BICYCLE MASTER PLAN

CONNECT . ENCOURAGE . STRUCTURE

Accepted by the
Lake Forest City Council on
June 3, 2013

BLANK PAGE
June 2013

ACKNOWLEDGEMENTS

The City of Lake Forest appreciates the efforts and hard work of the numerous residents, staff, and other bicycle enthusiasts who participated in the creation of the Bicycle Master Plan. The energy, creativity and thoughtfulness of the public was integral to the planning process.

In particular, the following residents, staff, and other agency members participated regularly in the development of the Plan.

City of Lake Forest City Council
Resident Focus Group
City of Lake Forest Boards and Commissions
- Park and Recreation Board
- Plan Commission

Partner Agencies
Lake County Department of Transportation
Village of Lake Bluff
Lake Forest Open Lands Association
Village of Lake Bluff

City of Lake Forest Project Team
Community Development
Public Works
Parks and Recreation
Public Safety

BLANK PAGE
June 2013

TABLE OF CONTENTS

BLANK PAGE
June 2013

Background: A Tour of the Bicycle Master Plan

- Benefits of a Master Plan
- Purpose
- Planning Process
- Goals and Objectives

Benefits of a Master Plan

Bicycling has always been a popular recreational activity for youth and adults alike. Recently, bicycling as an active mode of transportation has gained more support and popularity. Increasing awareness of the benefits of physical activity and the negative impacts of automobiles on the environment has led local municipalities to adopt complete street policies and bicycle master plans. Creation of these plans not only addresses growing environmental and personal health concerns, but also provides alternative transportation options for residents and visitors to encourage a mode-shift from vehicle to bicycle. See Figure 1.

The City of Lake Forest Bicycle Master Plan identifies a recommended bicycle network and establishes short and long term priorities to facilitate bicycle connectivity in the community. The Master Plan provides an opportunity to connect to regional trails and close the gaps within the existing system by creating a framework for future improvements. Improved bicycling conditions will encourage residents and visitors to ride bikes for recreational and utilitarian use. The implementation of this plan will provide residents and visitors to Lake Forest the opportunity to explore the city through a well-connected bike network.

If effectively implemented, the Bicycle Master Plan will produce numerous benefits including improved road safety, public health, air quality, reduced street congestion and long term cost savings for capital improvements. As Lake Forest is an historic community with established tree-lined streets, the following plan works to integrate on-road bike routes wherever possible to provide effective solutions and preserve the community character. This plan also provides the backbone for Lake Forest to apply for grant funding and national recognition as a Bicycle Friendly Community through the League of American Bicyclists showcasing Lake Forest as a destination for not only shopping, architecture, and history, but bicycling as well.

The Bicycle Master Plan provides an opportunity for coordination between City Departments and regional partners as infrastructure projects are proposed. Similar to policies already implemented at the County and State level that require an evaluation for complete streets, the Bicycle Master Plan can serve as a reminder that all capital improvements should consider bicycle facilities as funding becomes available, consistent with this plan.

Purpose

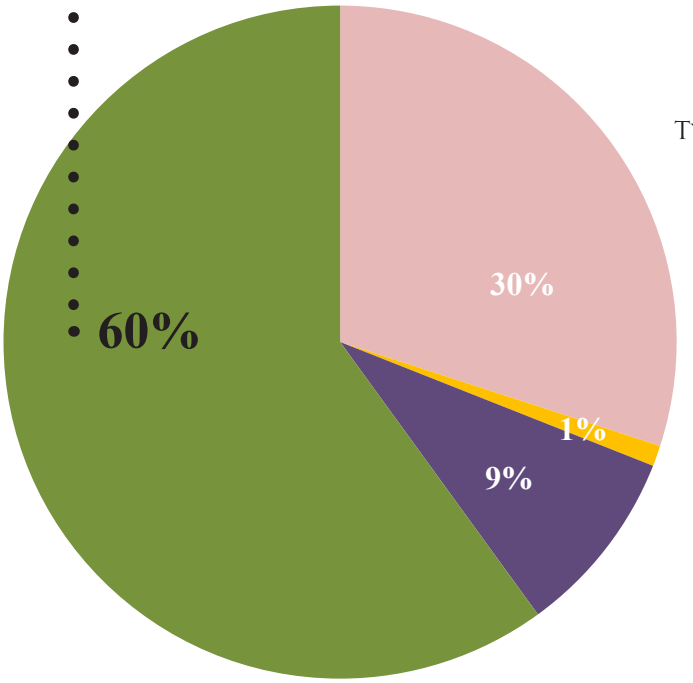
The purpose of the Lake Forest Bicycle Master Plan is to provide a clear framework and establish priorities for future bicycle facilities as part of an update to the Transportation section of the City's Comprehensive Plan. The Bicycle Master Plan strives to provide safe connectivity throughout Lake Forest for the "casual adult rider" to encourage people to travel by bike more and drive less.

Realization of the plan will position Lake Forest to become a bicycle friendly community and increase bicycle use in Lake Forest by creating a network of bike routes and trails within the community, facilitating connections to regional trails and providing essential infrastructure to support bicycling such as installing ample bicycle parking near key destinations and utilizing pavement markings on existing roads to direct cyclists and motorists.

Figure 1: Typical Cyclist Classification

Target Group: Interested but Concerned

The Bicycle Master Plan targets the resident who is interested in cycling more but is concerned with safety and may not be comfortable riding on streets where vehicles are present. Studies have shown that simple enhancements to a road can greatly improve the perceived safety of a route for bicyclists. On average, 40% of automobile trips are less than 2 miles. Numerous destinations in Lake Forest fall within this radius for many residents and can become more accessible by bike if the proper tools are implemented on the streets.



Typical U.S. City is comprised of:

- **Interested But Concerned** — Needs encouragement & support
- **Confident & Enthusiastic** — Will bike with good road conditions
- **Strong & Fearless** — Will bike regardless of road conditions
- **Not Interested** — Will not bike regardless of improvements

Source: League of American Bicyclists (Presentation at Bike Summit 2010)

Planning Process

Based on input received at Ward meetings in the first quarter of 2011, the City Council directed staff to facilitate and prepare a Bicycle Master Plan for Lake Forest. In an effort to pro-actively identify safe bike routes within the community and explore connections to regional bike trails, the development of a Bicycle Master Plan is the first phase of a multi-phased project. Recognizing that bicycling is not confined to the city limits, and consistent with ongoing efforts to share resources with neighboring communities, the City of Lake Forest coordinated efforts on the Bicycle Master Plan with the Village of Lake Bluff. The planning phase included community input through a public process. Together with Lake Bluff, the public planning process was an opportunity for members of both communities to come together to discuss bicycling within and through the two communities and discuss ways to improve bicycle safety and awareness.

Public Input

In order to gauge the level of bicycling that occurs in Lake Forest and Lake Bluff and to gain a better understanding of what challenges and issues are perceived by residents, electronic community surveys were conducted at the beginning of the process. Residents and non-residents who bike through or to Lake Forest and Lake Bluff were encouraged to participate in the surveys. Between August and November, 2011, more than 350 residents and cyclists in Lake Forest responded to the online surveys. A summary of the survey results is included as part of the Appendix to this report.

Over 60 residents of Lake Forest and Lake Bluff participated in two public workshops to assist staff in gathering data for the plan. Participants worked together at tables of 5-6 people to identify key local destinations, desired regional connections, hazards and dream routes for bicycling in Lake Forest and Lake Bluff. The information gathered at the public workshops was incorporated into this plan and served as the impetus for evaluating key routes within the community for appropriateness and bicycle compatibility.

Input was also received from the Lake Forest Parks and Recreation Board and a Public Open-House session where residents and bike enthusiasts came together to review the draft plan and provide comments on the Bicycle Master Plan. Key observations from the public workshops are identified in Figure 2.

City of Lake Forest Public Workshop, January 30, 2012

Figure 2: Key Observations

Infrastructure

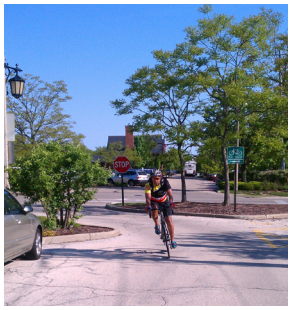
The residential streets in Lake Forest generally have a low traffic volume and rank high on the Bicycle Level of Service. Lake Forest has two excellent and well-used north-south bike trails but is lacking in east and west connections. There are several key streets with higher traffic counts and speeds that could benefit from improvement to increase compatibility with bicycling.

Existing Asset - Skokie Valley Bike Path along a ComEd easement

Low traffic residential streets are a good choice for bicyclists

Perceived Safety

Lake Forest has a low number of reported bike crashes. However, limited visibility and unpredictable behavior of cyclists are identified hazards in the community. Improving conditions to encourage bicycling in the community is desired. Road maintenance was identified as important to encouraging residents to ride through Lake Forest. Poor pavement conditions reduce the bicycle level of service and put cyclists and motorists at risk.



Need identified to improve visibilty of cyclists in Central Business District

Poor road conditions become hazards for a bicyclist

Way-Finding

Lake Forest has numerous local destinations accessible by bike. To encourage a mode shift for short trips, an identified network and signage will help direct cyclists around town. Way-finding signs can also benefit local businesses and promote Lake Forest as a destination for visitors traveling on bike.

Signage could be improved to help designate bicycle routes

Connections to existing trails are difficult to follow

Goals & Objectives

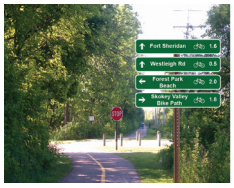
Goal 1 - Awareness

To generate awareness and acceptance of bicycling in Lake Forest.

- Adopt the Bicycle Master Plan as the guiding document relating to bicycle improvements in Lake Forest.
- Educate bicyclists and motorists on how to "share the road".
- Through the above efforts, become recognized as a "Bicycle Friendly Community" by the League of American Bicyclists.

Goal 2 - Connectivity

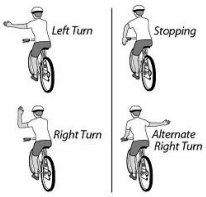
To connect major destinations within Lake Forest and facilitate access to the established regional network.



- Implement on-road bicycle facility improvements and signed bicycle routes in Lake Forest.
- Consider bicycle connections to regional trails and local destinations as part of new development plans and neighborhoods in Lake Forest.
- Collaborate with regional partners to evaluate future bicycle facilities on state routes within the city limits of Lake Forest and connections to surrounding communities.
- Facilitate the creation of "Bike to Metra" maps and brochures to promote bicycling in Lake Forest as a valid mode of transportation for people visiting and working in Lake Forest.

Goal 3 - Safety

To provide safe transportation options for people of all ages and physical abilities in Lake Forest.



- Achieve a Bicycle Level of Service rating of C or higher on residential streets.
- Create a safe environment for all users of the roadways and trails.
- Provide safe east-west bicycle connections in Lake Forest.
- Maintain a low number of bicycle crashes and injuries for all ages.
- Enforce traffic rules for bicyclists and motorists in accordance with Lake Forest Police standards and practices.
- Provide safe riding instruction through local community organizations.

Goal 4 - Health & Wellness

To promote bicycling as a healthy, safe, convenient and enjoyable means of transportation and recreation.

- Support healthy lifestyles and active transportation by promoting a bicycle friendly community.
- Encourage use of the bike network for utilitarian and recreational purposes.
- Provide basic information to the public regarding bicycle opportunities and the health benefits of increased physical activity.

Goal 5 - Environment

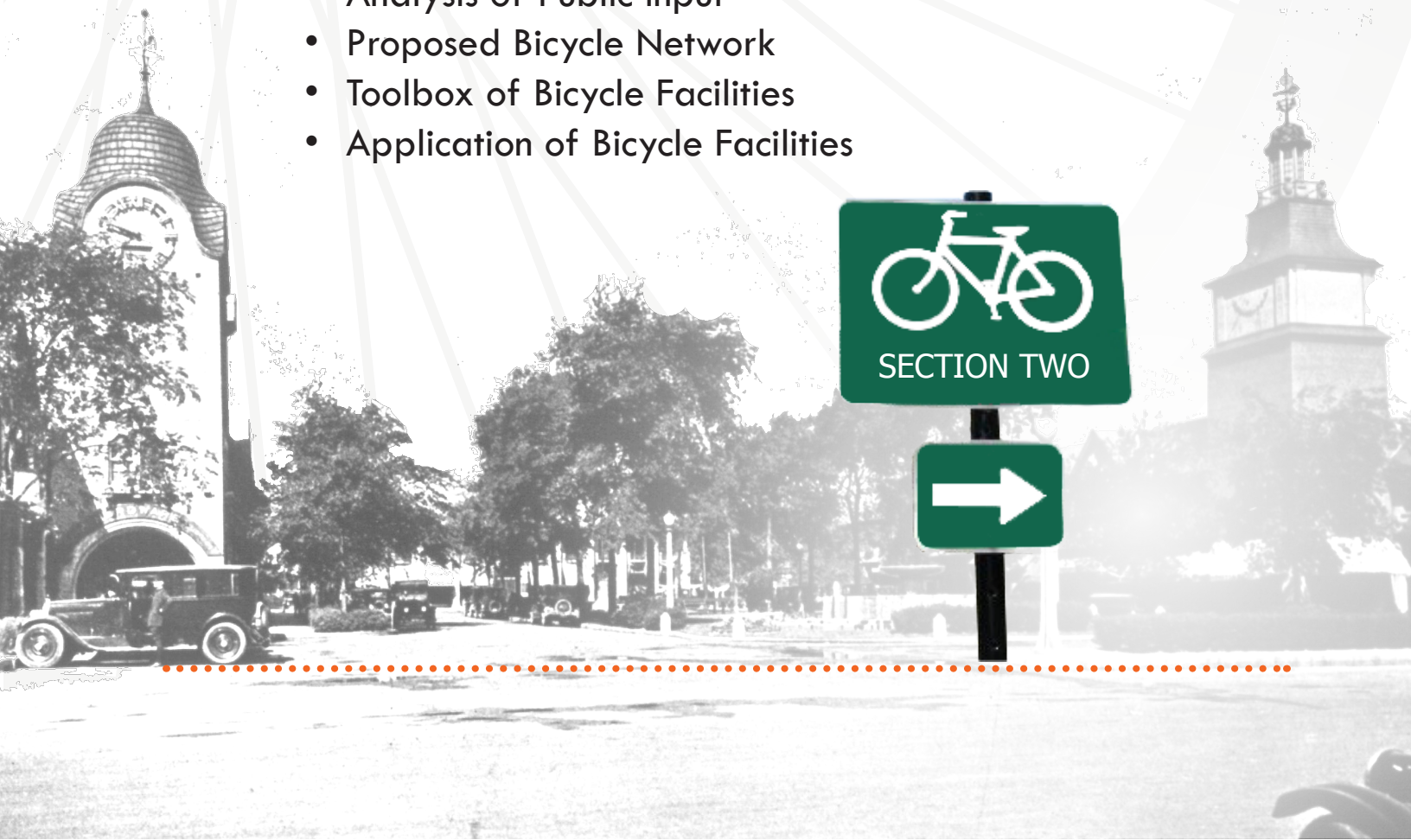
To protect the environment for the long term by promoting bicycling as a viable and sustainable transportation choice in Lake Forest.

- Install new bike parking racks in Lake Forest at key destinations.
- Reduce car emissions in Lake Forest by encouraging short trips of less than 2 miles to be completed by bicycle.
- Provide marked routes for bicyclists to establish a safe and sustainable trainsportation option to get to key destinations.
- Identify and encourage adoption of policies that require future development and capital projects to include bicycle connections when possible.
- Enhance public transportation hubs at the East and West Lake Forest train stations with safe bicycling thoroughfares and directional signage to key destinations.

BLANK PAGE
June 2013

Framework: Gearing up for Bikes

- Existing Conditions
- Analysis of Public Input
- Proposed Bicycle Network
- Toolbox of Bicycle Facilities
- Application of Bicycle Facilities



Existing Conditions

Recreational Trails

The City of Lake Forest is fortunate to have two major, paved north-south bike trails within the City limits as well as an unpaved recreational trail through the Middlefork Savanna. The North Shore Bike Path is the primary east-west connection for the surrounding area but becomes a gravel trail west of Waukegan Road. Existing bike paths and designated bicycle routes are shown in Figure 3.

The Robert McClory Bike Path is located adjacent to the Union Pacific North Line Metra tracks on the east side of Lake Forest. This path enters Lake Forest at Old Elm Road to the south and continues north, through the Lake Forest Central Business District, past Park Avenue into Lake Bluff and on to Wisconsin. The Robert McClory Bike Path has 12 access points in Lake Forest.

The Skokie Valley Bike Path is located within a ComEd easement along Highway 41, a major limited access roadway that bisects the City of Lake Forest. The path enters Lake Forest near Old Mill Road and continues north into Lake Bluff. The Skokie Valley Bike Path has 4 access points in Lake Forest and 1 in Lake Bluff at Route 176. When compared to the Robert McClory Bike Path in Lake Forest, access to the Skokie Valley Bike Path is limited.

