Feasibility Study

FS-0509A

NC 109
Identify Improvements to Mitigate Current and Future Traffic Congestion Through Thomasville

City of Thomasville,
Davidson County

Division 9

Feasibility Studies Unit
Program Development Branch
N.C. Department of Transportation

Documentation Prepared by Ko & Associates, P.C.,
A Florence & Hutcheson, Inc. Company

Mark L. Reep, P.E.
Project Manager
Ko & Associates, P.C.,
A Florence & Hutcheson, Inc. Company

Derrick W. Lewis, P.E.
Feasibility Studies Unit Head
Feasibility Studies Unit, NCDOT

F. Rasay Abadilla Jr., MSCE, PE
Feasibility Studies Engineer
Feasibility Studies Unit, NCDOT

6/24/2010
Date

Feasibility Study

FS-0509A

NC 109 Improvements to Mitigate Current and Future
Traffic Congestion Through Thomasville

Executive Summary

Introduction

This feasibility study evaluates reasonable improvements in an attempt to mitigate traffic congestion along NC 109 through Thomasville, Davidson County. The project study area begins south of I-85 near Lambeth Road (SR 2067), passes through the Thomasville Central Business District (CBD), and ends at I-85 Business as shown in Figure 1A. Key factors in the study include providing good access to the I-85 and I-85 Business interchanges and providing a bridge at the NC Railroad/ Norfolk Southern Railroad.

NC 109 serves as a major thoroughfare in the High Point-Thomasville urbanized area and is classified as an *Other Principal Arterial* on the Statewide Functional Classification System. It is a strategic north-south corridor linking Asheboro, Albemarle, Denton and the rural areas of western Randolph, southeast Davidson, and Montgomery Counties. NC 109 is a vital travel link for commerce between these urban areas and supports job opportunities for the rural communities served by NC 109 to the employment centers located in the Piedmont Triad (Greensboro, Winston-Salem – High Point – Thomasville) and Lexington areas.

Under current traffic conditions, most intersections in the study area operate at an acceptable level of service. Exceptions include Main Street-South (SR 2085), Liberty Drive (SR 2055), and Lambeth Road (SR 2067), where the intersections reach or exceed their capacity. By the year 2035 traffic conditions at most intersections are expected to reach or exceed the traffic carrying capacity. During peak periods, congestion can be attributed to delays at numerous traffic signals, the NC Railroad/ Norfolk Southern Railroad crossing, and low travel speeds. Crash rates along NC 109 in study area are nearly 2.5 times the statewide average rates for similar routes. Predominate crash types are angle, left turning, rear end, and sideswipe collisions.

Alternatives

Five alternatives were evaluated in this study (see Figure 1A). The conceptual designs include a four-lane divided roadway with a raised median and curbs and gutters on each side of the roadway. A 200-foot right of way width was used in the designs. Turn lanes are added or dropped at various intersection locations. A 50 mph design speed is proposed.

Alternative 1 addresses congestion along the commercialized area of NC 109 from south of I-85 to the Julian Avenue (SR 2185) intersection with Cloniger Street (NC 62), a length of approximately 1.5 miles. It includes intersection improvements and reconstruction of the I-85 interchange. It also implements the northern end of future NC 109 improvements (TIP Project R-4734). Improvements to NC 109 north of Julian Avenue (SR 2185) through downtown Thomasville was considered to be not feasible as widening NC 109 and bridging over the railroad near Main Street (SR 2123) would involve substantial property damages and community impacts.

Alternative 2 is a parallel route to NC 109 around the west side of Thomasville. It starts at NC 109 south of Lambeth Road (SR 2067) and travels west on new location to join Lake Road (SR 2085). It continues north along Baptist Children's Home Road (SR 2085), Peace Street, and Martin Luther King (MLK) Jr. Drive (SR 1792) to I-85 Business, a length of approximately 5.0 miles. Alternative 2 provides interchanges with I-85 and I-85 Business, and it implements part of the future Thomasville Southern Loop. Benefits associated with Alternative 2 include wide traffic lanes, an alignment that may not require substantial reconstruction, compatible posted speed limits, and the use of an existing bridge over the railroad near Main Street (SR 2123). There is the potential for impacts to minority and low income neighborhoods along Martin Luther King Jr. Drive (SR 1792).

Alternative 3 was considered early in the project's development. It follows Alternative 2 from NC 109 to Lake Road (SR 2085) at Fisher Ferry Road (SR 2183). It then follows Fisher Ferry Road (SR 2183) to Winston Street and joins NC 109 to I-85 Business, a length of 5.2 miles. There is not enough space between existing interchanges on I-85 to allow a new interchange with Fisher Ferry Road (SR 2183) on Alternative 3. A new bridge over the railroad near Main Street (SR 2123) would be disruptive to development in the downtown area. There are numerous low income houses and historic properties located along the alternative, the alignment is poor, and the existing lane widths are inadequate. For these reasons, this alternative was not considered feasible and was eliminated from further consideration.

Alternative 4 includes Alternative 1 and the closest parallel route to NC 109 along the east side of downtown Thomasville that follows Julian Avenue (SR 2185), continues north to Maple Avenue, and extends on new location to join Unity Street (SR 2051). It continues along Unity Street (SR 2051) to NC 109 and then north on NC 109 to I-85 Business, a length of approximately 4.5 miles. It would provide a multilane route with interchanges at I-85 and I-85 Business, and it implements parts of the High Point MPO Thoroughfare Plan with the extension of Julian Avenue (SR 2185) from Main Street (SR 2123) to Unity Street (SR 2051). Benefits of Alternative 4 include: it maintains the existing railroad bridge near Main Street (SR 2123); the NC 109 route designation could easily be shifted to the new route; wide traffic lanes; and compatible posted speed limits south of Main Street (SR 2123). However, substantial community impacts occur along the northern part from Main Street (SR 2123) to NC 109.

Alternative 5 is a parallel route to NC 109 along the east side of Thomasville. It follows NC 109 from south of Lambeth Road (SR 2067) and joins NC 62 (Cloniger Drive), Liberty Drive (SR 2055), Turner Street (SR 2165), and National Highway (NC 68) to I-85 Business, a length of approximately 4.7 miles. Benefits of Alternative 5 include the extension of a multilane facility from NC 109 south of Thomasville to National Highway (NC 68) for improved access between the two interstate facilities. It includes TIP Project U-4420, the widening improvements to Liberty Drive (SR 2055) and Turner Street (SR 2165) between Cloniger Street (NC 62) and National Highway (NC 68). It also includes a new bridge over the railroad near Main Street (SR 2123). Its disadvantage is it does not have a direct interchange with I-85. It joins National Highway (NC 68) north of Thomasville instead of NC 109 to provide access to I-85 Business. Construction costs are highest from Blair Street to National Highway (NC 68) at I-85 Business due to the extensive widening and the railroad grade separation. Substantial community impacts occur along Liberty Drive (SR 2055) between Cloniger Street (NC 62) and Blair Street.

Alternative 6 combines links from the High Point MPO Thoroughfare Plan to determine their overall benefit to traffic operations within the Thomasville area roadway network. It examines the combined roadway system improvements from Alternatives 1, 2, 4, and 5 to implement links in the High Point MPO Thoroughfare Plan. This is to determine the overall benefit to traffic operations within the Thomasville area road network. With Alternative 6, there is some improvement in traffic operations at NC 109 intersections as compared with the other alternatives alone. This typically occurs when an intersection along NC 109 is improved.

According to future traffic forecasts for the year 2035, Alternatives 2, 4, 5, and 6 divert less than 20% of the traffic from NC 109. While no alternative will alleviate the congestion along existing NC 109 in Thomasville, they offer viable alternative routes for local traffic and NC 109 through traffic around Thomasville. The costs and residential and business relocation impacts of the alternatives are summarized in Table i.

Table i - Summary of Costs and Relocations

	Length (miles)	Description	Total Costs	Residential and Business Relocations
Alt. 1	**1.55**	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	**$37,800,000**	**29**
Alt. 2	**5.03**	NC 109 South of Lambeth Rd. to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	**$70,700,000**	**152**
Alt. 4	**4.52**	South of Lambeth Rd. (SR 2067) to NC 109 at I-85 Bus.	**$97,400,000**	**178**
Alt. 5	**4.66**	South of Lambeth Rd. (SR 2067) to National Hwy. (NC 68) at I-85 Bus.	**$99,900,000**	**250**
Alt. 6	**13.46**	Combines Alternatives 1, 2, 4, and 5 from South of Lambeth Rd. (SR 2067) to I-85 Bus.	**$262,700,000**	**578**

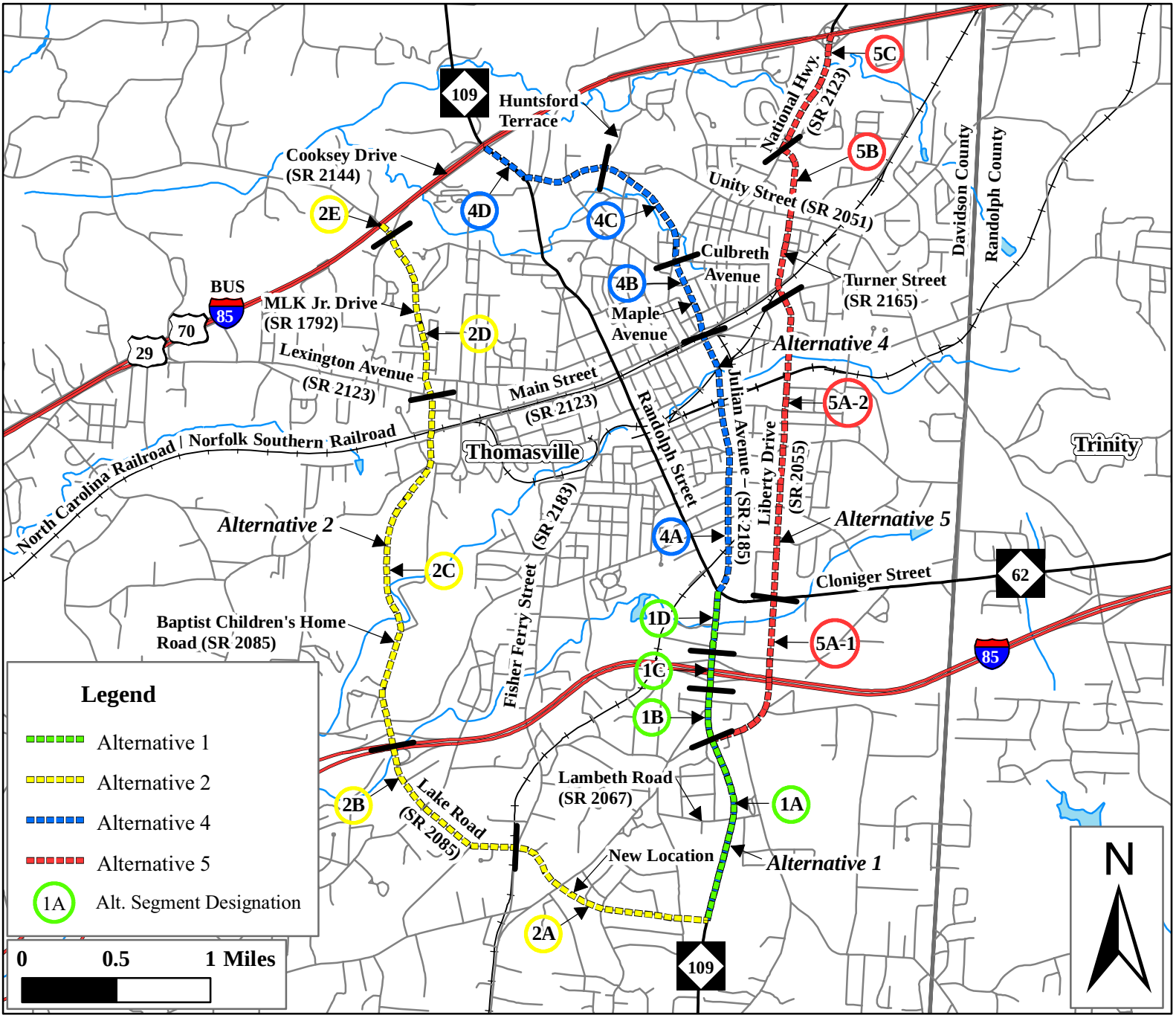
Recommendations

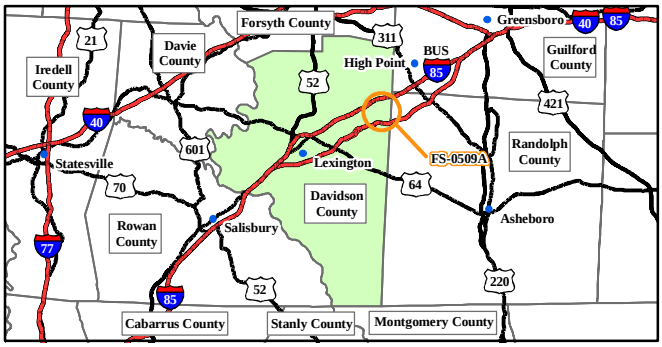
Of the alternatives considered in this study, Alternatives 1 and 4 offer the greatest benefits. These combine to complete an improved multilane facility between I-85 and I-85 Business along the east side of Thomasville and parallel to NC 109. The total cost of Alternative 4 is $97,400,000 when fully implemented. However, Alternative 1 and the portion of Alternative 4 north of Main Street (SR 2123) combine for the most important links. These are recommended as the highest priorities for phased improvements (see Figure 1B and Table ii).

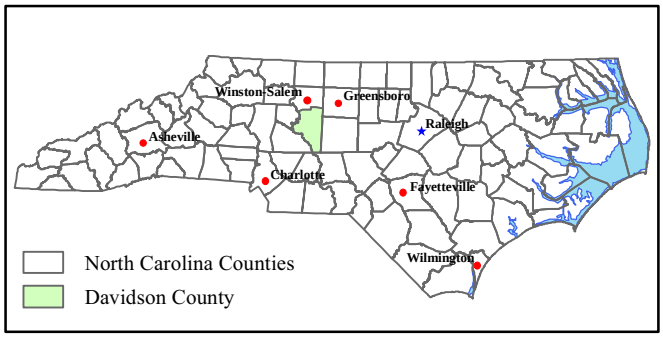
Alternatives 2 and 5 are also beneficial for improving accessibility between I-85 and I-85 Business along the east and west sides of Thomasville. The parts of Alternative 2 southeast of I-85 and north of Lexington Avenue (SR 2123) complete a continuous route around the west side of Thomasville. From Cloniger Street (NC 62) to National Highway (NC 68), Alternative 5 provides an improved route on the east side of Thomasville for better mobility between NC 109 (near I-85) and I-85 Business. These are recommended as secondary priorities for improvement.

Table ii – Recommended Improvement Priorities for Phased Implementation

	Length (miles)	Description	Total Costs	Residential and Business Relocations
	Highest Priority			
Alt. 1	**1.55**	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	**$37,800,000**	**29**
Alt. 4	**1.65**	Maple Ave. at East Main St. (SR 2123) to NC 109 at I-85 Bus.	**$34,100,000**	**104**
	Secondary Priority			
Alt. 2	**3.17**	NC 109 South of Lambeth Rd. to I-85 and Lexington Ave. (SR 2123) to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	**$53,200,000**	**134**
Alt. 5	**2.41**	Liberty Dr. (SR 2055) at Cloniger St. (NC 62) to National Hwy. (NC 68) at Turner St. (SR 2165)	**$58,500,000**	**212**







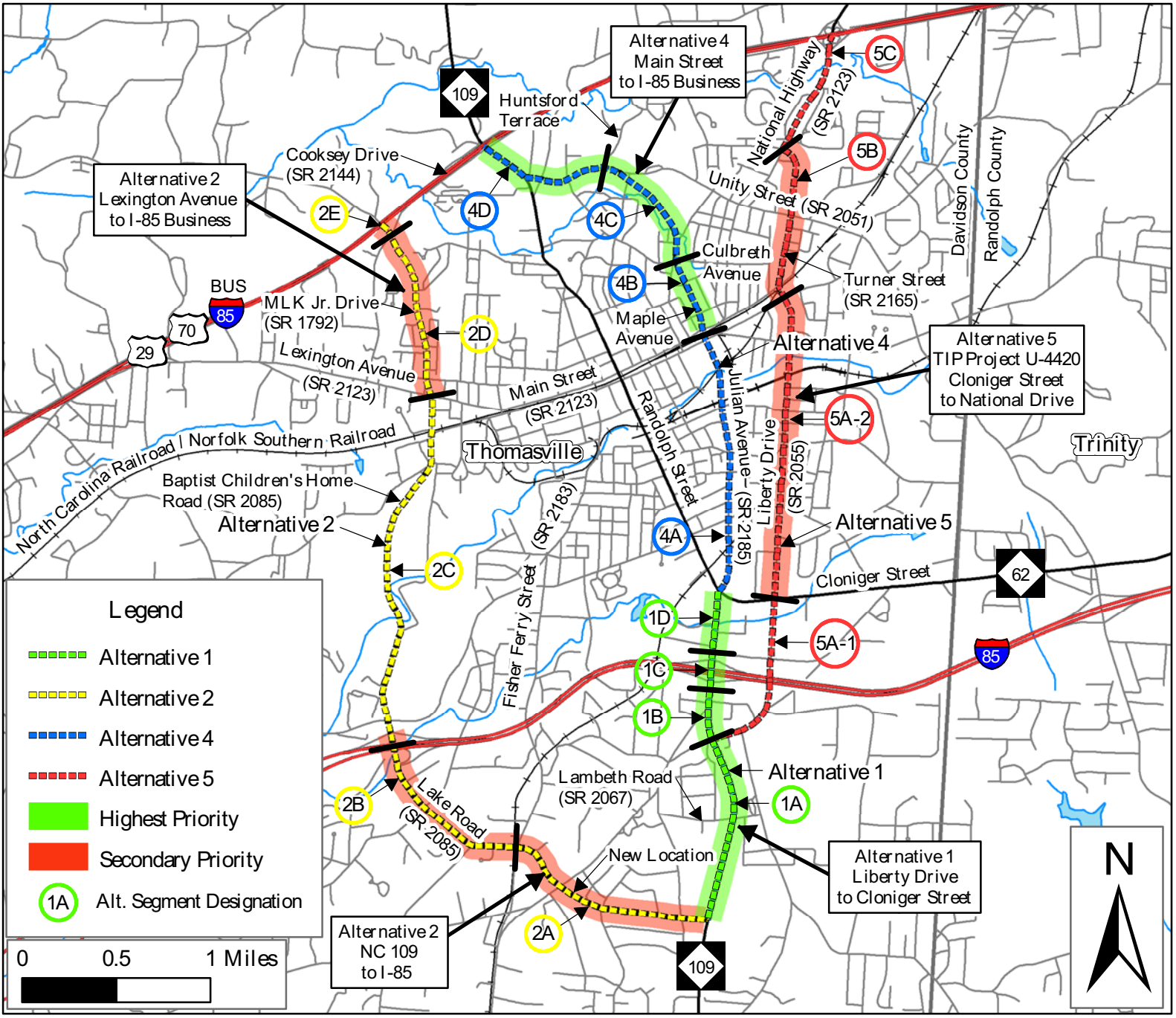
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FEASIBILITY STUDIES UNIT

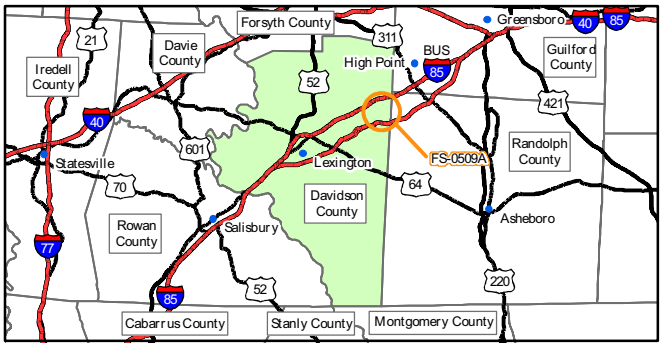
Project Location Map

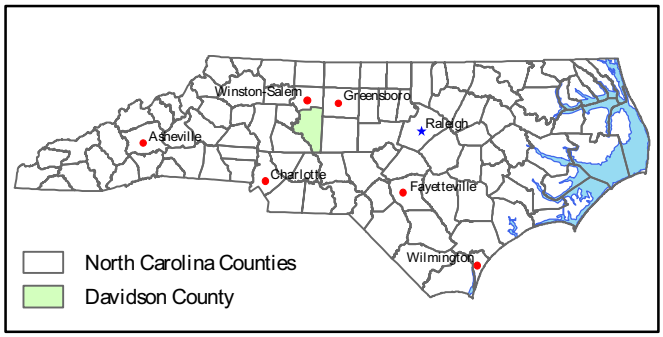
FS-0509A

NC 109 From North of I-85 Business
to South of SR 2067 (Lambeth Road)
City of Thomasville, Davidson County

Figure 1A







STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FEASIBILITY STUDIES UNIT

Priorities for Recommended Improvements

FS-0509A

NC 109 From North of I-85 Business
to South of SR 2067 (Lambeth Road)
City of Thomasville, Davidson County

Figure 1B

FS-0509A

NC 109
Identify Improvements to Mitigate Current and Future
Traffic Congestion Through Thomasville

City of Thomasville, Davidson County

Division 9

I. General Description

This feasibility study describes improvements in an attempt to mitigate congestion along NC 109 in Thomasville, Davidson County. The project study area is shown in Figure 1A.

This study is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project, including costs, and to identify potential problems that may require consideration in the future planning and design phase.

II. Background and Need for Project

The purpose of this project is to identify reasonable improvements in an attempt to mitigate current and future traffic congestion along NC 109 through Thomasville. Key factors in the study include providing good access to the I-85 and I-85 Business interchanges and providing a bridge at the NC Railroad/ Norfolk Southern Railroad.

NC 109 serves as a major thoroughfare in the High Point-Thomasville urbanized area and is classified as a minor arterial on the Statewide Functional Classification System. It is a strategic north-south corridor linking Asheboro, Albemarle, Denton and the rural areas of western Randolph, southeast Davidson, and Montgomery Counties. NC 109 is a vital travel link for commerce between these urban areas and supports job opportunities for the rural communities served by NC 109 to the employment centers located in the Piedmont Triad (Greensboro, Winston-Salem – High Point – Thomasville) and Lexington areas.

Existing NC 109, in the project area, transitions from a rural two-lane roadway in the south to a multi-lane roadway in the north. It travels through varying land uses common to facilities that serve rural communities and central business districts (CBD) alike. Table 1 presents typical section and land use information for NC 109 along different parts of the project area.

There is on-street parking along NC 109 in the CBD, and sidewalks are present on one or both sides of the road from Holly Hill Road (SR 2060) to James Avenue. Approximately 14 traffic signals are located on NC 109 from south of Lambeth Road (SR 2067) to I-85 Business, and the posted speed varies from 20 to 55 mph.

Table 1: Existing NC 109 Conditions

Section of NC 109	Typical Section	Land Uses
From ~one mile south of I-85 to ~650 ft. north of Lambeth Road (SR 2067)	Two-lane undivided with grass shoulders	Wooded / Undeveloped
From ~650 ft. north of Lambeth Road (SR 2067) to ~850 ft. south of Liberty Drive (SR 2055)	Four lanes (two northbound, two tapering to one southbound) separated by a raised concrete median with curbs and gutters	Primarily wooded / undeveloped
From ~850 ft. south of Liberty Drive (SR 2055) to Cedar Lodge Road (SR 2184)	Five lanes (two in each direction and a center turn lane) with curbs and gutters	Single-family residential / institutional
Cedar Lodge Road (SR 2184) to Hinkle Street	Five lanes (two in each direction and a center turn lane) with curbs and gutters	Commercial
Hinkle Street to Colonial Drive	Three lanes (one in each direction and a center turn lane) with curbs and gutters	Commercial / office / institutional / industrial
Colonial Drive to Unity Street (SR 2051)	Two-lane undivided with curbs and gutters	Commercial / institutional / office / single and multi-family residential / park
Unity Street (SR 2051) to I-85 Business	Four-lane median divided (grass) with curbs and gutters	Single-family residential / institutional

NC 109 crosses railroad tracks at-grade in two locations (i.e. the roadway and railroad tracks are at the same elevation and there is no bridging of one over the other). The High Point, Thomasville & Denton Railroad (HPTD) is a short line between Denton and High Point. It has a single track that crosses Randolph Street (NC 109) north of Julian Avenue (SR 2185). The NC Railroad/ Norfolk Southern Railroad main line crosses Salem Street (NC 109) near Main Street (SR 2123). This is a double track section between Raleigh and Charlotte with approximately 40 trains per day. Future High Speed Rail service is planned along this route, and NCDOT is working to provide safety improvements on this segment from Raleigh to Charlotte known as the 'Sealed Corridor' by closing private crossings where feasible and protecting the crossings that will remain open with enhanced safety measures. Under normal railroad operation, the event of a train crossing at this location will cause delay of up to several minutes for vehicular traffic depending on type and speed of train.

There are four programmed projects in the *2009-2015 State Transportation Improvement Program* (TIP) in the general vicinity of this project (see Figure 2):

- **R-4734** – widen NC 109 to multi-lanes from I-85 in Thomasville to NC 47 in Denton (16.9 miles, right of way and construction in future years)

- **U-4420** – widen Turner Street (SR 2165) and Liberty Drive (SR 2055) to multi-lanes from Cloniger Drive (NC 62) to National Highway (NC 68) (2.4 miles, right of way and construction in future years)
- **U-4411** – widen NC 109 from Royal Oaks Street to Colonial Drive (0.5 mile, right of way and construction in future years)
- **B-4499** – replace the Martin Luther King (MLK) Jr. Drive (SR 1792) Bridge No. 158 at I-85 Business (right of way scheduled in 2009 and construction in 2010)

III. Description of Alternatives

The following alternatives have been evaluated for this Feasibility Study. The alternatives are comprised of roadway segments that were used in preparing and evaluating costs and potential effects on adjacent properties. These segments and their lengths are described below and in Table 2. Note Alternative 3 is not listed as it was eliminated from consideration. See Section IV, Other Alternatives Considered, for more information on Alternative 3.

