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RES 15-476

Saint Paul Bicycle Plan

An Addendum to the Saint Paul Comprehensive Plan

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Mayor & City Council

Chris Coleman, Mayor
Russ Stark, Council President
Dan Bostrom
Amy Brendmoen
William Finney
Dai Thao
Dave Thune
Chris Tolbert

Kathy Lantry , Former City Council President
Melvin Carter III, Former City Council Member
Nathaniel Khaliq, Former Interim Council Member

City Staff

This plan was developed by city staff as a collaborative effort between the departments of Public Works, Planning & Economic Development, and Parks & Recreation.

Kathy Lantry, Director of Public Works
Mike Hahm, Director of Parks & Recreation
Jonathan Sage-Martinson, Director of Planning & Economic Development

Nancy Homans, Former Interim Director of Public Works
Rich Lallier, Former Director of Public Works
Cecile Bedor, Former Director of Planning & Economic Development

Project Team

Michelle Beaulieu, Reuben Collins, Donna Drummond, Jesse Farrell, Mark Finken, Dan Haak, Luke Hanson, Hilary Holmes, Anne Hunt, Anton Jerve, Mike Klobucar, Paul Kurtz, Eriks Ludins, John Maczko, Jody Martinez, Paul St. Martin, Don Varney.

Former City Staff Emily Erickson, Allen Lovejoy, Christina Morrison, Mike Klassen

Minnesota GreenCorps

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Laura Eash, Luke Hanson, Mark Riegel

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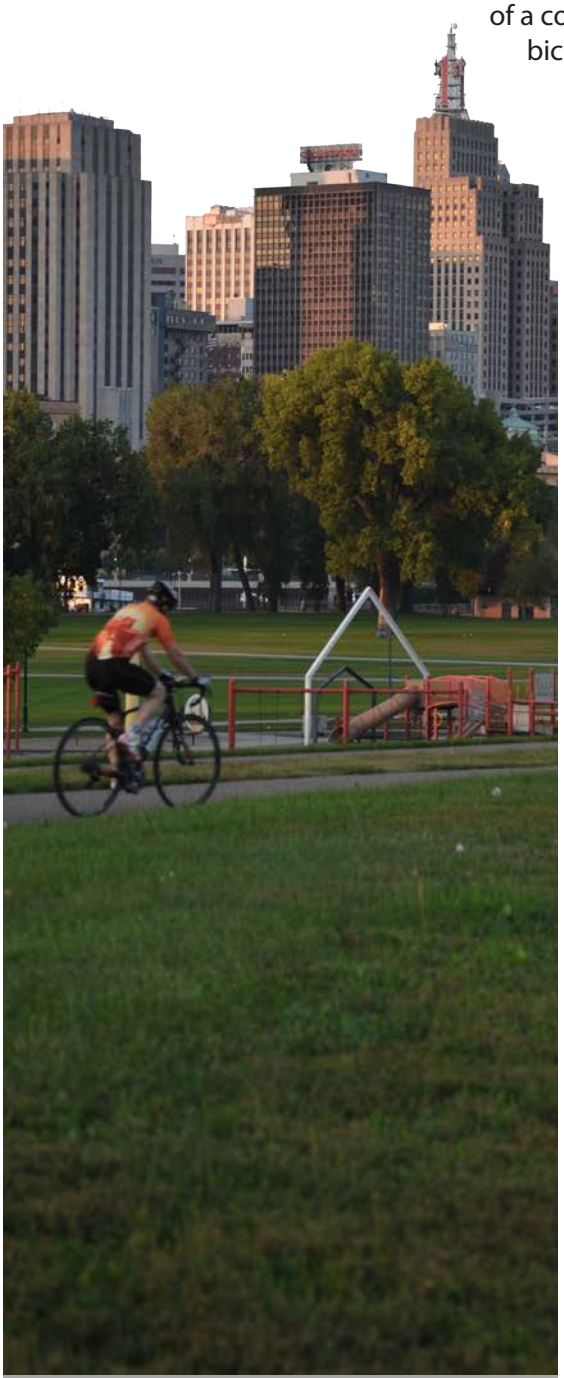
1.0 INTRODUCTION

The Saint Paul Comprehensive Plan adopted in 2008 establishes a strong vision to increase the number of bicycle trips throughout the city. The plan set a goal to increase the bicycle mode share from 2% in 2000 to 5% in 2025 and increase the mode share of bicycling commuters from 0.6% to 2.5% during the same period. The plan states a vision to become a world-class bicycling city, accommodating cyclists of all skill levels for both transportation and recreation while encouraging bicycle use as a part of everyday life. The plan promotes the development and maintenance of a complete and connected bikeway system, encouraging and supporting bicycling as transportation.



Saint Paul Bicycle Plan

1.1 Purpose

The purpose of this plan is to establish a framework that will allow Saint Paul to accomplish the goals in the Comprehensive Plan to increase the mode share of bicycling and establish a network of bikeways throughout the city. This plan establishes a vision for how and why bicycles will play an important role in the future of the city. To increase the number of people using bicycles, this plan outlines a wide range of policies, procedures, infrastructure improvements, and programs that will collectively create an environment conducive to bicycling.

The primary purpose of this plan is to provide a framework for the development of a bicycle network that allows all Saint Paul residents and visitors to safely and comfortably ride bicycles. This plan also provides a policy framework to aid in bicycle planning and development of facilities, provides recommendations regarding end-of-trip facilities such as bicycle parking and showers, and briefly outlines other bicycle programs.

1.2 Vision

Riding a bicycle is one of life's simplest pleasures. Bicycling is the easiest and most affordable way to travel around Saint Paul. Riding a bicycle allows residents to travel safely, conveniently, and efficiently as they go about daily business. Adults and children of all experience levels, skill levels, or preferences can comfortably travel by bicycle. Saint Paul is an attractive place to live and work for individuals and families who choose to reduce the number or frequency of trips made by automobile.

Bikeways in Saint Paul offer direct routes between important destinations, and the city ensures that bikeways are well maintained year-round. The bikeways in Saint Paul connect seamlessly with bikeways in surrounding communities, making regional bicycle travel attractive.

Downtown Saint Paul bikeways are connected elegantly with the surrounding neighborhoods. Bicycle facilities throughout downtown allow even the most casual of cyclists to access destinations downtown. Downtown is a critical hub where multiple trails and bikeways converge. Saint Paul residents know that riding a bicycle is the easiest, most convenient, and most affordable way to access downtown for leisure, for attending events, and for conducting business.

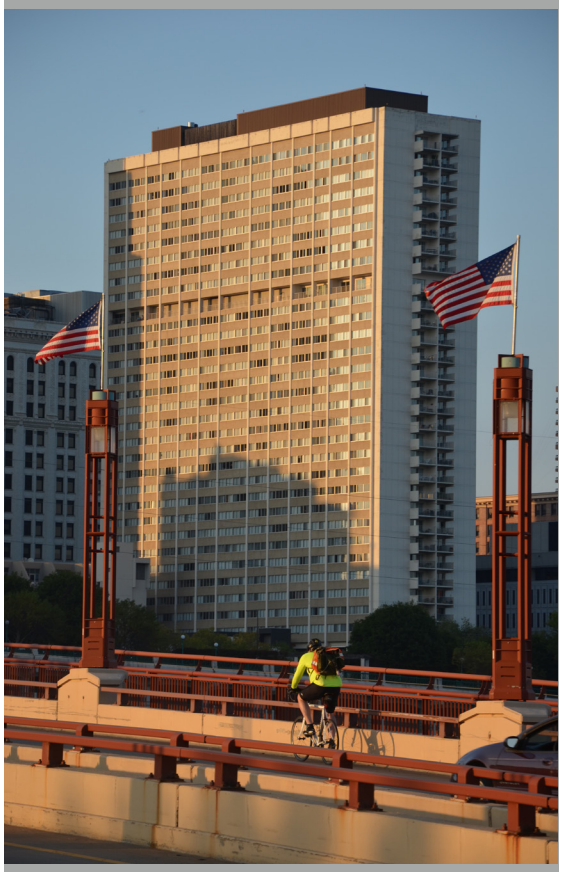
Bicycling is a favorite pastime in the city as residents enjoy the many off-street trails, the Grand Round, and the network of low-stress bicycle boulevards.

1.3 Public Planning Process

Phase I (2011-2013)

Phase I public involvement efforts began in 2011 with a concerted effort to understand how bicyclists were using the existing bicycle network and to gain a better understanding of what would encourage additional bicycle ridership. Phase I efforts included the following components:

- **September 2011 Open House Events** - Attendees of three open house events were asked to cartographically and verbally identify where they enjoyed riding a bicycle and what challenges they faced along the way. A summary of these meetings is presented in **Appendix A.**
- **Fall 2011 Electronic Web-Based Survey** - An electronic web-based survey was created in the fall of 2011 to gather input from the public about how they use the bicycle network. The city received 243 responses to the survey, which collected some general demographic information. The survey asked respondents to identify their home zip code, workplace zip code, gender, and age. The survey asked respondents to identify why they ride bicycles and allowed respondents to provide feedback on what would encourage them to ride a bicycle more often. A summary of the survey is presented in **Appendix B.**



Downtown Saint Paul is a critical hub where multiple trails and bikeways converge

Draft Bicycle Plan Open House in 2014

Question and answer session following the Draft Bicycle Plan Presentation in 2014

- **April-November 2013 Open Saint Paul Questions -** Three questions were posted on the city website using the Open Saint Paul engagement tool. Residents were asked questions regarding a vision for bicycling in Saint Paul, what key objectives should be included in this plan, where bicycle facilities are needed, what types of bicycle facilities they find attractive, and what concerns they have about riding in Saint Paul. A total of 114 comments were received and are presented in **Appendix C.**

Based on the results of the 2011 open houses, the 2011 web survey, and the information contained within the 2008 Comprehensive Plan, a set of criteria was developed to be used by city staff to create a draft network of proposed bikeways. The criteria established spacing guidelines for bikeways, as well as provided a list of the factors to be considered while identifying the draft bikeway network. The mapping criteria were posted to the city website and are presented in **Appendix D**.

Phase II (January – April 2014)

The draft plan was presented to the public in January 2014, and a deadline for receiving public comments on the plan was established for April 30 2014. Throughout these four months, city staff met with a number of neighborhood groups, advocacy groups, business groups and other organizations to gather feedback on the draft plan. A particular focus of Phase II was raising general awareness of the plan. Phase II efforts included the following components:

- **February 2014 Open House Events** – Four open house events were held to present the draft plan and request feedback. Attendees were encouraged to provide written comments. A total of 229 people attended the events and 60 statements were received
- **January – April 2014 Open Saint Paul Questions** – Two questions on Open Saint Paul asked residents to respond to questions about the draft plan as well as to begin establishing priorities for implementation. A total of 173 statements were received.
- **District Council Meetings** – City staff presented an overview of the draft plan at formal meetings of 14 of the 17 District Councils throughout the city. Ten of the District Councils submitted formal written comments to the city regarding the draft plan.

- **January-April 2014 Emails Received** – Residents were invited to send emails to city staff with any additional comments about the draft plan. A total of 144 emails were received.

A full summary of all Phase II involvement efforts and the statements received is presented in **Appendix E**.

Phase III (May 2014 – Adoption)

Phase III planning efforts centered on responding to comments received during Phase II and revising the plan to incorporate recommended improvements. City staff reviewed all comments received on the January 2014 draft of the plan and made substantial revisions to the plan as a result. A revised draft of the plan was presented to the public in October 2014. Phase III planning efforts included the following components:

- **November-December 2014 Open Saint Paul Questions** – A question was posted to Open Saint Paul requesting feedback on the October 2014 draft of the plan. A total of 98 statements were received.
- **November-December 2014 Emails Received** – Residents were invited to send emails directly to city staff with any additional comments about the draft plan. A total of 42 statements were received.
- **December 2014 Public Hearing at the Planning Commission** – A public hearing was held regarding the October 2014 draft of the plan. A total of 33 statements were delivered at the public hearing.

A full summary of all Phase III involvement efforts and the statements received regarding the October 2014 draft is presented in **Appendix F**. A final draft of the plan was presented to the public for adoption in February 2015.

Social Media & Newsletters

Throughout the development of this plan, several methods were used to publicize the efforts and encourage participation. The city distributes a monthly Bicycling Saint Paul electronic newsletter via email to a list of nearly 2,000 subscribers. The newsletter reports on all new and ongoing efforts relating to bicycling throughout the city, including opportunities to participate in the public involvement efforts detailed here. In addition the Department of Public Works maintains a Facebook and Twitter account, and opportunities to participate were publicized through these channels.

A video encouraging participation in the development of the Draft Bicycle Plan was shared on social media

Bicyclists on Summit Ave

1.4 Plan Scope & Use

The development of the Saint Paul Bicycle Plan marks a key milestone in Saint Paul bicycling history. While numerous previous planning efforts have addressed bicycling in one form or another, this is the first citywide bicycle planning effort that attempts to comprehensively address policies, infrastructure, and procedures for bicycles on a citywide and cross-departmental basis.

This plan has been adopted by the City Council as an addendum to the Comprehensive Plan. The recommendations of this plan should be incorporated into the next update of the Comprehensive Plan, and should serve as the starting point for other planning efforts that reference bicycling.

This is a corridor-level planning document that identifies specific corridors for future investment in bikeway infrastructure. Each corridor recommended in this plan has been subjected to a basic feasibility analysis. However, the scope of this plan does not permit looking at each corridor with a level of detail sufficient to complete final design. The details of each of the corridor recommendations in this plan will require further analysis and development before implementation.

This plan does not assess the current physical condition of existing bikeway facilities, though it does evaluate the appropriateness of each existing bikeway facility type within the larger bikeway network. It does not assess the need for small-scale improvements to existing bikeways (for example, a reconfiguration of an intersection to address a safety concern).

As a corridor-level planning document, this plan can not anticipate the many small-scale connections throughout the city that potentially provide great value to the community. For example, the construction of a short trail spur connecting a neighborhood to an adjacent trail, or creation of spurs from the proposed network to reach schools in order to achieve a Safe Routes to School network, may not be identified in this plan, though it is clearly in the spirit of promoting bicycle travel throughout the city. Such proposals should be judged to be consistent with the intent of this plan.

This plan should not be interpreted as a recommendation against providing bicycle facilities on any corridors. This plan does not identify any corridors where bicycle facilities would be inappropriate (beyond the corridors where bicycles are prohibited) or would not provide value and benefit to bicyclists.

The corridors for which this plan does not make recommendations should be interpreted as corridors where this plan did not identify the development of bicycle facilities as a priority, either because of limited space, because there are other priorities for the corridor, or because the corridor was not recognized as integral to establishing a network of bikeways.

1.5 Future Plan Updates

As is the case with all planning documents, this plan will require future updates to remain useful and relevant. The current state of bicycle planning nationwide is rapidly evolving and U.S. cities are embarking on an age of experimentation with new bicycle facilities. Cities are beginning to design and build new types of bikeways that were relatively unknown as little as five years ago. It is anticipated that bicycle planning innovations will continue to accelerate.

It is recommended that this plan be updated approximately every 5-7 years to take advantage of new opportunities, new innovations, and new trends. It is likely that over the coming years, new priorities or strategies will emerge citywide, and new initiatives and programs will be desired.

Chapter 2:
Why Bicycling Matters

Saint Paul
Bicycle Plan

2.0 WHY BICYCLING MATTERS

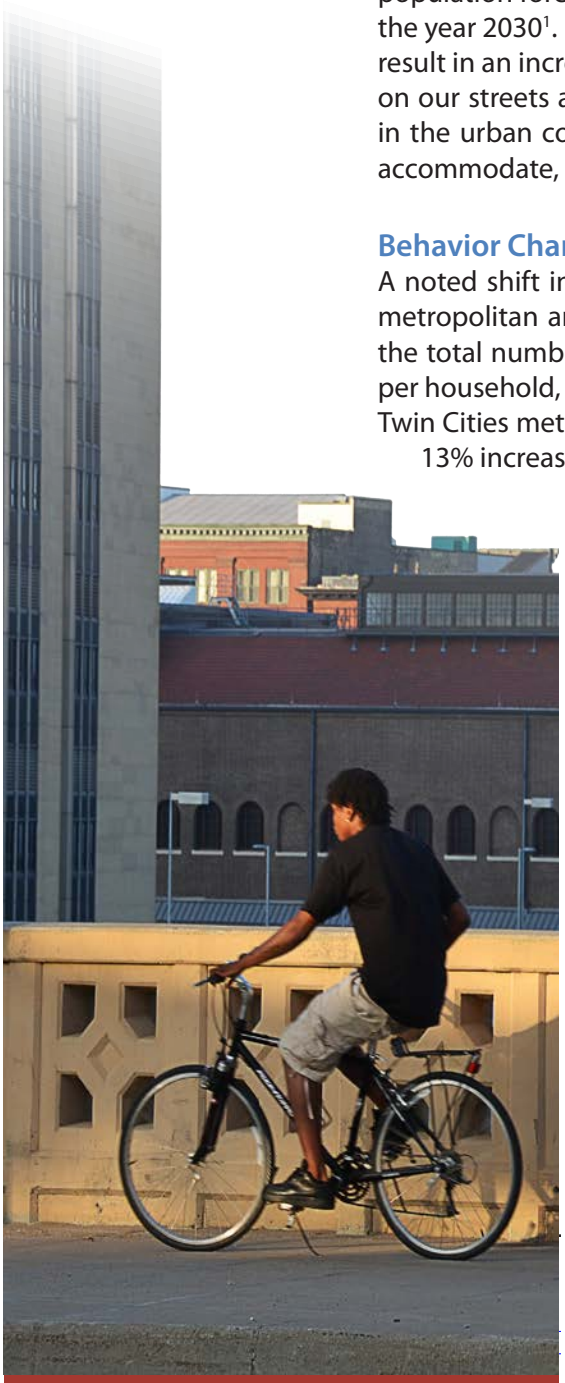
2.1 The Changing Landscape

Growth & Congestion

As Saint Paul continues to grow, population and redevelopment pressures will test our existing transportation infrastructure. According to the Metropolitan Council population forecasts, Saint Paul is projected to add an additional 45,000 residents by the year 2030[1]. As Saint Paul is fully developed within its boundaries, this growth will result in an increasingly dense built environment, and is likely to increase congestion on our streets and highways. Redevelopment pressures and increasing land values in the urban core will make automobile-oriented land uses increasingly difficult to accommodate, necessitating a flexible and multi-modal approach to transportation.

Behavior Change

A noted shift in transportation behavior is occurring nationwide. In the Twin Cities metropolitan area, motorized trips per household, motorized trips per person, and the total number of car trips have all declined since 2000. Similarly, licensed drivers per household, and vehicles per household have declined since 1970. Since 2000, the Twin Cities metropolitan mode share changes reflect a 6% decrease in driving, and a 13% increasing in bicycling.[2]



While a variety of factors contribute to these behavioral trends, considerations include: the cost of owning and operating an automobile, environmental and sustainability concerns, a desire for an active lifestyle, telecommuting and communication technology, the close proximity of employment and amenities in urban centers, the economic effects of the recession, and other time-competitive transportation modes.

2.2 Bicycling Complements our Existing Transportation Infrastructure

A safe and connected network of bicycle facilities will afford Saint Paul greater choice in transportation options. Providing practical transportation choices will maximize the efficiency of our current transportation system, providing options that better utilize the existing infrastructure. When paired with transit, for

1 U.S. Census Bureau, Decennial Census, "Metropolitan Council Annual Estimates, and Metropolitan Council Forecasts," January 2012. http://stats.metc.state.mn.us/profile/detail.aspx?c=02396511

2 Metropolitan Council, "The 2010 MSP Travel Behavior Inventory Report (TBI)," 2010. http://metro-council.org/Transportation/Planning/Transportation-Resources/Transportation-Behavior-Inventory/Travel-Behavior.aspx

example, bicycling can effectively expand and enhance mobility, extending trip distances and better connecting people to their jobs, schools, medical facilities, recreation, and entertainment.

Green Line LRT

With the Green Line light rail transit (LRT) line opening in 2014, Saint Paul has a unique opportunity to enhance bicycle access to Green Line stations, increasing accessibility while supporting ridership along the line. The Central Corridor Action Plan adopted by the city in 2010 advocates for bicycle and pedestrian connections and facilities that create a safe and inviting environment around the LRT line and surrounding area.[3] Developing safe and accessible bicycle connections to the Green Line will increase mobility, enhance community livability and sustainability, and attract new transit riders.

Nice Ride Minnesota

In 2011-2013, Nice Ride Minnesota, the non-profit bike-sharing program of the Twin Cities, made a significant expansion into Saint Paul.[4] Investing in bicycle facilities in Saint Paul will help capitalize on the existing network of Nice Ride stations, providing safe and connected bikeways that encourage utilization and promote Nice Ride as a practical and efficient solution for short trips within the Twin Cities.

The Existing Bicycle Network

Greater connectivity within Saint Paul's existing bicycle network will significantly enhance mobility and convenience. A more connected and balanced network will encourage and promote bicycling as transportation, helping people more safely and effectively travel throughout the city. Locally, increased neighborhood accessibility will improve quality of life and create new economic opportunities. It will also promote multi-modal transportation options, providing the infrastructure to better connect bicyclists with other transportation modes and facilities. Connections to regional amenities like the Gateway State Trail and Samuel Morgan Regional Trail will encourage travel into the city, and support bicycling as a tool for both transportation and recreation.

Nice Ride MN station in Saint Paul

3 City of Saint Paul, "Bike Walk Central Corridor Action Plan," May 2010. http://www.stpaul.gov/index.aspx?nid=2842

4 Nice Ride Minnesota,"Our Story,"Niceridemn.org/about, retrieved on October 19th, 2013. https://www.niceridemn.org/about/

When paired with transit, bicycling can increase trip distances and decrease travel time

The limited space requirements and high efficiency of bicycle facilities make a compelling case for further investment

2.3 Affordability & Equity

To distinguish Saint Paul as a vital place for people and economic development, equitable access to transportation is a necessity. With over 20,000 residents in Ramsey County without access to a vehicle, bicycling can provide enhanced mobility and access to those who rely on transit, shared rides, and walking for transportation.[5] According to the US Census American Community Survey data, roughly 15% of Saint Paul residents do not have vehicles available for daily use. As the costs of owning and maintaining a car continue to rise,[6] bicycling positions itself as a comparatively affordable transportation option while maintaining the independence and trip choice often associated with car ownership. When paired with transit, bicycling can increase trip distances and decrease travel time, better linking people with employment, education, and entertainment. Investing in bicycle facilities, particularly in low-income neighborhoods with high transit-dependent populations, will promote greater transportation equity and better connect Saint Paul residents with the services, jobs, and amenities they rely on.