The Middlefork Savanna Trail is a 4.5 mile, packed gravel trail through the Middlefork Savanna. Access points to this trail can be found at Elawa Farm, a local destination, and from the residential streets in the Newells Reserve Subdivision and Route 176.

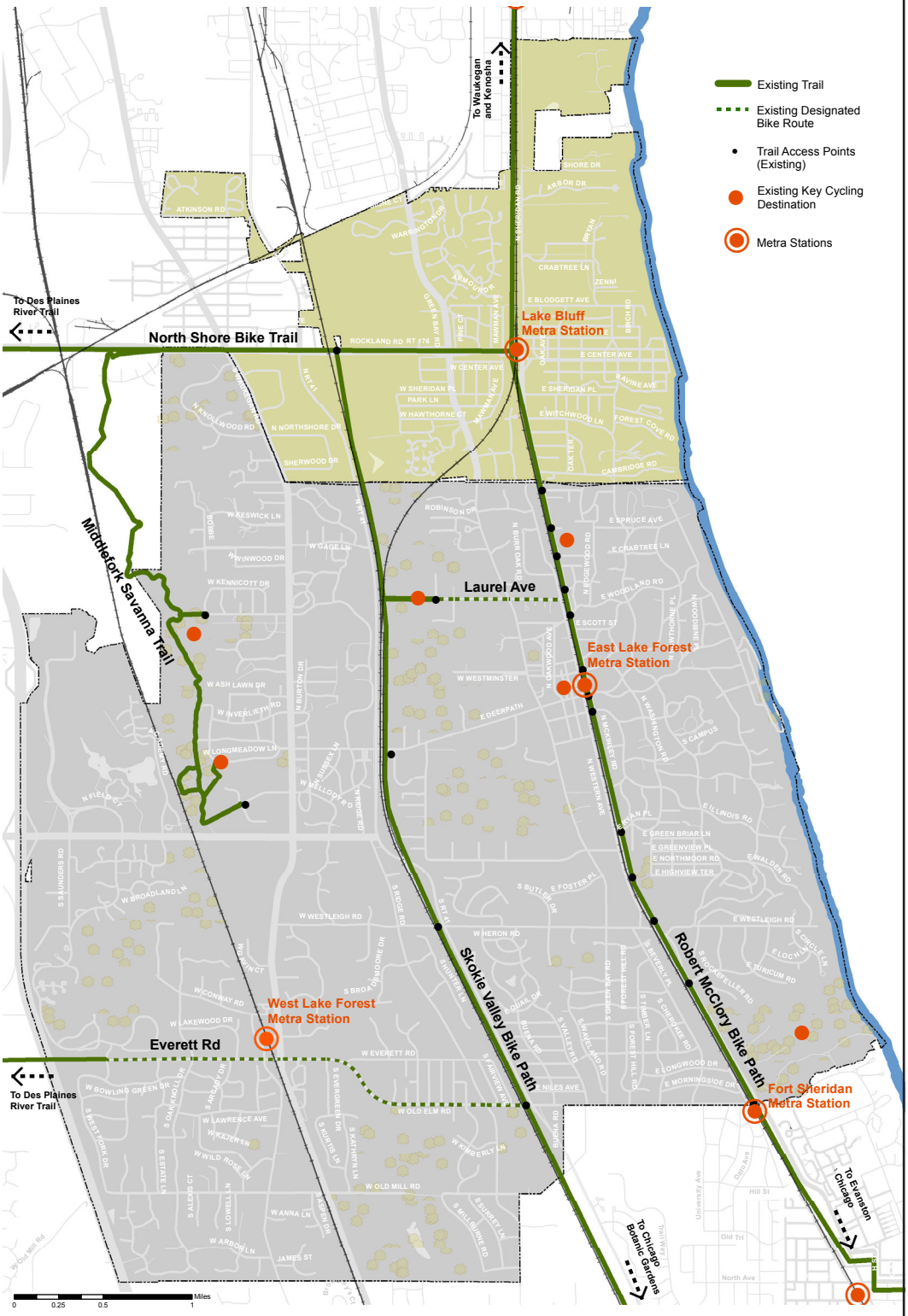
The North Shore Bike Path runs parallel to Route 176 on the south side of the road. The Middlefork Savanna Trail, Skokie Valley and Robert McClory Bike Paths connect to this trail. The North Shore Bike Path further connects Lake Forest with cities located to the west as well as to the Des Plaines River Trail, a popular recreational bike trail in the region.

Robert McClory Bike Path in Lake Forest showing the wooded character and amenities along the path. Routine maintanence is needed to address overgrown bushes and trail hazards.

Roadways

In general, consistent with resident observations from the survey, the smaller neighborhood streets appear to be suitable for bicycling for the majority of bicyclists; however, well-marked on-road shared bike facilities are presently non-existent in Lake Forest. An evaluation of the existing road network was completed by City staff including several suggested routes generated from public input and the Resident Focus Group. The evaluation summarized in Figure 4, was completed using the Bicycle Level of Service (BLOS) tool developed by the League of Illinois Bicyclists (LIB). The BLOS tool uses average daily traffic count, road widths, pavement conditions, speed limits and other

Figure 3: Existing Bike Trails and Designated Routes



Existing Conditions

road conditions to determine the suitability of a roadway for bicycling. Routes yielding a score of "B" or "C" are generally comfortable for casual adult bike riders. Routes with lower ratings tend to have faster speeds and higher traffic volume. While bicycle use is permitted on these roads by law, casual riders tend to shy away from using those routes.

Figure 4: Existing Bicycle Level of Service on Selected Routes

Street Segment Name/ID		Street Evaluated	From Intersecion	To Intersecion	Curb?	Width	Outside Lane	ADT	Speed	Percent Parking	Residential Street?	BLOS Rating
Onwentsia-Ahwanee												
	1	AHWAHNEE LN	DEERPATH	AHWANEE RD	Yes	22	11	200	25	0	Y	B
	2	AHWAHNEE RD	AHWANEE LN	MICHGAMME LN	No	22	11	900	25	0	Y	B
	3	AHWAHNEE RD	MICHGAMME LN	ONWENTSIA RD	No	20	10	900	25	0	Y	C
	4	ONWENTSIA RD	AHWANEE RD	WESTERN AV	Yes	22	11	900	25	0	Y	B
Conway Farms												
	5	CONWAY FARMS DR	RT 60	880 FT S. RT 60	Yes	50	12	500	25	0	N	B
	6	CONWAY FARMS DR	880 FT S. RT 60	WOODWARD CT	Yes	22	11	500	25	0	Y	B
	7	CONWAY FARMS DR	WOODWARD CT	SALISBURY LN	Yes	22	11	300	25	0	Y	B
	8	CONWAY FARMS DR	SALISBURY LN	EVERETT RD	Yes	24	12	300	25	0	Y	B
Deerpath (Middlefork Savanna to Beach)												
	9	DEERPATH	MIDDLEFORK SAV.	RT 43	Yes	20	10	400	25	0	Y	B
	10	DEERPATH	RT 43	KING MUIR RD	Yes	30	10	17000	25	0	Y	D
	11	DEERPATH	KING MUIR RD	SUSSEX LN	Yes	30	15	17000	25	0	Y	D
	12	DEERPATH	SUSSEX LN	DEERPATH	Yes	30	10	17000	25	0	Y	D
	13	DEERPATH	RT 41	AHWAHNEE LN	Yes	35	12	17000	35	0	Y	D
	14	DEERPATH	AHWANEE LN	AHWANEE RD	Yes	30	15	17000	35	0	Y	D
	15	DEERPATH	AHWANEE RD	BRIDGE	Yes	34	17	17000	35	0	Y	D
	16	DEERPATH	GOLF LN	HASTINGS RD	Yes	30	15	17000	35	0	N	D
	17	DEERPATH	HASTINGS RD	GREEN BAY RD	Yes	30	11	17000	35	0	Y	D
	18	DEERPATH	GREEN BAY RD	WESTERN AV	Yes	34	11	17000	35	100	N	D
	19	DEERPATH	WESTERN AV	MC KINLEY RD	Yes	36	13	8000	35	0	N	D
	20	DEERPATH	MC KINLEY RD	WALNUT RD	Yes	30	10	1000	25	100	N	D
	21	DEERPATH	WALNUT RD	WASHINGTON RD	Yes	25	12	1000	25	0	Y	B
	22	DEERPATH	WASHINGTON RD	SHERIDAN RD	Yes	30	11	1000	25	100	Y	C
	23	DEERPATH	SHERIDAN RD	LAKE RD	Yes	22	11	1000	25	0	Y	C
Everett-Old Elm												
	24	EVERETT RD	CONWAY FARMS DR	TELEGRAPH RD	Yes	30	15	4400	35	0	Y	C
	25	EVERETT RD	TELEGRAPH RD	R/R TRACKS. RT 43	Yes	35	12	4400	35	0	N	D
	26	EVERETT RD	R/R TRACKS. RT 43	EVERGREEN DR	Yes	35	12	4400	35	0	N	D
	27	EVERETT RD	EVERGREEN DR	OLD ELM RD	Yes	30	10	4400	35	0	Y	D
	28	OLD ELM RD	EVERETT RD	RIDGE RD	Yes	30	15	3400	30	0	Y	C
	29	OLD ELM RD	RIDGE RD	RT 41/RR TRACKS	Yes	28	14	3400	30	0	Y	C
	30	OLD ELM RD	RT 41	BUENA RD	Yes	36	12	3400	30	0	Y	C
	31	OLD ELM RD	BUENA RD N	GREEN BAY RD	Yes	28	14	3400	30	0	Y	C
	32	OLD ELM RD	GREEN BAY RD	FT SHERIDAN	No	20	10	3400	30	0	Y	D
Telegraph Rd (West Train Station to Half Day Rd)												
	33	CONWAY RD	RT 43	R/R TRACKS/TELEGRAPH	Yes	35	12	1400	25	0	N	C
	34	TELEGRAPH RD	EVERETT RD	EVERETT SCHOOL	Yes	30	10	1500	30	0	Y	C
	35	TELEGRAPH RD	EVERETT SCHOOL	WHITE OAK RD	No	33	12	1500	30	0	Y	C
	36	TELEGRAPH RD	WHITE OAK RD	OLD MILL RD	No	18	9	1400	30	0	Y	C
	37	TELEGRAPH RD	OLD MILL RD	HALF DAY RD	No	18	9	1000	30	0	y	C
Westleigh												
	38	WESTLEIGH RD	RT 43	YORKTOWNE LN	Yes	26	13	1000	35	0	Y	C
	39	WESTLEIGH RD	YORKTOWN LN	RIDGE RD	No	24	12	1000	35	0	Y	B
	40	WESTLEIGH RD	RIDGE RD	R/R TRACKS	Yes	26	13	1000	35	0	Y	B
	41	WESTLEIGH RD	RT 41	GREEN BAY RD	Yes	24	12	4600	25	0	Y	B
	42	WESTLEIGH RD	GREEN BAY RD	SHERIDAN RD	Yes	45	12	4600	25	0	Y	C
Middlefork												
	43	MIDDLEFORK DR	RT 43	ACORN TR	Yes	50	25	500	25	0	Y	A
	44	MIDDLEFORK DR	ACORN TR	JENSEN DR	Yes	26	13	500	25	0	Y	B
Field Drive-Saunders												
	45	FIELD DRIVE	RT 60	ROUNDABOUT/COM SER	Yes	56	12	5000	30	0	N	C
	46	SAUNDERS RD	CONWAY FARMS DR	RT 60	No	21	10.5	200	30	0	Y	B

Bicycle Level of Service (BLOS) rating was determined based on the methodology developed by the League of Illinois Bicyclists using data compiled by the City of Lake Forest for road width, average daily travel (ADT), pavement condition, heavy vehicle traffic, on-street parking and posted speed limit. The rating ranges from A-F with "A" being the highest and attributed to roads with extremely low traffic count to "F", the lowest rating reserved for roads with little to no compatibility for bicycles.

Barriers & Challenges

A major observation from the survey and public input sessions is the lack of a safe east-west connection in Lake Forest. Major barriers to travelling east-west by bicycle include HWY 41, railroads, waterways, and ravines. Very few City roads traverse the entire width of the City from east to west. Those roads that do provide access across the city (Deerpath, Westleigh Rd, Old Elm Rd and Everett Rd) have unique challenges given the wide intersections at major roadways and heavy vehicular traffic.

Existing barrier along the Middlefork Savanna Trail. An informal bike path exists on either side of the tracks with no safe or legal crossing.

Bridge over Woodland Road provides a safe crossing along the McClory Bike Path.

Signage

There is no cohesive signage plan in Lake Forest pertaining to bicycling. Existing signs are sporatic and not easy to understand. Signage plays a key role in wayfinding and bringing attention to bicyclists on the roadways.

Types of Users

The type of user, defined by skill, comfort level and experience, varies in Lake Forest from experienced team riders to casual adult riders to children. Some riders are more comfortable navigating busy streets and may not require additional accommodations on the roadway in order to travel by bike. Other riders have less experience and need more encouragement and direction in order to feel comfortable on the roads. Children may appear confident on bikes, but lack the traffic training, experience and sense of older adult riders and should continue to use sidewalk connections throughout the community.

The City of Lake Forest recognizes that the type of roadway and proposed enhancement will affect the type of cyclist and level of use a particular route will attract.

- Facilities for bicyclists should be planned to accommodate a connected network for all users.
- Sidewalk connections should be provided on routes where children and pedestrians are present.

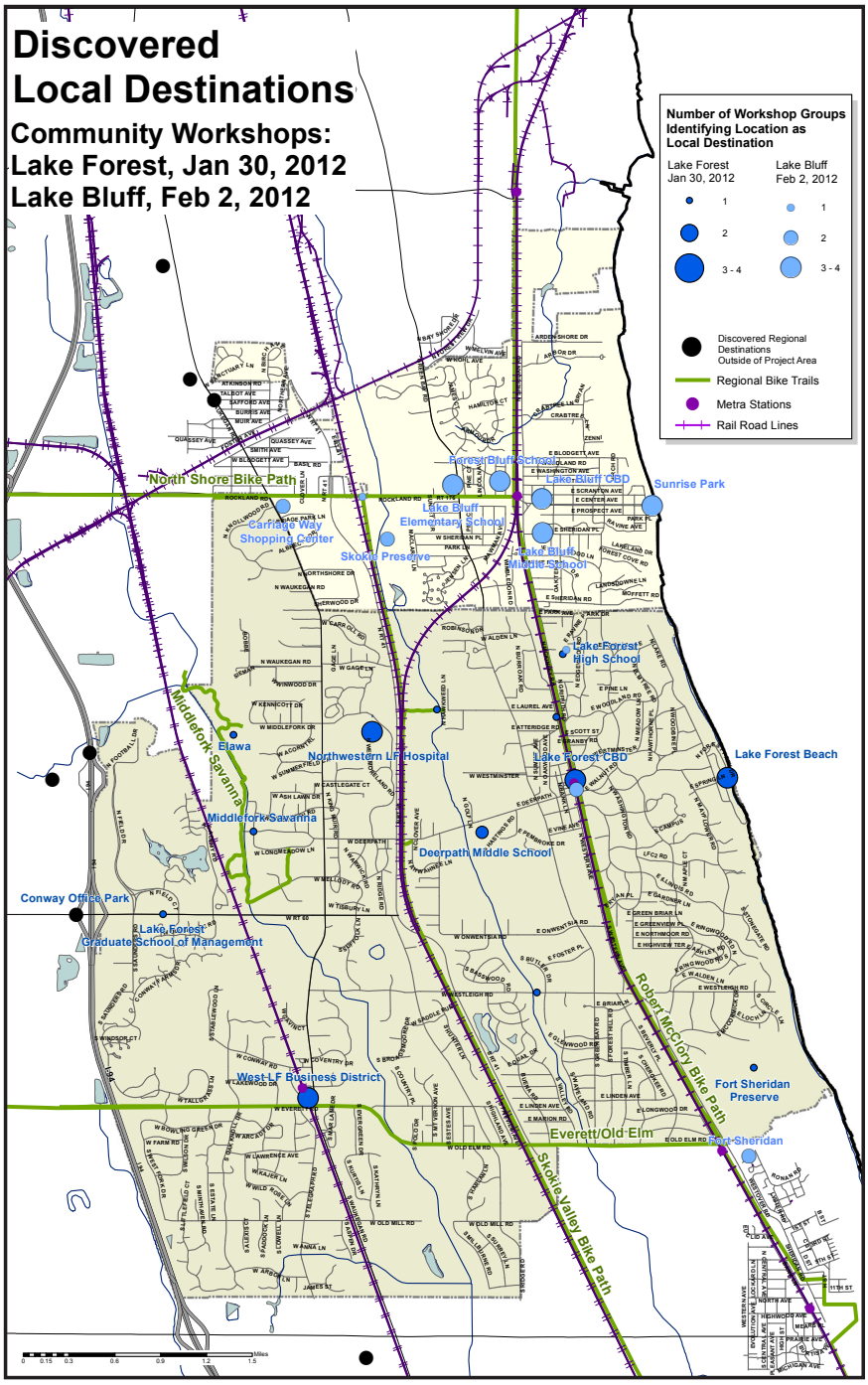
Wayfinding signage could help identify key destinations such as the Open Lands Skokie Valley Nature Preserve.

