1	
Approach LOS		D		C		D	
Intersection Summary							
HCM 2000 Control Delay			35.6		HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio			0.85				
Actuated Cycle Length (s)			88.7		Sum of lost time (s)		14.8
Intersection Capacity Utilization			75.6%		ICU Level of Service		D
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis - Near Term + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

























11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Future Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1498	1470
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1498	1470
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1996	90	112	1493	0	0	0	166	200	33	620
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	57	0	47	61
Lane Group Flow (vph)	0	1996	54	113	1493	0	0	0	109	200	284	261
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		81.4	81.4	9.8	95.9				21.2	12.5	28.6	28.6
Effective Green, g (s)		81.4	81.4	9.8	95.9				21.2	12.5	28.6	28.6
Actuated g/C Ratio		0.60	0.60	0.07	0.71				0.16	0.09	0.21	0.21
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2097	938	126	2471				248	312	315	309
v/s Ratio Prot		c0.57		c0.06	0.43				0.07	0.06	c0.19	
v/s Ratio Perm			0.03									0.18
v/c Ratio		0.95	0.06	0.90	0.60				0.44	0.64	0.90	0.85
Uniform Delay, d1		25.5	11.4	62.6	10.3				52.0	59.6	52.3	51.6
Progression Factor		1.00	1.00	0.85	0.44				1.00	1.00	1.00	1.00
Incremental Delay, d2		11.2	0.1	37.4	0.7				1.2	4.5	27.1	18.7
Delay (s)		36.7	11.5	90.9	5.3				53.2	64.0	79.4	70.2
Level of Service		D	B	F	A				D	E	E	E
Approach Delay (s)		35.6			11.3			53.2			72.3	
Approach LOS		D			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			34.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			136.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			86.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

5: Highland Avenue & Floral Avenue

11/20/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	655	1171	449	456	883	207	392	377	191	106	529	654
Future Volume (veh/h)	655	1171	449	456	883	207	392	377	191	106	529	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	675	1207	463	470	910	213	404	389	197	109	545	674
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	892	1876	773	523	925	408	416	895	399	133	721	1286
Arrive On Green	0.09	0.12	0.12	0.15	0.26	0.26	0.20	0.42	0.42	0.08	0.20	0.20
Sat Flow, veh/h	3428	5066	1572	3428	3526	1555	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	675	1207	463	470	910	213	404	389	197	109	545	674
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1555	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	26.2	30.9	15.7	18.3	34.9	12.8	15.9	10.6	12.4	8.3	19.8	0.0
Cycle Q Clear(g_c), s	26.2	30.9	15.7	18.3	34.9	12.8	15.9	10.6	12.4	8.3	19.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	892	1876	773	523	925	408	416	895	399	133	721	1286
V/C Ratio(X)	0.76	0.64	0.60	0.90	0.98	0.52	0.97	0.43	0.49	0.82	0.76	0.52
Avail Cap(c_a), veh/h	892	1876	773	565	925	408	416	995	444	209	985	1493
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.32	0.32	1.00	1.00	1.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	51.1	17.4	56.6	49.9	27.7	54.0	32.3	32.8	62.0	50.9	25.8
Incr Delay (d2), s/veh	1.2	0.6	1.1	16.6	25.8	4.7	26.5	0.2	0.6	13.4	2.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	14.2	6.5	9.1	18.6	5.2	7.6	4.1	4.2	4.2	8.9	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	51.7	18.5	73.2	75.7	32.5	80.5	32.5	33.4	75.4	53.2	26.1
LnGrp LOS	E	D	B	E	E	C	F	C	C	E	D	C
Approach Vol, veh/h	2345			1593			990			1328		
Approach Delay, s/veh	47.3			69.2			52.3			41.2		
Approach LOS	D			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.9	55.6	22.1	32.4	40.6	40.9	14.4	40.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 22	* 39	16.5	* 38	* 27	* 36	* 16	38.4				
Max Q Clear Time (g_c+I1), s	20.3	32.9	17.9	21.8	28.2	36.9	10.3	14.4				
Green Ext Time (p_c), s	0.4	4.4	0.0	6.0	0.0	0.0	0.1	3.0				

Intersection Summary

HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary Near Term + Project Buildout MD Peak (Saturday)

10: Highland Avenue & Rose Avenue

11/20/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	12	104	53	22	98	95	984	65	97	1108	69
Future Volume (veh/h)	41	12	104	53	22	98	95	984	65	97	1108	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	43	13	109	56	23	103	100	1036	68	102	1166	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	62	20	164	74	36	161	127	1284	84	180	1388	87
Arrive On Green	0.04	0.12	0.12	0.04	0.12	0.12	0.07	0.38	0.38	0.10	0.41	0.41
Sat Flow, veh/h	1767	170	1428	1767	295	1322	1767	3358	220	1767	3370	211
Grp Volume(v), veh/h	43	0	122	56	0	126	100	544	560	102	610	629
Grp Sat Flow(s),veh/h/ln	1767	0	1598	1767	0	1618	1767	1763	1816	1767	1763	1818
Q Serve(g_s), s	1.3	0.0	4.0	1.7	0.0	4.1	3.1	15.1	15.1	3.0	17.1	17.1
Cycle Q Clear(g_c), s	1.3	0.0	4.0	1.7	0.0	4.1	3.1	15.1	15.1	3.0	17.1	17.1
Prop In Lane	1.00		0.89	1.00		0.82	1.00		0.12	1.00		0.12
Lane Grp Cap(c), veh/h	62	0	184	74	0	197	127	674	694	180	726	749
V/C Ratio(X)	0.69	0.00	0.66	0.76	0.00	0.64	0.78	0.81	0.81	0.57	0.84	0.84
Avail Cap(c_a), veh/h	132	0	524	132	0	572	167	797	821	180	803	828
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	23.3	26.0	0.0	22.9	25.0	15.1	15.1	23.5	14.5	14.5
Incr Delay (d2), s/veh	13.0	0.0	4.1	14.5	0.0	3.4	16.3	5.3	5.2	4.1	7.3	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.5	1.0	0.0	1.6	1.7	5.6	5.8	1.3	6.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	0.0	27.3	40.5	0.0	26.4	41.3	20.4	20.3	27.6	21.8	21.7
LnGrp LOS	D	A	C	D	A	C	D	C	C	C	C	C
Approach Vol, veh/h		165			182			1204			1341	
Approach Delay, s/veh		30.4			30.7			22.1			22.2	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	26.3	6.5	12.3	8.2	27.9	6.1	12.7				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	5.4	* 25	* 4.1	18.0	5.2	* 25	* 4.1	* 19				
Max Q Clear Time (g_c+I1), s	5.0	17.1	3.7	6.0	5.1	19.1	3.3	6.1				
Green Ext Time (p_c), s	0.0	3.8	0.0	0.4	0.0	3.5	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SB	SE	SE	NW	NW	NW
Directions Served	L	T	TR	LT	TR	T	R	L	T	T
Maximum Queue (ft)	91	102	107	148	187	66	13	14	46	12
Average Queue (ft)	33	26	48	85	80	2	1	0	2	0
95th Queue (ft)	80	71	89	139	152	22	6	5	15	4
Link Distance (ft)		537	537	1285	1285	2509			1023	1023
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140						100	75		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	62	31	56	50	52
Average Queue (ft)	30	6	31	20	23
95th Queue (ft)	51	24	46	42	45
Link Distance (ft)	2668		1487	2746	2618
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	53	72	51	88	31	98	112	126	18
Average Queue (ft)	16	29	15	37	1	46	38	57	4
95th Queue (ft)	42	63	38	78	10	76	77	96	17
Link Distance (ft)		745		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	164	213	11	118	176	201	74	143	163	96	77
Average Queue (ft)	87	88	6	41	68	94	18	44	62	51	43
95th Queue (ft)	154	161	14	86	148	171	61	98	109	79	71
Link Distance (ft)	1267	1267			541	541	214			1836	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		6			1						
Queuing Penalty (veh)		2			1						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	90	224	232	210	55	96	192	221	295	296	221	111
Average Queue (ft)	44	66	94	107	7	40	86	85	127	142	39	7
95th Queue (ft)	77	130	169	177	36	85	150	155	239	258	123	48
Link Distance (ft)			541	541	541				221	221		176
Upstream Blk Time (%)								0	1	3	0	
Queuing Penalty (veh)								0	7	14	0	
Storage Bay Dist (ft)	105	105				40	150	150				250
Storage Blk Time (%)	0	1	6		1	7	1	1	5	3	0	
Queuing Penalty (veh)	0	2	13		3	12	2	3	14	3	0	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	103	183	202	178	162	129	92	196	204	185	147
Average Queue (ft)	7	111	129	69	59	45	29	100	79	64	62
95th Queue (ft)	45	171	187	135	114	99	68	160	151	127	121
Link Distance (ft)	176			564	564			920	920		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		1	2	0	5	0	0	7	3	2	1
Queuing Penalty (veh)		1	2	1	8	0	0	3	12	4	1

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	112	115	205	156	134	75
Average Queue (ft)	51	67	91	90	79	33
95th Queue (ft)	93	112	166	146	125	61
Link Distance (ft)	176	176	546	546	1191	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					250	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	73	157	134	149	192	171	49	38	70	59	86	57
Average Queue (ft)	9	46	62	29	55	48	14	17	26	13	35	21
95th Queue (ft)	36	104	117	89	138	117	38	34	61	41	74	44
Link Distance (ft)		546	546		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	0	1			2				0			
Queuing Penalty (veh)	0	0			1				0			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	83
Average Queue (ft)	26
95th Queue (ft)	60
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	347	220	265	217	130	309	194	355	150
Average Queue (ft)	65	134	46	117	41	76	161	71	196	51
95th Queue (ft)	122	246	109	200	105	139	274	162	315	98
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	1	17	0	17		17	31	1	22	
Queuing Penalty (veh)	2	20	0	30		64	28	5	20	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	386	310	263	215	139	274	258
Average Queue (ft)	160	133	101	89	119	121	65
95th Queue (ft)	261	240	204	180	155	252	138
Link Distance (ft)	1240		1501	1501		564	564
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	7	4			37	3	
Queuing Penalty (veh)	18	9			103	10	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	96	93	97	122	136	220	199	135	266	294
Average Queue (ft)	39	44	38	58	50	129	116	61	87	98
95th Queue (ft)	75	75	78	103	97	214	200	111	202	226
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)									1	
Queuing Penalty (veh)									1	

Network Summary

Network wide Queuing Penalty: 420

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	LT	TR	L	T	T	R	T	T
Maximum Queue (ft)	204	379	177	327	330	26	55	42	187	7	20
Average Queue (ft)	139	113	102	129	160	1	10	5	50	0	1
95th Queue (ft)	230	265	166	243	254	9	36	27	132	3	7
Link Distance (ft)		519	519	1285	1285		2509	2509		1136	1136
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	140					200			100		
Storage Blk Time (%)	12	0							2		
Queuing Penalty (veh)	35	1							2		

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	112	94	94	137	52
Average Queue (ft)	55	50	54	58	26
95th Queue (ft)	96	79	78	102	45
Link Distance (ft)	2668		1488	2746	2618
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	212	138	369	370	314	249	278	310	66
Average Queue (ft)	126	81	41	189	111	123	194	221	29
95th Queue (ft)	205	137	146	323	254	212	261	294	54
Link Distance (ft)		744		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)				6	0	0	1	3	
Queuing Penalty (veh)				2	1	0	5	16	

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	1285	1259	220	213	253	274	190	480	580	1870	580
Average Queue (ft)	827	847	80	100	94	105	82	353	404	719	177
95th Queue (ft)	1323	1332	254	188	206	211	159	573	674	1896	403
Link Distance (ft)	1267	1267			530	530	222			1836	
Upstream Blk Time (%)	0	0								20	
Queuing Penalty (veh)	3	1								0	
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		49		7	1			45	31	3	2
Queuing Penalty (veh)		34		51	1			275	193	15	15

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	165	225	583	581	588	160	200	240	351	352	241	241
Average Queue (ft)	161	223	540	536	518	95	168	212	286	276	128	135
95th Queue (ft)	178	231	585	601	659	200	227	284	380	382	303	285
Link Distance (ft)			530	530	530				241	241		154
Upstream Blk Time (%)			34	16	16			7	22	22	1	13
Queuing Penalty (veh)			258	118	117			0	165	168	0	95
Storage Bay Dist (ft)	105	105				40	150	150				250
Storage Blk Time (%)	69	70	46		21	12	31	18	33	22	1	
Queuing Penalty (veh)	253	257	283		82	44	128	74	135	42	2	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	236	227	285	597	618	130	200	488	577	200	150
Average Queue (ft)	131	220	278	468	344	87	113	239	226	159	120
95th Queue (ft)	292	242	306	709	669	149	219	362	412	235	172
Link Distance (ft)	154			563	563			946	946		
Upstream Blk Time (%)	13			18	1						
Queuing Penalty (veh)	99			125	8						
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		59	77	8	36	3	7	39	26	15	12
Queuing Penalty (veh)		129	168	29	67	6	21	34	171	44	37

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	T	L	R
Maximum Queue (ft)	260	223	270	379	445	403	692	370
Average Queue (ft)	35	51	16	39	189	183	274	127
95th Queue (ft)	127	145	115	206	390	390	485	282
Link Distance (ft)	154	154	241	241	542	542	1191	
Upstream Blk Time (%)	1	1	0	0				
Queuing Penalty (veh)	5	7	0	1				
Storage Bay Dist (ft)							250	
Storage Blk Time (%)							18	0
Queuing Penalty (veh)							41	0

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	144	427	429	149	383	385	124	139	134	194	262	320
Average Queue (ft)	31	178	216	79	137	133	38	65	72	105	123	51
95th Queue (ft)	110	377	401	148	277	268	103	129	131	171	197	160
Link Distance (ft)		542	542		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	1	20		13	17		0	3	22	8	13	0
Queuing Penalty (veh)	2	8		40	14		0	3	4	17	28	0

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	147
Average Queue (ft)	50
95th Queue (ft)	103
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	1
Queuing Penalty (veh)	3

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	565	98	290	220	129	1204	195	347	148
Average Queue (ft)	171	303	49	131	59	109	743	60	228	52
95th Queue (ft)	249	529	86	228	154	152	1119	164	335	108
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	45	29	0	19	1	50	46		28	
Queuing Penalty (veh)	173	78	1	26	4	358	48		15	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	R	L	T	T
Maximum Queue (ft)	237	222	623	627	420	139	362	217
Average Queue (ft)	167	124	309	272	42	133	188	124
95th Queue (ft)	232	211	612	560	250	150	319	220
Link Distance (ft)	1240		1501	1501			563	563
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		175			300	65		
Storage Blk Time (%)	6	1		11		42	4	
Queuing Penalty (veh)	20	3		6		199	20	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	92	72	93	182	140	445	441	369	393	370
Average Queue (ft)	32	39	46	69	58	188	187	79	165	187
95th Queue (ft)	70	69	84	127	110	324	326	180	319	336
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				1		4			4	
Queuing Penalty (veh)				0		3			5	

Network Summary

Network wide Queuing Penalty: 4949

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	LT	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	204	405	156	254	348	63	69	41	94	169	134	100
Average Queue (ft)	125	110	88	137	189	8	15	6	16	21	21	13
95th Queue (ft)	222	279	138	215	302	30	46	23	57	86	72	57
Link Distance (ft)		525	525	1285	1285		2509	2509			1136	1136
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					200			100	75		
Storage Blk Time (%)	7	0							0	4	2	0
Queuing Penalty (veh)	16	1							0	5	2	0

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	100	89	78	120	90
Average Queue (ft)	51	52	55	63	33
95th Queue (ft)	79	80	75	97	57
Link Distance (ft)	2668		1493	2746	2618
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	370	633	222	288	386	360	370	400	64
Average Queue (ft)	262	209	33	195	146	168	233	252	26
95th Queue (ft)	386	467	97	268	278	288	323	346	50
Link Distance (ft)		739		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)	29	0		2	0	2	3	9	
Queuing Penalty (veh)	82	0		1	1	6	17	54	

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	B28	B28	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	L	T	T	R	L	L	TR
Maximum Queue (ft)	1339	1358	220	161	150	123	190	165	200	180	329	325
Average Queue (ft)	1030	1049	66	18	17	74	69	78	81	82	137	192
95th Queue (ft)	1466	1460	232	92	85	125	155	165	163	143	241	316
Link Distance (ft)	1267	1267		874	874		530	530	222			1836
Upstream Blk Time (%)	8	12										
Queuing Penalty (veh)	62	91										
Storage Bay Dist (ft)			100			160				380	380	
Storage Blk Time (%)		56					0					
Queuing Penalty (veh)		48					0					

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	309
Average Queue (ft)	183
95th Queue (ft)	292
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	380
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	165	225	557	570	600	160	200	215	326	315	216	293
Average Queue (ft)	135	213	506	506	487	113	173	203	289	292	185	209
95th Queue (ft)	207	276	634	644	734	208	227	255	313	315	285	322
Link Distance (ft)			530	530	530				216	216		182
Upstream Blk Time (%)			11	8	13		0	23	51	53	2	34
Queuing Penalty (veh)			83	59	101		0	0	370	382	0	245
Storage Bay Dist (ft)	105	105				40	150	150			250	
Storage Blk Time (%)	44	46	54		17	22	48	38	53	53	2	
Queuing Penalty (veh)	170	180	356		78	84	212	169	240	109	7	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	270	227	284	586	478	130	200	396	438	200	150
Average Queue (ft)	207	175	203	205	112	58	128	239	245	172	116
95th Queue (ft)	318	262	306	475	248	119	226	363	395	243	164
Link Distance (ft)	182			565	565			939	939		
Upstream Blk Time (%)	31			0							
Queuing Penalty (veh)	225			3							
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		11	22	1	20	2	25	42	26	18	10
Queuing Penalty (veh)		20	42	5	37	3	65	44	171	48	27

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	T	L	R
Maximum Queue (ft)	267	275	241	351	569	559	528	370
Average Queue (ft)	226	239	54	87	402	391	261	112
95th Queue (ft)	310	320	146	231	661	640	413	279
Link Distance (ft)	182	182	216	216	542	542	1192	
Upstream Blk Time (%)	24	29	0	0	9	9		
Queuing Penalty (veh)	178	210	0	1	40	40		
Storage Bay Dist (ft)							250	
Storage Blk Time (%)							17	
Queuing Penalty (veh)							41	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	144	420	453	149	416	352	89	99	113	194	269	589
Average Queue (ft)	24	171	214	61	121	102	37	44	56	105	131	87
95th Queue (ft)	73	375	421	131	270	244	79	89	103	179	233	295
Link Distance (ft)		542	542		2646	2646		874	874			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	1	18		2	21				11	10	17	3
Queuing Penalty (veh)	3	8		6	14				1	13	22	13

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	200
Average Queue (ft)	44
95th Queue (ft)	110
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	2
Queuing Penalty (veh)	7

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	337	219	268	220	130	598	194	301	83
Average Queue (ft)	137	132	49	115	35	84	344	44	176	33
95th Queue (ft)	217	278	113	191	99	152	538	118	296	68
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	24	6	0	14		23	45		18	
Queuing Penalty (veh)	67	16	0	13		136	30		5	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	235	197	295	300	140	420	402
Average Queue (ft)	137	102	184	168	135	238	168
95th Queue (ft)	212	195	287	276	157	417	342
Link Distance (ft)	1240		1501	1501		565	565
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	3	1		0	35	14	
Queuing Penalty (veh)	9	1		0	169	73	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	53	118	53	79	138	182	157	94	213	207
Average Queue (ft)	28	42	31	41	55	98	95	53	99	120
95th Queue (ft)	58	87	58	74	99	157	156	84	169	182
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 5038

Appendix I: Cumulative Year 2030 No Project Traffic Conditions



Traffic Engineering, Inc.

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Traffic Engineering, Transportation Planning, & Parking Solutions

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HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project AM Peak (Weekday)

12/11/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	147	235	71	95	331	10	17	355	332	19	134	41
Future Volume (veh/h)	147	235	71	95	331	10	17	355	332	19	134	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	255	0	103	360	0	18	386	361	21	146	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	355	372		121	422		226	679	303	34	275	123
Arrive On Green	0.20	0.20	0.00	0.30	0.30	0.00	0.13	0.19	0.19	0.02	0.08	0.08
Sat Flow, veh/h	1767	1856	1572	408	1427	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	160	255	0	463	0	0	18	386	361	21	146	45
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1835	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	5.1	8.1	0.0	15.2	0.0	0.0	0.6	6.3	12.3	0.8	2.5	1.7
Cycle Q Clear(g_c), s	5.1	8.1	0.0	15.2	0.0	0.0	0.6	6.3	12.3	0.8	2.5	1.7
Prop In Lane	1.00		1.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	355	372		543	0		226	679	303	34	275	123
V/C Ratio(X)	0.45	0.68		0.85	0.00		0.08	0.57	1.19	0.61	0.53	0.37
Avail Cap(c_a), veh/h	1107	1162		721	0		226	679	303	111	607	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	23.6	0.0	21.2	0.0	0.0	24.5	23.4	25.8	31.1	28.3	27.9
Incr Delay (d2), s/veh	0.9	2.2	0.0	7.5	0.0	0.0	0.1	1.1	114.2	16.2	1.6	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.5	0.0	7.0	0.0	0.0	0.2	2.5	13.7	0.5	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.3	25.9	0.0	28.7	0.0	0.0	24.7	24.5	139.9	47.2	29.9	29.8
LnGrp LOS	C	C		C	A		C	C	F	D	C	C
Approach Vol, veh/h	415		A	463		A	765			212		
Approach Delay, s/veh	24.9			28.7			79.0			31.6		
Approach LOS	C			C			E			C		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	17.7		5.4	16.9		23.8	12.8	9.6				
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s	40.0		* 4	12.3		25.1	5.3	* 11				
Max Q Clear Time (g_c+I1), s	10.1		2.8	14.3		17.2	2.6	4.5				
Green Ext Time (p_c), s	1.9		0.0	0.0		1.7	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay 48.9

HCM 6th LOS D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	91	8	11	67	32	13	9	14	42	8	7
Future Vol, veh/h	6	91	8	11	67	32	13	9	14	42	8	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	99	9	12	73	35	14	10	15	46	9	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	108	0	0	108	0	0	241	250	104	245	237	91
Stage 1	-	-	-	-	-	-	118	118	-	115	115	-
Stage 2	-	-	-	-	-	-	123	132	-	130	122	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1476	-	-	1476	-	-	711	651	948	707	662	964
Stage 1	-	-	-	-	-	-	884	796	-	887	798	-
Stage 2	-	-	-	-	-	-	879	785	-	871	793	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1476	-	-	1476	-	-	691	642	948	680	653	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	691	642	-	680	653	-
Stage 1	-	-	-	-	-	-	880	792	-	883	791	-
Stage 2	-	-	-	-	-	-	855	778	-	842	789	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.7	10	10.6
HCM LOS			B	B


Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	756	1476	-	-	1476	-	-	701
HCM Lane V/C Ratio	0.052	0.004	-	-	0.008	-	-	0.088
HCM Control Delay (s)	10	7.5	0	-	7.5	0	-	10.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	437	36	63	432	0	0	0	85	205	41	97
Future Volume (vph)	0	437	36	63	432	0	0	0	85	205	41	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	446	37	64	441	0	0	0	87	209	42	99
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	63	0	0	66
Lane Group Flow (vph)	0	446	11	64	441	0	0	0	24	209	42	33
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		16.1	16.1	5.1	25.9				15.8	8.2	18.9	18.9
Effective Green, g (s)		16.1	16.1	5.1	25.9				15.8	8.2	18.9	18.9
Actuated g/C Ratio		0.29	0.29	0.09	0.46				0.28	0.15	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1002	448	158	1612				447	495	619	518
v/s Ratio Prot		c0.13		c0.04	0.13				0.02	c0.06	c0.02	
v/s Ratio Perm			0.01									0.02
v/c Ratio		0.45	0.02	0.41	0.27				0.05	0.42	0.07	0.06
Uniform Delay, d1		16.4	14.4	24.2	9.4				14.8	21.9	12.7	12.7
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.0	1.7	0.1				0.1	0.6	0.0	0.1
Delay (s)		16.8	14.5	25.9	9.5				14.8	22.5	12.8	12.7
Level of Service		B	B	C	A				B	C	B	B
Approach Delay (s)		16.6			11.6			14.8			18.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			56.3			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			36.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	375	132	295	458	130	228	278	146	54	465	267
Future Volume (veh/h)	190	375	132	295	458	130	228	278	146	54	465	267
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	204	403	142	317	492	140	245	299	157	58	500	287
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	184	890	397	449	756	214	252	957	427	73	822	644
Arrive On Green	0.10	0.25	0.25	0.13	0.28	0.28	0.07	0.27	0.27	0.04	0.23	0.23
Sat Flow, veh/h	1767	3526	1572	3428	2710	766	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	204	403	142	317	319	313	245	299	157	58	500	287
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1714	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	6.8	6.3	3.3	5.8	10.4	10.5	4.6	4.4	5.3	2.1	8.3	5.8
Cycle Q Clear(g_c), s	6.8	6.3	3.3	5.8	10.4	10.5	4.6	4.4	5.3	2.1	8.3	5.8
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	890	397	449	492	478	252	957	427	73	822	644
V/C Ratio(X)	1.11	0.45	0.36	0.71	0.65	0.65	0.97	0.31	0.37	0.79	0.61	0.45
Avail Cap(c_a), veh/h	184	2120	945	936	1384	1346	252	1849	825	260	2055	1610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.2	20.6	9.5	27.1	20.7	20.7	30.1	18.9	19.2	31.0	22.3	21.4
Incr Delay (d2), s/veh	97.8	0.4	0.5	2.0	1.4	1.5	48.3	0.2	0.5	17.0	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	2.5	1.6	2.4	4.2	4.1	3.4	1.6	1.7	1.2	3.2	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	127.0	20.9	10.0	29.2	22.1	22.3	78.4	19.1	19.8	48.0	23.1	21.9
LnGrp LOS	F	C	B	C	C	C	E	B	B	D	C	C
Approach Vol, veh/h		749			949			701			845	
Approach Delay, s/veh		47.8			24.5			40.0			24.4	
Approach LOS		D			C			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	21.7	10.0	19.8	12.0	23.4	6.9	22.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 18	* 39	4.8	* 38	* 6.8	* 51	* 9.6	* 34				
Max Q Clear Time (g_c+I1), s	7.8	8.3	6.6	10.3	8.8	12.5	4.1	7.3				
Green Ext Time (p_c), s	0.8	3.4	0.0	4.7	0.0	4.5	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			33.2									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	537	0	0	771	181	95
Future Volume (vph)	537	0	0	771	181	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	571	0	0	820	193	101
RTOR Reduction (vph)	0	0	0	0	0	81
Lane Group Flow (vph)	571	0	0	820	193	20
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	21.2			21.2	7.5	7.5
Effective Green, g (s)	21.2			21.2	7.5	7.5
Actuated g/C Ratio	0.56			0.56	0.20	0.20
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1960			1960	346	310
v/s Ratio Prot	0.16			c0.23	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.29			0.42	0.56	0.06
Uniform Delay, d1	4.4			4.8	13.7	12.3
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	1.9	0.1
Delay (s)	4.5			4.9	15.7	12.4
Level of Service	A			A	B	B
Approach Delay (s)	4.5			4.9	14.5	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	6.5			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.45					
Actuated Cycle Length (s)	37.9			Sum of lost time (s)		9.2
Intersection Capacity Utilization	39.0%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	25	424	128	64	546	5	69	274	31	172	118	29
Future Volume (veh/h)	25	424	128	64	546	5	69	274	31	172	118	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	27	461	139	70	593	5	75	298	0	187	128	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	44	853	255	89	1233	10	94	562		304	737	
Arrive On Green	0.03	0.32	0.32	0.05	0.34	0.34	0.05	0.16	0.00	0.09	0.21	0.00
Sat Flow, veh/h	1767	2672	800	1767	3582	30	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	27	303	297	70	292	306	75	298	0	187	128	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1709	1767	1763	1850	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.7	6.9	7.0	1.9	6.3	6.3	2.0	3.8	0.0	2.6	1.4	0.0
Cycle Q Clear(g_c), s	0.7	6.9	7.0	1.9	6.3	6.3	2.0	3.8	0.0	2.6	1.4	0.0
Prop In Lane	1.00		0.47	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	562	545	89	607	637	94	562		304	737	
V/C Ratio(X)	0.61	0.54	0.54	0.79	0.48	0.48	0.80	0.53		0.62	0.17	
Avail Cap(c_a), veh/h	145	1541	1494	189	1570	1648	262	2393		480	2364	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.5	13.6	13.6	22.8	12.5	12.5	22.7	18.8	0.0	21.4	15.8	0.0
Incr Delay (d2), s/veh	12.7	0.8	0.9	14.1	0.6	0.6	13.9	0.8	0.0	2.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.4	2.4	1.1	2.1	2.2	1.1	1.4	0.0	1.0	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	14.4	14.5	36.9	13.1	13.1	36.7	19.5	0.0	23.4	15.9	0.0
LnGrp LOS	D	B	B	D	B	B	D	B		C	B	
Approach Vol, veh/h	627			668			373			A		
Approach Delay, s/veh	15.4			15.6			23.0			20.3		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	15.1	6.6	20.1	9.2	12.7	5.4	21.3				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 7.2	32.6	* 5.2	* 43	6.8	* 33	* 4	43.3				
Max Q Clear Time (g_c+I1), s	4.0	3.4	3.9	9.0	4.6	5.8	2.7	8.3				
Green Ext Time (p_c), s	0.0	0.7	0.0	4.2	0.1	1.8	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	238	62	71	242	109	86	362	22	95	528	225
Future Volume (veh/h)	114	238	62	71	242	109	86	362	22	95	528	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	124	259	67	77	263	118	93	393	24	103	574	245
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	157	371	96	99	433	356	119	613	37	132	672	561
Arrive On Green	0.09	0.27	0.27	0.06	0.23	0.23	0.07	0.35	0.35	0.07	0.36	0.36
Sat Flow, veh/h	1767	1392	360	1767	1856	1529	1767	1728	106	1767	1856	1549
Grp Volume(v), veh/h	124	0	326	77	263	118	93	0	417	103	574	245
Grp Sat Flow(s),veh/h/ln	1767	0	1752	1767	1856	1529	1767	0	1834	1767	1856	1549
Q Serve(g_s), s	5.0	0.0	12.1	3.1	9.1	4.6	3.7	0.0	13.7	4.1	20.6	8.6
Cycle Q Clear(g_c), s	5.0	0.0	12.1	3.1	9.1	4.6	3.7	0.0	13.7	4.1	20.6	8.6
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	157	0	467	99	433	356	119	0	650	132	672	561
V/C Ratio(X)	0.79	0.00	0.70	0.78	0.61	0.33	0.78	0.00	0.64	0.78	0.85	0.44
Avail Cap(c_a), veh/h	216	0	586	164	566	467	167	0	850	211	888	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	0.0	23.8	33.6	24.7	23.0	33.1	0.0	19.4	32.8	21.2	17.4
Incr Delay (d2), s/veh	12.5	0.0	2.7	12.4	1.4	0.5	14.4	0.0	1.1	9.5	6.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	5.0	1.6	3.9	1.6	2.0	0.0	5.6	2.0	9.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	0.0	26.5	46.0	26.1	23.5	47.5	0.0	20.5	42.3	27.6	18.0
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		450			458			510			922	
Approach Delay, s/veh		31.5			28.8			25.4			26.7	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	30.5	8.2	23.8	9.1	31.0	10.6	21.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 8.6	* 33	* 6.7	24.1	* 6.8	34.5	* 8.8	22.0				
Max Q Clear Time (g_c+I1), s	6.1	15.7	5.1	14.1	5.7	22.6	7.0	11.1				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.0	3.5	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			27.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

2030 No Project AM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘					↗↘	↗	↘	↗↘	
Traffic Volume (vph)	0	0	528	0	0	0	0	982	49	357	542	0
Future Volume (vph)	0	0	528	0	0	0	0	982	49	357	542	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	556	0	0	0	0	1034	52	376	571	0
RTOR Reduction (vph)	0	0	456	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	0	0	100	0	0	0	0	1034	24	376	571	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			7.1					19.2	19.2	13.2	25.4	
Effective Green, g (s)			7.1					19.2	19.2	13.2	25.4	
Actuated g/C Ratio			0.17					0.46	0.46	0.31	0.60	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			466					1602	701	550	2119	
v/s Ratio Prot			0.04					c0.30		c0.21	0.16	
v/s Ratio Perm									0.02			
v/c Ratio			0.21					0.65	0.03	0.68	0.27	
Uniform Delay, d1			15.0					8.8	6.3	12.6	3.9	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					0.9	0.0	3.5	0.1	
Delay (s)			15.3					9.7	6.3	16.1	4.0	
Level of Service			B					A	A	B	A	
Approach Delay (s)		15.3			0.0			9.5			8.8	
Approach LOS		B			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.5									
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			42.0							9.6		
Intersection Capacity Utilization			54.9%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 No Project AM Peak (Weekday)

12/11/2018

Intersection												
Int Delay, s/veh	42.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	61	15	71	34	10	121	58	767	53	82	696	24
Future Vol, veh/h	61	15	71	34	10	121	58	767	53	82	696	24
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	66	16	77	37	11	132	63	834	58	89	757	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1498	1967	393	1554	1951	446	784	0	0	892	0	0
Stage 1	949	949	-	989	989	-	-	-	-	-	-	-
Stage 2	549	1018	-	565	962	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	84	61	603	76	63	557	824	-	-	750	-	-
Stage 1	278	335	-	263	321	-	-	-	-	-	-	-
Stage 2	485	311	-	474	330	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 46	50	603	43	51	557	823	-	-	750	-	-
Mov Cap-2 Maneuver	~ 46	50	-	43	51	-	-	-	-	-	-	-
Stage 1	257	295	-	243	296	-	-	-	-	-	-	-
Stage 2	330	287	-	344	290	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	290.8		243.4		0.6		1.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	823	-	-	47	603	137	750	-	-
HCM Lane V/C Ratio	0.077	-	-	1.758	0.128	1.309	0.119	-	-
HCM Control Delay (s)	9.7	-	-	\$ 551.5	11.8	243.4	10.4	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	8.2	0.4	11.3	0.4	-	-
























Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project PM Peak (Weekday)

12/11/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	627	432	12	88	319	55	39	592	565	55	514	102
Future Volume (veh/h)	627	432	12	88	319	55	39	592	565	55	514	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	682	470	0	96	347	0	42	643	614	60	559	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	667	700		87	313		86	675	300	67	637	284
Arrive On Green	0.38	0.38	0.00	0.22	0.22	0.00	0.05	0.19	0.19	0.04	0.18	0.18
Sat Flow, veh/h	1767	1856	1572	398	1438	1572	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	682	470	0	443	0	0	42	643	614	60	559	111
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1836	0	1572	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	40.0	22.4	0.0	23.1	0.0	0.0	2.5	19.1	20.3	3.6	16.4	6.6
Cycle Q Clear(g_c), s	40.0	22.4	0.0	23.1	0.0	0.0	2.5	19.1	20.3	3.6	16.4	6.6
Prop In Lane	1.00		1.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	667	700		400	0		86	675	300	67	637	284
V/C Ratio(X)	1.02	0.67		1.11	0.00		0.49	0.95	2.04	0.90	0.88	0.39
Avail Cap(c_a), veh/h	667	700		400	0		86	675	300	67	637	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	27.5	0.0	41.5	0.0	0.0	49.1	42.4	42.9	50.8	42.3	38.3
Incr Delay (d2), s/veh	40.7	2.5	0.0	77.3	0.0	0.0	4.2	24.7	481.3	76.0	15.8	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.8	10.1	0.0	18.8	0.0	0.0	1.2	10.4	47.8	3.0	8.3	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.7	30.0	0.0	118.8	0.0	0.0	53.4	67.1	524.2	126.8	58.1	42.3
LnGrp LOS	F	C		F	A		D	E	F	F	E	D
Approach Vol, veh/h	1152		A	443		A	1299		730			
Approach Delay, s/veh	55.9			118.8			282.7		61.4			
Approach LOS	E			F			F		E			
Timer - Assigned Phs	2		3	4		6	7		8			
Phs Duration (G+Y+Rc), s	44.9		8.2	24.9		28.0	9.4		23.7			
Change Period (Y+Rc), s	4.9		4.2	* 4.6		4.9	4.2		* 4.6			
Max Green Setting (Gmax), s	40.0		4.0	* 20		23.1	4.0		* 20			
Max Q Clear Time (g_c+I1), s	42.0		5.6	22.3		25.1	4.5		18.4			
Green Ext Time (p_c), s	0.0		0.0	0.0		0.0	0.0		0.8			

Intersection Summary

HCM 6th Ctrl Delay 146.0

HCM 6th LOS F

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018













Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	168	24	14	137	90	42	35	8	81	5	5
Future Vol, veh/h	17	168	24	14	137	90	42	35	8	81	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	183	26	15	149	98	46	38	9	88	5	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	247	0	0	209	0	0	465	509	196	484	473	198
Stage 1	-	-	-	-	-	-	232	232	-	228	228	-
Stage 2	-	-	-	-	-	-	233	277	-	256	245	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1313	-	-	1356	-	-	506	466	843	491	488	841
Stage 1	-	-	-	-	-	-	769	711	-	772	714	-
Stage 2	-	-	-	-	-	-	768	679	-	746	702	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1313	-	-	1356	-	-	487	452	843	445	474	841
Mov Cap-2 Maneuver	-	-	-	-	-	-	487	452	-	445	474	-
Stage 1	-	-	-	-	-	-	757	700	-	760	705	-
Stage 2	-	-	-	-	-	-	747	670	-	687	691	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.4			14			15		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	491	1313	-	-	1356	-	-	458				
HCM Lane V/C Ratio	0.188	0.014	-	-	0.011	-	-	0.216				
HCM Control Delay (s)	14	7.8	0	-	7.7	0	-	15				
HCM Lane LOS	B	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.8				

HCM Signalized Intersection Capacity Analysis

4: Floral Avenue & SR-99 SB Off-Ramp

2030 No Project PM Peak (Weekday)

12/11/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	832	70	111	767	0	0	0	169	306	49	160
Future Volume (vph)	0	832	70	111	767	0	0	0	169	306	49	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1543
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1543
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	867	73	116	799	0	0	0	176	319	51	167
RTOR Reduction (vph)	0	0	50	0	0	0	0	0	92	0	0	92
Lane Group Flow (vph)	0	867	23	116	799	0	0	0	84	319	51	75
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		20.5	20.5	6.4	31.6				17.1	11.9	22.6	22.6
Effective Green, g (s)		20.5	20.5	6.4	31.6				17.1	11.9	22.6	22.6
Actuated g/C Ratio		0.31	0.31	0.10	0.48				0.26	0.18	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1093	489	170	1685				415	615	634	530
v/s Ratio Prot		c0.25		c0.07	0.23				c0.05	c0.09	0.03	
v/s Ratio Perm			0.01									0.05
v/c Ratio		0.79	0.05	0.68	0.47				0.20	0.52	0.08	0.14
Uniform Delay, d1		20.7	15.8	28.7	11.5				19.0	24.3	14.5	14.9
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	0.0	10.7	0.2				0.2	0.7	0.1	0.1
Delay (s)		24.7	15.8	39.4	11.7				19.2	25.1	14.6	15.0
Level of Service		C	B	D	B				B	C	B	B
Approach Delay (s)		24.0			15.2			19.2			20.9	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.9			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			65.7			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	635	293	417	607	259	321	437	187	137	591	282
Future Volume (veh/h)	286	635	293	417	607	259	321	437	187	137	591	282
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	292	648	299	426	619	264	328	446	191	140	603	288
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	155	945	422	550	821	350	212	762	340	178	882	692
Arrive On Green	0.09	0.27	0.27	0.16	0.34	0.34	0.06	0.22	0.22	0.10	0.25	0.25
Sat Flow, veh/h	1767	3526	1572	3428	2407	1026	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	292	648	299	426	453	430	328	446	191	140	603	288
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1671	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.8	12.8	13.4	9.3	17.7	17.8	4.8	8.8	5.3	6.0	12.0	6.8
Cycle Q Clear(g_c), s	6.8	12.8	13.4	9.3	17.7	17.8	4.8	8.8	5.3	6.0	12.0	6.8
Prop In Lane	1.00		1.00	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	155	945	422	550	601	570	212	762	340	178	882	692
V/C Ratio(X)	1.89	0.69	0.71	0.77	0.75	0.75	1.55	0.59	0.56	0.79	0.68	0.42
Avail Cap(c_a), veh/h	155	1573	702	983	1161	1100	212	1179	526	404	1723	1352
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	25.5	25.7	31.3	22.7	22.7	36.5	27.4	10.6	34.1	26.4	24.4
Incr Delay (d2), s/veh	423.8	0.9	2.2	2.4	1.9	2.1	269.6	0.7	1.5	7.4	0.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.0	5.2	4.8	3.9	7.2	6.9	9.8	3.5	2.9	2.8	4.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	459.2	26.4	27.9	33.7	24.7	24.8	306.0	28.1	12.1	41.6	27.3	24.8
LnGrp LOS	F	C	C	C	C	C	F	C	B	D	C	C
Approach Vol, veh/h	1239				1309				965			
Approach Delay, s/veh	128.8				27.6				119.4			
Approach LOS	F				C				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	26.0	10.0	24.0	12.0	31.7	12.0	22.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 22	* 35	4.8	* 38	* 6.8	* 51	* 18	* 26				
Max Q Clear Time (g_c+I1), s	11.3	15.4	6.8	14.0	8.8	19.8	8.0	10.8				
Green Ext Time (p_c), s	1.2	5.5	0.0	5.4	0.0	6.8	0.2	2.9				

Intersection Summary

HCM 6th Ctrl Delay 74.9

HCM 6th LOS E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

6: SR-99 NB Off-Ramp & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	917	0	0	1019	378	245
Future Volume (vph)	917	0	0	1019	378	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	976	0	0	1084	402	261
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	976	0	0	1084	402	217
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	27.5			27.5	16.3	16.3
Effective Green, g (s)	27.5			27.5	16.3	16.3
Actuated g/C Ratio	0.52			0.52	0.31	0.31
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1818			1818	538	482
v/s Ratio Prot	0.28			c0.31	c0.23	
v/s Ratio Perm						0.14
v/c Ratio	0.54			0.60	0.75	0.45
Uniform Delay, d1	8.5			8.9	16.5	14.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.1			1.5	5.6	0.7
Delay (s)	9.6			10.3	22.1	15.4
Level of Service	A			B	C	B
Approach Delay (s)	9.6			10.3	19.5	
Approach LOS	A			B	B	
Intersection Summary						
HCM 2000 Control Delay			12.3		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			53.0		Sum of lost time (s)	9.2
Intersection Capacity Utilization			56.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	744	202	83	514	81	127	587	28	274	497	63
Future Volume (veh/h)	82	744	202	83	514	81	127	587	28	274	497	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	88	800	217	89	553	87	137	631	0	295	534	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	96	940	255	309	1413	222	165	789		305	797	
Arrive On Green	0.05	0.34	0.34	0.17	0.46	0.46	0.09	0.22	0.00	0.09	0.23	0.00
Sat Flow, veh/h	1767	2739	743	1767	3050	478	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	88	515	502	89	319	321	137	631	0	295	534	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1719	1767	1763	1765	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	5.5	29.8	29.8	4.8	13.0	13.1	8.4	18.6	0.0	9.4	15.2	0.0
Cycle Q Clear(g_c), s	5.5	29.8	29.8	4.8	13.0	13.1	8.4	18.6	0.0	9.4	15.2	0.0
Prop In Lane	1.00		0.43	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	96	605	590	309	817	818	165	789		305	797	
V/C Ratio(X)	0.91	0.85	0.85	0.29	0.39	0.39	0.83	0.80		0.97	0.67	
Avail Cap(c_a), veh/h	96	689	672	309	817	818	194	1058		305	984	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.7	33.5	33.5	39.4	19.3	19.4	49.0	40.4	0.0	49.9	38.8	0.0
Incr Delay (d2), s/veh	57.5	12.1	12.4	0.5	1.4	1.4	22.2	3.2	0.0	42.1	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	14.5	14.2	2.1	5.5	5.5	4.6	8.2	0.0	5.7	6.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.3	45.6	45.9	40.0	20.7	20.8	71.2	43.6	0.0	92.1	40.1	0.0
LnGrp LOS	F	D	D	D	C	C	E	D		F	D	
Approach Vol, veh/h		1105			729			768	A		829	A
Approach Delay, s/veh		50.8			23.1			48.5			58.6	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.5	29.8	23.8	42.0	14.7	29.5	10.2	55.6				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.6	* 4.2	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 12	30.7	* 6.7	* 43	9.8	* 33	* 6	43.3				
Max Q Clear Time (g_c+I1), s	10.4	17.2	6.8	31.8	11.4	20.6	7.5	15.1				
Green Ext Time (p_c), s	0.1	2.8	0.0	5.1	0.0	3.2	0.0	4.1				
Intersection Summary												
HCM 6th Ctrl Delay			46.3									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	223	277	89	51	227	94	98	652	62	60	507	196
Future Volume (veh/h)	223	277	89	51	227	94	98	652	62	60	507	196
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	237	295	95	54	241	100	104	694	66	64	539	209
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	268	384	124	69	324	269	131	727	69	82	757	636
Arrive On Green	0.15	0.29	0.29	0.04	0.17	0.17	0.07	0.44	0.44	0.05	0.41	0.41
Sat Flow, veh/h	1767	1336	430	1767	1856	1541	1767	1667	159	1767	1856	1559
Grp Volume(v), veh/h	237	0	390	54	241	100	104	0	760	64	539	209
Grp Sat Flow(s),veh/h/ln	1767	0	1766	1767	1856	1541	1767	0	1826	1767	1856	1559
Q Serve(g_s), s	12.3	0.0	18.9	2.8	11.5	5.4	5.4	0.0	37.6	3.3	22.7	8.6
Cycle Q Clear(g_c), s	12.3	0.0	18.9	2.8	11.5	5.4	5.4	0.0	37.6	3.3	22.7	8.6
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	268	0	507	69	324	269	131	0	796	82	757	636
V/C Ratio(X)	0.88	0.00	0.77	0.78	0.74	0.37	0.79	0.00	0.96	0.78	0.71	0.33
Avail Cap(c_a), veh/h	268	0	571	113	437	363	168	0	816	91	757	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	0.0	30.5	44.5	36.6	34.1	42.6	0.0	25.5	44.1	23.1	18.9
Incr Delay (d2), s/veh	27.2	0.0	5.6	17.3	4.6	0.9	17.7	0.0	21.0	31.9	3.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.0	8.5	1.5	5.5	2.0	3.0	0.0	20.0	2.1	9.8	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	0.0	36.1	61.8	41.3	34.9	60.2	0.0	46.5	76.0	26.2	19.2
LnGrp LOS	E	A	D	E	D	C	E	A	D	E	C	B
Approach Vol, veh/h	627		395			864			812			
Approach Delay, s/veh	47.4		42.5			48.2			28.4			
Approach LOS	D		D			D			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	45.6	7.8	31.5	11.1	43.0	18.4	20.9				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.8	* 42	* 6	30.2	* 8.9	37.0	* 14	22.0				
Max Q Clear Time (g_c+I1), s	5.3	39.6	4.8	20.9	7.4	24.7	14.3	13.5				
Green Ext Time (p_c), s	0.0	1.1	0.0	1.6	0.0	3.2	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			41.2									
HCM 6th LOS			D									
Notes												


* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR-99 SB Off-Ramp

2030 No Project PM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	677	0	0	0	0	1370	58	407	908	0
Future Volume (vph)	0	0	677	0	0	0	0	1370	58	407	908	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	736	0	0	0	0	1489	63	442	987	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	0	628	0	0	0	0	1489	32	442	987	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			13.7					24.2	24.2	14.5	25.1	
Effective Green, g (s)			13.7					24.2	24.2	14.5	25.1	
Actuated g/C Ratio			0.28					0.50	0.50	0.30	0.52	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			782					1756	769	525	1821	
v/s Ratio Prot			0.23					c0.42		c0.25	0.28	
v/s Ratio Perm									0.02			
v/c Ratio			0.80					0.85	0.04	0.84	0.54	
Uniform Delay, d1			16.0					10.5	6.1	15.8	7.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			6.0					4.0	0.0	11.7	0.3	
Delay (s)			22.0					14.5	6.2	27.5	8.1	
Level of Service			C					B	A	C	A	
Approach Delay (s)		22.0			0.0			14.1			14.1	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.7									
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			48.3							9.6		
Intersection Capacity Utilization			68.4%							C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 No Project PM Peak (Weekday)

12/11/2018

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	15	77	46	15	120	88	1057	58	127	1256	66
Future Vol, veh/h	38	15	77	46	15	120	88	1057	58	127	1256	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	16	81	48	16	126	93	1113	61	134	1322	69

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2376	2985	696	2267	2989	587	1391	0	0	1174	0	0
Stage 1	1625	1625	-	1330	1330	-	-	-	-	-	-	-
Stage 2	751	1360	-	937	1659	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 18	~ 13	382	~ 22	~ 13	450	483	-	-	585	-	-
Stage 1	106	158	-	162	220	-	-	-	-	-	-	-
Stage 2	367	213	-	283	152	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 8	382	-	~ 8	450	483	-	-	585	-	-
Mov Cap-2 Maneuver	-	~ 8	-	-	~ 8	-	-	-	-	-	-	-
Stage 1	86	122	-	131	178	-	-	-	-	-	-	-
Stage 2	194	172	-	150	117	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	1.1
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	483	-	-	-	382	-	585	-	-
HCM Lane V/C Ratio	0.192	-	-	-	0.212	-	0.229	-	-
HCM Control Delay (s)	14.2	-	-	-	16.9	-	13	-	-
HCM Lane LOS	B	-	-	-	C	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0.8	-	0.9	-	-
























Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project MD Peak (Saturday)

12/11/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	479	228	39	52	292	146	93	671	255	99	629	58
Future Volume (veh/h)	479	228	39	52	292	146	93	671	255	99	629	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	494	235	0	54	301	0	96	692	263	102	648	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	541	568		54	302		220	941	420	114	716	318
Arrive On Green	0.31	0.31	0.00	0.19	0.19	0.00	0.12	0.27	0.27	0.06	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	280	1561	1572	1767	3526	1572	1767	3526	1565
Grp Volume(v), veh/h	494	235	0	355	0	0	96	692	263	102	648	60
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1842	0	1572	1767	1763	1572	1767	1763	1565
Q Serve(g_s), s	29.6	11.1	0.0	21.2	0.0	0.0	5.5	19.7	16.2	6.3	19.7	3.5
Cycle Q Clear(g_c), s	29.6	11.1	0.0	21.2	0.0	0.0	5.5	19.7	16.2	6.3	19.7	3.5
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	541	568		357	0		220	941	420	114	716	318
V/C Ratio(X)	0.91	0.41		1.00	0.00		0.44	0.74	0.63	0.89	0.90	0.19
Avail Cap(c_a), veh/h	643	675		357	0		220	941	420	114	740	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	30.3	0.0	44.3	0.0	0.0	44.6	36.8	35.5	51.1	42.8	36.3
Incr Delay (d2), s/veh	15.9	0.5	0.0	46.4	0.0	0.0	1.4	5.1	6.9	52.8	17.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	4.9	0.0	14.1	0.0	0.0	2.5	8.9	6.8	4.4	10.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	30.8	0.0	90.7	0.0	0.0	45.9	41.9	42.4	103.9	59.9	37.6
LnGrp LOS	D	C		F	A		D	D	D	F	E	D
Approach Vol, veh/h		729	A		355	A		1051			810	
Approach Delay, s/veh		45.7			90.7			42.4			63.7	
Approach LOS		D			F			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		38.6	11.3	33.9		26.2	18.3	26.9				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 7.1	23.0		21.3	7.0	* 23				
Max Q Clear Time (g_c+I1), s		31.6	8.3	21.7		23.2	7.5	21.7				
Green Ext Time (p_c), s		2.0	0.0	0.7		0.0	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018

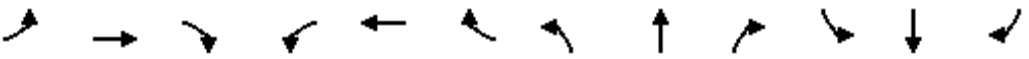
Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	124	18	8	123	82	38	32	13	98	5	4
Future Vol, veh/h	16	124	18	8	123	82	38	32	13	98	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	17	132	19	9	131	87	40	34	14	104	5	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	218	0	0	151	0	0	373	412	142	393	378	175
Stage 1	-	-	-	-	-	-	176	176	-	193	193	-
Stage 2	-	-	-	-	-	-	197	236	-	200	185	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1346	-	-	1424	-	-	582	528	903	565	552	866
Stage 1	-	-	-	-	-	-	823	752	-	806	739	-
Stage 2	-	-	-	-	-	-	803	708	-	800	745	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1346	-	-	1424	-	-	566	517	903	520	540	866
Mov Cap-2 Maneuver	-	-	-	-	-	-	566	517	-	520	540	-
Stage 1	-	-	-	-	-	-	811	741	-	795	734	-
Stage 2	-	-	-	-	-	-	788	703	-	741	735	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.3			12.3			13.7		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	579	1346	-	-	1424	-	-	529				
HCM Lane V/C Ratio	0.153	0.013	-	-	0.006	-	-	0.215				
HCM Control Delay (s)	12.3	7.7	0	-	7.5	0	-	13.7				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.8				