2.4 The Benefits of Bicycling

Practical & Competitive

Similar to the initial appearance of the bicycle in urban areas in the late 1800's, bicycling is once again emerging as a practical and efficient mode of transportation. Saint Paul's urban environment is conducive to bicycle travel, often providing competitive travel times on short-distance trips without the parking concerns associated with automobiles. While not immune to the realities of a northern climate, Saint Paul residents embrace the challenges of winter, aided by plowed and maintained bicycle facilities throughout the city. As automobile-oriented uses become increasingly difficult to accommodate, the limited space requirements and high efficiency of bicycle facilities make a compelling case for further investment. Changing demographics, attitudes, and lifestyles encourage multi-modal transportation options, while research continues to correlate bicycling with health, economic, safety, and environmental benefits.

5 Metropolitan Council, "Public Transit and Human Services Transportation Coordination Action Plan Twin Cities Metropolitan Area," February 2013. http://www.metrocouncil.org/Transportation/Publications-And-Resources/Public-Transit-and-Human-Services-Transportation-C.aspx

6 AAA, "Your Driving Costs, How much are you really paying to drive?," 2013. http://exchange.aaa.com/wp-content/uploads/2013/04/Your-Driving-Costs-2013.pdf

Bicycling is a Convenient & Affordable Means of Exercise

Bicycling is a fun and practical way of incorporating physical activity into your daily routine. Burning between 300 and 500 calories an hour, bicycling is an affordable and dependable mode of transportation that allows you to stay fit as you commute.[7]

Bicycling Helps Reduce Health Risks Associated with Obesity

Obesity is a national epidemic, and Minnesota is no exception. According to the Minnesota Department of Health, two out of every three Minnesotans are overweight or obese, due in part to insufficient physical activity.[8] The benefits of physical activity in decreasing obesity and enhancing overall health are well established, having proven to reduce the risk of heart disease, diabetes, high blood pressure, and other chronic illnesses. Active transportation can incorporate physical activity into daily routines, providing regular opportunities for exercise while bicycling and walking. The Minnesota Department of Health supports active transportation as a means to increase opportunities for physical activity, promote sustainable change in the overall health of the community, and decrease money spent towards health care.[8] A network of safe and well-connected bikeways will support active transportation in Saint Paul, allowing people of all ages and abilities to achieve daily physical activity and while increasing their physical and mental well being.

Bicycling Strengthens Saint Paul's Economy

Bicycling has an extensive and comprehensive impact on the local and regional economy. According to a recent study by the University of Minnesota, as the number of Nice Ride bike-sharing stations in the Twin Cities has grown, so has the economic activity in the areas surrounding them. The study estimated that cyclists spent $150,000 more annually near bike sharing stations as a result of the Nice Ride program.[9] More directly, bicycling supports local Saint Paul bike shops, manufacturers and distributors, rental outlets, wholesalers, and non-profit organizations. These impacts are wholly positive, and represent a bicycling-specific local economy. While more difficult to assess, indirect economic considerations, like reduced personal and societal health care

Bicycling supports a diverse array of local businesses and organizations in Saint Paul (Pictured: Cycles for Change)

7 511.org, "Bike to Work – Commuting by Bike", retrieved October 17th, 2013. http://bicycling.511.org/bike_work

8 Minnesota Department of Health, "Active Transportation, Promoting Active Transportation Fact Sheet," March 2012. http://www.health.state.mn.us/divs/hpcd/chp/cdrr/physicalactivity/docs/promotingactivecommunitiesfactsheet.pdf

9 Schoner, Jessica, University of Minnesota Humphrey School of Public Affairs, "Sharing to Grow, Economic Activity associated with Nice Ride Bike Share Stations," May 2012. http://www.cts.umn.edu/events/conference/2012/documents/presentations/24-schoner.pdf

costs associated with regular physical activity, are also important considerations, and reflect the comprehensive impact of bicycling on the local economy.

Bicycling Promotes a Healthy Environment

Traditional air pollutants from automobiles, such as fine particles, ozone and toxic air contaminants, contribute to serious health effects, particularly among the young and elderly and Minnesotans with heart and lung conditions.[10] The Minnesota State Legislature identifies increased bicycling as a statewide environmental goal for the transportation sector, promoting it as an energy-efficient, nonpolluting and healthy form of transportation.[11] Investing in improved bicycling infrastructure in Saint Paul will support this goal, reducing vehicle miles traveled, fine particle emissions, and greenhouse gas emissions through the replacement of automobile trips with bicycle trips.

Bicycling Improves Safety in Saint Paul

A recent Minneapolis bike crash analysis revealed an emerging trend: corridors with more bicycle traffic tend to have lower crash rates.[12] The analysis notes that the increasing number of bicyclists themselves appear to be improving safety. Similar trends have been reflected in data from California and Portland studies, finding that crash rates decline as bicycling traffic increases.[13,14] Supporting bicycle infrastructure that increases the number of cyclists in Saint Paul will improve the safety of our streets.

Another pertinent consideration is the relationship between improved bicycling facilities and a safer cycling environment. Through context-sensitive design, bicycling infrastructure can improve safety for bicyclists, motorists, and pedestrians. These improvements employ a variety of design techniques and facility types, and consider factors such as traffic volumes, vehicle speeds, and road widths to guide appropriate facility design and improve safety.

Emerging research suggests that crash rates decline as bicycle traffic increases

10 Minnesota Pollution Control Agency, "Air Quality in Minnesota: Emerging trends, 2009 Report to the Legislature," 2009. http://www.pca.state.mn.us/index.php/view-document.html?gid=5658

11 Minnesota Department of Transportation, Minnesota Statewide Multimodal Transportation Plan, "Minnesota Statewide Transportation Goals," MN Statutes Chapter 174, Subd. 2. September 2012. http://www.dot.state.mn.us/minnesotago/pdf/mn-legislative-goals.pdf

12 Blenski, Simon, City of Minneapolis, "Understanding Bicyclist-Motorist Crashes in Minneapolis, MN," January 2013. http://www.ci.minneapolis.mn.us/bicycles/data/safety

13 Jacobsen, P.L., "Safety in Numbers: more walkers and bicyclists, safer walking and bicycling," September 2003. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1731007/pdf/v009p00205.pdf

14 City of Portland, Portland Bicycle Plan for 2030, "Making the Case for Investing in Bicycling," February 2010. http://www.portlandoregon.gov/transportation/article/289122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Chapter 3:
Bikeways Accessible to Everyone

Saint Paul
Bicycle Plan

3.0 BIKEWAYS ACCESSIBLE TO EVERYONE

To become a truly world-class bicycling city, Saint Paul's bicycling network must accommodate cyclists of all levels, abilities, and preferences. Safety, both real and perceived, is essential in creating a network of bicycle facilities that are practical and convenient for all users.

3.1 Who are Cyclists?

Many characteristics have been used by various agencies or organizations to classify bicycle riders, including age, gender, comfort level, physical ability, and trip purpose. These typologies can be a valuable tool in helping to understand how and why people choose to ride bicycles and the preferences of each type of cyclist.

While each of these typologies is useful and instructive in some circumstances, each of these systems fails to fully capture the diverse population and preferences of people who choose to ride bicycles. People rarely fit into a single category, and a cyclist's preferences may change by time of day, trip purpose, traffic conditions, travel companions, weather, or other factors. For example, a cyclist who is comfortable riding in mixed traffic during daytime hours on a weekend may not be comfortable on the same street during rush hour traffic or during nighttime hours when visibility is reduced. Likewise, an individual's preferences while commuting may be different on days when they carry a young child with them for part or all of the commute.

3.2 Trip Purpose

Trips made by bicycle can be described as either utilitarian or recreation. The term describes the purpose of the trip only, and does not imply any other characteristics about the trip or the preferences of the cyclists, including travel speed, cyclist experience, or the facility type used.

Utilitarian Trips

Utilitarian or nondiscretionary trips are needed as part of a person's daily activities. This includes commuting to work or school, work-related non-commute trips, shopping or errands, or taking a child to school or daycare. Utilitarian trips made by bicycle can replace or seamlessly link with other transportation modes such as transit or motor vehicle trips.

While many people choose to use a bicycle, others may use bicycles for utilitarian trips because they do not have access to an

automobile or possess a driver's license, have no transit available, or are otherwise dependent upon bicycling.

Recreation Trips

Recreation or discretionary trips include trips made for exercise or leisure. Recreational trips can range from short trips within a neighborhood to long rides covering much greater distances. The most basic type of recreation trip might be a leisurely ride through a park, however there are many other more complex examples as well. For example, when a couple rides bicycles to a restaurant for dinner and then to a movie theater, this is a discretionary trip for recreational purposes, even if no trails were used in the process.

3.3 Bicyclist Typology Systems

Despite their weaknesses, bicyclist typology systems can still be a useful tool to help inform how we plan bikeways through the City of Saint Paul. Below are two common classification systems.

Federal Highway Administration

In 1994, the Federal Highway Administration developed the following general categories of bicyclist types to assist planners and designers in determining the impact of different facility types and roadway conditions on bicyclists.

- **Group A** - Advanced Bicyclists – Advanced or experienced riders are generally using their bicycles as they would a motor vehicle. They are riding for convenience and speed and want direct access to destinations with a minimum of detour or delay.
- **Group B** - Basic or less confident adult riders may also be using their bicycles for transportation purposes, e.g., to get to the store or to visit friends, but prefer to avoid roads with fast and busy motor vehicle traffic unless there is ample roadway width to allow easy overtaking by faster motor vehicles.
- **Group C** - Children, riding on their own or with their parents, may not travel as fast as their adult counterparts but still require access to key destinations in their community, such as schools, convenience stores and recreational facilities.

This typology system has been widely adopted and endorsed by numerous agencies.

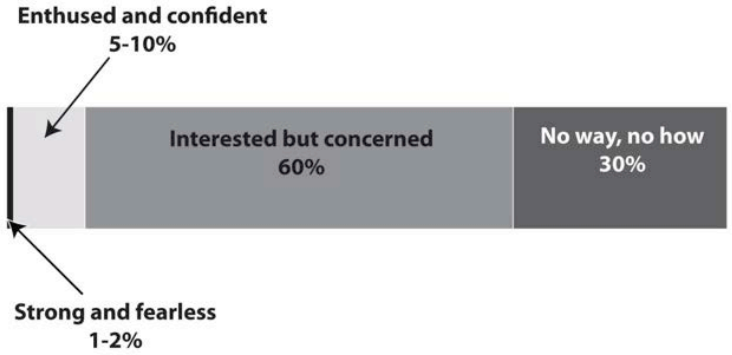
Bicyclists visiting the Shadow Falls Park Preserve

The bicycle network in St. Paul must accommodate all categories and levels of riders

Portland: Four Types of Transportation Cyclists

In 2004, The Portland Office of Transportation published a report that described four general categories of transportation cyclists and their differing needs. Through surveys and research, they identified four categories of residents and their relationship to bicycle transportation[1]:

- **"No way, no how" (30%)** – As the name implies, this category represents people who will not ride a bicycle for transportation, either out of disinterest or the inability to do so.
- **"Interested but Concerned" (60%)** – People in this category would like to ride more, but do not feel safe on busy streets with fast moving traffic nearby. Fewer and slower-moving cars would help them feel more comfortable. Constituting 60% of the demographic spectrum, this category represents the majority of residents.
- **"Enthused and Confident" (5-10%)** - This group is those who have been attracted to cycling as a result of previous investment in the bicycle network. They are comfortable sharing the road way with automobile traffic, but they prefer to ride on dedicated facilities such as bike lanes or paths.
- **"Strong and Fearless" (1-2%)** – This category, by far the smallest, will ride regardless of roadway conditions and regardless of investment in bicycle facilities.



Geller, Roger, Portland Bureau of Transportation, "The Four Types of Cyclists," 2004.
www.portlandoregon.gov/transportation/44597?a=237507

1 Geller, Roger, City of Portland, Portland Bureau of Transportation, "The Four Types of Cyclists," 2004. http://www.portlandoregon.gov/transportation/44597?a=237507

3.4 Planning for Trip Purpose & Cyclist Typology

Understanding trip purpose is an important part of planning for bikeways throughout Saint Paul, however, this plan intentionally avoids designating any existing or proposed routes for a particular trip purpose or a particular type of cyclist. It is often difficult to differentiate between utilitarian and recreational trips because the same bikeway network can be used for both purposes. Trip chaining, the process of making intermediate stops at multiple destinations between two trip endpoints, further complicates the question. Bikeways originally designed for recreational purposes (such as a recreational trail) can also play a critical role in helping people commute to work by bicycle or for other utilitarian purposes.

For example, imagine an individual who uses a bicycle to ride home after work, but occasionally chooses to take the long way home to take advantage of the comfort and attractiveness of a trail running through a regional park. Imagine another individual who rides a bicycle from work to their child's daycare center, then bikes with the child to the nearest ice cream shop before heading home. In both of these examples, it is not clear whether the trip is best described as utilitarian, recreation, or some combination of both.

This plan also intentionally avoids correlating the level of bicycling skill or experience with cyclists preferences. A person's level of experience or skill in handling a bicycle does not necessarily dictate a preference for certain facility types or a desire or willingness to integrate with motorized traffic. Many experienced and dedicated cyclists prefer off-street trails or low-volume streets that provide separation from motorized traffic.

This plan acknowledges that all people have various preferences depending on circumstances, and accommodates those preferences by recommending a wide variety of facility types throughout the city. By providing a diverse mixture of cycling facilities throughout the city, the plan ensures that all people, regardless of preferences, will have access to a facility type that caters to their needs.

The variety and differentiation represented by cyclist typologies highlights the wide range of public opinion about bicycling. For some, bicycling is intimidating or uninteresting. For others, bicycling is integral to their identity and lifestyle. Some cyclists

Bicyclists prefer a variety of facility types depending on circumstance

prefer dedicated bicycle facilities separated from traffic, while others favor riding in traffic on the street. As a result, the bicycle network in Saint Paul must accommodate all categories and levels of riders. Making bicycling comfortable and practical for all users will increase and encourage use, and make Saint Paul a world class bicycling city.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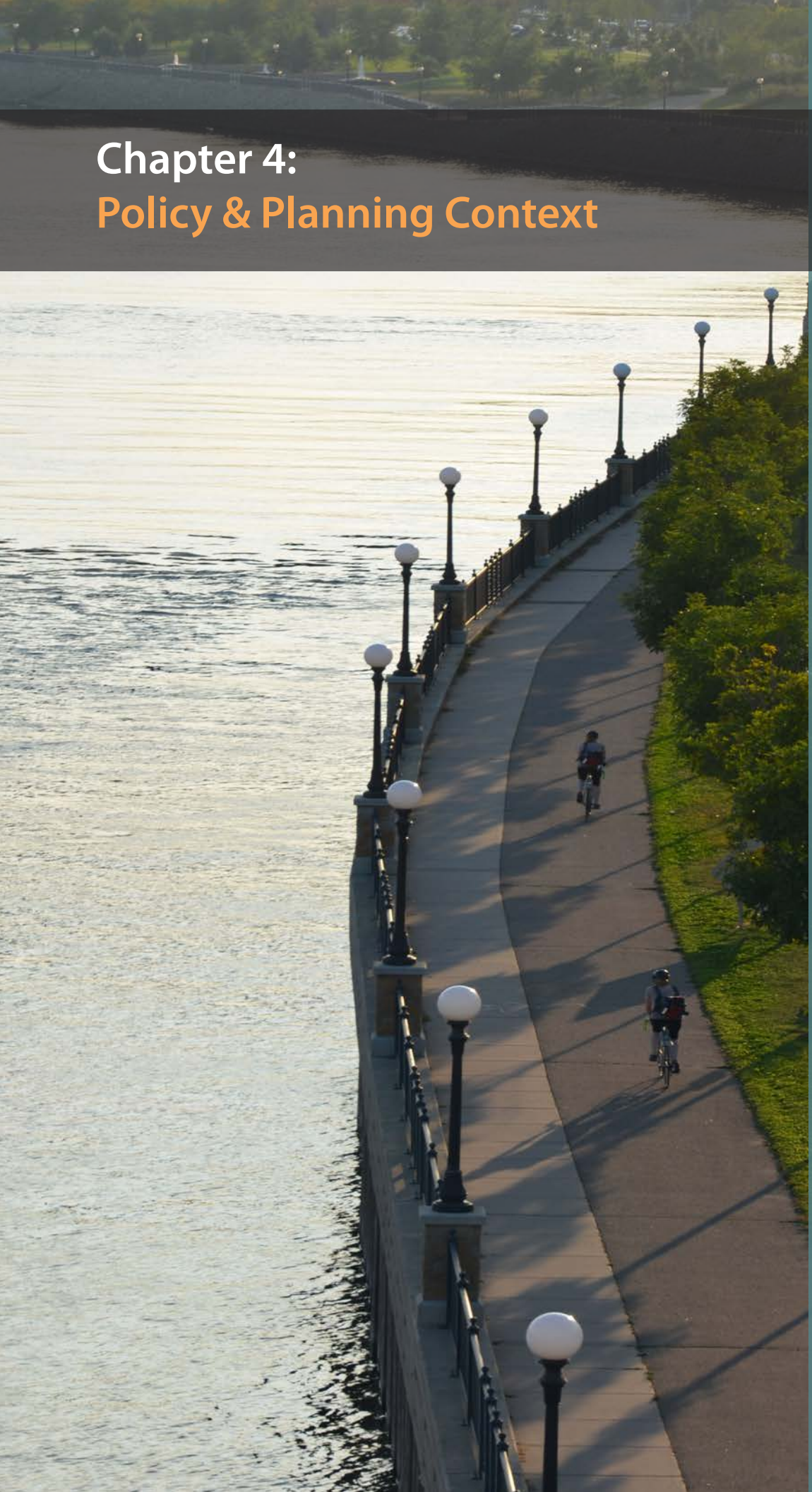
Chapter 4:
Policy & Planning Context

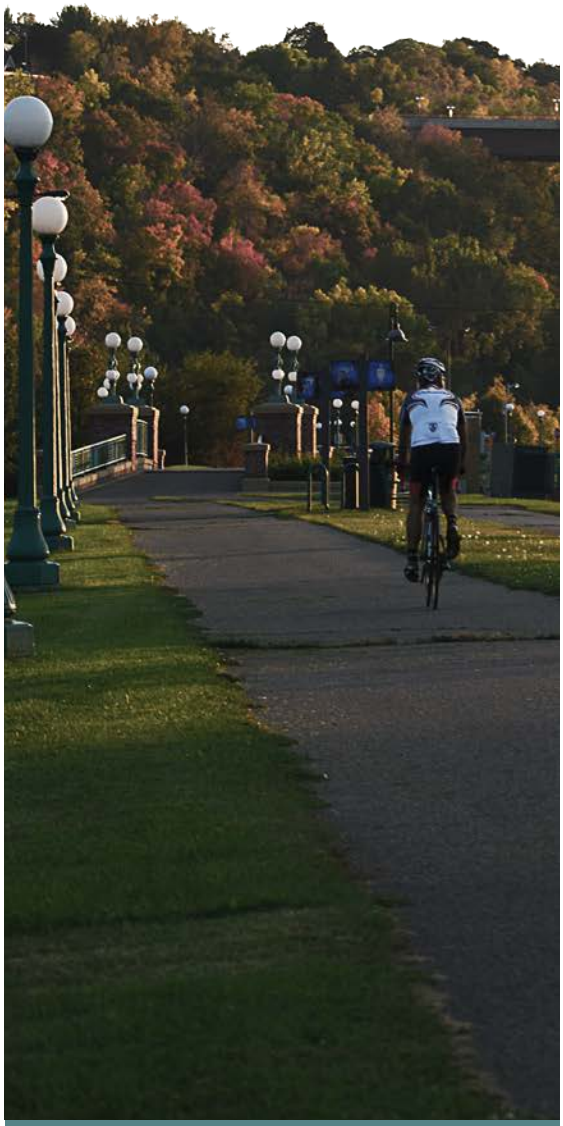


Saint Paul
Bicycle Plan

4.0 POLICY & PLANNING CONTEXT

The Bicycle Plan builds on previous planning efforts and existing policy both established by the City as well as work completed by agency partners, such as Ramsey County, MnDOT, and the Metropolitan Council. Planning for, constructing, and maintaining the bicycle network in Saint Paul is a joint effort between the Department of Public Works, the Department of Parks and Recreation, and the Department of Planning and Economic Development. Each department plays an important role in planning and developing bicycle facilities throughout the city.

There are numerous planning efforts that have informed the development of this plan, including Small Area Plans and District Plans, which have been adopted as addenda to the Comprehensive Plan. The level of detail into which each of these plans gives recommendations regarding the bicycle network varies greatly. In addition, there have been a number of planning efforts that were adopted by the city council but not as addenda to the Comprehensive Plan, as well as numerous studies that were not adopted by the council. Some of the large-scale planning and policy documents are described below.



4.1 Comprehensive Plan (2008)

The Comprehensive Plan strongly supports the development of a multi-modal transportation system, including the development of a citywide bicycle network. The plan states the importance of using a Complete Streets approach to planning the transportation system and promotes context sensitive design. The following strategies identified in the Comprehensive Plan are most directly relevant to this planning effort:

Transportation Chapter

- **1.1 Complete the Streets.** – The needs of all users of the transportation system – including pedestrians, cyclists, transit, freight, and motor vehicle drivers – should be accommodated. The public right-of-way must account for the safety and convenience of the most vulnerable populations.
- **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 15 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 part of everyday life.