Analysis of Public Input

A public workshop was held in Lake Forest to identify local destinations, regional connections, and local hazards for cyclists in Lake Forest. The information gathered at the workshop and from survey data collected at the beginning of the planning process was used to develop the proposed bike network in an effort to create a Bike Friendly Community for Lake Forest.

Figure 5 highlights the key local destinations in Lake Forest and Lake Bluff based on the public input. The Metra stations, Forest Park and Beach and the Conway Office Park were all called out as important destinations.

FIGURE 5:



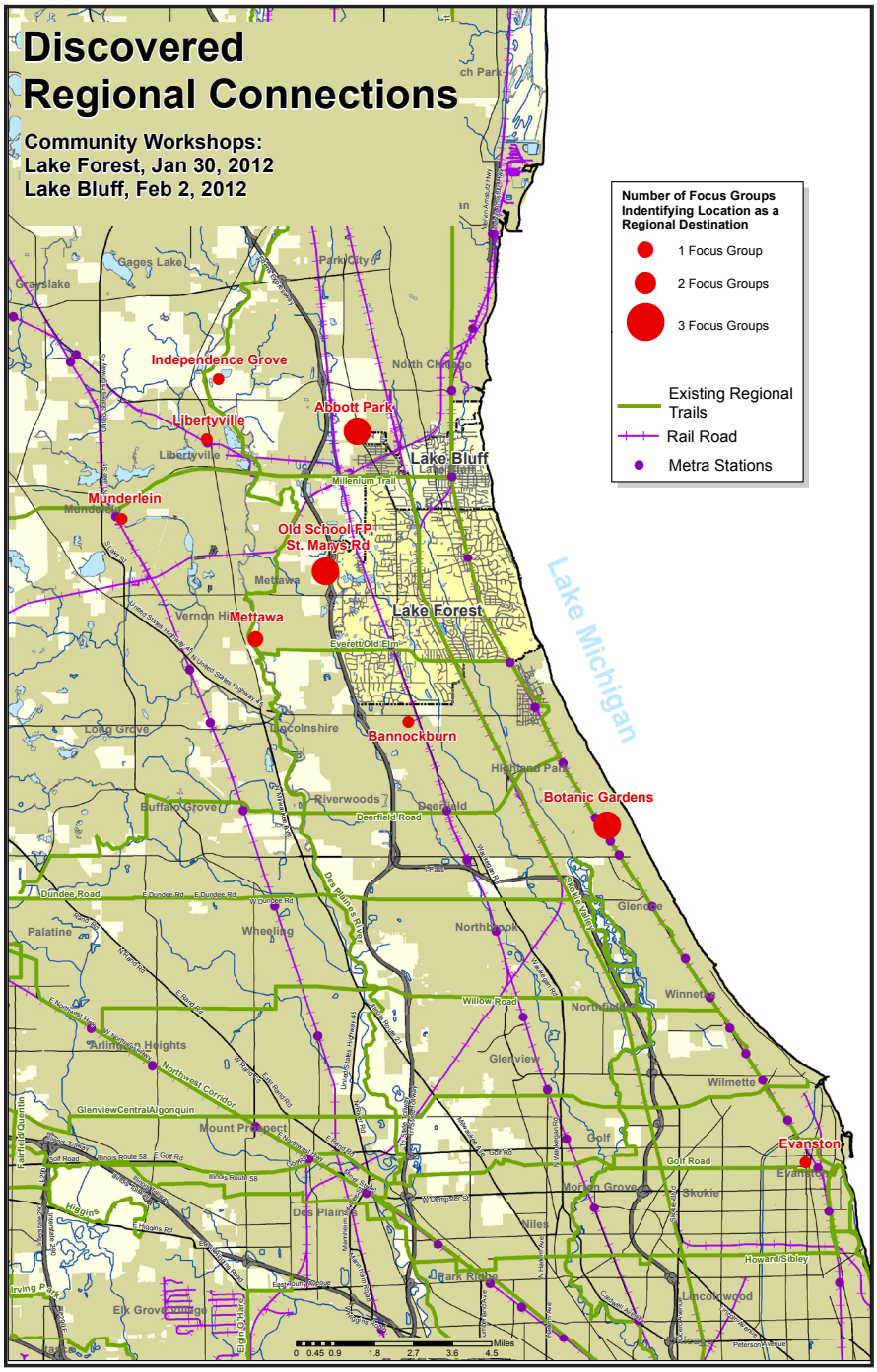
SURVEY SAYS...

80%

80% of cyclists in Lake Forest stated that they ride for health and recreational purposes. Building a bike network will encourage more utilitarian trips to be completed by bike.

Regionally, several destinations were identified in proximity to Lake Forest as shown in Figure 6. The regional destinations most accessible to Lake Forest are located along existing major north-south bike paths. Looking forward, new and improved connections to the north and west are desired. The information collected at the public workshops was consistent with the survey data collected at the beginning of the process.

FIGURE 6:

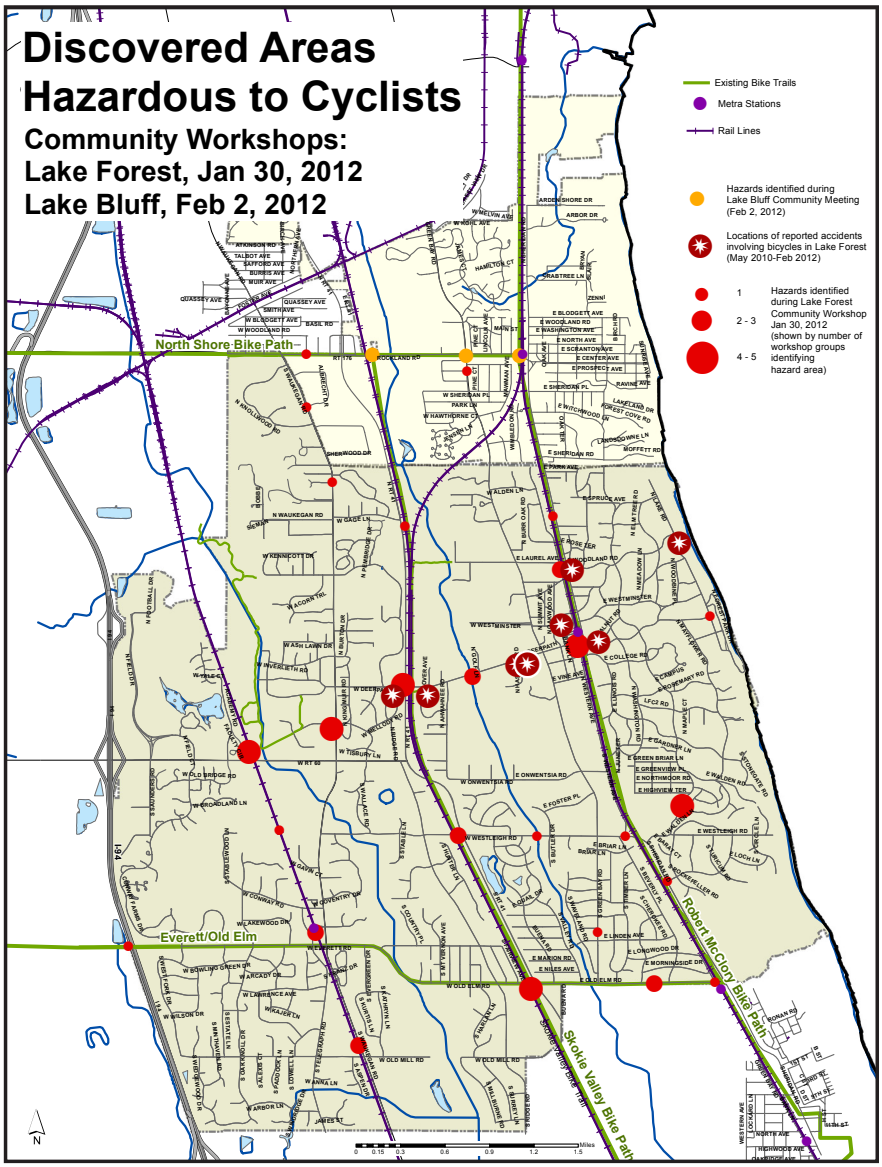


SURVEY SAYS...

85%

85% of respondents indicated that it is important that bike routes connect Lake Forest to destinations beyond the city limits.

FIGURE 7:



SURVEY SAYS...

50% Over 50% of cyclists would be encouraged to bike more if pavement markings and signage were installed in Lake Forest.

An overlay of reported bike crashes from the past five years and indentified hazard areas called out by participants at the public workshops are represented in Figure 7. Based on survey data and the input from the workshops, crossing busy intersections and conflicts with vehices while sharing the road were key issues stressed regarding bicycle safety in Lake Forest and Lake Bluff. Education on how to "share the road" and proper bicycling ettiquette will be important moving forward with this plan.

A series of "Dream Routes" were identified at the public workshops and used as the basis for evaluation to determine the bicycle network. While all roads can be used by cyclists, the Bicycle Master Plan recommends those routes that bypass busy, narrow streets and still connect to key destinations. Looking at a 2-mile radius around the two Metra stations shown in Figure 8, it is clear how bikeable Lake Forest could be with some minor improvements to support bicycles on the roadways.

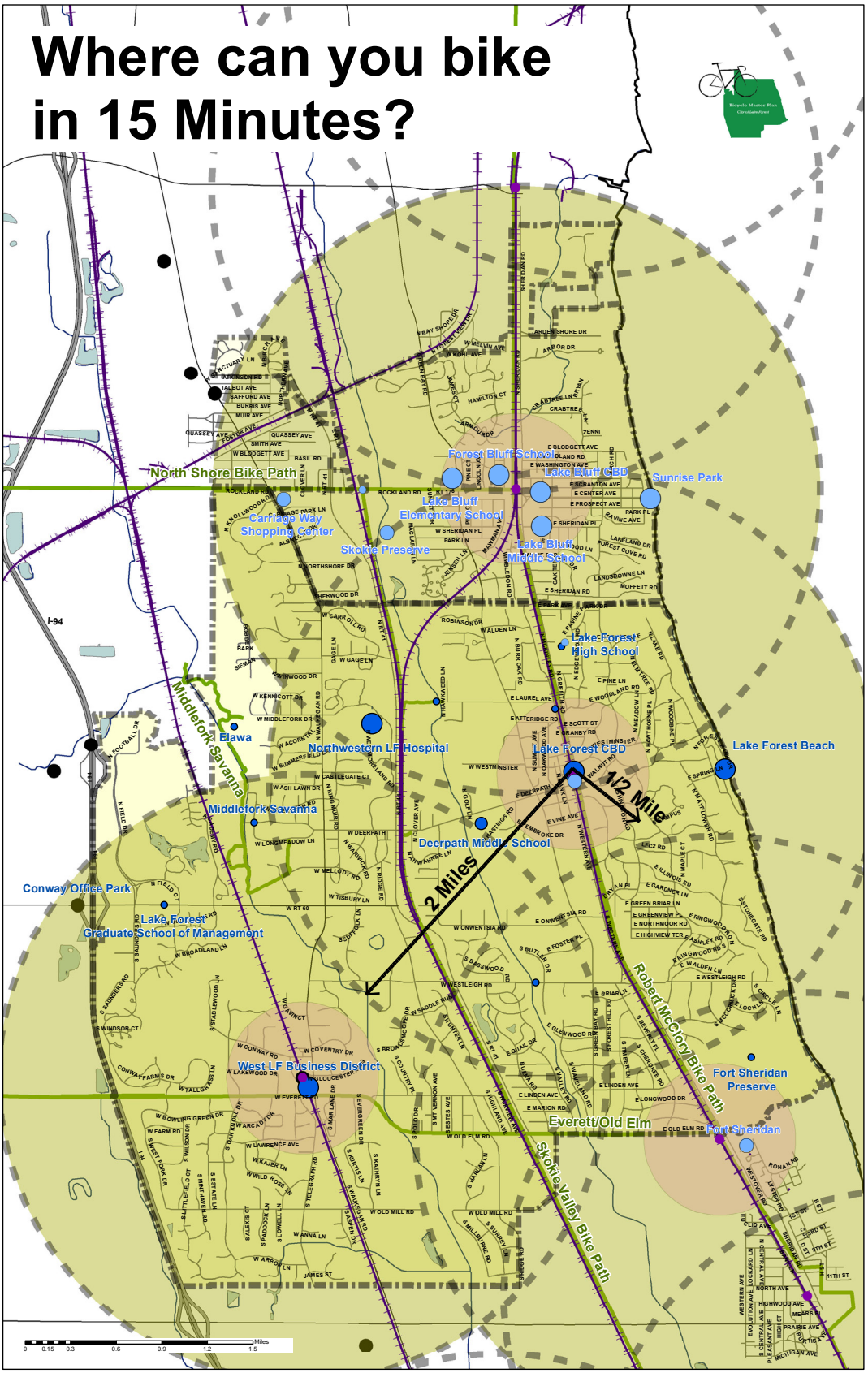


FIGURE 8

An average bicyclist can cycle 2 miles in 15 minutes. Looking at Lake Forest and Lake Bluff with this lens offers a glimpse into the possibilities for a bicycle friendly community.

Proposed Bicycle Network

The proposed Bicycle Network in Figure 9 identifies Core Routes and Branch Connections that facilitate movement through the community on bike. In order to improve the comfort level for cyclists on the identified routes, bicycle facilities can be installed to improve the Bicycle Level of Service (BLOS). Core Routes and Branch Connections were determined based on public input and analysis of the existing roadways. An example of how to use the Bicycle Master Plan is included later in this report. Priority should be given to improvements on Core Routes when feasible. A Priority Table, based on ease of completion, importance to the bicycle network and upcoming projects is included in Appendix D.

Core Routes

Core Routes are defined as critical to the bicycle network and provide connections not easily made on other streets or paths. For example, the existing bike paths within Lake Forest connect major destinations within the City and beyond and form the core of the Bicycle Network. Proposed Core Routes accommodate east-west movement on bikes. Improvements should be planned for the Core Routes to accommodate more regular bike traffic. Core Routes are utilitarian in nature and serve to support a mode-shift from vehicles to bicycles for short trips.

- Robert McClory Bike Path (existing trail)
- Skokie Valley Bike Path (existing trail)
- North Shore Bike Path (existing trail)
- Waukegan Road (existing side-path)
- Rt 60
- E Deerpath (Lake to McKinley)
- Ahwahnee-Onwentsia Corridor
- W. Deerpath (Ahwahnee to Middlefork Savanna Trail)
- Laurel Avenue
- Everett/Old Elm Corridor

Branch Connections

While all streets in Lake Forest should be considered part of the bicycle network, the key road segments or Branch Connections identified in the Bicycle Master Plan provide a higher level of connectivity to the Core Routes and key destinations. These routes could benefit from additional enhancement to support bicycling on the identified corridor.

- Beverly Place
- Conway Farms Drive
- Field Court/Field Drive
- Mayflower-Lake Road Corridor
- Middlefork Drive
- Ridge Road (by Grove Campus)
- Telegraph Road
- Westleigh Road
- Existing paved neighborhood park pathways

Intersections

Wide, busy intersections are challenging for bicyclists to cross. Improving key intersections can help facilitate east-west movement through the City. Intersections identified in the plan may require collaboration with the Illinois Department of Transportation (IDOT) to complete improvements. However, projects on routes leading to and from the intersections should be evaluated for bicycle compatibility and treated in a manner that would enhance and support future intersection improvements.

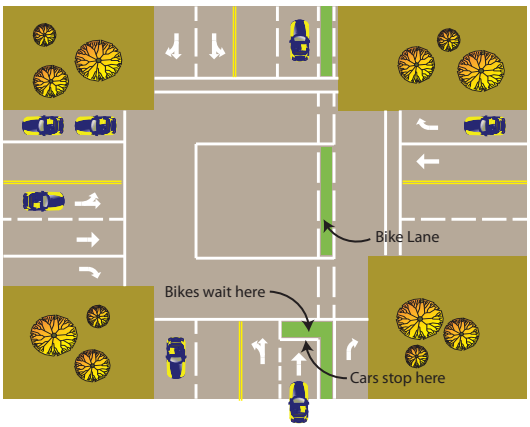
Key intersections identified in this plan are those routes that cross Waukegan Road, Highway 41, and Route 60. Given the nature of these major roads, with heavy traffic levels and higher speeds, providing enhancements to improve bicycle safety is important.

