

Twin Cities Regional Bicycle System Study

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Table of Contents

1. Project Overview	1	5 Study Outcomes	25
1.1 Study Scope	1	5.1 Proposed Network.....	25
1.2 Structure of this Report	1	5.1.1 Addressing Agency and Public	
		Input on Draft Network	28
2. Background and Existing Conditions.....	3	5.1.2 How the Network Addresses the	
2.1 Evolution of Bicycling in the		Guiding Principles.....	28
Twin Cities Region.....	3		
2.2 Planning Landscape.....	5	6 Moving Forward.....	30
2.2.1 Transportation Policy Plan (TPP)		6.1 Next Steps for the Network.....	30
and Other Planning Efforts	5	6.2 Framework for Evaluation and	
2.2.2 Primary Data Sources.....	7	Performance Measures.....	30
2.2.3 Existing Plan Review Findings.....	8	6.2.1 Performance Based Planning ...	30
		6.2.2 MnDOT Statewide Bicycle	
3. Agency and Public Input	9	Planning Study Recommended	
3.1 Agency Input	9	Performance Measures	31
3.2 Public Engagement.....	11	6.2.3 Twin Cities Region Performance	
		Measures – Near Term.....	32
4. Development of Proposed Regional Bicycle		6.2.4 Twin Cities Region Performance	
Transportation Network	12	Measures – Longer Term	32
4.1 Defining the Regional Bicycle		6.3 Conclusion	33
Transportation Network and Priority			
Regional			
Bicycle Transportation Corridors	12		
4.2 Defining Critical Bicycle			
Transportation Links.....	12		
4.3 Guiding Principles for			
Regional Bicycle Corridors.....	14		
4.4 Development of Corridor			
Spacing Guidelines.....	14		
4.4.1 Corridor Spacing Research.....	15		
4.4.2 Spacing of			
Proposed Network.....	16		
4.5 Network Scoring and Prioritization	16		
4.5.1 10 Key Factors for			
Network Scoring	17		
4.5.2 Scoring Methodology	18		
4.5.3 Prioritization	19		
4.6 Regional Bicycle Transportation			
Network Scoring Map.....	20		

List of Appendices

Appendix A – Summary of Relevant Data, Studies, and Plans
Appendix B – Community Engagement Report
Appendix C – Corridor Spacing Research
Appendix D – Stakeholder Input to Network Development
Appendix E – Final Scoring Methodology and Maps
Appendix F – Research on Performance Measures

1. Project Overview

The Twin Cities Regional Bicycle System Study (the “Study”) is designed to deepen understanding of the bicycle component of the regional transportation system and improve the knowledge base of the role of bicycling for the region’s 2040 Transportation Policy Plan (TPP) update. This includes a better understanding of how on-street bikeways and off-road trails interact to serve regional transportation trips. The Study results will inform the TPP process in setting regional priorities for planning and investments in bicycle transportation.

The current TPP addresses increasing connectivity and removing barriers for bicycle travel and has a primary focus on policy without defining a network or bicycle transportation system. This Study is the first step in defining a regional bicycle transportation system and developing a network approach to bicycling investments at the regional level.

The intent of the Regional Bicycle Transportation Network is to encourage planning and implementation of future bikeways. The result will be a seamless network of on- and off-road facilities that will improve conditions for regional bicycle transportation.

The Study will also inform aspects of MnDOT bicycle planning efforts, especially the MnDOT Metro District Bicycle System Plan to be completed in 2014. To increase coordination, MnDOT planners were a part of the Project Management Team (PWT) for the Study, and the MnDOT Bicycle and Pedestrian Coordinator had a seat on the Study’s Project Advisory Committee (PAC).

1.2 Study Scope

Specifically, this Study provides a more complete understanding of how the regional bicycle transportation network functions, particularly with respect to on-road routes and facilities. The focus of this Study is to examine the transportation function of the bicycle network, with an understanding that significant segments of multi-use, recreational off-road trails in the Twin Cities can often serve purposeful transportation trips by connecting key regional destinations. This Study used local data and stakeholder input to guide a process that:

- Identified key regional bicycle destinations.
- Developed guiding principles to define the roles for regional bicycle corridors and regional critical links.
- Identified a set of regional bicycle transportation corridors.
- Proposed a framework for monitoring the performance of the regional bicycle transportation system on an ongoing basis.

1.2 Structure of this Report

This report is divided into sections as described below.

Section 1 is the Project Overview.

Section 2 describes the *existing conditions* for bicycling in the Twin Cities and the *planning environment* in which this Study is being performed.

Section 3 provides a summary of the *agency and public input* received over the course of the Study.

Section 4 provides an overview of the *process used to develop and analyze the proposed Regional Bicycle Transportation Network*. This section describes the creation of the initial network and how data and

stakeholder input were used to analyze and refine the proposed regional bicycle network. This includes the process of developing the *guiding principles* for the regional bikeway network, the *network scoring and prioritization process*, and research on network corridor spacing and refinements made to the draft network.

Section 5 presents the Study outcomes including proposed *priority corridors* for the Regional Bicycle Transportation Network. Network corridor segments were evaluated against criteria based on the guiding principles outlined in Section 4.

► 2. Background and Existing Conditions

2.1 Evolution of Bicycling in the Twin Cities Region

Bicycling has long been an important part of the civic culture in the Twin Cities region. Bicycles were first introduced in the late 1800s, and by the early part of the 20th century, there already were bicycle paths through several parts of the urban core of Minneapolis and Saint Paul – both within parks, and along major streets.

Minneapolis has always been a leader in providing infrastructure needed to support bicycling. As early as 1896, the city constructed on-street bicycle facilities along arterials like Lake Street. The city's Grand Rounds park system - set aside around the turn of the 20th century - has provided a perfect venue to establish and expand an attractive off-road bikeway system. In the 1970s, paved off-road trails were completed

throughout the 55-mile loop. Minneapolis, along with other communities in the Twin Cities region, began to designate on-road bicycle routes.

Recent decades have seen a proliferation of new trails in the region. Abandoned railroad rights-of-way have been converted to trail use throughout the Twin Cities, starting with the Luce Line State Trail, which was constructed in 1977. In the 1990s, a number of influential rails-to-trail conversions opened, including:

- Cedar Lake Trail from downtown Minneapolis to the west suburbs, often dubbed the first “bicycle freeway” in the US.
- U of M Transitway between the Minneapolis and Saint Paul campuses.
- Gateway State Trail from Saint Paul to the northeast suburbs.
- A multi-use trail on the historic Stone Arch Bridge over the Mississippi River in downtown Minneapolis.

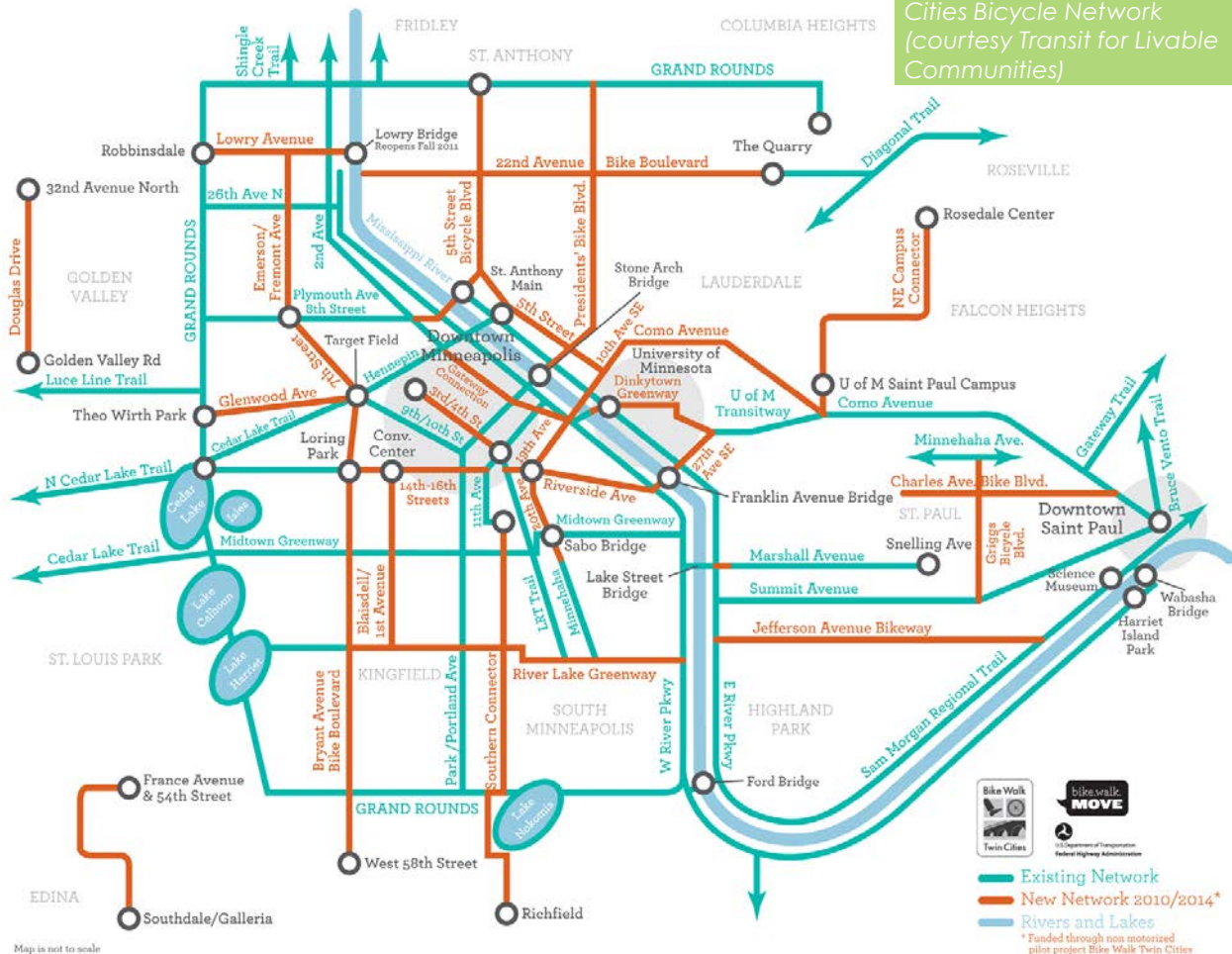
Minneapolis and Saint Paul began substantial efforts to implement on-road bicycle lanes in the late 1990s, including Park and Portland Avenues south of downtown Minneapolis and Summit Avenue through Saint Paul. A number of new bicycling projects were made possible as federal transportation funding began making more funds available for bicycle infrastructure, starting with the Intermodal Surface Transportation Equity Act (ISTEA) in 1991.

By the early 2000s, the region's bicycling infrastructure became interconnected, as many cities have built out a full range of bicycling infrastructure. Minneapolis' Midtown Greenway opened in 2000, and Saint Paul's Sam Morgan trail along the downtown riverfront opened in 2002. Meanwhile, cities and counties across the Twin Cities began designating bike lanes, bike boulevards, and other bicycle-



The Twin Cities benefit from a rich history of investing in trails for both recreation and transportation.

Figure 2- Bike Walk Twin Cities Bicycle Network (courtesy Transit for Livable Communities)



specific facilities to accommodate the full range of users and destinations by bicycle. Government agencies at the state and local levels have increasingly undertaken planning for new bicycle facilities, and have designated staff positions to bikeway planning and implementation.

Recent years have built on previous momentum. In 2005, Minneapolis was selected as one of four pilot communities to receive special funding through the federal Non-Motorized Transportation Pilot Program (NTPP¹) which was known locally as Bike

Walk Twin Cities and administered by Transit for Livable Communities (Figure 2). The NTPP earmarked over \$25 million for bicycling and walking investments targeted at Minneapolis and adjacent communities. Full build out of the NTPP program investments have resulted

1 The Nonmotorized Transportation Pilot Program (NTPP) SAFETEA-LU Section 1807 http://www.fhwa.dot.gov/environment/bicycle_pedestrian/ntpp/



Figure 3 - The Nonmotorized Transportation Pilot Program NTPP added 75 miles of new bicycle facilities, including Franklin Avenue in Minneapolis.

Table 1- 2012 Bicycle Commute Mode Share based on American Community Survey (ACS)

American Community Survey (ACS)	Bicycle Commute Mode Share 2012	Rank	Bike Friendly Status
Minneapolis, MN	4.5%	2	Gold
Saint Paul, MN	1.4%	17	Bronze
70 largest cities average	1.2%	n/a	n/a
National Average	0.6%	n/a	n/a

in the implementation of many recognizable new bicycle innovations, including 75 new miles of bicycle facilities (almost entirely on-road) and the first large-scale urban bicycle sharing program. The program, Nice Ride Minnesota, began operations in Minneapolis in 2010, and now operates in both Minneapolis and Saint Paul with over 1,400 bicycles available at 175 locations. The Nice Ride program has served as a national model for bike sharing.

In 2011, the Minnesota segment of the Mississippi River Trail (MRT) bikeway was designated as Minnesota's first state bikeway and became the first signed and completed segment of the United States Bicycle Route System.

Despite the challenge of having a cold climate, the Twin Cities consistently ranks highly in the US for bicycling's share of travel, and for its infrastructure (Table 1). According to the League of American Bicyclists, both Minneapolis and Saint Paul rank in the top 20 among the 70 largest US cities in percentage of bicycling commuters identified in the Census Bureau's American Community Survey (Minneapolis is currently ranked 2nd behind Portland, Oregon). The League of American Bicyclists has also recognized both cities with the Bicycle Friendly Community (BCF) designation and in 2013 added the city of Richfield to the BCF list. Minneapolis is one of only four major cities in the United States to achieve Gold status (Saint Paul and Richfield have both achieved bronze).

2.2 Planning Landscape

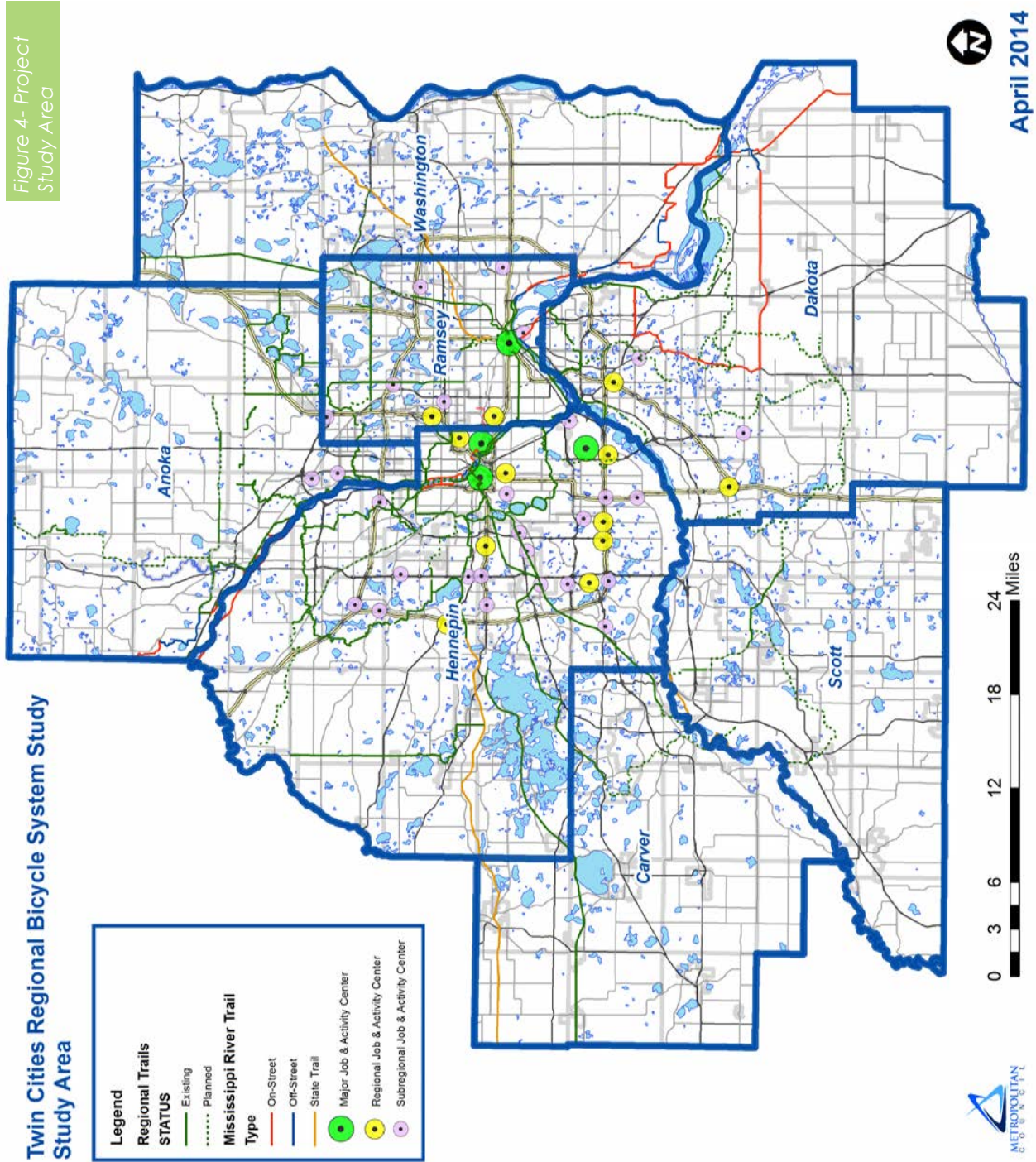
2.2.1 Transportation Policy Plan (TPP) and Other Planning Efforts

This Study is designed to help shape the future of bicycling in the seven-county metropolitan region (Figure 4) through a number of channels, but most significantly via the Twin Cities' Transportation Policy Plan (TPP). The Twin Cities' TPP guides decisions and investments in regional transportation infrastructure, including highways, transit, freight, pedestrians, bicyclists, aviation, and overall mobility. The Plan was last updated in 2010. Federal transportation policy requires that it be updated every four years.

As the federally designated Metropolitan Planning Organization for the Twin Cities metropolitan area, the Metropolitan Council, is responsible for updating the region's long-range TPP. The 2040 TPP update is being developed in conjunction with the update for the region's long-range development plan, known as Thrive MSP 2040.

The Metropolitan Council, guided by local partners on the Transportation Advisory Board, allocates federal funding for regionally significant transportation projects for all transportation modes. These projects become part of the region's four-year Transportation Improvement Program (TIP), updated at least every two years. These updates include engagement of a wide range of interested public stakeholders.

Figure 4- Project Study Area



The Regional Bicycle System Study originates from the work program adopted as part of the 2030 TPP. According to the 2030 TPP, this Study is to be “an analysis of existing conditions, connectivity and levels of use of the bikeway system with a special emphasis on connectivity to regional transitways and major travel generators” (2030 TPP, page 247). The results of this Study will provide the technical basis for updating the bicycling component of the region’s TPP update, to be completed in 2014.

Several other planning efforts will help define the future of bicycling in and around the metro area, and this Study is expected to help inform these related planning efforts.

Regional Trails Planning: Regional trails are designated by the Metropolitan Council as part of the regional parks system. The Metropolitan Council oversees long range planning and provides funding assistance for the acquisition and development of regional parks and trails. The regional parks system is owned and operated by 10 partner agencies: the counties of Anoka, Carver, Dakota, Ramsey, Scott and Washington; the cities of Bloomington and Saint Paul; the Minneapolis Park and Recreation Board and Three Rivers Park District.

Regional trails are identified in the 2030 Regional Parks Policy Plan as linking trails and destination/greenway trails. Linking regional trails are typically off-road facilities that connect regional parks and trails to one another. These trails are primarily located in the developed or developing areas of the region. Destination, or greenway, regional trails are adjacent to high quality natural areas and may follow waterways such as rivers, streams or lakes, where the trail itself is a destination.

Regional trails are an important component reviewed in this Study, since regional trails

may provide both a transportation and a recreation function. The proposed regional bicycle network includes portions of the regional trail system, particularly where regional trails serve to most efficiently connect regional destinations. Although regional trails may serve recreational cyclists and commuters, they are not exclusive bikeways. The regional trail system is intended to be multi-use and is available to bicyclists, pedestrians and inline skaters. Therefore, not all regional trails are included in the regional bicycle transportation network.

Thrive MSP 2040. The Metropolitan Council’s long-range regional development framework plan is updated every ten years. The Thrive MSP 2040 plan was adopted by the Metropolitan Council in the spring of 2014. Thrive MSP 2040 sets the overall policy framework for the region’s three systems plans, including the Transportation Policy Plan.

Minnesota Statewide Bicycle System Plan. In 2013-2014 MnDOT updated their plan for the statewide bicycle system as part of its Minnesota GO family of transportation plans. The Statewide Bicycle System Plan includes an inventory of existing conditions and a proposed plan for the future of the state bicycle system. Specific plans are developed for each of the eight MnDOT districts, and this Study informed the Metro District Bicycle System Plan in identifying regional priorities.

2.2.2 Primary Data Sources

This Study relied extensively on Geographic Information Systems (GIS) for mapping and analysis to develop and evaluate the proposed Regional Bicycle Transportation Network. Data from many sources were collected and assessed for potential use and analysis including data provided by the Metropolitan Council and local and state agencies. The following datasets were used in

network development:

- Metro Bikeways (2007, Metropolitan Council)
- Regional Trails, existing and planned (10/14/2013, Metropolitan Council)
- Cyclopath user request origin and destination data (12/2012, University of Minnesota)
- Planned Land Use 2030 (2010, Metropolitan Council)
- Regional job and activity centers (2010, Metropolitan Council)
- Metro Transit Transitways and Stations (2013, Metropolitan Council)
- Other key destinations such as regional parks, colleges and universities and major sports and entertainment destinations (various existing data sources)

Additionally, new data was generated during the Study process reflecting public input from the focus groups, workshops and on-line mapping tool. A list of all data sets available, as well as more specific information and descriptions of each of the data sets are provided in Appendix A.

2.2.3 Existing Plan Review Findings

The plan review documented criteria used to define existing bicycle corridors within the region. Existing plans reviewed included the Metropolitan Council's 2030 Transportation Policy Plan, bicycle and/or transportation plans from each of the seven metro counties, various metro area cities, and MnDOT's Statewide Bicycle Planning Study (completed in 2013) that laid the ground work for their twenty-year Statewide Bicycle System Plan.

Overall, the criteria documented in the plans include:

- Qualitative measures for defining trail and bikeway corridors, (e.g., links between origins and destinations, improved access to transit, continuous connections

between communities, connections between on-road bikeways and off-road trails, removal of barriers and gaps, and directness of routes).

- Quantitative measures regarding the type and spacing of bikeway facilities, as identified in both the Minneapolis Bicycle Master Plan and the Saint Paul Transportation Plan. Bloomington's Alternative Transportation Plan strongly advocates that the quality of bicycle facilities should take precedence over quantity.
- Geographic considerations based on roadway function, jurisdiction, and ownership (e.g., principal or minor arterials, public rights-of-way along roadways and rail corridors, high use corridors, and parallel local streets).
- Trip purpose (e.g., purposeful transportation including commute and errand trips or recreational trips).

Appendix A provides a comprehensive list of all the major criteria used in defining bicycle corridors that were documented in these plans.

3. Agency and Public Input

This Study was conducted under the direction of the Metropolitan Council and in collaboration with MnDOT. It was informed by a number of stakeholders as well as existing plans for the region.

3.1 Agency Input

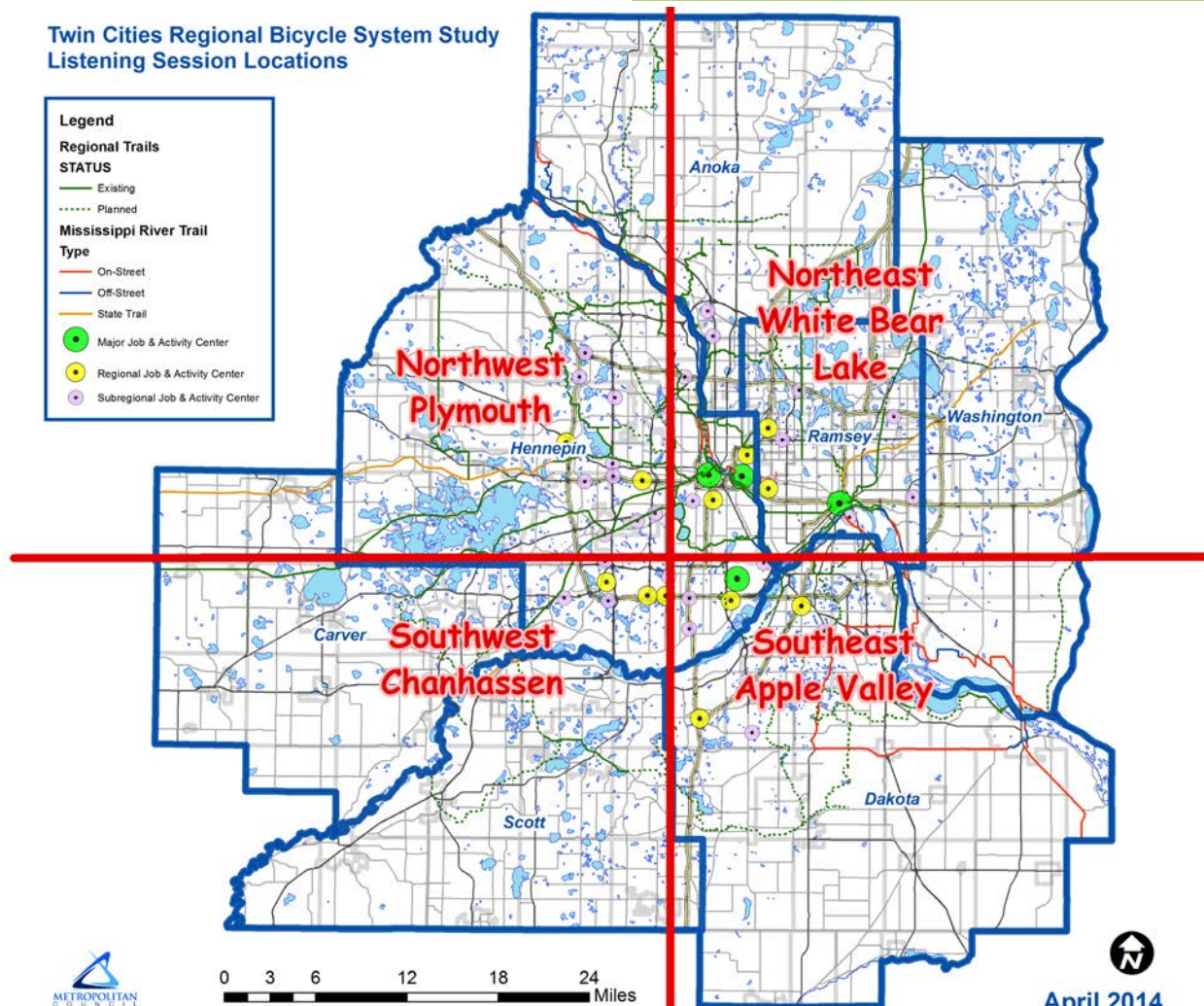
The work effort included a Project Management Team (PMT) and a Project Advisory Committee (PAC). The PMT was comprised of staff representing several departments of the Metropolitan Council, Metro Transit, and MnDOT. This team provided ongoing direction to the consultant team throughout its duration. The PAC was



Figure 5 - Listening Session Participants identify regional destinations on a map

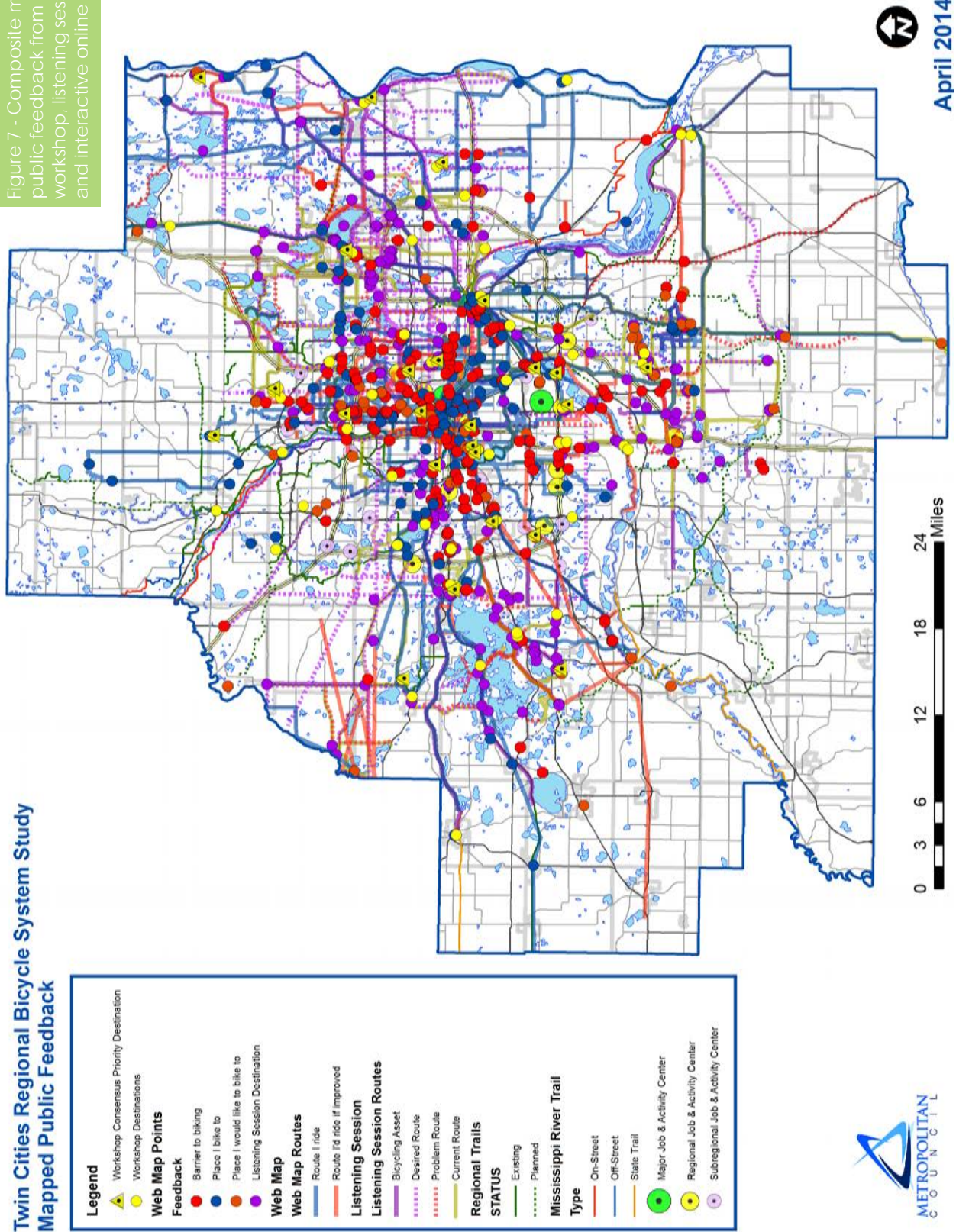
comprised of agency staff from cities, counties, regional and state government, as well as key stakeholders with bicycling

Figure 6 - Four Region Quadrants for Listening Sessions



Twin Cities Regional Bicycle System Study Mapped Public Feedback

Figure 7 - Composite map of public feedback from the workshop, listening sessions and interactive online map



interests or expertise. The PAC met five times during the Study's duration and played a valuable role in providing essential feedback to the project at critical junctures. Agencies represented on the PAC are listed in Appendix D.

3.2 Public Engagement

Members of the public were engaged in a number of ways, including focus group listening sessions and public workshops. On-line engagement included an interactive mapping tool that allowed the public to provide input on specific destinations and routes across the region from those who may not attend a meeting or workshop.

Listening Sessions. Four listening sessions were hosted in outlying suburban areas of the metropolitan area (Figure 5 and Figure 6) in April 2013 with a geographically targeted list of invitees. The outreach effort focused on reaching members of cycling clubs and residents with significant local knowledge of cycling conditions, routes, and barriers throughout the local area.

On-line feedback. Public feedback was collected on-line through a project page on the Metropolitan Council website². The page included an interactive map that allowed people to document regional bicycle destinations and routes they currently use, or identify barriers to bicycling and/or routes that would be used if conditions were improved (Figure 7).

Public workshops. Two sets of public workshops were held during the project.

The first round of workshops were held in June/July of 2013 in Saint Paul and St. Louis Park, respectively. These workshops focused

on prioritizing guiding principles for the regional bikeway system, and gathering input on significant regional destinations. The guiding principles are discussed in detail in Section 4.

The second round of workshops were held in October 2013 in Saint Paul and Minneapolis. These workshops provided an opportunity for stakeholders to review preliminary findings and provide feedback on the draft Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors discussed in Section 4 (Figure 8).

A full summary of the public engagement process can be found in the Community Engagement Report (Appendix B).



Figure 8 – Workshop participants review draft recommended corridors

2 <http://www.metrocouncil.org/Transportation/Planning/Transportation-Resources/Regional-Bicycle-Master-Study-Introduction.aspx>

► 4. Development of Proposed Regional Bicycle Transportation Network

The development of a Regional Bicycle Transportation Network was a central focus of this Study. The project team conducted an extensive review of major bicycle plans already adopted by local governments to gather input on local definitions and categories for bicycle corridors at the community level.

4.1 Defining the Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors

The Regional Bicycle Transportation Network is intended to act as an arterial system for bicycling in the region and is composed of two network tiers (defined below) that are supplemented by Critical Bicycle Transportation Links (defined in Section 4.2).

The Regional Bicycle Transportation Network is intended to represent a specified set of bicycle corridors and existing and planned alignments, but not specific facility types. In

some cases corridors are identified along a known existing or planned alignment; however, the corridors are intended to be conceptual bands varying in width from a ½-mile in the core cities to 1-mile in the surrounding suburbs and outlying rural areas. They are not intended to reflect specific alignments or facility types as they offer local planners flexibility to determine what will work best from a context-sensitive perspective.

Ultimately, within each corridor, there are a range of facilities that can be constructed to meet the goals of the Regional Bicycle Transportation Network. The Metropolitan Council conducted a series of corridor refinement meetings with agency staff from each of the seven counties in early 2014 with the aim of identifying specific alignments where consensus could be reached about planned or existing bicycle routes within the network. These specific alignments are identified along with bandwidth corridors in the final proposed network in Section 5 of this Study report.

Definition: Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors

Regional Bicycle Transportation Network. The entire set of proposed network corridors or facilities that serve as the “backbone” arterial system that will connect city and county bikeways with regional destinations.

Priority Regional Bicycle Transportation Corridors. A subset of the Regional Bicycle Transportation Network that have been identified as high priority based on the network scoring (described in Section 5.3) and the degree to which the corridors connect population centers with key regional destinations and the regional transit system. The “priority” corridors or designated alignments are intended to serve the highest potential bicycle demand based on the Met Council’s urban/suburban development context reflecting the existing and planned population and employment densities in the region.

4.2 Defining Critical Bicycle Transportation Links

The Regional Bicycle Transportation Network proposed in this Study is not designed to be an all-inclusive bicycle transportation system. The regional system will only maximize its potential if it is built out as planned, and if the local bicycle infrastructure provides strong and seamless connections to the regional network.

There are several types of barriers that can disrupt the connectivity of the Regional Bicycle Transportation Network and isolate communities and key destinations. The links to overcome these barriers are referred to as *Critical Bicycle Transportation Links* for this Study. Defining these critical links may help to facilitate the assessment of project proposals seeking regional funding through the regional solicitation process as directed by the Transportation Advisory Board.

Through the Study process the following definition was developed to provide solid direction for communities to identify and address system gaps where project solutions could be characterized as critical linkages.

Critical Bicycle Transportation Links

Perform one or more of the following functions:

- Serve to close a gap in the regional network
- Improve continuity and connections between jurisdictions (on or off-network)
- Remove a physical barrier (on or off-network)

Serve to close a gap in the regional network.

This Study includes a regional network of bikeway corridors and alignments that are proposed for inclusion in the TPP. Gaps in the existing regional network could be addressed in two ways:

- Improving bikeability within a Regional Bicycle Transportation Network corridor

to better serve all bicycling skill and the wide variety of experience levels within the corridor.

- Building a short (up to a 1/4-mile) but critical local link to or within a major regional destination, or to a major transit-oriented development on the regional transit system, or to a large transit center.

Improve continuity and connections between jurisdictions.

To some extent, each local government in the Twin Cities has employed their own approach to the provision of bicycle infrastructure. In some cases, a bikeway may extend to one city's border, and not carry through into the next city or county. Creating a more consistent, continuous and connected set of bicycle facilities will improve access to, and the overall bikeability of, the regional network.

Removing a physical barrier. Crossing major physical barriers are a significant challenge in providing bicycle infrastructure. These barriers can be both natural and man-made such as major railway corridors, rivers and waterways, freeways and multi-lane arterials.

Projects that remove or provide more bikeable options around physical barriers can arise in a number of ways. Planning work may underscore the need for a bikeway to cross a major barrier. Additionally, other infrastructure projects such as roadway bridges over rivers or freeways can provide opportunities to create bicycle connections across one or several barriers, particularly in instances where there is not a useful parallel alternative within a reasonable biking distance.

By their nature, projects to remove physical barriers can prove costly, and opportunities to enhance such connections may be opportunity driven with respect to major highway improvement projects. Given the significant expense of building connections like

bridges or underpasses and their anticipated long design lives, it is advantageous to consider the inclusion of bicycle infrastructure in all projects that improve options to cross or get around these physical barriers, even if the full potential of the bicycle connection is not evident at the time of construction.

4.3 Guiding Principles for Regional Bicycle Corridors

From the onset of the Study, the project team sought to develop a common understanding of the role and function of the Regional Bicycle Transportation Network. To this end the Study identified a set of Guiding Principles that helped steer direction of the analysis and eventual recommendations presented in this Study report. These are described in the green sidebar on this page.

The draft guiding principles were based on guidance received from the PAC early in the process, the input received from the public at four listening sessions, and a review of principles included in adopted regional and local transportation and bicycle plans. During the initial PAC meeting and the listening sessions, participants were asked to work individually and then in small groups to describe potential roles for a Regional Bicycle Transportation Network.

The following guiding principles were shaped largely by the existing plan review, public input, and PAC discussions. These guiding principles were the basis for the identification and placement of bikeway corridors on a Regional Bicycle Transportation Network (as further described in Sections 5 and 6).

Items in **bold** represent the principles that were ranked as the *six most important by majority consensus* of public workshops attendees. The percentage of public attendees identifying an item as one of the six priorities for the network is also provided.

Regional Bicycle Corridors Should....

- Overcome physical barriers and eliminate critical system gaps (85%)
- Facilitate safe and continuous trips to regional destinations in urban/suburb/rural areas (69%)
- Function as arteries to connect regional destinations and the transit system year-round (62%)
- Accommodate a broad range of cyclist abilities/preferences to attract variety of users (62%)
- Integrate and/or supplement existing and planned infrastructure (roads and trails) (54%)
- Provide improved opportunities to increase the share of trips made by bicycle (46%)
- Connect to local, state and national bikeway networks (31%)
- Consider opportunities to enhance economic development (23%)
- Be equitably distributed throughout the region (15%)
- Follow spacing guidelines to reflect established development and transportation patterns (0%)
- Consider regional priorities reflected in adopted bicycle plans (0%)

4.4 Corridor Spacing

Another consideration in the design of the bikeway network is the spacing of regional bikeway corridors. Regional bikeway corridors perform a different function than local bike routes, or community bike routes that provide key connections within parts of a city, but do not necessarily extend or function at a regional level. As noted in the guiding principles for regional bikeways, regional bikeways “function as arteries to connect regional destinations and the transit system year-round.” They also “facilitate safe and continuous bicycle travel to and between regional destinations.” Research on corridor

spacing from local and national plans and peer regions was conducted to compare and validate the spacing for the proposed Regional Bicycle Transportation Network corridors for the Twin Cities region.

4.4.1 Corridor Spacing Research

National research into regional bikeway spacing guidelines did not uncover any substantive existing research or state-of-practice documentation with an explicit focus on bikeway spacing at the regional level. Traditionally, spacing guidelines were developed by transportation agencies to establish a functional classification system across a roadway network to handle projected volumes of motor vehicle traffic across a network. The spacing of higher level roadways (collectors and arterials) are closely tied to population and trip generation factors that increase significantly within developed areas.

The focus of bicycle network planning is typically access to the system with an emphasis on increasing network density in more developed urban areas. There are no defined standards for level of access to the network at the regional level. However, it is useful to examine the regional efforts of peer systems as a consideration of addressing the needs of the Twin Cities.

Three approaches to bikeway spacing were researched.

Guidance from Local Plans. Important guidance is offered by spacing guidelines already in use by local municipalities, and certainly any regional spacing guidelines should consider local spacing guidance. The following bicycle facility spacing guidelines are used by local cities in the Twin Cities region:

- Principal arterial bikeways should be spaced about 2 miles apart with minor

arterial bikeways spaced 1 mile apart (Minneapolis Bicycle Master Plan, page 179)

- Generally, bikeways should be no more than a half-mile apart, and arterial striped bike lanes and/or off-street trails should be no more than one mile apart (Saint Paul Transportation Plan, page 16)

While these guidelines provide context, they should be considered in light of the regional context of this study.

Guidance from Roadway Spacing. Guidance for the spacing of regional bicycle corridors could also be tied to roadway spacing. In reviewing the existing 2010 TPP, minor arterials may provide an analogous spacing of the roadway network that could be relevant to a regional bikeway system. Appendix D of the 2010 TPP specifies four levels of spacing for minor arterial roadways:

- Metro centers and regional business concentrations: ¼ mile to ¾ mile spacing
- Developed areas of the region: ½ to 1 mile
- Developing areas of the region: 1 to 2 miles
- Rural areas: As needed, in conjunction with the major collectors, provide adequate interconnection to cities and towns outside the Twin Cities region.

Guidance from Peer Regions. Research on spacing guidelines included three peer regions across the country – the metropolitan areas of Atlanta, Denver and Nashville. These regions were selected based on similarities in metropolitan scale and general approach to identifying a regional bicycle network. None of the plans for these regions included specific reference to spacing guidelines, but the team was able to analyze the networks using GIS to develop general spacing comparisons based on distance from the urban core.

The results of the analysis are shown in Table 2, with spacing from peer areas evaluated

at five mile increments from the urban core of each city. A more detailed review of the methodology behind this comparison can be found in Appendix C.

Table 2 - Regional bicycle corridor spacing in peer regions

Peer Region	Distance from Center of Primary Business District		
	5 miles	10 miles	15 miles
Atlanta	3.4 mi	3.1 mi	6.6 mi
Denver	4.2 mi	4.7 mi	5.0 mi
Nashville	2.6 mi	4.3 mi	3.9 mi
Peer average	3.4 mi	4.0 mi	5.2 mi

4.4.2 Spacing of Proposed Network

Table 3 shows how the proposed Regional Bicycle Transportation Network developed for this study (shown in the map on page 26) compares to the findings from the other regions.

Table 3 - Analysis of Peer Region Bikeway Corridor Spacing

Region	Distance from Center of Primary Business District		
	5 miles	10 miles	15 miles
Peer average (Table 4)	3.4 mi	4.0 mi	5.2 mi
Proposed Regional Bicycle Transportation Network	1.1 mi	1.7 mi	2.7 mi
Difference	-2.3 mi	-2.3 mi	-2.5 mi

The results of the analysis show the proposed Regional Bicycle Transportation Network corridors have a spacing density that exceeds those found in the peer regions, especially in relation to the core urban areas at 5 and 10 miles. This is due, in large part, to the mature network of existing bicycle facilities found in the Twin Cities region, which

provides a more robust framework for a bicycle transportation system.

The results at the 10 to 15 mile distance suggest that the spacing of the proposed Regional Bicycle Transportation Network is twice as dense as the average of the three metro areas researched. However, this seems reasonable given the fact that the downtowns of Minneapolis and Saint Paul are spaced 10 miles apart and that development densities would be higher at greater distances from the combined core, (or at the 10 and even 15 mile range) based on the natural overlap of dense urban form extending outward from both downtowns.

4.5 Network Scoring and Prioritization

The methodology and approach for scoring and prioritizing the proposed network is a direct reflection of the guiding principles presented earlier in this section. Each corridor within the proposed network was scored on ten key factors that reflect regional bicycle demand, for which there was available data.

Emphasis on Regional Destinations. A key function of the network is connecting regional destinations.

For purposes of the Study, Regional Destinations were defined as being: Regionally-recognized activity nodes or corridors where people work, shop, recreate, or are entertained. These may be further defined by one or more activity thresholds. Regional Destinations will typically be centers where multiple transportation modal options, such as high-level transit service, are provided.

Regional Employment and Activity Centers. Metropolitan Council staff, as part of the Thrive MSP 2040 development process, used employment data to identify job and activity clusters across the region. These centers

constitute many of the primary destination points within the region. It will be important to provide access to them via the bicycle transportation system. The threshold set for any area to be recognized as a regional or sub-regional center is at least 7,000 jobs at a density of at least 10 jobs per acre of developable land. There are three intensities of job and activity centers included in the analysis – metropolitan, regional, and sub-regional.

Other Destinations of Regional Significance.

Because the list of job and activity centers used to define the Regional Employment and Activity Centers was not all-inclusive, the project team worked with the PMT and PAC to identify several other destination categories. Such as major sports and entertainment complexes, large high schools, and regional parks that attract heavy use.

Feedback Destinations and Feedback Priority Destinations. Public input regarding important regional destinations was gathered during the planning process and was mapped in GIS. These data points represent individual and group consensus input about important bicycling destinations.

Bicycle Travel Demand. Cyclopath is a local on-line mapping-based bicycle route identification utility built and hosted by the University of Minnesota. This web-based “geowiki” application assists the general public in finding suitable bicycle routes and providing feedback about the quality of the bicycle experience along facilities. This on-line routing tool has the ability to capture a unique data set containing every route request from the website’s growing user audience. This includes both origin and destination data for every request since the website’s inception. While these requests do not necessarily represent actual trips, they provide a very useful surrogate for bicycle

demand across and beyond the seven-county region.

Connecting with Transit. One of the stated goals of this Study is to better integrate the region’s bicycle infrastructure with the region’s transit infrastructure. The most meaningful connections will occur primarily at stations on regional transitways. These locations offer the highest frequency of transit service and the greatest capacity for the transfer and storage of bicycles.

Future Population. Projected population densities across the region were used to ensure the Regional Bicycle Transportation Network will serve long range transportation needs that are closely matched to future population growth in the region.

System Equity. As part of the Thrive MSP 2040 effort, the Metropolitan Council identified Racially Concentrated Areas of Poverty (RCAP). Given the diminished economic opportunity present in these areas, it was particularly important to ensure that the proposed bicycle network provides equitable service to these communities.

4.5.1 10 Key Factors for Network Scoring

After the draft network was identified, the corridors were scored based on ten key factors that address the guiding principles. A description of these factors and the total points possible for each is included in Table 4. Appendix E includes the mapped scoring results for each factor along with detailed descriptions of the data, total possible score and percent contribution to cumulative corridor score for each category.

Table 4 - Key Factors for Network Scoring and Prioritization

Factor	Description	Maximum Points Possible
Metropolitan centers	Centers holding at least 50,000 jobs at a density of at least 50 jobs per acre.	4.5
Regional job and activity centers	Centers holding 15,000 to 49,999 jobs at a density of 10 to 49 jobs per acre.	2
Sub-regional job and activity centers	Centers holding 7,000 to 14,999 jobs, at a density of 10 to 49 jobs per acre.	1
Selected other destinations	Major sports and entertainment complexes, high schools with 2000+ students, regional parks exceeding 400,000 visitors per year.	1
Feedback destinations	Destinations identified during the listening sessions, through the interactive web-mapping tool, and at the public workshops.	1
Feedback priority destinations	Destinations from priority lists developed at public workshops.	1
Cyclopath origin and destination requests	Unique origin and destination requests (both number and density along corridor).	2
Transitways and transit stations	Existing stations on the Northstar Commuter Rail Line, the Blue Line (Hiawatha LRT), the Red Line (Cedar Avenue BRT), planned and proposed stations along the Green Line (Central Corridor LRT and Southwest LRT), Gateway Corridor and Bottineau LRT.	1
Projected 2030 population density	Areas with population densities equal to or greater than 10 people per acre.	1
Racially concentrated areas of poverty (RCAP)	Areas where more than 50 percent of the residents are people of color and more than 40 percent of the residents have incomes less than or equal to 185 percent of the Federal poverty line.	1

4.5.2 Scoring Methodology

For purposes of evaluating the Regional Bicycle Transportation Network corridors, a one-mile bandwidth was selected as the extent of analysis across the region. The analysis was conducted by evaluating features within the one-mile area. If, for example, a major destination fell within a corridor's bandwidth, that was presumed to be a corridor asset and contributed to its overall score.

The draft network corridors were also divided into segments of varying length, with an average corridor segment length of about 5 miles. Starting and ending points for these segments were established based on logical termini or transitions in development/land use intensity.

Each corridor segment received a total cumulative score based on the sum of

points received for the ten factors. The final scores allowed for a more meaningful comparison of potential importance of each corridor in addressing regional bicycle transportation demand.

4.5.3 Prioritization

Based on the corridor scoring, a priority corridor subset was identified within the larger proposed regional network. In addition, other refinements were made such as realigning, removing, or adding corridors, where appropriate, based on stakeholder input.

Several considerations went into the prioritization of corridors. Higher-scoring corridors were generally determined to be priority corridors, based on their ability to connect regional destinations. To address the general guiding principle of regional geographic equity, care was taken to distribute the priority corridors around the region rather than identifying multiple priority corridors that served similar destinations. Finally, the placement and extent of priority corridors were based on how well they serve developed and developing areas as shown in Metropolitan Council's 2030 Development Framework Planning Areas map (see Figure 9).

In the Development Framework, *developed areas* are those where most of the land has been developed and infrastructure is well established. Because the developed area for the region is quite large, the urban core of Minneapolis and Saint Paul were treated as a subset of the developed areas for the Study analysis.

Developing areas are those where the most substantial amount of new growth is expected to occur in the coming decades. *Rural areas* are those that are dominated by cultivated farmland, nurseries, tree farms, orchards and vineyards, scattered individual home sites or clusters of houses, hobby farms,

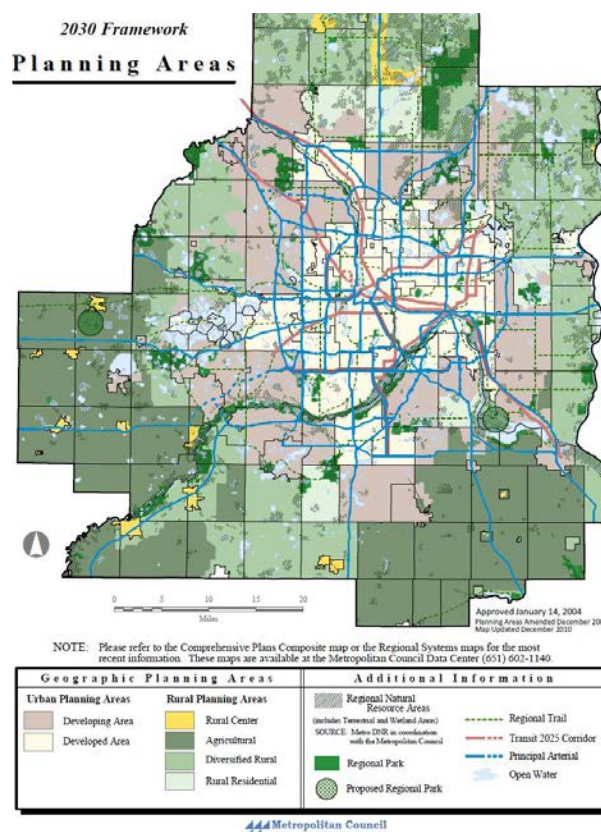


Figure 9 - Map of the 2030 Development Framework Planning Areas

small towns, gravel mines, and woodlands and are not expected to change significantly in the foreseeable future.

Based on this information, the network was adjusted so that the priority corridors better serve the developed areas of the region in order to reach the highest density of potential bicyclists. The priority corridors were generally terminated at the border between developing and developed areas, with some exceptions to allow them to serve isolated urban areas (e.g., Hastings and Stillwater). The final analysis and development of draft Priority Regional Bicycle Transportation Corridors reflected a comparison of corridors based on development context zones as follows:

- Zone 1 – Urban Core of Minneapolis and Saint Paul (subset of the Developed Urban Area)

- Zone 2 – Remaining Urban Areas that are currently developed
- Zone 3 – Developing Urban Areas
- Zone 4 – Rural Planning Areas

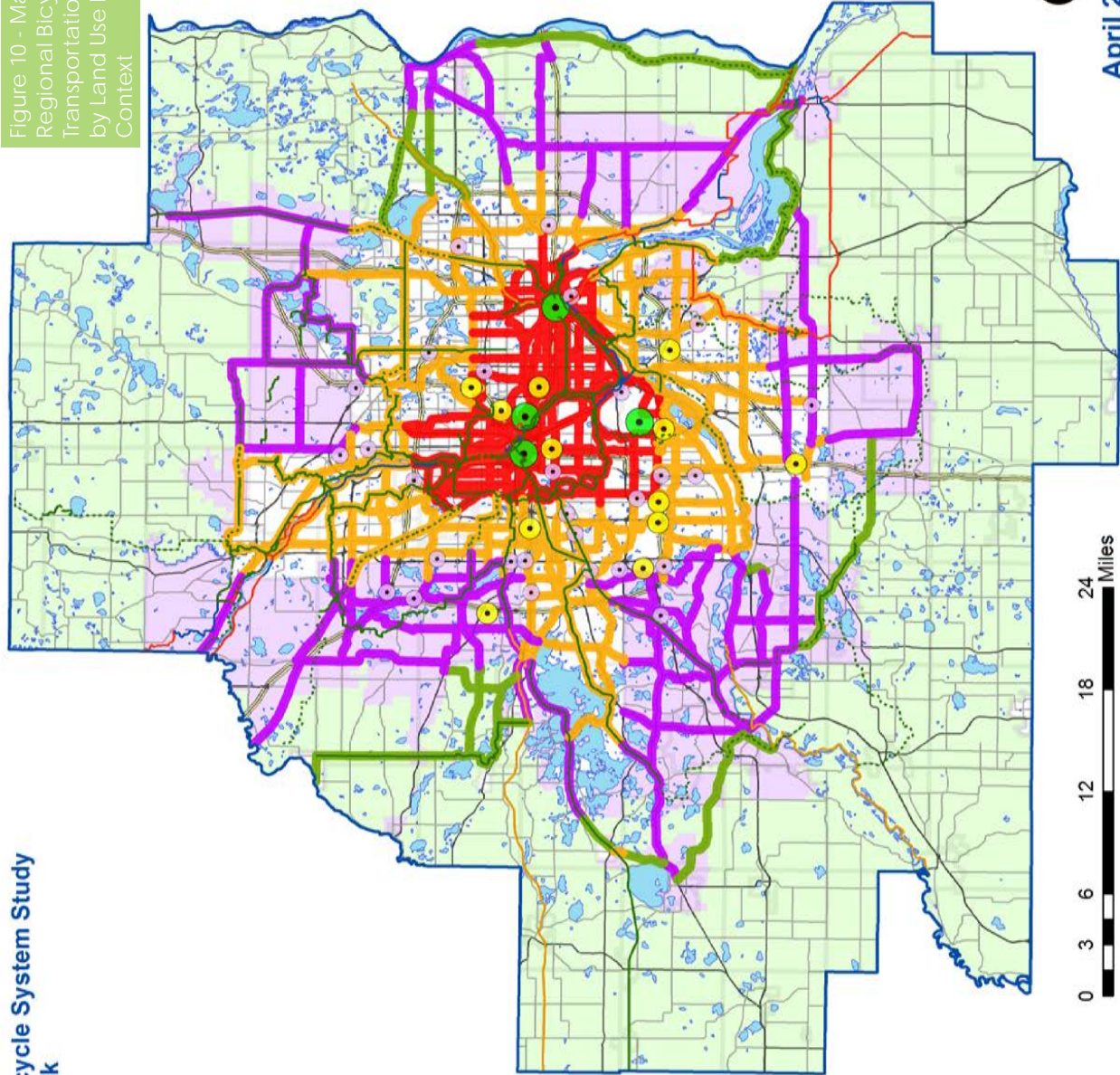
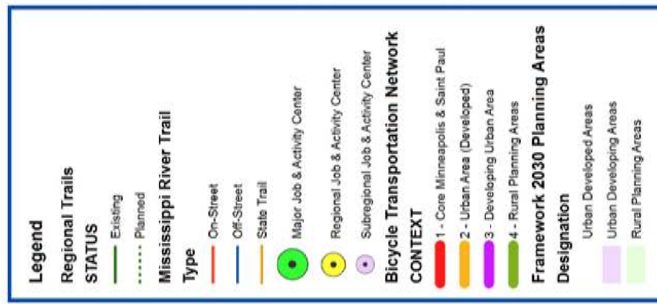
Figure 10 shows a map of the corridors based on these four context zones.

4.6 Regional Bicycle Transportation Network Scoring Map

The Regional Bicycle Transportation Network with cumulative scoring results is presented in Figure 11. Because of the iterative process, the final proposed network contains a number of changes from the network that was scored in October 2013, which is presented in Section 6.2.

Twin Cities Regional Bicycle System Study Mapped Public Feedback

Figure 10 - Map of
Regional Bicycle
Transportation Network
by Land Use Planning
Context



April 2014



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Twin Cities Regional Bicycle System Study

Preliminary Regional Bicycle Transportation Network with Cumulative Score Results

Figure 11 - Regional Bicycle Transportation Network with Cumulative Score Results (October 2013)

Legend

Regional Trails

STATUS

- Existing
- Planned

Mississippi River Trail

Type

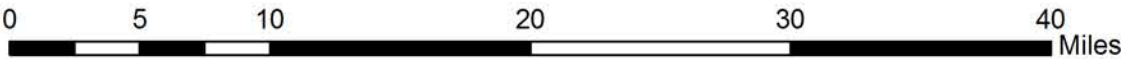
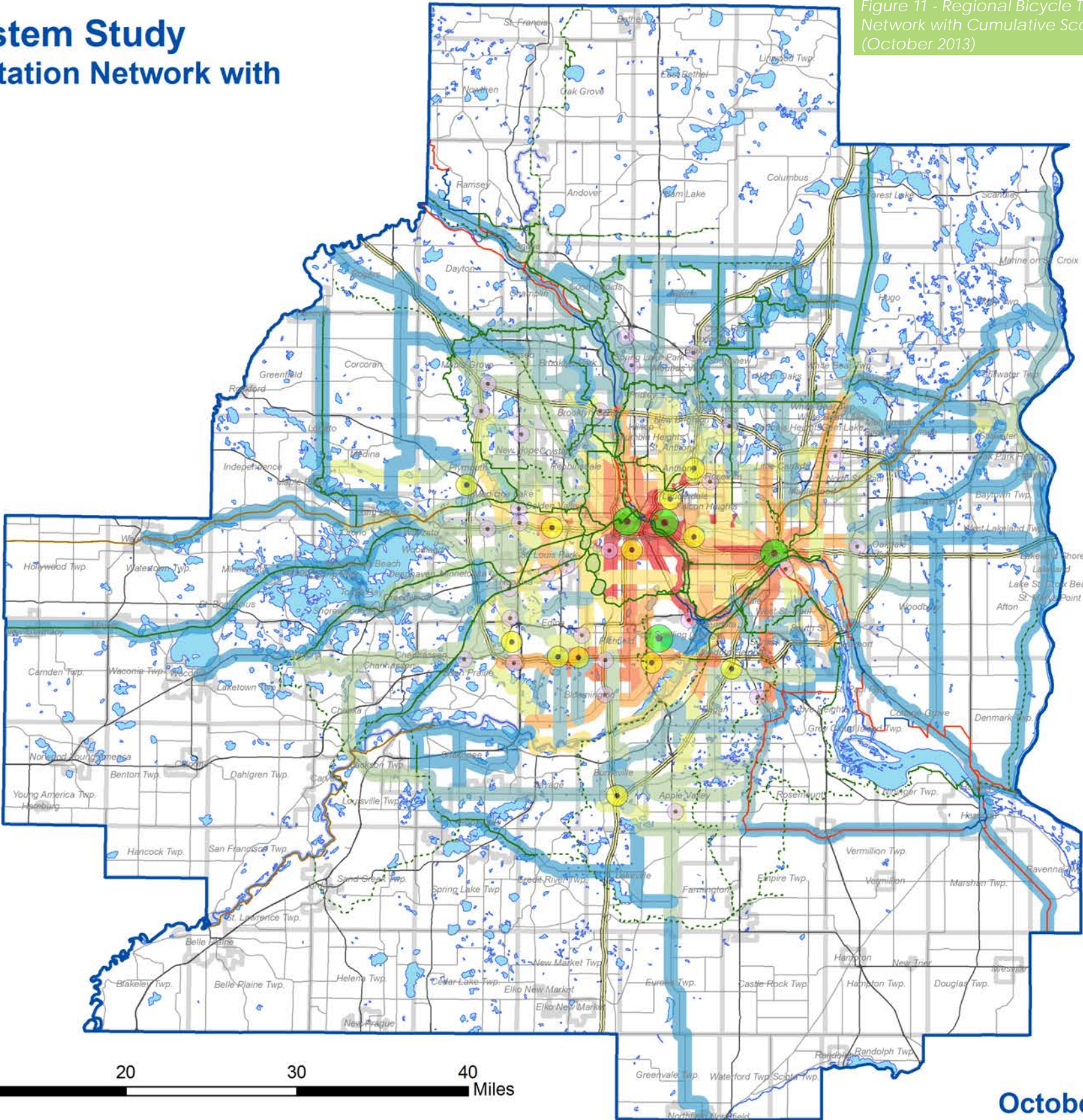
- On-Street
- Off-Street
- State Trail

- Major Job & Activity Center
- Regional Job & Activity Center
- Subregional Job & Activity Center

Preliminary Regional Bicycle Transportation Network

Cumulative Score

- 0.00 - 0.34
- 0.35 - 0.77
- 0.78 - 1.25
- 1.26 - 1.91
- 1.92 - 2.97
- 2.98 - 4.56
- 4.57 - 6.97
- 6.98 - 11.25



October 2013

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► 5. Study Outcomes

There are four major outcomes of this Study:

- 1) Regional Bicycle Transportation Network;
- 2) Priority Regional Bicycle Transportation Corridors;
- 3) Criteria definitions for identifying Critical Bicycle Transportation Links; and
- 4) a Framework for Evaluation and Performance Measures.

The guiding principles, introduced in Section 4, have provided the lens for evaluating the work as it progressed through the Study. Changes to the network and driven by stakeholder conversations, where the guiding principles provided a framework for appropriate choices for defining the Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors. The resulting Regional Bicycle Transportation Network (Figure 12) is a product of significant stakeholder input. It will be viewed as an initial framework for a regional bicycle transportation system that should evolve over time with future updates to the TPP.

5.1 Proposed Network

The Proposed Regional Bicycle Transportation Network serves the urban and growing suburban communities in the region.

These corridors are not intended to define specific alignments facility alignments, but rather to identify the general corridors for implementation of a regional bicycle network. Corridors generally represent one mile-wide bandwidths, and 1/2 mile bandwidths in the urban core. Existing or planned alignments may or may not be known and identifiable in these corridors. In cases where there is no existing or planned alignment within a network corridor, the Metropolitan Council will continue to work with local partners to identify appropriate routes and alignments.

The proposed Regional Bicycle Transportation Network including the Priority Regional Bicycle Transportation Corridors is shown in Figure 12.

The Proposed Regional Bicycle Transportation Network includes 1,270 miles of proposed network corridors. Within the overall network there are 579 miles proposed as Priority

Key Definitions:

Regional Bicycle Transportation Network. The entire set of proposed network corridors that serves as the “backbone” arterial system, connecting the county and local systems with regional destinations.

Priority Regional Bicycle Transportation Corridors. A subset of the Regional Bicycle Transportation Network that have been identified as high priority based on the network scoring (described in Section 5.3) and degree to which the corridors connect population centers with key regional destinations and the regional transit system. The “priority” corridors represent the highest potential bicycle demand corridors based on urban/suburban development context and reflecting the existing and planned population and employment densities in the region.

Critical Bicycle Transportation Links. Perform one or more of the following functions:

- Serve to close a gap in the regional network
- Improve continuity and connections between jurisdictions (on or off-network)
- Remove a physical barrier (on or off-network)

Twin Cities Regional Bicycle System Study

Regional Bicycle Transportation Network with Priority Regional Bicycle Transportation Corridors

Figure 12 – Regional Bicycle Transportation Network with Priority Regional Bicycle Corridors

Legend

Regional Trails
STATUS

Existing

Planned

Mississippi River Trail
Type

On-Street

Off-Street

State Trail

Major Job & Activity Center

Regional Job & Activity Center

Subregional Job & Activity Center

Regional Bicycle Transportation Network
Corridor Status

Defined Alignment

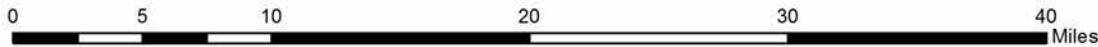
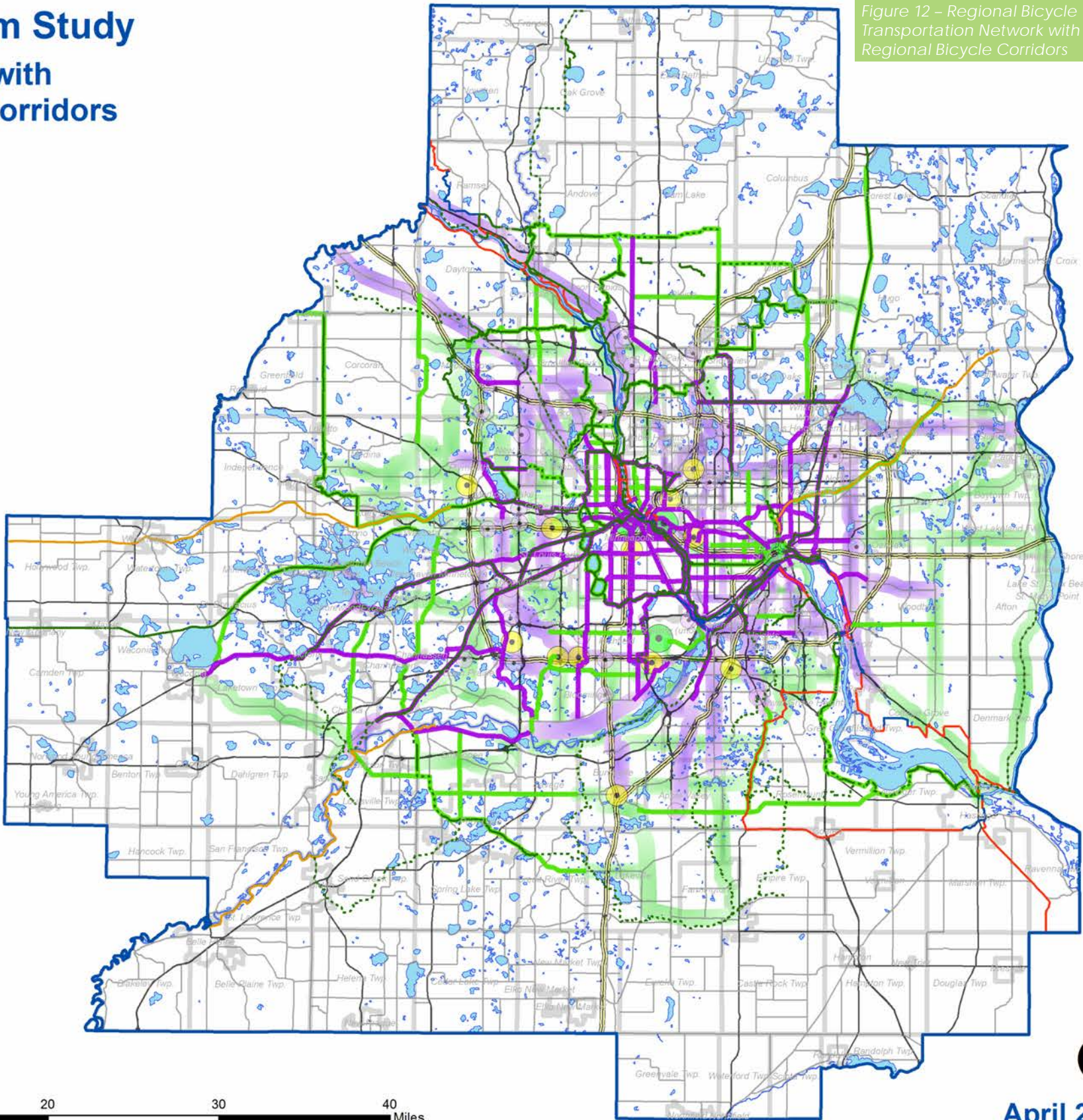
Priority Bicycle Transportation Corridor
Corridor Status

Defined Alignment

Corridor Alignments not defined

Regional Bicycle Transportation Network

Priority Regional Bicycle Transportation Corridors



April 2014

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Regional Bicycle Transportation Corridors, or about 46% of the proposed overall network.

5.1.1 Addressing Agency and Public Input on Draft Network

Arriving at the final Regional Bicycle Transportation Network shown in Figure 10 involved an iterative process of analysis and refinement of the proposed network between August and December of 2013 guided by extensive feedback from the PMT and the PAC.

In early 2014, the Metropolitan Council conducted a series of network refinement meetings with agency staff at each of the seven counties to review corridor alignments and to identify specific existing or planned facility alignments within the corridors where consensus could be reached. As a result of these refinement meetings, specific alignments for 689 miles, or more than half (54%) of the entire network, were identified and mapped. The remaining 581 miles of network are shown as one-mile wide

corridors (1/2 mile in the core cities) with specific alignments yet to be determined (see Figure 10).



Figure 13 - The Project Advisory Group (PAG) met five times over the course of the study.

5.1.2 How the Network Addresses the Guiding Principles

The creation of the proposed bikeway network was informed by the guiding principles for regional bicycle corridors as developed by the PAC and refined by the PMT. Below is a brief summary of how each guiding principle is reflected in the Study results.

Regional bikeway corridors should...

Overcome physical barriers and eliminate critical system gaps.

Much of the Study effort and analysis focused on barriers to bicycling in the region such as bridges, freeways, and rivers. The establishment of criteria defining Critical Bicycle Transportation Links specifically addresses gaps and barriers for future network implementation. Bridging these gaps will create a more convenient and continuous bikeway system.

Facilitate safe and continuous trips to regional destinations in urban, suburban and rural areas.

Building out and upgrading bicycle facilities along the proposed Regional Bicycle Transportation Network will improve the convenience and safety of bicycling along these facilities. Addressing Critical Bicycle Transportation Links that improve the connections and continuity of routes between cities or between counties will provide for easier and more bike-friendly travel and reduce the need for users to follow less safe routes to reach their destinations.

Function as arteries to connect regional destinations and the transit system year round.

Both the scoring of the network and identification of Priority Bicycle Transportation Corridors emphasized connections to regional destinations as well as connections to the regional transit system.

Accommodate a broad range of cyclist abilities and preferences to attract a wide variety of users.

The network was developed to help facilitate bicycle access to key regional destinations. Bicyclists experience varying levels of comfort based on facility type (on-road facility or off-road trail), roadway characteristics, and personal level of experience and ability. Establishing broad corridors for planning the bicycle network may allow locals to develop both an on-street facility and an off-road trail or barrier-separated facility in some high demand corridors; dual facility types in these corridors would serve to accommodate the full range of cyclist preferences.

Integrate and/or supplement existing and planned infrastructure (roads and trails).

The identification and refinement of the Regional Bicycle Transportation Network placed emphasis on alignments that take advantage of existing and planned facilities. Meetings with the agency staff in early 2014 provided additional opportunities to specify alignments based on existing and planned facilities.

Provide improved opportunities to increase the share of trips made by bicycle.

Implementing a complete Regional Bicycle Transportation Network that is designed to serve key regional destinations will provide more convenient connections to places people want to go, increasing the likelihood of choosing bicycling for transportation trips within the region.

Connect to local, state and national bikeway networks.

Identification and refinement of the Regional Bicycle Transportation Network relied heavily on knowledge of the existing local, state, and national systems. Placement of network corridors were based in part by how they connected to other systems.

Consider opportunities to enhance economic development.

Economic development impacts are accounted for in the heavy emphasis on connecting Regional Job and Activity Centers. Additionally, much of the network was developed to address existing and planned growth in the region. As evidenced by the high level of development that has followed the Midtown Greenway, it can be anticipated that new bicycling investments will have a positive impact on creating local economic development opportunities and foster the Twin Cities' image as highly livable region with many bikeable destinations.

Be equitably distributed throughout the region.

There was an emphasis on both geographic balance and social equity in developing the Regional Bicycle Transportation Network. This included a focus on where people live, work and recreate, but also emphasized equitable access to bicycling opportunities by including the Metropolitan Council's identified Racially Concentrated Areas of Poverty (RCAP) as an explicit analysis factor.

Follow spacing guidelines that reflect the established development and transportation patterns.

Both local and national practices related to regional bikeway spacing were analyzed (see Section 4.4). The Regional Bicycle Transportation Network was developed and refined in a manner such that the average spacing for the regional bicycle corridors was closer, and therefore representative of a more accessible network, compared to regional bikeway networks found in other regions.

Consider regional priorities reflected in adopted plans.

Local bicycle plans and policies related to bicycling were analyzed and those relevant to the region's priorities were incorporated in the development of the Regional Bicycle Transportation Network.

6. Moving Forward

6.1 Next Steps for the Network

The Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors developed through this Study will be proposed in the forthcoming 2040 TPP. The draft TPP, including a bicycle/pedestrian section describing planning strategies and funding priorities for the region, will be released in Summer 2014 for public review. After a public comment period, the TPP will be reviewed and finalized by the Metropolitan Council for final adoption in late 2014. Further information on the overall process for TPP development and public review can be found here: <http://www.metrocouncil.org/Transportation/Planning/2030-Transportation-Policy-Plan/TPPupdate.aspx>.

The TPP is one of three regional systems plans that will take policy direction from Thrive MSP 2040, the Council's update to its long range comprehensive development guide. Once adopted, local units of government in the region will be required to review their local comprehensive plans in their next round of legislatively required 10-year updates (to be completed by 2018) to conform with Thrive MSP 2040 policies. Further information about Thrive MSP 2040 can be found here: <http://metrocouncil.org/Planning/Projects/Thrive-2040.aspx>.

6.2 Framework for Evaluation and Performance Measures

This section includes background on the policy environment and need for performance measures, a summary of performance measure recommendations from MnDOT, and recommendations for performance measures for use by the Metropolitan Council in evaluating the success of the Twin Cities Regional Bicycle Transportation Network. Recommendations

on performance measures are split into two categories for consideration, near-term and long-term measures. Within each category, consideration is given both to performance measures that would be most appropriate for use by the Metropolitan Council, along with performance measures that local governments might develop themselves to complement regional indicators. Performance measures used in other systems around the country were assembled and considered. A list of these measures can be found in Appendix F.

The current federal transportation law, Moving Ahead for Progress in the 21st Century (MAP-21) was signed into law in 2012, and authorizes federal transportation programs for Federal Fiscal Years 2013 and 2014. MAP-21 includes an increased emphasis on performance-based transportation planning over previous federal laws. *Under MAP-21, long-range transportation plans such as the Metropolitan Council's TPP must include a description of the performance measures and targets used to address the transportation system.* The TPP must also include a system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the established performance targets. While these target requirements currently do not apply to the non-motorized system, this Study recommends a range of performance measures that the Metropolitan Council could apply to measure the performance of the region's bicycle system.

6.2.1 Performance Based Planning

The central defining feature of performance-based planning is that it moves beyond simple measurement, and instead deliberately links performance to planning and programming. Quality data is essential to implement the performance measures. Performance measures and data collection

strategies can evolve in tandem over time to more accurately assess progress toward goals and objectives.

6.2.2 MnDOT Statewide Bicycle Planning Study Recommended Performance Measures

In order to meet the intent of MAP-21's requirements around performance measures, it is recommended that the Metropolitan Council coordinate with state measures and targets. Below is a summary of the performance measures recommended in the MnDOT Statewide Bicycle Planning Study, which was completed in March 2013. While MnDOT's study did not provide specific targets, it did establish a general format for performance measures focused around three core areas of interest: usage, safety, and assets.