- **3.5 Support existing off-street shared-use paths and add facilities and amenities supportive of active living principles.**
- **3.6 Fill gaps in the bikeway system.**
- **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.
- **3.10 Create public bicycle parking facilities to increase bicycling trips citywide.** – Develop bicycle parking facilities as a part of new or improved public facilities, particularly at hubs of retail and commercial activity; in public parking facilities; and at community gathering spaces. Providing facilities for bicyclists to not only park their bikes but also to shower, store gear, and get needed bike maintenance can help make bicycling more convenient and attract new cyclists.

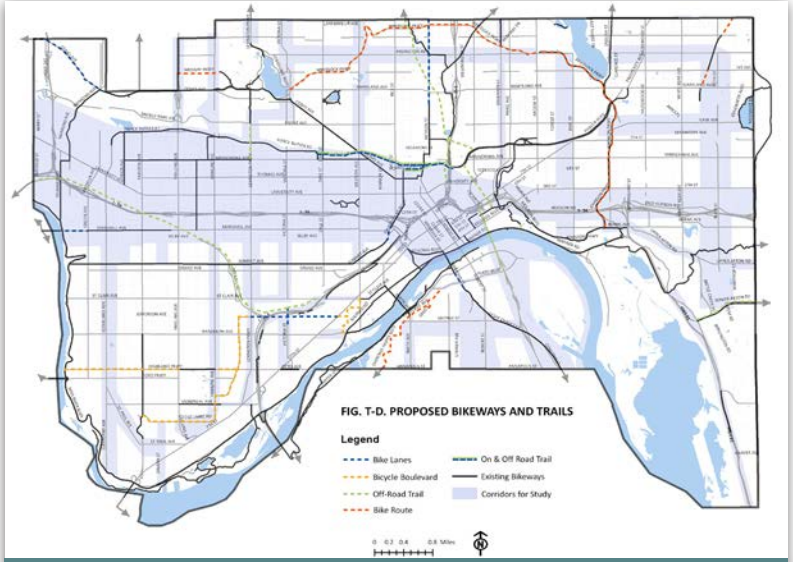
Parks & Recreation Chapter

- **1.2 Complete the trail and bikeway system.**
- **1.3. Provide functional, accessible, and secure bike racks at all parks and recreation centers.**
- **1.5 Provide better public information on getting to parks and recreation facilities on foot and bike.**
- **6.7 Build the Grand Round Parkway from a loop route to a complete parkway.** - The City should add off-road trails, on-road bike lanes, and "green" the Grand Round to create a scenic recreational parkway experience, enhance property values, and build tourism. Parkway identity should be achieved through the use of cohesive paving, lighting, landscaping, signage, and street furnishings.
- **6.8 Connect the Saint Paul and Minneapolis Grand Rounds parkways together.** - Since the 1880's a true Twin Cities Grand Rounds parkway system has been envisioned. The two parkway systems would create the finest and largest urban scenic byway system in the United States.
- **6.11 Work to close gaps in the trail system to ensure seamless connections for bicycles and pedestrians across the city of all ages and abilities.**

The newly-completed Trout Brook Trail extension in Trout Brook Nature Sanctuary

- **6.12 Work toward better pedestrian and bicycle connections between parks, recreation centers, schools, major facilities, and special events.**
- **6.13 Build new off-road trails and upgrade existing off-road trails to make cycling and walking more convenient, safe, and pleasant, and add facilities and amenities to improve the experience of using Saint Paul's trails.**

The Comprehensive Plan makes several recommendations regarding new bikeways to be developed throughout the city, many of which have since been implemented; however, the plan primarily establishes a number of search corridors for further study.



Comprehensive Plan Bikeways Map

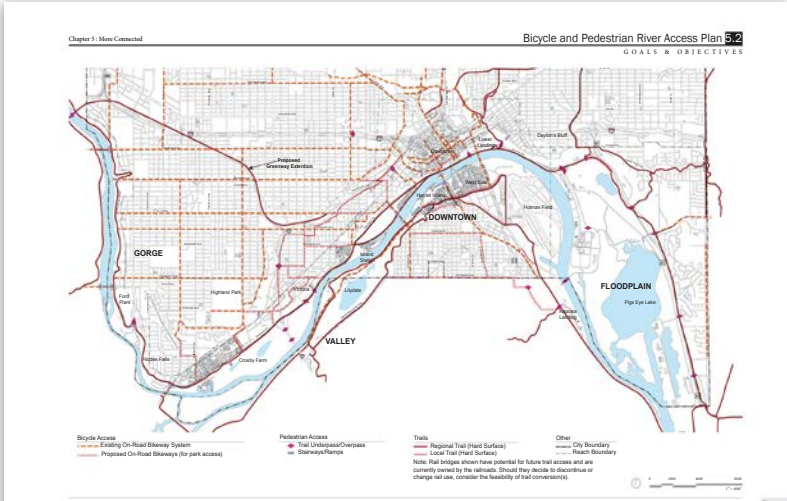
4.2 Parks & Recreation System Plan (2010)

This plan establishes a strong vision for bicycling, primarily within the context of Regional Parks & Trails, the Grand Round, and on city Parkways. The plan places a high emphasis on completing the city Grand Round, particularly along Johnson Parkway, Wheelock Parkway, Como Avenue, Pelham Boulevard, and Raymond Avenue. The plan envisions a number of new bikeways throughout the city, some of which have already been constructed, such as bike lanes along Ruth Street, the development of a trail within Cherokee Park and Ohio Street, and extension of the Furness Parkway trail. The plan strongly recommends the development of an extension of the Midtown Greenway from Minneapolis through the Ayd Mill Road corridor in Saint Paul.

Parks and Recreation System Plan Map

4.3 Great River Passage (2012)

The Great River Passage Plan places great emphasis on enhancing and improving the many existing trails along the Mississippi River corridor. The plan promotes the Mississippi River as a critical corridor for bicyclists and establishes a vision for drawing more users to the trails and the river. The plan establishes support for improving access to the river through bike lanes, shared lanes, off-street paths, and bicycle boulevards. The plan identified a number of proposed bikeways to connect the existing bikeway network to the Mississippi River corridor.

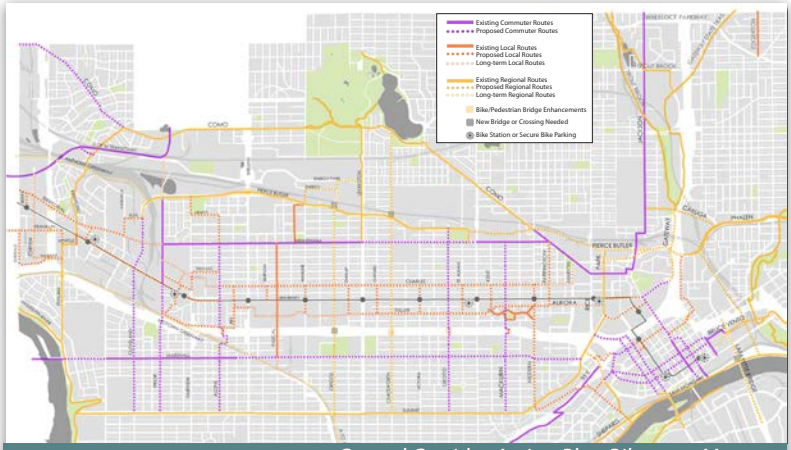


Great River Passage Bikeways and Pedestrain Access Map

Sam Morgan Regional Trail along the Mississippi River

4.4 Bike Walk Central Corridor Action Plan (2010)

The Bike Walk Central Corridor Action Plan was developed in anticipation of the Green Line LRT to plan for bicycle and pedestrian access along and across the Green Line. The plan identified bike routes and gave recommendations for facility types along these corridors. The plan identified a fine-grained network of bikeways to connect with Green Line station locations.



Central Corridor Action Plan Bikeways Map

4.5 Complete Streets Resolution (2009)

In March of 2009, the city council approved a resolution adopting a complete streets policy. The resolution directs city staff to approach roadway implementation projects with a "complete streets" approach to encourage walking, biking and transit usage. The resolution states that complete streets will be "achieved over time, project by project".

4.6 Ramsey County Planning and Policy Context

Ramsey County has jurisdiction over a number of roadways and parks within Saint Paul. The County and City work together to determine what type of accommodations for bicycles are appropriate along county roadways or throughout county parks.

Active Living Ramsey Communities, an arm of the County Parks department actively plans and encourages bicycling as an

important quality of life and health issue. They actively plan for bicycle facilities throughout Ramsey County.

At the time of this writing, Ramsey County is beginning a process to develop a county-wide bicycle and pedestrian plan.

Ramsey County 2030 Comprehensive Plan (2009)

The County Comprehensive Plan states the importance of providing and maintaining a regional transportation system of bicycle/pedestrian pathways throughout the County for both recreational and utilitarian trips. The plan states that the county's role in providing for bicycle travel is to provide a link between municipal and state bikeway networks. The plan states that "accommodation of pedestrians and bicycles is very important to the County", and that "the County will encourage multi-modal forms of transportation wherever feasible."

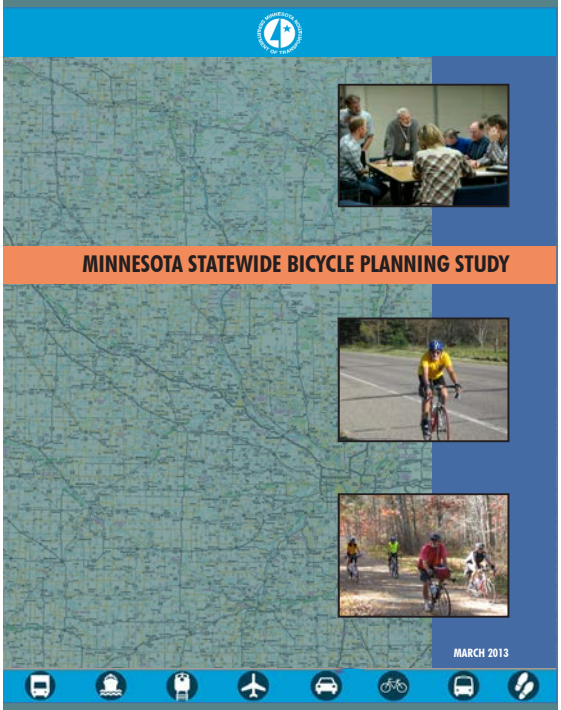
4.7 MnDOT Planning and Policy Context

The Minnesota Department of Transportation (MnDOT) owns and operates the trunk highways (TH) throughout the state, including a number of roadways throughout Saint Paul. MnDOT also typically has jurisdiction over bridges that cross MnDOT highways, even if the bridge carries local or county roadways or bikeways.

MnDOT typically relies on the City or County to operate, and maintain (including snow clearance) bicycle facilities along trunk highways, with the exception of facilities provided on major bridge structures. While MnDOT may permit or encourage the development of bike facilities along or across MnDOT rights-of-way, ongoing maintenance and operation of those facilities is typically a local responsibility.

MnDOT also plays an important role in providing critical connections across major barriers such as the Mississippi River. Many of the bridges across the Mississippi River are under MnDOT jurisdiction and provide critical connections for bicycles.

In the Twin Cities, MnDOT works closely with the Metropolitan Council to plan for regional transportation facilities and administer state and federal transportation funding sources. MnDOT collaborated on the Metropolitan Council's recently completed Regional Bicycle System Study to identify a set of regional bikeways. That study will inform MnDOT's forthcoming Metro District Bicycle Plan.



The Statewide Bicycle Planning Study was released by MnDOT in 2013

MnDOT Bicycle Modal Plan (2005)

The MnDOT Bicycle Modal Plan establishes the role of bicycle in Minnesota's transportation system. It reviews all State and Federal laws, policies, and guidance related to bicycle transportation. The modal plan clarifies policies under which accommodating bicycles is required on MnDOT projects, outlines an initiative to establish a scenic bikeway system throughout Minnesota, and provides basic bikeway design guidelines. An update to this plan is anticipated in 2015 under the title Statewide Bicycle System Plan.

Statewide Bicycle Planning Study (2013)

The Statewide Bicycle Planning Study provides foundational information to assist MnDOT in better integrating bikeway facility planning and integration into its day-to-day business. The study provided recommendations for MnDOT in the planning, programming, scoping, design, and implementation of trunk highway projects with consideration to state bikeways. A primary initiative of the study was to create a consistent statewide database of existing and planned statewide bicycle routes, including the production of a new State Bicycle Map.

4.8 Department of Natural Resources (DNR)

The Department of Natural Resources (DNR) manages the nearly 1,300 mile state trail network, of which 541 miles is paved and intended for use by people on bicycles, including the Gateway State Trail in Saint Paul. The Gateway State Trail was opened for public use in 1993, originally as an extension of the Minnesota-Wisconsin Boundary State Trail, which was envisioned to connect the Twin Cities with Duluth. The DNR is responsible for all maintenance and management of the Gateway State Trail. The City and the DNR work together to ensure integration of the Gateway State Trail into the city bikeway network.

The DNR plays an important role in promoting bicycling statewide. While the state trail network is intended primarily for recreational use, experience has shown that state trails can play an important role for utilitarian bicycle trips as well. This is especially true of state trails that penetrate into urban areas, such as the Gateway State Trail.

The DNR plays an important role in funding bikeway projects by administering several funding programs available to help local agencies statewide develop off-road paths, though many of the funding sources are available only to agencies outside the seven-

county metropolitan area. Within Saint Paul, applicable programs include the Federal Recreational Trails Program and the Local Trail Connections Program.

Gateway State Trail Master Plan (1985)

More accurately titled *A Master Plan for the Gateway Segment of the Minnesota Wisconsin Boundary State Trail*, this plan established the vision for the initial construction of the Gateway State Trail, including a desire to extend the trail into the "downtown area" of Saint Paul, though a preferred alignment for this extension was not identified. The plan identified the southwestern terminus of the trail near Arlington Avenue, though the trail has since been extended as far south as Cayuga Street. In conjunction with the MnDOT I-35E Cayuga Interchange project, the Gateway Trail will be extended approximately 0.7 miles south to University Avenue by 2016.

4.9 Metropolitan Council

The Metropolitan Council does not own, operate, develop, or maintain any bikeways or facilities. However, they play an important role in the planning, funding, and coordination of bicycle facilities throughout the Twin Cities region. Council staff works with MnDOT, counties, and municipalities on bicycle and pedestrian planning efforts in the region, and provides technical assistance to partner agencies.

The Metropolitan Council supports the development of bikeway facilities through two primary systems:

- Regional Bicycle Transportation Network
- Regional Trail System

The two systems are complementary, and some bikeways may be included in both systems. The two systems are described below in greater detail.

The Metropolitan Council provides planning guidance on land use issues related to bikeways and with the Transportation Advisory Board administers a competitive process for allocating federal transportation funds to bicycle and pedestrian projects.

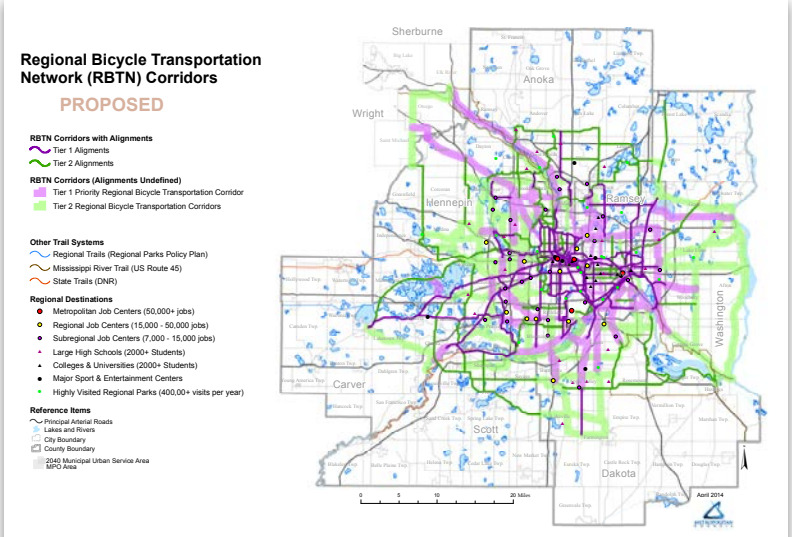
In addition, the Metropolitan Council assists local governments through the following:

- Establishes regional policies and strategies relating to bicycling
- Assists with interjurisdictional coordination and planning

The Gateway State Trail in Saint Paul

Mississippi River Boulevard has been designated a Tier 1 Bicycle Corridor

- Maps and inventories bikeways throughout the region
- Encourages educational and promotional programs
- Establishes priorities for distribution of federal funding



RBTN Network Map

2040 Transportation Policy Plan (2015)

The Metropolitan Council is charged with creating and updating the 25 year *Transportation Policy Plan (TPP)*, which was last updated in 2015 and establishes a long range regional transportation vision. The *TPP* establishes several policy objectives and strategies that promote and support bicycling as a critical part of the regional transportation network. The latest update to the *TPP* incorporates the Regional Bicycle Transportation Network (RBTN) as a regional transportation priority.

The goal of the RBTN is to establish an integrated seamless network of on-street bikeways and off-road trails to most effectively improve conditions for bicycle transportation at the regional level and to encourage planning and implementation of future bikeways by cities, counties, parks agencies, and the state, in support of the RBTN vision. The RBTN vision network is subdivided into two tiers for regional planning and investment prioritization.

- **Tier 1 corridors** and designated alignments are planned in locations where they can attract the most riders and where they can most effectively enhance mode choice in favor of biking, walking, and transit over driving alone. These

Tier 1 corridors are given the highest priority for regional planning and investment in the 2040 Transportation Policy Plan.

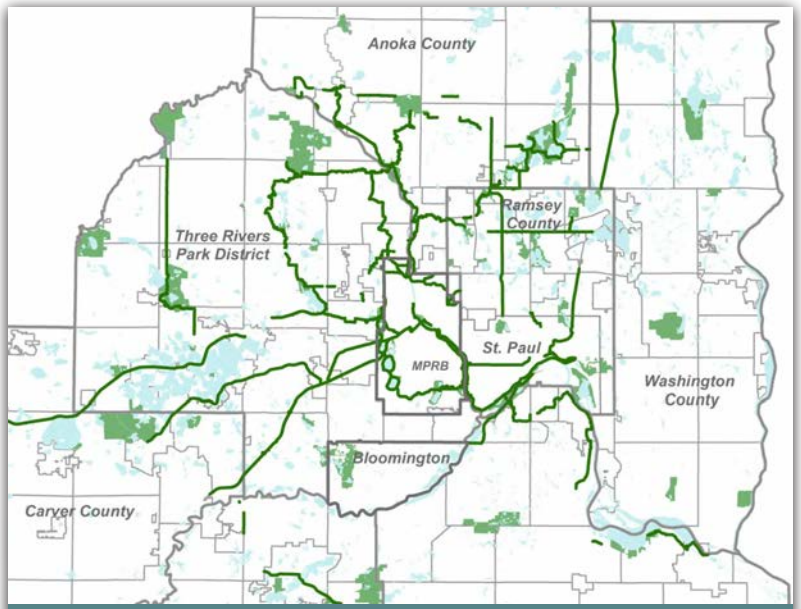
- **Tier 2 corridors** and designated alignments include all the remaining segments of the RBTN and are given the second highest priority for regional planning and investment.

2040 Regional Parks Policy Plan (2015)

The Metropolitan Council designates and coordinates a system of regional parks and recreational facilities, including a network of regional trails. The regional trail system is guided by the Council's *Regional Parks Policy Plan*, a 25 year vision policy plan to guide the development of regional parks and trails. The Metropolitan Council partners with 10 regional park implementing agencies, including Saint Paul and Ramsey County, which own and operate regional parks and trails.

Regional trails are designated to connect regional park facilities to one another. These parks and trails play an important role in providing recreational opportunities, however many regional trails also serve an important transportation function.

The Metropolitan Council plays an important role in funding the costs of acquiring and developing regional trails through its Regional Park Capital Improvement Program, Park Acquisition Opportunity Fund, and through administration of the Parks and Trails Legacy Fund. The Council also passes through state funds to partially finance operation and maintenance of regional parks and trails.



Regional Parks System Facilities Map

Chapter 5:
Bicycle Network Framework

Saint Paul
Bicycle Plan

5.0 BICYCLE NETWORK FRAMEWORK

Implementing a network of bikeways throughout the city is the most basic way the city encourages and promotes the use of bicycles. Providing safe, comfortable, and intuitive space for people to ride bicycles is a prerequisite to increasing bicycle use throughout the city. For many people, the perception of safety is the most important factor in determining whether to use a bicycle.

5.1 The Bicycle Base Map

Figure 1 presents a base map that identifies all roadways where bicycles are permitted as well as all roadways where bicycles are prohibited. The map also shows all off-street paths that permit bicycle use. In general, bicycles are permitted to use all roadways and paths unless steps are taken specifically to prohibit bicycle use, such as on freeways, or on off-street paths that are marked for pedestrians only.

Bikeways & the Bicycle Network

For the purposes of this plan, the term "bikeway" will refer to any roadway where signage or pavement markings have been used to identify a bicycle route or to alert bicyclists and motorists that bicycles will be on the roadway. The term "bikeway" is also applied to all off-street paths that permit bicycle use. As bikeways intersect each other and connect to destinations, they combine to create the bicycle network. It is the primary function of this plan to identify and designate the planned bicycle network.

Other Streets that Permit Bicycle Use

It is critical to understand that bicycle use is not limited to the bicycle network. All other streets that permit bicycle use but are not designated as bikeways or considered part of the bicycle network serve as circulation routes that provide "front door" access to every destination in the city. Most trips made by bicycle will use these streets for some portion of the trip. Bicyclists should be anticipated on every street where bicyclists are permitted. No signage, striping, marking, or other investment for bicycles is anticipated on these corridors at this time.

Shared Lane Roadways

Bicycles are permitted to ride on most roadways within the city. A shared lane is a term used to describe any lane on a roadway to which motorists and bicyclists are granted equal access, whether or not that roadway or lane has been designated as a bikeway. These roadways may not have any signage, striping, or pavement markings specific to the operation of a bicycle. Bicyclists and motorists are expected to share the roadway and bicycles are

subject to all of the same applicable laws and expectations as motorists. This arrangement works best on low-volume, low-speed roadways, however, roadways with any volume of motorized traffic or traffic speeds may be considered shared lane roadways. Most low-volume, low-speed residential roadways function well for most people on bicycles without any additional investment.