Figure 9: Proposed Bicycle Network

Possible enhancements might include:

- *Pavement Sensors*
  Providing for pavement sensors in areas identified for bicycle use help to encourage bicyclists to follow the rules of the road by treating bicycles with the same importance as vehicles when alerting a traffic light to change.
- *Timing of Traffic Lights*
  In some instances, the duration of traffic lights could be modified to improve the compatibility of a route for bicyclists and allow sufficient time for a bicycle to cross a large intersection without negatively disrupting vehicular flow.
- *No Turn on Red*
  Prohibiting right turn on red for motor vehicles provides a safer environment for bicyclists waiting to cross a major intersection. In cases where cars are permitted to turn on red, turn lanes should be clearly marked and pavement markings should clearly identify a safe path for bicyclists.
- *Bike Boxes*
  Pavement markings and clear deliniation of bicycle areas help to promote consistency and predictability of cyclists along a route. Figure 10 provides a sample of how a bike box could be configured at a busy intersection such as Westleigh Road and Highway 41.

FIGURE 10: SAMPLE BIKE BOX



CONNECTION OPPORTUNITIES

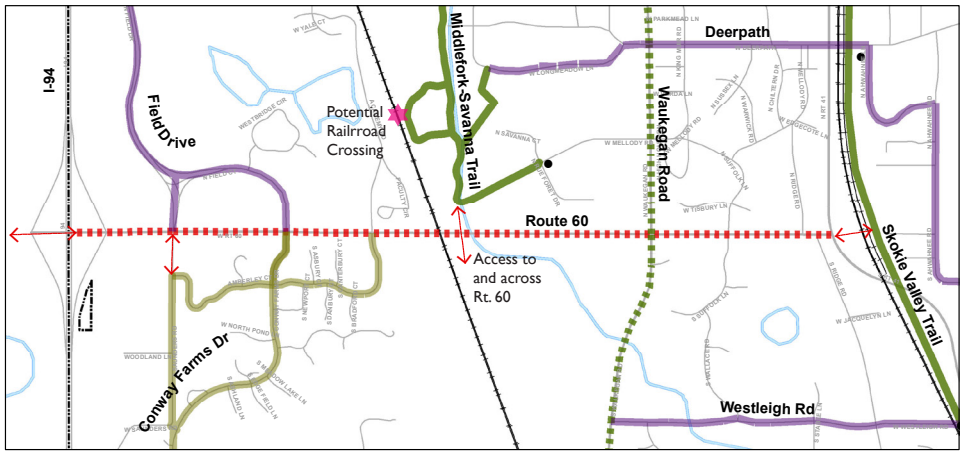
Connection opportunities are important connections identified in the Bicycle Network that require additional planning and collaboration with private land holders or other government entities. These connections go beyond evaluating a roadway and adding a bicycle facility to improve compatibility and highlight more creative areas for future bicycle connections. These opportunities relate to new development areas such as the Northwestern Lake Forest Hospital site and older establishments such as Lake Forest College and Lake Forest Academy and can help enhance the proposed bicycle network through private Master Plans. This plan recognizes the importance of the larger community institutions in completing a Bicycle Network and encourages continued communication and collaboration with the City of Lake Forest.

Other connection opportunities require joint effort from several government jurisdictions such as providing a connection from Field Drive in Lake Forest to Bradley Road in unincorporated Lake County to establish a more direct connection to Rt 176 and beyond. These connection opportunities are called out with brown arrows in Figure 9.

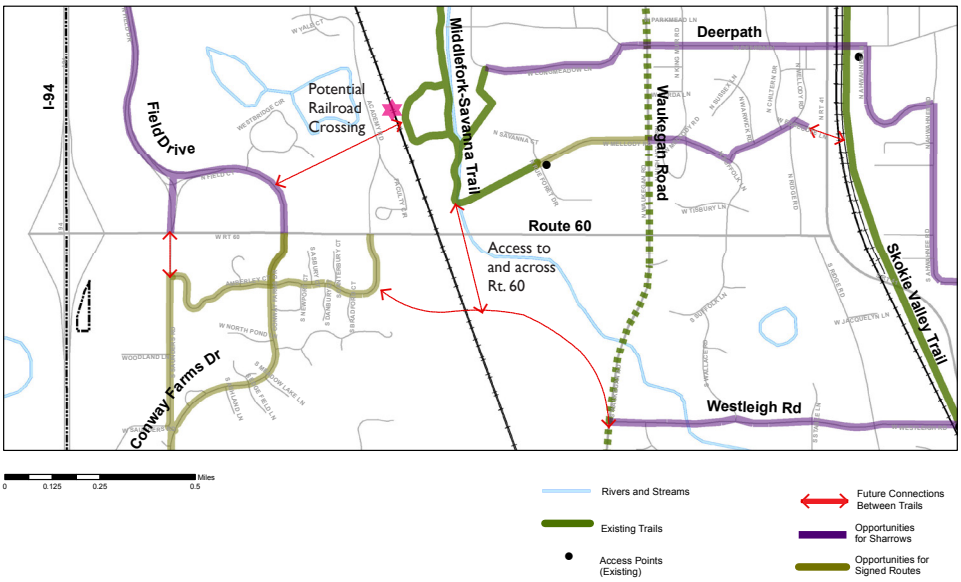
CASE STUDY - ROUTE 60 CORRIDOR

The Route 60 corridor is identified in the Bicycle Master Plan as a Core Route with several connection opportunies (Figure 11). The roadway has a high number of vehicles-traveled-per-day and a high posted speed limit. These conditions make an on-road facility challenging and not desired for the majority of riders. Despite the challenges associated with this corridor, Route 60 provides connections to regional trails and local destinations including Townline Park, Lake Forest Academy and Conway Office Park.

FIGURE 11:
ROUTE 60
CORRIDOR



Enhanced Connection



WHAT COULD ROUTE 60 LOOK LIKE?

The design of the Rt 60 bicycle facility could take on many different characters from a central median to a winding pathway.

HOW CAN THE CONNECTION BE ENHANCED?

The Rt 60 Corridor has several opportunities for enhanced connections. Recognizing the existing barriers such as railroad tracks and wetlands, the Master Plan identifies key connections that would enhance and facilitate east-west movement in Lake Forest. A railroad crossing north of Rt. 60 is identified as a priority.

Central Business District

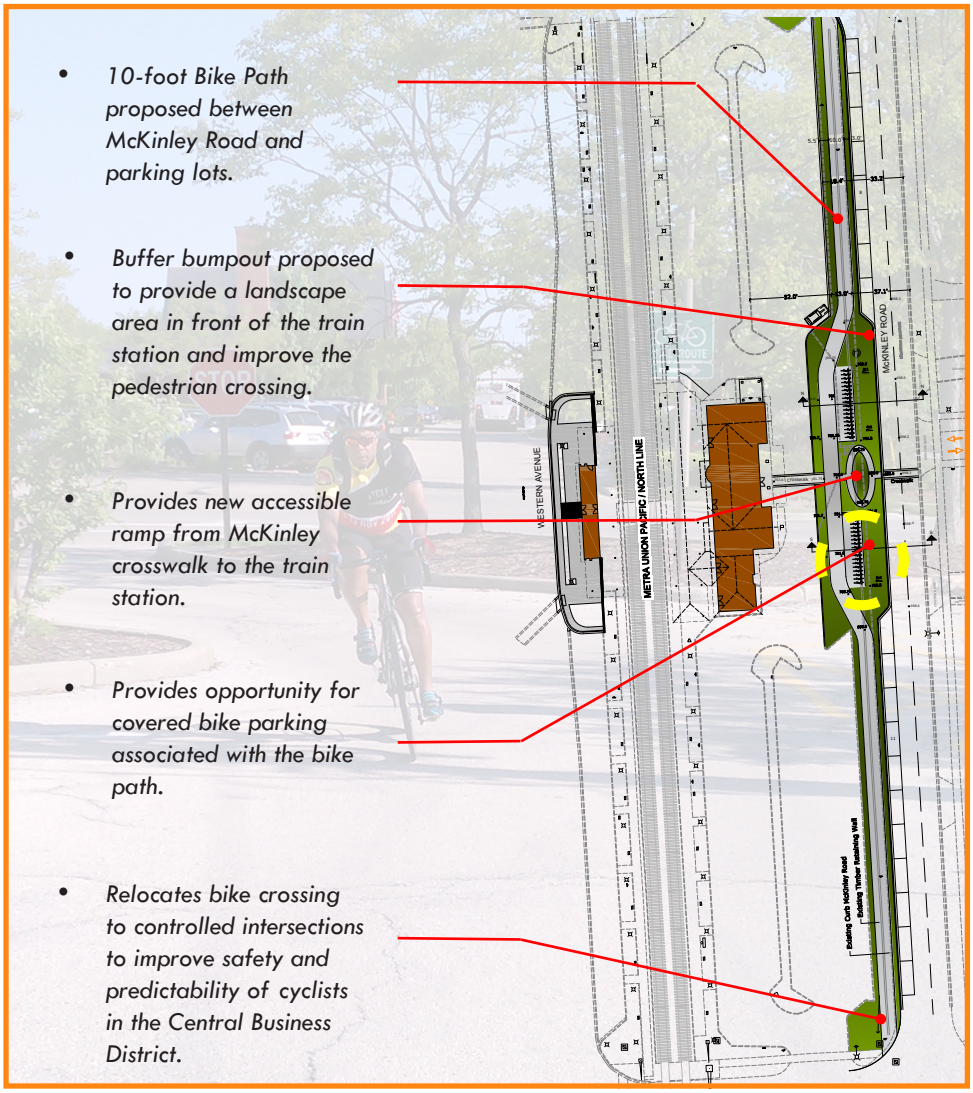
Encouraging people to bike to and around the Central Business District will increase economic development and promote active transportation options for errands, shopping and socializing. The East Lake Forest Train Station is a transportation hub for commuters and visitors to the Central Business District.

Bicycles are an important consideration to preserving a vibrant and active downtown. The City of Lake Forest is working to secure grant funding to improve conditions for bicyclists in the Central Business District including a bike path connection and additional bicycle parking at the train station.

Robert McClory Bike Path Connection

The Robert McClory Bike Path was constructed in the former Chicago North Shore and Milwaukee Railroad right of way. The bike path is separated from vehicular traffic throughout Lake Forest, except from

Figure 12: Proposed McKinley Two-Way Side Path Concept Plan



Woodland Road (north of the train station) to Illinois Road (south of the train station). Between Woodland and Illinois Roads bike traffic is routed through a series of parking lots serving the Metra Train Station, and the City of Lake Forest Central Business District, a distance of approximately 1/2 mile.

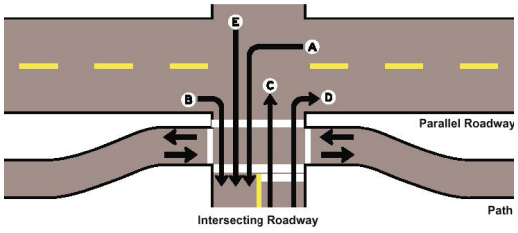
Improving the connection of the McClory Bike Path through the Central Business District to create a safe bicycling environment is recommended. Several public comments were received regarding the existing conditions of roads and traffic patterns in this area and the need to improve the connection for all users of the Robert McClory Bike Path. The proposed separated bike path along McKinley Road provides a continuous route between Illinois and Woodland Roads. As the design of this connection is finalized, the following considerations are critical to the success of the project.

- The path material should be consistent with the existing asphalt path with minimal pavement markings.
- Signage along the connection specifically, and Robert McClory Bike Path generally, should be minimized to preserve the character of the bike path.
- Signage limited to the necessary directional signage needed to direct cyclists to the Central Business District and Metra station is appropriate.
- Sufficient space should be installed between the path and the parking spaces on McKinley to protect bicyclists from open car doors.
- Careful attention to the approach and treatment of intersections to ensure predictibility and safety of all modes of transportation is required. See Figures 13 and 14.
- Landscaping should be installed to effectively screen parked cars from McKinley Road.
- Location, size, and design of the bicycle parking structures and modifications to the landscaping and streetscape in front of the East Lake Forest Train Station will be considered by the Historic Preservation Commission, consistent with standard City practices.
- Given the nature of the Robert McClory Bike Path as a multi-user pathway, design techniques to slow the flow of bicycle traffic through the Central Business District is encouraged.
- If after further study a separated side path is determined to be infeasible, wayfinding signage or marked, shared lanes for bicycling should be considered.

FIGURE 13: SAMPLE SIGNAGE ANNOUNCING INTERSECTION

Source: League of Illinois Bicyclists (Presentation at UIC, 2010)

FIGURE 14: SAMPLE INTERSECTION TREATMENT



Source: League of Illinois Bicyclists (Presentation at UIC, 2010)

The intersection of the proposed path with Deerpath and Westminster should be designed to increase visibility and provide safe crossing for all modes of transportation.

Signage and Maps

Signage is an important component of the Bicycle Master Plan. Signage helps to identify a bicycle route, remind motorists and bicyclists to share a roadway, and provides wayfinding information to key destinations.

Central Business District

The Central Business District is a hub for the Bicycle Network in Lake Forest. Clarification of the signage around the Central Business District is recommended as part of this plan to direct cyclists to key destinations and create a bike friendly environment in the Central Business District. The East Lake Forest Train station serves as a warming house for bicyclists using the Robert McClory Bike Path and commuters taking the train toward Chicago or Kenosha. Standard directional and wayfinding signage is encouraged in this area to support bicycle activity. Figure 15 provides an example of how signage could be clarified to encourage the pedestrian character of the downtown, while still encouraging bicyclists to ride to the Central Business District.

Figure 15: Central Business District Signage

Before - "Walk Bikes" signs imply that no bike riding is allowed in the Central Business District

After - install "Walk on Sidewalk/Ride on Street" signs to encourage predictable behavior

Bike Route Signage

There are several different types of bike route signage including signs to "Share the Road" shown in Figure 16 and basic "Bike Route" and Directional signage shown in Figure 17 and Figure 18. This type of signage can supplement pavement markings on a preferred bicycle corridor or stand alone as a reminder to all users that bikes and cars should be expected on the roadway. Installation of bike route signage is an affordable and effective way to establish a bicycle network. Whenever possible, existing sign poles should be used to avoid visual clutter along the roadways.

Figure 16: Sample Signed Route - Conway Farms

Figure 17: Sample Bike Route and Directional Signage installation at Longmeadow

Figure 18: Sample Directional Sign

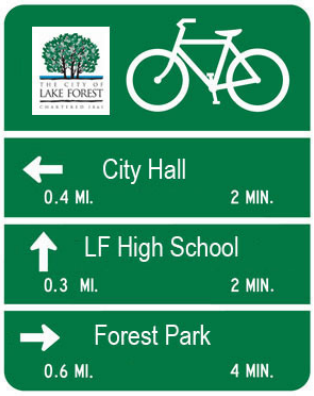


Figure 19: Sample Regulatory Sign

When vehicles are present, bicyclists should ride single file and in a manner that does not impede vehicular travel in accordance with State Law.

In addition, regulatory signage should be installed in key location to remind cyclists of the State law to ride in a manner that does not impede the normal flow of traffic. For example, in instances where approaching cars are present, cyclists should ride single file and in no case ride more than 2 riders abreast. Figure 19 provides an example of how signage could be clarified along preferred streets for cycling.

Publications

The City of Lake Forest has been selected to work with the League of Illinois Bicyclists to create a "Bike to Metra" brochure in an effort to raise awareness of how to utilize biking as part of a daily commute. The pamphlet will promote bike routes and destinations of interest in Lake Forest including the shops and restaurants in the Central Business District.

Bicycle Parking

Bicycle Parking is an important component of a bicycle friendly environment. Well-placed bicycle parking can encourage cyclists to make a trip on bike and also decrease clutter and hazards throughout the Central Business District and at key destinations (See Figure 21). Creative solutions to provide additional bicycle parking, such as the "BOOKS" rack at the Public Library are encouraged.

Type of Bike Racks

The type of bike rack may vary depending on the location, character and anticipated capacity. Bicycle rack design should follow standards outlined in the Bicycle Parking Guidelines prepared by the Association of Pedestrian and Bicycle Professionals.

The chosen bike rack should:

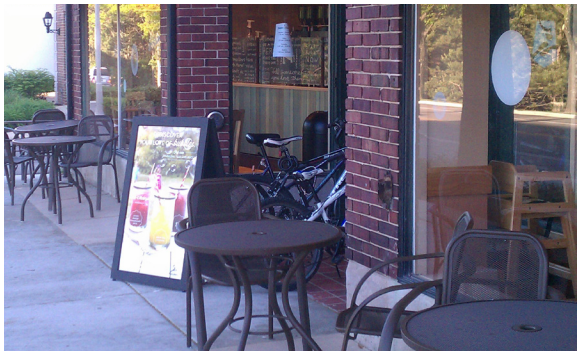
- Support the bicycle in an upright position.
- Stabilize the wheel of the bicycle from tipping.
- Support all types of bicycles.
- Enable both the frame and wheel of a bicycle to be secured.