HCM Signalized Intersection Capacity Analysis

4: SR 99 SB Off-Ramp & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	829	86	108	725	0	0	0	159	192	32	146
Future Volume (vph)	0	829	86	108	725	0	0	0	159	192	32	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1548
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	864	90	112	755	0	0	0	166	200	33	152
RTOR Reduction (vph)	0	0	61	0	0	0	0	0	86	0	0	77
Lane Group Flow (vph)	0	864	29	113	755	0	0	0	80	200	33	75
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		20.4	20.4	6.4	31.5				19.6	8.2	21.4	21.4
Effective Green, g (s)		20.4	20.4	6.4	31.5				19.6	8.2	21.4	21.4
Actuated g/C Ratio		0.32	0.32	0.10	0.49				0.30	0.13	0.33	0.33
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1110	496	174	1714				485	432	613	514
v/s Ratio Prot		c0.25		c0.06	0.22				c0.05	c0.06	0.02	
v/s Ratio Perm			0.02									0.05
v/c Ratio		0.78	0.06	0.65	0.44				0.16	0.46	0.05	0.15
Uniform Delay, d1		20.0	15.3	27.9	10.7				16.4	26.1	14.6	15.1
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.5	0.0	8.1	0.2				0.2	0.8	0.0	0.1
Delay (s)		23.5	15.4	36.0	10.9				16.6	26.8	14.7	15.2
Level of Service		C	B	D	B				B	C	B	B
Approach Delay (s)		22.7			14.2			16.6			21.2	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			18.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			64.4			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			51.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018







												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	626	333	456	636	273	341	377	191	155	529	244
Future Volume (veh/h)	229	626	333	456	636	273	341	377	191	155	529	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	236	645	343	470	656	281	352	389	197	160	545	252
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	145	993	443	602	899	385	240	655	292	199	789	620
Arrive On Green	0.08	0.28	0.28	0.18	0.38	0.38	0.07	0.19	0.19	0.11	0.22	0.22
Sat Flow, veh/h	1767	3526	1572	3428	2397	1027	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	236	645	343	470	482	455	352	389	197	160	545	252
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1661	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.8	13.3	16.6	10.8	19.5	19.5	5.8	8.4	6.0	7.3	11.7	6.4
Cycle Q Clear(g_c), s	6.8	13.3	16.6	10.8	19.5	19.5	5.8	8.4	6.0	7.3	11.7	6.4
Prop In Lane	1.00		1.00	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	145	993	443	602	661	623	240	655	292	199	789	620
V/C Ratio(X)	1.63	0.65	0.77	0.78	0.73	0.73	1.47	0.59	0.67	0.80	0.69	0.41
Avail Cap(c_a), veh/h	145	1346	600	1011	1069	1007	240	1048	467	410	1619	1271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	26.1	27.3	32.6	22.3	22.3	38.5	30.8	12.2	35.8	29.5	27.4
Incr Delay (d2), s/veh	310.7	0.7	4.4	2.2	1.6	1.7	230.8	0.9	2.7	7.3	1.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.4	5.5	6.2	4.6	7.9	7.5	10.0	3.4	3.4	3.4	4.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	348.7	26.9	31.7	34.8	23.8	23.9	269.3	31.7	14.9	43.1	30.6	27.9
LnGrp LOS	F	C	C	C	C	C	F	C	B	D	C	C
Approach Vol, veh/h		1224			1407			938			957	
Approach Delay, s/veh		90.3			27.5			117.3			32.0	
Approach LOS		F			C			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.7	28.5	11.4	23.1	12.0	36.2	13.5	21.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 24	* 32	5.8	* 38	* 6.8	* 50	* 19	24.6				
Max Q Clear Time (g_c+I1), s	12.8	18.6	7.8	13.7	8.8	21.5	9.3	10.4				
Green Ext Time (p_c), s	1.4	4.7	0.0	4.8	0.0	7.2	0.3	2.5				
Intersection Summary												
HCM 6th Ctrl Delay			64.0									
HCM 6th LOS			E									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis

6: SR 99 NB Off-Ramp & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018























						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↱
Traffic Volume (vph)	794	0	0	964	312	254
Future Volume (vph)	794	0	0	964	312	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	863	0	0	1048	339	276
RTOR Reduction (vph)	0	0	0	0	0	73
Lane Group Flow (vph)	863	0	0	1048	339	203
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	30.4			30.4	15.4	15.4
Effective Green, g (s)	30.4			30.4	15.4	15.4
Actuated g/C Ratio	0.55			0.55	0.28	0.28
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1937			1937	490	439
v/s Ratio Prot	0.25			c0.30	c0.19	
v/s Ratio Perm						0.13
v/c Ratio	0.45			0.54	0.69	0.46
Uniform Delay, d1	7.3			7.8	17.7	16.4
Progression Factor	1.00			1.07	1.00	1.00
Incremental Delay, d2	0.7			1.0	4.2	0.8
Delay (s)	8.0			9.4	21.9	17.2
Level of Service	A			A	C	B
Approach Delay (s)	8.0			9.4	19.8	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			11.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			55.0	Sum of lost time (s)		9.2
Intersection Capacity Utilization			51.6%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	578	262	65	424	79	114	528	20	280	436	30
Future Volume (veh/h)	82	578	262	65	424	79	114	528	20	280	436	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	85	602	273	68	442	82	119	550	0	292	454	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	620	681	309	456	572	105	146	694		312	746	
Arrive On Green	0.70	0.58	0.58	0.26	0.19	0.19	0.08	0.20	0.00	0.09	0.21	0.00
Sat Flow, veh/h	1767	2357	1068	1767	2972	548	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	85	450	425	68	261	263	119	550	0	292	454	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1662	1767	1763	1757	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	1.7	24.2	24.3	3.3	15.4	15.6	7.3	16.3	0.0	9.3	12.8	0.0
Cycle Q Clear(g_c), s	1.7	24.2	24.3	3.3	15.4	15.6	7.3	16.3	0.0	9.3	12.8	0.0
Prop In Lane	1.00		0.64	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	620	509	480	456	339	338	146	694		312	746	
V/C Ratio(X)	0.14	0.88	0.88	0.15	0.77	0.78	0.82	0.79		0.94	0.61	
Avail Cap(c_a), veh/h	620	681	642	456	689	687	175	1058		312	1029	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	10.9	21.6	21.6	31.5	42.1	42.2	49.6	42.0	0.0	49.7	39.2	0.0
Incr Delay (d2), s/veh	0.1	17.7	18.6	0.1	15.4	16.1	21.6	2.4	0.0	34.7	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	9.1	8.7	1.4	8.1	8.2	4.0	7.1	0.0	5.4	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	39.3	40.3	31.7	57.6	58.3	71.2	44.4	0.0	84.4	40.0	0.0
LnGrp LOS	B	D	D	C	E	E	E	D		F	D	
Approach Vol, veh/h		960			592			669	A		746	A
Approach Delay, s/veh		37.2			54.9			49.2			57.4	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	28.2	32.6	36.0	14.9	26.6	42.8	25.8				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 11	32.1	* 7	* 43	10.0	* 33	6.1	* 43				
Max Q Clear Time (g_c+I1), s	9.3	14.8	5.3	26.3	11.3	18.3	3.7	17.6				
Green Ext Time (p_c), s	0.0	2.6	0.0	5.3	0.0	3.0	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay	48.5
HCM 6th LOS	D

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

2030 No Project MD Peak (Saturday)

12/11/2018


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	175	78	54	188	47	54	559	50	34	533	160
Future Volume (veh/h)	212	175	78	54	188	47	54	559	50	34	533	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	214	177	79	55	190	47	55	565	51	34	538	162
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	262	314	140	69	278	234	69	658	59	50	709	598
Arrive On Green	0.15	0.26	0.26	0.04	0.15	0.15	0.04	0.39	0.39	0.03	0.38	0.38
Sat Flow, veh/h	1767	1214	542	1767	1856	1562	1767	1676	151	1767	1856	1564
Grp Volume(v), veh/h	214	0	256	55	190	47	55	0	616	34	538	162
Grp Sat Flow(s),veh/h/ln	1767	0	1756	1767	1856	1562	1767	0	1827	1767	1856	1564
Q Serve(g_s), s	7.5	0.0	8.1	2.0	6.2	1.7	2.0	0.0	19.7	1.2	16.1	4.6
Cycle Q Clear(g_c), s	7.5	0.0	8.1	2.0	6.2	1.7	2.0	0.0	19.7	1.2	16.1	4.6
Prop In Lane	1.00		0.31	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	262	0	455	69	278	234	69	0	718	50	709	598
V/C Ratio(X)	0.82	0.00	0.56	0.80	0.68	0.20	0.80	0.00	0.86	0.68	0.76	0.27
Avail Cap(c_a), veh/h	355	0	763	197	640	539	111	0	971	114	969	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.3	0.0	20.5	30.4	25.7	23.8	30.4	0.0	17.7	30.7	17.1	13.6
Incr Delay (d2), s/veh	10.3	0.0	1.1	18.4	2.9	0.4	18.4	0.0	5.9	14.8	2.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	3.1	1.1	2.8	0.6	1.2	0.0	8.5	0.7	6.2	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	21.6	48.8	28.6	24.2	48.8	0.0	23.7	45.5	19.5	13.8
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	B	B
Approach Vol, veh/h	470			292			671			734		
Approach Delay, s/veh	28.4			31.7			25.7			19.5		
Approach LOS	C			C			C			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	30.0	6.7	21.1	6.7	29.3	13.7	14.2				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.1	* 34	* 7.1	27.7	* 4	33.3	* 13	22.0				
Max Q Clear Time (g_c+I1), s	3.2	21.7	4.0	10.1	4.0	18.1	9.5	8.2				
Green Ext Time (p_c), s	0.0	3.4	0.0	1.3	0.0	3.4	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			25.0									
HCM 6th LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis

9: Highland Avenue & SR 99 SB Ramps

2030 No Project MD Peak (Saturday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	535	0	0	0	0	1270	42	445	903	0
Future Volume (vph)	0	0	535	0	0	0	0	1270	42	445	903	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1533	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1533	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	546	0	0	0	0	1296	43	454	921	0
RTOR Reduction (vph)	0	0	173	0	0	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	0	373	0	0	0	0	1296	20	454	921	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			11.2					23.7	23.7	16.7	29.3	
Effective Green, g (s)			11.2					23.7	23.7	16.7	29.3	
Actuated g/C Ratio			0.22					0.47	0.47	0.33	0.59	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			618					1661	726	585	2053	
v/s Ratio Prot			0.14					c0.37		c0.26	0.26	
v/s Ratio Perm									0.01			
v/c Ratio			0.60					0.78	0.03	0.78	0.45	
Uniform Delay, d1			17.4					11.0	7.0	15.0	5.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			1.7					2.4	0.0	6.4	0.2	
Delay (s)			19.1					13.4	7.0	21.4	6.0	
Level of Service			B					B	A	C	A	
Approach Delay (s)		19.1			0.0			13.2			11.1	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.3									
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			50.0									
Intersection Capacity Utilization			67.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 No Project MD Peak (Saturday)

12/11/2018

Intersection												
Int Delay, s/veh	204.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	41	12	102	53	20	92	95	948	65	87	1069	69
Future Vol, veh/h	41	12	102	53	20	92	95	948	65	87	1069	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	43	13	107	56	21	97	100	998	68	92	1125	73

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2056	2612	599	1985	2614	533	1198	0	0	1066	0	0
Stage 1	1346	1346	-	1232	1232	-	-	-	-	-	-	-
Stage 2	710	1266	-	753	1382	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 32	24	442	~ 36	24	489	573	-	-	644	-	-
Stage 1	158	216	-	186	246	-	-	-	-	-	-	-
Stage 2	388	236	-	366	208	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	17	442	~ 9	~ 17	489	573	-	-	644	-	-
Mov Cap-2 Maneuver	-	17	-	~ 9	~ 17	-	-	-	-	-	-	-
Stage 1	130	185	-	153	203	-	-	-	-	-	-	-
Stage 2	230	195	-	221	178	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 3280.2	1.1	0.8
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	573	-	-	-	442	23	644	-	-
HCM Lane V/C Ratio	0.175	-	-	-	0.243	7.551	0.142	-	-
HCM Control Delay (s)	12.6	-	-	-	15.3	3280.2	11.5	-	-
HCM Lane LOS	B	-	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	0.9	21.8	0.5	-	-
























Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project AM Peak (Weekday)

12/11/2018
























												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	147	235	71	95	331	10	17	355	332	19	134	41
Future Volume (veh/h)	147	235	71	95	331	10	17	355	332	19	134	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	255	0	103	360	0	18	386	361	21	146	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	692	375		121	422		225	678	620	34	275	123
Arrive On Green	0.20	0.20	0.00	0.30	0.30	0.00	0.13	0.19	0.19	0.02	0.08	0.08
Sat Flow, veh/h	3428	1856	1572	408	1427	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	160	255	0	463	0	0	18	386	361	21	146	45
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1835	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.5	8.1	0.0	15.2	0.0	0.0	0.6	6.4	11.6	0.8	2.5	1.7
Cycle Q Clear(g_c), s	2.5	8.1	0.0	15.2	0.0	0.0	0.6	6.4	11.6	0.8	2.5	1.7
Prop In Lane	1.00		1.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	692	375		543	0		225	678	620	34	275	123
V/C Ratio(X)	0.23	0.68		0.85	0.00		0.08	0.57	0.58	0.61	0.53	0.37
Avail Cap(c_a), veh/h	2143	1160		720	0		225	678	620	110	606	270
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	23.6	0.0	21.2	0.0	0.0	24.6	23.5	15.2	31.1	28.4	28.0
Incr Delay (d2), s/veh	0.2	2.2	0.0	7.6	0.0	0.0	0.1	1.1	1.4	16.2	1.6	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.5	0.0	7.0	0.0	0.0	0.2	2.5	5.4	0.5	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	25.8	0.0	28.8	0.0	0.0	24.8	24.6	16.6	47.3	30.0	29.8
LnGrp LOS	C	C		C	A		C	C	B	D	C	C
Approach Vol, veh/h	415		A	463		A	765		212			
Approach Delay, s/veh	24.2			28.8			20.8		31.7			
Approach LOS	C			C			C		C			
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	17.8		5.4	16.9		23.8	12.8	9.6				
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s	40.0		* 4	12.3		25.1	5.3	* 11				
Max Q Clear Time (g_c+I1), s	10.1		2.8	13.6		17.2	2.6	4.5				
Green Ext Time (p_c), s	2.1		0.0	0.0		1.7	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay	24.8											
HCM 6th LOS	C											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project AM Peak (Weekday)

12/11/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	375	132	295	458	130	228	278	146	54	465	267
Future Volume (veh/h)	190	375	132	295	458	130	228	278	146	54	465	267
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	204	403	142	317	492	140	245	299	157	58	500	287
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	296	827	369	450	757	214	306	1014	452	73	823	645
Arrive On Green	0.09	0.23	0.23	0.13	0.28	0.28	0.09	0.29	0.29	0.04	0.23	0.23
Sat Flow, veh/h	3428	3526	1572	3428	2710	766	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	204	403	142	317	319	313	245	299	157	58	500	287
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1714	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	3.8	6.4	3.3	5.7	10.3	10.5	4.5	4.3	5.1	2.1	8.2	5.8
Cycle Q Clear(g_c), s	3.8	6.4	3.3	5.7	10.3	10.5	4.5	4.3	5.1	2.1	8.2	5.8
Prop In Lane	1.00		1.00	1.00		0.45	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	296	827	369	450	493	479	306	1014	452	73	823	645
V/C Ratio(X)	0.69	0.49	0.38	0.70	0.65	0.65	0.80	0.29	0.35	0.79	0.61	0.44
Avail Cap(c_a), veh/h	306	2075	925	940	1390	1352	306	1912	853	261	2064	1617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	21.5	9.5	27.0	20.6	20.6	29.0	18.0	18.3	30.8	22.2	21.3
Incr Delay (d2), s/veh	6.1	0.4	0.7	2.0	1.4	1.5	13.9	0.2	0.5	17.1	0.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.5	1.6	2.4	4.1	4.1	2.3	1.5	1.7	1.2	3.2	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	21.9	10.1	29.0	22.0	22.1	42.9	18.2	18.8	47.9	22.9	21.8
LnGrp LOS	C	C	B	C	C	C	D	B	B	D	C	C
Approach Vol, veh/h	749			949			701			845		
Approach Delay, s/veh	23.2			24.4			27.0			24.3		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	20.4	11.0	19.8	10.8	23.3	6.9	23.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 18	* 38	5.8	* 38	* 5.8	* 51	* 9.6	* 35				
Max Q Clear Time (g_c+I1), s	7.7	8.4	6.5	10.2	5.8	12.5	4.1	7.1				
Green Ext Time (p_c), s	0.8	3.3	0.0	4.7	0.0	4.5	0.0	2.3				

Intersection Summary

HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Notes






















* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 No Project AM Peak (Weekday)

12/11/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	15	71	34	10	121	58	767	53	82	696	24
Future Volume (veh/h)	61	15	71	34	10	121	58	767	53	82	696	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	16	77	37	11	132	63	834	58	89	757	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	85	40	190	46	14	171	81	1881	131	113	2019	69
Arrive On Green	0.05	0.14	0.14	0.03	0.12	0.12	0.05	0.56	0.56	0.06	0.58	0.58
Sat Flow, veh/h	1767	278	1337	1767	122	1469	1767	3344	233	1767	3477	119
Grp Volume(v), veh/h	66	0	93	37	0	143	63	440	452	89	384	399
Grp Sat Flow(s),veh/h/ln	1767	0	1615	1767	0	1591	1767	1763	1814	1767	1763	1834
Q Serve(g_s), s	3.5	0.0	5.0	2.0	0.0	8.4	3.4	14.0	14.0	4.8	11.2	11.2
Cycle Q Clear(g_c), s	3.5	0.0	5.0	2.0	0.0	8.4	3.4	14.0	14.0	4.8	11.2	11.2
Prop In Lane	1.00		0.83	1.00		0.92	1.00		0.13	1.00		0.07
Lane Grp Cap(c), veh/h	85	0	230	46	0	185	81	992	1020	113	1024	1065
V/C Ratio(X)	0.78	0.00	0.40	0.80	0.00	0.77	0.78	0.44	0.44	0.79	0.37	0.37
Avail Cap(c_a), veh/h	107	0	607	79	0	597	88	992	1020	125	1024	1065
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	37.5	46.5	0.0	41.2	45.3	12.2	12.2	44.3	10.8	10.8
Incr Delay (d2), s/veh	24.4	0.0	1.1	26.2	0.0	6.7	32.8	1.4	1.4	25.5	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	1.9	1.2	0.0	3.6	2.2	5.2	5.3	2.8	4.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.6	0.0	38.6	72.7	0.0	47.9	78.1	13.7	13.6	69.8	11.8	11.8
LnGrp LOS	E	A	D	E	A	D	E	B	B	E	B	B
Approach Vol, veh/h	159			180			955			872		
Approach Delay, s/veh	51.5			53.0			17.9			17.7		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.3	59.3	6.7	19.7	8.6	61.1	10.6	15.8				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	6.0	* 4.6				
Max Green Setting (Gmax), s	* 6.8	29.1	* 4.3	36.1	* 4.8	31.1	5.8	* 36				
Max Q Clear Time (g_c+I1), s	6.8	16.0	4.0	7.0	5.4	13.2	5.5	10.4				
Green Ext Time (p_c), s	0.0	4.3	0.0	0.4	0.0	4.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay	23.2											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project PM Peak (Weekday)

12/11/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	627	432	12	88	319	55	39	592	565	55	514	102
Future Volume (veh/h)	627	432	12	88	319	55	39	592	565	55	514	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	682	470	0	96	347	0	42	643	614	60	559	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	1026	555		95	345		197	654	762	187	634	283
Arrive On Green	0.30	0.30	0.00	0.24	0.24	0.00	0.11	0.19	0.19	0.11	0.18	0.18
Sat Flow, veh/h	3428	1856	1572	398	1438	1572	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	682	470	0	443	0	0	42	643	614	60	559	111
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1836	0	1572	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	19.1	26.1	0.0	26.4	0.0	0.0	2.4	20.0	20.4	3.5	17.0	6.9
Cycle Q Clear(g_c), s	19.1	26.1	0.0	26.4	0.0	0.0	2.4	20.0	20.4	3.5	17.0	6.9
Prop In Lane	1.00		1.00	0.22		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1026	555		441	0		197	654	762	187	634	283
V/C Ratio(X)	0.66	0.85		1.01	0.00		0.21	0.98	0.81	0.32	0.88	0.39
Avail Cap(c_a), veh/h	1247	675		441	0		197	654	762	187	673	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	36.2	0.0	41.8	0.0	0.0	44.5	44.6	19.9	45.5	44.0	39.8
Incr Delay (d2), s/veh	1.0	8.3	0.0	44.3	0.0	0.0	0.5	31.4	8.9	1.0	16.1	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	12.8	0.0	17.1	0.0	0.0	1.1	11.3	18.6	1.5	8.6	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	44.5	0.0	86.1	0.0	0.0	45.0	76.0	28.8	46.5	60.1	43.8
LnGrp LOS	C	D		F	A		D	E	C	D	E	D
Approach Vol, veh/h	1152		A	443		A	1299		730			
Approach Delay, s/veh	38.7			86.1			52.7		56.5			
Approach LOS	D			F			D		E			
Timer - Assigned Phs	2		3	4		6	7		8			
Phs Duration (G+Y+Rc), s	37.8		15.9	25.0		31.3	16.5		24.4			
Change Period (Y+Rc), s	4.9		4.2	* 4.6		4.9	4.2		* 4.6			
Max Green Setting (Gmax), s	40.0		4.6	* 20		26.4	4.0		* 21			
Max Q Clear Time (g_c+I1), s	28.1		5.5	22.4		28.4	4.4		19.0			
Green Ext Time (p_c), s	4.4		0.0	0.0		0.0	0.0		0.8			

Intersection Summary

HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
























Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project PM Peak (Weekday)

12/11/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	635	293	417	607	259	321	437	187	137	591	282
Future Volume (veh/h)	286	635	293	417	607	259	321	437	187	137	591	282
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	292	648	299	426	619	264	328	446	191	140	603	288
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	292	934	417	547	816	348	250	796	355	178	875	687
Arrive On Green	0.09	0.26	0.26	0.16	0.34	0.34	0.07	0.23	0.23	0.10	0.25	0.25
Sat Flow, veh/h	3428	3526	1572	3428	2407	1026	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	292	648	299	426	453	430	328	446	191	140	603	288
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1671	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	6.8	13.1	13.7	9.5	18.2	18.2	5.8	8.9	5.3	6.1	12.3	6.9
Cycle Q Clear(g_c), s	6.8	13.1	13.7	9.5	18.2	18.2	5.8	8.9	5.3	6.1	12.3	6.9
Prop In Lane	1.00		1.00	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	292	934	417	547	598	567	250	796	355	178	875	687
V/C Ratio(X)	1.00	0.69	0.72	0.78	0.76	0.76	1.31	0.56	0.54	0.79	0.69	0.42
Avail Cap(c_a), veh/h	292	1496	667	963	1136	1077	250	1199	535	396	1687	1324
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	26.3	26.5	32.0	23.3	23.4	36.8	27.3	10.6	34.9	27.1	25.0
Incr Delay (d2), s/veh	52.4	0.9	2.3	2.5	2.0	2.1	165.2	0.6	1.3	7.5	1.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.4	4.9	4.0	7.5	7.1	8.0	3.5	2.9	2.9	5.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.7	27.2	28.8	34.5	25.3	25.5	202.0	27.9	11.9	42.4	28.0	25.5
LnGrp LOS	F	C	C	C	C	C	F	C	B	D	C	C
Approach Vol, veh/h		1239			1309			965			1031	
Approach Delay, s/veh		42.1			28.4			83.9			29.3	
Approach LOS		D			C			F			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	26.2	11.0	24.3	12.0	32.1	12.2	23.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 22	* 34	5.8	* 38	* 5.8	* 51	* 18	* 27				
Max Q Clear Time (g_c+I1), s	11.5	15.7	7.8	14.3	8.8	20.2	8.1	10.9				
Green Ext Time (p_c), s	1.2	5.3	0.0	5.4	0.0	6.8	0.2	3.0				
Intersection Summary												
HCM 6th Ctrl Delay			44.1									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 No Project PM Peak (Weekday)

12/11/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	15	77	46	15	120	88	1057	58	127	1256	66
Future Volume (veh/h)	38	15	77	46	15	120	88	1057	58	127	1256	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	16	81	48	16	126	93	1113	61	134	1322	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	56	33	166	63	23	180	119	1523	83	170	1626	85
Arrive On Green	0.03	0.12	0.12	0.04	0.13	0.13	0.07	0.45	0.45	0.10	0.48	0.48
Sat Flow, veh/h	1767	266	1347	1767	180	1420	1767	3399	186	1767	3409	178
Grp Volume(v), veh/h	40	0	97	48	0	142	93	577	597	134	683	708
Grp Sat Flow(s),veh/h/ln	1767	0	1613	1767	0	1600	1767	1763	1822	1767	1763	1824
Q Serve(g_s), s	1.5	0.0	3.7	1.8	0.0	5.6	3.4	17.8	17.8	4.9	21.9	22.0
Cycle Q Clear(g_c), s	1.5	0.0	3.7	1.8	0.0	5.6	3.4	17.8	17.8	4.9	21.9	22.0
Prop In Lane	1.00		0.84	1.00		0.89	1.00		0.10	1.00		0.10
Lane Grp Cap(c), veh/h	56	0	199	63	0	203	119	790	816	170	841	870
V/C Ratio(X)	0.72	0.00	0.49	0.77	0.00	0.70	0.78	0.73	0.73	0.79	0.81	0.81
Avail Cap(c_a), veh/h	128	0	876	112	0	888	171	960	992	240	1029	1065
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	0.0	27.1	31.7	0.0	27.7	30.4	15.0	15.0	29.3	14.8	14.8
Incr Delay (d2), s/veh	15.9	0.0	1.9	17.5	0.0	4.3	13.6	2.3	2.2	10.8	4.2	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	1.0	0.0	2.3	1.8	6.2	6.4	2.4	7.7	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	0.0	29.0	49.2	0.0	32.0	44.0	17.3	17.2	40.1	19.0	18.9
LnGrp LOS	D	A	C	D	A	C	D	B	B	D	B	B
Approach Vol, veh/h	137		190				1267				1525	
Approach Delay, s/veh	34.5		36.4				19.2				20.8	
Approach LOS	C		D				B				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	35.0	6.5	14.2	8.7	36.9	6.3	14.4				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 9	36.1	* 4.2	36.0	* 6.4	38.7	* 4.8	* 37				
Max Q Clear Time (g_c+I1), s	6.9	19.8	3.8	5.7	5.4	24.0	3.5	7.6				
Green Ext Time (p_c), s	0.1	6.6	0.0	0.4	0.0	7.6	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			21.7									
HCM 6th LOS			C									
Notes												

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 No Project Buildout MD Peak (Saturday)

11/21/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	479	228	39	52	292	146	93	671	255	99	629	58
Future Volume (veh/h)	479	228	39	52	292	146	93	671	255	99	629	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	494	235	0	54	301	0	96	692	263	102	648	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	637	345		53	296		440	1363	900	110	692	307
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.25	0.39	0.39	0.06	0.20	0.20
Sat Flow, veh/h	3428	1856	1572	280	1561	1572	1767	3526	1572	1767	3526	1564
Grp Volume(v), veh/h	494	235	0	355	0	0	96	692	263	102	648	60
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1842	0	1572	1767	1763	1572	1767	1763	1564
Q Serve(g_s), s	14.5	12.5	0.0	20.1	0.0	0.0	4.6	15.9	9.1	6.1	19.2	3.4
Cycle Q Clear(g_c), s	14.5	12.5	0.0	20.1	0.0	0.0	4.6	15.9	9.1	6.1	19.2	3.4
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	637	345		349	0		440	1363	900	110	692	307
V/C Ratio(X)	0.78	0.68		1.02	0.00		0.22	0.51	0.29	0.93	0.94	0.20
Avail Cap(c_a), veh/h	1294	700		349	0		440	1363	900	110	692	307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	40.2	0.0	43.0	0.0	0.0	31.6	24.8	11.6	49.5	42.0	35.6
Incr Delay (d2), s/veh	2.1	2.4	0.0	52.4	0.0	0.0	0.2	1.4	0.8	63.0	21.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	5.8	0.0	14.0	0.0	0.0	1.9	6.6	4.9	4.6	10.2	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	42.6	0.0	95.4	0.0	0.0	31.9	26.2	12.4	112.5	63.8	37.0
LnGrp LOS	D	D		F	A		C	C	B	F	E	D
Approach Vol, veh/h	729		A	355		A	1051		810			
Approach Delay, s/veh	42.9			95.4			23.2		67.9			
Approach LOS	D			F			C		E			
Timer - Assigned Phs	2		3	4		6	7		8			
Phs Duration (G+Y+Rc), s	24.6		10.8	45.6		25.0	31.0		25.4			
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6		* 4.6			
Max Green Setting (Gmax), s	40.0		* 6.6	20.7		20.1	6.5		* 21			
Max Q Clear Time (g_c+I1), s	16.5		8.1	17.9		22.1	6.6		21.2			
Green Ext Time (p_c), s	3.2		0.0	1.5		0.0	0.0		0.0			

Intersection Summary

HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
























Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 No Project Buildout MD Peak (Saturday)

11/21/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	626	333	456	636	273	341	377	191	155	529	244
Future Volume (veh/h)	229	626	333	456	636	273	341	377	191	155	529	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	236	645	343	470	656	281	352	389	197	160	545	252
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	275	1005	448	577	895	383	276	688	307	199	784	615
Arrive On Green	0.08	0.29	0.29	0.17	0.37	0.37	0.08	0.20	0.20	0.11	0.22	0.22
Sat Flow, veh/h	3428	3526	1572	3428	2397	1027	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	236	645	343	470	482	455	352	389	197	160	545	252
Grp Sat Flow(s),veh/h/ln	1714	1763	1572	1714	1763	1661	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	5.7	13.5	16.8	11.2	19.9	20.0	6.8	8.4	6.2	7.5	12.0	6.6
Cycle Q Clear(g_c), s	5.7	13.5	16.8	11.2	19.9	20.0	6.8	8.4	6.2	7.5	12.0	6.6
Prop In Lane	1.00		1.00	1.00		0.62	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	1005	448	577	658	620	276	688	307	199	784	615
V/C Ratio(X)	0.86	0.64	0.77	0.81	0.73	0.73	1.28	0.57	0.64	0.80	0.70	0.41
Avail Cap(c_a), veh/h	275	1457	650	816	1068	1007	276	1068	477	402	1586	1245
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	26.4	27.6	33.9	22.8	22.8	38.8	30.8	12.5	36.6	30.2	28.1
Incr Delay (d2), s/veh	22.9	0.7	3.3	4.4	1.6	1.7	149.1	0.7	2.2	7.4	1.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	5.6	6.2	4.9	8.1	7.7	8.4	3.4	3.4	3.5	5.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	27.1	30.9	38.2	24.4	24.5	187.9	31.5	14.8	44.0	31.3	28.5
LnGrp LOS	E	C	C	D	C	C	F	C	B	D	C	C
Approach Vol, veh/h	1224		1407				938		957			
Approach Delay, s/veh	34.8		29.1				86.7		32.7			
Approach LOS	C		C				F		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	29.3	12.4	23.4	12.0	36.7	13.7	22.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 20	* 35	6.8	* 38	* 4.8	* 51	* 19	25.6				
Max Q Clear Time (g_c+I1), s	13.2	18.8	8.8	14.0	7.7	22.0	9.5	10.4				
Green Ext Time (p_c), s	1.0	5.2	0.0	4.8	0.0	7.2	0.3	2.6				
Intersection Summary												
HCM 6th Ctrl Delay	43.3											
HCM 6th LOS	D											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 No Project Buildout MD Peak (Saturday)

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	12	102	53	20	92	95	948	65	87	1069	69
Future Volume (veh/h)	41	12	102	53	20	92	95	948	65	87	1069	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	43	13	107	56	21	97	100	998	68	92	1125	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	17	139	72	31	142	123	2045	139	116	2038	132
Arrive On Green	0.03	0.10	0.10	0.04	0.11	0.11	0.07	0.61	0.61	0.07	0.61	0.61
Sat Flow, veh/h	1767	173	1426	1767	288	1329	1767	3349	228	1767	3361	218
Grp Volume(v), veh/h	43	0	120	56	0	118	100	525	541	92	590	608
Grp Sat Flow(s),veh/h/ln	1767	0	1599	1767	0	1616	1767	1763	1814	1767	1763	1816
Q Serve(g_s), s	2.6	0.0	7.8	3.3	0.0	7.5	5.9	17.5	17.5	5.4	21.0	21.0
Cycle Q Clear(g_c), s	2.6	0.0	7.8	3.3	0.0	7.5	5.9	17.5	17.5	5.4	21.0	21.0
Prop In Lane	1.00		0.89	1.00		0.82	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	55	0	156	72	0	173	123	1076	1108	116	1069	1101
V/C Ratio(X)	0.79	0.00	0.77	0.78	0.00	0.68	0.81	0.49	0.49	0.79	0.55	0.55
Avail Cap(c_a), veh/h	82	0	543	77	0	566	123	1076	1108	117	1069	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	0.0	46.7	50.4	0.0	45.6	48.6	11.4	11.4	48.8	12.3	12.3
Incr Delay (d2), s/veh	24.9	0.0	7.8	37.3	0.0	4.7	31.9	1.6	1.5	30.3	2.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	3.3	2.2	0.0	3.2	3.6	6.4	6.6	3.3	7.7	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.9	0.0	54.5	87.7	0.0	50.3	80.5	13.0	13.0	79.1	14.4	14.3
LnGrp LOS	E	A	D	F	A	D	F	B	B	E	B	B
Approach Vol, veh/h	163		174				1166				1290	
Approach Delay, s/veh	60.1		62.3				18.8				19.0	
Approach LOS	E		E				B				B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.1	70.0	8.5	16.3	11.6	69.6	7.5	17.3				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 7	38.7	* 4.6	36.0	* 7.4	38.3	* 4.9	* 37				
Max Q Clear Time (g_c+I1), s	7.4	19.5	5.3	9.8	7.9	23.0	4.6	9.5				
Green Ext Time (p_c), s	0.0	6.3	0.0	0.6	0.0	6.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			24.0									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW
Directions Served	L	L	T	R	LT	R	L	T	T	R	L	T
Maximum Queue (ft)	100	123	177	175	419	85	19	124	94	153	4	18
Average Queue (ft)	13	46	87	6	197	19	1	46	43	29	0	2
95th Queue (ft)	54	99	144	58	349	78	8	95	84	91	1	12
Link Distance (ft)			539		1310			2543	2543			1045
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140	140		150		35	200			100	75	
Storage Blk Time (%)		0	2	0	53				0	1		
Queuing Penalty (veh)		0	4	0	5				1	2		

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW
Directions Served	T	R
Maximum Queue (ft)	30	36
Average Queue (ft)	1	1
95th Queue (ft)	10	12
Link Distance (ft)	1045	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	120	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	25	30	50
Average Queue (ft)	3	19	25
95th Queue (ft)	16	37	41
Link Distance (ft)	2312	2752	2624
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	125	181	38	87	180	114	70	75	114	52	74
Average Queue (ft)	66	49	7	35	72	44	9	42	52	18	34
95th Queue (ft)	117	107	22	66	142	104	45	73	86	47	63
Link Distance (ft)	1267	1267			543	543	223			1836	1836
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		
Storage Blk Time (%)		2			1						
Queuing Penalty (veh)		1			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	TR	L	L	T
Maximum Queue (ft)	142	133	143	134	155	148	127	235	212	115	157	184
Average Queue (ft)	61	51	69	77	30	90	78	105	126	70	79	86
95th Queue (ft)	114	101	119	120	81	150	125	185	202	113	127	156
Link Distance (ft)			543	543				467	467			577
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105	105			40	150	150			170	170	
Storage Blk Time (%)	3	1	2	25	3	1		2			0	0
Queuing Penalty (veh)	5	1	5	33	5	2		6			0	1

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R	R
Maximum Queue (ft)	164	116	200	288	233	200	119
Average Queue (ft)	50	40	39	123	83	55	49
95th Queue (ft)	129	84	102	205	169	112	84
Link Distance (ft)	577			940	940		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		80	100			100	100
Storage Blk Time (%)	1	2	0	16	4	0	1
Queuing Penalty (veh)	1	3	0	9	10	1	1

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	116	165	166	152	94	72
Average Queue (ft)	41	57	70	75	54	36
95th Queue (ft)	92	116	128	131	80	59
Link Distance (ft)	467	467	546	546	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					250	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	133	137	171	106	141	197	67	148	111	63	84	85
Average Queue (ft)	16	59	81	35	59	57	19	51	70	18	33	22
95th Queue (ft)	61	119	142	80	122	136	50	112	115	51	71	52
Link Distance (ft)		546	546		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)	0	2		1	1			2	13			0
Queuing Penalty (veh)	0	1		3	1			1	4			0

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	70
Average Queue (ft)	21
95th Queue (ft)	54
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	199	262	120	280	220	129	316	194	380	114
Average Queue (ft)	90	115	56	142	61	70	173	63	209	43
95th Queue (ft)	183	218	91	228	154	132	275	132	351	79
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	10	13	1	20	1	9	32		20	
Queuing Penalty (veh)	29	14	2	37	2	36	28		19	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	331	266	252	200	139	288	244
Average Queue (ft)	156	116	92	90	126	153	80
95th Queue (ft)	252	220	199	184	157	298	181
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	6	3			37	3	
Queuing Penalty (veh)	16	8			101	12	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	168	139	74	161	73	234	223	182	226	222
Average Queue (ft)	58	37	33	55	42	107	125	64	88	98
95th Queue (ft)	119	86	63	105	76	199	213	133	182	194
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)	1	0		0		0				
Queuing Penalty (veh)	1	0		0		0				

Zone Summary

Zone wide Queuing Penalty: 410

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	B29	SB	SB	SE	SE	SE	SE	NW
Directions Served	L	L	T	R	T	LT	R	L	T	T	R	L
Maximum Queue (ft)	172	205	566	75	62	770	85	41	257	324	200	94
Average Queue (ft)	106	184	271	9	2	521	38	11	157	169	138	19
95th Queue (ft)	188	240	475	48	20	771	105	35	227	275	246	59
Link Distance (ft)			514		971	1310			2543	2543		
Upstream Blk Time (%)			1									
Queuing Penalty (veh)			5									
Storage Bay Dist (ft)	140	140		50			35	200			100	75
Storage Blk Time (%)	2	7	50	0		73	0		3	23	11	1
Queuing Penalty (veh)	9	31	317	0		40	0		1	128	34	2

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	224	246	220
Average Queue (ft)	85	89	9
95th Queue (ft)	159	172	74
Link Distance (ft)	1155	1155	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			120
Storage Blk Time (%)	8	3	
Queuing Penalty (veh)	4	3	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	49	30	53	54
Average Queue (ft)	7	2	32	31
95th Queue (ft)	31	13	48	45
Link Distance (ft)	2669	2312	2752	2624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	225	218	51	140	267	215	121	116	139	74	117
Average Queue (ft)	128	106	6	53	123	71	58	62	78	24	53
95th Queue (ft)	199	186	24	104	204	156	105	100	121	56	94
Link Distance (ft)	1267	1267			535	535	236			1836	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		7			2						
Queuing Penalty (veh)		5			2						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	TR	L	L	T
Maximum Queue (ft)	165	225	490	471	160	200	249	467	467	227	285	617
Average Queue (ft)	134	146	216	230	136	125	162	209	215	197	234	428
95th Queue (ft)	180	232	416	401	204	197	270	346	344	263	350	783
Link Distance (ft)			535	535				467	467			577
Upstream Blk Time (%)								0	0			30
Queuing Penalty (veh)								1	1			203
Storage Bay Dist (ft)	105	105			40	150	150			170	170	
Storage Blk Time (%)	46	43	19	49	29	3	7	17		53	63	2
Queuing Penalty (veh)	146	135	54	143	93	10	22	70		115	137	5

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R	R
Maximum Queue (ft)	628	129	199	246	320	200	100
Average Queue (ft)	327	65	145	195	178	88	47
95th Queue (ft)	717	109	246	247	275	188	86
Link Distance (ft)	577			971	971		
Upstream Blk Time (%)	1						
Queuing Penalty (veh)	8						
Storage Bay Dist (ft)		80	100			100	100
Storage Blk Time (%)	8	3	21	38	35	2	0
Queuing Penalty (veh)	15	7	62	52	99	7	0

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	280	291	290	254	303	139
Average Queue (ft)	108	129	134	140	147	70
95th Queue (ft)	222	262	239	238	241	120
Link Distance (ft)	467	467	542	542	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					250	
Storage Blk Time (%)					1	
Queuing Penalty (veh)					3	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	144	542	543	149	200	222	219	251	277	140	193	269
Average Queue (ft)	59	222	243	54	109	108	62	104	116	5	97	125
95th Queue (ft)	132	423	446	128	183	200	140	229	262	46	167	220
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		1	1									
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)	6	27		2	11		4	17	22		6	12
Queuing Penalty (veh)	21	22		5	9		13	22	6		35	69

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	338	200	150
Average Queue (ft)	143	135	15
95th Queue (ft)	258	202	89
Link Distance (ft)	2914		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)	18	17	
Queuing Penalty (veh)	107	90	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	854	95	224	215	130	703	195	498	154
Average Queue (ft)	150	265	38	120	51	92	414	59	247	45
95th Queue (ft)	232	570	70	193	117	157	677	140	406	99
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	36	26	0	20	0	31	44	0	28	
Queuing Penalty (veh)	133	58	1	29	1	225	43	1	17	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	R	L	T	T
Maximum Queue (ft)	267	225	1068	1025	420	139	253	220
Average Queue (ft)	166	137	509	490	140	125	151	126
95th Queue (ft)	232	223	1120	1099	467	160	251	186
Link Distance (ft)	1240		1501	1501			577	577
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		175			300	65		
Storage Blk Time (%)	5	2		35		33	10	
Queuing Penalty (veh)	18	6		20		149	41	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	73	119	76	133	116	385	356	369	592	559
Average Queue (ft)	27	48	42	64	62	160	160	105	206	227
95th Queue (ft)	61	96	74	112	107	278	276	232	422	443
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)									0	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				0		1			6	
Queuing Penalty (veh)				0		1			7	

Zone Summary

Zone wide Queuing Penalty: 3126

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SE	SE	SE	SE	NW	NW
Directions Served	L	L	T	R	LT	R	L	T	T	R	L	T
Maximum Queue (ft)	172	204	444	75	415	85	297	376	417	200	164	219
Average Queue (ft)	116	148	160	5	270	64	62	201	203	93	60	119
95th Queue (ft)	191	220	324	35	395	121	176	319	347	246	134	206
Link Distance (ft)			554		1310			2543	2543			1156
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140	140		50		35	200			100	75	
Storage Blk Time (%)	1	6	41	0	64	0	0	10	33		18	15
Queuing Penalty (veh)	2	16	210	0	93	0	0	10	85		56	15

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW
Directions Served	T
Maximum Queue (ft)	278
Average Queue (ft)	118
95th Queue (ft)	227
Link Distance (ft)	1156
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	7
Queuing Penalty (veh)	4

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	23	28	50	90
Average Queue (ft)	2	1	27	33
95th Queue (ft)	11	9	43	59
Link Distance (ft)	2669	2312	2752	2624
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	192	150	44	120	149	153	104	92	118	71	78
Average Queue (ft)	101	95	8	46	91	60	43	39	60	17	40
95th Queue (ft)	168	145	28	91	152	130	97	64	99	51	68
Link Distance (ft)	1267	1267			534	534	236			1836	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		5			0						
Queuing Penalty (veh)		5			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	L	T	TR	L	L	T
Maximum Queue (ft)	164	224	535	549	160	200	250	464	445	227	285	546
Average Queue (ft)	109	123	211	235	128	154	184	218	213	155	176	185
95th Queue (ft)	175	225	409	448	199	225	279	396	367	239	286	381
Link Distance (ft)			534	534				467	467			577
Upstream Blk Time (%)			0	0				0				
Queuing Penalty (veh)			1	1				1				
Storage Bay Dist (ft)	105	105			40	150	150			170	170	
Storage Blk Time (%)	25	21	22	46	27	18	15	16		12	15	7
Queuing Penalty (veh)	78	66	50	153	85	57	48	73		22	28	24

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R	R
Maximum Queue (ft)	429	130	200	364	329	200	86
Average Queue (ft)	151	91	108	177	144	81	34
95th Queue (ft)	334	150	185	280	247	185	65
Link Distance (ft)	577			931	931		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		80	100			100	100
Storage Blk Time (%)	10	6	15	32	19	0	0
Queuing Penalty (veh)	19	11	39	49	46	1	0

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	227	217	304	306	242	115
Average Queue (ft)	74	100	130	110	123	66
95th Queue (ft)	161	184	241	231	204	107
Link Distance (ft)	467	467	542	542	1193	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					250	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	144	255	377	149	196	197	152	290	278	140	195	264
Average Queue (ft)	49	131	157	67	98	102	61	127	132	9	92	116
95th Queue (ft)	117	241	284	126	165	164	128	256	247	67	183	206
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)	4	20		5	6		1	21	31		12	7
Queuing Penalty (veh)	13	17		11	4		3	24	6		57	33

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	457	194	49
Average Queue (ft)	135	108	2
95th Queue (ft)	287	172	16
Link Distance (ft)	2914		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)	16	11	
Queuing Penalty (veh)	85	53	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	469	92	186	73	129	759	194	268	89
Average Queue (ft)	117	134	41	100	31	53	359	39	163	37
95th Queue (ft)	209	307	79	152	59	120	672	97	253	76
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	22	9	0	12		13	45		15	
Queuing Penalty (veh)	55	19	0	12		78	24		5	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	354	306	421	392	139	551	516
Average Queue (ft)	208	176	153	135	136	304	209
95th Queue (ft)	312	291	338	308	152	483	406
Link Distance (ft)	1240		1501	1501		577	577
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	18	11		1	54	5	
Queuing Penalty (veh)	49	29		1	246	23	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	73	160	129	202	369	464	449	161	410	433
Average Queue (ft)	32	60	58	70	79	189	201	66	163	189
95th Queue (ft)	66	119	108	148	187	353	363	132	315	346
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)		0		2		5			2	
Queuing Penalty (veh)		0		1		4			2	

Zone Summary

Zone wide Queuing Penalty: 2201

Appendix J: Cumulative Year 2030 plus Project Buildout Traffic Conditions



Traffic Engineering, Inc.