Roadways where Bicycles are Prohibited

There are several roadways where bicycling is prohibited. These are limited access roadways and freeways and the accompanying ramps that have high motorized vehicle speeds and volumes. The roadways where bicycles are prohibited in the City of Saint Paul include the following:

- Interstate 94
- Interstate 35E
- Trunk Highway 280
- US Highway 52
- US Highway 61 (south of Lower Afton Road)
- Trunk Highway 5 (west of approximately Wheeler Street)
- Ayd Mill Road

While bicycles are prohibited from operating in the roadway in these corridors, several of them provide off-street accommodations for bicyclists. For example, the TH-52 (Lafayette) bridge over the Mississippi River provides an off-street path for use by bicycles and pedestrians. Similar accommodations are provided on the I-35E and TH-5 bridges over the Mississippi River.

5.2 Bicycle Network Functional Classification

This plan establishes a new bicycle network functional classification, which is primarily intended to ensure that the bikeway facility types developed within each transportation corridor are consistent with how bicyclists are anticipated to use the corridor. The functional classification system is also intended to encourage that the bicycle network provides appropriate facility types for the larger transportation context. The functional classification system does not specify a facility type for each corridor, however it suggests that the operational characteristics

Lafayette Bridge (US Highway 52) over the Mississippi River

Bruce Vento Regional Trail

of the facility type assigned to each corridor should be consistent with the intended purpose of the bikeway.
Each element of the bicycle network is assigned to one of two bicycle network functional classifications:

- Major Bikeways
- Minor Bikeways

Bicycle network functional classification, much like the roadway functional classification system, is primarily a planning tool designed to help guide city policies regarding development, maintenance, and design of bikeways rather than something that will be visible to persons riding bicycles throughout the city.

Distinguishing features between the bicycle network functional classification system include:

- The level of investment anticipated on each corridor
- Connections to major attractions or trip generators
- The relative number of anticipated users
- Trip and facility length and connectivity to other bikeways or jurisdictions
- The appropriate modal balance relative to the competing needs of the multi-modal transportation system

In some cases, this plan identifies planned bikeways that cannot be easily implemented on a short-term time frame because there may be a substantial disruption or challenge involved, because development of the bikeway is contingent on another event occurring (e.g. redevelopment of a large parcel), or because the city has little control over the timeline. For example, this plan identifies the use of several active railroad corridors for the development of off-street path facilities. While the city is committed to pursuing these opportunities, the timeline for these projects is generally controlled by the railroad companies. Implementation of a trail along an active railroad corridor requires permission and approval from the railroad company and property owner, and may be a significant obstacle to implementation. These trails are best implemented after a railroad company has ceased use of the corridor for freight or passenger movement. These more challenging bikeways are identified in this plan as Long Term facilities.

All facilities and corridors that have been designated by the Metropolitan Council as a component of the regional bicycle

transportation network (RBTN) are identified as major bikeways in this plan. Future updates to this plan should consider introducing the RBTN as a separate tier in the city's bicycle network functional classification system.

Major Bikeways

Major bikeways form the backbone of the bicycle network. They carry the majority of longer-distance bicycle trips and provide the primary connections to major attractions and trip generators. Major bikeways provide the primary connections across major barriers (e.g. rivers, railroad tracks, freeways) or to other adjacent communities. Greater weight should be given to the needs of bicycles regarding questions of how to balance the competing multi-modal needs. Major bikeways should be designed to anticipate a larger number of users.

Major bikeways should be distributed throughout the city at approximately one-mile spacing. This plan prioritizes facility types on Major bikeways that provide dedicated space to cyclists, such as bike lanes, cycle tracks, or off-street paths. The designation of a corridor as a major bikeway emphasizes the needs of bicyclists along these corridors. In some cases (but not all cases), it may be necessary to remove parking, travel lanes, or other roadway features to establish space for use by bicycles, and when these occasions arise on a major bikeway, this designation gives greater weight to the needs of bicycles than on other bikeways.

Where space does not permit the development of dedicated space facilities, or other conditions do not warrant this treatment, shared space facilities such as bicycle boulevards or enhanced shared lanes may be recommended. When the major bikeway classification is applied to off-street trails where shared use with pedestrians is anticipated, the major bikeway classification does not imply that the needs of bicyclists outweigh the needs of pedestrians using the same facility.

Minor Bikeways

Minor bikeways are anticipated to provide neighborhood level connectivity to the major bikeway network. They should be spaced at approximately a half-mile apart and ensure that every destination in the city is within a quarter-mile of a major or minor bikeway.

Minor bikeways may be recommended for the development of dedicated space facilities (in-street separated lane or off-street path facilities) depending on the space available and the larger roadway and traffic context, however the minor bikeway

An example of a minor bikeway on Prior Ave

designation does not establish the same preference for bicycles relative to other transportation modes as the major bikeway designation. Designation as a minor bikeway should not be interpreted as a willingness to compromise on elements of bikeway design related to safety.

5.3 Bikeway Facility Type Groups

There are many different types of bikeway facilities, and each has inherent operational characteristics. Some of the most common facility types in Saint Paul include bike lanes and off-street paths. In recent years, the City of Saint Paul has begun developing a new type of bike facility often called a "bicycle boulevard." Across the U.S., a number of cities are also developing relatively new bicycle facilities referred to as "cycle tracks" or "protected bike lanes." In addition, there is a wide array of signage and pavement markings that can be used to designate and improve bikeways.

Bicycle boulevard facility type on Charles Ave

The range of bicycle facility types available to engineers is rapidly evolving and expanding, and the task of determining which facility type is appropriate for each corridor requires a detailed engineering examination of each corridor, which is beyond the scope of this planning effort. However, this planning effort has established several facility type groups that identify bikeway facility types with similar operational characteristics. Rather than identifying a specific facility type for each corridor, this planning effort identifies the preferred facility type group for each corridor, leaving final decisions about the specific facility type for a later date when additional data can be collected.

For example, this plan may identify a corridor for the development of an off-street path facility. There are many variations that this facility could take – it could be a shared-use path with pedestrians, or it could be a path intended only for bicycles adjacent to a sidewalk for pedestrians. This plan will not specify on which side of the street the trail should be located, or how wide that trail should be. It will not identify which signage or pavement markings should be used along that trail. These questions will need to be answered through an engineering study at the time of implementation.

A second example – this plan may identify a corridor for the development of an in-street separated lane facility. This may take the form of a bike lane established through the use of paint. It may have bike lanes in both directions on the street, or only one direction. The bike lane may include a painted buffer zone

between moving traffic and the bicycle lane. The design may also include locating a parking lane between moving traffic and the bike lane, a strategy sometimes referred to as a "cycle track." Each of these variations of in-street separated lane facilities may be appropriate in different locations depending on circumstances. The final configuration of the facility will be determined through an engineering study at the time of implementation.

This planning document is not intended to provide engineering design guidance for the various types of bikeway facilities. For additional discussion of the operational characteristics or design considerations of various bicycle facility types, readers are referred to the Saint Paul Street Design Manual.

The four bikeway facility type groups discussed in this plan are as follows:

- Group 1: Enhanced Shared Lane
- Group 2: Bicycle Boulevard
- Group 3: In-Street Separated Lane
- Group 4: Off-Street Path

Group 1: Enhanced Shared Lane

An enhanced shared lane uses pavement markings or signage to reinforce the rights and responsibilities of roadway users. These are corridors where bicyclists and motorists share the roadway and bicyclists are subject to all of the same applicable laws and expectations as motorists. These corridors are identified using some form of signage or pavement markings intended to provide greater visibility for cyclists, or as wayfinding guides for cyclists to find preferred routes. Enhanced shared lanes are best suited to roadways with lower operational speeds and traffic volumes. Specific treatments for these corridors will depend on context, however, common treatments may include:

- Shared Lane Markings ("Sharrows")
- W11-1 or W15-1P Bicycle Warning or SHARE THE ROAD Signage
- R4-11 BIKES MAY USE FULL LANE signage
- D1 series wayfinding signage
- D11-1 series BIKE ROUTE signage
- M1 series identification signage

Shared lane markings were installed on Prior Ave in 2013, establishing the corridor as an enhanced shared lane facility

Identification and wayfinding signage options for enhanced shared lanes

Bicycle boulevard type facilities designate low-stress bikeways on local residential streets

Bicycle boulevards generally do not impact on-street parking

The type of treatments selected should be consistent with the level of guidance warranted by specific local conditions. In select cases where there is a desire to provide additional guidance or conspicuity, the use of innovative or experimental treatments should be considered, subject to FHWA guidance, including the use of colored pavements or other features.

These facilities are similar to Group 2: Bicycle Boulevard facilities in that they both rely on motorists and bicyclists sharing space. However, enhanced shared lane strategies may be used on roadways with higher traffic volumes or speeds than would be appropriate for a bicycle boulevard facility.

Group 2: Bicycle Boulevard

A bicycle boulevard is a shared lane facility that has been identified for prioritizing non-motorized travel above motorized travel. These streets remain open and usable by motorists, and these facilities generally do not impact on-street parking. However, longer motorized trips on bicycle boulevards are discouraged, providing a lower-speed, traffic-calmed environment where longer-distance trips by bicycle are more attractive.

Specific treatments for these corridors will depend on context, however, common treatments may include:

- Traffic calming elements
- Bump-outs
- Neighborhood traffic circles
- Elements to facilitate bicycle movement, such as crossing medians where a bicycle boulevard crosses a larger roadway
- Shared lane markings ("sharrows")
- Bicycle boulevard pavement markings
- D1 series wayfinding signage
- M1 series identification signage

These facilities are similar to Group 1: Enhanced Shared Lane facilities in that they both rely on motorists and bicyclists sharing space. However, bicycle boulevards are limited in applicability to streets with very low traffic volumes and speeds and are characterized through an emphasis on traffic calming.

Group 3: In-Street Separated Lane

An in-street separated lane designates a portion of a roadway for exclusive use by bicyclists. These facilities provide dedicated space for cyclists on a roadway, and typically accommodate a higher bicycle operating speed than other facility types. These facilities are most appropriate on roadways with higher operating speed or volumes. Separated lane facilities enhance the safety of people on bicycles by providing dedicated space, which allows motorists to more easily pass cyclists. This facility type group includes the following types of facilities:

- Bike lanes (shared lane markings may be used for short segments)
- Buffered bike lanes
- Bike shoulders
- Protected bike lanes or cycle tracks (including one-way or two-way facilities)
- Climbing bike lane (bike lane provided only in uphill direction)

A two-way cycle track, protected with optional flexible bollards and buffer

Group 4: Off-Street Path

An off-street path provides bicyclists with space separated from motor vehicle travel. These facilities are often (but not always) shared with pedestrians, and thus typically have a lower operating speed for bicyclists than other facility types. Off-street

A bike lane on Burns Ave was established in 2013

A buffered bike lane

A one-way cycle track protected by a parking lane and buffer and showing optional green paint

Path adjacent to Mississippi River Blvd

Trail through Battle Creek Regional Park

paths tend to attract the widest variety of users. When at-grade street crossings are kept to a minimum, off-street paths can greatly enhance safety for cyclists.

Sidewalks are not off-street paths. Minnesota statutes permit bicycle riding a bicycle on sidewalks except for in business districts, though riding on sidewalks is discouraged for adult cyclists. However, the distinction between sidewalks and off-street paths is not always clear to users, as both sidewalks and paths may have various widths and be constructed of various pavement materials. A typical concrete sidewalk along residential streets in Saint Paul is approximately five feet in width and is not a recommended place for adult cyclists. A wider concrete sidewalk outside of residential neighborhoods may provide a better user experience than cycling in the street, depending on conditions.

This plan considers all pedestrian bridges (e.g. over freeways) to be shared-use paths, even in cases where the existing bridge includes stairs on the approaches or is relatively narrow and may require walking a bicycle. In current form, such conditions may be a significant deterrent to bicycle travel. However, as pedestrian bridges age and are replaced, the replacement bridges should be designed to accommodate bicycles.

5.4 Merging Facility Types & Functional Classification

The framework presented in this plan establishes a loose connection between the functional classification and facility type that is identified for each corridor. The facility type assigned to each corridor should be consistent with the larger transportation context of that corridor. As such, facilities that are identified as major bikeways should anticipate higher volumes of bicyclists and thus provide facility types that will be attractive to the largest number of bicyclists.

Facility types that provide dedicated space for cyclists, specifically off-street paths and in-street separated lane facilities, are better suited to accomplish the purposes of the major bikeway functional classification, and they are the preferred facility types for major bikeways. In some cases bicycle boulevards may also effectively serve this purpose if they are of sufficient length and provide direct connections. Enhanced shared lane facilities are discouraged from use within the major bikeway network as they typically provide the least degree of separation from motorized traffic, however, in some cases, other suitable alternatives cannot be identified.

5.5 Planned Bikeway Identification Process

The planned improvements to the bikeway network are based on a set of mapping criteria established early in the planning process for this plan. The full mapping criteria used to develop the recommendations in this plan are provided in **Appendix D** and are summarized below. The bikeways identified in this plan are based on a combination of the recommendations adopted from previous planning efforts as well as field work to identify new corridors.

Spacing

The 2008 Comprehensive Plan established the spacing and facility type standard that "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." This plan interprets and fulfills this directive by establishing spacing guidelines for major and minor bikeways at one-mile and half-mile spacing respectively.

This plan strives to identify bikeways that achieve geographic and socio-economic equity. Spacing bikeways at no greater than one-half mile apart guarantees that most properties and residents in the city will be no more than a quarter mile from a bikeway.

Previous Planning Efforts

Much planning has been completed in the past by both the City and other partner agencies. This plan strives to be consistent with these other planning efforts to the extent possible.

Making Direct Connections

The bicycle network should provide direct and continuous routes between destinations. Bicycle routes that meander or make unnecessary turns are less likely to be an effective means of increasing the number of bicyclists using the facility. Especially in the case of signed bike routes or bicycle boulevards, facilities that turn or meander for reasons that are not readily apparent to people riding bicycles may be confusing for users. In some cases, cyclists may be willing to travel additional distance to utilize a more attractive route, but this is dependent on a number of variables that are not easily identified. This plan places a high priority on providing direct, straight, and continuous bikeways.

The bicycle network should connect key destinations to each other, and connect residential neighborhoods with employment and commercial centers, schools, and other key destinations. The bicycle network should build off and connect with existing bikeways and transitways.

"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 Comprehensive Plan

Wayfinding signage displaying connections to nearby destinations.

Modal Balance

Bikeway facility types and locations must be a reflection of the existing context, including both topography and the context of the built environment. Bikeway recommendations must consider factors such as roadway motorized traffic volume, signal locations, roadway width, right-of-way width, and topography. In some cases, providing appropriate accommodations for bicycles requires tradeoffs from other transportation systems, such as narrowing travel lanes, removing travel lanes, or removing on-street parking. This plan strives to achieve a balance between the needs of all the various modal users (including bicycles, pedestrians, transit, freight, and general traffic), and seeks to identify opportunities for bicycling to complement other modes as much as possible.

Effectiveness

This plan seeks to identify a bicycle network that will increase bicycle ridership, improve safety conditions, and address critical gaps in the network. This plan does not propose development of bikeways where this potential is limited. The effectiveness of each bikeway is weighed against the relative cost.

Safety

This plan identifies a bicycle network that minimizes conflict with other travel modes and accommodates people with varying levels of experience and diverse preferences. Special consideration is given to areas where there are known safety concerns. This plan recommends a bicycle network that utilizes proven safety design features that provide dedicated operating space for bicyclists (e.g. a route where dedicated bike lanes can be developed is preferred over a route with similar traffic characteristics where dedicated bike lanes can not be developed).

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Chapter 6:
Expanding the Bicycle Network

Saint Paul
Bicycle Plan

6.0 EXPANDING THE BICYCLE NETWORK

The primary objective of this plan is to establish the planned bicycle network as directed by Strategy 3.4 of the Comprehensive Plan. The planned bicycle network is the result of a planning process that included substantial public input and collaboration between city staff from several departments, including Public Works, Planning & Economic Development, and Parks & Recreation. The primary objective of the planned bicycle network is to provide safe and comfortable places for people of all ages, abilities, and preferences to ride a bicycle.

6.1 Existing Bicycle Network

There are a total of 153 miles of bikeways in Saint Paul, including facilities owned and managed by agency partners. The network of existing bikeways is divided relatively evenly between off-street paths and on-street facilities of various types. About 48% of the existing facilities throughout the city are off-street paths, with bike lanes and shoulders composing an additional 35% of the bike network. The remaining 17% of the existing bicycle network is comprised of bicycle boulevards or enhanced shared lanes. The existing bicycle network is identified on **Figure 2**.

Table 6.1.1 Existing Bicycle Network

Facility Type		Existing* Facilities (Miles)	Percent of Bikeway Network
Off-Street Facilities	Off-Street Path	73.9	48%
	Off-Street Sub Total:	73.9	48%
On-Street Facilities**	Bike Lanes***	35.4	23%
	Bikeable Shoulders***	17.9	12%
	Bike Boulevards	7.3	5%
	Enhanced Shared Lanes	18.2	12%
	On Street Sub Total:	78.8	52%
Total		**152.7**	**100%**

* This table excludes bikeways that are planned, funded, or under construction, but not yet open for public use.

** This table reports total miles of roadway, not mileage of lanes. Roadways with bike lanes on one side of the street are not differentiated from roadways with bike lanes on both sides.

6.2 Planned Bicycle Network

This plan identifies a full bicycle network of 350 miles, an increase of 197 miles of new bikeways. This is a 129% increase in bikeways, compared to the existing 153 miles of bikeways. The planned bicycle network was designed to serve major destinations throughout the city based on the mapping criteria presented in **Appendix D**. The complete functional classification and facility types for each link in the bicycle network are shown on **Figure 3** and **Figure 4**.

This plan envisions a bikeway system based primarily on off-street paths and in-street separated lane facilities such as bike lanes or cycle tracks to appeal to the widest range of potential users. Approximately 70% of the planned bicycle network is comprised of off-street path or in-street separated lane facilities. An additional 13% of the full bikeway network is comprised of bicycle boulevard facilities. Roughly 17% of the planned bicycle network are enhanced shared lane facilities. In many cases this facility type recommendation was made where space or traffic characteristics did not permit for the implementation of one of the other three facility types. Roughly 60% of the planned bicycle network is identified as major bikeways, 4% of which were identified as long term facilities.

In some cases, the planned bicycle network includes improvements to existing bikeways. For example, this plan recommends that the 17.9 miles of roadway with "bikeable shoulders" should be modified to fit into one of the planned bikeway facility type groups. In many cases, the existing shoulders can be converted into bicycle lanes relatively easily, though in other cases this plan recommends development of an alternate facility type.

Table 6.2.1 Planned Bicycle Network Expansion by Facility Type

Facility Type		Existing Facilities (Miles)	Proposed Facilities (Miles)	Total Facilities (Miles)	Percent of Bikeway Network
Off-Street Facilities	Off-Street Path	74	57	131	37%
	Off-Street Sub Total:	74	57	131	37%
On Street Facilities	In-Street Separated Lanes*	53	61	115	33%
	Bicycle Boulevards	7	40	47	13%
	Enhanced Shared Lanes	18	39	58	17%
	On-Street Sub Total:	79	140	219	63%
Total		**153**	**197**	**350**	**100%**

* This table reports total miles of roadway, not mileage of lanes. Roadways with bike lanes on one side of the street are not differentiated from roadways with bike lanes on both sides. Existing mileage includes bikeable shoulders. All corridors that currently have bikeable shoulders are proposed to transition to other facility types.

Table 6.2.2 Planned Bicycle Network by Functional Classification

Functional Class	Total Facilities* (Miles)	Percent of Bikeway Network
Major	195	56%
Major Long Term	13	4%
Minor	140	40%
Minor Long Term	3	1%
Total	**350**	**100%**

* Includes existing facilities.

The major bikeway network stresses separation between motor vehicles and bicycles, while the minor bikeway network relies more heavily on shared facilities. Nearly 90% of the major bikeways are off-street paths or in-street separated lane facilities. In contrast, only 43% of the minor bikeways are off-street paths or in-street separated facilities. Nearly 25% of the minor bikeways are bicycle boulevard facilities.

Table 6.2.3 Planned Bicycle Network by Facility Type & Functional Classification

Facility Type		Major Bikeways			Minor Bikeways			Total Facilities (Miles)
		Near Term Facilities (Miles)	Long Term Facilities (Miles)	Total Major Facilities (Miles)	Near Term Facilities (Miles)	Long Term Facilities (Miles)	Total Minor Facilities (Miles)	
Off-Street Facilitites	Off-Street Paths	88	13	100	30	0.1	30	131
	Off-Street SubTotal:	88	13	100	30	0	30	131
On-Street Facilities	In-Street Separated Lanes*	84	0.1	84	29	2	31	115
	Bicycle Boulevards	12	0	12	35	0	35	47
	Enhanced Shared Lanes	11	0	11	46	0.4	47	58
	On-Street SubTotal:	107	0	107	110	2	112	219
Total		**195**	**13**	**207**	**140**	**3**	**143**	**350**

* This table reports total miles of roadway, not mileage of lanes. Roadways with bike lanes on one side of the street are not differentiated from roadways with bike lanes on both sides.

6.3 Barrier Crossings

One of the most significant challenges to bicycling in Saint Paul is the challenge of finding safe locations to cross linear barriers, such as freight railroads and freeways. In addition, while the Mississippi River is a major attractor for bicyclists looking to enjoy the scenic riverbanks, opportunities to cross the Mississippi River are limited.

Most barrier crossing locations take the form of bridges over the river, a freeway, or a railroad. However, some crossings are underpasses below the barrier, and there are a number of existing locations where bicyclists (as well as pedestrians and motorists) are permitted to cross freight railroads at-grade. For this reason, this plan intentionally uses the generic term "crossing" to describe locations where the bicycle network crosses barriers. **Figure 5** presents all of the crossings located on the existing or planned bicycle network.