Destination Bicycle Parking

Providing bicycle parking at key locations requires collaboration with private property owners and The City of Lake Forest. Continued monitoring of bicycle parking throughout Lake Forest is encouraged to facilitate and encourage bicycle use to key destinations.

- Bicycle parking should be considered as part of new development in the Business and Office Zoning Districts and Special Use Permits.
- Bicycle parking should be provided at all City owned buildings and parks.
- Bicycle parking should be located in a manner that does not restrict pedestrian access to building entrances or use of the sidewalk.
- Bicycle parking should be located within 50 feet of a desired destination and be visible from the main entrance to a destination or park.
- Temporary Bike Corrals are encouraged to support bicycling in the warmer months. Figure 20 provides an example of a temporary bike corral on Western Avenue within existing vehicle parking spaces.

Figure 20:
Example of Temporary Bicycle Parking in Central Business District



Observed bicycle parking in the Central Business District within a doorway to a local business. Blocking the entrance to buildings in not only a nuisance but a safety concern as well.

Temporary bicycle corrals at key locations in the Central Business District will help promote bicycle use.

Figure 21: Observation of Existing Bicycle Parking Issues in Central Business District

The provided bicycle parking is located too far from the front door and is not used by cyclists. Providing visible, well located bicycle parking is essential to creating a bicycle friendly community.

Commuter Bicycle Parking

Covered, long-term bicycle parking at the two train stations in Lake Forest should be installed to promote bicycling to and from the train stations. Additional consideration of commuter bicycle parking at major office centers such as the Conway Office Park should be considered.

Covered bike parking should:

- Be located in a manner that does not negatively impact historic structures or landscapes. Figure 22 provides a conceptual idea for bicycle parking at the East Lake Forest Train Station.
- Be located within 50 feet of the train station or destination.
- Be safe and secure.
- Protect bicycles from the elements.

Figure 22:
Example of Covered Bicycle Parking

Possible Covered Bike Parking at East Lake Forest Train Station. Structures in this area should not block views of the historic station and will be considered by the Historic Preservation Commission.

Toolbox of Bicycle Facilities

Lower Financial Impact

Signage

- Signed bike routes identify destinations and connections using standard signage. Given the historic character of Lake Forest, careful attention to the placement and number of signs will be critical to the success of this tool. Signage in key areas will help guide residents & visitors around town.
- Share the Road signage identifies a preferred bicycle route in Lake Forest and provides a visual sign for motorists and bicycles to share the road.
- Destination and mileage signage is appropriate to direct visitors to the Central Business District and key destinations throughout town.

Pavement Markings

- Pavement markings help to identify preferred bike routes in the city. Tools like "sharrows" and bike boulevard markings provide clear direction to share the road in circumstances where a designated bike lane is not feasible due to road width constraints.
- Intersection improvements such as "bike boxes" help to identify placement for cyclists at busy intersections.
- Colored bike lanes assist in directing bicycles to a preferred location on the roadway and crosswalks. Appropriate locations include intersections, crosswalks, key connections to destinations and bike paths and in circumstances not easily navigated by bicycle but critical to the Bicycle Network.

Bike Lanes

- A minimum of 5 feet in each direction is needed for a standard bike lane. Given the narrow streets in Lake Forest, very few streets are suitable for bike lanes without significant improvements to widen the road.
- Road design should be in compliance with current AASHTO design guidelines included by reference at the end of this plan. A copy of the 1999 Guide is available at the City of Lake Forest.
- In areas where only 4 feet are available within the existing roadway, wide shoulders could be incorporated into the Lake Forest street network to provide cyclists with a safe, designated area to share the road with motor vehicles.

2-Way Side-Path

- Side-paths are best located along busy streets with limited curb cuts or conflicts with turning vehicles.
- Side paths may be appropriate in instances where a bicycle connection is needed and on-road facilities are not desirable or feasible.
- A 10-foot minimum width is recommended for a two-way cycle path. In cases where right of way is limited, a two-way path of no less than 8 feet may be considered.
- "No Turn on Red" signage is important to protect cyclists traveling along side-paths to avoid conflict with turning vehicles.
- Vegetation may be installed between the road and the bike path but should not block views of cyclists on the path from the drivers on the road.

Paths/Trails

- Off-road trails are typically located through wooded areas or along railroads and rivers and are excellent for the recreational rider.
- A minimum of 10 feet in width with 2 feet of clearance from shrubs and other hazards is recommended.
- Signage along trails should be limited with key destination and directional signs installed at access points.
- Access to paths and trails should be well marked, free of vegetation and accessible with depressed curbs.
- Bike paths should be free of debris and tree roots.
- Path lighting should be reviewed by the Historic Preservation Commission or Building Review Board.

Application of Bicycle Facilities

Careful evaluation of the bicycle facilities included in this plan is critical to the success of the bicycle network. Priority should be given to the Core Routes and Branch Connections identified in this plan. Determination of facilities should be based on current road configuration, current and anticipated use of the corridor, streetscape character and overall consistency with the City's Capital Improvement Plan.

Core Routes are expected to faciliate more bicycle traffic than Branch Connections. Greater impact facilities such as pavement markings and side paths may be necessitated based on the posted vehicle travel speed and the road configuration.

In situations where a segment of a corridor is proposed for infrastructure improvement, consideration should be given to the entire corridor when choosing a bicycle facility. When possible, on-street facilities should be evaluated in advance of more expensive options such as side paths and off-road trails.

Bicycle improvements should correspond with Capital Improvement Projects and specific projects may require consideration by City Boards and Commissions in advance of final approval by the City Council.

FIGURE 23: WESTLEIGH ROAD - EXISTING

Wide vehicle travel lanes and a moderate speed limit make Westleigh Road a good option for bicyclists.

CASE STUDY - WESTLEIGH ROAD

A combination of bicycle facilities are appropriate for the Westleigh Road corridor given the difference in road width and number of motor vehicles present on the road between Western Avenue and Waukegan Road.

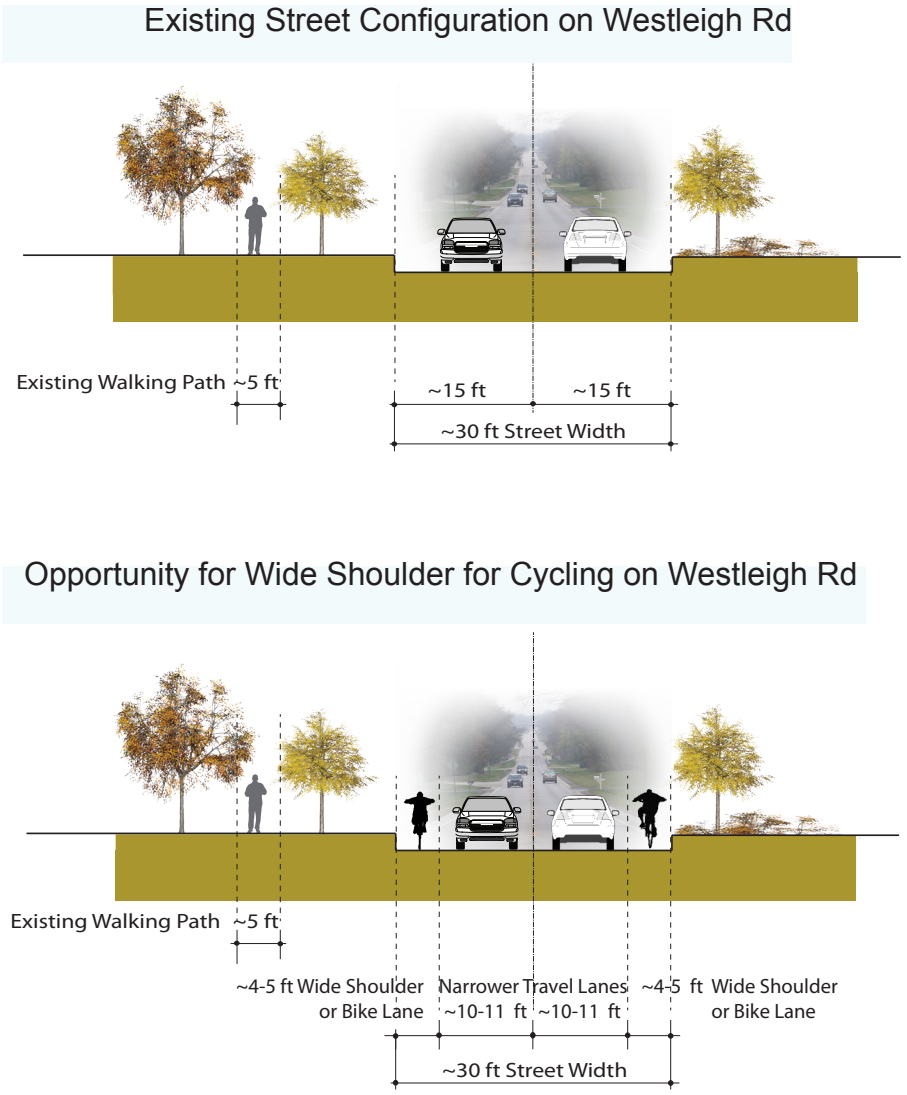
1. Evaluate Character and Challenges

The road and sidewalk configuration changes along Westleigh Road. The road segment east of Highway 41 has wide lanes and drainage ditches on either side of the road as shown in Figure 23. Sidewalks are found on one or both sides of the street in this area. Extended curbs from side-streets that intersect with Westleigh Road protrude into the existing shoulder on Westleigh Road. The location and possible hazard of these curbs should be evaluated prior to installation of a bicycle facility on this road to determine the necessity of additional roadway improvements. West of Highway 41, Westleigh Road changes to a residential lane with no curb and a sidewalk on the south side of the road. Given the varied character along the route, multiple types of on-road facilities could be appropriate.

2. Determine the Lowest Impact Facility

Given the character of the roadway, and the fact that this corridor is a major vehicular route with several cross streets and driveways, on-road bicycle facilities are more appropriate to ensure safety of bicyclists and motorists. The existing sidewalks support pedestrian and younger cyclists along this route. Given the width of the roadway east of HWY 41, pavement markings would be more effective than signage to clearly designate where cyclists should travel on the roadway. Continuation of pavement markings along the entire route is appropriate.

FIGURE 24: SAMPLE WESTLEIGH ROAD DIET



3. Review National Standards for Bike Facilities

The American Association of State Highway and Transportation Officials (AASHTO) regulations require a minimum of 5 feet for a designated bike lane. However, other design standards such as the National Association of City Traffic Officials (NACTO) Design Guidance for Bike Lanes indicate that a minimum of 4 feet is necessary to safely designate a bike area on the road. Figure 24 demonstrates an example of a "road diet" for Westleigh Road, east of Highway 41. The existing 15 foot wide vehicular travel lanes could be reduced to 10 feet to allow for a bike lane to designate an area for bicyclists. Reducing the width of vehicle travel lanes has been proven to slow traffic and support adherence to the posted speed limit creating a safer environment for motorists, cyclists, and pedestrians.

Alternatively, the travel lanes could be reduced to 11 feet in both directions, more typical of the engineering standards in Lake Forest, to clearly designate an area for motor vehicles and bicycles along a designated bicycle route. The wide shoulder could be utilized for cyclists in this area.

A greater impact solution to improve this route for cycling is to widen the road east of Highway 41 two or more feet to allow for a 5 foot bike lane and wider vehicular travel lanes.

The width of the road along Westleigh Road, west of Highway 41, does not support bike lanes or the installation of a wide shoulder given the drainage ditches and surface restraints in this area. Figure 25 provides a graphic representation of how the addition of a "sharrow" designates an area of the roadway for bicycles. Sharrows alert motorists and bicyclists to share the road while preserving the historic character of the roadway. A sharrow implies that bikes will use this route, but cars may have to wait to pass cyclists along this portion of the road since there is not enough roadway for both to travel side by side. In all cases, bicyclists should move to single file when a vehicle is present and should not ride more than two abreast.

The major intersections along Westleigh Road should be reviewed and updated as appropriate to improve safety and predictability at the crossing.

4. Determine Location of Key Destinations.

Westleigh Road is a Branch Connection between Waukegan Road and East Lake Forest. The Skokie Valley Bike Path is easily accessed from Westleigh Road and destination and directional signage would be appropriate along this route. New bicycle signs should utilize existing traffic signs and poles to limit clutter along the roadways.

5. Obtain Appropriate Permits and Approvals

Bike facilities are most cost effective when implemented at the time of a Capital Improvement Project. Depending on the type of project, presentation at a public hearing may be appropriate. Figure 26 establishes a process for review and consideration of bicycle improvements on City streets.

6. Identify Grant Opportunities

Several grant opportunities are available for communities that have a Bicycle Master Plan in place. Creating local and regional connections for bicycles is important. A summary of current grant opportunities is provided in Appendix B of this report.

FIGURE 25: SAMPLE WESTLEIGH SHARROW - WEST OF HIGHWAY 41

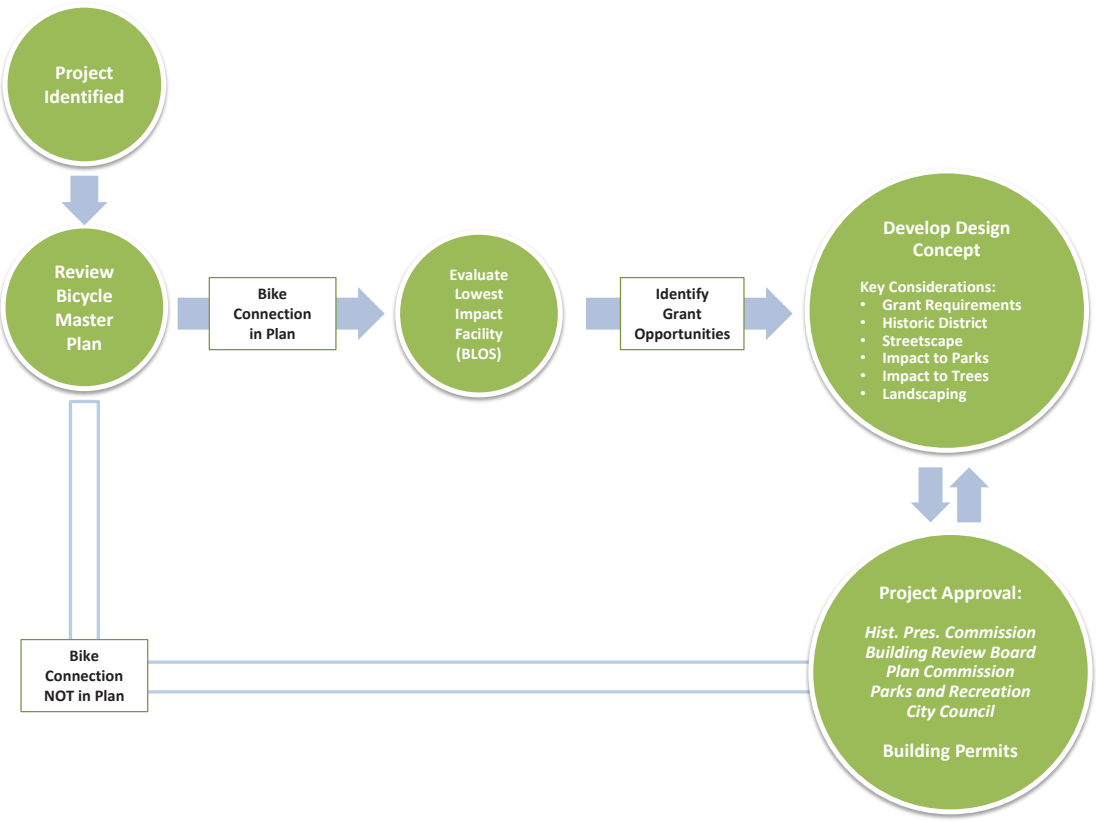
Before: Narrow lane, no designation for bicyclists

After: installation of a sharrow is a cost effective way to designate a road as a preferred bike route.

FIGURE 26: CAPITAL IMPROVEMENT REVIEW PROCESS

PROCESS

1. Evaluate which bike facility will maintain a Bicycle Level of Service (BLOS) rating of B or higher on all Core Routes and a rating of C or higher on all Branch Connections.
2. Evaluate facility designs for neighborhood context and immediate surroundings.
3. Evaluate intersections in the context of other bike facilities as well as safety for all modes of transportation.
4. Identify key destinations along route and evaluate availability of bike parking at destinations along the proposed facility.