Usage. It is important to understand the degree to which the bicycle system invites regular use by providing potential bicyclists with an attractive choice for transportation. There are many ways to measure usage, such as the number of daily bicycle commuters, number of miles travelled on bicycles, and number of trips made by bicycles.

In the past, MnDOT has relied on the American Community Survey (ACS) report of bicycle usage. However, ACS data on bicycling is based on a limited sample size, which can often make it challenging to track increases in mode share. Change from year to year can sometimes be lower than the margin of error for the sample population. To improve upon this, MnDOT is undertaking a statewide data collection study to evaluate the effectiveness of both permanent and temporary portable counters capable of monitoring bicycle travel throughout the state. MDOT is partnering with the University of Minnesota to develop a systematic approach to counting bicycle trips. That

methodology will allow MnDOT to infer overall bicycle counts from a sample of data collected in the field.

Safety. Safety is another core measure of system performance. Reducing bicycle crashes to zero is always the goal, but understanding improvements in the rate of crashes, as the total number of trips taken by bicycle increases (or decreases) is critical to better understanding safety trends. This metric requires detailed data collection and is based on the total number of crashes involving bicyclists and the total number of bicycle trips. MnDOT's recent research on usage will contribute to a better measure of safety.

Assets. The third measure of system performance identified in the MnDOT study is to better understand the physical infrastructure in the bicycle system. The assets of the regional bicycle system can be measured in a number of ways, including miles of bikeways and number of local governments with bicycle plans. Another consideration is how well-placed the bikeway facilities are – do bikeways connect people effectively to things like goods and services, employment, recreational destinations and transit service? The state network MnDOT recommends in its upcoming Bicycle System Plan for the Metro District will be informed by the results of this Study, which has considered connections between destinations in detail. Thus, measuring the progress toward network completion will help to address system performance.

This measure requires an understanding of the existing system. MnDOT has made improvements to its data collection methods for bicycling infrastructure assets as a result of the Statewide Bicycle Planning Study. MnDOT continues to refine its data collection and storage while also looking at how to best

measure quality, quantity or access to the state's bicycling assets. Some of this work will be through research projects and some will be through the Statewide Bicycle System Plan.

6.2.3 Twin Cities Region Performance Measures – Near Term

The three MnDOT-proposed performance measures – usage, safety, and assets – may represent the three top-level measures of performance of the regional bicycle network as well. MAP-21 recommends coordination between MPOs and state transportation agencies conducting this research, and this is an opportunity for the Metropolitan Council to align its practices with those of MnDOT.

MnDOT's implementation of these performance measures would be phased in over time as robust data collection is not immediately available for all measures. The Metropolitan Council may wish to evaluate local roles in data collection based on the outcome of the MnDOT study and examine existing manual count programs being undertaken by the Cities of Minneapolis and Saint Paul and Transit for Livable Communities that have grown out of the Non-Motorized Transportation Pilot Program (NTPP) program.

Performance measures applicable to the Metropolitan Council's efforts may differ from MnDOT's performance measures. In particular, the Metropolitan Council may wish to focus analysis only on the regional corridors ultimately adopted from this Study into the final TPP. Thus, as the process for data collection becomes clearer, the Metropolitan Council may determine that MnDOT's data need to be supplemented with more local data for a finer-grained analysis of the Twin Cities region.

Safety or bicycle crash data, where available and reliable, could be more easily tailored to particular corridors, but given the low

numbers of bicycle crashes at any single location, these data may not provide a clear picture or even mask potential safety issues. Providing improved bicycle facilities within a corridor should improve bicycling safety within that corridor. But such improvements are also likely to change trip patterns in the region, making it difficult to maintain comparable sets of data as facilities change over time. Thus, safety data may be most meaningful at a broad regional scale and tracked annually over time.

Unlike safety and usage data, data on assets are particularly easy to collect specifically for the regional bicycle network. However, before such measures can be taken, the definition of what kinds of facilities qualify as meeting the intent of a regional bicycle corridor must be refined. Once that definition is established, existing facilities must be inventoried to identify facilities that meet the definition. Collection of this data may take longer, as it requires more unique local effort. Collecting this data may make more sense on a longer-term schedule.

6.2.4 Twin Cities Region Performance Measures – Long Term

Quantifying progress toward building out the Regional Bicycle Transportation Network is an important long-term performance measure for the Metropolitan Council. This performance measure assumes that the regional bicycle corridors identified by this Study adequately respond to regional bicycling demand and regional destinations. To account for changing conditions as the Twin Cities region continues to grow, it is appropriate to develop a performance measure that evaluates how well the bicycle network serves regional destinations.

It is recommended that the Metropolitan Council further develop two additional interrelated performance measures. The first would measure the percentage of regional destinations that are within a mile of a constructed regional bicycle corridor. This requires a definition of regional destination (see Section 4 for the definition of regional destinations).

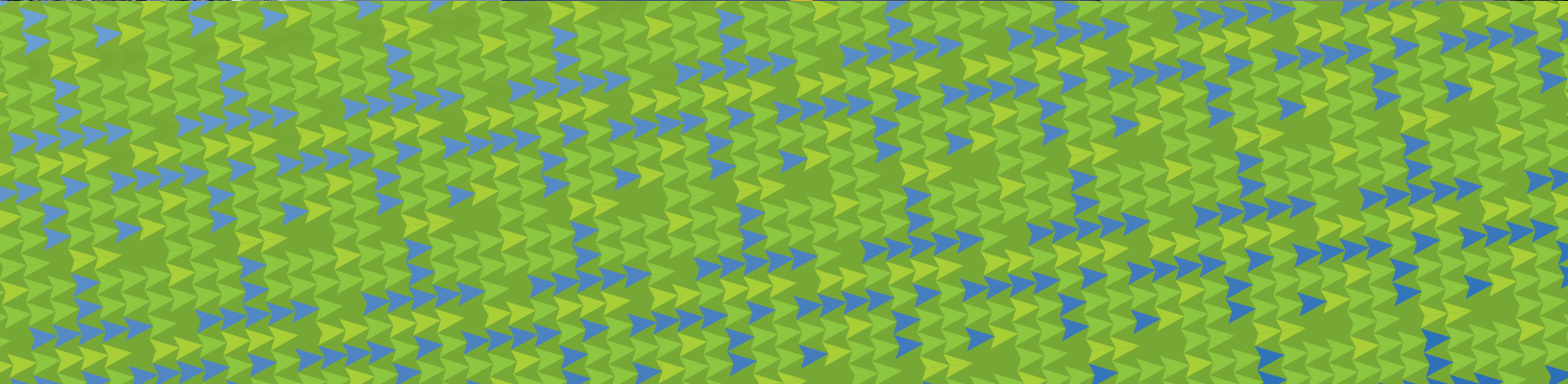
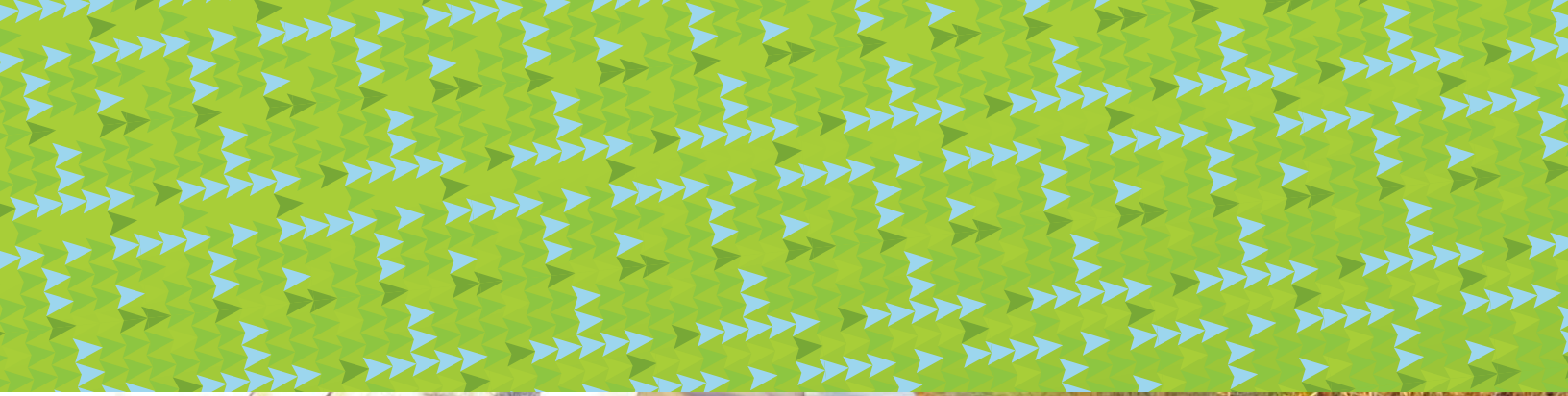
The second performance measure would measure the percentage of the region's population within one mile of a constructed regional bicycle corridor. This would be a relatively simple calculation, and would utilize GIS data to analyze the proportion of the region's population, based on the latest block-level Census data, that lies within one mile of a constructed regional bicycle corridor.

The Metropolitan Council should continue to have a meaningful dialog about performance measures in conjunction with the TPP process to further refine and select the metrics that best reflect the agency goals for system performance. As part of this Study, the project team reviewed a number of existing performance measures being used by other transportation agencies across the country. A summary of select performance measures identified can be found in Appendix F.

6.3 Conclusion

The Twin Cities Regional Bicycle System Study is the first step in defining the Regional Bicycle Transportation Network and establishing Priority Bicycle Transportation Corridors. The intent of the Regional Bicycle Transportation Network is to encourage more consistent planning and implementation of future bikeways with the goal of establishing a seamless network of on- and off-road facilities that will optimize the potential for bicycle transportation across the region.

Moving forward the study recommendations will inform the forthcoming 2040 TPP that will include more opportunity for public comment before final adoption in late 2014. Further information on the overall process for TPP development and public review can be found here: <http://www.metrocouncil.org/Transportation/Planning/2030-Transportation-Policy-Plan/TPPupdate.aspx>.



Regional Bicycle Transportation Network (RBTN) Corridors

PROPOSED

RBTN Corridors with Alignments

- Tier 1 Alignments
- Tier 2 Alignments

RBTN Corridors (Alignments Undefined)

- Tier 1 Priority Regional Bicycle Transportation Corridor
- Tier 2 Regional Bicycle Transportation Corridors

Other Trail Systems

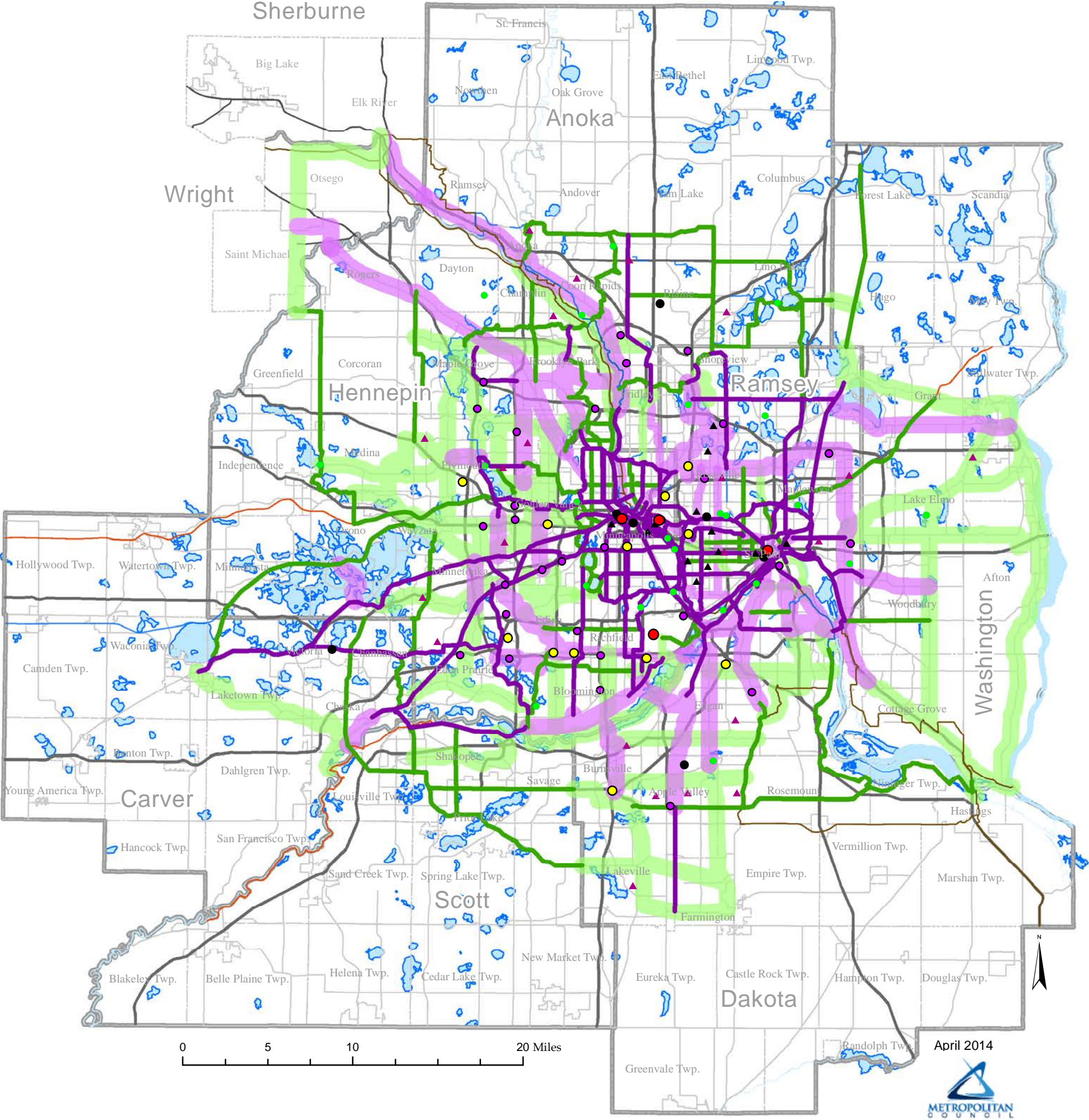
- Regional Trails (Regional Parks Policy Plan)
- Mississippi River Trail (US Route 45)
- State Trails (DNR)

Regional Destinations

- Metropolitan Job Centers (50,000+ jobs)
- Regional Job Centers (15,000 - 50,000 jobs)
- Subregional Job Centers (7,000 - 15,000 jobs)
- Large High Schools (2000+ Students)
- Colleges & Universities (2000+ Students)
- Major Sport & Entertainment Centers
- Highly Visited Regional Parks (400,00+ visits per year)

Reference Items

- Principal Arterial Roads
- Lakes and Rivers
- City Boundary
- County Boundary
- 2040 Municipal Urban Service Area
- MPO Area



Regional Bicycle Transportation Network (RBTN) Corridors

PROPOSED

RBTN Corridors with Alignments

- Tier 1 Alignments
- Tier 2 Alignments

RBTN Corridors (Alignments Undefined)

- Tier 1 Priority Regional Bicycle Transportation Corridor
- Tier 2 Regional Bicycle Transportation Corridors

Other Trail Systems

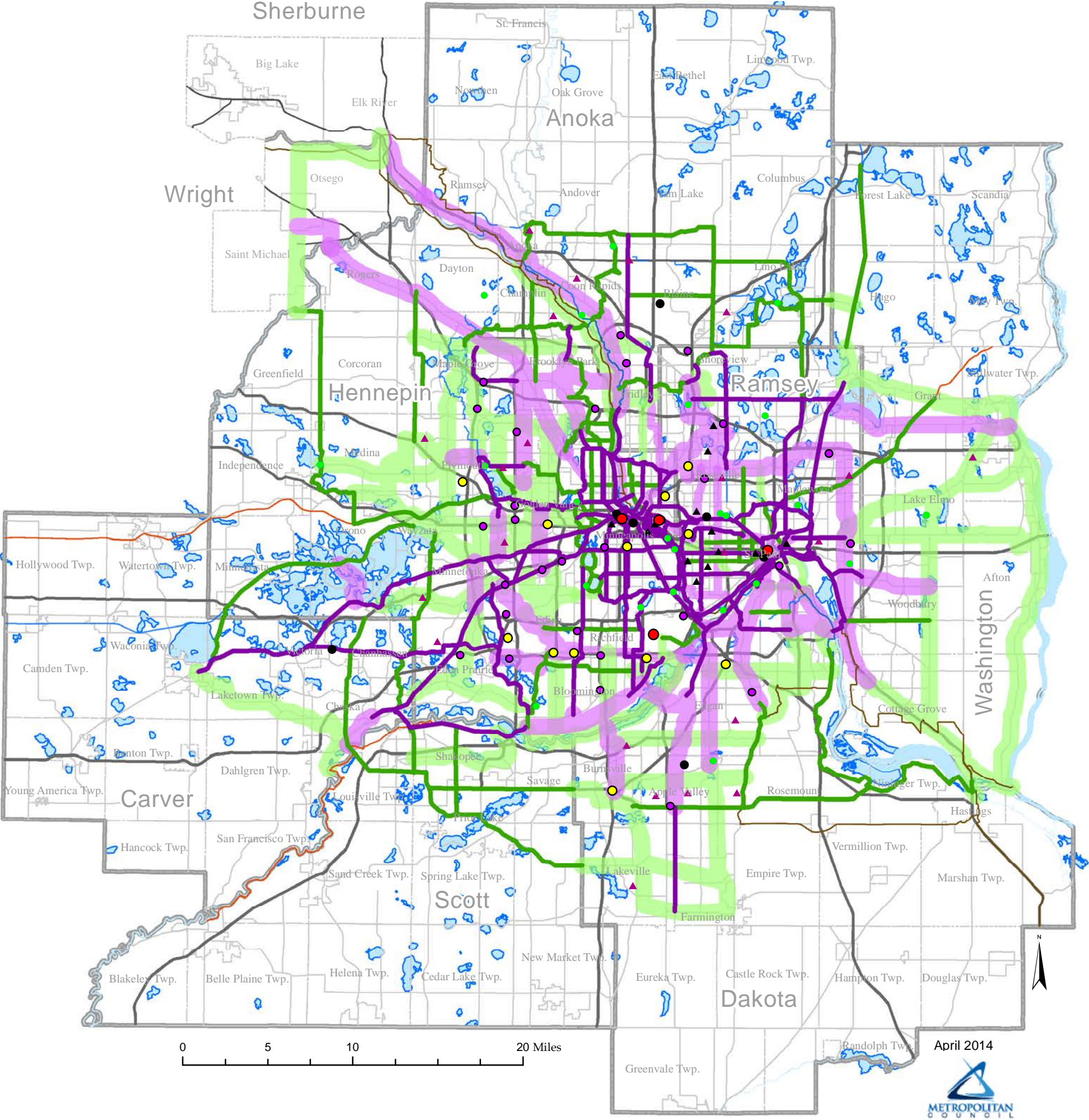
- Regional Trails (Regional Parks Policy Plan)
- Mississippi River Trail (US Route 45)
- State Trails (DNR)

Regional Destinations

- Metropolitan Job Centers (50,000+ jobs)
- Regional Job Centers (15,000 - 50,000 jobs)
- Subregional Job Centers (7,000 - 15,000 jobs)
- Large High Schools (2000+ Students)
- Colleges & Universities (2000+ Students)
- Major Sport & Entertainment Centers
- Highly Visited Regional Parks (400,00+ visits per year)

Reference Items

- Principal Arterial Roads
- Lakes and Rivers
- City Boundary
- County Boundary
- 2040 Municipal Urban Service Area
- MPO Area



4.2 Defining Critical Bicycle Transportation Links

The Regional Bicycle Transportation Network proposed in this Study is not designed to be an all-inclusive bicycle transportation system. The regional system will only maximize its potential if it is built out as planned, and if the local bicycle infrastructure provides strong and seamless connections to the regional network.

There are several types of barriers that can disrupt the connectivity of the Regional Bicycle Transportation Network and isolate communities and key destinations. The links to overcome these barriers are referred to as *Critical Bicycle Transportation Links* for this Study. Defining these critical links may help to facilitate the assessment of project proposals seeking regional funding through the regional solicitation process as directed by the Transportation Advisory Board.

Through the Study process the following definition was developed to provide solid direction for communities to identify and address system gaps where project solutions could be characterized as critical linkages.

Critical Bicycle Transportation Links

Perform one or more of the following functions:

- Serve to close a gap in the regional network
- Improve continuity and connections between jurisdictions (on or off-network)
- Remove a physical barrier (on or off-network)

Serve to close a gap in the regional network.

This Study includes a regional network of bikeway corridors and alignments that are proposed for inclusion in the TPP. Gaps in the existing regional network could be addressed in two ways:

- Improving bikeability within a Regional Bicycle Transportation Network corridor

to better serve all bicycling skill and the wide variety of experience levels within the corridor.

- Building a short (up to a 1/4-mile) but critical local link to or within a major regional destination, or to a major transit-oriented development on the regional transit system, or to a large transit center.

Improve continuity and connections between jurisdictions.

To some extent, each local government in the Twin Cities has employed their own approach to the provision of bicycle infrastructure. In some cases, a bikeway may extend to one city's border, and not carry through into the next city or county. Creating a more consistent, continuous and connected set of bicycle facilities will improve access to, and the overall bikeability of, the regional network.

Removing a physical barrier. Crossing major physical barriers are a significant challenge in providing bicycle infrastructure. These barriers can be both natural and man-made such as major railway corridors, rivers and waterways, freeways and multi-lane arterials.

Projects that remove or provide more bikeable options around physical barriers can arise in a number of ways. Planning work may underscore the need for a bikeway to cross a major barrier. Additionally, other infrastructure projects such as roadway bridges over rivers or freeways can provide opportunities to create bicycle connections across one or several barriers, particularly in instances where there is not a useful parallel alternative within a reasonable biking distance.

By their nature, projects to remove physical barriers can prove costly, and opportunities to enhance such connections may be opportunity driven with respect to major highway improvement projects. Given the significant expense of building connections like

bridges or underpasses and their anticipated long design lives, it is advantageous to consider the inclusion of bicycle infrastructure in all projects that improve options to cross or get around these physical barriers, even if the full potential of the bicycle connection is not evident at the time of construction.

Technical Memorandum #1

To: Steve Elmer, Metropolitan Council
From: Ciara Schlichting, Toole Design Group; Hongyi Duan, Stantec
Date: May 21, 2013

Reference: Summary of Relevant Data, Plans and Studies (Task 2)

The purpose of this technical memorandum is to provide a summary of relevant data, studies and plans. The summary focuses on displaying existing data (see attachments), describing how the datasets will be used to identify bicycle corridors of regional significance, and documenting criteria used to define existing bicycle corridors. The documented criteria will be further analyzed to help define the criteria to be used to identify bicycle corridors of regional significance in Task 3.

DATA AND MAPS

The consultant team has obtained the following data from the Metropolitan Council and the Datafinder website to review as part of this study:

- **Cycletracks info table, segments and trips.**

Cycletracks is a smart phone app that records GPS points as a person bikes on a route. The dataset obtained from the Metropolitan Council is a self-selected participation dataset recorded from May to November of 2012 in the Metro area. The dataset included roughly 4,000 bicycle related trips and recorded information such as the rider's age, gender, zip code for home/work/school, cycling frequency, purpose of the trip, as well as the trip information related to start/end locations, speed, date and time.

This dataset is useful in identifying the origins and destinations (O/Ds) of bicycle trips in the region. When used as a set together, the starting and ending points give a snap shot of where people were biking to and from in reality during the data collection period (May to November 2012). Furthermore, this dataset also maps the actual route people take therefore it is possible to see the trips relevant to actual road and bikeway facilities. This is especially useful in evaluating facility alternatives when multiple alternatives appear to be viable in close proximity to one another.

There are two major limitations of this dataset. First is the lack of attributes relating the trip routes to any given road or trail facility. Although the trips were recorded with GPS points along the actual route the rider took, there is no data relating the route to the ID or name of any road or trail. So even though we can visually inspect the locations of the routes in relation to the facilities, it is impossible to quantify the number of trips taken on any given facility.

The other limitation of the data is the base sampling method of data collection made it difficult to derive a statistically significant comparison to other regional data. The data was reported on a volunteer basis. So it is possible to have some riders

reporting a lot of trips while other riders reporting much less or none at all. Since we cannot be certain about the representation of the reported trips versus all trips, we cannot present the density of either the O/Ds or the trip routes as representing the actual regional frequency patterns.

Based on these findings, we will emphasize the use of this dataset in a locational instead of quantitative manner. We will use it in evaluating alternatives of both the O/Ds and the regional corridors.

- **Metro Bikeways**

At the beginning of this project, we obtained the 2007 metro bikeways data from the Metropolitan Council's Datafinder website. This data was based on the Metro Bicycle Network map book of 2001 with additional information digitized from 2003 through 2007 based on various county and local jurisdiction datasets. This dataset included both on road and off road facilities throughout Metro communities. It also identified both the existing and planned facilities. Attributes included many types of information concerning individual segments.

This dataset was the most comprehensive data available regarding the location and detailed information of the existing and proposed bicycle facilities in the region. It provided a good base understanding of the system and was theoretically easy to keep up to date because almost all county and local data in the metro area has been created and maintained in the same GIS format.

Since 2007, this data set has gone through several updating efforts. Most recently, it was incorporated into the base information for Cyclopath and updated there. We have obtained a recent export from Cyclopath and will be using this updated version as our primary base for studying the connectivity of the current bikeway system, delineating potential regional corridors and analyzing system gaps.

The new bikeway data has attributes related to facility type and corresponding roadway information if the facility is on road. A limitation of the dataset is unlike the original 2007 data, the field that indicates whether a facility exists, is planned or proposed is not populated. Therefore, we will need to consult the specific local plans to know whether any particular facility actually exists. While this does not constitute a major problem in our analysis for the regional corridors, it will dictate additional time in our studies.

- **Regional Trails – 01/15/2013 version**

The regional trails dataset was developed by the Metropolitan Council. This is a compilation of alignments for existing and planned regional trails for the 7 county Twin Cities Metropolitan Area. This data has attributes depicting the name, status, length and operating agency for each trail. Most of the metro regional trails are shared use paths. This data will be helpful in analyzing connectivity to O/Ds in this project.

Associated with this data, we have also received a spreadsheet from the Metropolitan Council regarding regional parks and trails with high annual visitation. This will be very valuable in the selection of regional O/Ds.

- **Cyclopath extracted data – 10/2012**

Cyclopath is a web based geowiki for public users to identify potential routes from one place to another on bicycle. As users query the routes, the system records the places they wanted to start and end as well as the routes generated by the application. Periodically, this data is extracted to a conglomerated dataset to help planning efforts like this project in understanding the regional O/Ds and potential usage of facilities.

We have obtained the most recently extracted dataset from October 2012 and made three maps (attached). One map depicts patterns of route request frequencies. A second map depicts patterns of trip beginning points. The third map depicts patterns of trip ending points.

From reviewing of these maps and data, we feel this data is helpful in helping to identify prominent corridors and O/D areas. It provides an understanding on where people wanted to go and the potential best routes based on facility strengths.

The limitation of this dataset lies in the fact that the records are for potential trips instead of actual trips. The user can select many ways to evaluate the strength of any route segment. While this is very useful for the user, it creates difficulties in statistically evaluating the quantities of the resulting routes. We do not know how many trips and which trips were actually taken. Therefore caution will be used when we apply quantitative analysis to the data.

- **2010 existing land use**

The Metropolitan Council publishes a dataset depicting the existing land use for the region every 5 years. The latest was in 2010. We have mapped this data to illustrate the current development pattern of the metro area (attached). This data will be used to provide context for the O/Ds for this project.

- **2030 planned land use**

The Metropolitan Council has put the planned land use from local comprehensive plans together into this dataset that shows the planned 2030 land use for the region. We have mapped this data to illustrate the planned development pattern of the metro area (attached). This data is mapped in two ways: one depicts the generalized land use types and one depicting the density expectations of residential development. We will be mapping the initial O/D areas based on this dataset.

- **Metro existing roadway classification and planned 2030 additions and transit corridors**

We have obtained these datasets from the Metropolitan Council's datafinder website. We have mapped this data on one map to illustrate the transportation system envisioned for 2030 (attached). This data together with all the above mentioned information can assist us in identifying the regional bikeway corridors and their hierarchy and timeframe.

- **TBI HH Survey Data Table Feb 2013 UNEXPANDED**

This dataset came from a two year metro wide survey of trips made by a sample of households via all transportation modes. The sampling size was 1% of area households and over 80,000 trips were recorded. Attention was given to make the sampling comparable among age and other characteristics of the households.

Bicycle use was identified as one type of transportation modes in the data collected and around 1,100 trips were recorded where bicycle was either the primary mode for the entire trip or to a transit facility. The data only recorded the starting and ending points of the trips. No route information was recorded. Detailed information regarding the household members was recorded. This information included location, income, car ownership, bike ownership, usage of transit, housing type (cost, rent/own), age, gender, number of children, student or not, education level, etc. Regarding the trips, the records included trip mode, cost, purpose of trip, whether anyone accompanied the recorder, time of day, etc.

We feel this dataset is very helpful for identifying the O/Ds for this project. Since this data was derived from a carefully selected sample of the area households, the distribution pattern is statistically better than other mentioned datasets in displaying the patterns of the O/D areas. We will not use it to arrive at the initial set of O/Ds but will be using it to verify and supplement them.

- **Regional Job and Activity Centers**

Metropolitan Council developed this dataset based on 2010 employment data from the Census, the 2010 existing land use mentioned earlier, and the proprietary Longitudinal Employer-Household Dynamics (LEHD) data from The Center for Economic Studies. A threshold was set for any areas to be recognized as a center when the area holds at least 7,000 jobs at a density of at least 10 jobs per acre of developable land. These centers are classified as Metro Centers when they held 50,000 + jobs at the density of 50+ Jobs per acre; Regional Centers when the area held 15,000 to 49,999 Jobs at a density of 10 to 49 jobs per acre; and Subregional Centers when the area held 7,000 to 14,999 jobs at a density of 10 to 49 jobs per acre. Each category was further divided to sub categories based on the prominent type of jobs in the area.

This data set was originally developed to assist the location of regional transit corridors. Thus the emphasis on employment. We feel it is also helpful in verifying our selection of the O/Ds as biking to and from work can be an important component of all bicycle usage.

The Metropolitan Council provided the consultant team with the following maps as graphics inside various documents to review as part of this study (the maps are attached to this memo for reference):

- Existing Twin Cities Metro Bikeways (Regional 2030 Transportation Policy Plan)
- Minneapolis Existing and Funded Bike Routes map (Feb. 2012)
- Minneapolis Bicycle Master Plan map (2011)
- Minneapolis Bicycle Functional Classification (2011)
- St. Paul 2011 Citywide Bike Plan map
- St. Paul Proposed Bikeways and Trails
- Bloomington Active Living Biking and Hiking Guide
- Bloomington Alternative Transportation Plan (2008)
- Bloomington Core Alternative Transportation System Plan with Principal Destinations map (2008)
- Carver County 2030 Trail and Bikeway Plan (2030 comprehensive plan)
- Dakota County Bike Trails map and Trail Gaps map (2030 Transportation Plan)
- Hennepin County Bicycle System Plan map and Bicycle Gaps map (Sep. 2012)
- Anoka County (Parks) Bike map
- Ramsey County Active Living (parks) Bike map
- Ramsey County 2011 Bicycle System Map
- Ramsey County Hiking and Biking Trail Information
- Scott County Regional and County Trail System map (2030 Comprehensive Plan)
- Washington County Existing Trails map and Planned Trail System map (2030 Comprehensive Plan)

These maps are useful in verifying if the datasets we obtained include or are missing bicycle facilities (both existing and planned) that are included in adopted plans analysis.

PLANS

The objective of the plan review is to document criteria used to define existing regional bicycle corridors. Overall, the criteria documented in the plans include:

- Qualitative measures for defining trail and bikeway corridors, (e.g., links between origins and destinations, improve access to transit, continuous connections between communities, connections between on-road bikeways and off-road trails, remove barriers, fill gaps, directness, etc.).
- Quantitative measures regarding desired spacing of bikeway facilities is not included in regional or county plans, but is included in both the Minneapolis Bicycle Master Plan (i.e., *Principal arterial bikeways should be spaced about 2 miles apart with minor arterial bikeways spaced 1 mile apart*) and St. Paul Transportation Plan (i.e., *bikeways should be no more than a half-mile apart, and arterial striped bike lanes and/or off-street trails should be no more than one mile apart*). Bloomington's Alternative Transportation Plan strongly advocates the overarching principle that quality should take precedence over quantity.
- Geographic considerations based on roadway function, jurisdiction, and ownership (e.g., principal or minor arterials, county right-of-way along roadways and rail corridors, not on county road shoulders, high use corridors, parallel local streets, etc.).
- Trip purpose (e.g., transportation or recreation)

The Metropolitan Council provided the consultant team with several plans to review and the consultant team obtained additional plan documents via the internet. Excerpts from each plan are provided below and potential criteria are in **bolded font**. The documented criteria will be further analyzed to help define the criteria used to identify bicycle corridors of regional significance in Task 3.

METROPOLITAN COUNCIL 2030 TRANSPORTATION POLICY PLAN

Policies and Strategies (pg. 172)

- Strategy 18a. Bicycle and Pedestrian Regional Investment Priorities: The Council will prioritize federal funding for bicycle and pedestrian improvements based on their **ability to accomplish regional transportation objectives** for bicycling or walking in a cost-effective manner and **improving access to major destinations**.
- Strategy 18b. Connectivity to Transit: Recognizing the importance of walking and bicycling to a multimodal transportation system, the Council will strongly encourage local units of government to develop a safe and attractive pedestrian environment near major transit corridors and stations with **linkages for pedestrians and bicyclists from origins and destinations to buses and trains**.
- Strategy 18d. Interjurisdictional Coordination: The Metropolitan Council, along with local and state agencies, will coordinate planning efforts to develop efficient and **continuous bikeway systems** and pedestrian paths, **eliminate barriers and critical gaps** and ensure adequate interjurisdictional connections and signage.
- Strategy 18e. Complete Streets: Local and state agencies should implement a multimodal roadway system and should explicitly consider **providing facilities for**

pedestrians and bicyclists in the design and planning stage of **principal or minor arterial road construction and reconstruction projects** with special emphasis placed on travel barrier removal and safety for bicyclists and pedestrians in the travel corridor.

Investment Priorities and Requirements (pg.175)

- Transportation Purpose. Federal transportation funds will be used on bicycle projects that **serve primarily a transportation function** in addition to recreation. **Bikeway facilities should be located where potential use is highest** and where they can most significantly enhance transportation choices.

Designing Complete Streets (pgs. 178-179)

- When a **principal or minor arterial road is constructed or reconstructed**, off-road walkway designs and both on- and off-road bikeway designs should be considered at the planning and scoping stage of the project, with special emphasis placed on safety and barrier removal with the goal that the street meets the needs of all users. In the case that bicycle or pedestrian facilities on the roadway right-of-way itself are **deemed impractical** during the planning and scoping stages of the project, such travel should be **facilitated and improved along the general corridor such as on adjacent streets or trails** to the greatest extent feasible.
- **Bicycle facilities should be provided within existing rights-of-way** whenever feasible instead of acquiring exclusive new rights-of-way. Improvements could include the addition of wide marked shoulders or bike lanes, sidewalks or multi-use paths, as well as intersection treatments that are sensitive to the safety of non-motorized users of the roadway. Improvements for bicycle and pedestrian safety and mobility should be made on **minor arterials** so long as they do not diminish the capability for multimodal function and capacity.
- Some communities with grid street systems have introduced “**bicycle boulevards**” on which bicycle travel is prioritized on local residential streets with pavement markings, traffic calming techniques and careful intersection crossing treatments so that cyclists may travel unimpeded parallel to a major arterial where bike lanes are impractical. Converting these types of streets is an innovative way to improve the environment for bicycling by retrofitting underutilized infrastructure. However, **they do not replace the need to provide bicycle accommodation on collector or minor arterial roadways.**

Bridges (pg. 179)

- **Every bridge that** is newly constructed or reconstructed with federal or state funding and that **removes or crosses a barrier for pedestrians and bicyclists must safely accommodate bicycle and pedestrian travel unless** a reasonable alternative exists within one-half mile for bicyclists and one quarter mile for pedestrians. However, bicyclists and pedestrians must be explicitly considered in project planning and scoping for all new or reconstructed bridges.

Interjurisdictional Coordination (pg. 182)

- The regional bikeways mapping project is an example of this effort. This effort was initiated originally by MnDOT, with participation from regional partners, to evaluate the need to **plan a regional bikeway system focused on the highest priority bicycling transportation corridors and destinations and to remove barriers in the bicycle transportation system**. A regional bikeways map published by the Council is a starting point for cities and counties to use in developing integrated metro-wide bikeway systems. The Council will update the dataset with information from local comprehensive plans which should provide the most current inventory of what local governments are planning and what exists today.
- **Efforts are needed to integrate the trail systems within the region's bicycle network as well as connections between on-road bikeways and off-road trails.** Recreational bicycling and walking are popular activities among the region's residents and bicycling for recreation is usually the first introduction that potential bicycle commuters have to bicycling.

METROPOLITAN COUNCIL 2030 REGIONAL PARKS POLICY PLAN

Siting and Acquisition Strategy 3 (pgs. 2-15 – 2-17): New trails, or trail segments, that serve a regional audience are a significant priority for the regional parks system.

- To qualify for regional trail status, an existing or proposed trail must serve a regional audience, based on visitor origin and service-area research on regional trails, and should not duplicate an existing trail. The trail may include part of an existing county or local trail if it is a destination itself, providing a high-quality recreation experience that traverses significant natural resource areas where the trail treadway will have no adverse impact on the natural resource base, and/or it links two or more units of the regional recreation open space system.
- New Linking Regional Trails should be located within the developing or developed area of the region. For Linking Regional Trails, any two trails running parallel to each other and not separated by natural or human-built barriers should be at least 1.5 miles apart so as not to overlap the localized service area of those trails. For Destination Regional Trails or Greenways, there should be no spacing minimums or maximums; instead, the decision to locate the trail should be based on the availability of existing high-quality natural resources or the opportunity for natural resources restoration, enhancement and protection. Areas within the urban and urbanizing portion of the metropolitan area that are not within 3 miles of a regional trail should be identified as search sites for new regional trails.
- Destination Regional Trails or Greenways should be located to reasonably maximize the amount of high quality natural resources within the trail corridor boundaries. Whenever possible, Linking Regional Trails should be located to reasonably maximize inclusion of high-quality natural resources and connections to local trails, areas of lifecycle and affordable housing, and areas of infill and redevelopment.
- Trail corridors planned and operated mainly to provide bicycle transportation such as trips to work, shopping, etc., are not emphasized as a part of this policy plan—the emphasis is on recreational trail activities—but new regional trails that are projected to serve both recreation and commuting uses are desirable as part of the

regional trail system. Some regional trails also function as bicycle transportation corridors and have been funded in part with federal transportation funds. The selection, development and operation of bicycle transportation arteries are covered as a component of the Council's transportation plan. The commuter on a regional trail typically enjoys a more scenic travel experience compared to the experience offered on road-based bicycle transportation lanes, so commuting trips taken on regional trails have an inherent recreation component. Increased commuting opportunities by locating new regional trails benefit the region through reduced congestion and the health benefits associated with physical activity. Examples of existing regional trails that provide multiple benefits include the Southwest LRT Regional Trails, Cedar Lake Regional Trail, the Mississippi River Regional Trail, the Big Rivers Regional Trail and the Bruce Vento Regional Trail.

- User surveys indicate that recreation trails draw heavily from nearby areas, so the priority is to concentrate on the acquisition of more trail corridors in the metropolitan urban service area, where more than 90 percent of the population lives. In this urbanized area, attention should be given to both high-quality natural resources and, in the fully built-up areas, to major human-built or developed resources. The interesting human-built developed resources include historical and architectural buildings and sites, education facilities, cultural facilities, and major public and private buildings. Utilizing the surface rights of underground utility corridors, such as large sewers, for trail purposes protects the utility for access/maintenance and provides a linear corridor for the trail.
- The regional trail system in the metropolitan area is like the highway system, with regional and local components. The regional component consists of trails in the regional trail system and state-administered trails. This system is complemented by shorter, local trails, which may eventually feed into units of the regional trail system. The opportunities for interesting trail recreation experiences are substantially enhanced where local trails intersect with or are reached by elements of the regional system. Another priority for designation of regional trails is the existing or likely possibility of intersecting with the local trail system.
- Some of the metropolitan area's inner-ring suburbs are not close to regional parks and don't have large tracts of land that would be available for future development of parks for the regional system. Regional trail development should be pursued in these suburbs when the need has been identified, to help achieve equitable geographic distribution of regional parks system facilities.

Finance Strategy 4 (pg. 2-21): Any development should primarily benefit citizens of the metropolitan area. The eligibility criteria (not in any priority order) for development and rehabilitation of regional park reserves, parks, trails and special facilities are:

- Regional trails that connect to other trails or regional facilities or extend existing trails.

Finance Strategy 7 (pgs. 2-25 – 2-26): Trails that may be used for transit in the future should only be acquired if it is clear they will be used as trails for at least 10 years.

- ...potential problem situations occur. First is a situation where the surplus corridor is wide enough to accommodate permanent use both as a light-rail/busway transit right-of-way and for trail recreational purposes. Such areas are of substantial

interest to the regional parks system. It is hoped that differences between the transportation use and the recreation use can be resolved so that both types of activity can become permanent, valuable additions to the metropolitan area. Planning, development and management arrangements, however, will have to be worked out among the various interests involved.

Planning Strategy 1 (pgs. 2-32 – 2-33): Acquisition and improvement projects must be part of approved master plans, or their amendments.

- Master plans for regional linking trails, regional destination trails or greenways must include a demand forecast - the recreational demand to be met by the trail as identified by the Council, the regional park implementing agency or other sources

Planning Strategy 2 (pg. 2-34): Joint-powers agreements for regional trails are encouraged.

- Regional trails generally extend through several communities. Unlike regional parks, where the regional park implementing agency owns the park and usually deals with one or two local governments, regional trails affect several local governments and may not be “owned” by the regional park implementing agency. The regional park implementing agency may lease the trail land and manage it with a local government through a joint-powers agreement.
- Joint-powers agreements need not be identical, but regional park implementing agencies are encouraged to negotiate arrangements that deal with the primary issue of how trail land ownership is controlled and how the trail is going to be managed, and that insure the trail will be open to all people (not restricted by residence). The trail should be treated as a truly regional facility, since regional and state funds are or will be used to finance its acquisition, development and operations/maintenance.

Recreation Activities and Facilities Strategy 1 (pg. 2-38): Activities in regional parks must be tied to the natural resources of the parks, but not impact them negatively.

- Night trail use. Opening trails at night allows those who work during the weekdays to use them more frequently. Walking and cross-country skiing at night increases trail uses during the off-peak spring, fall and winter seasons. Trail lighting projects are encouraged where appropriate, especially on trails with high demand. When considering lighted trails, however, it's important to assess lighting's impact on adjacent land uses.

Recreation Activities and Facilities Strategy 2 (pg. 2-41): Most heavy recreational use should be in the more urban regional parks.

- When feasible, transit system elements should be developed to provide access to regional parks system units. Transit planners should prepare specific transit system elements that are sensitive to parks, park users, park development plans and local agencies' rules and regulations.
- The 2030 Regional Development Framework integrates plans for regional parks, park reserves and trails in the rural area. These regional parks and trails should primarily serve the demands of residents of the urban area; they should not interfere with agricultural activities or natural resource conservation and hunting, and should be planned in a way that discourages urban-density developments from occurring around their peripheries.

Recreation Activities and Facilities Strategy 3 (pg. 2-42): Regional parks facilities and programs should encourage use by special populations.

- Metro Transit and other transit providers are urged to work with the regional park implementing agencies to identify any transportation barriers for special populations and design programs to increase the level of access to the regional parks system.

Recreation Activities and Facilities Strategy 4 (pg. 2-43): Bicycle and pedestrian access and trails must be part of the regional parks system.

- Safe, high-quality, continuous, barrier-free bicycle and pedestrian systems shall be developed, maintained and improved to function as integral parts of the region's transportation and recreation systems.
- Regional trails may serve a transportation function as well as a recreation function—especially for bicycle commuting. Where bicycling can safely be accommodated with pedestrian traffic, it will be allowed. The selection, development and operation of bicycle transportation arteries is covered as a component of the Council's 2030 Transportation Policy Plan rather than the Regional Parks Policy Plan.
- The Metropolitan Council's 2030 Transportation Policy Plan, adopted in January 2009, contains a policy and related strategies that address these issues. That policy has been included in this plan, since it is an important consideration when planning for the regional parks system. For the purposes of this plan, the policy has been updated to recognize recreational use of trails.

The regional trails system will provide primarily these bicycle facilities:

- Off-road facilities, which are paths within the roadway rights-of-way but separated from the roadway surface. They may be used for hiking and in-line skating as well as bicycling.
- Independent trails, such as trails using abandoned railroad corridors or utility easements that exist in their own independent rights-of-way.

These facilities are intended to serve:

- Group B bicyclists, who are casual or new adult and teenage riders who prefer comfortable access, preferably by a direct route, on low-speed or low-traffic streets where having the right-of-way as a moving vehicle is not critical. Group B bicyclists are most comfortable on designated bikeways, off-road facilities and independent trails.
- Group C bicyclists, who are pre-teen riders whose roadway use is usually accompanied by a parent. They need access to local schools, libraries, recreation facilities, shopping or other residential areas. They need separation of bicycles and motor vehicles through off-road facilities or

independent trails, or access to streets with low vehicle speeds and volumes.

In addition to Group B and C bicyclists, the regional trail system may occasionally serve Group A bicyclists, who are experienced riders, including regular bicycle commuters, messengers and racers/trainers who can operate under most traffic conditions. They want direct access to destinations at maximum speed with minimum delays. Group A bicyclists primarily rely on the road system for routes and value having the right-of-way like other vehicles, but occasionally enjoy independent trails if they are relatively continuous and not overly crowded.

The majority of regional trail miles should be off-road. However, in some instances it may be necessary for a short stretch of trail to be adjacent to or on a road in order to bypass natural or man-made barriers or private property. These portions of trails should be designed to safely accommodate Group C bicyclists.

Regional parks system funds and federal transportation enhancement grants may be used to finance parts of the regional trail system where the system serves a transportation function as well as a recreation function.

Transportation funds for highway and bridge construction/reconstruction should be used to provide on-road and off-road facilities, including striped bike lanes that exist within the extent of the actual road surface and bicycle/ pedestrian bridge lanes to provide safe routes over rivers, freeways or railroad tracks to provide continuity to the regional trail system. The appropriate sources of funding for local trails are the local tax base and the Minnesota Department of Natural Resources Local Trails Grant Program.

A comprehensive network of trails that serves both recreation and transportation needs is desirable. This network links state, regional, county and local trails, and integrates the trail system with other transportation modes such as the bus and light-rail transit systems. Regional trails are primarily recreation trails, though some of the urban regional trails also have important commuter functions. County and local trails serve as recreation and transportation routes for the immediate local population. They may also serve as "feeder" trails into the larger regional system of trails. To help integrate the network, the Council is responsible for reviewing the comprehensive plans of all cities and townships within the metropolitan area. This review includes an assessment of local trails and their relationship to the regional trail and transit systems. Enhanced dialogue between recreation providers at all levels will be promoted by the Council and should result in a well-designed comprehensive system of trails throughout the metropolitan area.

The Metropolitan Council is responsible for regional transportation planning, including bicycle transportation facilities. Since regional trails also serve non-motorized commuters, it is important that the regional trail system and the regional transportation system work in unison when developing trail and transportation plans. Regional trail projects that would serve transportation needs qualify for additional funding with transportation enhancement grants.

Regional Trails (pg. 3-57)

- Trails also are selected for their ability to intersect with local trail networks, with the regional trails functioning much like regional highways that interconnect with more local arterials and collector streets. The regional trail network, especially in the urban areas, serves as commuting routes for bicyclists. As the regional trail and transit systems expand, opportunities to provide connections between these forms of travel should be explored. People can ride the bus or light rail to access a regional trail, and conversely, people can use regional trails to access transit.
- Regional trails can also be developed as greenways, or linear parks, where the trail itself is a destination. These greenways typically include wide corridors that provide opportunities for improving wildlife habitat, protecting natural resources, and providing recreational opportunities.
- People tend to prefer trails that are relatively close to where they live. Surveys conducted by the Metropolitan Council show that more than 75 percent of trail visitors live within 3 miles of the trails they used. However, trail users are traveling from one city or county to another. It is this inter-jurisdictional trail length that makes these trails regionally significant.

Classification System for Local and Regional Facilities*

Component	Use	Service Area
Local linear parks, trail, corridors and parkways	Area developed for one or more varying modes of recreational travel such as hiking, biking, snowmobiling, horseback riding, cross-country skiing, canoeing and driving.	A neighborhood or several neighborhoods in a city or township
County linear parks, trail, corridors and parkways	Area developed for one or more varying modes of recreational travel such as hiking, biking, snowmobiling, horseback riding, cross-country skiing, canoeing and driving.	Several cities and/or townships in a county.
Regional destination trail	Area developed for one or more varying modes of nonmotorized recreational travel such as hiking, biking, horseback riding, cross-country skiing, and canoeing.	The entire metropolitan region
Regional linking trail	Area developed for one or more varying modes of nonmotorized recreational travel such as hiking, biking, horseback riding, cross-country skiing, and canoeing.	The entire metropolitan region

* Adapted from Table 3-1, pgs. 3-59 - 3-60, Met Council Regional Parks Policy Plan (2012)

HENNEPIN COUNTY BIKE PLAN (2001)

Executive Summary (pgs. i, vi, xi)

- Efforts are needed to **integrate the trail systems within the region's bicycle network** as well as **connections between on-road bikeways and off-road trails**. Recreational bicycling and walking are popular activities among the region's residents and bicycling for recreation is usually the first introduction that potential bicycle commuters have to bicycling.
- The selection of corridors that make up the bicycle transportation system evolved from the initial goals and objectives established for the plan and the need to satisfy the enhanced **continuity and connectivity** system needs.

To identify the primary system of bicycle routes, the general corridors were overlaid on the Hennepin County roadway system and appropriate county roads were selected for inclusion in the Bicycle Transportation System.

Where **county roads were not available** or were identified as being inappropriate for bicycle transportation, **secondary system routes were identified**. Independent trails were included as part of the overall system.

The result of the planning process above was a system of primary and secondary bicycle routes and independent trails identified graphically on the map.

The **primary routes** (blue) in the system were identified as being corridors where the **goal of full bicycle accommodation for bicyclists is focused**. These corridors may be comprised of **county roadways and right-of-ways** or they may make use of **parallel lower volume city streets**.

- Full bicycle accommodation defines roadways that provide both on-road and off-road facilities for bicyclists within or adjacent to the road right-of-way.

HENNEPIN COUNTY GAP STUDY (2002)

Gap evaluation criteria (pgs. 3-5):

- Gap is Identified on a Bicycle Systems Plan
- Gap is Across a Natural or Man-made Barrier
- Gap is Within an Upcoming County, City or Agency Capital Improvement Program (CIP)
- Bicycle / Pedestrian Accident History
- Gap is in an Area with Few Other Options for Travel
- Length of Gap
- Other considerations **anticipated facility use, connection to a high bike-trip generator, use benefits within dense areas, directness/continuity of the overall route, connecting existing facilities** that are designed consistent with county and Mn/DOT design guidelines, and if the gap connects to segments that are themselves more than 1 mile in length.

WASHINGTON COUNTY 2030 TRANSPORTATION PLAN

Non-motorized facilities (pgs. 4-39, 4-49, and 4-72)

- Washington County operates trail corridors that serve both recreational and transportation purposes. In addition to bicycle commuters, these trails are commonly used by walkers/runners, recreational bicyclists, inline skaters, and, on some trails, cross-country skiers and snowmobilers. Where separated trails do not exist, road shoulders provide an interim facility for nonmotorized travel. **Washington County does not designate shoulders as trails or bicycle routes.**
- Policy 4-21: Identify and support trail connections that provide **links to parks, cultural and historic resources, and community destinations.**
- Non-motorized facilities consist mainly of off-road trails along county roads which provide opportunities for both recreational use and commuting to and from work. Enhancing these nonmotorized facilities, as part of the overall transportation system, is a key element to providing a transportation system that is sustainable, **links destinations and attractions**, and encourages healthy and active lifestyles. Connectivity of the facilities includes **connections within neighborhoods, between neighborhoods, to activity centers, to other regional trail facilities, and to transit facilities.** This connectivity forms a seamless integration for users to be able to utilize this transportation mode to meet their needs. Much of the neighborhood connectivity occurs at the local level in land use planning of neighborhoods and commercial areas. This planning lays the foundation for how the community provides these local connections to these areas and supports walking and bicycling. At the county level, the focus is more on **connecting to the local trail/sidewalk network and providing connections to destinations and attractions.**

SCOTT COUNTY 2030 TRANSPORTATION PLAN

Trails and Non-Motorized Facilities (pg. VI-56 and VI-57)

- Given that the County's highways are high volume, high-speed facilities, **separated bike and pedestrian ways are an important element of a safe and efficient transportation system.**
- Figure VI-27 shows the current Metropolitan Council adopted regional trail network in yellow. The blue lines are anticipated future separated trails that will be considered with future road projects. The pink is the County's desire for a regional trail to be considered in future regional plans. Other **County highways are to have on road bike facilities provided as roads are reconstructed.** It is anticipated the County will **include trails on both sides of the road** when highways are reconstructed in or near the urban areas.
- **On-Road Bikeways.** These are associated with the road surface. **Typically are local and do not serve as a regional route.**

CARVER COUNTY 2030 COMPREHENSIVE PLAN

Trails – Bicycle and Pedestrian (pg. 4.13)

- As stated in the Parks, Open Space, and Trails portion of the County Comprehensive plan, the County goal is to provide residents with a high quality, **interconnected** trail and bikeway system for recreation, fitness, and transportation and as a means to **tie parks and open spaces together with local communities**.

County Goal Parks Open Space (pg. 6.7)

- To provide residents with a high quality, **interconnected trail and bikeway system for recreation, fitness, and transportation** and as a means to **tie parks and open spaces together with local communities**.

Objectives in Support of Goal Statement:

- To provide a trail system that emphasizes harmony with the natural environment
- To develop a system of high value trails and bikeways, with a focus on providing a **high quality experience to encourage high levels of use**
- To allow for relatively uninterrupted walking, hiking, biking, and other uses to and through the County's park and open space system and developed areas
- To **effectively tie the various parks together into an interconnected, high quality system; and to effectively tie the county trail system with those of local communities**
- To safely protect users from developmental encroachment and associated vehicular traffic

Trail and Bikeway Plan (pg. 6.30 and 6.39 – 6.40)

- The trail system is underpinned by the common vision defined in Sections 1 and 2. The over-arching goals of the trail system are to:
 - Develop an **interlinking** system of high value trails throughout the county that **connect with local cities and townships**
 - Provide **reasonable trail access to parks, open spaces, and natural resource amenities within the county** without unduly compromising their integrity and natural qualities
 - Provide an appropriate level of **universal accessibility** to trails throughout the system
- Bikeways (which in most cases will take the form of a **6-foot or wider shoulder**) along identified routes are used to meet the needs of subgroup of bicyclists preferring to ride on streets and roadways for recreation, fitness, and transportation.
- With the bikeway system, the primary goal with the routes shown on the plan is to **create a series of loops across the county that link small towns with the larger growing cities**. Providing a wide shoulder and bike route signage along these roads will allow a bicyclist to safely use county roads when out for longer recreation and fitness rides, or using their bike for transportation.

DAKOTA COUNTY 2030 TRANSPORTATION PLAN

Integrating Pedestrian and Bicycling Modes (pg. 5-40)

- The County will integrate pedestrian and bicycling modes to provide for safe, timely, and **efficient connections between communities, activity generators and employment centers.**

County Role in Pedestrian and Bicycle Travel (pg. 5-42)

- Pedestrian and bicyclists share destinations with motorists. Many of these destinations are on the County highway system, particularly **commercial areas, schools, employment centers and regional parks.** The County highway system is in many cases the most **direct** option for pedestrians and bicyclists; in some cases it is the only option. Most suburbanized areas of Dakota County lack a connected road network that would allow pedestrians and bicyclists to travel off the County system. This makes the County highway system the only choice.

General Strategies and Policies (pg. 5-44)

- Create a countywide greenway system to support non-motorized transportation modes.
 - Create an **off-road trail hierarchy** with attractive spine routes **that function similarly to the highway system's arterials.**
 - **Connect city and County parks, new pedestrian-oriented development, schools, and existing pedestrian-scale areas (downtowns) with the greenway system.**
- Bicycle and Trail Facilities
 - Create bicycle and regional trails that form a framework to serve countywide needs (e.g. **access to major County facilities, activity centers, employment centers and schools**), and provide connections between municipalities and to adjacent counties

ANOKA COUNTY 2030 TRANSPORTATION PLAN

Goals for the 2030 Transportation System:

- Modes: **Enhance alternative travel modes and connections**—transit, **bicycle**, pedestrian, freight, air, and trails.
- **Trails/sidewalks adjacent to improved county roads**
- **Improve connectivity between residential areas and major activity centers**, including employment areas, schools, commercial areas, medical facilities, etc.
- **Support of land uses and transit facilities with the bikeway and pedestrian system** where these modes can be used as a **convenient and efficient alternative mode** of travel, as well as an attractive recreational opportunity.
- **Support extension** of the county, cities, and township **bikeway, trail, and pedestrian systems** to be integrated and coordinated with new development and transportation improvement projects, consistent with the county's 2006 Parks and Recreation Comprehensive System Plan and city and township Comprehensive Plans.

MINNEAPOLIS BICYCLE MASTER PLAN

Engineering (pgs. 75 – 80)

- 4.5.1 Density —Dense communities typically result in more bicycling. Bike projects that are located in areas that **connect high population densities to high employment densities** are very desirable because they are likely the projects that will serve the highest numbers of bicyclists. These areas also tend to be the most congested and tend to generate the most crashes. **Population and employment density are two factors often used to prioritize regional funding.**
- 4.5.2 Development Factors—Minneapolis was platted in a grid before the invention of the automobile. Most of the surrounding first ring suburbs were constructed between 1940 and 1965 in the height of the interstate era with little consideration for bicycles. Many of the bicycle accommodations in Minneapolis are the result of redevelopment. Newer communities (second and third ring suburbs) have also included bicycle facilities into new streets and developments. A map of all bicycle facilities in the metropolitan area was completed a few years ago and a striking observation can be made. There are **relatively few bicycle facilities in first ring suburbs, creating a donut around both Minneapolis and St. Paul.** Several regional trails have been completed within the last 15 years that have helped bridge this gap including the SW LRT Trails, the Luce Line Trail, the Gateway Trail, and the Bruce Vento Trail. Many of the first ring suburbs now also have policies that support bicycling and walking.
- 4.5.3 Spacing of Bikeways —To ensure a safe and reasonable bicycle facility network, it has been concluded that **trails should be spaced approximately 2 miles apart, bike lanes 1 mile apart, and local signed routes 1/2 mile apart.** This density ensures that no one within the city is more than 1 mile from a trail, a 1/2 mile from a bike lane, or 1/4 mile from a signed route. In denser areas including Downtown and the U of M, facilities may be spaced more closely together.
- 4.5.7 Access to Destinations—**Access to destinations is important for all travel modes**, especially for popular locations that attract large numbers. Colleges/universities, shopping malls, stadiums, and central business districts require planning and accommodations for bicycles.

4.6 Equity (pg. 94)

- 4.6.1 Modal Connections—Distance and weather are two common barriers for bicyclists. **By ensuring good modal connections, bicyclists can travel seamlessly from place to place using public transit for part of their trip.** Buses and trains can be easily retrofitted to accommodate bicycles and many of the major transit stops have bicycle parking for those who do not wish to take their bike with on a round trip.

5.5 Engineering (pg. 116)

- Corridor Improvement Needs: These needs are based on a number of factors including **existing bikeway gaps and discontinuities, bikeway spacing, adjacent land use, available right-of-way, potential use, topography, and minimizing conflicts with other modes.**

5.6 Equity (pg. 117)

- 5.6.1 Equity Needs—The Minneapolis Bicycle Program must be fair and present opportunities for all. There are three areas of emphasis with regard to equity; geographic, demographic, and modal equity.
 - Need for Geographic Equity: Geographic equity ensures that **all parts of the city will see the same types of facilities at the same density and quality.**
 - Need for Demographic Equity: Demographic equity ensures that **people of all age, race, ethnicity, and gender are treated equally.**
 - Need for Modal Equity: Modal equity is achieved when **bicycling is treated as an equal mode of transportation** alongside autos, trucks, motorcycles, buses, and pedestrians.
- 7.2.6 Bikeways Master Plan (pg. 159)—**Factors:** Before placing a bicycle route on the Bikeways Master Plan a number of factors were considered including (detailed analysis has not been done):

• Potential use	• Jurisdictional responsibility/function
• Traffic safety and personal safety	• Community support
• Directness of route	• Truck volumes/potential truck conflicts
• Access to destinations and land use	• Proximity to parks and schools
• System connectivity	• Location of existing traffic control devices
• Removing system gaps and barriers	• Motor vehicle parking impacts
• Connections to transit/bus routes	• Bicyclist comfort/scenic route locations
• Types of users and skill levels to be served	• Number of at-grade locations
• Available right-of-way/available space	• Motor vehicle volumes and speeds
• Proximity to other bicycle facilities	• Grades/topography
- 7.3.2 **Bicycle Functional Classification** (pg. 179) —Bicycle functional classification can be used as a tool to help **prioritize stand-alone bikeway projects**. Many of the qualifying and prioritizing criteria including system connectivity, travel demand, cost effectiveness, operations/maintenance, regional benefit, regional equity, and access to destinations can be graphically portrayed. By assigning designations for every bikeway in the 2010 Bikeways Master Plan, limited resources can be applied appropriately. Modeled after roadway functional classification, corridors within each travelshed are assigned as arterial bikeways, collector bikeways, and neighborhood bikeways. It is important not to confuse

roadway functional classification with bicycle functional classification as many arterial bikeways are located on collector streets and some collector bikeways are located along minor arterial roads.

- Travelsheds: Travelsheds are geographic zones that are bound by significant barriers such as freeways, rivers, and railroads. Travelsheds are oriented to fan out from Downtown Minneapolis like slices of pie. Travelsheds ensure that all parts of the city are treated equally and that the bikeway network maximizes mobility/accessibility.
- **Arterial Bikeways: Arterial bikeways have regional significance and attract the highest numbers of bicyclists.** Principal arterial bikeways are like freeways with grade separation corridors and faster speeds. **Principal arterial bikeways should be spaced about 2 miles apart with minor arterial bikeways spaced 1 mile apart.** It is also important that each travelshed include at least one arterial bikeway. Ideally arterial bikeways should form a spider web throughout the city, crossing travelsheds and becoming the spine for the bikeway network. Since different types of bikeways accommodate different bicyclists' needs, there may be situations where arterial bikeways are located on two parallel routes within close proximity. Due to limited resources, the strategy is to maintain arterial routes at a high standard, but give lesser attention to collector and neighborhood bikeways.
- **Collector Bikeways:** Collector bikeways feed into arterial bikeways similar to how smaller rivers flow into larger ones. **Collector bikeways should be spaced about 1/2 mile apart** to capture bicyclists in every part of the city.
- **Neighborhood Bikeways:** Neighborhood bikeways feed into collector routes and can be found in just about every neighborhood. Neighborhood bikeways are intended to **provide local connections and are not eligible for regional funding.**

ST. PAUL TRANSPORTATION PLAN

Coordinated Transportation and Land Use (pg. 10)

- 2.1 Create true transportation choices for residents, workers, and visitors in every part of the city. A more balanced transportation system should **improve access to a range of travel modes and facilities**, as well as increase the capacity of the regional transportation system. The City should **create places to live, work, play, and conduct business that do not depend principally on the automobile for access**, but rather accommodate all modes of transportation.

Increased Transit Ridership and Management of Single-Occupancy Vehicle Use (pg. 13)

- 2.11 Create more seamless connections between pedestrians, bicycles, transit, and automobiles. Regional efforts must be made to enable more convenient and safe connections for all modes of transportation:

a. Work with Metro Transit and other stakeholders to ensure that sufficient **bicycle facilities** and pedestrian amenities are **provided to and at transit stations**;

c. **Support bicycle-sharing programs near transit stations and major destinations** to encourage daily bicycle use and minimize the need for parking at these locations;

Opportunities for integrating physical activity into daily routines as an alternative to driving (pgs. 16 – 19)

- 3.4 Develop and maintain a complete and connected bikeway system. Generally, **bikeways should be no more than a half-mile apart, and arterial striped bike lanes and/or off-street trails should be no more than one mile apart**. It is the desired goal of the City to increase the bicycle mode share from 2% in 2000 to 5% in fifteen years and increase the mode share of bicycling commuters from 0.6% to 2.5% during the same period. Saint Paul will become a world-class bicycling city that accommodates cyclists of varying skill levels riding bicycles for both transportation and recreation and encourages bicycle use as a part of everyday life.
- 3.5 Support existing off-street shared-use paths and add facilities and amenities supportive of active living principles. Good coordination between the Department of Public Works and the Department of Parks and Recreation will be required to **integrate Saint Paul's system of off-road trails and facilities with on-street bicycle facilities and the sidewalk system**.
- 3.6 **Fill gaps in the bikeway system**. The bikeway system includes both **on-street and off-street routes**.
- 3.8 Promote "**bicycle boulevards**" as a new type of bikeway. The implementation of bicycle boulevards should be explored, particularly to **connect neighborhoods and major destinations** and to provide convenient nearby alternatives to bicycling on major streets. Used in cities across North America and Europe, these routes typically utilize low-traffic, largely residential streets to create safe corridors for bicycling. Routes should be well-signed and facilitate safe and convenient crossings across major streets. Local traffic is allowed to access and park on the streets to reach homes and local destinations, while through-traffic is discouraged with various calming methods.
- 3.11 Provide **safe citywide connections to schools, libraries, parks, and recreation centers, with improved crossings and comfortable pedestrian environments at high demand destinations**. Safety issues on routes to these destinations should be identified and criteria in ranking priority projects should be established.

Connectivity to regional systems (pgs. 20 – 22)

- 4.4 **Coordinate with surrounding communities and jurisdictions to enhance regional bicycle and pedestrian networks, recognizing the importance of Saint Paul in regional and statewide connectivity**
 - a. Support Hennepin County and City of Minneapolis efforts to build a **new bicycle and pedestrian bridge across the river to extend the Midtown Greenway**;

- b. Complete the Saint Paul **extension of the Midtown Greenway**;
- c. Provide a **connection from the Lafayette Bridge to the Bruce Vento Regional Trail**;
- d. Participate in regional discussions about the **implementation of a standardized system of route identification**, signage, and directional and destination information;
- e. Support the **completion of the Trout Brook/Lower Phalen Creek Greenway trail connections** and the **extension of the Trout Brook Regional Trail through the Trillium Preserve**; and
- f. Emphasize **connections to regional destinations**, including Como, Battle Creek, and Phalen Regional Parks.

Community Accessibility (pgs. 23 – 24)

- 4.7 **Connect neighborhoods** that have poor sidewalks or little access to trails and bike routes, especially east and north of Downtown.
- 4.10 Create **new connections and improve existing stairways and paths between neighborhoods, parkland, and the Mississippi River**, while protecting natural vegetation and the integrity of the bluffline.

BLOOMINGTON ALTERNATIVE TRANSPORTATION PLAN

Classifications for Core Alternative Transportation Components (pg. 2.8)

- Destination Trails: Destination trails are paved trails for walking, jogging, bicycling, and in-line skating **located within a greenway, open space, park, parkway, or designated trail corridor. Destination trails will form the backbone of the trail system** that loops the city and connects to adjoining communities and the Minnesota River.
- Linking Trails: Linking trails emphasize **safe travel** for walking, jogging, bicycling, and in-line skating **to/from parks and destinations around the community**. Linking trails are most **often located within road rights-of-way**. Linking trails will be primarily used as a means to connect neighborhoods and developed areas to the destination trail system, and provide safe routes to various destinations and schools.
- On-Road Bikeways: Bike routes and lanes are on-road facilities that primarily serve fitness and transportation bicyclists, as well as recreationalists with a higher skill and comfort level being around automobiles. **Bikeways augment, but do not take the place of, the trail and sidewalk system.**

Values and Preferences of Common User Groups (pg. 2-9)

- **Family Group** – Various Modes: **Safety and convenience** are top priorities, followed by a pleasant recreational experience. Controlled, traffic-free access to sidewalks and trails is preferred. Length of trail is less important than **quality of**

experience. Will typically only use **low-volume residential streets** when biking or skating, and **rarely busy streets** even with bike lanes or routes.

- **Transportation Walker, Bicyclists, and In-Line Skater: Directness of route** is important. Will use a combination of sidewalks, trails, residential streets, and roads that are relatively **safe, convenient, and direct. Bike lanes/routes are preferred on busy roads to improve safety.** Bicyclists are **not overly dependent on trails,** but **will use them if convenient** and **not too heavily used by families and recreational users,** who tend to slow them down. Walkers need a trail or sidewalk.

Guiding Principles (pg. 2-11)

- Principle #1: Develop an initial or core system of **interconnected, high value trails, pedestrian-ways, and bikeways to form the backbone of an alternative transportation system** that will evolve over time and complement the existing vehicular-oriented system.

Quality Over Quantity (pg. 2-12)

- In support of these principles, the plan strongly advocates the overarching principle that **quality should take precedence over quantity.** The key understanding here is that higher levels of use of alternative forms of transportation will only occur if the facilities meet or exceed expectations and desirable design standards and aesthetic qualities. Developing facilities that do not reach this standard tend to perform poorly and serve to disenfranchise those they were intended to serve.

Principal Destinations (pgs. 3-3 – 3-7):

- **parks and city-based public facilities,**
- **Metro Transit connections,**
- **schools,**
- **retail, business, and commercial nodes**

Core On-Road Bikeways (pgs. 3-21 – 3-23)

- The goal of the alternative transportation plan is to establish a **base network of safe and “reasonable” north-south/east-west bikeway routes across the city** while recognizing established vehicular traffic patterns. Reasonable in this context relates to the practical reality that vehicular traffic levels are heavy on many of the collector or higher-level roads in the city and elimination of drive lanes to accommodate a bikeway is simply not always feasible. To that end, the core bikeway plan was developed in recognition of the traffic flow patterns associated with the major thoroughfares across the city. In general, proposed routes, as shown on the System Plan, **targeted streets with less than 10,000 ADT.**

MNDOT STATEWIDE BICYCLE PLANNING STUDY (2013)

Project/Route Prioritization (pg. 11)

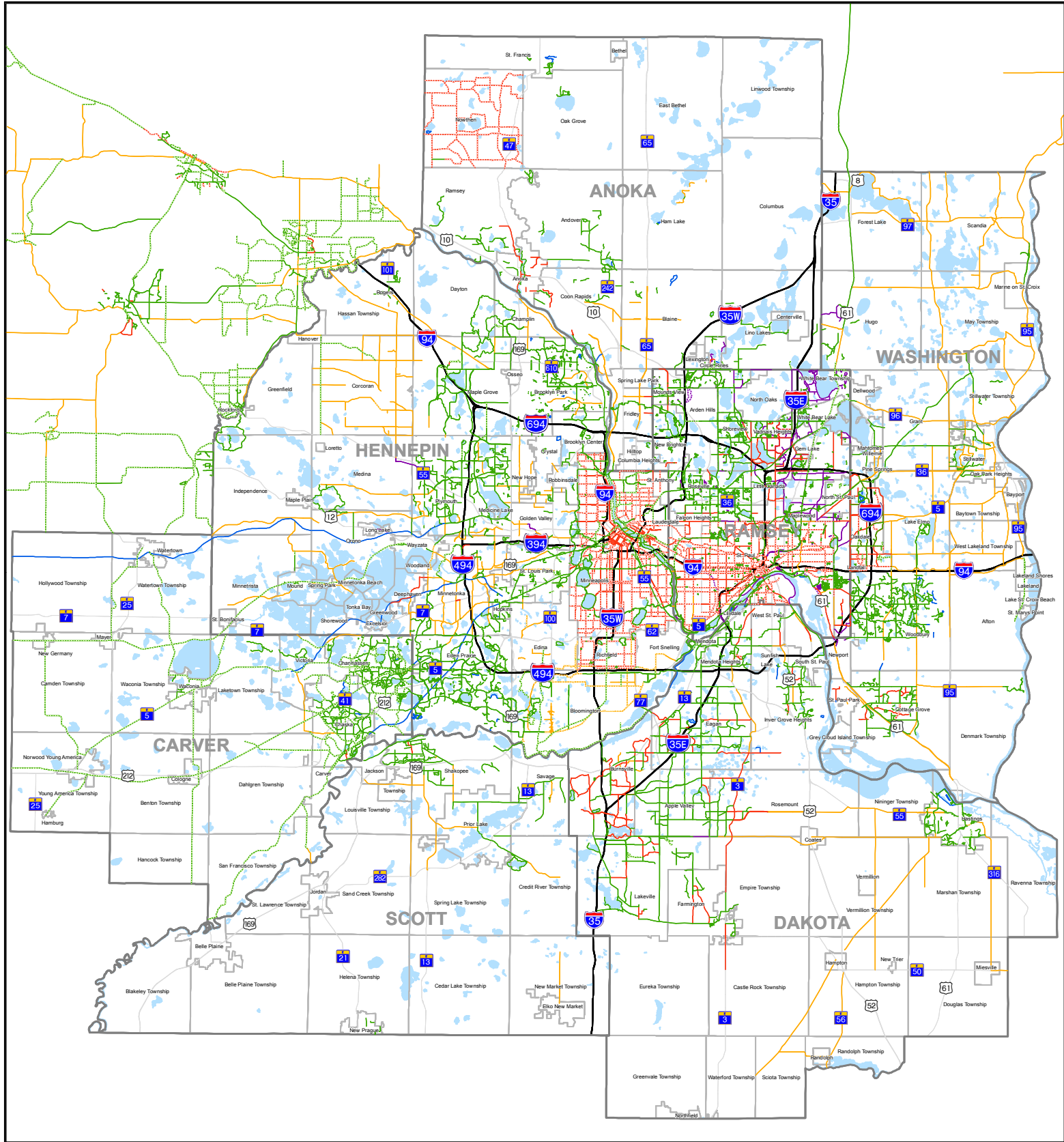
- Refine and clarify **route prioritization criteria identified in the MnDOT Bicycle Modal Plan.**
- Identify regional and district priorities and coordinate with statewide network goals.
- Consider requiring cities over a certain size to develop and maintain a bicycle plan.

Connectivity (pgs. 12-13)

- Identify a **fully connected system statewide**. Include **both the Trunk Highways system and primary connections at the local level**. Consider the MRT route establishment and implementation process as a model for identifying state bikeways and candidates for the emerging USBRS.
- Evaluate existing roadways and current bikeway accommodations.
- **Establish a desired level of service or level of separation for bicycles based on roadway classification.**
- Develop both statewide and district bikeway maps.
- Develop a database that provides information about local and regional level bikeway planning to district staff and allows local jurisdictions to access information about state and regional priorities. The statewide Cycloplan tool currently being developed by MnDOT provides an opportunity to implement this recommendation.