Alternative 1 follows NC 109 from approximately 0.3 mile south of Lambeth Road (SR 2067) to Julian Avenue (SR 2185), a length of approximately 1.5 miles (see Figure 3A).

Alternative 2 starts at NC 109 approximately 0.6 mile south of Lambeth Road (SR 2067) and travels west on new location to join Lake Road (SR 2085). It continues north along Baptist Children's Home Road (SR 2085), Peace Street, and Martin Luther King (MLK) Jr. Drive (SR 1792) to I-85 Business, a length of approximately 5.0 miles. (see Figure 3B).

Alternative 4 includes Alternative 1 and it continues north along Julian Avenue (SR 2185) and Maple Avenue to Culbreth Avenue and veers west on new location to join Unity Street (SR 2051) at Huntsford Terrace. It then continues along Unity Street (SR 2051) to NC 109 and then north on NC 109 to I-85 Business, a length of approximately 4.5 miles (see Figure 3C).

Alternative 5 follows NC 109 from approximately 0.3 mile south of Lambeth Road (SR 2067) and joins NC 62 (Cloniger Drive), Liberty Drive (SR 2055), Turner Street (SR 2165), and National Highway (NC 68) to I-85 Business, a length of approximately 4.7 miles (see Figure 3D).

Alternative 6 combines links from the High Point MPO Thoroughfare Plan to determine their overall benefit to traffic operations within the Thomasville area roadway network. It includes combinations of all the alternatives, and the total length of improvements is approximately 13.5 miles.

Table 2 – Alternative Segment Descriptions

	Segment	Description	Length (miles)
Alternative 1	1A	South of Lambeth Rd. (SR 2067) to Liberty Dr. (SR 2055)	0.75
	1B	Liberty Dr. (SR 2055) to South of I-85	0.27
	1C	I-85 Interchange	0.21
	1D	North of I-85 to Julian Avenue (SR 2185)	0.32
			1.55
Alternative 2	2A	New location - NC 109 South of Lambeth Rd. to Lake Rd. (SR 2085)	1.10
	2B	Lake Rd. (SR 2085) at Fisher Ferry Rd. (SR 2183) to I-85	0.80
	2C	Baptist Children's Home Rd. (SR 2085) at I-85 to Lexington Ave. (SR 2123)	1.86
	2D	Martin Luther King Jr. Dr. (SR 1792) at Lexington Ave. (SR 2123) to I-85 Bus.	0.83
	2E	I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	0.44
			5.03
Alternative 4	1A-1D	South of Lambeth Rd. (SR 2067) to Julian Ave. (SR 2185)	1.55
	4A	Julian Ave. (SR 2185) at NC 109 to East Main St. (SR 2123)	1.32
	4B	Maple Ave. at East Main St. (SR 2123) to Culbreth Ave.	0.38
	4C	New location - Maple Avenue at Culbreth Ave. to Unity St. (SR 2051) at Huntsford Terrace	0.68
	4D	Unity St. (SR 2051) at Huntsford Terrace to NC 109 at I-85 Bus.	0.59
			4.52

Table 2 – Alternative Segment Descriptions (Continued)

	Segment	Description	Length (miles)
Alternative 5	1A	South of Lambeth Rd. (SR 2067) to Liberty Dr. (SR 2055)	0.75
	5A-1	Liberty Dr. (SR 2055) at NC 109 to Cloniger St. (NC 62)	0.92
	5A-2	Liberty Dr. (SR 2055) at NC 62 to Blair St. (South of E. Main St.)	1.61
	5B	Turner St. (SR 2165) at Blair St. to National Hwy. (NC 68)	0.80
	5C	National Hwy. (NC 68) at Turner St. (SR 2165) to I-85 Bus.	0.58
			4.66
Alternative 6	1A-1D	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	1.55
	2A-2E	NC 109 South of Lambeth Rd. to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	5.03
	4A-4D	Julian Ave. (SR 2185) at NC 109 to NC 109 at I-85 Bus.	2.97
	5A-5C	Liberty Dr. (SR 2055) at NC 109 to National Hwy. (NC 68) at I-85 Bus.	3.91
			13.46

The conceptual designs include a four-lane divided roadway with a raised median, curbs and gutters, and a berm on each side of the roadway. A 200-foot right of way width was used in the designs. The proposed roadway includes two 12-foot travel lanes in each direction, a 23-foot raised median, 2.5-foot curbs and gutters, 10-foot wide grassed berms, and variable width construction slopes (see typical sections in Figures 3A through 3D). Turn lanes are added or dropped at various intersection locations. A 50 mph design speed is proposed.

Alternatives 1, 4, and 6, propose interchange reconstruction at NC 109 and I-85 to include turn lane and median width improvements. Dual bridges on I-85 over NC 109 will be replaced with longer structures, approximately 270 feet long. These improvements require some ramp reconstruction as well as temporary bridge construction detours along I-85. Alternatives 2 and 6 propose minor turn lane improvements at the I-85 interchange at Lake Road (SR 2085). All alternatives will include a bridge at the NC Railroad/ Norfolk Southern Railroad crossings to separate train and vehicle traffic.

IV. Other Alternatives Considered

Alternative 1 originally extended from south of Lambeth Road (SR 2067) to Julian Avenue (SR 2185), along Randolph and Salem Streets (NC 109) through downtown Thomasville to the I-85 Business interchange. However, this extension was not determined to be feasible due to extensive property damages and impacts to the community and historic sites. In the downtown area, Randolph and Salem Streets (NC 109) exist as a two-lane roadway with on street parking, dense development, and are located within Salem Street and Thomasville Downtown historic districts. NC 109 crosses the NC Railroad/ Norfolk Southern Railroad at grade near Main Street (SR 2123) where numerous daily trains present conflicts and delays for motorists. The traffic capacity analysis shows a need for multilane improvements in parts of the downtown area. Widening NC 109 and constructing a railroad grade separation in downtown Thomasville would involve substantial property damages and community impacts.

TIP Project U-4411 proposes to widen NC 109 from Royal Oaks Street to Colonial Drive in future years. This 0.5-mile section of NC 109 exists as a three-lane roadway (one lane in each direction with a center turning lane). Alternative 1 does not include this part of NC 109. It focuses on the part of NC 109 that would be common with improvements along Julian Avenue (SR 2185) (Alternatives 4) and Liberty Drive (SR 2055) (Alternative 5).

Alternative 3 was considered early in the project's development. It follows Alternative 2 from NC 109 to Lake Road (SR 2085) at Fisher Ferry Road (SR 2183). It then follows Fisher Ferry Road (SR 2183) to Winston Street and joins NC 109 to I-85 Business, a length of 5.2 miles. There is not enough space between existing interchanges on I-85 to allow a new interchange with Fisher Ferry Road (SR 2183) on Alternative 3. A new bridge over the railroad near Main Street (SR 2123) would be disruptive to development in the downtown area. There are numerous low income houses and historic properties located along the alternative, the alignment is poor, and the existing lane widths are inadequate. For these reasons, this alternative was not considered feasible and was eliminated from further consideration.

V. Traffic and Safety

Traffic Study Results

Highway capacity analyses were performed for the years 2007 and 2035 to evaluate existing and future traffic operations along existing NC 109 and along Alternatives 1 through 5. Traffic operating conditions are measured using levels of service (LOS) represented by a letter designation from A to F. LOS A represents the best operating conditions and LOS F the worst. LOS D is generally considered to be acceptable in urban areas. LOS E designates conditions in which a facility reaches its traffic carrying capacity, and LOS F represents a breakdown in traffic flow.

Table 3 summarizes the operational effects (in terms of delay times and LOS) to intersections along existing NC 109 for the year 2007 and as a result of each Alternative for the year 2035. The 2035 No-Build data represents conditions along NC 109 if none of the Alternatives are in place. Data for each Alternative represents conditions along NC 109 assuming the proposed improvements for the respective Alternative are in place. Note, operational data for the signalized intersections along NC 109 between Lambeth Road (SR 2067) and Julian Avenue (SR 2185) are not shown in Table 3. The highway capacity analysis for Alternatives 4, 5, and 6 did not evaluate improvements made to existing NC 109 south of the intersection with Julian Avenue (SR 2185) and Cloniger Drive (NC 62). As a result, delay times and LOS for some of these NC 109 intersections are not presented for Alternatives 4, 5, and 6 in Table 3.

Tables 4 through 6 present 2035 delay times and LOS at intersections along or near Alternatives 2, 4, and 5. Data for intersections common between each Alternative (1, 2, 4, and 5) and Alternative 6 is also given in the following tables.

The analysis results show that where alternatives do not improve NC 109 intersections, they do not considerably affect NC 109 operations. This is because the alternatives divert less than 20% of the projected 2035 design year traffic from NC 109 (see the Appendix for traffic forecast diagrams). Alternative 1 would provide the best operations and level of service to NC 109 where recommended improvements are made.

Table 3: NC 109 - 2007 and 2035 Level of Service and Delay (Seconds per Vehicle)

Intersection	Existing (2007)		No-Build (2035)		Alternative 1 (2035)		Alternative 2 (2035)		Alternative 4 (2035)		Alternative 5 (2035)		Alternative 6 (2035)	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Lambeth Road (SR 2067)	*	F	*	F	13.1	B	+	+	**	**	**	**	**	**
Liberty Drive (SR 2055)	57.7	E	257.2	F	40.6	D	196.7	F	**	**	**	**	**	**
Cedar Lodge Road (SR 2184)	28.0	C	150.2	F	15.0	B	69.7	E	**	**	67.9	E	**	**
I-85 Ramp C	20.5	C	99.7	F	25.1	C	79.9	E	**	**	72.0	E	**	**
I-85 Ramp A	33.5	C	176.1	F	51.5	D	149.9	F	**	**	125.6	F	**	**
Julian Avenue (SR 2185)	50.0	D	132.1	F	41.5	D	113.9	F	**	**	87.1	F	**	**
Holly Hill Road (SR 2060)	30.3	C	57.1	E	**	**	52.7	D	65.6	E	54.5	D	37.4	D
Main Street (South) (SR 2085)	60.1	E	147.0	F	**	**	398.7	F	134.1	F	106.6	F	75.4	E
Main Street (North) (SR 2123)	43.6	D	95.7	F	**	**	197.5	F	81.8	F	63.7	E	55.7	E
Unity Street (SR 2051)	25.5	C	36.6	D	**	**	46.0	D	**	**	50.2	D	**	**
I-85 Bus. Ramp D	13.3	B	21.3	C	**	**	13.7	B	15.8	B	12.1	B	12.2	B
I-85 Bus. Ramp A	18.3	B	22.7	C	**	**	25.1	C	24.1	C	27.3	C	27.7	C

* Delay time is unavailable – intersection is currently unsignalized.

** Improvements to these intersections / interchanges are not included in the capacity analysis for this Alternative.

+ Lambeth Road (SR 2067) is proposed as an unsignalized intersection for Alternatives 2, 4, 5 and 6.

Table 4: Alternatives 2 and 6 2035 Build Level of Service and Delay (Seconds per Vehicle)

Intersection	Alternative 2		Alternative 6	
	Delay	LOS	Delay	LOS
Thomasville Southern Loop and NC 109	41.2	D	40.9	D
Thomasville Southern Loop and Cedar Lodge Road (SR 2184)	22.0	C	25.9	C
Lake Road (SR 2085) and Fisher Ferry Road (SR 2183)	27.2	C	28.5	C
Lake Road (SR 2085) and Emanuel Church / Kendall Mill Road (SR 2060)	36.5	D	31.9	C
I-85 Ramp D and Lake Road (SR 2085)	24.9	C	21.9	C
I-85 Ramp A and Lake Road (SR 2085)	25.5	C	24.8	C
Holly Hill Road (SR 2060) and Lake Road (SR 2080)	15.0	C	15.9	C
Martin Luther King Jr. Drive (SR 1792) and Main Street – South (SR 2085)	8.7	A	9.7	A
Martin Luther King Jr. Drive (SR 1792) and Lexington Avenue (SR 2123)	42.1	D	47.4	D
I-85 Bus. Ramp C and Jacob Street	19.8	B	20.5	C
I-85 Bus. Ramp A and Jacob Street (SR 1792)	23.2	C	15.8	B

Table 5: Alternatives 4 and 6 2035 Build Level of Service and Delay (Seconds per Vehicle)

Intersection	Alternative 4		Alternative 6	
	Delay	LOS	Delay	LOS
Cloniger Drive and NC 109	40.6	D	*	*
Holly Hill Road (SR 2060) and Julian Avenue (SR 2185)	30.1	C	26.1	C
Sunrise Avenue (SR 2056) and Julian Avenue (SR 2185)	7.7	A	5.5	A
Main Street – South (SR 2053) and Julian Avenue (SR 2185)	37.8	D	32.3	C
Main Street – North (SR 2123) and Maple Avenue	55.7	E	40.2	D
Unity Street (SR 2051)	29.6	C	29.0	C
NC 109	26.3	C	24.4	C

* Alternative 6 does not include improvements to NC 109 at this intersection.

Table 6: Alternatives 5 and 6 2035 Build Level of Service and Delay (Seconds per Vehicle)

Intersection	Alternative 5		Alternative 6	
	Delay	LOS	Delay	LOS
NC 109 and Liberty Drive (SR 2055)	43.5	D	*	*
Cloniger Drive (NC 62) and Liberty Drive (SR 2055)	36.3	D	30.5	C
Holly Hill Road (SR 2060) and Liberty Drive (SR 2055)	28.8	C	23.2	C
Sunrise Avenue and Liberty Drive (SR 2055)	10.8	B	10.2	B
Trinity Street (SR 2054) and Liberty Drive (SR 2055)	14.6	B	22.5	C
Turner Street (SR 2165) / Liberty Drive (SR 2055) and Main Street (SR 2123)	15.4	B	13.4	B
Unity Street (SR 2051) and Turner Street (SR 2165)	28.4	C	12.6	B
Brookdale Drive and National Highway (NC 68)	24.0	C	22.7	C
I-85 Business Ramp C and National Highway (NC 68)	30.0	C	29.2	C
I-85 Business Ramp A and National Highway (NC 68)	28.1	C	25.9	C

* Alternative 6 does not include improvements to NC 109 at this intersection.

Based on the existing conditions analyses, the NC 109 study area intersections currently operate at LOS D or better for most intersections. Main Street-South (SR 2085) and Liberty Drive (SR 2055) operate at LOS E and the side-street movements at Lambeth Road (SR 2067) operate at LOS F. By 2035, without improvements, all analyzed intersections aside from the I-85 Business interchange, Unity Street (SR 2051), and Holly Hill Road (SR 2060) will operate or have movements operating at LOS F without improvements.

With Alternatives 2, 4, 5, and 6, NC 109 intersections operate similarly. In some specific intersection locations, NC 109 does experience considerable improvements with the other alternatives. This occurs when an alternative includes an intersection along NC 109. In these instances, that intersection was improved under the alternative resulting in noticeably improved operations.

The intersection of NC 109 and Liberty Drive (SR 2055) will operate at LOS D for Alternatives 1 and 5 and LOS F for Alternative 2. For the intersection of Lambeth Road (SR 2067) and NC 109, all side street movements operate at LOS F for Alternatives 2, 4, 5, 6, and the No Build. This intersection was analyzed as signalized as part of the improvements evaluated for Alternative 1. As a signalized intersection in Alternative 1, the Lambeth Road (SR 2067) and NC 109 intersection is expected to operate at LOS B or better.

The Cedar Lodge Road (SR 2184) and NC 109 intersection is expected to operate at LOS E for Alternatives 2 and 5. Alternative 1, which provides improvements to this intersection, will operate at a LOS of B. The No Build condition is the only scenario that results in LOS F operations.

The interchange for NC 109 and I-85 is expected to operate at LOS D or better with Alternative 1 since the interchange would be reconstructed. A similar operation will result with Alternative 4. Alternatives 2 and 5 would result in LOS E and F operations at this interchange but would offer some improvement to operations when compared with the No Build condition.

The intersection of Cloniger Street (NC 62)/ NC 109/ Julian Avenue (SR 2185) is a very heavily traveled intersection and has a skewed alignment. These factors combine for poor operations under most alternatives. However, all alternatives provide improved operations over the No Build conditions. Alternatives 1 and 4 give the most improvement in level of service by providing a LOS D in the design year. It is important to note that Alternatives 1 and 4 have movements that operate at LOS E. Alternative 5 and the No Build condition operate at LOS F.

The intersection of Holly Hill Road (SR 2060) and NC 109 operates at LOS D or better for all alternatives including the No Build conditions aside from the PM peak of the No Build conditions and Alternative 4. Therefore this intersection also performs similarly for all alternatives.

NC 109 and Main Street (North and South) (SR 2123/ SR 2085) are in the center of downtown Thomasville and operate poorly in all build alternatives. The poor operations are due in part to the constraint of the railroad crossing between the intersections and the impact it has on potential improvements and signal phasing. To meet an acceptable level of service at these intersections, NC 109 would need to be widened from three lanes to at least five lanes through the downtown area. This was not considered to be feasible because of substantial property damages and community impacts. Of the alternatives, Alternative 2 experiences heavier traffic along NC 109 which results in the most extensive intersection delay.

For the intersection of NC 109 and Unity Street (SR 2051), Alternatives 1, 2, and 5 result in the intersection operating at LOS D or better. These alternatives operate similarly for this intersection. It should be noted that this intersection is to be realigned under Alternatives 4 and 6.

For the I-85 Business interchange, both ramp terminal intersections operate at LOS C or better for all alternatives and the No Build conditions.

Crash Analysis

Table 7 presents results of crash analyses for each alternative. The total number of crashes between July 1, 2006 and June 30, 2009 were used in the analyses. Crash rates above critical crash rates are shown in bold italics.

Table 7: Crash Statistics

Rate	Crashes	Crashes per 100 Million Vehicle Miles (MVM	Statewide Rate [1]	Critical Rate [2]
Alternative 1				
Total	241	***824.31***	341.50	359.65
Fatal	2	***6.84***	1.27	3.98
Non-Fatal	74	***253.11***	111.08	122.17
Night	47	***160.76***	69.72	78.86
Wet	52	***177.86***	52.28	60.42
Alternative 2				
Total	96	340.29	413.78	478.55
Fatal	1	3.54	1.31	6.63
Non-Fatal	39	138.24	130.38	167.52
Night	21	74.44	96.90	129.16
Wet	11	38.99	62.26	88.47
Alternative 4 [3]				
Total	109	***604.83***	341.50	415.89
Fatal	0	0.00	1.27	8.41
Non-Fatal	31	***172.02***	111.08	154.70
Night	22	***122.08***	69.72	104.85
Wet	11	61.04	52.28	83.07
Alternative 5 [3]				
Total	199	488.73	479.50	537.18
Fatal	3	***7.37***	1.11	5.05
Non-Fatal	69	169.46	148.38	181.01
Night	32	78.59	95.05	121.41
Wet	41	***100.69***	75.81	99.48

[1] 2005-2007 Statewide crash rates: *Alternatives 1 and 4* – urban NC route; *Alternative 2* – two-lane undivided, urban secondary route; *Alternative 5* – four-lane undivided, urban secondary route.

[2] Based on the statewide crash rate (95% level of confidence).

[3] The data shown does not account for the crashes along the NC 109 section of this alternative.

Crash rates along NC 109 in study area are nearly 2.5 times the statewide average rates for similar routes. The predominate crash types are angle, left turning, rear end, and sideswipe collisions. Two fatalities occurred during the studied time period.

The critical crash rate is a statistically derived number that can be used as a tool to identify or screen for high accident locations. Locations with a crash rate higher than the critical rate may have safety and operational deficiencies. Crash rates for all categories for Alternative 1 are above the critical rate. None of the crash rate categories exceed the critical rates for Alternative 2. The total, non-fatal, and night crash rates were higher than the critical rates for Alternative 4. The fatal and wet crash rates were the only two categories above the respective critical crash rates for Alternative 5.

VI. Evaluation of Alternatives

A detailed discussion of the alternatives, including costs and potential property effects, follows and is summarized in Table 8 and Table A-1 of the Appendix.

Table 8 - Summary of Costs and Relocations

	Length (miles)	Construction/ Utility Relocation Costs	Right of Way Costs	Total Costs	Relocations		
					Residences	Businesses	Total
Alt. 1	**1.55**	$17,600,000	$20,200,000	**$37,800,000**	6	23	**29**
Alt. 2	**5.03**	$39,600,000	$31,100,000	**$70,700,000**	131	21	**152**
Alt. 4	**4.52**	$40,200,000	$57,200,000	**$97,400,000**	132	46	**178**
Alt. 5	**4.66**	$44,500,000	$55,400,000	**$99,900,000**	217	33	**250**
Alt. 6	**13.46**	$120,300,000	$142,400,000	**$262,700,000**	479	99	**578**

Alternative 1 addresses congestion along the 1.55-mile multilane portion of NC 109 through the heavily commercialized area from south of I-85 to the Julian Avenue (SR 2185) intersection with Cloniger Street (NC 62). This alternative includes turn lane and traffic signal improvements at major intersections and reconstruction of the I-85 interchange. The portion of NC 109 from south of Lambeth Road (SR 2067) to north of the I-85 interchange (Segments 1A-1C) implements the northern end of future NC 109 improvements from NC 47 in Denton to I-85 (TIP Project R-4734). Part of this alternative is also used with Alternatives 4, 5, and 6.

Alternative 1 is estimated to cost $17,600,000 for construction and $20,200,000 for right of way acquisition. The total estimated cost is $37,800,000. This alternative displaces six residences and 23 businesses, for a total of 29 relocations. The most expensive sections of this alternative are from the I-85 interchange to Julian Avenue (SR 2185) (Segments 1C and 1D). This is due to the I-85 interchange reconstruction and extensive right of way acquisition costs at numerous commercial properties.

Consideration was given to extending Alternative 1 northward from Julian Avenue (SR 2185) through downtown Thomasville to the I-85 Business interchange. The traffic capacity analysis shows a need for multilane improvements at various locations along this route. However, this extension was not determined to be feasible due to extensive reconstruction work, property damages, and impacts to community and historic resources. A more detailed discussion of these findings is provided in Section V, Other Alternatives Considered.

Alternative 2 serves as an alternative route to NC 109 around the west side of Thomasville. It implements several parts of the High Point MPO Thoroughfare Plan. These include the future Thomasville Southern Loop from NC 109 to Lake Road (SR 2085), an existing bridge over the NC Railroad/ Norfolk Southern Railroad, and a future interchange at I-85 Business and Martin Luther King, Jr. Drive (SR 1792). Project B-4499 replaces the MLK Jr. Drive Bridge (No. 158) at I-85 Business. It is a planned two lane bridge with right of way scheduled for 2009 and construction in 2010. Once replaced, this bridge is anticipated to be used as a detour during construction of an I-85 Business interchange with Alternative 2. To establish sufficient access control limits at the I-85 Business interchange, the Cooksey Drive (SR 2144) and Pineywood Road intersections with Martin Luther King Jr. Drive (SR 1792) will need to be eliminated; however, alternative access is provided through the use of other connecting streets. Also, the Cooksey Drive access point on I-85 Business just east of the proposed interchange should be eliminated.

Alternative 2 is estimated to cost $39,600,000 for construction and $31,100,000 for right of way acquisition. The total estimated cost is $70,700,000. This alternative displaces 131 residences and 21 businesses, for a total of 152 relocations. Construction costs are highest between I-85 and Lexington Avenue (SR 2123) (Segment 2C) and at I-85 Business (Segment 2E). This is due to additional bridge construction over the railroad and the new I-85 Business interchange. The greatest community impacts occur along Lake Road (SR 2085) from Fisher Ferry Road (SR 2183) to I-85 (Segment 2B) and from Lexington Avenue (SR 2123) to I-85 Business (Segment 2D). This is due to the extensive right of way acquisition and relocation costs of numerous residences and businesses in these areas. The neighborhood along Martin Luther King Jr. Drive from Lexington Avenue (SR 2123) to I-85 Business has low-income housing and a substantial minority population. There is the potential for impacting a much larger proportion of low-income and minority populations in this area, meeting the criteria for environmental justice. Winding Creek Golf Course, a municipal course, is located just north of I-85 Business near the proposed interchange. This publicly owned recreation area may be subject to the provisions of Section 4(f) of the DOT Act of 1966.

The most important parts of Alternative 2 can be implemented in phases. The northern part between Lexington Avenue (SR 2123) and I-85 Business would complete a link between the two interstates. The extension from I-85 to NC 109 would complete a continuous route around the west side of Thomasville. These parts are 3.2 miles long, are estimated to cost $53,200,000, and would displace 134 residences and businesses (see Figure 1B and Table 9).

Benefits associated with Alternative 2 include wide traffic lanes in the downtown area, an alignment that may not require substantial reconstruction, compatible posted speed limits, and the use of an existing bridge over the railroad near Main Street (SR 2085).