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HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	179	277	71	95	432	10	17	355	388	19	134	41
Future Volume (veh/h)	179	277	71	95	432	10	17	355	388	19	134	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	195	301	0	103	470	0	18	386	422	21	146	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	384	403		116	531		201	606	270	33	253	113
Arrive On Green	0.22	0.22	0.00	0.35	0.35	0.00	0.11	0.17	0.17	0.02	0.07	0.07
Sat Flow, veh/h	1767	1856	1572	331	1508	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	195	301	0	573	0	0	18	386	422	21	146	45
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1839	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	7.5	11.7	0.0	22.7	0.0	0.0	0.7	7.9	13.3	0.9	3.1	2.1
Cycle Q Clear(g_c), s	7.5	11.7	0.0	22.7	0.0	0.0	0.7	7.9	13.3	0.9	3.1	2.1
Prop In Lane	1.00		1.00	0.18		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	384	403		647	0		201	606	270	33	253	113
V/C Ratio(X)	0.51	0.75		0.89	0.00		0.09	0.64	1.56	0.63	0.58	0.40
Avail Cap(c_a), veh/h	913	959		810	0		201	606	270	91	542	242
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	28.3	0.0	23.6	0.0	0.0	30.7	29.8	32.1	37.7	34.8	34.3
Incr Delay (d2), s/veh	1.0	2.8	0.0	9.8	0.0	0.0	0.2	2.2	270.1	18.2	2.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	5.2	0.0	10.8	0.0	0.0	0.3	3.3	25.0	0.5	1.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	31.1	0.0	33.4	0.0	0.0	30.9	32.0	302.2	55.9	36.8	36.6
LnGrp LOS	C	C		C	A		C	C	F	E	D	D
Approach Vol, veh/h	496		A	573		A	826			212		
Approach Delay, s/veh	29.7			33.4			170.0			38.7		
Approach LOS	C			C			F			D		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	21.7		5.7	17.9		32.1	13.4	10.2				
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s	40.0		* 4	13.3		34.1	5.4	* 12				
Max Q Clear Time (g_c+I1), s	13.7		2.9	15.3		24.7	2.7	5.1				
Green Ext Time (p_c), s	2.3		0.0	0.0		2.5	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay 86.6

HCM 6th LOS F

Notes





* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 + Project Buildout AM Peak (Weekday)







11/26/2018

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	120	8	15	85	35	13	9	21	45	8	7
Future Vol, veh/h	6	120	8	15	85	35	13	9	21	45	8	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	130	9	16	92	38	14	10	23	49	9	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	130	0	0	139	0	0	301	311	135	308	296	111
Stage 1	-	-	-	-	-	-	149	149	-	143	143	-
Stage 2	-	-	-	-	-	-	152	162	-	165	153	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1449	-	-	1438	-	-	649	602	911	642	614	940
Stage 1	-	-	-	-	-	-	851	772	-	857	777	-
Stage 2	-	-	-	-	-	-	848	762	-	835	769	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1449	-	-	1438	-	-	628	592	911	610	604	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	628	592	-	610	604	-
Stage 1	-	-	-	-	-	-	847	768	-	853	768	-
Stage 2	-	-	-	-	-	-	822	753	-	800	765	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.8			10.3			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	729	1449	-	-	1438	-	-	635				
HCM Lane V/C Ratio	0.064	0.005	-	-	0.011	-	-	0.103				
HCM Control Delay (s)	10.3	7.5	0	-	7.5	0	-	11.3				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3				

HCM 6th TWSC
3: Floral Avenue & Project Driveway

2030 + Project Buildout AM Peak (Weekday)













11/26/2018

Intersection							
Int Delay, s/veh	15						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	28	182	12	204	296	310	14
Future Vol, veh/h	28	182	12	204	296	310	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	30	198	13	222	322	337	15
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	544	0	-	-	0	667	272
Stage 1	-	-	-	-	-	409	-
Stage 2	-	-	-	-	-	258	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	1017	-	-	-	-	406	724
Stage 1	-	-	-	-	-	637	-
Stage 2	-	-	-	-	-	782	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1017	-	-	-	-	394	724
Mov Cap-2 Maneuver	-	-	-	-	-	394	-
Stage 1	-	-	-	-	-	619	-
Stage 2	-	-	-	-	-	782	-
Approach	EB	WB		SB			
HCM Control Delay, s	1.2			47.5			
HCM LOS	E						
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1017	-	-	-	-	394	724
HCM Lane V/C Ratio	0.03	-	-	-	-	0.855	0.021
HCM Control Delay (s)	8.6	-	-	-	-	49.2	10.1
HCM Lane LOS	A	-	-	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	8.2	0.1

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/26/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	256
Future Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	729	37	64	767	0	0	0	87	209	42	261
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	62	0	0	83
Lane Group Flow (vph)	0	729	11	64	767	0	0	0	25	209	42	178
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		17.1	17.1	3.5	25.3				16.3	6.1	18.9	18.9
Effective Green, g (s)		17.1	17.1	3.5	25.3				16.3	6.1	18.9	18.9
Actuated g/C Ratio		0.31	0.31	0.06	0.45				0.29	0.11	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1076	481	110	1592				467	372	626	524
v/s Ratio Prot		c0.21		0.04	c0.22				0.02	c0.06	0.02	
v/s Ratio Perm			0.01									c0.12
v/c Ratio		0.68	0.02	0.58	0.48				0.05	0.56	0.07	0.34
Uniform Delay, d1		16.9	13.5	25.4	10.6				14.2	23.5	12.4	13.7
Progression Factor		1.01	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.7	0.0	7.6	0.2				0.0	1.9	0.0	0.4
Delay (s)		18.7	13.5	33.0	10.9				14.2	25.5	12.5	14.1
Level of Service		B	B	C	B				B	C	B	B
Approach Delay (s)		18.5			12.6			14.2			18.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			55.7			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			47.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	264	498	212	295	596	130	253	278	146	54	465	424
Future Volume (veh/h)	264	498	212	295	596	130	253	278	146	54	465	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	284	535	228	317	641	140	272	299	157	58	500	456
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	163	997	445	433	911	199	223	990	442	74	889	696
Arrive On Green	0.09	0.28	0.28	0.13	0.32	0.32	0.07	0.28	0.28	0.04	0.25	0.25
Sat Flow, veh/h	1767	3526	1572	3428	2876	627	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	284	535	228	317	393	388	272	299	157	58	500	456
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1740	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	6.8	9.5	6.4	6.6	14.4	14.5	4.8	4.9	5.9	2.4	9.1	10.9
Cycle Q Clear(g_c), s	6.8	9.5	6.4	6.6	14.4	14.5	4.8	4.9	5.9	2.4	9.1	10.9
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	997	445	433	559	551	223	990	442	74	889	696
V/C Ratio(X)	1.74	0.54	0.51	0.73	0.70	0.70	1.22	0.30	0.36	0.79	0.56	0.65
Avail Cap(c_a), veh/h	163	1873	835	827	1223	1207	223	1634	729	230	1815	1422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	22.4	11.3	31.0	22.1	22.2	34.5	20.9	21.2	35.0	24.0	24.7
Incr Delay (d2), s/veh	359.0	0.5	0.9	2.4	1.6	1.7	132.4	0.2	0.5	16.4	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.1	3.8	2.9	2.8	5.9	5.8	6.0	1.9	2.0	1.3	3.6	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	392.5	22.8	12.2	33.4	23.8	23.8	166.9	21.0	21.7	51.5	24.6	25.8
LnGrp LOS	F	C	B	C	C	C	F	C	C	D	C	C
Approach Vol, veh/h		1047			1098			728			1014	
Approach Delay, s/veh		120.8			26.6			75.7			26.7	
Approach LOS		F			C			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.5	26.1	10.0	23.2	12.0	28.6	7.3	25.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 18	* 39	4.8	* 38	* 6.8	* 51	* 9.6	* 34				
Max Q Clear Time (g_c+I1), s	8.6	11.5	6.8	12.9	8.8	16.5	4.4	7.9				
Green Ext Time (p_c), s	0.8	4.8	0.0	5.5	0.0	5.8	0.0	2.3				

Intersection Summary

HCM 6th Ctrl Delay 61.2

HCM 6th LOS E







Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout AM Peak (Weekday)

6: SR 99 NB Off-Ramp & Floral Avenue

11/26/2018























						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↱
Traffic Volume (vph)	578	0	0	827	263	95
Future Volume (vph)	578	0	0	827	263	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	615	0	0	880	280	101
RTOR Reduction (vph)	0	0	0	0	0	77
Lane Group Flow (vph)	615	0	0	880	280	24
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	19.7			19.7	8.9	8.9
Effective Green, g (s)	19.7			19.7	8.9	8.9
Actuated g/C Ratio	0.52			0.52	0.24	0.24
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1826			1826	412	369
v/s Ratio Prot	0.18			0.25	0.16	
v/s Ratio Perm						0.02
v/c Ratio	0.34			0.48	0.68	0.06
Uniform Delay, d1	5.3			5.8	13.2	11.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.2	4.4	0.1
Delay (s)	5.4			6.0	17.6	11.3
Level of Service	A			A	B	B
Approach Delay (s)	5.4			6.0	15.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			37.8		Sum of lost time (s)	9.2
Intersection Capacity Utilization			45.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	25	443	147	64	574	5	69	274	31	195	118	29
Future Volume (veh/h)	25	443	147	64	574	5	69	274	31	195	118	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	27	482	160	70	624	5	75	298	0	212	128	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	44	857	283	87	1268	10	95	552		331	752	
Arrive On Green	0.02	0.33	0.33	0.05	0.35	0.35	0.05	0.16	0.00	0.10	0.21	0.00
Sat Flow, veh/h	1767	2603	858	1767	3584	29	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	27	325	317	70	307	322	75	298	0	212	128	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1698	1767	1763	1850	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.8	7.7	7.8	2.0	6.9	6.9	2.1	3.9	0.0	3.0	1.5	0.0
Cycle Q Clear(g_c), s	0.8	7.7	7.8	2.0	6.9	6.9	2.1	3.9	0.0	3.0	1.5	0.0
Prop In Lane	1.00		0.51	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	580	559	87	624	655	95	552		331	752	
V/C Ratio(X)	0.61	0.56	0.57	0.80	0.49	0.49	0.79	0.54		0.64	0.17	
Avail Cap(c_a), veh/h	140	1471	1417	182	1499	1573	322	2301		481	2155	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	13.9	14.0	23.8	12.8	12.8	23.6	19.6	0.0	22.0	16.2	0.0
Incr Delay (d2), s/veh	12.9	0.9	0.9	15.2	0.6	0.6	13.5	0.8	0.0	2.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.7	2.7	1.1	2.3	2.4	1.1	1.4	0.0	1.2	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	14.8	14.9	39.0	13.4	13.4	37.1	20.5	0.0	24.1	16.3	0.0
LnGrp LOS	D	B	B	D	B	B	D	C		C	B	
Approach Vol, veh/h		669			699			373	A		340	A
Approach Delay, s/veh		15.7			15.9			23.8			21.1	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	15.7	6.7	21.2	9.8	12.8	5.5	22.5				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.2	30.9	* 5.2	* 42	7.1	* 33	* 4	43.0				
Max Q Clear Time (g_c+I1), s	4.1	3.5	4.0	9.8	5.0	5.9	2.8	8.9				
Green Ext Time (p_c), s	0.1	0.7	0.0	4.5	0.1	1.8	0.0	4.0				

Intersection Summary

HCM 6th Ctrl Delay 18.1

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	239	66	71	246	109	92	362	22	95	528	232
Future Volume (veh/h)	118	239	66	71	246	109	92	362	22	95	528	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	260	72	77	267	118	100	393	24	103	574	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	162	366	101	99	430	354	128	617	38	132	667	557
Arrive On Green	0.09	0.27	0.27	0.06	0.23	0.23	0.07	0.36	0.36	0.07	0.36	0.36
Sat Flow, veh/h	1767	1368	379	1767	1856	1528	1767	1728	106	1767	1856	1548
Grp Volume(v), veh/h	128	0	332	77	267	118	100	0	417	103	574	252
Grp Sat Flow(s),veh/h/ln	1767	0	1747	1767	1856	1528	1767	0	1834	1767	1856	1548
Q Serve(g_s), s	5.2	0.0	12.6	3.1	9.4	4.7	4.1	0.0	13.8	4.2	21.0	9.1
Cycle Q Clear(g_c), s	5.2	0.0	12.6	3.1	9.4	4.7	4.1	0.0	13.8	4.2	21.0	9.1
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	162	0	467	99	430	354	128	0	655	132	667	557
V/C Ratio(X)	0.79	0.00	0.71	0.78	0.62	0.33	0.78	0.00	0.64	0.78	0.86	0.45
Avail Cap(c_a), veh/h	213	0	576	162	559	460	189	0	838	208	851	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	24.2	34.0	25.2	23.4	33.3	0.0	19.5	33.2	21.7	17.9
Incr Delay (d2), s/veh	13.8	0.0	3.1	12.4	1.5	0.5	11.8	0.0	1.0	9.5	7.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	5.2	1.6	4.1	1.6	2.1	0.0	5.7	2.0	9.4	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	27.3	46.5	26.7	23.9	45.1	0.0	20.6	42.7	29.0	18.5
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		460			462			517			929	
Approach Delay, s/veh		32.6			29.3			25.3			27.7	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	31.0	8.3	24.1	9.5	31.2	10.9	21.5				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 8.6	* 33	* 6.7	24.1	* 7.8	33.5	* 8.8	22.0				
Max Q Clear Time (g_c+I1), s	6.2	15.8	5.1	14.6	6.1	23.0	7.2	11.4				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.0	3.3	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C


Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout AM Peak (Weekday)

9: Highland Avenue & SR 99 SB Ramps

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↗					↖↖	↗	↖	↖↖	
Traffic Volume (vph)	0	0	528	0	0	0	0	1007	49	423	556	0
Future Volume (vph)	0	0	528	0	0	0	0	1007	49	423	556	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	556	0	0	0	0	1060	52	445	585	0
RTOR Reduction (vph)	0	0	469	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	0	87	0	0	0	0	1060	23	445	585	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			7.2					20.5	20.5	16.1	29.5	
Effective Green, g (s)			7.2					20.5	20.5	16.1	29.5	
Actuated g/C Ratio			0.16					0.44	0.44	0.35	0.64	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			430					1555	681	610	2238	
v/s Ratio Prot			0.03					c0.30		c0.25	0.17	
v/s Ratio Perm									0.02			
v/c Ratio			0.20					0.68	0.03	0.73	0.26	
Uniform Delay, d1			17.0					10.2	7.3	13.1	3.6	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					1.2	0.0	4.4	0.1	
Delay (s)			17.2					11.5	7.3	17.5	3.7	
Level of Service			B					B	A	B	A	
Approach Delay (s)		17.2			0.0			11.3			9.7	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.9									
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			46.2							9.6		
Intersection Capacity Utilization			59.3%							B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

Intersection												
Int Delay, s/veh	47.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	61	15	71	34	10	126	58	784	53	84	705	24
Future Vol, veh/h	61	15	71	34	10	126	58	784	53	84	705	24
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	66	16	77	37	11	137	63	852	58	91	766	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1520	1998	397	1580	1982	455	793	0	0	910	0	0
Stage 1	962	962	-	1007	1007	-	-	-	-	-	-	-
Stage 2	558	1036	-	573	975	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	81	59	600	73	60	550	817	-	-	738	-	-
Stage 1	273	330	-	256	314	-	-	-	-	-	-	-
Stage 2	479	305	-	469	326	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 43	48	600	40	49	550	816	-	-	738	-	-
Mov Cap-2 Maneuver	~ 43	48	-	40	49	-	-	-	-	-	-	-
Stage 1	252	289	-	236	290	-	-	-	-	-	-	-
Stage 2	320	282	-	338	286	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s\$	322.7	281.2	0.6	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	816	-	-	44	600	132	738	-	-
HCM Lane V/C Ratio	0.077	-	-	1.877	0.129	1.4	0.124	-	-
HCM Control Delay (s)	9.8	-	-	\$ 613	11.9	281.2	10.6	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	8.5	0.4	12.3	0.4	-	-
























Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	823	604	12	88	518	55	39	592	738	55	514	102
Future Volume (veh/h)	823	604	12	88	518	55	39	592	738	55	514	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	895	657	0	96	563	0	42	643	802	60	559	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	738	775		61	355		54	593	264	59	604	269
Arrive On Green	0.42	0.42	0.00	0.23	0.23	0.00	0.03	0.17	0.17	0.03	0.17	0.17
Sat Flow, veh/h	1767	1856	1572	268	1574	1572	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	895	657	0	659	0	0	42	643	802	60	559	111
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1842	0	1572	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	50.1	38.3	0.0	27.1	0.0	0.0	2.8	20.2	20.2	4.0	18.7	7.6
Cycle Q Clear(g_c), s	50.1	38.3	0.0	27.1	0.0	0.0	2.8	20.2	20.2	4.0	18.7	7.6
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	738	775		416	0		54	593	264	59	604	269
V/C Ratio(X)	1.21	0.85		1.58	0.00		0.78	1.08	3.04	1.02	0.93	0.41
Avail Cap(c_a), veh/h	738	775		416	0		59	593	264	59	604	269
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	31.5	0.0	46.5	0.0	0.0	57.8	49.9	49.9	58.0	49.0	44.3
Incr Delay (d2), s/veh	108.2	8.8	0.0	274.1	0.0	0.0	45.5	61.6	927.5	122.6	22.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	42.8	18.5	0.0	43.9	0.0	0.0	1.9	13.8	75.7	3.8	9.9	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	143.1	40.3	0.0	320.5	0.0	0.0	103.3	111.5	977.4	180.6	71.2	48.9
LnGrp LOS	F	D		F	A		F	F	F	F	E	D
Approach Vol, veh/h		1552	A		659	A		1487			730	
Approach Delay, s/veh		99.6			320.5			578.3			76.8	
Approach LOS		F			F			F			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		55.0	8.2	24.8		32.0	7.8	25.2				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		50.1	* 4	20.2		27.1	* 4	20.2				
Max Q Clear Time (g_c+I1), s		52.1	6.0	22.2		29.1	4.8	20.7				
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 289.5

HCM 6th LOS F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

Intersection												
Int Delay, s/veh	50.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	250	24	211	210	96	42	35	265	90	5	5
Future Vol, veh/h	17	250	24	211	210	96	42	35	265	90	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	272	26	229	228	104	46	38	288	98	5	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	332	0	0	298	0	0	1064	1111	285	1222	1072	280
Stage 1	-	-	-	-	-	-	321	321	-	738	738	-
Stage 2	-	-	-	-	-	-	743	790	-	484	334	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1222	-	-	1258	-	-	200	208	752	156	220	756
Stage 1	-	-	-	-	-	-	689	650	-	408	423	-
Stage 2	-	-	-	-	-	-	405	400	-	562	641	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1222	-	-	1258	-	-	158	158	752	~ 64	167	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	158	-	~ 64	167	-
Stage 1	-	-	-	-	-	-	677	638	-	401	327	-
Stage 2	-	-	-	-	-	-	306	309	-	320	629	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3.5	57.7	\$ 418.4
HCM LOS			F	F







Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	407	1222	-	-	1258	-	-	69
HCM Lane V/C Ratio	0.913	0.015	-	-	0.182	-	-	1.575
HCM Control Delay (s)	57.7	8	0	-	8.5	0	-	\$ 418.4
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	9.8	0	-	-	0.7	-	-	9.3

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
3: Floral Avenue & Project Driveway

2030 + Project Buildout PM Peak (Weekday)


11/26/2018

Intersection							
Int Delay, s/veh	3858.8						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	216	281	38	584	563	1019	151
Future Vol, veh/h	216	281	38	584	563	1019	151
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	235	305	41	635	612	1108	164
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1247	0	-	-	0	1798	624
Stage 1	-	-	-	-	-	1023	-
Stage 2	-	-	-	-	-	775	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	552	-	-	-	-	~ 79	427
Stage 1	-	-	-	-	-	~ 307	-
Stage 2	-	-	-	-	-	~ 451	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	552	-	-	-	-	~ 45	427
Mov Cap-2 Maneuver	-	-	-	-	-	~ 45	-
Stage 1	-	-	-	-	-	~ 176	-
Stage 2	-	-	-	-	-	~ 451	-
Approach	EB	WB		SB			
HCM Control Delay, s	7.1			\$ 9403.2			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	552	-	-	-	-	45	427
HCM Lane V/C Ratio	0.425	-	-	-	-	24.614	0.384
HCM Control Delay (s)	16.3	-	-	-	-	10793.8	18.6
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	2.1	-	-	-	-	135.9	1.8
Notes							
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon							

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

11/26/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Future Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1538
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1842	73	116	1468	0	0	0	176	319	51	592
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	64	0	0	60
Lane Group Flow (vph)	0	1842	35	116	1468	0	0	0	112	319	51	532
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.3	58.3	8.3	71.3				20.3	25.2	37.2	37.2
Effective Green, g (s)		58.3	58.3	8.3	71.3				20.3	25.2	37.2	37.2
Actuated g/C Ratio		0.49	0.49	0.07	0.59				0.17	0.21	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1702	761	121	2082				269	714	571	476
v/s Ratio Prot		c0.53		c0.07	0.42				0.07	0.09	0.03	
v/s Ratio Perm			0.02									c0.35
v/c Ratio		1.08	0.05	0.96	0.71				0.42	0.45	0.09	1.12
Uniform Delay, d1		30.9	16.2	55.7	17.0				44.6	41.3	29.4	41.4
Progression Factor		1.00	0.95	0.80	0.56				1.00	1.00	1.00	1.00
Incremental Delay, d2		47.8	0.1	15.6	0.2				1.0	0.4	0.1	77.5
Delay (s)		78.7	15.5	60.0	9.7				45.6	41.8	29.4	118.9
Level of Service		E	B	E	A				D	D	C	F
Approach Delay (s)		76.3			13.4			45.6			88.6	
Approach LOS		E			B			D			F	
Intersection Summary												
HCM 2000 Control Delay			56.2			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			84.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	654	1104	392	417	831	259	367	437	187	137	591	654
Future Volume (veh/h)	654	1104	392	417	831	259	367	437	187	137	591	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	667	1127	400	426	848	264	374	446	191	140	603	667
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	288	1197	534	586	919	286	137	547	244	294	992	779
Arrive On Green	0.11	0.23	0.23	0.34	0.69	0.69	0.07	0.26	0.26	0.17	0.28	0.28
Sat Flow, veh/h	1767	3526	1572	3428	2647	823	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	667	1127	400	426	564	548	374	446	191	140	603	667
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1707	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	19.6	37.7	28.4	13.1	32.7	32.8	4.8	14.3	13.5	8.6	17.8	27.4
Cycle Q Clear(g_c), s	19.6	37.7	28.4	13.1	32.7	32.8	4.8	14.3	13.5	8.6	17.8	27.4
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	1197	534	586	612	593	137	547	244	294	992	779
V/C Ratio(X)	2.31	0.94	0.75	0.73	0.92	0.92	2.73	0.82	0.78	0.48	0.61	0.86
Avail Cap(c_a), veh/h	288	1205	537	586	737	714	137	764	341	294	1116	876
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.20	0.20	0.20	0.69	0.69	0.69	0.41	0.41	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.4	45.2	41.6	37.1	17.0	17.0	56.0	42.8	42.6	45.3	37.4	40.8
Incr Delay (d2), s/veh	592.6	4.2	2.0	3.2	16.4	17.0	785.7	2.0	3.3	1.2	0.8	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	56.5	17.8	11.6	4.9	9.7	9.5	16.9	5.6	4.8	3.9	7.7	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	646.1	49.4	43.6	40.2	33.4	34.0	841.7	44.9	45.9	46.5	38.2	48.5
LnGrp LOS	F	D	D	D	C	C	F	D	D	D	D	D
Approach Vol, veh/h	2194				1538				1011			
Approach Delay, s/veh	229.7				35.5				339.8			
Approach LOS	F				D				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.7	45.9	10.0	38.4	24.8	46.8	25.2	23.2				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	5.2	* 4.6				
Max Green Setting (Gmax), s	* 16	* 41	4.8	* 38	* 7.8	* 50	17.8	* 26				
Max Q Clear Time (g_c+I1), s	15.1	39.7	6.8	29.4	21.6	34.8	10.6	16.3				
Green Ext Time (p_c), s	0.2	1.0	0.0	4.4	0.0	6.8	0.2	2.3				

Intersection Summary

HCM 6th Ctrl Delay	156.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout PM Peak (Weekday)

6: SR-99 NB Off-Ramp & Floral Avenue

11/26/2018























	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	1091	0	0	1160	461	245
Future Volume (vph)	1091	0	0	1160	461	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1161	0	0	1234	490	261
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	1161	0	0	1234	490	230
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	70.6			70.6	40.2	40.2
Effective Green, g (s)	70.6			70.6	40.2	40.2
Actuated g/C Ratio	0.59			0.59	0.34	0.34
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2062			2062	586	525
v/s Ratio Prot	0.33			0.35	0.28	
v/s Ratio Perm						0.15
v/c Ratio	0.56			0.60	0.84	0.44
Uniform Delay, d1	15.2			15.7	36.9	31.1
Progression Factor	0.21			0.20	1.00	1.00
Incremental Delay, d2	0.8			1.1	10.0	0.6
Delay (s)	3.9			4.2	46.9	31.7
Level of Service	A			A	D	C
Approach Delay (s)	3.9			4.2	41.6	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	9.2
Intersection Capacity Utilization			65.3%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	838	272	83	591	81	127	587	28	326	497	63
Future Volume (veh/h)	82	838	272	83	591	81	127	587	28	326	497	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	88	901	292	89	635	87	137	631	0	351	534	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	427	949	307	265	833	114	165	768		405	876	
Arrive On Green	0.48	0.73	0.73	0.15	0.27	0.27	0.09	0.22	0.00	0.12	0.25	0.00
Sat Flow, veh/h	1767	2617	846	1767	3110	425	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	88	606	587	89	359	363	137	631	0	351	534	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1700	1767	1763	1773	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	3.4	36.2	36.7	5.4	22.5	22.6	9.1	20.5	0.0	12.1	16.1	0.0
Cycle Q Clear(g_c), s	3.4	36.2	36.7	5.4	22.5	22.6	9.1	20.5	0.0	12.1	16.1	0.0
Prop In Lane	1.00		0.50	1.00		0.24	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	639	617	265	472	475	165	768		405	876	
V/C Ratio(X)	0.21	0.95	0.95	0.34	0.76	0.76	0.83	0.82		0.87	0.61	
Avail Cap(c_a), veh/h	427	689	664	265	668	672	255	970		423	896	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.4	15.5	15.5	45.7	40.4	40.4	53.5	44.7	0.0	52.0	39.9	0.0
Incr Delay (d2), s/veh	0.2	21.7	23.0	0.7	11.0	11.1	12.7	4.6	0.0	16.6	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	10.4	10.3	2.4	11.1	11.2	4.6	9.2	0.0	6.0	7.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.6	37.2	38.5	46.4	51.4	51.5	66.2	49.4	0.0	68.6	41.1	0.0
LnGrp LOS	C	D	D	D	D	D	E	D		E	D	
Approach Vol, veh/h		1281			811			768	A		885	A
Approach Delay, s/veh		36.9			50.9			52.4			52.0	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.4	34.7	22.2	47.7	19.1	31.0	33.2	36.7				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 17	30.5	* 7.8	* 47	14.8	* 33	8.8	* 46				
Max Q Clear Time (g_c+I1), s	11.1	18.1	7.4	38.7	14.1	22.5	5.4	24.6				
Green Ext Time (p_c), s	0.2	2.7	0.0	4.8	0.1	2.9	0.0	4.4				

Intersection Summary

HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

8: McCall Avenue & Floral Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	265	284	101	51	234	94	112	652	62	60	507	214
Future Volume (veh/h)	265	284	101	51	234	94	112	652	62	60	507	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	282	302	107	54	249	100	119	694	66	64	539	228
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	292	393	139	69	327	272	144	708	67	81	723	607
Arrive On Green	0.17	0.30	0.30	0.04	0.18	0.18	0.08	0.42	0.42	0.05	0.39	0.39
Sat Flow, veh/h	1767	1300	461	1767	1856	1541	1767	1667	159	1767	1856	1558
Grp Volume(v), veh/h	282	0	409	54	249	100	119	0	760	64	539	228
Grp Sat Flow(s),veh/h/ln	1767	0	1761	1767	1856	1541	1767	0	1826	1767	1856	1558
Q Serve(g_s), s	15.1	0.0	20.2	2.9	12.2	5.5	6.3	0.0	39.2	3.4	23.9	10.0
Cycle Q Clear(g_c), s	15.1	0.0	20.2	2.9	12.2	5.5	6.3	0.0	39.2	3.4	23.9	10.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	292	0	533	69	327	272	144	0	776	81	723	607
V/C Ratio(X)	0.96	0.00	0.77	0.78	0.76	0.37	0.82	0.00	0.98	0.79	0.75	0.38
Avail Cap(c_a), veh/h	292	0	586	111	427	355	144	0	776	81	723	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	0.0	30.3	45.5	37.4	34.7	43.2	0.0	27.1	45.1	25.1	20.9
Incr Delay (d2), s/veh	43.0	0.0	5.6	17.2	5.8	0.8	30.7	0.0	27.2	38.6	4.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	9.0	1.6	5.9	2.1	4.0	0.0	22.0	2.3	10.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.6	0.0	35.8	62.7	43.2	35.5	73.9	0.0	54.3	83.7	29.3	21.2
LnGrp LOS	F	A	D	E	D	D	E	A	D	F	C	C
Approach Vol, veh/h		691			403			879			831	
Approach Delay, s/veh		54.9			43.9			56.9			31.3	
Approach LOS		D			D			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	45.5	7.9	33.5	12.0	42.1	20.0	21.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.4	* 41	* 6	31.8	* 7.8	36.5	* 16	22.0				
Max Q Clear Time (g_c+I1), s	5.4	41.2	4.9	22.2	8.3	25.9	17.1	14.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.7	0.0	3.0	0.0	1.0				

Intersection Summary

HCM 6th Ctrl Delay	47.0
HCM 6th LOS	D


















Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout PM Peak (Weekday)

9: Highland Avenue & SR-99 SB Off-Ramp

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	677	0	0	0	0	1416	58	458	956	0
Future Volume (vph)	0	0	677	0	0	0	0	1416	58	458	956	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	736	0	0	0	0	1539	63	498	1039	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	0	645	0	0	0	0	1539	33	498	1039	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			18.5					31.0	31.0	19.4	32.0	
Effective Green, g (s)			18.5					31.0	31.0	19.4	32.0	
Actuated g/C Ratio			0.31					0.52	0.52	0.32	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			851					1810	793	566	1869	
v/s Ratio Prot			0.23					c0.44		c0.28	0.30	
v/s Ratio Perm									0.02			
v/c Ratio			0.76					0.85	0.04	0.88	0.56	
Uniform Delay, d1			18.7					12.5	7.2	19.2	9.3	
Progression Factor			1.00					1.00	1.00	1.23	0.74	
Incremental Delay, d2			3.9					5.2	0.1	11.9	0.9	
Delay (s)			22.6					17.7	7.3	35.7	7.8	
Level of Service			C					B	A	D	A	
Approach Delay (s)		22.6			0.0			17.3			16.8	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.1									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			72.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	15	79	46	17	125	88	1090	58	135	1289	66
Future Vol, veh/h	38	15	79	46	17	125	88	1090	58	135	1289	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	16	83	48	18	132	93	1147	61	142	1357	69

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2445	3070	713	2335	3074	604	1426	0	0	1208	0	0
Stage 1	1676	1676	-	1364	1364	-	-	-	-	-	-	-
Stage 2	769	1394	-	971	1710	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 16	~ 12	372	~ 19	~ 12	439	468	-	-	568	-	-
Stage 1	98	149	-	154	212	-	-	-	-	-	-	-
Stage 2	358	205	-	270	143	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 7	372	-	~ 7	439	468	-	-	568	-	-
Mov Cap-2 Maneuver	-	~ 7	-	-	~ 7	-	-	-	-	-	-	-
Stage 1	78	112	-	123	170	-	-	-	-	-	-	-
Stage 2	180	164	-	135	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	1.2
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	468	-	-	-	372	-	568	-	-
HCM Lane V/C Ratio	0.198	-	-	-	0.224	-	0.25	-	-
HCM Control Delay (s)	14.6	-	-	-	17.4	-	13.4	-	-
HCM Lane LOS	B	-	-	-	C	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0.8	-	1	-	-
























Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	706	427	39	52	511	146	93	671	446	99	629	58
Future Volume (veh/h)	706	427	39	52	511	146	93	671	446	99	629	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	728	440	0	54	527	0	96	692	460	102	648	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	660	693		41	398		305	1026	457	93	590	261
Arrive On Green	0.37	0.37	0.00	0.24	0.24	0.00	0.17	0.29	0.29	0.05	0.17	0.17
Sat Flow, veh/h	1767	1856	1572	172	1675	1572	1767	3526	1572	1767	3526	1563
Grp Volume(v), veh/h	728	440	0	581	0	0	96	692	460	102	648	60
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1847	0	1572	1767	1763	1572	1767	1763	1563
Q Serve(g_s), s	41.1	21.4	0.0	26.1	0.0	0.0	5.2	19.0	32.0	5.8	18.4	3.7
Cycle Q Clear(g_c), s	41.1	21.4	0.0	26.1	0.0	0.0	5.2	19.0	32.0	5.8	18.4	3.7
Prop In Lane	1.00		1.00	0.09		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	660	693		438	0		305	1026	457	93	590	261
V/C Ratio(X)	1.10	0.63		1.33	0.00		0.31	0.67	1.01	1.09	1.10	0.23
Avail Cap(c_a), veh/h	660	693		438	0		305	1026	457	93	590	261
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.5	28.3	0.0	42.0	0.0	0.0	39.8	34.4	39.0	52.1	45.8	39.7
Incr Delay (d2), s/veh	66.5	1.9	0.0	161.8	0.0	0.0	0.6	3.6	43.5	121.1	67.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.1	9.6	0.0	31.3	0.0	0.0	2.3	8.4	17.3	5.7	13.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.9	30.2	0.0	203.7	0.0	0.0	40.4	38.0	82.5	173.2	112.8	41.7
LnGrp LOS	F	C		F	A		D	D	F	F	F	D
Approach Vol, veh/h	1168		A	581		A	1248		810			
Approach Delay, s/veh	74.3			203.7			54.6		115.1			
Approach LOS	E			F			D		F			
Timer - Assigned Phs	2		3	4		6	7		8			
Phs Duration (G+Y+Rc), s	46.0		10.0	37.0		31.0	24.0		23.0			
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6		* 4.6			
Max Green Setting (Gmax), s	41.1		* 5.8	18.4		26.1	5.8		* 18			
Max Q Clear Time (g_c+I1), s	43.1		7.8	34.0		28.1	7.2		20.4			
Green Ext Time (p_c), s	0.0		0.0	0.0		0.0	0.0		0.0			

Intersection Summary

HCM 6th Ctrl Delay 96.3

HCM 6th LOS F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)







11/26/2018

Intersection												
Int Delay, s/veh	62											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	214	18	236	209	89	38	32	296	108	5	4
Future Vol, veh/h	16	214	18	236	209	89	38	32	296	108	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	17	228	19	251	222	95	40	34	315	115	5	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	317	0	0	247	0	0	1048	1091	238	1218	1053	270
Stage 1	-	-	-	-	-	-	272	272	-	772	772	-
Stage 2	-	-	-	-	-	-	776	819	-	446	281	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1237	-	-	1313	-	-	205	214	798	157	225	766
Stage 1	-	-	-	-	-	-	732	683	-	391	408	-
Stage 2	-	-	-	-	-	-	389	388	-	590	677	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1237	-	-	1313	-	-	161	161	798	~ 65	169	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	161	-	~ 65	169	-
Stage 1	-	-	-	-	-	-	720	672	-	385	312	-
Stage 2	-	-	-	-	-	-	291	297	-	334	666	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			3.7			44.8			\$ 512		
HCM LOS							E			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	454	1237	-	-	1313	-	-	69				
HCM Lane V/C Ratio	0.858	0.014	-	-	0.191	-	-	1.804				
HCM Control Delay (s)	44.8	8	0	-	8.4	0	-	\$ 512				
HCM Lane LOS	E	A	A	-	A	A	-	F				
HCM 95th %tile Q(veh)	8.7	0	-	-	0.7	-	-	11.1				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM 6th TWSC
3: Floral Avenue & Project Driveway

2030 + Project Buildout MD Peak (Saturday)













11/26/2018

Intersection							
Int Delay, s/veh	6446.3						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	238	284	45	619	609	1154	171
Future Vol, veh/h	238	284	45	619	609	1154	171
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	259	309	49	673	662	1254	186
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1335	0	-	-	0	1929	668
Stage 1	-	-	-	-	-	1102	-
Stage 2	-	-	-	-	-	827	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	510	-	-	-	-	~ 65	400
Stage 1	-	-	-	-	-	~ 279	-
Stage 2	-	-	-	-	-	~ 426	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	510	-	-	-	-	~ 32	400
Mov Cap-2 Maneuver	-	-	-	-	-	~ 32	-
Stage 1	-	-	-	-	-	~ 137	-
Stage 2	-	-	-	-	-	~ 426	-
Approach	EB	WB		SB			
HCM Control Delay, s	8.7			\$ 15175.8			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	510	-	-	-	-	32	400
HCM Lane V/C Ratio	0.507	-	-	-	-	39.198	0.465
HCM Control Delay (s)	19.1	-	-	-	-	\$ 17421.4	21.6
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	2.8	-	-	-	-	155.8	2.4
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/26/2018
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Future Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1547
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1547
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1996	90	112	1493	0	0	0	166	200	33	620
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	55	0	0	50
Lane Group Flow (vph)	0	1996	44	113	1493	0	0	0	111	200	33	570
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.7	58.7	7.3	70.7				33.7	11.4	37.8	37.8
Effective Green, g (s)		58.7	58.7	7.3	70.7				33.7	11.4	37.8	37.8
Actuated g/C Ratio		0.49	0.49	0.06	0.59				0.28	0.10	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1714	767	106	2065				448	323	581	487
v/s Ratio Prot		c0.57		c0.06	0.43				0.07	0.06	0.02	
v/s Ratio Perm			0.03									c0.37
v/c Ratio		1.16	0.06	1.07	0.72				0.25	0.62	0.06	1.17
Uniform Delay, d1		30.6	16.1	56.4	17.6				33.3	52.2	28.7	41.1
Progression Factor		1.01	1.01	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		80.8	0.0	106.3	1.3				0.3	3.5	0.0	96.8
Delay (s)		111.8	16.4	162.7	18.9				33.6	55.7	28.7	137.9
Level of Service		F	B	F	B				C	E	C	F
Approach Delay (s)		107.7			29.0			33.6			114.4	
Approach LOS		F			C			C			F	
Intersection Summary												
HCM 2000 Control Delay			79.5			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			86.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	655	1171	449	456	883	273	392	377	191	155	529	654
Future Volume (veh/h)	655	1171	449	456	883	273	392	377	191	155	529	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	675	1207	463	470	910	281	404	389	197	160	545	674
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	174	1255	560	473	1047	322	143	788	352	190	1008	791
Arrive On Green	0.10	0.36	0.36	0.14	0.40	0.40	0.04	0.22	0.22	0.11	0.29	0.29
Sat Flow, veh/h	1767	3526	1572	3428	2649	816	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	675	1207	463	470	605	586	404	389	197	160	545	674
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1701	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	11.4	38.7	31.0	15.8	36.4	36.7	4.8	11.1	9.0	10.2	15.1	26.5
Cycle Q Clear(g_c), s	11.4	38.7	31.0	15.8	36.4	36.7	4.8	11.1	9.0	10.2	15.1	26.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	1255	560	473	697	673	143	788	352	190	1008	791
V/C Ratio(X)	3.88	0.96	0.83	0.99	0.87	0.87	2.83	0.49	0.56	0.84	0.54	0.85
Avail Cap(c_a), veh/h	174	1257	561	473	767	741	143	788	352	294	1162	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	36.4	33.9	49.7	32.1	32.2	55.3	39.1	19.6	50.5	34.8	38.9
Incr Delay (d2), s/veh	1309.5	17.1	9.9	39.8	9.7	10.4	842.9	0.5	2.0	12.3	0.5	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	68.3	19.3	12.7	9.3	17.1	16.7	18.7	4.7	3.3	5.1	6.4	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1361.4	53.4	43.8	89.4	41.8	42.5	898.2	39.5	21.6	62.8	35.2	45.8
LnGrp LOS	F	D	D	F	D	D	F	D	C	E	D	D
Approach Vol, veh/h	2345				1661				990			
Approach Delay, s/veh	428.0				55.6				386.3			
Approach LOS	F				E				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.1	46.2	10.4	37.6	16.6	50.8	16.6	31.4				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 16	* 41	4.8	* 38	* 7.8	* 50	* 19	23.6				
Max Q Clear Time (g_c+I1), s	17.8	40.7	6.8	28.5	13.4	38.7	12.2	13.1				
Green Ext Time (p_c), s	0.0	0.4	0.0	4.5	0.0	6.1	0.2	2.2				

Intersection Summary

HCM 6th Ctrl Delay 241.4

HCM 6th LOS F







Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout MD Peak (Saturday)

6: SR 99 NB Off-Ramp & Floral Avenue

11/26/2018























						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↗	↖
Traffic Volume (vph)	995	0	0	1119	404	254
Future Volume (vph)	995	0	0	1119	404	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1082	0	0	1216	439	276
RTOR Reduction (vph)	0	0	0	0	0	43
Lane Group Flow (vph)	1082	0	0	1216	439	233
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	66.9			66.9	33.9	33.9
Effective Green, g (s)	66.9			66.9	33.9	33.9
Actuated g/C Ratio	0.61			0.61	0.31	0.31
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2131			2131	539	483
v/s Ratio Prot	0.31			c0.35	c0.25	
v/s Ratio Perm						0.15
v/c Ratio	0.51			0.57	0.81	0.48
Uniform Delay, d1	12.2			12.9	35.1	30.9
Progression Factor	1.00			0.29	1.00	1.00
Incremental Delay, d2	0.9			1.1	9.2	0.8
Delay (s)	13.1			4.8	44.3	31.7
Level of Service	B			A	D	C
Approach Delay (s)	13.1			4.8	39.5	
Approach LOS	B			A	D	
Intersection Summary						
HCM 2000 Control Delay	16.0			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.65					
Actuated Cycle Length (s)	110.0			Sum of lost time (s)		9.2
Intersection Capacity Utilization	61.0%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary

7: Whitson Street & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	686	344	65	510	79	114	528	20	336	436	30
Future Volume (veh/h)	82	686	344	65	510	79	114	528	20	336	436	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	85	715	358	68	531	82	119	550	0	350	454	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	575	777	388	366	672	103	146	694		305	740	
Arrive On Green	0.65	0.68	0.68	0.21	0.22	0.22	0.08	0.20	0.00	0.09	0.21	0.00
Sat Flow, veh/h	1767	2275	1138	1767	3062	471	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	85	554	519	68	305	308	119	550	0	350	454	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1650	1767	1763	1771	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	2.0	29.5	29.6	3.5	18.0	18.1	7.3	16.3	0.0	9.8	12.8	0.0
Cycle Q Clear(g_c), s	2.0	29.5	29.6	3.5	18.0	18.1	7.3	16.3	0.0	9.8	12.8	0.0
Prop In Lane	1.00		0.69	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	575	602	563	366	387	389	146	694		305	740	
V/C Ratio(X)	0.15	0.92	0.92	0.19	0.79	0.79	0.82	0.79		1.15	0.61	
Avail Cap(c_a), veh/h	575	710	664	366	713	716	175	1058		305	1022	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.3	16.2	16.2	36.0	40.5	40.6	49.6	42.0	0.0	50.1	39.4	0.0
Incr Delay (d2), s/veh	0.1	19.2	20.3	0.2	14.9	15.2	21.6	2.4	0.0	97.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	9.0	8.6	1.5	9.3	9.4	4.0	7.1	0.0	8.2	5.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	35.3	36.4	36.2	55.4	55.8	71.2	44.4	0.0	147.1	40.2	0.0
LnGrp LOS	B	D	D	D	E	E	E	D		F	D	
Approach Vol, veh/h		1158			681			669	A		804	A
Approach Delay, s/veh		34.2			53.7			49.2			86.8	
Approach LOS		C			D			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	28.0	27.0	41.8	14.7	26.6	40.0	28.7				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.2	4.9	* 4.9	4.2	* 4.6				
Max Green Setting (Gmax), s	* 11	31.9	* 5.4	* 44	9.8	* 33	4.8	* 45				
Max Q Clear Time (g_c+I1), s	9.3	14.8	5.5	31.6	11.8	18.3	4.0	20.1				
Green Ext Time (p_c), s	0.0	2.5	0.0	5.9	0.0	3.0	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay	54.0
HCM 6th LOS	D

Notes

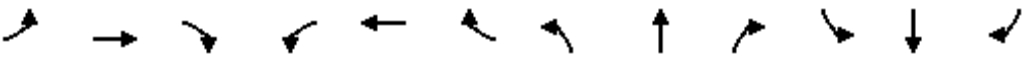











* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 8: McCall Avenue & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	183	92	54	196	47	69	559	50	34	533	180
Future Volume (veh/h)	261	183	92	54	196	47	69	559	50	34	533	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	264	185	93	55	198	47	70	565	51	34	538	182
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	311	335	168	69	281	236	89	641	58	49	668	563
Arrive On Green	0.18	0.29	0.29	0.04	0.15	0.15	0.05	0.38	0.38	0.03	0.36	0.36
Sat Flow, veh/h	1767	1163	585	1767	1856	1562	1767	1676	151	1767	1856	1564
Grp Volume(v), veh/h	264	0	278	55	198	47	70	0	616	34	538	182
Grp Sat Flow(s),veh/h/ln	1767	0	1748	1767	1856	1562	1767	0	1827	1767	1856	1564
Q Serve(g_s), s	9.9	0.0	9.2	2.1	6.9	1.8	2.7	0.0	21.4	1.3	17.8	5.8
Cycle Q Clear(g_c), s	9.9	0.0	9.2	2.1	6.9	1.8	2.7	0.0	21.4	1.3	17.8	5.8
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	311	0	504	69	281	236	89	0	699	49	668	563
V/C Ratio(X)	0.85	0.00	0.55	0.79	0.71	0.20	0.79	0.00	0.88	0.69	0.81	0.32
Avail Cap(c_a), veh/h	383	0	761	184	598	503	119	0	854	106	835	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	20.6	32.5	27.5	25.4	32.0	0.0	19.6	32.9	19.7	15.8
Incr Delay (d2), s/veh	13.8	0.0	0.9	18.2	3.2	0.4	21.6	0.0	9.2	15.9	4.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	3.6	1.2	3.1	0.7	1.6	0.0	10.0	0.7	7.5	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	0.0	21.5	50.7	30.8	25.8	53.7	0.0	28.8	48.7	24.4	16.1
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		542			300			686			754	
Approach Delay, s/veh		31.0			33.6			31.3			23.5	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	31.0	6.9	24.3	7.6	29.5	16.2	14.9				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.1	* 32	* 7.1	29.7	* 4.6	30.7	* 15	22.0				
Max Q Clear Time (g_c+I1), s	3.3	23.4	4.1	11.2	4.7	19.8	11.9	8.9				
Green Ext Time (p_c), s	0.0	2.7	0.0	1.5	0.0	2.9	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			29.0									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout MD Peak (Saturday)

9: Highland Avenue & SR 99 SB Ramps

11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↰↰					↱↱	↰	↰	↱↱	
Traffic Volume (vph)	0	0	535	0	0	0	0	1321	42	504	960	0
Future Volume (vph)	0	0	535	0	0	0	0	1321	42	504	960	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1533	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1533	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	546	0	0	0	0	1348	43	514	980	0
RTOR Reduction (vph)	0	0	163	0	0	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	0	383	0	0	0	0	1348	20	514	980	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			12.1					26.1	26.1	19.7	33.8	
Effective Green, g (s)			12.1					26.1	26.1	19.7	33.8	
Actuated g/C Ratio			0.22					0.47	0.47	0.36	0.61	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			602					1651	722	623	2138	
v/s Ratio Prot			0.14					c0.38		c0.29	0.28	
v/s Ratio Perm									0.01			
v/c Ratio			0.64					0.82	0.03	0.83	0.46	
Uniform Delay, d1			19.7					12.6	7.9	16.3	5.8	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			2.2					3.2	0.0	8.7	0.2	
Delay (s)			21.9					15.8	7.9	25.0	6.0	
Level of Service			C					B	A	C	A	
Approach Delay (s)		21.9			0.0			15.6			12.5	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.3									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			55.4									
Intersection Capacity Utilization			72.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

Intersection												
Int Delay, s/veh	441											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	41	12	104	53	22	98	95	984	65	97	1108	69
Future Vol, veh/h	41	12	104	53	22	98	95	984	65	97	1108	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	43	13	109	56	23	103	100	1036	68	102	1166	73

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2137	2711	620	2064	2713	552	1239	0	0	1104	0	0
Stage 1	1407	1407	-	1270	1270	-	-	-	-	-	-	-
Stage 2	730	1304	-	794	1443	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 27	20	428	~ 31	~ 20	475	552	-	-	622	-	-
Stage 1	145	202	-	176	235	-	-	-	-	-	-	-
Stage 2	378	227	-	345	194	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	-	14	428	~ 4	~ 14	475	552	-	-	622	-	-
Mov Cap-2 Maneuver	-	14	-	~ 4	~ 14	-	-	-	-	-	-	-
Stage 1	119	169	-	144	192	-	-	-	-	-	-	-
Stage 2	213	186	-	199	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		\$ 6990.4	1.1	0.9
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	552	-	-	-	428	12	622	-	-
HCM Lane V/C Ratio	0.181	-	-	-	0.256	15.175	0.164	-	-
HCM Control Delay (s)	13	-	-	-	16.3	6990.4	11.9	-	-
HCM Lane LOS	B	-	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	1	24.1	0.6	-	-























Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout AM Peak (Weekday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	179	277	71	95	432	10	17	355	388	19	134	41
Future Volume (veh/h)	179	277	71	95	432	10	17	355	388	19	134	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	195	301	77	103	470	11	18	386	422	21	146	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	698	567	143	334	666	16	298	856	702	35	307	137
Arrive On Green	0.20	0.20	0.20	0.19	0.19	0.19	0.17	0.24	0.24	0.02	0.09	0.09
Sat Flow, veh/h	3428	2787	701	1767	3521	82	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	195	189	189	103	235	246	18	386	422	21	146	45
Grp Sat Flow(s),veh/h/ln	1714	1763	1726	1767	1763	1841	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	2.6	5.2	5.3	2.7	6.7	6.8	0.5	5.0	11.0	0.6	2.1	1.5
Cycle Q Clear(g_c), s	2.6	5.2	5.3	2.7	6.7	6.8	0.5	5.0	11.0	0.6	2.1	1.5
Prop In Lane	1.00		0.41	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	698	359	351	334	333	348	298	856	702	35	307	137
V/C Ratio(X)	0.28	0.53	0.54	0.31	0.71	0.71	0.06	0.45	0.60	0.59	0.48	0.33
Avail Cap(c_a), veh/h	2539	1305	1278	461	460	480	298	868	707	131	868	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	19.2	19.2	18.9	20.5	20.5	18.9	17.4	11.3	26.3	23.5	23.2
Incr Delay (d2), s/veh	0.2	1.2	1.3	0.5	2.9	2.9	0.1	0.4	1.4	14.9	1.1	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.0	2.0	1.0	2.7	2.9	0.2	1.8	4.9	0.4	0.8	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	20.4	20.5	19.4	23.4	23.4	18.9	17.8	12.7	41.1	24.6	24.6
LnGrp LOS	B	C	C	B	C	C	B	B	B	D	C	C
Approach Vol, veh/h	573				584				826			
Approach Delay, s/veh	19.7				22.7				15.2			
Approach LOS	B				C				B			
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.9		5.3	17.7		15.1	13.7	9.3				
Change Period (Y+Rc), s	4.9		* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s	40.0		* 4	13.3		14.1	4.0	* 13				
Max Q Clear Time (g_c+I1), s	7.3		2.6	13.0		8.8	2.5	4.1				
Green Ext Time (p_c), s	3.0		0.0	0.2		1.5	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay	19.4											
HCM 6th LOS	B											
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.3

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	6	120	8	15	85	35	13	9	21	45	8	7
Future Vol, veh/h	6	120	8	15	85	35	13	9	21	45	8	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	130	9	16	92	38	14	10	23	49	9	8
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

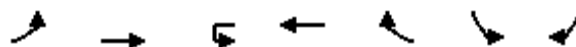
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8.5	8.4	7.8	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	30%	4%	100%	0%	75%
Vol Thru, %	21%	90%	0%	71%	13%
Vol Right, %	49%	6%	0%	29%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	134	15	120	60
LT Vol	13	6	15	0	45
Through Vol	9	120	0	85	8
RT Vol	21	8	0	35	7
Lane Flow Rate	47	146	16	130	66
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.058	0.18	0.025	0.171	0.087
Departure Headway (Hd)	4.482	4.459	5.434	4.727	4.768
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	800	805	660	760	753
Service Time	2.504	2.478	3.152	2.445	2.789
HCM Lane V/C Ratio	0.059	0.181	0.024	0.171	0.088
HCM Control Delay	7.8	8.5	8.3	8.4	8.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.7	0.1	0.6	0.3

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout AM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/26/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	28	182	12	204	296	310	14
Future Volume (vph)	28	182	12	204	296	310	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	198	13	222	322	337	15
RTOR Reduction (vph)	0	0	0	0	220	0	11
Lane Group Flow (vph)	30	198	13	222	102	337	4
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	0.4	12.2	0.4	12.2	12.2	11.1	11.1
Effective Green, g (s)	0.4	12.2	0.4	12.2	12.2	11.1	11.1
Actuated g/C Ratio	0.01	0.32	0.01	0.32	0.32	0.29	0.29
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	18	584	18	1110	496	980	452
v/s Ratio Prot	c0.02	c0.11	0.01	0.06		c0.10	
v/s Ratio Perm					0.07		0.00
v/c Ratio	1.67	0.34	0.72	0.20	0.21	0.34	0.01
Uniform Delay, d1	19.1	10.1	19.0	9.6	9.6	10.8	9.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	462.2	0.3	87.1	0.1	0.2	0.2	0.0
Delay (s)	481.3	10.4	106.0	9.7	9.8	11.0	9.8
Level of Service	F	B	F	A	A	B	A
Approach Delay (s)		72.4		12.0		11.0	
Approach LOS		E		B		B	
Intersection Summary							
HCM 2000 Control Delay			23.8		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.36				
Actuated Cycle Length (s)			38.5		Sum of lost time (s)		14.8
Intersection Capacity Utilization			34.1%		ICU Level of Service		A
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/26/2018

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	256
Future Volume (vph)	0	714	36	63	752	0	0	0	85	205	41	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1545	1468
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1545	1468
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	729	37	64	767	0	0	0	87	209	42	261
RTOR Reduction (vph)	0	0	25	0	0	0	0	0	75	0	54	83
Lane Group Flow (vph)	0	729	12	64	767	0	0	0	12	209	100	66
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		18.3	18.3	3.5	26.5				7.7	10.1	19.0	19.0
Effective Green, g (s)		18.3	18.3	3.5	26.5				7.7	10.1	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.06	0.46				0.14	0.18	0.33	0.33
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1125	503	107	1629				215	602	515	489
v/s Ratio Prot		c0.21		0.04	c0.22				0.01	c0.06	c0.06	
v/s Ratio Perm			0.01									0.04
v/c Ratio		0.65	0.02	0.60	0.47				0.05	0.35	0.19	0.13
Uniform Delay, d1		16.6	13.2	26.1	10.4				21.5	20.6	13.5	13.3
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.0	8.7	0.2				0.1	0.3	0.2	0.1
Delay (s)		17.9	13.3	34.8	10.7				21.6	20.9	13.7	13.4
Level of Service		B	B	C	B				C	C	B	B
Approach Delay (s)		17.7			12.5			21.6			16.6	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			57.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			46.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	264	498	212	295	596	130	253	278	146	54	465	424
Future Volume (veh/h)	264	498	212	295	596	130	253	278	146	54	465	424
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	284	535	228	317	641	140	272	299	157	58	500	456
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	291	1172	364	439	968	430	291	1089	486	73	915	717
Arrive On Green	0.08	0.23	0.23	0.13	0.27	0.27	0.08	0.31	0.31	0.04	0.26	0.26
Sat Flow, veh/h	3428	5066	1572	3428	3526	1566	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	284	535	228	317	641	140	272	299	157	58	500	456
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1566	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	5.6	6.2	6.1	6.1	11.0	3.7	5.4	4.4	5.2	2.2	8.4	10.0
Cycle Q Clear(g_c), s	5.6	6.2	6.1	6.1	11.0	3.7	5.4	4.4	5.2	2.2	8.4	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	1172	364	439	968	430	291	1089	486	73	915	717
V/C Ratio(X)	0.97	0.46	0.63	0.72	0.66	0.33	0.93	0.27	0.32	0.79	0.55	0.64
Avail Cap(c_a), veh/h	291	1863	578	799	1870	830	291	1844	822	236	1963	1538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	22.5	11.3	28.6	22.0	11.2	31.0	17.8	18.1	32.4	21.8	22.4
Incr Delay (d2), s/veh	45.7	0.3	1.8	2.3	0.8	0.4	35.6	0.1	0.4	16.8	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	2.4	2.9	2.5	4.4	1.6	3.5	1.6	1.7	1.2	3.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.9	22.8	13.0	30.9	22.7	11.6	66.6	17.9	18.5	49.3	22.3	23.3
LnGrp LOS	E	C	B	C	C	B	E	B	B	D	C	C
Approach Vol, veh/h	1047				1098				728			
Approach Delay, s/veh	35.4				23.7				36.3			
Approach LOS	D				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.9	21.0	11.0	22.3	11.0	23.9	7.0	26.3				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 16	* 25	5.8	* 38	* 5.8	* 36	* 9.1	* 36				
Max Q Clear Time (g_c+I1), s	8.1	8.2	7.4	12.0	7.6	13.0	4.2	7.2				
Green Ext Time (p_c), s	0.7	4.2	0.0	5.5	0.0	5.1	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay	29.3											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 + Project Buildout AM Peak (Weekday)