ATTACHMENTS:

1. Twin Cities Base Map Series
2. Maps from Met Council, County and City Plans



Twin Cities Metropolitan Area - Bikeways

Twin Cities Regional Bicycle System Master Study

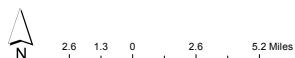
Bikeways - Met Council 2007

TYPE, PROPOSED

- Bike Lane, N
- Bike Lane, Y
- Low Volume Road with Shoulder < 5', N
- Non-paved Trail, N
- Non-paved Trail, Y
- One-way Bike Lane, N
- One-way Bike Lane, Y
- One-way Paved Trail, N
- One-way Paved Trail, Y

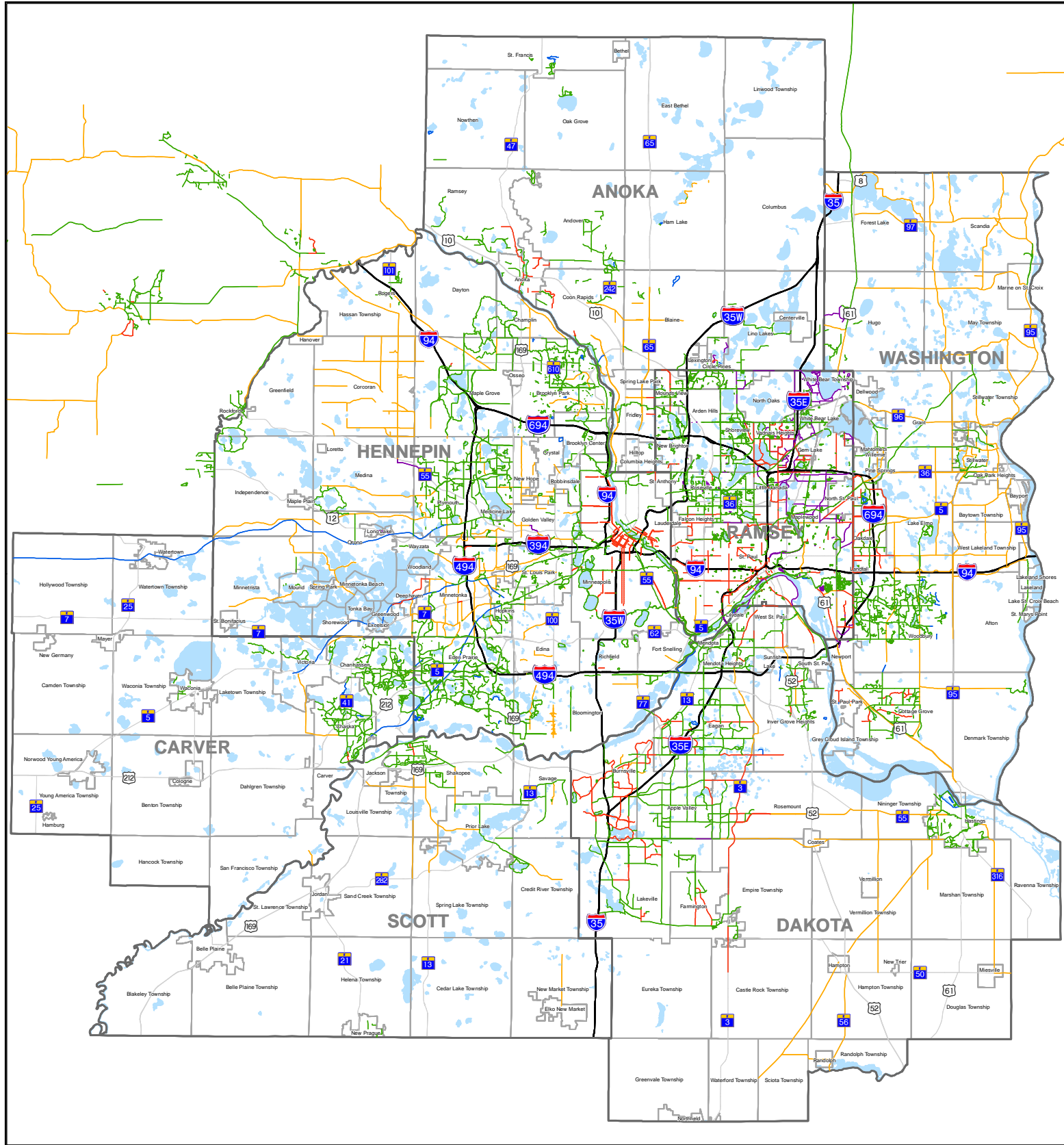
- One-way Shoulder >= 5', N
- One-way Shoulder >= 5', Y
- Other, N
- Other, Y
- Paved Trail, N
- Paved Trail, Y
- Shoulder >= 5', N
- Shoulder >= 5', Y
- Sub-Standard, N
- US/State Road with Shoulder >= 5', N

- County Boundary
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- Municipal Boundary
- Open Water



Map 1

March 22, 2013



Twin Cities Metropolitan Area - Bikeways - Existing

Map 2

Twin Cities Regional Bicycle System Master Study

Bikeways - Met Council 2007 TYPE, PROPOSED

- Bike Lane, N
- Low Volume Road with Shoulder < 5', N
- Non-paved Trail, N
- One-way Bike Lane, N
- One-way Paved Trail, N

- One-way Shoulder >= 5', N
- Other, N
- Paved Trail, N
- Shoulder >= 5', N
- Sub-Standard, N
- US/State Road with Shoulder >= 5', N

- County Boundary
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- Municipal Boundary
- Open Water

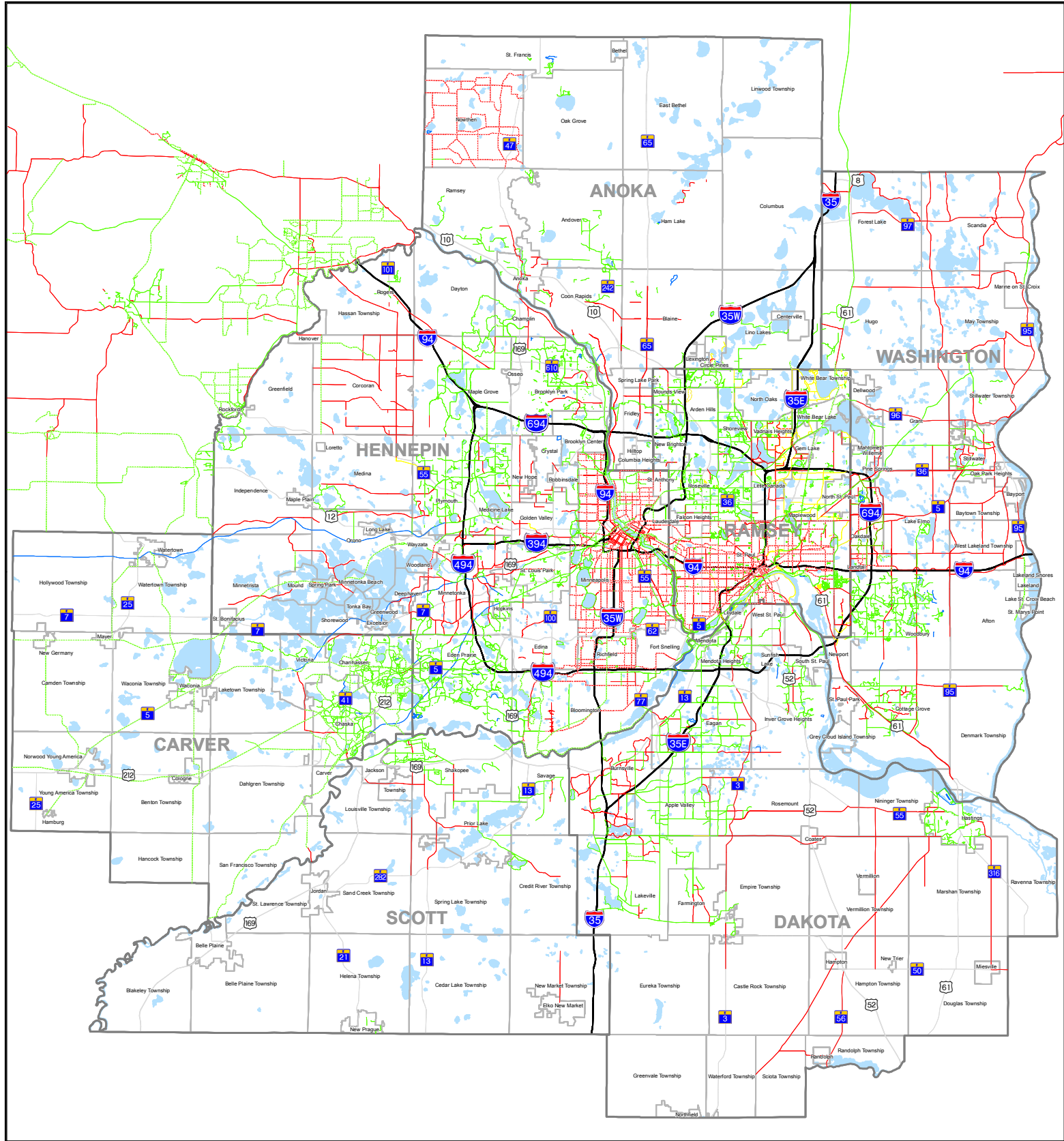


2.6 1.3 0 2.6 5.2 Miles

March 22, 2013



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Twin Cities Metropolitan Area - Bikeways

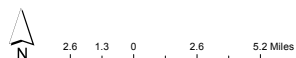
Twin Cities Regional Bicycle System Master Study

Bikeways - Met Council 2007 CLASS, PROPOSED

, N
 , Y
 GAP, N
 GAP, Y

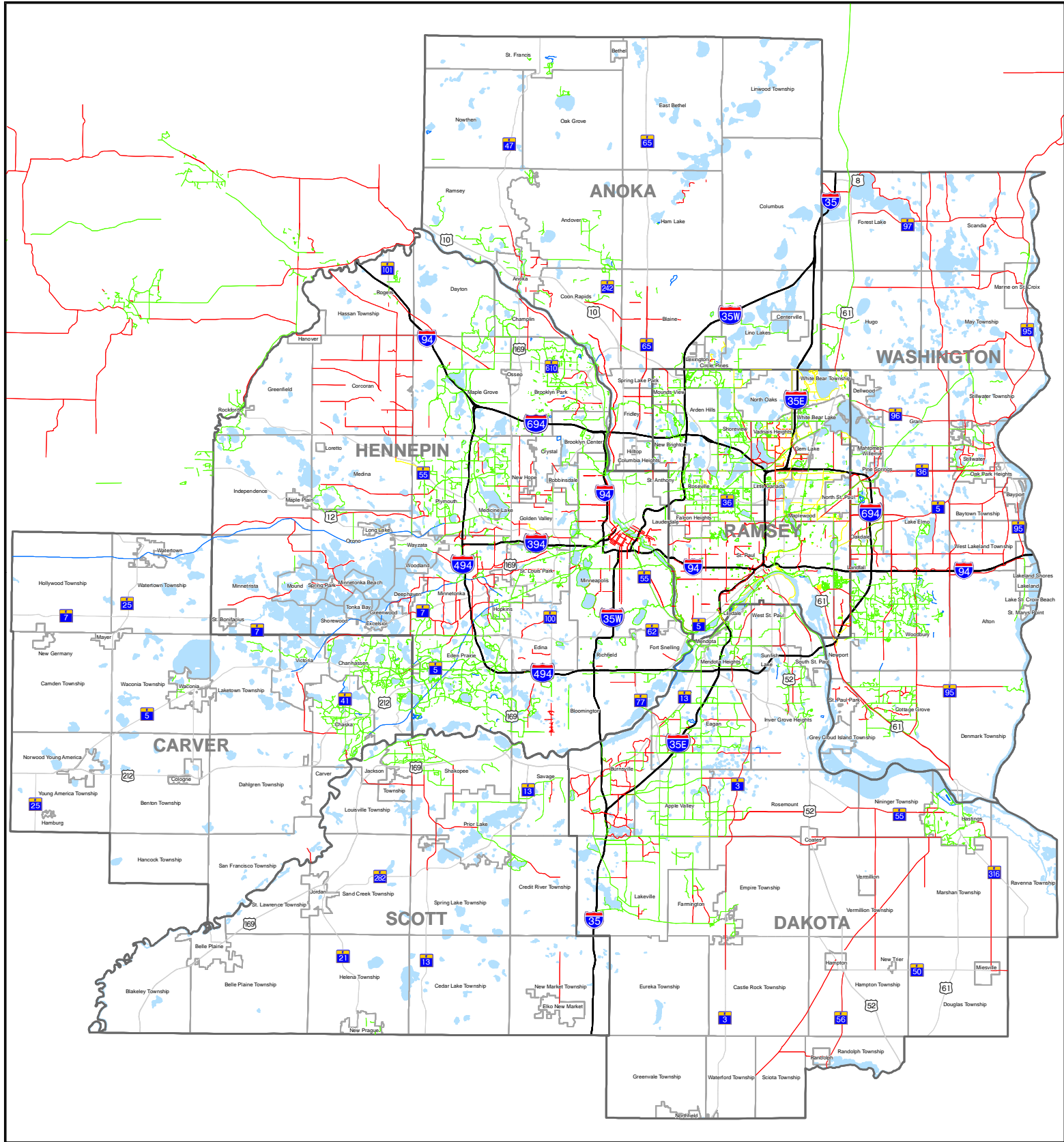
Paved Trail, N
 Paved Trail, Y
 Road, N
 Road, Y
 Trail, N
 Trail, Y

County Boundary
 Interstate Trunk Highway
 US Trunk Highway
 State Trunk Highway
 Municipal Boundary
 Open Water



Map 3

March 22, 2013



Twin Cities Metropolitan Area - Bikeways - Existing

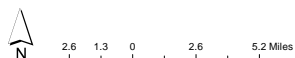
Twin Cities Regional Bicycle System Master Study

Map 4

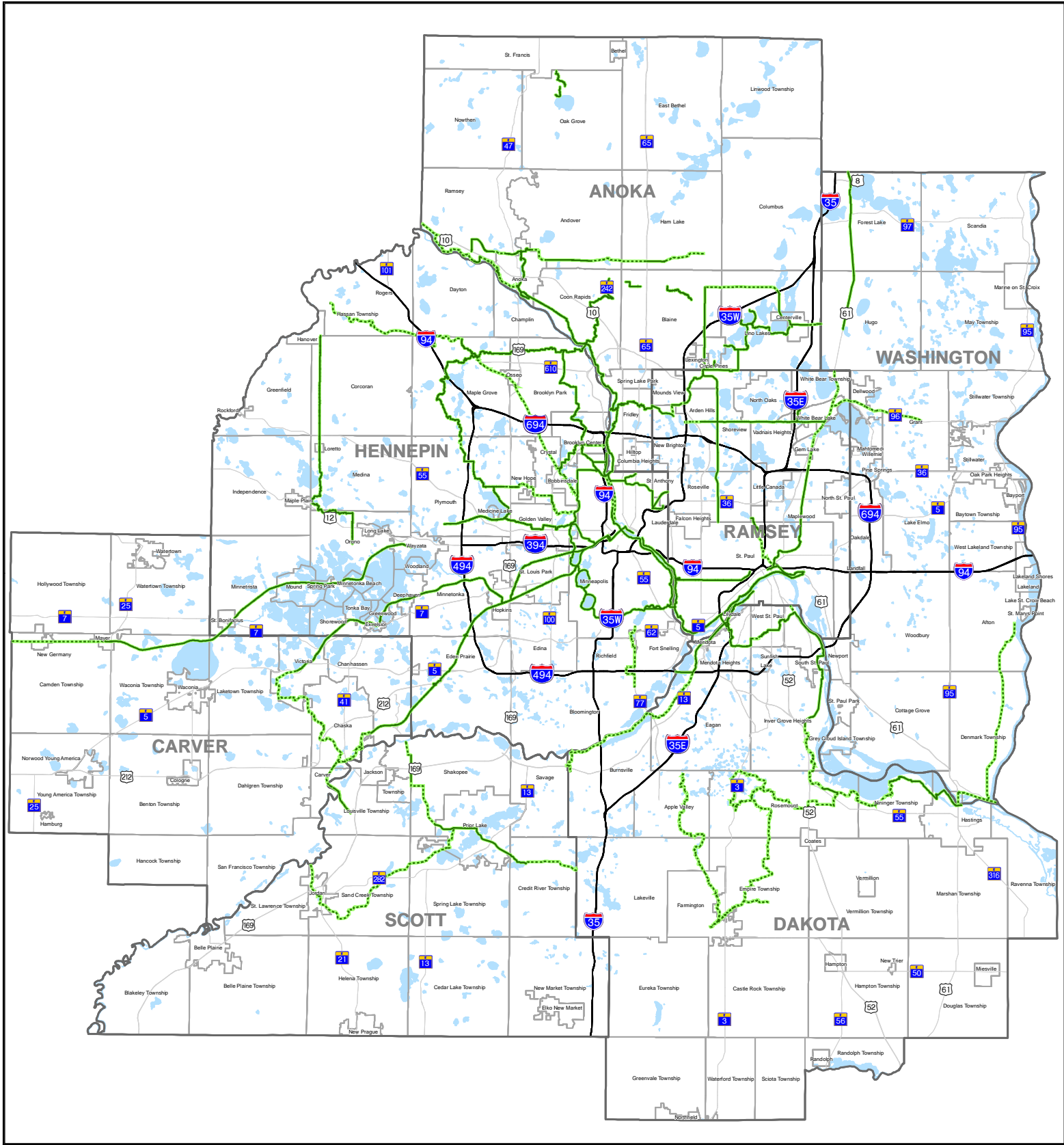
Bikeways - Met Council 2007 CLASS, PROPOSED

- , N
- GAP, N
- Paved Trail, N
- Road, N
- Trail, N

- County Boundary
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- Municipal Boundary
- Open Water



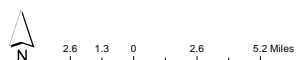
March 22, 2013



Twin Cities Metropolitan Area - Regional Trails

Twin Cities Regional Bicycle System Master Study

Map 5



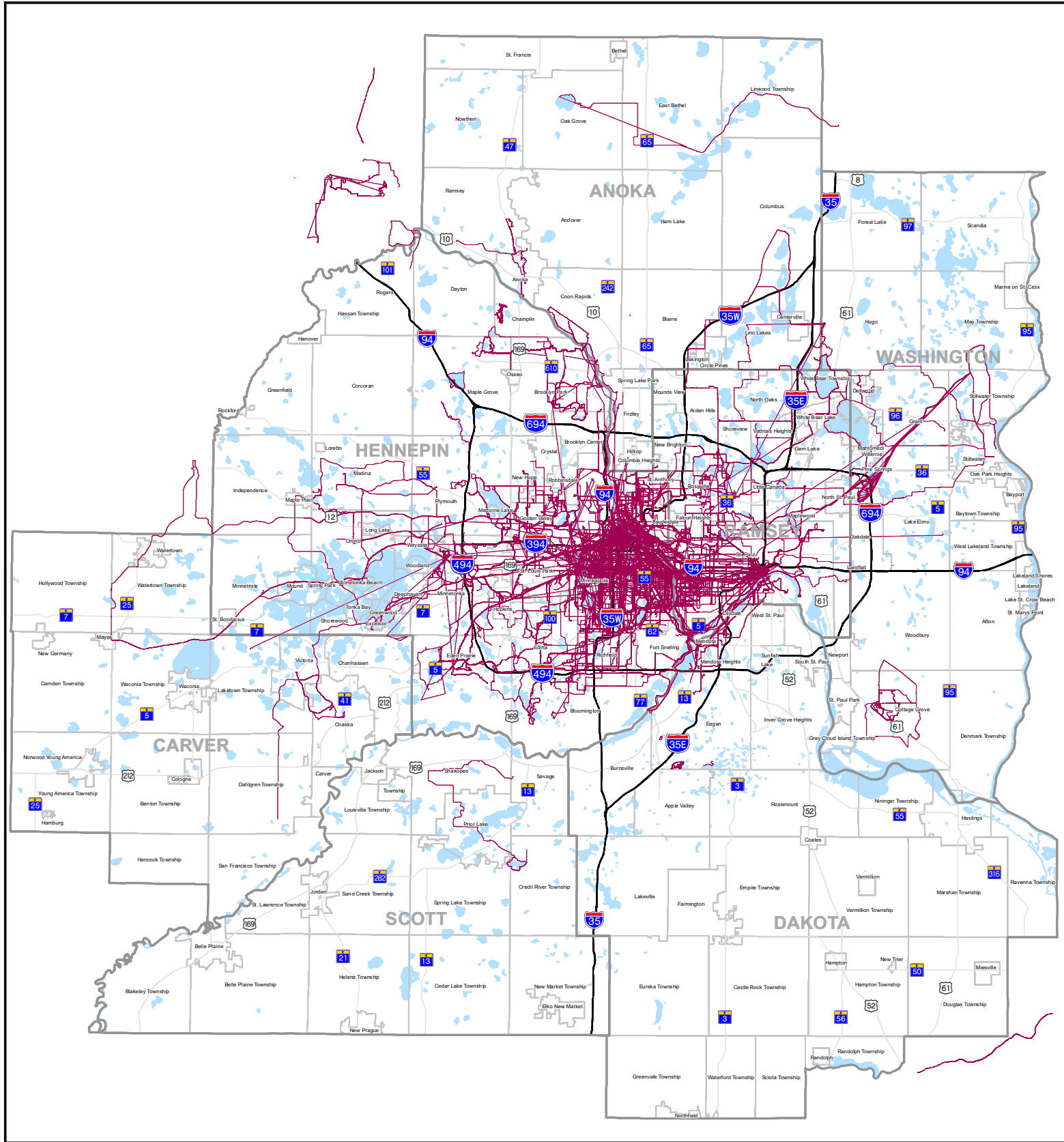
Met Council Regional Trails

STATUS

- Existing
- - - Planned

- County Boundary
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- Municipal Boundary
- Open Water

March 22, 2013



Twin Cities Metropolitan Area - Cycletrack Trips

Twin Cities Regional Bicycle System Master Study

- Cycletrack Trips
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- County Boundary
- Municipal Boundary
- Open Water



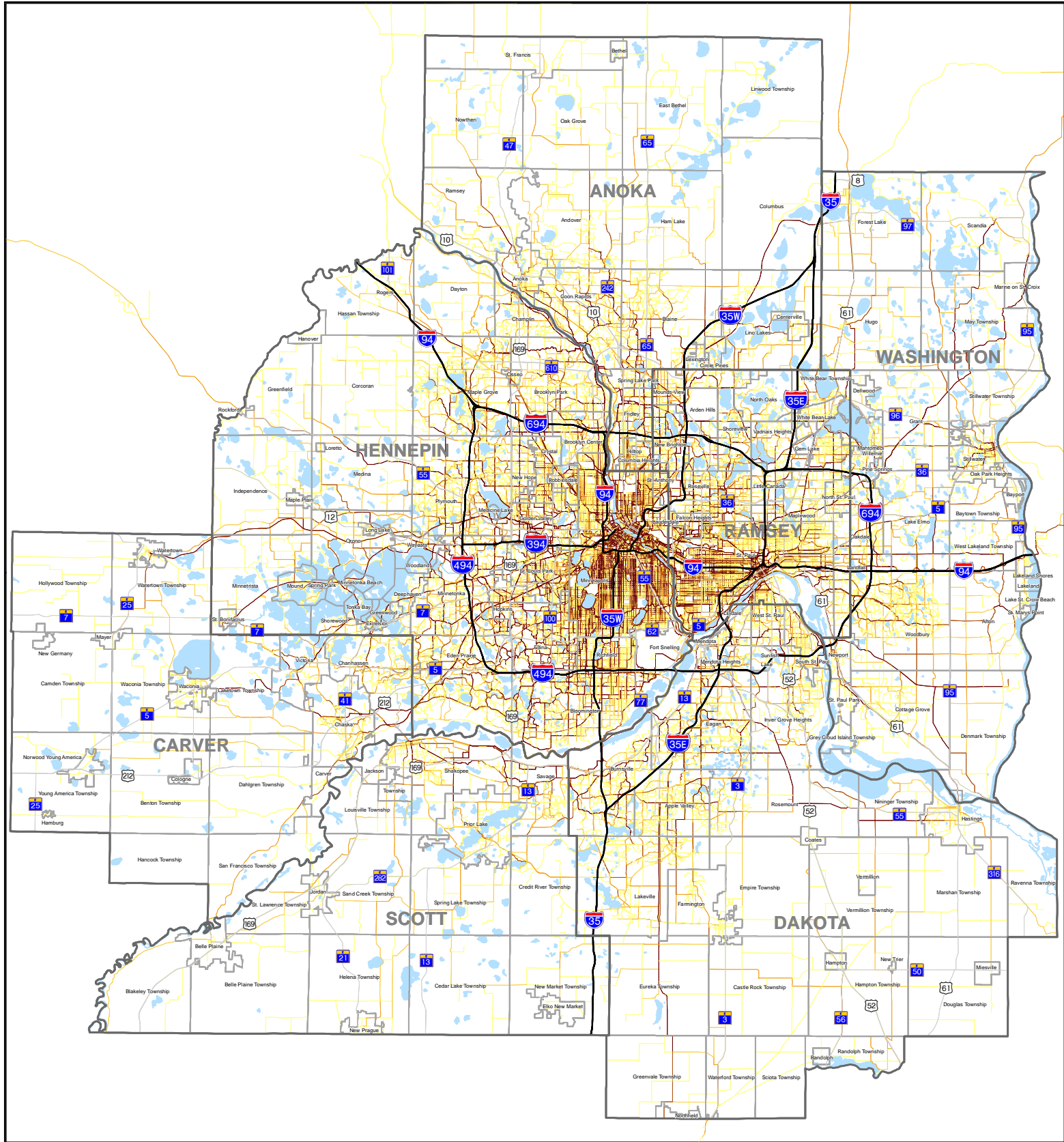
2.6 1.3 0 2.6 5.2 Miles

Map 6

March 22, 2013



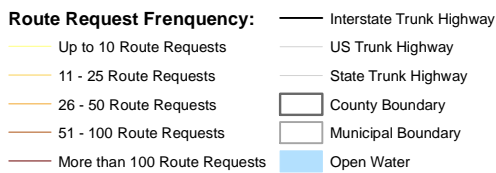
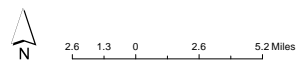
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Twin Cities Metropolitan Area - Cyclopath Road Network with Route Statistics

Map 7

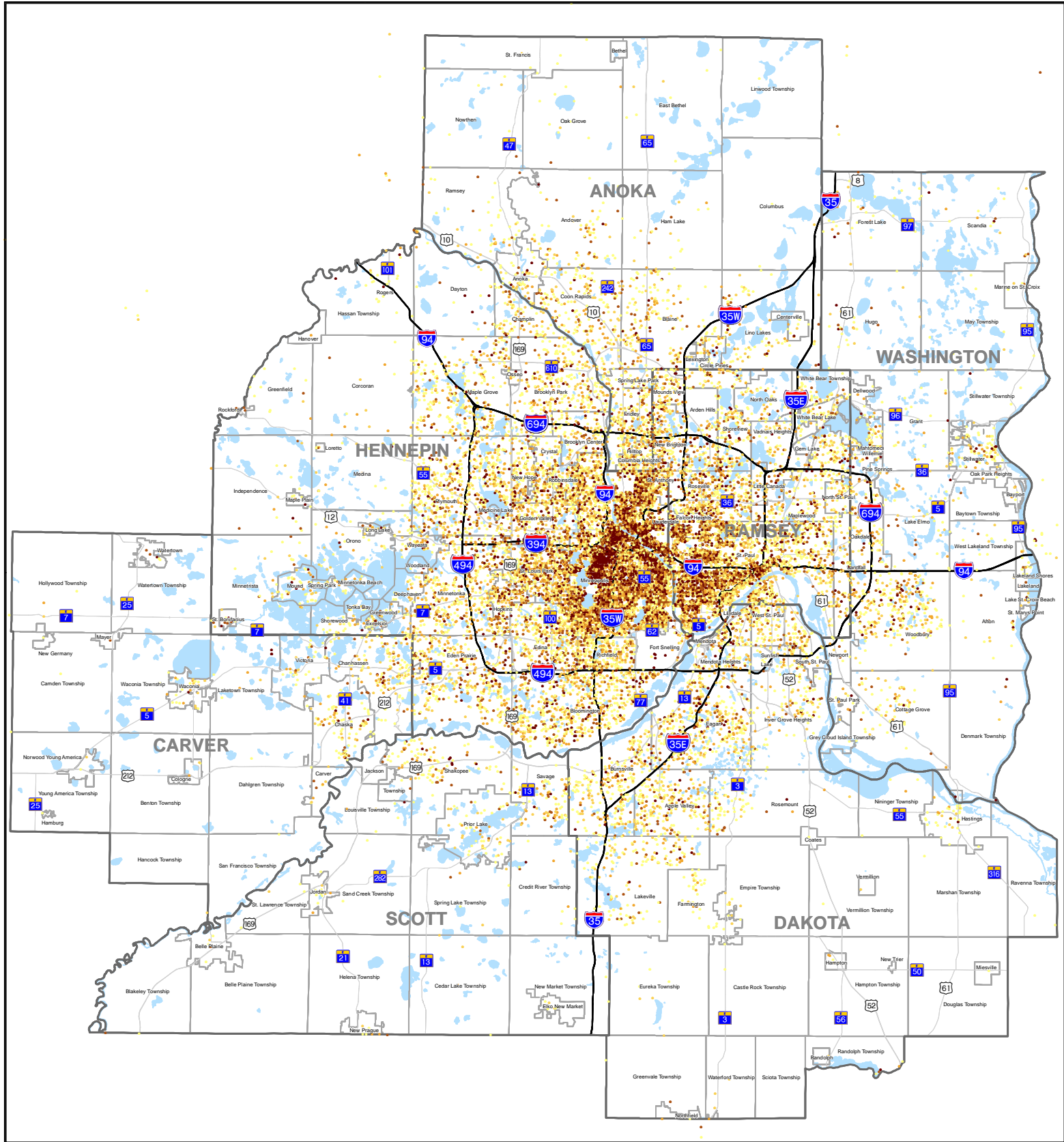
Twin Cities Regional Bicycle System Master Study



March 22, 2013



V:\193\active\19380184\GIS\Projects\Cyclopath Route Statistics.mxd



Twin Cities Metropolitan Area - Cyclopath Requested Route Beginning Points

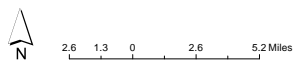
Map 8

Twin Cities Regional Bicycle System Master Study

Number of Requests

- 1
- 2
- 3 - 4
- 5 - 10
- 11+

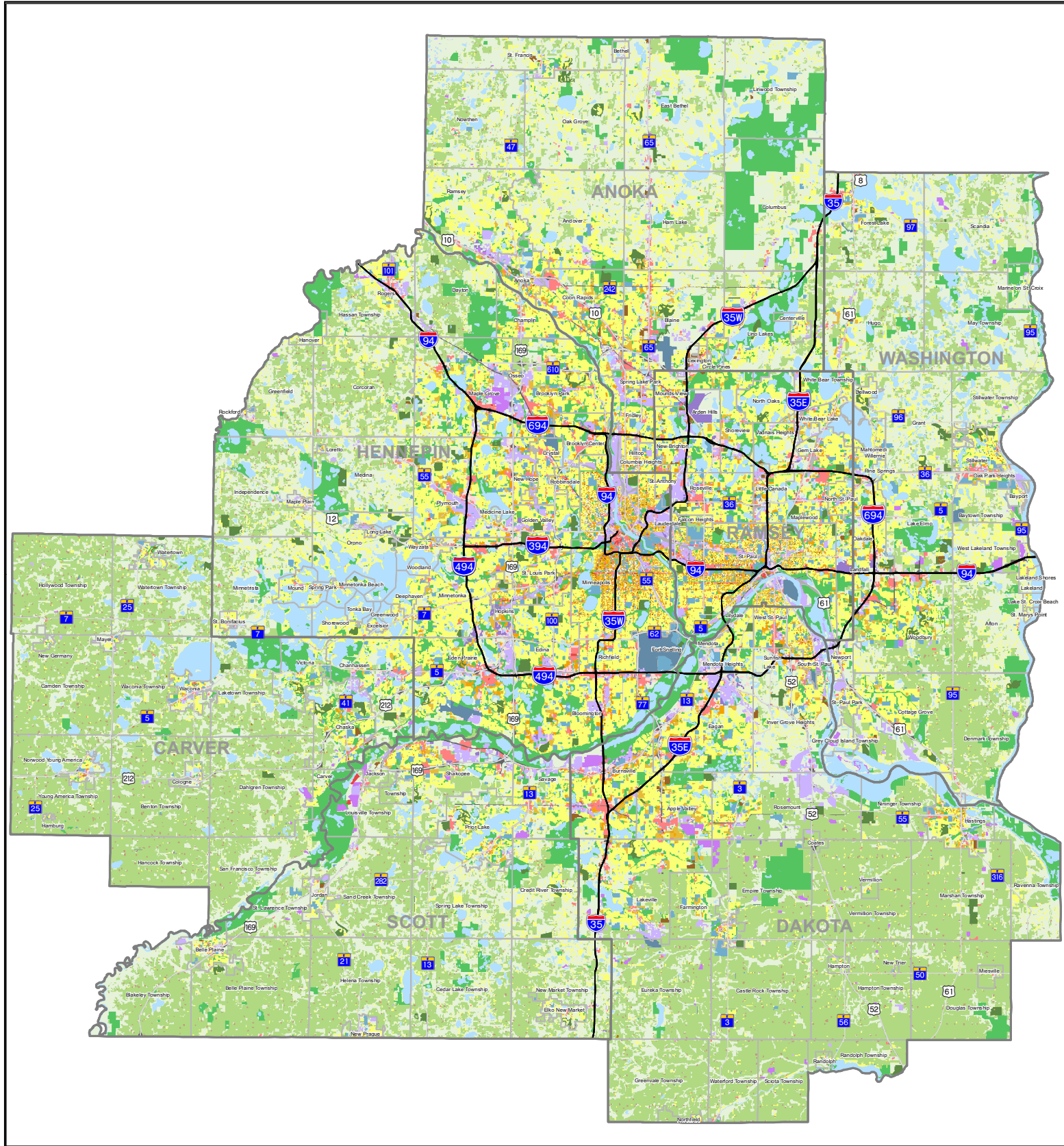
- Interstate Trunk Highway
- US Trunk Highway
- State Trunk Highway
- County Boundary
- Municipal Boundary
- Open Water



March 22, 2013

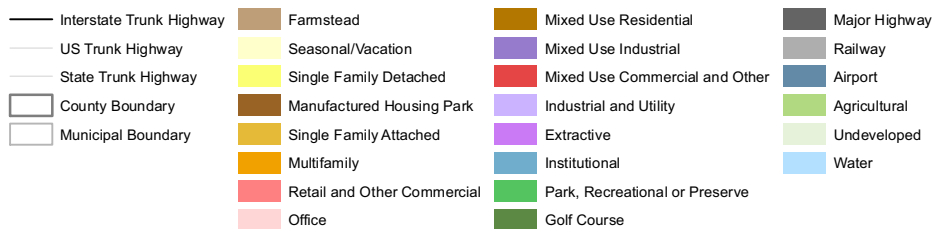


V:\1938\active\193801841\GIS\Bike\GIS\Cyclopath Route Beginning Points.mxd



Twin Cities Metropolitan Area - 2010 Existing Land Use

Twin Cities Regional Bicycle System Master Study

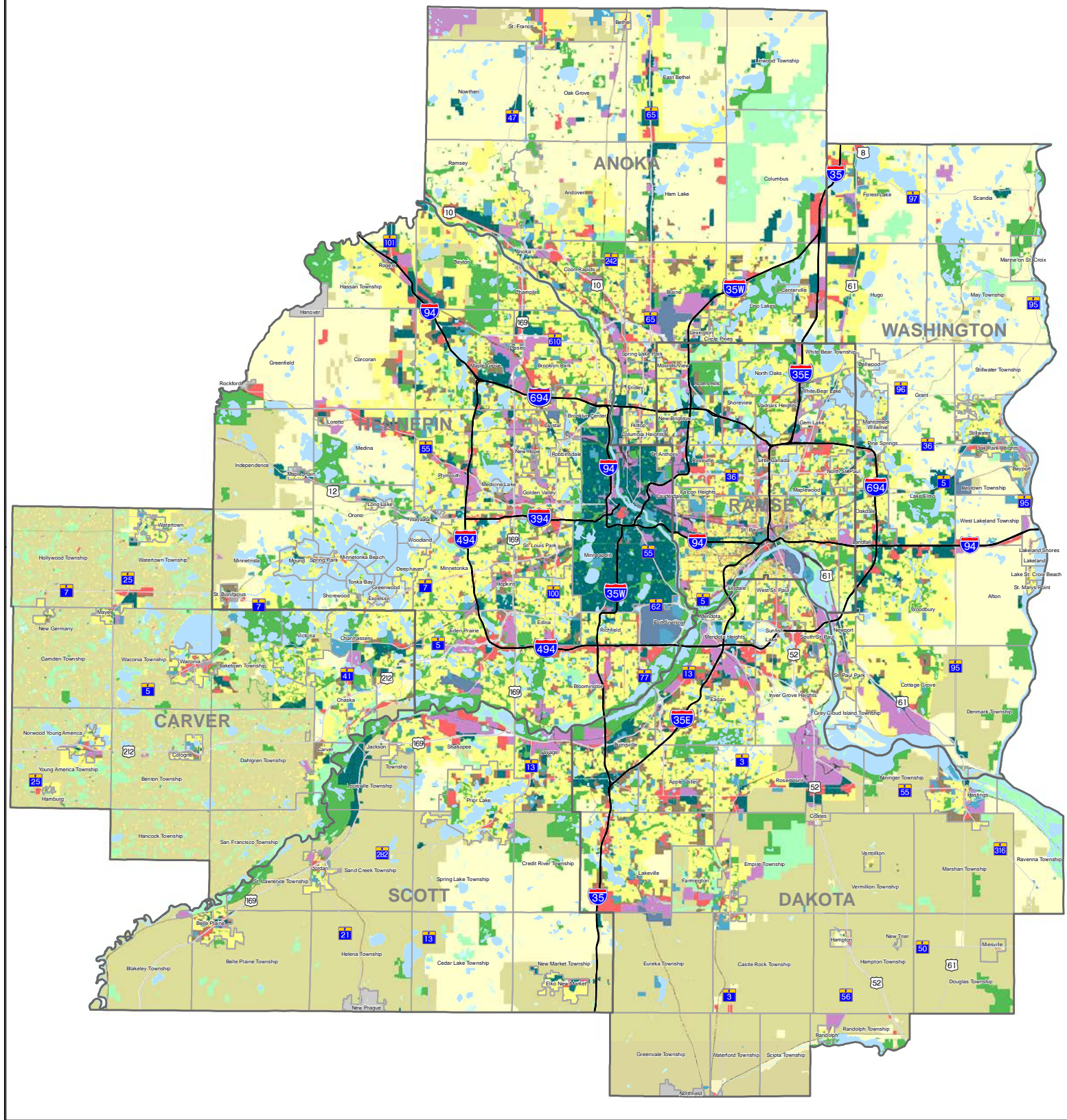


2.6 1.3 0 2.6 5.2 Miles

Map 10

March 22, 2013

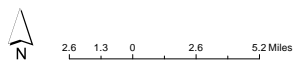




Twin Cities Metropolitan Area - 2030 Planned Land Use

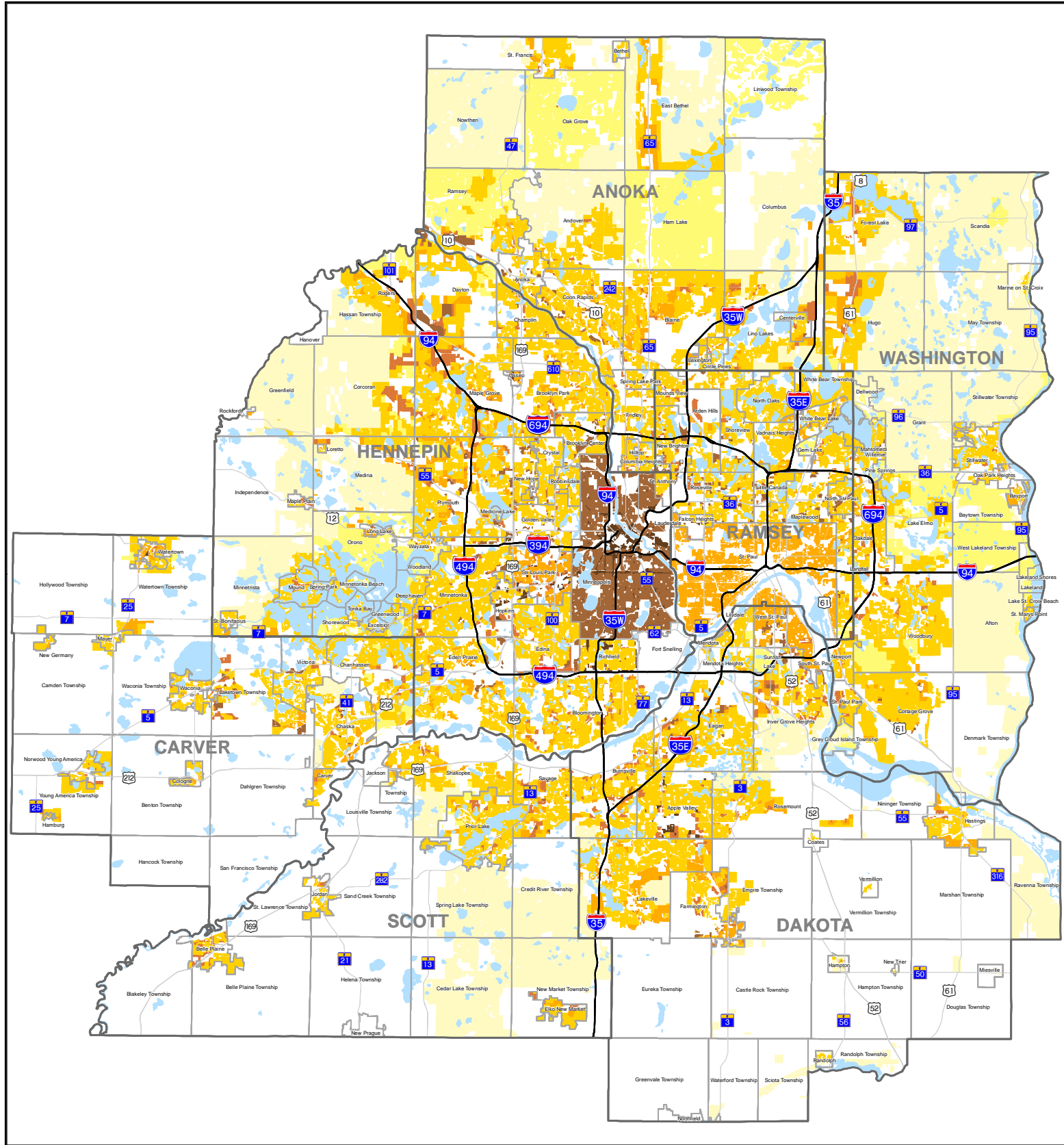
Twin Cities Regional Bicycle System Master Study

- | | | |
|--------------------------|--------------------------------|-------------------------------|
| Interstate Trunk Highway | Agricultural | Multi-Optional Development |
| US Trunk Highway | Rural or Large-Lot Residential | Park and Recreation |
| State Trunk Highway | Single Family Residential | Open Space or Restrictive Use |
| County Boundary | Multifamily Residential | Rights-of-Way (i.e., Roads) |
| Municipal Boundary | Commercial | Railway (inc. LRT) |
| Open Water | Industrial | Airport |
| | Institutional | Vacant or Unknown |
| | Mixed Use | Open Water |



Map 11

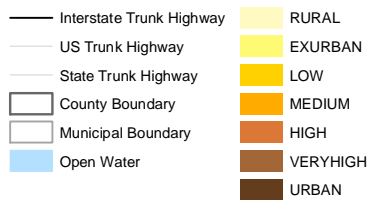
March 22, 2013



Twin Cities Metropolitan Area - 2030 Planned Housing Density

Map 12





Twin Cities Regional Bicycle System Master Study



March 22, 2013



Existing Twin Cities Metro Bikeways

-  Bike Lane or
Shoulder 5' or wider
-  Paved Trail
-  Non-Paved Trail
-  Other / Unclassified

Bikeways data was prepared for the Metropolitan Council by the Minnesota Department of Administration's Land Management Information Center in cooperation with the Minnesota Department of Transportation, counties and most cities in the metropolitan area. While every effort was made to collect and map the most current data available, portions of this map may now be out of date.

Updated: April 2007

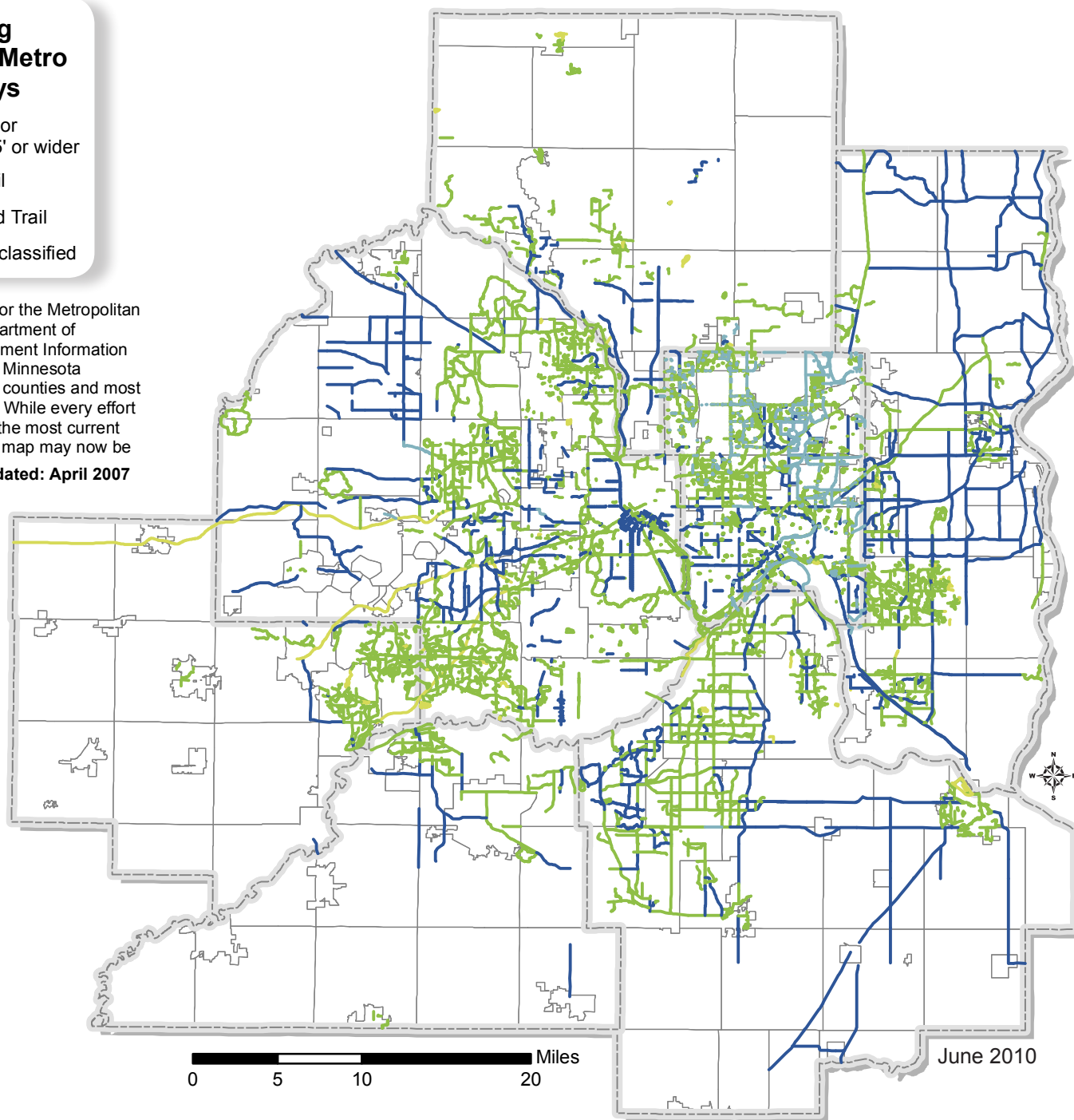


Figure 9-6: Existing Metro Bike Trails



Figure 3-1

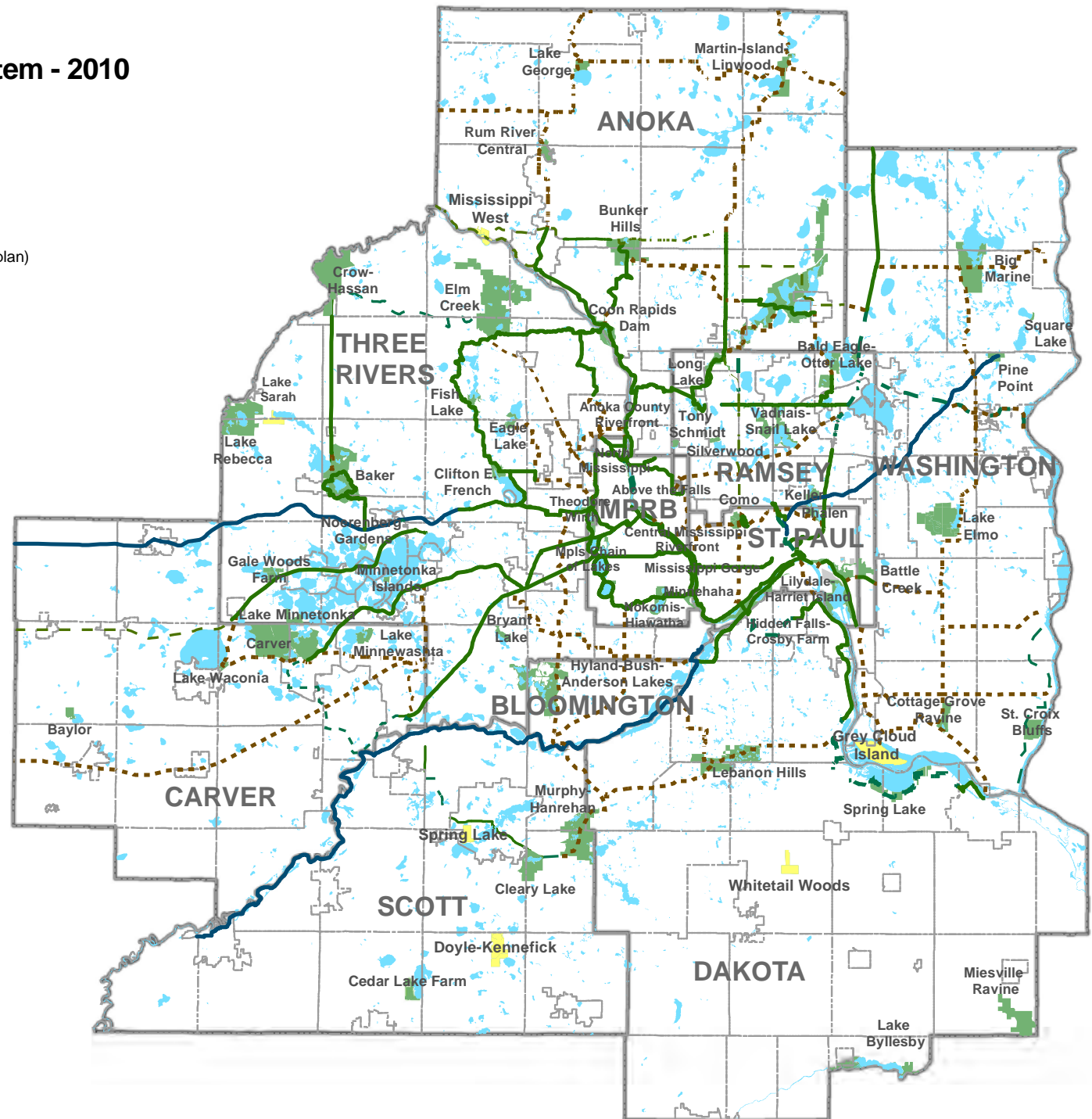
Metropolitan Regional Parks System - 2010

Regional Trails

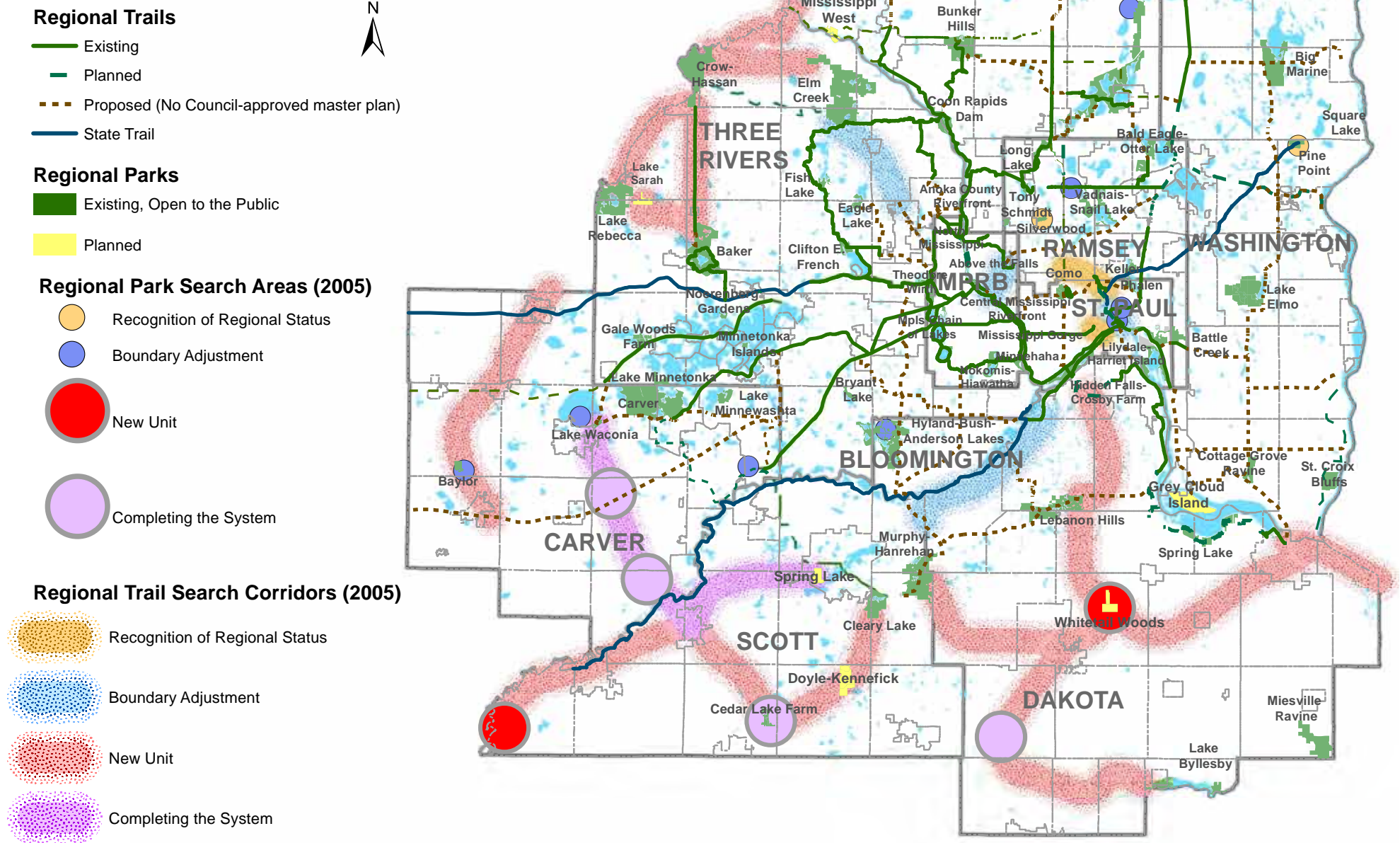
- Existing
- - - Planned
- - - Proposed (No Council-approved master plan)
- State Trail

Regional Parks

- Existing, Open to the Public
- Planned



Based on Plan Adopted in 2005



Existing and Funded Bike Routes

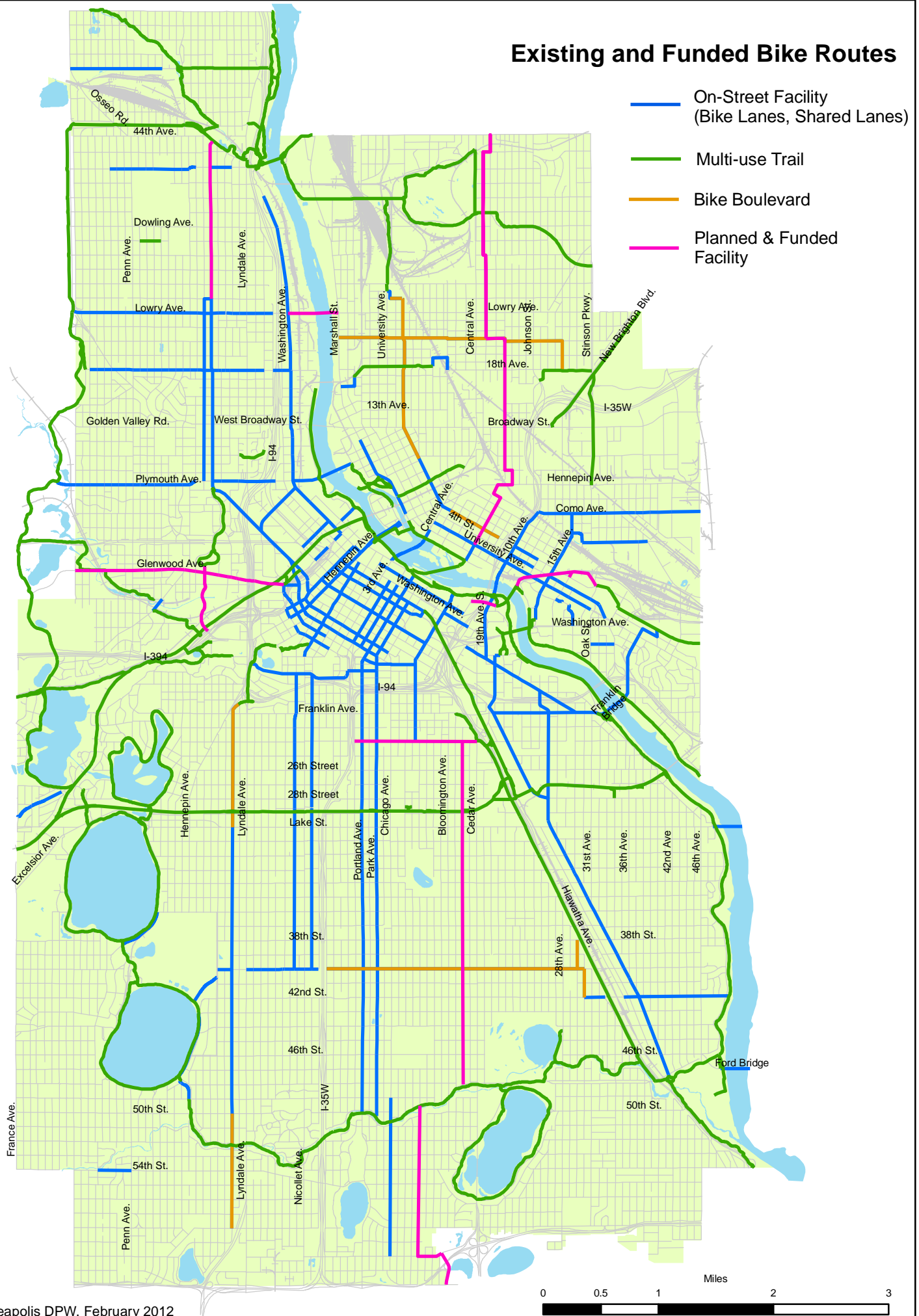


Figure 7.7 - Bikeways Master Plan

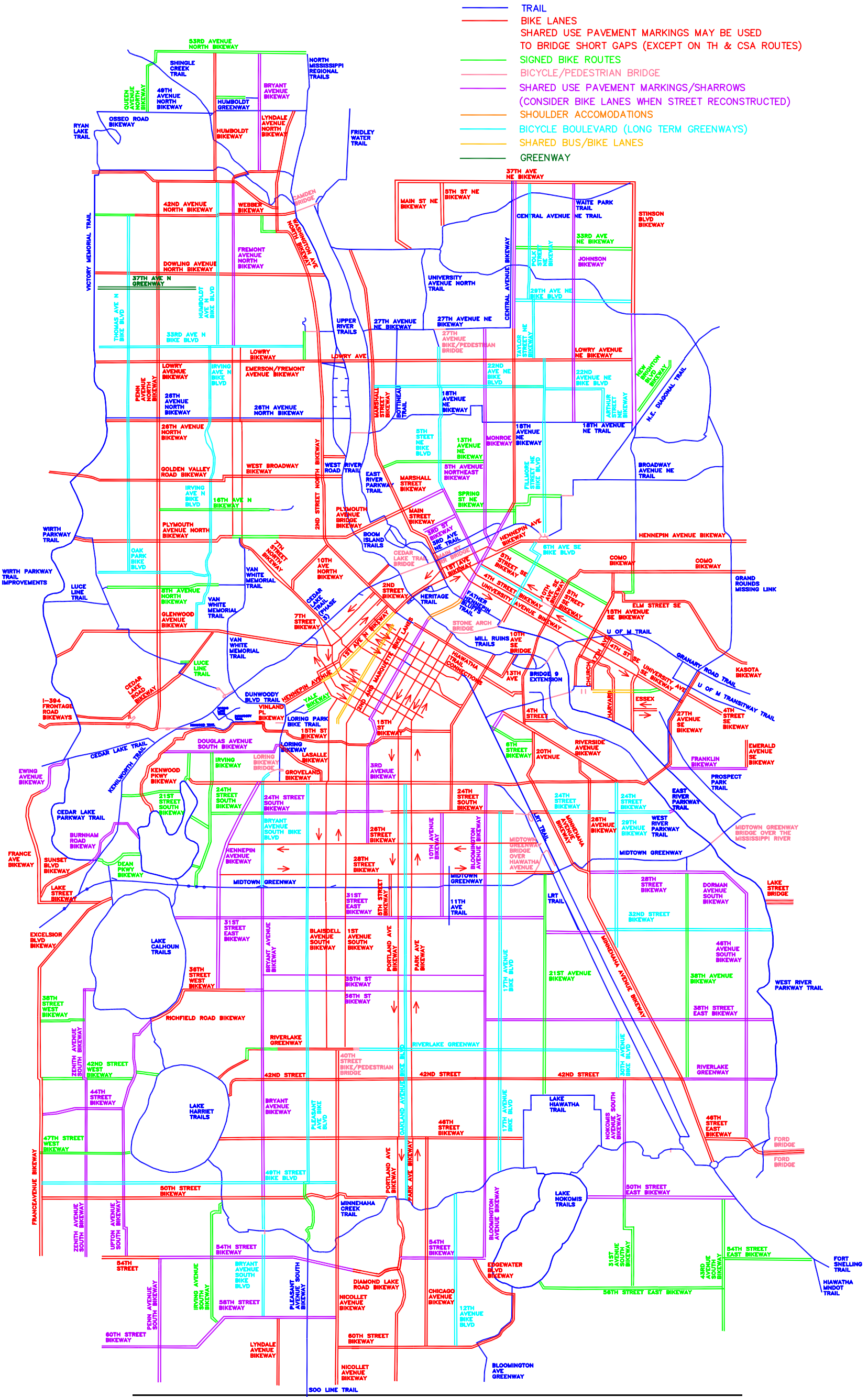
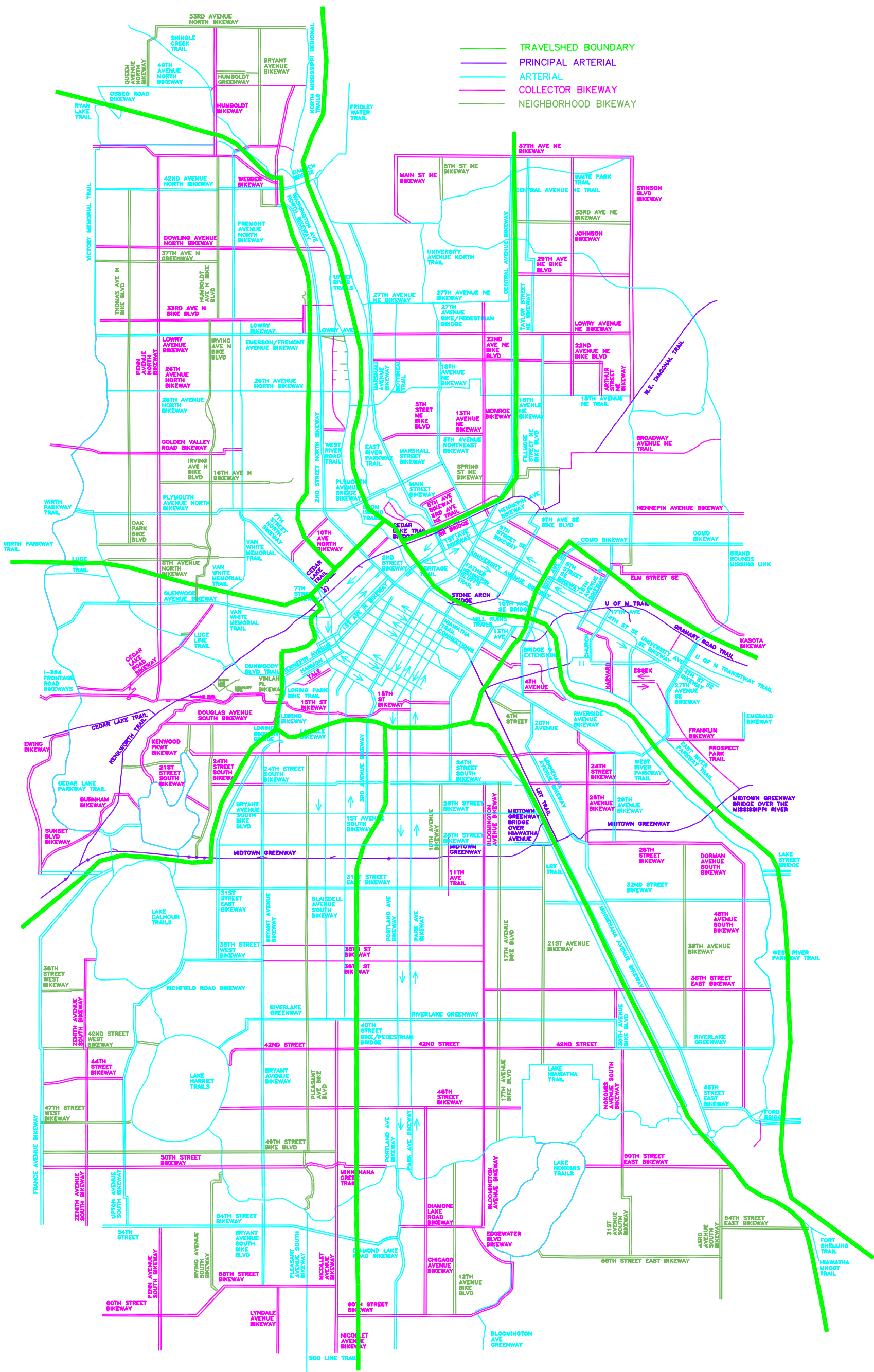


Figure 7.11 - Bicycle Functional Classification



Help Us Complete the Bike Network!

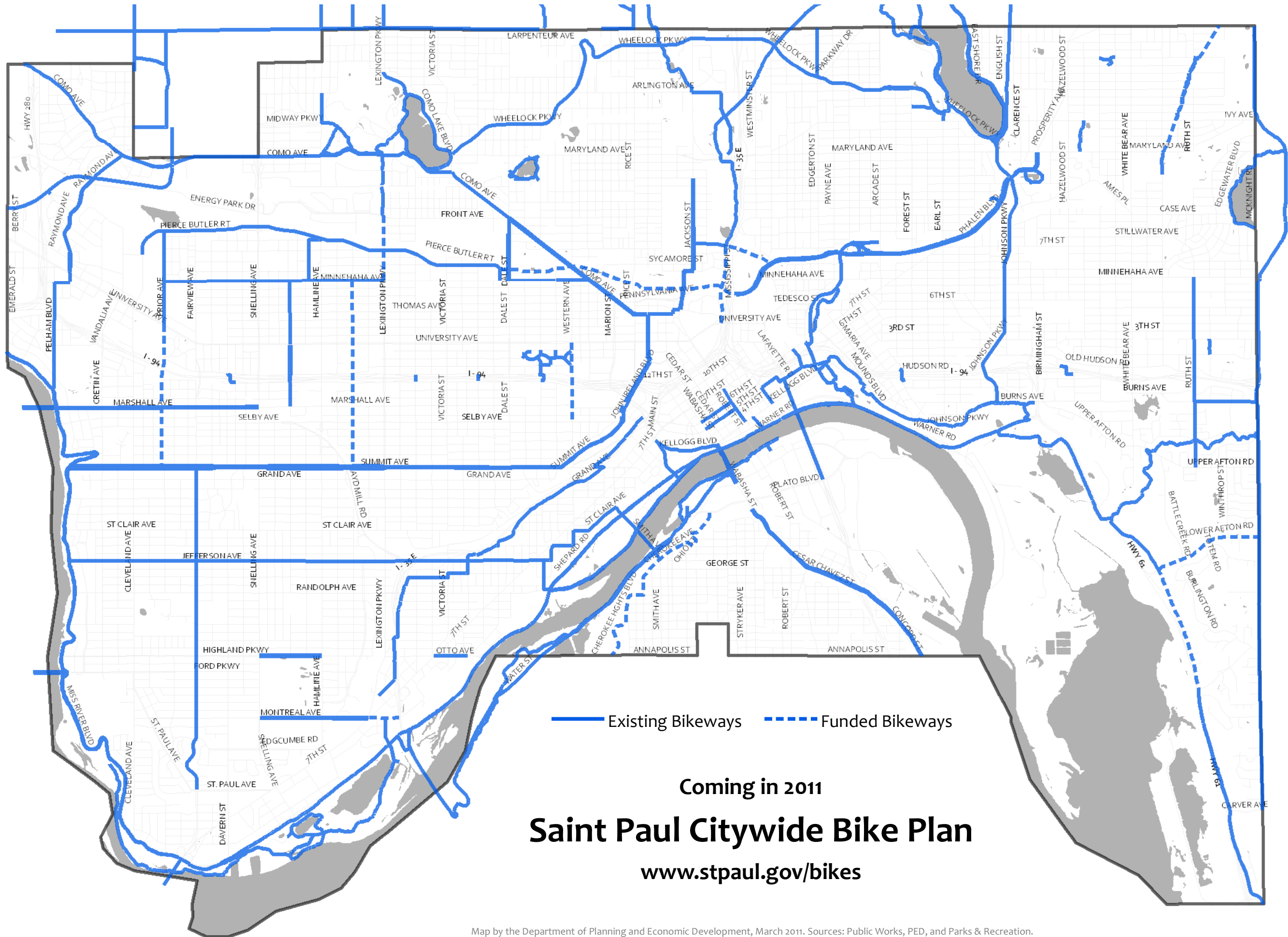
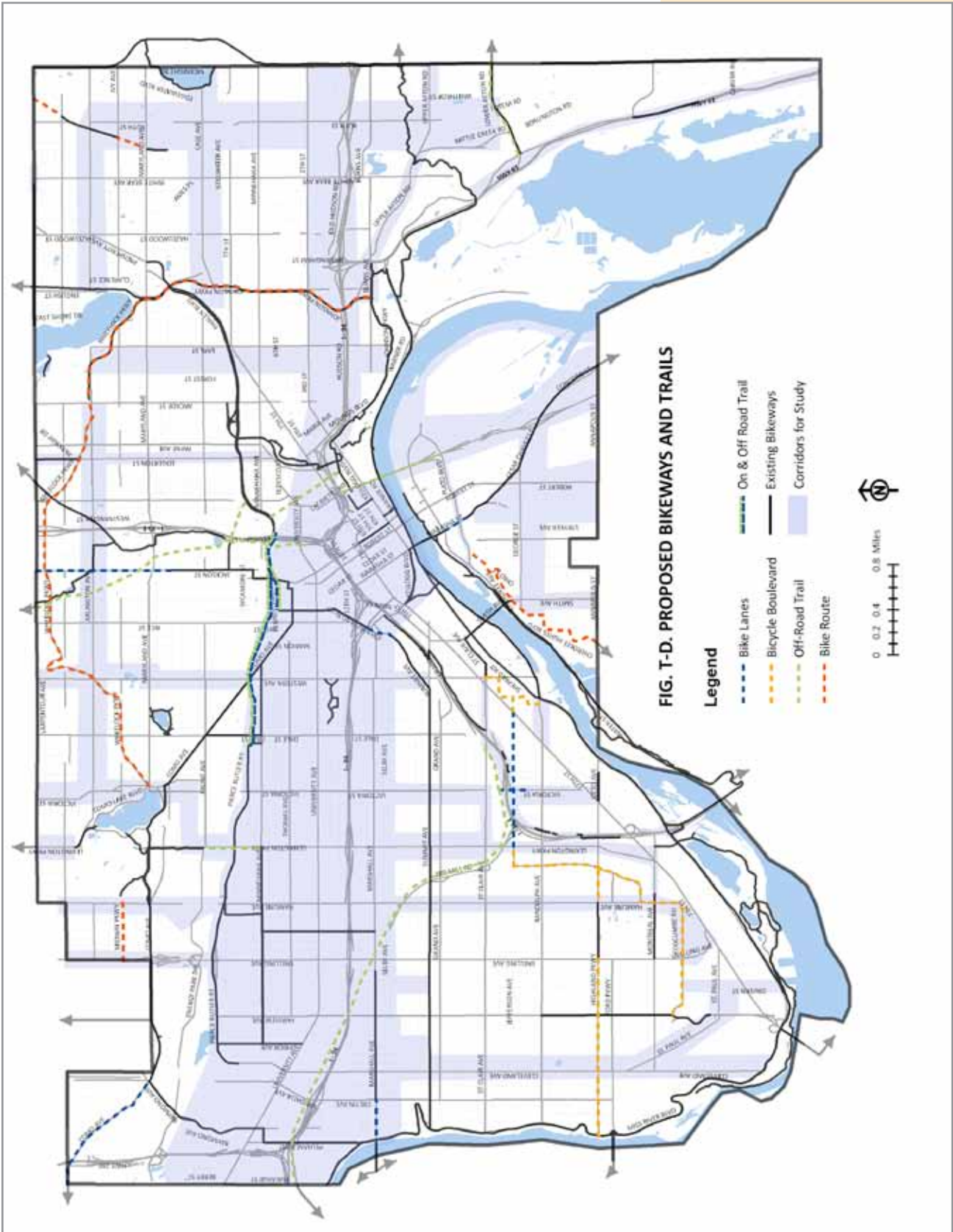


FIGURE T-D. PROPOSED BIKEWAYS AND TRAILS





This is the first page of our **Active Living Biking and Hiking Guide**, a 30” by 24” map that is about 14MB in size.

If you are downloading this file to view it online, please be patient. Depending on the speed of your internet connection, the remaining pages may take some time to arrive at your computer.



EXISTING ON-ROAD BIKE ROUTES

Bloomington has a number of on-road bike routes to serve recreation, fitness and transportation bicyclists comfortable with riding on the road. Many of the bike routes feature striped shoulders. On-road bike routes are shown with heavy red lines on the map on the opposite side.

86TH STREET BIKEWAY

Coordinates B2 - F1.

Beginning at the Hyland Lake Park Reserve entrance on West 94th Street, the bikeway proceeds east to Poplar Bridge Road and West 90th Street, turns north onto Xerxes Avenue South, turns east at West 86th Street and ends near East Old Shakopee Road at the Bass Ponds upper parking lot. Most of the bikeway features five-foot-wide, bikeable shoulders. Parking along the route includes Lower Penn Lake Park, 1925 W. 86th Street, and the Bass Ponds, 2501 E. 86th Street. Toilets are provided seasonally at Ridgeview Park, 6001 W. 94th St., and Cedarcrest Park, 8700 Bloomington Avenue S.

102ND STREET BIKEWAY

Coordinates B3 - D3 (West segment), D3 - E3 (East segment).

The bikeway's western segment begins at Nesbitt Avenue South and heads east until Penn Avenue South. The eastern segment starts at Lyndale Avenue South and heads east to Portland Avenue South. Sections feature bikeable shoulders. Parking along the bikeway includes the Gene C. Kelly Playfields, 185 E. 102nd Street. A chemical toilet is provided seasonally at Gene C. Kelly Playfields.

BIKING SIGNALS – STAY SAFE

When you use these signals, other drivers can anticipate your intentions.