Table 9 – Recommended Improvement Priorities

	Length (miles)	Description	Total Costs	Residential and Business Relocations
	Highest Priority			
Alt. 1	**1.55**	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	**$37,800,000**	**29**
Alt. 4	**1.65**	Maple Ave. at East Main St. (SR 2123) to NC 109 at I-85 Bus.	**$34,100,000**	**104**
	Secondary Priority			
Alt. 2	**3.17**	NC 109 South of Lambeth Rd. to I-85 and Lexington Ave. (SR 2123) to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	**$53,200,000**	**134**
Alt. 5	**2.41**	Liberty Dr. (SR 2055) at Cloniger St. (NC 62) to National Hwy. (NC 68) at Turner St. (SR 2165)	**$58,500,000**	**212**

Alternative 4 is a continuous parallel route to NC 109 from south of I-85 to I-85 Business along the east side of downtown Thomasville. Since it includes all of Alternative 1, it addresses congestion along NC 109 through the commercial area from south of I-85 to Cloniger Street (NC 62). It implements the northern end of future NC 109 improvements from NC 47 in Denton to I-85 (TIP Project R-4734). It also implements parts of the High Point MPO Thoroughfare Plan. These include a future extension of Julian Avenue (SR 2185) from Main Street (SR 2123) to Unity Street (SR 2051) and the maintenance of an existing railroad bridge over the roadway near Main Street (SR 2123). Julian Avenue (SR 2185) is currently used for local travel between Thomasville and High Point.

The High Point MPO Thoroughfare Plan shows the Julian Avenue (SR 2185) extension between Main Street (SR 2123) and Unity Street (SR 2051) following Maple Avenue and Cox Avenue. To allow Alternative 4 to provide a more continuous route, it was shifted to the west to join Unity Street (SR 2051) near Memorial Park Drive and Huntsford Terrace.

Alternative 4 is estimated to cost $40,200,000 for construction and $57,200,000 for right of way acquisition. The total estimated cost is $97,400,000. This alternative displaces 132 residences and 46 businesses, for a total of 178 relocations. Construction costs are highest in the I-85 interchange area (Segment 1C). Impacts to commercial properties are highest from the I-85 interchange area to Main Street (SR 2123) (Segments 1D and 4A).

The greatest community impacts occur along the northern portion of this alternative from Main Street (SR 2123) to NC 109 near Unity Street (SR 2051) (Segments 4B, 4C, and 4D). This is due to the extensive right of way acquisition and relocation costs of numerous residences in these areas.

The northern part of Alternative 4 is the most important part of this alternative. It would complete a multilane route east of NC 109 between the two interstates. This part is 1.7 miles long, is estimated to cost $34,100,000, and would displace 104 residences and businesses.

Benefits of Alternative 4 include: use of an existing railroad bridge near Main Street (SR 2123); its close proximity to NC 109 and route continuity east of NC 109; the NC 109 route designation could easily be shifted to the new route; wide traffic lanes in the downtown area; and compatible posted speed limits south of Main Street (SR 2123).

Alternative 5 is a parallel route to NC 109 from south of I-85 to I-85 Business along the east side of Thomasville. It includes the Segment 1A improvements to Liberty Drive (SR 2055) and follows Liberty Drive (SR 2055) and Turner Street (SR 2165) to National Highway (NC 68). It does not have a direct interchange with I-85 and Liberty Drive (SR 2055). It joins National Highway (NC 68) north of Thomasville instead of NC 109 to provide access to I-85 Business. It implements parts of the High Point MPO Thoroughfare Plan. These include the Liberty Drive (SR 2055) and Turner Street (SR 2165) widening improvements (TIP Project U-4420) between Cloniger Street and National Highway (NC 68) and a new bridge over the railroad near Main Street (SR 2123).

Liberty Drive (SR 2055) has five lanes from NC 109 to south of I-85 and four lanes with no median from south of I-85 to Cloniger Street. From Cloniger Street to Blair Street (south of Main Street), it has two lanes. Turner Street (SR 2165) meets Liberty Drive (SR 2055) north of Blair Street. It has two lanes between Blair Street and National Highway (NC 68). National Highway (NC 68) has four lanes (two southbound, one northbound, and a center turn lane).

Alternative 5 is estimated to cost $44,500,000 for construction and $55,400,000 for right of way acquisition. The total estimated cost is $99,900,000. This alternative displaces 217 residences and 33 businesses, for a total of 250 relocations. Construction costs are highest from Blair Street to National Highway (NC 68) at I-85 Business. This is due to the extensive widening of Turner Street (SR 2165) and National Highway (NC 68) and the construction of a bridge over the railroad. Substantial community impacts occur along Liberty Drive (SR 2055) between Cloniger Street and Blair Street due to extensive right of way acquisition and relocation costs of numerous residences in these areas.

The most important part of this alternative is within the limits of TIP Project U-4420 between Cloniger Street (NC 62) and National Highway (NC 68). This part is 2.4 miles long, is estimated to cost $58,500,000, and would displace 212 residences and businesses.

Benefits of Alternative 5 include the extension of a multilane facility from NC 109 south of Thomasville to National Highway (NC 68) for improved access between the two interstate facilities.

Alternative 6 examines the combined roadway system improvements from Alternatives 1, 2, 4, and 5 to implement links in the High Point MPO Thoroughfare Plan. This is to determine the overall benefit to traffic operations within the Thomasville area road network.

Alternative 6 is estimated to cost $120,300,000 for construction and $142,400,000 for right of way acquisition. The total estimated cost is $262,700,000. This alternative displaces 479 residences and 99 businesses, for a total of 578 relocations. With Alternative 6, there is some improvement in traffic operations at NC 109 intersections as compared with the other alternatives alone. This typically occurs when an intersection along NC 109 is improved.

VII. Community Issues

See Figure 2 for the locations of community facilities in the project study area.

- The Thomasville Public Library is located along NC 109 near the central business district (CBD).
- There are five public schools located along or in close proximity to the proposed alternatives: Thomasville Middle and High Schools, Liberty Drive Elementary School, Thomasville Primary School, and East Davidson High School. These are in the vicinity of Alternatives 2, 4, and 5.
- There are three parks located adjacent to or in close proximity to some of the alternatives: Optimist Park, King Row Park, and Veteran's Memorial Park and Swimming Pool. These are in the vicinity of existing NC 109 and Alternative 2.
- Winding Creek Golf Course is a City of Thomasville municipal course located just north of I-85 Business between Martin Luther King, Jr. Drive (SR 1792) and NC 109. This publicly owned recreation area may be subject to the provisions of Section 4(f) of the DOT Act of 1966. The Alternative 2 interchange with I-85 Business is in the vicinity of the golf course.
- A Wal-Mart Supercenter is located along Liberty Drive (SR 2055) east of NC 109 near Alternative 5.
- Based on site visit observations, the neighborhood along Martin Luther King Jr. Drive (SR 1792) between Lexington Avenue (SR 2123) and I-85 Business has low-income housing and a substantial minority population. There is the potential for impacting a much larger proportion of low-income and minority populations in this area, meeting the criteria for environmental justice. This is in the vicinity of Alternative 2.
- The Thomasville Fire Department's Howard Matthews Headquarters – Station 21 is located adjacent Julian Avenue (SR 2185) along Alternative 4.
- The Thomasville Police Department is in the CBD along NC 109.
- There are three properties and two districts listed on the National Register of Historic Places along NC 109 in the downtown area: Church Street School, Thomasville

Railroad Passenger Depot, Smith Clinic, Salem Street Historic District, and Thomasville Downtown Historic District.

- The HPTD Railroad crosses Randolph Street (NC 109), Julian Avenue (SR 2185), Liberty Drive (SR 2055), and Lake Road (SR 2085). The NC Railroad/ Norfolk Southern Railroad crosses Randolph/ Salem Streets (NC 109) and Liberty Drive (SR 2055) at grade. There are in the vicinity of Alternatives 2, 4, and 5.

VIII. Natural Environment Issues

A detailed environmental study was not conducted for this feasibility study, however an environmental screening did find the following items which may need further evaluation in later planning and design stages:

- *Protected Species* – A search was conducted using the database from the North Carolina National Heritage Program for the High Point West and Fair Grove quadrangles (updated August 2, 2009). This search revealed one federally endangered species [Schweinitz's sunflower (*Helianthus schweinitzii*)] in the Fair Grove quadrangle and one Federal Species of Concern [Eastern small-footed myotis (*Myotis leibii*)] in both quadrangles.
- *Wetlands* – Based on a search of the National Wetland Inventory (NWI) using geographical information systems (GIS), there are wetlands adjacent to Alternatives 2 and 5 that could be affected by this project (see Figure 4). The preliminary alignments on new location for Alternatives 2 and 4 do not appear to impact any NWI wetlands.
- *Streams* – This project will involve the crossing of four streams: Hunts Fork, Hanks Branch, North Hamby Creek, and Hamby Creek. According to the North Carolina Division of Water Quality's Draft 2008 303(d) list[1], Hunts Fork, North Hamby Creek and Hamby Creek are all impaired waters (see Figure 4).
- *Hazardous Materials Sites, Superfund Sites, and Underground Storage Tanks* – Based on a search performed by Environmental Data Resources, Inc., there are numerous hazardous materials sites and underground storage tanks along or in close proximity to the alternatives (see Figure 4). No superfund sites or brownfields are located in the project area. See the Appendix for a table listing the hazardous materials sites and underground storage tanks.

[1] At the time of this document the Draft 2008 303(d) list had not yet been approved by the United States Environmental Protection Agency. It is possible additional waters will be added before final approval, but it is unlikely any will be removed.

IX. Conclusions

Of the alternatives considered in this study, Alternatives 1 and 4 offer the greatest benefits. These combine to complete a multilane facility between I-85 and I-85 Business along the east side of Thomasville and parallel to NC 109. Alternative 1 and Alternative 4 north of Main Street (SR 2123) combine for the most economical and important links. These are recommended as the highest priorities for improvement (see Figure 1B and Table 9).

Alternative 1 addresses congestion along the commercialized area of NC 109 from south of I-85 to the Julian Avenue (SR 2185) intersection with Cloniger Street (NC 62). It includes intersection improvements and reconstruction of the I-85 interchange. It also implements the northern end of future NC 109 improvements from NC 47 in Denton to I-85 (FS-0109A and TIP Project R-4734).

Alternative 4 is the closest parallel route to NC 109 along the east side of downtown Thomasville. It includes all of Alternative 1 to address congestion along NC 109 from south of I-85 to Cloniger Street (NC 62). It has interchanges with I-85 and I-85 Business. Alternative 4 costs substantially more than Alternative 2 but less than Alternative 5. It also relocates fewer residences and businesses than Alternative 5. The greatest community impacts occur along the northern part from Main Street (SR 2123) to NC 109. Benefits of Alternative 4 include: use of an existing railroad bridge near Main Street (SR 2123); its close proximity to NC 109 and route continuity east of NC 109; the NC 109 route designation could easily be shifted to the new route; wide traffic lanes in the downtown area; and compatible posted speed limits south of Main Street (SR 2123).

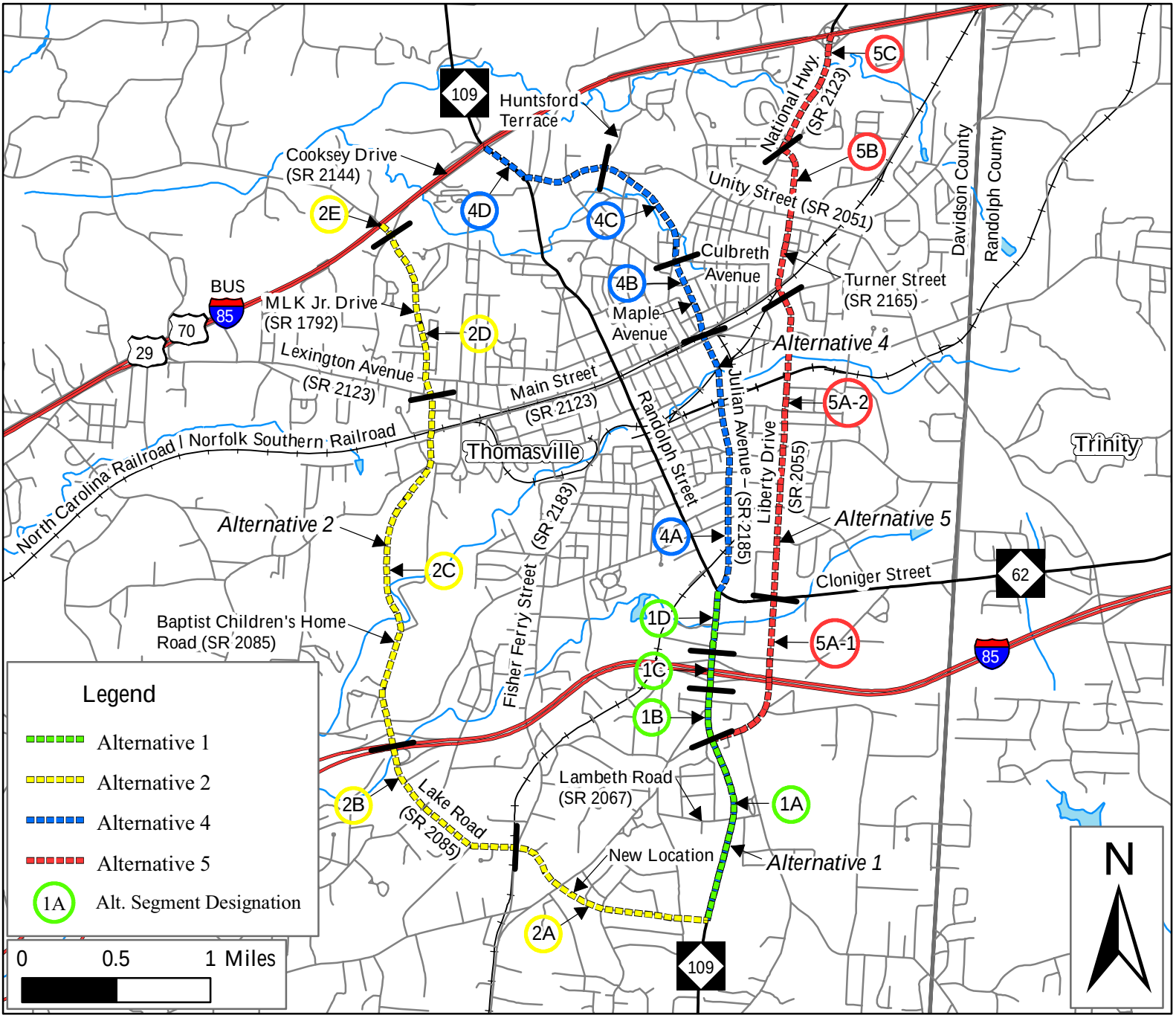
Alternatives 2 and 5 are also beneficial for improving accessibility between I-85 and I-85 Business along the east and west sides of Thomasville. The parts of Alternative 2 southeast of I-85 and north of Lexington Avenue (SR 2123) complete a continuous route around the west side of Thomasville. From Cloniger Street (NC 62) to National Highway (NC 68), Alternative 5 provides an improved route on the east side of Thomasville for better mobility between NC 109 (near I-85) and I-85 Business. These are recommended as secondary priorities for improvement.

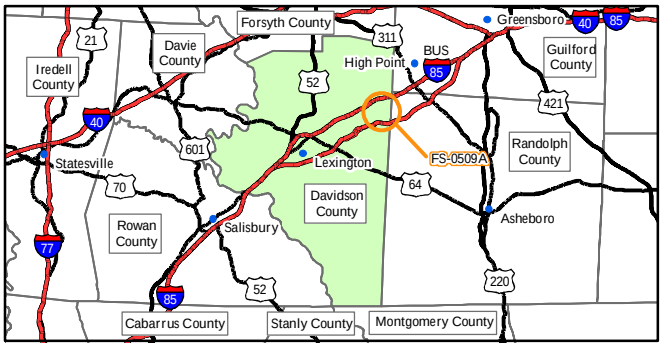
Alternative 2 is a parallel route to NC 109 around the west side of Thomasville. It provides interchanges with I-85 and I-85 Business. It costs substantially less than Alternatives 4 and 5 and relocates the least number of residences and businesses. It follows more new location and implements part of the future Thomasville Southern Loop. There is the potential for impacts to minority and low income neighborhoods along Martin Luther King Jr. Drive (SR 1792) from Lexington Avenue (SR 2123) to I-85 Business. The municipal golf course near the proposed I-85 Business interchange may be subject to the provisions of Section 4(f) of the DOT Act of 1966. Benefits associated with Alternative 2 include wide traffic lanes in the downtown area, an alignment that may not require substantial reconstruction, compatible posted speed limits, and the use of an existing bridge over the railroad near Main Street (SR 2123).

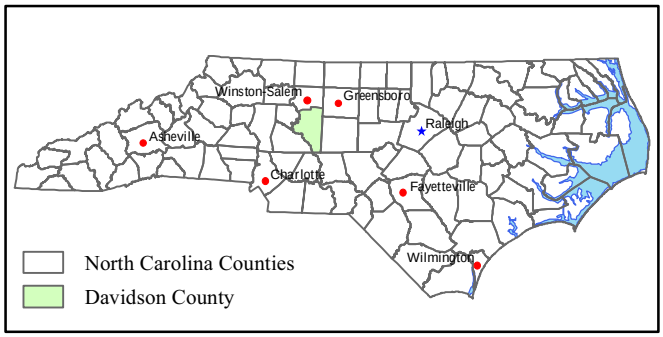
Alternative 5 is a parallel route to NC 109 along the east side of Thomasville. It has the highest cost and relocates more residences and businesses than Alternatives 2 and 4. This is due to the extensive widening of Turner Street (SR 2165) and National Highway (NC 68) and the construction of a bridge over the railroad. Substantial community impacts occur along Liberty Drive (SR 2055) between Cloniger Street and Blair Street due to extensive right of way acquisition and relocation costs of numerous residences in these areas. Benefits of Alternative 5 include the extension of a multilane facility from NC 109 south of Thomasville to National Highway (NC 68) for improved access between the two interstate facilities.

Alternative 6 combines the roadway system improvements from Alternatives 1, 2, 4, and 5 to implement links in the High Point MPO Thoroughfare Plan. It cost nearly four times as much as Alternative 2 and relocates nearly four times as many residences and businesses. There is some improvement in traffic operations at NC 109 intersections as compared with the other alternatives alone. This typically occurs when an intersection along NC 109 is improved.

FIGURES







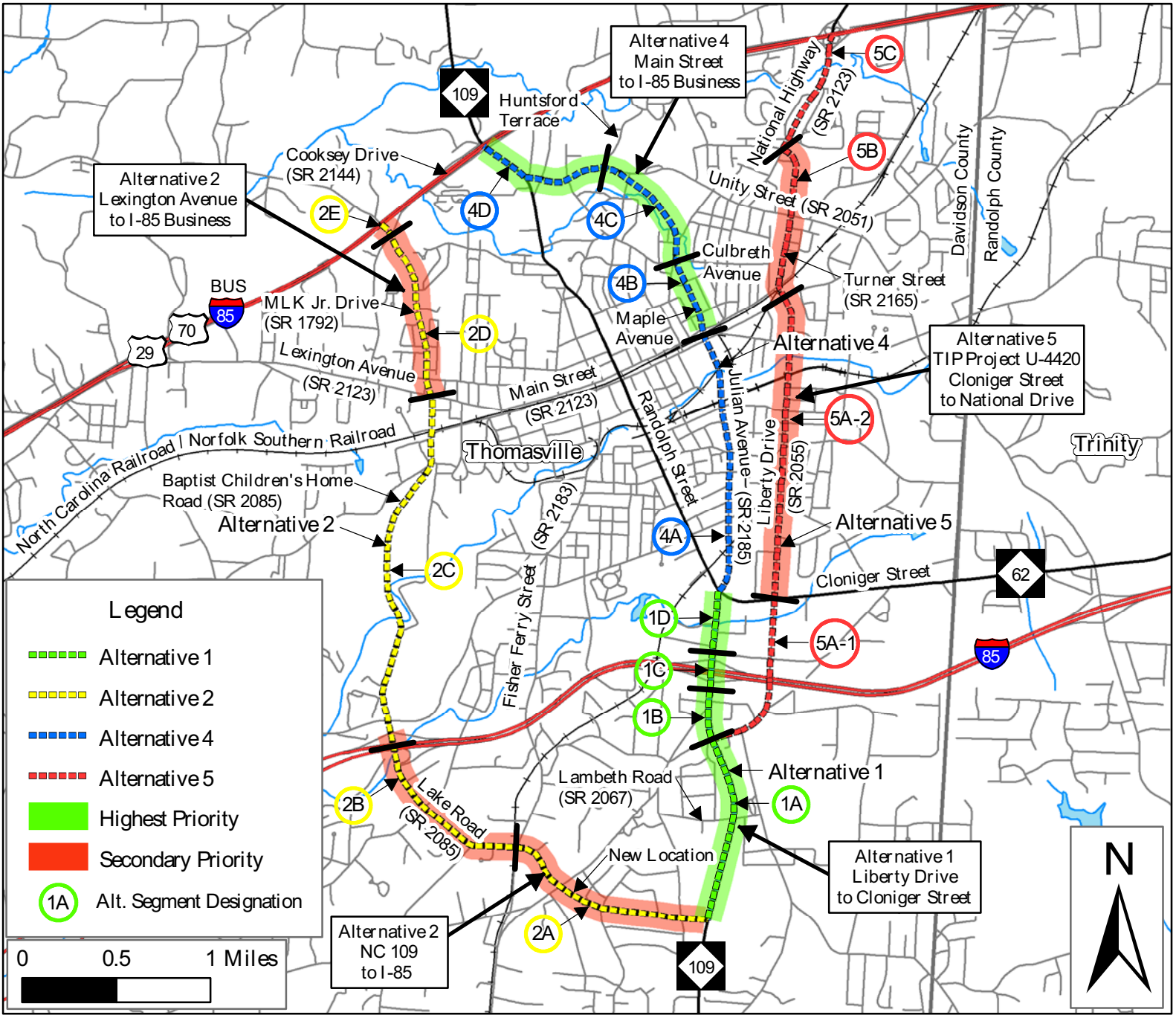
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FEASIBILITY STUDIES UNIT

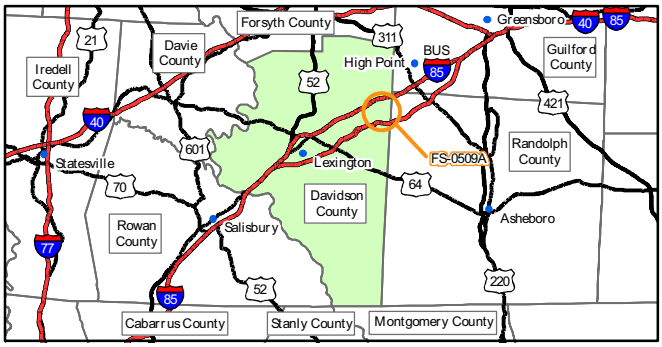
Project Location Map

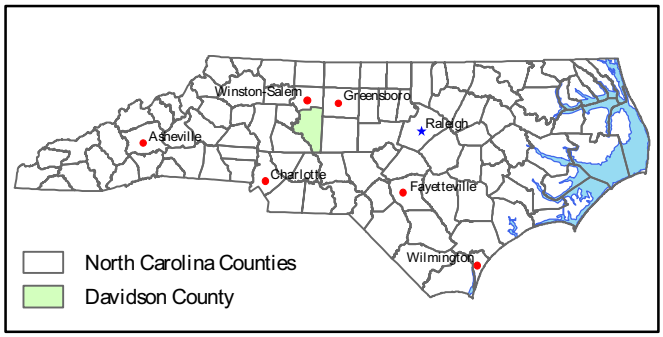
FS-0509A

NC 109 From North of I-85 Business
to South of SR 2067 (Lambeth Road)
City of Thomasville, Davidson County

Figure 1A







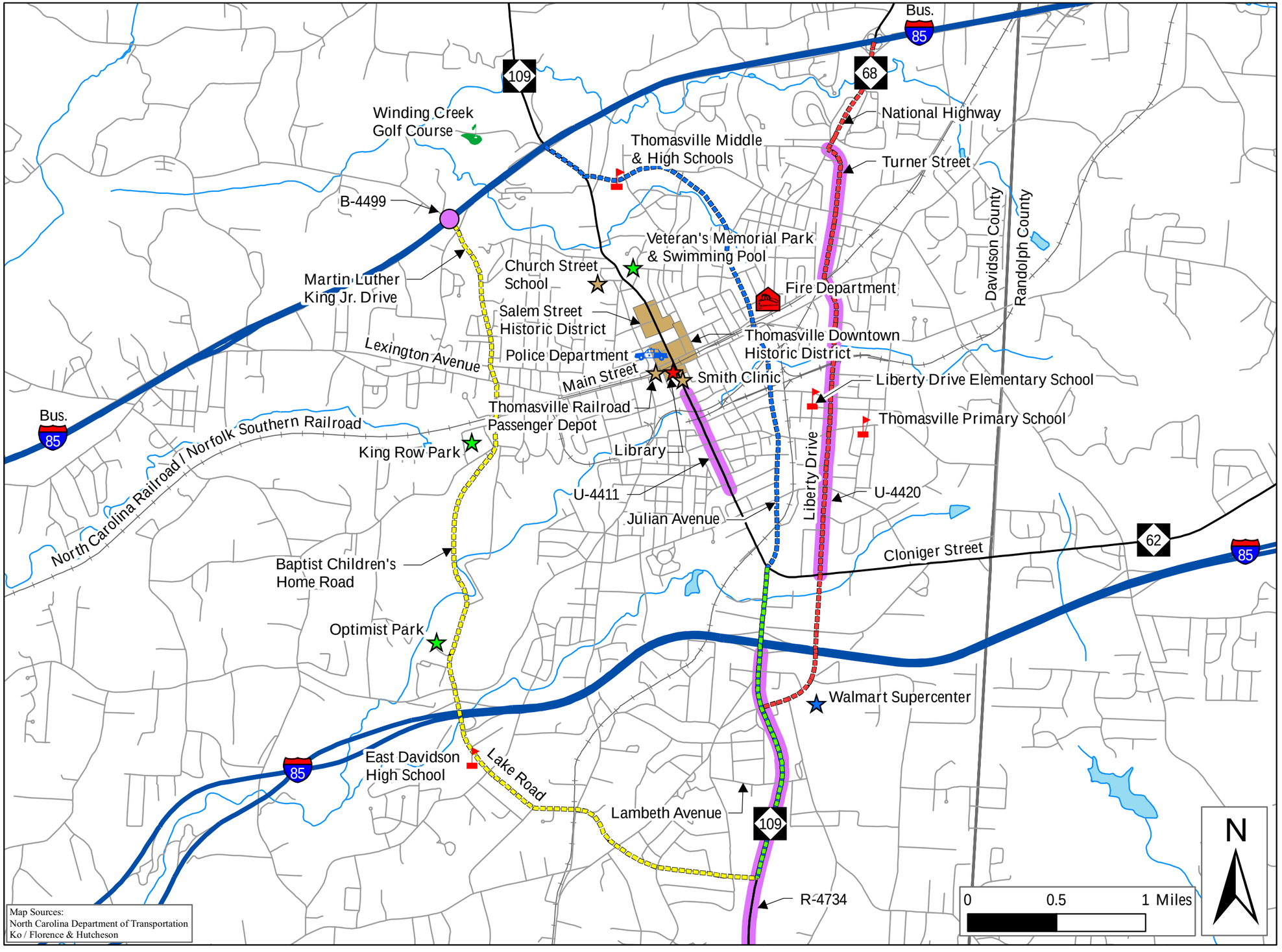
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
FEASIBILITY STUDIES UNIT

Priorities for Recommended Improvements

FS-0509A

NC 109 From North of I-85 Business
to South of SR 2067 (Lambeth Road)
City of Thomasville, Davidson County

Figure 1B

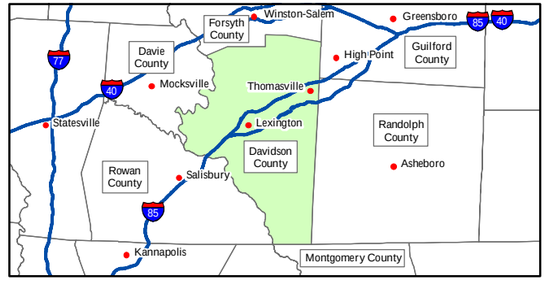


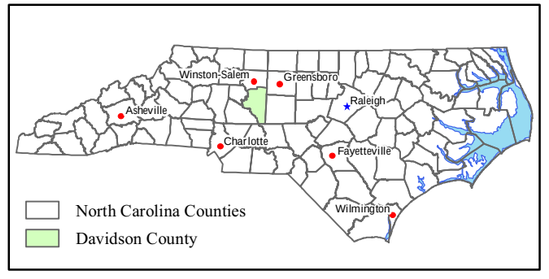
Map Sources:
North Carolina Department of Transportation
Ko / Florence & Hutcheson

Figure 2 - Community Resources

- Alternative 1
- Alternative 2
- Alternative 4
- Alternative 5
- TIP Projects
- Interstates
- US & NC Routes
- Secondary Roads
- Railroads
- Streams & Creeks
- National Register Districts *
- National Register Structures
- Parks
- Thomasville Public Library
- Walmart Supercenter
- Public Schools
- Thomasville Fire Department
- Thomasville Police Department
- Winding Creek Golf Course

* National Register District boundaries are approximate and are shown for representational purposes only.