11/26/2018























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	15	71	34	10	126	58	784	53	84	705	24
Future Volume (veh/h)	61	15	71	34	10	126	58	784	53	84	705	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	16	77	37	11	137	63	852	58	91	766	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	85	23	109	127	14	176	81	1931	131	115	2074	70
Arrive On Green	0.05	0.08	0.08	0.07	0.12	0.12	0.05	0.58	0.58	0.07	0.60	0.60
Sat Flow, veh/h	1767	278	1337	1767	118	1472	1767	3349	228	1767	3479	118
Grp Volume(v), veh/h	66	0	93	37	0	148	63	448	462	91	388	404
Grp Sat Flow(s),veh/h/ln	1767	0	1615	1767	0	1591	1767	1763	1814	1767	1763	1834
Q Serve(g_s), s	3.5	0.0	5.4	1.9	0.0	8.7	3.4	13.9	13.9	4.9	10.9	11.0
Cycle Q Clear(g_c), s	3.5	0.0	5.4	1.9	0.0	8.7	3.4	13.9	13.9	4.9	10.9	11.0
Prop In Lane	1.00		0.83	1.00		0.93	1.00		0.13	1.00		0.06
Lane Grp Cap(c), veh/h	85	0	131	127	0	191	81	1016	1046	115	1051	1093
V/C Ratio(X)	0.78	0.00	0.71	0.29	0.00	0.78	0.78	0.44	0.44	0.79	0.37	0.37
Avail Cap(c_a), veh/h	87	0	606	127	0	608	88	1016	1046	125	1051	1093
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	43.0	42.2	0.0	41.0	45.3	11.5	11.5	44.2	10.0	10.0
Incr Delay (d2), s/veh	35.1	0.0	6.8	1.3	0.0	6.6	32.8	1.4	1.4	26.2	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	2.3	0.9	0.0	3.7	2.2	5.0	5.2	2.9	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.3	0.0	49.8	43.5	0.0	47.6	78.1	12.9	12.9	70.4	11.0	11.0
LnGrp LOS	F	A	D	D	A	D	E	B	B	E	B	B
Approach Vol, veh/h		159			185			973			883	
Approach Delay, s/veh		62.5			46.8			17.1			17.1	
Approach LOS		E			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	60.6	11.1	13.8	8.6	62.5	8.8	16.1				
Change Period (Y+Rc), s	* 4.2	5.3	4.2	* 6	* 4.2	5.3	4.2	* 4.6				
Max Green Setting (Gmax), s	* 6.8	29.5	4.0	* 36	* 4.8	31.5	4.7	* 37				
Max Q Clear Time (g_c+I1), s	6.9	15.9	3.9	7.4	5.4	13.0	5.5	10.7				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.4	0.0	4.3	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			22.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	823	604	12	88	518	55	39	592	738	55	514	102
Future Volume (veh/h)	823	604	12	88	518	55	39	592	738	55	514	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	895	657	13	96	563	60	42	643	802	60	559	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	1049	1081	21	344	625	66	306	866	867	207	670	299
Arrive On Green	0.31	0.31	0.31	0.19	0.19	0.19	0.17	0.25	0.25	0.12	0.19	0.19
Sat Flow, veh/h	3428	3536	70	1767	3214	342	1767	3526	1571	1767	3526	1572
Grp Volume(v), veh/h	895	327	343	96	308	315	42	643	802	60	559	111
Grp Sat Flow(s),veh/h/ln	1714	1763	1843	1767	1763	1793	1767	1763	1571	1767	1763	1572
Q Serve(g_s), s	33.4	21.5	21.6	6.3	23.2	23.3	2.7	22.9	33.4	4.2	20.8	8.4
Cycle Q Clear(g_c), s	33.4	21.5	21.6	6.3	23.2	23.3	2.7	22.9	33.4	4.2	20.8	8.4
Prop In Lane	1.00		0.04	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1049	539	564	344	343	349	306	866	867	207	670	299
V/C Ratio(X)	0.85	0.61	0.61	0.28	0.90	0.90	0.14	0.74	0.93	0.29	0.83	0.37
Avail Cap(c_a), veh/h	1213	623	652	365	364	371	306	866	867	207	902	402
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.3	40.2	40.2	46.7	53.5	53.5	47.6	47.3	21.2	54.8	53.0	48.0
Incr Delay (d2), s/veh	5.4	1.3	1.3	0.4	23.4	23.8	0.2	5.7	17.1	0.8	11.7	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	9.5	9.9	2.8	12.4	12.7	1.2	10.6	31.7	1.9	10.1	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	41.6	41.5	47.1	76.9	77.3	47.8	53.1	38.2	55.6	64.8	51.5
LnGrp LOS	D	D	D	D	E	E	D	D	D	E	E	D
Approach Vol, veh/h	1565				719				1487			
Approach Delay, s/veh	46.3				73.1				44.9			
Approach LOS	D				E				D			
Timer - Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	46.5		20.2	38.0	31.3		27.7	30.4				
Change Period (Y+Rc), s	4.9		4.2	* 4.6	4.9		4.2	* 4.6				
Max Green Setting (Gmax), s	48.1		7.8	* 33	28.1		6.4	* 35				
Max Q Clear Time (g_c+I1), s	35.4		6.2	35.4	25.3		4.7	22.8				
Green Ext Time (p_c), s	6.2		0.0	0.0	1.1		0.0	3.1				
Intersection Summary												
HCM 6th Ctrl Delay	52.7											
HCM 6th LOS	D											
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 18.4

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	17	250	24	211	210	96	42	35	265	90	5	5
Future Vol, veh/h	17	250	24	211	210	96	42	35	265	90	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	272	26	229	228	104	46	38	288	98	5	5
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

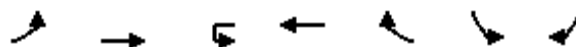
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	18.7	18.1	20.1	13
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	12%	6%	100%	0%	90%
Vol Thru, %	10%	86%	0%	69%	5%
Vol Right, %	77%	8%	0%	31%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	342	291	211	306	100
LT Vol	42	17	211	0	90
Through Vol	35	250	0	210	5
RT Vol	265	24	0	96	5
Lane Flow Rate	372	316	229	333	109
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.646	0.585	0.468	0.61	0.23
Departure Headway (Hd)	6.257	6.661	7.34	6.604	7.626
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	576	541	491	545	470
Service Time	4.304	4.717	5.094	4.358	5.699
HCM Lane V/C Ratio	0.646	0.584	0.466	0.611	0.232
HCM Control Delay	20.1	18.7	16.4	19.2	13
HCM Lane LOS	C	C	C	C	B
HCM 95th-tile Q	4.6	3.7	2.5	4.1	0.9

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout PM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/26/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	216	281	38	584	563	1019	151
Future Volume (vph)	216	281	38	584	563	1019	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	305	41	635	612	1108	164
RTOR Reduction (vph)	0	0	0	0	427	0	107
Lane Group Flow (vph)	235	305	41	635	185	1108	57
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	11.9	31.5	3.5	23.1	23.1	26.8	26.8
Effective Green, g (s)	11.9	31.5	3.5	23.1	23.1	26.8	26.8
Actuated g/C Ratio	0.16	0.41	0.05	0.30	0.30	0.35	0.35
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	758	80	1056	472	1189	548
v/s Ratio Prot	c0.13	0.17	0.02	c0.18		c0.33	
v/s Ratio Perm					0.12		0.04
v/c Ratio	0.86	0.40	0.51	0.60	0.39	0.93	0.10
Uniform Delay, d1	31.6	15.9	35.7	22.8	21.2	24.0	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.6	0.4	5.4	1.0	0.5	12.9	0.1
Delay (s)	55.1	16.3	41.2	23.8	21.7	37.0	16.9
Level of Service	E	B	D	C	C	D	B
Approach Delay (s)		33.2		23.4		34.4	
Approach LOS		C		C		C	
Intersection Summary							
HCM 2000 Control Delay			29.6		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.79				
Actuated Cycle Length (s)			76.6		Sum of lost time (s)		14.8
Intersection Capacity Utilization			69.5%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

11/26/2018

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Future Volume (vph)	0	1768	70	111	1409	0	0	0	169	306	49	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.98	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1506	1460
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1506	1460
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1842	73	116	1468	0	0	0	176	319	51	592
RTOR Reduction (vph)	0	0	30	0	0	0	0	0	57	0	50	50
Lane Group Flow (vph)	0	1842	43	116	1468	0	0	0	119	319	273	270
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		79.8	79.8	11.0	95.5				22.7	17.3	29.0	29.0
Effective Green, g (s)		79.8	79.8	11.0	95.5				22.7	17.3	29.0	29.0
Actuated g/C Ratio		0.59	0.59	0.08	0.70				0.17	0.13	0.21	0.21
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2056	920	141	2461				266	432	321	311
v/s Ratio Prot		c0.53		c0.07	0.42				0.07	0.09	0.18	
v/s Ratio Perm			0.03									c0.18
v/c Ratio		0.90	0.05	0.82	0.60				0.45	0.74	0.85	0.87
Uniform Delay, d1		24.5	11.9	61.5	10.4				51.0	57.2	51.4	51.6
Progression Factor		1.00	1.00	1.08	0.44				1.00	1.00	1.00	1.00
Incremental Delay, d2		6.6	0.1	22.8	0.7				1.2	6.5	19.1	21.5
Delay (s)		31.1	12.0	89.2	5.4				52.2	63.7	70.5	73.2
Level of Service		C	B	F	A				D	E	E	E
Approach Delay (s)		30.4			11.5			52.2			69.1	
Approach LOS		C			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			32.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			136.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			85.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	654	1104	392	417	831	259	367	437	187	137	591	654
Future Volume (veh/h)	654	1104	392	417	831	259	367	437	187	137	591	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	667	1127	400	426	848	264	374	446	191	140	603	667
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	696	1403	622	765	1074	479	406	571	255	343	821	1206
Arrive On Green	0.07	0.09	0.09	0.22	0.30	0.30	0.04	0.05	0.05	0.19	0.23	0.23
Sat Flow, veh/h	3428	5066	1572	3428	3526	1572	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	667	1127	400	426	848	264	374	446	191	140	603	667
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1572	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	26.4	29.7	13.1	15.0	30.0	11.8	14.8	17.0	16.3	9.4	21.5	24.4
Cycle Q Clear(g_c), s	26.4	29.7	13.1	15.0	30.0	11.8	14.8	17.0	16.3	9.4	21.5	24.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	696	1403	622	765	1074	479	406	571	255	343	821	1206
V/C Ratio(X)	0.96	0.80	0.64	0.56	0.79	0.55	0.92	0.78	0.75	0.41	0.73	0.55
Avail Cap(c_a), veh/h	696	1531	661	765	1074	479	406	933	416	343	985	1335
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.41	0.41	0.41	1.00	1.00	1.00	0.46	0.46	0.46	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.9	58.2	17.4	46.9	43.3	15.1	64.7	62.0	61.7	48.0	48.3	28.5
Incr Delay (d2), s/veh	13.4	2.1	2.1	0.9	5.9	4.5	14.8	1.1	2.1	0.8	2.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	13.8	5.4	6.5	13.9	4.6	7.6	8.1	7.0	4.2	9.7	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.3	60.2	19.5	47.8	49.2	19.6	79.5	63.1	63.7	48.8	50.6	28.9
LnGrp LOS	E	E	B	D	D	B	E	E	E	D	D	C
Approach Vol, veh/h	2194				1538				1011			
Approach Delay, s/veh	57.7				43.7				69.3			
Approach LOS	E				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.5	42.9	21.3	36.3	31.8	46.6	31.0	26.6				
Change Period (Y+Rc), s	* 5.2	* 5.2	* 5.2	4.6	* 4.2	* 5.2	4.6	* 4.6				
Max Green Setting (Gmax), s	* 21	* 41	* 16	38.0	* 28	* 35	19.1	* 36				
Max Q Clear Time (g_c+I1), s	17.0	31.7	16.8	26.4	28.4	32.0	11.4	19.0				
Green Ext Time (p_c), s	0.6	6.0	0.0	5.3	0.0	1.9	0.2	3.0				

Intersection Summary

HCM 6th Ctrl Delay	52.1
HCM 6th LOS	D

Notes





















* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 + Project Buildout PM Peak (Weekday)

11/26/2018























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	15	79	46	17	125	88	1090	58	135	1289	66
Future Volume (veh/h)	38	15	79	46	17	125	88	1090	58	135	1289	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	16	83	48	18	132	93	1147	61	142	1357	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	33	172	62	25	185	119	1418	75	207	1648	84
Arrive On Green	0.03	0.13	0.13	0.03	0.13	0.13	0.07	0.42	0.42	0.12	0.48	0.48
Sat Flow, veh/h	1767	261	1352	1767	192	1410	1767	3405	181	1767	3414	173
Grp Volume(v), veh/h	40	0	99	48	0	150	93	594	614	142	699	727
Grp Sat Flow(s),veh/h/ln	1767	0	1612	1767	0	1602	1767	1763	1823	1767	1763	1824
Q Serve(g_s), s	1.5	0.0	3.9	1.8	0.0	6.1	3.5	20.3	20.3	5.3	23.3	23.4
Cycle Q Clear(g_c), s	1.5	0.0	3.9	1.8	0.0	6.1	3.5	20.3	20.3	5.3	23.3	23.4
Prop In Lane	1.00		0.84	1.00		0.88	1.00		0.10	1.00		0.09
Lane Grp Cap(c), veh/h	55	0	205	62	0	210	119	734	759	207	851	880
V/C Ratio(X)	0.73	0.00	0.48	0.78	0.00	0.71	0.78	0.81	0.81	0.69	0.82	0.83
Avail Cap(c_a), veh/h	124	0	848	103	0	856	150	929	961	237	1017	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	0.0	27.8	32.8	0.0	28.5	31.4	17.6	17.6	29.0	15.2	15.2
Incr Delay (d2), s/veh	16.6	0.0	1.7	18.5	0.0	4.4	18.6	4.3	4.2	6.7	4.7	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	1.1	0.0	2.5	2.0	7.6	7.9	2.4	8.4	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	29.5	51.3	0.0	32.9	50.0	21.8	21.7	35.7	19.9	19.9
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	B	B
Approach Vol, veh/h	139					198		1301		1568		
Approach Delay, s/veh	35.3					37.4		23.8		21.3		
Approach LOS	D					D		C		C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	33.8	6.6	14.7	8.8	38.3	6.3	15.0				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.2	* 36	* 4	36.0	* 5.8	39.5	* 4.8	* 37				
Max Q Clear Time (g_c+I1), s	7.3	22.3	3.8	5.9	5.5	25.4	3.5	8.1				
Green Ext Time (p_c), s	0.1	6.2	0.0	0.5	0.0	7.6	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	23.9											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

1: Highland Avenue & Golden State Boulevard

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	706	427	39	52	511	146	93	671	446	99	629	58
Future Volume (veh/h)	706	427	39	52	511	146	93	671	446	99	629	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	728	440	40	54	527	151	96	692	460	102	648	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	852	813	74	380	582	166	118	1161	908	124	1173	522
Arrive On Green	0.25	0.25	0.25	0.22	0.22	0.22	0.07	0.33	0.33	0.07	0.33	0.33
Sat Flow, veh/h	3428	3269	296	1767	2707	772	1767	3526	1572	1767	3526	1570
Grp Volume(v), veh/h	728	236	244	54	342	336	96	692	460	102	648	60
Grp Sat Flow(s),veh/h/ln	1714	1763	1802	1767	1763	1717	1767	1763	1572	1767	1763	1570
Q Serve(g_s), s	27.6	15.8	16.0	3.4	25.7	25.9	7.3	22.3	23.7	7.7	20.4	3.6
Cycle Q Clear(g_c), s	27.6	15.8	16.0	3.4	25.7	25.9	7.3	22.3	23.7	7.7	20.4	3.6
Prop In Lane	1.00		0.16	1.00		0.45	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	852	438	448	380	379	369	118	1161	908	124	1173	522
V/C Ratio(X)	0.85	0.54	0.54	0.14	0.90	0.91	0.81	0.60	0.51	0.82	0.55	0.11
Avail Cap(c_a), veh/h	1011	520	531	404	403	393	153	1161	908	153	1173	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.7	44.3	44.4	43.2	52.0	52.1	62.6	38.1	17.1	62.4	37.1	31.5
Incr Delay (d2), s/veh	6.3	1.0	1.0	0.2	22.3	23.8	21.8	2.3	2.0	24.1	1.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	7.0	7.2	1.5	13.6	13.5	4.0	9.8	14.8	4.3	9.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	45.4	45.4	43.4	74.3	75.9	84.4	40.3	19.2	86.5	39.0	31.9
LnGrp LOS	E	D	D	D	E	E	F	D	B	F	D	C
Approach Vol, veh/h		1208			732			1248			810	
Approach Delay, s/veh		51.2			72.8			35.9			44.4	
Approach LOS		D			E			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		38.7	13.8	49.4		34.2	13.3	49.9				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		40.1	* 12	34.4		31.1	* 12	34.4				
Max Q Clear Time (g_c+I1), s		29.6	9.7	25.7		27.9	9.3	22.4				
Green Ext Time (p_c), s		4.3	0.0	4.0		1.3	0.0	3.4				

Intersection Summary

HCM 6th Ctrl Delay	49.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th AWSC
2: DeWolf Avenue & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

Intersection												
Intersection Delay, s/veh	18											
Intersection LOS	C											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	16	214	18	236	209	89	38	32	296	108	5	4
Future Vol, veh/h	16	214	18	236	209	89	38	32	296	108	5	4
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	17	228	19	251	222	95	40	34	315	115	5	4
Number of Lanes	0	1	0	1	1	0	0	1	0	0	1	0

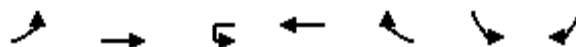
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	16.4	17.9	20.6	13.2
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	10%	6%	100%	0%	92%
Vol Thru, %	9%	86%	0%	70%	4%
Vol Right, %	81%	7%	0%	30%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	366	248	236	298	117
LT Vol	38	16	236	0	108
Through Vol	32	214	0	209	5
RT Vol	296	18	0	89	4
Lane Flow Rate	389	264	251	317	124
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.664	0.497	0.511	0.582	0.259
Departure Headway (Hd)	6.14	6.782	7.329	6.604	7.49
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	588	530	492	545	478
Service Time	4.188	4.84	5.083	4.358	5.559
HCM Lane V/C Ratio	0.662	0.498	0.51	0.582	0.259
HCM Control Delay	20.6	16.4	17.5	18.2	13.2
HCM Lane LOS	C	C	C	C	B
HCM 95th-tile Q	4.9	2.7	2.9	3.7	1

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout MD Peak (Saturday)

3: Floral Avenue & Project Driveway

11/26/2018



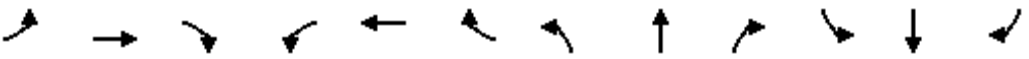
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	238	284	45	619	609	1154	171
Future Volume (vph)	238	284	45	619	609	1154	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	309	49	673	662	1254	186
RTOR Reduction (vph)	0	0	0	0	473	0	115
Lane Group Flow (vph)	259	309	49	673	189	1254	71
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	14.6	36.0	3.9	25.3	25.3	34.0	34.0
Effective Green, g (s)	14.6	36.0	3.9	25.3	25.3	34.0	34.0
Actuated g/C Ratio	0.16	0.41	0.04	0.29	0.29	0.38	0.38
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	748	77	999	447	1303	601
v/s Ratio Prot	c0.15	0.17	0.03	c0.19		c0.37	
v/s Ratio Perm					0.12		0.05
v/c Ratio	0.90	0.41	0.64	0.67	0.42	0.96	0.12
Uniform Delay, d1	36.3	18.8	41.7	28.0	25.8	26.7	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.3	0.4	16.0	1.8	0.6	16.7	0.1
Delay (s)	64.6	19.2	57.7	29.9	26.4	43.4	17.8
Level of Service	E	B	E	C	C	D	B
Approach Delay (s)		39.9		29.2		40.1	
Approach LOS		D		C		D	
Intersection Summary							
HCM 2000 Control Delay			35.6		HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio			0.85				
Actuated Cycle Length (s)			88.7		Sum of lost time (s)		14.8
Intersection Capacity Utilization			75.6%		ICU Level of Service		D
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis 2030 + Project Buildout MD Peak (Saturday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/26/2018

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Future Volume (vph)	0	1916	86	108	1433	0	0	0	159	192	32	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1498	1470
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1498	1470
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1996	90	112	1493	0	0	0	166	200	33	620
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	57	0	47	61
Lane Group Flow (vph)	0	1996	54	113	1493	0	0	0	109	200	284	261
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		81.4	81.4	9.8	95.9				21.7	16.7	28.6	28.6
Effective Green, g (s)		81.4	81.4	9.8	95.9				21.7	16.7	28.6	28.6
Actuated g/C Ratio		0.60	0.60	0.07	0.71				0.16	0.12	0.21	0.21
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2097	938	126	2471				254	417	315	309
v/s Ratio Prot		c0.57		c0.06	0.43				0.07	0.06	c0.19	
v/s Ratio Perm			0.03									0.18
v/c Ratio		0.95	0.06	0.90	0.60				0.43	0.48	0.90	0.85
Uniform Delay, d1		25.5	11.4	62.6	10.3				51.6	55.6	52.3	51.6
Progression Factor		1.00	1.00	0.85	0.63				1.00	1.00	1.00	1.00
Incremental Delay, d2		11.2	0.1	36.6	0.7				1.2	0.9	27.1	18.7
Delay (s)		36.7	11.5	89.9	7.2				52.7	56.5	79.4	70.2
Level of Service		D	B	F	A				D	E	E	E
Approach Delay (s)		35.6			13.1			52.7			70.6	
Approach LOS		D			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			34.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			136.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			86.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

5: Highland Avenue & Floral Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	655	1171	449	456	883	273	392	377	191	155	529	654
Future Volume (veh/h)	655	1171	449	456	883	273	392	377	191	155	529	654
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	675	1207	463	470	910	281	404	389	197	160	545	674
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	671	1876	773	523	1179	521	416	788	352	186	721	1107
Arrive On Green	0.06	0.12	0.12	0.15	0.33	0.33	0.08	0.15	0.15	0.11	0.20	0.20
Sat Flow, veh/h	3428	5066	1572	3428	3526	1558	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	675	1207	463	470	910	281	404	389	197	160	545	674
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1558	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	26.6	30.9	15.7	18.3	31.5	19.9	16.0	13.8	15.8	12.1	19.8	16.3
Cycle Q Clear(g_c), s	26.6	30.9	15.7	18.3	31.5	19.9	16.0	13.8	15.8	12.1	19.8	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	671	1876	773	523	1179	521	416	788	352	186	721	1107
V/C Ratio(X)	1.01	0.64	0.60	0.90	0.77	0.54	0.97	0.49	0.56	0.86	0.76	0.61
Avail Cap(c_a), veh/h	671	1876	773	565	1179	521	416	861	384	277	985	1315
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.35	0.35	0.35	1.00	1.00	1.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.6	51.1	17.4	56.6	40.6	36.7	62.2	50.7	51.6	59.9	50.9	14.9
Incr Delay (d2), s/veh	22.2	0.6	1.2	16.6	4.9	4.0	26.5	0.3	0.9	16.1	2.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.4	14.2	6.5	9.1	14.5	8.0	8.6	6.3	6.5	6.2	8.9	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.8	51.7	18.6	73.2	45.5	40.7	88.8	51.0	52.5	76.0	53.2	15.5
LnGrp LOS	F	D	B	E	D	D	F	D	D	E	D	B
Approach Vol, veh/h	2345			1661			990			1379		
Approach Delay, s/veh	55.0			52.5			66.7			37.4		
Approach LOS	E			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.9	55.6	22.1	32.4	30.8	50.7	18.5	36.0				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 4.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 22	* 39	16.5	* 38	* 27	* 36	* 21	33.2				
Max Q Clear Time (g_c+I1), s	20.3	32.9	18.0	21.8	28.6	33.5	14.1	17.8				
Green Ext Time (p_c), s	0.4	4.4	0.0	6.0	0.0	1.5	0.2	2.6				

Intersection Summary

HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

Notes





















* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

10: Highland Avenue & Rose Avenue

2030 + Project Buildout MD Peak (Saturday)

11/26/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	12	104	53	22	98	95	984	65	97	1108	69
Future Volume (veh/h)	41	12	104	53	22	98	95	984	65	97	1108	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	43	13	109	56	23	103	100	1036	68	102	1166	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	18	147	71	33	149	373	1804	118	130	1299	81
Arrive On Green	0.03	0.10	0.10	0.04	0.11	0.11	0.21	0.54	0.54	0.07	0.39	0.39
Sat Flow, veh/h	1767	170	1428	1767	295	1322	1767	3358	220	1767	3370	211
Grp Volume(v), veh/h	43	0	122	56	0	126	100	544	560	102	610	629
Grp Sat Flow(s),veh/h/ln	1767	0	1598	1767	0	1618	1767	1763	1816	1767	1763	1818
Q Serve(g_s), s	1.9	0.0	5.9	2.5	0.0	6.0	3.8	16.5	16.5	4.5	26.0	26.0
Cycle Q Clear(g_c), s	1.9	0.0	5.9	2.5	0.0	6.0	3.8	16.5	16.5	4.5	26.0	26.0
Prop In Lane	1.00		0.89	1.00		0.82	1.00		0.12	1.00		0.12
Lane Grp Cap(c), veh/h	54	0	165	71	0	182	373	947	975	130	679	701
V/C Ratio(X)	0.79	0.00	0.74	0.79	0.00	0.69	0.27	0.57	0.57	0.79	0.90	0.90
Avail Cap(c_a), veh/h	93	0	360	88	0	388	373	947	975	137	716	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	0.0	34.8	38.1	0.0	34.2	26.4	12.4	12.4	36.5	23.1	23.1
Incr Delay (d2), s/veh	21.9	0.0	6.4	30.6	0.0	4.6	0.4	2.5	2.5	24.6	16.9	16.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.4	1.7	0.0	2.5	1.5	6.0	6.1	2.7	12.6	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	0.0	41.2	68.6	0.0	38.8	26.8	14.9	14.9	61.0	40.0	39.8
LnGrp LOS	E	A	D	E	A	D	C	B	B	E	D	D
Approach Vol, veh/h	165				182				1204			
Approach Delay, s/veh	46.2				48.0				15.9			
Approach LOS	D				D				B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	48.3	7.4	14.3	22.2	36.1	6.7	15.0				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	5.3	* 5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	* 6.2	32.1	* 4	18.0	5.8	* 33	* 4.2	* 19				
Max Q Clear Time (g_c+I1), s	6.5	18.5	4.5	7.9	5.8	28.0	3.9	8.0				
Green Ext Time (p_c), s	0.0	5.5	0.0	0.3	0.0	2.8	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	SE	SE
Directions Served	L	L	T	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	55	68	86	243	90	170	196	17	71	60	146
Average Queue (ft)	8	26	29	66	26	79	103	1	16	13	12
95th Queue (ft)	32	58	69	133	62	139	159	6	48	42	60
Link Distance (ft)			530	530		1279	1279		2501	2501	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	350	350			250			200			100
Storage Blk Time (%)											1
Queuing Penalty (veh)											1

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	50	29	64	31	50
Average Queue (ft)	31	8	36	16	24
95th Queue (ft)	41	27	53	37	40
Link Distance (ft)	2668		1487	2746	2618
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	R	L	L	R
Maximum Queue (ft)	53	72	28	75	99	94	111	41
Average Queue (ft)	21	29	7	34	43	32	57	4
95th Queue (ft)	47	56	26	76	75	65	95	20
Link Distance (ft)		745		874			1678	1678
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		250		250	250		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	212	184	13	76	158	192	54	74	94	100	74
Average Queue (ft)	82	74	6	35	76	93	5	36	55	51	42
95th Queue (ft)	145	131	15	65	136	156	31	67	82	83	71
Link Distance (ft)	1267	1267			542	542	221			1842	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		3			0						
Queuing Penalty (veh)		1			0						

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	158	176	196	222	93	69	192	220	229	296	221	26
Average Queue (ft)	74	86	108	125	8	34	94	99	146	157	49	1
95th Queue (ft)	130	144	180	189	43	67	163	181	220	244	162	9
Link Distance (ft)			542	542	542				221	221		176
Upstream Blk Time (%)								1	0	1	0	
Queuing Penalty (veh)								0	2	8	0	
Storage Bay Dist (ft)	105	105				40	150	150				250
Storage Blk Time (%)	1	4	8		1	5	2	3	7	1	0	
Queuing Penalty (veh)	2	7	22		1	9	6	8	21	2	0	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	178	182	235	269	130	108	203	151	172	150
Average Queue (ft)	90	110	82	79	54	49	119	91	85	84
95th Queue (ft)	156	170	173	177	108	94	186	156	146	146
Link Distance (ft)			564	564			920	920		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	170	170			80	100			100	100
Storage Blk Time (%)	1	1	0	7	0	1	14	8	4	2
Queuing Penalty (veh)	1	1	1	11	0	2	8	32	9	5

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	L	R
Maximum Queue (ft)	175	184	29	165	164	188	96
Average Queue (ft)	72	90	2	92	90	76	32
95th Queue (ft)	158	164	11	156	153	139	65
Link Distance (ft)	176	176	221	546	546	1191	
Upstream Blk Time (%)	0	0					
Queuing Penalty (veh)	0	1					
Storage Bay Dist (ft)						250	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	56	175	189	149	154	129	103	121	131	56	87	80
Average Queue (ft)	11	65	90	48	68	56	26	46	57	16	32	25
95th Queue (ft)	35	142	171	106	126	106	70	97	101	44	70	56
Link Distance (ft)		546	546		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		4		1	3		0	0	8			0
Queuing Penalty (veh)		1		2	2		0	0	3			0

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	55
Average Queue (ft)	27
95th Queue (ft)	56
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	318	138	352	220	129	288	195	384	335
Average Queue (ft)	100	138	50	142	42	92	158	102	237	59
95th Queue (ft)	190	265	98	261	106	145	233	205	397	153
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	9	23	1	22		33	32	2	30	
Queuing Penalty (veh)	27	27	4	39		128	30	11	28	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	322	302	174	246	139	363	162
Average Queue (ft)	165	138	87	86	117	151	65
95th Queue (ft)	268	258	145	167	171	313	130
Link Distance (ft)	1240		1501	1501		564	564
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	9	5			34	2	
Queuing Penalty (veh)	23	13			94	9	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	114	116	74	106	80	290	301	156	226	248
Average Queue (ft)	46	41	28	49	35	111	114	56	70	96
95th Queue (ft)	93	82	61	86	68	239	247	105	167	195
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)						1				
Queuing Penalty (veh)						1				

Network Summary

Network wide Queuing Penalty: 601

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	SE	SE	NW
Directions Served	L	L	T	TR	L	T	TR	L	T	T	R	L
Maximum Queue (ft)	298	314	302	307	370	592	630	40	299	407	200	101
Average Queue (ft)	187	194	145	156	76	294	327	4	154	178	147	9
95th Queue (ft)	288	286	250	256	271	545	557	20	251	330	255	46
Link Distance (ft)			514	514		1279	1279		2501	2501		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350	350			250			200			100	75
Storage Blk Time (%)						27			3	17	12	2
Queuing Penalty (veh)						24			1	126	36	4

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	202	249	52
Average Queue (ft)	95	103	2
95th Queue (ft)	180	204	17
Link Distance (ft)	1126	1126	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			120
Storage Blk Time (%)	10	4	
Queuing Penalty (veh)	5	5	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	L	TR	LTR	LTR
Maximum Queue (ft)	138	117	79	135	97
Average Queue (ft)	62	56	47	68	36
95th Queue (ft)	105	92	70	110	61
Link Distance (ft)	2668		1488	2746	2618
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	261	179	75	268	214	265	368	452	64
Average Queue (ft)	138	71	37	153	95	140	206	235	28
95th Queue (ft)	222	125	70	234	188	225	310	349	53
Link Distance (ft)		744		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)	1			0		0	2	6	
Queuing Penalty (veh)	2			0		1	12	30	

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	B28	B28	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	L	T	T	R	L	L	TR
Maximum Queue (ft)	1357	1376	220	635	639	183	276	246	163	398	357	271
Average Queue (ft)	1080	1087	51	135	134	91	71	103	75	194	202	173
95th Queue (ft)	1552	1549	203	486	483	160	164	188	151	337	344	240
Link Distance (ft)	1267	1267		874	874		532	532	229			1840
Upstream Blk Time (%)	29	29										
Queuing Penalty (veh)	195	197										
Storage Bay Dist (ft)			100			160				380	380	
Storage Blk Time (%)		49				1	1			1		
Queuing Penalty (veh)		35				9	1			6		

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	SB
Directions Served	R
Maximum Queue (ft)	250
Average Queue (ft)	164
95th Queue (ft)	243
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	380
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	165	225	560	590	586	160	200	241	338	335	241	237
Average Queue (ft)	161	223	548	537	502	113	149	228	308	311	211	212
95th Queue (ft)	171	228	559	622	688	201	213	289	372	357	314	277
Link Distance (ft)			532	532	532				241	241		154
Upstream Blk Time (%)			36	13	9			4	35	38	1	30
Queuing Penalty (veh)			272	99	67			0	285	309	0	239
Storage Bay Dist (ft)	105	105				40	150	150			250	
Storage Blk Time (%)	71	60	37		16	22	17	16	53	38	1	
Queuing Penalty (veh)	262	219	242		63	81	70	66	222	99	5	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	254	227	285	590	572	130	200	526	544	200	150
Average Queue (ft)	211	194	230	313	220	70	156	324	342	188	116
95th Queue (ft)	281	277	340	603	478	142	253	495	528	250	182
Link Distance (ft)	154			563	563			946	946		
Upstream Blk Time (%)	29			2	0						
Queuing Penalty (veh)	237			12	2						
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		31	45	10	28	1	14	47	38	15	17
Queuing Penalty (veh)		67	98	38	53	2	42	64	249	43	50

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	L	R
Maximum Queue (ft)	119	135	320	568	557	695	370
Average Queue (ft)	43	73	11	447	441	361	141
95th Queue (ft)	102	130	105	666	689	583	341
Link Distance (ft)	154	154	241	542	542	1191	
Upstream Blk Time (%)		0	0	3	2		
Queuing Penalty (veh)		0	1	15	9		
Storage Bay Dist (ft)						250	
Storage Blk Time (%)						22	
Queuing Penalty (veh)						55	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	114	354	429	149	343	347	219	418	323	140	195	270
Average Queue (ft)	31	100	138	70	181	174	104	134	150	23	122	197
95th Queue (ft)	81	231	287	152	315	302	210	306	303	108	217	319
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)	4	13		6	28		10	14	26		18	31
Queuing Penalty (veh)	15	11		18	23		31	17	7		100	174

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	1144	200	150
Average Queue (ft)	423	174	39
95th Queue (ft)	961	230	147
Link Distance (ft)	2914		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)	45	36	
Queuing Penalty (veh)	286	207	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	441	218	251	219	130	1967	194	325	131
Average Queue (ft)	173	248	47	123	50	110	1332	68	219	51
95th Queue (ft)	249	425	114	218	111	155	2353	160	316	98
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)							38			
Queuing Penalty (veh)							0			
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	35	29	1	18	0	51	48	1	24	
Queuing Penalty (veh)	133	78	2	27	0	364	54	3	15	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	265	260	600	554	140	576	394
Average Queue (ft)	163	132	237	230	135	251	185
95th Queue (ft)	240	239	452	430	150	466	358
Link Distance (ft)	1240		1501	1501		563	563
Upstream Blk Time (%)						1	
Queuing Penalty (veh)						7	
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	6	1		2	43	13	
Queuing Penalty (veh)	21	4		1	205	61	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	93	94	76	112	116	368	379	177	302	327
Average Queue (ft)	30	41	27	61	58	179	187	76	151	175
95th Queue (ft)	68	80	65	92	112	304	319	129	253	288
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)						3			1	
Queuing Penalty (veh)						2			1	

Network Summary

Network wide Queuing Penalty: 6192

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	SE	SE	NW
Directions Served	L	L	T	TR	L	T	TR	L	T	T	R	L
Maximum Queue (ft)	236	265	170	197	111	571	613	140	276	374	200	225
Average Queue (ft)	154	170	65	102	20	228	314	45	130	130	72	37
95th Queue (ft)	229	246	133	158	63	440	489	102	231	266	202	135
Link Distance (ft)			520	520		1279	1279		2501	2501		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350	350			250			200			100	75
Storage Blk Time (%)						4			3	12	6	3
Queuing Penalty (veh)						2			3	54	19	8

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	283	286	220
Average Queue (ft)	136	142	7
95th Queue (ft)	239	243	72
Link Distance (ft)	1126	1126	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			120
Storage Blk Time (%)	25	17	
Queuing Penalty (veh)	25	10	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	B34	NB	SB
Directions Served	LTR	L	TR	T	LTR	LTR
Maximum Queue (ft)	93	111	101	768	157	88
Average Queue (ft)	63	59	59	26	87	40
95th Queue (ft)	86	92	87	253	138	63
Link Distance (ft)	2668		1493	739	2746	2618
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				1		
Storage Bay Dist (ft)		150				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	289	200	368	506	624	370	369	431	68
Average Queue (ft)	168	108	45	251	198	191	256	274	35
95th Queue (ft)	265	173	150	404	433	353	364	379	67
Link Distance (ft)		739		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)	1			17	1	4	6	12	
Queuing Penalty (veh)	4			8	4	13	33	71	

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	B28	B28	WB	WB	WB	NB	SB	SB	SB
Directions Served	T	T	R	T	T	L	T	T	R	L	L	TR
Maximum Queue (ft)	1357	1376	220	193	247	201	260	248	190	215	282	292
Average Queue (ft)	1028	1039	118	19	32	100	159	165	82	84	142	156
95th Queue (ft)	1437	1465	296	99	140	177	251	245	158	153	237	257
Link Distance (ft)	1267	1267		874	874		532	532	229			1840
Upstream Blk Time (%)	10	13										
Queuing Penalty (veh)	75	94										
Storage Bay Dist (ft)			100			160				380	380	
Storage Blk Time (%)		53				2	8					
Queuing Penalty (veh)		45				13	9					

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	257
Average Queue (ft)	152
95th Queue (ft)	237
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	380
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	164	224	580	565	572	160	200	215	308	310	216	264
Average Queue (ft)	160	224	542	525	471	107	180	211	285	272	176	187
95th Queue (ft)	182	225	593	600	697	185	227	236	331	354	292	320
Link Distance (ft)			532	532	532				216	216		182
Upstream Blk Time (%)			19	8	8		0	26	45	29	1	25
Queuing Penalty (veh)			141	58	63		0	0	344	224	0	194
Storage Bay Dist (ft)	105	105				40	150	150			250	
Storage Blk Time (%)	64	55	44		15	20	39	45	41	29	1	
Queuing Penalty (veh)	251	215	288		67	76	172	198	189	80	5	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	264	227	284	362	310	130	200	366	454	200	150
Average Queue (ft)	173	163	191	153	107	74	162	240	208	154	103
95th Queue (ft)	313	248	287	300	231	141	226	339	362	234	159
Link Distance (ft)	182			565	565			939	939		
Upstream Blk Time (%)	17										
Queuing Penalty (veh)	131										
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		12	17	6	18	2	43	41	31	7	4
Queuing Penalty (veh)		23	33	24	35	4	114	63	205	17	11

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	B35	B35	WB	WB	NB	NB
Directions Served	T	T	T	T		T	T	L	R
Maximum Queue (ft)	252	269	304	299	224	568	544	1207	370
Average Queue (ft)	117	137	22	27	7	329	319	405	135
95th Queue (ft)	223	230	136	155	74	514	491	897	351
Link Distance (ft)	182	182	216	216	216	542	542	1192	
Upstream Blk Time (%)	3	5	1	2	0	1	0	7	
Queuing Penalty (veh)	22	41	5	9	2	3	1	0	
Storage Bay Dist (ft)								250	
Storage Blk Time (%)							29		
Queuing Penalty (veh)							75		

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	144	264	350	150	282	266	162	286	292	140	195	270
Average Queue (ft)	55	100	140	73	142	126	56	81	98	5	111	143
95th Queue (ft)	115	206	255	156	229	234	123	186	217	46	199	236
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)	6	10		2	16		2	7	16		11	20
Queuing Penalty (veh)	21	8		4	10		7	8	3		52	92

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	566	198	150
Average Queue (ft)	154	124	10
95th Queue (ft)	321	199	72
Link Distance (ft)	2914		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)	22	17	
Queuing Penalty (veh)	130	95	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	199	350	116	293	220	129	542	70	369	78
Average Queue (ft)	125	142	45	123	43	74	294	27	217	32
95th Queue (ft)	202	268	87	210	128	127	501	59	316	60
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	17	16	1	18	0	15	43		25	
Queuing Penalty (veh)	48	41	1	18	0	93	30		9	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	244	197	344	256	140	399	275
Average Queue (ft)	151	115	147	131	135	207	88
95th Queue (ft)	214	192	233	230	152	376	204
Link Distance (ft)	1240		1501	1501		565	565
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	2	1			47	2	
Queuing Penalty (veh)	6	2			224	8	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	72	121	80	184	156	251	272	156	419	466
Average Queue (ft)	32	54	41	70	78	133	120	76	163	185
95th Queue (ft)	62	104	75	140	129	247	235	132	314	347
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				1		0			3	
Queuing Penalty (veh)				1		0			3	

Network Summary

Network wide Queuing Penalty: 4787

Appendix K: Cumulative Year 2030 with Dinuba Avenue Interchange plus Project Buildout Traffic Conditions



Traffic Engineering, Inc.

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Page | K

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard





11/27/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	155	249	74	93	425	10	16	319	281	18	136	42
Future Volume (veh/h)	155	249	74	93	425	10	16	319	281	18	136	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	168	271	0	101	462	0	17	347	305	20	148	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	366	384		114	520		158	540	241	33	269	120
Arrive On Green	0.21	0.21	0.00	0.34	0.34	0.00	0.09	0.15	0.15	0.02	0.08	0.08
Sat Flow, veh/h	1767	1856	1572	330	1509	1572	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	168	271	0	563	0	0	17	347	305	20	148	46
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1839	0	1572	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	5.6	9.1	0.0	19.4	0.0	0.0	0.6	6.2	10.3	0.8	2.7	1.9
Cycle Q Clear(g_c), s	5.6	9.1	0.0	19.4	0.0	0.0	0.6	6.2	10.3	0.8	2.7	1.9
Prop In Lane	1.00		1.00	0.18		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	366	384		634	0		158	540	241	33	269	120
V/C Ratio(X)	0.46	0.70		0.89	0.00		0.11	0.64	1.27	0.61	0.55	0.38
Avail Cap(c_a), veh/h	1051	1104		741	0		158	540	241	105	540	241
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	24.8	0.0	20.8	0.0	0.0	28.1	26.8	28.5	32.8	30.0	29.6
Incr Delay (d2), s/veh	0.9	2.4	0.0	11.5	0.0	0.0	0.3	2.6	148.6	17.0	1.8	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.0	0.0	9.4	0.0	0.0	0.2	2.6	13.5	0.5	1.1	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	27.1	0.0	32.3	0.0	0.0	28.4	29.3	177.1	49.7	31.7	31.6
LnGrp LOS	C	C		C	A		C	C	F	D	C	C
Approach Vol, veh/h		439	A		563	A		669			214	
Approach Delay, s/veh		26.0			32.3			96.7			33.4	
Approach LOS		C			C			F			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.8	5.4	14.9		28.1	10.6	9.7				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	10.3		27.1	4.0	* 10				
Max Q Clear Time (g_c+I1), s		11.1	2.8	12.3		21.4	2.6	4.7				
Green Ext Time (p_c), s		2.1	0.0	0.0		1.7	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			53.8									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 w/ Dinuba + Project Buildout AM Peak (Weekday)







11/27/2018

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	108	6	20	72	109	8	39	21	165	24	13
Future Vol, veh/h	4	108	6	20	72	109	8	39	21	165	24	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	4	117	7	22	78	118	9	42	23	179	26	14
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	196	0	0	124	0	0	330	369	121	342	313	137
Stage 1	-	-	-	-	-	-	129	129	-	181	181	-
Stage 2	-	-	-	-	-	-	201	240	-	161	132	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1371	-	-	1457	-	-	621	559	928	610	601	909
Stage 1	-	-	-	-	-	-	872	787	-	818	748	-
Stage 2	-	-	-	-	-	-	799	705	-	839	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1371	-	-	1457	-	-	582	548	928	551	589	909
Mov Cap-2 Maneuver	-	-	-	-	-	-	582	548	-	551	589	-
Stage 1	-	-	-	-	-	-	869	785	-	816	735	-
Stage 2	-	-	-	-	-	-	746	693	-	772	783	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.7			11.4			15.2		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	632	1371	-	-	1457	-	-	570				
HCM Lane V/C Ratio	0.117	0.003	-	-	0.015	-	-	0.385				
HCM Control Delay (s)	11.4	7.6	0	-	7.5	0	-	15.2				
HCM Lane LOS	B	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	1.8				

HCM 6th TWSC
3: Floral Avenue & Project Driveway

2030 w/ Dinuba + Project Buildout AM Peak (Weekday)


11/27/2018

Intersection							
Int Delay, s/veh	18.2						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	66	192	11	199	267	286	28
Future Vol, veh/h	66	192	11	199	267	286	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	72	209	12	216	290	311	30
Major/Minor	Major1		Major2		Minor2		
Conflicting Flow All	506	0	-	-	0	738	253
Stage 1	-	-	-	-	-	385	-
Stage 2	-	-	-	-	-	353	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	1051	-	-	-	-	367	745
Stage 1	-	-	-	-	-	656	-
Stage 2	-	-	-	-	-	708	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1051	-	-	-	-	342	745
Mov Cap-2 Maneuver	-	-	-	-	-	342	-
Stage 1	-	-	-	-	-	611	-
Stage 2	-	-	-	-	-	708	-
Approach	EB		WB		SB		
HCM Control Delay, s	2.2				59		
HCM LOS					F		
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1051	-	-	-	-	342	745
HCM Lane V/C Ratio	0.068	-	-	-	-	0.909	0.041
HCM Control Delay (s)	8.7	-	-	-	-	63.8	10
HCM Lane LOS	A	-	-	-	-	F	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	9	0.1
























HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	689	36	63	698	0	0	0	85	205	41	240
Future Volume (vph)	0	689	36	63	698	0	0	0	85	205	41	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1546
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1546
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	703	37	64	712	0	0	0	87	209	42	245
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	61	0	0	82
Lane Group Flow (vph)	0	703	11	64	712	0	0	0	26	209	42	163
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		16.6	16.6	3.5	24.8				16.3	6.1	18.9	18.9
Effective Green, g (s)		16.6	16.6	3.5	24.8				16.3	6.1	18.9	18.9
Actuated g/C Ratio		0.30	0.30	0.06	0.45				0.30	0.11	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1054	471	111	1574				471	375	631	529
v/s Ratio Prot		c0.20		0.04	c0.20				0.02	c0.06	0.02	
v/s Ratio Perm			0.01									c0.11
v/c Ratio		0.67	0.02	0.58	0.45				0.05	0.56	0.07	0.31
Uniform Delay, d1		16.9	13.6	25.1	10.5				13.9	23.3	12.2	13.3
Progression Factor		1.01	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6	0.0	7.1	0.2				0.0	1.8	0.0	0.3
Delay (s)		18.6	13.6	32.2	10.7				14.0	25.1	12.3	13.7
Level of Service		B	B	C	B				B	C	B	B
Approach Delay (s)		18.3			12.5			14.0			18.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			55.2			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			45.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)
 5: Highland Avenue & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	497	212	295	596	130	253	235	146	45	474	332
Future Volume (veh/h)	193	497	212	295	596	130	253	235	146	45	474	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	208	534	228	317	641	140	272	253	157	48	510	357
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	1016	453	438	921	201	231	957	427	61	821	643
Arrive On Green	0.10	0.29	0.29	0.13	0.32	0.32	0.07	0.27	0.27	0.03	0.23	0.23
Sat Flow, veh/h	1767	3526	1572	3428	2876	627	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	208	534	228	317	393	388	272	253	157	48	510	357
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1740	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	6.8	9.0	6.0	6.3	13.9	13.9	4.8	4.0	5.8	1.9	9.2	8.1
Cycle Q Clear(g_c), s	6.8	9.0	6.0	6.3	13.9	13.9	4.8	4.0	5.8	1.9	9.2	8.1
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	1016	453	438	565	557	231	957	427	61	821	643
V/C Ratio(X)	1.23	0.53	0.50	0.72	0.70	0.70	1.18	0.26	0.37	0.79	0.62	0.55
Avail Cap(c_a), veh/h	169	1941	866	857	1268	1251	231	1729	771	221	1882	1474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	21.3	10.3	29.8	21.2	21.2	33.2	20.3	21.0	34.1	24.5	24.1
Incr Delay (d2), s/veh	145.2	0.4	0.9	2.3	1.6	1.6	115.2	0.1	0.5	19.7	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	3.6	2.7	2.6	5.6	5.5	5.5	1.5	2.0	1.1	3.7	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	177.4	21.7	11.2	32.1	22.7	22.8	148.4	20.5	21.5	53.9	25.3	24.8
LnGrp LOS	F	C	B	C	C	C	F	C	C	D	C	C
Approach Vol, veh/h		970			1098			682			915	
Approach Delay, s/veh		52.6			25.4			71.8			26.6	
Approach LOS		D			C			E			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.3	25.7	10.0	21.2	12.0	28.0	6.7	24.5				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 18	* 39	4.8	* 38	* 6.8	* 51	* 8.9	* 35				
Max Q Clear Time (g_c+I1), s	8.3	11.0	6.8	11.2	8.8	15.9	3.9	7.8				
Green Ext Time (p_c), s	0.8	4.8	0.0	5.1	0.0	5.8	0.0	2.0				

Intersection Summary







HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout AM Peak (Weekday) 6: SR 99 NB Off-Ramp & Floral Avenue























11/27/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↲
Traffic Volume (vph)	578	0	0	827	263	95
Future Volume (vph)	578	0	0	827	263	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	615	0	0	880	280	101
RTOR Reduction (vph)	0	0	0	0	0	77
Lane Group Flow (vph)	615	0	0	880	280	24
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	19.7			19.7	8.9	8.9
Effective Green, g (s)	19.7			19.7	8.9	8.9
Actuated g/C Ratio	0.52			0.52	0.24	0.24
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1826			1826	412	369
v/s Ratio Prot	0.18			c0.25	c0.16	
v/s Ratio Perm						0.02
v/c Ratio	0.34			0.48	0.68	0.06
Uniform Delay, d1	5.3			5.8	13.2	11.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.2	4.4	0.1
Delay (s)	5.4			6.0	17.6	11.3
Level of Service	A			A	B	B
Approach Delay (s)	5.4			6.0	15.9	
Approach LOS	A			A	B	
Intersection Summary						
HCM 2000 Control Delay	7.8			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.54					
Actuated Cycle Length (s)	37.8			Sum of lost time (s)		9.2
Intersection Capacity Utilization	45.1%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)
 7: Whitson Street & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	25	443	147	64	573	5	65	261	23	195	121	29
Future Volume (veh/h)	25	443	147	64	573	5	65	261	23	195	121	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	27	482	160	70	623	5	71	284	0	212	132	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	44	860	284	88	1273	10	90	536		332	748	
Arrive On Green	0.03	0.33	0.33	0.05	0.36	0.36	0.05	0.15	0.00	0.10	0.21	0.00
Sat Flow, veh/h	1767	2603	858	1767	3584	29	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	27	325	317	70	306	322	71	284	0	212	132	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1698	1767	1763	1850	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	0.8	7.6	7.7	2.0	6.8	6.8	2.0	3.7	0.0	3.0	1.5	0.0
Cycle Q Clear(g_c), s	0.8	7.6	7.7	2.0	6.8	6.8	2.0	3.7	0.0	3.0	1.5	0.0
Prop In Lane	1.00		0.51	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	44	582	561	88	626	657	90	536		332	748	
V/C Ratio(X)	0.61	0.56	0.56	0.80	0.49	0.49	0.79	0.53		0.64	0.18	
Avail Cap(c_a), veh/h	141	1484	1430	183	1512	1587	349	2321		486	2124	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.2	13.8	13.8	23.6	12.6	12.6	23.5	19.6	0.0	21.8	16.2	0.0
Incr Delay (d2), s/veh	12.9	0.8	0.9	15.0	0.6	0.6	14.4	0.8	0.0	2.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.7	2.6	1.1	2.3	2.4	1.1	1.4	0.0	1.1	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	14.6	14.7	38.5	13.2	13.2	37.9	20.4	0.0	23.8	16.3	0.0
LnGrp LOS	D	B	B	D	B	B	D	C		C	B	
Approach Vol, veh/h		669			698			355	A		344	A
Approach Delay, s/veh		15.6			15.7			23.9			20.9	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	15.5	6.7	21.2	9.8	12.5	5.5	22.4				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 9.9	30.2	* 5.2	* 42	7.1	* 33	* 4	43.0				
Max Q Clear Time (g_c+I1), s	4.0	3.5	4.0	9.7	5.0	5.7	2.8	8.8				
Green Ext Time (p_c), s	0.1	0.7	0.0	4.5	0.1	1.7	0.0	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			18.0									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)
 8: McCall Avenue & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	239	66	71	246	108	92	362	22	94	517	232
Future Volume (veh/h)	118	239	66	71	246	108	92	362	22	94	517	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.97	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	260	72	77	267	117	100	393	24	102	562	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	162	368	102	99	432	356	128	610	37	131	658	549
Arrive On Green	0.09	0.27	0.27	0.06	0.23	0.23	0.07	0.35	0.35	0.07	0.35	0.35
Sat Flow, veh/h	1767	1368	379	1767	1856	1529	1767	1728	106	1767	1856	1548
Grp Volume(v), veh/h	128	0	332	77	267	117	100	0	417	102	562	252
Grp Sat Flow(s),veh/h/ln	1767	0	1747	1767	1856	1529	1767	0	1834	1767	1856	1548
Q Serve(g_s), s	5.1	0.0	12.4	3.1	9.3	4.6	4.0	0.0	13.7	4.1	20.2	9.0
Cycle Q Clear(g_c), s	5.1	0.0	12.4	3.1	9.3	4.6	4.0	0.0	13.7	4.1	20.2	9.0
Prop In Lane	1.00		0.22	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	162	0	470	99	432	356	128	0	648	131	658	549
V/C Ratio(X)	0.79	0.00	0.71	0.78	0.62	0.33	0.78	0.00	0.64	0.78	0.85	0.46
Avail Cap(c_a), veh/h	216	0	584	164	566	466	191	0	849	211	862	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	23.8	33.6	24.8	23.0	32.9	0.0	19.5	32.8	21.5	17.9
Incr Delay (d2), s/veh	13.3	0.0	2.9	12.4	1.4	0.5	11.3	0.0	1.1	9.6	6.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	5.1	1.6	4.0	1.6	2.1	0.0	5.6	2.0	8.9	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	0.0	26.7	46.1	26.2	23.5	44.2	0.0	20.6	42.4	28.1	18.5
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		460			461			517			916	
Approach Delay, s/veh		31.9			28.8			25.2			27.1	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	30.4	8.2	24.0	9.4	30.5	10.8	21.4				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 8.6	* 33	* 6.7	24.1	* 7.8	33.5	* 8.8	22.0				
Max Q Clear Time (g_c+I1), s	6.1	15.7	5.1	14.4	6.0	22.2	7.1	11.3				
Green Ext Time (p_c), s	0.0	2.4	0.0	1.3	0.0	3.4	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.0									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout AM Peak (Weekday)