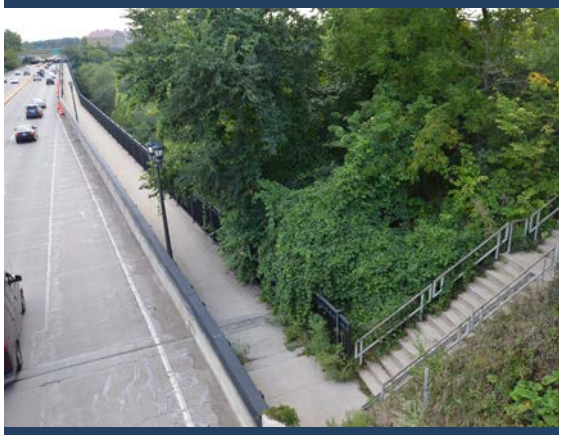
While there are examples of locations where off-street paths cross freight railroads at-grade both in Saint Paul as well as other places in the metropolitan area, recent history suggests that new at-grade crossings of mainline freight railroads are unlikely, and that any new crossings will require a bridge or underpass.

This plan envisions seven new bridges or underpasses, which are identified on **Figure 5**, the majority of which were first identified in previous planning efforts. Planned crossings were identified based on the spacing between adjacent crossings, the feasibility of identifying alternate routes, and an informal engineering feasibility analysis. Of the seven planned crossings, five of them will be bicycle and pedestrian crossings only. The remaining two crossings will be constructed in connection with planned new roadway bridges. In particular, this plan identifies the Kittson Road bridge over the freight rail to intersect Warner Road as well as the Transfer Road extension across the freight rail to intersect Como Avenue.

One of the planned bicycle and pedestrian crossings will replace and relocate an antiquated existing bridge over I-94 on the eastern side of the city. The existing bridge at Hazelwood Street is planned to be relocated to approximately Kennard Street to the east. This location will provide increased visibility of the bridge and improve access to the planned Flandrau Street Bikeway and the shopping center south of I-94.

A number of the existing bridge structures are not conducive to bicycle use due to width or because they have stairs on the approaches, such as the TH- 5 bridge over the Mississippi River or the Hazelwood Street bridge over I-94. In addition, many older bridges over freeways were constructed primarily for pedestrians and were not designed with bicyclists in mind. However, as aging bridges are replaced, current regulations require all new bridge structures to be designed with ramps rather than stairs, and these bridges will be designed to accommodate both bicycles and pedestrians.

Bicycle and pedestrian underpass at I-35E on the Mississippi River Trail



Stairway-only access to the Trunk Highway 5 Bridge limits accessibility

Samuel Morgan Regional Trail

Action Item 6.3.1

Complete detailed feasibility studies of the planned crossings to identify concept designs, cost estimates, and impacts.

6.4 Regional Bicycle Transportation Network Refinement

The purpose of the Regional Bicycle Transportation Network (RBTN) is described previously in Section 4 of this plan. **Figure 6** identifies the Tier 1 and Tier 2 RBTN alignments and corridors in Saint Paul. In some cases, the RBTN does not identify a particular alignment, but rather identifies a search corridor. Additional work remains to identify specific alignments for all segments of the RBTN.

Further evaluation of the RBTN should be completed to determine the need for possible future revisions or additions to the RBTN within Saint Paul. If desired revisions or additions are identified, the city will be required to seek an amendment to the Metropolitan Council's *Transportation Policy Plan*.

Action Item 6.4.1

Identify specific alignments for the RBTN to be developed within the RBTN search corridors.

6.5 Regional Trail Improvement

Regional trail corridors are intended to provide for recreational travel along linear pathways for bicyclists, pedestrians, and other users throughout the metropolitan area. Regional trails must be designated by the Metropolitan Council and are intended to pass through or provide connections between components in the Regional Parks System. Regional trails are defined in the Metropolitan Council's Regional Parks Policy Plan. Regional parks and trails identified in the Regional Parks Policy Plan are eligible for other funding sources, as described in **Appendix G**.

In urban areas such as Saint Paul, the regional trail network also plays an important function for transportation bicycling and often forms the backbone of the bicycle transportation network. Regional trail facilities are often developed along natural or linear features, which can limit the number of intersections, greatly enhancing safety and comfort for trail users.

Four facilities in Saint Paul have been designated as Regional Trails:

- Samuel Morgan Regional Trail
- Bruce Vento Regional Trail
- Trout Brook Regional Trail
- Summit Avenue

The Metropolitan Council generally does not designate trails that are wholly contained within regional parks as regional trails. However, many of these trails are critical in connecting the various regional trails together into a cohesive network and are eligible for the same funding sources as regional trails. In Saint Paul, these facilities are

- Mississippi River Boulevard (Mississippi Gorge) Trail
- Lilydale/Harriet Island Trail
- Cherokee Trail
- Indian Mounds Trail
- Battle Creek Trail

Figure 7 identifies the existing regional trails and other linear trails that pass through regional parks, as well as planned regional trails and regional trail search corridors. The Metropolitan Council requires the city to prepare a master plan document for all planned regional trails. Regional trail search corridors are defined by the Metropolitan Council in the Parks Policy Plan.

Action Item 6.5.1

Actively pursue designation and development of additional regional trails as shown on Figure 7. Identify regional trail alignments within the regional trail search corridors, and prepare regional trail master plans for trails where alignments are known.

The Samuel Morgan Regional Trail / Mississippi River Trail comprises the southern section of the Grand Round

6.6 Grand Round

The Grand Round / Mississippi River Blvd

The 2010 Saint Paul Parks and Recreation System Plan describes the desire to enhance the 27-mile Grand Round system throughout the city: "Trails are currently the most desired parks and recreation facility by Saint Paul residents. They are an important quality of life element and a factor in choosing where to locate for many residents and businesses. […] Trails and parkways are advantageous from a fiscal and a recreation standpoint. Trails allow self-directed recreation which is immensely popular, does not require any staffing (besides periodic maintenance) and requires less initial investment than [other types of facilities]. Due to their linear nature, they have large service areas, and can expand the service areas of parks connected by trails. […] For these reasons, trails, especially those associated with the historic Grand Round, are a key part of the 21st Century Parks and Recreation System." The Grand Round is identified on **Figure 8**.

While the Grand Round was initially perceived as a recreational facility, the portions of the route that are already in place also form the backbone of the bicycle network for transportation cycling as well. The potential for high-quality parkway trails to encourage bicycle use for transportation purposes and to attract a new segment of the population to bicycles should not be underestimated.

An enhanced system of parkways and multi-use off-street paths will allow connections to and between the regional parks, downtown, and other key destinations. The Grand Round - a scenic green parkway for drivers, pedestrians, and people on bicycles around the entire city - has been a vision for Saint Paul for over 100 years.

The Saint Paul Grand Round was conceived by famed landscape architect H.W.S. Cleveland over 100 years ago. His vision led to the completion of several parkway segments in the early 1900s. By the 1930s, however, implementation of the remainder of the system was halted. Many residents are familiar with the alignment of the Grand Round through participation in the Saint Paul Classic Bike Tour, the largest annual bicycle tour in Minnesota that follows the scenic loop around the city.

The ideal Grand Round is comprised of low-speed scenic parkways and off-street pedestrian and bicycle paths. Wherever possible, bicycles and pedestrians should be provided with separate paths or sidewalks to minimize conflict between the two modes, either

on the same side or opposite sides of the parkway. The Grand Round should include bicycle and pedestrian facilities that are useable and maintained year-round, including snow removal in the winter.

The Saint Paul Grand Round plays an important role in the bicycle transportation and recreation network. This plan establishes a vision for much of the Grand Round to accommodate all types of users by providing multiple facility types within the same corridor. Providing both off-street paths and on-street bike lanes along portions of the Grand Round is envisioned to attract users of all preferences. Off-street paths will attract slower bicyclists and pedestrians, while on-street bike lanes will attract faster cyclists.

While the off-street paths attract a wider range of cyclists and are critical to establishing the inclusive nature of the Grand Round, the city should strive to provide on-street bicycle facilities where space permits as well. As many of the off-street paths will permit both bicycles and pedestrians, providing the in-street bicycle facilities will immensely help to encourage faster-moving bicyclists to use the roadway rather than the trail.

In addition, the Saint Paul Grand Round should include a number of other features, including wayfinding, interpretive signing, bike racks, connections to local parks, drinking fountains, appropriate lighting, historical markers and interpretive elements, landscaping, public art, street furniture, scenic overlooks, and other amenities that add to the comfort, safety, and enjoyment of visitors.

Some portions of the Grand Round have already been implemented with multiple facility types in the same corridor. For example, Wheelock Parkway between Arcade Street and Phalen Boulevard provides on-street and off-street bicycle facilities. This plan envisions extending these facilities to other parts of the Grand Round, including Wheelock Parkway west of Arcade Street, Johnson Parkway, and portions of Pelham Boulevard and Como Avenue.

However, this plan does not present a singular vision for the Grand Round, and the planned improvements must be guided by existing constraints. This vision does not propose in-street facilities where the Grand Round follows the Sam Morgan Regional Trail. On-street bicycle facilities are not recommended for Shepard Road or Warner Road. This vision also does not propose off-street path facilities along Raymond Avenue and

portions of Como Avenue where right-of-way is limited. In-street bicycle facilities are recommended in these locations.'

6.7 State Trails

State trails are owned, operated, and maintained by the Minnesota Department of Natural Resources (DNR). The DNR operates one trail facility in the City of Saint Paul. The Gateway State Trail was opened for public use in 1993, originally as an extension of the Minnesota-Wisconsin Boundary Trail, which was envisioned to connect the Twin Cities with Duluth. Approximately 2.1 miles of the trail is located within Saint Paul.

At the time if this writing, the southern terminus of the Gateway State Trail is located at Cayuga Street west of I-35E, though in conjunction with the I-35E Cayuga Interchange project, the Gateway State Trail will be extended approximately 0.7 miles south to University Avenue by 2016. The 1986 master plan created by the DNR established a desire to extend the trail into the "downtown area", though a preferred alignment for this extension was not identified.

Action Item 6.7.1

Coordinate with the DNR to identify the appropriate long-term southern terminus of the Gateway State Trail.

The Mississippi River Trail (MRT) in Saint Paul

6.8 Mississippi River Trail (MRT) - U.S. Bike Route (USBR) 45

MnDOT has been the lead agency on the development of the Mississippi River Trail (MRT), also known as U.S. Bike Route (USBR) 45, which is a 3,000 mile long planned bikeway from the Mississippi River headwaters to the Gulf of Mexico. The U.S. Bike Route System is a national effort to establish a network of numbered interstate bicycle routes across the nation. Approximately five numbered routes have been identified at a conceptual level that pass through Minnesota. One of these, the MRT, passes through Saint Paul. MnDOT has been the lead agency in identifying the specific alignment of the MRT, and is the lead agency in establishing all signage designating the route.

In Saint Paul, the MRT is established entirely on existing bikeway corridors through signage and wayfinding. The MRT is identified on **Figure 9.**

Action Item 6.8.1

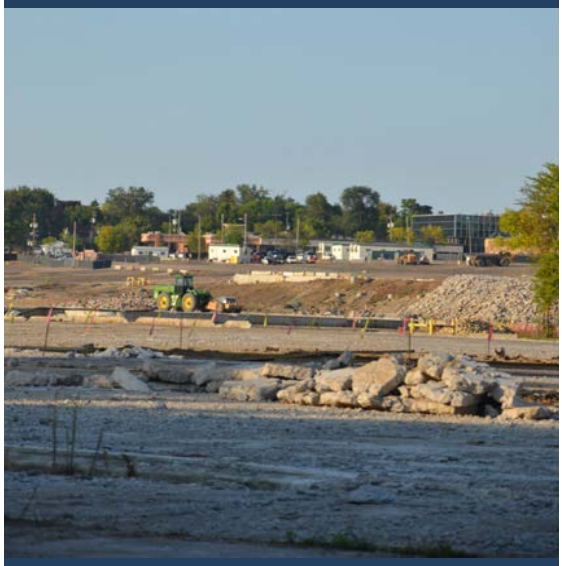
Coordinate with MnDOT to determine possible future revisions to the alignment of the Mississippi River Trail, particularly as it passes through Lilydale. Consider revising the MRT alignment to include the South Saint Paul to Harriet Island Regional Trail after it is constructed (planned for 2017).

6.9 Ford Site

The 125-acre Ford Motor Company Twin Cities Assembly Plant is currently in the process of undergoing a major transformation. The former assembly plant has been removed and the city is currently in the process of planning for future redevelopment. The city has established a vision for a "21st Century Community," and the site will be a livable, mixed use neighborhood that looks to the future with clean technologies and high-quality design for energy, buildings, and infrastructure. The site will place a high priority on encouraging walking, biking, and transit.

The city is currently in the process of setting a vision for new roadways, transit access, walkways, and bikeways throughout the site, and planning should be complete in 2016. This ongoing planning process should include establishing a plan for bikeways to be developed throughout the site. Special care should be taken to identify bikeways that both serve the planned development site as well as facilitate bicycle passage through the site. At a minimum, the following bikeway priorities should be set for the Ford Site and the surrounding areas:

- **Dedicated Bicycle Infrastructure** - Off-street and in-street bikeways, as well as support facilities such as bicycle parking, should be incorporated to the fullest extent possible within the Ford site redevelopment, to provide a strong network of bicycle connections to, from, and within the site for all types of users.



The Ford site in 2014

- **Improvements to the existing facilities along Mississippi River Boulevard** – The existing trails adjacent to the Ford Site along the west side of Mississippi River Boulevard are not of sufficient width to accommodate existing users, and space to expand the trails is limited given the current location of Mississippi River Boulevard. Improvements to Mississippi River Boulevard that result in additional space to develop higher quality off-street trail facilities along the west side of Mississippi River Boulevard adjacent to the Ford Site should be considered, including the existing trail bottleneck where Mississippi River Boulevard passes underneath Ford Parkway.
- **Improved connections between Mississippi River Boulevard and Ford Parkway** – The existing connections between Mississippi River Boulevard and the Ford Parkway bridge are insufficient and opportunities to improve these connections should be explored.
- **Ford Rail Spur** – Ford site planning should anticipate reuse of the freight railroad spur as a public transportation opportunity and include off-street paths for walking and biking, in addition to other potential modes such as transit. Ford site planning efforts should develop a plan to connect trail users to both Mississippi River Boulevard and the Ford Parkway bridge.
- **Montreal Avenue Extension** – Montreal Avenue is an important existing east/west bicycle route. Concepts should be developed that facilitate east/west travel between the current western terminus of Montreal Avenue and Mississippi River Boulevard.
- **Ford Parkway Improvements** – This plan identifies an enhanced shared lane strategy for a portion of Ford Parkway adjacent to the Ford site. However, this is not an optimal solution given the traffic volumes and speeds on Ford Parkway. Ford site planning efforts should consider alternative options to accommodate east/west bicycle travel on Ford Parkway.

6.10 Downtown Trail Loop & Shared Lanes

This plan recommends the development of a unique off-street trail network throughout the downtown area as well as enhanced shared lanes on most downtown streets. This strategy is designed to make downtown a hub in the city bicycle network and to effectively and safely accommodate cyclists of all preferences. The trails are designed to accommodate slower bicyclists and to

encourage new or casual cyclists to visit downtown. The enhanced shared lanes throughout downtown will accommodate faster cyclists who are seeking the operational and speed benefits of integrating with motorized traffic.

The planned downtown trail network can be described as a loop alignment as well as connections between the loop and the existing bikeways approaching downtown. The loop trail will effectively place a majority of downtown within two or three blocks of the trail. Connections between the loop and other existing and planned routes into and out of downtown will be developed prior to or in concurrence with the loop to ensure connectivity to the surrounding bicycle network.

The trails are planned to be off-street path type facilities that accommodate two-way bicycle traffic, even when adjacent to one-way streets. The trails throughout downtown will be of a different aesthetic character than other trails throughout the city. Generally off-street path facilities are constructed using asphalt, and are surrounded by turf, landscaping, or other boulevards on both sides where space permits. The downtown trails will take on more of an urban character and may be constructed out of a number of different materials, including concrete to provide a distinctive appearance. Despite the different look and feel of these urban trails, they will share similar operational characteristics with other popular off-street trails throughout the city. People who are comfortable riding a bicycle on off-street paths in other contexts will find these facilities familiar and attractive.

The downtown trail network is a unique recommendation that places Saint Paul at the forefront of bicycle planning in the U.S. Very few other cities have developed similar facilities. Saint Paul may look to the Indianapolis Cultural Trail for design inspiration. The Indianapolis Cultural Trail is a similar eight-mile network of off-street paths through downtown Indianapolis connecting the major cultural institutions throughout the city. In Saint Paul, the off-street trail network would connect popular attractions such as the Xcel Center, the Ordway Theater, the Science Museum of Minnesota, the Minnesota History Center, the Union Depot, the Farmers Market, the Lowertown Ballpark, the Landmark Center, the Minnesota Children's Museum, and other institutions and businesses throughout downtown.

The recommendation to develop a network of off-street trails throughout the downtown has larger objectives than simply accommodating bicycle transportation. At a basic level, this is a recommendation to develop vibrant urban spaces that encourage

Indianapolis Cultural Trail

Rendering of off-street trail along Jackson St

city residents and visitors to enjoy being outdoors whether or not they are using a bicycle. This strategy is best implemented within the context of full reconstruction of adjacent sidewalks (if not the full right-of-way), when the needs of pedestrians and ground floor activity in adjacent buildings can be enhanced. The call for utilizing unique and innovative design features extends beyond the bicycle facilities to the sidewalks, plazas, and other public spaces.

This recommendation is designed to be an economic development catalyst for downtown businesses. Companies that choose to locate in downtown must be confident that downtown is a place where employees will want to work and spend time. Businesses must be confident that the downtown built environment will help them attract top talent from across the nation, in addition to encouraging graduates from the many colleges and universities in Saint Paul to want to stay and work locally. Businesses of all types will flourish as downtown becomes a place where people want to spend time outdoors.

Phase I - Jackson Street

The first phase of the downtown bicycle facilities will be developed on Jackson Street, from Shepard Road to 11th Street. Jackson Street is a logical choice to be developed as phase one of the downtown trail loop because of the wide right-of-way, and the need to invest in the corridor to correct other deficiencies such as poor pavement quality. In addition, development of this first phase of the loop will help make the connection between the Gateway State Trail and the Sam Morgan Regional Trail, a critical missing link in the regional trail network. The trail is initially envisioned to be along the west side of Jackson Street, though this recommendation should be confirmed as detailed design progresses.

Additional Trail Alignments

As work progresses on developing a trail along Jackson Street, further study is needed to determine the final alignment of the loop trail network as well as connections between the loop and the existing bikeways that approach downtown. The following corridors should be evaluated to determine the most appropriate final alignment for the remaining three sides of the loop:

- Saint Peter Street or Wabasha Street
- Kellogg Boulevard or 4th Street
- 10th Street or 11th Street

Connections between the loop and other existing and planned routes into and out of downtown will be developed to ensure connectivity to the surrounding bicycle network. The following corridors should be evaluated to determine the most appropriate connections between the loop and the surrounding areas:

- West along Kellogg Boulevard or 5th Street to connect to the bikeways on Summit Avenue, Marshall Avenue, and Eagle Parkway.
- East on Kellogg Boulevard or 4th Street to connect to the Union Depot Trail, Bruce Vento Regional Trail, Trout Brook Regional Trail, and Indian Mounds Trail.
- Northwest on Saint Peter Street or Wabasha Street to connect to the existing bike lanes on John Ireland Boulevard, Park Street, and Como Avenue, as well as the Charles Avenue Bikeway.
- South on Sibley Street to connect to the Sam Morgan Regional Trail.
- The alignment should include a connection to the Wabasha Bridge.

Rendering of off-street trail along Jackson Street

Downtown Loop Trail Alignment

6.11 Interim Facilities & Other Notes

In some cases, the planned bikeways identified in this plan are intended to be an interim measure until alternative facilities can be developed. Several of the planned bikeways have been identified as interim facilities, while others have unique circumstances or conditions. A summary of these conditions is presented below:

Table 6.11.1 Interim Facilities & Other Notes

Street Name	From	To	Length (Miles)	Existing Facility Type	Planned Facility Type Group	Notes
Marshall Ave	Western Ave	John Ireland Blvd	0.4		In-Street Separated Lane	Counter-flow bike lane.
Manomin Ave	George St	Cherokee Ave	0.1	Enhanced Shared Lane	Enhanced Shared Lane	Existing interim route until Cherokee Ave Trail extension across Smith Ave is constructed.
George St	Cherokee Ave	Smith Ave	0.1	Enhanced Shared Lane	Enhanced Shared Lane	Existing interim route until Cherokee Ave Trail extension across Smith Ave is constructed.
George St	Smith Ave	Manomin Ave	0.1	Bike Lane	In-Street Separated Lane	Existing interim route until Cherokee Ave Trail extension across Smith Ave is constructed.
Hamline Ave	Montreal Ave	Pierce Butler Rte	3.8		In-Street Separated Lane	Implementation of bike lanes is contingent upon further engineering study and traffic analysis. Portions of this alignment may not be feasible with current traffic volumes.
Aldine St	Summit Ave	Carroll Ave	0.8		Bicycle Boulevard	Must convert roadway to 2-way traffic and remove parking.
Earl St	Wakefield Ave	Maryland Ave	1.7		In-Street Separated Lane	Northbound bike lane - One-way pair with Forest Street.
Forest St	Old Hudson Rd	Maryland Ave	1.7		In-Street Separated Lane	Southbound bike lane - One-way pair with Earl Street.
University Ave	Raymond Ave	Aldine St	1.4		Enhanced Shared Lane	Recommended as interim route until alternate parallel routes to north and south are established.
Vandalia St	Territorial Rd	Ellis Ave	0.2		Enhanced Shared Lane	Recommended as interim route until Minnehaha Avenue extension from Vandalia Street to Prior Avenue can be developed.
Ellis Ave	Vandalia St	Transfer Rd	0.2		Enhanced Shared Lane	Recommended as interim route until Minnehaha Avenue extension from Vandalia Street to Prior Avenue can be developed.
Charles Ave	Raymond Ave	Transfer Rd	0.6		Enhanced Shared Lane	Recommended as interim route until Minnehaha Avenue extension from Vandalia Street to Prior Avenue can be developed.
Jackson St	Trout Brook Regional Trail	Arlington Ave	0.4		Off-Street Path	Recommended as interim route until ROW can be aquired from RR as identified in Trout Brook Regional Trail Master Plan.
W 7th St	Kellogg Blvd	Mississippi River Blvd	5		Enhanced Shared Lane	Implementation of enhanced shared lanes will not displace parking or travel lanes.