CEDAR LODGE RD.

I-85

NC 109

RANDOLPH ST

NC 109

END FS-0509A
ALTERNATIVE 1
STA. 130+50

JULIAN AVE

LAMBETH RD

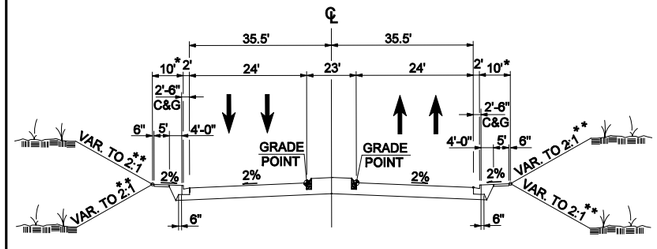
BEGIN FS-0509A
ALTERNATIVE 1
STA. 50+00

LIBERTY DR

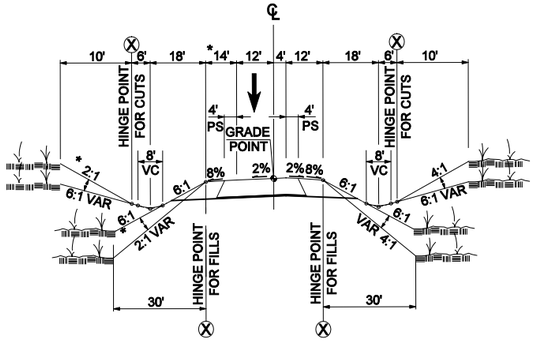
I-85

CLONIGER ST

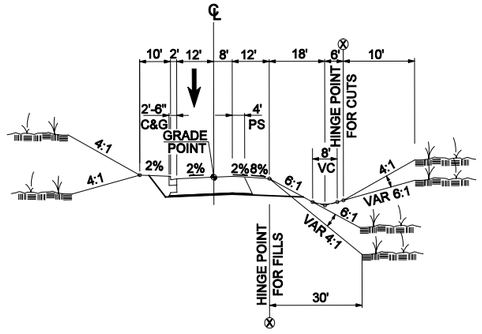
*14' WHEN GUARDRAIL REQUIRED
**VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4066

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 1
CITY OF THOMASVILLE
DAVIDSON COUNTY

August 2009 FIGURE 3A Sheet 1 of 1

HPTD RAILROAD

CEDAR LODGE RD

BLACK RD

EMANUEL CHURCH RD

LAKE RD.

KENDALL MILL RD

I-85

LAKE RD

FISHER FERRY RD

NC 109

THOMASVILLE SOUTHERN LOOP

I-85

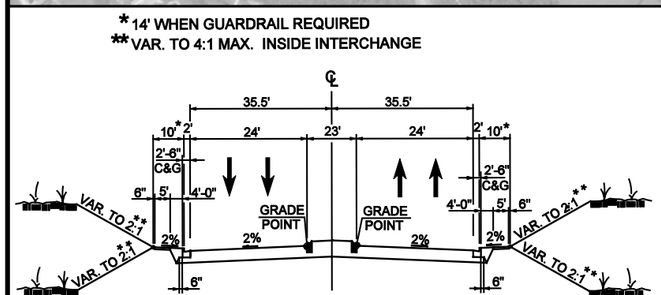
HOLLY HILL RD

BAPTIST CHILDREN'S HOME RD

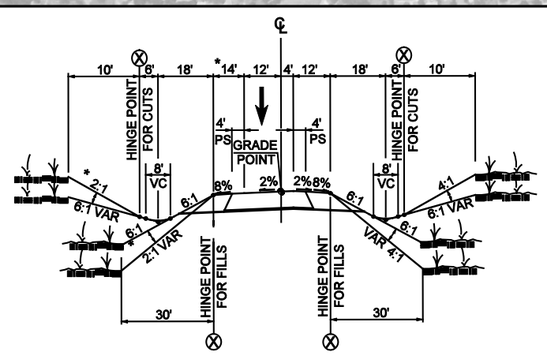
MATCH SHEET 2 OF 2

BEGIN FS-0509A
ALTERNATIVE 2
STA. 32+50

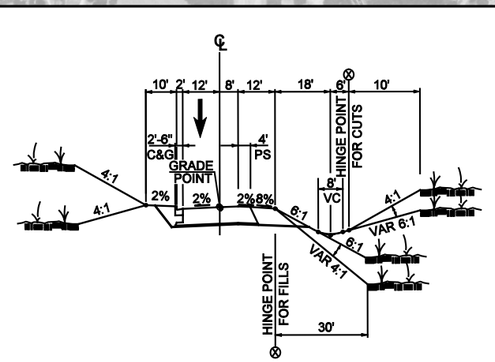
* 14' WHEN GUARDRAIL REQUIRED
** VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
3121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-6005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 2
CITY OF THOMASVILLE
DAVIDSON COUNTY

August 2009 FIGURE 3B Sheet 1 of 2

JOHNSTOWN RD

NC RAILROAD / NORFOLK SOUTHERN RAILROAD

LEXINGTON AVE

I-85 BUS.

JACOB ST

MATCH SHEET 1 OF 2

PINEYWOOD RD

END FS-0509A
ALTERNATIVE 2
STA. 310+00

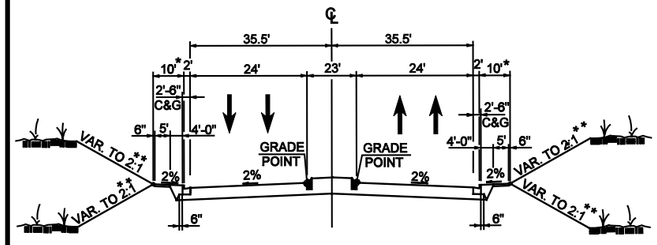
MARTIN LUTHER KING JR. DR

MAIN ST

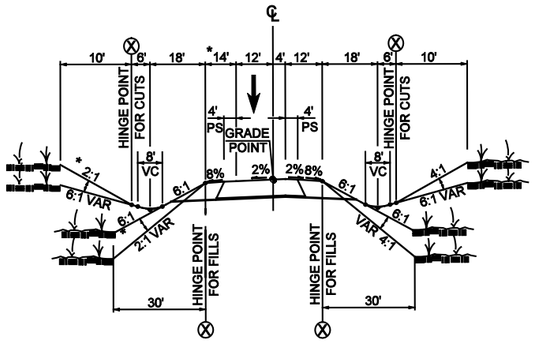
I-85 BUS.
COOKSEY DR

NC 109

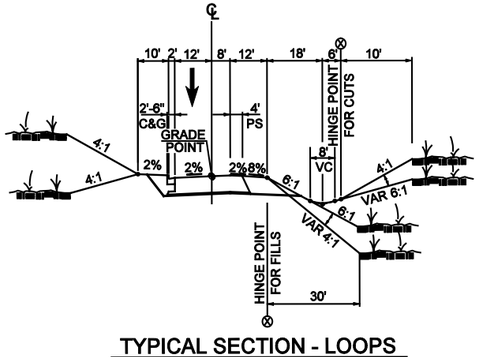
*14' WHEN GUARDRAIL REQUIRED
**VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
5121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 2
CITY OF THOMASVILLE
DAVIDSON COUNTY

August 2009 FIGURE 3B Sheet 2 of 2

CEDAR LODGE RD

LAMBETH RD

NC 109

I-85

LIBERTY DR

I-85

CLONIGER ST

HOLLY HILL RD

BEGIN FS-0509A
ALTERNATIVE 4
STA. 10+00

JULIAN AVE

RANDOLPH ST

NC 109

MAIN STREET (SOUTH)

NC RAILROAD / NORFOLK SOUTHERN RAILROAD

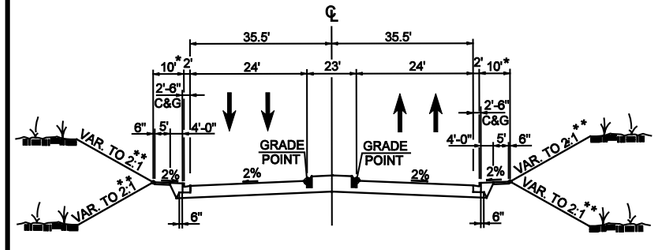
MATCH SHEET 2 OF 2

HPTD RAILROAD

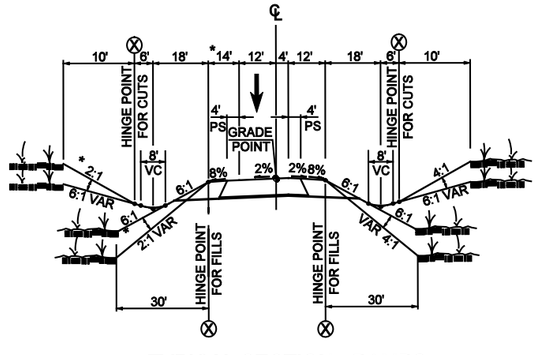
SUNRISE AVE

HPTD RAILROAD

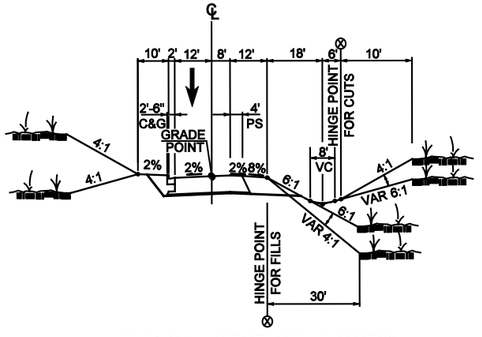
* 14' WHEN GUARDRAIL REQUIRED
** VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY
PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
3121 EDINBORO WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4066

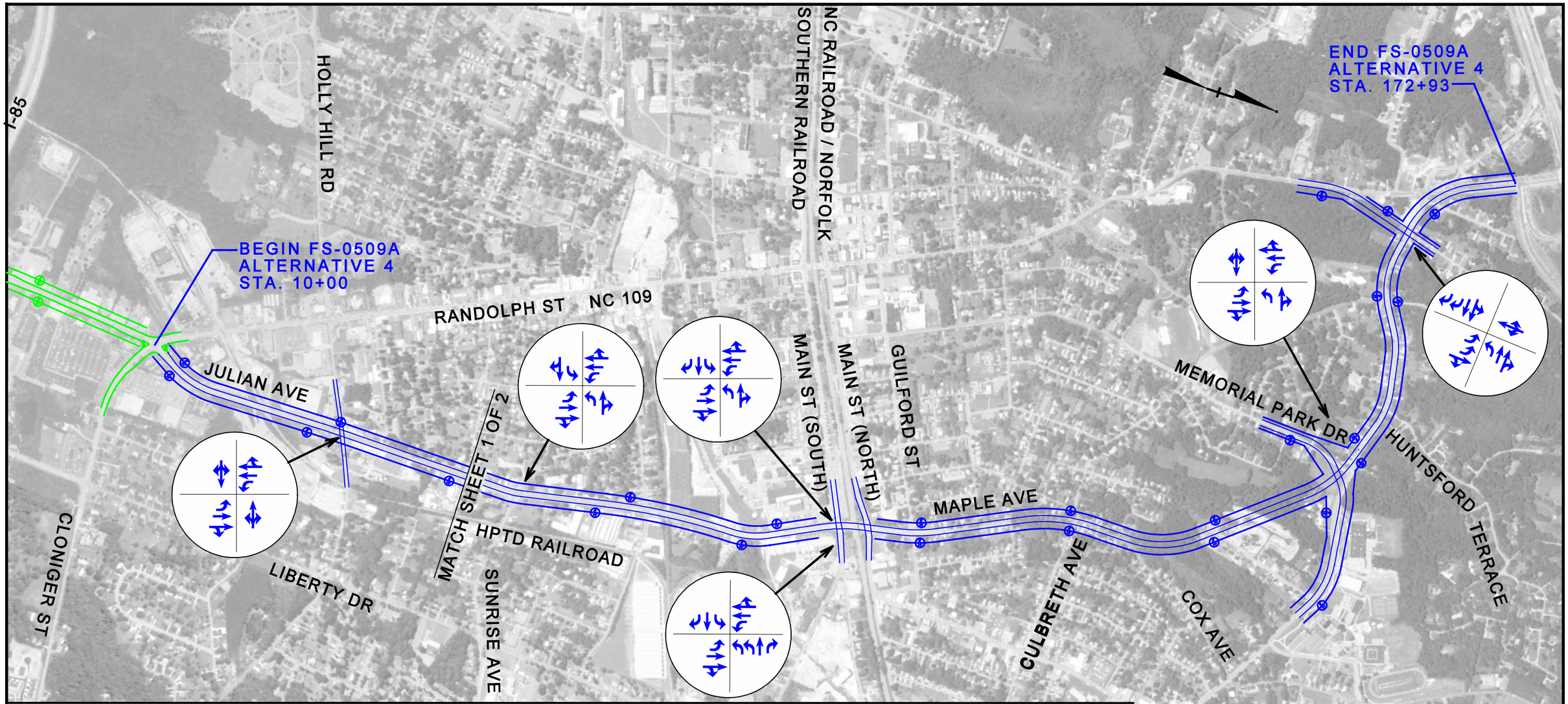
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

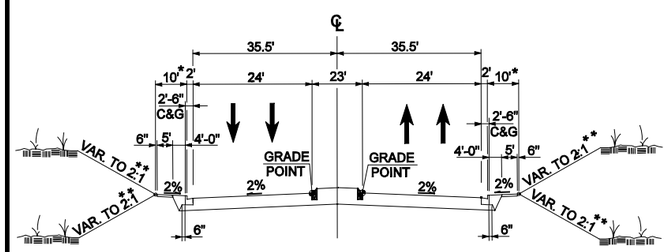
0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 4
CITY OF THOMASVILLE
DAVIDSON COUNTY

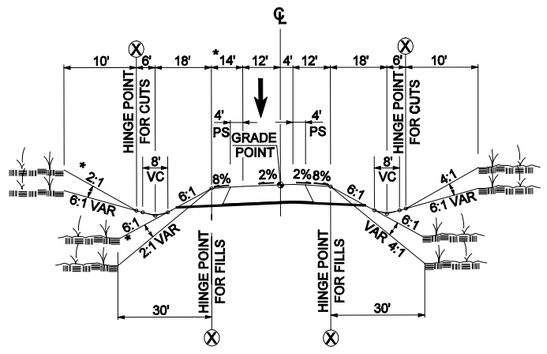
August 2009 FIGURE 3C Sheet 1 of 2



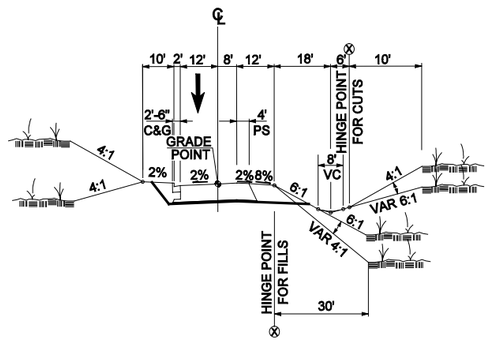
*14' WHEN GUARDRAIL REQUIRED
**VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY
PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF:
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
3121 EDGEDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4966

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 4
CITY OF THOMASVILLE
DAVIDSON COUNTY

August 2009 FIGURE 3C Sheet 2 of 2

CEDAR LODGE RD

I-85

BEGIN FS-0509A
ALTERNATIVE 5
STA. 10+00

NC 109

RANDOLPH ST

JULIAN AVE

HOLLY HILL RD

SUNRISE AVE

MATCH SHEET 2 OF 2

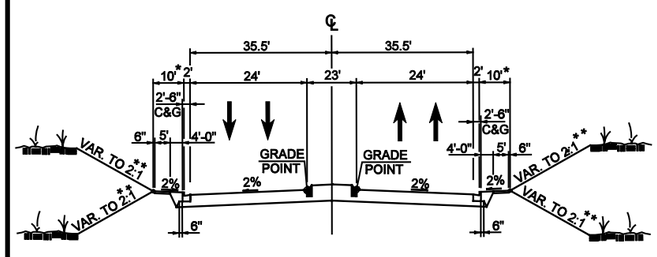
LIBERTY DR

I-85

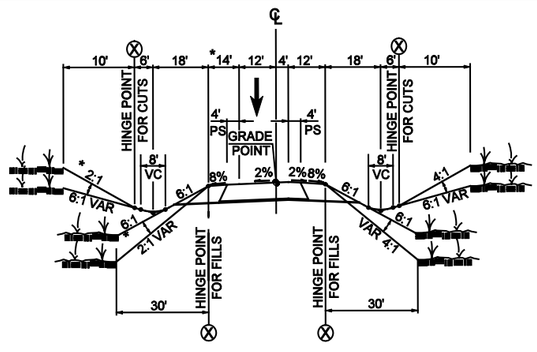
CLONIGER ST

HPTD RAILROAD

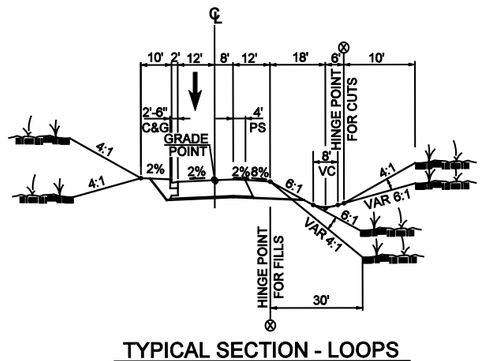
*14' WHEN GUARDRAIL REQUIRED
**VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY
PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
3121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 5
CITY OF THOMASVILLE
DAVIDSON COUNTY

August 2009 FIGURE 3D Sheet 1 of 2

RANDOLPH ST

JULIAN AVE

SUNRISE AVE

LIBERTY DR

MATCH SHEET 1 OF 2

TRINITY ST

BLAIR ST

MAIN ST

UNITY ST

NATIONAL HWY

TURNER ST

NC 68

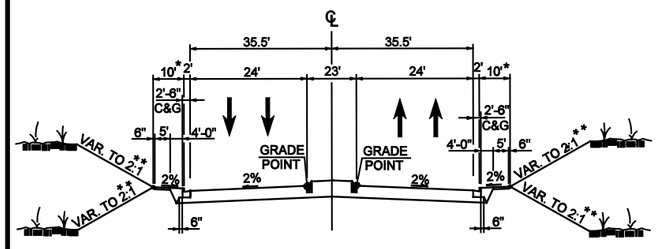
END FS-0509A
ALTERNATIVE 5
STA. 216+50

NC RAILROAD / NORFOLK SOUTHERN RAILROAD

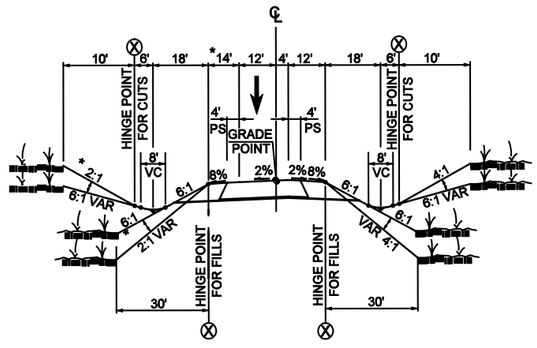
HPTD RAILROAD

I-85 BUS

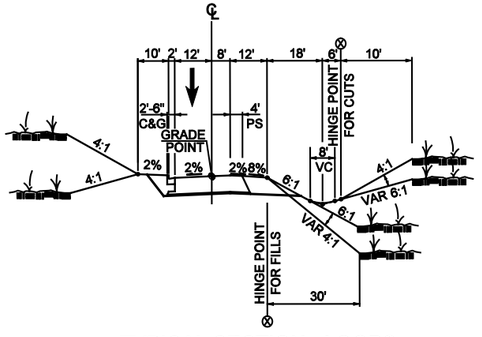
*14' WHEN GUARDRAIL REQUIRED
**VAR. TO 4:1 MAX. INSIDE INTERCHANGE



TYPICAL SECTION- ROADWAY
ALTERNATIVES 1, 2, 4 & 5



TYPICAL SECTION - RAMPS



TYPICAL SECTION - LOOPS

LEGEND

PROPOSED ALTERNATIVE
PROPOSED RIGHT-OF-WAY

PLANS PREPARED FOR N.C.D.O.T. IN THE OFFICE OF
KO & ASSOCIATES, P.C.
Consulting Engineers
A Florence & Hutcheson, Inc. Company
3121 KINGDOM WAY, SUITE 100 RALEIGH, N.C. 27607
(919) 851-4005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

FUNCTIONAL PLANS
DESIGN ALTERNATIVES
DO NOT USE FOR CONSTRUCTION
DO NOT USE FOR R/W ACQUISITION

0 250 500 750 1000
(FEET)

FS-0509A
NC 109 IMPROVEMENTS
ALTERNATIVE 5
CITY OF THOMASVILLE
DAVIDSON COUNTY

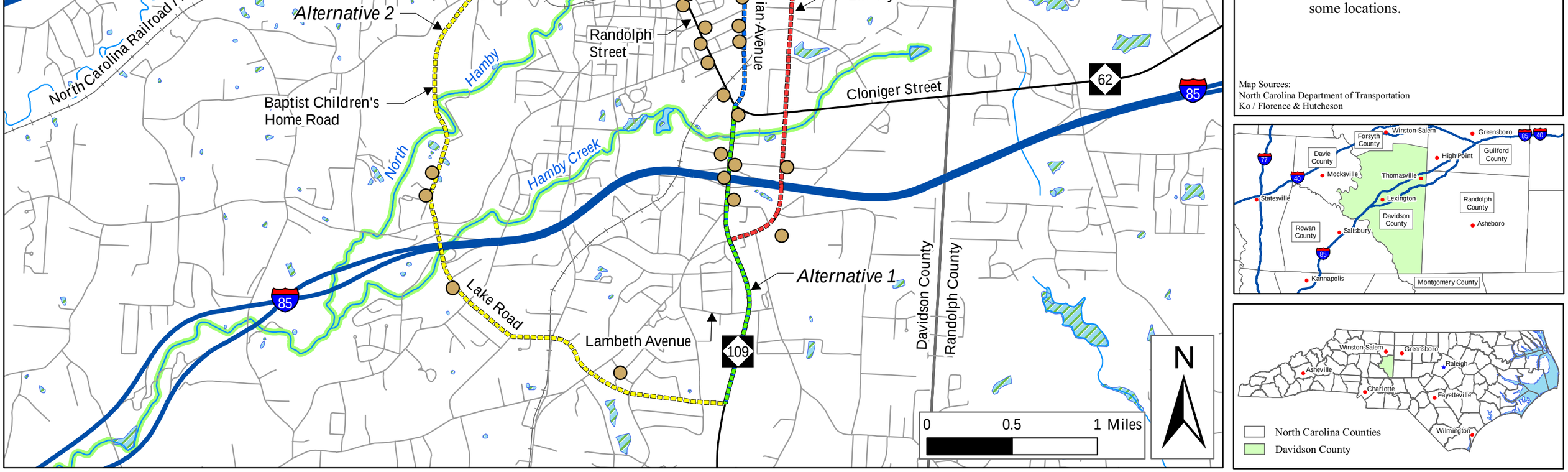
August 2009 FIGURE 3D Sheet 2 of 2

Figure 4 - Natural Environment Resources & Hazardous Material Sites

- Alternative 1
- Alternative 2
- Alternative 4
- Alternative 5
- Interstates
- US & NC Routes
- Secondary Roads
- Railroads
- Streams & Creeks
- 303(d) Impaired Streams
- Water Bodies
- Wetlands (NWI)
- Hazardous Material Sites

May represent more than one site in some locations.