9: Highland Avenue & SR 99 SB Ramps

11/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	530	0	0	0	0	1007	49	425	556	0
Future Volume (vph)	0	0	530	0	0	0	0	1007	49	425	556	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	558	0	0	0	0	1060	52	447	585	0
RTOR Reduction (vph)	0	0	470	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	0	88	0	0	0	0	1060	23	447	585	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			7.2					20.5	20.5	16.2	29.6	
Effective Green, g (s)			7.2					20.5	20.5	16.2	29.6	
Actuated g/C Ratio			0.16					0.44	0.44	0.35	0.64	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			429					1551	679	613	2240	
v/s Ratio Prot			0.03					c0.30		c0.26	0.17	
v/s Ratio Perm									0.01			
v/c Ratio			0.21					0.68	0.03	0.73	0.26	
Uniform Delay, d1			17.1					10.3	7.3	13.1	3.6	
Progression Factor			1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2			0.2					1.3	0.0	4.3	0.1	
Delay (s)			17.3					11.6	7.3	17.5	3.7	
Level of Service			B					B	A	B	A	
Approach Delay (s)		17.3			0.0			11.4			9.7	
Approach LOS		B			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			11.9									
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			46.3							9.6		
Intersection Capacity Utilization			59.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 w/ Dinuba + Project Buildout AM Peak (Weekday)

11/27/2018

Intersection												
Int Delay, s/veh	44.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	56	15	71	34	10	126	58	784	53	84	701	24
Future Vol, veh/h	56	15	71	34	10	126	58	784	53	84	701	24
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	61	16	77	37	11	137	63	852	58	91	762	26

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1516	1994	395	1578	1978	455	789	0	0	910	0	0
Stage 1	958	958	-	1007	1007	-	-	-	-	-	-	-
Stage 2	558	1036	-	571	971	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	81	59	601	73	60	550	820	-	-	738	-	-
Stage 1	274	332	-	256	314	-	-	-	-	-	-	-
Stage 2	479	305	-	471	327	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 43	48	601	40	49	550	819	-	-	738	-	-
Mov Cap-2 Maneuver	~ 43	48	-	40	49	-	-	-	-	-	-	-
Stage 1	253	291	-	236	290	-	-	-	-	-	-	-
Stage 2	320	282	-	340	286	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	287	281.2	0.6	1.1
HCM LOS	F	F		
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	819	-	-	44	601	132	738	-	-
HCM Lane V/C Ratio	0.077	-	-	1.754	0.128	1.4	0.124	-	-
HCM Control Delay (s)	9.8	-	-	\$ 562	11.9	281.2	10.6	-	-
HCM Lane LOS	A	-	-	F	B	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	7.8	0.4	12.3	0.4	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard

11/27/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	614	636	17	90	515	32	30	564	632	67	307	99
Future Volume (veh/h)	614	636	17	90	515	32	30	564	632	67	307	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	667	691	0	98	560	0	33	613	687	73	334	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	605	636		73	419		42	687	306	71	746	333
Arrive On Green	0.34	0.34	0.00	0.27	0.27	0.00	0.02	0.19	0.19	0.04	0.21	0.21
Sat Flow, veh/h	1767	1856	1572	274	1568	1572	1767	3526	1568	1767	3526	1572
Grp Volume(v), veh/h	667	691	0	658	0	0	33	613	687	73	334	108
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1842	0	1572	1767	1763	1568	1767	1763	1572
Q Serve(g_s), s	41.1	41.1	0.0	32.1	0.0	0.0	2.2	20.3	23.4	4.8	9.9	7.0
Cycle Q Clear(g_c), s	41.1	41.1	0.0	32.1	0.0	0.0	2.2	20.3	23.4	4.8	9.9	7.0
Prop In Lane	1.00		1.00	0.15		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	605	636		493	0		42	687	306	71	746	333
V/C Ratio(X)	1.10	1.09		1.34	0.00		0.79	0.89	2.25	1.03	0.45	0.32
Avail Cap(c_a), veh/h	605	636		493	0		80	687	306	71	746	333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.4	39.5	0.0	44.0	0.0	0.0	58.3	47.1	48.3	57.6	41.2	40.1
Incr Delay (d2), s/veh	67.7	61.7	0.0	164.3	0.0	0.0	27.7	16.2	571.2	116.4	1.9	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	28.7	29.1	0.0	36.8	0.0	0.0	1.3	10.3	57.4	4.4	4.4	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	107.1	101.2	0.0	208.3	0.0	0.0	86.0	63.2	619.5	174.0	43.2	42.6
LnGrp LOS	F	F		F	A		F	E	F	F	D	D
Approach Vol, veh/h		1358	A		658	A		1333			515	
Approach Delay, s/veh		104.1			208.3			350.5			61.6	
Approach LOS		F			F			F			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		46.0	9.0	28.0		37.0	7.0	30.0				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		41.1	* 4.8	23.4		32.1	* 5.4	22.8				
Max Q Clear Time (g_c+I1), s		43.1	6.8	25.4		34.1	4.2	11.9				
Green Ext Time (p_c), s		0.0	0.0	0.0		0.0	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			201.2									
HCM 6th LOS			F									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 w/ Dinuba + Project Buildout PM Peak (Weekday)

11/27/2018

Intersection												
Int Delay, s/veh	204.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	242	14	195	209	419	15	202	262	313	20	1
Future Vol, veh/h	1	242	14	195	209	419	15	202	262	313	20	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	1	263	15	212	227	455	16	220	285	340	22	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	682	0	0	278	0	0	1163	1379	271	1404	1159	455
Stage 1	-	-	-	-	-	-	273	273	-	879	879	-
Stage 2	-	-	-	-	-	-	890	1106	-	525	280	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	906	-	-	1279	-	-	171	~ 144	765	~ 116	195	603
Stage 1	-	-	-	-	-	-	731	682	-	341	364	-
Stage 2	-	-	-	-	-	-	336	285	-	534	677	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	906	-	-	1279	-	-	117	~ 102	765	-	138	603
Mov Cap-2 Maneuver	-	-	-	-	-	-	117	~ 102	-	-	138	-
Stage 1	-	-	-	-	-	-	730	681	-	341	258	-
Stage 2	-	-	-	-	-	-	218	~ 202	-	~ 227	676	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2	\$ 803.4	
HCM LOS			F	-







Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	195	906	-	-	1279	-	-	-
HCM Lane V/C Ratio	2.67	0.001	-	-	0.166	-	-	-
HCM Control Delay (s)	\$ 803.4	9	0	-	8.4	0	-	-
HCM Lane LOS	F	A	A	-	A	A	-	-
HCM 95th %tile Q(veh)	45	0	-	-	0.6	-	-	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
3: Floral Avenue & Project Driveway

2030 w/ Dinuba + Project Buildout PM Peak (Weekday)


11/27/2018

Intersection							
Int Delay, s/veh	5707.2						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	334	316	32	585	480	857	242
Future Vol, veh/h	334	316	32	585	480	857	242
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	363	343	35	636	522	932	263
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1158	0	-	-	0	2036	579
Stage 1	-	-	-	-	-	967	-
Stage 2	-	-	-	-	-	1069	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	597	-	-	-	-	~ 55	457
Stage 1	-	-	-	-	-	~ 328	-
Stage 2	-	-	-	-	-	~ 327	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	597	-	-	-	-	~ 22	457
Mov Cap-2 Maneuver	-	-	-	-	-	~ 22	-
Stage 1	-	-	-	-	-	~ 129	-
Stage 2	-	-	-	-	-	~ 327	-
Approach	EB	WB		SB			
HCM Control Delay, s	10.2			\$ 14773.4			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	597	-	-	-	-	22	457
HCM Lane V/C Ratio	0.608	-	-	-	-	42.342	0.576
HCM Control Delay (s)	19.9	-	-	-	-	\$ 18938.6	23
HCM Lane LOS	C	-	-	-	-	F	C
HCM 95th %tile Q(veh)	4.1	-	-	-	-	116.7	3.5
Notes							
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon							
























HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1600	70	111	1251	0	0	0	169	306	49	529
Future Volume (vph)	0	1600	70	111	1251	0	0	0	169	306	49	529
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1538
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1667	73	116	1303	0	0	0	176	319	51	551
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	64	0	0	60
Lane Group Flow (vph)	0	1667	35	116	1303	0	0	0	112	319	51	491
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.2	58.2	8.6	71.5				20.5	25.1	37.0	37.0
Effective Green, g (s)		58.2	58.2	8.6	71.5				20.5	25.1	37.0	37.0
Actuated g/C Ratio		0.49	0.49	0.07	0.60				0.17	0.21	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1699	760	125	2088				272	711	568	474
v/s Ratio Prot		c0.48		c0.07	0.37				0.07	0.09	0.03	
v/s Ratio Perm			0.02									c0.32
v/c Ratio		0.98	0.05	0.93	0.62				0.41	0.45	0.09	1.04
Uniform Delay, d1		30.4	16.3	55.4	15.6				44.4	41.4	29.5	41.5
Progression Factor		1.00	0.95	0.87	0.50				1.00	1.00	1.00	1.00
Incremental Delay, d2		17.8	0.1	10.9	0.1				1.0	0.5	0.1	50.8
Delay (s)		48.3	15.5	59.3	7.9				45.4	41.9	29.6	92.3
Level of Service		D	B	E	A				D	D	C	F
Approach Delay (s)		46.9			12.1			45.4			71.4	
Approach LOS		D			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			40.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			77.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)
 5: Highland Avenue & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	509	1029	412	417	824	226	365	502	187	88	654	505
Future Volume (veh/h)	509	1029	412	417	824	226	365	502	187	88	654	505
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	519	1050	420	426	841	231	372	512	191	90	667	515
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	376	1467	654	457	920	253	137	625	279	186	854	670
Arrive On Green	0.14	0.28	0.28	0.27	0.67	0.67	0.07	0.30	0.30	0.11	0.24	0.24
Sat Flow, veh/h	1767	3526	1572	3428	2733	750	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	519	1050	420	426	542	530	372	512	191	90	667	515
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1720	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	25.5	32.2	22.0	14.6	31.3	31.4	4.8	16.2	9.5	5.8	21.2	20.8
Cycle Q Clear(g_c), s	25.5	32.2	22.0	14.6	31.3	31.4	4.8	16.2	9.5	5.8	21.2	20.8
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	376	1467	654	457	594	579	137	625	279	186	854	670
V/C Ratio(X)	1.38	0.72	0.64	0.93	0.91	0.91	2.71	0.82	0.69	0.48	0.78	0.77
Avail Cap(c_a), veh/h	376	1467	654	457	752	734	137	911	406	188	1116	876
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.38	0.38	0.38	0.69	0.69	0.69	0.35	0.35	0.35	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	36.9	21.7	43.5	18.1	18.1	56.0	40.5	21.4	50.6	42.5	42.3
Incr Delay (d2), s/veh	178.0	1.2	1.9	20.1	15.7	16.1	777.9	1.4	1.1	2.0	2.7	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.2	14.7	8.7	6.6	9.8	9.6	16.8	6.1	3.1	2.6	9.4	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	229.4	38.0	23.6	63.5	33.8	34.2	833.9	41.9	22.5	52.6	45.2	45.4
LnGrp LOS	F	D	C	E	C	C	F	D	C	D	D	D
Approach Vol, veh/h	1989				1498				1075			
Approach Delay, s/veh	84.9				42.4				312.5			
Approach LOS	F				D				F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.2	55.1	10.0	33.7	30.7	45.6	17.8	25.9				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	5.2	* 4.6				
Max Green Setting (Gmax), s	* 16	* 41	4.8	* 38	* 6.8	* 51	12.8	* 31				
Max Q Clear Time (g_c+I1), s	16.6	34.2	6.8	23.2	27.5	33.4	7.8	18.2				
Green Ext Time (p_c), s	0.0	4.5	0.0	5.9	0.0	7.0	0.1	3.1				

Intersection Summary

HCM 6th Ctrl Delay	107.4
HCM 6th LOS	F







Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.























HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout PM Peak (Weekday)

6: SR-99 NB Off-Ramp & Floral Avenue























11/27/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↱	↱
Traffic Volume (vph)	1053	0	0	1150	381	225
Future Volume (vph)	1053	0	0	1150	381	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1120	0	0	1223	405	239
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	1120	0	0	1223	405	203
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	32.7			32.7	18.1	18.1
Effective Green, g (s)	32.7			32.7	18.1	18.1
Actuated g/C Ratio	0.55			0.55	0.30	0.30
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	1910			1910	528	473
v/s Ratio Prot	0.32			0.35	0.23	
v/s Ratio Perm						0.13
v/c Ratio	0.59			0.64	0.77	0.43
Uniform Delay, d1	9.1			9.5	19.0	16.8
Progression Factor	1.57			1.39	1.00	1.00
Incremental Delay, d2	1.0			1.5	6.6	0.6
Delay (s)	15.3			14.8	25.6	17.4
Level of Service	B			B	C	B
Approach Delay (s)	15.3			14.8	22.6	
Approach LOS	B			B	C	
Intersection Summary						
HCM 2000 Control Delay			16.7	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			60.0	Sum of lost time (s)		9.2
Intersection Capacity Utilization			60.6%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)
 7: Whitson Street & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	800	272	83	582	82	123	578	19	326	343	63
Future Volume (veh/h)	42	800	272	83	582	82	123	578	19	326	343	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	860	292	89	626	88	132	622	0	351	369	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	57	1158	392	111	1485	208	159	760		405	879	
Arrive On Green	0.07	0.90	0.90	0.06	0.48	0.48	0.09	0.22	0.00	0.12	0.25	0.00
Sat Flow, veh/h	1767	2583	875	1767	3101	435	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	45	586	566	89	355	359	132	622	0	351	369	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1695	1767	1763	1774	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	3.0	12.3	12.4	6.0	15.8	15.9	8.8	20.2	0.0	12.1	10.5	0.0
Cycle Q Clear(g_c), s	3.0	12.3	12.4	6.0	15.8	15.9	8.8	20.2	0.0	12.1	10.5	0.0
Prop In Lane	1.00		0.52	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	57	790	760	111	844	849	159	760		405	879	
V/C Ratio(X)	0.78	0.74	0.74	0.80	0.42	0.42	0.83	0.82		0.87	0.42	
Avail Cap(c_a), veh/h	121	790	760	130	844	849	244	970		423	917	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.7	4.1	4.1	55.5	20.4	20.4	53.7	44.8	0.0	52.0	37.8	0.0
Incr Delay (d2), s/veh	16.6	5.0	5.3	25.5	1.5	1.5	13.0	4.4	0.0	16.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.9	2.9	3.4	6.7	6.8	4.4	9.1	0.0	6.0	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.3	9.1	9.3	80.9	22.0	22.0	66.7	49.3	0.0	68.6	38.1	0.0
LnGrp LOS	E	A	A	F	C	C	E	D		E	D	
Approach Vol, veh/h		1197			803			754	A		720	A
Approach Delay, s/veh		11.6			28.5			52.3			53.0	
Approach LOS		B			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	34.8	11.8	58.4	19.1	30.8	8.1	62.1				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.2	* 4.6	4.9	* 4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 17	31.2	* 8.8	* 46	14.8	* 33	* 8.2	46.1				
Max Q Clear Time (g_c+I1), s	10.8	12.5	8.0	14.4	14.1	22.2	5.0	17.9				
Green Ext Time (p_c), s	0.1	2.1	0.0	9.8	0.1	2.9	0.0	4.7				
Intersection Summary												
HCM 6th Ctrl Delay			32.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.												













HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)
 8: McCall Avenue & Floral Avenue 11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	284	101	57	234	85	118	652	62	55	507	211
Future Volume (veh/h)	237	284	101	57	234	85	118	652	62	55	507	211
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	252	302	107	61	249	90	126	694	66	59	539	224
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	278	377	133	78	328	273	154	722	69	75	722	606
Arrive On Green	0.16	0.29	0.29	0.04	0.18	0.18	0.09	0.43	0.43	0.04	0.39	0.39
Sat Flow, veh/h	1767	1300	460	1767	1856	1541	1767	1667	159	1767	1856	1558
Grp Volume(v), veh/h	252	0	409	61	249	90	126	0	760	59	539	224
Grp Sat Flow(s),veh/h/ln	1767	0	1760	1767	1856	1541	1767	0	1826	1767	1856	1558
Q Serve(g_s), s	13.2	0.0	20.3	3.2	12.0	4.8	6.6	0.0	38.1	3.1	23.6	9.7
Cycle Q Clear(g_c), s	13.2	0.0	20.3	3.2	12.0	4.8	6.6	0.0	38.1	3.1	23.6	9.7
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	278	0	510	78	328	273	154	0	791	75	722	606
V/C Ratio(X)	0.91	0.00	0.80	0.78	0.76	0.33	0.82	0.00	0.96	0.78	0.75	0.37
Avail Cap(c_a), veh/h	278	0	568	120	433	360	154	0	804	84	731	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.0	0.0	31.0	44.6	36.9	33.9	42.3	0.0	25.9	44.7	24.8	20.5
Incr Delay (d2), s/veh	31.2	0.0	7.4	16.1	5.5	0.7	28.2	0.0	22.4	33.6	4.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	9.3	1.7	5.8	1.8	4.1	0.0	20.5	2.0	10.4	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	0.0	38.4	60.6	42.3	34.6	70.5	0.0	48.3	78.3	29.0	20.9
LnGrp LOS	E	A	D	E	D	C	E	A	D	E	C	C
Approach Vol, veh/h		661			400			886			822	
Approach Delay, s/veh		50.5			43.4			51.5			30.3	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	45.7	8.4	31.9	12.4	41.6	19.0	21.3				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.5	* 42	* 6.4	30.4	* 8.2	37.1	* 15	22.0				
Max Q Clear Time (g_c+I1), s	5.1	40.1	5.2	22.3	8.6	25.6	15.2	14.0				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.5	0.0	3.2	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			43.8									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout PM Peak (Weekday)

9: Highland Avenue & SR-99 SB Off-Ramp

11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	677	0	0	0	0	1414	57	491	960	0
Future Volume (vph)	0	0	677	0	0	0	0	1414	57	491	960	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1535	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1535	1752	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	736	0	0	0	0	1537	62	534	1043	0
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	0	645	0	0	0	0	1537	31	534	1043	0
Confl. Peds. (#/hr)									1			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			18.5					29.9	29.9	20.5	32.0	
Effective Green, g (s)			18.5					29.9	29.9	20.5	32.0	
Actuated g/C Ratio			0.31					0.50	0.50	0.34	0.53	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			851					1746	764	598	1869	
v/s Ratio Prot			0.23					c0.44		c0.30	0.30	
v/s Ratio Perm									0.02			
v/c Ratio			0.76					0.88	0.04	0.89	0.56	
Uniform Delay, d1			18.7					13.5	7.7	18.7	9.3	
Progression Factor			1.00					1.00	1.00	0.85	0.62	
Incremental Delay, d2			3.9					6.7	0.1	12.2	0.9	
Delay (s)			22.6					20.2	7.8	28.1	6.7	
Level of Service			C					C	A	C	A	
Approach Delay (s)		22.6			0.0			19.7			13.9	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.9									
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			60.0							9.6		
Intersection Capacity Utilization			74.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 w/ Dinuba + Project Buildout PM Peak (Weekday)

11/27/2018

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	38	15	77	46	15	127	88	1086	58	135	1293	66
Future Vol, veh/h	38	15	77	46	15	127	88	1086	58	135	1293	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	16	81	48	16	134	93	1143	61	142	1361	69

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2446	3070	715	2333	3074	602	1430	0	0	1204	0	0
Stage 1	1680	1680	-	1360	1360	-	-	-	-	-	-	-
Stage 2	766	1390	-	973	1714	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 16	~ 12	371	~ 19	~ 12	440	466	-	-	570	-	-
Stage 1	97	148	-	155	213	-	-	-	-	-	-	-
Stage 2	359	206	-	269	142	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 7	371	-	~ 7	440	466	-	-	570	-	-
Mov Cap-2 Maneuver	-	~ 7	-	-	~ 7	-	-	-	-	-	-	-
Stage 1	78	111	-	124	170	-	-	-	-	-	-	-
Stage 2	181	165	-	135	107	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	1.2
HCM LOS	-	-		
























Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	466	-	-	-	371	-	570	-	-
HCM Lane V/C Ratio	0.199	-	-	-	0.218	-	0.249	-	-
HCM Control Delay (s)	14.6	-	-	-	17.4	-	13.4	-	-
HCM Lane LOS	B	-	-	-	C	-	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	-	0.8	-	1	-	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

1: Highland Avenue & Golden State Boulevard

11/27/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	497	465	44	54	510	123	84	643	340	111	422	55
Future Volume (veh/h)	497	465	44	54	510	123	84	643	340	111	422	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	512	479	0	56	526	0	87	663	351	114	435	57
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	553	581		49	460		103	703	313	100	697	309
Arrive On Green	0.31	0.31	0.00	0.28	0.28	0.00	0.06	0.20	0.20	0.06	0.20	0.20
Sat Flow, veh/h	1767	1856	1572	178	1669	1572	1767	3526	1572	1767	3526	1565
Grp Volume(v), veh/h	512	479	0	582	0	0	87	663	351	114	435	57
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1847	0	1572	1767	1763	1572	1767	1763	1565
Q Serve(g_s), s	33.6	28.7	0.0	33.1	0.0	0.0	5.9	22.3	23.9	6.8	13.6	3.6
Cycle Q Clear(g_c), s	33.6	28.7	0.0	33.1	0.0	0.0	5.9	22.3	23.9	6.8	13.6	3.6
Prop In Lane	1.00		1.00	0.10		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	553	581		509	0		103	703	313	100	697	309
V/C Ratio(X)	0.93	0.82		1.14	0.00		0.84	0.94	1.12	1.14	0.62	0.18
Avail Cap(c_a), veh/h	589	619		509	0		103	703	313	100	697	309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	38.2	0.0	43.5	0.0	0.0	56.0	47.4	48.0	56.6	44.1	40.1
Incr Delay (d2), s/veh	20.0	8.5	0.0	85.4	0.0	0.0	43.9	22.6	87.1	132.0	4.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.3	14.2	0.0	26.9	0.0	0.0	3.8	11.7	16.7	6.7	6.2	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.9	46.6	0.0	128.9	0.0	0.0	99.9	70.0	135.1	188.6	48.2	41.4
LnGrp LOS	E	D		F	A		F	E	F	F	D	D
Approach Vol, veh/h		991	A		582	A		1101			606	
Approach Delay, s/veh		53.5			128.9			93.1			74.0	
Approach LOS		D			F			F			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		42.5	11.0	28.5		38.0	11.2	28.3				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		40.0	* 6.8	21.5		33.1	* 7	21.3				
Max Q Clear Time (g_c+I1), s		35.6	8.8	25.9		35.1	7.9	15.6				
Green Ext Time (p_c), s		2.0	0.0	0.0		0.0	0.0	1.4				
Intersection Summary												
HCM 6th Ctrl Delay			84.0									
HCM 6th LOS			F									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: DeWolf Avenue & Floral Avenue

2030 w/ Dinuba + Project Buildout MD Peak (Saturday)







11/27/2018

Intersection												
Int Delay, s/veh	186.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	206	8	215	206	412	11	199	290	331	15	0
Future Vol, veh/h	0	206	8	215	206	412	11	199	290	331	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	219	9	229	219	438	12	212	309	352	16	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	657	0	0	228	0	0	1128	1339	224	1380	1124	438
Stage 1	-	-	-	-	-	-	224	224	-	896	896	-
Stage 2	-	-	-	-	-	-	904	1115	-	484	228	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	926	-	-	1334	-	-	181 ~ 152	813	~ 121	204	617	
Stage 1	-	-	-	-	-	-	776	716	- ~ 333	357	-	
Stage 2	-	-	-	-	-	-	330	282	- 562	714	-	
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	926	-	-	1334	-	-	129 ~ 107	813	-	144	617	
Mov Cap-2 Maneuver	-	-	-	-	-	-	129 ~ 107	-	-	144	-	
Stage 1	-	-	-	-	-	-	776	716	- ~ 333	252	-	
Stage 2	-	-	-	-	-	-	219 ~ 199	- ~ 246	714	-	-	
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.1			\$ 701.6					
HCM LOS							F			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	217	926	-	-	1334	-	-	-				
HCM Lane V/C Ratio	2.451	-	-	-	0.171	-	-	-				
HCM Control Delay (s)	\$ 701.6	0	-	-	8.3	0	-	-				
HCM Lane LOS	F	A	-	-	A	A	-	-				
HCM 95th %tile Q(veh)	43.9	0	-	-	0.6	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM 6th TWSC
3: Floral Avenue & Project Driveway

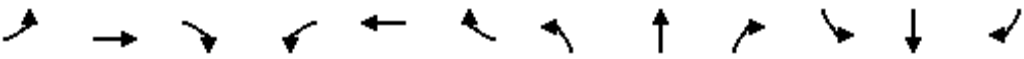
2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

11/27/2018

Intersection							
Int Delay, s/veh	12450.7						
Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	363	323	37	626	522	973	269
Future Vol, veh/h	363	323	37	626	522	973	269
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	250	-	250	-	-	250	0
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	395	351	40	680	567	1058	292
Major/Minor	Major1	Major2		Minor2			
Conflicting Flow All	1247	0	-	-	0	2185	624
Stage 1	-	-	-	-	-	1044	-
Stage 2	-	-	-	-	-	1141	-
Critical Hdwy	4.145	-	-	-	-	6.645	6.945
Critical Hdwy Stg 1	-	-	-	-	-	5.845	-
Critical Hdwy Stg 2	-	-	-	-	-	5.445	-
Follow-up Hdwy	2.2285	-	-	-	-	3.5285	3.3285
Pot Cap-1 Maneuver	552	-	-	-	-	~ 44	427
Stage 1	-	-	-	-	-	~ 299	-
Stage 2	-	-	-	-	-	~ 302	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	552	-	-	-	-	~ 12	427
Mov Cap-2 Maneuver	-	-	-	-	-	~ 12	-
Stage 1	-	-	-	-	-	~ 85	-
Stage 2	-	-	-	-	-	~ 302	-
Approach	EB	WB		SB			
HCM Control Delay, s	13.9			\$ 31199.3			
HCM LOS				F			
Minor Lane/Major Mvmt	EBL	EBT	WBU	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	552	-	-	-	-	12	427
HCM Lane V/C Ratio	0.715	-	-	-	-	-88.134	0.685
HCM Control Delay (s)	26.2	-	-	-	-	\$ 39816.5	29.8
HCM Lane LOS	D	-	-	-	-	F	D
HCM 95th %tile Q(veh)	5.8	-	-	-	-	133.7	5
Notes							
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon							

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout MD Peak (Saturday) 4: SR 99 SB Off-Ramp & Floral Avenue
























11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↑	↗
Traffic Volume (vph)	0	1726	86	108	1261	0	0	0	159	192	32	555
Future Volume (vph)	0	1726	86	108	1261	0	0	0	159	192	32	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1845	1547
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1845	1547
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1798	90	112	1314	0	0	0	166	200	33	578
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	64	0	0	60
Lane Group Flow (vph)	0	1798	44	113	1314	0	0	0	102	200	33	518
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		58.6	58.6	8.1	71.4				19.9	25.3	37.1	37.1
Effective Green, g (s)		58.6	58.6	8.1	71.4				19.9	25.3	37.1	37.1
Actuated g/C Ratio		0.49	0.49	0.07	0.60				0.17	0.21	0.31	0.31
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1711	765	118	2085				264	716	570	478
v/s Ratio Prot		c0.51		c0.06	0.37				0.06	0.06	0.02	
v/s Ratio Perm			0.03									c0.33
v/c Ratio		1.05	0.06	0.96	0.63				0.39	0.28	0.06	1.08
Uniform Delay, d1		30.7	16.2	55.8	15.7				44.6	39.7	29.2	41.5
Progression Factor		1.00	0.99	0.77	0.56				1.00	1.00	1.00	1.00
Incremental Delay, d2		36.5	0.1	15.7	0.1				0.9	0.2	0.0	65.6
Delay (s)		67.3	16.2	58.7	9.0				45.5	39.9	29.2	107.0
Level of Service		E	B	E	A				D	D	C	F
Approach Delay (s)		64.8			12.9			45.5			87.3	
Approach LOS		E			B			D			F	
Intersection Summary												
HCM 2000 Control Delay			51.1			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			78.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)







5: Highland Avenue & Floral Avenue

11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	525	1085	475	456	876	240	389	395	191	106	529	492
Future Volume (veh/h)	525	1085	475	456	876	240	389	395	191	106	529	492
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	541	1119	490	470	903	247	401	407	197	109	545	507
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1178	525	774	986	269	137	544	243	193	817	642
Arrive On Green	0.13	0.22	0.22	0.45	0.72	0.72	0.07	0.26	0.26	0.11	0.23	0.23
Sat Flow, veh/h	1767	3526	1572	3428	2731	746	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	541	1119	490	470	582	568	401	407	197	109	545	507
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1714	1763	1714	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	23.9	37.5	36.7	12.4	32.5	32.7	4.8	12.7	14.1	7.0	16.9	20.7
Cycle Q Clear(g_c), s	23.9	37.5	36.7	12.4	32.5	32.7	4.8	12.7	14.1	7.0	16.9	20.7
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	1178	525	774	636	619	137	544	243	193	817	642
V/C Ratio(X)	1.54	0.95	0.93	0.61	0.92	0.92	2.92	0.75	0.81	0.56	0.67	0.79
Avail Cap(c_a), veh/h	351	1181	527	774	752	731	137	817	364	221	1116	876
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.23	0.23	0.23	0.78	0.78	0.78	0.51	0.51	0.51	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	45.6	45.3	28.9	15.2	15.2	56.0	42.4	42.9	50.7	41.9	43.3
Incr Delay (d2), s/veh	246.1	5.4	8.5	1.1	16.6	17.2	875.9	1.1	4.3	2.6	0.9	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	35.0	17.9	15.8	4.3	8.9	8.8	18.7	5.0	5.1	3.2	7.4	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	298.1	51.0	53.8	30.0	31.8	32.4	931.9	43.5	47.3	53.3	42.8	46.8
LnGrp LOS	F	D	D	C	C	C	F	D	D	D	D	D
Approach Vol, veh/h		2150			1620			1005			1161	
Approach Delay, s/veh		113.8			31.5			398.7			45.5	
Approach LOS		F			C			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	32.3	45.3	10.0	32.4	29.1	48.5	18.3	24.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	5.2	* 5.6				
Max Green Setting (Gmax), s	* 17	* 40	4.8	* 38	* 6.8	* 51	15.0	* 28				
Max Q Clear Time (g_c+I1), s	14.4	39.5	6.8	22.7	25.9	34.7	9.0	16.1				
Green Ext Time (p_c), s	0.5	0.5	0.0	5.1	0.0	7.3	0.1	2.4				
Intersection Summary												
HCM 6th Ctrl Delay			126.2									
HCM 6th LOS			F									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

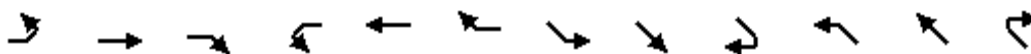
HCM Signalized Intersection Capacity Analysis / Dinuba + Project Buildout MD Peak (Saturday) 6: SR 99 NB Off-Ramp & Floral Avenue

11/27/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↵	↵
Traffic Volume (vph)	953	0	0	1108	338	237
Future Volume (vph)	953	0	0	1108	338	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	4.6
Lane Util. Factor	0.95			0.95	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3505			3505	1752	1568
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3505			3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1036	0	0	1204	367	258
RTOR Reduction (vph)	0	0	0	0	0	56
Lane Group Flow (vph)	1036	0	0	1204	367	203
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			2	8	
Permitted Phases						8
Actuated Green, G (s)	79.6			79.6	31.2	31.2
Effective Green, g (s)	79.6			79.6	31.2	31.2
Actuated g/C Ratio	0.66			0.66	0.26	0.26
Clearance Time (s)	4.6			4.6	4.6	4.6
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2324			2324	455	407
v/s Ratio Prot	0.30			0.34	0.21	
v/s Ratio Perm						0.13
v/c Ratio	0.45			0.52	0.81	0.50
Uniform Delay, d1	9.7			10.4	41.6	37.7
Progression Factor	0.30			1.28	1.00	1.00
Incremental Delay, d2	0.4			0.8	10.1	1.0
Delay (s)	3.3			14.1	51.6	38.7
Level of Service	A			B	D	D
Approach Delay (s)	3.3			14.1	46.3	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay	17.2			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.60					
Actuated Cycle Length (s)	120.0			Sum of lost time (s)		9.2
Intersection Capacity Utilization	57.0%			ICU Level of Service		B
Analysis Period (min)	15					
c Critical Lane Group						

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday) 7: Whitson Street & Floral Avenue

11/27/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	42	644	344	65	499	80	110	519	11	337	282	30
Future Volume (veh/h)	42	644	344	65	499	80	110	519	11	337	282	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	44	671	358	68	520	83	115	541	0	351	294	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	57	768	410	345	1551	247	141	669		411	810	
Arrive On Green	0.01	0.11	0.11	0.20	0.51	0.51	0.08	0.19	0.00	0.12	0.23	0.00
Sat Flow, veh/h	1767	2220	1184	1767	3047	484	1767	3526	1572	3428	3526	1572
Grp Volume(v), veh/h	44	533	496	68	300	303	115	541	0	351	294	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1641	1767	1763	1768	1767	1763	1572	1714	1763	1572
Q Serve(g_s), s	3.0	35.7	35.7	3.9	12.1	12.2	7.7	17.6	0.0	12.0	8.4	0.0
Cycle Q Clear(g_c), s	3.0	35.7	35.7	3.9	12.1	12.2	7.7	17.6	0.0	12.0	8.4	0.0
Prop In Lane	1.00		0.72	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	57	610	568	345	897	900	141	669		411	810	
V/C Ratio(X)	0.78	0.87	0.87	0.20	0.33	0.34	0.81	0.81		0.85	0.36	
Avail Cap(c_a), veh/h	94	660	614	345	897	900	228	970		480	1008	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.9	50.6	50.6	40.4	17.4	17.4	54.3	46.5	0.0	51.8	38.8	0.0
Incr Delay (d2), s/veh	18.0	14.3	15.2	0.3	1.0	1.0	11.0	3.4	0.0	12.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	19.3	18.2	1.7	5.1	5.1	3.8	7.9	0.0	5.8	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.0	64.9	65.8	40.7	18.4	18.5	65.3	49.9	0.0	64.2	39.1	0.0
LnGrp LOS	E	E	E	D	B	B	E	D		E	D	
Approach Vol, veh/h		1073			671			656	A		645	A
Approach Delay, s/veh		65.8			20.7			52.6			52.7	
Approach LOS		E			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	32.5	28.0	45.7	18.6	27.7	8.0	65.7				
Change Period (Y+Rc), s	* 4.2	4.9	* 4.6	* 4.2	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 16	34.3	* 7.8	* 45	* 17	33.0	* 6.4	45.9				
Max Q Clear Time (g_c+I1), s	9.7	10.4	5.9	37.7	14.0	19.6	5.0	14.2				
Green Ext Time (p_c), s	0.1	1.7	0.0	3.8	0.4	2.8	0.0	3.9				

Intersection Summary

HCM 6th Ctrl Delay	50.3
HCM 6th LOS	D

Notes























* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NWR, SER] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

8: McCall Avenue & Floral Avenue


11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	228	183	92	54	196	38	75	531	50	29	533	177
Future Volume (veh/h)	228	183	92	54	196	38	75	531	50	29	533	177
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	230	185	93	55	198	38	76	536	51	29	538	179
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	280	318	160	69	287	242	97	629	60	45	645	544
Arrive On Green	0.16	0.27	0.27	0.04	0.15	0.15	0.05	0.38	0.38	0.03	0.35	0.35
Sat Flow, veh/h	1767	1163	585	1767	1856	1562	1767	1667	159	1767	1856	1563
Grp Volume(v), veh/h	230	0	278	55	198	38	76	0	587	29	538	179
Grp Sat Flow(s),veh/h/ln	1767	0	1748	1767	1856	1562	1767	0	1825	1767	1856	1563
Q Serve(g_s), s	7.9	0.0	8.6	1.9	6.4	1.3	2.7	0.0	18.6	1.0	16.8	5.3
Cycle Q Clear(g_c), s	7.9	0.0	8.6	1.9	6.4	1.3	2.7	0.0	18.6	1.0	16.8	5.3
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	280	0	479	69	287	242	97	0	689	45	645	544
V/C Ratio(X)	0.82	0.00	0.58	0.79	0.69	0.16	0.79	0.00	0.85	0.65	0.83	0.33
Avail Cap(c_a), veh/h	387	0	797	199	648	546	163	0	954	115	899	758
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	19.7	30.0	25.2	23.1	29.4	0.0	18.0	30.4	18.9	15.1
Incr Delay (d2), s/veh	9.6	0.0	1.1	18.0	3.0	0.3	13.0	0.0	5.5	14.7	4.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	3.3	1.1	2.8	0.5	1.4	0.0	8.0	0.6	7.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.2	0.0	20.9	48.0	28.1	23.4	42.4	0.0	23.5	45.1	23.7	15.5
LnGrp LOS	D	A	C	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		508			291			663			746	
Approach Delay, s/veh		27.4			31.3			25.7			22.6	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	28.7	6.7	21.8	7.6	26.8	14.2	14.3				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	4.6	* 4.2	4.9	* 4.2	4.6				
Max Green Setting (Gmax), s	* 4.1	* 33	* 7.1	28.7	* 5.8	30.5	* 14	22.0				
Max Q Clear Time (g_c+I1), s	3.0	20.6	3.9	10.6	4.7	18.8	9.9	8.4				
Green Ext Time (p_c), s	0.0	3.2	0.0	1.5	0.0	3.1	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			25.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout MD Peak (Saturday)

9: Highland Avenue & SR 99 SB Ramps

11/27/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			TT					TT	T	T	TT	
Traffic Volume (vph)	0	0	535	0	0	0	0	1318	42	526	964	0
Future Volume (vph)	0	0	535	0	0	0	0	1318	42	526	964	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.2					4.9	4.9	4.7	5.3	
Lane Util. Factor			0.88					0.95	1.00	1.00	0.95	
Frpb, ped/bikes			1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes			1.00					1.00	1.00	1.00	1.00	
Frt			0.85					1.00	0.85	1.00	1.00	
Flt Protected			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)			2760					3505	1533	1752	3505	
Flt Permitted			1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)			2760					3505	1533	1752	3505	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	546	0	0	0	0	1345	43	537	984	0
RTOR Reduction (vph)	0	0	162	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	0	0	384	0	0	0	0	1345	21	537	984	0
Confl. Peds. (#/hr)									2			
Turn Type			Prot					NA	Perm	Prot	NA	
Protected Phases			5					2		1	6	
Permitted Phases									2			
Actuated Green, G (s)			12.6					28.9	28.9	21.5	37.9	
Effective Green, g (s)			12.6					28.9	28.9	21.5	37.9	
Actuated g/C Ratio			0.21					0.48	0.48	0.36	0.63	
Clearance Time (s)			4.2					4.9	4.9	4.7	5.3	
Vehicle Extension (s)			3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)			579					1688	738	627	2213	
v/s Ratio Prot			0.14					c0.38		c0.31	0.28	
v/s Ratio Perm									0.01			
v/c Ratio			0.66					0.80	0.03	0.86	0.44	
Uniform Delay, d1			21.8					13.1	8.2	17.8	5.7	
Progression Factor			1.00					1.00	1.00	1.36	0.62	
Incremental Delay, d2			2.9					4.0	0.1	8.3	0.5	
Delay (s)			24.6					17.1	8.2	32.5	4.0	
Level of Service			C					B	A	C	A	
Approach Delay (s)		24.6			0.0			16.8			14.1	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.8									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			60.0							9.6		
Intersection Capacity Utilization			73.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Highland Avenue & Rose Avenue

2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

























11/27/2018

Intersection												
Int Delay, s/veh	441.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	
Traffic Vol, veh/h	41	12	102	53	20	100	95	980	65	97	1113	69
Future Vol, veh/h	41	12	102	53	20	100	95	980	65	97	1113	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	-	250	-	-	250	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	43	13	107	56	21	105	100	1032	68	102	1172	73
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2140	2713	623	2063	2715	550	1245	0	0	1100	0	0
Stage 1	1413	1413	-	1266	1266	-	-	-	-	-	-	-
Stage 2	727	1300	-	797	1449	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	~ 27	20	426	~ 31	~ 20	476	549	-	-	625	-	-
Stage 1	144	201	-	177	236	-	-	-	-	-	-	-
Stage 2	379	228	-	344	193	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	14	426	~ 4	~ 14	476	549	-	-	625	-	-
Mov Cap-2 Maneuver	-	14	-	~ 4	~ 14	-	-	-	-	-	-	-
Stage 1	118	168	-	145	193	-	-	-	-	-	-	-
Stage 2	215	187	-	199	162	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s			\$ 6990.4		1.1		0.9					
HCM LOS	-		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	549	-	-	-	426	12	625	-	-			
HCM Lane V/C Ratio	0.182	-	-	-	0.252	15.175	0.163	-	-			
HCM Control Delay (s)	13	-	-	-	16.3	\$ 6990.4	11.9	-	-			
HCM Lane LOS	B	-	-	-	C	F	B	-	-			
HCM 95th %tile Q(veh)	0.7	-	-	-	1	24.1	0.6	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)

1: Highland Avenue & Golden State Boulevard























11/28/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	155	249	74	93	425	10	16	319	281	18	136	42
Future Volume (veh/h)	155	249	74	93	425	10	16	319	281	18	136	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	168	271	0	101	462	11	17	347	305	20	148	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	795	430		298	594	14	191	660	659	35	318	142
Arrive On Green	0.23	0.23	0.00	0.17	0.17	0.17	0.11	0.19	0.19	0.02	0.09	0.09
Sat Flow, veh/h	3428	1856	1572	1767	3520	84	1767	3526	1572	1767	3526	1572
Grp Volume(v), veh/h	168	271	0	101	231	242	17	347	305	20	148	46
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1767	1763	1840	1767	1763	1572	1767	1763	1572
Q Serve(g_s), s	1.9	6.2	0.0	2.4	5.9	6.0	0.4	4.2	6.6	0.5	1.9	1.3
Cycle Q Clear(g_c), s	1.9	6.2	0.0	2.4	5.9	6.0	0.4	4.2	6.6	0.5	1.9	1.3
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	795	430		298	298	311	191	660	659	35	318	142
V/C Ratio(X)	0.21	0.63		0.34	0.78	0.78	0.09	0.53	0.46	0.58	0.46	0.32
Avail Cap(c_a), veh/h	2893	1566		302	301	315	191	692	673	149	692	309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	16.4	0.0	17.4	18.8	18.8	19.0	17.4	9.9	23.0	20.5	20.2
Incr Delay (d2), s/veh	0.1	1.5	0.0	0.7	11.9	11.6	0.2	0.7	0.5	14.4	1.1	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.4	0.0	0.9	3.1	3.2	0.2	1.5	2.9	0.3	0.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	17.9	0.0	18.0	30.8	30.4	19.2	18.0	10.4	37.5	21.5	21.5
LnGrp LOS	B	B		B	C	C	B	B	B	D	C	C
Approach Vol, veh/h		439	A		574			669			214	
Approach Delay, s/veh		16.7			28.4			14.6			23.0	
Approach LOS		B			C			B			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		15.9	5.1	13.5		12.9	9.7	8.9				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.0	* 4	9.3		8.1	4.0	* 9.3				
Max Q Clear Time (g_c+I1), s		8.2	2.5	8.6		8.0	2.4	3.9				
Green Ext Time (p_c), s		2.2	0.0	0.3		0.0	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			20.2									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)

2: DeWolf Avenue & Floral Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	108	6	20	72	109	8	39	21	165	24	13
Future Volume (veh/h)	4	108	6	20	72	109	8	39	21	165	24	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	117	7	22	78	118	9	42	23	179	26	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	921	1048	63	33	154	131	16	79	96	216	177	95
Arrive On Green	0.52	0.60	0.60	0.02	0.08	0.08	0.01	0.04	0.04	0.12	0.16	0.16
Sat Flow, veh/h	1767	1733	104	1767	1856	1572	1767	1856	1572	1767	1135	611
Grp Volume(v), veh/h	4	0	124	22	78	118	9	42	23	179	0	40
Grp Sat Flow(s),veh/h/ln	1767	0	1837	1767	1856	1572	1767	1856	1572	1767	0	1746
Q Serve(g_s), s	0.1	0.0	2.7	1.2	3.9	5.4	0.5	2.1	1.3	9.5	0.0	1.9
Cycle Q Clear(g_c), s	0.1	0.0	2.7	1.2	3.9	5.4	0.5	2.1	1.3	9.5	0.0	1.9
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	921	0	1110	33	154	131	16	79	96	216	0	272
V/C Ratio(X)	0.00	0.00	0.11	0.67	0.51	0.90	0.57	0.53	0.24	0.83	0.00	0.15
Avail Cap(c_a), veh/h	921	0	1110	144	503	426	107	387	357	438	0	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	8.1	46.8	42.1	24.6	47.4	45.0	43.0	41.2	0.0	35.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	21.4	11.4	56.3	28.9	5.5	1.3	7.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.9	0.7	2.2	4.6	0.3	1.0	0.5	4.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	8.3	68.2	53.5	80.9	76.3	50.6	44.2	49.1	0.0	35.3
LnGrp LOS	B	A	A	E	D	F	E	D	D	D	A	D
Approach Vol, veh/h	128		218				74		219			
Approach Delay, s/veh	8.3		69.8				51.7		46.5			
Approach LOS	A		E				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.9	10.1	6.0	64.0	5.1	20.9	56.0	14.0				
Change Period (Y+Rc), s	* 4.2	6.0	* 4.2	6.0	* 4.2	6.0	6.0	* 6				
Max Green Setting (Gmax), s	* 24	20.0	* 7.8	24.0	* 5.8	38.0	5.8	* 26				
Max Q Clear Time (g_c+I1), s	11.5	4.1	3.2	4.7	2.5	3.9	2.1	7.4				
Green Ext Time (p_c), s	0.3	0.1	0.0	0.5	0.0	0.1	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			47.4									
HCM 6th LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout AM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/28/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	66	192	11	199	267	286	28
Future Volume (vph)	66	192	11	199	267	286	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	209	12	216	290	311	30
RTOR Reduction (vph)	0	0	0	0	117	0	25
Lane Group Flow (vph)	72	209	12	216	173	311	5
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	8.1	64.0	1.5	57.4	57.4	15.7	15.7
Effective Green, g (s)	8.1	64.0	1.5	57.4	57.4	15.7	15.7
Actuated g/C Ratio	0.08	0.67	0.02	0.60	0.60	0.16	0.16
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	147	1230	27	2095	937	556	256
v/s Ratio Prot	c0.04	0.11	0.01	0.06		c0.09	
v/s Ratio Perm					c0.11		0.00
v/c Ratio	0.49	0.17	0.44	0.10	0.19	0.56	0.02
Uniform Delay, d1	42.0	6.0	46.8	8.3	8.7	37.0	33.7
Progression Factor	0.95	0.25	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.3	11.2	0.1	0.4	1.2	0.0
Delay (s)	42.3	1.8	58.1	8.4	9.2	38.2	33.7
Level of Service	D	A	E	A	A	D	C
Approach Delay (s)		12.2		10.0		37.8	
Approach LOS		B		A		D	
Intersection Summary							
HCM 2000 Control Delay			18.8		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.29				
Actuated Cycle Length (s)			96.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			33.9%		ICU Level of Service		A
Analysis Period (min)			15				

c Critical Lane Group

























HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout AM Peak (Weekday)

4: SR 99 SB Off-Ramp & Floral Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑				↗	↖	↗	↖
Traffic Volume (vph)	0	689	36	63	698	0	0	0	85	205	41	240
Future Volume (vph)	0	689	36	63	698	0	0	0	85	205	41	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1549	1468
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1549	1468
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	703	37	64	712	0	0	0	87	209	42	245
RTOR Reduction (vph)	0	0	25	0	0	0	0	0	75	0	65	83
Lane Group Flow (vph)	0	703	12	64	712	0	0	0	12	209	82	57
Confl. Peds. (#/hr)												4
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		17.9	17.9	3.5	26.1				7.7	10.1	19.0	19.0
Effective Green, g (s)		17.9	17.9	3.5	26.1				7.7	10.1	19.0	19.0
Actuated g/C Ratio		0.32	0.32	0.06	0.46				0.14	0.18	0.34	0.34
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1108	495	108	1616				217	606	519	492
v/s Ratio Prot		c0.20		0.04	c0.20				0.01	c0.06	c0.05	
v/s Ratio Perm			0.01									0.04
v/c Ratio		0.63	0.02	0.59	0.44				0.05	0.34	0.16	0.12
Uniform Delay, d1		16.6	13.3	25.9	10.3				21.3	20.4	13.2	13.0
Progression Factor		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	0.0	8.4	0.2				0.1	0.3	0.1	0.1
Delay (s)		17.7	13.3	34.3	10.5				21.4	20.7	13.3	13.1
Level of Service		B	B	C	B				C	C	B	B
Approach Delay (s)		17.5			12.5			21.4			16.4	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			15.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			56.6			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			45.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												





















HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)
 5: Highland Avenue & Floral Avenue 11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	497	212	295	596	130	253	235	146	45	474	332
Future Volume (veh/h)	193	497	212	295	596	130	253	235	146	45	474	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	208	534	228	317	641	140	272	253	157	48	510	357
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	295	1178	366	441	970	431	346	1092	487	62	840	658
Arrive On Green	0.09	0.23	0.23	0.13	0.28	0.28	0.10	0.31	0.31	0.04	0.24	0.24
Sat Flow, veh/h	3428	5066	1572	3428	3526	1566	3428	3526	1572	1767	3526	2762
Grp Volume(v), veh/h	208	534	228	317	641	140	272	253	157	48	510	357
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1566	1714	1763	1572	1767	1763	1381
Q Serve(g_s), s	4.0	6.1	5.9	6.0	10.9	3.6	5.2	3.6	5.2	1.8	8.7	7.6
Cycle Q Clear(g_c), s	4.0	6.1	5.9	6.0	10.9	3.6	5.2	3.6	5.2	1.8	8.7	7.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	1178	366	441	970	431	346	1092	487	62	840	658
V/C Ratio(X)	0.70	0.45	0.62	0.72	0.66	0.33	0.79	0.23	0.32	0.77	0.61	0.54
Avail Cap(c_a), veh/h	295	1812	563	809	1842	818	346	2020	901	189	1989	1558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	22.2	10.3	28.2	21.6	11.2	29.6	17.3	17.8	32.2	22.9	22.5
Incr Delay (d2), s/veh	7.4	0.3	1.7	2.2	0.8	0.4	11.4	0.1	0.4	18.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.3	2.9	2.5	4.3	1.5	2.5	1.3	1.7	1.0	3.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	22.4	12.1	30.4	22.4	11.6	40.9	17.4	18.2	50.2	23.6	23.2
LnGrp LOS	D	C	B	C	C	B	D	B	B	D	C	C
Approach Vol, veh/h		970			1098			682			915	
Approach Delay, s/veh		23.2			23.4			27.0			24.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.9	20.9	12.0	20.6	11.0	23.7	6.6	26.1				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 5.2	* 5.2	* 4.2	* 5.2				
Max Green Setting (Gmax), s	* 16	* 24	6.8	* 38	* 5.8	* 35	* 7.2	* 39				
Max Q Clear Time (g_c+I1), s	8.0	8.1	7.2	10.7	6.0	12.9	3.8	7.2				
Green Ext Time (p_c), s	0.7	4.1	0.0	5.2	0.0	5.0	0.0	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			24.4									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

























HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout AM Peak (Weekday)

10: Highland Avenue & Rose Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	15	71	34	10	126	58	784	53	84	701	24
Future Volume (veh/h)	56	15	71	34	10	126	58	784	53	84	701	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	61	16	77	37	11	137	63	852	58	91	762	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	78	23	109	121	14	176	81	1943	132	115	2086	71
Arrive On Green	0.04	0.08	0.08	0.07	0.12	0.12	0.05	0.58	0.58	0.07	0.60	0.60
Sat Flow, veh/h	1767	278	1337	1767	118	1472	1767	3349	228	1767	3478	119
Grp Volume(v), veh/h	61	0	93	37	0	148	63	448	462	91	386	402
Grp Sat Flow(s),veh/h/ln	1767	0	1615	1767	0	1591	1767	1763	1814	1767	1763	1834
Q Serve(g_s), s	3.3	0.0	5.4	1.9	0.0	8.7	3.4	13.8	13.8	4.9	10.8	10.8
Cycle Q Clear(g_c), s	3.3	0.0	5.4	1.9	0.0	8.7	3.4	13.8	13.8	4.9	10.8	10.8
Prop In Lane	1.00		0.83	1.00		0.93	1.00		0.13	1.00		0.06
Lane Grp Cap(c), veh/h	78	0	131	121	0	191	81	1022	1052	115	1057	1100
V/C Ratio(X)	0.78	0.00	0.71	0.31	0.00	0.78	0.78	0.44	0.44	0.79	0.37	0.37
Avail Cap(c_a), veh/h	81	0	606	121	0	613	88	1022	1052	125	1057	1100
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	43.0	42.6	0.0	41.0	45.3	11.4	11.4	44.2	9.9	9.9
Incr Delay (d2), s/veh	36.7	0.0	6.8	1.4	0.0	6.6	32.8	1.4	1.3	26.2	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	2.3	0.9	0.0	3.7	2.2	5.0	5.1	2.9	3.8	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.1	0.0	49.8	44.0	0.0	47.6	78.1	12.7	12.7	70.4	10.8	10.8
LnGrp LOS	F	A	D	D	A	D	E	B	B	E	B	B
Approach Vol, veh/h		154			185			973			879	
Approach Delay, s/veh		62.6			46.9			16.9			17.0	
Approach LOS		E			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	61.0	10.7	13.8	8.6	62.9	8.4	16.1				
Change Period (Y+Rc), s	* 4.2	5.3	4.2	* 6	* 4.2	5.3	4.2	* 4.6				
Max Green Setting (Gmax), s	* 6.8	29.5	4.0	* 36	* 4.8	31.5	4.4	* 37				
Max Q Clear Time (g_c+I1), s	6.9	15.8	3.9	7.4	5.4	12.8	5.3	10.7				
Green Ext Time (p_c), s	0.0	4.5	0.0	0.4	0.0	4.3	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			22.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
























HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)
 1: Highland Avenue & Golden State Boulevard 11/28/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	614	636	17	90	515	32	30	564	632	67	307	99
Future Volume (veh/h)	614	636	17	90	515	32	30	564	632	67	307	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	667	691	0	98	560	35	33	613	687	73	334	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	1352	732		313	596	37	42	806	979	92	907	405
Arrive On Green	0.39	0.39	0.00	0.18	0.18	0.18	0.02	0.23	0.23	0.05	0.26	0.26
Sat Flow, veh/h	3428	1856	1572	1767	3370	210	1767	3526	1570	1767	3526	1572
Grp Volume(v), veh/h	667	691	0	98	293	302	33	613	687	73	334	108
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1767	1763	1817	1767	1763	1570	1767	1763	1572
Q Serve(g_s), s	18.4	45.3	0.0	6.1	20.6	20.7	2.3	20.5	28.8	5.1	9.8	6.9
Cycle Q Clear(g_c), s	18.4	45.3	0.0	6.1	20.6	20.7	2.3	20.5	28.8	5.1	9.8	6.9
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	1352	732		313	312	322	42	806	979	92	907	405
V/C Ratio(X)	0.49	0.94		0.31	0.94	0.94	0.79	0.76	0.70	0.79	0.37	0.27
Avail Cap(c_a), veh/h	1390	753		313	312	322	94	806	979	95	907	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	36.8	0.0	45.2	51.2	51.2	61.2	45.4	14.4	59.0	38.4	37.3
Incr Delay (d2), s/veh	0.3	20.1	0.0	0.6	34.9	34.9	27.2	6.7	4.2	34.0	1.2	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	24.0	0.0	2.7	12.0	12.4	1.4	9.5	22.9	3.1	4.3	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	56.9	0.0	45.7	86.0	86.0	88.4	52.0	18.6	93.0	39.5	38.9
LnGrp LOS	C	E		D	F	F	F	D	B	F	D	D
Approach Vol, veh/h		1358	A		693			1333			515	
Approach Delay, s/veh		43.2			80.3			35.7			47.0	
Approach LOS		D			F			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		54.6	10.8	33.4		27.2	7.2	37.0				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	* 4.2	4.6				
Max Green Setting (Gmax), s		51.1	* 6.8	27.2		22.3	* 6.7	27.3				
Max Q Clear Time (g_c+I1), s		47.3	7.1	30.8		22.7	4.3	11.8				
Green Ext Time (p_c), s		2.4	0.0	0.0		0.0	0.0	2.1				
Intersection Summary												
HCM 6th Ctrl Delay			47.7									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)

2: DeWolf Avenue & Floral Avenue

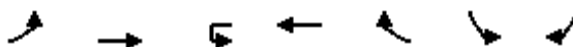
11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	242	14	195	209	419	15	202	262	313	20	1
Future Volume (veh/h)	1	242	14	195	209	419	15	202	262	313	20	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	263	15	212	227	455	16	220	285	340	22	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	295	17	514	879	745	24	259	677	370	616	28
Arrive On Green	0.00	0.17	0.17	0.29	0.47	0.47	0.01	0.14	0.14	0.21	0.35	0.35
Sat Flow, veh/h	1767	1739	99	1767	1856	1572	1767	1856	1572	1767	1761	80
Grp Volume(v), veh/h	1	0	278	212	227	455	16	220	285	340	0	23
Grp Sat Flow(s),veh/h/ln	1767	0	1838	1767	1856	1572	1767	1856	1572	1767	0	1841
Q Serve(g_s), s	0.1	0.0	18.6	12.2	9.2	11.4	1.1	14.6	0.0	23.7	0.0	1.0
Cycle Q Clear(g_c), s	0.1	0.0	18.6	12.2	9.2	11.4	1.1	14.6	0.0	23.7	0.0	1.0
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	2	0	312	514	879	745	24	259	677	370	0	644
V/C Ratio(X)	0.52	0.00	0.89	0.41	0.26	0.61	0.67	0.85	0.42	0.92	0.00	0.04
Avail Cap(c_a), veh/h	56	0	408	514	879	745	77	324	732	474	0	735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.9	0.0	51.2	36.0	19.9	4.4	61.9	52.9	25.0	48.8	0.0	27.0
Incr Delay (d2), s/veh	134.0	0.0	29.5	0.5	0.7	3.7	27.2	15.8	0.4	20.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	10.8	5.1	3.9	8.0	0.7	7.7	5.6	12.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	196.9	0.0	80.6	36.5	20.6	8.1	89.1	68.7	25.4	68.8	0.0	27.0
LnGrp LOS	F	A	F	D	C	A	F	E	C	E	A	C
Approach Vol, veh/h		279			894			521			363	
Approach Delay, s/veh		81.1			18.0			45.6			66.1	
Approach LOS		F			B			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	32.4	23.6	42.7	27.4	5.9	50.0	4.3	65.7				
Change Period (Y+Rc), s	6.0	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	33.8	* 22	21.8	* 28	* 5.5	50.3	* 4	45.8				
Max Q Clear Time (g_c+I1), s	25.7	16.6	14.2	20.6	3.1	3.0	2.1	13.4				
Green Ext Time (p_c), s	0.6	1.0	0.3	0.7	0.0	0.1	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			42.0									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout PM Peak (Weekday)

3: Floral Avenue & Project Driveway

11/28/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	334	316	32	585	480	857	242
Future Volume (vph)	334	316	32	585	480	857	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	343	35	636	522	932	263
RTOR Reduction (vph)	0	0	0	0	353	0	180
Lane Group Flow (vph)	363	343	35	636	169	932	83
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	30.6	67.3	4.1	40.8	40.8	39.8	39.8
Effective Green, g (s)	30.6	67.3	4.1	40.8	40.8	39.8	39.8
Actuated g/C Ratio	0.24	0.53	0.03	0.32	0.32	0.32	0.32
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	425	985	57	1134	507	1073	495
v/s Ratio Prot	c0.21	0.19	0.02	c0.18		c0.27	
v/s Ratio Perm					0.11		0.05
v/c Ratio	0.85	0.35	0.61	0.56	0.33	0.87	0.17
Uniform Delay, d1	45.6	16.8	60.2	35.2	32.3	40.6	31.1
Progression Factor	1.23	1.21	1.07	0.75	1.06	1.00	1.00
Incremental Delay, d2	13.2	0.8	14.8	1.6	1.4	7.6	0.2
Delay (s)	69.3	21.1	79.4	28.1	35.6	48.3	31.3
Level of Service	E	C	E	C	D	D	C
Approach Delay (s)		45.9		32.8		44.5	
Approach LOS		D		C		D	
Intersection Summary							
HCM 2000 Control Delay			40.3		HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio			0.75				
Actuated Cycle Length (s)			126.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			71.5%		ICU Level of Service		C
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout PM Peak (Weekday)

4: Floral Avenue & SR-99 SB Off-Ramp

























11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1600	70	111	1251	0	0	0	169	306	49	529
Future Volume (vph)	0	1600	70	111	1251	0	0	0	169	306	49	529
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.98	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.88	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1509	1461
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1509	1461
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1667	73	116	1303	0	0	0	176	319	51	551
RTOR Reduction (vph)	0	0	32	0	0	0	0	0	60	0	62	62
Lane Group Flow (vph)	0	1667	41	116	1303	0	0	0	116	319	242	236
Confl. Peds. (#/hr)												6
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		70.0	70.0	11.2	85.9				23.5	16.3	28.6	28.6
Effective Green, g (s)		70.0	70.0	11.2	85.9				23.5	16.3	28.6	28.6
Actuated g/C Ratio		0.56	0.56	0.09	0.68				0.19	0.13	0.23	0.23
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1947	871	155	2389				297	439	342	331
v/s Ratio Prot		c0.48		c0.07	0.37				0.07	0.09	0.16	
v/s Ratio Perm			0.03									c0.16
v/c Ratio		0.86	0.05	0.75	0.55				0.39	0.73	0.71	0.71
Uniform Delay, d1		23.7	12.8	56.0	10.2				45.0	52.7	44.9	44.9
Progression Factor		0.73	0.10	0.93	0.91				1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5	0.1	13.3	0.6				0.8	5.9	6.6	7.1
Delay (s)		21.8	1.3	65.4	9.9				45.8	58.6	51.4	52.0
Level of Service		C	A	E	A				D	E	D	D
Approach Delay (s)		20.9			14.5			45.8			54.1	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			27.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			126.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			80.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)

5: Highland Avenue & Floral Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	509	1029	412	417	824	226	365	502	187	88	654	505
Future Volume (veh/h)	509	1029	412	417	824	226	365	502	187	88	654	505
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	519	1050	420	426	841	231	372	512	191	90	667	515
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	522	1289	577	804	1214	542	386	632	282	303	839	1081
Arrive On Green	0.05	0.08	0.08	0.23	0.34	0.34	0.19	0.30	0.30	0.17	0.24	0.24
Sat Flow, veh/h	3428	5066	1572	3428	3526	1572	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	519	1050	420	426	841	231	372	512	191	90	667	515
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1572	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	19.1	25.7	18.2	13.7	25.9	8.7	13.6	16.9	13.4	5.6	22.4	11.1
Cycle Q Clear(g_c), s	19.1	25.7	18.2	13.7	25.9	8.7	13.6	16.9	13.4	5.6	22.4	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	522	1289	577	804	1214	542	386	632	282	303	839	1081
V/C Ratio(X)	0.99	0.81	0.73	0.53	0.69	0.43	0.96	0.81	0.68	0.30	0.79	0.48
Avail Cap(c_a), veh/h	522	1379	605	804	1214	542	386	1122	500	303	1063	1256
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.49	0.49	1.00	1.00	1.00	0.38	0.38	0.38	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.8	54.8	44.5	42.2	35.6	11.9	50.9	42.1	40.9	45.6	45.1	13.4
Incr Delay (d2), s/veh	25.9	2.9	4.0	0.7	3.3	2.4	19.8	1.0	1.1	0.5	3.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	12.0	8.1	5.9	11.6	3.2	6.3	6.4	4.7	2.5	10.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.7	57.7	48.5	42.8	38.8	14.4	70.7	43.1	42.0	46.1	48.4	13.7
LnGrp LOS	F	E	D	D	D	B	E	D	D	D	D	B
Approach Vol, veh/h	1989				1498				1075			
Approach Delay, s/veh	63.1				36.2				52.5			
Approach LOS	E				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.7	37.3	19.4	34.6	23.4	48.6	26.8	27.2				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.2	* 4.6	* 4.2	* 5.2	5.2	* 4.6				
Max Green Setting (Gmax), s	* 19	* 34	14.2	* 38	* 19	* 35	13.1	* 40				
Max Q Clear Time (g_c+I1), s	15.7	27.7	15.6	24.4	21.1	27.9	7.6	18.9				
Green Ext Time (p_c), s	0.6	4.4	0.0	5.6	0.0	3.8	0.1	3.7				






















Intersection Summary

HCM 6th Ctrl Delay	47.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

























HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout PM Peak (Weekday)
 10: Highland Avenue & Rose Avenue 11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	15	77	46	15	127	88	1086	58	135	1293	66
Future Volume (veh/h)	38	15	77	46	15	127	88	1086	58	135	1293	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	40	16	81	48	16	134	93	1143	61	142	1361	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	55	34	172	62	22	188	119	1413	75	211	1650	83
Arrive On Green	0.03	0.13	0.13	0.03	0.13	0.13	0.07	0.42	0.42	0.12	0.48	0.48
Sat Flow, veh/h	1767	266	1347	1767	171	1428	1767	3404	182	1767	3414	173
Grp Volume(v), veh/h	40	0	97	48	0	150	93	592	612	142	701	729
Grp Sat Flow(s),veh/h/ln	1767	0	1613	1767	0	1599	1767	1763	1823	1767	1763	1824
Q Serve(g_s), s	1.5	0.0	3.8	1.8	0.0	6.2	3.6	20.3	20.3	5.3	23.4	23.6
Cycle Q Clear(g_c), s	1.5	0.0	3.8	1.8	0.0	6.2	3.6	20.3	20.3	5.3	23.4	23.6
Prop In Lane	1.00		0.84	1.00		0.89	1.00		0.10	1.00		0.09
Lane Grp Cap(c), veh/h	55	0	206	62	0	210	119	732	757	211	852	882
V/C Ratio(X)	0.73	0.00	0.47	0.78	0.00	0.71	0.78	0.81	0.81	0.67	0.82	0.83
Avail Cap(c_a), veh/h	124	0	846	103	0	853	149	927	959	237	1015	1050
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	27.8	32.8	0.0	28.6	31.5	17.7	17.7	28.9	15.2	15.3
Incr Delay (d2), s/veh	16.7	0.0	1.7	18.6	0.0	4.5	18.7	4.3	4.2	6.3	4.8	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	1.1	0.0	2.5	2.0	7.6	7.9	2.4	8.5	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.0	29.5	51.4	0.0	33.0	50.2	21.9	21.8	35.2	20.0	20.0
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h	137		198				1297				1572	
Approach Delay, s/veh	35.3		37.5				23.9				21.4	
Approach LOS	D		D				C				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	33.8	6.6	14.8	8.8	38.5	6.3	15.0				
Change Period (Y+Rc), s	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3	* 4.2	* 6				
Max Green Setting (Gmax), s	9.2	* 36	* 4	36.0	* 5.8	39.5	* 4.8	* 37				
Max Q Clear Time (g_c+I1), s	7.3	22.3	3.8	5.8	5.6	25.6	3.5	8.2				
Green Ext Time (p_c), s	0.1	6.2	0.0	0.4	0.0	7.6	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay	24.0											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)
























1: Highland Avenue & Golden State Boulevard

11/28/2018

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	497	465	44	54	510	123	84	643	340	111	422	55
Future Volume (veh/h)	497	465	44	54	510	123	84	643	340	111	422	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	512	479	0	56	526	127	87	663	351	114	435	57
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	983	532		363	579	139	363	994	894	138	534	237
Arrive On Green	0.29	0.29	0.00	0.21	0.21	0.21	0.21	0.28	0.28	0.08	0.15	0.15
Sat Flow, veh/h	3428	1856	1572	1767	2819	678	1767	3526	1572	1767	3526	1562
Grp Volume(v), veh/h	512	479	0	56	328	325	87	663	351	114	435	57
Grp Sat Flow(s),veh/h/ln	1714	1856	1572	1767	1763	1734	1767	1763	1572	1767	1763	1562
Q Serve(g_s), s	15.8	31.3	0.0	3.3	22.9	23.1	5.2	21.0	15.6	8.0	15.0	4.0
Cycle Q Clear(g_c), s	15.8	31.3	0.0	3.3	22.9	23.1	5.2	21.0	15.6	8.0	15.0	4.0
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	983	532		363	362	356	363	994	894	138	534	237
V/C Ratio(X)	0.52	0.90		0.15	0.91	0.91	0.24	0.67	0.39	0.82	0.81	0.24
Avail Cap(c_a), veh/h	1097	593		377	376	370	363	994	894	165	764	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	43.2	0.0	41.1	48.9	49.0	41.8	40.0	15.1	57.2	51.7	47.1
Incr Delay (d2), s/veh	0.4	15.8	0.0	0.2	24.4	25.9	0.3	3.5	1.3	24.0	12.8	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	16.4	0.0	1.4	12.4	12.4	2.3	9.4	10.2	4.4	7.5	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	59.0	0.0	41.3	73.3	74.8	42.2	43.5	16.4	81.2	64.5	49.5
LnGrp LOS	D	E		D	E	E	D	D	B	F	E	D
Approach Vol, veh/h		991	A		709			1101			606	
Approach Delay, s/veh		48.2			71.5			34.8			66.3	
Approach LOS		D			E			C			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		41.0	14.1	40.1		30.8	30.5	23.7				
Change Period (Y+Rc), s		4.9	* 4.2	4.6		4.9	4.6	* 4.6				
Max Green Setting (Gmax), s		40.3	* 12	28.4		26.9	12.9	* 27				
Max Q Clear Time (g_c+I1), s		33.3	10.0	23.0		25.1	7.2	17.0				
Green Ext Time (p_c), s		2.9	0.0	2.6		0.8	0.1	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			51.9									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday) 2: DeWolf Avenue & Floral Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	206	8	215	206	412	11	199	290	331	15	0
Future Volume (veh/h)	0	206	8	215	206	412	11	199	290	331	15	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	0	219	9	229	219	438	12	212	309	352	16	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	1	252	10	584	965	818	19	251	732	382	632	0
Arrive On Green	0.00	0.14	0.14	0.33	0.52	0.52	0.01	0.14	0.14	0.22	0.34	0.00
Sat Flow, veh/h	1767	1770	73	1767	1856	1572	1767	1856	1572	1767	1856	0
Grp Volume(v), veh/h	0	0	228	229	219	438	12	212	309	352	16	0
Grp Sat Flow(s),veh/h/ln	1767	0	1842	1767	1856	1572	1767	1856	1572	1767	1856	0
Q Serve(g_s), s	0.0	0.0	15.3	12.6	8.1	23.3	0.9	14.1	7.7	24.6	0.7	0.0
Cycle Q Clear(g_c), s	0.0	0.0	15.3	12.6	8.1	23.3	0.9	14.1	7.7	24.6	0.7	0.0
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1	0	262	584	965	818	19	251	732	382	632	0
V/C Ratio(X)	0.00	0.00	0.87	0.39	0.23	0.54	0.62	0.85	0.42	0.92	0.03	0.00
Avail Cap(c_a), veh/h	56	0	380	584	965	818	56	309	782	488	763	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	52.9	32.5	16.4	20.1	62.1	53.2	7.7	48.3	27.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	30.4	0.4	0.5	2.5	28.7	16.1	0.4	19.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	9.0	5.2	3.3	8.3	0.5	7.4	2.9	12.4	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	83.3	32.9	17.0	22.6	90.7	69.3	8.1	68.3	27.7	0.0
LnGrp LOS	A	A	F	C	B	C	F	E	A	E	C	A
Approach Vol, veh/h	228		886				533			368		
Approach Delay, s/veh	83.3		23.9				34.3			66.5		
Approach LOS	F		C				C			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.4	23.0	47.6	23.9	5.6	48.9	0.0	71.5				
Change Period (Y+Rc), s	* 4.2	6.0	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 35	21.0	23.8	* 26	* 4	51.8	* 4	45.8				
Max Q Clear Time (g_c+I1), s	26.6	16.1	14.6	17.3	2.9	2.7	0.0	25.3				
Green Ext Time (p_c), s	0.7	1.0	0.4	0.6	0.0	0.0	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay	41.2											
HCM 6th LOS	D											
Notes												

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout MD Peak (Saturday)

3: Floral Avenue & Project Driveway

11/28/2018




Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	363	323	37	626	522	973	269
Future Volume (vph)	363	323	37	626	522	973	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	1845	1752	3505	1568	3400	1568
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1845	1752	3505	1568	3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	395	351	40	680	567	1058	292
RTOR Reduction (vph)	0	0	0	0	405	0	172
Lane Group Flow (vph)	395	351	40	680	162	1058	120
Turn Type	Prot	NA	Prot	NA	Perm	Prot	Perm
Protected Phases	7	4	3	8		6	
Permitted Phases					8		6
Actuated Green, G (s)	31.8	62.1	5.7	36.0	36.0	43.4	43.4
Effective Green, g (s)	31.8	62.1	5.7	36.0	36.0	43.4	43.4
Actuated g/C Ratio	0.25	0.49	0.05	0.29	0.29	0.34	0.34
Clearance Time (s)	4.2	6.0	4.2	6.0	6.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	442	909	79	1001	448	1171	540
v/s Ratio Prot	c0.23	0.19	0.02	c0.19		c0.31	
v/s Ratio Perm					0.10		0.08
v/c Ratio	0.89	0.39	0.51	0.68	0.36	0.90	0.22
Uniform Delay, d1	45.5	20.0	58.8	39.9	35.8	39.3	29.3
Progression Factor	0.85	0.93	1.01	0.98	1.67	1.00	1.00
Incremental Delay, d2	17.4	1.0	4.1	3.0	1.8	9.9	0.2
Delay (s)	56.1	19.7	63.5	42.2	61.6	49.2	29.5
Level of Service	E	B	E	D	E	D	C
Approach Delay (s)		39.0		51.4		44.9	
Approach LOS		D		D		D	
Intersection Summary							
HCM 2000 Control Delay			46.1		HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio			0.83				
Actuated Cycle Length (s)			126.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			77.5%		ICU Level of Service		D
Analysis Period (min)			15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis - Dinuba + Project Buildout MD Peak (Saturday) 4: SR 99 SB Off-Ramp & Floral Avenue

























11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑	↑↑				↑	↑↑	↑	↑
Traffic Volume (vph)	0	1726	86	108	1261	0	0	0	159	192	32	555
Future Volume (vph)	0	1726	86	108	1261	0	0	0	159	192	32	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	4.7	6.3				4.7	5.2	5.2	5.2
Lane Util. Factor		0.95	1.00	1.00	0.95				1.00	0.97	0.95	0.95
Frpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	0.99	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00				0.86	1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (prot)		3505	1568	1752	3505				1596	3400	1500	1470
Flt Permitted		1.00	1.00	0.95	1.00				1.00	0.95	1.00	1.00
Satd. Flow (perm)		3505	1568	1752	3505				1596	3400	1500	1470
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1798	90	112	1314	0	0	0	166	200	33	578
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	62	0	62	66
Lane Group Flow (vph)	0	1798	53	113	1314	0	0	0	104	200	248	235
Confl. Peds. (#/hr)												1
Turn Type		NA	Perm	Prot	NA				pt+ov	Prot	NA	Perm
Protected Phases		2		1	6				1 8	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		73.6	73.6	10.1	88.4				19.8	11.7	26.1	26.1
Effective Green, g (s)		73.6	73.6	10.1	88.4				19.8	11.7	26.1	26.1
Actuated g/C Ratio		0.58	0.58	0.08	0.70				0.16	0.09	0.21	0.21
Clearance Time (s)		6.3	6.3	4.7	6.3					5.2	5.2	5.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2047	915	140	2459				250	315	310	304
v/s Ratio Prot		c0.51		c0.06	0.37				0.06	0.06	c0.17	
v/s Ratio Perm			0.03									0.16
v/c Ratio		0.88	0.06	0.81	0.53				0.41	0.63	0.80	0.77
Uniform Delay, d1		22.4	11.3	57.0	9.0				47.9	55.1	47.5	47.2
Progression Factor		0.54	0.29	0.84	0.75				1.00	1.00	1.00	1.00
Incremental Delay, d2		4.9	0.1	20.8	0.6				1.1	4.1	13.7	11.6
Delay (s)		17.0	3.4	68.8	7.3				49.0	59.2	61.2	58.8
Level of Service		B	A	E	A				D	E	E	E
Approach Delay (s)		16.3			12.2			49.0			59.8	
Approach LOS		B			B			D			E	
Intersection Summary												
HCM 2000 Control Delay			24.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			126.0			Sum of lost time (s)			20.9			
Intersection Capacity Utilization			80.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

5: Highland Avenue & Floral Avenue






















11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	525	1085	475	456	876	240	389	395	191	106	529	492
Future Volume (veh/h)	525	1085	475	456	876	240	389	395	191	106	529	492
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	541	1119	490	470	903	247	401	407	197	109	545	507
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	825	1279	578	906	973	426	395	872	389	134	722	1233
Arrive On Green	0.08	0.08	0.08	0.26	0.28	0.28	0.04	0.08	0.08	0.08	0.20	0.20
Sat Flow, veh/h	3428	5066	1572	3428	3526	1544	3428	3526	1572	1767	3526	2768
Grp Volume(v), veh/h	541	1119	490	470	903	247	401	407	197	109	545	507
Grp Sat Flow(s),veh/h/ln	1714	1689	1572	1714	1763	1544	1714	1763	1572	1767	1763	1384
Q Serve(g_s), s	19.3	27.5	24.0	14.7	31.4	13.8	14.5	13.9	8.1	7.7	18.3	0.0
Cycle Q Clear(g_c), s	19.3	27.5	24.0	14.7	31.4	13.8	14.5	13.9	8.1	7.7	18.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	825	1279	578	906	973	426	395	872	389	134	722	1233
V/C Ratio(X)	0.66	0.87	0.85	0.52	0.93	0.58	1.02	0.47	0.51	0.81	0.76	0.41
Avail Cap(c_a), veh/h	825	1307	587	906	991	434	395	1038	463	216	1063	1501
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.45	0.45	0.45	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	55.8	47.0	39.5	44.4	24.7	60.6	49.9	14.5	57.4	47.1	23.7
Incr Delay (d2), s/veh	0.9	4.1	7.1	0.5	16.0	5.7	37.1	0.2	0.5	11.6	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	13.0	11.0	6.3	15.8	5.5	8.7	6.6	3.0	3.8	8.1	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.8	59.9	54.1	40.1	60.4	30.3	97.8	50.1	15.0	68.9	48.9	23.9
LnGrp LOS	D	E	D	D	E	C	F	D	B	E	D	C
Approach Vol, veh/h	2150			1620				1005			1161	
Approach Delay, s/veh	57.0			49.9				62.3			39.9	
Approach LOS	E			D				E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	38.5	37.0	20.1	30.4	35.5	40.0	13.7	36.7				
Change Period (Y+Rc), s	* 5.2	* 5.2	5.6	* 4.6	* 5.2	* 5.2	* 4.2	5.6				
Max Green Setting (Gmax), s	* 21	* 33	14.5	* 38	* 19	* 35	* 15	37.1				
Max Q Clear Time (g_c+I1), s	16.7	29.5	16.5	20.3	21.3	33.4	9.7	15.9				
Green Ext Time (p_c), s	0.7	2.3	0.0	5.5	0.0	1.3	0.1	3.0				
Intersection Summary												
HCM 6th Ctrl Delay			52.6									
HCM 6th LOS			D									
Notes												

HCM 6th Signalized Intersection Summary 2030 w/ Dinuba + Project Buildout MD Peak (Saturday)

10: Highland Avenue & Rose Avenue

11/28/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	12	102	53	20	100	95	980	65	97	1113	69
Future Volume (veh/h)	41	12	102	53	20	100	95	980	65	97	1113	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	43	13	107	56	21	105	100	1032	68	102	1172	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	95	18	145	71	29	143	377	1808	119	130	1297	81
Arrive On Green	0.05	0.10	0.10	0.04	0.11	0.11	0.21	0.54	0.54	0.07	0.38	0.38
Sat Flow, veh/h	1767	173	1426	1767	269	1345	1767	3357	221	1767	3371	210
Grp Volume(v), veh/h	43	0	120	56	0	126	100	542	558	102	612	633
Grp Sat Flow(s),veh/h/ln	1767	0	1599	1767	0	1614	1767	1763	1816	1767	1763	1818
Q Serve(g_s), s	1.9	0.0	5.8	2.5	0.0	6.1	3.8	16.4	16.4	4.5	26.2	26.3
Cycle Q Clear(g_c), s	1.9	0.0	5.8	2.5	0.0	6.1	3.8	16.4	16.4	4.5	26.2	26.3
Prop In Lane	1.00		0.89	1.00		0.83	1.00		0.12	1.00		0.12
Lane Grp Cap(c), veh/h	95	0	163	71	0	171	377	949	978	130	678	699
V/C Ratio(X)	0.45	0.00	0.74	0.79	0.00	0.74	0.27	0.57	0.57	0.79	0.90	0.90
Avail Cap(c_a), veh/h	97	0	360	93	0	387	377	949	978	137	710	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	0.0	34.9	38.1	0.0	34.7	26.2	12.3	12.3	36.5	23.2	23.2
Incr Delay (d2), s/veh	3.4	0.0	6.3	27.8	0.0	6.1	0.4	2.5	2.4	24.6	17.6	17.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	2.4	1.6	0.0	2.6	1.5	5.9	6.1	2.7	12.8	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	0.0	41.2	65.8	0.0	40.7	26.6	14.8	14.7	61.0	40.8	40.6
LnGrp LOS	D	A	D	E	A	D	C	B	B	E	D	D
Approach Vol, veh/h	163		182			1200			1347			
Approach Delay, s/veh	40.9		48.5			15.7			42.2			
Approach LOS	D		D			B			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	48.4	7.4	14.1	22.4	36.1	8.5	13.1				
Change Period (Y+Rc), s	* 4.2	5.3	4.2	* 6	5.3	* 5.3	4.2	* 4.6				
Max Green Setting (Gmax), s	* 6.2	31.9	4.2	* 18	5.9	* 32	4.4	* 19				
Max Q Clear Time (g_c+I1), s	6.5	18.4	4.5	7.8	5.8	28.3	3.9	8.1				
Green Ext Time (p_c), s	0.0	5.5	0.0	0.3	0.0	2.5	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			31.6									
HCM 6th LOS			C									
Notes												

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	SE	NW	NW
Directions Served	L	L	T	R	L	T	TR	T	T	R	L	T
Maximum Queue (ft)	74	98	242	75	154	155	179	26	64	22	5	18
Average Queue (ft)	9	35	99	19	23	84	97	3	4	2	0	2
95th Queue (ft)	34	76	196	70	73	147	171	13	23	10	2	9
Link Distance (ft)			552			1279	1279	2501	2501			1043
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350	350		50	250					100	75	
Storage Blk Time (%)			14	0								
Queuing Penalty (veh)			32	1								

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW
Directions Served	T
Maximum Queue (ft)	30
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	1043
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	T	R	L	TR
Maximum Queue (ft)	30	129	70	45	44	29	90	46	250	64
Average Queue (ft)	4	41	15	7	9	8	37	10	109	17
95th Queue (ft)	19	87	46	27	28	27	75	33	187	47
Link Distance (ft)		2662		1469			2746			2605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		250		250	250		250	250	
Storage Blk Time (%)									0	
Queuing Penalty (veh)									0	

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	138	135	49	116	49	137	158	168	41
Average Queue (ft)	49	40	14	42	4	42	68	96	11
95th Queue (ft)	96	106	39	94	22	92	130	142	32
Link Distance (ft)		745		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	194	222	54	112	112	155	101	89	101	96	54
Average Queue (ft)	96	111	9	47	57	79	14	42	56	50	33
95th Queue (ft)	177	189	28	87	104	136	58	68	86	82	60
Link Distance (ft)	1267	1267			542	542	221			1842	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		6									
Queuing Penalty (veh)		2									

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	L	T	T	R	L
Maximum Queue (ft)	122	224	232	247	56	94	138	219	172	282	220	204
Average Queue (ft)	67	63	114	139	11	46	87	74	106	130	38	76
95th Queue (ft)	113	146	199	224	45	88	139	144	177	235	121	142
Link Distance (ft)			542	542	542				221	221		
Upstream Blk Time (%)								0		1	0	
Queuing Penalty (veh)								0		7	0	
Storage Bay Dist (ft)	105	105				40	150	150			250	170
Storage Blk Time (%)	3	1	9		1	10	2	0	2	1	0	0
Queuing Penalty (veh)	4	1	16		2	17	6	0	5	2	0	0

Intersection: 5: Highland Avenue & Floral Avenue

Movement	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	218	140	134	118	199	202	177	110	91
Average Queue (ft)	97	75	39	45	42	129	91	59	47
95th Queue (ft)	159	135	109	87	121	198	148	95	80
Link Distance (ft)		564	564			920	920		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	170			80	100		100	100	
Storage Blk Time (%)	1		2	1	0	14	5	0	0
Queuing Penalty (veh)	1		4	1	0	6	18	1	1

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	175	207	204	156	177	72
Average Queue (ft)	63	92	82	83	73	33
95th Queue (ft)	142	171	148	139	122	57
Link Distance (ft)	176	176	546	546	1191	
Upstream Blk Time (%)	0	1				
Queuing Penalty (veh)	1	2				
Storage Bay Dist (ft)					250	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	NW	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	L	L	T
Maximum Queue (ft)	53	158	192	84	154	96	89	102	108	56	68	63
Average Queue (ft)	12	55	82	26	55	43	24	44	67	15	33	23
95th Queue (ft)	36	126	157	61	120	93	64	87	102	41	63	49
Link Distance (ft)		546	546		2646	2646		980	980			2914
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			120	120	
Storage Blk Time (%)		4		1	1			0	14			
Queuing Penalty (veh)		1		2	1			0	3			

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW
Directions Served	T
Maximum Queue (ft)	72
Average Queue (ft)	25
95th Queue (ft)	56
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	349	103	224	219	129	301	194	350	144
Average Queue (ft)	100	159	49	110	47	61	157	105	199	51
95th Queue (ft)	183	308	90	183	114	126	242	205	316	102
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	13	23	2	19	1	8	32	3	24	
Queuing Penalty (veh)	41	27	7	34	2	30	29	16	22	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	557	325	237	232	139	575	328
Average Queue (ft)	267	205	112	108	121	209	82
95th Queue (ft)	480	365	202	206	168	452	198
Link Distance (ft)	1240		1501	1501		564	564
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						1	
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	36	26			43	2	
Queuing Penalty (veh)	94	69			121	10	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	101	89	75	140	136	281	293	114	204	244
Average Queue (ft)	39	37	29	57	43	111	104	61	81	99
95th Queue (ft)	80	64	60	104	90	211	234	106	187	201
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				0		1				
Queuing Penalty (veh)				0		0				

Network Summary

Network wide Queuing Penalty: 640

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	B29	SB	SB	SB	SE	SE	SE	SE
Directions Served	L	L	T	R	T	L	T	TR	L	T	T	R
Maximum Queue (ft)	208	500	605	70	68	115	365	394	300	398	457	200
Average Queue (ft)	118	196	392	6	3	56	221	248	12	158	158	124
95th Queue (ft)	186	426	552	38	24	110	339	379	101	273	310	236
Link Distance (ft)			534		946		1279	1279		2501	2501	
Upstream Blk Time (%)			2									
Queuing Penalty (veh)			28									
Storage Bay Dist (ft)	350	350		50		250			200			100
Storage Blk Time (%)			54	0			11			5	24	8
Queuing Penalty (veh)			343	1			10			1	154	23

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW	NW	NW
Directions Served	L	T	T	R
Maximum Queue (ft)	101	146	164	8
Average Queue (ft)	26	53	57	1
95th Queue (ft)	74	115	120	4
Link Distance (ft)		1154	1154	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	75			120
Storage Blk Time (%)	4	4	1	
Queuing Penalty (veh)	6	3	1	

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	B34	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	T	L	T	R	L	TR
Maximum Queue (ft)	24	244	198	154	249	796	51	285	179	293	88
Average Queue (ft)	1	152	116	84	135	52	14	159	102	188	9
95th Queue (ft)	10	228	185	165	223	372	39	251	178	278	43
Link Distance (ft)		2662		1470		744		2746			2605
Upstream Blk Time (%)						0					
Queuing Penalty (veh)						1					
Storage Bay Dist (ft)	250		250		250		250		250	250	
Storage Blk Time (%)		0			0			1		2	
Queuing Penalty (veh)		0			0			3		1	

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	U	T	T	R	L	L	R
Maximum Queue (ft)	369	429	76	374	289	278	364	408	107
Average Queue (ft)	256	129	29	220	152	110	256	275	49
95th Queue (ft)	360	279	70	346	277	208	359	376	87
Link Distance (ft)		744		874	874			1678	1678
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	250		250			250	250		
Storage Blk Time (%)	12	0		8	0	0	6	14	
Queuing Penalty (veh)	39	0		2	2	1	28	58	

Intersection: 4: Floral Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	960	983	220	169	257	236	233	436	438	453	221
Average Queue (ft)	764	785	82	79	132	153	93	242	270	166	127
95th Queue (ft)	1097	1161	255	142	223	242	191	430	445	350	205
Link Distance (ft)	1267	1267			532	532	229			1840	
Upstream Blk Time (%)							0				
Queuing Penalty (veh)							0				
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		50		0	2			3	11	0	
Queuing Penalty (veh)		35		1	3			16	61	0	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	165	225	559	587	614	160	200	241	362	316	241	179
Average Queue (ft)	163	223	531	532	514	144	170	216	256	209	95	44
95th Queue (ft)	170	232	660	635	692	193	228	274	383	318	239	137
Link Distance (ft)			532	532	532				241	241		154
Upstream Blk Time (%)			23	10	13			4	7	4	0	0
Queuing Penalty (veh)			156	68	90			0	55	30	0	2
Storage Bay Dist (ft)	105	105				40	150	150				250
Storage Blk Time (%)	78	66	49		22	35	26	15	20	4	0	
Queuing Penalty (veh)	266	226	250		90	121	107	63	83	9	2	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	146	228	285	610	611	130	200	428	444	200	150
Average Queue (ft)	17	217	274	501	442	65	105	247	248	174	74
95th Queue (ft)	85	259	330	731	721	139	227	370	400	248	135
Link Distance (ft)	154			563	563			946	946		
Upstream Blk Time (%)	0			14	2						
Queuing Penalty (veh)	0			101	11						
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		59	74	18	24	0	4	33	21	2	1
Queuing Penalty (veh)		147	187	64	44	1	13	29	107	7	3

Intersection: 6: SR-99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	T	L	R
Maximum Queue (ft)	224	247	202	212	301	333	455	370
Average Queue (ft)	29	38	7	7	73	68	266	107
95th Queue (ft)	105	112	67	70	197	192	404	260
Link Distance (ft)	154	154	241	241	542	542	1191	
Upstream Blk Time (%)	1	1						
Queuing Penalty (veh)	5	5						
Storage Bay Dist (ft)							250	
Storage Blk Time (%)							17	
Queuing Penalty (veh)							38	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	144	494	509	150	243	258	219	305	382	140	173	175
Average Queue (ft)	35	150	182	64	132	134	86	113	115	9	86	97
95th Queue (ft)	103	318	372	136	237	253	172	244	241	67	147	164
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)		23		1	19		3	13	33		3	8
Queuing Penalty (veh)		10		4	16		8	16	6		10	30

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW	NW
Directions Served	T	T	R
Maximum Queue (ft)	212	198	150
Average Queue (ft)	98	100	5
95th Queue (ft)	167	157	49
Link Distance (ft)	2914		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	100
Storage Blk Time (%)	11	8	
Queuing Penalty (veh)	61	39	

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	740	219	225	220	130	1043	195	392	111
Average Queue (ft)	173	282	56	121	58	99	640	90	224	46
95th Queue (ft)	234	546	122	200	123	149	1051	193	384	89
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	41	30	0	20	1	36	53	0	24	
Queuing Penalty (veh)	158	71	1	28	2	255	63	2	13	

Intersection: 9: Highland Avenue & SR-99 SB Off-Ramp

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	R	L	T	T
Maximum Queue (ft)	241	202	991	989	420	140	529	545
Average Queue (ft)	150	108	431	401	70	138	330	264
95th Queue (ft)	215	184	931	924	328	144	497	471
Link Distance (ft)	1240		1501	1501			563	563
Upstream Blk Time (%)								0
Queuing Penalty (veh)								0
Storage Bay Dist (ft)		175			300	65		
Storage Blk Time (%)	3	0		21		49	8	
Queuing Penalty (veh)	9	0		12		237	38	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	74	121	94	152	136	326	326	246	374	387
Average Queue (ft)	27	41	37	66	61	169	168	81	172	189
95th Queue (ft)	66	84	79	111	116	281	279	157	336	347
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	150		150		250			250		
Storage Blk Time (%)				0		3		0	3	
Queuing Penalty (veh)				0		2		1	4	

Network Summary

Network wide Queuing Penalty: 4296

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	SE	SE	NW
Directions Served	L	L	T	R	L	T	TR	L	T	T	R	L
Maximum Queue (ft)	245	264	414	370	369	509	508	125	290	315	200	141
Average Queue (ft)	74	98	201	12	45	280	340	20	161	154	46	67
95th Queue (ft)	156	170	330	122	194	455	487	67	245	250	174	119
Link Distance (ft)			540			1279	1279		2501	2501		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350	350		250	250			200			100	75
Storage Blk Time (%)			4			18			3	23	1	9
Queuing Penalty (veh)			24			10			3	80	3	19

Intersection: 1: Highland Avenue & Golden State Boulevard

Movement	NW	NW
Directions Served	T	T
Maximum Queue (ft)	168	207
Average Queue (ft)	87	88
95th Queue (ft)	152	164
Link Distance (ft)	1154	1154
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	10	4
Queuing Penalty (veh)	11	2

Intersection: 2: DeWolf Avenue & Floral Avenue

Movement	EB	WB	WB	WB	B34	NB	NB	NB	SB	SB
Directions Served	TR	L	T	R	T	L	T	R	L	TR
Maximum Queue (ft)	208	303	233	214	776	50	311	184	370	466
Average Queue (ft)	132	155	101	105	50	12	171	82	208	19
95th Queue (ft)	206	253	193	194	359	35	262	136	326	157
Link Distance (ft)	2662		1475		739		2746			2605
Upstream Blk Time (%)					0					
Queuing Penalty (veh)					1					
Storage Bay Dist (ft)		250		250		250		250	250	
Storage Blk Time (%)		2	0				2		7	
Queuing Penalty (veh)		14	0				6		1	

Intersection: 3: Floral Avenue & Project Driveway

Movement	EB	EB	WB	WB	WB	WB	B28	B28	SB	SB	SB
Directions Served	L	T	U	T	T	R	T	T	L	L	R
Maximum Queue (ft)	369	469	370	993	969	370	1331	1280	370	453	168
Average Queue (ft)	246	142	168	769	745	273	405	416	285	302	50
95th Queue (ft)	363	347	441	1230	1265	477	1177	1181	401	433	99
Link Distance (ft)		739		874	874		1267	1267		1678	1678
Upstream Blk Time (%)				31	34		3	2			
Queuing Penalty (veh)				286	308		25	21			
Storage Bay Dist (ft)	250		250			250			250		
Storage Blk Time (%)	12	0		72	25	16			13	18	
Queuing Penalty (veh)	38	1		27	129	51			65	88	

Intersection: 4: SR 99 SB Off-Ramp & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	R	L	L	TR	R
Maximum Queue (ft)	1269	1284	220	260	348	353	140	142	333	410	382
Average Queue (ft)	701	734	95	105	127	139	84	65	133	173	164
95th Queue (ft)	1208	1227	270	190	265	276	145	121	262	323	315
Link Distance (ft)	1267	1267			532	532	229			1840	
Upstream Blk Time (%)	0	0									
Queuing Penalty (veh)	1	2									
Storage Bay Dist (ft)			100	160				380	380		380
Storage Blk Time (%)		51		1	6					0	0
Queuing Penalty (veh)		44		3	6					1	0

Intersection: 5: Highland Avenue & Floral Avenue

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B35
Directions Served	L	L	T	T	T	R	L	L	T	T	R	T
Maximum Queue (ft)	165	225	573	582	585	160	200	216	308	310	216	282
Average Queue (ft)	158	216	505	507	481	122	148	203	272	269	164	105
95th Queue (ft)	184	274	672	665	717	210	211	250	334	339	286	258
Link Distance (ft)			532	532	532				216	216		182
Upstream Blk Time (%)			11	10	11		0	4	26	27	1	7
Queuing Penalty (veh)			76	68	78		0	0	187	192	0	48
Storage Bay Dist (ft)	105	105				40	150	150			250	
Storage Blk Time (%)	65	54	54		27	35	9	10	40	27	1	
Queuing Penalty (veh)	236	195	285		127	127	37	42	183	64	5	

Intersection: 5: Highland Avenue & Floral Avenue

Movement	B35	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	L	T	T	R	R
Maximum Queue (ft)	245	227	284	474	498	130	198	250	281	200	150
Average Queue (ft)	100	180	208	193	128	63	81	141	120	101	80
95th Queue (ft)	249	258	298	371	291	124	145	217	207	181	147
Link Distance (ft)	182			565	565			939	939		
Upstream Blk Time (%)	7										
Queuing Penalty (veh)	50										
Storage Bay Dist (ft)		170	170			80	100			100	100
Storage Blk Time (%)		15	25	3	12	1	8	19	7	7	3
Queuing Penalty (veh)		29	49	12	24	1	22	20	35	19	9

Intersection: 6: SR 99 NB Off-Ramp & Floral Avenue

Movement	EB	EB	B35	WB	WB	NB	NB
Directions Served	T	T	T	T	T	L	R
Maximum Queue (ft)	134	140	31	352	338	356	360
Average Queue (ft)	59	82	1	149	148	172	88
95th Queue (ft)	115	134	10	289	280	302	218
Link Distance (ft)	182	182	216	542	542	1192	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)						250	
Storage Blk Time (%)						5	
Queuing Penalty (veh)						12	

Intersection: 7: Whitson Street & Floral Avenue

Movement	EB	EB	EB	WB	WB	WB	SE	SE	SE	SE	NW	NW
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	L
Maximum Queue (ft)	144	316	339	149	187	248	220	252	264	140	194	269
Average Queue (ft)	27	104	145	50	80	93	105	152	164	5	92	123
95th Queue (ft)	88	243	273	115	153	190	201	229	233	46	188	216
Link Distance (ft)		542	542		2646	2646		874	874			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	80			100			120			70	120	120
Storage Blk Time (%)	0	11		1	4		9	29	61		7	14
Queuing Penalty (veh)	1	5		3	3		23	31	7		20	44

Intersection: 7: Whitson Street & Floral Avenue

Movement	NW	NW
Directions Served	T	T
Maximum Queue (ft)	360	192
Average Queue (ft)	94	80
95th Queue (ft)	192	141
Link Distance (ft)	2914	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	10	6
Queuing Penalty (veh)	49	27

Intersection: 8: McCall Avenue & Floral Avenue

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	200	260	96	140	54	130	513	66	394	65
Average Queue (ft)	125	144	41	95	21	71	249	15	206	32
95th Queue (ft)	211	270	79	145	49	130	408	46	340	58
Link Distance (ft)		1238		1933			1928		1903	1903
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		100		100	65		120		
Storage Blk Time (%)	15	10	1	9		10	36		24	
Queuing Penalty (veh)	40	22	3	8		61	27		7	

Intersection: 9: Highland Avenue & SR 99 SB Ramps

Movement	EB	EB	NB	NB	SB	SB	SB
Directions Served	R	R	T	T	L	T	T
Maximum Queue (ft)	220	209	364	331	140	432	335
Average Queue (ft)	150	110	194	169	135	271	140
95th Queue (ft)	203	186	315	287	156	408	301
Link Distance (ft)	1240		1501	1501		565	565
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		175			65		
Storage Blk Time (%)	3	0		0	47	2	
Queuing Penalty (veh)	9	0		0	227	10	

Intersection: 10: Highland Avenue & Rose Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	73	117	105	94	96	219	216	180	306	304
Average Queue (ft)	30	41	42	52	54	126	123	73	140	165
95th Queue (ft)	67	79	79	82	92	220	224	137	260	277
Link Distance (ft)		2562		2527		2437	2437		605	605
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250		150		250			250		
Storage Blk Time (%)									1	
Queuing Penalty (veh)									1	

Network Summary

Network wide Queuing Penalty: 4128

Appendix L: Signal Warrants



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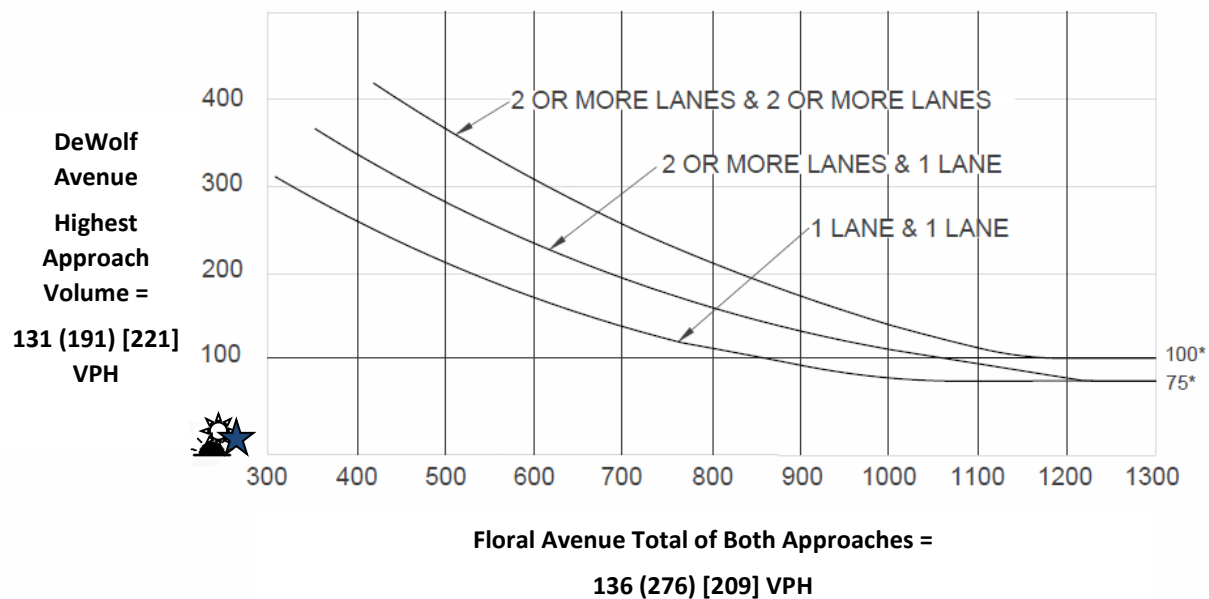
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Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions
2. DeWolf Avenue / Floral Avenue
AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  AM Peak Hour (Weekday) – Signal Warrant is Not Met
-  PM Peak Hour (Weekday) – Signal Warrant is Not Met
-  MD Peak Hour (Saturday) – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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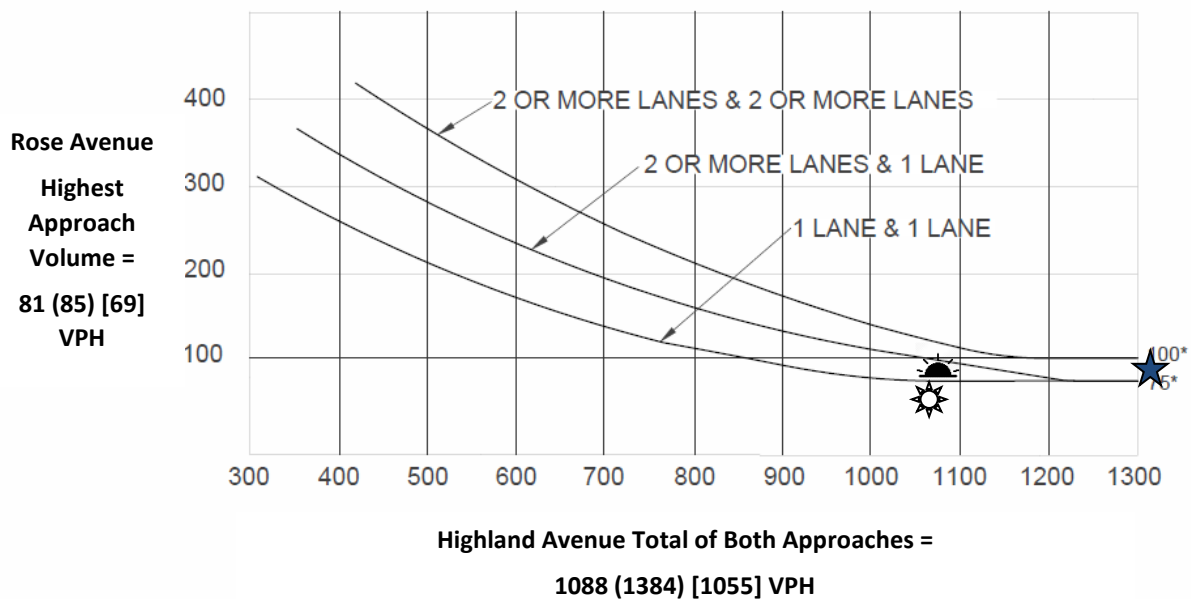
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Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions
10. Highland Avenue / Rose Avenue
AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  **AM Peak Hour (Weekday) – Signal Warrant is Not Met**
-  **PM Peak Hour (Weekday) – Signal Warrant is Met**
-  **MD Peak Hour (Saturday) – Signal Warrant is Not Met**