BLANK PAGE
June 2013

Bicycle Tune-Up: Bike Friendly Planning

- Engineering
- Education
- Encouragement
- Enforcement and Traffic Safety
- Evaluation and Planning

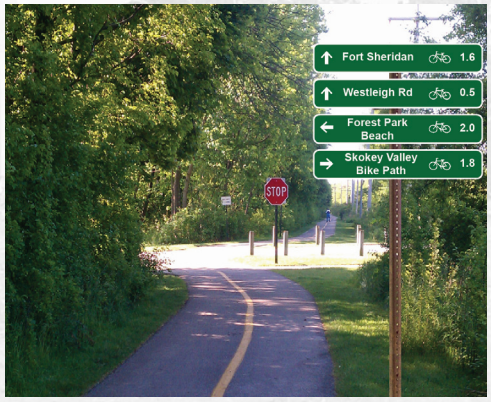
Engineering Priorities

The 5E's

Use the five E's to provide a bike friendly community and support new and experienced riders.

Engineer
Educate
Encourage
Enforce
Evaluate

Provide Way-finding Signs



Designate Bike Routes

Trail and Side Path Improvements

- Provide adequate clearance of trees and shrubs along all bike trails and side paths.
- Repair damaged pavement along all bike trails and side paths.
- Verify that stop signs are present at all major intersections along bike trails and side paths to notify bicyclists to stop at the intersection ahead.
- Widen existing Side Path on Waukegan Road to meet minimum standards in plan.

Policy & Regulatory

- Consider requirements to provide bike parking for new businesses.
- Install regulatory and directional signs on designated routes.

Roadway Improvements

- Implement bicycle facilities identified in the Plan.
- Maintain roads edge to edge.
- Install bike friendly sewer grates along Core Routes and Branch Connections that are flush with the pavement and do not create a hazard for cyclists.
- Improve road material at railroad crossings to protect bike wheels.
- Use non-slip paint for pavement markings.
- Prioritize snow removal on Core Routes and Branch Connections.

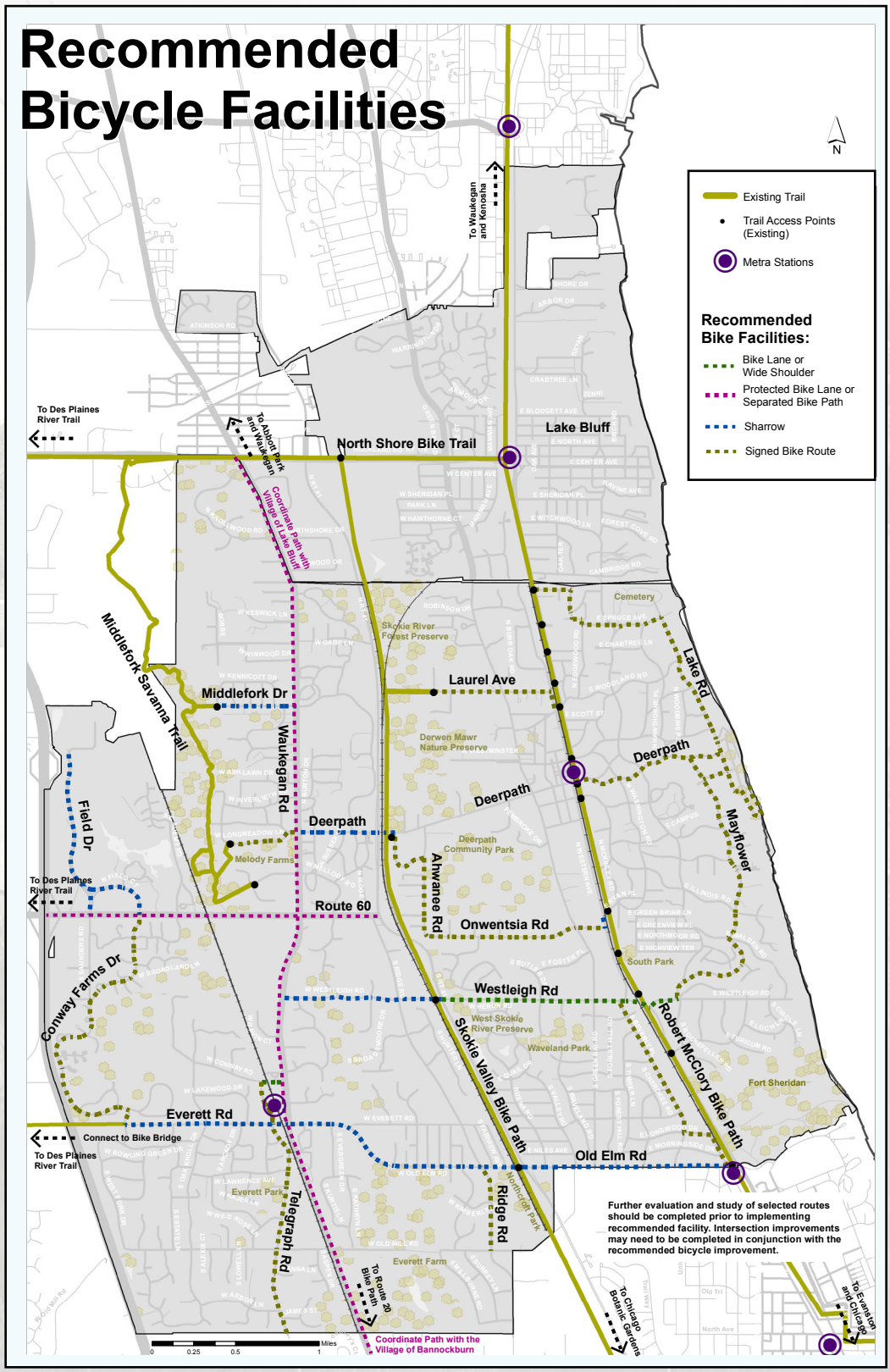


FIGURE 27: RECOMMENDED BICYCLE FACILITIES

Route priorities are identified in Appendix D.

Education & Traffic Safety

The 5E's

Use the five E's to provide a bike friendly community and support new and experienced riders.

Engineer
Educate
Encourage
Enforce
Evaluate

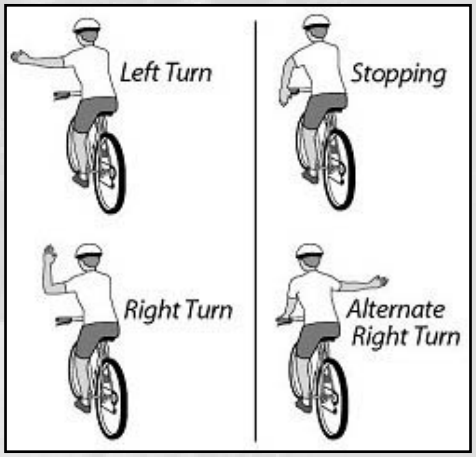
An important component of the Bicycle Master Plan is education. Educating bicyclists on how to ride when cars are present and motorists on how to coexist on the road with bicyclists will help encourage people to ride more and drive less. There are several resources available that provide access to the rules of the road to provide clear expectations of how all modes of transportation will behave on the street.

Action Steps

- Provide access to rules of the road on City Website and distribute Traffic Safety Cards.
- Establish Police Community Training Events and presentations to students in the schools.
- Educate Police Officers and post current bicycling regulations at the Public Safety Building.
- Encourage driver education programs to include lessons on how to share the road as a driver and a cyclist.
- Sponsor Bike Rodeos for young children on an annual basis.
- Encourage local bike shops and advocates to provide bicycle maintainance classes for students and adults.
- Support the establishment of Bike Clubs in the community including the schools, Senior Center, and CROYA.
- Remind riders and drivers of the rules of the road annually in the Spring issue of the Dialogue!

Share the Road!

Be Predictable!



Source: City of Lawrence, KS (www.lawrenceks.org)

Encouragement

The 5E's

Use the five E's to provide a bike friendly community and support new and experienced riders.

Engineer
Educate
Encourage
Enforce
Evaluate

Explore Lake Forest!

Perks for bikes!

In order to encourage more people to ride bicycles in Lake Forest and promote healthy lifestyles, The City supports and encourages community events and facilities that promote bicycling. All special events should follow standard City procedures and obtain the appropriate approvals in advance.

Possible Activities to Encourage Bicycling

- Community Bike Rides – coordinate with local bike clubs and stores.
- Bike to School/Work Days – coordinate with schools and Lake Forest High School Environmental Club.
- Discounts Days for bicyclists – coordinate with the Chamber of Commerce and the City's Economic Development Coordinator.
- Bike and Dine Events – coordinate with Chamber of Commerce and the City's Economic Development Coordinator.
- Temporary Bike Corrals in the Central Business District during the summer and at special events such as the Fourth of July Fireworks and Saturday morning Farmer's Market.
- "Bike Sheridan Road" or "Bike the Square" events where the roads are closed to cars for a morning to allow bicyclists to experience the roads car-free.

Enforcement

The 5E's

Use the five E's to provide a bike friendly community and support new and experienced riders.

Engineer
Educate
Encourage
Enforce
Evaluate

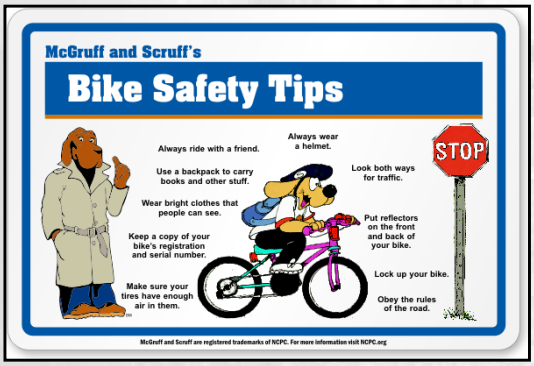
The Lake Forest Police Department played an active role in the development of this plan. The Police Department already utilizes bicycle patrol in Lake Forest and continues to set an example of how to follow the "rules of the road" while cycling on the streets.

Rules of the Road - The Basics

- Obey traffic laws, signs and signals.
- Ride in the right lane, except when passing another vehicle, preparing for a left turn or avoiding hazards.
- Ride on paved shoulders and bike lanes when present and free of hazards.
- Ride on the right, never ride against traffic.
- Ride no more than two abreast, returning to single-file if riding two abreast impedes the flow of traffic.
- Use hand signals to indicate right or left turns, slowing or stopping.
- Use a headlight, taillight and reflectors at night.
- Act like a vehicle on the roads -- bicycles have the same rights and responsibilities.
- Never assume motorists see you or that you have the right-of-way.
- Wear appropriate gear to protect yourself: helmet, glasses and gloves.

Know the Rules!

Be Safe!



Evaluation and Planning

The 5E's

Use the five E's to provide a bike friendly community and support new and experienced riders.

Engineer
Educate
Encourage
Enforce
Evaluate

What makes Lake Forest a bike friendly place?

Bicycle parking at key destinations

Making all driveways a trailhead and using the roads to access designated bike trails

Covered bike parking at train stations and key employment hubs for commuters

Traffic regulations that support bicycle use

Smooth roads

Safe intersection crossings for all modes of transportation

Way-finding signage to help cyclists find key destinations

Bike lanes and pavement markings to alert bicyclists and motorists to share the road

The Bicycle Master Plan is not a static document but should be evaluated every 5 years to ensure consistency with current trends and that the improvements are meeting the needs of residents. The Bicycle Level of Service tool and other resources identified in Appendix B should be used to evaluate bicycle routes and help to inform the design of proposed modifications to increase the bicycle compatibility of a route.

Action Steps

- Add 15 miles of designated bicycle routes in Lake Forest by 2025.
- Install "Share the Road" signage on all designated routes to raise awareness of bicycling in Lake Forest.
- Maintain a bicycling section on the City of Lake Forest Website to serve as an information source for residents and visitors including a feedback form.
- Actively seek grant funding sources for projects. A list of current grant opportunities is included as Appendix B.
- Prepare an annual report to the City Council on the progress of implementing bicycling improvements, give a review of bicycle crashes and establish priorities for the coming year to continue to improve safety and conditions for bicycling.

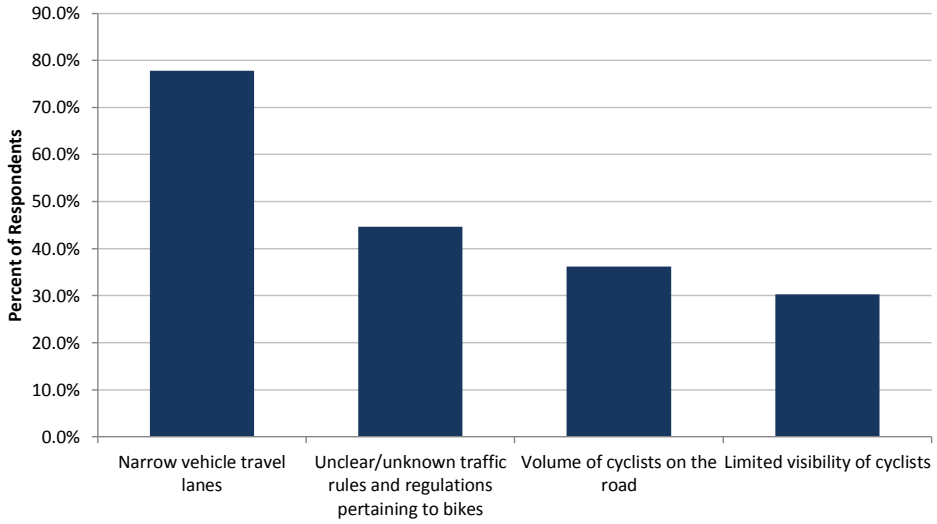
BLANK PAGE
June 2013

APPENDICES:

- Appendix A: Community Survey Summary
- Appendix B: Resources
- Appendix C: Definitions
- Appendix D: Engineering Priorities

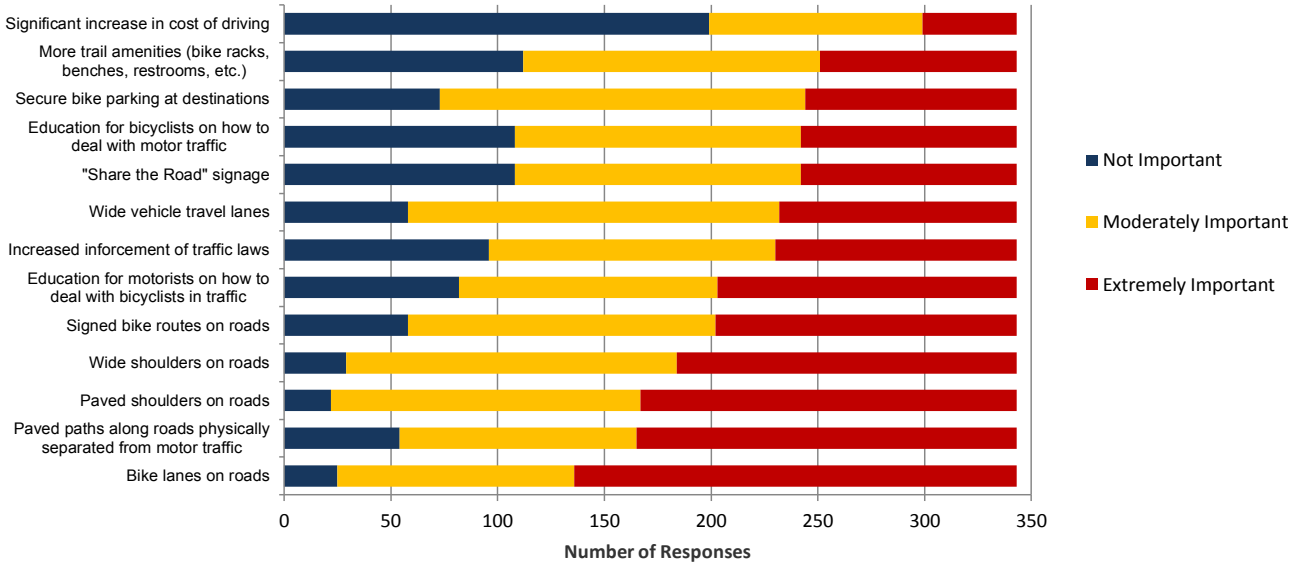
Appendix A: Community Survey Summary

1. When driving on streets where cyclists are present, what challenges currently exist in Lake Forest?



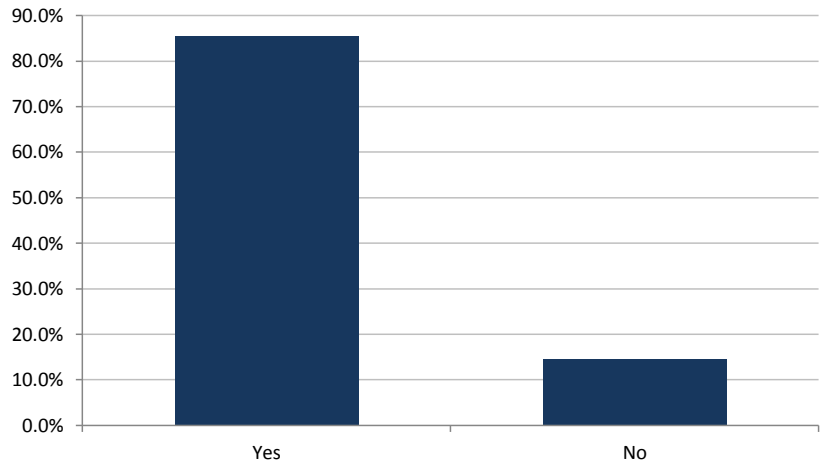
Seventy-eight percent of respondents indicated that narrow vehicle travel lanes are an issue in Lake Forest when it comes to driving on streets where cyclists are present. Respondents identified unclear or unknown traffic rules and regulations pertaining to bikes as the second most common issue.