Map Sources:
North Carolina Department of Transportation
Ko / Florence & Hutcheson



APPENDIX

Table A1 - Construction and Right of Way Costs By Segment

	Segment	Description	Length (miles)	Construction/ Utility Costs	Utility Relocation Costs	Total Construction/ Utility Relocation Costs	Relocations			Relocation Costs	Acquisition Costs	Land & Damage Costs	Right of Way Costs	Total Costs
							Residences	Businesses	Total					
Alternative 1	1A	South of Lambeth Rd. (SR 2067) to Liberty Dr. (SR 2055)	0.75	$3,800,000	$40,000	$3,900,000	1	1	2	$50,000	$170,000	$840,000	$1,100,000	$5,000,000
	1B	Liberty Dr. (SR 2055) to South of I-85	0.27	$1,400,000	$140,000	$1,600,000	4	9	13	$300,000	$60,000	$5,220,000	$5,600,000	$7,200,000
	1C	I-85 Interchange	0.21	$10,200,000	$40,000	$10,300,000	1	2	3	$70,000	$50,000	$1,680,000	$1,800,000	$12,100,000
	1D	North of I-85 to Julian Avenue (SR 2185)	0.32	$1,550,000	$170,000	$1,800,000	0	11	11	$280,000	$70,000	$11,350,000	$11,700,000	$13,500,000
	1A-1D	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	**1.55**	**$17,000,000**	**$600,000**	**$17,600,000**	**6**	**23**	**29**	**$700,000**	**$400,000**	**$19,100,000**	**$20,200,000**	**$37,800,000**
Alternative 2	2A	New location - NC 109 South of Lambeth Rd. to Lake Rd. (SR 2085)	1.10	$6,300,000	$160,000	$6,500,000	11	0	11	$220,000	$320,000	$2,790,000	$3,400,000	$9,900,000
	2B	Lake Rd. (SR 2085) at Fisher Ferry Rd. (SR 2183) to I-85	0.80	$4,000,000	$560,000	$4,600,000	37	1	38	$770,000	$230,000	$8,330,000	$9,400,000	$14,000,000
	2C	Baptist Children's Home Rd. (SR 2085) at I 85 to Lexington Ave. (SR 2123)	1.86	$12,200,000	$970,000	$13,200,000	11	7	18	$400,000	$540,000	$3,330,000	$4,300,000	$17,500,000
	2D	Martin Luther King Jr. Dr. (SR 1792) at Lexington Ave. (SR 2123) to I-85 Bus.	0.83	$3,700,000	$690,000	$4,400,000	68	13	81	$1,680,000	$240,000	$10,870,000	$12,800,000	$17,200,000
	2E	I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	0.44	$10,400,000	$430,000	$10,900,000	4	0	4	$80,000	$130,000	$930,000	$1,200,000	$12,100,000
	2A-2E	NC 109 South of Lambeth Rd. to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	**5.03**	**$36,600,000**	**$3,000,000**	**$39,600,000**	**131**	**21**	**152**	**$3,200,000**	**$1,600,000**	**$26,300,000**	**$31,100,000**	**$70,700,000**
Alternative 4	1A-1D	South of Lambeth Rd. (SR 2067) to Julian Ave. (SR 2185)	1.55	$17,000,000	$600,000	$17,600,000	6	23	29	$700,000	$400,000	$19,100,000	$20,200,000	$37,800,000
	4A	Julian Ave. (SR 2185) at NC 109 to East Main St. (SR 2123)	1.32	$6,500,000	$1,320,000	$7,900,000	26	19	45	$990,000	$710,000	$15,820,000	$17,600,000	$25,500,000
	4B	Maple Ave. at East Main St. (SR 2123) to Culbreth Ave.	0.38	$2,200,000	$330,000	$2,600,000	30	2	32	$650,000	$200,000	$3,110,000	$4,000,000	$6,600,000
	4C	New location - Maple Avenue at Culbreth Ave. to Unity St. (SR 2051) at Huntsford Terrace	0.68	$6,900,000	$540,000	$7,500,000	39	1	40	$800,000	$360,000	$7,340,000	$8,500,000	$16,000,000
	4D	Unity St. (SR 2051) at Huntsford Terrace to NC 109 at I-85 Bus.	0.59	$3,700,000	$860,000	$4,600,000	31	1	32	$650,000	$320,000	$5,870,000	$6,900,000	$11,500,000
	1A-1D/ 4A-4D	South of Lambeth Rd. (SR 2067) to NC 109 at I-85 Bus.	**4.52**	**$36,300,000**	**$3,900,000**	**$40,200,000**	**132**	**46**	**178**	**$3,800,000**	**$2,100,000**	**$51,300,000**	**$57,200,000**	**$97,400,000**
Alternative 5	1A	South of Lambeth Rd. (SR 2067) to Liberty Dr. (SR 2055)	0.75	$3,800,000	$40,000	$3,900,000	1	1	2	$50,000	$380,000	$840,000	$1,300,000	$5,200,000
	5A-1	Liberty Dr. (SR 2055) at NC 109 to Cloniger St. (NC 62)	0.92	$7,500,000	$500,000	$8,000,000	23	3	26	$540,000	$470,000	$9,400,000	$10,500,000	$18,500,000
	5A-2	Liberty Dr. (SR 2055) at NC 62 to Blair St. (South of E. Main St.)	1.61	$8,300,000	$1,400,000	$9,700,000	155	11	166	$3,370,000	$820,000	$18,580,000	$22,800,000	$32,500,000
	5B	Turner St. (SR 2165) at Blair St. to National Hwy. (NC 68)	0.80	$9,500,000	$750,000	$10,300,000	31	15	46	$990,000	$410,000	$14,240,000	$15,700,000	$26,000,000
	5C	National Hwy. (NC 68) at Turner St. (SR 2165) to I-85 Bus.	0.58	$11,900,000	$620,000	$12,600,000	7	3	10	$220,000	$290,000	$4,590,000	$5,100,000	$17,700,000
	Total	South of Lambeth Rd. (SR 2067) National Hwy. (NC 68) at I-85 Bus.	**4.66**	**$41,000,000**	**$3,500,000**	**$44,500,000**	**217**	**33**	**250**	**$5,200,000**	**$2,500,000**	**$47,700,000**	**$55,400,000**	**$99,900,000**
Alternative 6	1A-1D	South of Lambeth Rd. (SR 2067) to Julian Avenue (SR 2185)	1.55	$17,000,000	$600,000	$17,600,000	6	23	29	$700,000	$400,000	$19,100,000	$20,200,000	$37,800,000
	2A-2E	NC 109 South of Lambeth Rd. to I-85 Bus. interchange at Martin Luther King Jr. Dr. (SR 1792)	5.03	$36,600,000	$3,000,000	$39,600,000	131	21	152	$3,200,000	$1,600,000	$26,300,000	$31,100,000	$70,700,000
	4A-4D	Julian Ave. (SR 2185) at NC 109 to NC 109 at I-85 Bus.	2.97	$19,300,000	$3,300,000	$22,600,000	126	23	149	$3,100,000	$1,700,000	$32,200,000	$37,000,000	$59,600,000
	5A-5C	Liberty Dr. (SR 2055) at NC 109 to National Hwy. (NC 68) at I-85 Bus.	3.91	$37,200,000	$3,300,000	$40,500,000	216	32	248	$5,200,000	$2,000,000	$46,900,000	$54,100,000	$94,600,000
	2A-2D/ 4A-4D/	Combination of Alternatives 1, 2, 4, and 5	**13.46**	**$110,100,000**	**$10,200,000**	**$120,300,000**	**479**	**99**	**578**	**$12,200,000**	**$5,700,000**	**$124,500,000**	**$142,400,000**	**$262,700,000**

Table A2: Hazardous Material Sites

Name	Address	Alternative Affected
Adam-Millis	100 Liberty Drive	5
Beck Oil Company	610 Jacob Street Suite A	2
Black Lumber Company, Inc.	1015 Randolph Street	1
Bost Bakery, Inc.	1022 Randolph Street	1
Brasscraft - Thomasville	1024 Randolph Street	1
Broker's, Inc.	706 E. Main Street	4
Carolina Business Furniture Inc.	101 Liberty Drive	5
Casa Bique Incorp.	500 Carolina Avenue	4
Casa Bique, LT.	501 Carolina Avenue	4
Casa Buque Ltd.	605 Julian Avenue	4
City Mobil	1102 National Hwy.	5
Classic Cleaners #701	801 Julian Avenue	4
Claude Thayer Insulating Co.	1121 Randolph Street	1 and 4
Coastal Mart #441	1032 Randolph Street	1 and 4
Commercial Carving Co-Finishing	602 May Road	2
Commercial Carving Company	1010 Randolph Street	1
Cranford Shell Service	Salem & Guilford Street	1
Crown #605-B	816 Randolph Street	1
Dales Place	1143 Randolph Street	1 and 4
Dalton Myers Oil Company	1000 National Hwy.	5
Dogwood Hosiery Company	603 Salem Street	1
Duffy Oil Company	301 Julian Ave.	4
Eagle Mart	1450 Baptist Childrens'	2
East Davidson High School	1408 Lake Road	2
Electric Drives, Inc.	16 Carolina Avenue	1
Erwin-Lambeth, Inc.	201 Holly Hill Rd.	4
Exxon RAS #46692	1034 Randolph Street	1 and 4
Exxon Company USA #46692-A	1035 Randolph Street	1 and 4
Fairway One Stop 14	1055 Randolph Street	1 and 4
Fast Fare NC 605	816 Randolph Street	1
Fast Track #109	740 Randolph Street	1
Fast Track #109	1140 Randolph Street	1 and 4
Finch Fabricating & Plating Pl.	117B Liberty Drive	5
First Citizens – Salem Street Branch	50 Salem Street	1
H and H Firestone Store	103 Salem Street	1
HP Hydraulics, Inc.	1020 National Hwy.	5
Hamby Creek Wastewater Treatment Plant	110 Optimist Parks Road	2
Harcros Chemicals, Inc.	125 Sedgehill Rd.	1 and 4
Harcros Chemicals, Inc.	1005 Randolph Street	1
Hydro Conduit Corporation	209 Randolph Street	1
Hydro Conduit Corporation	9 Carolina Avenue	1

Table A2: Hazardous Material Sites Continued

Name	Address	Alternative Affected
Hydro Conduit - Prestress	208 Randolph Street	1
Hydroconduit/Carolina Avenue	11 Carolina Avenue	1
I-85 North of MM 103N	I-85 North of MM	1 and 4
Iloco Mart #9/AMOCO	1055 Randolph Street	1 and 4
Joy Food Store 441	1032 Randolph Street	1 and 4
K & M Auto Parts	809 Randolph Street	1
Larry Cagle Fuel Oil Spill	701-A Douglas Drive	2
Liberty Drive Elementary	401 Liberty Drive	5
Maro Hosiery Corp.	106 Liberty Drive	5
Merchant's Tire & Auto #05043	900 Randolph Street	1
Murphy USA Number	Liberty Drive/Tower Road	4
Murphy USA 6808	1583 Liberty Drive	4
N State Telephone Company	25 Salem Street	1
Peacock Concepts Incorp.	710 Julian Avenue	4
Petro Express #39	1121 Randolph Street	1 and 4
Police Department	7 West Guilford Street	1
Racetrac #203	1040 Randolph Street	1 and 4
Randolph Mobil	314 Randolph Street	1
Randy's Mart 1 Inc.	315 Randolph Street	1
S&S Produce	615 E. Main Street	4
Sams Mart 785	816 Randolph Street	1
Servco #00421	1033 Randolph Street	1 and 4
Silver Hill Mines, Inc.	203-L Arthur Drive	4
Sky City	13 Cloniger Drive	1 and 4
Southern Veneer Co.	120 Liberty Drive	5
Southern Veneer Company, Incorp.	118 Liberty Drive	5
Stillwell's Service Center	1026 Randolph Street	1
Stroupe Mirror Co.	Holly Hill Road	1
Sunoco 0810-6528	1034 Randolph Street	1 and 4
TA Finch Auditorium	406 Unity Street	4
Thomason Chevrolet	1025 National Hwy.	5
Thomasville City Schools	400 Turner Street	5
Thomasville City – Small MS4	10 Salem Street	1
Thomasville Cleaners	501 Randolph Street	1
Thomasville Ford, Inc.	525 Turner Street	5
Thomasville GM Superstore	1025 National Hwy.	5
Thomasville High School	410 Unity Street	4
Thomasville Middle School	400 Unity Street	4
Thomasville Times	512 Turner Street	5
Thomasville Veneer Company	521 Broad Street	4
Three R's	801 Salem Street	1

Table A2: Hazardous Material Sites Continued

Name	Address	Alternative Affected
Tire Kingdom Inc. #346	2 Cloniger Drive	1
Unity Mobil	1 Unity Street	1 and 4
Wal-Mart Supercenter #3503	1585 Liberty Drive	4
Wilco Food Mart 291	407 Randolph Street	1
Wilco – Randolph Street	Randolph Street	1
Wilco 292	1033 Randolph Street	1 and 4
Wrenn Manufacturing Co., Incorp.	115 Liberty Drive	5
13 Carolina Avenue *	13 Carolina Avenue	1

* From the US CDL data base (a listing of clandestine drug lab locations).

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 28, 2007

MEMORANDUM TO: Derrick Lewis PE
Feasibility Studies Unit
Program DevelopmentBranch

FROM: Richard Tanner
Western Traffic Forecasting Group
Transportation Planning Branch

SUBJECT: Traffic Forecast for TIP# FS-0509A, NC109 Improvements from north of I-85 Business to south of the proposed Thomasville Southern Loop in Davidson County

Please find attached the traffic forecast for TIP Project FS-0509A which was developed subject to your request submitted June 22, 2006. The forecast includes Base Year 2007 estimates and Horizon Year 2035 projections for each of four project alternatives (Alternatives 1, 2, 3, and 4). Note that Alternative 1 is the NO BUILD Alternative.

A one-sheet forecast diagram is provided for each forecast year of each forecast alternative. Thus there is a total of 10 forecast diagram sheets attached. A reference map of is also provided for clarification.

Estimates and projections attached include passenger cars, motorcycles, buses and trucks. Travel demand for pedestrians, bicycles and transit ridership are not included in the forecast.

Estimates and projections attached were developed using output from the current version of the Triad Regional Traffic Model.

Please note that the outcome of our analysis, which is supported by the model, indicates that each of the proposed Alternatives (2, 3 and 4) will divert less than 20% of the projected Horizon Year 2035 traffic volume from the study section of NC109.

If you require travel demand projections for additional years, please submit a new request using our standard procedure. We do not recommend the use of straight-line interpolation for the projection of AADT to years other than 2035 because model predictions are available

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING BRANCH
1554 MAIL SERVICE CENTER
RALEIGH NC 27699-1554

NCDOT TPB
TRANSPORTATION PLANNING BRANCH
www.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH, NC 27601
Phone: 919-733-4705
Fax: 919-733-2417

for several intermediate horizon years. Feel free to contact me for discussion prior to submitting your request. For assistance with this or any other issue regarding this traffic forecast please contact me at 715-5482 x.366, or by email at rtanner@dot.state.nc.us.

RPT

cc (with attachments):
Jay Bennett PE
Wayne Davis PhD, PE
Deborah Hutchings PE
Hardee Cox
BenJetta Johnson PE
File: FS-0509A

2007 AVERAGE ANNUAL DAILY TRAFFIC WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

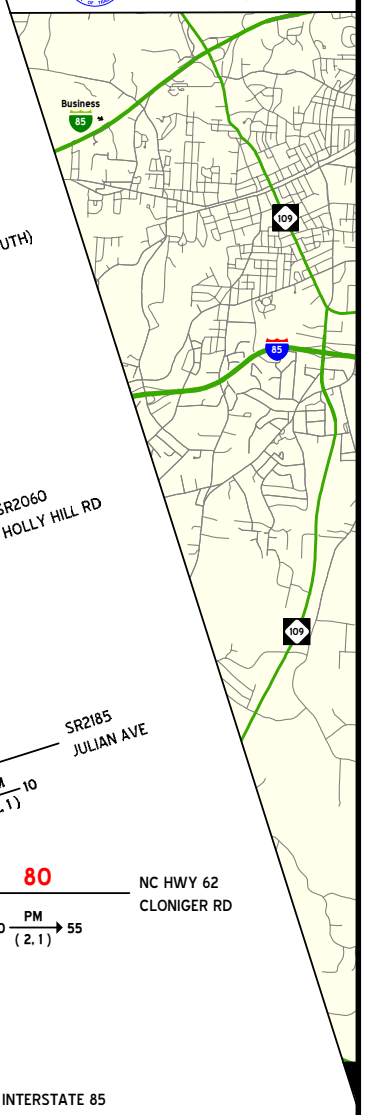
FIGURE 1 OF 8 - ALT 1, BASE YEAR

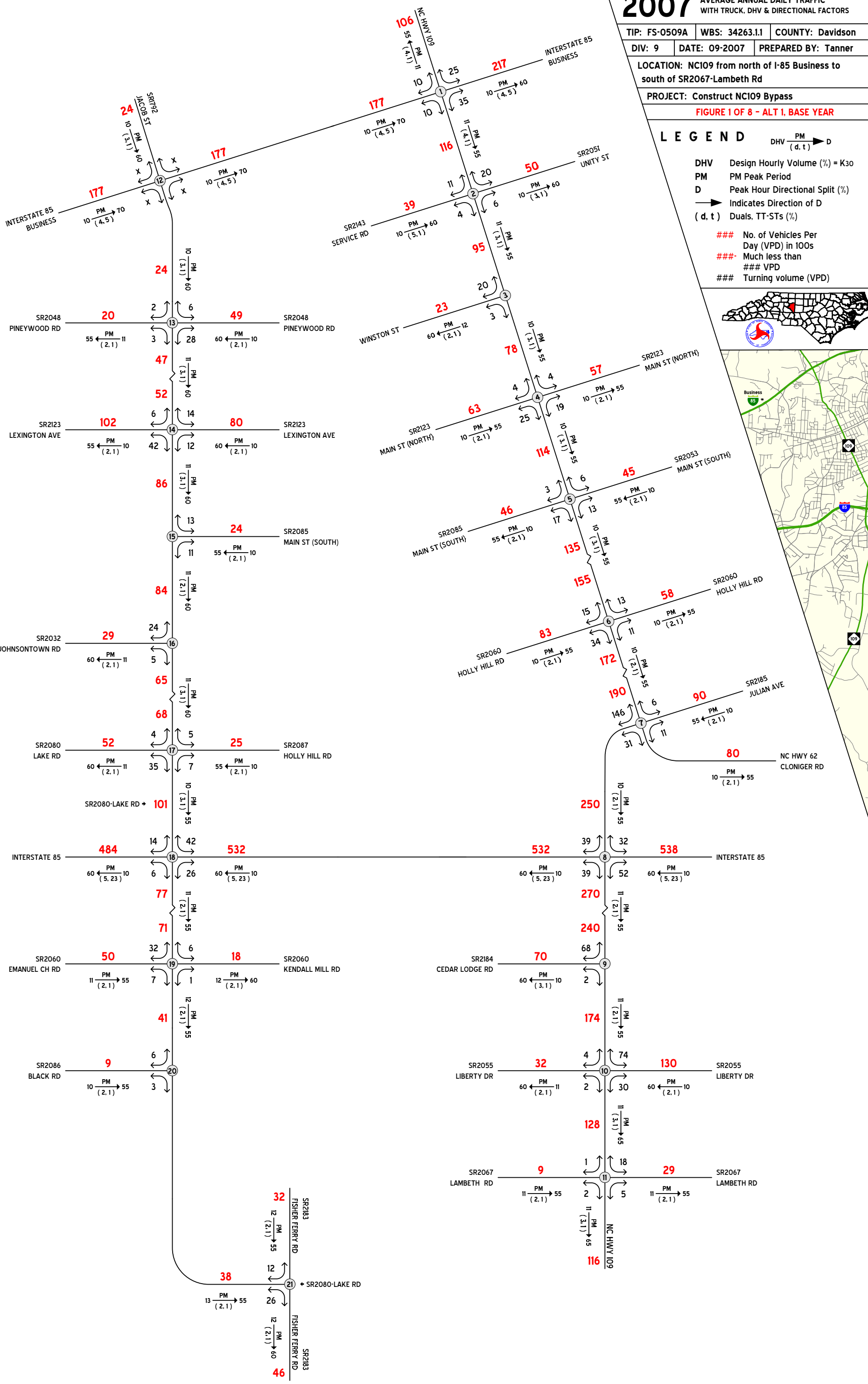
LEGEND

DHV PM (d, t) D

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TT-STs (%)

- ### No. of Vehicles Per Day (VPD) in 100s
- ###- Much less than ### VPD
- ### Turning volume (VPD)





2007

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

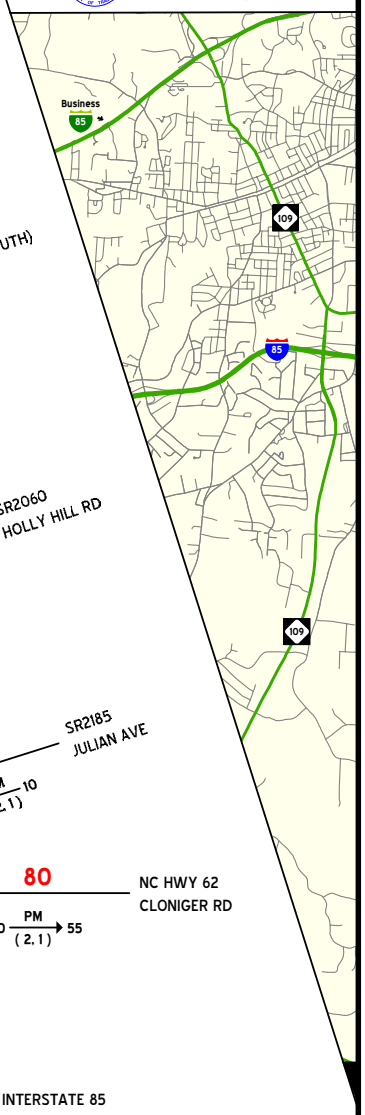
FIGURE 2 OF 8 - ALT 2, BASE YEAR

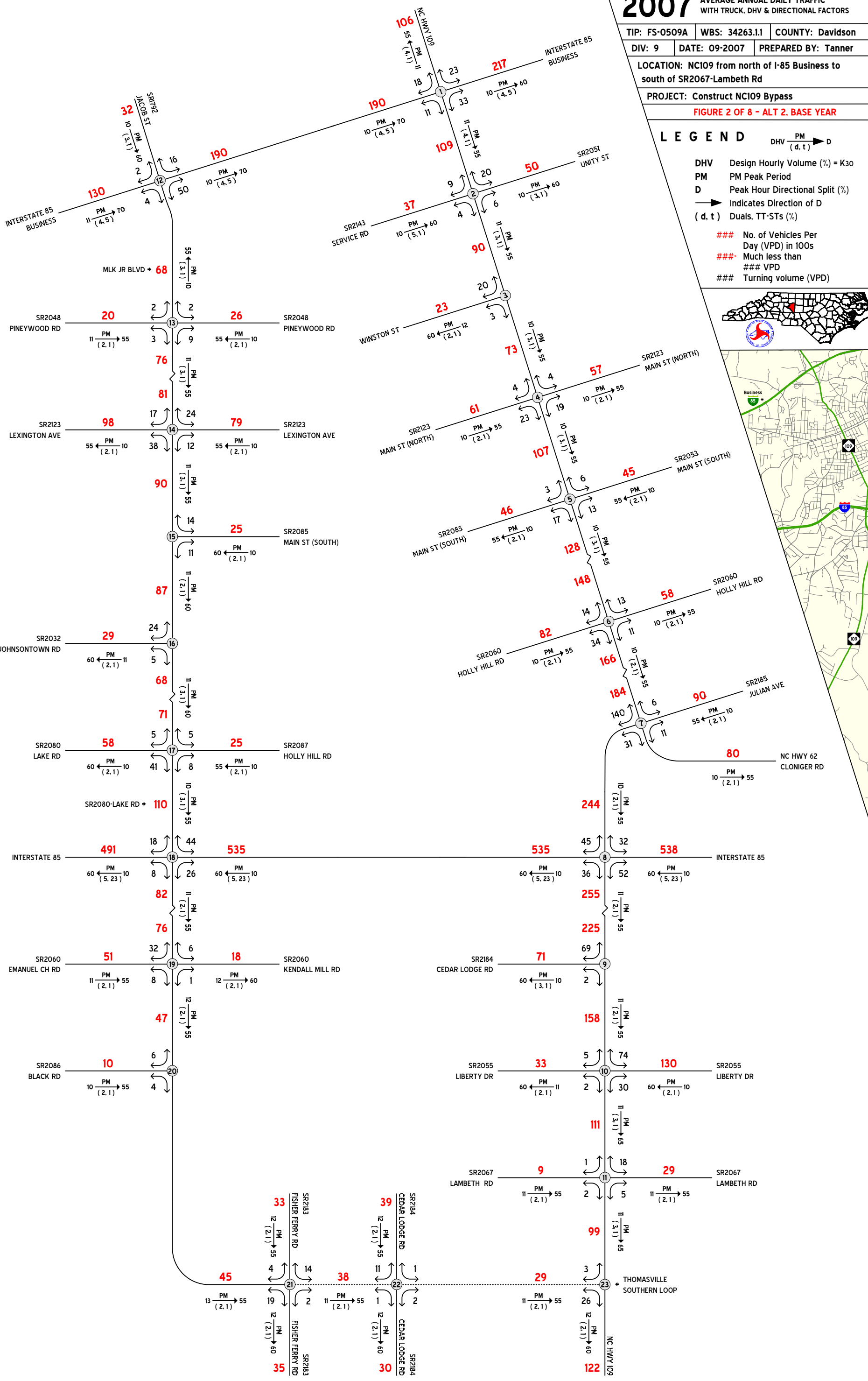
LEGEND

DHV PM (d, t) D

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TT-STs (%)