Chapter 7:
End of Trip Facilities

Saint Paul
Bicycle Plan

7.0 END OF TRIP FACILITIES

Ensuring adequate end-of-trip facilities, including bicycle parking, showers, changing rooms, and other amenities, is a critical part of creating an attractive bicycle transportation system. The presence or absence of these facilities will often play a substantial role in determining whether bicycling is viewed as a realistic transportation option.

7.1 Bike Parking

Bicycle parking is an important part of a functioning streetscape and is a basic need for anybody using a bicycle. At both ends of every trip, users must be confident that their bicycle can be stored in a safe location.

Bicycle Parking can be described as short-term or long-term. Short-term bicycle parking should emphasize convenience and ease of use for parking durations of less than two hours. Long-term bicycle parking should emphasize security and weather protection for durations of greater than two hours.

Table 7.1.1 Short-term & Long-term Bicycle Parking Characteristics

Criteria	Short-term	Long-term
Parking Duration	Less than two hours	More than two hours
Fixture types	Simple Bicycle Racks	Lockers, racks in a secured area
Weather protection	Typically unsheltered	Sheltered or enclosed
Security	Relies on user-provided bicycle locks and passive surveillance (e.g. eyes on the street)	Unsupervised:
		"Individual-secure" such as bicycle lockers
		"Shared-secure" such as a restricted access room
		Supervised:
		Staffed bicycle storage area
Location	May be inside or outside of the public right-of-way	Typically outside of the public right-of-way
Provider	May be privately owned or provided by the city or other partner agency	Typically privately owned and located on private property

Source: Adapted from APBP Bicycle Parking Guidelines

Properly designed long-term bicycle parking almost always offers a superior level of security compared with short-term parking, and will typically be located outside the public right-of-way or on private property. However, it will often be located in access controlled areas and may not be available for use by visitors. Short-term bicycle parking, where feasible, may be provided on private property. However, much of the demand for short-term bicycle parking will be met by providing bicycle parking in the public right-of-way.

It is of critical importance to provide appropriate long-term bicycle parking within residential properties. While many residents in single-family homes have a garage that effectively serves this function, many residents of multi-family housing do not have a similar space to store a bicycle. Residents of multi-family housing should be provided a secure and sheltered long-term bicycle parking location that is separate from their private living space and does not require the bicycle to be carried on stairs or elevators.

It is desirable to ensure a sufficient quantity of bicycle parking to discourage people from locking bicycles to inappropriate objects, such as gas meters, trees, or hand rails; or in areas where the locked bicycle will impede movement, such as in front of doorways, pedestrian curb ramps, or at bus stops. By proactively providing bicycle parking in appropriate locations, the city can discourage bicycle parking in inappropriate locations.

The vast majority of bicycle parking owned by the city is short-term parking provided in the public right-of-way. The City does not operate any bike lockers, though some are available through partner agencies such as the Metropolitan Council on city-owned property.

City Zoning Code Bicycle Parking Requirements

Section 63.200 of the City zoning code establishes the bicycle parking requirements for all new construction and redevelopment throughout the city. The code establishes the minimum number of bicycle parking spaces required for a development, and provides guidance for where and how bicycle parking should be provided.

The code states that "the location of bicycle parking facilities shall be at least as convenient to the main entrance of the primary use as the most convenient third of the automobile parking." The code allows the required bicycle parking to be located within the

Short-term bike parking along Como Ave

public right-of-way with a permit from the city engineer. Bicycle parking must be provided a similar level of protection from weather as is provided for motor vehicle parking.

A summary of the current minimum bicycle parking requirements are as follows:

- **General:** one bicycle parking space for every 20 motor vehicle parking spaces
- **Residential:** one bicycle parking space for every 14 dwelling units
- **Allowed Substitution:** Bicycle parking spaces may be substituted for up to 10% of the required motor vehicle parking spaces. One motor vehicle parking space may be replaced by two bicycle lockers or four bicycle parking spaces.

The current zoning code does not specify whether the required bicycle parking is intended to function as short-term or long-term bicycle parking, and does not provide different guidelines for each type. In addition, the requirement for residential bicycle parking may not provide adequate bicycle parking. For non-residential properties, the number of required bicycle parking spaces is directly tied to the number of motor vehicle parking spaces provided, which may not provide adequate bicycle parking facilities in locations such as along the Green Line LRT where required motorized parking may be reduced by 100 percent.

Action Item 7.1.1

Conduct a zoning study to evaluate revisions to the zoning code to differentiate between short-term and long-term bicycle parking; to evaluate minimum bicycle parking requirements for residential developments; and to consider strategies to ensure sufficient bicycle parking is provided along the Green Line LRT and future transit corridors.

Bicycle Parking in the Public Right-of-Way

Short-term bicycle parking should be located near the primary entrance to each destination. Often, locating bicycle parking

within the public right-of-way will provide the most convenient experience for bicycle users. Short-term bicycle parking in the public right-of-way is primarily provided in commercial areas to help people on bicycles easily access local businesses and workplaces. In most cases, this is accomplished through the installation of simple bicycle racks in the boulevard and furnishing zone of the sidewalk. Public Works has developed installation and spacing guidelines for bicycle parking in the public right-of-way.

In some locations, opportunities to locate bicycle parking in the boulevard are limited, though demand for bicycle parking may be high. In these cases, it may be appropriate to locate bicycle parking within the parking lane of a roadway, often called a "bike corral." Bike corrals will typically only be installed at the request of an adjacent property owner. The first bike corral in the city was installed in the fall of 2014.

Public Works maintains a database of bicycle rack locations throughout the city, though some of the data may be outdated or incomplete at the time of this writing. The database of bike racks is publicly available through the city's online GISmo mapping tool.

Action Item 7.1.2

Complete a full inventory of bicycle parking within the public right-of-way and establish a procedure to update and publish the maps and inventory as appropriate.

The city continues to receive requests for additional bicycle parking within the public right-of way. In response, the City has developed a Neighborhood Bike Rack Program for the purpose of installing short-term bicycle parking. In 2014, this program was funded by a grant in the amount of $10,000. The number of requests for bicycle parking exceeded the available funding. No long term funding source has been identified to continue this program.

It is not well understood at this time where there is a need for additional bike parking in the public right-of-way, how much is needed, or how to prioritize future investments in bike parking.

Private bicycle rack in the public right-of-way on Raymond Ave

Short-term bicycle racks at the Union Depot Transit Center

Action Item 7.1.3

Conduct a study to identify where a bike parking deficit exists in commercial areas and create a proactive strategy and program to fund and install additional bike parking in high-demand areas.

The easiest and most cost effective opportunity to install bicycle parking in the public right-of-way is by performing the work at the same time as other work is being performed, such as street or sidewalk reconstruction. Many bicycle racks have been installed in the public right-of-way in the past as part of larger reconstruction efforts, however, the City has not consistently taken advantage of these opportunities due to a lack of established procedures.

Action Item 7.1.4

Establish a policy and procedure to install bicycle parking facilities in the public right-of-way in conjunction with all street or sidewalk construction or reconstruction projects. The quantity and placement of the bicycle parking should be consistent with existing or anticipated demand.

Bicycle Parking within Heritage Preservation Districts

The bicycle has played an important role throughout the history of transportation. Bicycles were popular and affordable before the automobile reached widespread use, enjoying an initial peak in popularity in the 1880's and 1890's, a time when much of Saint Paul was still developing. Special care must be taken to incorporate bicycle parking facilities into identified Heritage Preservation Districts in a thoughtful manner.

Action Item 7.1.5

Coordinate with the Heritage Preservation Commission and staff to identify appropriate short-term bicycle rack styles to be used within the public right-of-way in identified Heritage Preservation Districts.

Bicycle Parking at Transit Stations

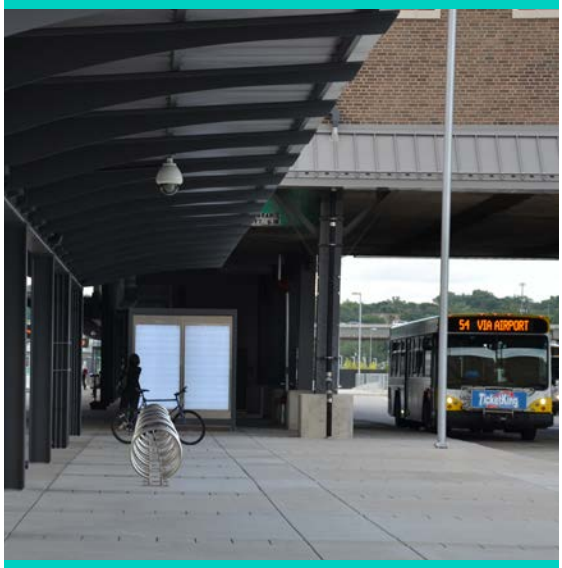
Improving bicycle access to transit stations and stops is a top priority to encourage multi-modal trips. Effective integration of bicycle parking and routes with transit facilities and routes will increase both bicycle use as well as transit ridership.

Bicycling can greatly expand the viability of using transit to complete a trip. While bicycling has the potential to expand the effective service area of a transit route, transit likewise expands the ability to use a bicycle for a portion of a trip. This is especially true for trips of sufficient length that bicycling alone is not a realistic option. The vast majority of buses and LRT vehicles operating in Saint Paul already permit transit users to bring bicycles onto the transit vehicles, giving people using bicycles the option of leaving their bicycle at the transit stop or station, or bringing their bicycle with them on the bus or LRT vehicle.

Provision of bicycle parking at transit stations and stops is a collaborative effort between the city and transit operators. For example, bicycle parking provided by Metro Transit is located at many of the Green Line LRT stations in a location of prime convenience for transit users. However, bicycle parking is frequently not provided at typical bus stop locations. In absence of bicycle parking at bus stops, however, transit users may lock a bicycle to a transit post sign or other object within the bus stop area that interferes with bus loading and unloading.

Action Item 7.1.6

Support transit agency partners in their efforts to provide high quality bicycle parking in and around transit stops and stations, much of which will be located within the public right-of-way. Integrate bicycle parking into station areas as possible at all new high-capacity transit stops and stations, including stops and stations along the arterial BRT routes, such as the "A Line," as well as other transitways such as the Gateway Corridor. Coordinate with transit agencies to ensure that adequate bicycle parking is provided at Park and Ride facilities in and near the city.



Sheltered bike parking at the Union Depot Transit Center

Bike tune up station on the Bruce Vento Trail at Lake Phalen

7.2 Showers, Lockers, & other Amenities

End-of-trip facilities such as changing rooms, showers, personal lockers, and self repair services (such as air pumps) are all important factors in determining whether individuals will choose to use a bicycle for transportation, especially for commuters who may need to maintain a professional appearance at work. An attractive and secure place to freshen up after breaking a sweat is a necessity for many potential bicycle commuters.

Employers should be encouraged to provide showers and other end-of-trip facilities for their employees. For many smaller businesses or developments, this will not be a realistic possibility. However, opportunities for multiple small businesses to share facilities can make it a more realistic possibility. In some cases, partnerships with nearby facilities (such as private gyms or fitness centers) may provide realistic opportunities for employers to provide this benefit to employees. In many cases, large employers or office developments will include showers in connection with other on-site fitness amenities.

There are currently no requirements regarding provision of changing rooms, showers, or other end-of-trip amenities.

Action Item 7.2.1

Consider encouraging or requiring end-of-trip amenities as appropriate in new development, particularly in large office buildings.

Bicycle Tune-Up Stations

In the summer of 2014, five tune-up stations provided by private sponsors were installed at locations throughout Saint Paul. The tune-up stations provide air pumps to inflate tires as well as other basic tools to help bicyclists keep their bicycles in working order. Opportunities to expand the offering of tune-up stations should be explored.

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Chapter 8:
Bicycle Programs & Other Topics

Saint Paul
Bicycle Plan

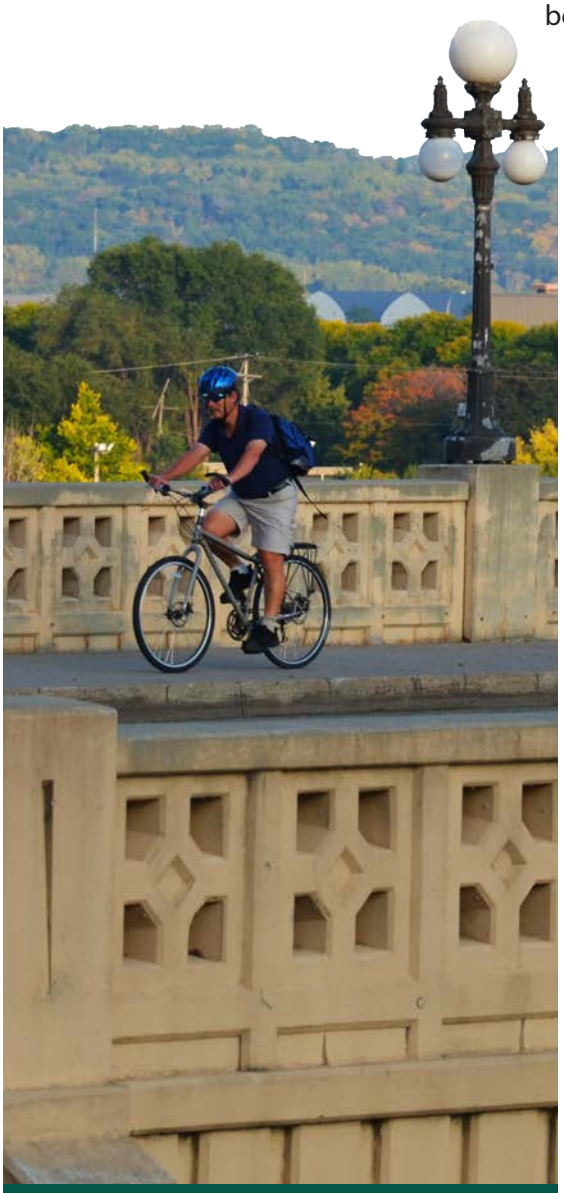
8.0 BICYCLE PROGRAMS & OTHER TOPICS

8.1 Bicycle Counting

It is important to understand how and where people are using bicycles to make informed decisions about infrastructure. However, the city currently has a limited understanding of how many people are using bicycles, how frequently they are using them, and what routes they are using, especially compared to our understanding of usage levels of other modes of transportation.

Manual Counts

There have been several efforts to begin gathering count information of bicyclists. A local nonprofit organization Transit for Livable Communities established a program to conduct annual counts at a handful of locations in Saint Paul in 2007. Other data has been collected by the city or neighborhood groups on an ad-hoc basis for specific projects or other initiatives over time.



In 2013, the city established a bicycle and pedestrian count initiative to establish a formal methodology and counting procedure. The counting methodology relies on volunteers to collect two hours of count data each year in early September, and is based on recommendations from MnDOT and the FHWA about bicycle counting methods. The methodology recommends that the counting effort be repeated annually. The count was repeated in 2014, though it is uncertain whether the city can sustain this effort on an annual basis.

The city frequently receives requests from individuals, developers, and neighborhood organizations for data regarding the number of bicycles using a particular route. The city does not currently have a clear method for cataloging and publishing bicycle count data. The results of the 2013 and 2014 bicycle counts are published on the city website, but more efficient or useful data presentation methods may be developed.

Action Item 8.1.1

Explore the feasibility of continuing the manual counting efforts on an annual basis. Consider partnerships with other groups and agencies that may be able to assist with volunteer recruitment, training, and organization. Establish a clear methodology for cataloguing, and publishing bicycle count data.

While the various volunteer-driven manual counting efforts have provided a good start to understanding bicycle traffic, manual counting efforts are labor intensive and may not be a sustainable approach over time to collecting data. In addition, the current methodology of collecting two hours count data one day each year provides merely a snapshot in time of bicycle usage. The current methodology does not provide an understanding of bicycle usage throughout the day, week, or year.

Automated Counts

Various methods to automate the collection of count data are rapidly emerging. Traditional technologies such as pneumatic tubes can be used to collect bicycle count data in some circumstances. In addition, new technologies such as thermal imaging or cameras may be an effective strategy. While automated counting procedures may not provide perfect counting accuracy, the ability to collect greater volumes of data over time is inherently valuable.

Action Item 8.1.2

Explore opportunities to automate the collection of bicycle and pedestrian count data. Document costs associated with automated counting as well as current best practices for ensuring accuracy. To the extent feasible, establish a methodology for collecting and publishing automated count data.

8.2 Wayfinding & Mapping

Wayfinding tools such as signage, pavement markings, maps, or electronic guidance can help make the city easier to navigate by bicycle, especially for new cyclists, or people using an unfamiliar route. The city publishes a map of the existing bicycle network and updates the map at least annually. In addition, various organizations such as advocacy groups have published bicycle network maps.

Several online wayfinding tools such as Google Maps directions and Cyclopath allow bicyclists with internet access to access route information and recommendations. However, these services provided by third parties may not have up-to-date information about the bicycle network, including information about temporary disruptions or detours to the network.

Wayfinding signage along Charles Ave

Nice Ride station at Lake Phalen

Action Item 8.2.1

Ensure the portability of electronic information about the bicycle network and provide third parties with easy access to the data.

However, the city should not assume that all persons using bicycles have access to electronic route information. Traditional wayfinding elements such as signage and pavement markings should be used to help bicyclists find destinations when the route is not clear or obvious. The existing wayfinding system should be enhanced and expanded, in accordance with the guidance included in the Saint Paul Street Design Manual. Coordination of wayfinding signage across route systems should be coordinate among the various managing agencies.

8.3 Nice Ride Minnesota

Nice Ride Minnesota is a nonprofit bicycle sharing system operating in the Twin Cities. The system was established in Minneapolis in 2010 and expanded into Saint Paul in 2011. The system currently boasts over 1,550 bikes and 170 stations in operation across the Twin Cities.

Bicycle sharing is often ideal for short distance point-to-point trips, especially spontaneous trips where users do not have their own personal bicycles with them, or when they would rather leave their bicycles at home. In many ways, bicycle sharing can be viewed as an extension of the transit network, with bicycling providing the last mile service of a combined trip with the light rail or bus service. The system is popular for both residents and tourists and is often one of the simplest ways to get around Saint Paul.

Users of Nice Ride are typically seeking a casual bicycling experience. The bicycles are designed to provide a comfortable upright seating position and are geared to provide easy pedaling, though that results in slower speeds than on more high-performance bicycles. As a result, users of Nice Ride are often drawn to bicycle facilities that provide the most comfortable user experience traveling at slower speeds. Users of Nice Ride will naturally be drawn to facilities such as off-street paths or cycle tracks that enhance the perception of safety and provide separation from motor vehicles.

While Nice Ride stations are typically located in the public right-of-way and must be coordinated and approved by the city, the station locations are typically selected by Nice Ride.

The current Nice Ride service area is focused around downtown and the central portions of the city bounded by University Avenue and Grand Avenue, though some stations exist on the city's West Side and as far north as Como Regional Park. However, the east side of Saint Paul is not currently served by Nice Ride.

Action Item 8.3.1

Coordinate with Nice Ride to encourage and facilitate the continued expansion of the system to portions of the city not currently served as well as the densification of the system throughout the city. Encourage coordination of station locations near substantial bicycle trip generators, transit facilities, and near the bicycle network. Support Nice Ride MN efforts to test new strategies and tools to encourage bicycle ridership.

8.4 Lighting

Ensuring that the bicycle network is well lit is critical to ensure the safety and usability of bicycles. This is especially true of off-street paths that pass through isolated areas and are not adjacent to roadways or buildings. The usability of poorly lit or unlit paths can be greatly diminished during overnight hours and much of the winter when daytime hours are reduced.

The city has a well established street lighting policy that guides how lighting is used along public rights-of-way. However, this policy is focused primarily on roadways lighting and does not provide clear guidance on lighting expectations for bicycle facilities that are not adjacent to roadways. In general, bikeways that are located in the street or immediately adjacent to the street do not require any additional lighting beyond what is provided according to the current street lighting policy.

When lighting bikeways, special care should be taken around bridges, culverts, or other structures that may cast shadows or block other ambient light sources. Special care should also be given to appropriate lighting of bicycle and pedestrian bridges.

Lighting installed on the under construction Union Depot off-street path

Action Item 8.4.1

Develop a policy to guide lighting of bikeways that are not adjacent to roadways, including lighting on bicycle and pedestrian bridges.

8.5 Traffic Signal Detection

Throughout the development of this plan, many bicyclists stressed the importance of ensuring that traffic signals throughout the city function appropriately for bicyclists. In many cases, traffic signals are programmed to detect the presence of bicyclists, motorists, or pedestrians to trigger a green light for bicyclists. In some cases, if a traffic signal is not capable of detecting the presence of a bicycle, bicyclists must wait through a long traffic signal cycle, even if there is no opposing traffic. In in other cases, the bicyclist will never receive a green light if they are not detected. Traffic signals that do not efficiently accommodate bicyclists may result in an increased rate of bicyclists illegally running red lights.

Minnesota State Statute 169.06 subd. 9 permits bicyclists to enter an intersection against a red light provided that:

- The bicycle has been brought to a complete stop
- The signal shows a red light for an unreasonable time
- The signal is malfunctioning or is not capable of detecting bicyclists
- No motor vehicle or person is approaching on the street or is far enough from the intersection that it does not constitute an immediate hazard

There are various methods and technologies that can be used to detect bicyclists. Active detection methods require bicyclists take an action, such as push a button, to be detected. This may be appropriate in locations such as where a low traffic volume bicycle boulevard crosses a busy arterial. In these cases, the push button should be placed in a location where bicyclists are able to easily reach the button without dismounting.

Passive detection methods such as induction loops or cameras do not require the bicyclists to take an action to be detected, though they may still require a bicyclists to stop at a specific location in the roadway. In these cases, a pavement marking may be used to indicate where bicyclists should position themselves.