2. Which conditions would encourage you to bike more than you do today?



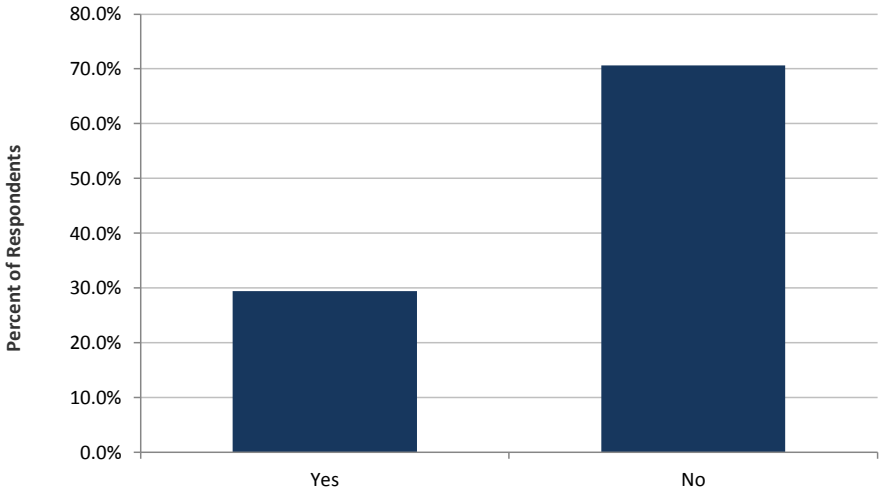
Most of the respondents indicated that they would be "extremely" or "moderately" encouraged to ride more often if there were marked bike lanes on the roads. The majority also indicated that paved or wide shoulders on roads would also encourage them to ride more often. Many indicated that signed bike routes, education of motorists and cyclists and increased enforcement of traffic rules would be encouraging as well.

3. Do you think it is important for bike routes in Lake Forest to provide connectivity beyond city boundaries?



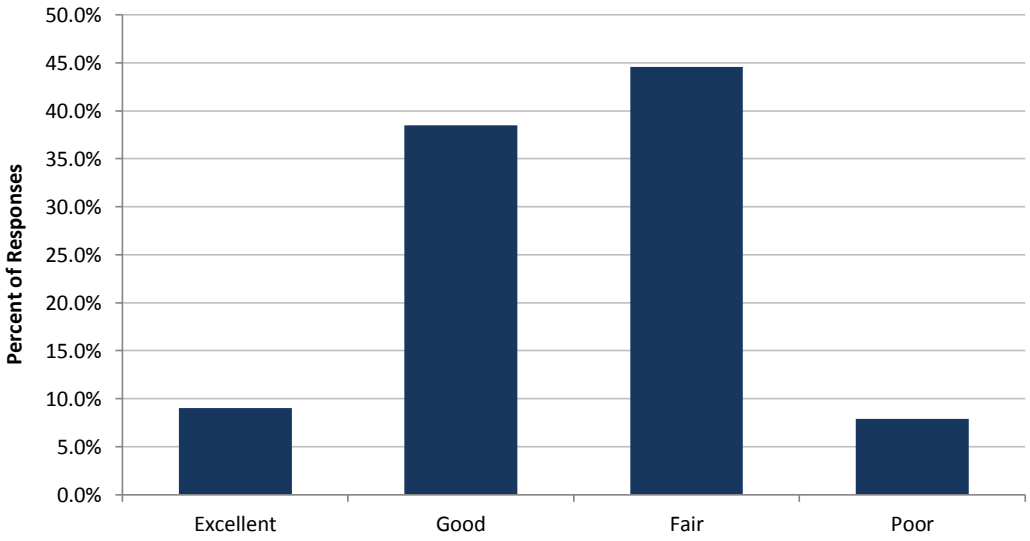
Over 85% of respondents indicated that it is important that bike routes connect Lake Forest to destinations beyond the City limits.

4. Do the existing bike facilities in Lake Forest provide adequate connectivity within Lake Forest?



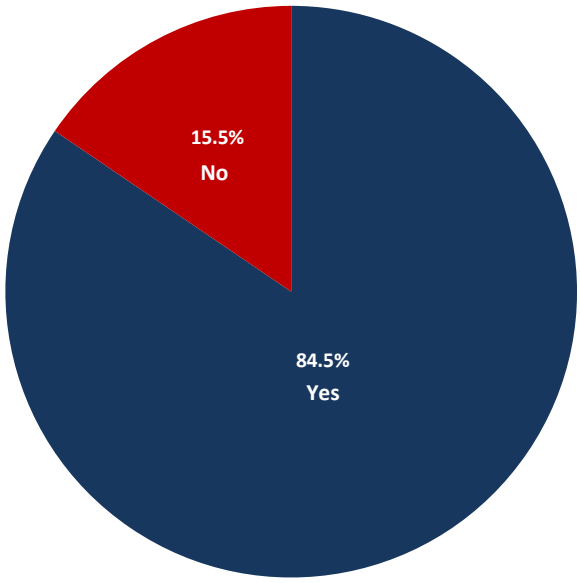
The majority of respondents (71%) indicated that Lake Forest does not provide adequate connectivity within the City.

5. What is your opinion of availability of bike trails and paths in Lake Forest?

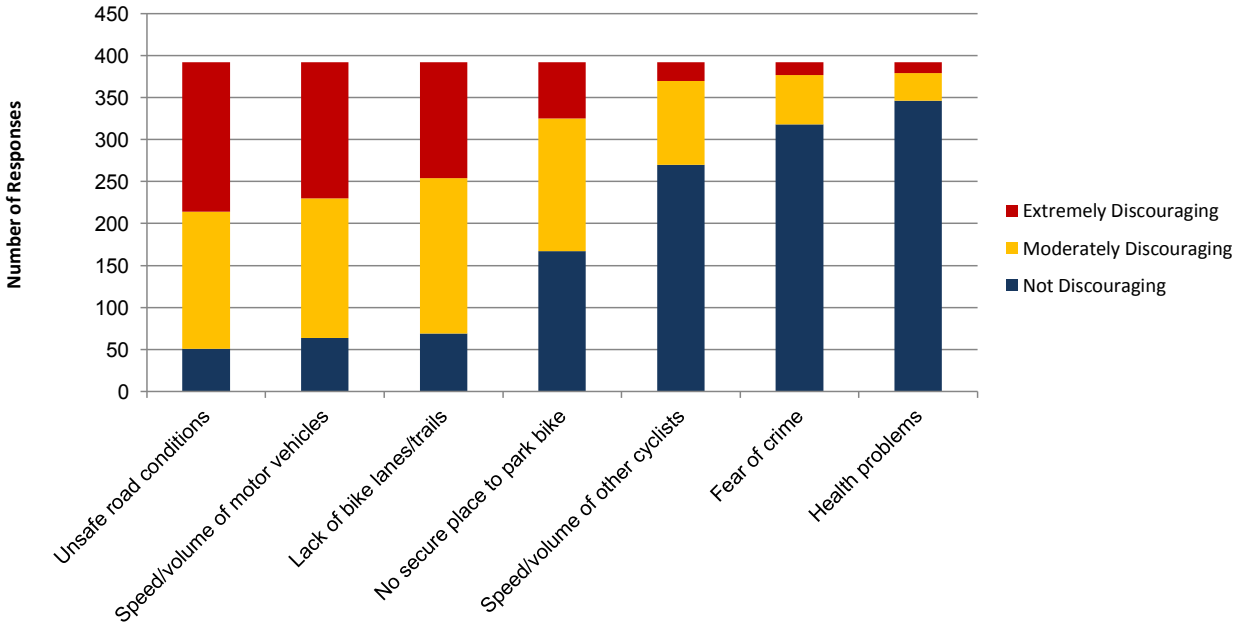


Forty-five percent of respondents indicated that the availability of bike trails and bike paths in Lake Forest is only fair; while 39% indicated that the availability is good.

6. Would you take longer routes to your destination in order to use bike facilities?

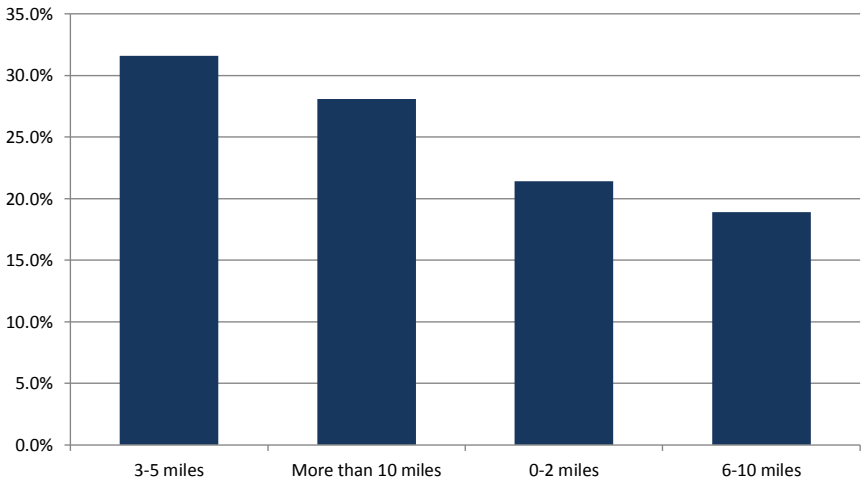


7. Which situation discourages you from riding a bike more often or from not riding at all?



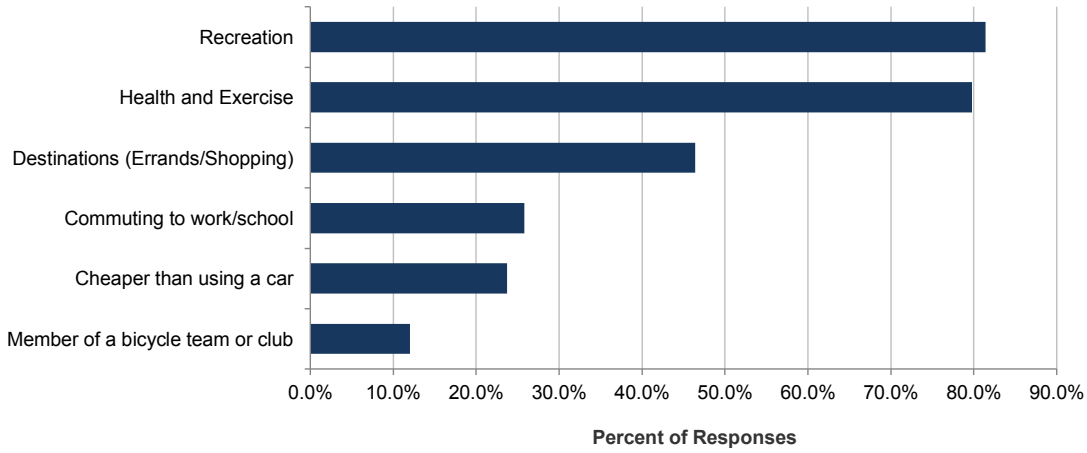
Responses to the survey indicate that cyclists are more discouraged from riding more by unsafe road conditions, the speed and volume of motor vehicles, and the lack of bike facilities. Lack of secure bike parking also discourages a large percentage of cyclists. Seceral responses also indicate concerns about the speed and volume of other cyclists.

8. How many miles do you typically ride your bike during a single trip?



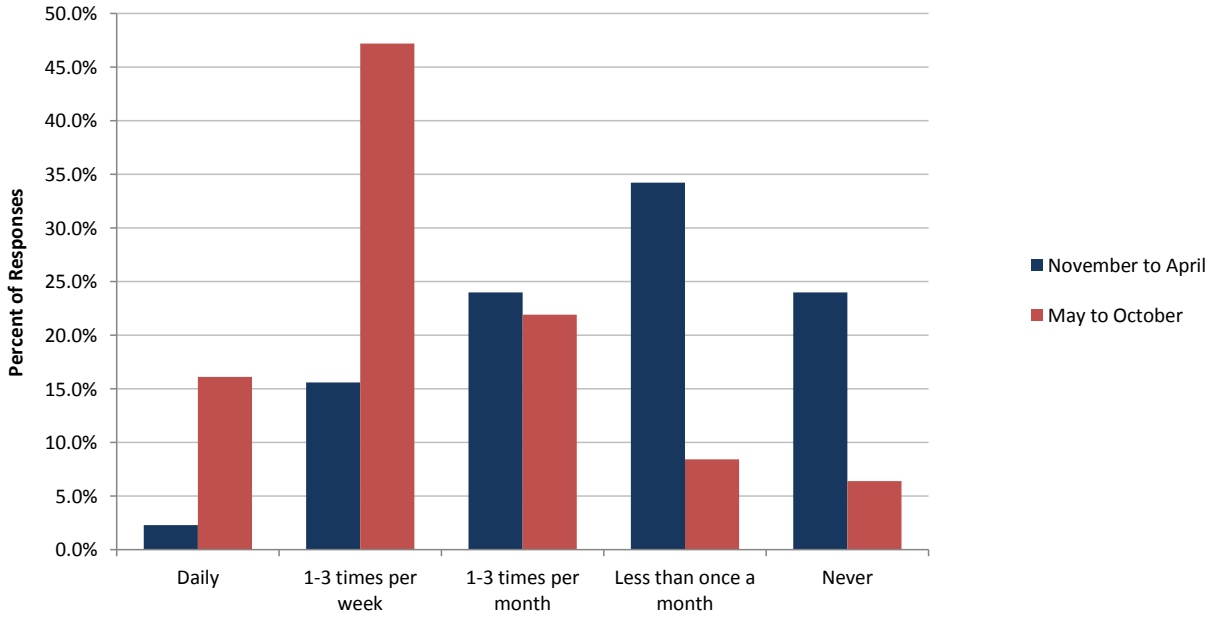
Responses to the survey indicate that bikes are used in Lake Forest for a variety of trips including recreation purposes and exercise, commuting, and to run errands. Over 30% of respondents indicated that they ride 3-5 miles during a single trip and 28 % ride more than 10 miles for a typical ride.

9. Why do you ride your bike?



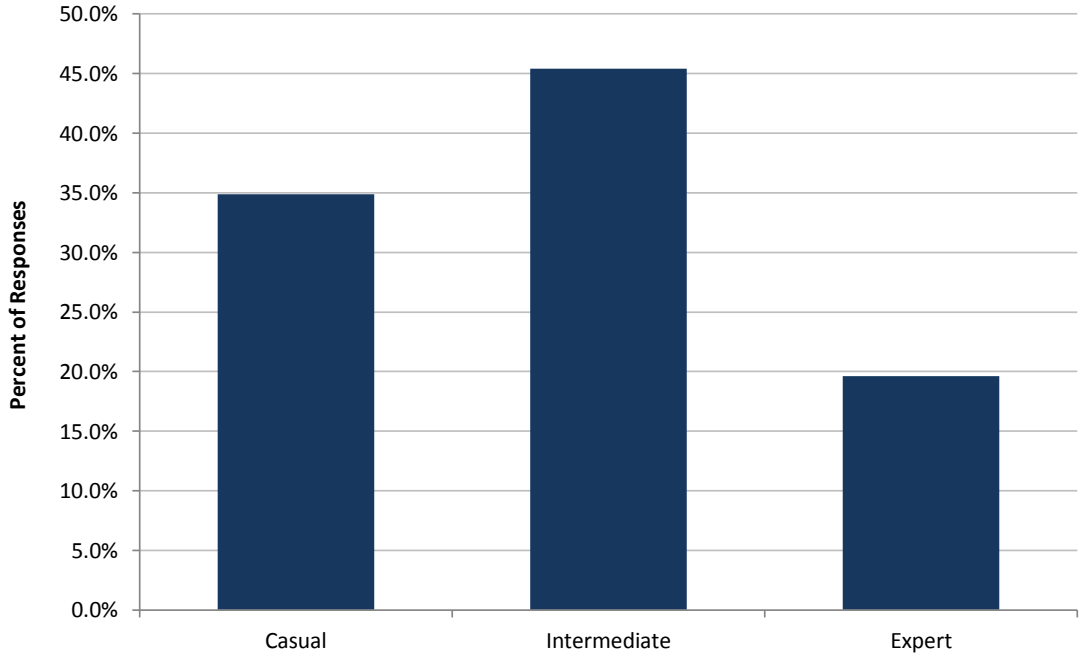
Most respondents who live, work or attend school in Lake Forest indicated that they bike for health and exercise as well as for recreation. Almost 50% of respondents indicated that they also ride their bikes to run errands or to go shopping. Twenty six percent of respondents indicated that they use their bikes to get to and from work or school.