- ### No. of Vehicles Per Day (VPD) in 100s
- ###- Much less than ### VPD
- ### Turning volume (VPD)





2007 AVERAGE ANNUAL DAILY TRAFFIC WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

FIGURE 3 OF 8 - ALT 3, BASE YEAR

LEGEND

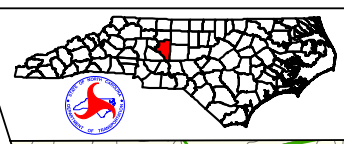
DHV PM (d, t) D

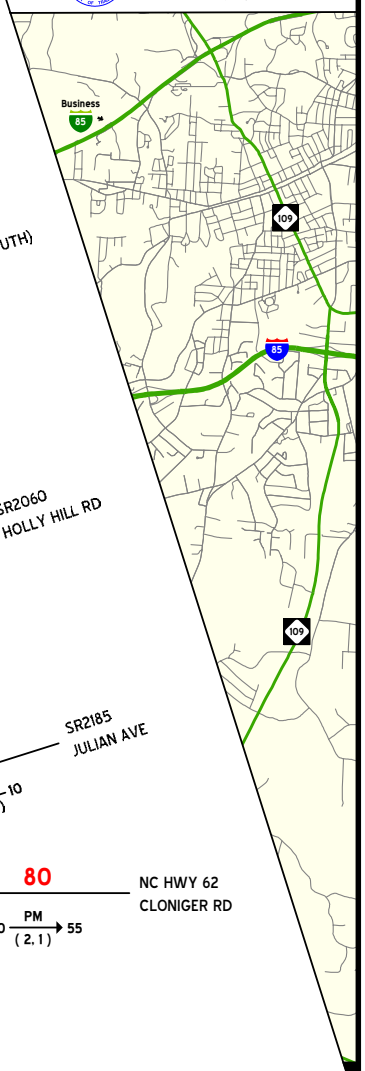
- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- → Indicates Direction of D
- (d, t) Duals, TT-STs (%)

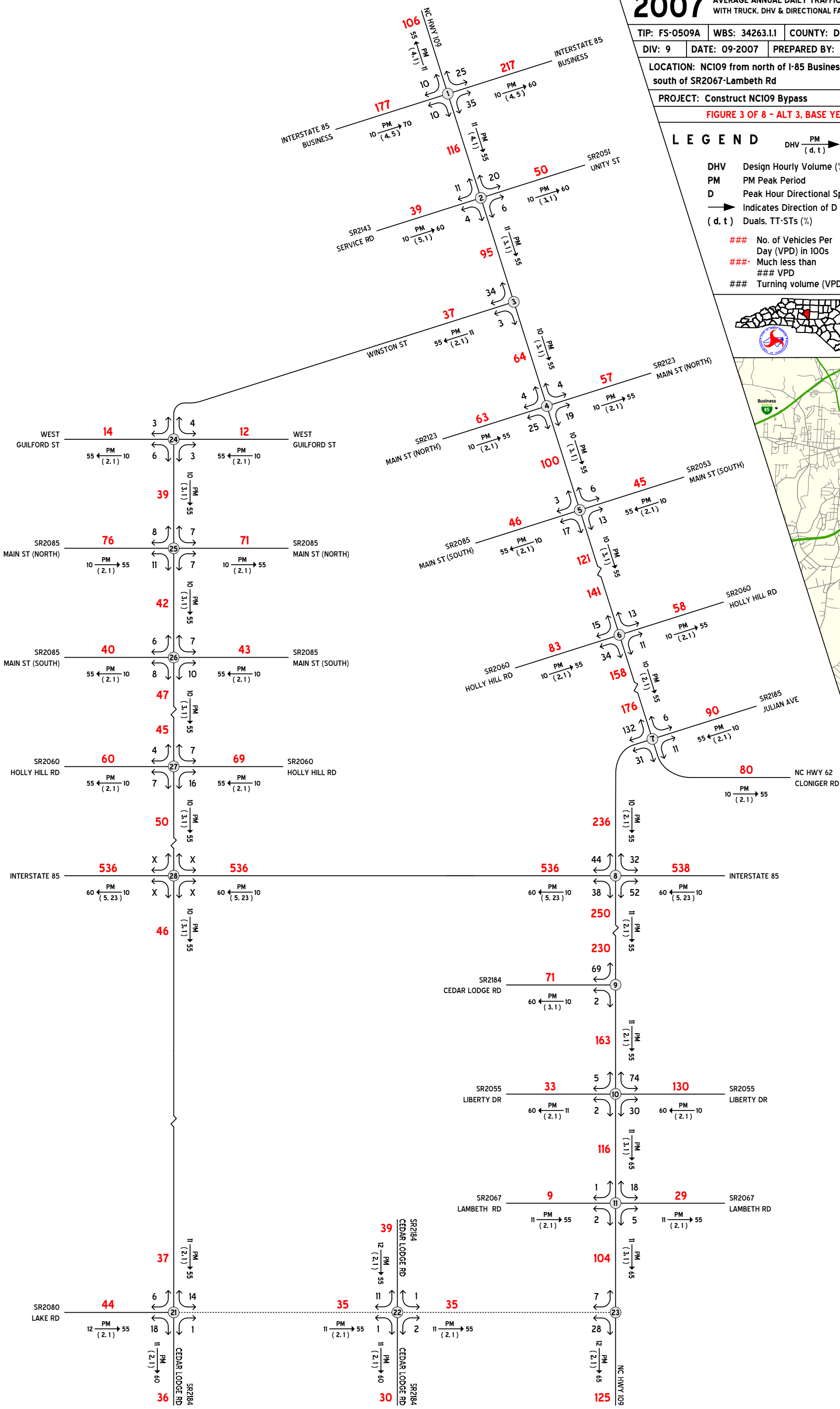
No. of Vehicles Per Day (VPD) in 100s

- Much less than ### VPD

Turning volume (VPD)







2007 AVERAGE ANNUAL DAILY TRAFFIC WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

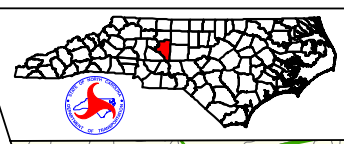
PROJECT: Construct NC109 Bypass

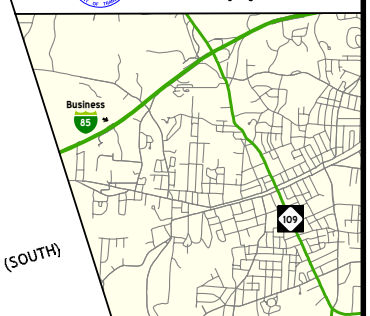
FIGURE 4 OF 8 - ALT 4 BASE YR

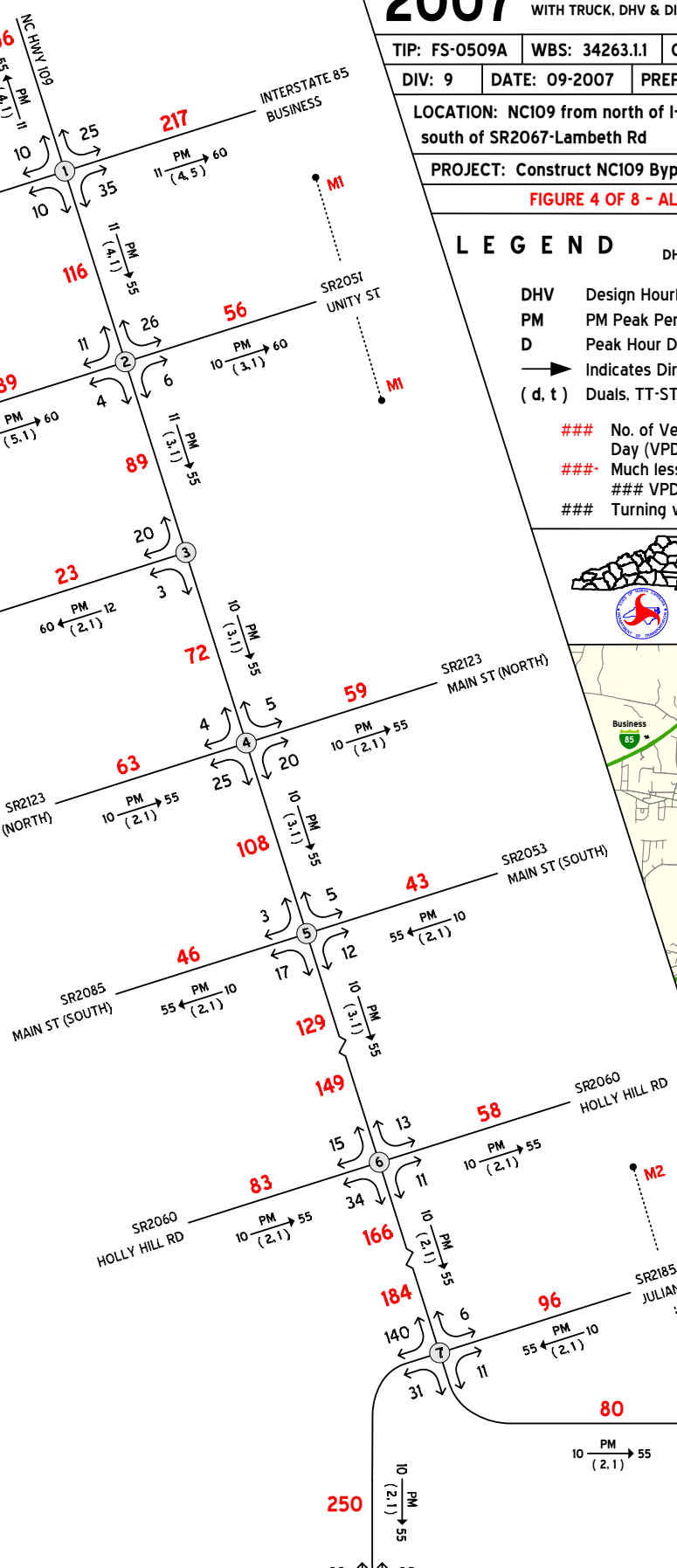
L E G E N D

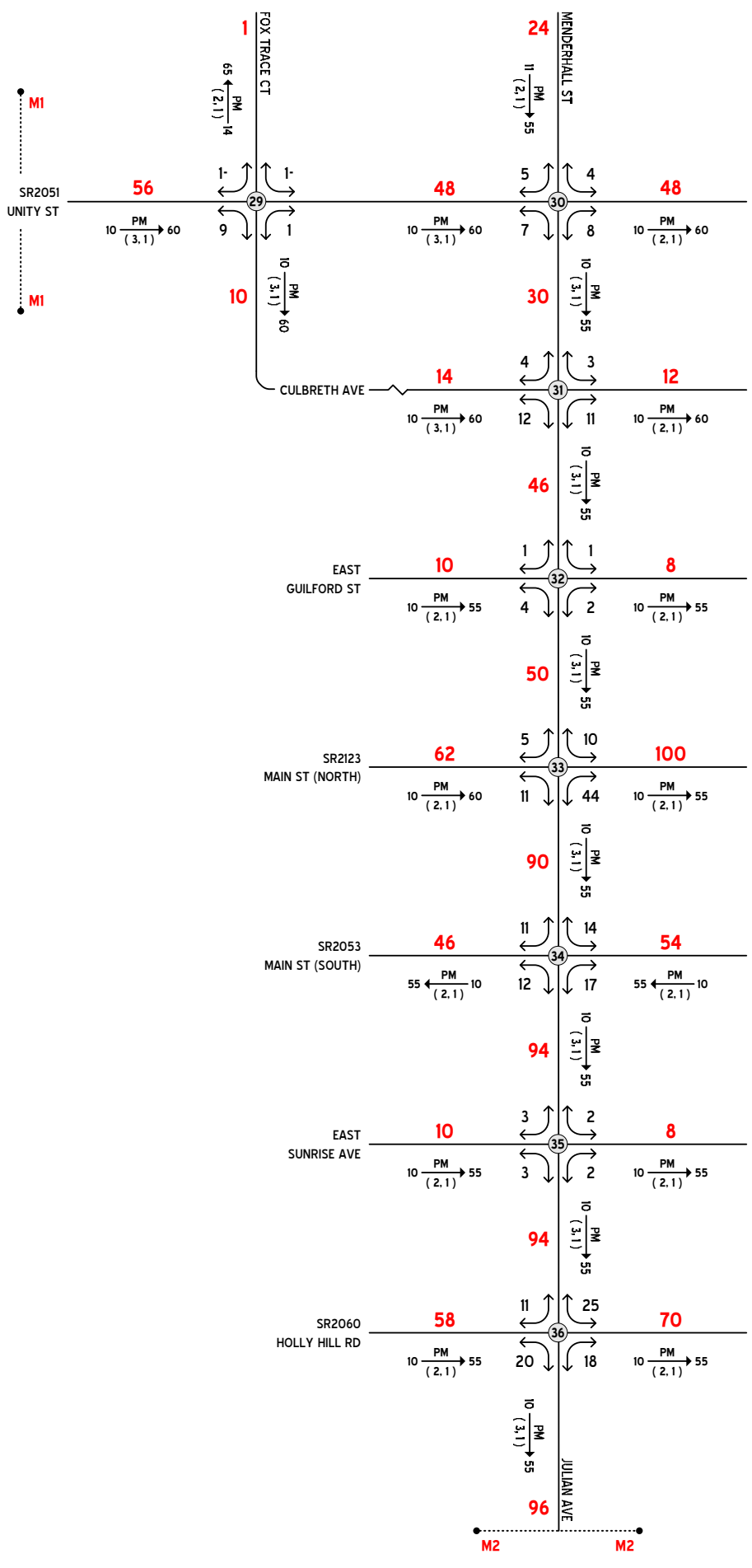
DHV PM (d, t) D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)









2035

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

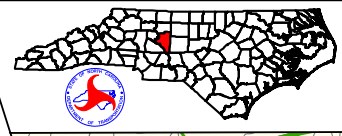
FIGURE 5 OF 8 – ALT 1, DESIGN YEAR

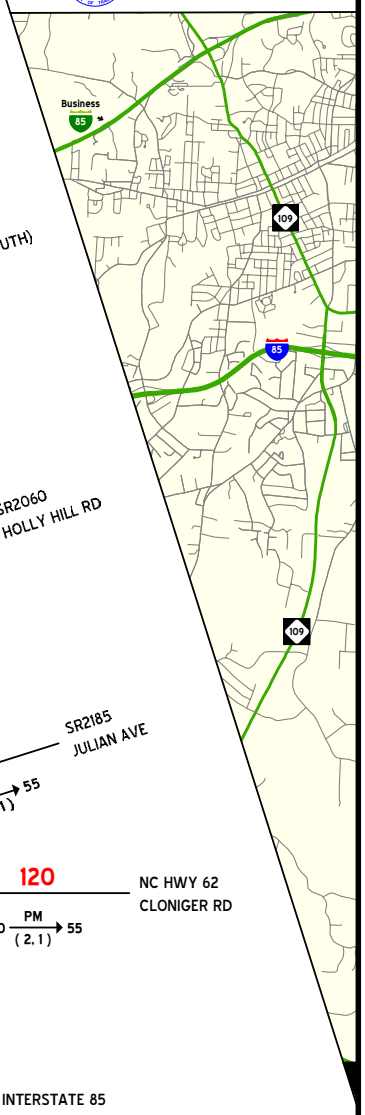
LEGEND

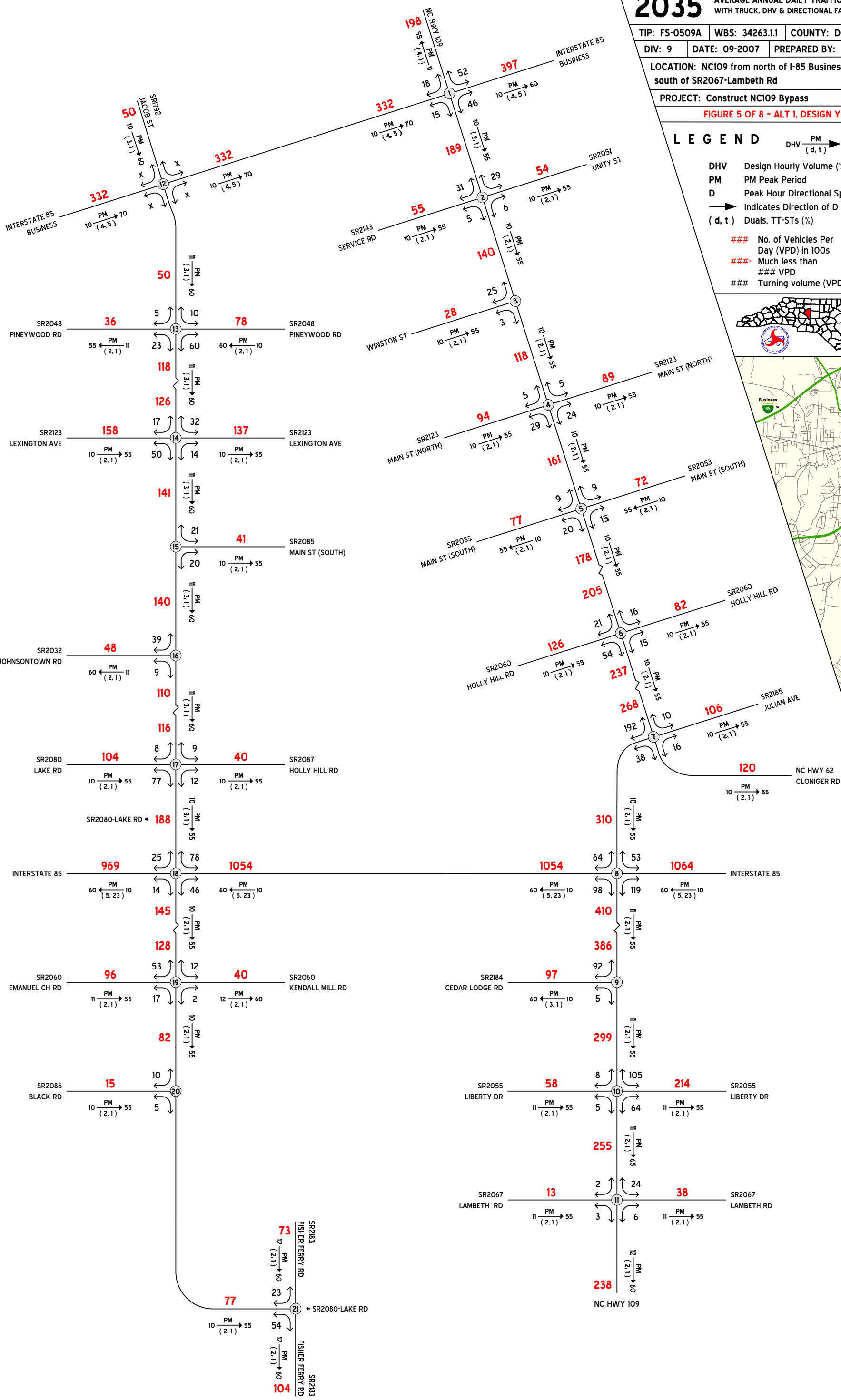
DHV PM (d, t) D

- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

- ### — No. of Vehicles Per Day (VPD) in 100s
- ###- — Much less than ### VPD
- ### — Turning volume (VPD)







2035

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

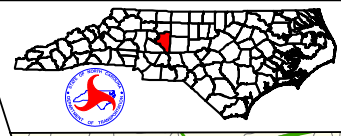
FIGURE 6 OF 8 - ALT 2, DESIGN YEAR

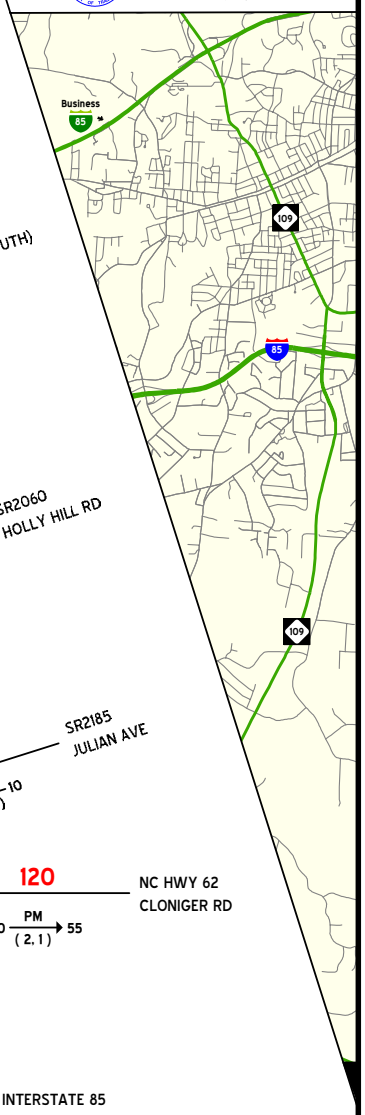
LEGEND

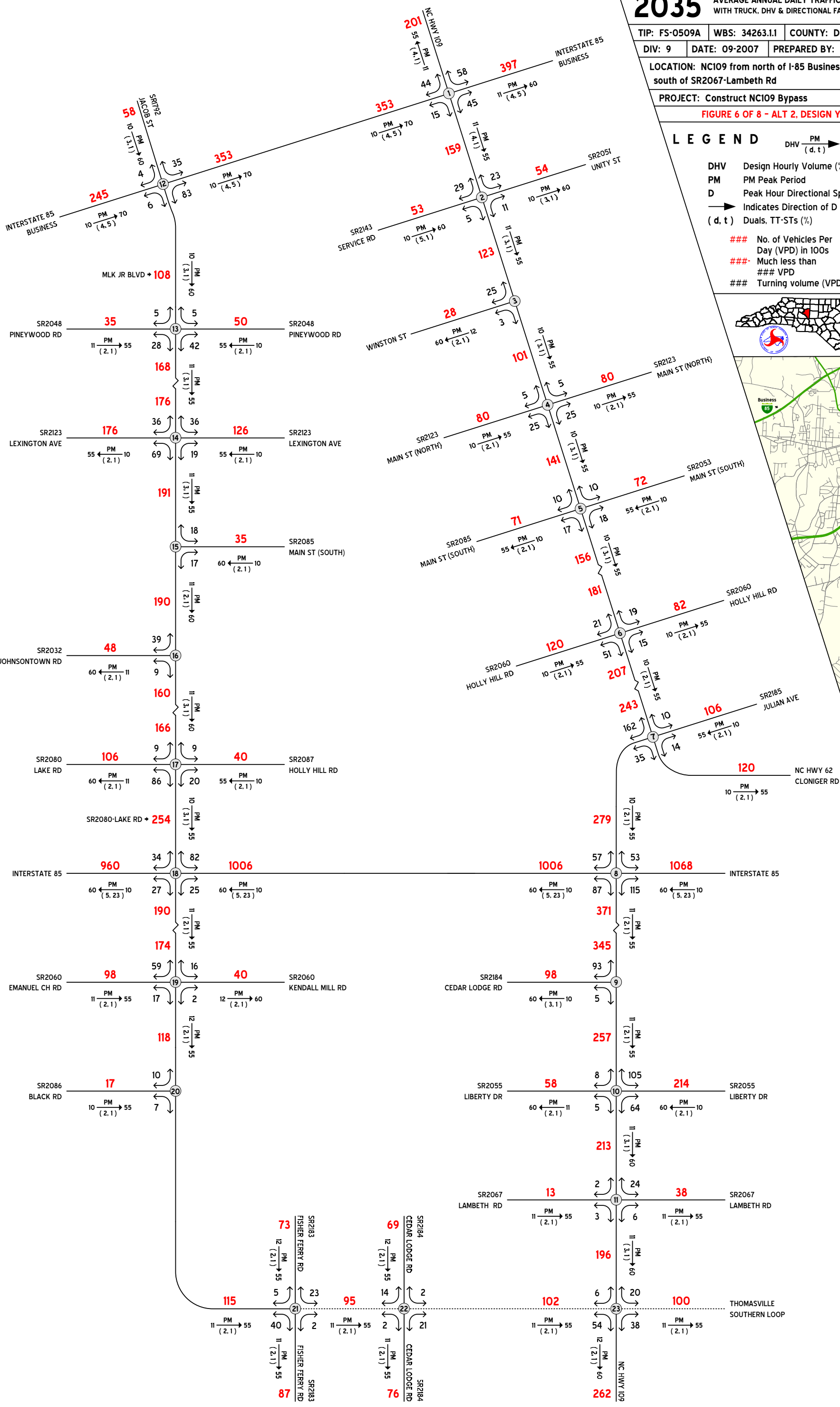
DHV PM (d, t) D

- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

- ### — No. of Vehicles Per Day (VPD) in 100s
- ###- — Much less than ### VPD
- ### — Turning volume (VPD)