Bicyclist waiting for a traffic signal in Lowertown

Bicyclist detection is not necessary in some situations, such as when the traffic signal operates on a fixed cycle and phasing pattern. In addition, detection may not be necessary on higher-volume roadways where the signal is already programmed to prioritize the heavy through traffic volumes.

Action Item 8.5.1

Consider bicyclist detection at all signalized intersections on the bicycle network and as part of all new signal installations.

8.6 Bicycling on Sidewalks

Minnesota Statute 169.222 permits riding a bicycle on a sidewalk, except for within a business district unless permitted by local authorities. Bicycling on sidewalks is generally discouraged for adult bicyclists, and can be unsafe for bicyclists, pedestrians, and motorists. Saint Paul does not currently have any local ordinances that govern bicycle riding on sidewalks, nor has the city installed any signage or pavement markings in business districts to actively discourage unsafe sidewalk bicycling. In many cases, bicyclists who choose to ride on the sidewalk rather than in the street do so because they do not feel safe in the street. Actions to discourage bicycle riding on the sidewalk may not be effective without simultaneous efforts to provide bicyclists with a safe alternative space to ride.

Action Item 8.6.1

Consider developing a policy regarding signage or pavement markings to discourage bicyclists from riding on sidewalks in business districts.

8.7 Education, Encouragement, & Enforcement

The vision established in this plan to encourage new bicycle ridership will not be realized without a range of programs designed to encourage use of bicycles, to provide education materials, promote enforcement of traffic laws. Education

Bicyclists riding on the sidewalk in downtown

MnDOT's Share the Road promotional material

and encouragement efforts will raise the visibility of bicycling throughout the community and help information of bicycling reach new audiences. In particular, helping new bicyclists understand the rules and expectations for bicyclists.

Many community groups are well positioned to assist with education and encouragement efforts and the city should work to promote partnerships with groups who can provide leadership on these efforts. Groups such as St. Paul Women on Bikes, Cycles for Change, Friendly Streets Initiative, Nice Ride, Saint Paul Bicycle Coalition, and other groups may be able to contribute significantly to encouragement and education efforts. In addition, partnerships with local schools may be an effective venue to provide educational materials and workshops for children.

MnDOT has developed a range of educational and promotional materials that local agencies can use and adapt to improve bicycle safety. The popular Share the Road campaign includes flyers, videos, and other resources Saint Paul could use. The materials highlight expectations and regulations for both bicyclists and motorists.

Enforcement of existing traffic laws is an important step to encourage bicyclists and motorists to behave predictably and responsibly while driving and biking. The Saint Paul Police Department is responsible for enforcing existing traffic laws for motorists, bicyclists, and pedestrians. Travelers using all modes benefit from increased compliance with traffic laws. Enforcing existing laws for all users will help make bicycling a safe and easy choice and will help support more respectful relationships between bicyclists and drivers. In particular, some agencies have reported success in using targeted enforcement efforts as a chance to distribute educational materials to bicyclists, motorists, and pedestrians.

Action Item 8.7.1

Explore opportunities to partner with other agencies or community groups to develop education, encouragement, and enforcement efforts, safety programs, and other initiatives designed to raise awareness of bicycling.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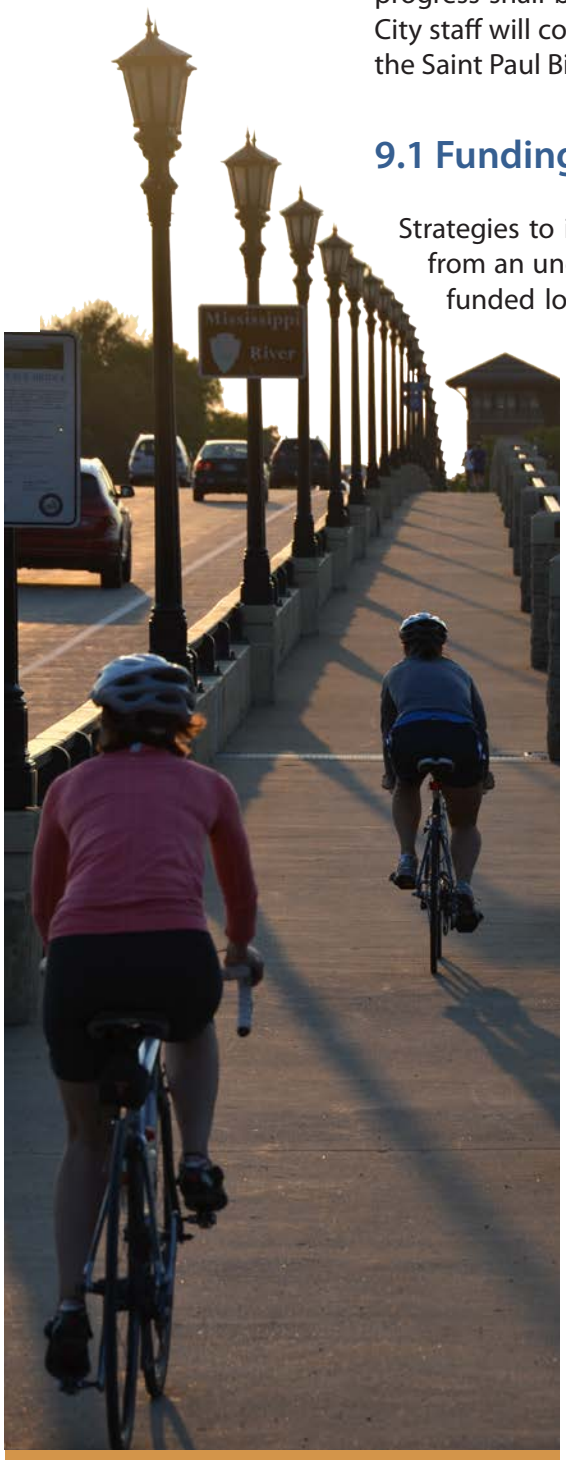
Chapter 9:
Implementation

Saint Paul
Bicycle Plan

9.0 IMPLEMENTATION

This document establishes a long-term vision that will take many years to fully implement. This plan does not establish a formal timeline for implementation. As such, regular and routine progress reports should be completed to provide a transparent accounting of progress in achieving the vision of this plan. Saint Paul Bicycle Plan progress shall be reviewed annually by the Transportation Committee. In addition, City staff will compile a ranked list and plan for completing the Action Items listed in the Saint Paul Bicycle Plan for Transportation Committee review.



9.1 Funding Network Expansion

Strategies to implement the recommendations of this plan must necessarily flow from an understanding of how the city funds capital projects. Most projects are funded locally, though some projects are funded by agency partners such as Ramsey County, MnDOT, or the Metropolitan Council. External state or federal grant sources are also available, though these sources are often not a predictable way to plan for network expansion.

Many of the bikeways recommended in this plan will be funded and developed as independent projects, though there may be some opportunity to bundle several similar projects together in a single funding request. In addition, much of the bicycle network will be funded through routine maintenance or reconstruction efforts. Bicycle network capital projects may be managed by either the Department of Public Works or the Department of Parks and Recreation, and are channeled through the city's Capital Improvement Budget (CIB) process for financing and implementation.

Capital Improvement Budget

The City maintains a two-year Capital Improvement Budget (CIB) that outlines all capital expenditures anticipated for the upcoming two-year period. The CIB is overseen by the CIB Committee, a citizen's committee comprised of 18 city residents appointed by the Mayor and approved by the City Council. The CIB is created through what is commonly referred to as the "CIB process," in which all city capital projects compete with each other for funding.

On a bi-annual basis, city departments (such as Public Works or Parks and Recreation) as well as community organizations submit proposals for capital funding. These proposals are evaluated and ranked by several citizen-based task forces of the CIB Committee.

Next, the CIB Committee prepares a recommended budget, which is reviewed, modified, and approved by the Mayor and City Council. Generally, only a small portion of the capital projects that are proposed will be selected to receive funding.

Every bicycle capital project will be proposed and funded through this process, either as a standalone bikeway project, or as part of a larger capital project. This includes projects that are successful at receiving state or federal funding to aid in implementation and require additional matching local funds, which will be identified through the CIB process.

Bicycle, Pedestrian, & Traffic Safety Program

Included within the CIB is the annually funded Bicycle, Pedestrian, and Traffic Safety Program, designed to fund safety improvements at various locations throughout the city. The program is intentionally flexible to fund safety improvements such as pavement markings, signs, pedestrian countdown timers, audible pedestrian signals, pedestrian ramps, traffic calming elements, dynamic speed display signs, and other elements.

While limited in scope by its funding appropriation ($252,000 in 2014), the program remains an important local funding source for bicycle infrastructure. However, it is not intended in scope to be the primary source of funding for expanding the bicycle network. Rather, it is intended to fund miscellaneous small-scale pedestrian and bicycle improvements that would not otherwise be funded.

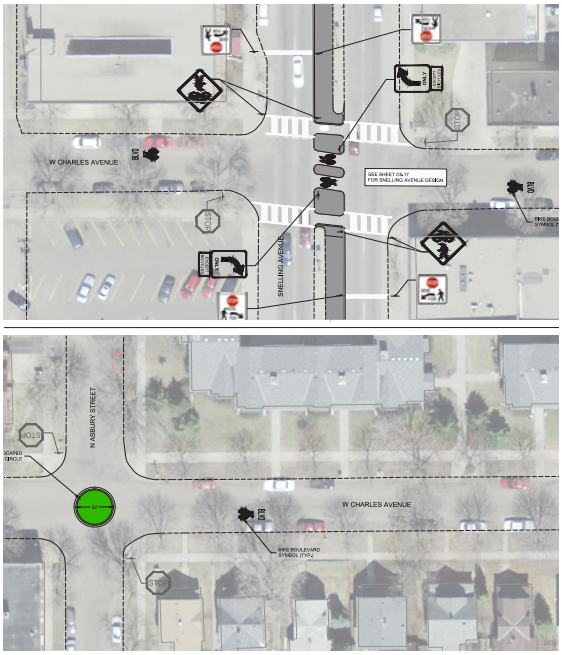
External Grants

The city will seek external funding sources as much as possible to implement the bicycle network, though the application process is often quite competitive. Typical grant sources include trail funding sources administered through the DNR and federal transportation grants administered by the Metropolitan Council. A full list of funding sources is presented in **Appendix G**.

Each funding source is unique and often comes with very specific requirements regarding eligible expenses. Often the qualifying or selection criteria for each funding source will determine the type of bikeway project that is likely to be successful at receiving funding.

The city will be best positioned to compete for external grants by completing the Phase 1: Planning portion of the Bikeway Development Process to demonstrate public support for the project and to be well-prepared to complete the applications.

The Charles Ave Bicycle Boulevard received an external grant for project planning and development



Approved design concept for the Charles Ave bicycle boulevard

9.2 Bikeway Development Process

This plan strives to create a consistent, careful, and systematic approach to implementing elements of the bicycle network. The intent of this approach is to minimize the timeline required to secure funding for the project, to facilitate the development of effective bicycle infrastructure in a cost-effective manner, and to better position the city to compete for external funding sources for bikeway implementation.

The project development approach can be described in four phases:

- Phase 1: Planning
- Phase 2: Develop Implementation Strategy
- Phase 3: Final Design & Implementation
- Phase 4: Evaluation & Maintenance

This document establishes a long-term vision for the development of a bicycle network throughout the city. However, there are still many details that remain to be determined for each corridor identified in this plan. This process is intended to help city staff and residents understand how and when these details are determined.

This process is not intended to be rigid or to discourage neighborhoods or staff from employing unique or new strategies of public involvement or planning. It is understood that each neighborhood will require a unique planning approach and that unanticipated opportunities for implementation may present themselves that should be seized.

In some cases, bikeways may be implemented quickly and easily without changing the operational characteristics of a roadway. This is particularly true of roadways identified for enhanced shared lane type bikeways that rely on shared lane markings or signage alone to establish the bikeway. In these cases, a formal planning or public involvement process may not be necessary and the bikeway may be implemented immediately upon identification of funding. In other cases, where impacts to the corridor may be more significant (e.g. parking restrictions or lane removals), a public involvement process will be necessary to discuss design alternatives, engage nearby residents, and confirm the recommendations in this plan before implementation.

The Bikeway Development Process proposed in this plan should be scaled as appropriate to each project. Where an

implementation opportunity has not been identified, this planning process may be completed over the course of a year or more. In other cases, such as when an implementation opportunity such as a scheduled mill and overlay is approaching, this process may need to be condensed so that an informed decision can be made in a timely manner. In both cases, the intent of this process is to provide a robust public engagement process.

Phase 1: Planning

The purpose of this phase is to establish the long-term vision and preferred design for full build-out of a bikeway. It is increasingly becoming a reality of local, state, and federal funding sources that city staff and residents must have completed a substantial amount of initial planning and public engagement in advance of applying for external funding. The purpose of this phase is not to discourage the city or neighborhoods from seeking funding without completing initial planning or public involvement efforts if there is a compelling reason to do so. Rather it is to better position those projects to be successful at receiving funding either external to the city or through the city CIB process.

Initial planning efforts for development of new bikeways or improvements to existing bikeways may be led either by city staff or neighborhood groups in collaboration with city staff. The end result of this phase should be an understanding of the existing conditions, a vision of the desired bikeway, and what improvements are required to realize the preferred design. This phase should also establish a concept level construction cost estimate for the bikeway.

This is also the most appropriate time to coordinate efforts between the City, Ramsey County, MnDOT, the DNR, and the Metropolitan Council to ensure consistency and agreement among agencies.

At a minimum, the planning phase should include the following:

- Collection of relevant data such as street widths, motorized and non-motorized traffic volumes, right-of-way width, existing conditions, crash history
- Identification of objectives
- Identification of long-term vision
- Initial public engagement effort
- Development of design alternatives
- Identification of a preferred design
- Development of concept level cost estimate

Bike lanes on Raymond Ave are being implemented in several construction phases

Construction of the Griggs Ave Bicycle Boulevard

Phase 2: Develop Implementation Strategy

The second phase is the process of matching the identified preferred design with a funding source or implementation opportunity. Funding for infrastructure projects is often a combination of several different sources, and each source will bring with it certain expectations and limitations. In some cases, the full project may need to be constructed in several construction phases over time, and each phase may be constructed using a different funding source.

This phase of the process should:

- Identify short-term and long-term opportunities
- Identify short-term and long-term priorities
- Evaluate potential for bundling bikeway implementation with other opportunities (such as upcoming routine roadway maintenance or planned reconstruction)
- Identify internal and external funding opportunities and timelines
- Apply for funding of full or partial project implementation
- Secure funding

In many cases, this will become an iterative process. If funding is secured to implement only a portion of the preferred design, the elements of the preferred design that remain unfunded will continue in Phase 2 until funding can be identified.

Phase 3: Final Design & Implementation

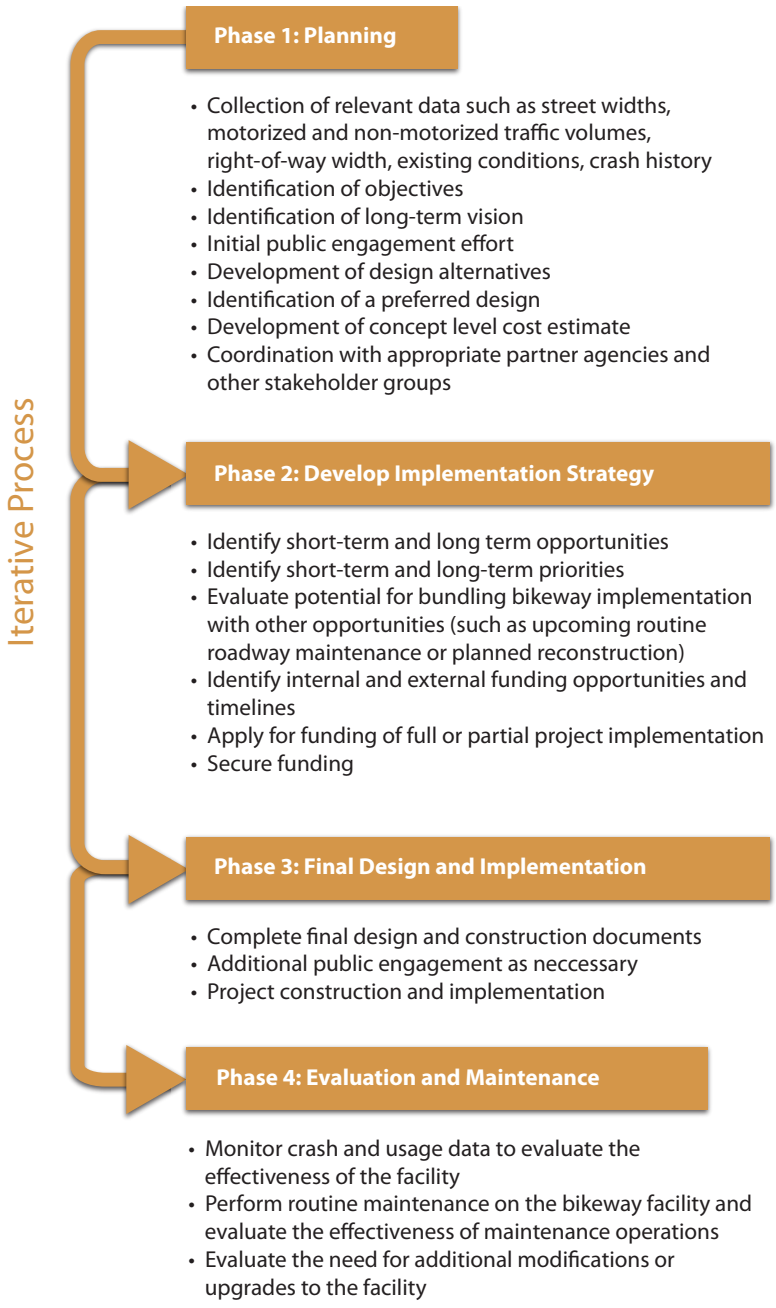
After funding has been secured to implement a preferred design, final design and construction documents will be completed by city staff and the project will be implemented. Construction may be performed by city staff or a private contractor, depending on the project scope and other factors. In most cases, this phase should also include a public involvement and notification effort consistent with the level of anticipated impacts. In some cases, educational or marketing materials may be needed to provide information to bicyclists, motorists, residents, and other stakeholders about new or unfamiliar designs.

Phase 4: Evaluation & Maintenance

After a bikeway has been implemented, it should continue to be evaluated and monitored to ensure that the design is performing as intended and to identify any unforeseen challenges or possible future improvements. This phase is continuous as the city should always be monitoring and evaluating existing infrastructure. At a minimum this phase includes the following:

- Monitor crash and usage data to evaluate the effectiveness of the facility
- Perform routine maintenance on the bikeway and evaluate the effectiveness of maintenance operations
- Evaluate the need for additional modifications or upgrades to the facility

Bikeway Development Process



9.3 Implementation Opportunities

The most fiscally efficient way to implement bicycle facilities is by implementing the bikeway as part of a larger construction or maintenance project, and doing so will often result in a better overall finished project. By including bicycle elements into other projects with a larger scope, the cost of implementing the bikeway is absorbed into the budget of the larger project, often at little additional cost to the larger project. The following is a list of common capital projects that can provide the means for implementing bikeways.

Mill and Overlay

The mill and overlay process involves grinding off the existing surface of the roadway and replacing it with new asphalt. In this process, the existing roadway striping and markings are removed, presenting an opportunity to re-evaluate the previous striping and lane configurations and consider implementing painted bicycle facilities for very little additional cost.

Implementing bicycle facilities through a mill and overlay process is not always possible. In some cases, implementing the planned bikeway will require additional work beyond the scope of a mill and overlay, such as roadway widening or significant signal revisions. In these cases, it will not be possible to implement the planned bikeway without identifying additional funding.

Bike lanes on Jackson St following the mill and overlay process

Action Item 9.3.1

Incorporate implementation of bikeways with routine maintenance projects whenever possible.

Residential Street Vitality Program

The Residential Street Vitality Program (RSVP) is a local street reconstruction program designed to coordinate and implement public and private utilities, street paving, lighting, and landscaping improvements. Typically, only local residential streets are included in the RSVP program. The RSVP program presents a cost effective opportunity to construct bikeways and traffic calming elements on local streets, especially bicycle boulevard facilities. RSVP projects include a full reconstruction of the roadway and curbs, allowing for the implementation of traffic calming elements at little additional cost.

Action Item 9.3.2

Incorporate implementation of bikeways with RSVP projects.

Arterial & Collector Reconstruction

Full reconstruction of arterial or collector roadways presents the most cost-effective opportunity to implement all types of bikeway facilities, including end-of-trip facilities such as bicycle parking. In a full reconstruction, the existing roadway is removed and replaced, including all curbs. Full reconstruction also typically includes replacement or repair of sidewalks, driveway aprons, lighting, trees, and other streetscape elements. This process provides an opportunity to reevaluate elements such as street width, parking availability, sidewalks, off-street paths, lane configurations, and signal locations. Often, the cost of including bicycle facilities in a full reconstruction project is minimal.

Action Item 9.3.3

Incorporate implementation of bikeways with full reconstruction projects.

9.4 Improving Existing Bikeways

Much of this plan focuses on expanding the bicycle network and the construction of new facilities. It is important to remember the need to continuously evaluate and improve existing bikeways. Improvements to existing bikeways may be needed in response to field observations about how the facility is operating, an analysis of crash history, in response to public complaints, or other reasons. Implementing improvements to existing facilities must proceed through the same funding processes as implementing new infrastructure.

Bike lanes were implemented on Raymond Ave following a full street reconstruction in 2014

"The development of a network of bicycle facilities in the downtown core is the top priority for encouraging bicycle ridership and economic development in Saint Paul."

- Saint Paul Bicycle Plan

9.5 Bicycle Network Prioritization Principles

Full implementation of this plan will take many years to complete, elevating the importance of developing a process to prioritize investment. Throughout the public involvement process that helped develop this plan, several important themes emerged that established the two top priorities

Priority 1: Develop a Downtown Bicycle Network

The development of a network of bicycle facilities in the downtown core is the top priority for encouraging bicycle ridership and economic development in Saint Paul. Statements received from city residents throughout the development of this plan repeatedly mentioned the challenges associated with circulating throughout downtown and as well as the challenged associated with entering and exiting downtown on a bicycle.