OFF-ROAD BIKING AND HIKING TRAILS

Bloomington's off-road trails offer commuter, recreational and fitness opportunities for the whole family. The majority of the trails are multiple use; bikers, hikers, roller bladders, dog walkers and other enthusiasts share the trails. The multiple-use trails are shown in orange on the maps. A select number of trails are pedestrian only; they are shown in green. Paved trails are shown with a solid line, unpaved trails are shown with a dotted line.

Make sure to confirm designated uses for each trail when planning your visit.

BLOOMINGTON FERRY ROAD AND VENESS ROAD

Coordinates A2 - A3.

This 2.4 mile trail runs north from West 106th Street along Bloomington Ferry Road, then northeast on Veness Road to West Bush Lake Road. With the songs of birds as

background music, the trail travels by neighborhoods and wetlands. Owned and operated by the City of Bloomington, portions of these trails were reconstructed in 2010 with additional segments scheduled to be reconstructed in 2011. Most trails are eight feet wide, bituminous and designated for multiple use.

BUSH LAKE PARK BIKING AND HIKING TRAILS

Coordinates A2.

The trails around Bush Lake are owned and operated by the City of Bloomington. The majority will be reconstructed in 2011. Most trails are 10 feet wide, bituminous and designated for multiple use. Some trails wind up and down through forests; others pass playground equipment and fishing piers. Access points with parking are Bush Lake Beach, 9140 East Bush Lake Road, and West Bush Lake Park, 9401 West Bush Lake Road. Restrooms are provided seasonally at Bush Lake Beach and West Bush Lake Park.

*** NOTE ON TRESPASSING:** Nine private properties are located on the shores of Bush Lake and its northeast bay. It is not possible to walk all the way around the lake without trespassing on private property. Note where private properties are located and do not cross them when visiting Bush Lake Park.



CENTRAL AND MOIR PARKS HIKING TRAILS

Coordinates D3 - D4.

The trails in Central and Moir Parks are owned and operated by the City of Bloomington. Most are 8- to 10-foot wide with a bituminous surface and restricted to pedestrians. Trails south of West 106th Street are natural surfaced. While Nine Mile Creek is 15 miles long and winds through neighboring cities, the trails south of West Old Shakopee Road are set in a beautiful ravine landscape. The length of your hike depends on your access point; approximate mile markers are located along the trails. Access points with parking include: Harrison Picnic Grounds, 1701 W. 100th Street; Moir Park, 10320 Morgan Avenue S.; and a car park area at West 106th Street near Morgan Avenue South. The access near the Minnesota River at West 12th Street and Queen Avenue South is not shown. Toilet facilities are provided seasonally at Moir Park.



GIRARD LAKE PARK HIKING TRAIL

Coordinates C1.

The trail around Girard Lake, that is owned and operated by the City of Bloomington, is 10 feet wide and 1.08 miles long with a cushioned, wood-chip surface. As the trail loops gently around the lake, you will have ample opportunities to view nature. Parking is available on West 84th Street just east of France Avenue South.



NORMANDALE LAKE PARK BIKING AND HIKING TRAILS

Coordinates B1.

The trails around Normandale Lake are owned and operated by the City of Bloomington. The inner 1.9-mile trail is 10-foot wide, bituminous and designated as pedestrian only. This trail is identified by a solid green line. The two-mile outer trail is designated multiple use,

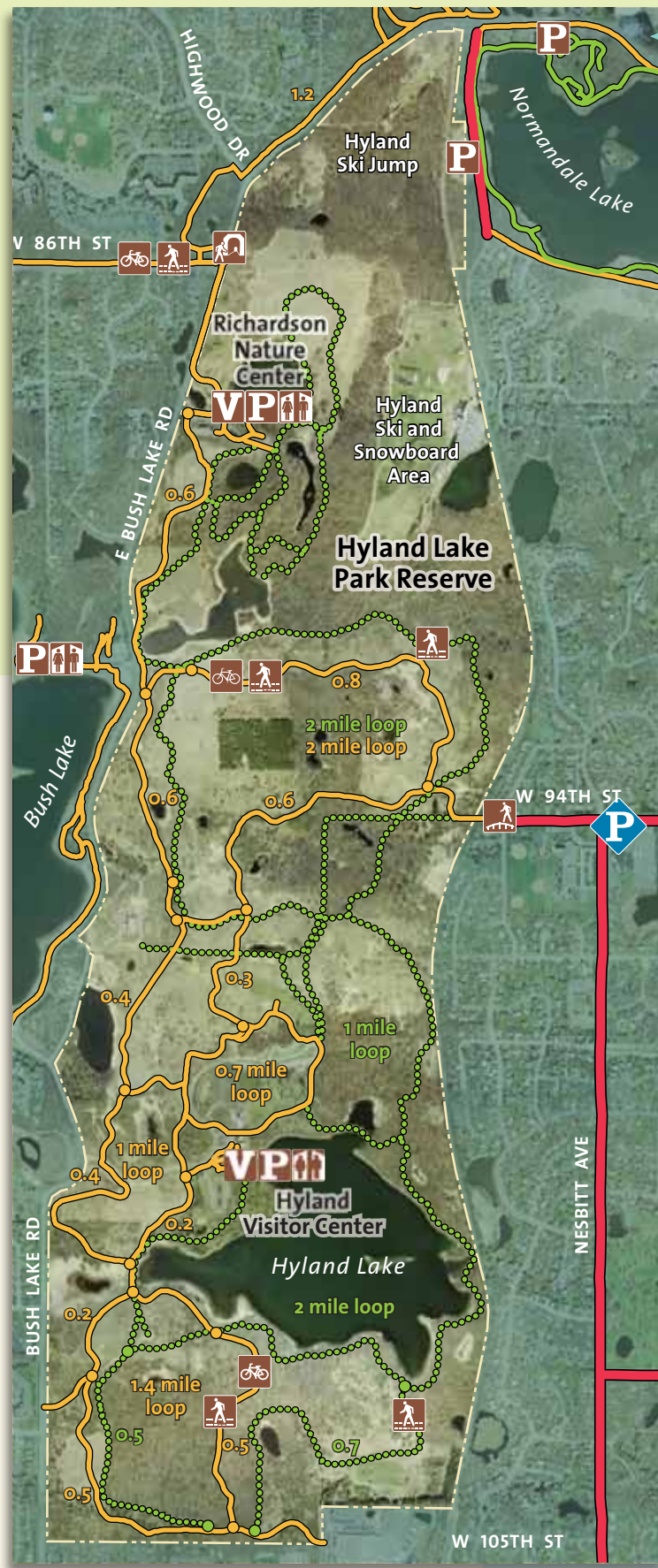


NORTH AND SOUTH CORRIDOR PARKS/ WEST BUSH LAKE ROAD/TIERNEY'S WOODS BIKING AND HIKING TRAILS

Coordinates A2 to B1.

The trails in the North and South Corridor Parks, and along West Bush Lake Road, are owned and operated by the City of Bloomington. Tierney's Woods is also owned by the City of Bloomington, but operated by Three Rivers Park District. The North and South Corridor trails are 8- to 10-foot-wide, bituminous trails. The West Bush Lake Road

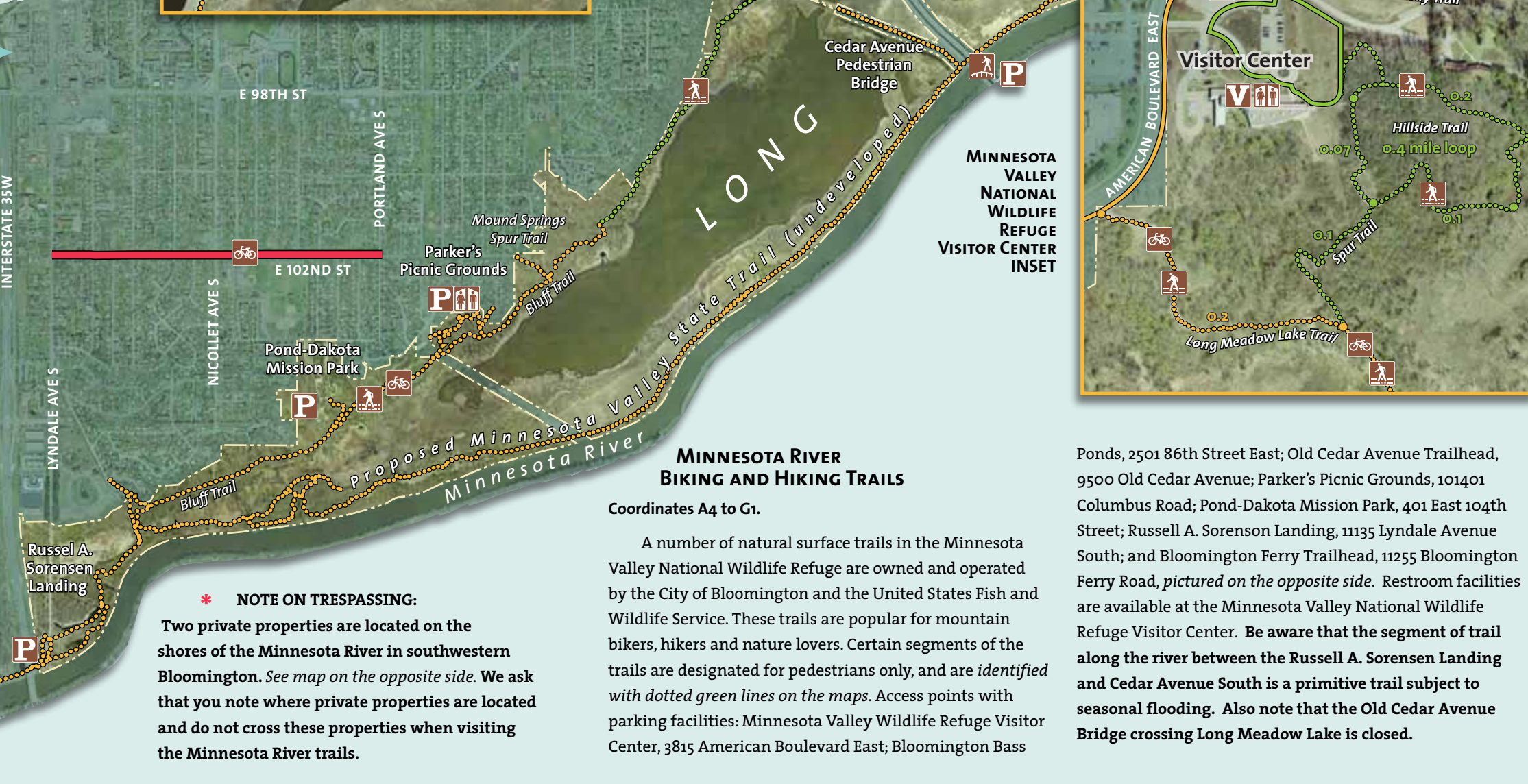
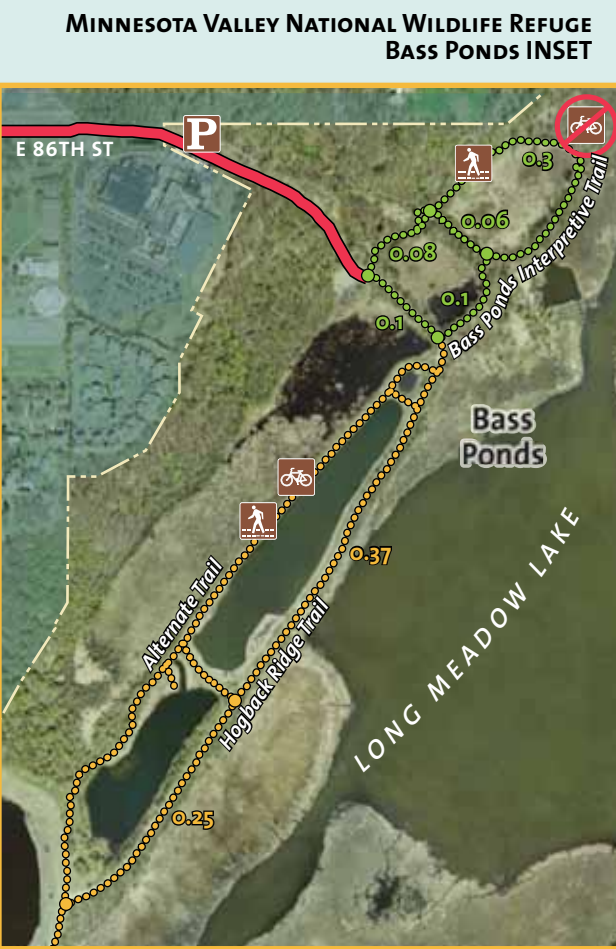
is a 6- to 8-foot-wide, bituminous trail that connects the Bush Lake Park trails to the North and South Corridor Park trails. Trails in Tierney's Woods are natural surfaced and restricted to pedestrians; no bicycles or dogs are allowed. Underpasses at the northwest corner of Bush Lake under West Bush Lake Road and at the eastern end of the South Corridor Park under East Bush Lake Road connect to trails in Hyland Lake Park Reserve. Parking is available at the Tierney's Wood parking lot on Highwood Drive, just west of West Bush Lake Road.



HYLAND LAKE PARK RESERVE TRAILS

Coordinates B1 to B3.

The trails in Hyland Lake Park Reserve are owned and operated by Three Rivers Park District. These destination trails traverse the picturesque reserve and connect on the south, north and east ends to City trails. Both bituminous and natural surface trails are available. Biking and hiking are permitted on the paved trails, pictured as solid orange lines, while the natural surface trails, pictured as dotted green lines, are restricted to pedestrians. Access points are: West 94th Street at Colorado Road; West 105th Street at Hampshire Avenue South; Richardson Nature Center, 8737 E. Bush Lake Road; and Hyland Visitor Center, 10145 E. Bush Lake Road. Parking and restrooms are available along the trails, including the Hyland Visitor Center and Richardson Nature Center.



MINNESOTA RIVER BIKING AND HIKING TRAILS

Coordinates A4 to G1.

A number of natural surface trails in the Minnesota Valley National Wildlife Refuge are owned and operated by the City of Bloomington and the United States Fish and Wildlife Service. These trails are popular for mountain bikers, hikers and nature lovers. Certain segments of the trails are designated for pedestrians only, and are identified with dotted green lines on the maps. Access points with parking facilities: Minnesota Valley Wildlife Refuge Visitor Center, 3815 American Boulevard East; Bloomington Bass

*** NOTE ON TRESPASSING:** Two private properties are located on the shores of the Minnesota River in southwestern Bloomington. See map on the opposite side. We ask that you note where private properties are located and do not cross these properties when visiting the Minnesota River trails.

SMITH PARK BIKING AND HIKING TRAILS

Coordinates E1.

The trails in Smith Park are owned and operated by the City of Bloomington. Most are 10-foot wide, lighted, bituminous and designated for multiple use. A total of more than one mile of trails encompasses a loop around Smith Pond. Access points with parking include: East 82nd Street at Park Avenue South; Chicago Avenue South, north of East 82nd Street; and East 82nd Street at 10th Avenue South. Restrooms are available seasonally near the Chicago Avenue parking lot.



LEGEND FOR MAPS

SCALE VARIES

TRAILS	SYMBOLS
On-Road Bike	Biking Trail
Off-Road Paved	Hiking Trail
Off-Road Unpaved	Parking
Off-Road Paved Pedestrian Only	Pedestrian Bridge
Off-Road Unpaved Pedestrian Only	Seasonal Restroom
Distance in Miles between Markers	Underpass
	Visitor/Nature Center

PHOTO CREDITS

THIS SIDE
• Existing bike routes: Bigstock.com
• Smith Park: Faye Roy
• Cover: Three Rivers Park District

• Biking etiquette: bigstockphoto.com
• Concept credit: Three Rivers Park District
• Kids hiking: Minnesota Valley National Wildlife Refuge

OPPOSITE SIDE
• Biker: stock.xchng (http://www.sxc.hu)
• Woman and dog: Bigstock.com
• All others: City of Bloomington



ACTIVE LIVING BIKING AND HIKING GUIDE



EXPLORE BLOOMINGTON'S PARKS, STREETS AND TRAILS USING PEDAL AND FOOT POWER!

Whether you're in the mood for a hike, an easy walk with the family, a leisurely bike ride, a challenging all-terrain trail, walking your dog or commuting to work on your bike, you can find a path to follow in Bloomington. With nearly 9,000 acres of parkland and recreational spaces, the Minnesota River, lakes, wide streets and well-lit sidewalks, being active is easy.

The trails showcased here are special. Tiny jewels, such as Girard Lake Park, feel secluded and restful – you can get close to nature while traveling the short trail. If you like drama with your hike, visit the Central and Moir Parks trails; you will traverse ravines and cross bridges that span the rock-strewn Nine Mile Creek as it bubbles down to the Minnesota River. Like to watch people and nature? Hyland Lake Park Reserve is always busy; there's lots to do and see. Finally, if

you like fresh air and exercise and want to get from point A to point B, take Bloomington's on-road bikeways.

Whoever you are – a commuter, a solitary traveler or someone looking to exercise with friends and family – explore Bloomington's biking and hiking trails. Get active! It's great for your body. And the fresh air and nature will soothe your mind and spirit.

Additional on-road bikeways and off-road hiking and biking trails are planned. For more information, check out the City's *Alternative Transportation Plan* on the City's website, www.ci.bloomington.mn.us, keywords: "Alternative transportation plan."

The coordinates on this page refer to the large map on the opposite side.

BIKING AND HIKING ETIQUETTE



BE PREDICTABLE

Travel in a consistent and predictable manner. Always look behind before changing position on the trail.



DON'T BLOCK THE TRAIL

When in a group, avoid using more than half the trail.



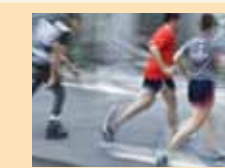
CONTROL DOGS

Keep your dog under control and on a six foot non-retractable leash.



KEEP RIGHT

For safety, stay to the right of the trail, except when passing another user.



PASS ON THE LEFT

Pass others going in your direction on their left. Faster traffic must yield to slower and oncoming traffic.



GIVE AUDIBLE SIGNALS

When passing, use a warning such as... "PASSING ON YOUR LEFT." Give a clear warning by voice, bell or horn.



WEAR HELMETS

Bicyclists, skaters and skateboarders should always wear a properly fitted helmet.



STOP MEANS STOP

BIKING EQUIPMENT CHECKLIST

- Wear a helmet – always. This inexpensive investment prevents head injuries and can save you thousands of dollars later on.
- Bring water. Staying hydrated helps with long distances and makes rides enjoyable.
- Use sunglasses. Protect your eyes from the sun, gravel and bugs.
- Check bike tires for proper inflation. On rides, carry a spare tube, a patch kit and a pump.
- Make sure your bike is the proper height.
- Check brakes. You want brakes that skid on dry pavement but don't send you hurtling over the top of the handlebars. Using rear brakes helps prevent this.

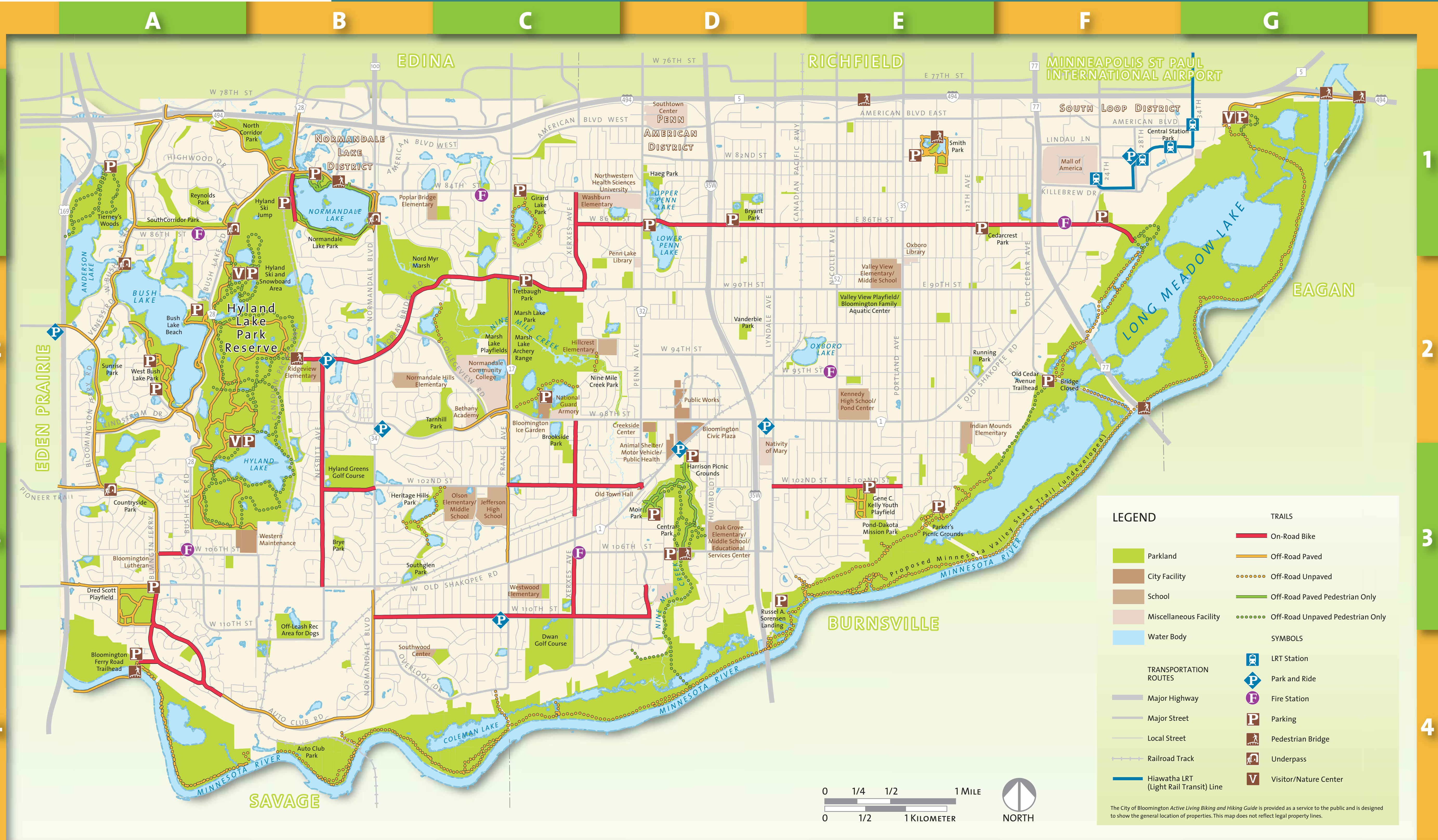
HIKING EQUIPMENT CHECKLIST

- Wear comfortable shoes that fit.
- Bring water. This is a definite must for longer walks and, even, for short ones on very warm days.
- Use sunglasses all year round to protect your eyes from the sun and bugs.
- Bring bag(s) to carry out what you carry in.
- Be prepared for weather changes.

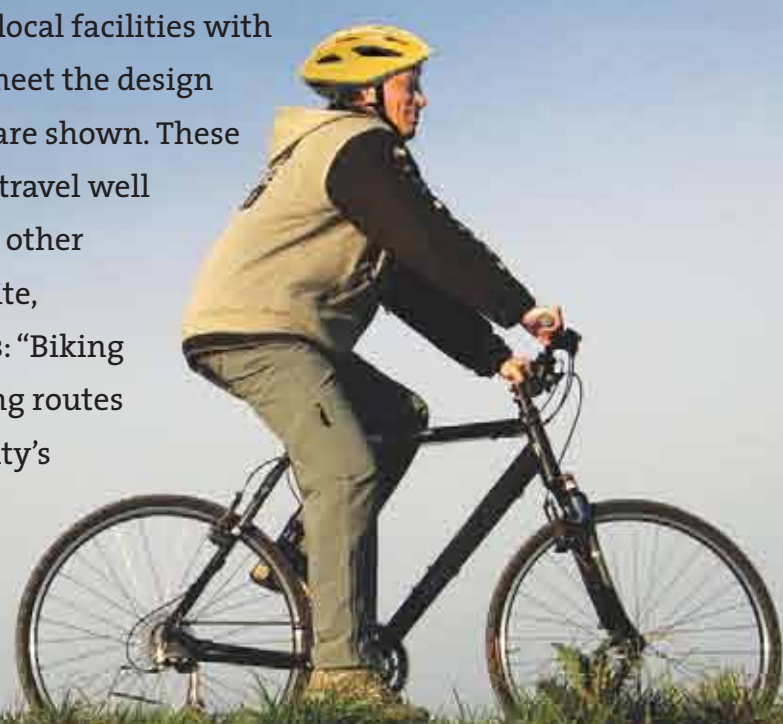


ACTIVE LIVING BIKING AND HIKING GUIDE





This Active Living Biking and Hiking Guide shows a portion of the many hiking trails, sidewalks and bikeways that thread their way through our beautiful city. State, regional, county and local facilities with city-wide significance and trails that meet the design guidelines of the City of Bloomington are shown. These routes connect to other segments that travel well beyond our borders. Find this map and other bicycle information on the City's website, www.ci.bloomington.mn.us, keywords: "Biking and hiking guide." Plans for more biking routes and hiking trails are available in the City's *Alternative Transportation Plan* that is also on our website, keywords: "Alternative transportation plan."



CITY OF BLOOMINGTON FACILITIES

Bloomington Civic Plaza, 1800 W. Old Shakopee Rd.
D3 Center for the Arts, north section of Civic Plaza.
D3 City Hall, center section of Civic Plaza.
D3 Police Department, south section of Civic Plaza.
D3 Animal Shelter, 9920 Logan Ave. S.
D3 Creekside Community Center, 9801 Penn Ave. S.
D3 Motor Vehicle Registration, 9930 Logan Ave. S.
D3 Public Health Center, 1900 W. Old Shakopee Rd.
D2 Public Works, 1700 W. 98th St.

PRIVATE SCHOOLS

C2 Bethany Academy, 4300 W. 98th St.
A3 Bloomington Lutheran, 10600 Bloomington Ferry Rd.
D3 Nativity of Mary, 9901 E. Bloomington Freeway.

BLOOMINGTON SCHOOLS

D1 Community Education Center, 2575 W. 88th St.
D3 Educational Service Center, 1350 W. 106th St.
D3 Hillcrest Elementary, 9301 Thomas Road
E2 Indian Mounds Elementary, 9801 11th Ave. S.
C3 Jefferson St. High, 4001 W. 102nd St.
E2 Kennedy St. High, 9701 Nicollet Ave. S.
C2 Normandale Community College, 9700 France Ave. S.
B2 Normandale Hills Elementary, 9501 Toledo Ave. S.
D1 Northwestern Health Sciences Univ., 2501 W. 84th St.
D3 Oak Grove Elementary, 1301 W. 104th St.
D3 Oak Grove Middle, 1300 W. 106th St.
C3 Olson Elementary, 4501 W. 102nd St.
C3 Olson Middle, 4551 W. 102nd St.
E2 Pond Center, 9600 3rd Ave. S.
C1 Poplar Bridge Elementary, 8401 Palmer Rd.
B2 Ridgeview Elementary, 9400 Nesbitt Rd.
C4 Southwood Center, 4901 W. 112th St.
B1 Valley View Elementary, 351 E. 88th St.
B1 Valley View Middle, 8900 Portland Ave. S.
C1 Washburn Elementary, 8401 Xerxes Ave. S.
C3 Westwood Elementary, 3701 W. 108th St.

MISCELLANEOUS FACILITIES

BUSINESS DISTRICTS:
B1 Normandale Lake District.
D1 Penn American District.
F1 - G1, F2 - G2 South Loop District.
HENNEPIN COUNTY LIBRARIES:
D2 Penn Lake Library, 8800 Penn Ave. S.
E2 Oxboro Library, 8801 Portland Ave. S.
F1 Mall of America, 8100 24th Ave. S.
G1 Minnesota Valley National Wildlife Refuge
Visitors Center, 3815 American Blvd. E.
C2 National Guard Armory, 3000 W. 98th St.
C2 Normandale Community College, 9700 France Ave. S.
D1 Northwestern Health Sciences University, 2501 W. 84th St.

MORE INFORMATION

- Commuter Services, www.494corridor.org/
- Bicycle Alliance of Minnesota, www.bikemn.org
- Bike Walk Twin Cities, www.bikewalktincities.org
- City of Bloomington, www.ci.bloomington.mn.us, keywords "alternative transportation plan."
- Hennepin County Bicycle Advisory Committee (BAC), www.co.hennepin.mn.us
- League of American Cyclists, www.bikeleague.org/resources/better/index.php
- Minnesota Complete Streets Coalition, www.mncompletestreets.org/
- Minnesota Department of Natural Resources, www.dnr.state.mn.us
- Minnesota Dept. of Transportation Bicycle Information, www.sharetheroadmn.org
- Minnesota Off-Road Cyclists (MORC), www.morcmtb.org
- Minnesota Valley National Wildlife Refuge, www.fws.gov/Midwest/MinnesotaValley
- Three Rivers Park District, www.threeriversparks.org
- Transit for Livable Communities, www.tlcmnnesota.org/index.php

MINNESOTA'S
VISION
A Better State of Health
Statewide Health Improvement Program | SHIP

The City of Bloomington does not discriminate on the basis of disability in the admission or access to, or treatment or employment in, its services, programs, or activities. Upon request, accommodation will be provided to allow individuals with disabilities to participate in all City of Bloomington services, programs, and activities. The City has designated coordinators to facilitate compliance with the Americans with Disabilities Act of 1990 (ADA), as required by Section 35.107 of the U.S. Department of Justice regulations, and to coordinate compliance with Section 504 of the Rehabilitation Act of 1973, as mandated by Section 8.33 of the U.S. Department of Housing and Urban Development regulations. For information, contact the Human Services Division, City of Bloomington, 1800 West Old Shakopee Road, Bloomington, MN 55431-3096; 952-563-8733 (Voice); 952-563-8740 (TTY).

Upon request, this information can be available in Braille, large print, audio tape and/or computer disk.



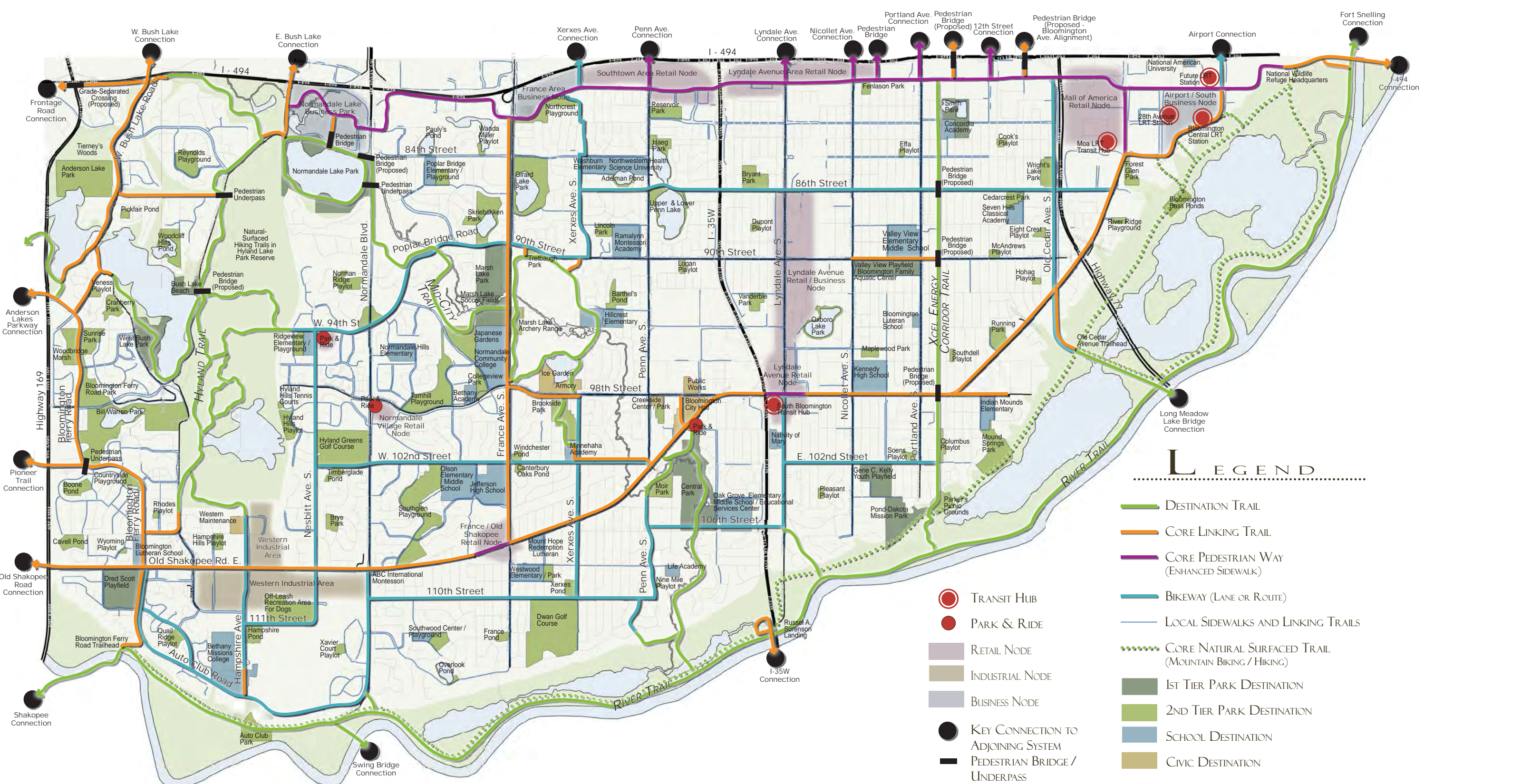
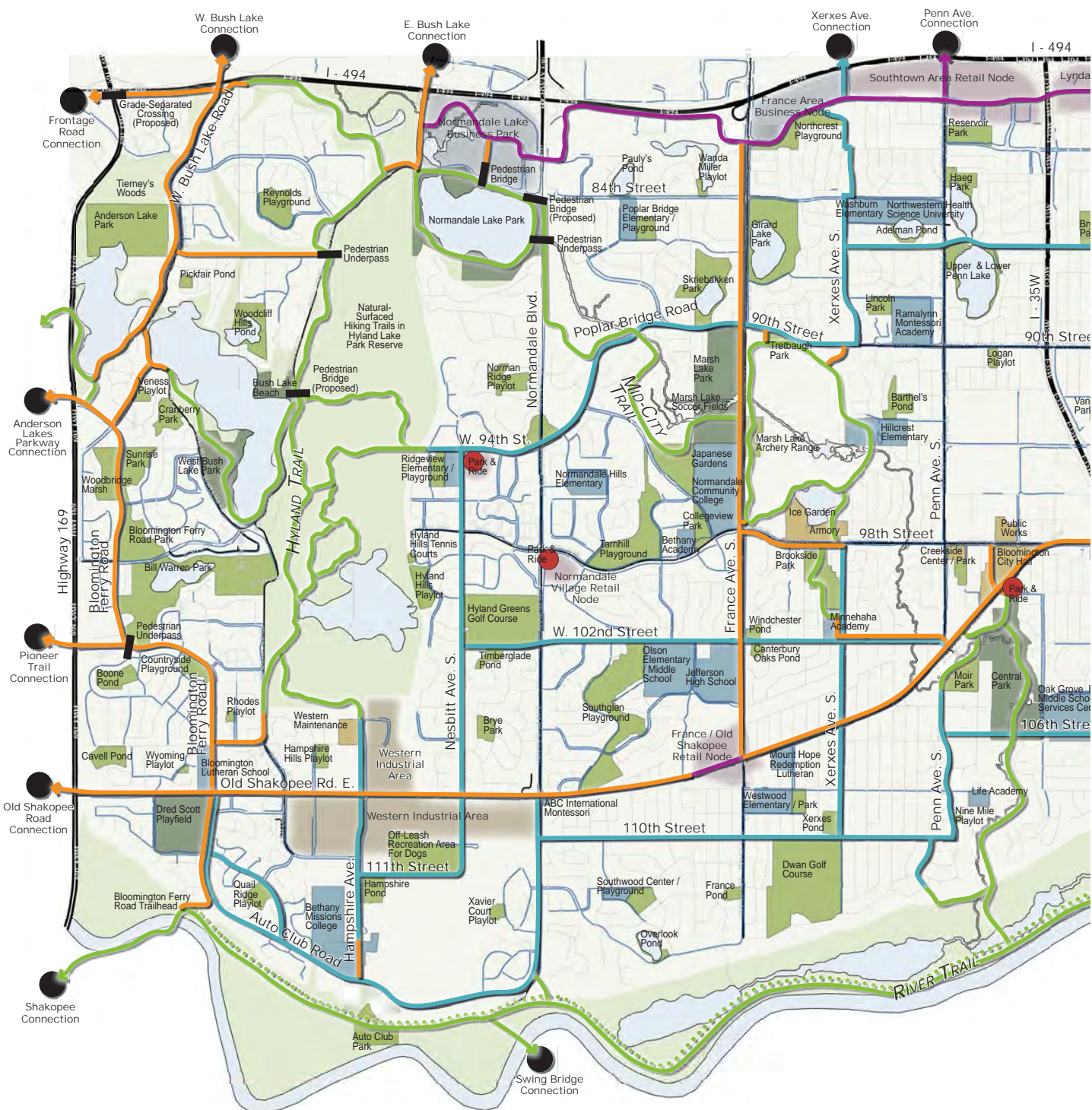


FIGURE 3.4 – CORE ALTERNATIVE TRANSPORTATION SYSTEM PLAN WITH PRINCIPAL DESTINATIONS



POTENTIAL CORE ALTERNATIVE
TRANSPORTATION SYSTEM
MILEAGE WITH FULL
DEVELOPMENT

Classification

Total Combined Miles

Destination Trails

38.0

Linking Trails

28.0

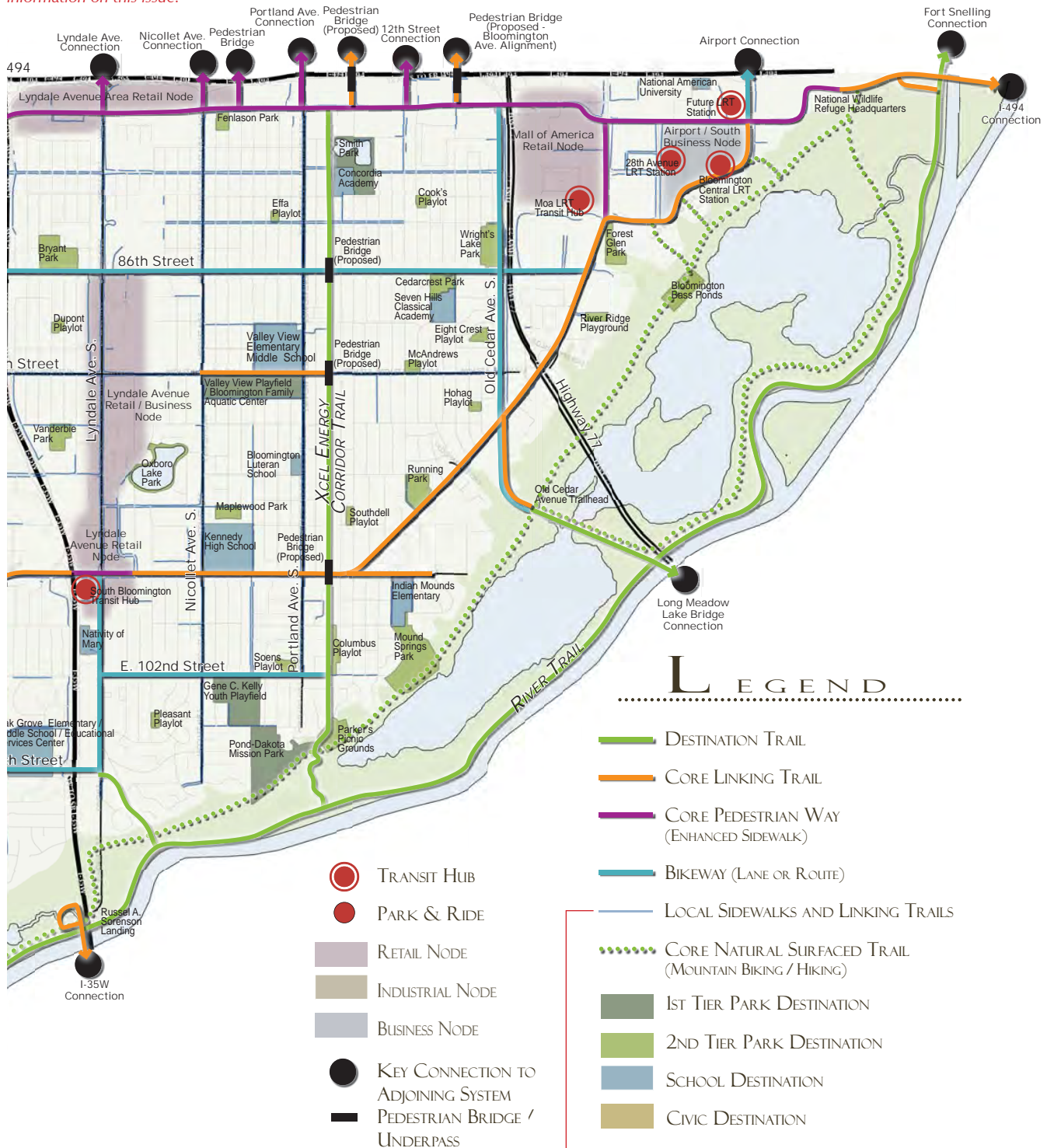
Pedestrian-ways

10.0

Bikeways

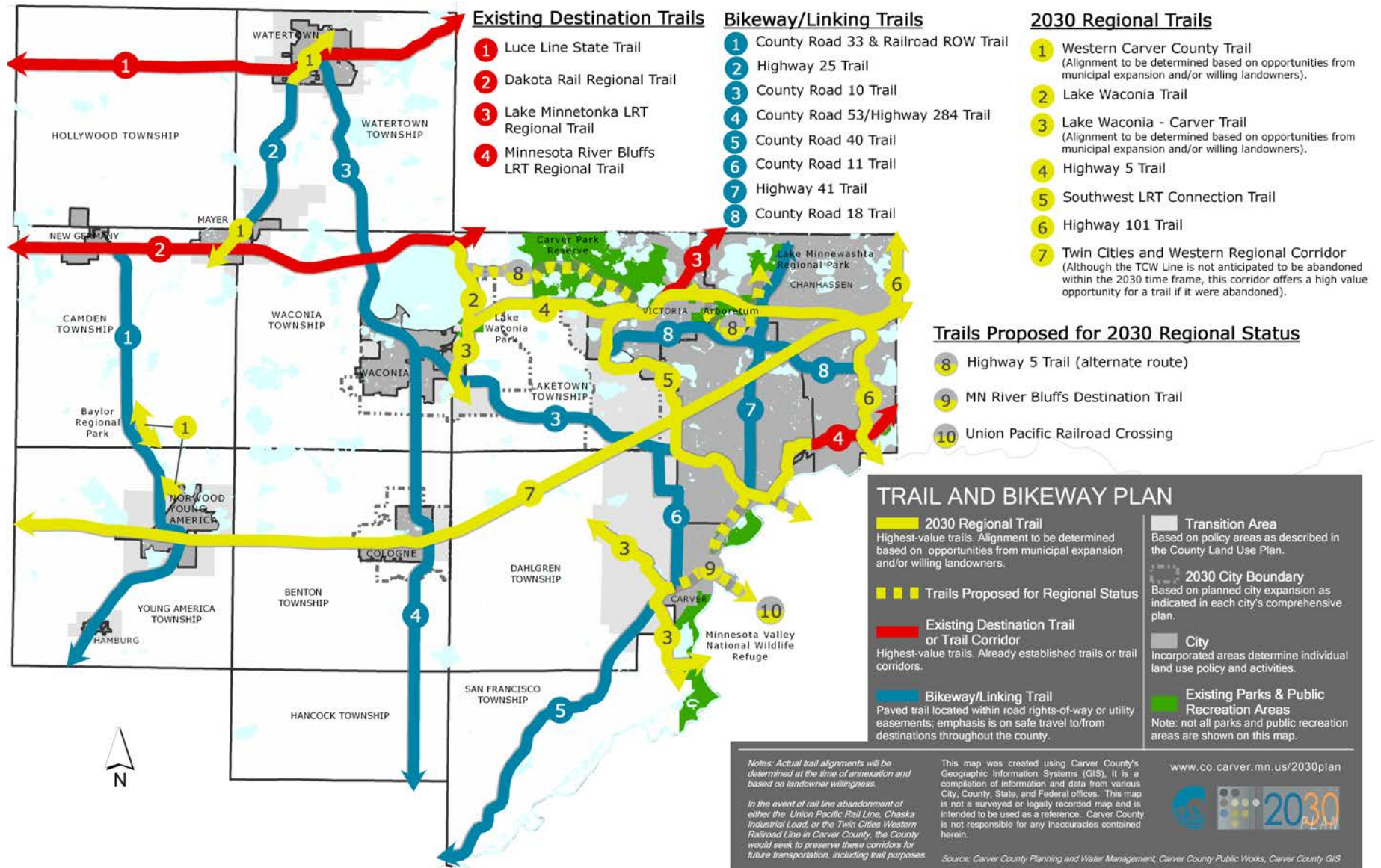
28.0

Connections to Adjoining Communities Note: The connection points shown on the map are conceptual and subject to refinement after further consultation with adjoining communities as detailed plans evolve over time. Also note that the crossing points for bikeways may be different than those for trails and sidewalks depending on street and bridge configurations and specific points of connection with adjoining systems. Refer to page 3.42 for additional information on this issue.



Secondary Sidewalks, Linking Trails, and Bikeways Note: Addressing gaps in the local sidewalk, trail, and bikeway system throughout the city is considered under the Complete Streets Program discussion starting on page 3.45. Once implemented, this program will complement the core alternative transportation features shown on this plan.

FIGURE 6.8 TRAIL AND BIKEWAY PLAN (SOURCE: CARVER COUNTY)





Prepared by:
Dakota County Office of GIS, 1/2012.

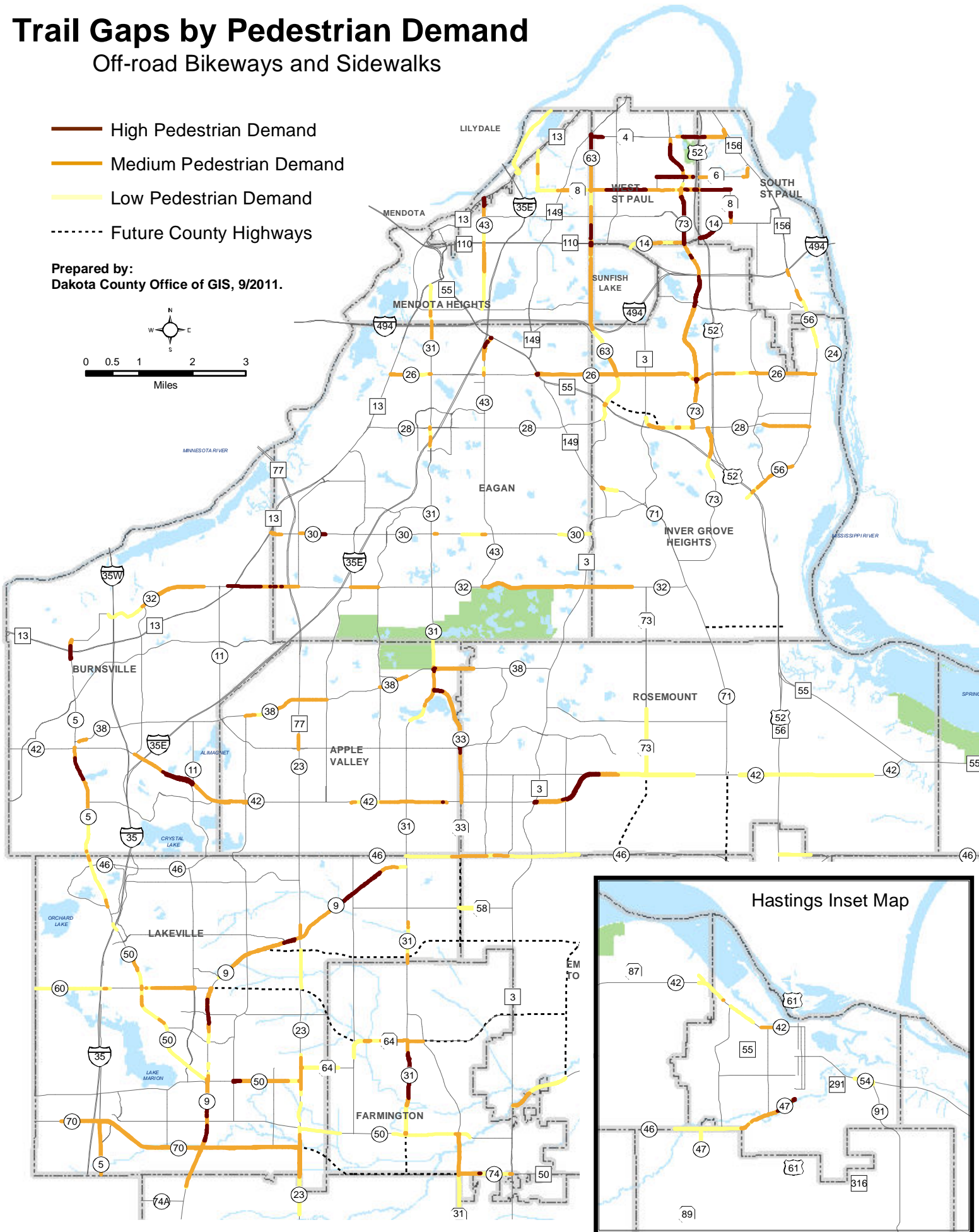
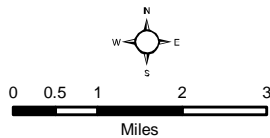
Dakota County 2030 Transportation Plan - Figure 19

Trail Gaps by Pedestrian Demand

Off-road Bikeways and Sidewalks

- High Pedestrian Demand
- Medium Pedestrian Demand
- Low Pedestrian Demand
- Future County Highways

Prepared by:
Dakota County Office of GIS, 9/2011.



Dakota County 2030 Transportation Plan - Figure 20

Bicycle Gaps

Hennepin County

September 2012

Existing Bike Routes

- On-Road
- Pending On-Road
- Off-Road
- Pending Off-Road
- Both On-Road & Off-Road
- Sub-Standard

Plan Classification

- Bikeway
- Independent
- Secondary

Bicycle Route Gaps

- Gap On Plan
- Gap Not On Plan

LRT Stations

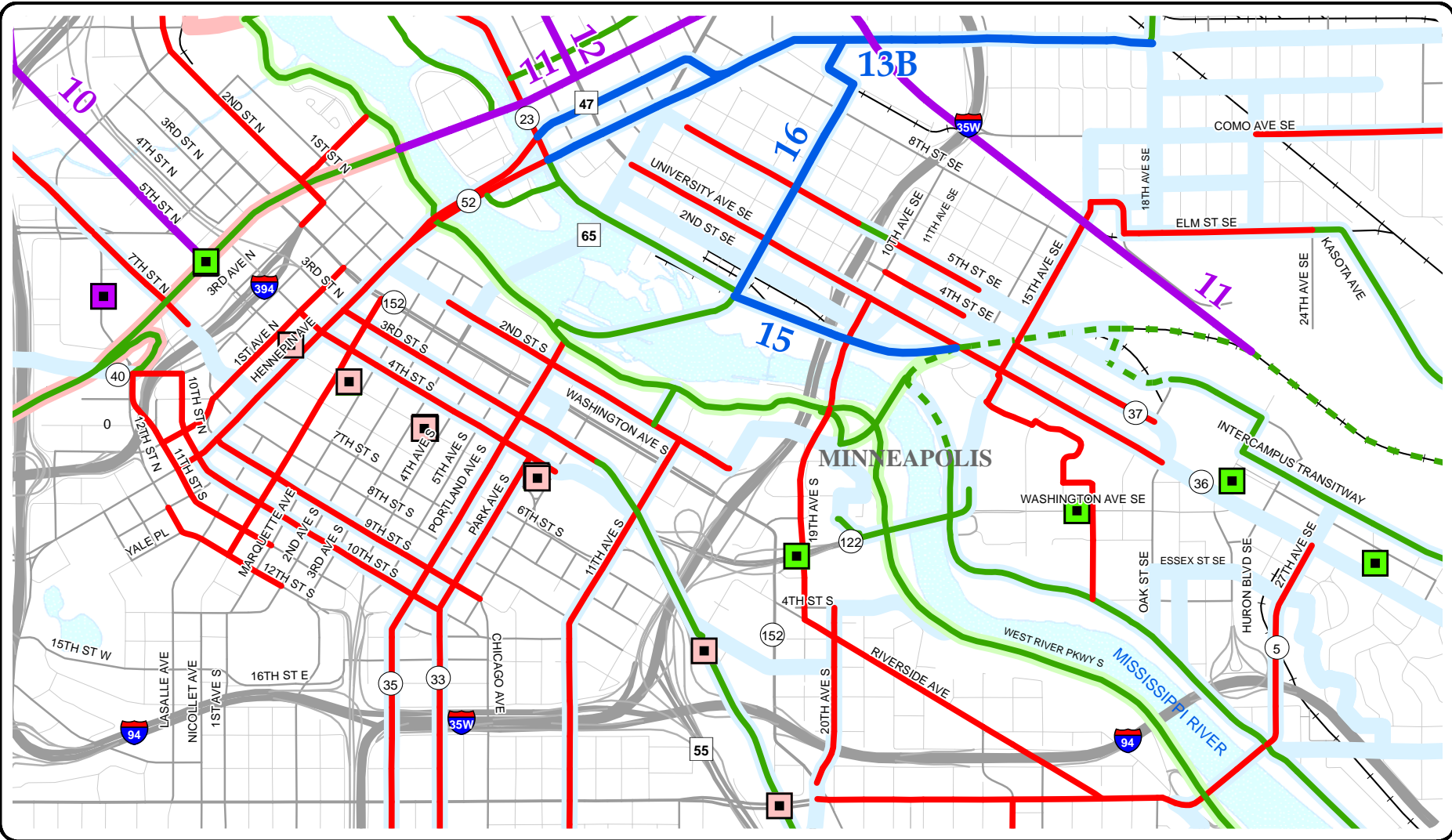
- Hiawatha
- Central Corridor
- Southwest

Bike Gap Mileages		
Status	Miles	Percent
On Plan	71.20	60.9%
Not On Plan	45.64	39.1%
Total	116.84	100.0%

Revision History

March 2002	Original	Gap Study
Spring 2004		
Fall 2004		
March 2007		
December 2008		
Spring 2009		
Spring 2010		
Spring 2011		
January 2012		
September 2012		

Downtown Minneapolis Bike Gaps



Hennepin County Bicycle System Plan

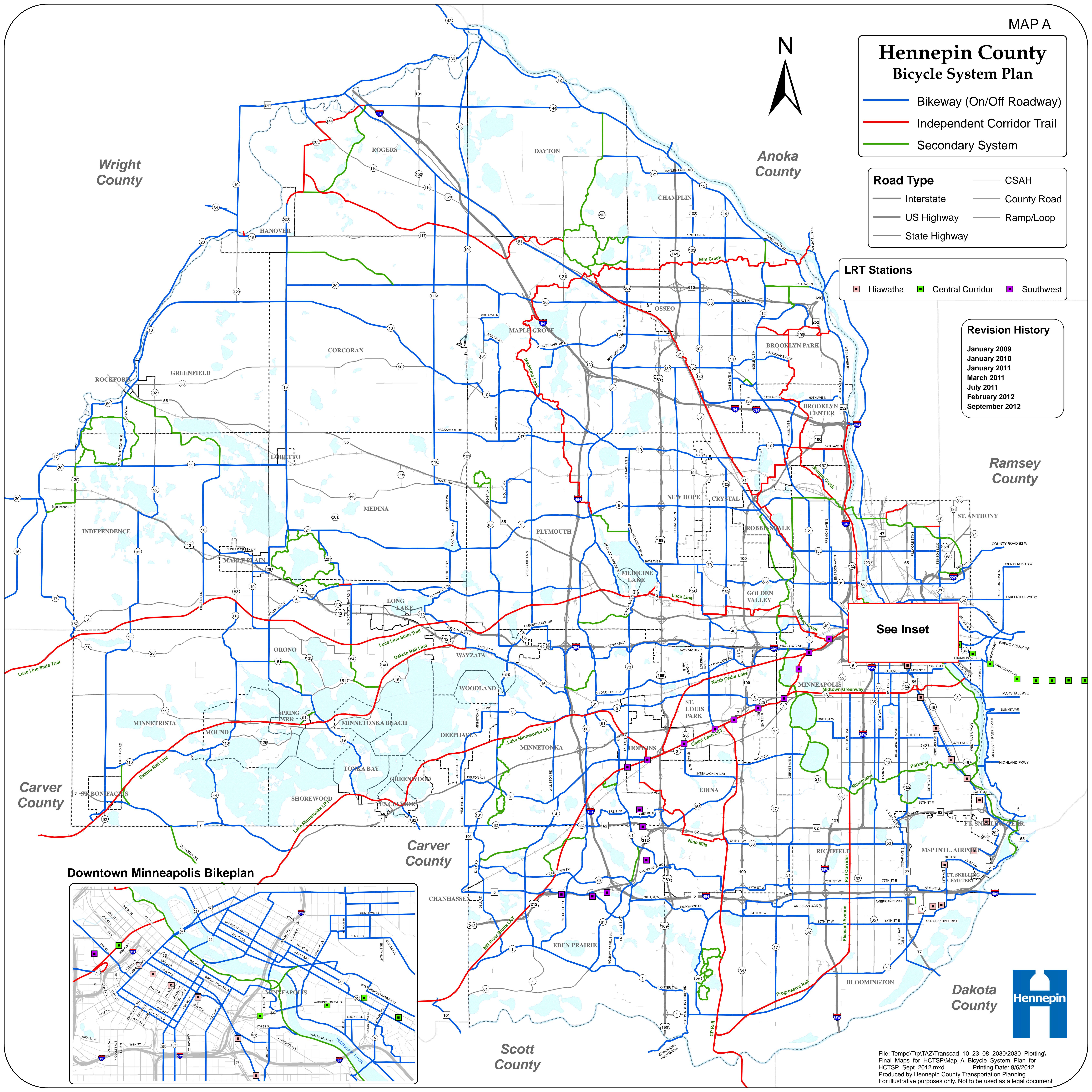
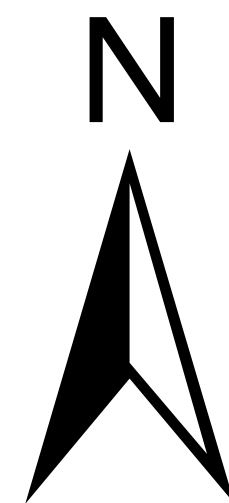
- Bikeway (On/Off Roadway)
- Independent Corridor Trail
- Secondary System

- Road Type**
- CSAH
 - Interstate
 - US Highway
 - State Highway
 - County Road
 - Ramp/Loop

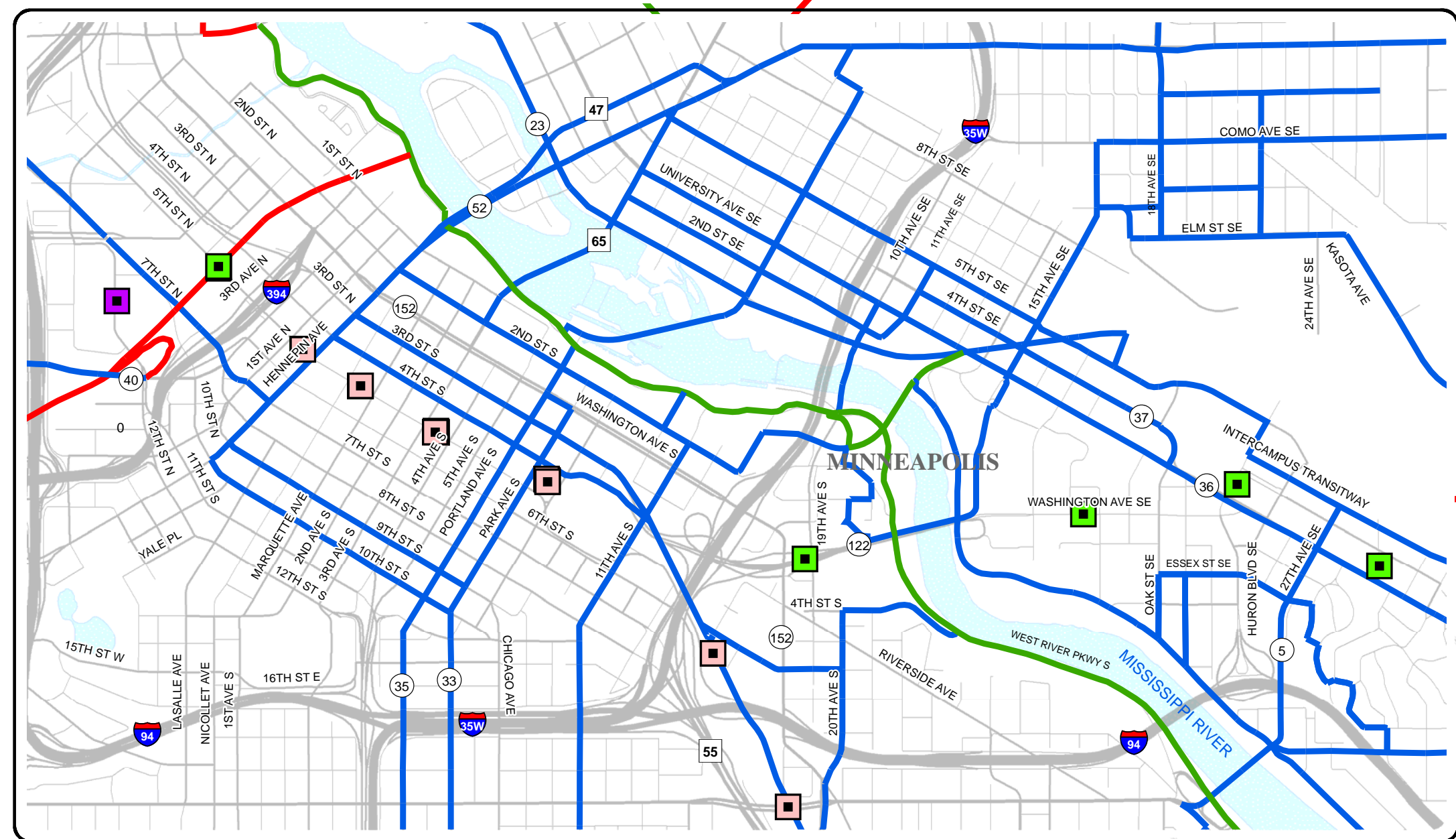
- LRT Stations**
- Hiawatha
 - Central Corridor
 - Southwest

Revision History

January 2009
January 2010
January 2011
March 2011
July 2011
February 2012
September 2012

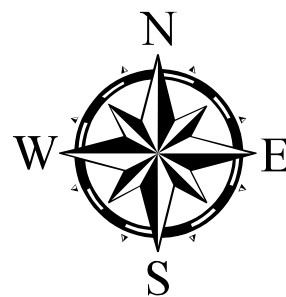
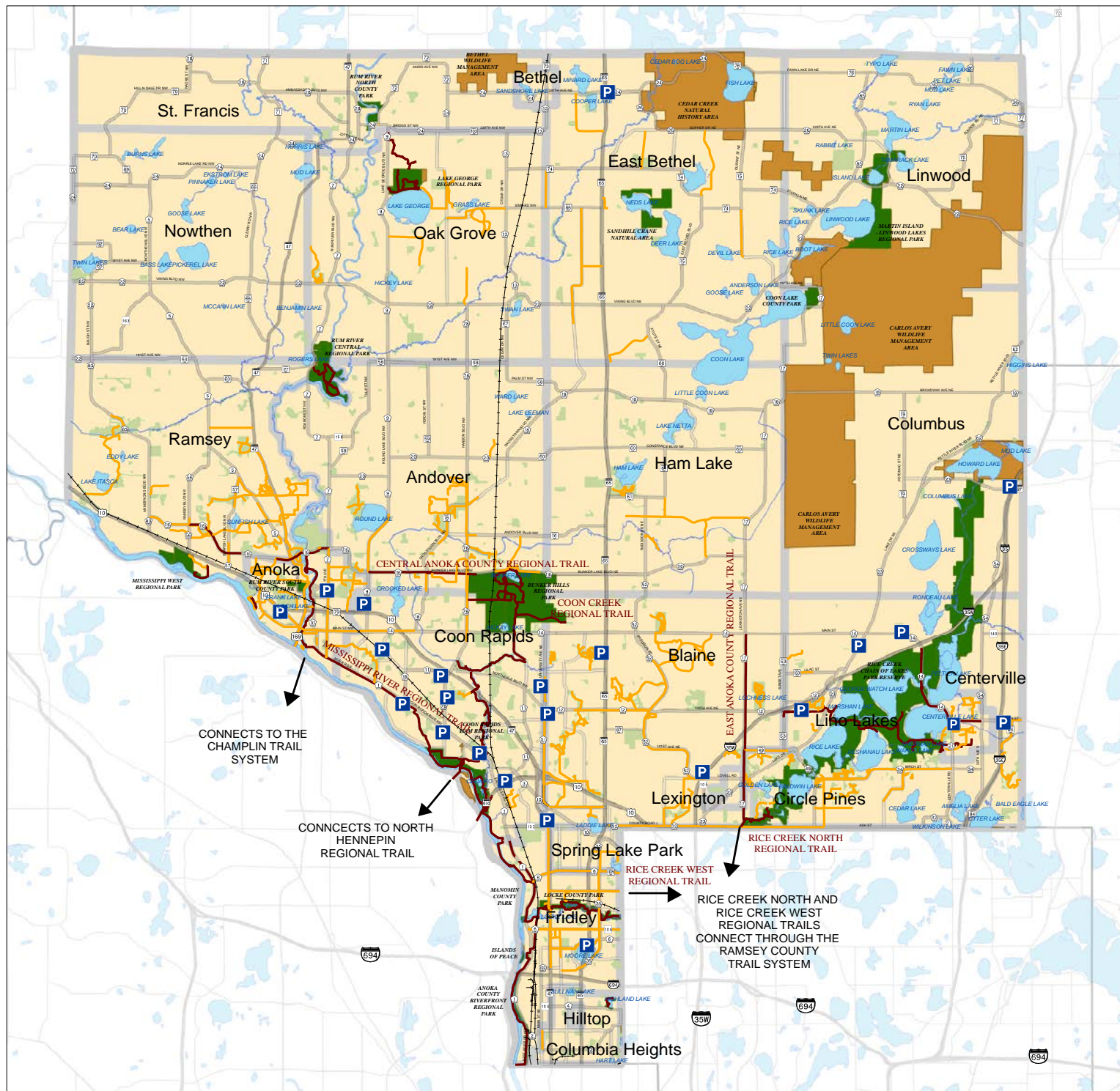


Downtown Minneapolis Bikeplan



Dakota
County





Ramsey Co. 2011 Bicycle System Map

Existing & Proposed/Planned Facilities

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 0.25 0.5 1 1.5 2
Miles

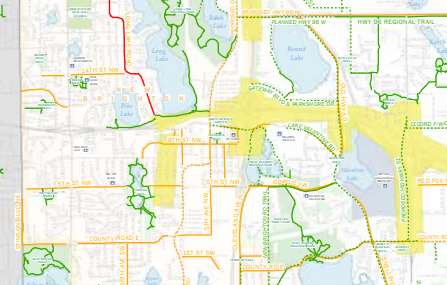
- Trail - Existing
- Trail - Planned
- Trail - Proposed
- Bike Lane - Existing
- Bike Lane - Proposed
- Bike Route - Existing
- Striped Shoulder - Existing
- Striped Shoulder - Proposed

- City Park
- Regional or County Park, or Open Space
- State Park
- Golf Course

- Study Area
- Schools
- Park 'n' Rides

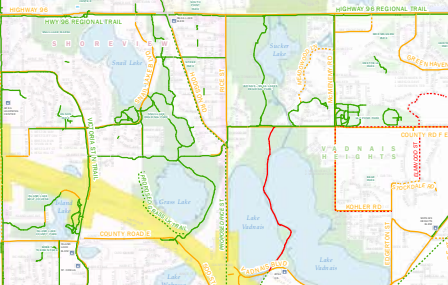
Bike Facilities & Gaps Map 1:

Mounds View - New Brighton - Arden Hills



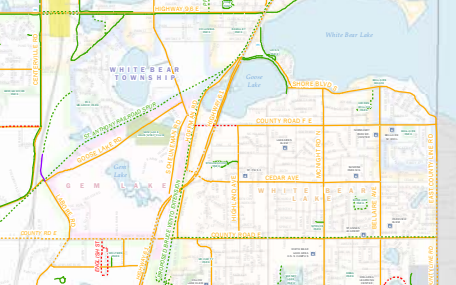
Bike Facilities & Gaps Map 2:

Shoreview - N. Oaks - Vadnais Heights



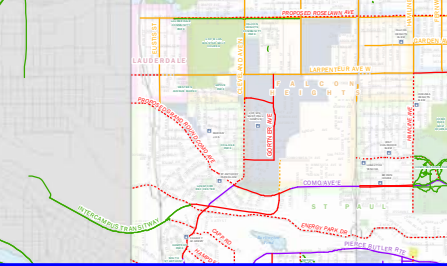
Bike Facilities & Gaps Map 3:

White Bear Lake - White Bear Township



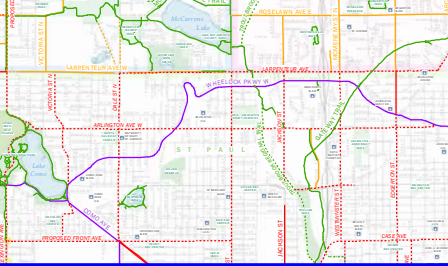
Bike Facilities & Gaps Map 4:

W. Roseville - Falcon Heights - Lauderdale



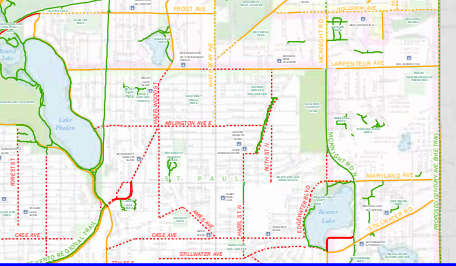
Bike Facilities & Gaps Map 5:

E. Roseville - Little Canada - Como



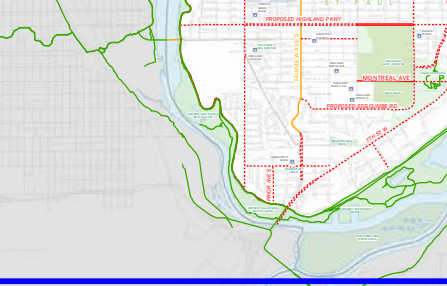
Bike Facilities & Gaps Map 6:

Maplewood - N. St. Paul - Lake Phalen



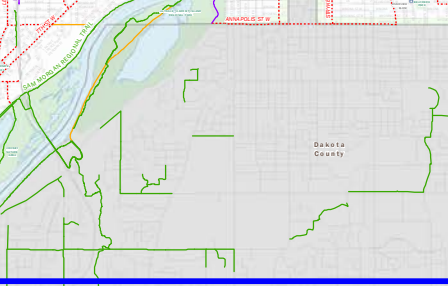
Bike Facilities & Gaps Map 7:

Mac-Groveland - Highland Park



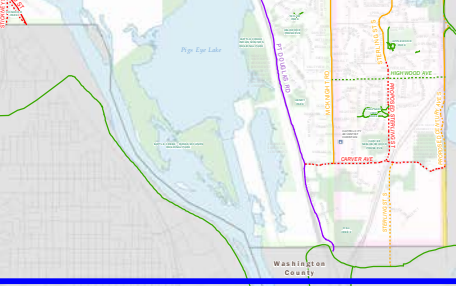
Bike Facilities & Gaps Map 8:

Downtown STP - West Side STP



Bike Facilities & Gaps Map 9:

East Side STP - Battle Creek

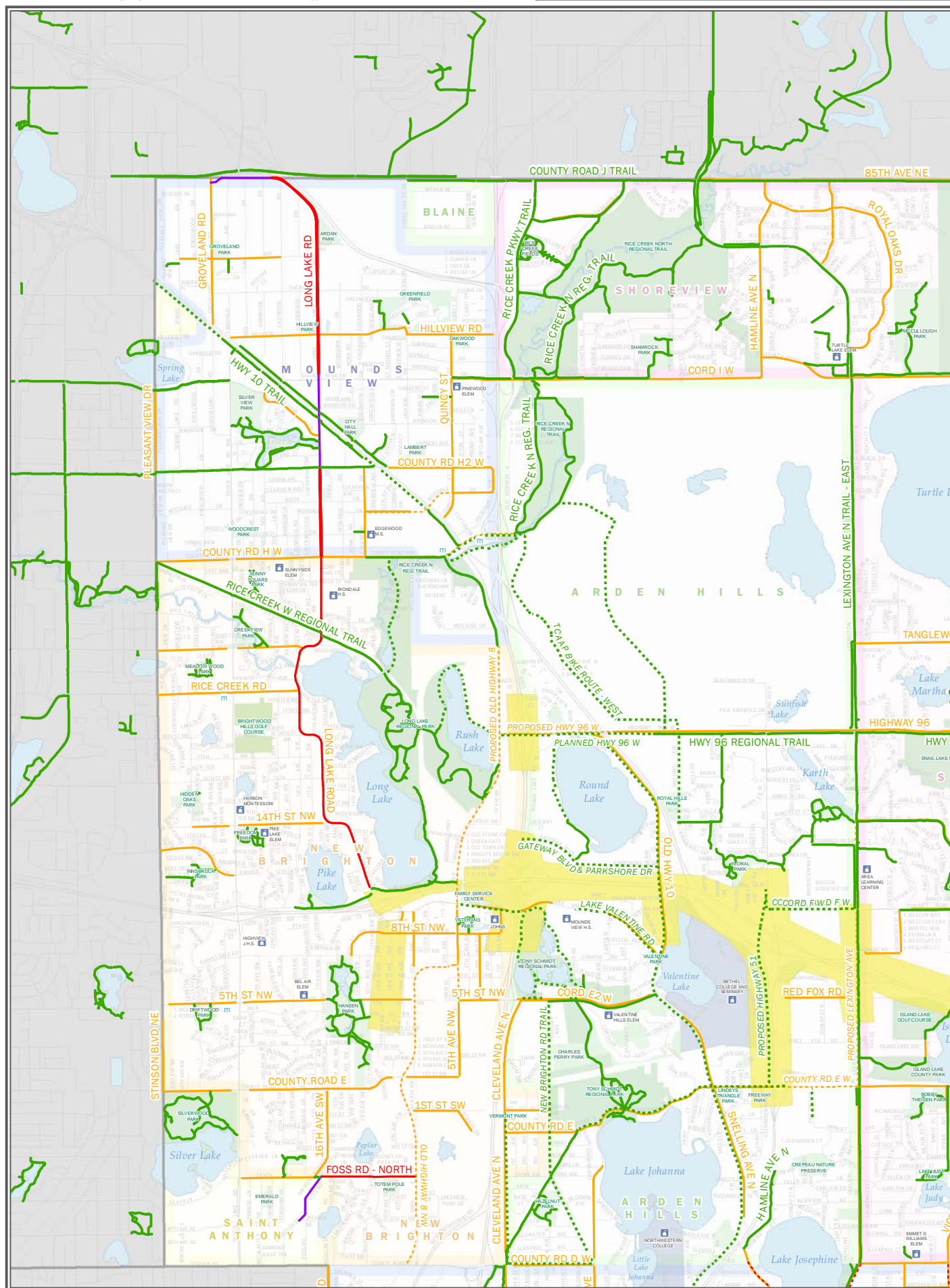


Map 1: Mounds View - New Brighton - Arden Hills

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011



- | | | | | | |
|--|-----------------------------|--|--|--|----------------|
| | Trail - Existing | | City Park | | Study Area |
| | Trail - Planned | | Regional or County Park, or Open Space | | Schools |
| | Trail - Proposed | | State Park | | Park 'n' Rides |
| | Bike Lane - Existing | | Golf Course | | |
| | Bike Lane - Proposed | | | | |
| | Bike Route - Existing | | | | |
| | Striped Shoulder - Existing | | | | |
| | Striped Shoulder - Proposed | | | | |