10. How often do you ride your bike in Lake Forest?



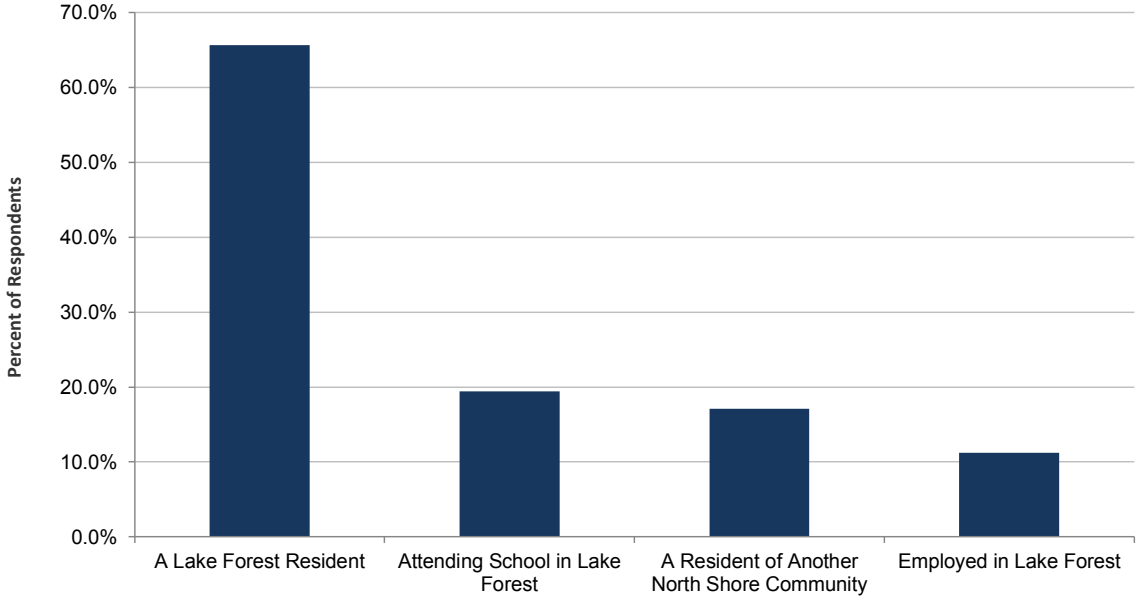
Most respondents indicate that they ride their bikes in Lake Forest more often during the warmer months of May to October than November to April. However, over 15% of respondents indicate that they still ride their bikes 1-3 times per week during the winter months and 24% ride 1-3 times per month during that time. Fifteen percent of respondents ride their bikes daily during the warmer part of the year. Thirty-two percent of the total "daily" riders cycle for the purpose of getting to and from school.

11. What do you consider your level of biking experience?



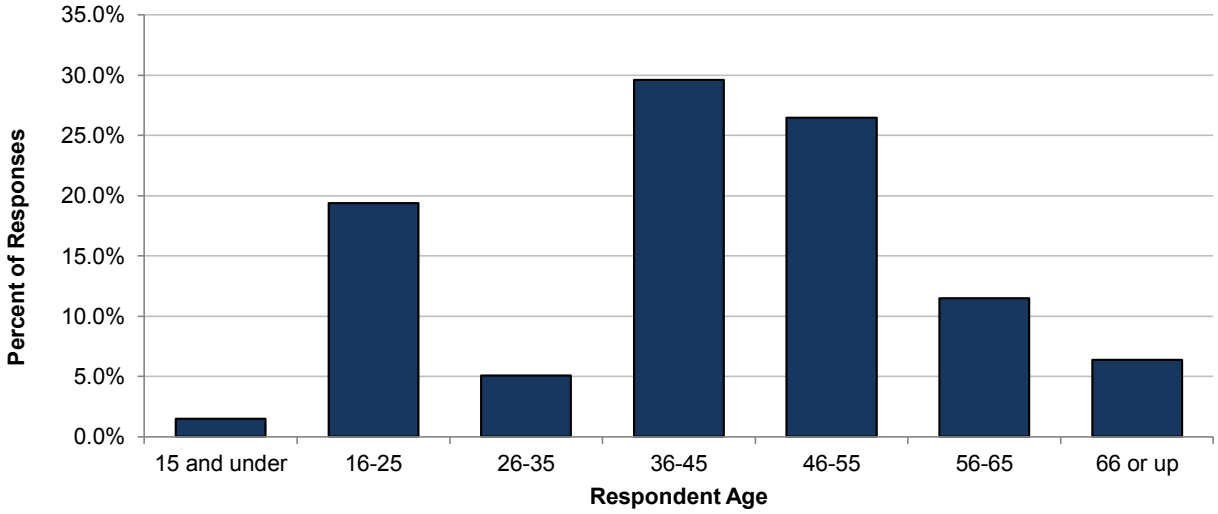
Most respondents were of "intermediate" or "casual" level of experience (45% and 35% respectively).

12. Are you...



The majority, 66%, of respondents were Lake Forest residents. Nineteen percent of respondents attend school in Lake Forest.

13. Respondent Age



393 people responded to the Bicycle Master Plan Survey. The highest response came from people aged 36-45 (almost 30%). The second largest group of respondents were aged 16-25 and represented 19% of the total responses.

Appendix B: Resources

Design Criteria

The proposed planning and design of the routes identified in the Bicycle Master Plan should follow the industry standards and accepted design guidelines in the State of Illinois. The following manuals, as updated by the State, or Advocacy Groups should be consulted as part of the implementation of any new bicycle facililty.

- Active Transportation Alliance
- Bicycle Parking Guidelines - Association of Pedestrian and Bicycle Professionals
- Guide for the Development of Bicycle Facilities - AASHTO, American Association of State Highway and Transportation Officials
- Illinois Bicycle Rules of the Road - Secretary of State
- League of Illinois Bicyclists (LIB)
- League of American Bicyclists (LAB)
- Manual on Uniform Traffic Control Devices, Part 9 - Federal Highway Adminstration, U.S. Department of Transportation
- Urban Bikeway Design Guide - NACTO, National Association of City Transportation Officials

Funding Opportunities (revised April 2012)

	Surface Transportation Program (STP)	Highway Safety Improvement Program (HSIP)	Safe Routes to School Program (SRTS)	Transportation Enhancement Activities (TEA)	Congestion Mitigation/Air Quality Program (CMAQ)	Recreational Trails Program (RTP)	Federal Transit Administration Capital Funds (FTA)	Transit Enhancements (TE)	Bridge (BRI)	State and Community Traffic Safety Program (402)	State/Metropolitan Planning Funds (PLA)	Transportation and Community and System Preservation Pilot Program (TCSP)	Access to Jobs/Reverse Commute Program (JOBS)	Federal Lands Highway Program (FLH)	Scenic Byways (BYW)
Bicycle lanes on roadway	*	*	*	*	*		*	*	*			*		*	*
Paved Shoulders	*	*	*	*	*				*			*		*	*
Signed bike route	*		*	*	*		*					*		*	*
Shared use path/transportation trail	*	*	*	*	*	*	*		*			*		*	*
Recreational trail						*						*		*	
Spot improvement program	*	*	*	*	*		*					*			
Maps	*		*		*		*			*		*			
Bicycle parking facilities	*		*	*	*		*	*				*			*
Bicycle share (capital costs only, operations not eligible)	*			*	*		*	*				*	*	*	
Bicycle storage/service center	*		*	*	*		*	*				*	*		
Sidewalks, new or retrofit	*	*	*	*	*		*	*	*			*		*	*
Crosswalks, new or retrofit	*	*	*	*	*		*	*				*		*	*
Trail/highway intersection	*	*	*	*	*	*						*		*	*
Signal improvements	*	*	*	*	*		*					*			
Curb cuts and ramps	*	*	*	*	*		*					*			
Traffic calming	*	*	*				*					*			
Safety/education position	*		*						*						
Police Patrol			*						*						
Helmet Promotion	*		*	*					*						
Safety brochure/book	*		*	*	*	*			*						
Training	*		*	*	*	*			*						

Source: "FHWA Guidance - (Updated October 22, 2008) Bicycle and Pedestrian Provisions of Federal Transportation Legislation"
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/bp-guid.cfm#bp4

Appendix C: Definitions

AASHTO (AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS)
A nonprofit organization representing highway and transportation departments in the US with a goal to foster the development, operation, and maintenance of an integrated national transportation system.

ACTIVE TRANSPORTATION
A form of travel that is powered by the human body. Most popular active modes of transportation are cycling and walking, but also includes in-line skating, using a wheelchair, riding a skateboard, cross country skiing, canoeing and kayaking.

ALTERNATIVE TRANSPORTATION
A type of transportation that does not utilize the use of a private car such as bicycling or riding a train.

BICYCLE (BIKE) FACILITY
Improvements and provisions made to accommodate or encourage bicycling such as: new or improved lanes, path or shoulders for the use of bicyclists, traffic control devices, shelters and parking facilities for bicycles.

BICYCLE LEVEL OF SERVICE (BLOS)
A nationally recognized measure of on-road bicyclist comfort level as a function of a roadway's geometry and traffic conditions as developed by the League of Illinois Bicyclists.

BICYCLE PARKING:
Infrastructure specifically designed for the safe parking of bicycles.

BICYCLE (BIKE) ROUTE - Signed:
A roadway designated as preferential for bicycle use by adding "bike route" signs, without providing other specific bicycle facilities.

BIKE BOX:
A colored area at a signalized intersection that allows bicyclists to pull in front of waiting traffic. Designed to be used only at red lights, the box is intended to reduce car-bike conflicts, increase cyclist visibility and provide bicyclists with a head start when the light turns green. Of particular concern is the "right hook" collision that can happen when drivers turn right as a bicycle starts straight through an intersection. Bike boxes have been shown to be most effective when paired with a brightly colored bike lane that extends through the intersection, to remind motorists that cyclists may be traveling straight.

BIKE LANE:
Portion of a roadway which has been designated by pavement markings for the preferential or exclusive use of bicyclists.

BIKE TRAIL:
A bikeway physically separated from motorized vehicular traffic by an open space or barrier.

COMPLETE STREET:
A street that is designed for all users alike: motor vehicles, pedestrians and cyclists.

IDOT:
Illinois Department of Transportation.

LANE (TRAVEL)
Lanes on the road designated for vehicular traffic

LEAGUE OF ILLINOIS BICYCLISTS (LIB):
A not-for-profit organization dedicated to improving bicycling conditions in Illinois and a statewide advocate for all Illinois bicyclists, promoting bicycle access, education, and safety.

LIMITED ACCESS ROADWAY:
A highway or arterial road for high-speed traffic with limited or no access to adjacent property, some degree of separation of opposing traffic flow, use of grade separated interchanges to some extent, prohibition of some modes of transport such as bicycles or horses and very few or no intersecting cross-streets.

MODE-SHIFT:
Transitions from one mode of transportation to the other as the advantages are acknowledged.

NACTO:
National Association of City Transportation Officials. A coalition of several US largest cities with a mission to "encourage the exchange of transportation ideas, insights and practices among large cities while advocating for a federal transportation policy that prioritizes investment in infrastructure in the nation's large cities and metropolitan areas."

PAVEMENT SENSORS:
Sensors embedded in the pavement of the road triggering traffic signals to change. Many pavement sensors are not sensitive to bikes.

UTILITARIAN USE OF A BIKE FACILITY:
The use of a bike facility for the purpose of transportation such as commuting or running errands rather than for recreation.

ROAD DIET:
Reducing the width of a vehicle travel lane to accommodate bicycle improvements.

SHARROW:
A street marking installed just right of center in a vehicle travel lane to indicate an area for bicyclists. Sharrows are used when vehicle lane width is not great enough to allow a car and bike to move side by side. Cars passing bicycles on a route with sharrows may need to cross the road centerline when on-coming traffic has cleared to move around the cyclist.

SHOULDER:
The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles. Shoulders are recognized as the best way to accommodate bicyclists in rural areas.

TRAFFIC VOLUME:
The average amount of traffic passing on a street measured in Average Annual Daily Traffic Count (AADT or ADT), which is the average number of cars per day on a given section of a road. AADT is reported as one number, indicating both lanes of traffic combined or as two numbers, one for each lane of traffic. Low = Under 2,000 AADT; Medium = 2,000 to 10,000 AADT; High = Over 10,000 AADT.

Appendix D: Engineering Priorities

Connection	Improvement/Bicycle Facility	Priority Level		
		High	Med.	Low
Everett/Old Elm Roads (Fort Sheridan to West Metra Station and I-94 Overpass)	Improve bicycle crossing at the intersections with HWY 41 and Route 43 by incorporating bike boxes and sensors.	X		
	Improve the roadway surface conditions.	X		
	Replace existing signage and install updated signage.	X		
	Install Sharrows.	X		
Westleigh Rd	Improve bicycle crossing at the intersections with HWY 41 and Route 43 by incorporating bike boxes and sensors.	X		
	Install sharrows between HWY 41 and Waukegan Road.		X	
	Install Share the Road signage.	X		
	Improve the roadway surface conditions.	X		
	"Road Diet" between Route 41 and Western Ave to provide a wide shoulder/bike lane for bicyclists.		X	
Route 60 (Route 41 to Tollway)	Coordinate with State authorities and surrounding land holders to develop a vision for Route 60 corridor and the surrounding connection opportunities including a railroad crossing north of Route 60.	X		
	Improve bicycle crossing at the intersections with Route 43 by sensors and pavement markings at crossing.			X
Laurel Ave (Robert McClory Bike Path to Skokie Valley Bike Path)	Improve intersection with Green Bay Road.	X		
	Install wayfinding signage on Western Ave to Woodland Rd to provide a connection to the Robert McClory Bike Path.		X	
	Improve the roadway surface conditions.			X
	Install wayfinding signage along Laurel Ave.			X
Deerpath (Skokie Valley Bike Path to Middlefork Savanna Trail)	Improve bicycle crossing at the intersections with Route 43 by incorporating bike boxes.	X		
	Improve intersection with HWY 41.	X		
	Install Sharrows.		X	
	Improve the roadway surface conditions.			X
	Provide connection to Middlefork Savanna Trail.			X
	Install wayfinding signage showing alternative route along Ahwanee/Onwentsia.	X		
Deerpath (Robert McClory Bike Path to Forest Park)	Install wayfinding signage and "Bike Route" signs.		X	
	Provide improved bicycle parking at Forest Park.	X		
	Improve the roadway surface conditions.			X
Onwentsia-Ahwanee	Install wayfinding signage and "Bike Route" signs.	X		
	Improve the roadway surface conditions.		X	

Connection	Improvement/Bicycle Facility	Priority Level		
		High	Med.	Low
Lake and Ravine Tour (Ringwood-Mayflower-Spring-Lake-Spruce-McClory Bike Path)	Install wayfinding signage and "Bike Route" signs.		X	
	Improve the roadway surface conditions.		X	
Conway Farms (Everett Rd to Route 60)	Install wayfinding signage and "Bike Route" signs.		X	
	Improve the roadway surface conditions.			X
Field Drive (Route 60 to Municipal Services Building)	Install sharrows.			X
	Install wayfinding signage and "Bike Route" signs.		X	
	Improve the roadway surface conditions.			X
	Provide bicycle parking at office buildings.			X
Middlefork Drive (Waukegan Rd. to Middlefork Savanna Trail)	Install wayfinding signage and "Bike Route" signs.			X
	Improve the roadway surface conditions.			X
Telegraph Road (West Lake Forest Train Station South to Bannockburn)	Install wayfinding signage and "Bike Route" signs.			X
	Improve the roadway surface conditions.		X	
Ridge Rd (Skokie Valley Bike Path to Senior Center and Northcroft Park)	Install wayfinding signage and "Bike Route" signs.		X	
	Improve the roadway surface conditions.	X		
Waukegan Rd (Lake Bluff-Lake Forest Bannock-Connection)	Coordinate regional connections with state authorities, Village of Lake Bluff, Village of Bannockburn and surrounding land owners		X	
	Provide wayfinding signage.		X	
	Modify existing side path to meet standards outlined in the Bicycle Master Plan.		X	
Robert McClory Bike Path	Improve the pathway surface conditions.	X		
	Provide a multi-use connection between Illinois and Woodland Roads.	X		
	Provide wayfinding signage.	X		
	Clear pathway of brush and vegetation that restricts visibility and is hazardous to trail users.	X		
Skokie Valley Bike Path	Improve the pathway surface conditions.		X	
	Provide wayfinding signage.	X		
	Clear pathway of brush and vegetation that restricts visibility and is hazardous to trail users.		X	

BLANK PAGE
June 2013

Keep on Pedaling!