2035

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

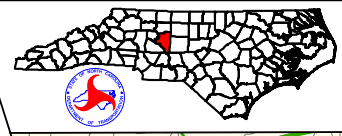
FIGURE 7 OF 8 - ALT 3 DESIGN YR

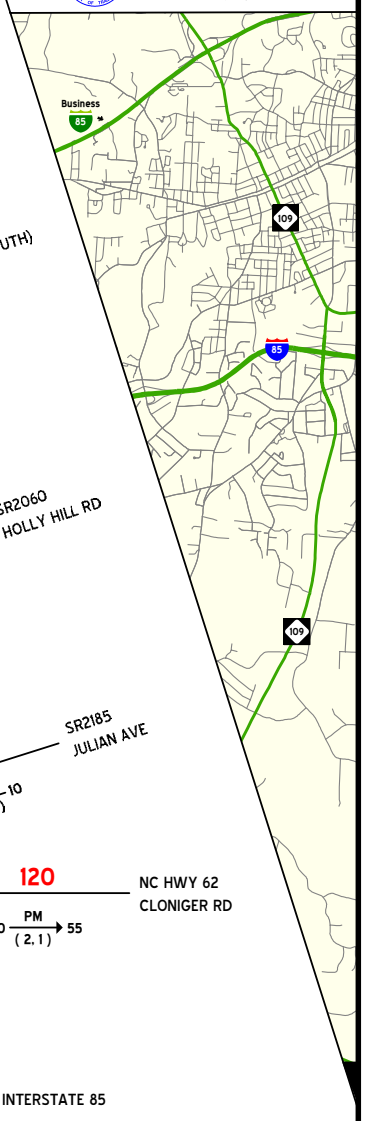
LEGEND

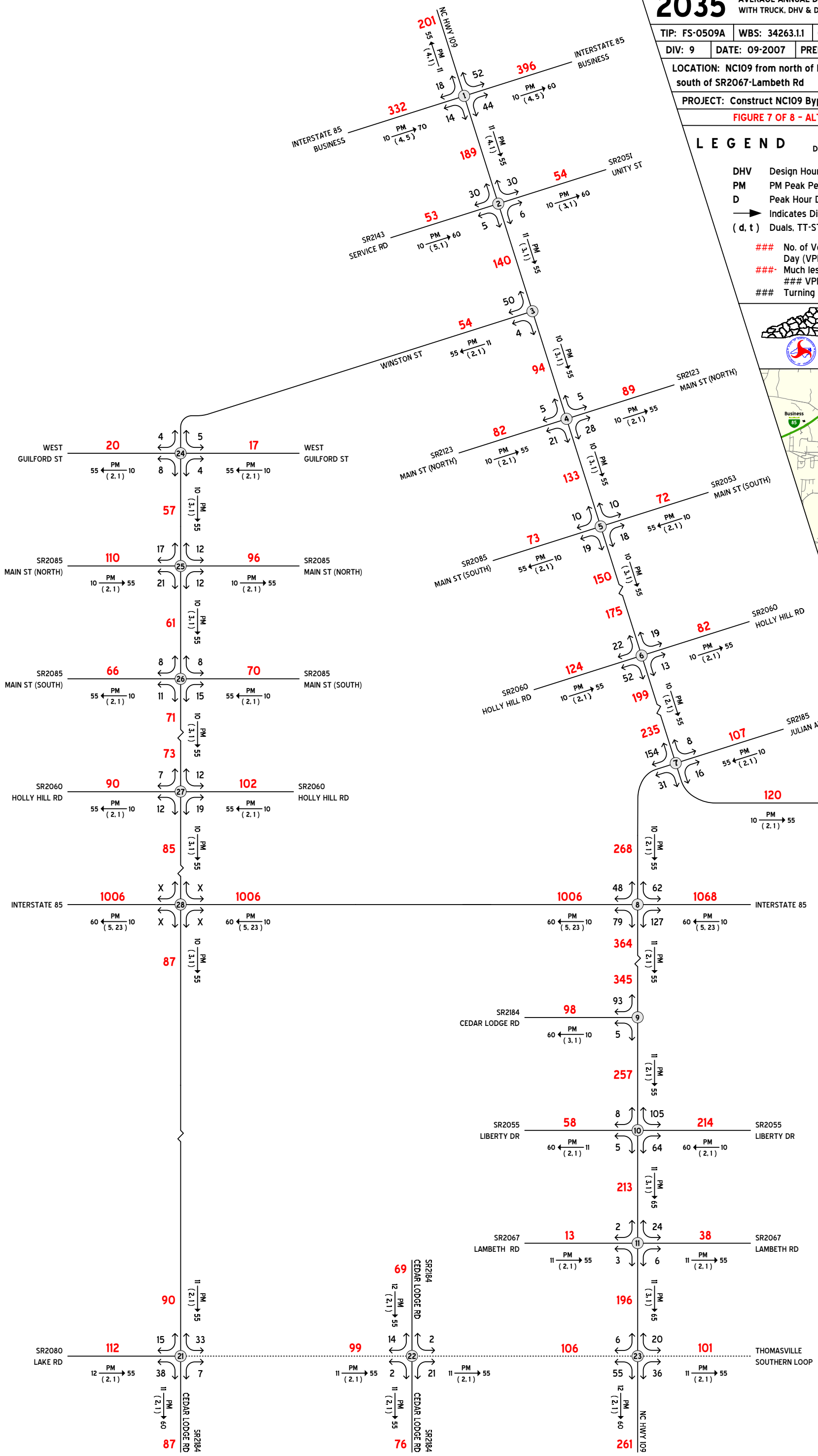
DHV PM (d, t) D

- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

- ### — No. of Vehicles Per Day (VPD) in 100s
- ###- — Much less than ### VPD
- ### — Turning volume (VPD)







2035

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 09-2007	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

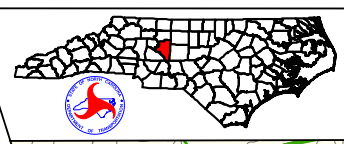
FIGURE 8 OF 8 - ALT 4 DESIGN YR

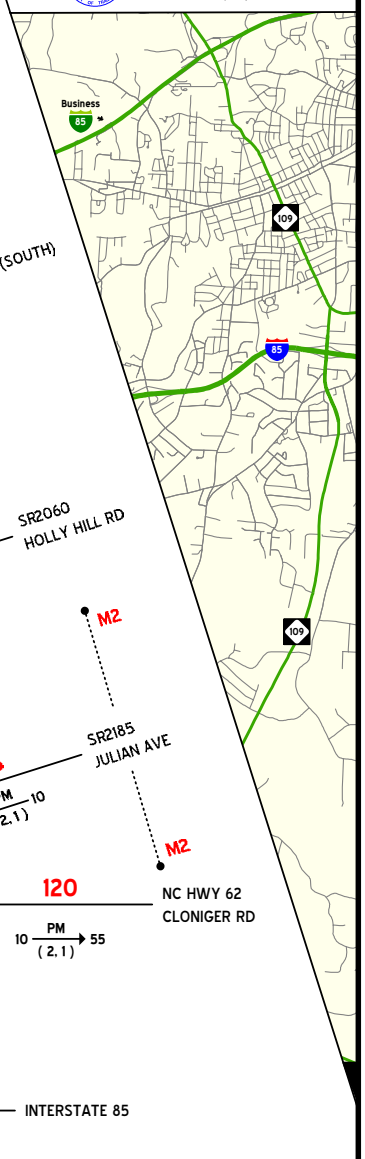
LEGEND

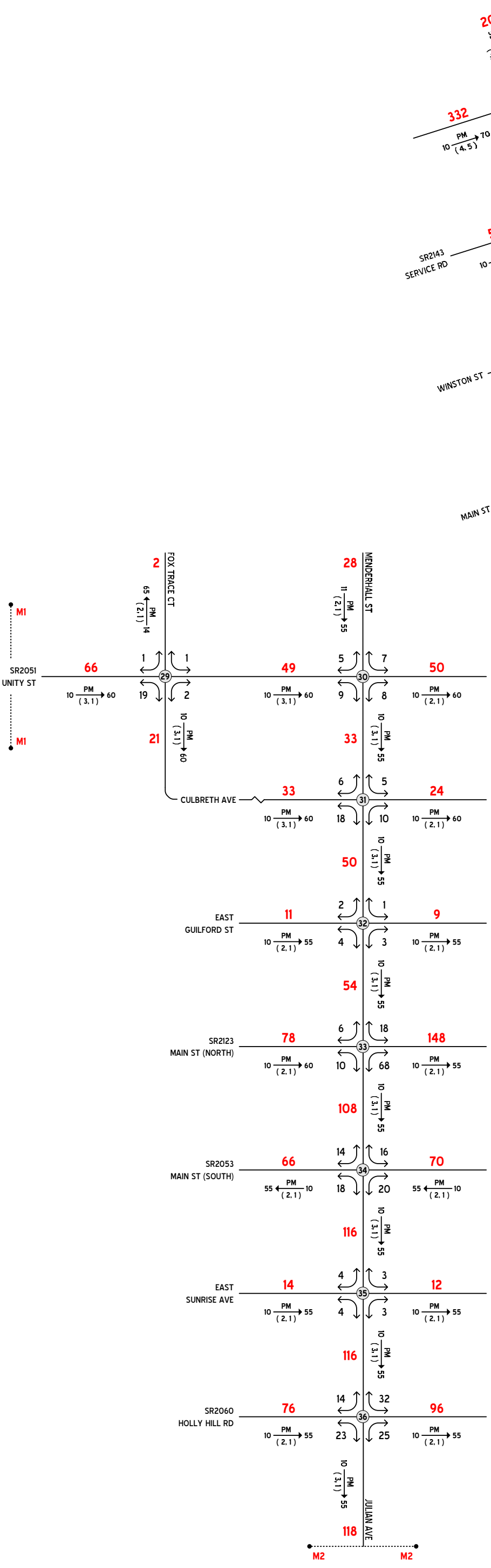
DHV PM (d, t) D

- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

- ### — No. of Vehicles Per Day (VPD) in 100s
- ###- — Much less than ### VPD
- ### — Turning volume (VPD)







STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 7, 2008

MEMORANDUM TO: Rasay Abadilla
Program Development Branch

FROM: Richard Tanner
Transportation Planning Branch

SUBJECT: Traffic Forecast for TIP Project FS-0509A
Davidson County
NC Hwy 109

Please find attached the 2007-2035 traffic forecast for the above mentioned project. The project involves establishing an alternative routing of NC109 around Thomasville, NC in Davidson County. The project lies inside the High Point MPO jurisdiction. This forecast is an addition to a previous forecast for the project dated Sept. 28, 2007.

Andy Bailey of NCDOT Triad Planning Group and Ken Hepler of the City of Thomasville were consulted during the development of this forecast.

The following forecast scenarios are provided:

Base Year 2007 Existing condition
Horizon Year 2035 BUILD scenario

The attached forecast is based on the following set up assumptions:

Fiscal Constraint. The future year scenarios assume completion of all projects contained in the fiscally constrained High Point MPO Comprehensive Transportation Plan which was adopted in October 2004.

Future Conditions. The forecast was developed using output from the current version of the Piedmont Travel Demand Model adopted January 26, 2007. Assumptions about future development activity and changes in the distribution of population and employment in the forecast study area are implicit in the model.

If you require travel demand projections for additional years, please submit a new request using our standard procedure. We do not recommend the use of straight-line interpolation for the projection of AADT to years other than 2035 because model predictions are available for several intermediate horizon years. Feel free to contact me for discussion prior to submitting your request. For assistance with this or any other issue regarding this traffic forecast please contact me at 715-5482 x.366, or by email at rtanner@ncdot.gov.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
TRANSPORTATION PLANNING BRANCH
1554 MAIL SERVICE CENTER
RALEIGH NC 27699-1554

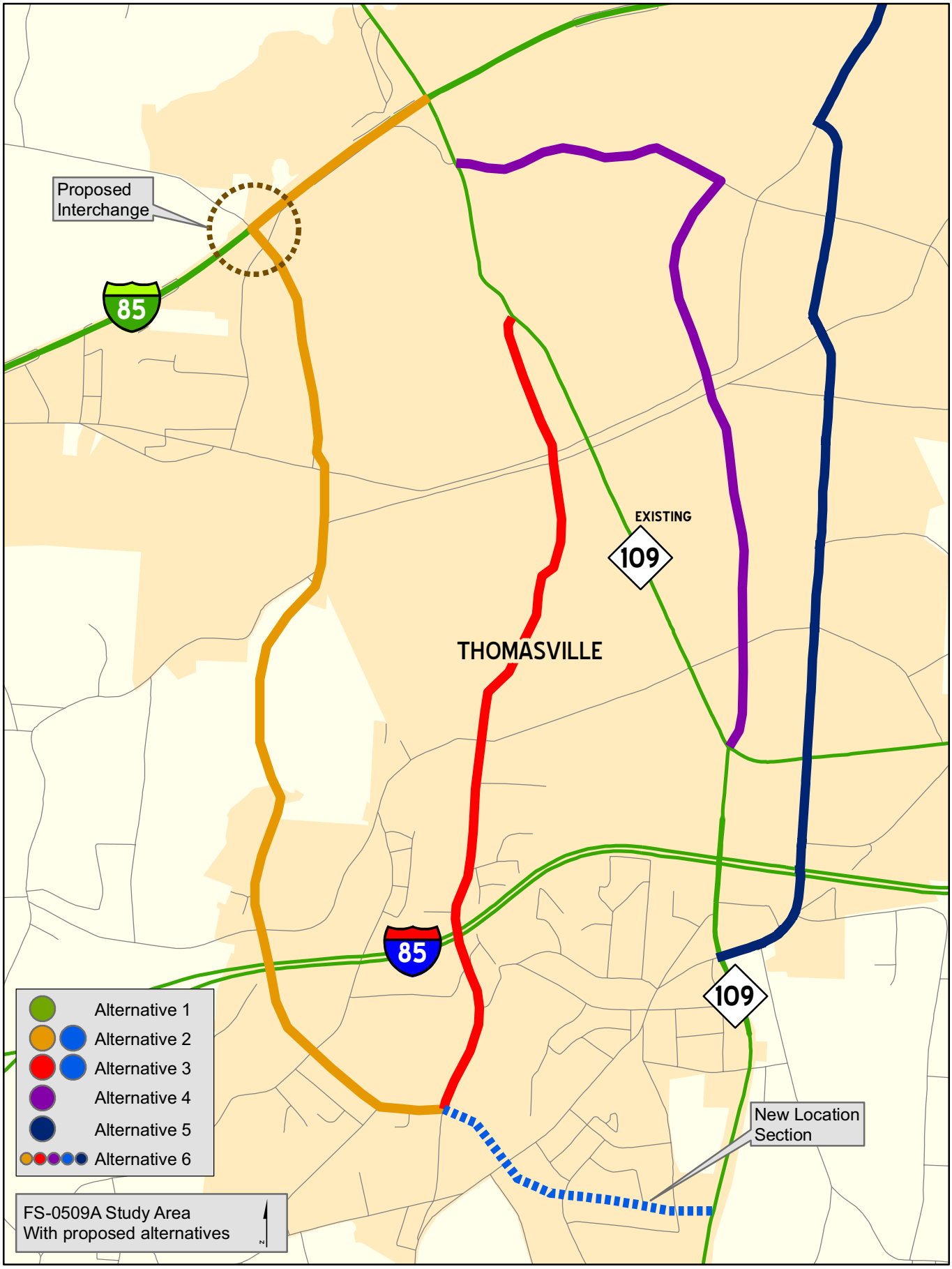
TELEPHONE: 919-733-4705
FAX: 919-733-2417

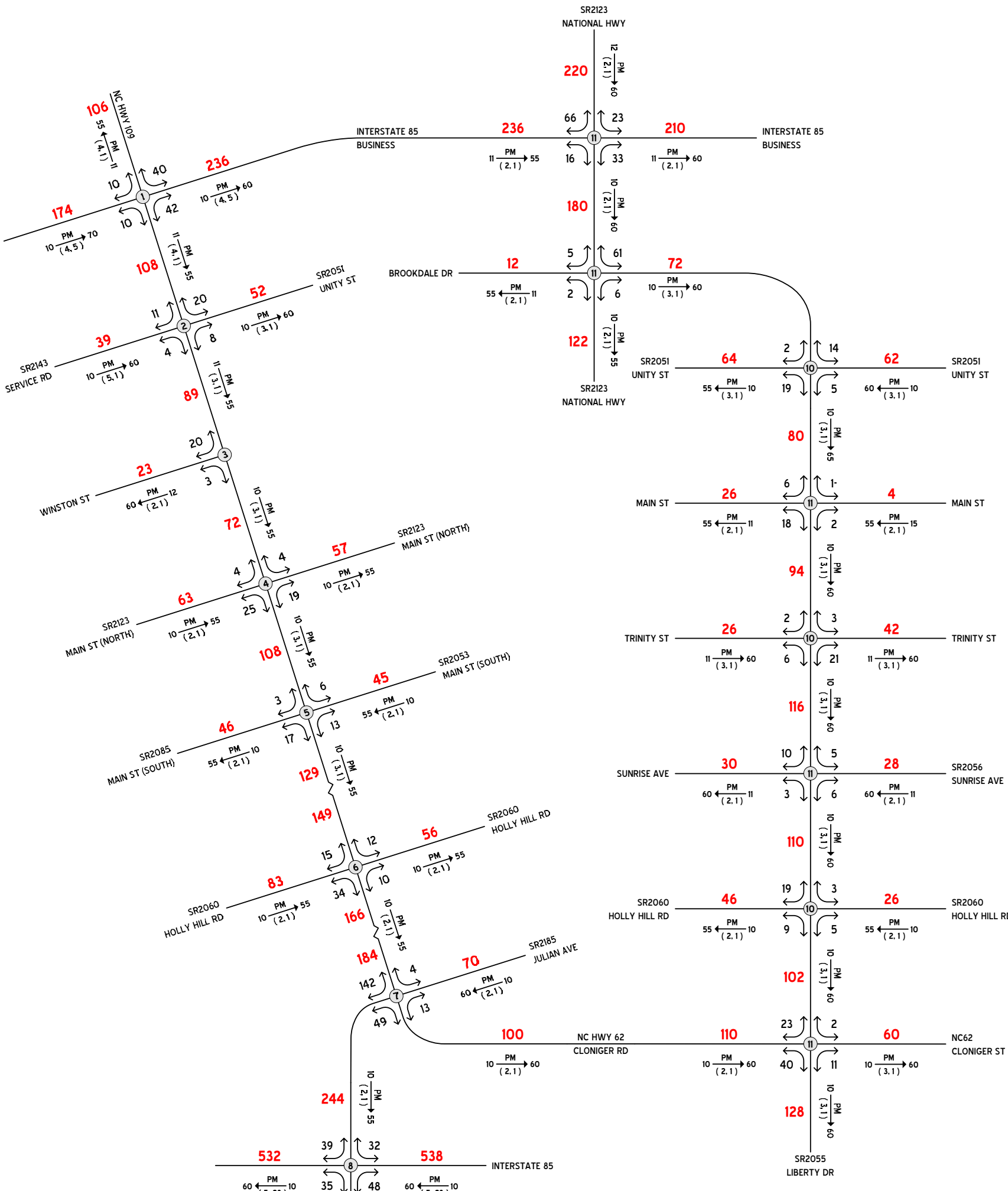
WEBSITE: WWW.DOT.STATE.NC.US

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

cc : FILE (Davidson County, FS-0509A)

cc: (via e-mail with PDF attachments)
Jay Bennett, PE, Roadway Design Unit
Deborah Hutchings, PE, Transportation Planning Branch
Wayne Davis, PhD, PE, Transportation Planning Branch
BenJetta L. Johnson, PE, Congestion Management Section
Hardee Cox , Roadway Inventory Information Systems Section


Proposed Interchange
85
EXISTING
109
THOMASVILLE
85
109
Alternative 1
Alternative 2
Alternative 3
Alternative 4
Alternative 5
Alternative 6
New Location Section
FS-0509A Study Area
With proposed alternatives



2007 AVERAGE ANNUAL DAILY TRAFFIC

WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

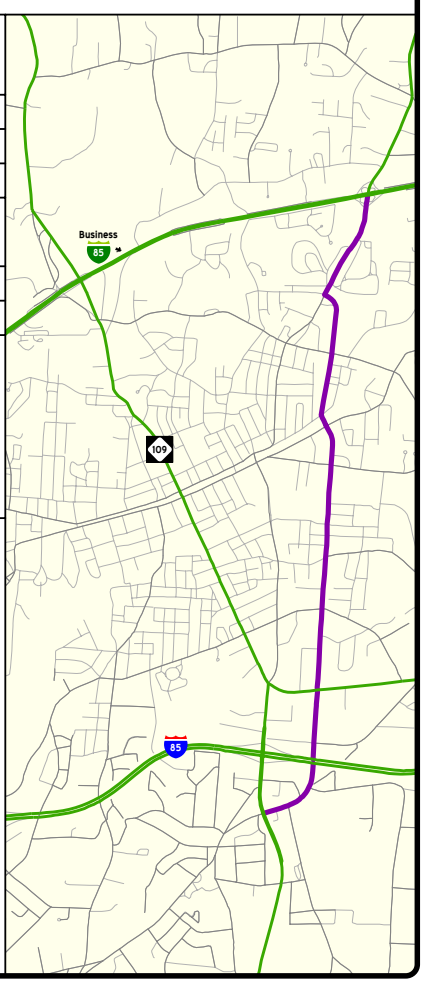
PROJECT: Construct NC109 Bypass

FIGURE 1 OF 8 - ALT 5, BASE YEAR

LEGEND

DHV PM (d, t) D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)



2007

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 08-2008	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