Existing & Proposed/Planned Facilities

Map 2: Shoreview - N. Oaks - Vadnais Heights

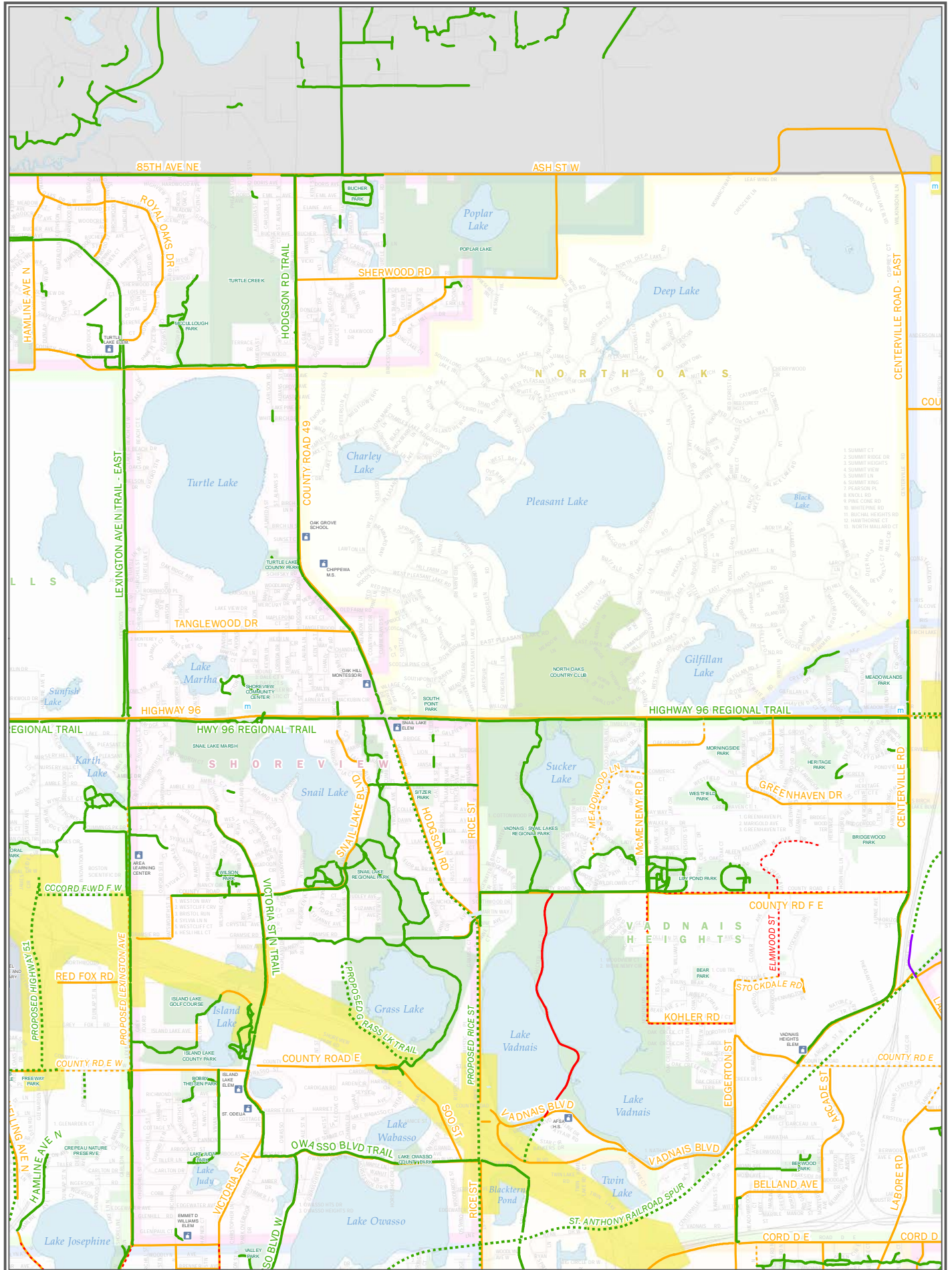
Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 .25 .5 1 .75 1.5 2
Miles

- Trail - Existing
- Trail - Planned
- Trail - Proposed
- Bike Lane - Existing
- Bike Lane - Proposed
- Bike Route - Existing
- Striped Shoulder - Existing
- Striped Shoulder - Proposed

- City Park
- Regional or County Park, or Open Space
- State Park
- Golf Course












- Study Area
- Schools
- m Park 'n' Rides

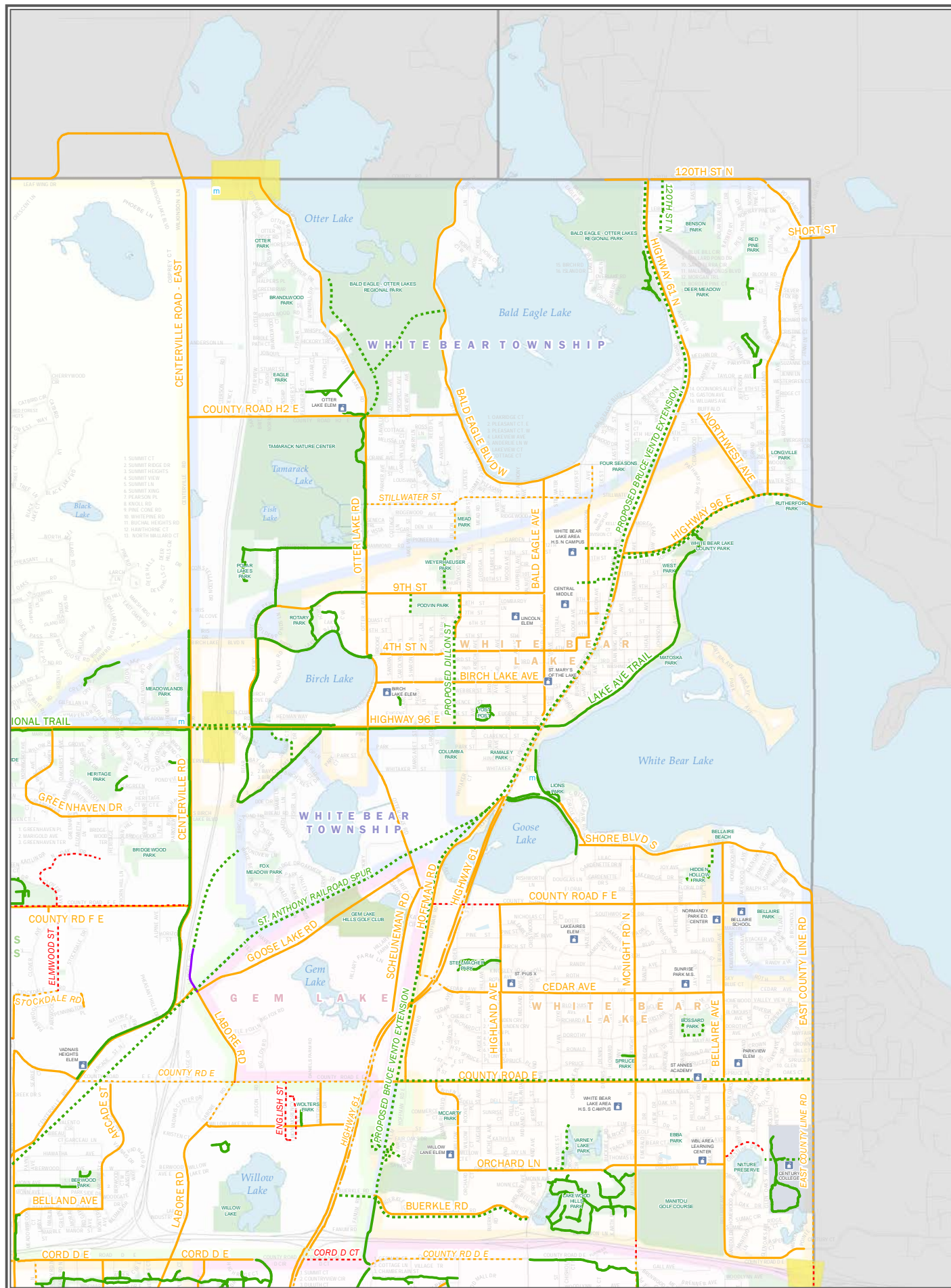


Map 3: White Bear Lake - White Bear Township

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011



- | | | |
|---|--|--|
|  Trail - Existing |  City Park |  Study Area |
|  Trail - Planned |  Regional or County Park, or Open Space |  Schools |
|  Trail - Proposed |  State Park |  Park 'n' Rides |
|  Bike Lane - Existing |  Golf Course | |
|  Bike Lane - Proposed | | |
|  Bike Route - Existing | | |
|  Striped Shoulder - Existing | | |
|  Striped Shoulder - Proposed | | |



Existing & Proposed/Planned Facilities

Map 4: W. Roseville - Falcon Heights - Lauderdale

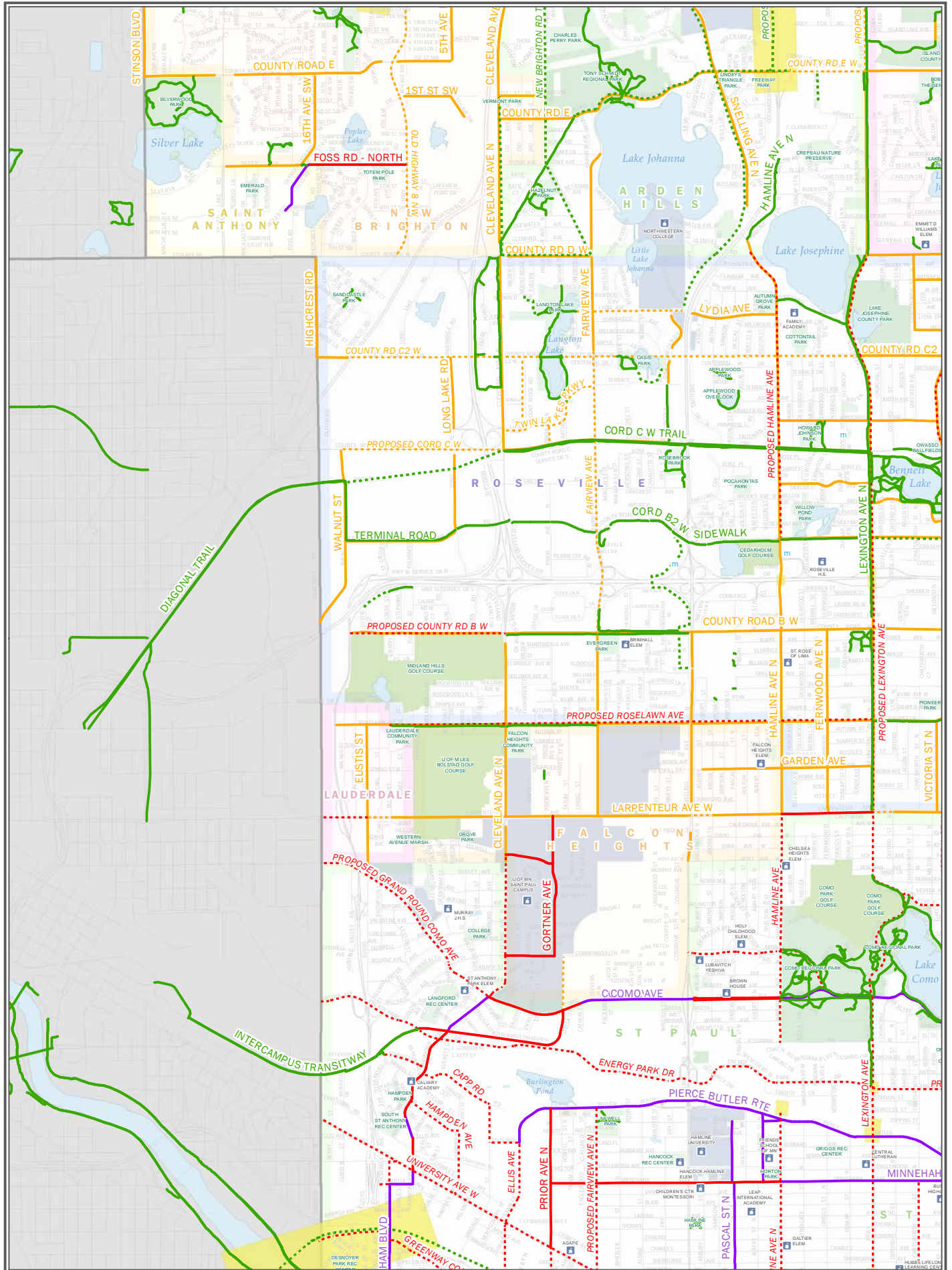
Prepared by: Ramsey County GIS
Tuesday, July 05, 2011



- Trail - Existing
- - - Trail - Planned
- . - Trail - Proposed
- Bike Lane - Existing
- - - Bike Lane - Proposed
- Bike Route - Existing
- Striped Shoulder - Existing
- - - Striped Shoulder - Proposed

- City Park
- Regional or County Park, or Open Space
- State Park
- Golf Course

- Study Area
- Schools
- m Park 'n' Rides



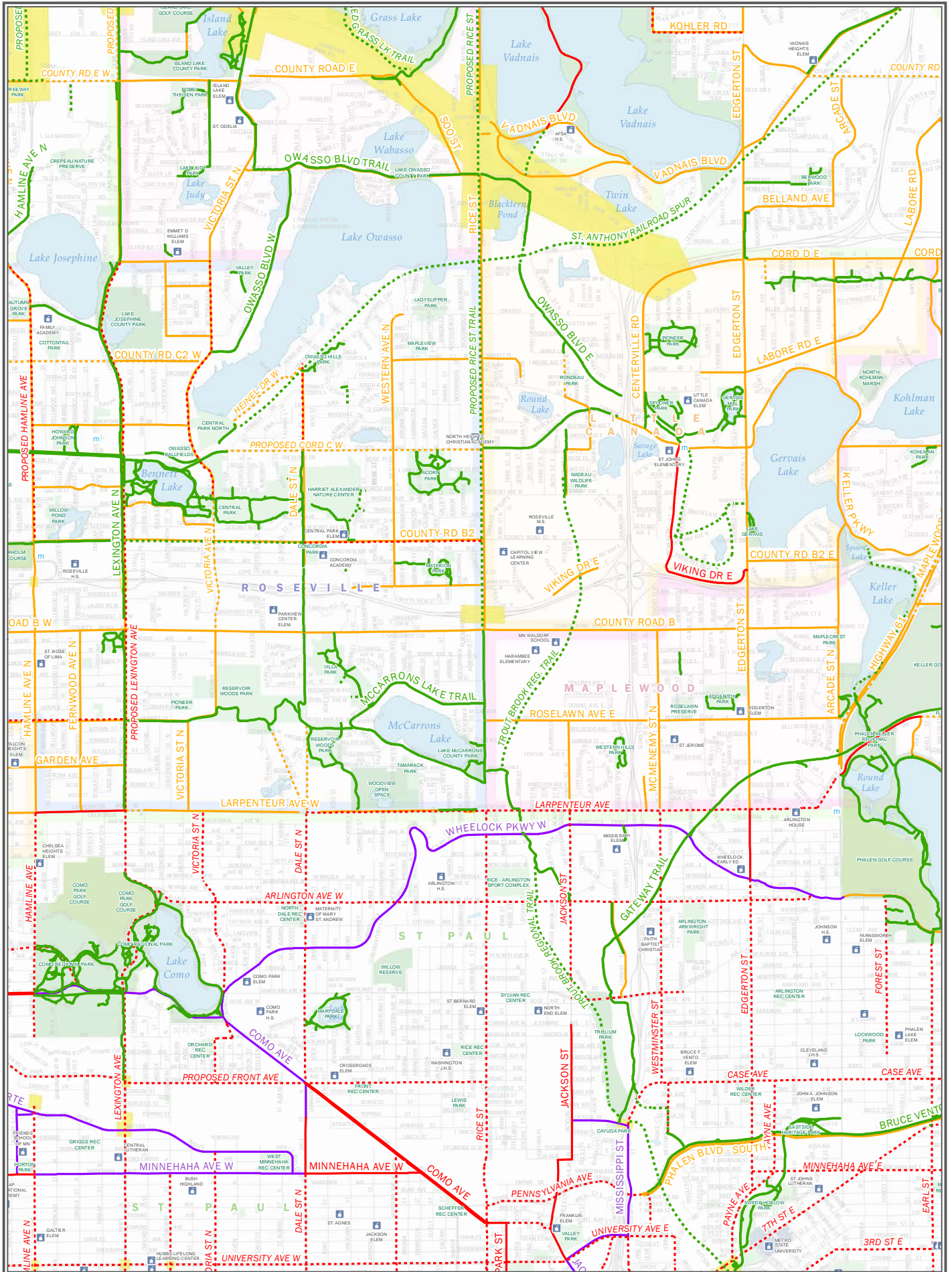
Existing & Proposed/Planned Facilities

Map 5: E. Roseville - Little Canada - Como

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | | | | | |
|--|-----------------------------|--|--|--|----------------|
| | Trail - Existing | | City Park | | Study Area |
| | Trail - Planned | | Regional or County Park, or Open Space | | Schools |
| | Trail - Proposed | | State Park | | Park 'n' Rides |
| | Bike Lane - Existing | | Golf Course | | |
| | Bike Lane - Proposed | | | | |
| | Bike Route - Existing | | | | |
| | Striped Shoulder - Existing | | | | |
| | Striped Shoulder - Proposed | | | | |



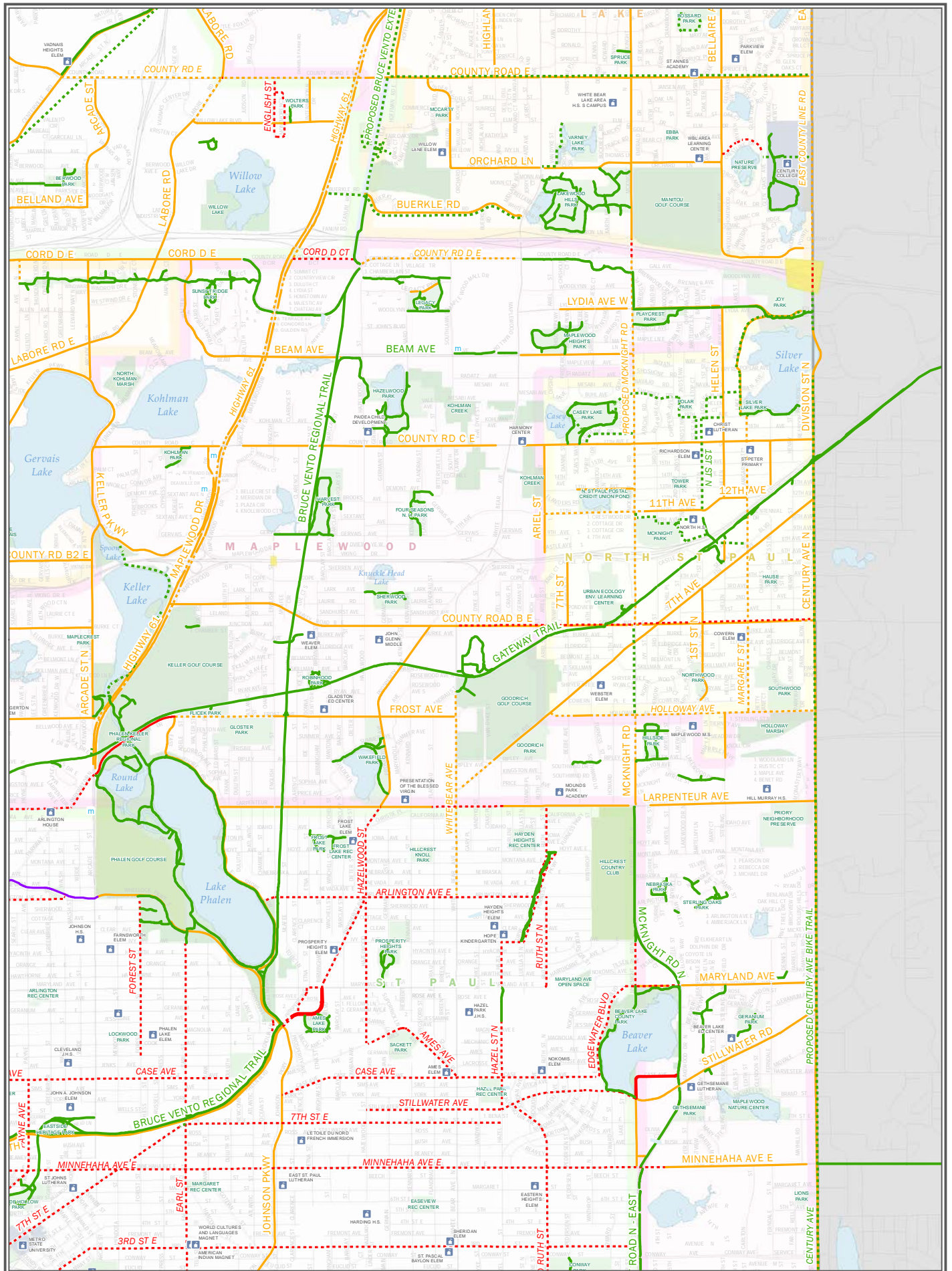
Existing & Proposed/Planned Facilities

Map 6: Maplewood - N. St. Paul - Lake Phalen

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | | | | | |
|--|-----------------------------|--|--|--|----------------|
| | Trail - Existing | | City Park | | Study Area |
| | Trail - Planned | | Regional or County Park, or Open Space | | Schools |
| | Bike Lane - Existing | | State Park | | Park 'n' Rides |
| | Bike Lane - Proposed | | Golf Course | | |
| | Bike Route - Existing | | | | |
| | Striped Shoulder - Existing | | | | |
| | Striped Shoulder - Proposed | | | | |

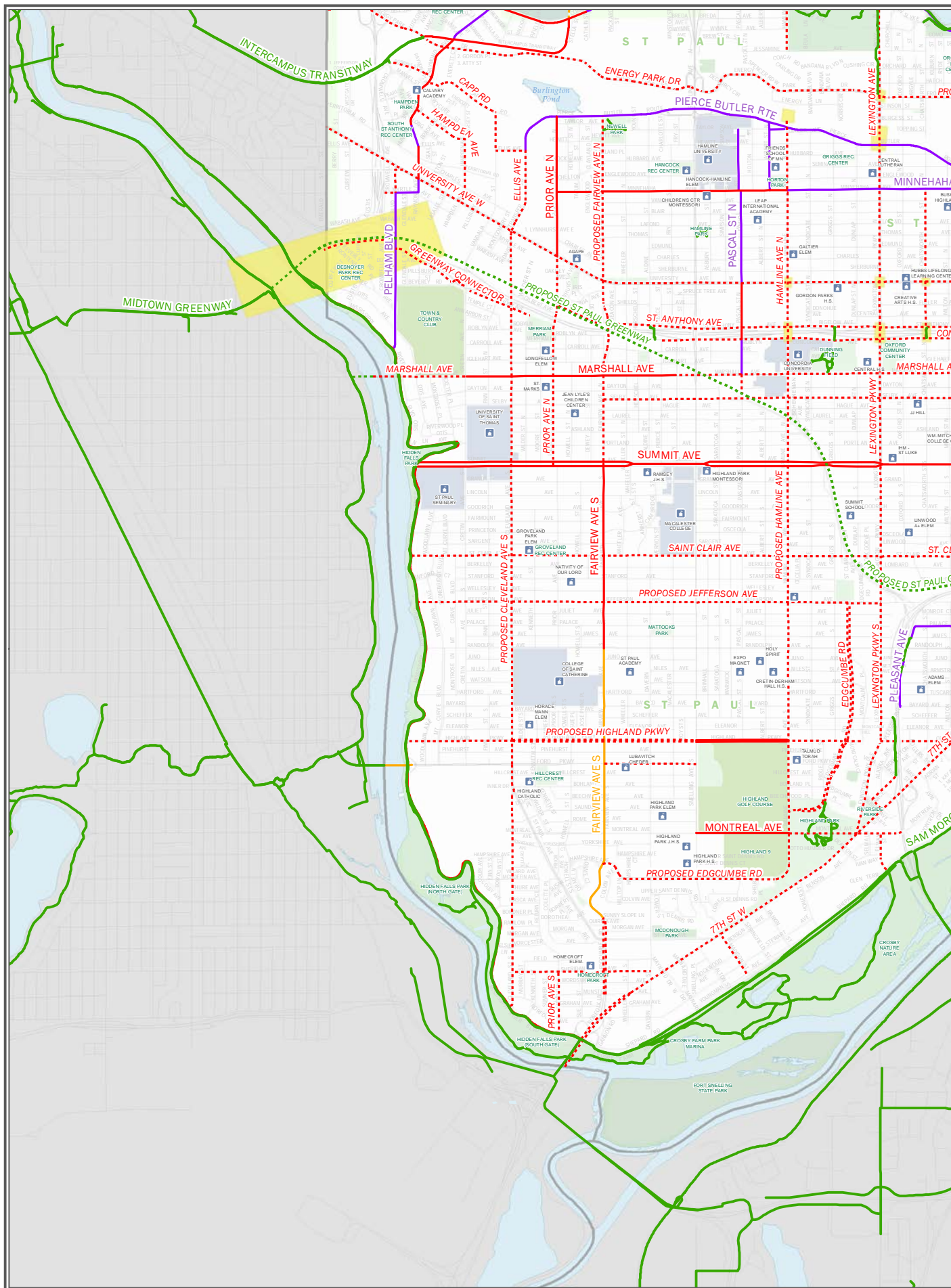


Map 7: Mac-Groveland - Highland Park

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011



- | | | | | | |
|--|-----------------------------|--|---|--|----------------|
| | Trail - Existing | | City Park | | Study Area |
| | Trail - Planned | | Regional or County Park,
or Open Space | | Schools |
| | Trail - Proposed | | State Park | | Park 'n' Rides |
| | Bike Lane - Existing | | Golf Course | | |
| | Bike Lane - Proposed | | | | |
| | Bike Route - Existing | | | | |
| | Striped Shoulder - Existing | | | | |
| | Striped Shoulder - Proposed | | | | |



Existing & Proposed/Planned Facilities

Map 8: Downtown STP - West Side STP

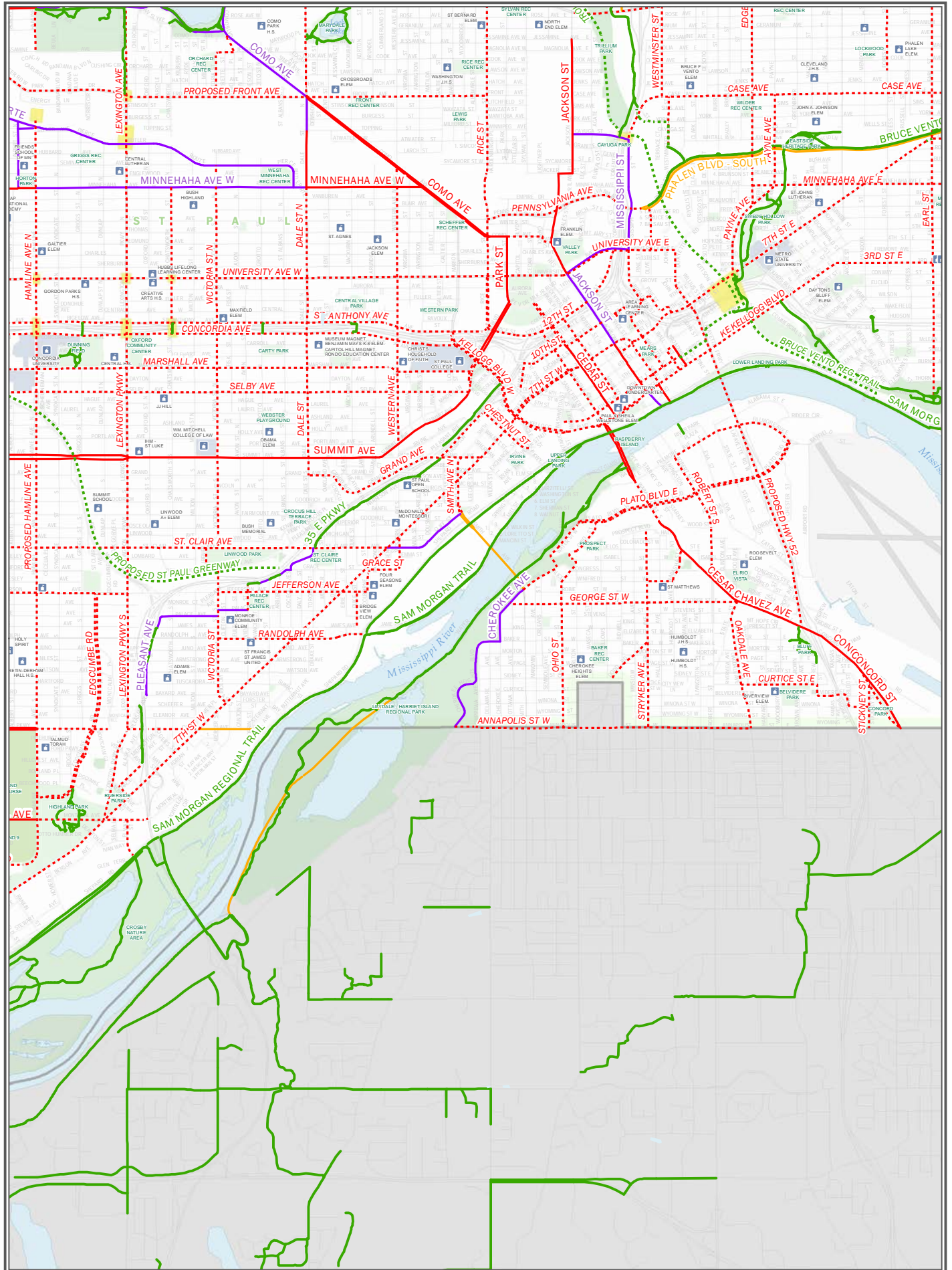
Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 0.25 0.5 1 1.5 2
Miles

- Trail - Existing
- - - Trail - Planned
- . - Trail - Proposed
- Bike Lane - Existing
- - - Bike Lane - Proposed
- Bike Route - Existing
- Striped Shoulder - Existing
- - - Striped Shoulder - Proposed

- City Park
- Regional or County Park, or Open Space
- State Park
- Golf Course

- Study Area
- Schools
- m Park 'n' Rides



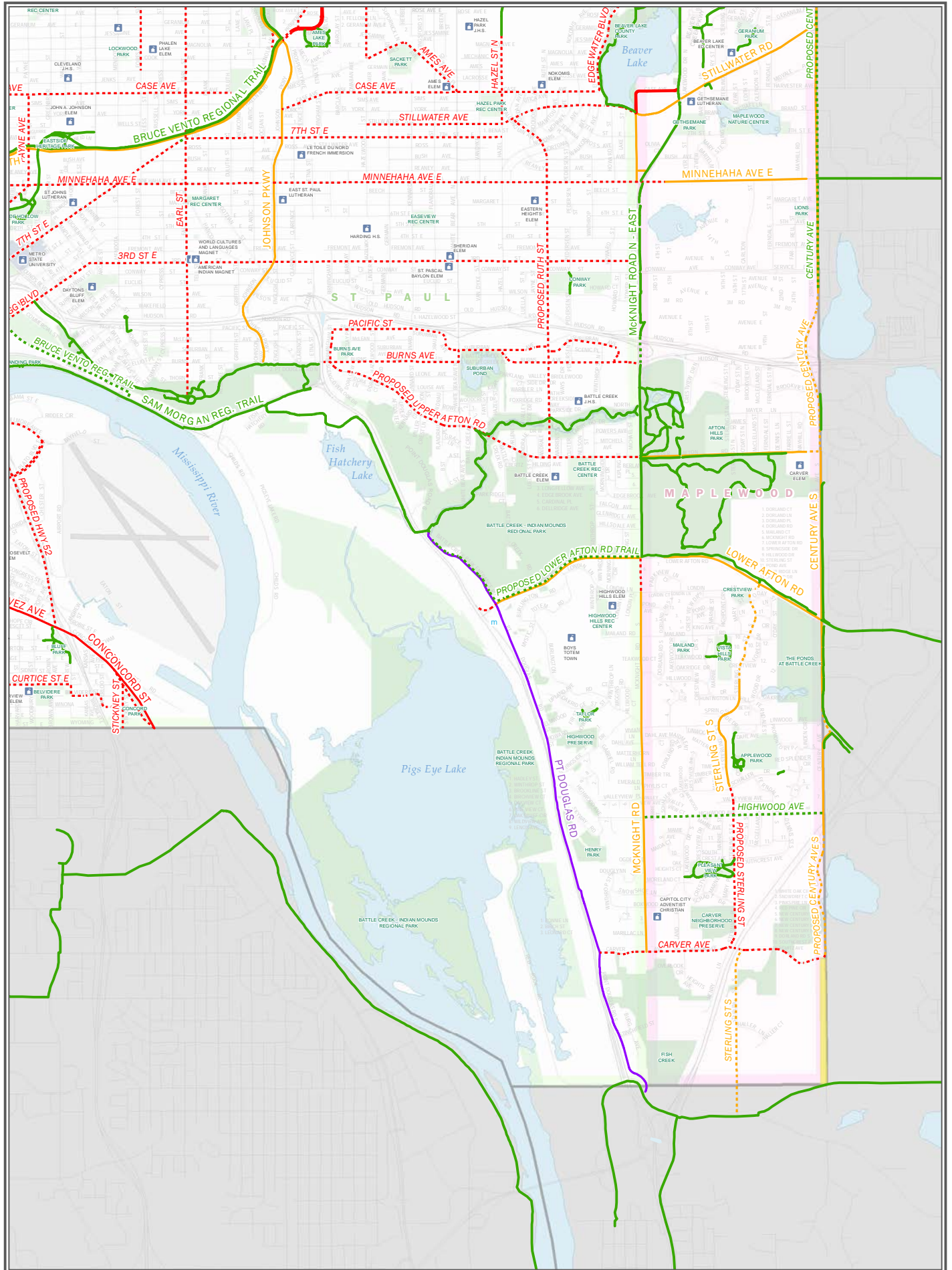
Existing & Proposed/Planned Facilities

Map 9: East Side STP - Battle Creek

Prepared by: Ramsey County GIS
Tuesday, July 05, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | | |
|-----------------------------|--|----------------|
| Trail - Existing | City Park | Study Area |
| Trail - Planned | Regional or County Park, or Open Space | Schools |
| Trail - Proposed | State Park | Park 'n' Rides |
| Bike Lane - Existing | Golf Course | |
| Bike Lane - Proposed | | |
| Bike Route - Existing | | |
| Striped Shoulder - Existing | | |
| Striped Shoulder - Proposed | | |












Ramsey Co. 2011 Bicycle System Map

Existing Facilities

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 0.25 0.5 1 1.5 2
Miles

- | | | |
|---|--|--|
|  Trail - Existing |  City Park |  Schools |
|  Bike Lane - Existing |  Regional or County Park, or Open Space |  Park 'n' Rides |
|  Bike Route - Existing |  State Park | |
|  Striped Shoulder - Existing |  Golf Course | |

Bike Map 1:

Mounds View - New Brighton - Arden Hills

Bike Map 2:

Shoreview - N. Oaks - Vadnais Heights

Bike Map 3:

White Bear Lake - White Bear Township

Bike Map 4:

W. Roseville - Falcon Heights - Lauderdale

Bike Map 5:

E. Roseville - Little Canada - Como

Bike Map 6:

Maplewood - N. St. Paul - Lake Phalen

Bike Map 7:

Mac-Groveland - Highland Park

Bike Map 8:

Downtown STP - West Side STP

Bike Map 9:

East Side STP - Battle Creek

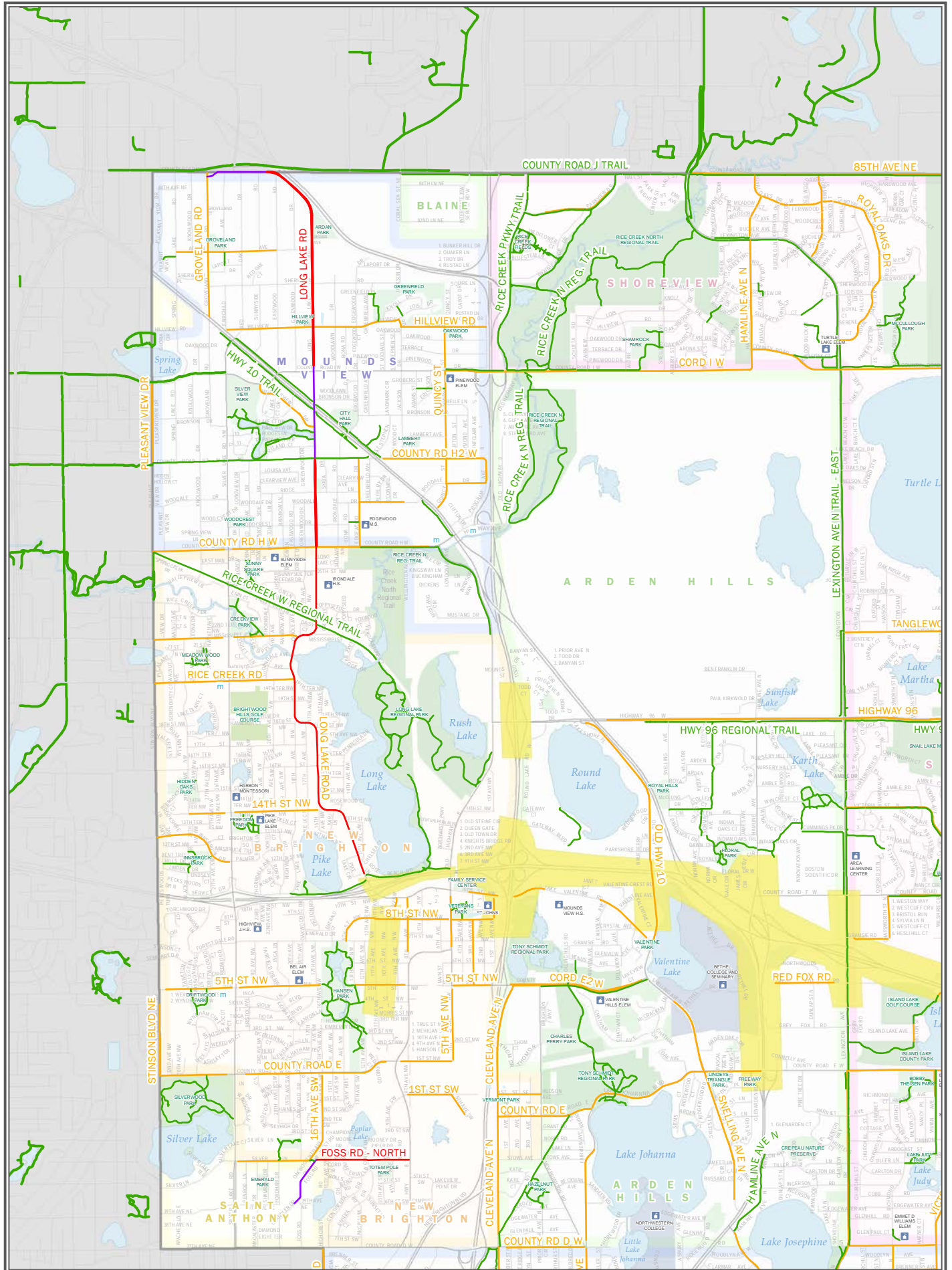
Existing Bike Facilities

Map 1: Mounds View - New Brighton - Arden Hills

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 0.25 0.5 1 1.5 2
Miles

- | | | |
|-----------------------------|--|----------------|
| Trail - Existing | City Park | Schools |
| Bike Lane - Existing | Regional or County Park, or Open Space | Park 'n' Rides |
| Bike Route - Existing | State Park | |
| Striped Shoulder - Existing | Golf Course | |













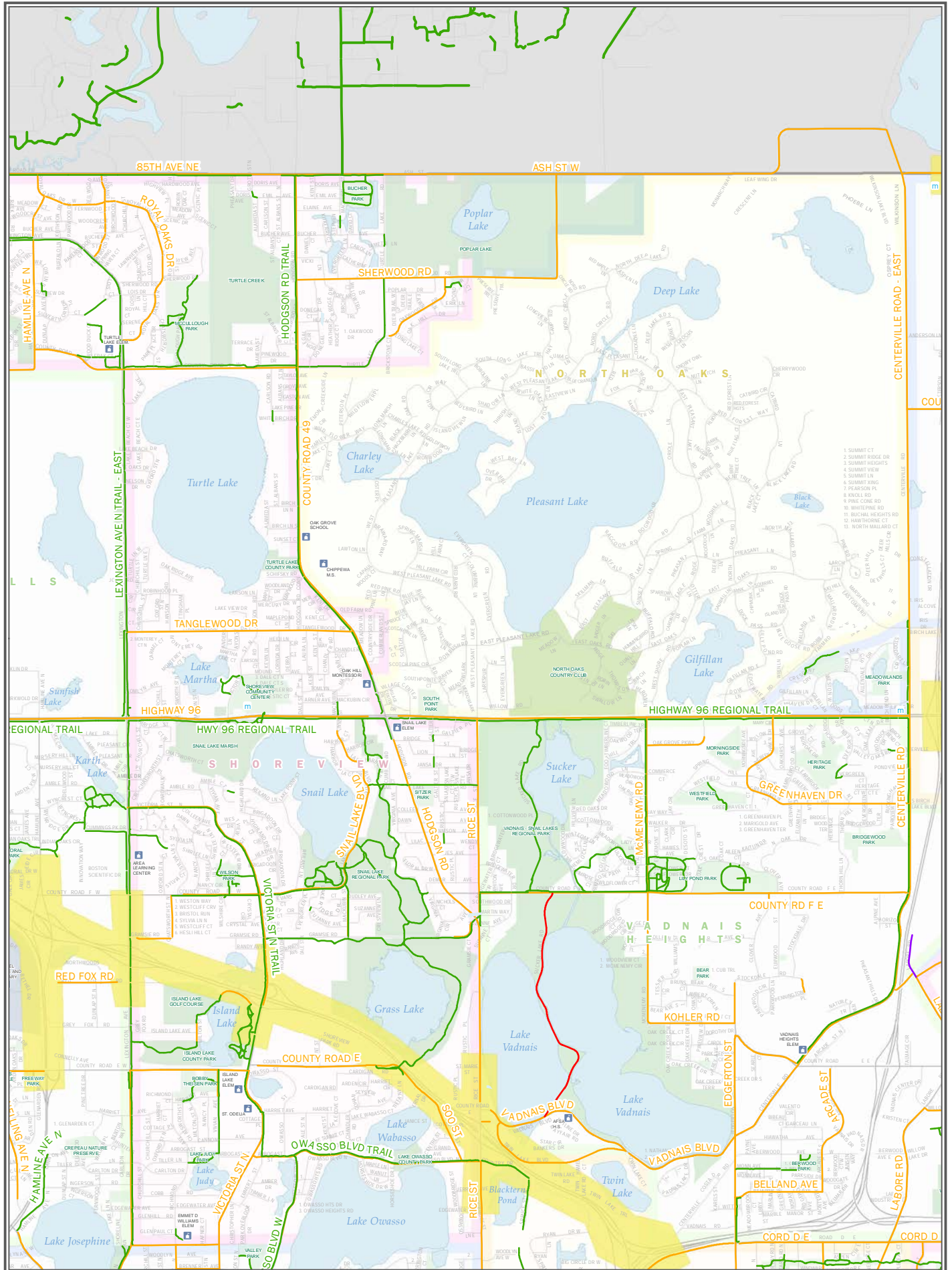
Existing Bike Facilities

Map 2: Shoreview - N. Oaks - Vadnais Heights

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | | |
|---|--|--|
|  Trail - Existing |  City Park |  Schools |
|  Bike Lane - Existing |  Regional or County Park, or Open Space |  Park 'n' Rides |
|  Bike Route - Existing |  State Park | |
|  Striped Shoulder - Existing |  Golf Course | |



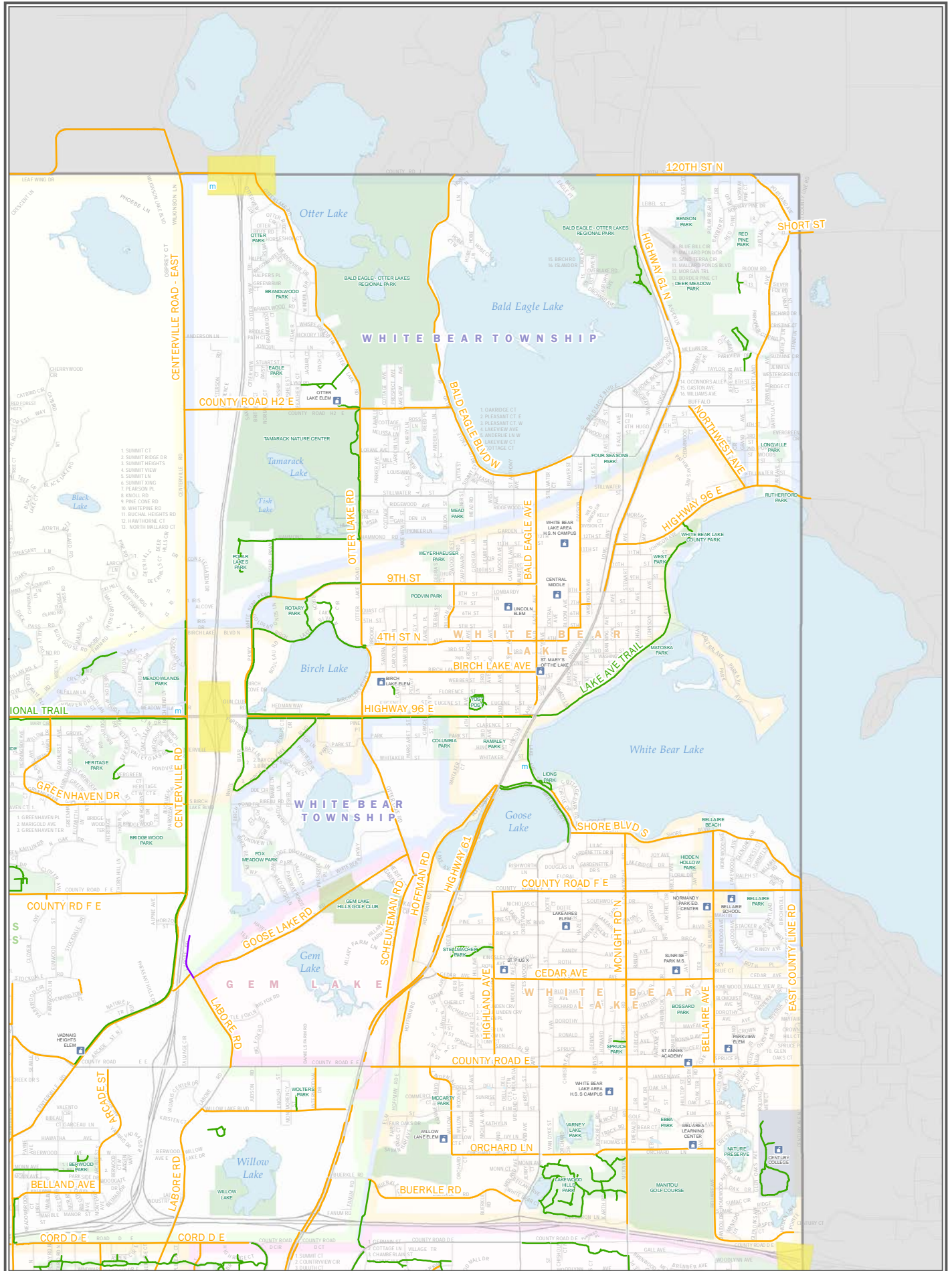
Existing Bike Facilities

Map 3: White Bear Lake - White Bear Township

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | |
|-----------------------------|--|
| Trail - Existing | City Park |
| Bike Lane - Existing | Regional or County Park, or Open Space |
| Bike Route - Existing | State Park |
| Striped Shoulder - Existing | Golf Course |
| | Schools |
| | Park 'n' Rides |



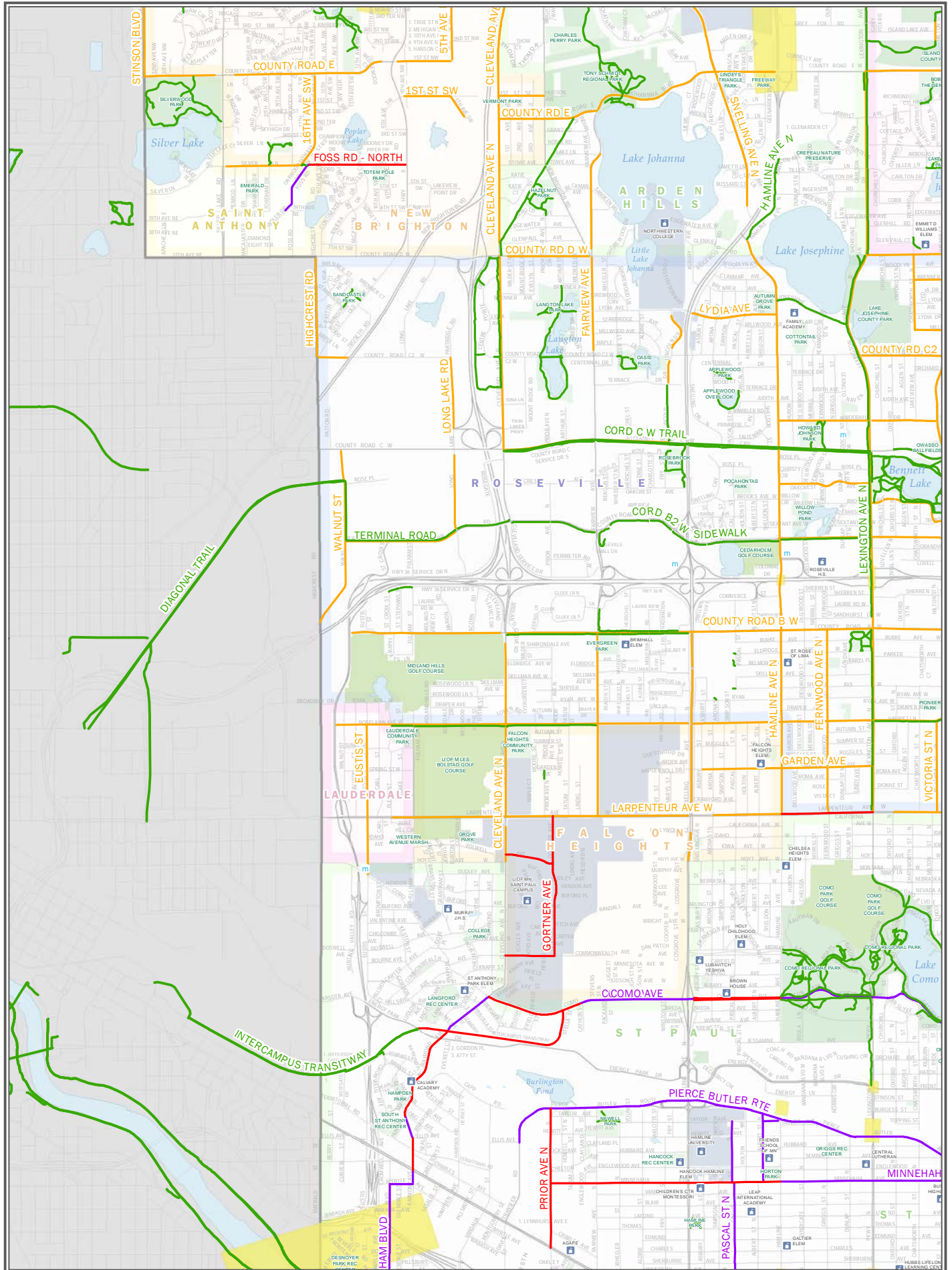
Existing Bike Facilities

Map 4: W. Roseville - Falcon Heights - Lauderdale

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 .25 .5 1 .75 1.5 2
Miles








- | | | |
|-----------------------------|--|----------------|
| Trail - Existing | City Park | Schools |
| Bike Lane - Existing | Regional or County Park, or Open Space | Park 'n' Rides |
| Bike Route - Existing | State Park | |
| Striped Shoulder - Existing | Golf Course | |

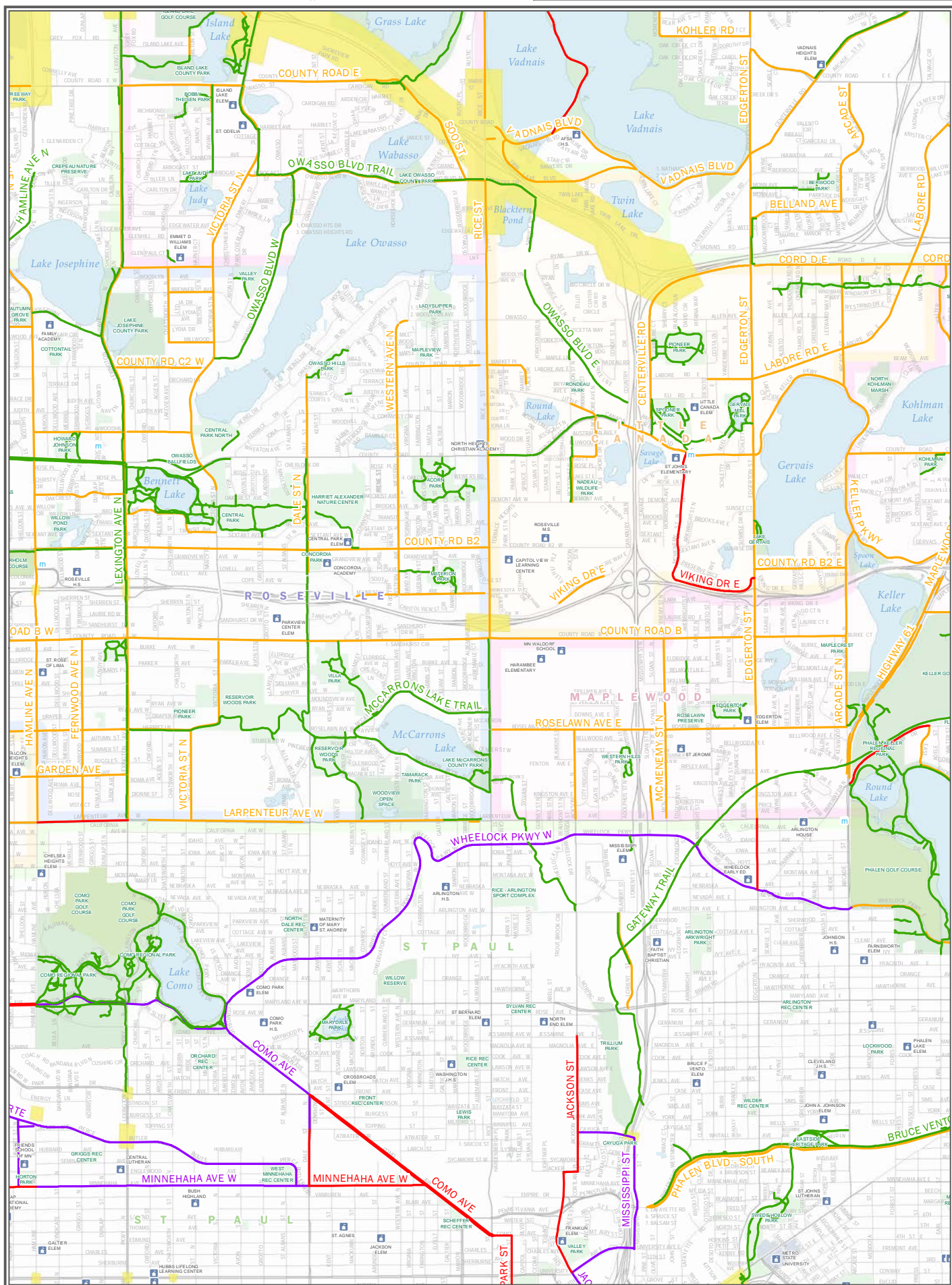


Map 5: E. Roseville - Little Canada - Como

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011



- | | | | |
|---|--|---|----------------|
|  Trail - Existing |  City Park | | |
| Bike Lane - Existing |  Regional or County Park, or Open Space |  | Schools |
| Bike Route - Existing |  State Park |  | Park 'n' Rides |
| Striped Shoulder - Existing |  Golf Course | | |



Existing Bike Facilities

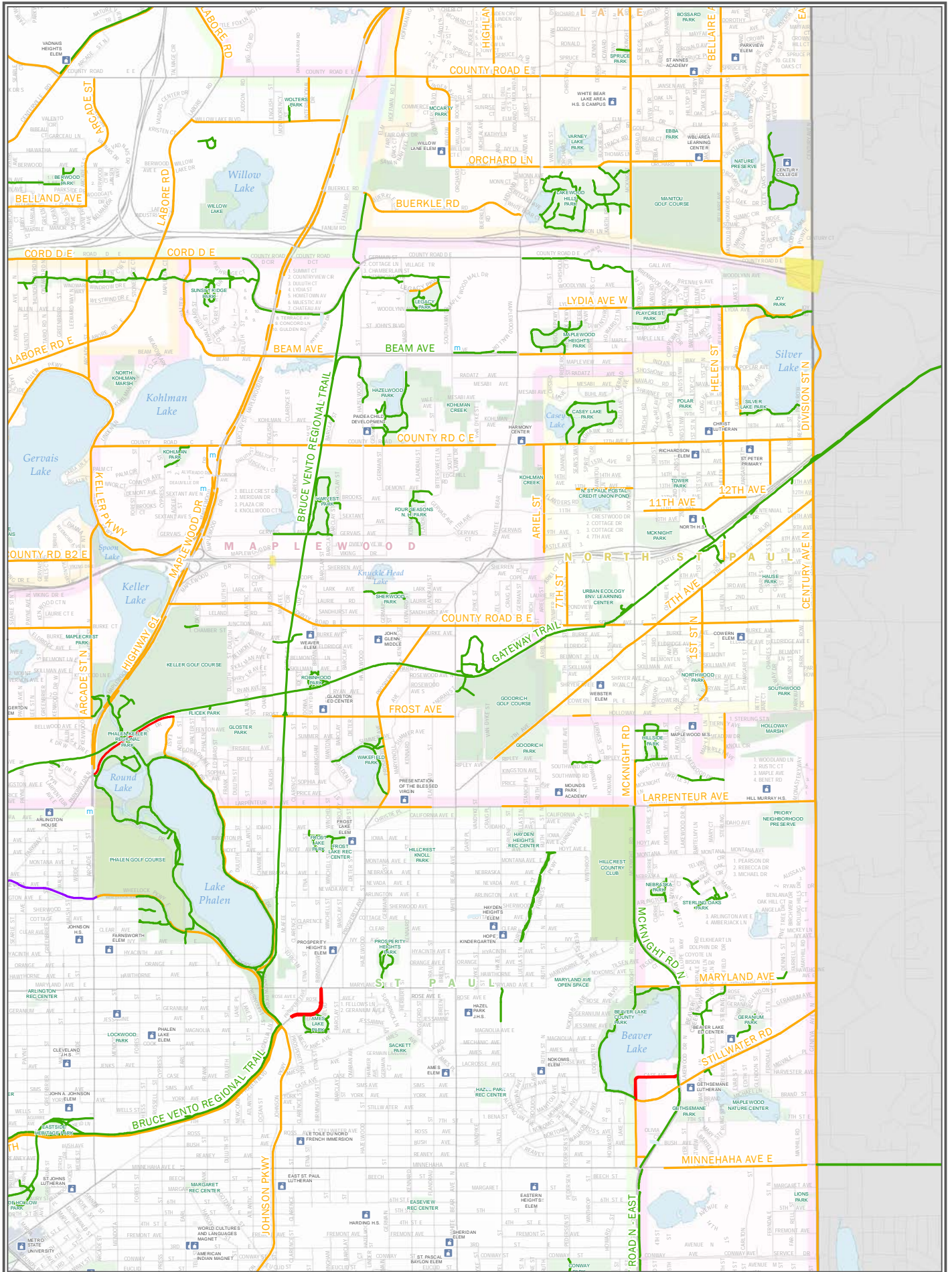
Map 6:

Maplewood - N. St. Paul - Lake Phalen









Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

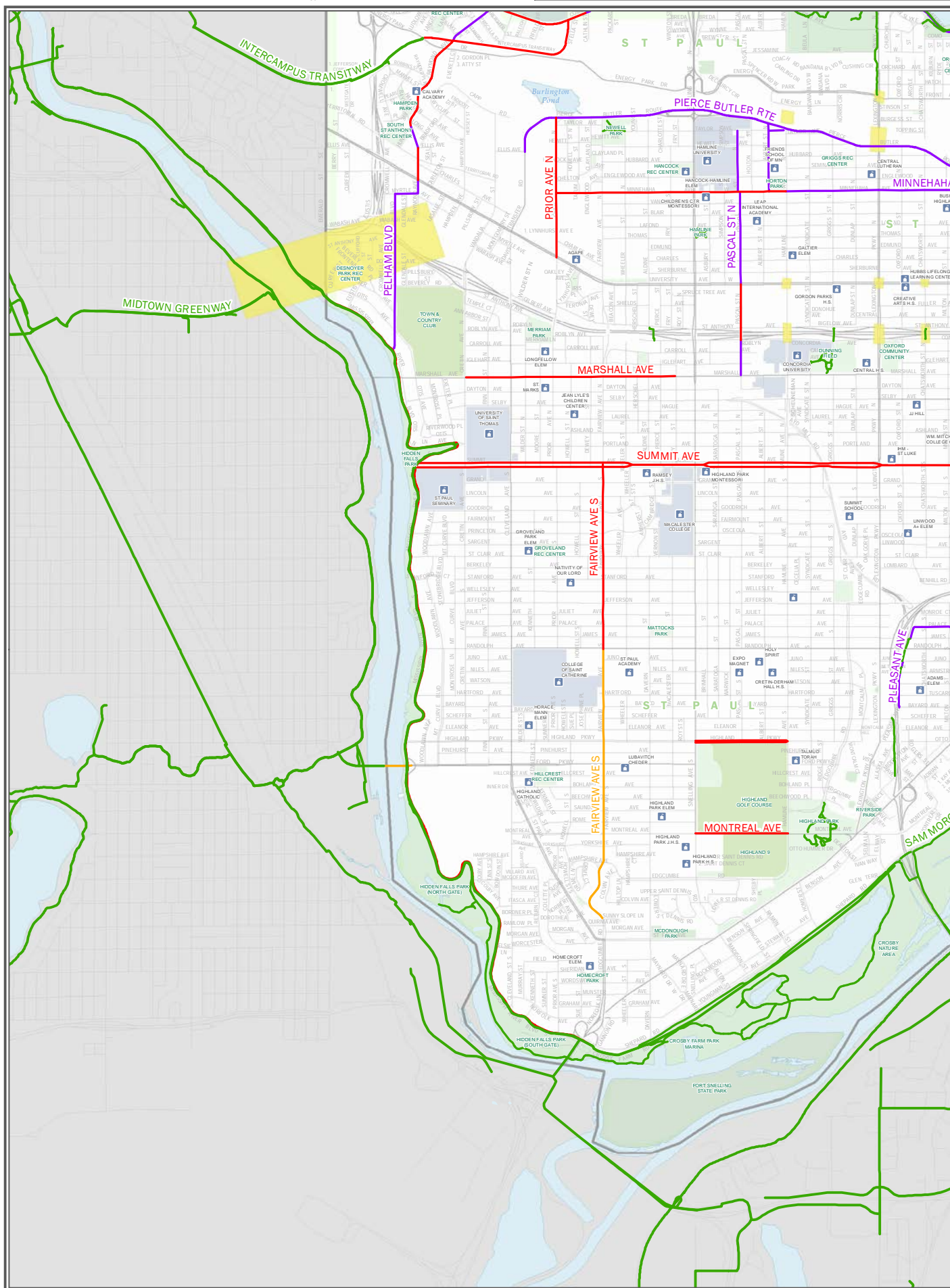
0 .25 .5 1 .75 1.5 2
Miles

- | | | |
|-----------------------------|--|----------------|
| Trail - Existing | City Park | Schools |
| Bike Lane - Existing | Regional or County Park, or Open Space | Park 'n' Rides |
| Bike Route - Existing | State Park | |
| Striped Shoulder - Existing | Golf Course | |



Map 7: Mac-Groveland - Highland Park

- | | | | |
|---|--|---|----------------|
|  Trail - Existing |  City Park | | |
|  Bike Lane - Existing |  Regional or County Park, or Open Space |  | Schools |
| Bike Route - Existing |  State Park |  | Park 'n' Rides |
|  Striped Shoulder - Existing |  Golf Course | | |



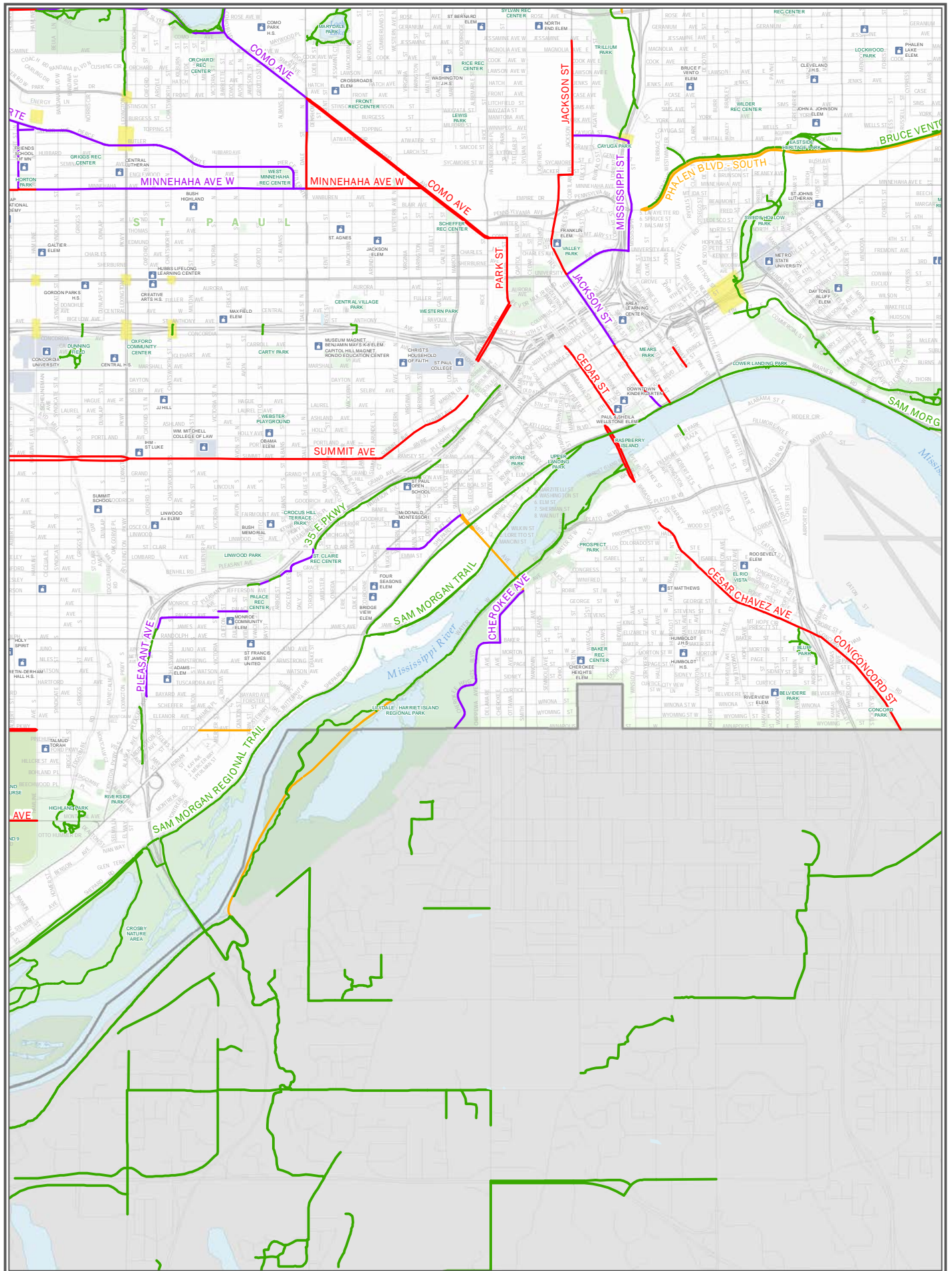
Existing Bike Facilities

Map 8: Downtown STP - West Side STP

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 0.25 0.5 1 1.5 2
Miles

- | | | |
|-----------------------------|--|----------------|
| Trail - Existing | City Park | Schools |
| Bike Lane - Existing | Regional or County Park, or Open Space | Park 'n' Rides |
| Bike Route - Existing | State Park | |
| Striped Shoulder - Existing | Golf Course | |













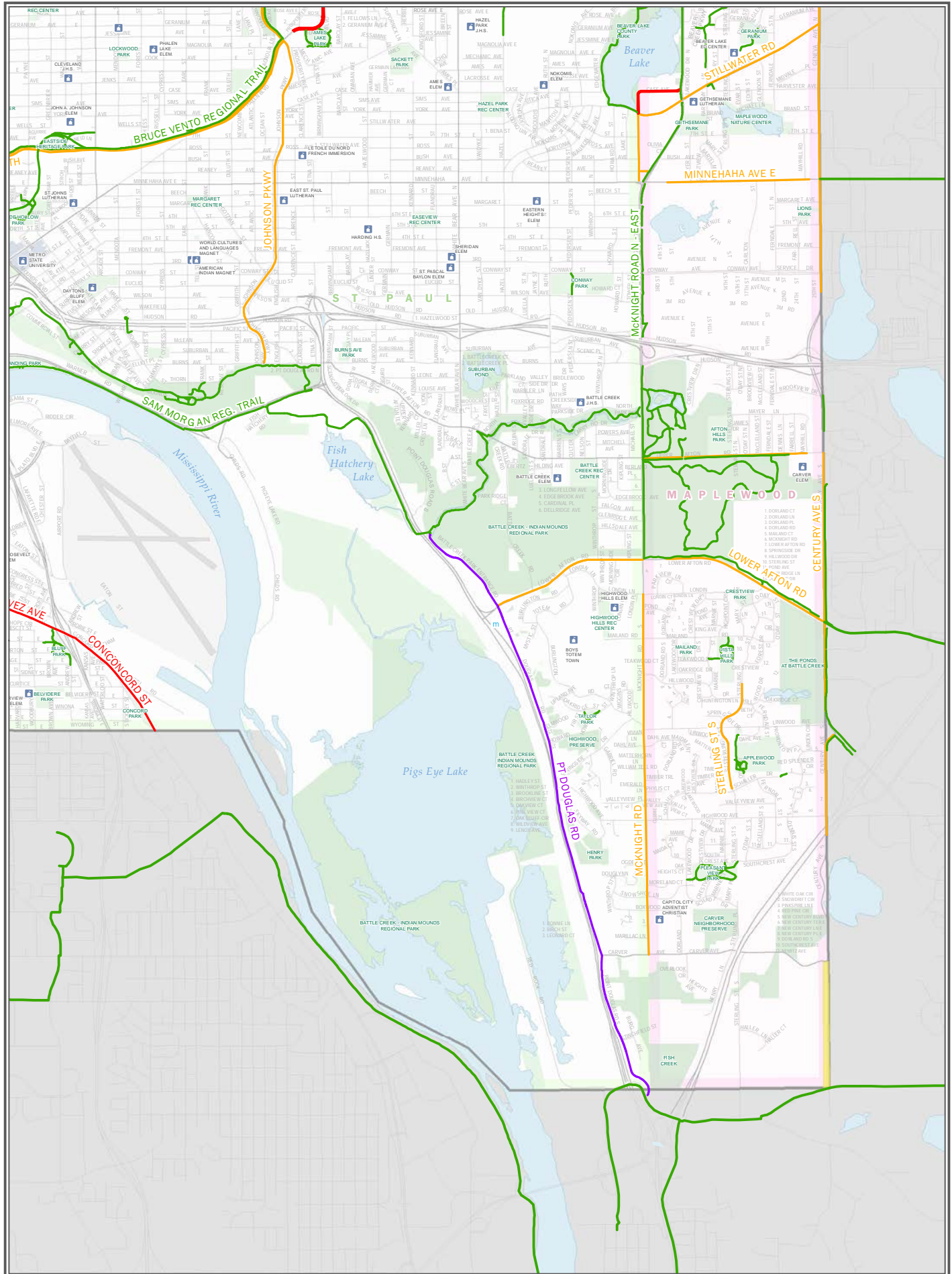
Existing Bike Facilities

Map 9: East Side STP - Battle Creek

Prepared by: Ramsey County GIS
Wednesday, July 06, 2011

0 .25 .5 1 .75 1.5 2
Miles

- | | | |
|---|--|--|
|  Trail - Existing |  City Park |  Schools |
|  Bike Lane - Existing |  Regional or County Park, or Open Space |  Park 'n' Rides |
|  Bike Route - Existing |  State Park | |
|  Striped Shoulder - Existing |  Golf Course | |



Hiking and Biking Trail Information



For All Seasons

GENERAL INFORMATION

This brochure shows several systems of paved trails suitable for hiking and/or biking within Ramsey County. The maps include trails within parks as well as connecting off-road trails. They include city, county and state trails which are connected. The maps are not intended to include all trails within Ramsey County, nor do they include non-paved trails suitable for hiking. More detailed maps of paved and non-paved trails are available for individual parks.

TRAIL USE GUIDELINES

- Bikers must yield to pedestrians/walkers/hikers.
- Bikers should pass pedestrians on left and announce approach on left before passing.
- Be courteous to others while using trails.
- Observe (where posted) directional signs and speed limits.

TRAIL RULES

- PARK HOURS: 1/2 hour before sunrise to 1/2 hour after sunset.
- No motorized vehicles on trails.
- No unleashed pets on trails; owners must clean up pet feces and dispose of in a sanitary manner.
- Bikes allowed on paved trails only.

NOTE: Mountain bikes are allowed only at Battle Creek Regional Park (Winthrop Street site). Off-leash dog areas are provided at Battle Creek Regional Park, Rice Creek North Regional Trail and Reservoir Woods.

TRAIL PATROL

Trails are patrolled by the Ramsey County Sheriff's Department and municipal police. For trail patrol concerns, call 484-1312; for trail emergencies call 911.

RAMSEY COUNTY PARKS AND RECREATION DEPARTMENT

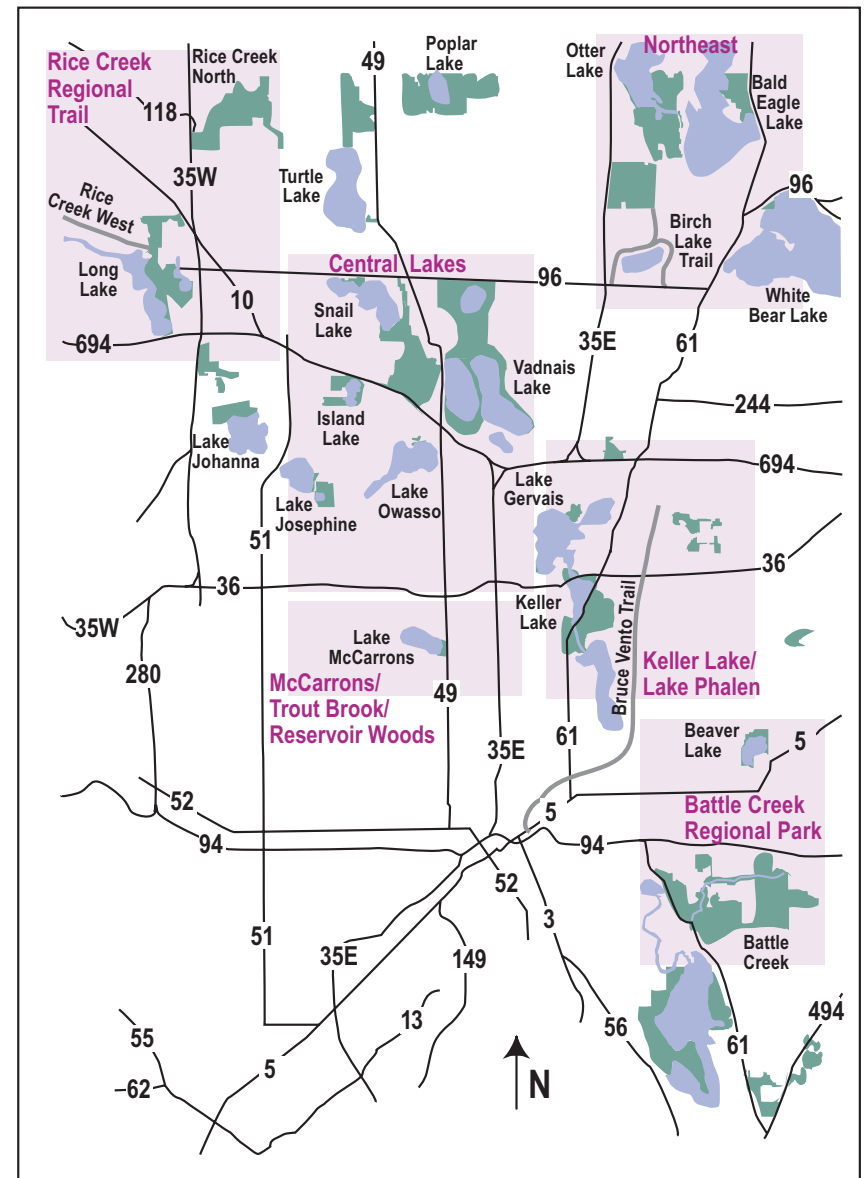
ADMINISTRATIVE OFFICES

2015 North Van Dyke Street
Maplewood, MN 55109-3796

For more information on Ramsey County Parks and Recreation facilities or services, call (651) 748-2500 or visit our website at www.co.ramsey.mn.us/parks.