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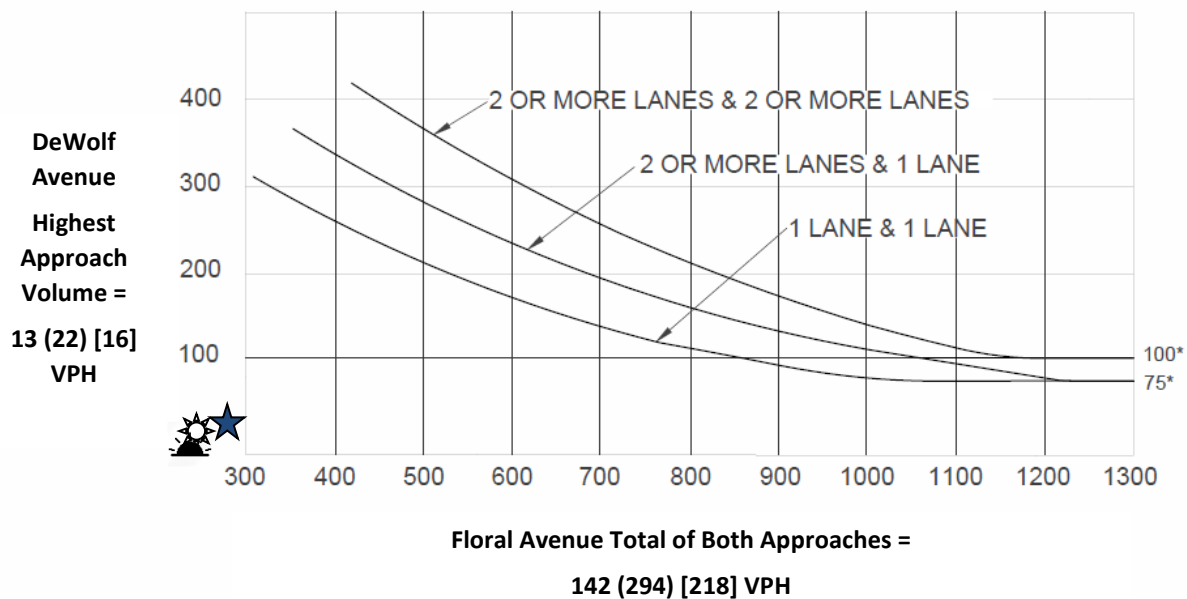
Warrant 3: Peak Hour (Rural)

Existing plus Dealership Traffic Conditions

2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  AM Peak Hour (Weekday) – Signal Warrant is Not Met
-  PM Peak Hour (Weekday) – Signal Warrant is Not Met
-  MD Peak Hour (Saturday) – Signal Warrant is Not Met

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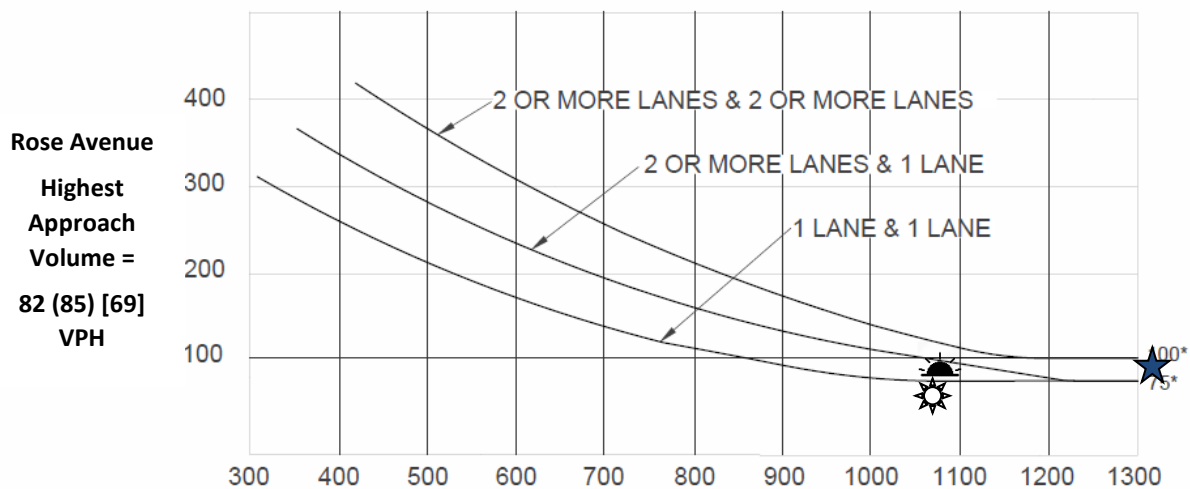
Warrant 3: Peak Hour (Rural)

Existing plus Dealership Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Highland Avenue Total of Both Approaches =

1091 (1387) [1057] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Not Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Not Met

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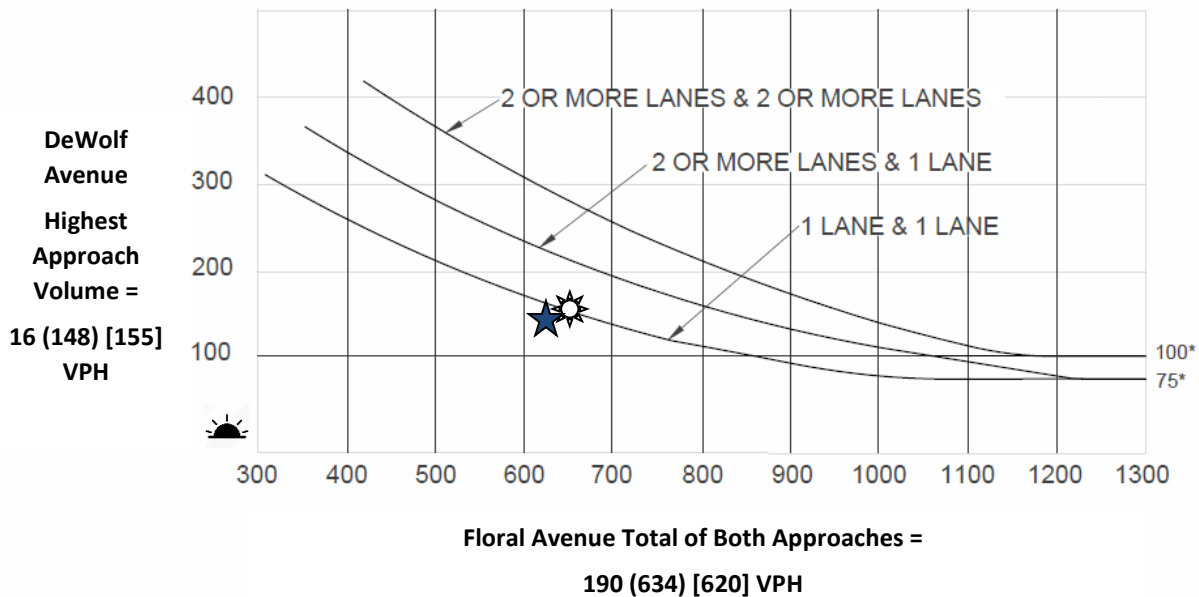
Warrant 3: Peak Hour (Rural)

Existing plus Project Buildout Traffic Conditions


2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  **AM Peak Hour (Weekday) – Signal Warrant is Not Met**
-  **PM Peak Hour (Weekday) – Signal Warrant is Not Met**
-  **MD Peak Hour (Saturday) – Signal Warrant is Not Met**

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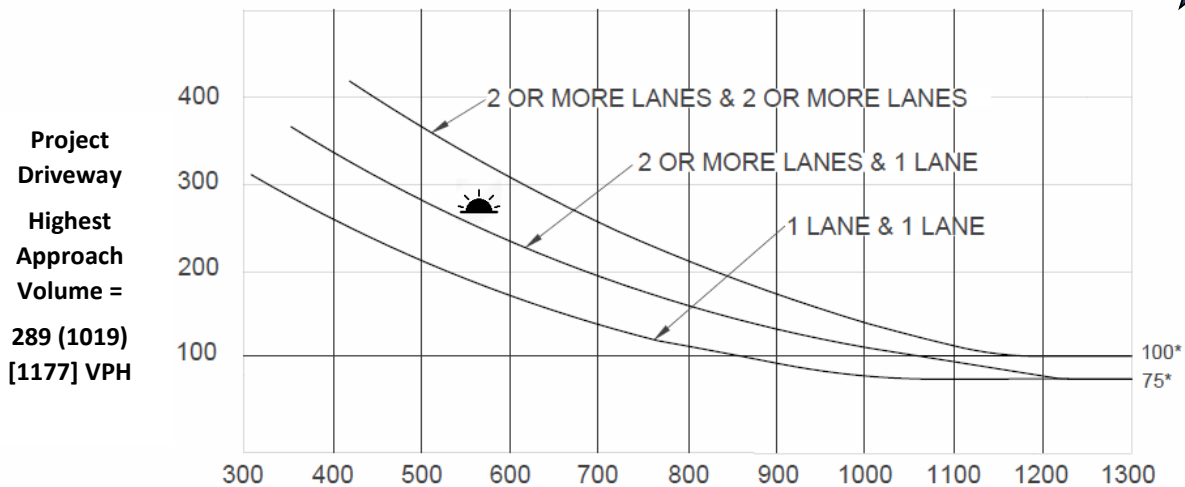
Warrant 3: Peak Hour (Rural)

Existing plus Project Buildout Traffic Conditions

3. Project Driveway / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Floral Avenue Total of Both Approaches =

586 (1459) [1542] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

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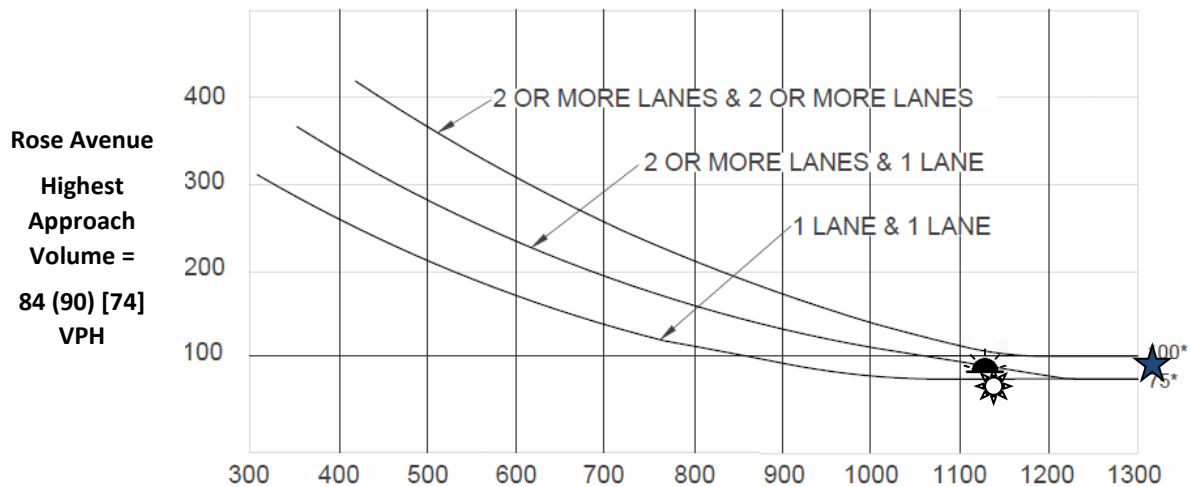
Warrant 3: Peak Hour (Rural)

Existing plus Project Buildout Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Highland Avenue Total of Both Approaches =

1116 (1458) [1140] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Not Met

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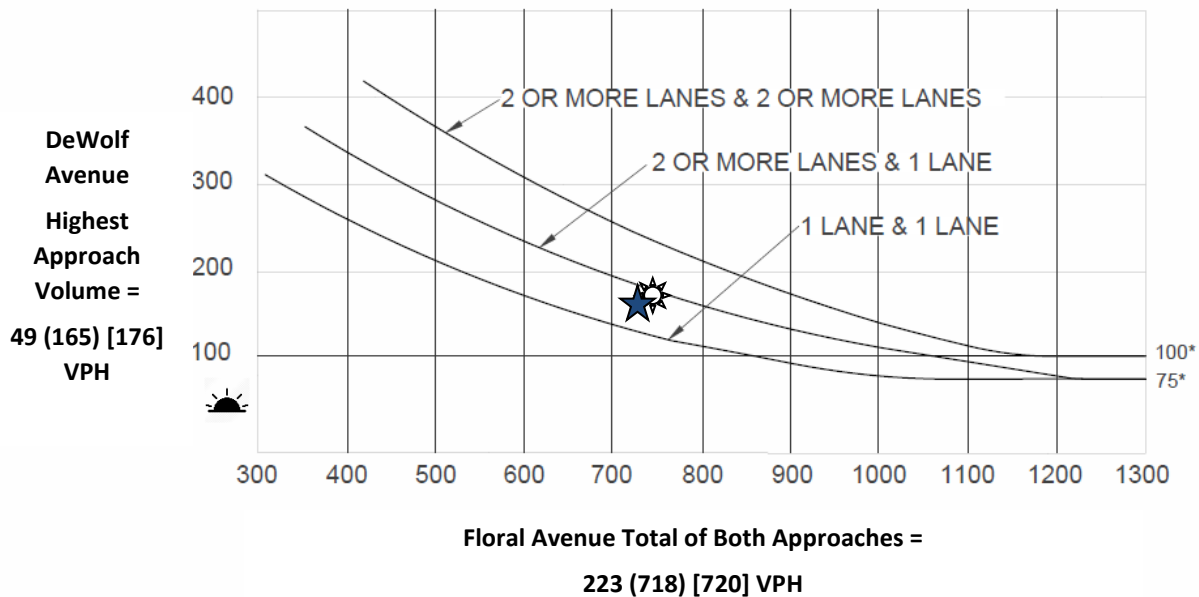
Warrant 3: Peak Hour (Rural)

Near Term Year 2025 plus Project Buildout Traffic Conditions




2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  **AM Peak Hour (Weekday) – Signal Warrant is Not Met**
-  **PM Peak Hour (Weekday) – Signal Warrant is Met**
-  **MD Peak Hour (Saturday) – Signal Warrant is Met**

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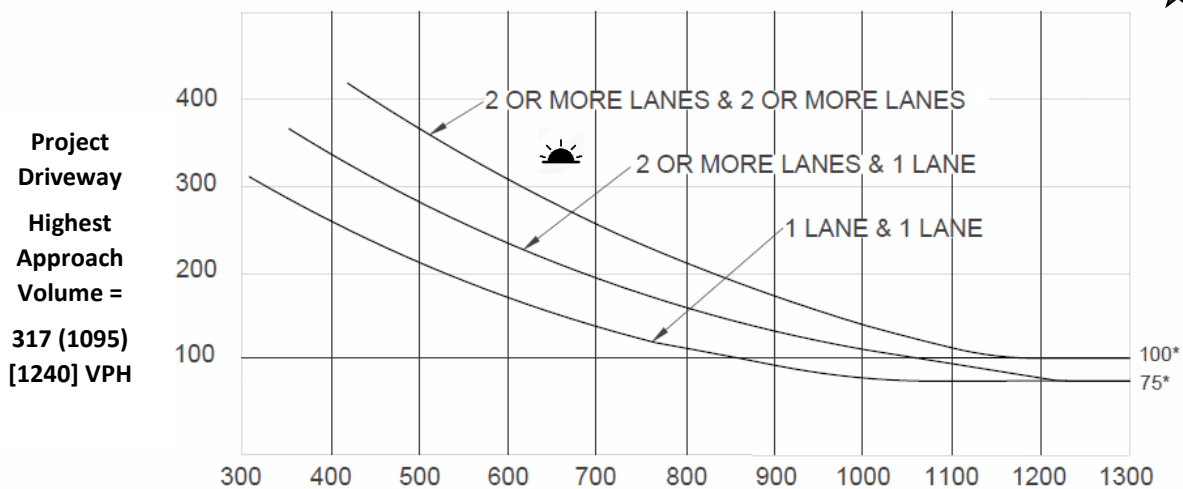
Warrant 3: Peak Hour (Rural)

Near Term Year 2025 plus Project Buildout Traffic Conditions

3. Project Driveway / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET) ★☀



Floral Avenue Total of Both Approaches =

688 (1682) [1795] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

- ☀ AM Peak Hour (Weekday) – Signal Warrant is Met
- ★ PM Peak Hour (Weekday) – Signal Warrant is Met
- ☀ MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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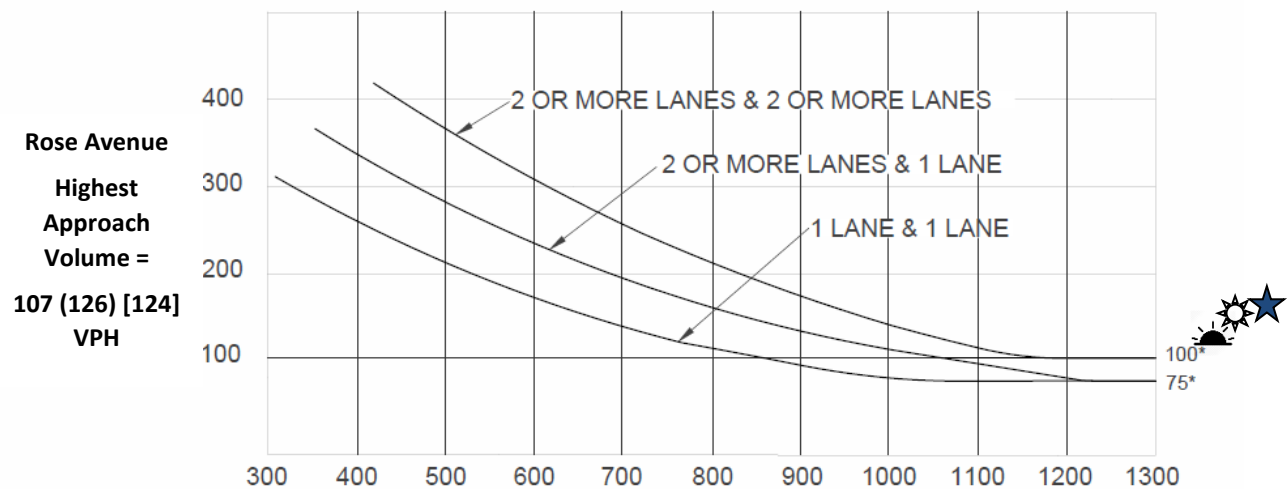
Warrant 3: Peak Hour (Rural)

Near Term Year 2025 plus Project Buildout Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Highland Avenue Total of Both Approaches =

1643 (2726) [2418] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

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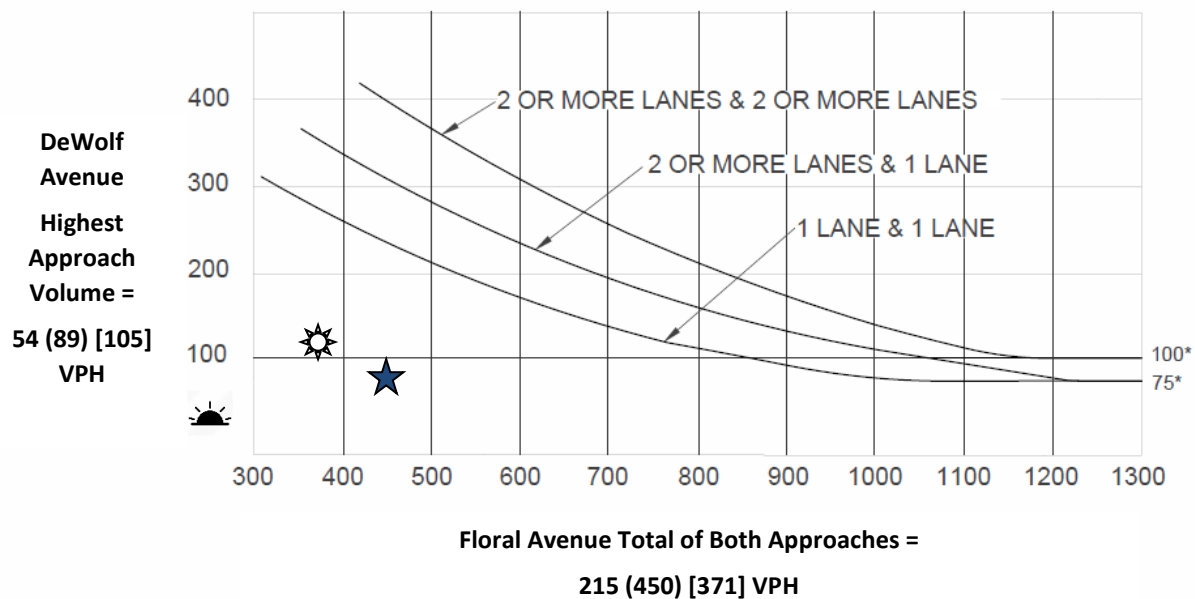
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 No Project Buildout Traffic Conditions

2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  AM Peak Hour (Weekday) – Signal Warrant is Not Met
-  PM Peak Hour (Weekday) – Signal Warrant is Not Met
-  MD Peak Hour (Saturday) – Signal Warrant is Not Met

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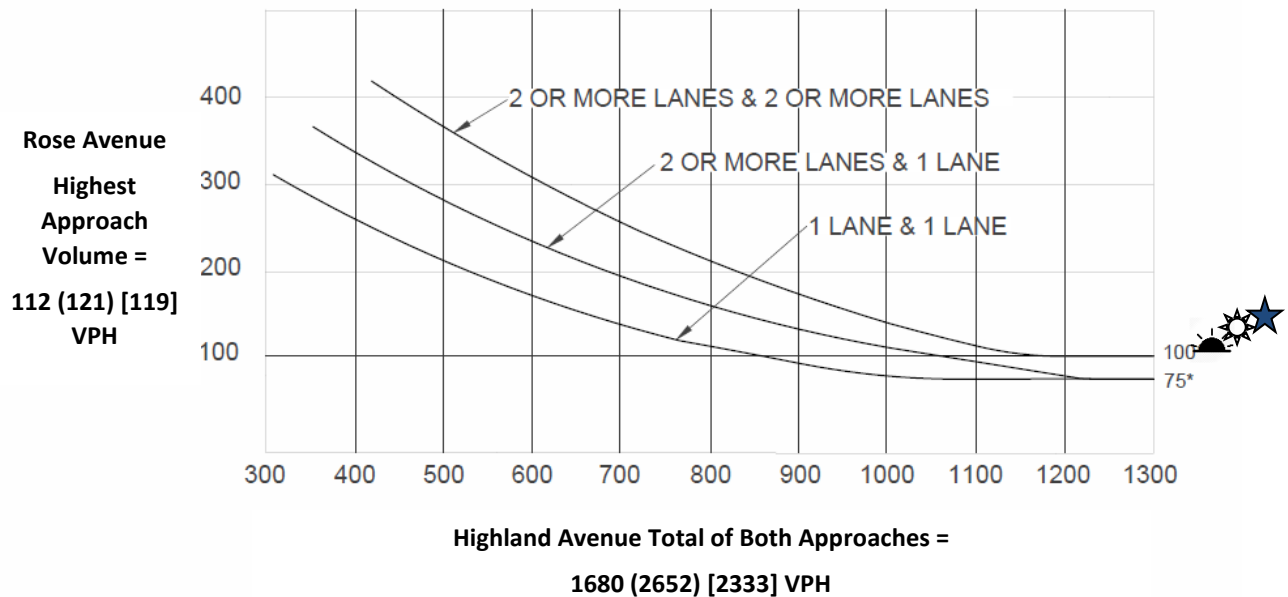
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 No Project Buildout Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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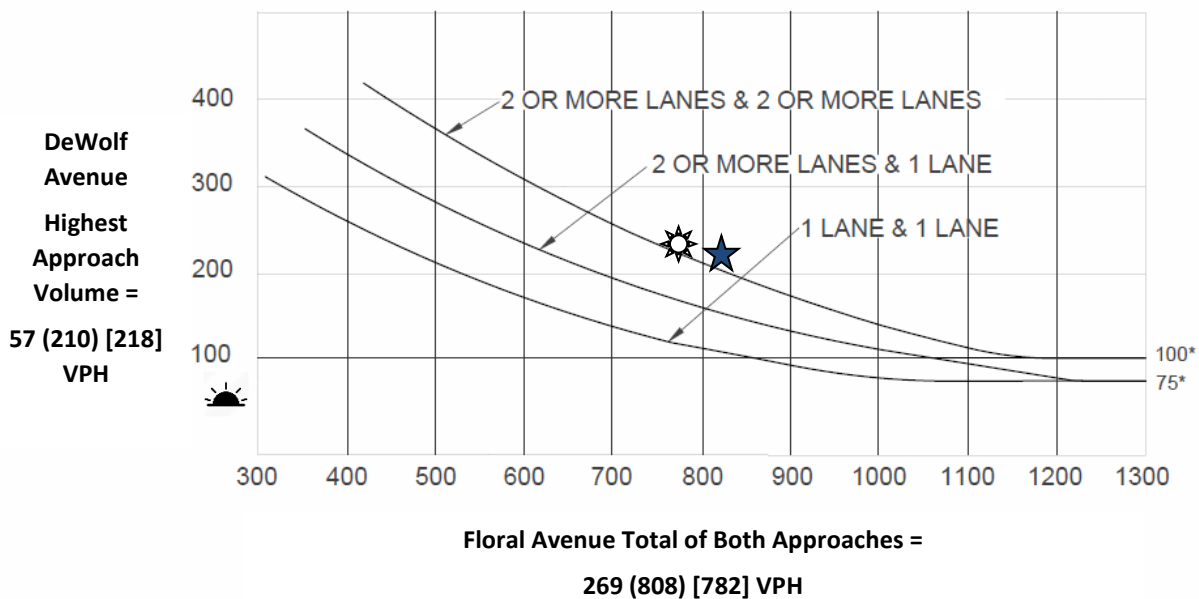
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 plus Project Buildout Traffic Conditions

2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Not Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014



Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

www.JLBtraffic.com

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991

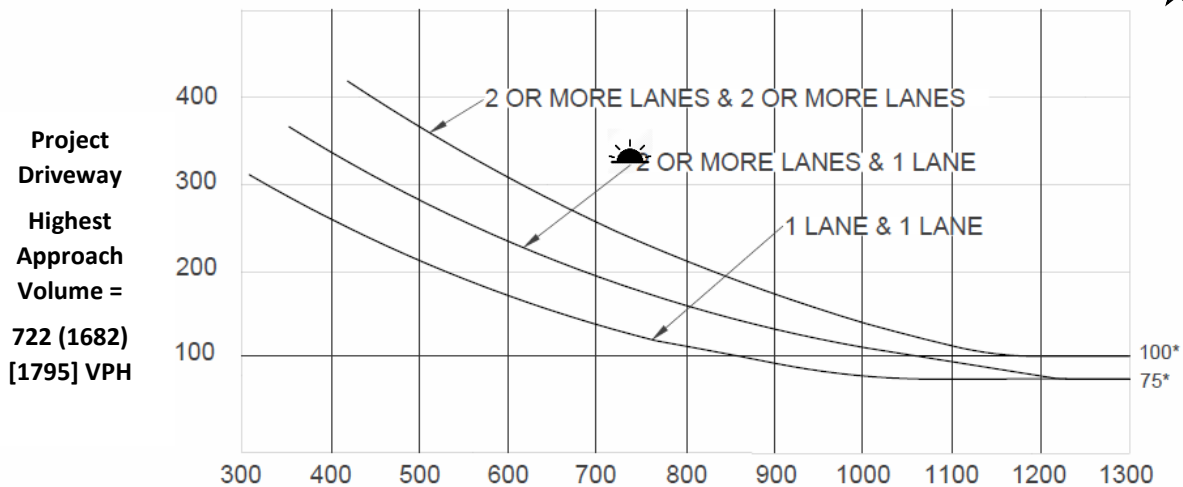
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 plus Project Buildout Traffic Conditions

3. Project Driveway / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET) ★☀



Floral Avenue Total of Both Approaches =

317 (1095) [1240] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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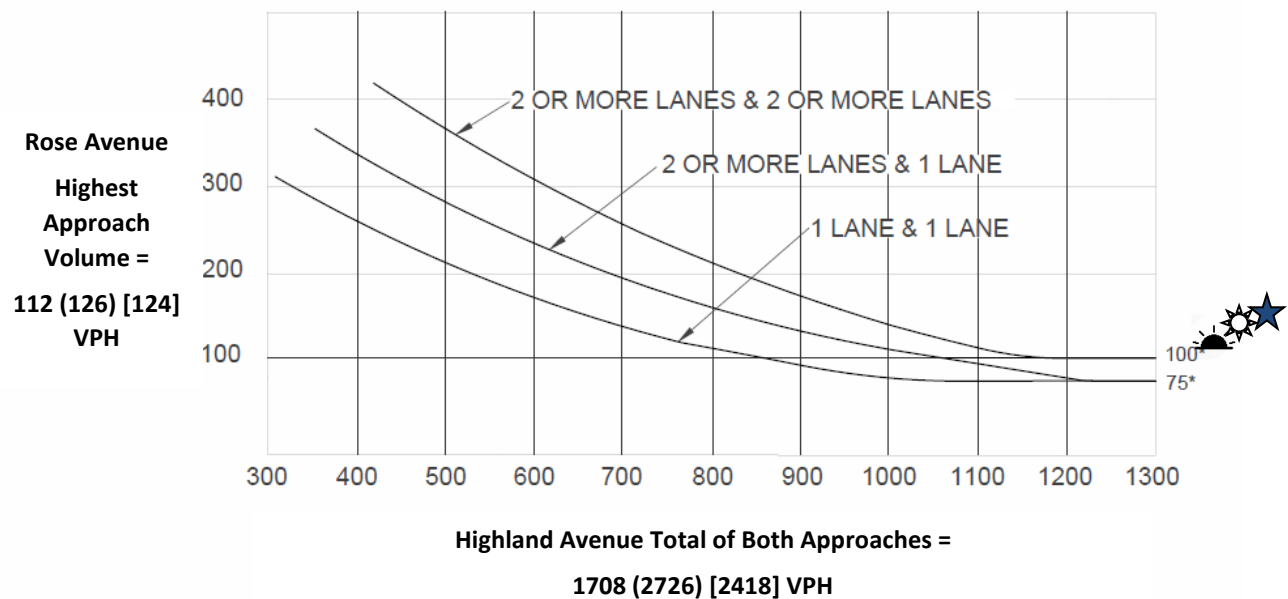
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 plus Project Buildout Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



-  AM Peak Hour (Weekday) – Signal Warrant is Met
-  PM Peak Hour (Weekday) – Signal Warrant is Met
-  MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

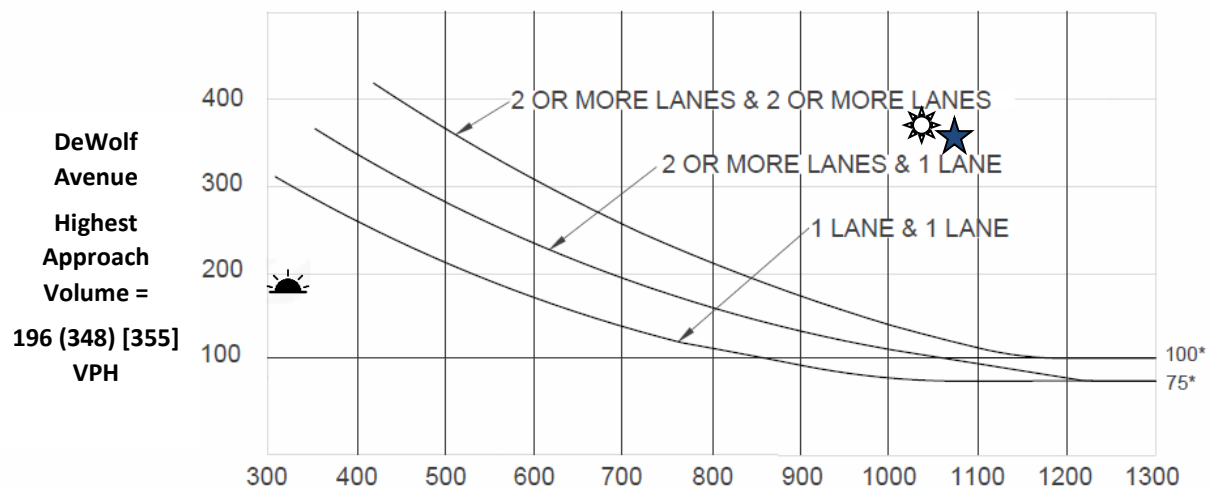
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 with Dinuba Interchange
plus Project Buildout Traffic Conditions

2. DeWolf Avenue / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Floral Avenue Total of Both Approaches =

319 (1080) [1047] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Not Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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Warrant 3: Peak Hour (Rural)

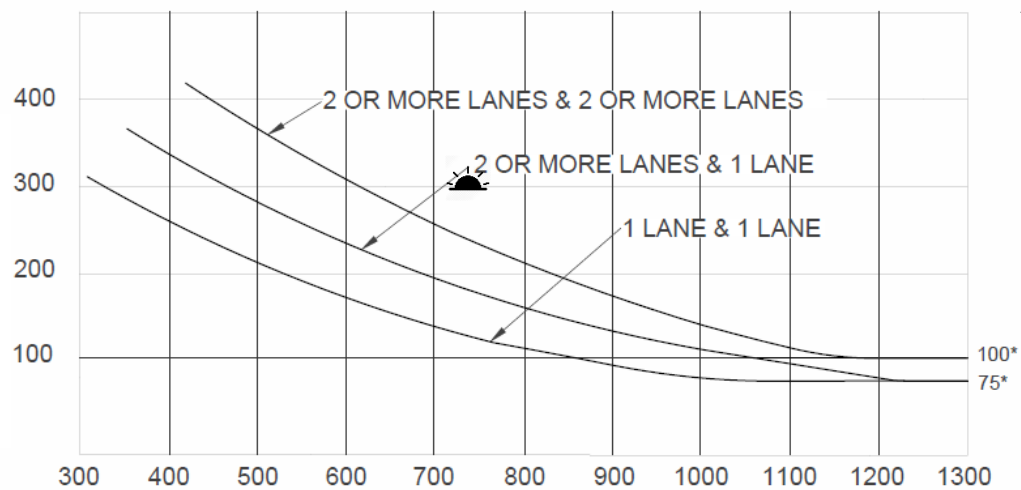
Cumulative Year 2030 with Dinuba Interchange
plus Project Buildout Traffic Conditions

3. Project Driveway / Floral Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)


Project
Driveway
Highest
Approach
Volume =
300 (978)
[1108] VPH



Floral Avenue Total of Both Approaches =

735 (1747) [1871] VPH

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.

-  AM Peak Hour (Weekday) – Signal Warrant is Met
-  PM Peak Hour (Weekday) – Signal Warrant is Met
-  MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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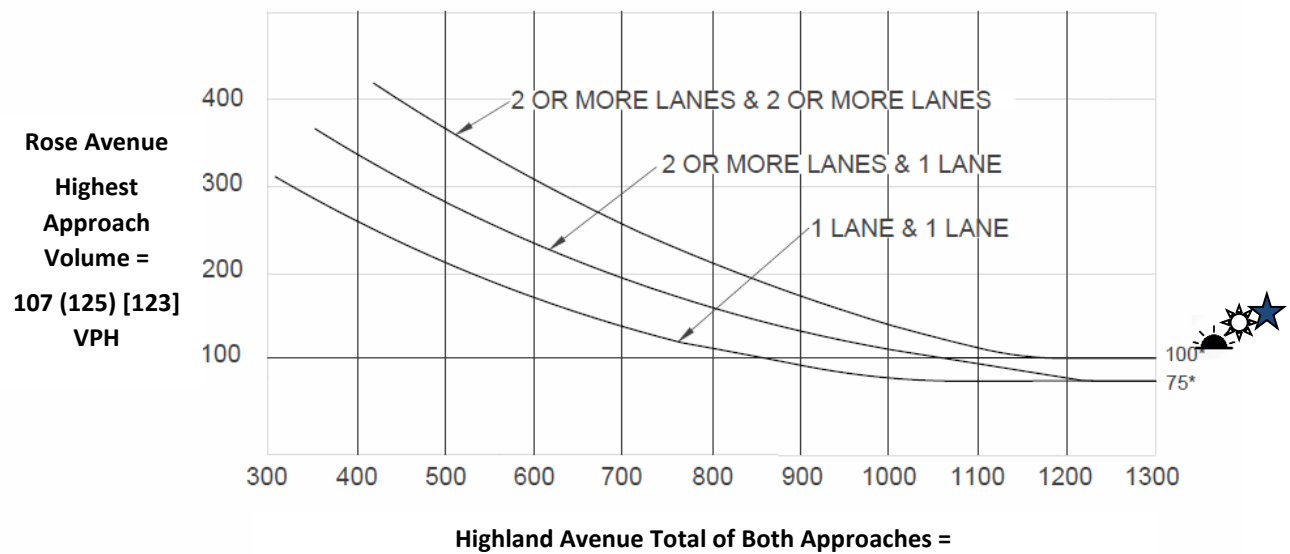
Warrant 3: Peak Hour (Rural)

Cumulative Year 2030 with Dinuba Interchange
plus Project Buildout Traffic Conditions

10. Highland Avenue / Rose Avenue

AM (PM) [MD] Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one lane.



AM Peak Hour (Weekday) – Signal Warrant is Met



PM Peak Hour (Weekday) – Signal Warrant is Met



MD Peak Hour (Saturday) – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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November 7, 2014



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Fresno, CA 93710

(559) 570-8991

Attachment 10

March 28, 2022

Brandon A. Broussard, P.E.
City Engineer
City of Selma
1710 Tucker Street
Selma, CA 93662

Via Email Only: bbroussard@ytmail.com

Subject: Addendum 1 to the Traffic Impact Analysis Report for the Selma Grove Commercial Development Project located in the City of Selma (JLB Project No. 001-005)

Dear Mr. Broussard,

JLB Traffic Engineering, Inc. (JLB) has completed Addendum 1 which includes a **Traffic Count Comparison Analysis** for the three selected intersections analyzed as part of the Selma Grove Commercial Development Project (Selma Grove) Traffic Impact Analysis (TIA). The latest version of the Selma Grove TIA is dated March 13, 2019. The Project desires to move forward to obtain City Council approval; however, there is concern that the TIA, dated March 13, 2019, may underestimate near term and cumulative year traffic impacts. As a result, JLB collected new year 2022 traffic counts at three of the study intersections and compared these counts with forecasted year 2022 traffic volumes based on data contained within the March 13, 2019 Selma Grove TIA.

The purpose of Addendum 1 is to compare the newly collected 2022 traffic counts to the forecasted 2022 traffic volumes based on data contained within the March 13, 2019 Selma Grove TIA. This analysis compares the new traffic counts collected in March 2022 to the traffic counts used in the Selma Grove TIA by expanding the TIA volumes by the average annual growth rate, as projected in the Selma Grove TIA, to the year 2022.

Newly Collected 2022 Traffic Volumes

The first step in the comparison analysis was to collect new intersection turning movement counts for the weekday AM and PM peaks as well as the Saturday midday peak at three of the study intersections. These intersections include 1) State Route 99 Southbound Off Ramp at Floral Avenue, 2) Whitson Avenue at Floral Avenue and 3) Highland Avenue at Rose Avenue. The existing weekday AM and PM intersection peak hour turning movement counts were conducted at the three study intersections on Thursday, March 3, 2022, while schools in the vicinity of the Project site were in session. The existing Saturday midday intersection peak hour turning movement counts were conducted at the three study intersections on Saturday, March 5, 2022. The intersection turning movement counts included pedestrian and bicycle volumes. The newly collected 2022 traffic counts are contained in Appendix I.



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(559) 570-8991

Page | 1

According to Vehicle Miles Travelled (VMT) data on the Berkely TIMS database, VMT has normalized to pre-Covid numbers. As a result of the VMT data normalizing and schools being in session with in-person instruction, JLB proposes that no escalation be applied to the newly collected 2022 traffic counts due to Covid.

Existing Selma Grove TIA Volumes

The existing conditions peak hour turning movement volume counts utilized in the Selma Grove TIA were collected at the study intersections in June 2016, while schools in the vicinity of the Project site were in session. A summary of the existing volumes for the three intersections and peak periods can be found in Table I.

Table I: Existing Selma Grove TIA Volumes

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Existing Intersection Volumes in Selma Grove TIA (VPH)	1,070	1,940	1,611	1,393	1,869	1,465	1,243	1,549	1,184

Selma Grove TIA Volume Forecasting

In order to arrive at the forecasted year 2022 traffic volumes, JLB derived an average annual growth rate between the existing 2016 counts and the Cumulative Year 2030 No Project forecasted traffic volumes contained in the Selma Grove TIA. The methodologies used to derive at the Cumulative Year 2030 No Project forecasted traffic volumes are explained in the Selma Grove TIA. The growth rate of each approach and peak periods for the three selected intersections can be found in Table II. These growth rates were then used to expand the 2016 counts for six (6) years to arrive at the forecasted year 2022 volumes. A summary of the forecasted year 2022 volumes for each of these three intersections and peak periods can be found in Table III, while the forecasted year 2022 volumes by movement can be found in Appendix II.

Table II: Selma Grove TIA Forecasted Average Annual Traffic Growth Rate

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Eastbound	2.92%	2.57%	3.48%	1.87%	2.79%	3.69%	18.29%	14.31%	18.74%
Westbound	2.26%	2.17%	2.88%	0.99%	2.57%	3.48%	1.13%	1.60%	2.61%
Northbound	0.00%	0.00%	0.00%	2.21%	4.88%	5.60%	3.17%	4.71%	5.47%
Southbound	0.80%	0.37%	0.93%	5.49%	7.57%	8.55%	3.13%	4.80%	6.18%

Table III: Collected and Forecast Year 2022 Volume Comparison

	State Route 99 Southbound Off Ramp / Floral Avenue			Whitson Avenue / Floral Avenue			Highland Avenue / Rose Avenue		
	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak	AM Peak	PM Peak	MD Peak
Year 2022 Forecast Intersection Volumes (VPH)	1,197	2,144	1,864	1,578	2,362	1,948	1,499	2,034	1,656
Newly Collected Year 2022 Intersection Volumes (VPH)	1,109	1,921	2,000	1,343	1,893	1,795	1,268	1,643	1,383
Intersection Volume Difference (VPH)	88	223	-136	235	469	153	231	391	273
Percent Difference	7.9%	11.6%	-6.8%	17.5%	24.8%	8.5%	18.2%	23.8%	19.7%

Volume Comparison

The year 2022 forecast volumes were then compared to the newly collected year 2022 volumes. The volume and percent difference for each intersection per peak period can be found in Table III. In most cases, the forecast year 2022 volumes were found to be higher than the newly collected 2022 volumes. As a result, the level of traffic volume growth assumed in the Selma Grove TIA, dated March 13, 2019, is higher than that which has taken place. This would indicate that the projected traffic impacts included in the Selma Grove TIA could be lower, and therefore, those presented in the TIA would be considered a worst-case scenario. The current lower volumes when compared to the TIA projections are also a result of many of the Near Term Cumulative projects not being built as fast as previously anticipated by the City. The intersection of State Route 99 Southbound Off Ramp at Floral Avenue during the weekend MD peak period was the only study scenario in which the forecast 2022 volumes were less than the newly collected 2022 volumes, by 6.8 percent. However, it is of JLB's opinion that any projected traffic volumes which are less than ten (10) percent lower than actual counts would be considered reasonable and normal.

Conclusions and Recommendations

Conclusions and recommendations regarding the Traffic Count Comparison are provided below:

- The expanded 2016 traffic counts to the year 2022 were, on average, higher than the newly collected year 2022 traffic counts.
- Thus, the volume forecasting within the Selma Grove TIA is higher than that which has taken place in the last five years.
- The traffic operational impacts presented in the Selma Grove TIA could likely be lesser, and as a result be considered conservative findings.
- The Selma Grove TIA more than adequately projects traffic forecasting and, as a result, it should not be necessary to redo the TIA.

If you have any questions or require additional information, please contact me via phone at (559) 570-8991, or via email at jbenavides@jlbtraffic.com.