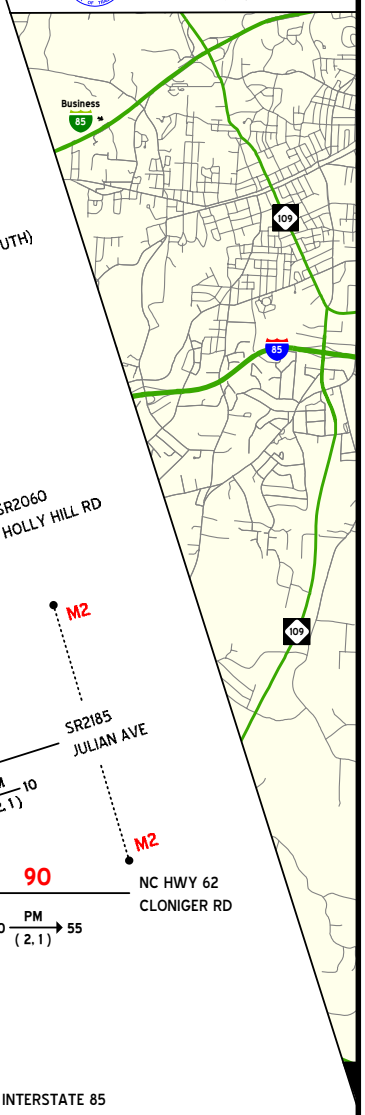
FIGURE 2 OF 8 - ALT 6, BASE YEAR

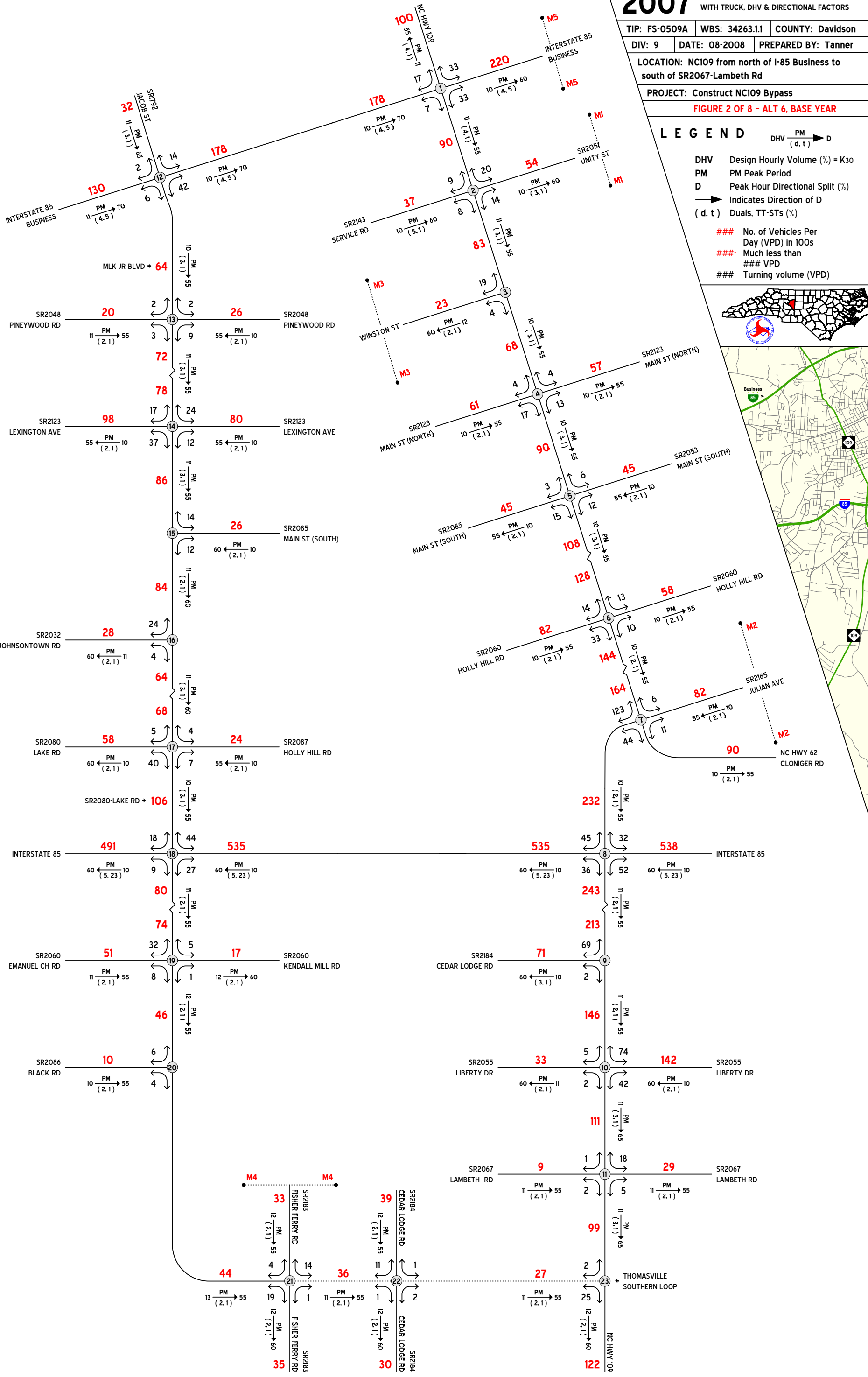
LEGEND

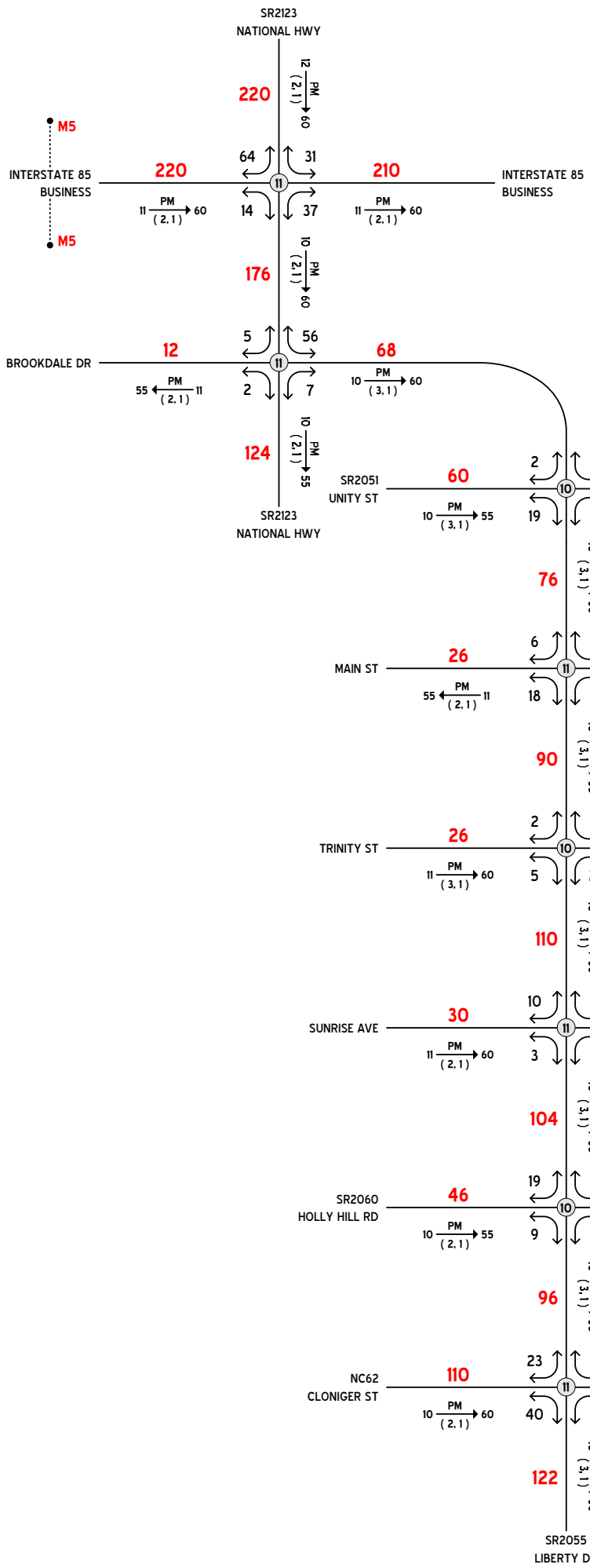
DHV PM (d, t) D

- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

— No. of Vehicles Per Day (VPD) in 100s
###- — Much less than ### VPD
— Turning volume (VPD)







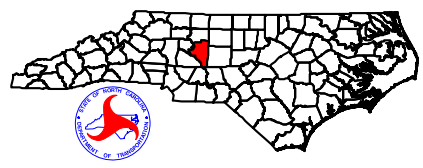
2007 AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

FIGURE 3 OF 8 - ALT 6, BASE YEAR



LEGEND

DHV PM (d, t) D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)

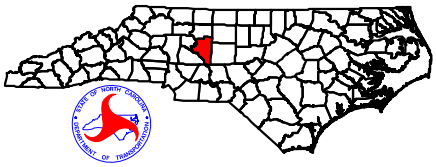
2007 AVERAGE ANNUAL DAILY TRAFFIC

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

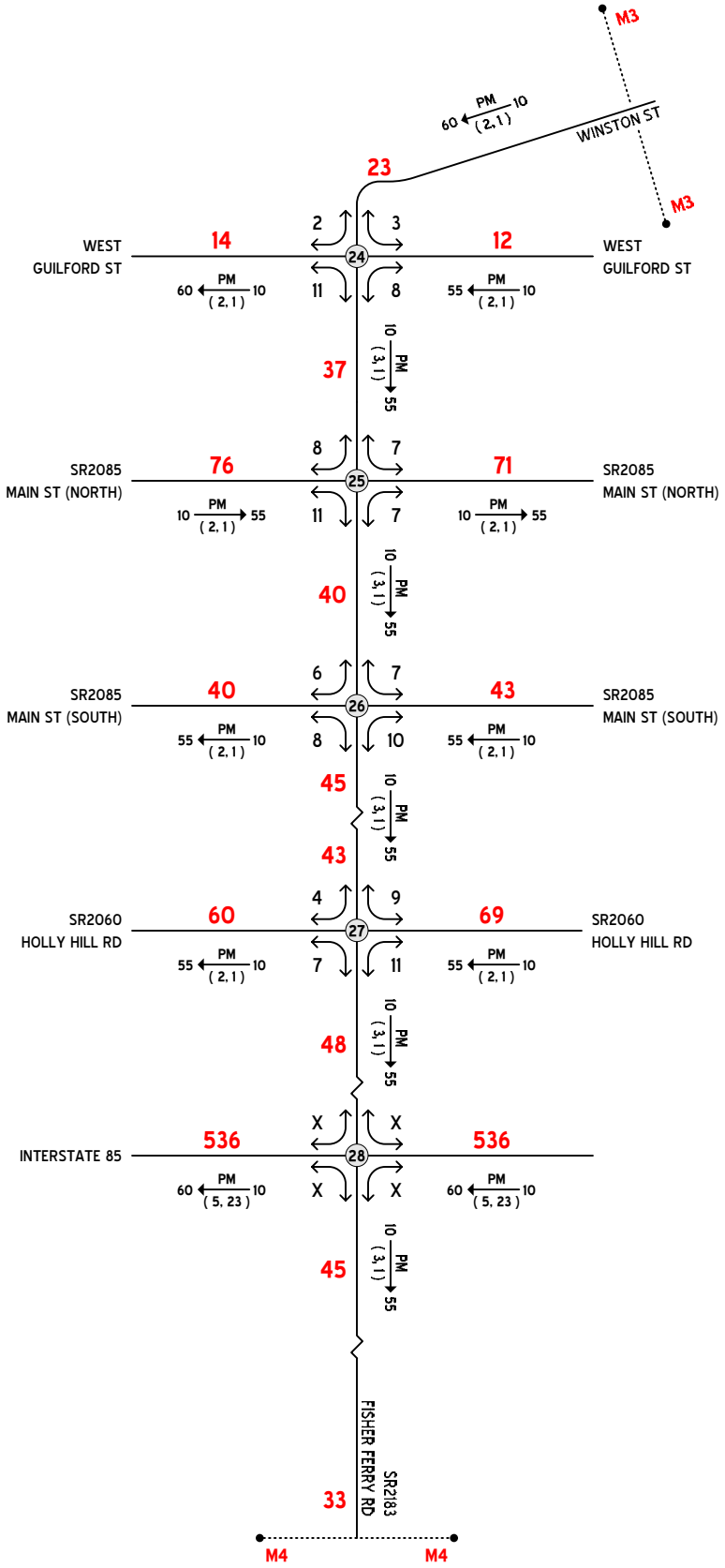
FIGURE 4 OF 8 - ALT 6, BASE YEAR

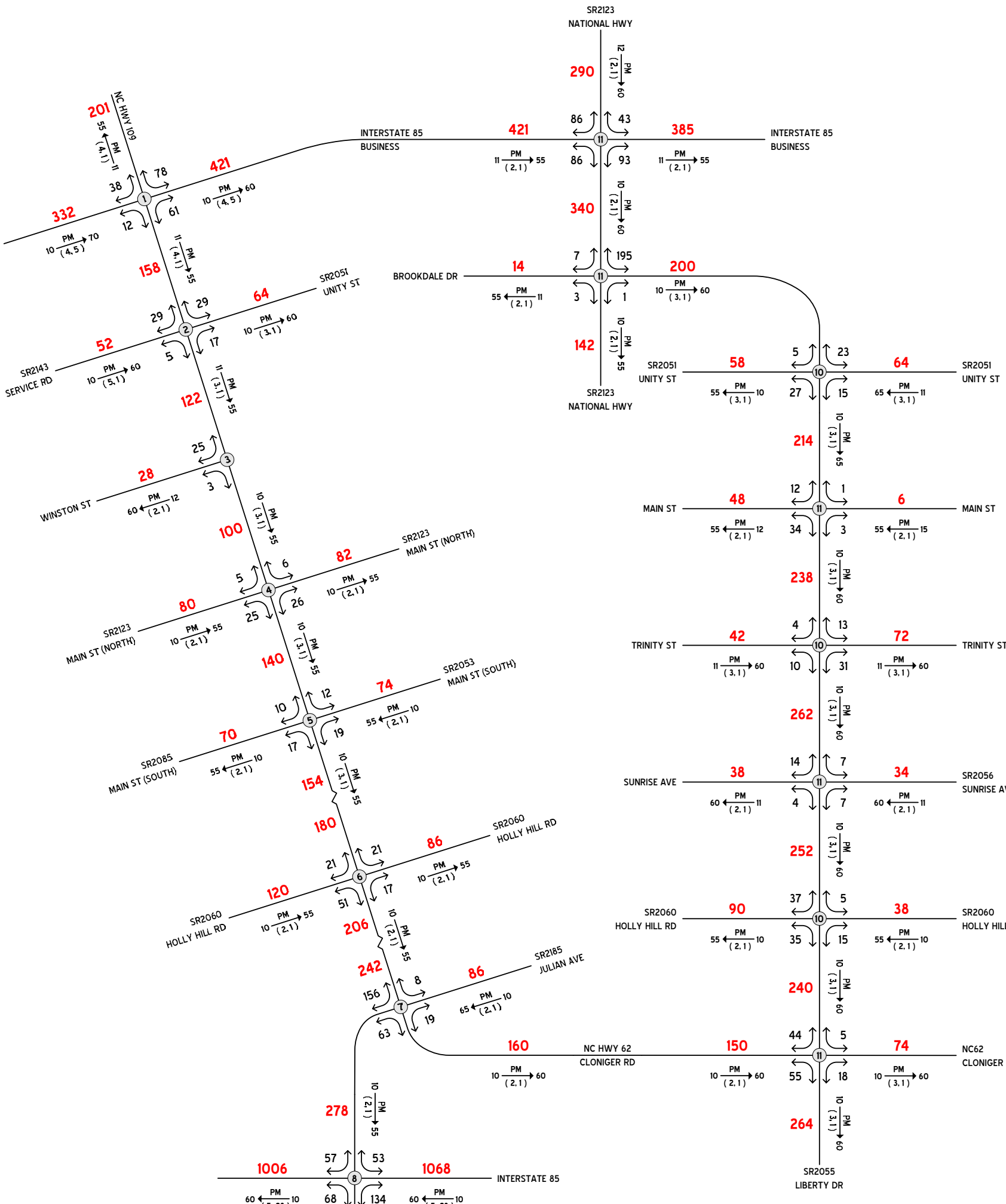


L E G E N D

DHV $\xrightarrow{\text{PM}}_{(d,\,t)}$ D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)





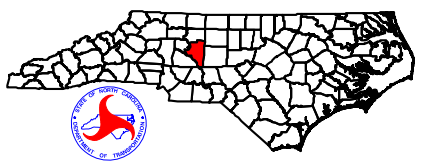
2035 AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

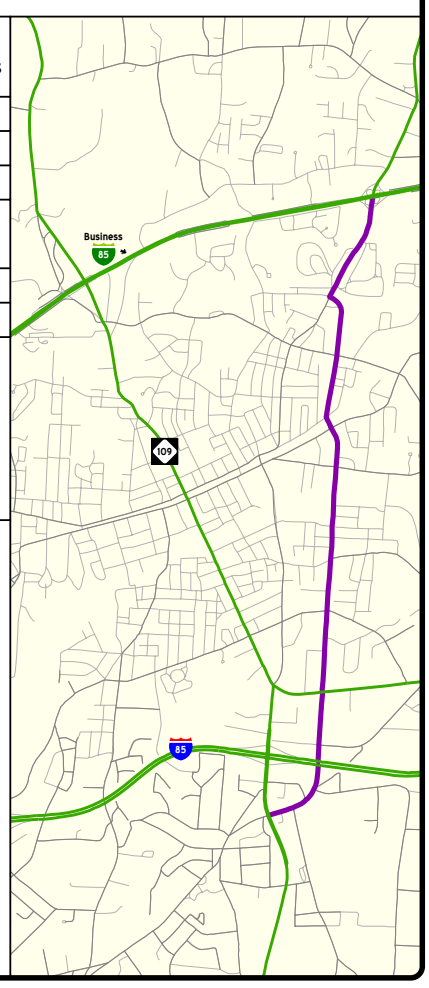
FIGURE 5 OF 8 - ALT 5, HORIZON YEAR



L E G E N D

DHV PM (d, t) D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)



2035

AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1	COUNTY: Davidson
DIV: 9	DATE: 08-2008	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Business to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

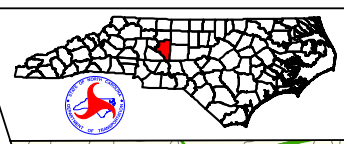
FIGURE 6 OF 8 - ALT 6, HORIZON YEAR

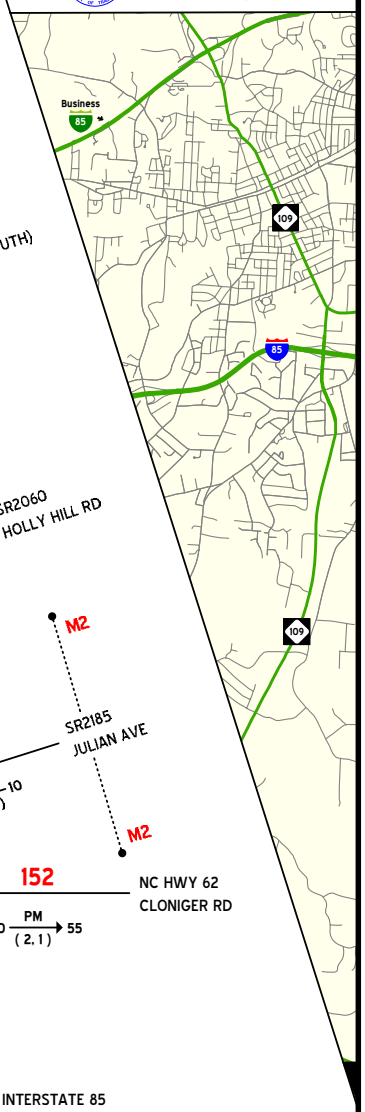
LEGEND

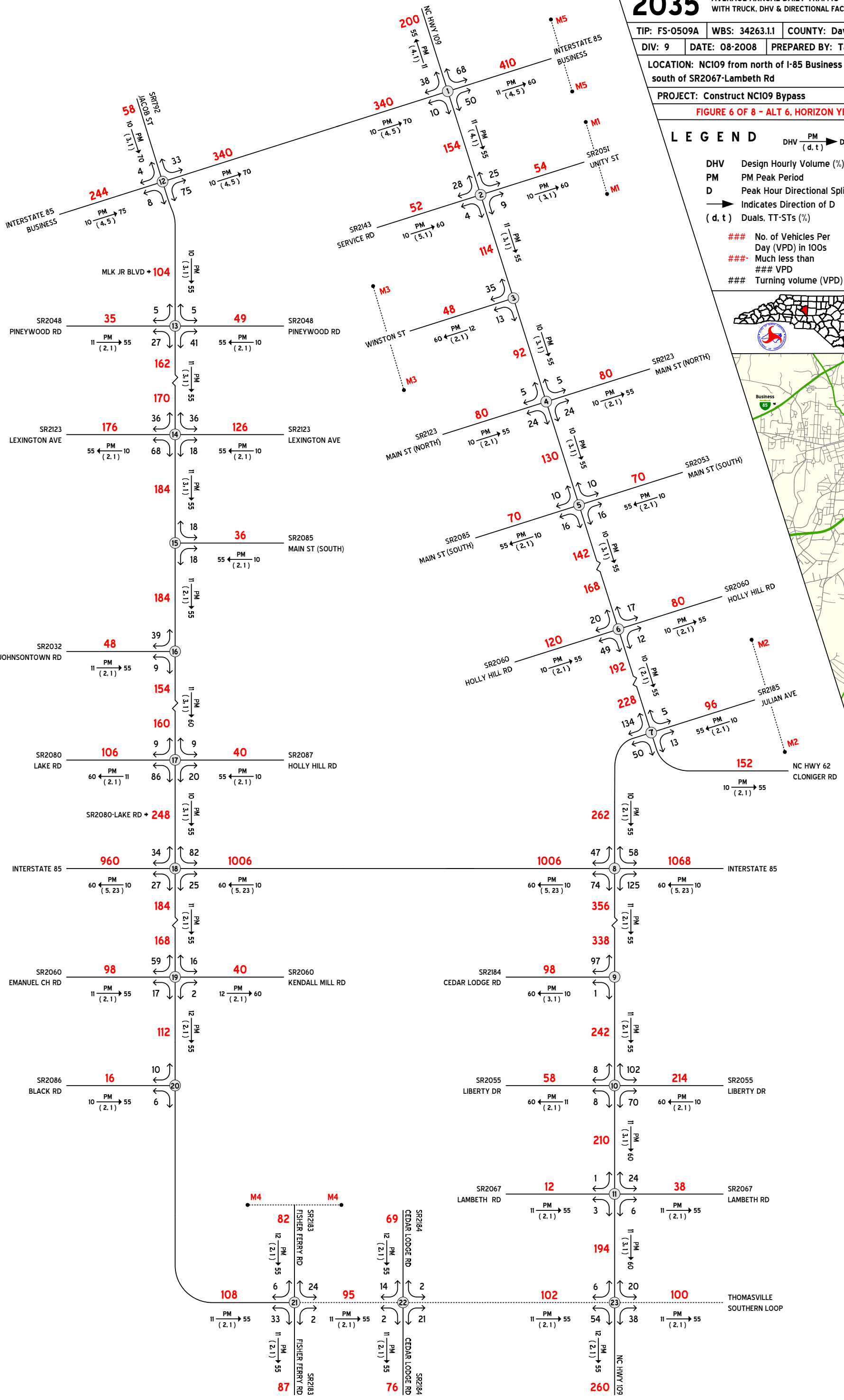
DHV PM (d, t) D

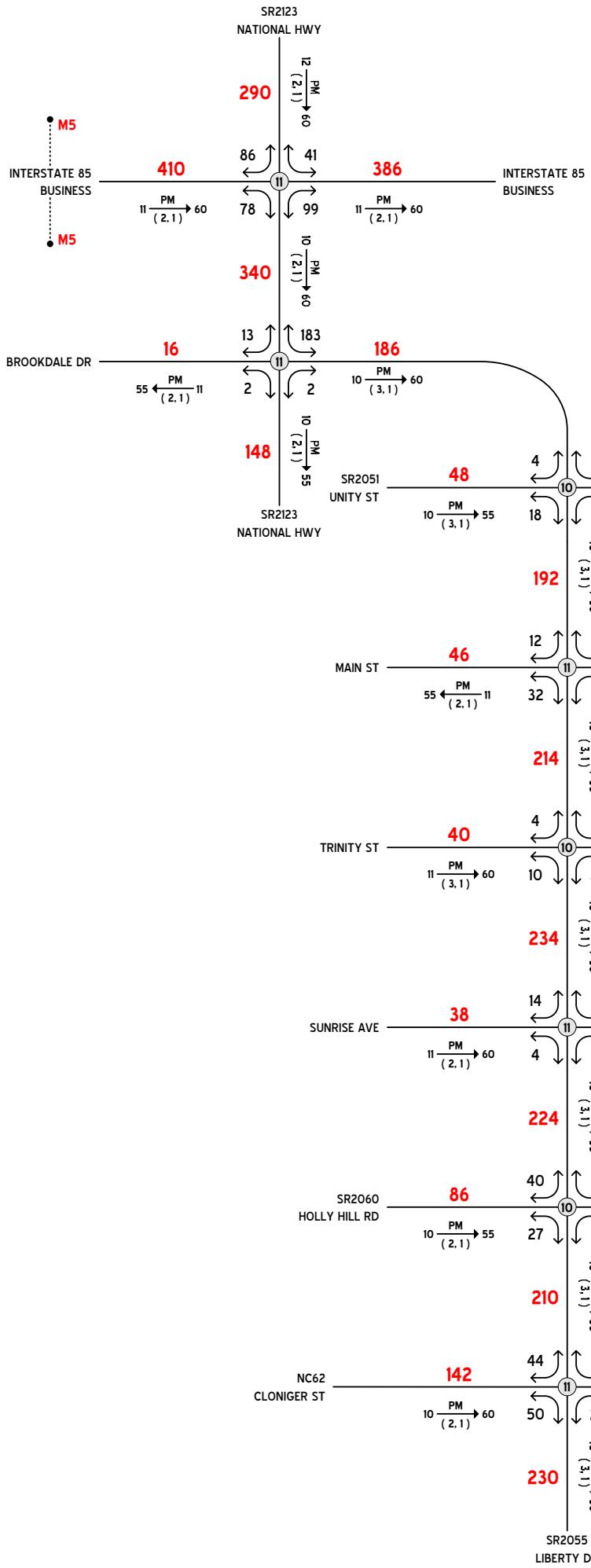
- DHV — Design Hourly Volume (%) = K30
- PM — PM Peak Period
- D — Peak Hour Directional Split (%)
- → — Indicates Direction of D
- (d, t) — Duals, TT-STs (%)

— No. of Vehicles Per Day (VPD) in 100s
###- — Much less than ### VPD
— Turning volume (VPD)









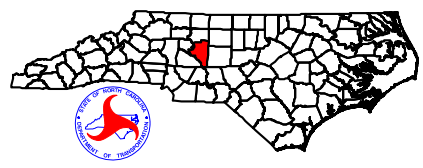
2035 AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

FIGURE 7 OF 8 - ALT 6, HORIZON YEAR



LEGEND

DHV PM (d, t) D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)

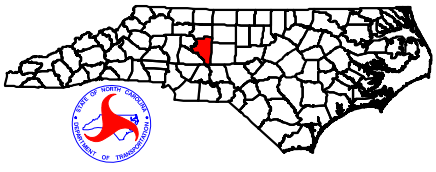
2035 AVERAGE ANNUAL DAILY TRAFFIC
WITH TRUCK, DHV & DIRECTIONAL FACTORS

TIP: FS-0509A	WBS: 34263.1.1
DIV: 9	DATE: 08-2008
COUNTY: Davidson	PREPARED BY: Tanner

LOCATION: NC109 from north of I-85 Bus. to south of SR2067-Lambeth Rd

PROJECT: Construct NC109 Bypass

FIGURE 8 OF 8 - ALT 6, HORIZON YEAR



L E G E N D

DHV $\xrightarrow{\text{PM}}_{(d,\,t)}$ D

DHV	Design Hourly Volume (%) = K30
PM	PM Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d, t)	Duals, TT-STs (%)
###	No. of Vehicles Per Day (VPD) in 100s
###-	Much less than ### VPD
###	Turning volume (VPD)