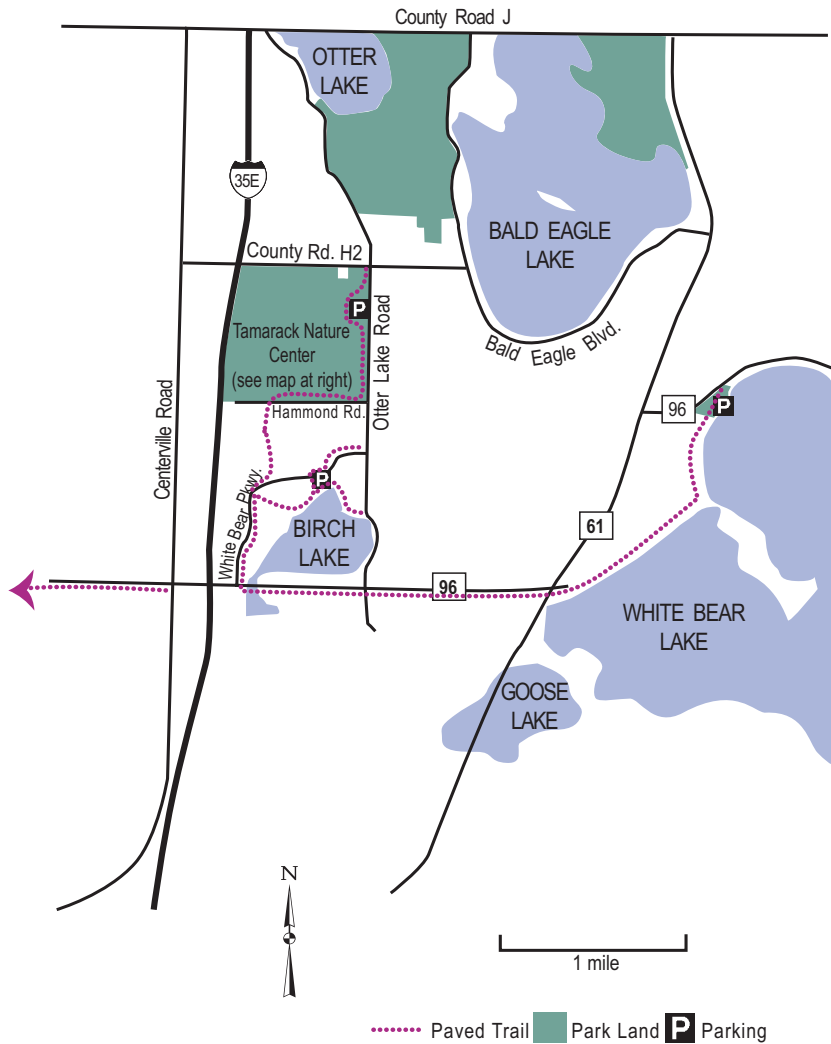
Ramsey County Trails

Trails within each of the shaded areas below are illustrated in the maps that follow.



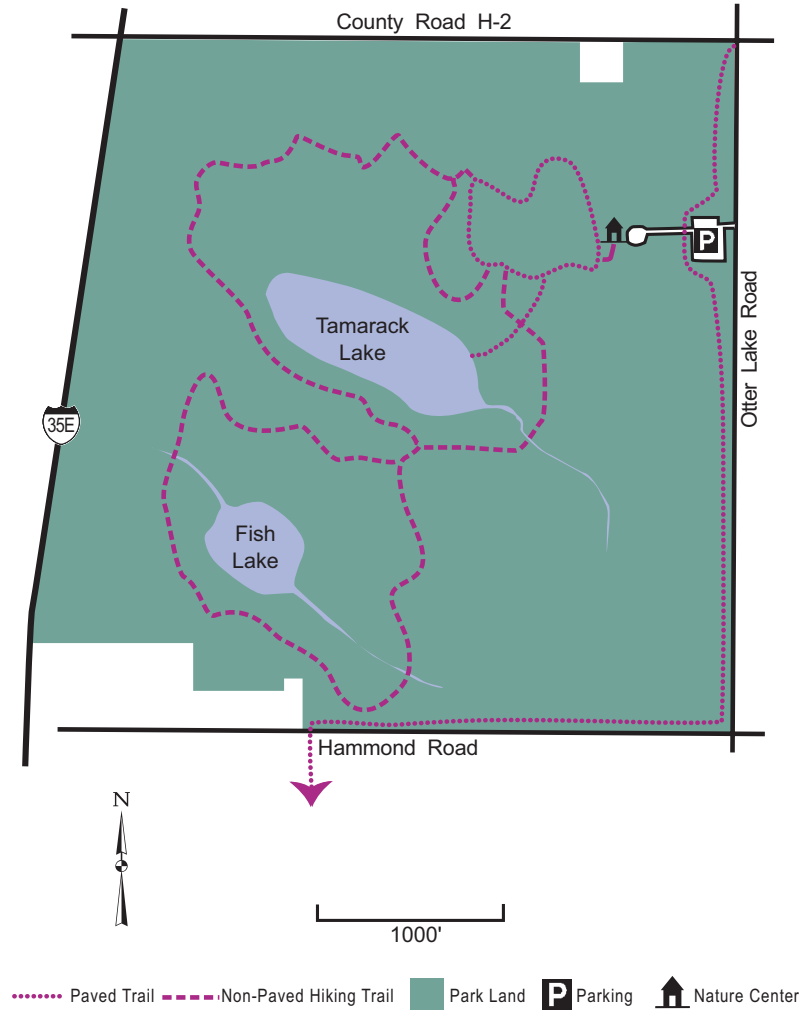
Northeast

Areas included: Birch Lake Regional Trail, Bald Eagle-Otter Lakes Regional Park, White Bear Lake County Park



Tamarack Nature Center

Note: Trails within Nature Center limited to hiking.
Biking permitted on trails adjacent to Hammond Road and Otter Lake Road.

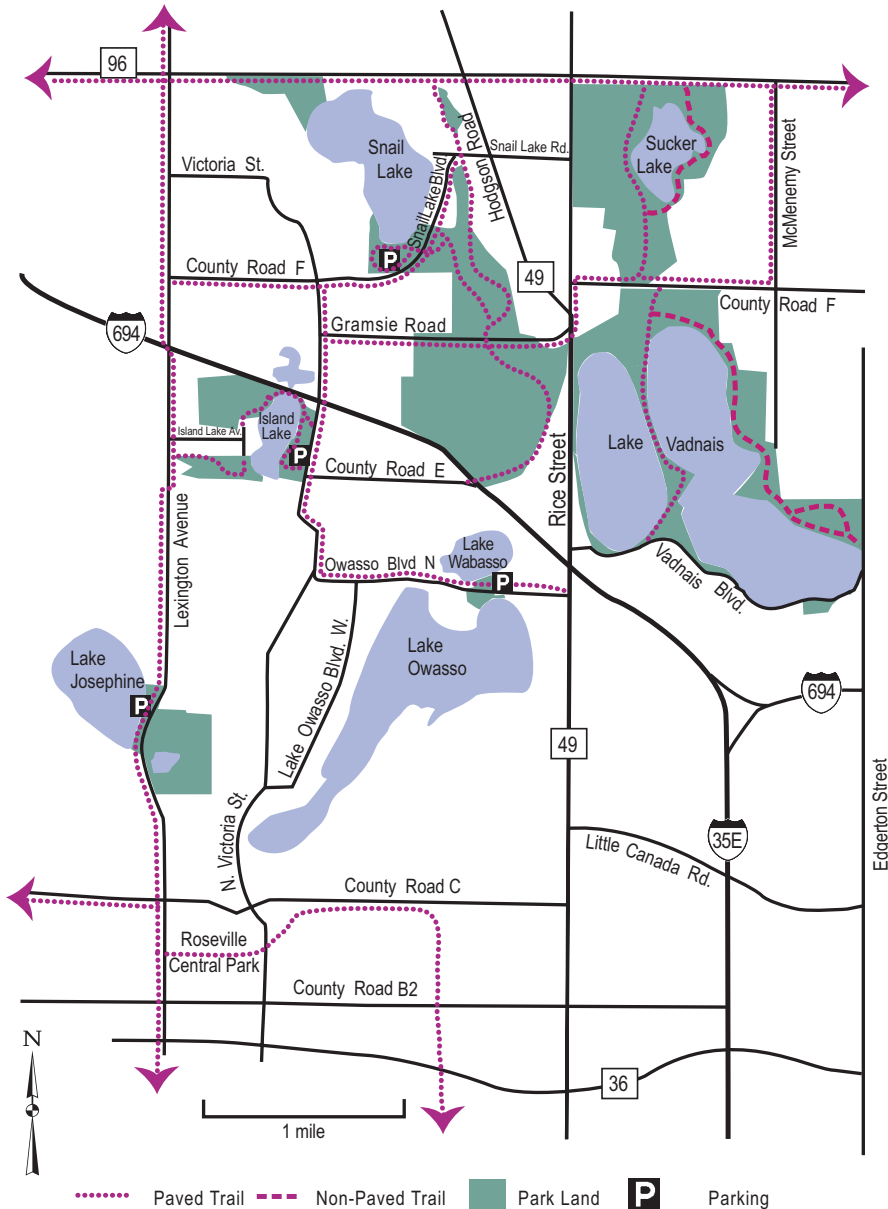


Pets, bikes, motor vehicles or in-line skating are not permitted on Tamarack's trails.

5287 Otter Lake Road, White Bear Township, MN 55110 (651) 407-5350

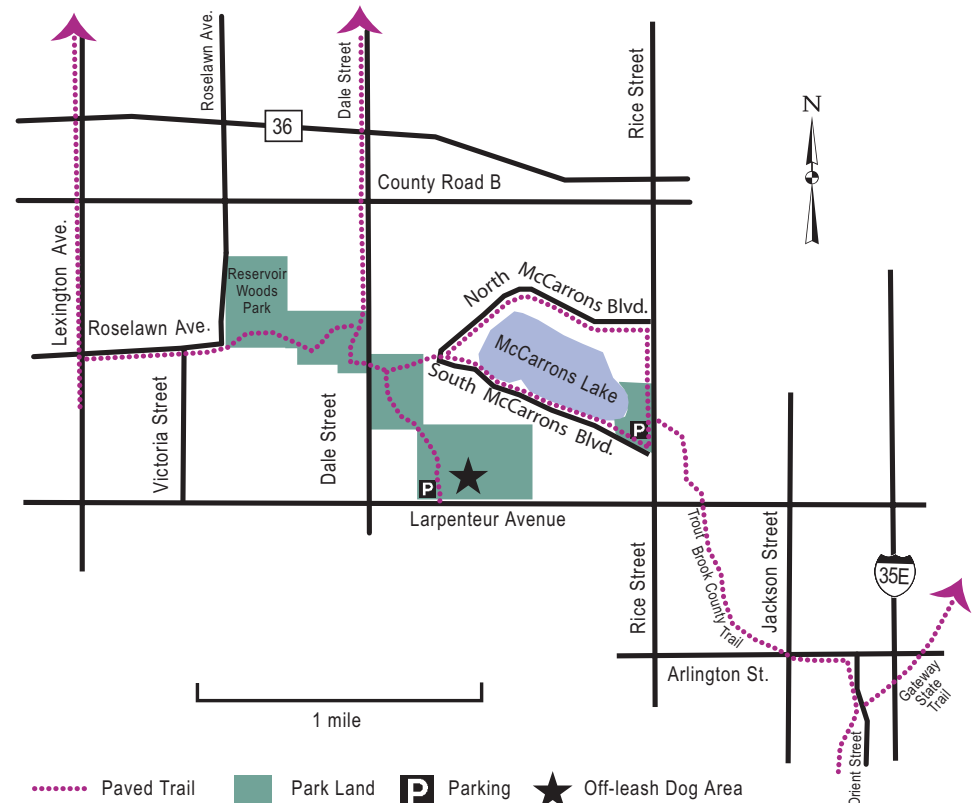
Central Lakes

Areas included: Vadnais-Snail Lake Regional Park, Sucker Lake, Lake Vadnais County Park, Lake Owasso County Park, Island Lake County Park, Lake Wabasso County Park, Lake Josephine County Park, Highway 96 Regional Trail



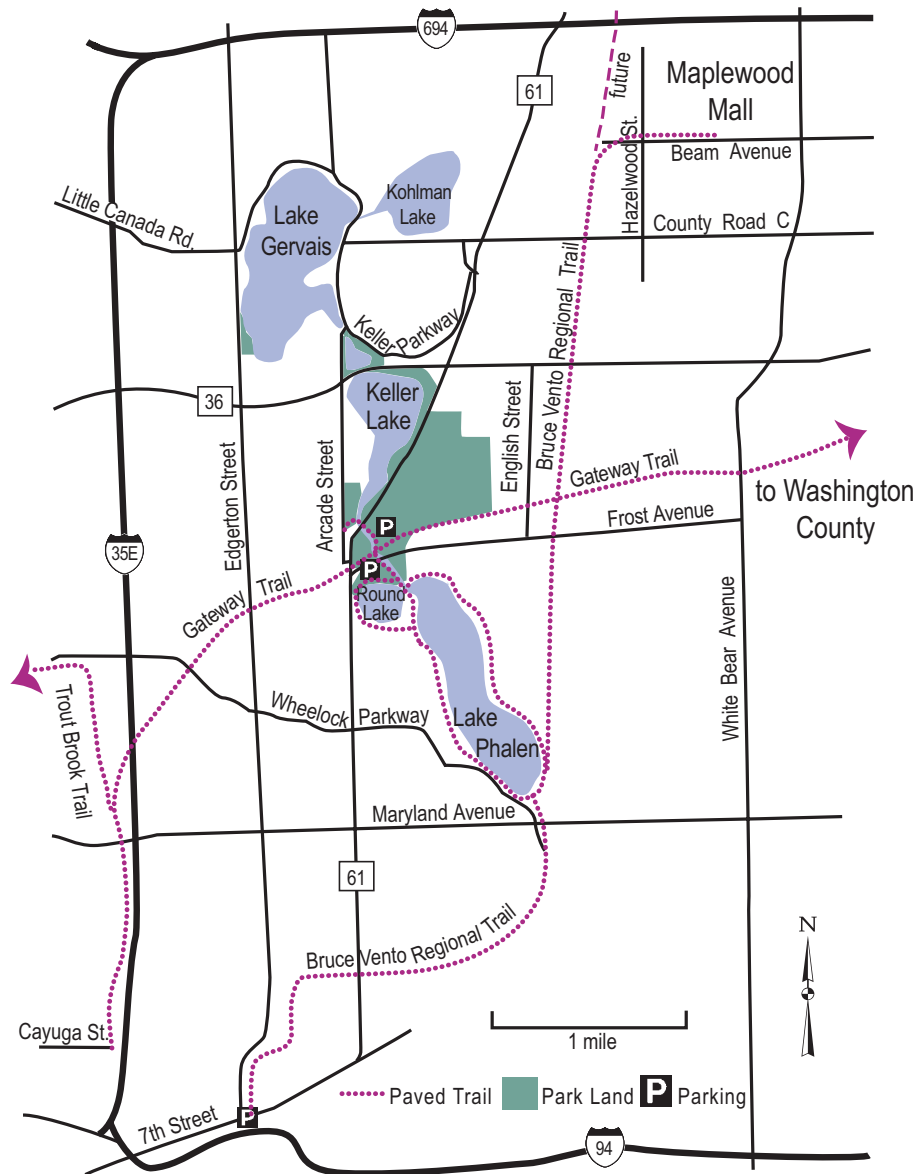
McCarrons/Trout Brook/Reservoir Woods

Areas included: Lake McCarrons County Park, Trout Brook County Trail, Reservoir Woods Park



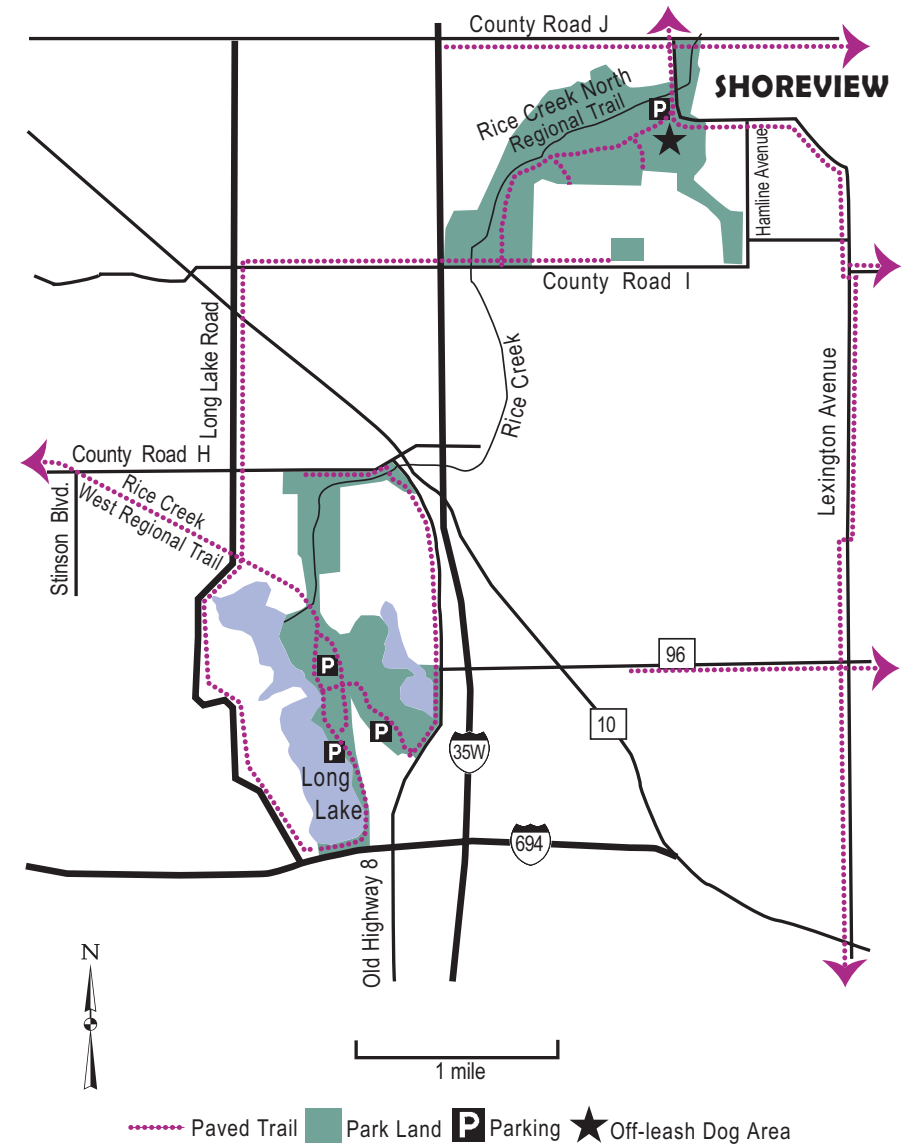
Keller Lake/Lake Phalen

Areas included: Lake Gervais County Park, Kohlman Lake, Round Lake, Lake Phalen Regional Park, Keller Regional Park, Bruce Vento Regional Trail, Gateway State Trail



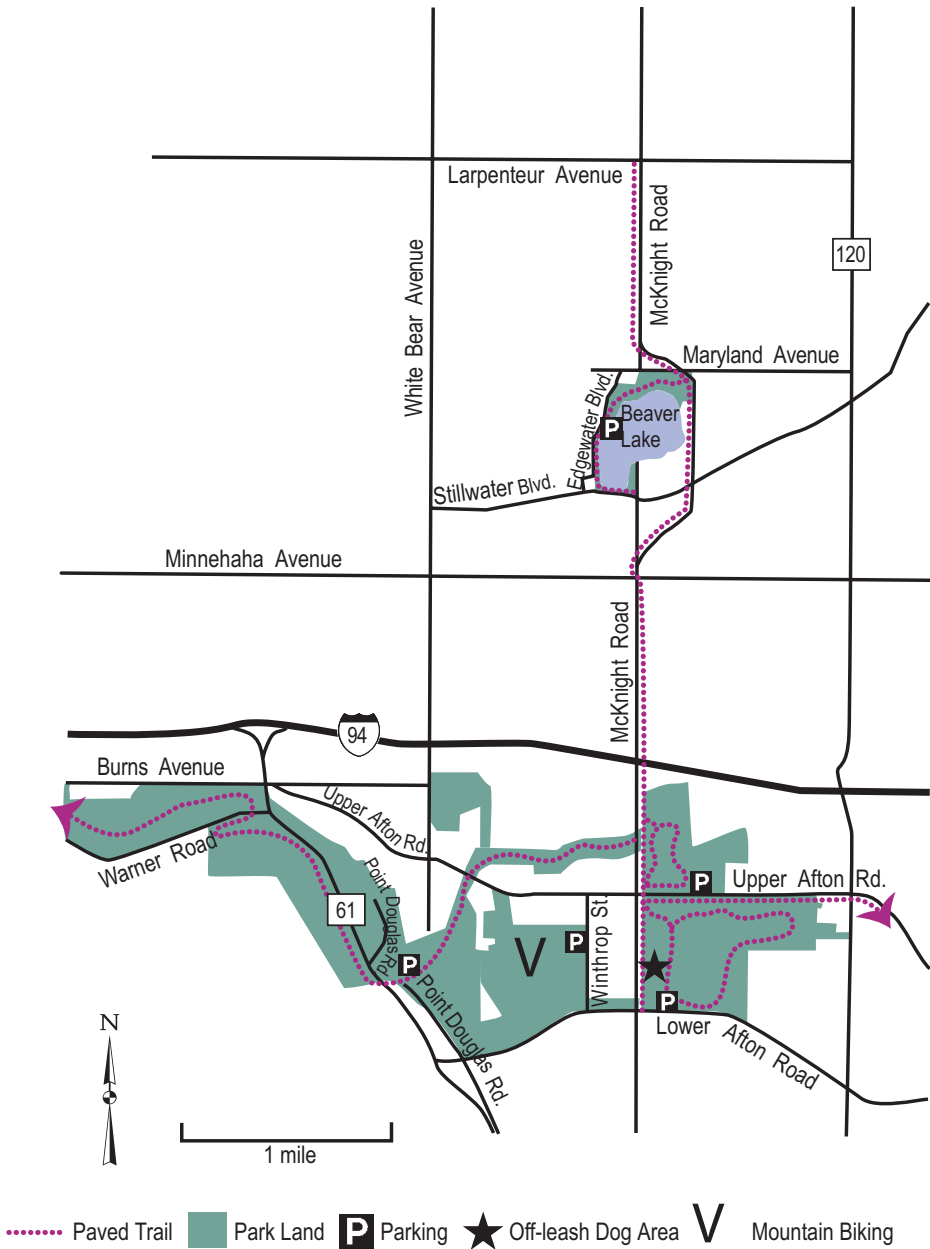
Rice Creek Regional Trail

Areas included: Rice Creek West and North Regional Trails, Long Lake Regional Park



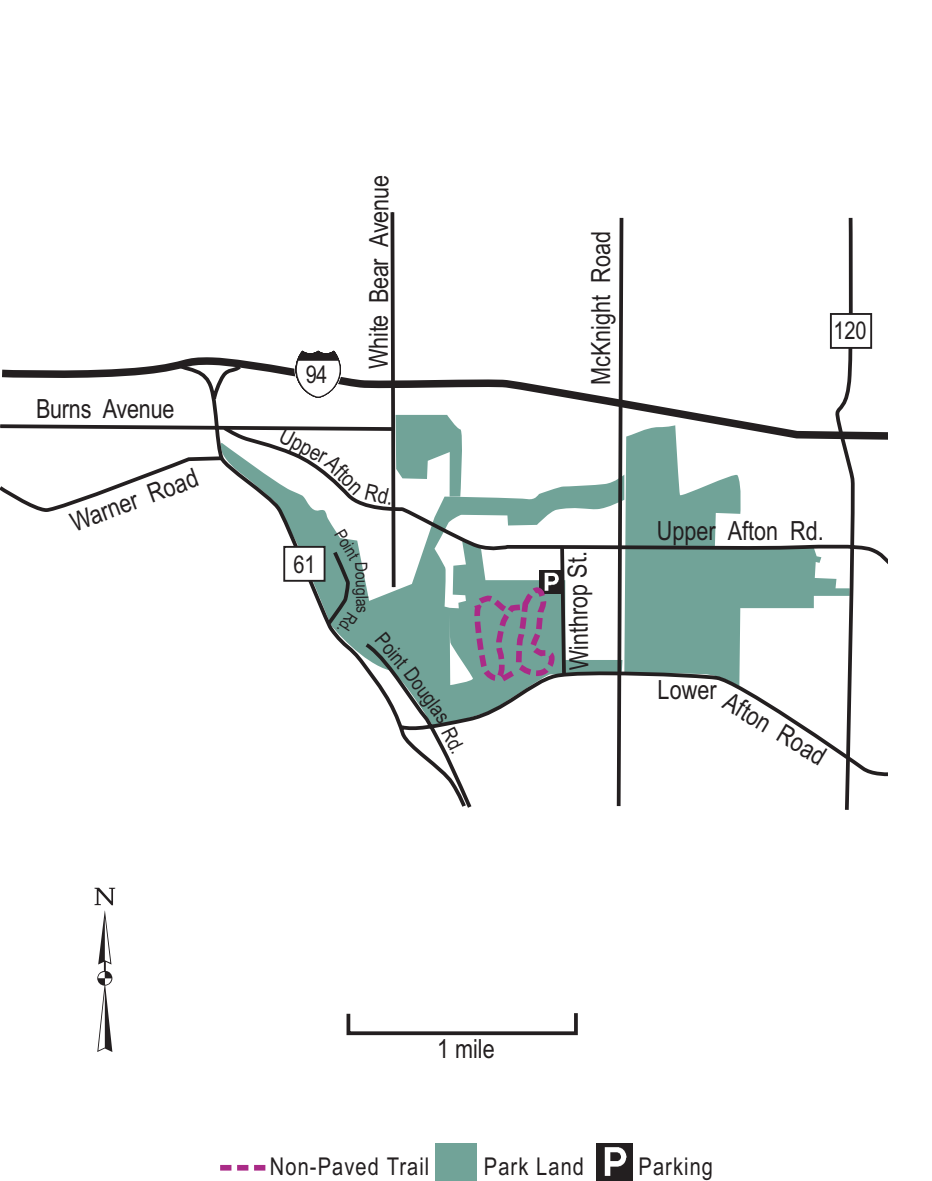
Battle Creek Regional Park

Areas included: Battle Creek Regional Park, Beaver Lake County Park



Battle Creek - Mountain Biking

Areas included: Battle Creek Regional Park (Winthrop Street site)



Scott County 2030 Comprehensive Plan Update



Scott County Regional and County Trail System

Legend

- Regional Trail Corridor Search Area*
- Proposed Trail Corridor Search Area (will seek regional status)
- County Trail Corridor** (unincorporated area)
- State Trail Corridor
- State Grant-In-Aid Snowmobile Trails (2007 route)
- Snowmobile Park and Rides
- Regional Park
- Regional Park Search Area
- U.S. & State Highway
- County Highway (paved)
- County Highway (gravel)
- Railroad
- Trail River Crossing

*As identified in the Metropolitan Council 2030 Regional Parks Policy Plan. A master plan has been approved for the Scott County West Regional Trail.

**All County roadways within urban areas are designated as County Trail Corridors.

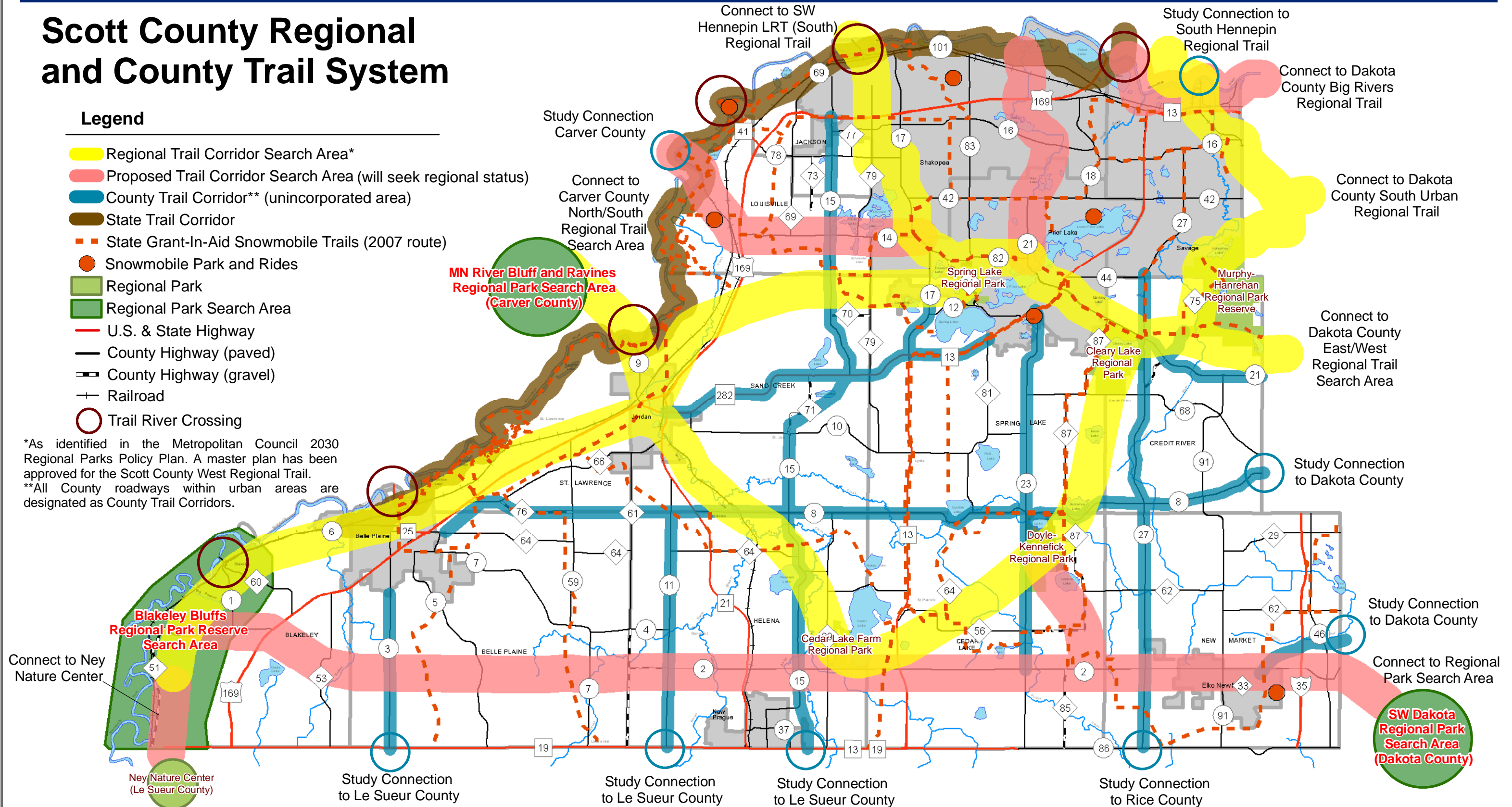
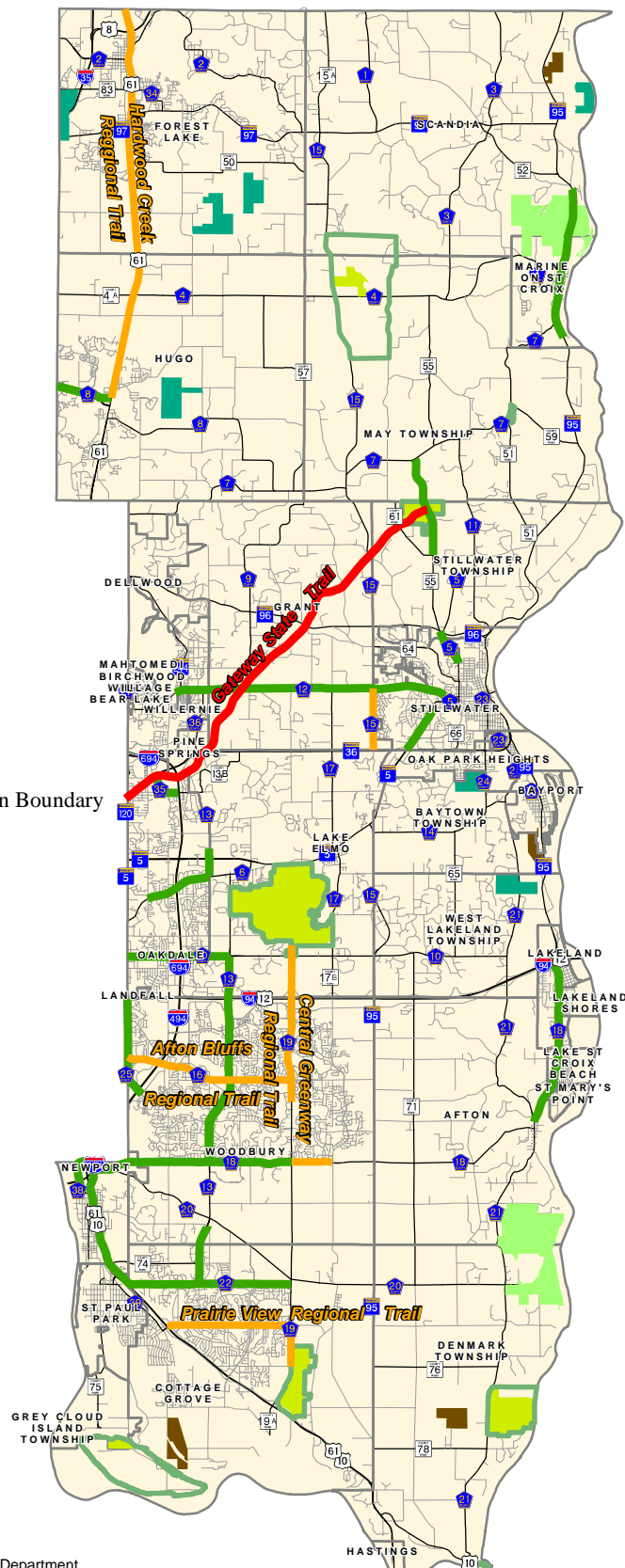
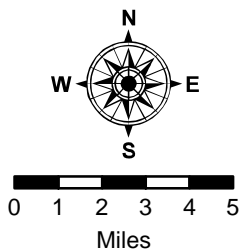




Figure 4-14

Existing Trail System

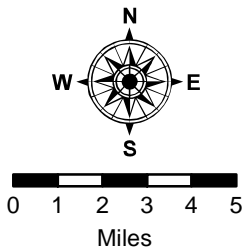
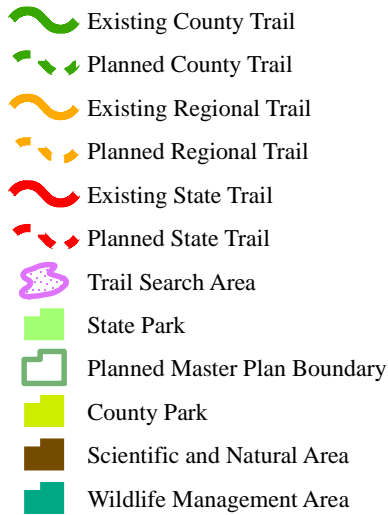
-  Existing County Trail
-  Existing Regional Trail
-  Existing State Trail
-  State Park
-  County Park Planned Master Plan Boundary
-  County Park
-  Scientific and Natural Area
-  Wildlife Management Area



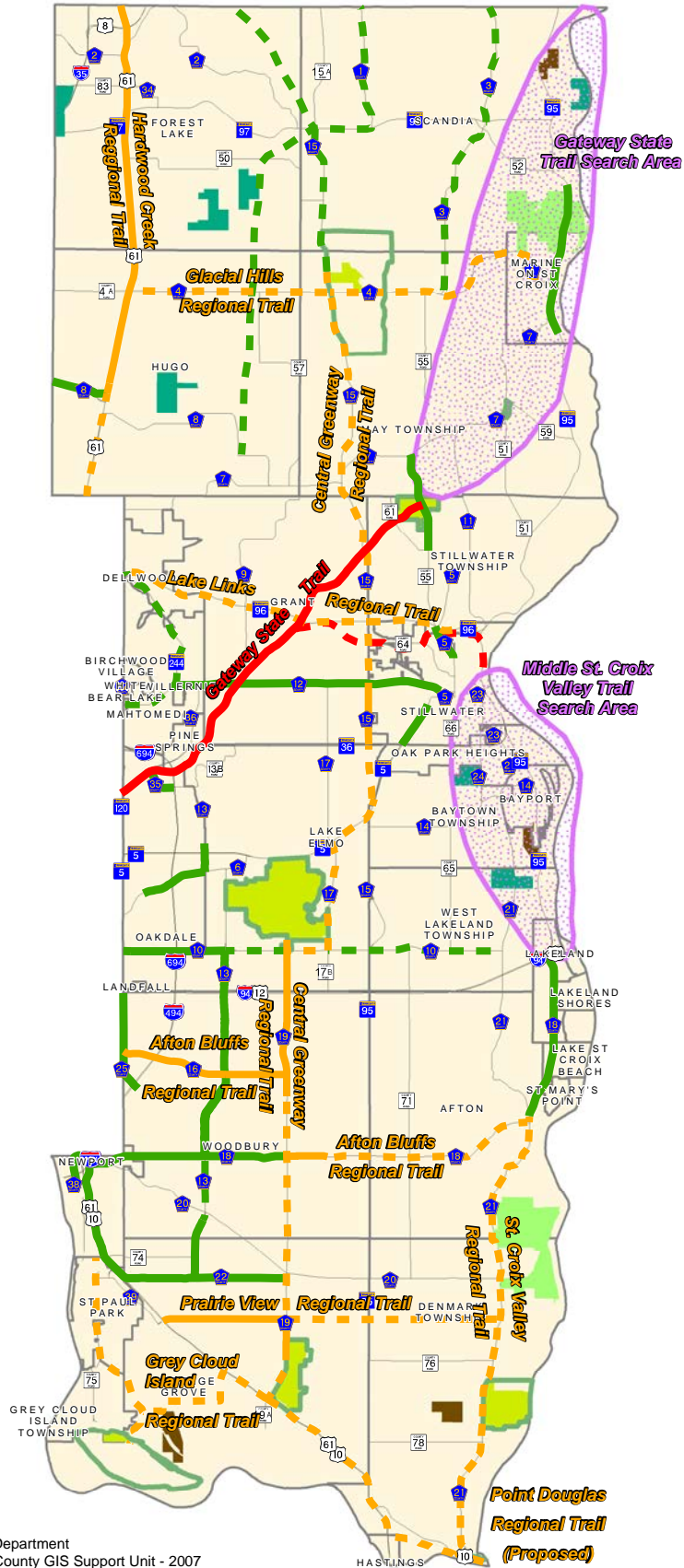
Prepared By: Washington County GIS Support Unit, IT Department
Data Source: Metropolitan Council - 2007, Washington County GIS Support Unit - 2007

Figure 4-21

Planned Trail System



Prepared By: Washington County GIS Support Unit, IT Department
Data Source: Metropolitan Council - 2007, Washington County GIS Support Unit - 2007



PROJECT REPORT

Community Facilitation and Engagement for the Metropolitan Council Regional Bicycle System Master Study

**A Report on
Community Engagement and
Community Conversations
for Development of the
Metropolitan Council Regional
Bicycle System Master Study**



**DRAFT
02/06/14**



Delivering sustainable,
people-centered solutions,
to mobility and place
community design group
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Table of Contents

This report includes the following sections:

Section	Page
1. Introduction	2
2. Engagement Process and Results	5
2.1 - Overview of Engagement Activities	6
2.2 - Overall Themes	7
2.3 - Public Workshops	8
Overall Public Workshop Results	9
2.4 - Online Engagement	13
2.5 - Community Listening Sessions	15
Overall Listening Session Results	18

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Section 1

Introduction

This section provides an introduction to the Regional Bicycle System Master Study, and provides an overview of the role of the community engagement effort within it.

In this section

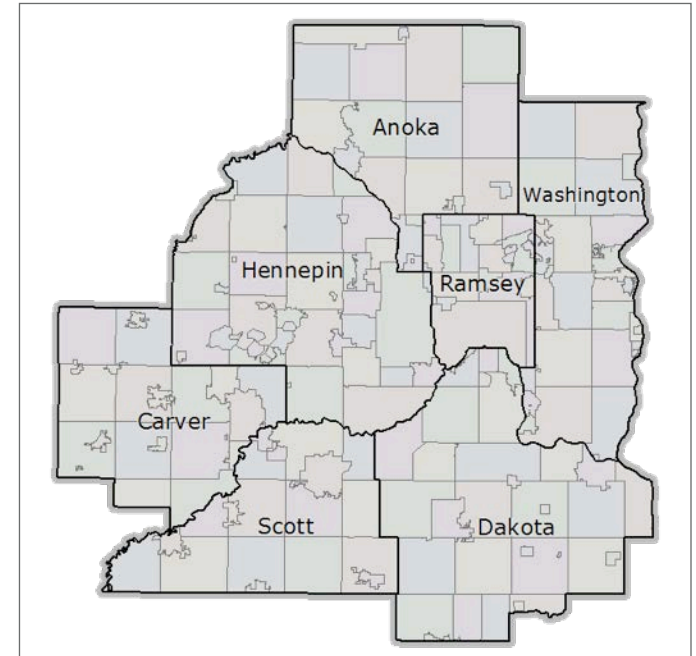
- 1.1 - Background: Regional Bicycle System Master Study
- 1.2 - Overview of the Community Engagement Effort

1.1 - Background: Regional Bicycle System Master Study

The Twin Cities Regional Bicycle Master Study (the “Study”) is designed to deepen understanding of the bicycle component of the metropolitan transportation system, and to use this improved understanding to more proactively guide its continued development in the next update to the region’s long-range Transportation Policy Plan (TPP) to be completed in 2014. The current Transportation Policy Plan is primarily focused on increasing connectivity and removing barriers for bicycle travel.

Specifically, this study provides a more complete understanding of how the regional bicycle transportation network functions, particularly with respect to on-road routes and facilities. The focus of this study is examining the transportation function of the bicycle network, with an understanding that significant segments of recreational trail facilities often serve a dual purpose of providing access to recreation while also connecting key destinations. This study uses local data and stakeholder input to guide a process that will:

- Evaluate the connectivity of the existing bicycle transportation network
- Define the role of regional bicycle corridors and regional critical links
- Identify a set of proposed regional bikeway corridors
- Propose a framework for monitoring the performance of the regional bicycle transportation system on an ongoing basis.



The Metropolitan Council Regional Planning area.



The Metropolitan Council seeks to coordinate development of a system of bikeways for transportation across the metro region. Image: The Cedar Lake Trail.

1.2 - Overview of the Community Engagement Effort

The preparation of a community engagement strategy was one of the first tasks for the Regional Bicycle System Master Study. Its goal was to map out a strategy that would allow the project team to receive guidance from bicyclists and the general public residing throughout the Metropolitan Council's seven county planning area. A variety of opportunities to contribute opinions, insights, and experiences to the Master Study work were offered as part of this project.

This report summarizes and documents the conversations and learnings that resulted from implementation of the community engagement activities for the study. Its purpose is to serve as a tool for the Metropolitan Council in guiding and determining important regional bikeway corridors, in identifying and addressing gaps in existing regional routes, and in inform and providing background for the recommendations made as part of the overall Master Study.

The principal goals for the community engagement portion of the Master Study included:

- Engaging bicyclists and bicycling advocates living in urban, suburban, and rural communities across the Metropolitan Council's seven county planning area;
- Collecting citizens' opinions on perceived important characteristics of regional bikeway corridors;
- Collecting data on participants' bicycle trip origins, destinations, existing routes, desired routes, as well as opinions on assets and obstacles surrounding bicycle infrastructure; and,
- Receiving comments and ideas about desired regional bikeway corridors in the seven county planning area, and
- Providing multiple opportunities for community engagement by offering a process that includes a variety of activities, including listening sessions, a website and online survey, and open houses.



Participants during a public workshop activity.



Participants working on the mapping exercise at the White Bear Lake listening session.

Section 2

Engagement Process and Results

This section describes the specific process and materials used in the community engagement activities. In addition, it details the results obtained, including overall guidance and results from individual listening sessions and open houses.

In this section

- 2.1 - Overview of Engagement Activities
- 2.2 - Summary of Overall Results
- 2.3 - Public Workshops
- 2.4 - Online Engagement
- 2.5 - Community Listening Sessions

2.1 - Overview of Engagement Activities

A range of community activities were completed as part of the engagement process for the Twin Cities Regional Bicycle Master Study:

Public Workshops

Four large format public workshops were held to inform members of the general public of the details of the study and to gather their comments and guidance at different stages of the project. Specific activities at each workshop reflected project questions and issues at the time of the workshop, providing a helpful opportunity to receive public guidance on project direction and progress. A summary of these workshops and the guidance received is included in Section 2.3.

Online Engagement

A public website (<http://www.metrocouncil.org/Transportation/Planning/Transportation-Resources/Regional-Bicycle-Master-Study-Introduction.aspx>) included updates on project process and information. An online map was made available for the public to provide comments and guidance for the regional bicycle network. A description of online engagement and feedback received is included in Section 2.4.

Community Listening Sessions

Four community listening sessions were held - one in each of four identified quadrants of the Metropolitan Council's seven county regional planning area. A summary of these sessions and the input received is included in Section 2.5.

Section 2.2 presents overall results and major themes from all engagement activities conducted for the project.



Participants at a listening session plot routes, barriers, and destinations on maps using markers and color-coded dots.

2.2 - Overall Themes

Several overall themes emerged over the course of the study and were repeated across engagement opportunities:

Regional assets for bicycle transportation

Participants identified the existing regional trail system as an outstanding asset that extends their ability to connect between and within cities and communities throughout the region. Participants also identified the regional network's general separation from automobile traffic as a contributor to their sense of comfort and safety. Several on-road facilities in the southern metropolitan region were also identified as providing high-quality bicycle connections.

General issues to address

Participants identified the existence of discontinuities and gaps in the current bikeway network system as a prominent issue, especially around physical barriers (freeways and major roadways, and rivers and other other natural features). Participants noted the interruption of routes at these points as an impediment to greater regional travel.

Opportunities for improving conditions for bicycling

Accessibility for all types of bicyclists

A primary theme expressed was the desire for the regional bicycle network to be accessible, convenient, and comfortable to current and potential bicyclists of all ages and abilities. This theme is also reflected in the more specific ideas received in the community engagement effort, including:

Improve crossings of major barriers: Participants identified regional highway systems, railroads and waterways as main barriers to the connectivity of the regional trail system. Discontinuity of bicycle facilities at these junctions and confusion about crossings were frequently noted. Crossing the Mississippi River was identified as a major barrier, especially at the Cedar Bridge crossing. Additionally, comfort and safety at at-grade intersections of regional trails with roadways carrying higher traffic speeds and volumes were a prominent concern.

Improve connection to local destinations and recreational trails and assets: Many participants identified a need for bicycle facilities that connect to nearby trails and other destinations safely and comfortably. Employment and commercial centers, schools, parks, adjacent cities and recreational facilities were all identified as important destinations requiring connection.

Maintain facilities year-round: Year-round, including winter, maintenance for regional bikeways was identified as an important contributor to system performance and usefulness.

Address system gaps: Engagement activities provided identification of specific network gaps, with participant recommendations to address these discontinuities to improve overall connectivity.

Network organization and hierarchy: Participant recommendations included developing a network hierarchy of primary arteries providing continuous connectivity at a broader scale with frequent connection to finer-grained, local scale bicycle networks providing access to local destinations.

2.3 - Public Workshops

Process

Two sets of public workshops were held during the project:

The first set of workshops (“Round 1”) offered a opportunity for the general public to learn about the study and focused on gathering input on the guiding principles and significant regional destinations for the regional bikeway system. This first set of workshops included two open house meetings, which were held at:

- June 27, 2013 - Neighborhood House in St. Paul
- July 11, 2013 - St. Louis Park Recreation Center

The second set of workshops (“Round 2”) provided an opportunity for members of the public to review preliminary findings and provide feedback on the draft Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors. This second set of workshops included two open house meetings, which were held at:

- October 27, 2013 - Hallie Q. Brown Center in St. Paul
- October 28, 2013 - University of Minnesota’s Urban Outreach and Engagement Center in Minneapolis

Each set of workshops included two identical public meetings, held in different sections of the Metropolitan region, to increase workshop reach and access. These workshops were held in addition to the four community listening sessions that focused on reaching outlying areas of the region’s four quadrants.

Public workshops were broadly advertised, encouraging members of the general public (as well as current and potential cyclists) to attend. The goal was to expand participation and increase opportunities to receive comments and guidance from members of the general public so this information could help guide project direction and progress.



Sharing project information with workshop participants.



Reviewing maps of existing and proposed bicycle networks during one of the Open House Workshops.

Public Workshops Overall Results

Round 1 Public Workshops

Round 1 Public Workshops focused on prioritization of the guiding principles for the regional bikeway system, and gathering input on significant regional destinations.

The two workshops conducted during Round 1 were attended by a total of **Pending information from project team** participants. Each workshop included an introduction to the study team and overview of the study purpose, schedule and intended outcome. Participants were also guided through two interactive exercises directed to get at specific feedback to inform the study process.

For the first exercise, participants were presented with the draft guiding principles that had been developed from existing plans and conversations with the Project Advisory Group (PAG) and the Project Management Team (PMT). Participants were broken into groups of four to six and asked to respond to three questions:

- Which of these principles are most important to you?
- Which of these principles are most important to your community?
- What is missing from these principles?

The participants used Post-It Notes to record multiple responses to each question, and then were asked to post their responses along with their neighbors along a wall in the room. The participants were asked to not only post their own responses, but read the responses from other attendees before returning to their group.

The participants were then given poster boards and materials to work with. The participants were asked to cut and paste from a list of the existing guiding principles (including some blanks) and reach consensus about the five most important principles and include comments about why each was determined to be a priority. The results of the combined workshops are summarized in Figure 1 at right.

Figure 1. Five most important guiding principles to consider when planning the bicycle network

Principle	% Top 5
Overcome physical barriers and system gaps	85%
Facilitate safe and continuous trips to regional destinations	69%
Work for a broad range of cyclist types	62%
Function as arteries to connect regional destinations year-round	62%
Use existing and planned infrastructure	54%
Improve opportunities to increase the share of bicycle trips	46%
Connect to local, state and national bike networks	31%
Enhance economic development	23%
Be equitably distributed	15%
Space corridors to reflect land use and transportation patterns	0%
Consider regional priorities adopted in local bicycle plans	0%

Source: Round 1 Public Workshops

For the second exercise participants were introduced to the concept of regional destinations and given an overview of the locations that had already been identified based upon Metropolitan Council definitions and input from the Project Advisory Group (PAG) and the Project Management Team (PMT). The group was then instructed to visit four stations with a map of each quadrant of the region and place dot stickers to identify locations they felt were important regional destinations for bicycling.

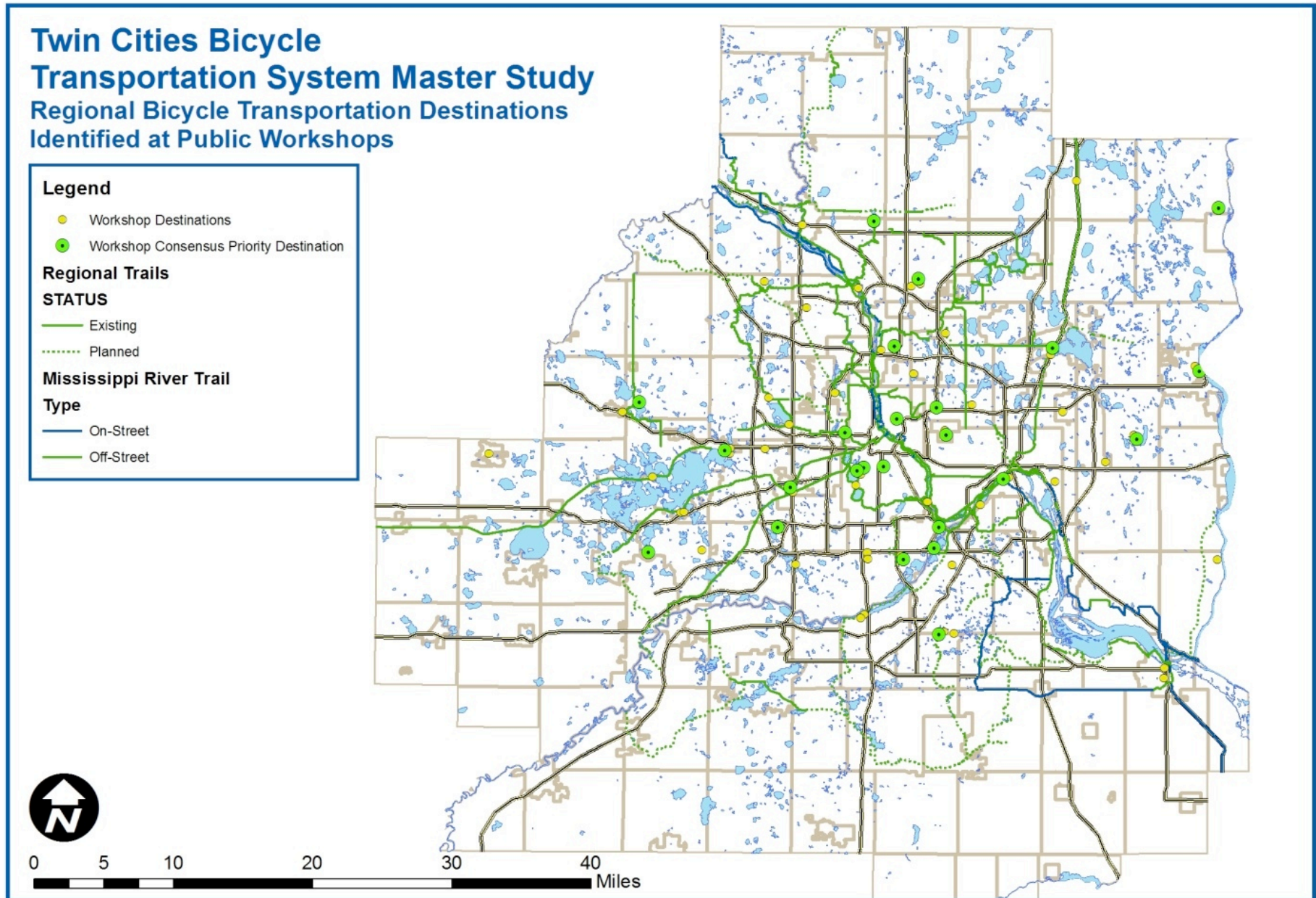
After some time to review the maps and provide input the participants were asked to choose one of the four tables and work within a group to complete a worksheet that would identify the 5 most important regional destinations for each quadrant based on group consensus. The results of this exercise were recorded and mapped by the project team and these data were used to supplement the scoring evaluation for the proposed Regional Bicycle Transportation Network corridors.

A map (Figure 2a) showing the locations identified and a full listing of the locations by geographical region (Figure 2b) is included below.

Round 2 Public Workshops

Round 2 workshops provided an opportunity for stakeholders to review preliminary findings and provide feedback on the draft regional network.

Pending information from project team

Figure 2a. Identified Regional Destinations

Source: Round 1 Public Workshops

Figure 2b. Five Most Important Regional Destinations for Each Map Quadrant

	NE	SE	SW	NW
Open House Workshop 1	Marine on St Croix*	Zoo (MN)*	Minnesota Arboretum*	Target Brooklyn Park
	Stillwater*	Hasting/Prescott	City Lakes*	Blaine
	White Bear Lake - downtown*	West Side (Harriet Island Lilydale)*	Fort Snelling State Park*	Maple Plain
	State Fairgrounds/UMN St Paul Campus*	Minnehaha Park/Highland	Minnesota River Valley*	Medicine Lake
	Lake Elmo Park*	Chain of Lakes	Minnesota Zoo*	Hopkins
	North St. Paul - downtown	Old Cedar Bridge		Wayzata
	Forest Lake	Northfield*		Excelsior
	National Sports Center - Blaine	Mall of America		Minnetonka Beach
	TCAPP	Battle Creek Park		Watertown
	Central Park - Roseville	3M		Big Lake
Open House Workshop 2	Bunker Hills Park*	Zoo + Lebanon Hills Park	Golden Triangle [Park Nicollet/Opus/United Health]*	Downtown Hopkins*
	National Sports Center	Chain of Lakes	Downtown Wayzata [Regional trailhead]	Elm Creek Park Reserve
	Coon Rapids Dam	MOA	Excelsior, city of [regional trailhead]	National Sports Center*
	Fridley MS/HS & Community Center*	Hastings	Mall of America [transit hub/employment ctr]*	Downtown Wayzata*
	Silverwood Park	Afton State Park	Greenway/Lake Street Area [commercial]*	St Paul Campus/Fairgrounds/Lake Como
	Rosedale*	Business Corridor on Hwy 13	Uptown*	Baker Park Reserve*
	Northstar Rail Station	494 Corridor	Ridgedale [transit/shopping]	French Regional Park/Medicine Lake
	Lake Elmo Park	Cedar Ave Bridge	Normandale Lakes/Highland Park Reserve	Central Ave NE*
	Stillwater	E. St Paul? Acros from DT Saint Paul	Theodore Wirth*	Robbinsdale - Downtown
	Downtown Whitebear Lake*	Lilydale / Samuel Morfan	Chanhassen	Anoka

*Consensus-identified Top 5 priority destination

Source: Round 1 Public Workshops

No Top 5 priority destinations identified from the SE Group in workshop 2 and NW workshop 1

Only 5 locations identified (all as priority) in SW Group Workshop 1

2.4 - Online Engagement

Process

Public comments were also collected online through a project page on the Metropolitan Council website (<http://www.metrocouncil.org/Transportation/Planning/Transportation-Resources/Regional-Bicycle-Master-Study-Introduction.aspx>).

The page included an interactive Wikimap that allowed residents throughout the seven counties to document important regional bicycle destinations and routes they currently use, or identify barriers to bicycling, and/or routes that would be useful if conditions were improved.

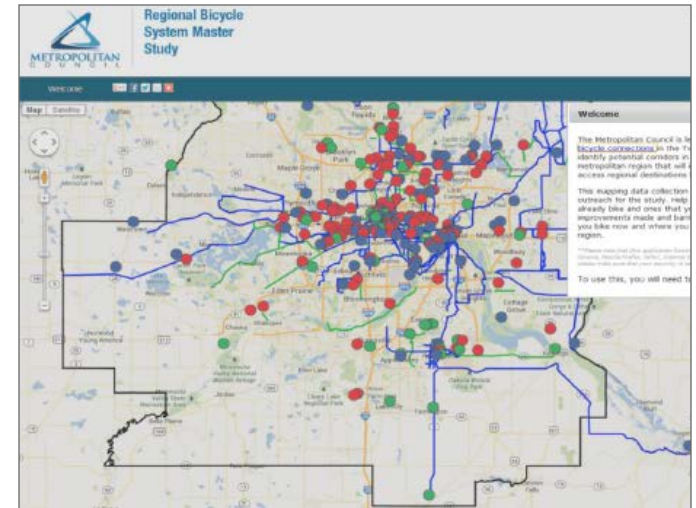
Respondents were asked to identify the following information:

- Route I ride;
- Route I'd ride if improved;
- Barrier to biking;
- Place I bike to; and
- Place I would like to bike to.

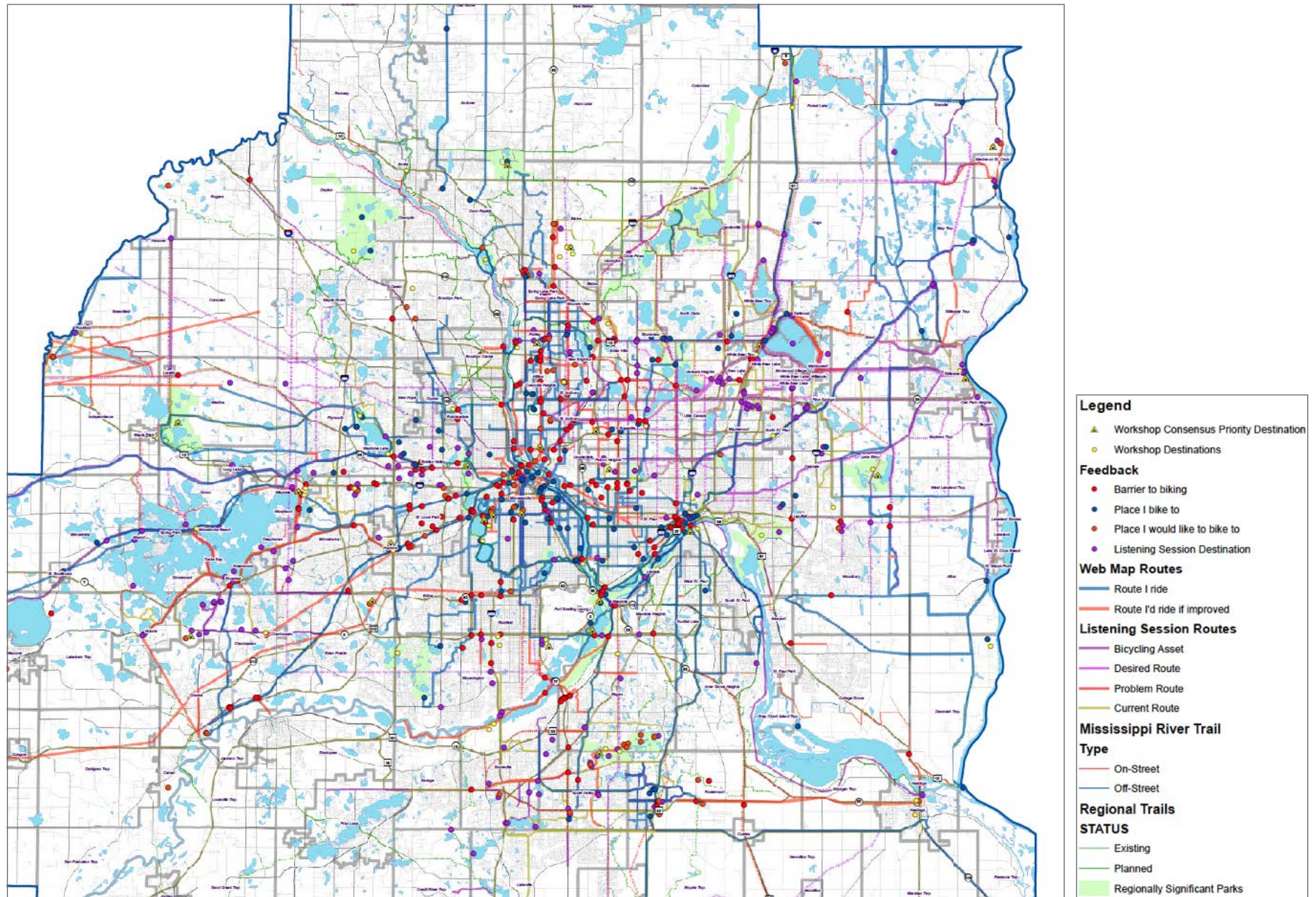
Results

Figure 3 below is a compilation of comments received from the online map feedback, the listening sessions, and the public workshops.

The map illustrates the common opinion the region's bicyclists have about difficult crossings and critical missing links in the region's bicycle network.



Participants were invited to enter information about bicycle routes, destinations, and barriers into an online mapping tool on the project website.

Figure 3. All Map Comments Received (Online and In-Person Meetings)

2.5 - Community Listening Sessions

Process

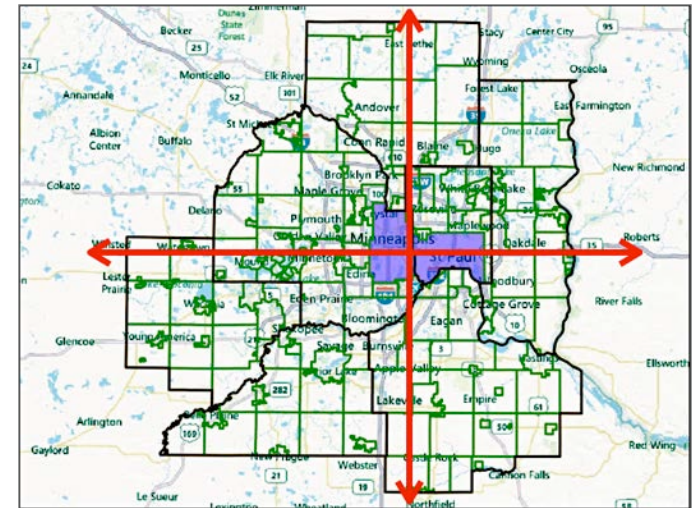
Four listening sessions were organized and conducted with the goal of directly engaging with cycling advocates and others with significant knowledge of cycling assets and barriers in their part of the region.

Outreach efforts involved a focused effort to reach members of cycling clubs and residents with significant local knowledge of cycling conditions, assets and barriers throughout the seven county planning area. The project team contacted dozens of bike shops, advocacy groups, cycling clubs, and municipal planning and recreation officials via email, phone, and social media in order to inform the cycling community in the targeted areas of the listening sessions. The Bicycle Alliance of Minnesota and Streets.MN posted information announcements about the sessions on their Facebook pages and through their e-newsletters.

Given the size of Metropolitan Council's seven county planning area geography and population, it would not be possible to convene meetings in all communities. A primary task was to divide the planning area into four quadrants, and select a location to hold a Listening Session in each quadrant during the month of April 2013.

The goal of the listening sessions was to meet with local bicycle experts and citizens bicycling in their local communities and collect information from these individuals on the origins and destinations of bicycle trips made, routes taken, bicycle assets and challenges, and desired regional bikeway corridor routes in different parts of the planning area. Determining individuals' opinions on important characteristics of regional bikeway corridors was an essential goal of the listening sessions.

The listening sessions were meant to provide a set of data and information about bicycling in the outlying Metropolitan Council planning area. Advertising the listening sessions included reaching out to bicycle groups, shops, and related businesses and organizations in these areas, making extensive use of social media, and promoting the



The Metropolitan Council's seven county regional planning area was divided into four approximate quadrants in order to facilitate meeting organization.



Participants engaging in activities at a listening session in Plymouth.

meetings specifically as a way local bicyclists can contribute their opinions and experiences bicycling in their local communities to the work of the Master Study.

Sessions and Activities

Listening sessions were held in April 2013 in the following locations:

- Apple Valley Community Center - April 15
- White Bear Lake Library - April 17
- Plymouth Library - April 24
- Chanhassen Recreation Center - April 25

Listening sessions included the following activities:

- 1) A brief introductory presentation to explain project process and goals, and explaining the role of the listening sessions,
- 2) An individual brainstorming exercise, asking participants to provide their input on what regional bikeway corridors characteristics regional bikeway corridors should possess,
- 3) A group discussion on regional bikeway corridor characteristics, including reflection on other participants' ideas of a regional bikeway corridor (i.e. what new ideas did participants see or hear from other participants?)
- 4) A small-group exercise, using maps, markers and stickers, to identify key assets, destinations, and barriers for bicycling, as well as current and desired bike routes at a local and regional scale,
- 5) Small group workshop activities where participants located ideal or desirable regional bikeway corridors on maps,
- 6) A group discussion following the small-group activity to discuss findings with the larger group, and

- 7) The provision of comment cards for participants to write out additional thoughts about regional bikeway corridors or about the engagement process.

Presentation

A brief presentation shared at the beginning of each workshop introduced participants to the Regional Bicycle System Master Study goals and process, and how the listening sessions fit within the project scope. The presentation also introduced participants to and guided them through the activities carried out at the listening session.

Individual Regional Bikeway Corridor Brainstorm Exercise

Workshop participants were then invited to participate in a brief written exercise immediately following the presentation. Each participant was asked to write down on Post-It Notes qualities that a regional bikeway corridor should possess.

Participants then ranked the attributes they had written down and placed them in vertical order on the wall next to others' notes, and were instructed to review the comments of others in the process.

Small-Group Mapping Exercise

Several large format paper maps displaying the area where the listening session took place were provided to groups of participants. The participants were first asked to individually identify three types of locations on the maps:

- 1) Common destinations to which they bike or would like to bike,
- 2) Existing routes that they use for cycling at a regional scale,

- 3) Routes of specific locations that pose challenges to them as cyclists, and
- 4) Routes which were agreed upon as being ideal or desired regional bikeway corridors.

Participants identified locations by placing color-coded stickers and drawing color-coded routes (yellow for origins and destinations, green for strengths or assets, and red for weaknesses or problems/challenges, blue for existing routes, and purple for desired or ideal regional corridors) on specific intersections, streets, trails, and destinations.

Participants were encouraged to provide notes on the maps near the markings that they placed on the maps describing issues in more detail.

Participants then worked as a group to further explore the maps and begin to prioritize assets, challenges and destinations. Each group of participants was asked to identify and describe their top ten bicycling destinations, the top ten challenging or unsafe locations for bicycling, and their top ten locations with favorable bicycling conditions.

All locations and description information provided by participants was coded into a geographic information systems and used to develop maps of locations and routes that participants identified as having positive or negative attributes. All notes and comments on data provided were included in the GIS.

Workshop Conclusion and Next Steps

If time permitted, participants were engaged in a larger group discussion about the key findings and aspects of the small group discussions that took place on bicycle origins, destinations, assets, and challenges.



An example of a marked up map from a listening session.



Participants marking up a map at the White Bear Lake listening session.

Overall Listening Session Results

The following are overall themes that resulted from the listening sessions conducted throughout the project.

Desired Characteristics for Regional Bikeway Corridors

One of the benefits of holding several listening sessions across the metropolitan region is that common themes emerge across locations and meetings, which may reflect widely-desired characteristics for regional bikeway corridors. Some of these characteristics that were prominently mentioned throughout include guidance that Regional Bikeway Corridors should be:

- **safe,**
- **continuous,**
- **separated from vehicular traffic,** and
- provide **fast, convenient, and comfortable connections** to key destinations.

In addition, effective **signing and wayfinding**, and **services along the route** (water, restrooms) were also prominently mentioned.

Examining Overall Patterns in Desired Corridors

If the desired regional bikeway corridors from all four listening sessions are combined on one single map, a “heat” map of desired corridors can be created. While it is important to remember that comments received at the listening sessions are not a statistically-valid sample of Metropolitan Region bicyclists nor of the general population, the conceptual map that emerges can be useful as an initial approximation of general patterns desired for the regional corridor network, and for potential regional routes for a specific location - for example, pointing out the desire for radial corridors

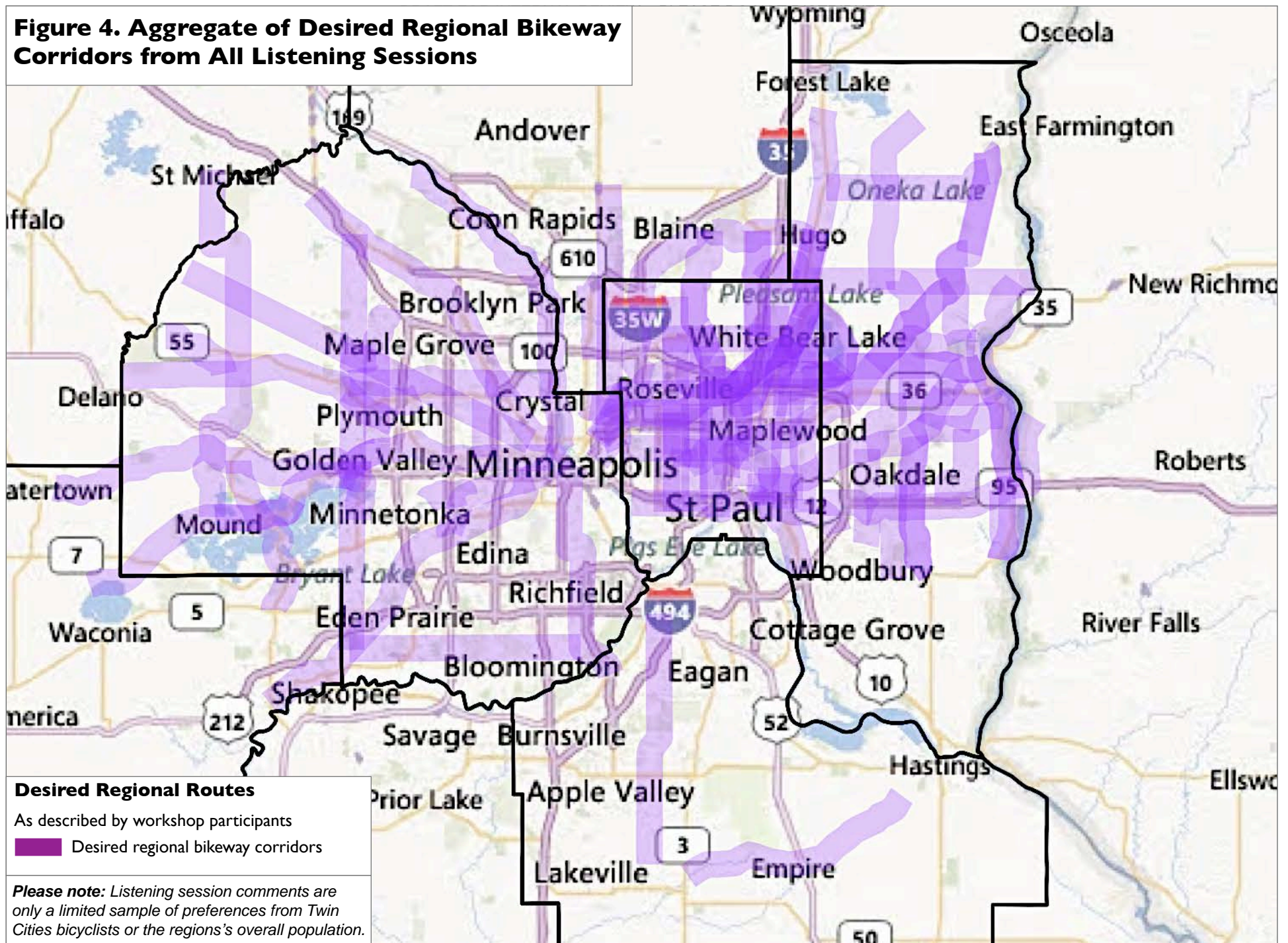
from outer jurisdictions into the central cities and for the desire to have regional corridors provide direct links between suburban locations in direct north-south or east-west patterns unrelated to bicycle travel into the region’s core.

The conceptual map depicted in Figure 4 below depicts desired regional bikeway corridor routes with wide transparent bands of color. Where bands overlap (i.e., where there are multiple instances of a corridor being identified as a desired regional corridor), darker areas are shown. Viewing this conceptual map at a broad scale can facilitate thinking about an overall regional bikeway corridor system.