Sincerely,



Jose Luis Benavides, P.E., T.E.
President

Z:\01 Projects\001 Selma\001-005 Selma Grove TIA\Count Comparison Letter\L03282022 Selma Grove Count Comparison.docx



www.JLBtraffic.com
info@JLBtraffic.com

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Fresno, CA 93704
(559) 570-8991

Appendix I: March 2022 Traffic Counts





Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Floral Ave @ SR 99 SB Offramp / Shopping Center Driveway

LATITUDE 36.5764

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Thursday, March 3, 2022

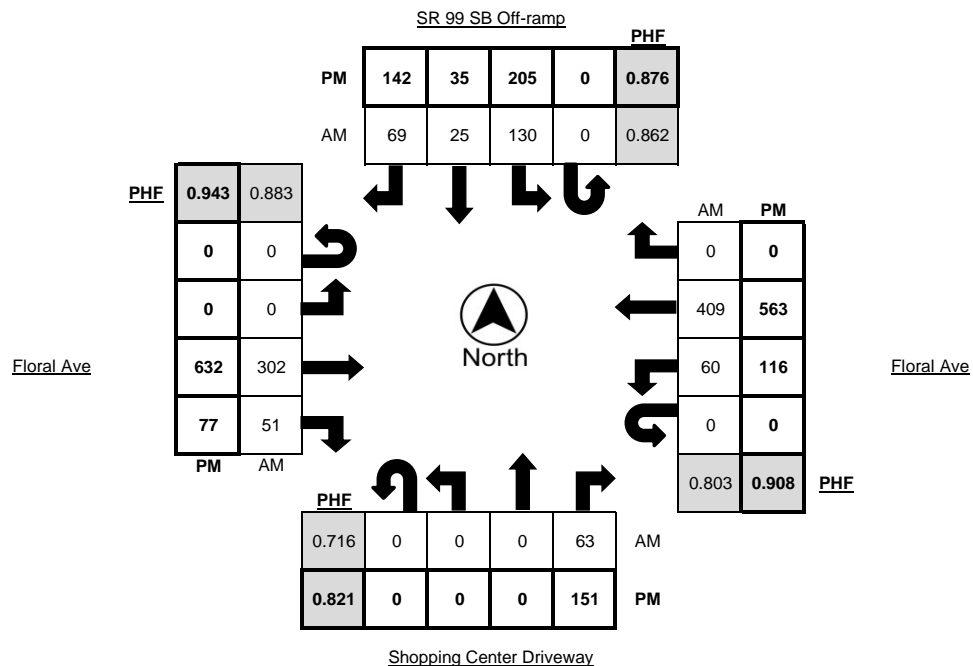
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	0	7	0	0	33	3	23	7	0	0	59	8	2	0	11	45	0	1
7:15 AM - 7:30 AM	0	0	0	8	0	0	45	5	17	2	0	0	45	3	1	0	10	47	0	1
7:30 AM - 7:45 AM	0	0	0	18	0	0	56	3	13	2	0	0	60	4	1	0	12	68	0	2
7:45 AM - 8:00 AM	0	0	0	16	0	0	47	8	22	4	0	0	66	9	2	0	8	93	0	1
8:00 AM - 8:15 AM	0	0	0	15	0	0	36	4	16	2	0	0	63	9	2	0	7	109	0	1
8:15 AM - 8:30 AM	0	0	0	12	0	0	43	6	16	4	0	0	70	16	3	0	12	104	0	1
8:30 AM - 8:45 AM	0	0	0	22	0	0	31	10	18	5	0	0	87	13	3	0	14	77	0	0
8:45 AM - 9:00 AM	0	0	0	14	0	0	20	5	19	1	0	0	82	13	1	0	27	119	0	3
TOTAL	0	0	0	112	0	0	311	44	144	27	0	0	532	75	15	0	101	662	0	10

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	0	47	0	0	41	9	28	2	0	0	153	14	0	0	38	159	0	2
4:15 PM - 4:30 PM	0	0	0	56	0	0	69	13	30	2	0	0	126	19	0	0	29	128	0	1
4:30 PM - 4:45 PM	0	0	0	34	0	0	53	5	29	1	0	0	145	18	1	0	20	147	0	3
4:45 PM - 5:00 PM	0	0	0	40	0	0	49	11	33	1	0	0	128	22	3	0	27	128	0	1
5:00 PM - 5:15 PM	0	0	0	30	0	0	45	13	26	0	0	0	154	16	2	0	33	140	0	3
5:15 PM - 5:30 PM	0	0	0	45	0	0	53	9	35	1	0	0	167	21	2	0	30	149	0	1
5:30 PM - 5:45 PM	0	0	0	46	0	0	60	9	40	1	0	0	154	12	2	0	27	160	0	1
5:45 PM - 6:00 PM	0	0	0	30	0	0	47	4	41	2	0	0	157	28	2	0	26	114	0	1
TOTAL	0	0	0	328	0	0	417	73	262	10	0	0	1184	150	12	0	230	1125	0	13

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
8:00 AM - 9:00 AM	0	0	0	63	0	0	130	25	69	12	0	0	302	51	9	0	60	409	0	5
5:00 PM - 6:00 PM	0	0	0	151	0	0	205	35	142	4	0	0	632	77	8	0	116	563	0	6

	PHF	Trucks
AM	0.927	2.3%
PM	0.944	0.9%





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 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION al Ave @ SR 99 SB Offramp / Shopping Center Drive

LATITUDE 36.5764

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Thursday, March 3, 2022

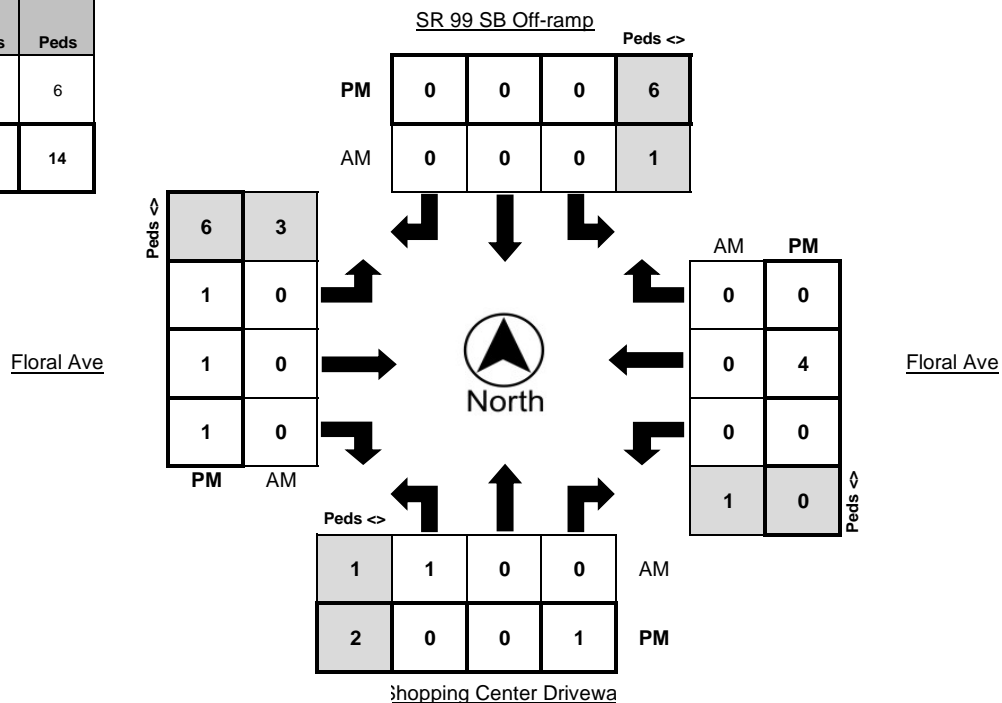
WEATHER Clear

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	2	0	0	1	0	0	0	1	0	1	0	1	0	0	0	3

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	7	0	0	0	1	0	1	0	0	0	0	0	4
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	2	0	0	0	1	0	1	0	0	0	3	0	2
5:15 PM - 5:30 PM	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	2
5:30 PM - 5:45 PM	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	0	0	1	14	0	0	0	3	1	2	1	0	0	4	0	11

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
8:00 AM - 9:00 AM	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3
5:00 PM - 6:00 PM	0	0	1	6	0	0	0	2	1	1	1	0	0	4	0	6

	Bikes	Peds
AM Peak Total	1	6
PM Peak Total	8	14



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION al Ave @ SR 99 SB Offramp / Shopping Center Drive

LATITUDE al Ave @ SR 99 SB Offramp / Shopping Center Drive

COUNTY Fresno

LONGITUDE -119.6307

COLLECTION DATE Saturday, March 5, 2022

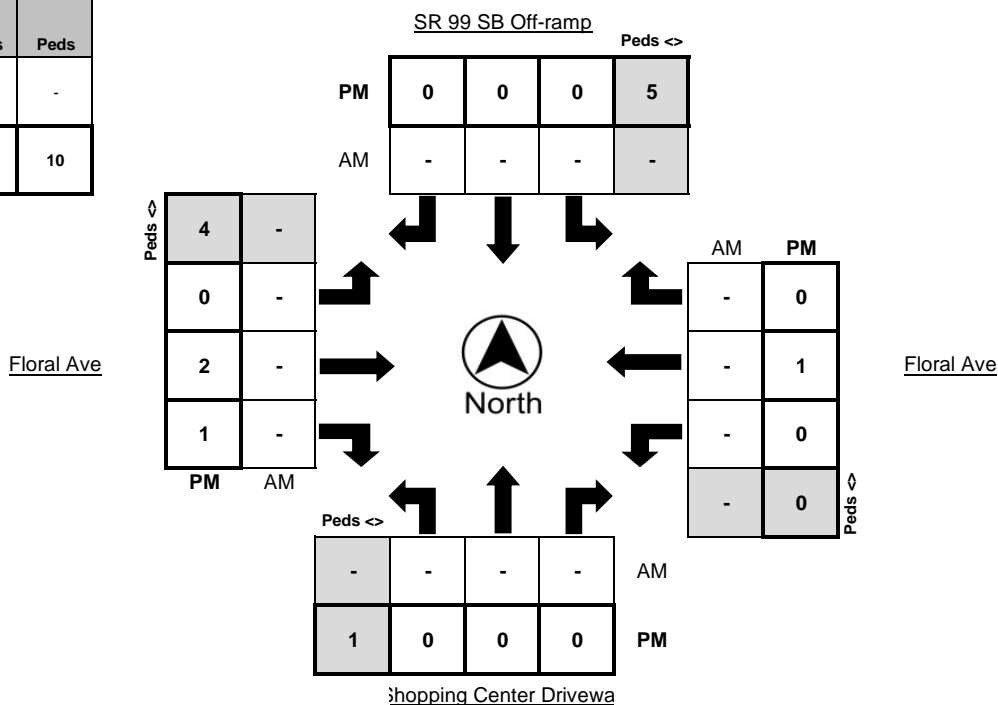
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
1:30 PM - 1:45 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3
2:00 PM - 2:15 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	6
2:15 PM - 2:30 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
TOTAL	0	0	0	7	0	0	0	3	0	3	1	0	0	2	0	14

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 PM - 2:00 PM	0	0	0	5	0	0	0	1	0	2	1	0	0	1	0	4

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	4	10





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Hanford, CA 93230
800-975-6938 Phone/Fax
www.metrotraffdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Floral Ave @ Whitson St

LATITUDE 36.5763

COUNTY Fresno

LONGITUDE -119.6246

COLLECTION DATE Thursday, March 3, 2022

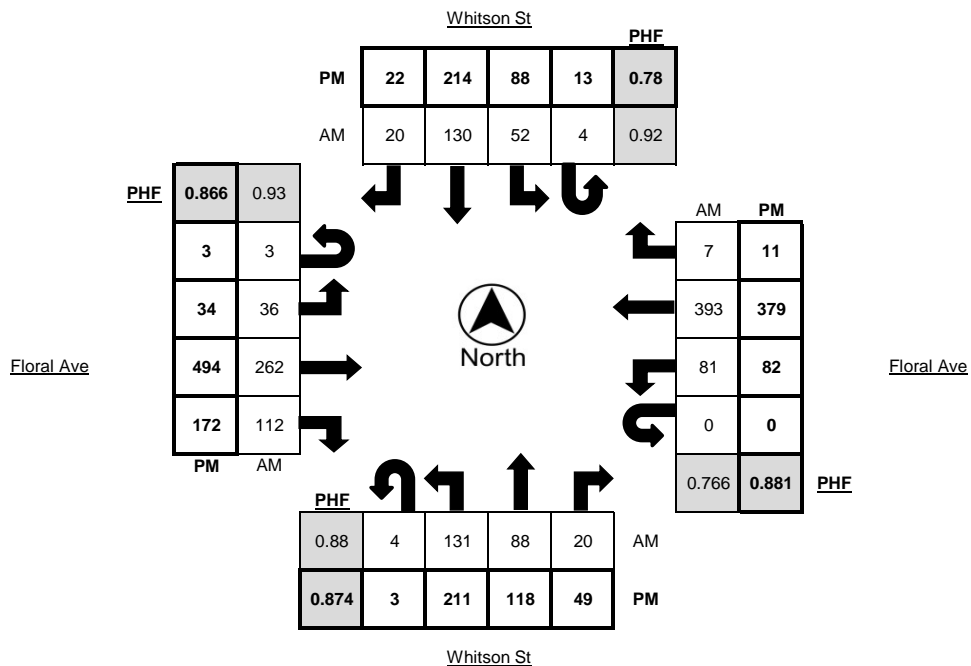
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	1	16	18	5	1	0	7	18	0	0	0	12	42	16	5	0	2	53	1	0
7:15 AM - 7:30 AM	0	22	24	0	4	0	4	13	0	0	3	7	44	24	5	0	3	75	1	2
7:30 AM - 7:45 AM	1	20	27	0	1	1	9	14	0	0	1	10	76	20	5	0	11	94	3	0
7:45 AM - 8:00 AM	3	27	24	5	0	2	11	32	3	4	0	9	78	21	0	0	20	102	1	2
8:00 AM - 8:15 AM	1	35	27	6	2	1	14	34	4	1	1	9	53	26	5	0	29	126	2	1
8:15 AM - 8:30 AM	0	38	19	4	4	1	15	31	9	2	0	10	69	32	6	0	16	92	0	2
8:30 AM - 8:45 AM	0	31	18	5	2	0	12	33	4	4	2	8	62	33	6	0	16	73	4	1
8:45 AM - 9:00 AM	0	34	23	3	2	1	13	27	5	3	3	10	55	28	4	0	21	77	3	3
TOTAL	6	223	180	28	16	6	85	202	25	14	10	75	479	200	36	0	118	692	15	11

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	35	29	13	1	2	16	52	8	1	2	13	118	44	3	0	23	116	1	0
4:15 PM - 4:30 PM	0	38	19	7	3	1	27	54	5	2	2	13	127	72	2	0	18	73	2	0
4:30 PM - 4:45 PM	0	32	17	13	3	0	16	52	4	3	1	8	119	31	4	0	18	80	3	1
4:45 PM - 5:00 PM	0	37	22	9	2	1	26	48	6	2	6	14	130	30	4	0	9	93	1	0
5:00 PM - 5:15 PM	0	59	30	14	3	6	32	66	4	1	1	9	95	30	3	0	24	88	2	0
5:15 PM - 5:30 PM	2	57	36	14	1	4	13	55	7	3	0	7	123	46	2	0	22	109	3	0
5:30 PM - 5:45 PM	1	55	17	13	0	1	26	54	7	7	0	6	151	46	3	0	16	88	3	0
5:45 PM - 6:00 PM	0	40	35	8	1	2	17	39	4	1	2	12	125	50	0	0	20	94	3	0
TOTAL	4	353	205	91	14	17	173	420	45	20	14	82	988	349	21	0	150	741	18	1

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	4	131	88	20	8	4	52	130	20	11	3	36	262	112	17	0	81	393	7	6
5:00 PM - 6:00 PM	3	211	118	49	5	13	88	214	22	12	3	34	494	172	8	0	82	379	11	0

	PHF	Trucks
AM	0.912	3.1%
PM	0.950	1.3%





Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION Floral Ave @ Whitson St
COUNTY Fresno
COLLECTION DATE Thursday, March 3, 2022

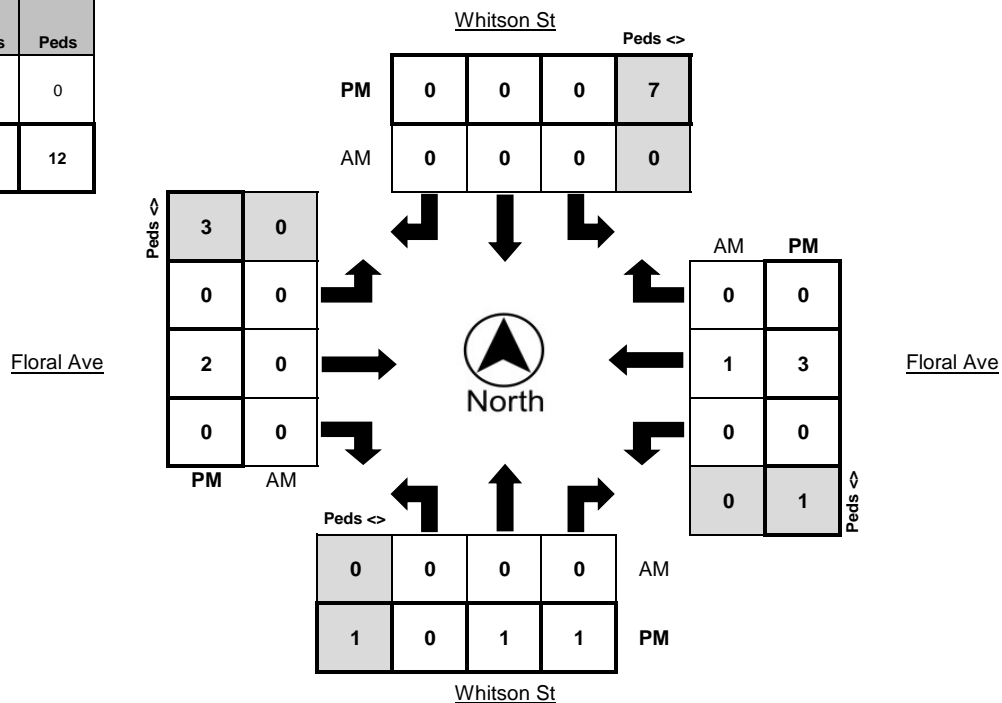
LATITUDE 36.5763
LONGITUDE -119.6246
WEATHER Clear

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	2	0	0	0	0	0	1	0	0	0	1	0	1

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	2	0	0	0	2	0	1	0	0	0	0	0	2
5:00 PM - 5:15 PM	0	0	0	4	0	0	0	1	0	1	0	1	0	1	0	0
5:15 PM - 5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	0
5:30 PM - 5:45 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	0	1	1	12	0	0	0	3	0	4	0	2	0	3	0	5

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:45 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
5:00 PM - 6:00 PM	0	1	1	7	0	0	0	1	0	2	0	1	0	3	0	3

	Bikes	Peds
AM Peak Total	1	0
PM Peak Total	7	12



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION	Floral Ave @ Whitson St
COUNTY	Fresno
COLLECTION DATE	Saturday, March 5, 2022

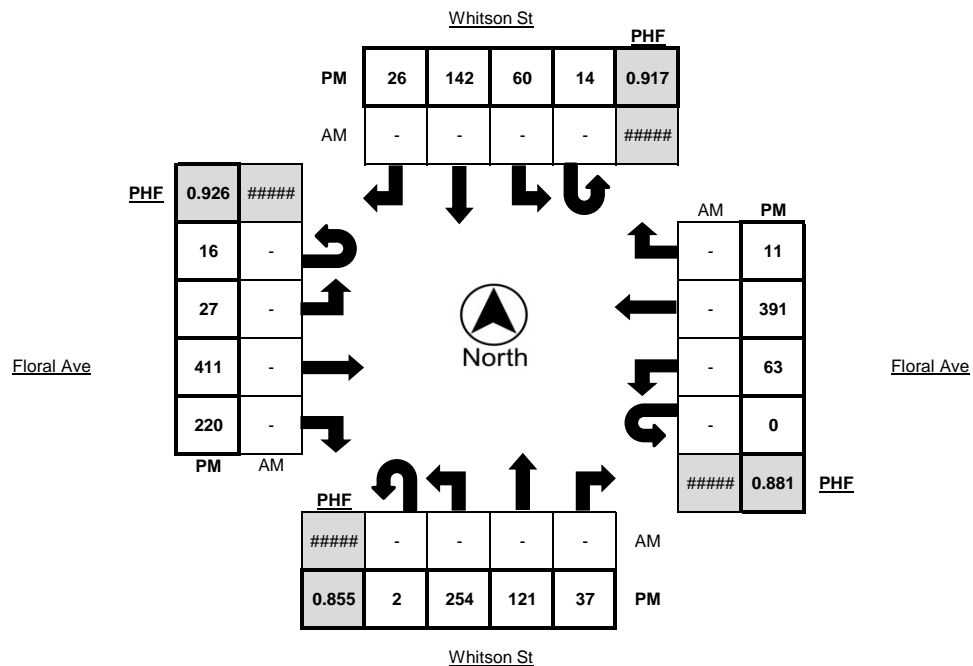
LATITUDE	Floral Ave @ Whitson St
LONGITUDE	-119.6246
WEATHER	Clear

[illegible]

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
1:00 PM - 1:15 PM	0	53	34	8	1	4	12	40	6	0	4	6	95	46	3	0	24	88	1	2
1:15 PM - 1:30 PM	2	78	28	13	0	3	13	38	9	0	4	6	90	57	1	0	13	102	2	0
1:30 PM - 1:45 PM	0	68	34	6	1	4	16	27	7	0	2	12	108	60	3	0	22	107	3	1
1:45 PM - 2:00 PM	0	47	27	7	2	3	17	41	5	2	3	2	108	55	1	0	11	91	4	0
2:00 PM - 2:15 PM	0	61	32	11	0	4	14	36	5	0	7	7	105	48	1	0	17	91	2	2
2:15 PM - 2:30 PM	2	60	30	5	2	8	6	29	6	2	2	2	89	49	2	0	12	84	1	0
2:30 PM - 2:45 PM	0	69	29	5	1	5	10	26	7	0	2	10	92	43	0	0	14	81	4	0
2:45 PM - 3:00 PM	0	49	25	9	1	2	12	38	3	0	5	12	99	46	2	0	16	95	2	0
TOTAL	4	485	239	64	8	33	100	275	48	4	29	57	786	404	13	0	129	739	19	5

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:15 PM - 2:15 PM	2	254	121	37	3	14	60	142	26	2	16	27	411	220	6	0	63	391	11	3

	PHF	Trucks
AM	-	-
PM	0.943	0.8%



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Floral Ave @ Whitson St

LATITUDE Floral Ave @ Whitson St

COUNTY Fresno

LONGITUDE -119.6246

COLLECTION DATE Saturday, March 5, 2022

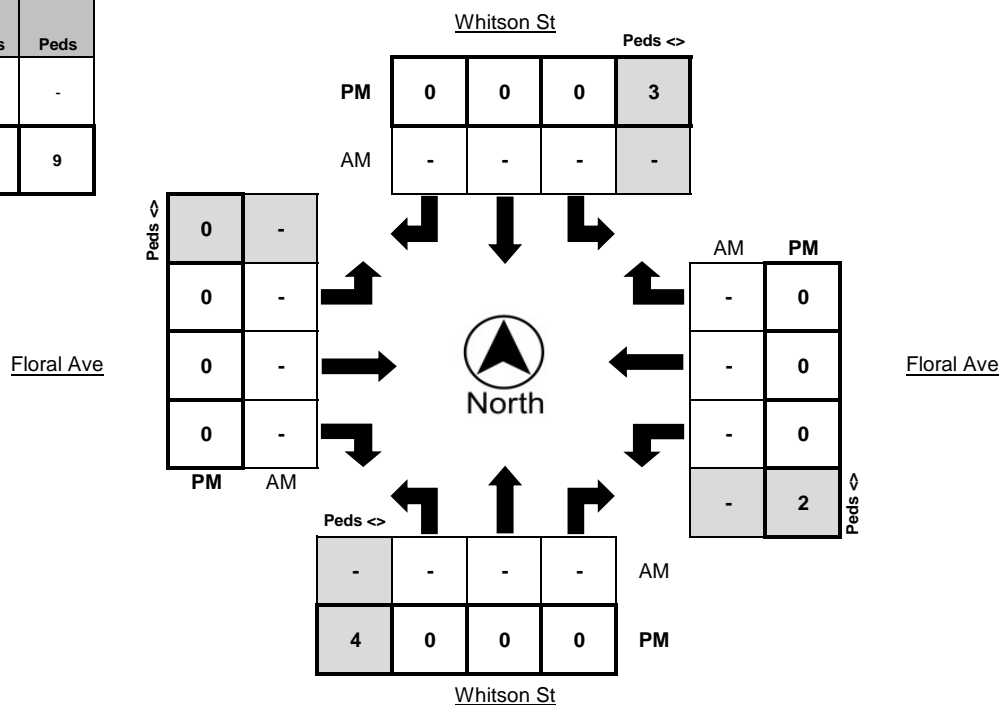
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
1:30 PM - 1:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:30 PM - 2:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	3	0	1	0	5	0	0	0	2	0	0	1	2

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:15 PM - 2:15 PM	0	0	0	3	0	0	0	4	0	0	0	2	0	0	0	0

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	0	9





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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave

LATITUDE 36.5688

COUNTY Fresno

LONGITUDE -119.6288

COLLECTION DATE Thursday, March 3, 2022

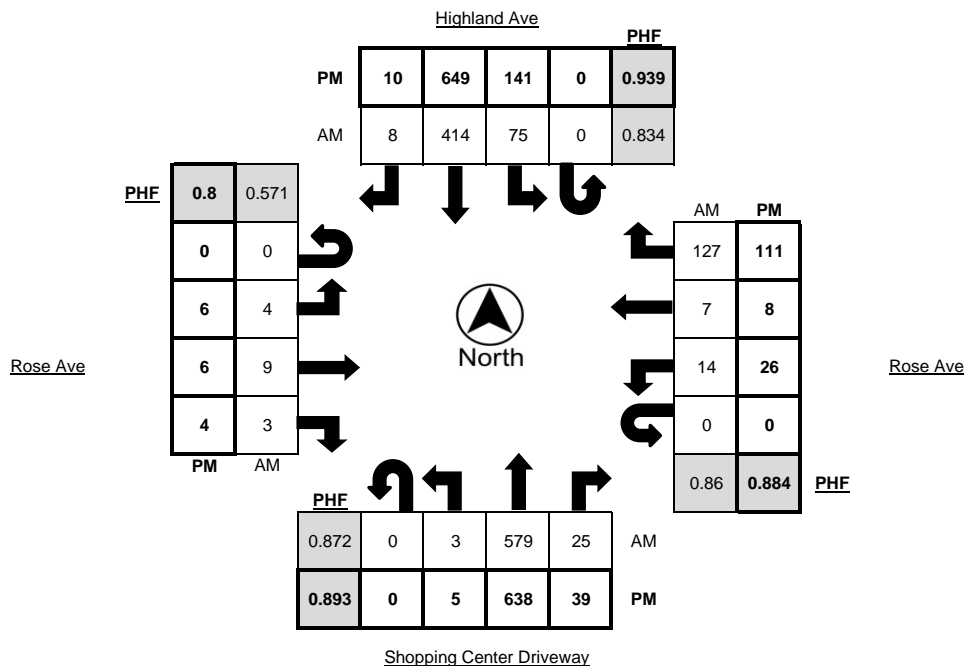
WEATHER Clear

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	114	3	3	0	14	118	2	18	0	2	2	1	0	0	4	1	24	0
7:15 AM - 7:30 AM	0	2	167	5	11	0	18	126	5	14	0	1	0	0	0	0	1	1	27	0
7:30 AM - 7:45 AM	0	0	147	4	7	0	13	109	0	19	0	1	3	3	0	0	6	1	31	1
7:45 AM - 8:00 AM	0	0	130	8	15	0	24	81	2	8	0	1	6	0	0	0	3	3	37	0
8:00 AM - 8:15 AM	0	1	135	8	9	0	20	98	1	16	0	1	0	0	0	0	4	2	32	0
8:15 AM - 8:30 AM	0	1	134	7	8	0	8	88	0	16	0	2	1	0	0	0	6	1	31	0
8:30 AM - 8:45 AM	0	1	124	3	11	0	9	97	2	16	0	2	0	2	1	0	4	1	35	0
8:45 AM - 9:00 AM	0	2	121	6	8	0	6	97	3	11	0	1	1	1	0	0	3	1	28	0
TOTAL	0	7	1072	44	72	0	112	814	15	118	0	11	13	7	1	0	31	11	245	1

Time	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	1	157	12	7	0	45	168	3	9	0	2	3	0	0	0	6	3	37	0
4:15 PM - 4:30 PM	0	2	135	8	8	0	42	149	2	6	0	3	1	0	0	0	3	2	22	0
4:30 PM - 4:45 PM	0	2	166	7	4	0	32	157	2	4	0	0	2	1	0	0	5	1	35	0
4:45 PM - 5:00 PM	0	0	145	10	3	0	37	152	4	1	0	1	1	2	1	0	6	3	22	0
5:00 PM - 5:15 PM	0	1	151	9	10	0	43	170	0	4	0	3	1	1	0	0	7	3	22	0
5:15 PM - 5:30 PM	0	2	176	13	7	0	29	170	4	2	0	2	2	0	0	0	8	1	32	0
5:30 PM - 5:45 PM	0	0	130	9	5	0	35	175	5	6	0	1	1	4	0	0	7	4	25	0
5:45 PM - 6:00 PM	0	2	138	11	4	0	48	159	2	1	0	2	2	0	0	0	4	1	25	0
TOTAL	0	10	1198	79	48	0	311	1300	22	33	0	14	13	8	1	0	46	18	220	0

PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	3	579	25	42	0	75	414	8	57	0	4	9	3	0	0	14	7	127	1
4:30 PM - 5:30 PM	0	5	638	39	24	0	141	649	10	11	0	6	6	4	1	0	26	8	111	0

	PHF	Trucks
AM	0.898	7.9%
PM	0.936	2.2%





Metro Traffic Data Inc.
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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 516 W. Shaw Ave, Suite 103
 Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave
COUNTY Fresno
COLLECTION DATE Thursday, March 3, 2022

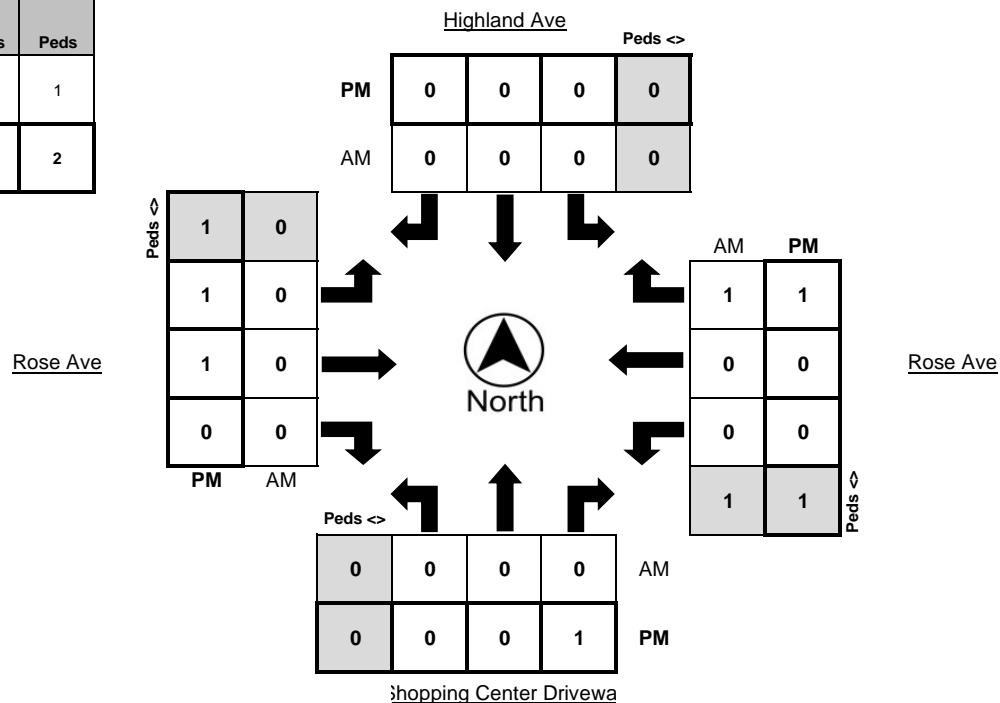
LATITUDE 36.5688
LONGITUDE -119.6288
WEATHER Clear

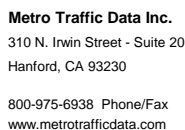
Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM - 5:45 PM	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
TOTAL	0	0	7	0	1	1	0	0	1	1	0	2	0	0	1	1

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:30 PM - 5:30 PM	0	0	1	0	0	0	0	0	1	1	0	1	0	0	1	1

	Bikes	Peds
AM Peak Total	1	1
PM Peak Total	4	2





Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION	Highland Ave @ Rose Ave
COUNTY	Fresno
COLLECTION DATE	Saturday, March 5, 2022

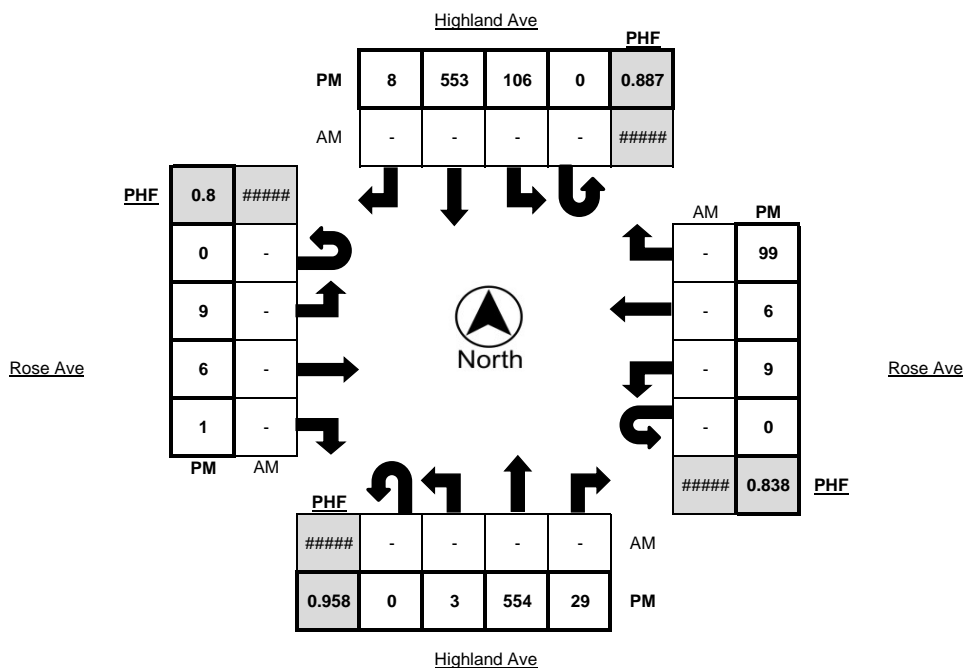
LATITUDE	Highland Ave @ Rose Ave
LONGITUDE	-119.6288
WEATHER	Clear

[illegible]

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
1:00 PM - 1:15 PM	0	1	111	8	0	0	23	110	2	1	0	3	1	0	0	0	3	2	23	0
1:15 PM - 1:30 PM	0	1	120	4	2	0	23	99	1	4	0	0	3	3	0	0	9	2	22	1
1:30 PM - 1:45 PM	0	1	128	5	4	1	26	111	5	2	0	0	0	2	0	0	5	0	31	0
1:45 PM - 2:00 PM	0	2	107	7	0	0	21	125	4	0	0	0	0	0	0	0	7	2	25	0
2:00 PM - 2:15 PM	0	1	137	7	1	0	26	134	2	1	0	3	2	0	0	0	2	2	20	0
2:15 PM - 2:30 PM	0	1	130	9	2	0	22	132	3	3	0	3	0	0	0	0	2	0	24	1
2:30 PM - 2:45 PM	0	0	142	6	5	0	33	126	1	4	0	1	1	1	0	0	2	1	31	0
2:45 PM - 3:00 PM	0	1	145	7	4	0	25	161	2	2	0	2	3	0	0	0	3	3	24	0
TOTAL	0	8	1020	53	18	1	199	998	20	17	0	12	10	6	0	0	33	12	200	2

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM - 3:00 PM	0	3	554	29	12	0	106	553	8	10	0	9	6	1	0	0	9	6	99	1

	PHF	Trucks
AM	-	-
PM	0.920	1.7%



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
516 W. Shaw Ave, Suite 103
Fresno, CA 93704

LOCATION Highland Ave @ Rose Ave

LATITUDE Highland Ave @ Rose Ave

COUNTY Fresno

LONGITUDE -119.6288

COLLECTION DATE Saturday, March 5, 2022

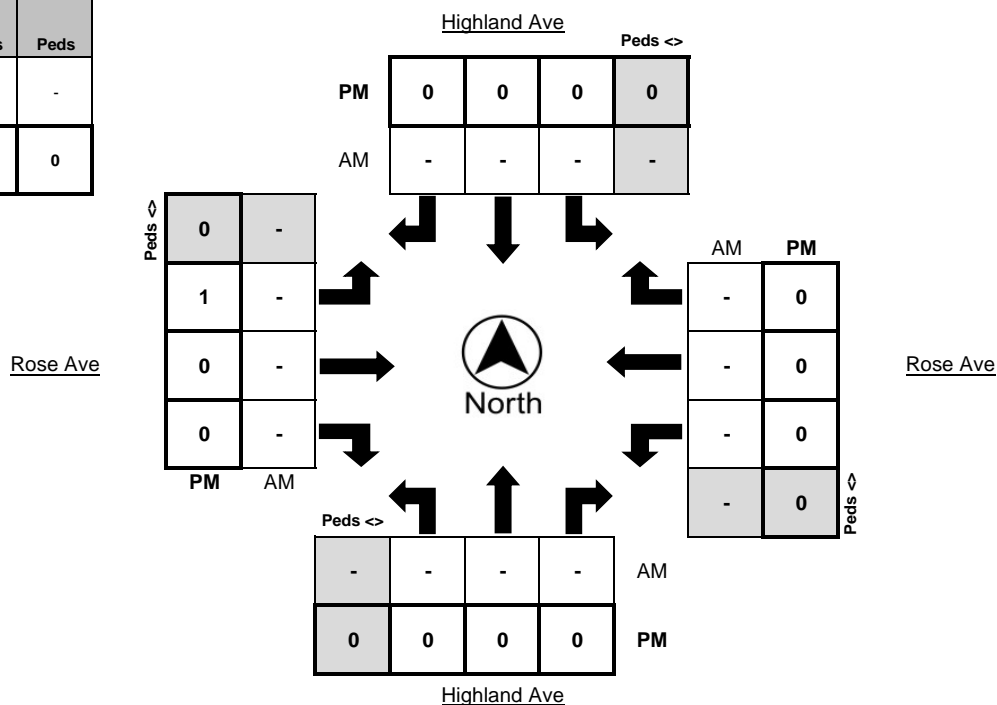
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
1:00 PM - 1:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
1:15 PM - 1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM - 1:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
1:45 PM - 2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	1	0	0	2	0	0	1	0

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	-	-
PM Peak Total	1	0



Appendix II: Expanded 2016 Traffic Counts



Selma Grove TIA Turning Movement Volumes

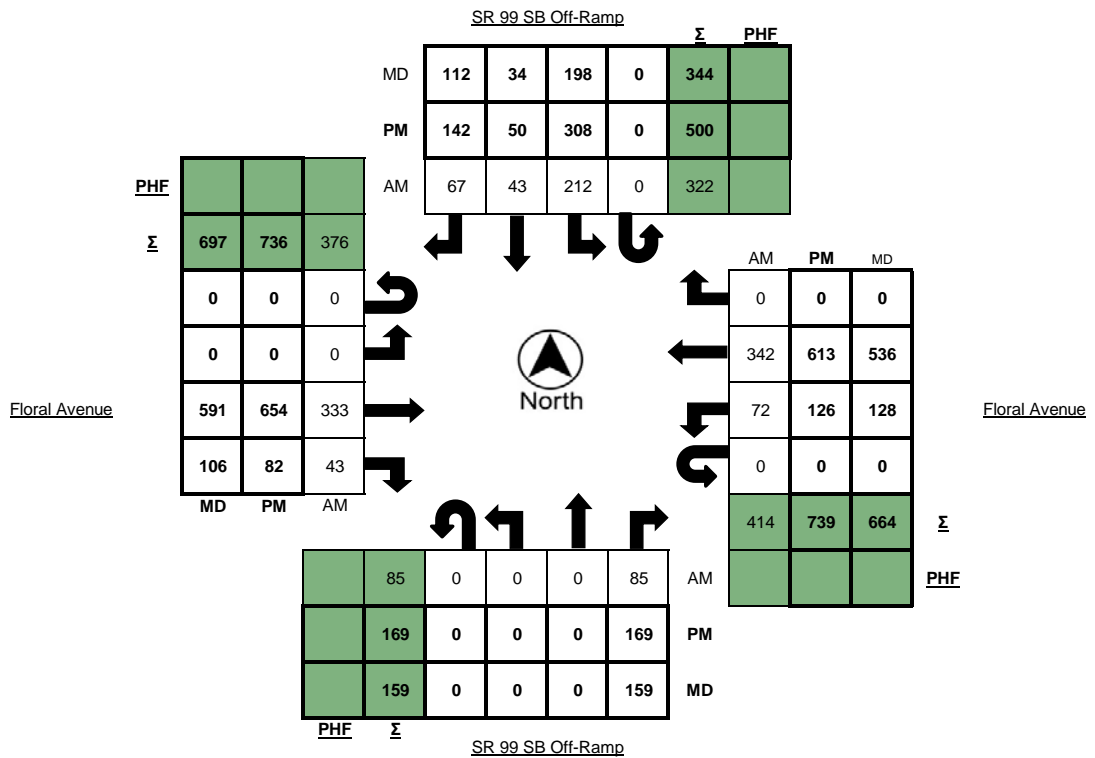
LOCATION SR 99 SB Off-Ramp at Floral Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 0.00%	AM Growth Rate 0.80%	AM Growth Rate 2.92%	AM Growth Rate 2.26%
# of Years 6	PM Growth Rate 0.00%	PM Growth Rate 0.37%	PM Growth Rate 2.57%	PM Growth Rate 2.17%
	MD Growth Rate 0.00%	MD Growth Rate 0.93%	MD Growth Rate 3.48%	MD Growth Rate 2.88%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	0	0	0	85		0	202	41	64		0	0	280	36		0	63	299	0	
4:45 PM - 5:45 PM	0	0	0	169		0	301	49	139		0	0	562	70		0	111	539	0	
1:00 PM - 2:00 PM	0	0	0	159		0	187	32	106		0	0	481	86		0	108	452	0	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:45 AM - 8:45 AM	0	0	0	85		0	212	43	67		0	0	333	43		0	72	342	0	
4:45 PM - 5:45 PM	0	0	0	169		0	308	50	142		0	0	654	82		0	126	613	0	
1:00 PM - 2:00 PM	0	0	0	159		0	198	34	112		0	0	591	106		0	128	536	0	



Selma Grove TIA Turning Movement Volumes

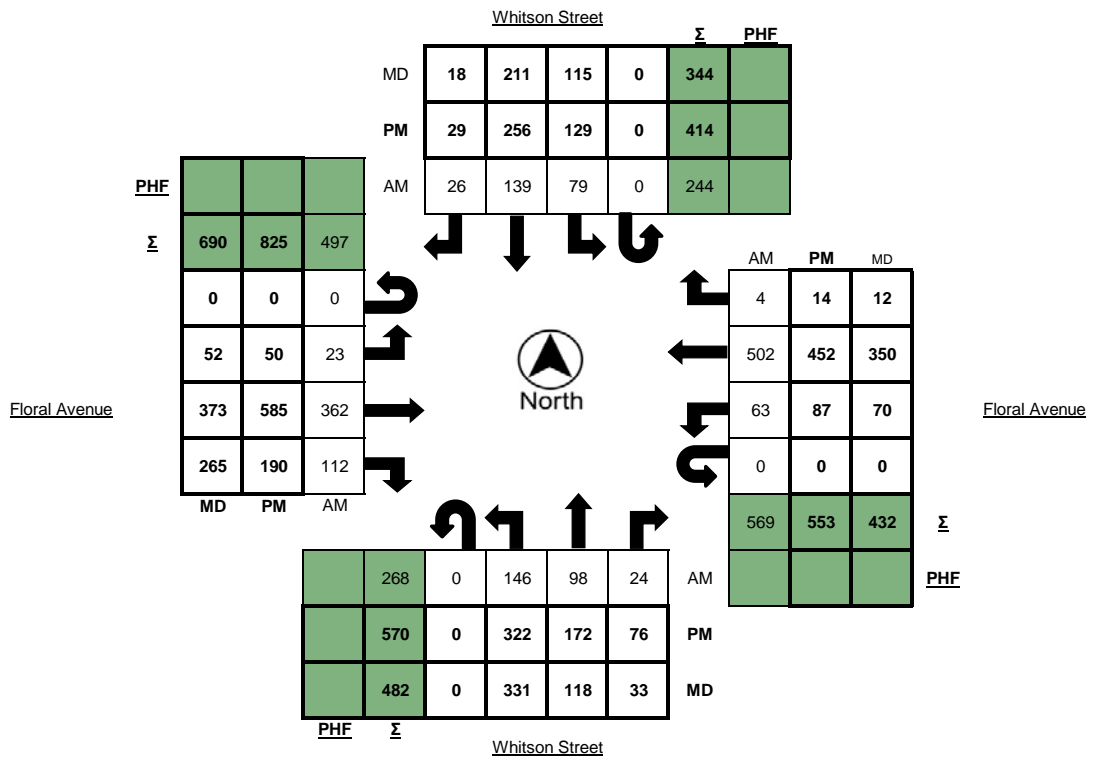
LOCATION Whitson Street at Floral Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 2.21%	AM Growth Rate 5.49%	AM Growth Rate 1.87%	AM Growth Rate 0.99%
# of Years 6	PM Growth Rate 4.88%	PM Growth Rate 7.57%	PM Growth Rate 2.79%	PM Growth Rate 2.57%
	MD Growth Rate 5.60%	MD Growth Rate 8.55%	MD Growth Rate 3.69%	MD Growth Rate 3.48%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	128	86	21		0	57	101	19		0	21	324	100		0	59	473	4	
4:00 PM - 5:00 PM	0	242	129	57		0	83	165	19		0	42	496	161		0	75	388	12	
1:00 PM - 2:00 PM	0	239	85	24		0	70	129	11		0	42	300	213		0	57	285	10	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	146	98	24		0	79	139	26		0	23	362	112		0	63	502	4	
4:00 PM - 5:00 PM	0	322	172	76		0	129	256	29		0	50	585	190		0	87	452	14	
1:00 PM - 2:00 PM	0	331	118	33		0	115	211	18		0	52	373	265		0	70	350	12	



Selma Grove TIA Turning Movement Volumes

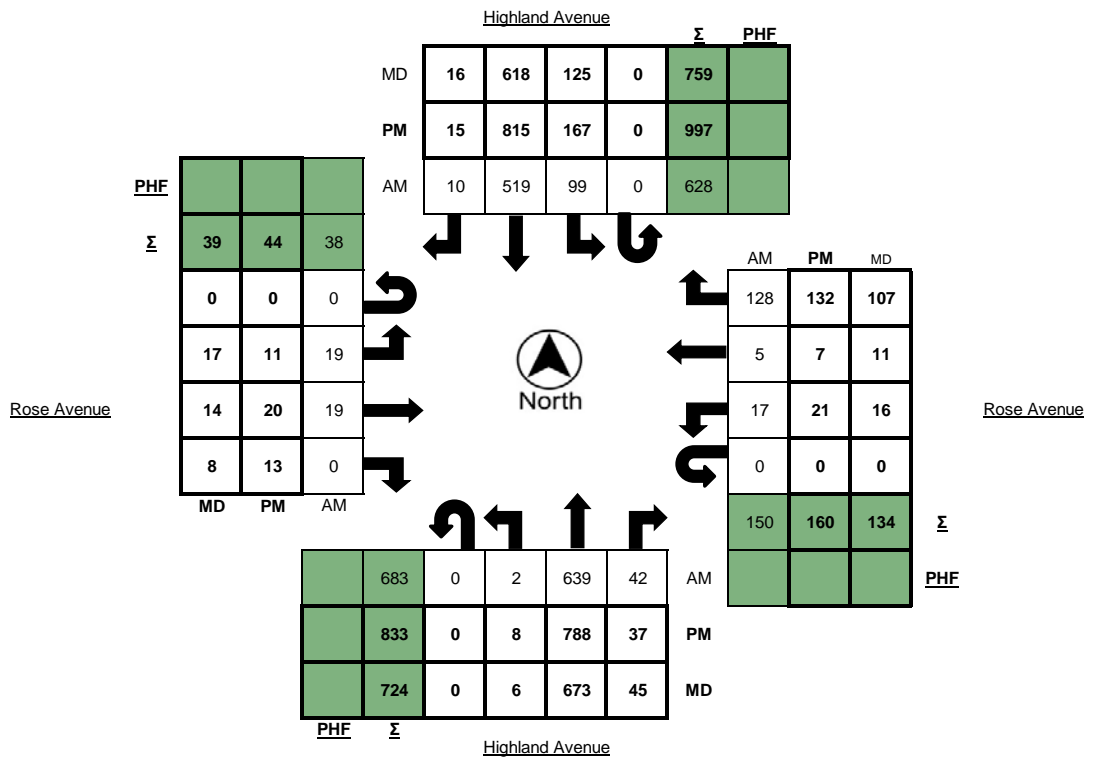
LOCATION Highland Avenue at Rose Avenue
 COUNTY Fresno
 COLLECTION DATE June 2016

LATITUDE _____
 LONGITUDE _____
 WEATHER Clear

Count Year 2016	Northbound Growth Rate	Southbound Growth Rate	Eastbound Growth Rate	Westbound Growth Rate
Projected Year 2022	AM Growth Rate 3.17%	AM Growth Rate 3.13%	AM Growth Rate 18.29%	AM Growth Rate 1.13%
# of Years 6	PM Growth Rate 4.71%	PM Growth Rate 4.80%	PM Growth Rate 14.31%	PM Growth Rate 1.60%
	MD Growth Rate 5.47%	MD Growth Rate 6.18%	MD Growth Rate 18.74%	MD Growth Rate 2.61%

Existing Selma Grove TIA Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	2	530	35		0	82	431	8		0	7	7	0		0	16	5	120	
4:15 PM - 5:15 PM	0	6	598	28		0	126	615	11		0	5	9	6		0	19	6	120	
2:00 PM - 3:00 PM	0	4	489	33		0	87	431	11		0	6	5	3		0	14	9	92	

Selma Grove TIA Forecast Year 2022 Volumes																				
PEAK HOUR	Northbound					Southbound					Eastbound					Westbound				
	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	2	639	42		0	99	519	10		0	19	19	0		0	17	5	128	
4:15 PM - 5:15 PM	0	8	788	37		0	167	815	15		0	11	20	13		0	21	7	132	
2:00 PM - 3:00 PM	0	6	673	45		0	125	618	16		0	17	14	8		0	16	11	107	



Attachment 11

California Department of Transportation

DISTRICT 6 OFFICE
1352 WEST OLIVE AVENUE | P.O. BOX 12616 | FRESNO, CA 93778-2616
(559) 981-1041 | FAX (559) 488-4195 | TTY 711
www.dot.ca.gov



August 16, 2021

FRE-99- 6.556
Selma Grove
4th Review

<https://ld-igr-gts.dot.ca.gov/district/6/report/12037#33140>

SENT VIA EMAIL

Kira Noguera
Selma Contract City Planner
1710 Tucker Street
Selma, CA 93662
PlanningDept@cityofselma.com

Dear Mx. Noguera:

Thank you for the opportunity to review the application for amendment to site plan Selma Grove 2006-0008. This development was previously reviewed in April 2020. The Applicant proposes a 62.9-acre development including a hotel, a 55,000 SF movie cinema, regional shopping center, supermarket, drugstore, and restaurants. The project site is on the north side of Floral Avenue just west of the existing Walmart, approximately 1,500 feet west of State Route (SR) 99 in the city of Selma.

Caltrans provides the following comments consistent with the State's smart mobility goals that support a vibrant economy and sustainable communities:

1. Caltrans previously recommended lengthening the existing single eastbound left turn lane on Floral Ave at Highland Ave. This lengthening would be maximized by the elimination of the westbound left turn lane on Floral Avenue at SR 99 SB off-ramp/ shopping Center driveway. Upon further evaluation, this alternative is no longer recommended because elimination of a left turn lane into a larger shopping center is not feasible, and the single left turn lane would not provide the dual left turn lane capacity as recommended by the project traffic impact study.
2. Caltrans now concurs with the recommendation of the traffic impact study to provide dual eastbound left turn lanes on Floral Ave at Highland Ave. The lengths of the eastbound left turn lanes should be maximized within the existing geometric constraints without impacting the westbound left turn lane. This work would require intersection widening, signal relocation/ modification and reconstruction of the

existing raised median island. **The proposed development should be 100% responsible for this opening-day improvement and should be completed prior to project opening.**

3. We concur with the traffic study's recommendation to convert the existing southbound through-lane to a shared through-right-turn lane at the SR 99 southbound off-ramp. **However, having a pedestrian crosswalk at the receiving leg (west leg of Floral Ave) of the intersection may pose potential safety issue due to sight distance.** If two vehicles are making right turns side by side, the ability for the driver on the left to see pedestrians at the crosswalk may be obstructed by the vehicle on the right, especially if it's a truck. **Therefore, the crosswalk at the west leg (Floral Ave) of the intersection should be eliminated and construct a paved pedestrian walking path along** the south side of Floral Ave from this intersection (Floral Ave/SR 99 SB Ramps) to the adjacent intersection to the west (Floral Ave/Walmart Driveway). This would provide a way for a pedestrian to walk to the adjacent signalized intersection and cross Floral Ave. **The proposed development should be 100% responsible for this opening-day improvement and should be completed prior to project opening.**
4. Caltrans also concurs with the traffic study's recommendation indicating the proposed development should contribute its proportional share (6.08%) to the signalization and lane configuration modifications at the SR 43 intersection with Rose Avenue.
5. Given that this development is oriented towards regional attraction, Caltrans recommends the project proponents(s) conduct a vehicle-miles traveled (VMT) study. In the absence of a local agency VMT guideline, the preparer should refer to the Caltrans Vehicle Miles Traveled-Focused Transportation Impact Study Guide, dated May 20, 2020. Improvements for existing/future bike and pedestrian facilities on roads in the vicinity of the Project and connectivity between home to work/home to shops should be considered and included in the VMT mitigation plan.
6. Caltrans recommends the Project implement "smart-growth" principles regarding parking solutions or providing alternative transportation choices to future employees/customers. Smart growth and alternative transportation choices may include but not limited to convenient drop-off locations for car-share and/or ride-share programs and/or electric vehicle parking/charging stations.
7. If transit is not available within ¼-mile of the site, transit should be extended to provide services.

Kira Noguera Selma Grove
August 16, 2021
Page 3

8. Active Transportation Plans and Smart Growth efforts support the state's 2050 Climate goals. Caltrans supports reducing VMT and GHG emissions in ways that increase the likelihood people will use and benefit from a multimodal transportation network.

If you have any other questions, please call or email Edgar Hernandez at (559) 981-7436 or edgar.hernandez@dot.ca.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'David Padilla', with a long horizontal flourish extending to the right.

David Padilla, Branch Chief
Transportation Planning – North

California Department of Transportation

DISTRICT 6 OFFICE
1352 WEST OLIVE AVENUE | P.O. BOX 12616 | FRESNO, CA 93778-2616
(559) 981-1041 | FAX (559) 488-4195 | TTY 711
www.dot.ca.gov



February 10, 2023

FRE-99- 6.556

Selma Grove Development

<https://ld-igr-gts.dot.ca.gov/district/6/report/12037#33140>

SENT VIA EMAIL

Trevor Stearns, Contract Planner
City of Selma
1710 Tucker Street
Selma, CA 93662
(559) 449-2400 Office
(559) 307-8939 Mobile
www.QKinc.com

Dear Mr. Stearns,

This letter serves as an addendum to our previous comment letter dated August 16, 2021.

As part of a recent meeting held on February 2, 2023, with the City of Selma, Applicant/Developer, and Caltrans, our office has agreed to forego our opening day improvement(s) request for comment #2 and comment #3 of our comment letter dated August 16, 2022, and instead allow the Applicant/Developer to phase-in their identified improvements throughout the duration of the Selma Grove development.

The City provided an updated conditions of approval memorandum dated February 8, 2023, indicating the Developer or successor in interest shall be responsible for their fair share contributions to the proposed improvements recommended by the State of California Department of Transportation (Caltrans). The developer or successor in interest shall be responsible for their fair share contributions consistent with the analysis of the updated Project Traffic Impact Analysis Mitigation Measure MM T-1 and Caltrans recommendations regarding the improvements detailed in Items 2 and 3 of the attached letter from Caltrans. The specific improvements are outlined as follows:

- Provide dual eastbound left turn lanes within the existing geometric constraints at the Floral and Highland Avenue intersection.
- Any related intersection widening, signal relocation/modification and reconstruction of the existing raised median island if needed due to the above-mentioned improvement.
- Eliminate the Floral Avenue and State Route 99 Southbound off-ramp intersection crosswalk at the west leg of the intersection and construct a paved pedestrian walking path along the south side of Floral Avenue from the aforementioned intersection to the Floral Avenue and Walmart Driveway intersection.

2/10/20223

Page 2

The timing in which these improvements must be constructed shall be no later than when 75% of total development is completed (measured by square footage). Our office accepts the City's latest conditions of approval listed above.

Our comments #1, #4, #5, #6, #7, and #8 from our comment letter dated August 16, 2021, still apply.

If you have any other questions, please call or email Edgar Hernandez at (559) 981-7436 or edgar.hernandez@dot.ca.gov.

Sincerely,



David Padilla, Branch Chief
Transportation Planning – North

Attachment 12

California Department of Transportation

DISTRICT 6 OFFICE
1352 WEST OLIVE AVENUE | P.O. BOX 12616 | FRESNO, CA 93778-2616
(559) 981-1041 | FAX (559) 488-4195 | TTY 711
www.dot.ca.gov



February 10, 2023

FRE-99- 6.556

Selma Grove Development

<https://ld-igr-gts.dot.ca.gov/district/6/report/12037#33140>

SENT VIA EMAIL

Trevor Stearns, Contract Planner
City of Selma
1710 Tucker Street
Selma, CA 93662
(559) 449-2400 Office
(559) 307-8939 Mobile
www.QKinc.com

Dear Mr. Stearns,

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2/10/20223

Page 2

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Our comments #1, #4, #5, #6, #7, and #8 from our comment letter dated August 16, 2021, still apply.

If you have any other questions, please call or email Edgar Hernandez at (559) 981-7436 or edgar.hernandez@dot.ca.gov.

Sincerely,



David Padilla, Branch Chief
Transportation Planning – North