The pattern that emerges shows desired regional corridors converging in the central cities in a spoke-like fashion, with shorter segments providing interconnections between these primary routes.

Descriptions of all listening sessions conducted and the information gathered are included in the sections that follow.

Figure 4. Aggregate of Desired Regional Bikeway Corridors from All Listening Sessions



Results From Individual Listening Sessions

Listening Session 1: Apple Valley

Background

Listening Session 1 took place on Monday, April 15 from 6:00 - 8:00 pm at the Apple Valley Community Center, located at 14603 Hayes Road in Apple Valley. This workshop was the first in the series of four listening sessions held across the seven county Metropolitan Council planning area in the month of April 2013.

This session was open to the public, and was attended by a mix of eleven citizens and public officials from the southeastern metropolitan area in and around Eagan, Burnsville, and Apple Valley. Representatives from the Metropolitan Council and the Minnesota Department of Transportation were also in attendance.

Summary of Guidance Received: Regional Bikeway Corridors

Individual Priorities/Post-It Exercise

Key elements of regional bikeway corridors that emerged included the following items identified as top priorities by individual participants (comments are presented here as provided by participants, with emphasis added to highlight main ideas):

- **Connect destinations** or centers of activity
- Mimic motor vehicle arterial system
- Be **like a freeway system** for bicycles
- Provide **safe, comfortable facilities** for riders of **all ages and abilities**
- **Be easily identified** and **clearly labeled**
- **Safe** - so do not feel like you are risking your life getting somewhere by bicycle
- **Connect sections** of cities **with on-road bicycle lanes**
- Should not be more than **8-10 miles apart** in any direction

Participants wished for planners to examine the possible application of greenway corridors and bicycle boulevards, such as those in Minneapolis, in communities throughout the southeast metropolitan region.



Participants listen to the opening presentation before engaging in activities.



Marking existing conditions at the Apple Valley Listening Session.

Priorities and Ideas from Small Group Exercise

Primary origins and destinations identified included the Minnesota Zoo; Lebanon Hills Regional Park; destinations in Eagan, Rosemount, and Apple Valley; Crystal Lake; Alimagnet Park; Downtown Minneapolis; Downtown St. Paul; and Bloomington, Richfield, and the Mall of America.

According to participants, various existing corridors provide good bicycle connections across large stretches of the southeast metropolitan region including McAndrews Road and County Road 11/River Hills Drive West, as well as an off-road bicycle trail along Ipava Avenue. Additionally, the Highland Lilly Trail running from Interstate 35 East to Dodd Road was identified as an attractive bikeway corridor.

The railroad and several interstates and state highways were identified as barriers or obstacles to bicycle travel in the area, where, in many cases, crossings cannot be made. These included Interstate 495; Interstates 35 West and 35 East; U.S. Highway 52; Cedar Avenue/Minnesota Route 77; and Minnesota Routes 55 and 110. Participants also identified the lack of bicycle accommodations on bridges crossing the Mississippi River at Interstate 35 West and Minnesota Route 77/Cedar Avenue. General consensus was that these impediments to travel at crossing points needed to be addressed.

In addition to crossings over the Mississippi River, additional desired routes for connection included between Farmington and Hastings through Vermillion, and a north - south connection along Pilot Knob Road from Interstate 494 south to Farmington.

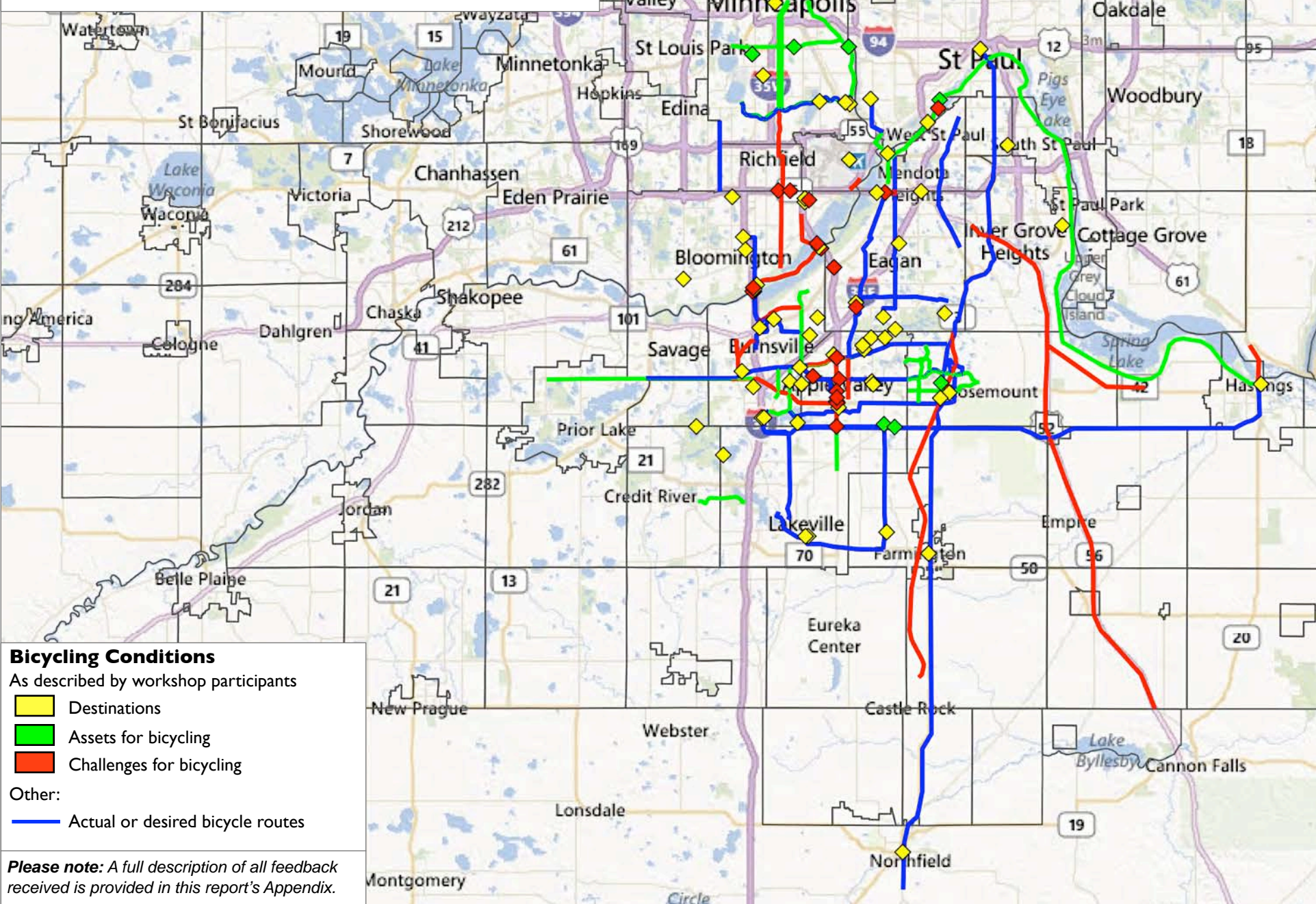
Session Summary

Findings from the individual activity indicated that participants desire regular, fast, continuous, well-marked, and comfortable regional bikeway facilities that provide important connections for riders of all ages and

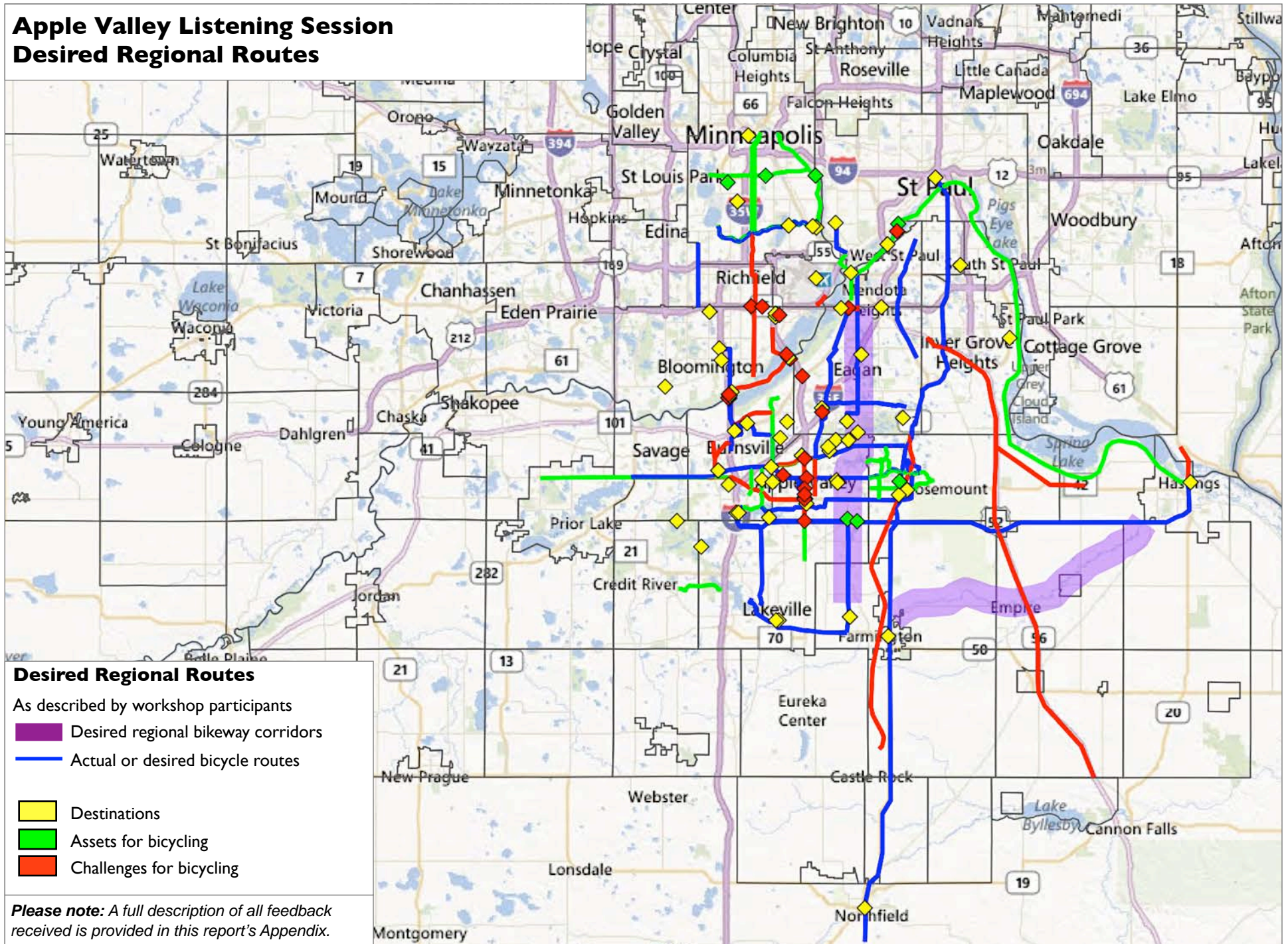


Participants adding suggested regional bikeway corridors at the Apple Valley listening session.

Apple Valley Listening Session Origins, Destinations, Assets, and Liabilities



Apple Valley Listening Session Desired Regional Routes



abilities. Participants also mentioned their desire for bicycle corridors to connect to transit stations and neighboring cities, be well-publicized and marked, and remove barriers for people of all ages and abilities to ride their bicycles.

The group activity led to the identification of a desire for improved connections from the area to Minneapolis and St. Paul. Existing railroads and highways provide barriers to bicycle travel in many parts of the area, notably Cedar Avenue/Minnesota Route 77.



Bridges, highways, and interstates were identified as barriers to bicycle travel.

Listening Session 2: White Bear Lake

Background

Listening Session 2 took place on Wednesday, April 17 from 6:00 - 8:00 pm at the White Bear Lake Library, located at 4698 Clark Avenue in White Bear Lake. This workshop was the second in the series of four listening sessions held across the seven county Metropolitan Council planning area in the month of April 2013.

This session was open to the public, and was attended by about forty-five citizens eager to share their experiences and ideas regarding bicycling in the northeastern metropolitan area. Attendees offered a range of personal experiences related to bicycling in the area, with many of them noting their affiliation with bicycle interest and advocacy groups including the Minnesota Bicycle Alliance, Active Living Ramsey Communities, and others. Representatives from the Metropolitan Council were also in attendance.

Summary of Guidance Received: Regional Bikeway Corridors

Individual Priorities/Post-It Exercise

Key elements of regional bikeway corridors that emerged included the following items identified as top priorities by individual participants (comments are presented here as provided by participants, with emphasis added to highlight main ideas):

- Have **safe and practical crossings** at all intersections
- Be **separate from vehicular traffic** either by a dedicated lane or physical separate off-road trail
- **Connect** to parks and schools and major employers
- **Connect** current bike paths
- Wide enough to **separate bicyclists** from pedestrians and other traffic
- **Connect** over/under critical gaps in the network

Participants mentioned the importance of regional bikeway corridors consisting of a regular pattern of grid routes, having consistent and clear way finding and signage, very



Participants introduce themselves at the start of the meeting.



Participants marking existing conditions and suggested regional bikeway corridors at the White Bear Lake listening session.

few stops, and appropriately timed intersection controls so as to not slow bicyclists down.

Priorities and Ideas from Small Group Exercise

Primary origins and destinations identified included various commercial and employment centers, local and regional parks, and residential areas including Downtown St. Paul and Downtown Minneapolis; the University of Minnesota; Como Park and State Fairgrounds; the area of St. John's Hospital and Maplewood Mall; destinations in White Bear Lake; and recreation areas along the Mississippi River.

Participants also identified major existing routes and corridors in the northeast metropolitan area. Some of the more prominent existing routes included paths and roadways circumnavigating White Bear Lake; the Gateway Trail; 75th Street North between Mahtomedi and Stillwater; Minnesota Route 96; Forest Boulevard North; and the Bruce Vento Trail.

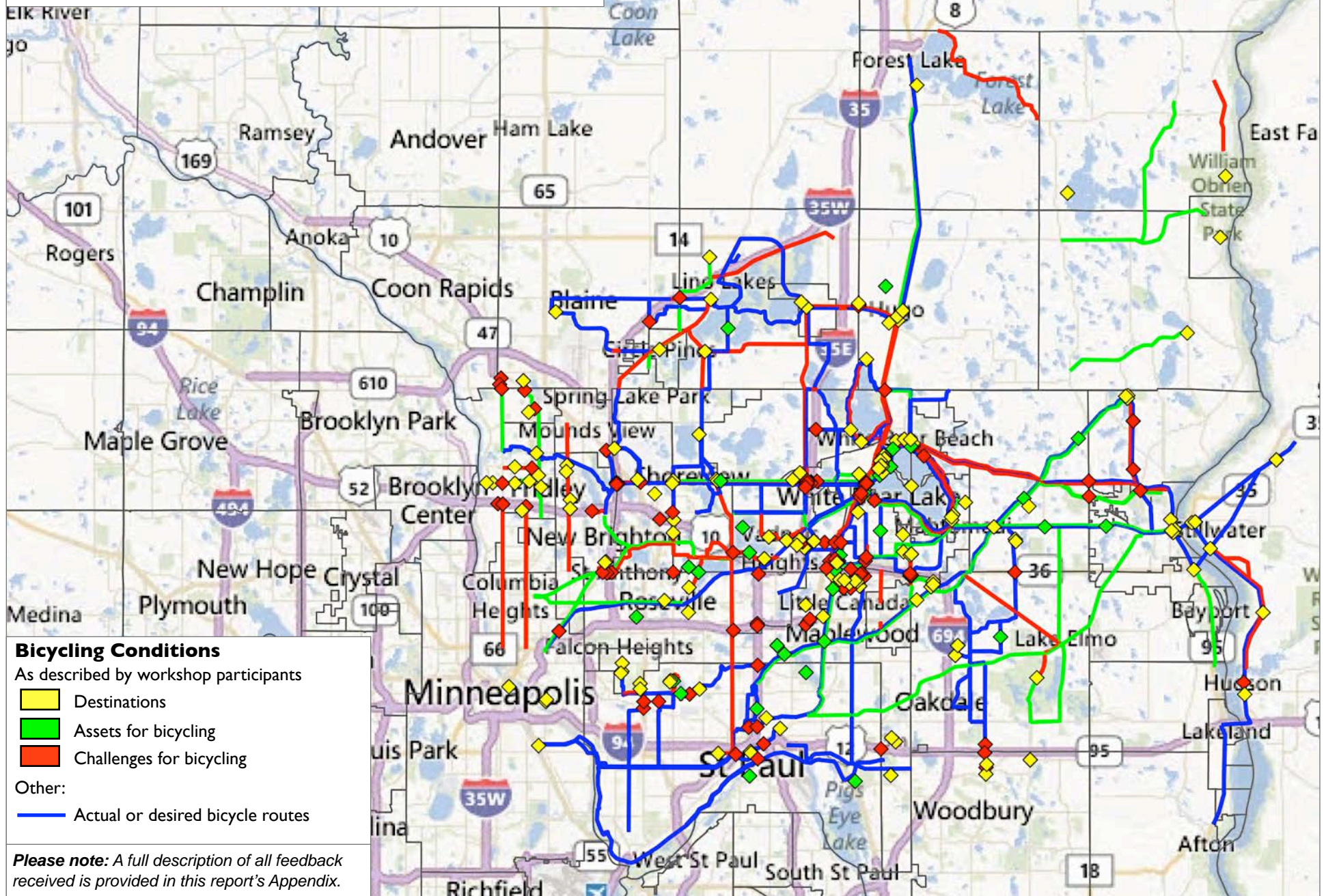
Major gaps were identified at a number of locations along these corridors. These included the east side of White Bear Lake (the lake); the westernmost point of the City of White Bear Lake; the intersection of Minnesota Route 96 and Interstate 35 East; the intersection of Minnesota Route 96 and Interstate 35 West; Minnesota Route 96 east of White Bear Lake; U.S. Highway 61 through the City of White Bear Lake; U.S. Highway 61 and Buerkle Road; the intersection U.S. Highway 61 and Minnesota Route 36; Interstate 694 and Century Avenue; County Road 55/Norell Avenue between Pine Point Park and Stillwater; and the intersection of County Road 19 and Interstate 35 West. These locations were identified by groups as being significant impediments to regional bicycle travel.

Additionally, desired routes for regional corridors were identified. Numerous desired routes were drawn out on the maps provided for participants, and several emerged as being desired among almost all

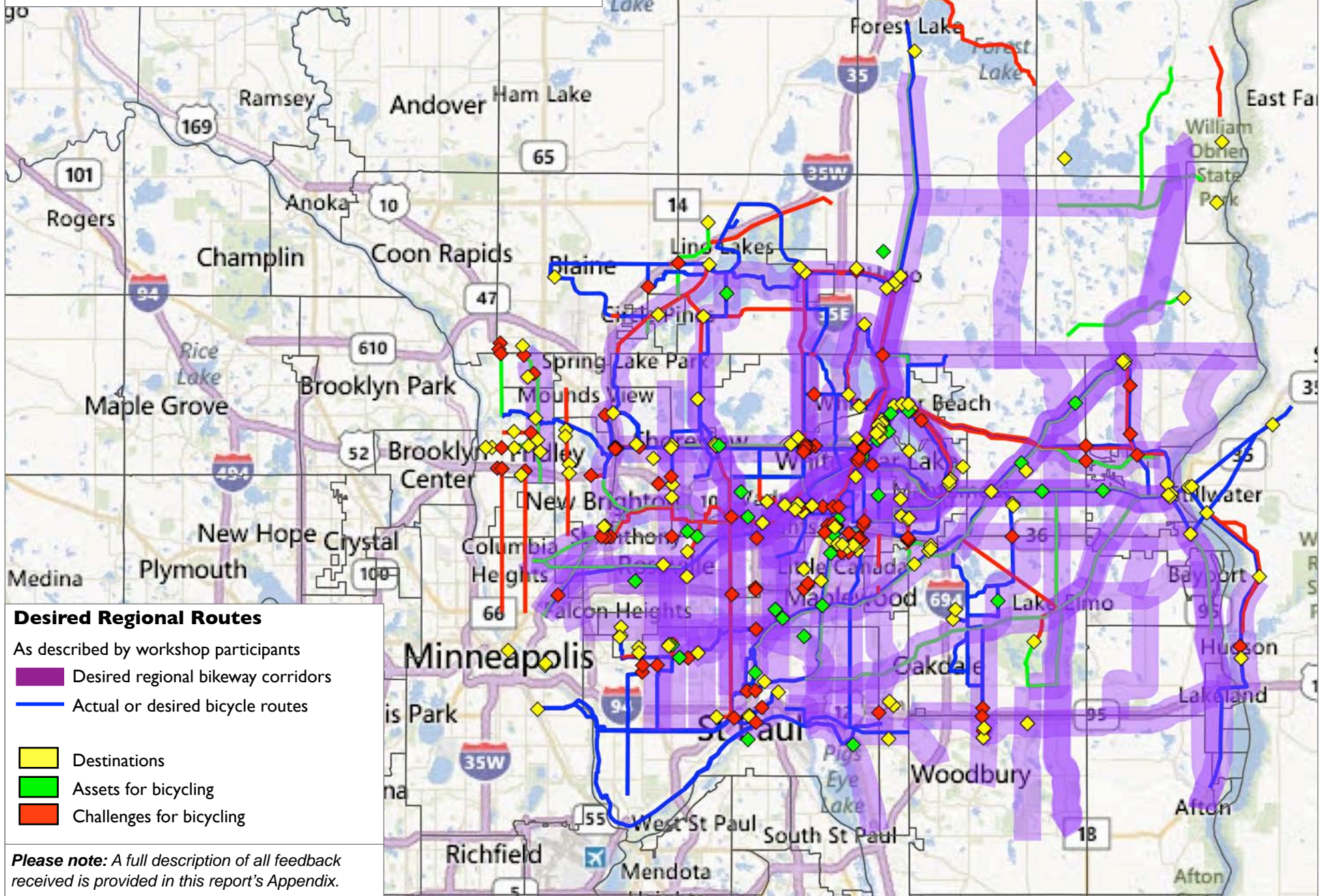


Participants mark up area maps during the small group exercise at the White Bear Lake listening session.

White Bear Lake Listening Session Origins, Destinations, Assets, and Liabilities



White Bear Lake Listening Session Desired Regional Routes

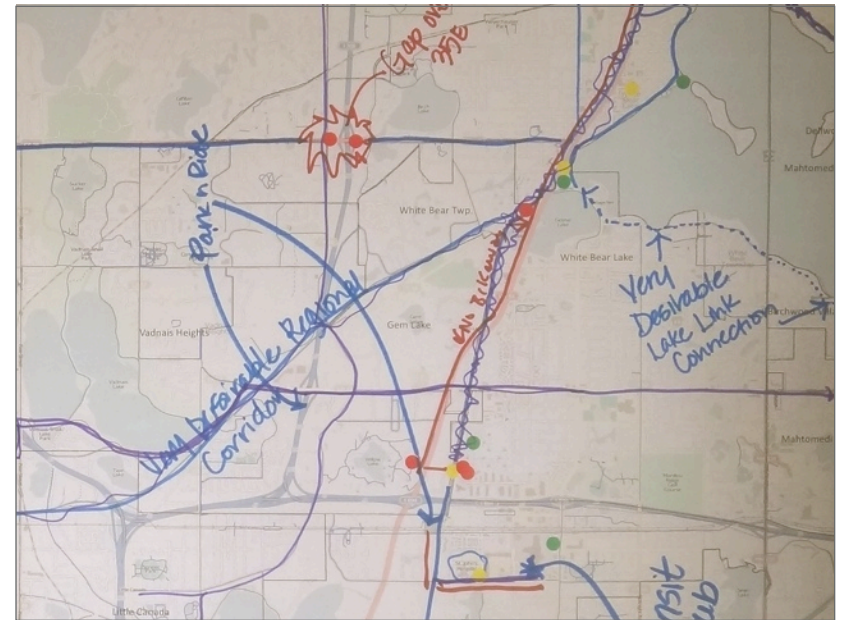


participants. These included U.S. Highway 61; the rail corridor which heads southwest from White Bear Lake towards Minneapolis; Hodgson Road to Rice Street; Lake Elmo Avenue to Settlers Ridge Parkway; gaps around White Bear Lake; and Lexington Parkway/Avenue.

Session Summary

Individual and group activities pointed to a desire for regional bicycle corridors as facilities separated from vehicle traffic with safe crossings and short wait times for bicyclists at intersections. Connections to major destinations, schools, business, and employers in the area was also a commonly desired characteristic.

Several participants indicated gaps in the bicycle network around White Bear Lake, and a desire for bicycle connections to the south along the railroad corridor or U.S. Highway 61 or the railroad towards St. Paul and Minneapolis.



An example of a marked up map from the White Bear Lake listening session displaying origins, destinations, existing and desired routes, good infrastructure, and problem areas.

Listening Session 3: Plymouth

Background

Listening Session 3 took place on Wednesday, April 24 from 6:00 - 8:00 pm at the Plymouth Library, located at 15700 36th Avenue North in Plymouth. This workshop was the third in the series of four listening sessions held across the seven county Metropolitan Council planning area in the month of April 2013.

This session was open to the public, and was attended by about ten participants. Representatives from the Metropolitan Council, Minnesota Department of Transportation, Hennepin County, and the City of Plymouth were also in attendance.

Summary of Guidance Received: Regional Bikeway Corridors

Individual Priorities/Post-It Exercise

Key elements of regional bikeway corridors that emerged included the following individual comments by individual participants (comments are presented here as provided by participants, with emphasis added to highlight main ideas):

- **Connect** to other corridors
- Safe
- Be **off road, separated**
- **Easy to find** - to enter and exit
- Be **paved**
- **Continuous** over long distances
- Equitable - serve metro area including **urban, suburban, and rural**
- **Quick travel** for bicycles
- **Convenient** - connect directly to key destinations

Participants also spoke of the importance of regional bikeway corridors possessing sight lines suitable for road bike speeds; being cleared of snow in the winter months; and being clearly marked on intersecting roads. Additional important characteristics of regional bikeway corridors included providing connections to transit options and to



Participants engage in the individual Post-It exercise.



Participants discuss comments on regional bikeway corridors.

school, commercial, and residential areas; having proper signage and wayfinding; providing access to restrooms; and being for commuters as much as for recreational bicycle riders.

Priorities and Ideas from Small Group Exercise

Primary origins and destinations identified included the Ridgedale Shopping Center, destinations in Fridley and Wayzata, and along the Minnesota Route 55 corridor in Plymouth and Golden Valley.

Several major roads provide connections for bicyclists in the northwest metro area, including Rebecca Park Trail traveling east out of Rockford; County Road 11 traveling east-west into Loretto; County Road 24 traveling east from Lake Independence; and Barker Park Road and Halgren Road traveling north-south through Morris T. Baker County Park and the City of Maple Plain. Several of these routes were identified as problem areas due to a lack of adequate shoulders for bicyclists.

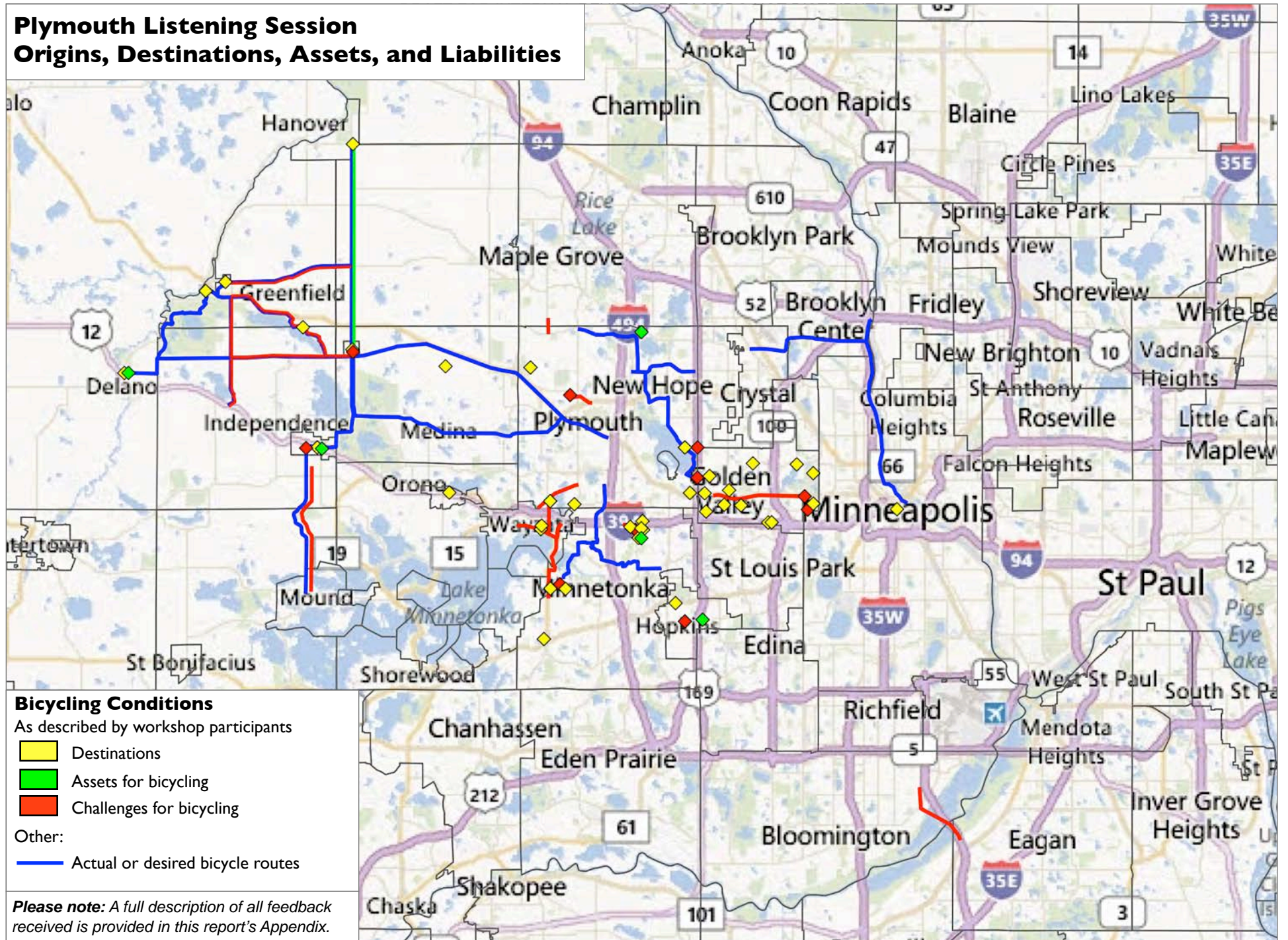
Major gaps and problem areas were identified at a number of locations in the area. These include the lack of paving on the Luce Line Trail in the Gleason Lake area; the lack of a connection between the Luce Line Trail and the Dakota Rail Trail; and the absence of bicycle lanes in areas of Wayzata, Hopkins, and Minnetonka, including downtown Wayzata, Minnetonka Boulevard, and 8th Avenue in Hopkins. Crossing Minnesota Route 55 between U.S. Highway 169 and U.S. Highway 100 in Golden Valley was also identified as an obstacle to safe bicycling.

Additionally, desired routes for regional corridors were identified north-south traveling along West Fish Lake Road and Vicksburg Lane North from Fish Lake south to Gleason Lake and U.S. Highway 12. An east-west connection is desired along Schmidt Lake Road from Peony Lane North to Crystal. Furthermore, several individuals identified the Minnesota Route 55

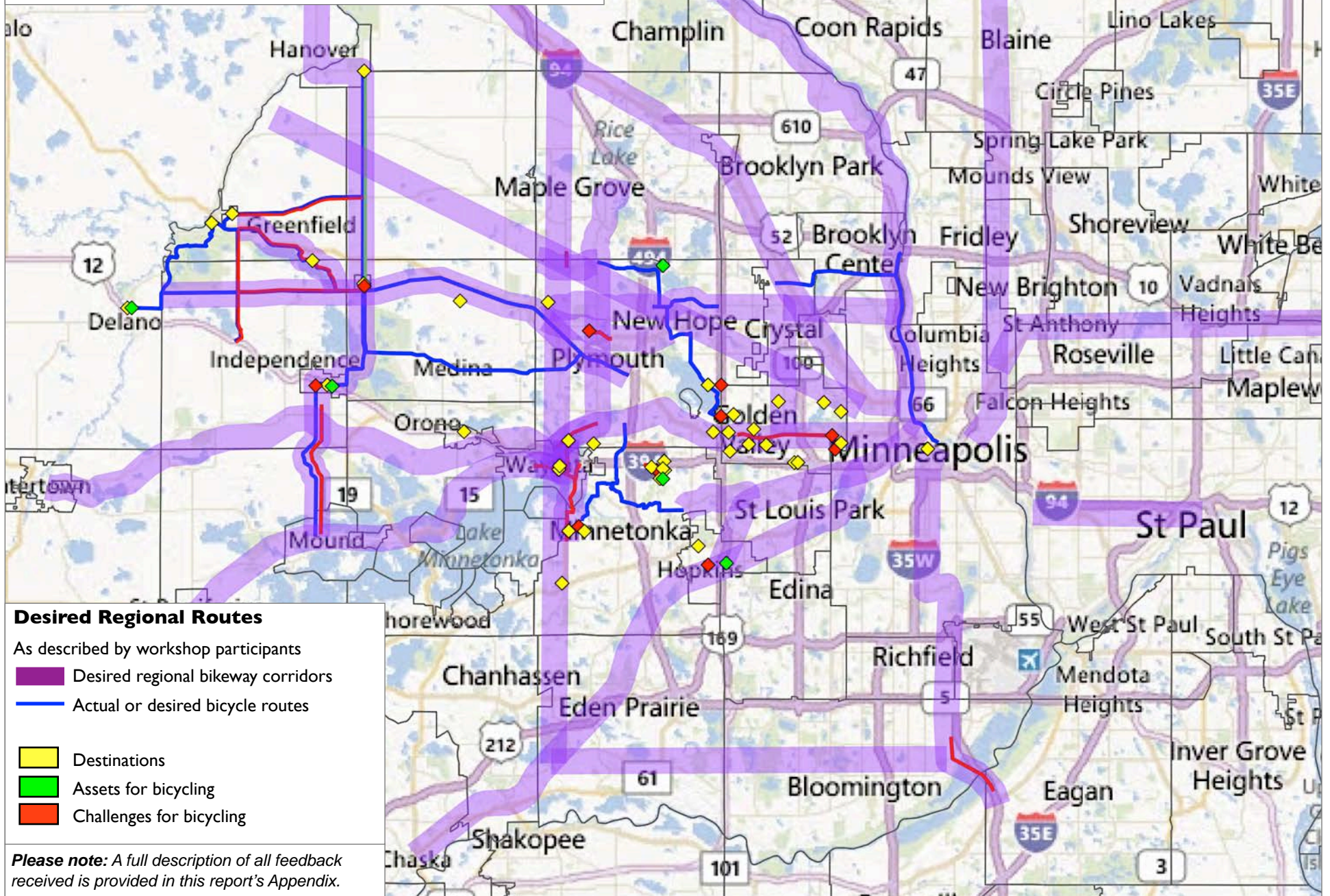


The Minnesota Route 55 corridor toward Minneapolis to the southeast was identified as a desired regional bikeway corridor, as identified on this map.

Plymouth Listening Session Origins, Destinations, Assets, and Liabilities



Plymouth Listening Session Desired Regional Routes



corridor as a desired regional bikeway corridor route from the area into Minneapolis to the southeast.

Session Summary

Individual and group activities pointed to a desire for regional bicycle corridors as safe facilities separated from vehicle traffic with easy wayfinding and convenient connections to other corridors and key destinations. In addition, the importance of providing access to restroom facilities and offering equitable access to bicyclists in all parts of the metro area (i.e., urban, suburban, and rural areas) were two ideas prominently mentioned at this listening session.

Several participants identified area roads with high bicycle traffic that are lacking adequate accommodations for bicyclists such as Minnetonka Boulevard and Minnesota Route 55. The Minnesota Route 55 corridor was identified as a logical connection to Minneapolis and was identified as a desired regional bikeway corridor route.



Several origins were identified along the Interstate 394 corridor in Golden Valley, but I-394 and U.S. Highway 169 were noted as barriers to bicycle travel.

Listening Session 4: Chanhassen

Background

Listening Session 4 took place on Thursday, April 25 from 6:00 - 8:00 pm at the Chanhassen Recreation Center, located at 2310 Coulter Boulevard in Chanhassen. This workshop was the last in the series of four listening sessions held across the seven county Metropolitan Council planning area in the month of April 2013.

This session was open to the public, and was attended by a mix of four citizens and public officials from the southwestern metropolitan area, mostly from the Lake Minnetonka area. Representatives from the Metropolitan Council and the Minnesota Department of Transportation were also in attendance.

Summary of Guidance Received: Regional Bikeway Corridors

Individual Priorities/Post-It Exercises

Key elements of regional bikeway corridors that emerged included the following items identified as top priorities by individuals participants (comments are presented here as provided by participants, with emphasis added to highlight main ideas):

- Safety
- **Connections** between different communities
- **Connections** between existing corridors, particularly north-south connections
- **Facilities** should be wide enough for comfortable use by bicyclists and pedestrians
- Provide **more transportation options** for people to move around their communities
- **Off-road facilities** and **on-road facilities** where appropriate

Participants placed a strong emphasis on community linkages, noting that even though distances may be relatively short, it is currently extremely difficult to get from one community to another without a car in the southwestern region of the Metropolitan Council planning area.



Attendees participating in the individual regional bikeway corridor priority exercise.



Participants marking origins of bicycle trips, as well as challenges and assets of existing bicycle infrastructure.

Priorities and Ideas from Small Group Exercise

Primary origins and destinations identified included the Minnesota Landscape Arboretum, Lake Minnetonka, Lake Minnewashta, and destinations in Excelsior, Deephaven, Tonka Bay, and Chanhassen.

Good existing corridors were identified as being primarily east-west in direction, and include the Lake Minnetonka LRT Regional Trail, the Luce Line Trail, and the Dakota Rail Trail. Additionally, Minnesota 41 and Powers Boulevard were identified as beneficial north-south corridors in Chanhassen, but these routes were noted as not being connected to Excelsior and Shorewood to the north.

Major gaps were identified along County Road 19, Mill Road in Excelsior, and County 41 in Shorewood. County Road 19 in particular was identified as being a crucial north-south connector which is currently heavily travelled by motorists, bicyclists and pedestrians, but with no facilities for the latter two present. According to participants, many pedestrians and bicyclists do not feel it is safe to travel on County Road 19 currently. Additionally, County Road 19 continues to be a barrier where it intersects the Lake Minnetonka LRT Regional Trail, despite crossing improvements in recent years.

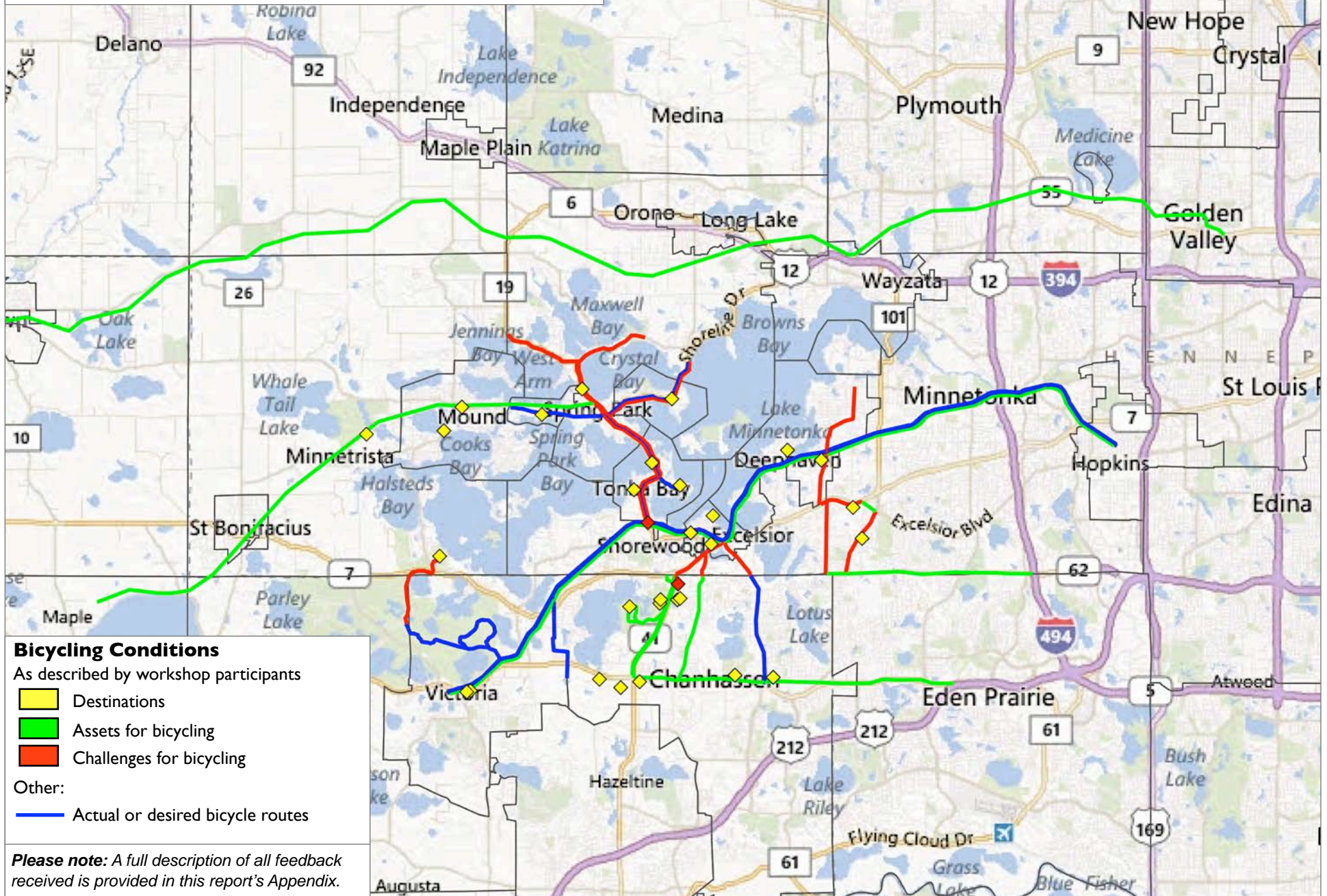
In addition to north-south routes around the Excelsior, Tonka Bay, and Chanhassen areas, routes in Minnetonka were identified as gaps, especially for access to shopping and schools. Minnesota 101 and Minnetonka Boulevard in particular were identified as challenges to bicycling.

Much of the discussion at the meeting revolved around bicycle connections in and around the Orono - Navarre - Tonka Bay area of Lake Minnetonka. Participants mentioned challenging bicycle connections on the County Road 19 corridor running north - south connecting the Dakota Rail Trail along

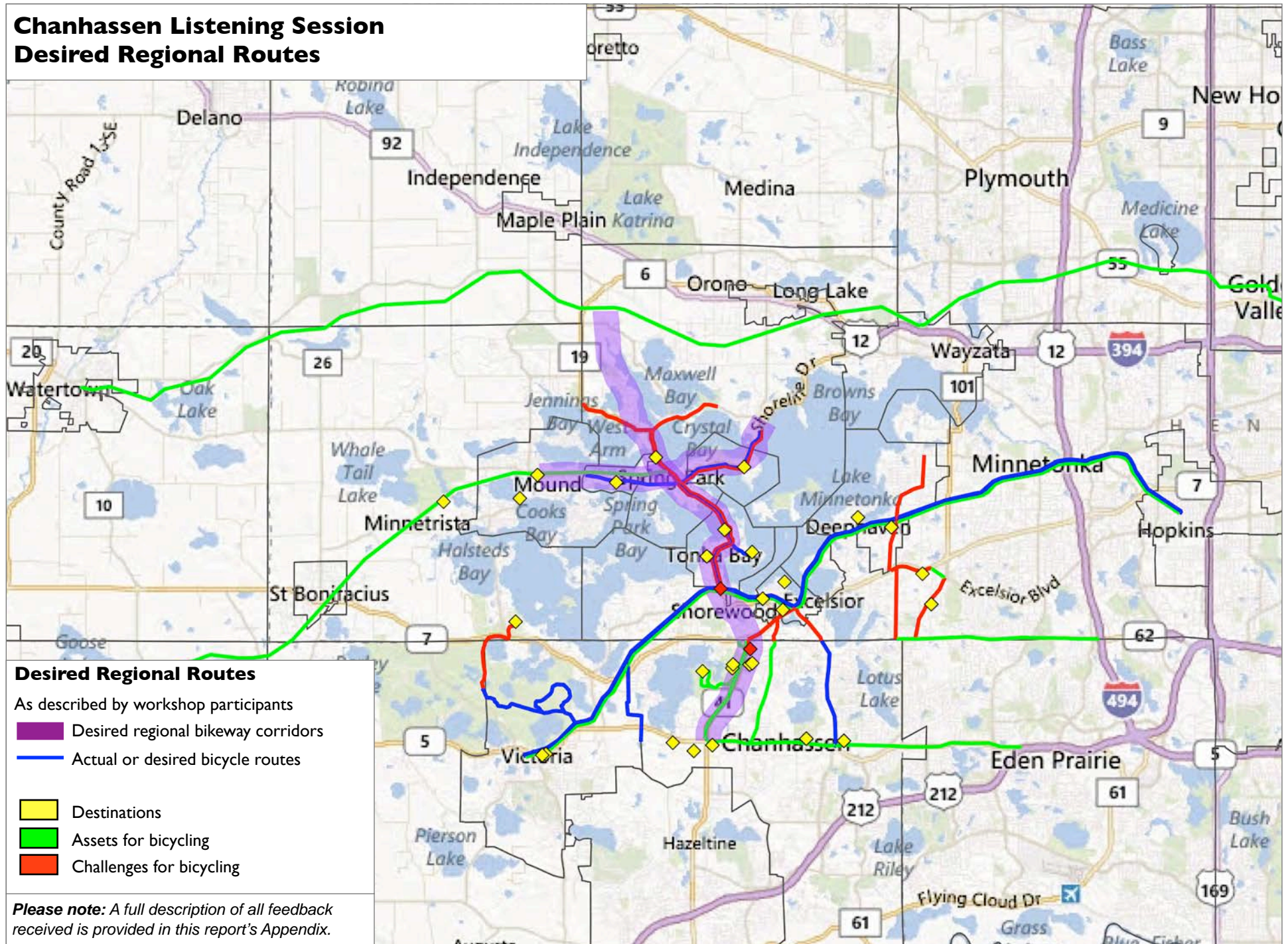


Participants marking existing conditions and desired regional bikeways at the Chanhassen listening session.

Chanhassen Listening Session Origins, Destinations, Assets, and Liabilities



Chanhasen Listening Session Desired Regional Routes



Shoreline Drive to the north with the Lake Minnetonka Regional Trail along the Minnesota Route 7 corridor to the south.

Mentioned by participants at the meeting, a study was completed in 2009 examining different conceptual alternatives for providing this trail linkage along County Road 19.

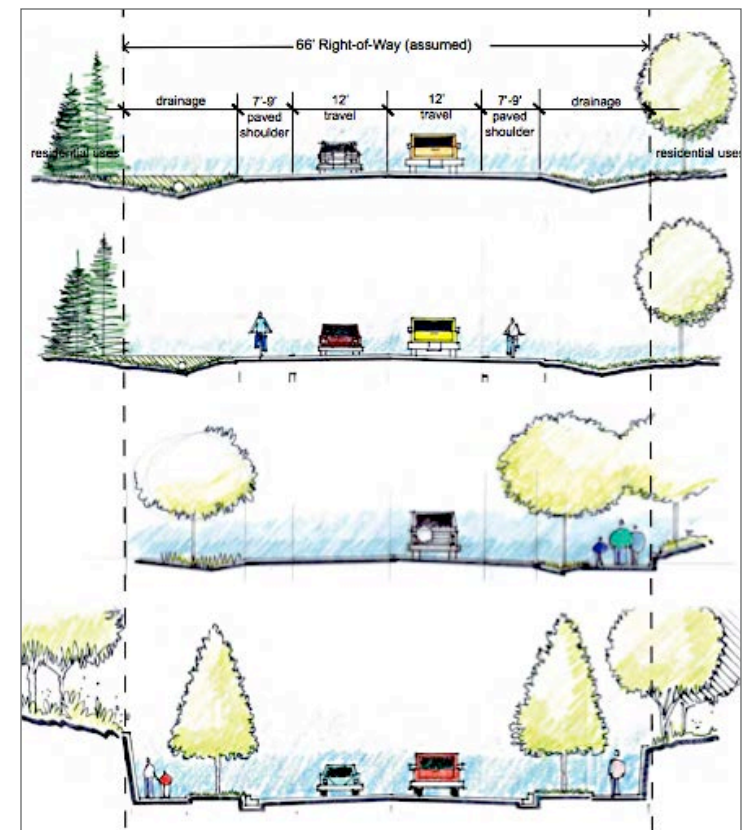
Session Summary

Findings from the individual activity demonstrated a strong desire for greater connectivity between communities in the western and southwestern metropolitan area to generate more options for transportation choices and to foster new and strong relationships between communities.

An emphasis was placed on gaps in north-south routes, especially along County Road 19, while existing east-west routes were generally considered to be assets in connecting to adjacent communities as well as to Minneapolis and St. Paul.



Connections through the Lake Minnetonka area were identified as a high priority by participants.



Conceptual trail alternatives explored in a 2009 study of bicycle infrastructure options along County Road 19.

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Appendix C. Corridor Spacing Research

Task 3 of the Twin Cities Bicycle Study called for the development of bicycle corridor spacing guidelines. This section summarizes research of the spacing of planned regional bicycle corridors in three peer regions, and documents a comparison of spacing in those regions with the draft network proposed in October 2013.

National research into regional bikeway spacing guidelines did not uncover any substantive research or state-of-practice documentation with an explicit focus on bikeway spacing at the regional level. Traditionally, the development of spacing guidelines is most commonly associated with motor vehicle roadway networks where spacing guidelines help transportation agencies make plans based on a functional classification system and the capacity needed to handle volumes of traffic across a network. The spacing of higher level roadways (collectors and arterials) are closely tied to population and trip generation factors that increase significantly within developed areas.

Regional bicycle system spacing needs are currently less defined in practice. The focus of bicycle network planning is typically on access to the system with an emphasis on increasing network density in more developed urban areas. There are not defined standards for level of access to the network at the local or regional level. However, it is useful to examine the bicycle networks of peer regions as a consideration for addressing the needs of the Twin Cities.

Under direction of Council staff, the project team identified three peer regions to analyze and compare regional bicycle system network density and system spacing, Atlanta, Denver and Nashville. These peer regions were selected based on review of these regional efforts and identification of some similarities to the Twin Cities..

Comparing corridor spacing between regions comes with some notable caveats. First, each region's topography and geography is unique, and uniquely frames decisions about infrastructure. The particular spacing of corridors may also be shaped by a Metropolitan Planning Organization's goals for corridor identification, and the commitment of regional leaders to invest in a bicycle transportation network. Finally, each region has unique population patterns and densities, to which the corridors will respond – these factors are highlighted in Table I. With those notable caveats, we provide a snapshot comparison of corridor spacing between these regions.

Table 1. Comparison of Population Characteristics

Metropolitan Statistical Area	Overall Population (2010)	2010 population density (people per square mile)
Atlanta-Sandy Springs-Roswell, GA	5.9 million	2173
Denver-Aurora-Lakewood, CO	3.1 million	4803
Nashville-Davidson–Murfreesboro–Franklin, TN	1.8 million	1695
Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area	3.7 million	3383

Source: Census Bureau

METHODOLOGY.

For each region, the project team geo-referenced maps from regional planning documents in ArcGIS for easy scaling, and then drew concentric circles at 5, 10, 15 and 20 miles out from the heart of the region’s downtown. Points at which identified bicycle corridors crossed each of those concentric circles were identified. Along each of those four concentric circles, we recorded the linear distance between the points at which a corridor crosses the circle. Then, we averaged the distances between those points. This number represented the average spacing of corridors at that specific distance (5, 10, 15, or 20 miles) from downtown.

Though this procedure was somewhat inexact in the measurement step, subsequent use of the methodology should achieve substantively similar results. Also, each region had unique features that required slight modification to the methodology. The purpose of this analysis was to gain a general sense of how the proposed Regional Bicycle Transportation Network Corridors compare to other regional networks and help inform recommendations for spacing assumptions based on local context and Metropolitan Council designated planning area definitions.

ATLANTA CORRIDOR SPACING.

The team reviewed the “Atlanta Region Bicycle and Pedestrian Walkways Plan” (2007). Figures 1A and 1B show the concentric circles used for measurement in the Atlanta region and Table 2 summarizes the average corridor spacing.

Table 2. Atlanta Region Corridor Spacing

Distance from city center >	5 miles	10 miles	15 miles	20 miles
Average corridor spacing	3.38 miles	3.05 miles	6.6 miles	7.05 miles

DENVER CORRIDOR SPACING.

The team reviewed the “Pedestrian and Bicycle Element of the 2035 Metro Vision Regional Transportation Plan” (2006). Figure 2 shows the concentric circles used for measurement in the Denver region and Table 3 summarizes the average corridor spacing.

Three features unique to Denver required a modified methodology. First, the Rocky Mountains to the region’s west limit development and trail connections there. Thus, only the portion of concentric circles outside of the mountainous area was included in the measurements. Second, especially in the southern part of the region, no trails are planned because of a large swath of protected lands and a resultant lack of planned development. Thus, the portion of the 20-mile concentric circle that traveled through this area was not included in measurements. Finally, two kinds of corridors were designated in the Denver region. First were regional corridors. Second, the plan also designated local (or community) corridors, that according to the plan, “will primarily supplement and provide connections with the Regional Bicycle Corridor System” (page 44). The team first evaluated the regional corridors alone, and then evaluated them together with local/community corridors.

Table 3. Denver Region Corridor Spacing

Average corridor spacing	<i>Distance from city center</i>			
	<i>5 miles</i>	<i>10 miles</i>	<i>15 miles</i>	<i>20 miles</i>
regional corridors only	4.2 miles	4.69 miles	4.99 miles	5.85 miles
regional and community corridors	1.28 miles	1.76 miles	2.01 miles	2.09 miles

In the end the team elected to evaluate the regional corridors alone, as the intent and definitions for the community corridors were not well aligned with definitions for the proposed Regional Bicycle Transportation Network in the Twin Cities.

NASHVILLE CORRIDOR SPACING.

The team reviewed the “Nashville Area Bicycle and Pedestrian Study” (2009). Figure 3 shows the concentric circles used for measurement in the Nashville region and Table 4 summarizes the average corridor spacing.

Nashville has one unique feature – areas to the west were not part of the bicycle corridor study, and as such, those portions of each of the concentric circles were not included in this analysis.

Table 4. Nashville Region Corridor Spacing

<i>Distance from city center ></i>	<i>5 miles</i>	<i>10 miles</i>	<i>15 miles</i>	<i>20 miles</i>
Average corridor spacing	2.6 miles	4.13 miles	3.87 miles	5.3 miles

TWIN CITIES CORRIDOR SPACING.

The team used the October 2013 draft of the regional bicycle network to evaluate the corridor spacing for the Regional Bicycle Transportation Network. Figure 4 shows the concentric circles used for measurement in the Twin Cities region and Table 5 summarizes the average corridor spacing.

Three features unique to the Twin Cities refined our methodology in the region. First, there are two principal downtowns, and not just one. For this reason, we drew two circles at the 5 mile scale – one around downtown Minneapolis and one around downtown St. Paul, and the combination of the two circles provided the average spacing. Subsequent concentric circles were drawn focused between the downtowns, roughly centered in the Midway area in St. Paul. Second, two types of corridors are proposed in the Twin Cities. Thus, separation between the priority regional bicycle corridors was measured alone, and then separation between all bicycle corridors was measured. The third unique aspect was that the distance between corridors at the 20 mile distance was so great that linear measurements of distance were made in two segments, making certain such linear segments measured distances that stayed between the 15 and 20 mile circles. It should be noted that much of this area captures parts of the region outside of the developed and developing area, and the land use context for the peer examples was not able to be clearly defined.

Table 5. Twin Cities Region Corridor Spacing (based on October 2013 Draft network)

<i>Distance from city center ></i>	<i>5 miles</i>	<i>10 miles</i>	<i>15 miles</i>	<i>20 miles</i>
Average corridor spacing – entire regional network	1.09 miles	1.66 miles	2.73 miles	5.3 miles

SUMMARY & ANALYSIS.

Table 6 summarizes the corridor spacing for the three peer regions and the proposed Regional Bicycle Transportation Network (based on the October 2013 draft network)

Table 6. Summary of Corridor Spacing

<i>Distance from city center ></i>	<i>5 miles</i>	<i>10 miles</i>	<i>15 miles</i>	<i>20 miles</i>
Atlanta	3.38	3.05	6.6	7.05
Denver *	4.2	4.69	4.99	5.85
Nashville	2.6	4.13	3.87	5.3
Peer Average	3.39	3.96	5.15	6.07
<i>Proposed Regional Bicycle Transportation Network</i>	<i>1.09</i>	<i>1.66</i>	<i>2.73</i>	<i>5.3</i>

*Denver includes Regional Corridors only

The results of the analysis show the proposed Regional Bicycle Transportation Network corridors have a spacing density that exceeds those found in the peer regions, especially in relation to the core urban areas at 5 and 10 miles. This is due, in large part, to the mature network of existing bicycle facilities found in the Twin Cities region, which provides a more robust framework for a bicycle transportation system.

The results at the 10 to 15 mile distance could suggest that the density of the proposed Regional Bicycle Transportation Network might be disproportionately out of line with the peer regions, with our proposed network being roughly twice the density of the 3 metro area averages. However, the fact that the two core cities of Minneapolis and Saint Paul are spaced 10 miles apart, makes it reasonable to expect the densities to be higher at greater distances from the combined core, or at the 10 and even 15 mile range, based on the natural overlap of dense urban form extending outward from both downtowns.

The comparison of results at the 20 mile level should be viewed cautiously based on the inconsistent methods that had to be applied for both Denver and Nashville. The network proposed in October was still found to be in line with the results as presented, but the project team recommends that more emphasis should be placed on providing connections to the developed and developing areas out beyond 20 miles where the predominance of rural land use outweighs the need for rigid corridor spacing. The reference to this analysis in section seven is therefore limited to presenting the comparisons at the 5, 10 and 15 mile extents.

FIGURE 1A. Atlanta 10, 15 and 20 mile measurement

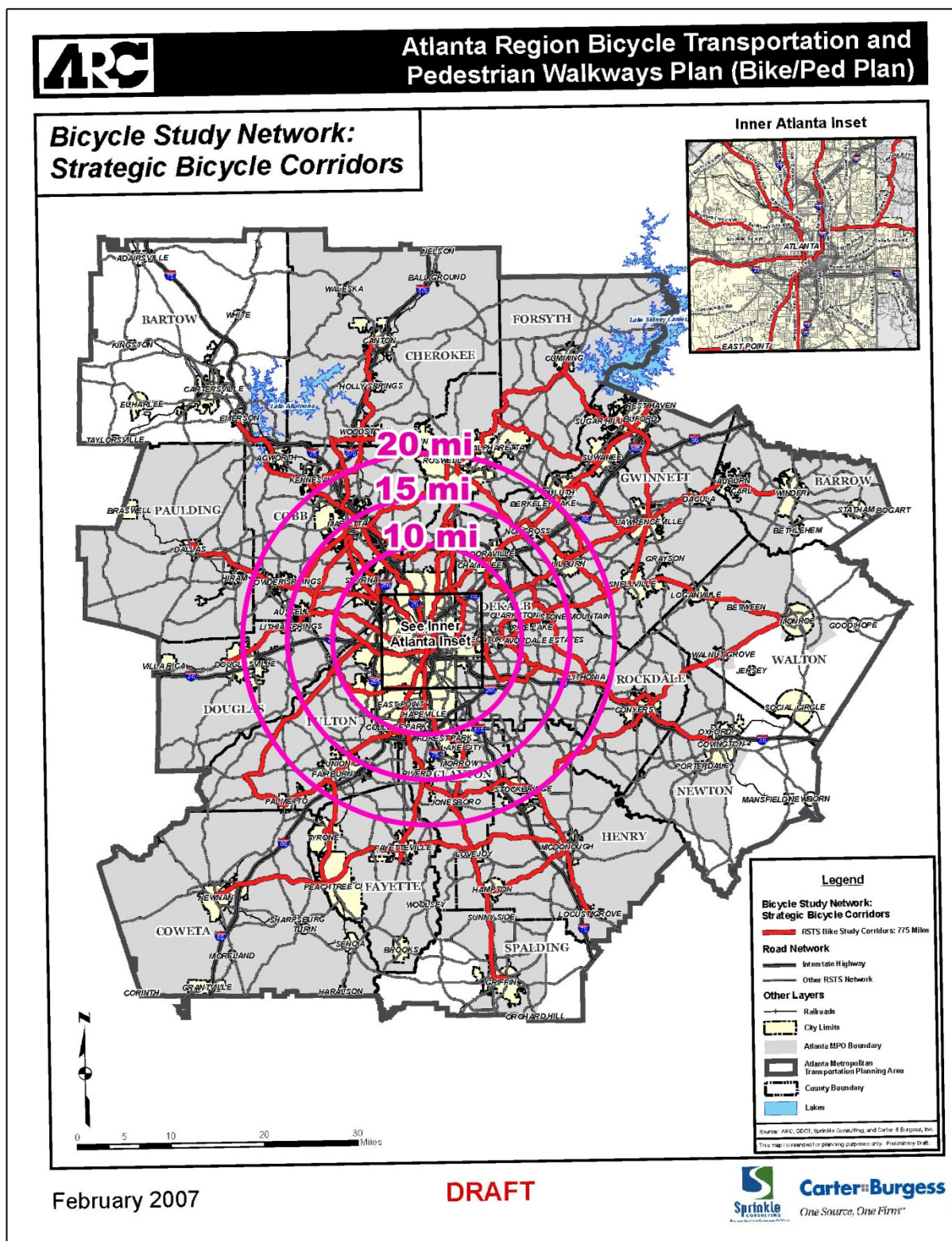


FIGURE 1B. Atlanta 5 mile measurement

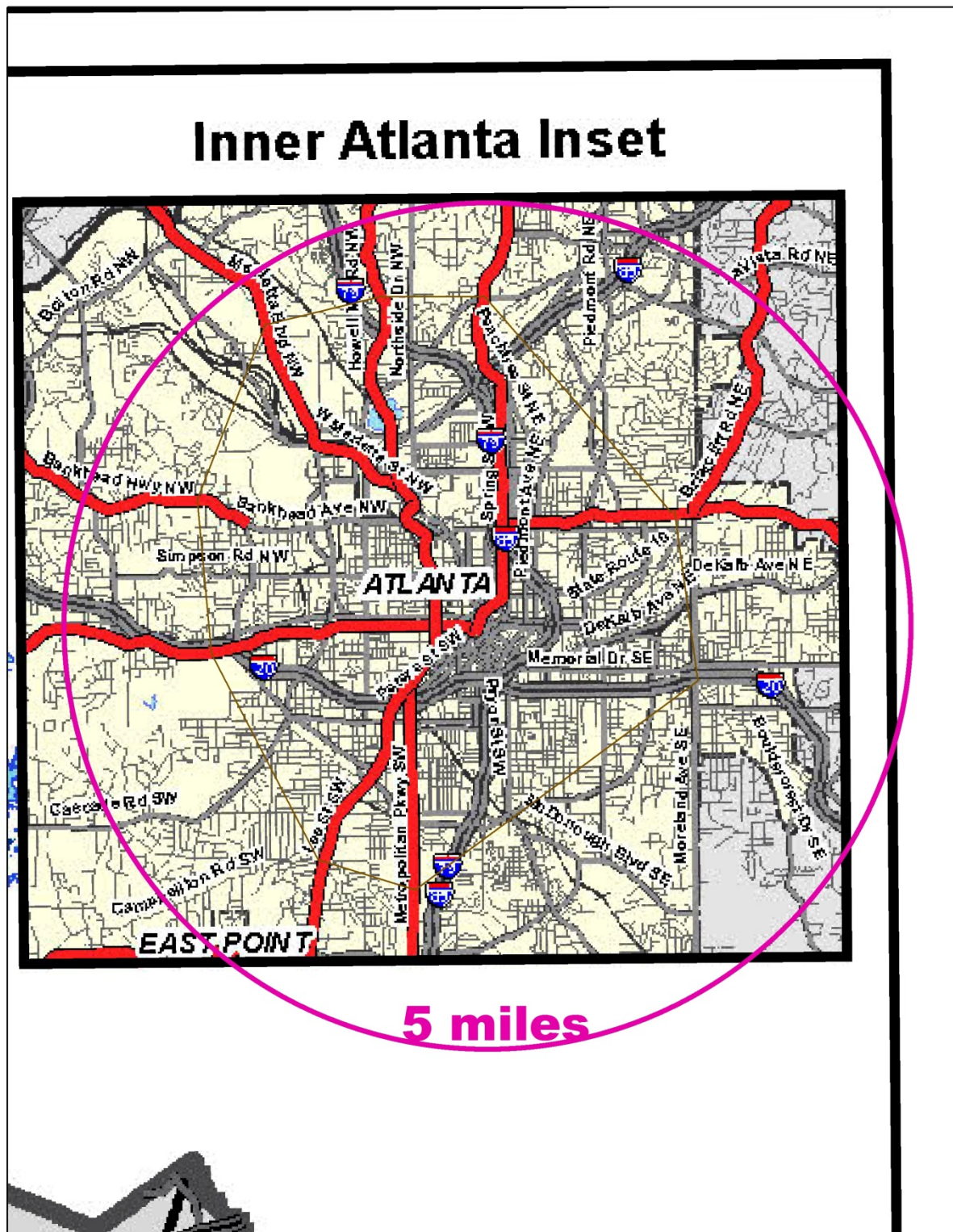


FIGURE 2. Denver corridors and measurements

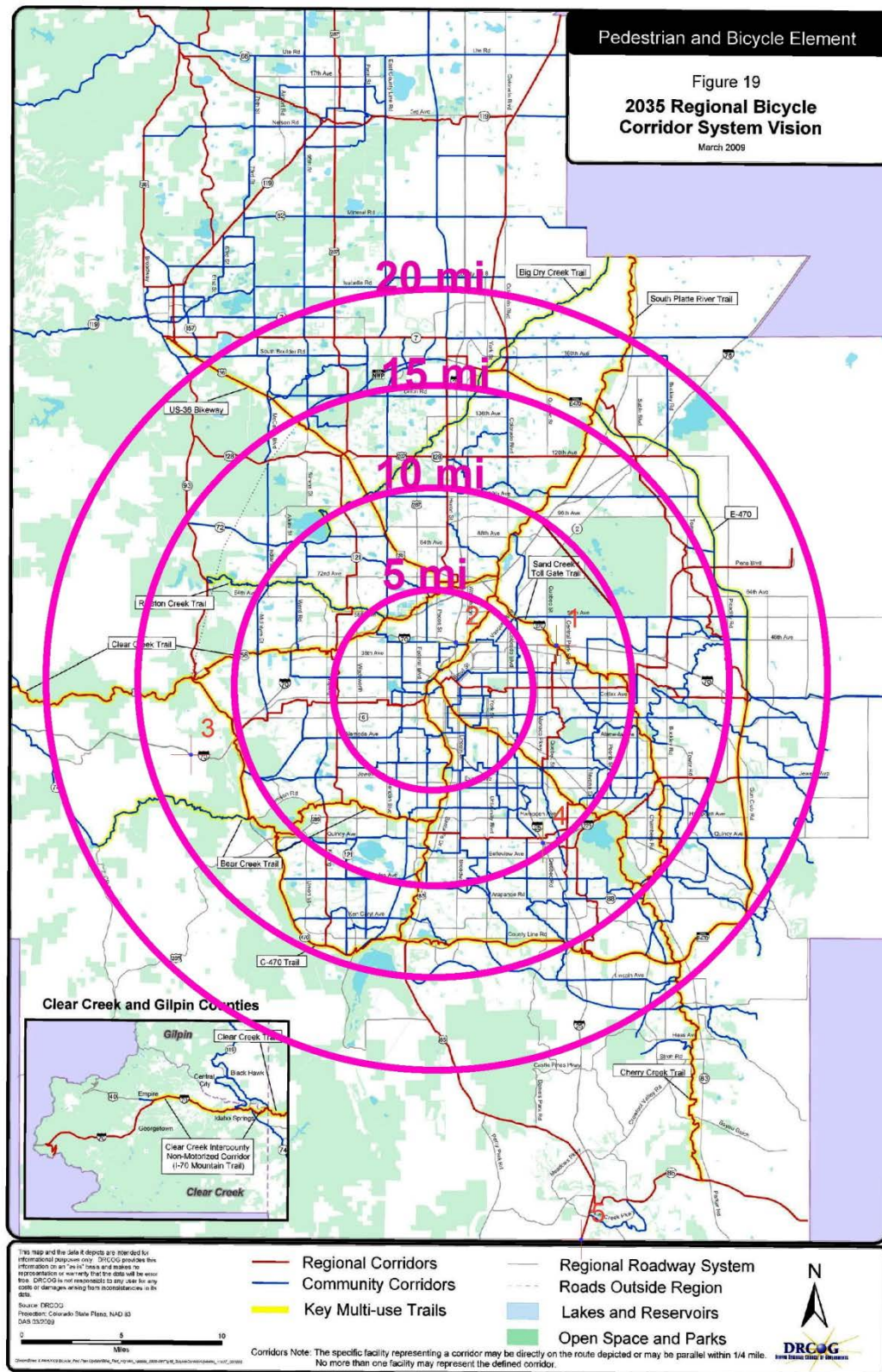


FIGURE 3. Nashville corridors and measurements

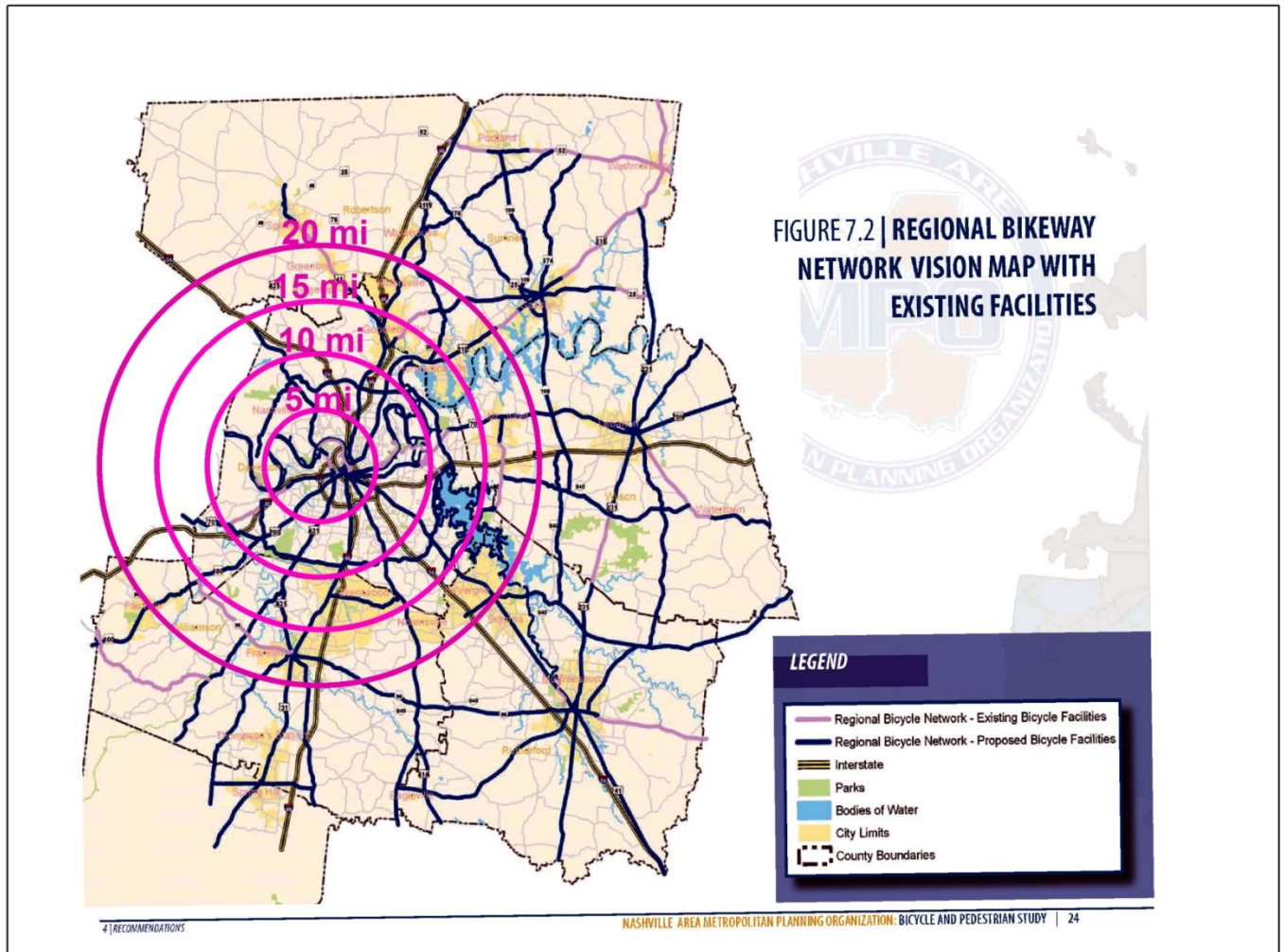
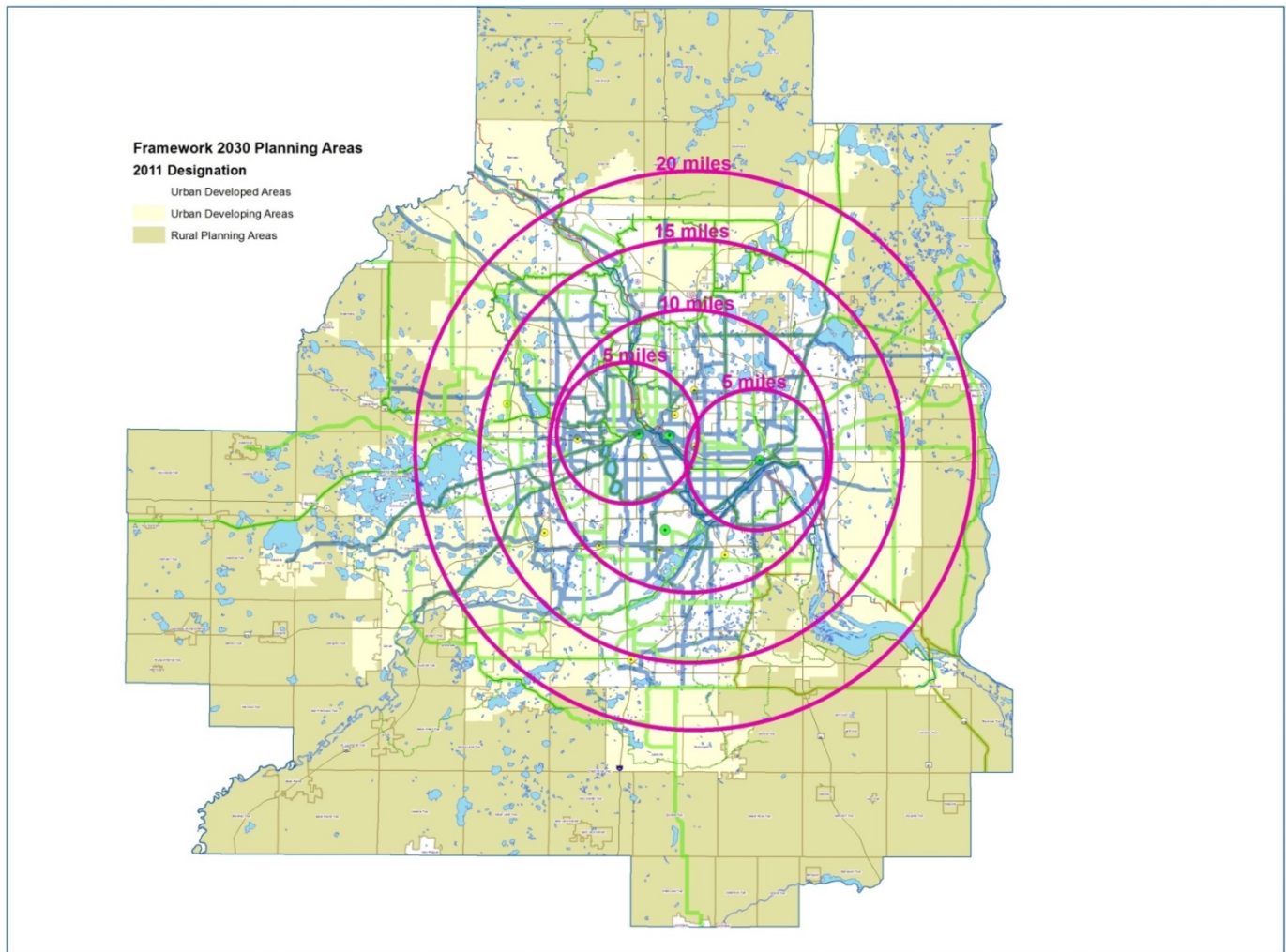


FIGURE 4. Proposed Regional Bicycle Transportation Network (October Draft) and measurements



Appendix D. Stakeholder Input to Network Development

The development of the final network was guided by significant contributions from local stakeholders.

Stakeholder Input

Through listening sessions, public workshops, on-line engagement and meetings with the Project Management Team (PMT) and Project Advisory Committee (PAC), the project team received a wealth of input that is reflected in the final Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors as proposed in section 6 of this report.

Project Management Team (PMT). The PMT was comprised of staff representing several departments of the Metropolitan Council, Metro Transit, and MnDOT, who provided technical review and assistance and to the consultant team. This team also provided ongoing direction to the project throughout its duration.

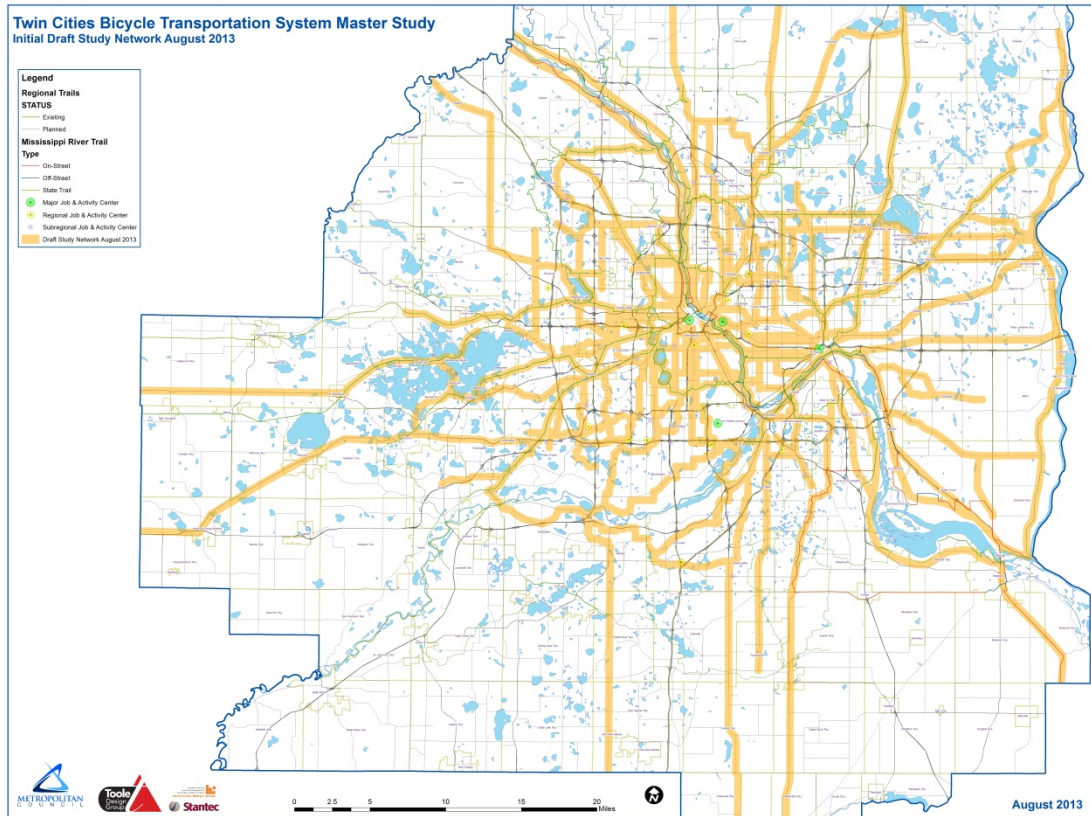
Project Advisory Committee (PAC). The PAC was comprised of agency staff from cities, counties, regional and state government, as well as bicycle advocacy groups. The PAC met five times during the project's duration and played a valuable role in providing essential feedback to the PMT at critical junctures. The PAC included representatives from the following organizations:

- Met Council
- MnDOT
- Anoka County
- Carver County
- Dakota County
- Hennepin County
- Ramsey County
- Scott County
- Washington County
- City of Bloomington
- City of Fridley
- City of Minneapolis
- City of Saint Paul
- City of West St Paul
- Three Rivers Park District
- University of Minnesota
- Active Living Ramsey County
- Bicycle Alliance of Minnesota
- Transit for Livable Communities

Network Development

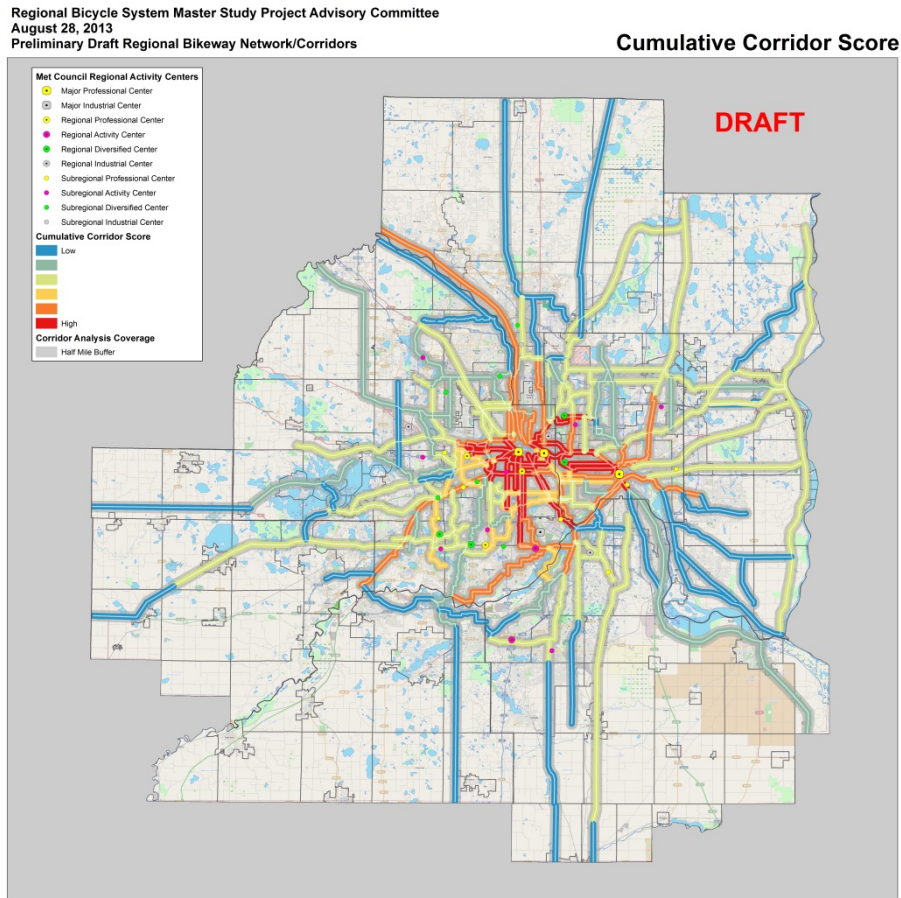
After presenting a set of candidate corridors (see Figure I) and corridor scoring approach to the PMT and PAC in August 2013, the team developed multiple iterations of the proposed network.

Figure I - Initial Candidate Corridors Presented to PAC August 2013



The initial round of scoring (see Figure 2) and input from stakeholders helped the project team refine the study network to enhance connectivity to and between regional destinations in developed and developing areas.

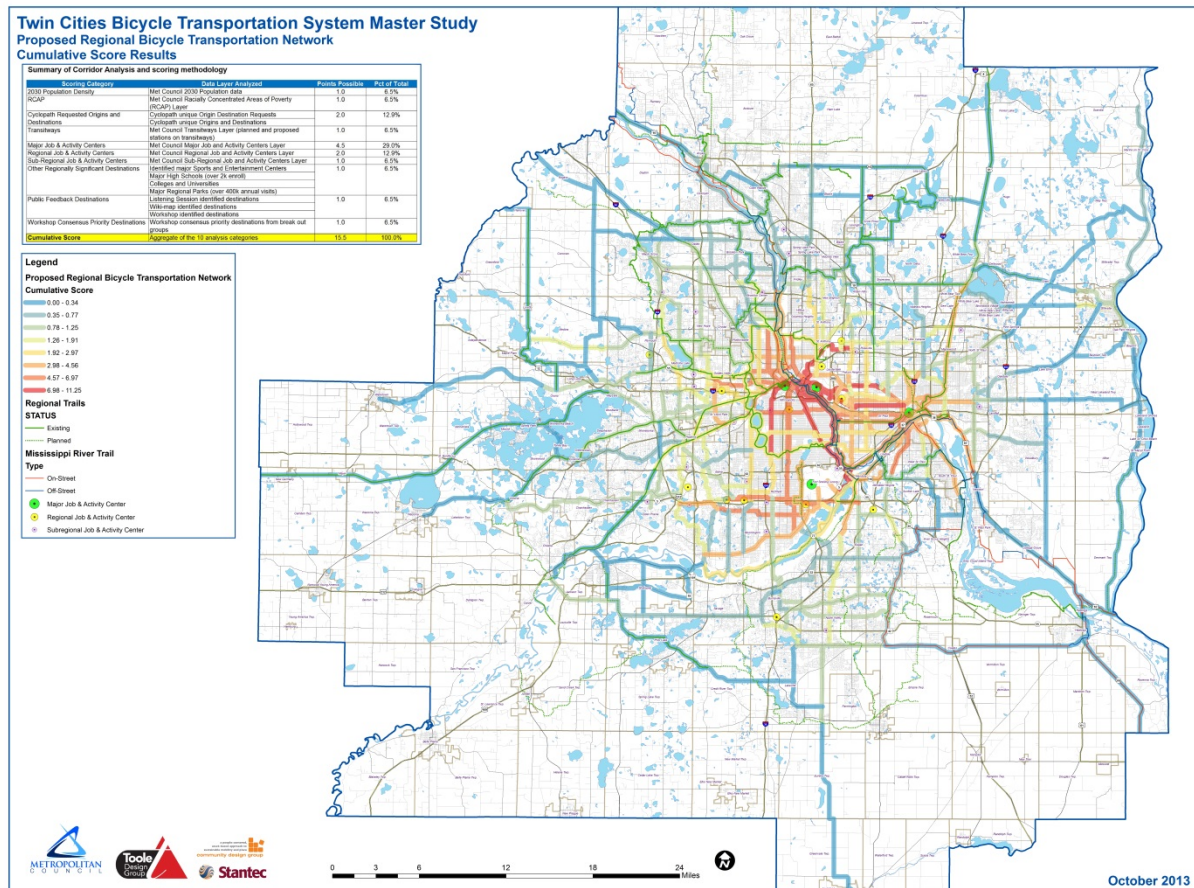
Figure 2 - Preliminary Scoring of Initial Draft Study Network Presented to PAC August 2013



The initial study network included a wide range of corridor lengths (ranging from 2 to 30 miles). The revised network focused on developing segments with more consistent length (averaging about 5 miles) with section breaks based on logical termini or transitions of land use intensity.

The revised network was scored using a refined methodology (see Appendix E - Scoring Methodology). The revised, scored network (see Figure 3) along with the proposed Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors were presented to the PMT, PAC and the public for review and comment.

Figure 3 - Final Study Network Scoring Presented to PAC and Public Workshops October 2013



In addition to the score, corridor prioritization was based on several considerations, including the following key factors:

- Connectivity - provide connections to and between destinations
- Metropolitan Council's 2030 Regional Development Framework – serve the developed and developing areas to reach the highest density of potential users (see Figure 5)
- Regional Geographic Equity - distribute the priority corridors throughout the developed and developing areas

In the 2030 Regional Development Framework, **developed areas** are those where most of the land has been developed and infrastructure is well established. Because the developed area for the region is quite large and includes much of the suburban developed area with the core cities, an additional level was used to isolate the corridors that serve the highest density developed areas of Minneapolis and Saint Paul.

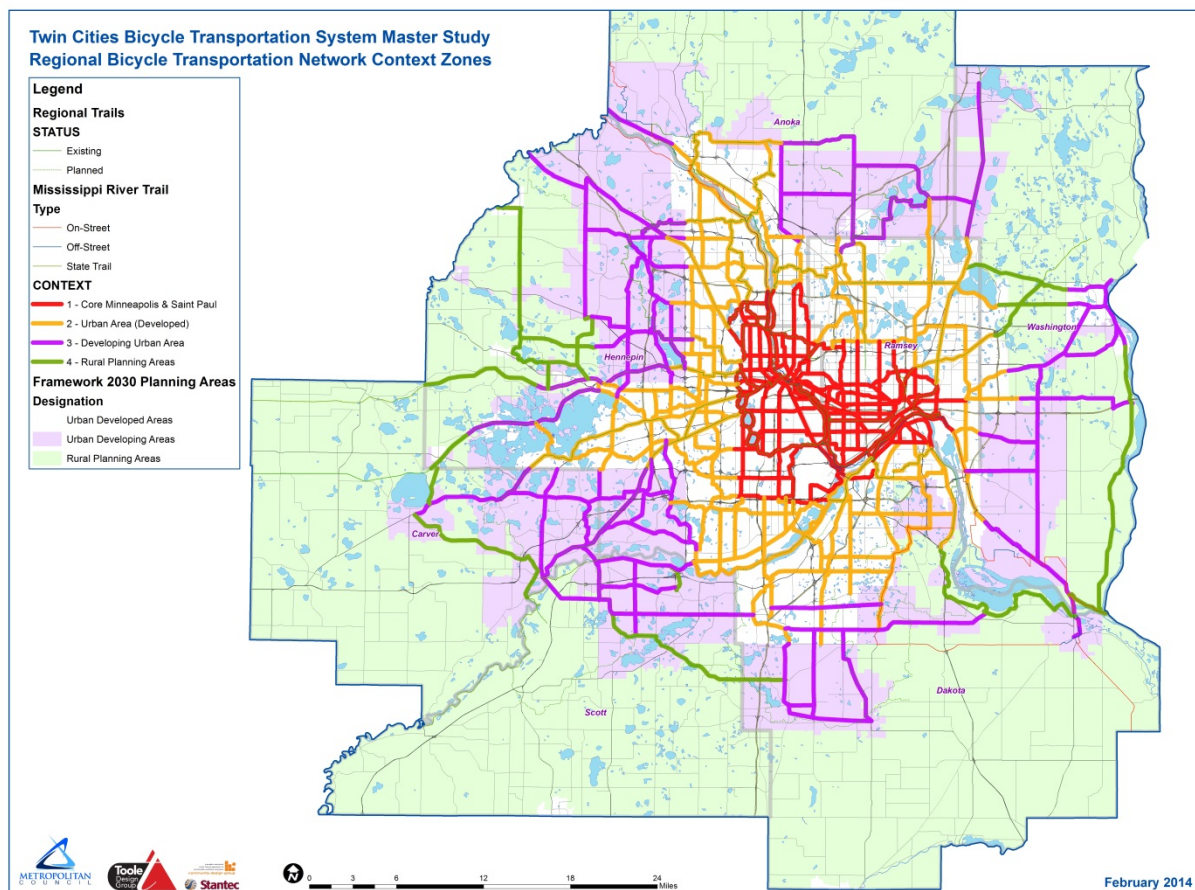
Developing areas are those where the most substantial amount of new growth is expected to occur in the coming decades. **Rural areas** are those that are dominated by cultivated farmland, nurseries,

tree farms, orchards and vineyards, scattered individual home sites or clusters of houses, hobby farms, small towns, gravel mines, and woodlands and are not expected to change.

The final analysis and development of draft Priority Regional Bicycle Transportation Corridors reflected a comparison of corridors based on the planning area designations with an additional category added for the Minneapolis and Saint Paul urban core as follows:

- Zone 1 – Urban Core of Minneapolis and Saint Paul (subset of the Developed Urban Area)
- Zone 2 – Remaining Urban Areas that are currently developed
- Zone 3 – Developing Urban Areas
- Zone 4 – Rural Planning Areas

Figure 4 - Proposed Regional Bicycle Transportation Network Context Zones



Proposed Network

The final proposed Regional Bicycle Transportation Network reflects significant changes based on a series of meetings with representatives from cities, counties, and MnDOT. The proposed network provides for a regional bicycle transportation system that mainly serves the developed and developing areas of the region. These corridors as presented are not intended to define specific facility alignments, but rather to identify the general corridors for implementation of a regional bicycle network. Corridors generally represent mile-wide bandwidths (1/2 mile in the urban core) where existing or planned facilities may or may not be known and identifiable. In cases where there is no existing or planned facility within a network corridor, the Met Council will continue to work with local stakeholders to identify appropriate routes and alignments.

The proposed Regional Bicycle Transportation Network is composed of two tiers of corridors (see Figure 6).

Definition: Regional Bicycle Transportation Network and Priority Regional Bicycle Transportation Corridors

Regional Bicycle Transportation Network. The entire set of proposed network corridors or facilities that serve as the “backbone” arterial system that will connect city and county bikeways with regional destinations.

Priority Regional Bicycle Transportation Corridors. A subset of the Regional Bicycle Transportation Network that have been identified as high priority based on the network scoring (described in Section 5.3) and the degree to which the corridors connect population centers with key regional destinations and the regional transit system. The “priority” corridors or designated alignments are intended to serve the highest potential bicycle demand based on the Met Council’s urban/suburban development context reflecting the existing and planned population and employment densities in the region.

Summary Statistics

The Proposed Regional Bicycle Transportation Network includes 1,270 miles of proposed network. Within the overall network there are 573 miles of Priority Regional Bicycle Transportation Corridor, or about 45% of the proposed network. Through the stakeholder engagement process 689 miles, or 54% of the corridors have a defined alignment. The miles of network within each county is shown in Table 1. Information about the land area and population of each county is shown in Table 2.

Table 1 - Network Summary Statistics

County	Network Mileage	Priority Bicycle Transportation Corridor (Miles)	Defined Network Alignment (Miles)
Anoka	98	36	65
Carver	49	22	34
Dakota	168	60	57
Hennepin	561	271	326
Ramsey	218	165	142
Scott	50	8	42

Washington	127	17	23
Seven County Total	1,270	579	688

Table 2 – County Land Area and Population

County	Land Area	Population (2012)	Population Density
Anoka	423.61	336,414	794.16
Carver	357.04	93,707	262.46
Dakota	569.58	405,088	711.20
Hennepin	556.62	1,184,576	2,128.16
Ramsey	155.78	520,152	3,339.02
Scott	356.68	135,152	378.92
Washington	391.46	244,088	623.53
Seven County Total	2,811	2,919,177	1,039

Figure 5 - Final Proposed Regional Bicycle Transportation Network & Priority Regional Bicycle Transportation Corridors

Twin Cities Regional Bicycle System Study

Regional Bicycle Transportation Network with Priority Regional Bicycle Transportation Corridors

Legend

Regional Trails STATUS

- Existing
- Planned

Mississippi River Trail

Type

- On-Street
- Off-Street
- State Trail

- Major Job & Activity Center
- Regional Job & Activity Center
- Subregional Job & Activity Center

Regional Bicycle Transportation Network Corridor Status

- Defined Alignment

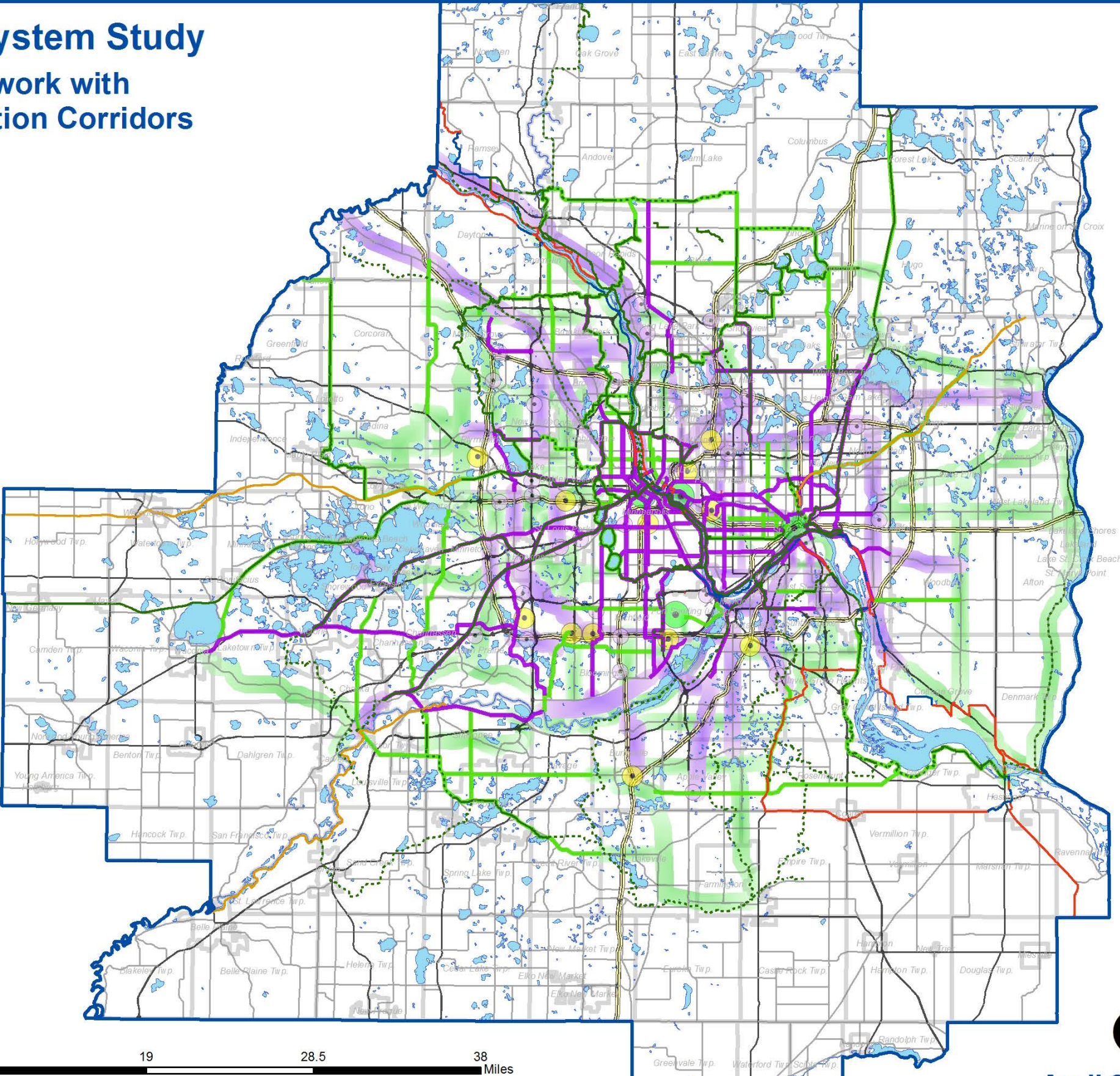
Priority Bicycle Transportation Corridor

Corridor Status

- Defined Alignment

Corridor Alignments not defined

- Regional Bicycle Transportation Network
- Priority Regional Bicycle Transportation Corridors



0 4.75 9.5 19 28.5 38 Miles

03/27/14

April 2014

Appendix E. Final Scoring Methodology and Maps

For the purposes of scoring, the draft network corridors were divided into segments of varying length, with an average corridor length of 5 miles with starting and ending points established based on logical termini or transitions in land use intensity. The analysis was conducted by creating a buffer around each corridor segment that captured a mile-wide swath. If, for example, a major destination fell within a corridor's buffer, that was presumed to be an asset of the corridor, and contributed to the corridor's overall score.

For purposes of evaluating the Regional Bicycle Transportation Network corridors, a one-mile width was selected for corridors outside of the highest density urban core of Minneapolis and Saint Paul and a width of a ½-mile was used for all corridors within the core cities.

The scoring criteria discussed below were developed based largely on best representation of Regional Destinations and factors that support existing and future demand for bicycle travel. The section below is an overview of each scoring category, the feature(s) evaluated and criteria for scoring.

Each corridor segment received a total category score based on the cumulative factor scores for that segment. The maximum number of points any corridor could score for each category is provided for reference. The relative percentage contribution to the overall cumulative corridors analysis score is also shown for each category.

Emphasis on Regional Destinations. A key function of the Network is connecting to regional destinations. As mentioned in Section 2 of this report, emphasis was placed on defining the purpose of the Regional Bicycle Transportation Network and on the determination of what constitutes a regional destination.

For purposes of the study, Regional Destinations were defined as being:

Regionally-recognized activity nodes or corridors where people work, shop, recreate, or are entertained. These may be further defined by one or more activity thresholds. Regional Destinations will typically be centers where multiple transportation modal options such as high-level transit service are provided.

Regional Employment and Activity Centers. Metropolitan Council staff, as part of Thrive MSP 2040, analyzed employment data to identify job and activity clusters across the region. These centers constitute many of the primary destination points within the region, and will be important to serve by bicycle. The Job & Activity Centers dataset based on 2010 employment data from the Census, 2010 existing land uses, and the proprietary Longitudinal Employer-Household Dynamics (LEHD) data from The Center for Economic Studies. A threshold was set for any areas to be recognized as a center when the area holds at least 7,000 jobs at a density of at least 10 jobs per acre of developable land.

There are three intensities of job and activity centers included in the analysis: metropolitan, regional, and sub-regional which are described in the following three tables, respectively. The following is a detailed description of each scoring feature, including the total points possible and percent of the cumulative score (shown as percent contribution to cumulative corridor analysis score) for each category, and a map of the scoring results for the October 2013 draft network. (Note: the final proposed network includes a number of edits and changes made based on stakeholder feedback after the October workshops that are not reflected on these scoring maps.)

Category: Metropolitan centers

Description: Metropolitan Centers held at least 50,000 jobs at the density of at least 50 jobs per acre. Four centers meet this threshold: downtown Minneapolis, downtown Saint Paul, the University of Minnesota-Twin Cities, and a district that includes the MSP Airport. 16.2% of regional jobs are contained in these areas.

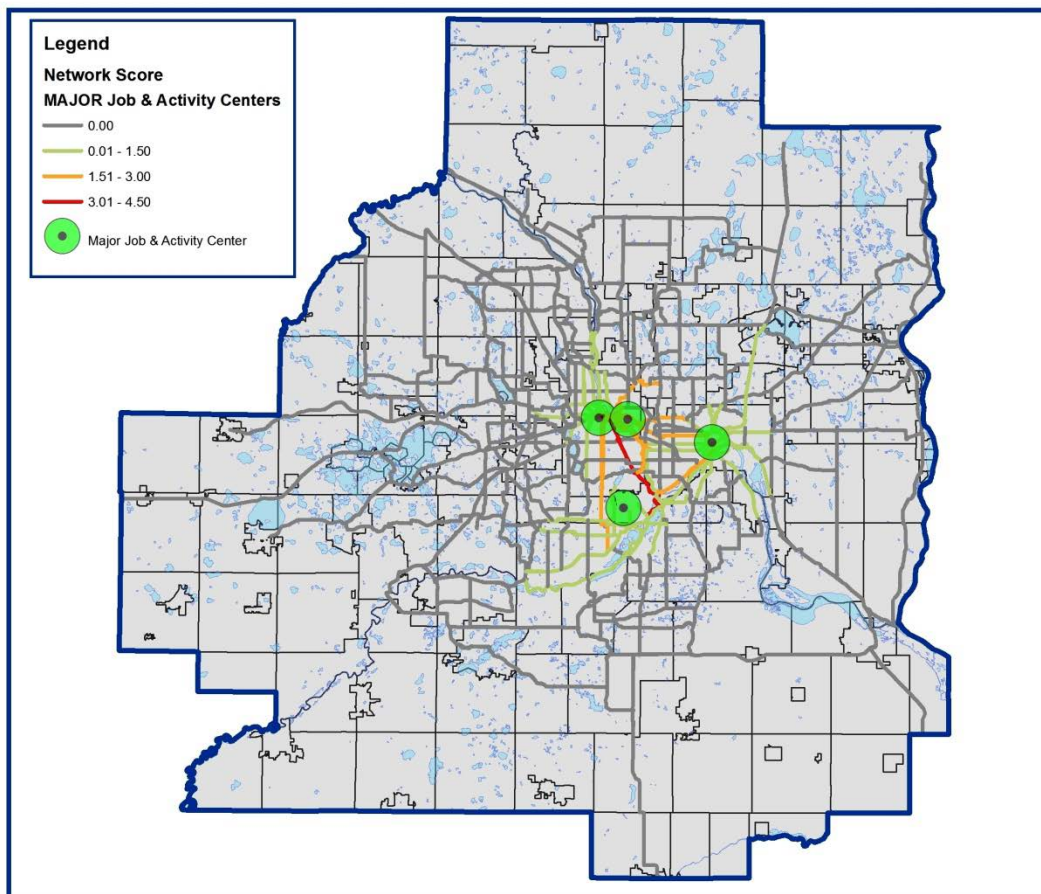
Scoring: Sum of major centers captured in the buffer, normalized so the maximum possible score was 4.5 points.

possible score:

4.5

percent contribution
to cumulative corridors
analysis score:

29.0%



Category: Regional job and activity centers

Description: Regional Centers represent a subgroup of the Job & Activity Centers dataset. Regional job and activity centers are those that held 15,000 to 49,999 jobs at a density of 10 to 49 jobs per acre. Twelve centers fall in this category, including areas such as the professional center around I-494/France in Bloomington and Edina, or the diversified center around MN-280/I-94 in Saint Paul. 16.0% of regional jobs are contained in these areas.

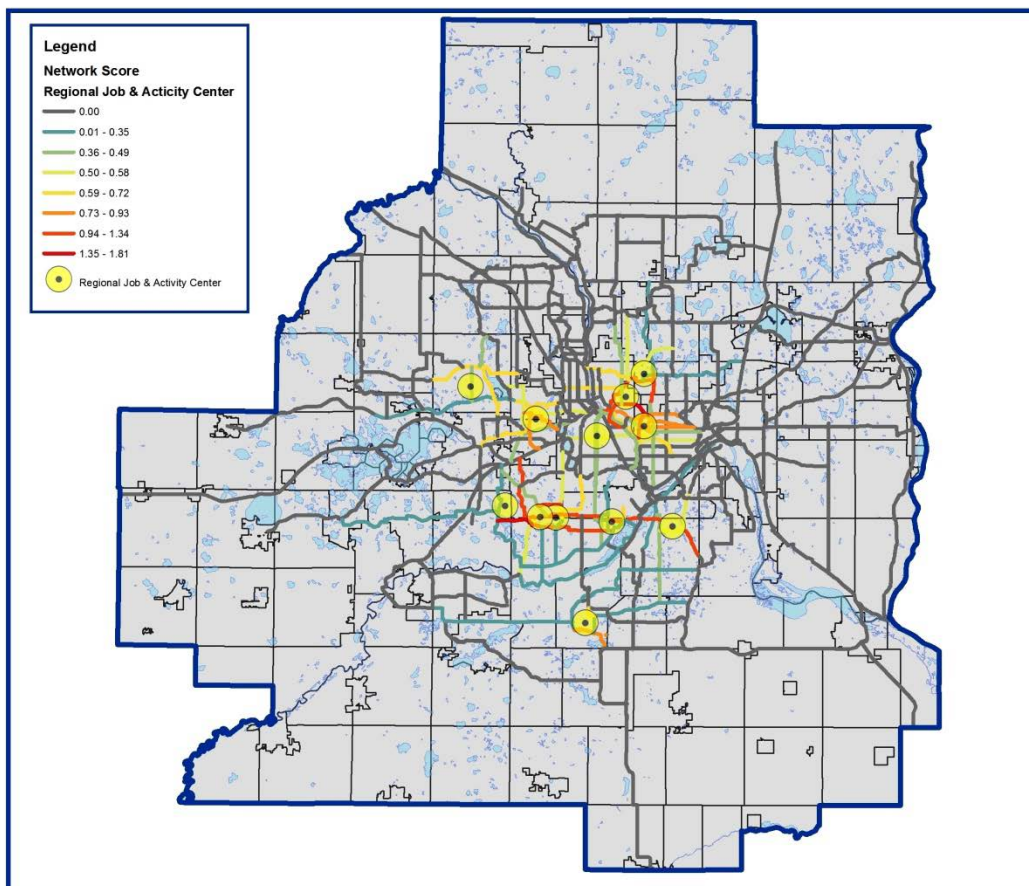
Scoring: Sum of regional centers captured in the buffer, normalized so the maximum possible score was 2 points.

possible score:

2.0

percent contribution
to cumulative corridors
analysis score:

12.9%



Category: Sub-regional job and activity centers

Description: Sub-regional job and activity centers represent a subgroup of the Job & Activity Centers dataset. Sub-regional job and activity centers have between 7,000 and 14,999 jobs, at a density of 10 to 49 jobs per acre. 28 centers fall in this category, including areas such as Southdale Mall in Edina, or the West Side Flats area of Saint Paul. 17.5% of regional jobs are contained in these areas.

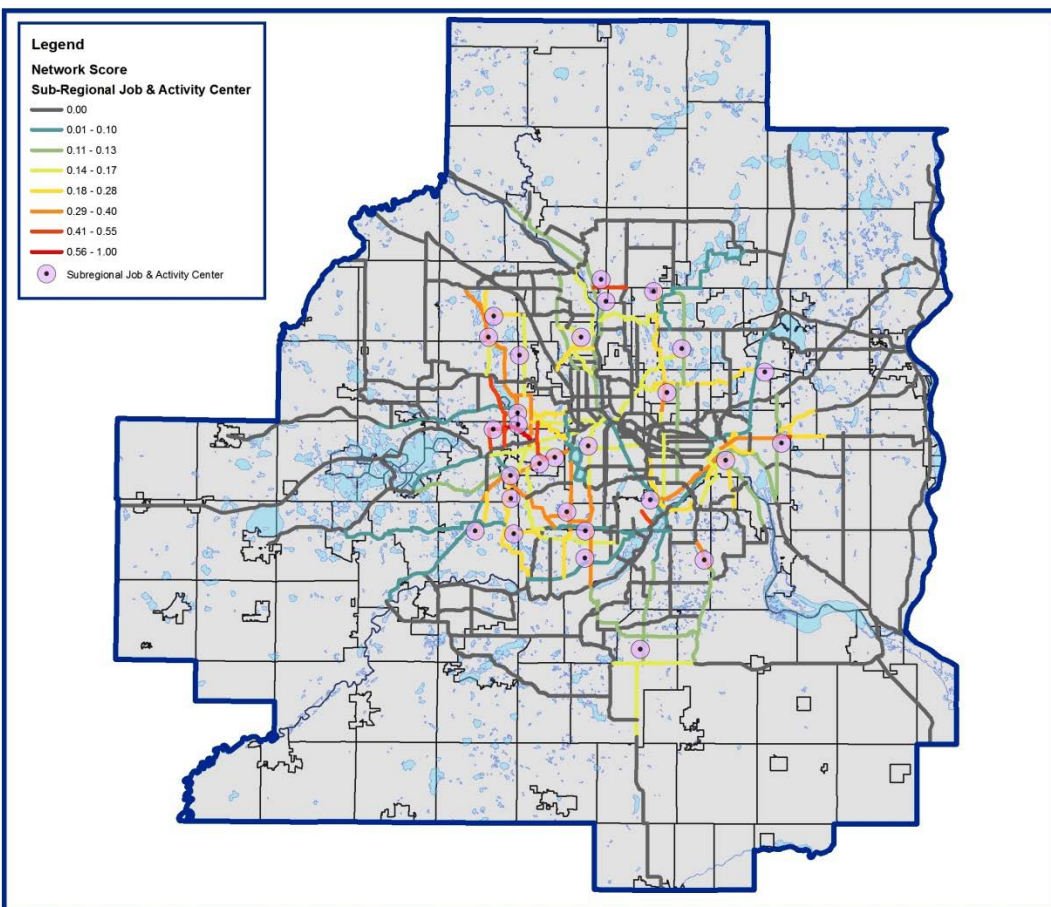
Scoring: Sum of sub-regional centers captured in the buffer, normalized so the maximum possible score was 1 point.

possible score:

1.0

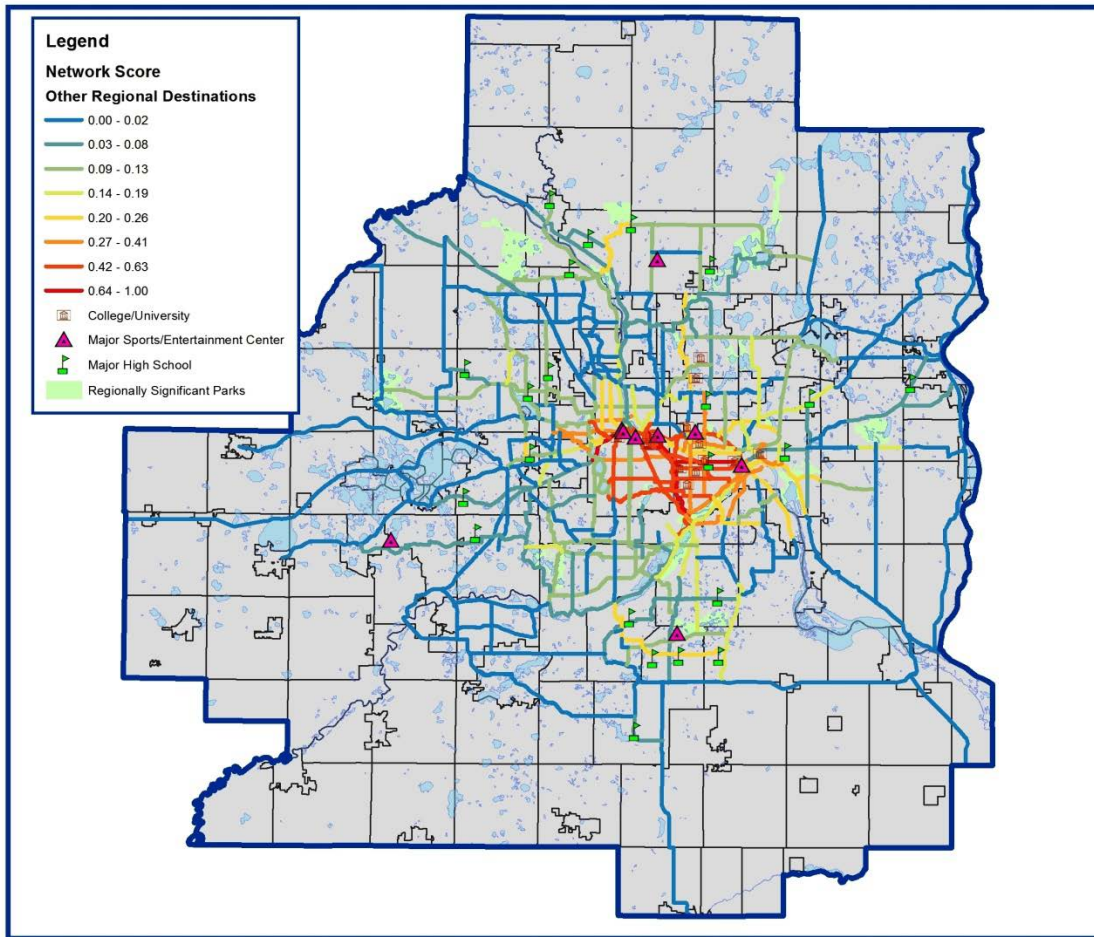
percent contribution
to cumulative corridors
analysis score:

6.5%



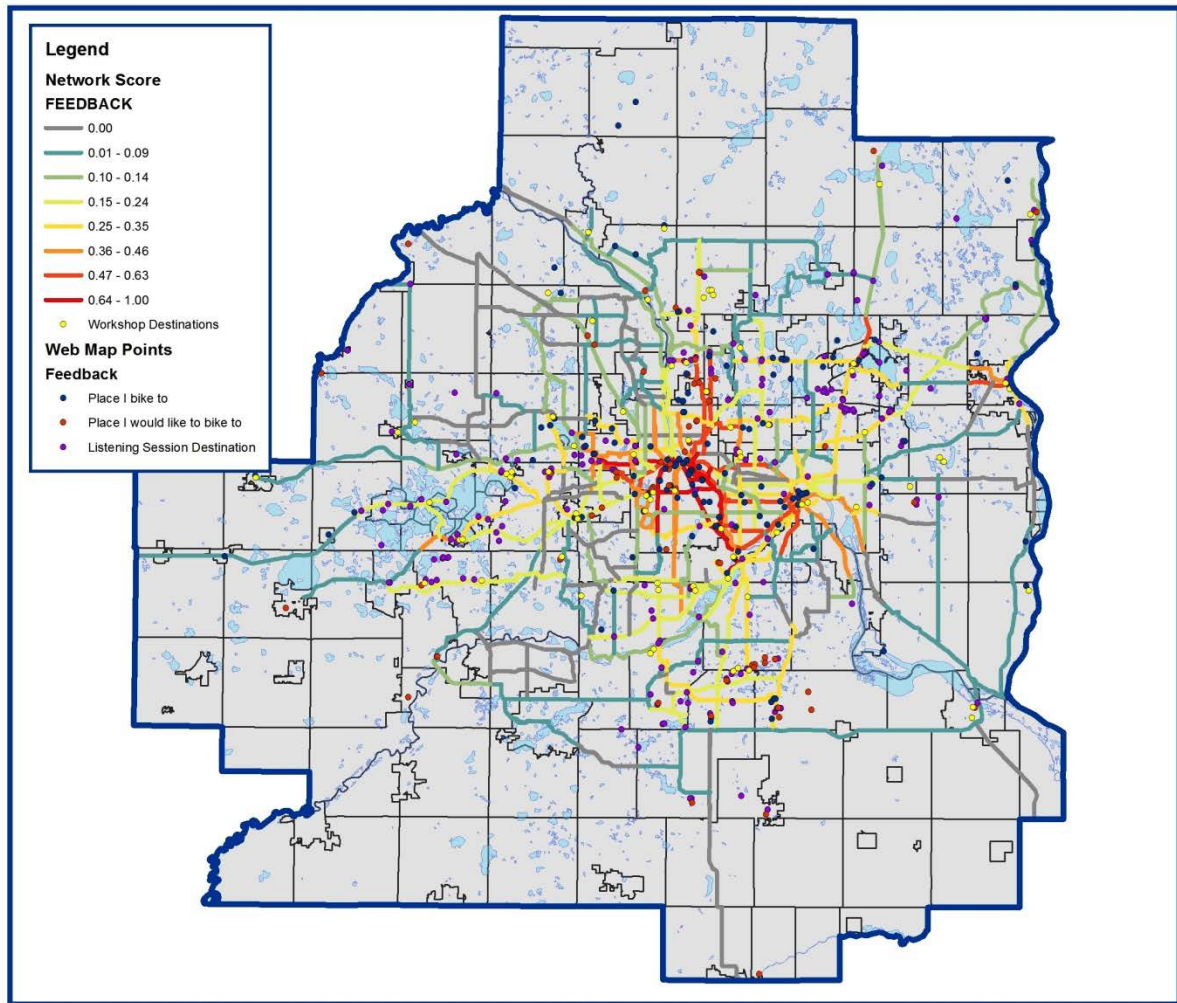
Other Destinations of Regional Significance. Because list of job and activity centers above was not all-inclusive, the study utilized several other categories of destinations that also factored into the analysis.

Category: Selected other destinations	
<p><i>Description:</i></p> <ul style="list-style-type: none"> • <i>Major sports and entertainment complexes</i> were identified, in particular those with a regional draw. This included Target Field, Target Center, TCF Stadium, Xcel Energy Center, the future Vikings stadium, the National Sports Center, the Minnesota Zoo, the University of Minnesota Arboretum, and the Minnesota State Fair. • <i>Major High Schools</i> in the region, which was defined as those with an enrollment in excess of 2,000 students. 22 such institutions were identified for analysis. • <i>Colleges and Universities</i> in the region, which includes those with an enrollment over 2,000. There are thirteen such institutions in Minneapolis Saint Paul. • <i>Major regional parks</i> in the region. The Metropolitan Council has designated a system of regional parks throughout Minneapolis Saint Paul, and among those parks, those that exceeded 400,000 visitors were identified. <p><i>Scoring:</i> The sum of these destinations that captured in the buffer, normalized so the maximum possible score was 1 point.</p>	<p><i>possible score:</i></p> <p>1.0</p> <p><i>percent contribution to cumulative corridors analysis score:</i></p> <p>6.5%</p>



Public Input – Regional Destinations. Throughout the public outreach process input on important destinations was mapped using GIS. These data points represent individual and group input about important bicycling destinations that should be included in the analysis. They fall into three categories:

Category: Feedback destinations	
<p><i>Description:</i></p> <ul style="list-style-type: none"> • <i>Destinations identified during listening sessions.</i> As described in Section 2, four listening sessions were held – one in each quadrant of the Twin Cities metro area. At each location, members of cycling clubs and residents with significant local knowledge worked in small groups and identified the major destinations that were important to serve in crafting a regional bicycle network. 76 such destinations were identified. • <i>Destinations identified through the interactive web-mapping tool (wikimap).</i> During the early phases of the project, a wikimap was made available online to collect and record feedback from the public at-large about key destinations they thought needed to be better represented in planning for bicycle infrastructure. In total, 203 destinations were identified on the wikimap. • <i>Destinations identified at project workshops.</i> On June 27th and July 11th, 2013, two public workshops were held. Workshop attendees were encouraged to identify destinations. In total, 74 unique destinations were identified in the project workshops. <p><i>Scoring:</i> The sum of these destinations that were captured in the buffer, normalized so the maximum possible score was 1 point.</p>	<p><i>possible score:</i></p> <p>1.0</p> <p><i>percent contribution to cumulative corridors analysis score:</i></p> <p>6.5%</p>



An additional category was provided to recognize regional destinations that were identified and then prioritized by group consensus during the June/July workshops.

Category: Feedback priority destinations

Description: During the workshops on June 27th and July 11th each group of participants were asked to consider a range of suggested destinations and work together to prioritize the five most important regional destinations in each quadrant of the region. The priority lists from each workshop group combined to make a list of 25 unique destinations.

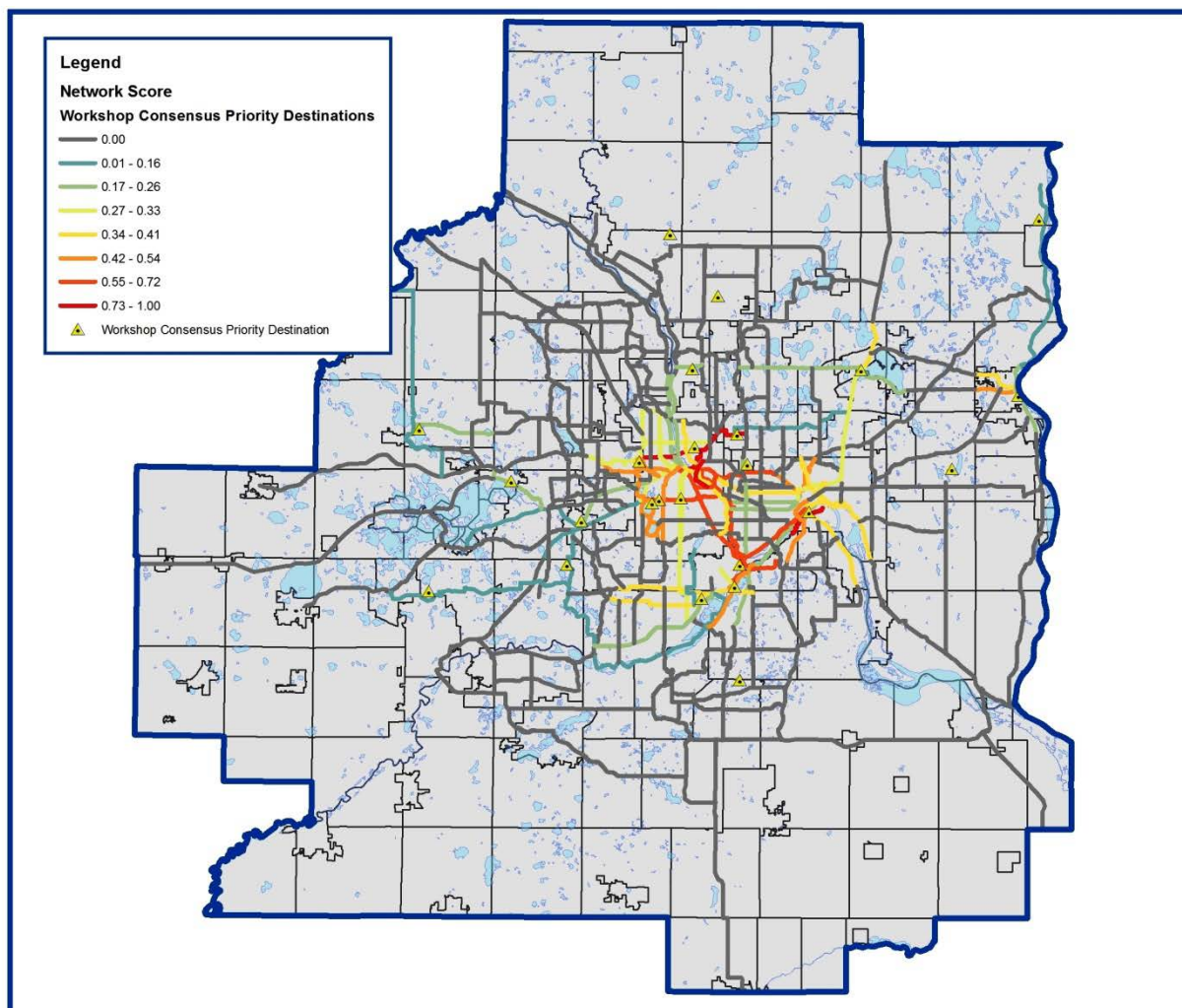
Scoring: The sum of these destinations that were captured in the buffer, normalized so the maximum possible score was 1 point.

possible score:

1.0

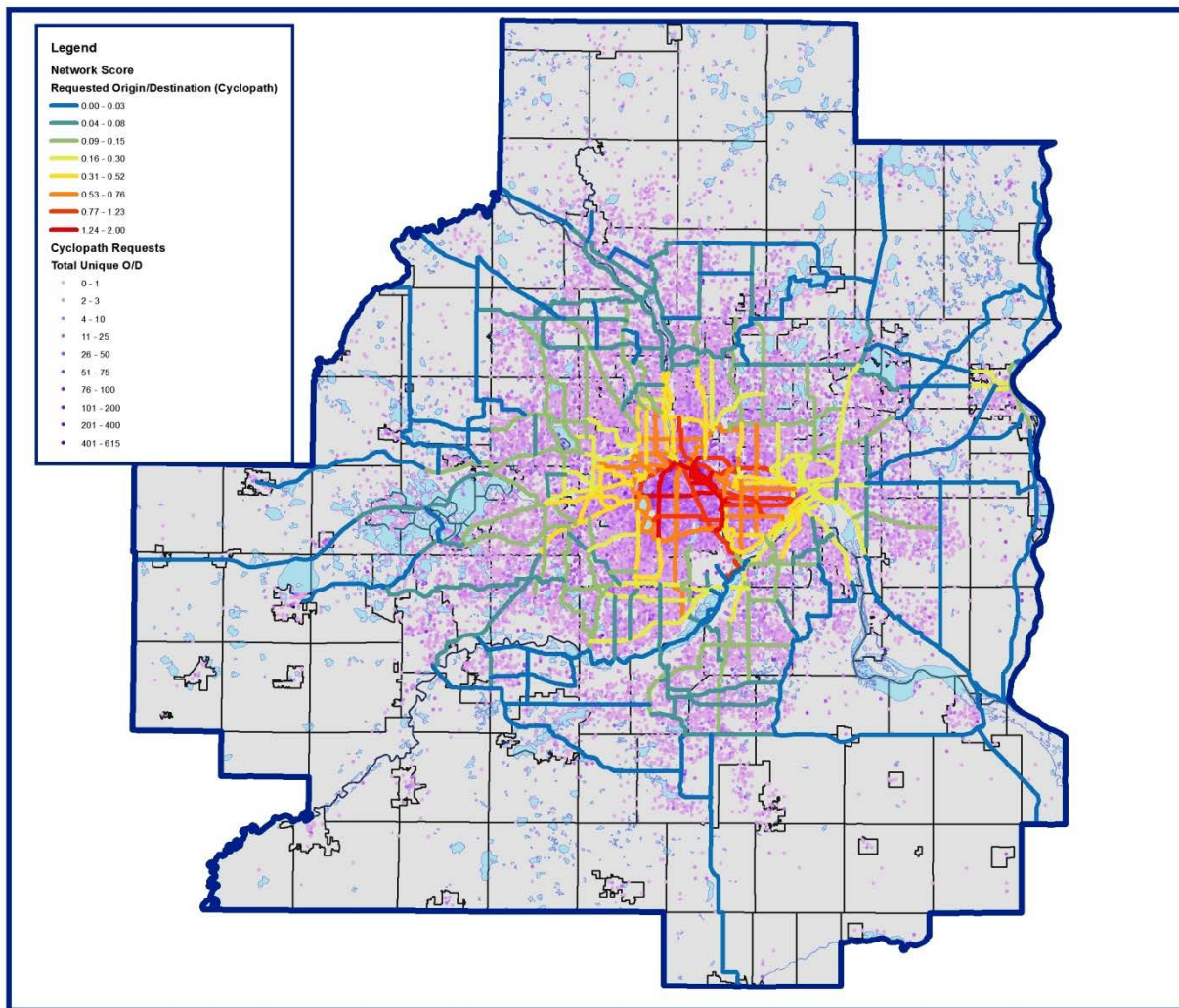
percent contribution
to cumulative corridors
analysis score:

6.5%



Origin Destination Demand. Cyclopath is a local online mapping-based bicycle route identification utility, built and hosted by the University of Minnesota’s GroupLens Research group. This web-based “geowiki” application assists the general public in finding suitable bicycle routes and providing feedback about the quality of the bicycle experience along local facilities. This on-line routing tool has the ability to capture a unique data set containing every route request from the website’s growing user audience. This includes both origin and destination data for every request since the website’s inception. While these requests do not necessarily represent actual trips, they provide a great surrogate for potential demand across and beyond the seven county region.

Category: Cyclopath origin and destination requests	
<p><i>Description:</i> There were 27,143 unique origin and destination data request points from Cyclopath included in the analysis.</p> <p><i>Scoring:</i> Two measures from the Cyclopath origins and destinations were added together to create the score:</p> <ul style="list-style-type: none"> • The sum of the unique origin and destination <i>requests</i> that were captured in the buffer • The sum of the unique origin and destination <i>locations</i> that were captured in the buffer <p>These two numbers were added together, and then normalized so the maximum possible score was 2 points.</p>	<p><i>possible score:</i></p> <p>2.0</p> <p><i>percent contribution to cumulative corridors analysis score:</i></p> <p>12.9%</p>



Connecting with Transit. One of the stated goals of this study is to better integrate the region's bicycle infrastructure with the region's transit infrastructure. The most meaningful connections between bicycle infrastructure and transit infrastructure will occur primarily at stations on regional transitways. The Metropolitan Council has data on all existing and planned stations along transitways across the metro area.

Category: Transitways and transit stations

Description: These stations include existing stations on the Northstar Commuter Rail Line, the Blue Line (Hiawatha LRT), the Red Line (Cedar Avenue BRT), as well as stations that have been specifically planned and proposed along the Green Line (Central Corridor LRT and Southwest LRT), and the Gateway Corridor.

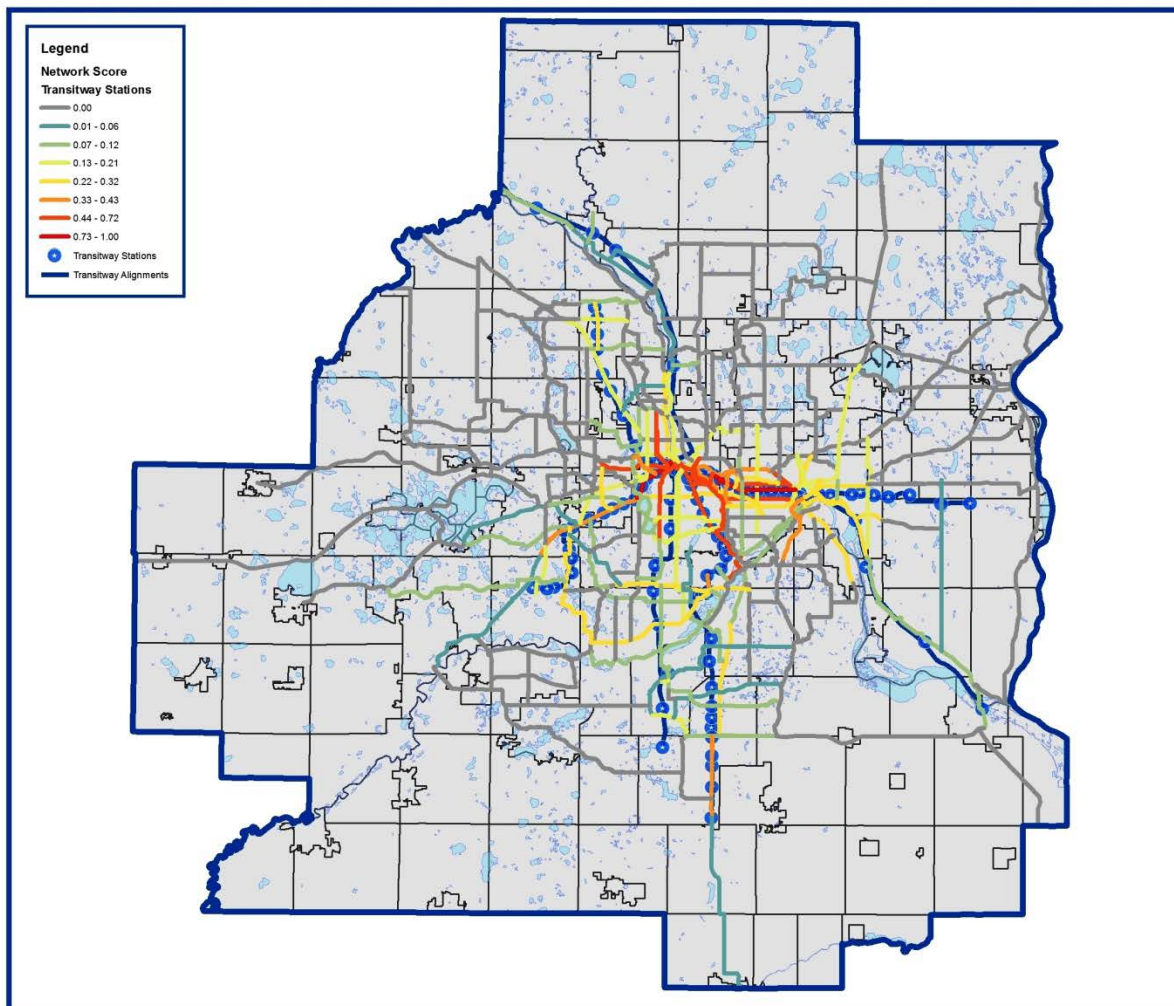
Scoring: Number of transit stations captured per square mile in corridor buffer, and then normalized so the maximum possible score was 1 point.

possible score:

1.0

percent contribution
to cumulative corridors
analysis score:

6.5%



Future Population. As part of the Blueprint 2030 plan for regional growth, the Metropolitan Council projected population density for areas across the region. Establishing a Regional Bicycle Transportation Network to serve long range transportation needs is closely tied to the future population growth in the region.

Category: projected 2030 population density

Description: Areas with population densities equal to or greater than 10 people per acre were identified, and selected from among the larger region as representing areas where the major destinations utilized in daily life were more likely to be easily accessible at bikeable distances.

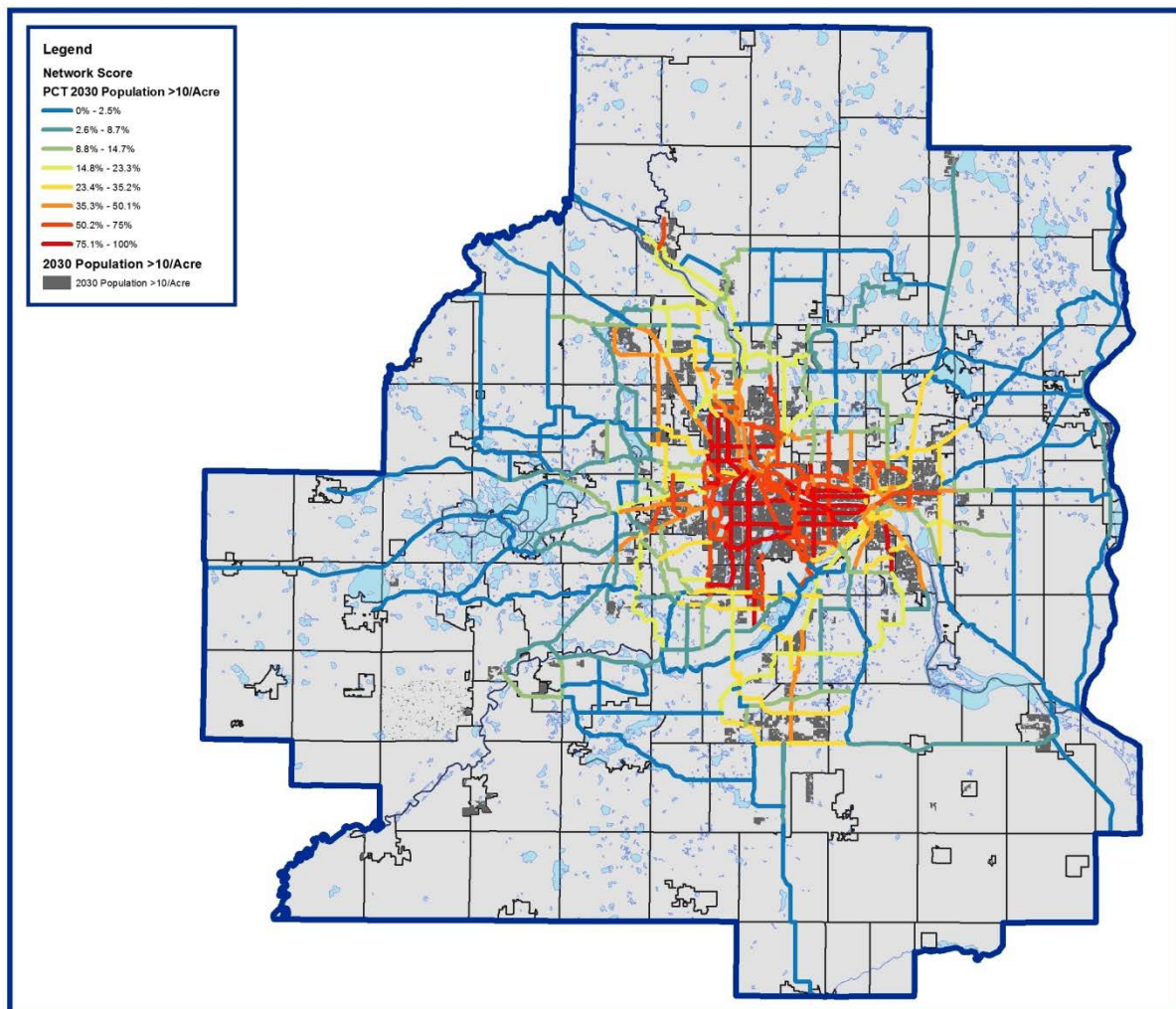
Scoring: Percent of buffer capturing areas projecting population density above 10 person/acre in 2030, normalized so the maximum possible score was 1 point.

possible score:

1.0

*percent contribution
to cumulative corridors
analysis score:*

6.5%



System Equity. As part of the Thrive MSP 2040 effort, the Metropolitan Council identified Racially Concentrated Areas of Poverty (RCAP). Given the diminished economic opportunity present in these areas, it was particularly important to ensure that a proposed bicycle network provide some level of equity to these underserved communities.

Category: Racially Concentrated Areas of Poverty (RCAP)

Description: RCAPs are areas where more than 50 percent of the residents are people of color and more than 40 percent of the residents have incomes less than or equal to 185-percent of the Federal poverty line. The region's RCAPs are clustered in its urban core and inner-ring suburbs. Central cities such as Minneapolis and St. Paul and inner suburban areas such as Brooklyn Center, Brooklyn Park, Richfield, and Fort Snelling include census tracts that are RCAPs.

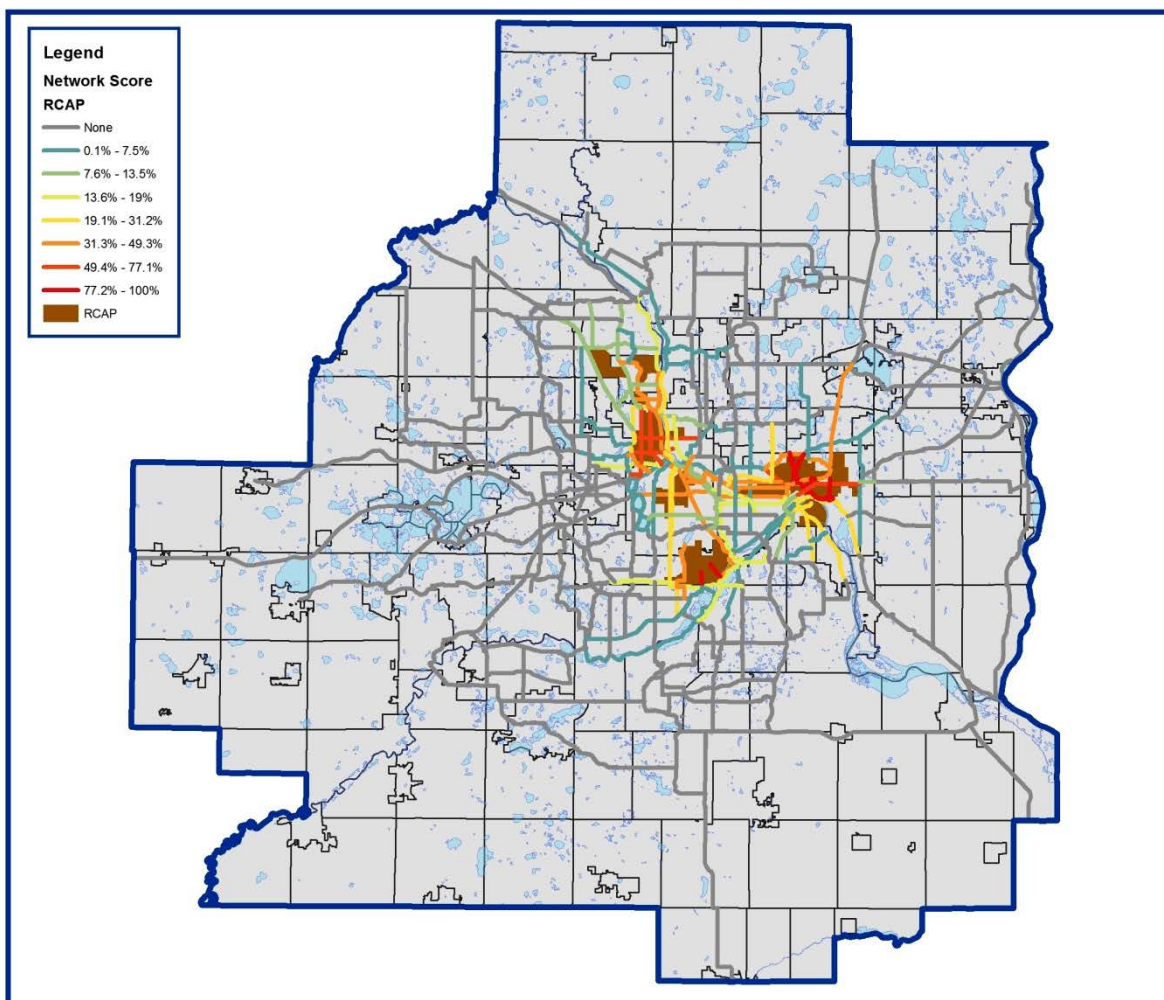
Scoring: Percent of buffer capturing the RCAP areas, and then normalized so the maximum possible score was 1 point.

possible score:

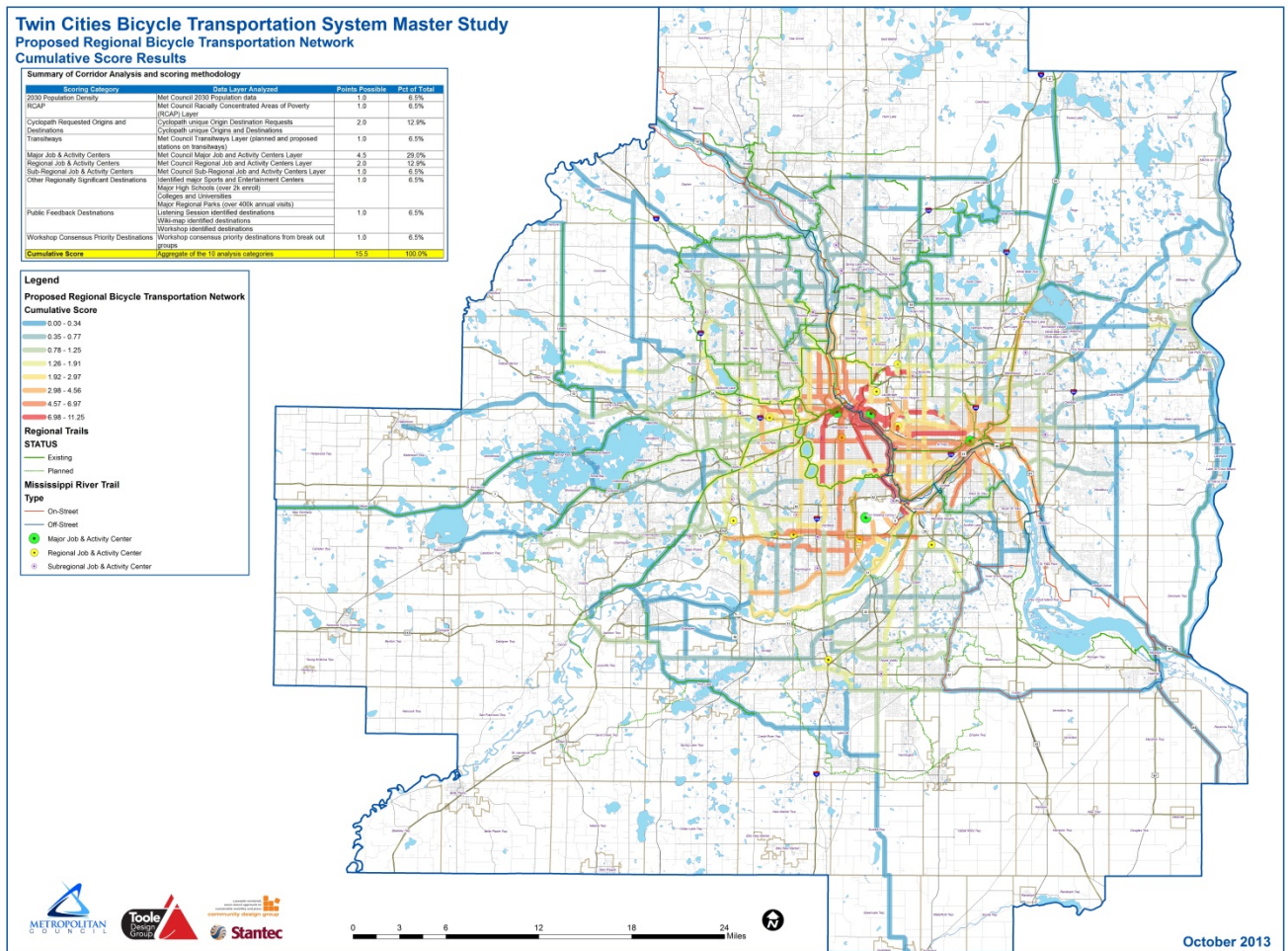
1.0

percent contribution
to cumulative corridors
analysis score:

6.5%



These ten features were added together to create a total score for each corridor segment. The following is a map showing the composite scoring results for the proposed Regional Bicycle Transportation Network.



Appendix F. Research on Performance Measures

In addition to the performance measures recommended here a number of other performance measures implemented or considered in other regions that were researched. The table below provides an overview of some select performance measures identified from other regions.

Performance Measure	Source
Bicycle counts	Seattle City Bicycle Master Plan (2013)
Bicycle and pedestrian miles traveled (total and per capita)	Portland Active Transportation Plan draft (August 2013)
Biking...mode share compared to 2010 modeled mode share within urban growth boundary	Portland Active Transportation Plan draft (August 2013)
Mode share by trip purpose	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Share of region's K-12 students that walk or bike to school	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Average peak period travel time by mode	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Percent increase in bicycle network separated from traffic	Portland Active Transportation Plan draft (August 2013)
Bridges accommodating bikes	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Share of streets with bicycle facilities (non limited-access highways)*	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Miles of designated bicycle routes	Blue Ridge Bike Plan (2013)
Miles of bikeable shoulders/bicycle lanes	Blue Ridge Bike Plan (2013)
Miles of multi-use trails/greenways	Blue Ridge Bike Plan (2013)
Miles of signed bicycle routes/share the road routes	Blue Ridge Bike Plan (2013)
Percentage of bicycle facilities addressed from plan	Blue Ridge Bike Plan (2013)
Percent network completion	Seattle City Bicycle Master Plan (2013)
Percent of regional trails completed	Portland Active Transportation Plan draft (August 2013)
Percent of center-line miles that are considered a "Complete Street"	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Jurisdictions with "Complete Streets" policies/ordinances	Blue Ridge Bike Plan (2013)
Essential destinations accessible within 30 minutes by bicycling and public transit for low income, minority, senior and disabled populations	Portland Active Transportation Plan draft (August 2013)
Number of essential destinations accessible within 30 minutes by trails [and] bicycling...for all residents.	Portland Active Transportation Plan draft (August 2013)
Percent of population within 1/2 mile of a shared-Use path or on-road bicycle facility	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed

Percentage of households within 1/4 mile of a bicycle facility	Seattle City Bicycle Master Plan (2013)
Areas lacking bicycle facilities	Seattle City Bicycle Master Plan (2013)
Network Connectivity Index	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Increase in connectivity of regional bicycle and pedestrian networks region-wide and by mobility corridor	Portland Active Transportation Plan draft (August 2013)
Increase in density of regional bicycle network region-wide and by mobility corridor	Portland Active Transportation Plan draft (August 2013)
Percent of transit Stations with bicycle accommodations*	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Bicycle parking availability and utilization at [transit] stops	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Number of crashes Involving a bicyclist per capita	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Number of bicycle crashes (by location, normalized for population & other features)	Blue Ridge Bike Plan (2013)
Collision rate	Seattle City Bicycle Master Plan (2013)
Number of pedestrian, bicyclist and motor vehicle occupant fatalities plus serious injuries	Portland Active Transportation Plan draft (August 2013)
Number of identified high crash rate locations rectified	St. Louis Bicycle Plan (2010)
Miles of projected vehicle traveled reduced per dollar for projects	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Cost/benefit ratio for major projects (benefits include reduced emissions, new transit riders, reduced toxics exposure, HH income to transportation, travel time to jobs, etc.)	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed
Annual emission reduced by the use of alternatives to single-occupancy vehicles (transit, rideshare, walking & biking)	Boston Region MPO - Appendix A - Draft Universe of Potential Performance Measures Developed