The planned reconstruction of Jackson Street through downtown in 2016 will implement bicycle facilities on this portion of the street. A separate study will finalize recommendations for additional alignments throughout downtown. The next critical step is to identify funding for implementation of the remaining facilities throughout downtown.

Priority 2: Complete the Grand Round

Completing the Grand Round will impact neighborhoods throughout Saint Paul and encourage longer distance bicycle trips. The Grand Round prioritizes off-street paths and in-street bike lanes to appeal to a wide range of users. The Grand Round is well-positioned to provide significant transportation and recreation opportunities. Progress will be made on completing portions of the Grand Round throughout 2015 and 2016, however some sections of the Grand Round will remain unfinished. The next critical step is to identify funding for implementation of the remaining sections of the Grand Round.

Prioritizing Other Bikeways

Prioritization of the remaining bikeways throughout the city is a complex process with many variables and is not easily quantified. At this stage in the development of the bicycle network, opportunities that offer swift and cost effective implementation may rise to the top of the list. Opportunities to improve existing bikeways should be prioritized alongside opportunities to expand the bicycle network. The following principles are provided to aid in the decision making process:

Prioritization Principles:

Connectivity

- Address gaps and extend the major bikeway network.

Cost Effectiveness

- Leverage external funding or make low-cost, high-benefit improvements.

Equity

- Make improvements in areas with a higher percentage of minority populations, low income residents, or households without access to an automobile.

Safety

- Improve safety conditions at locations with a history of crashes and address conflicts with other modes, including pedestrians.

Usage

- Connect bikeways to significant destinations and make critical connections.

Each of these principles should be given equal weight. Projects that are consistent with more than one of these principles should be prioritized before projects that accomplish fewer of these principles. To aid in the decision making process, a matrix may be used to help compare potential projects with each other.

Bicycle and pedestrian refuge islands on Lexington Pkwy aim to minimize conflicts with motor vehicles

Table 9.5.1 Example Prioritization Matrix

Project Name	Project Description	Connectivity	Cost Effectiveness	Equity	Safety	Usage	Total
Example Project 1	Construct 1.5 miles of off-street path	x			x	x	3
Example Project 2	Implement 1 mile of bike lanes	x	x		x	x	4
Example Project 3	Construct 2 miles of bicycle boulevards		x	x			2
Example Project 4	Implement 0.5 miles of bike lanes			x		x	3

9.6 Planning Level Cost Estimate

Planning level cost estimates were developed for the recommendations in this plan based on general assumptions about the various bicycle facility types outlined in this plan. For each facility, a planning-level cost estimate per linear mile was developed using cost information based on past project implementation experience. The cost of each segment will vary greatly based on a range of local factors unique to each project. Detailed cost estimates will be developed as part of the Bikeway Development Process for each project.

Implementation Assumptions

Off-Street Path
This cost estimate assumes a 10-foot wide asphalt trail, no right-of-way acquisition required, and no modifications to adjacent roadways. Typical installation includes trail construction, replacement of curb ramps, modification to traffic signals or other intersection controls, utility relocation, and landscaping.

In-street Separated Lane
This cost estimate assumes implementation will be limited only to pavement markings and signage. In some cases, roadway widening will be required, but these facilities are likely to be implemented as part of a larger roadway reconstruction project rather than as an independent bikeway project. Therefore, those costs are not identified here. Typical installation includes striping, pavement markings, and signage.

Bicycle Boulevard
Typical implementation includes installation of identification and wayfinding signage, arterial crossing treatments, and traffic calming elements. The arterial crossing treatments are often the most costly element of bicycle boulevard development, and the details and costs of these crossings are also challenging to anticipate without detailed study. Cost estimates are based on previous local experience developing bicycle boulevards as well as cost estimates from other agencies.

Enhanced Shared Lane
Typical implementation includes adding pavement markings and signage to an existing street.

Implementation Costs

The following planning level cost estimates have been developed based on the above assumptions; however, significant cost savings are anticipated by implementing the proposed work

Griggs bicycle boulevard under construction

in conjunction with other planned work. For example, in-street separated lanes that are constructed as part of a mill & overlay project will incur little additional cost beyond the amount already budgeted for the mill & overlay. Likewise, the cost of constructing an off-street path adjacent to a roadway is significantly reduced when the adjacent roadway is also being reconstructed compared to the cost of constructing a path without adjacent roadway work. Thus, the costs presented below are likely an overestimate of actual costs.

Table 9.6.1 Planning Level Implementation Cost

Bikeway Facility Type	Existing Facilities	Planned Facilities	Estimated Implementation Cost	Planned Facilities Estimated Implementation Cost
	(Miles)	(Miles)	(Per Mile)	(Total)
Off-Street Paths	74	57	$1,500,000	$85,427,025
In-Street Separated Lanes	53	61	$30,000	$1,840,608
Bicycle Boulevards	7	40	$500,000	$19,842,193
Enhanced Shared Lanes	18	39	$21,000	$826,877
Total	153	197		$107,936,703

Maintenance Costs

This plan estimates annual maintenance costs for existing and planned facilities based on current maintenance costs for similar existing facilities. As the bicycle network expands, so do the ongoing maintenance costs. These estimates assume facilities will continue to be maintained at current levels, including snow removal. If an additional level of maintenance above current levels is desired, it would come with additional costs.

Table 9.6.2 Planning Level Annual Maintenance Cost

Bikeway Facility Type	Existing Facilities	Planned Facilities	Estimated Annual Maintenance Cost	Existing Facilities Annual Maintenance Cost	Planned Facilities Annual Maintenance Cost	Full Network Annual Maintenance Cost
	(Miles)	(Miles)	(Per Mile)	(Total)	(Total)	(Total)
Off-Street Paths	74	57	$12,000	$886,728	$683,416	$1,570,144
In-Street Separated Lanes	53	61	$8,000	$426,266	$490,829	$917,094
Bicycle Boulevards	7	40	$16,000	$117,005	$634,950	$751,955
Enhanced Shared Lanes	18	39	$6,000	$109,039	$236,250	$345,289
Total	153	197		$1,539,037	$2,045,446	$3,584,483

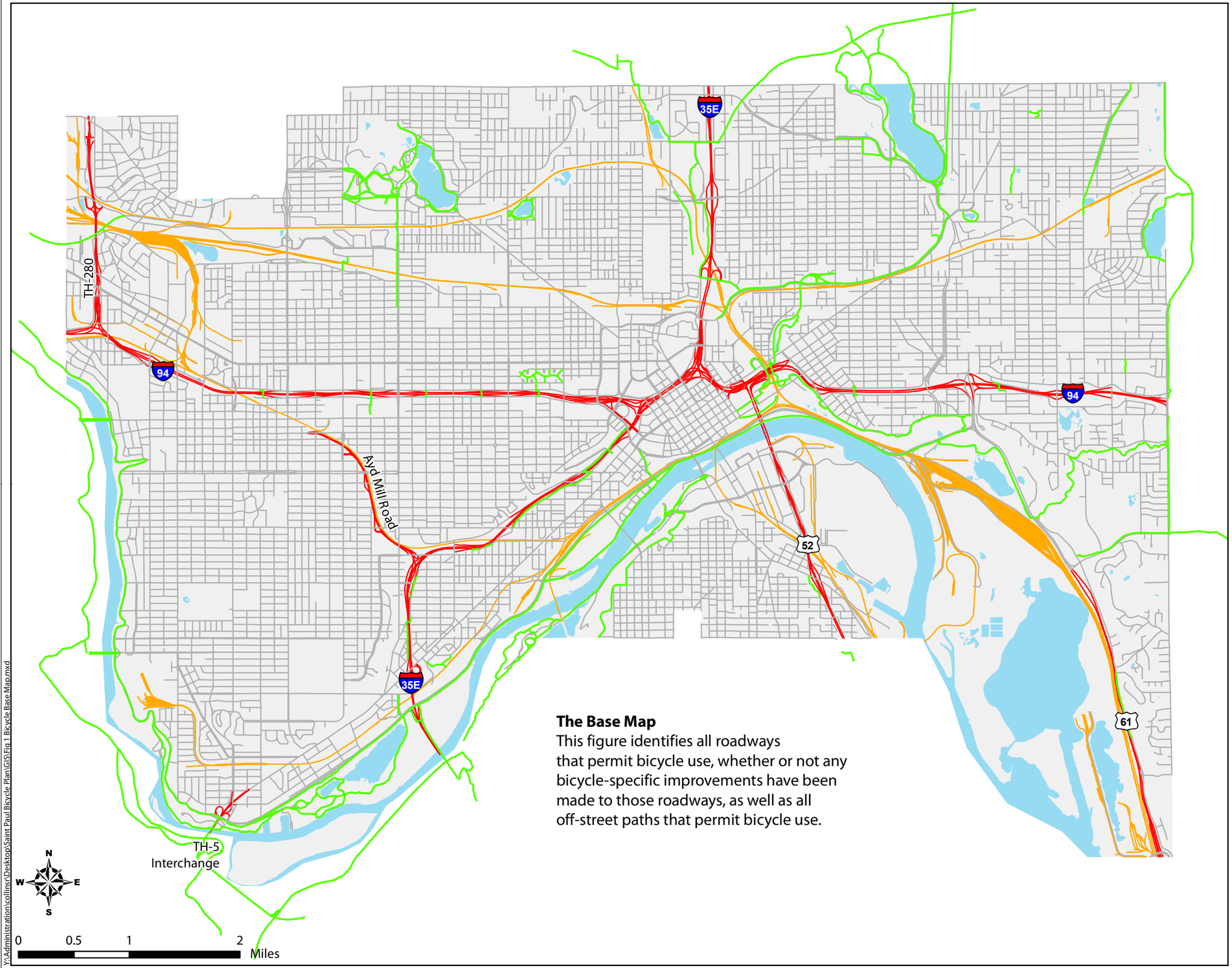
Bicycle Parking Costs

The cost to install common bike racks in the public right-of-way can vary greatly depending on how much site preparation work needs to be completed. City policy requires that bicycle parking be installed on a concrete pad (rather than the grass in the boulevard or where pavers are present). Where a concrete pad is already in place, a new bicycle rack can be purchased and installed for approximately $215 each. If a concrete pad must be installed, the additional costs can range between $400 and several thousand dollars, depending on local circumstances.

Figures

Saint Paul
Bicycle Plan

Saint Paul Bicycle Plan



Legend

- Roadway - bicycles permitted
- Roadway - bicycles prohibited
- Off-Street Path
- Freight Railroad

The Base Map
This figure identifies all roadways that permit bicycle use, whether or not any bicycle-specific improvements have been made to those roadways, as well as all off-street paths that permit bicycle use.

Figure 1
Bicycle Base Map

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Saint Paul Bicycle Plan

Legend

- Off-Street Path
- Bike Lane
- Shoulder
- Enhanced Shared Lane
- Bicycle Boulevard
- Freight Railroad

N W E S

0 0.5 1 2 Miles

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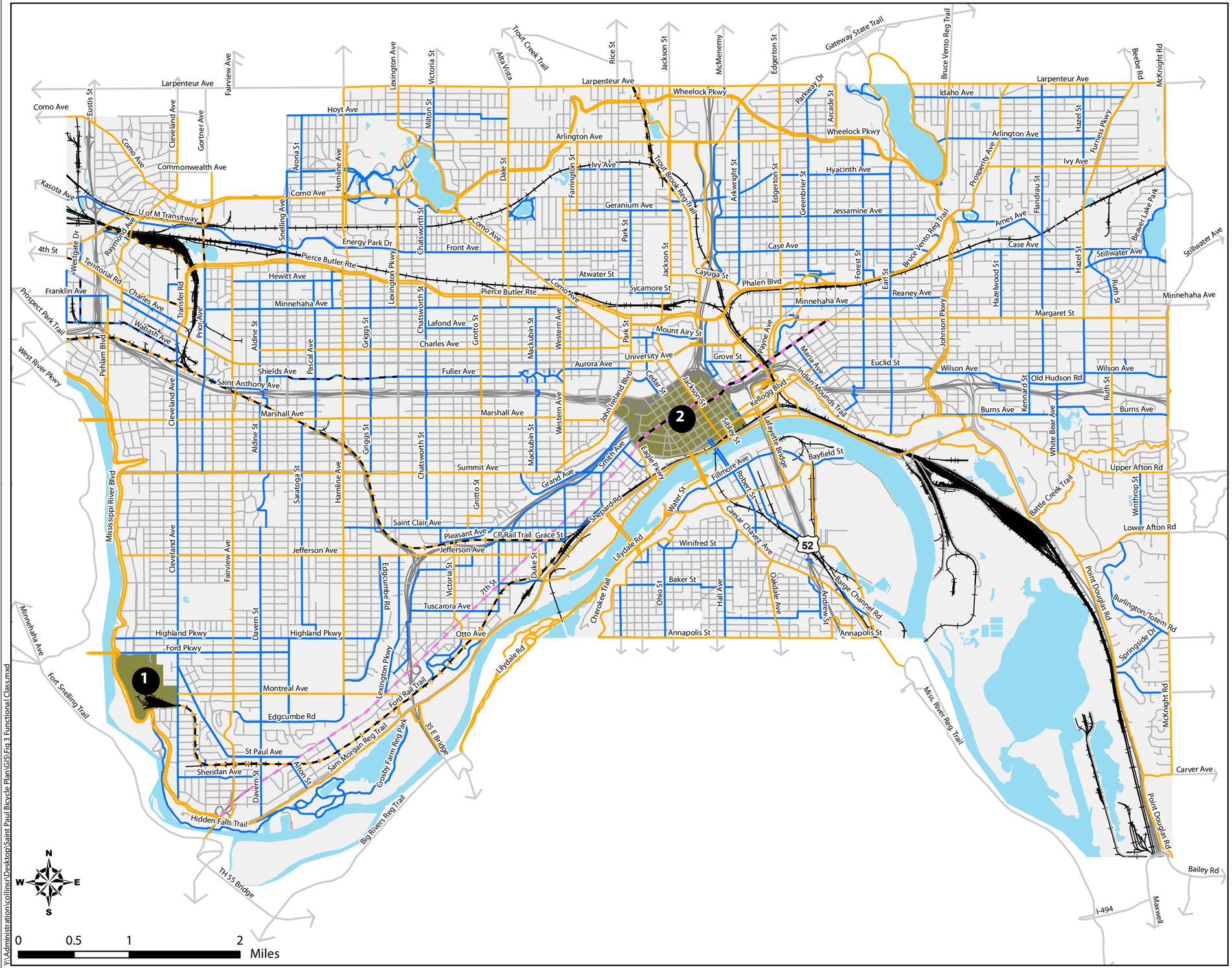
Figure 2
Existing Bicycle Network

Saint Paul Bicycle Plan



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Legend

Bicycle Network
Functional Classification

- Major Bikeway
- Major Long Term Bikeway
- Minor Bikeway
- Minor Long Term Bikeway
- Corridor for Additional Study
- Corridor for Additional Study of Enhanced Shared Lanes
- Area for Additional Study
- Freight Railroad

1. Ford Site - Bicycle facilities are to be planned in conjunction with other site planning related to anticipated redevelopment. A plan for bikeways through the site should be complete in 2016.

2. Downtown Loop - The Bicycle Plan recommends a "loop and spur" bicycle network throughout the downtown area. One portion of the "loop" will be located on Jackson Street. A study is underway to refine the appropriate alignments for other portions of the loop and connections to existing and planned bikeways outside of downtown. The alignment is anticipated to be finalized by the end of 2015.

Figure 3
Planned Bicycle Network Functional Classification

Saint Paul Bicycle Plan

Legend

Facility Type Group

- Off-Street Path
- In-Street Separated Lane
- Bicycle Boulevard
- Enhanced Shared Lane
- Corridor for Additional Study
- Corridor for Additional Study of Enhanced Shared Lanes
- Area for Additional Study
- Freight Railroad

1. Ford Site - Bicycle facilities are to be planned in conjunction with other site planning related to anticipated redevelopment. A plan for bikeways through the site should be complete in 2016.

2. Downtown Loop - The Bicycle Plan recommends a "loop and spur" bicycle network throughout the downtown area. One portion of the "loop" will be located on Jackson Street. A study is underway to refine the appropriate alignments for other portions of the loop and connections to existing and planned bikeways outside of downtown. The alignment is anticipated to be finalized by the end of 2015.

Facility Type Group Descriptions

Off-Street Path - These are typically shared-use bicycle and pedestrian trails.

In-Street Separated Lane - These are in-street facilities where exclusive space for bicycles is provided in the roadway such as bike lanes, buffered bike lanes, one-way cycle tracks, or two-way cycle tracks.

Bicycle Boulevard - These are low-volume, low-speed roadways that are optimized for bicycles and pedestrians. Through motor vehicle travel is discouraged.

Enhanced Shared Lane - A combination of pavement markings such as "sharrows" or signage is used to highlight the presence of bicycles on the roadway. The markings and signage encourage bicycles and motorists to share travel lanes on the roadway.

N W E S

0 0.5 1 2 Miles

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Figure 4
Planned Bicycle Network
Facility Type Group

Saint Paul Bicycle Plan

Legend

Barrier Type

- Roadway - bicycles prohibited
- Freight Railroad
- Planned Bicycle Network
- Area for Additional Study

Crossing Type Description

- Existing Crossing
  - located on the existing or planned bicycle network
- Existing Crossing (1)
  - Crossing will be relocated
- Planned Barrier Crossing (5)
  - A new bicycle and pedestrian bridge or underpass will be developed
- Planned Barrier Crossing (2)
  - A new roadway bridge will be developed that will include an adjacent off-street path

This figure identifies significant barriers to bicycle use - freight railroads, freeways, and other roadways that prohibit bicycle use, To a lesser extent, the Mississippi River acts as a barrier to making bicycle connections to adjacent communities.

This figure identifies locations where the planned bicycle network provides an opportunity for people using bicycles to cross a barrier including bridges, underpasses, and legal at-grade crossings.

This figure does not show locations where it is legal to cross a barrier on a bicycle that are not included in the planned bicycle network such as where West 7th street crosses I-35E.

0 0.5 1 2 Miles

N W E S

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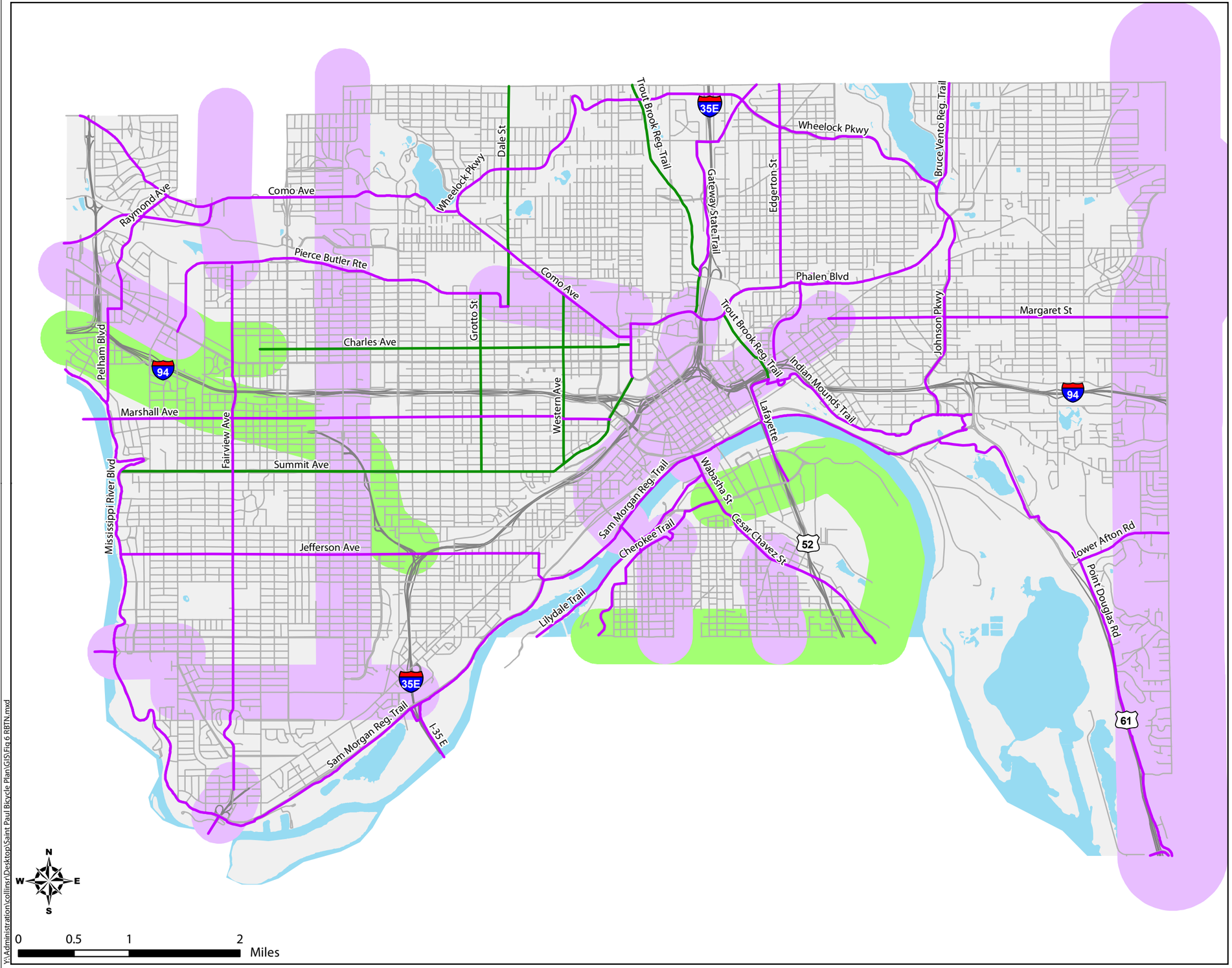
Figure 5
Planned Bicycle Network Barrier Crossings

Saint Paul Bicycle Plan



Legend

Regional Bicycle Transportation Network

- Tier 1 Alignment
- Tier 2 Alignment
- Tier 1 Corridor
- Tier 2 Corridor

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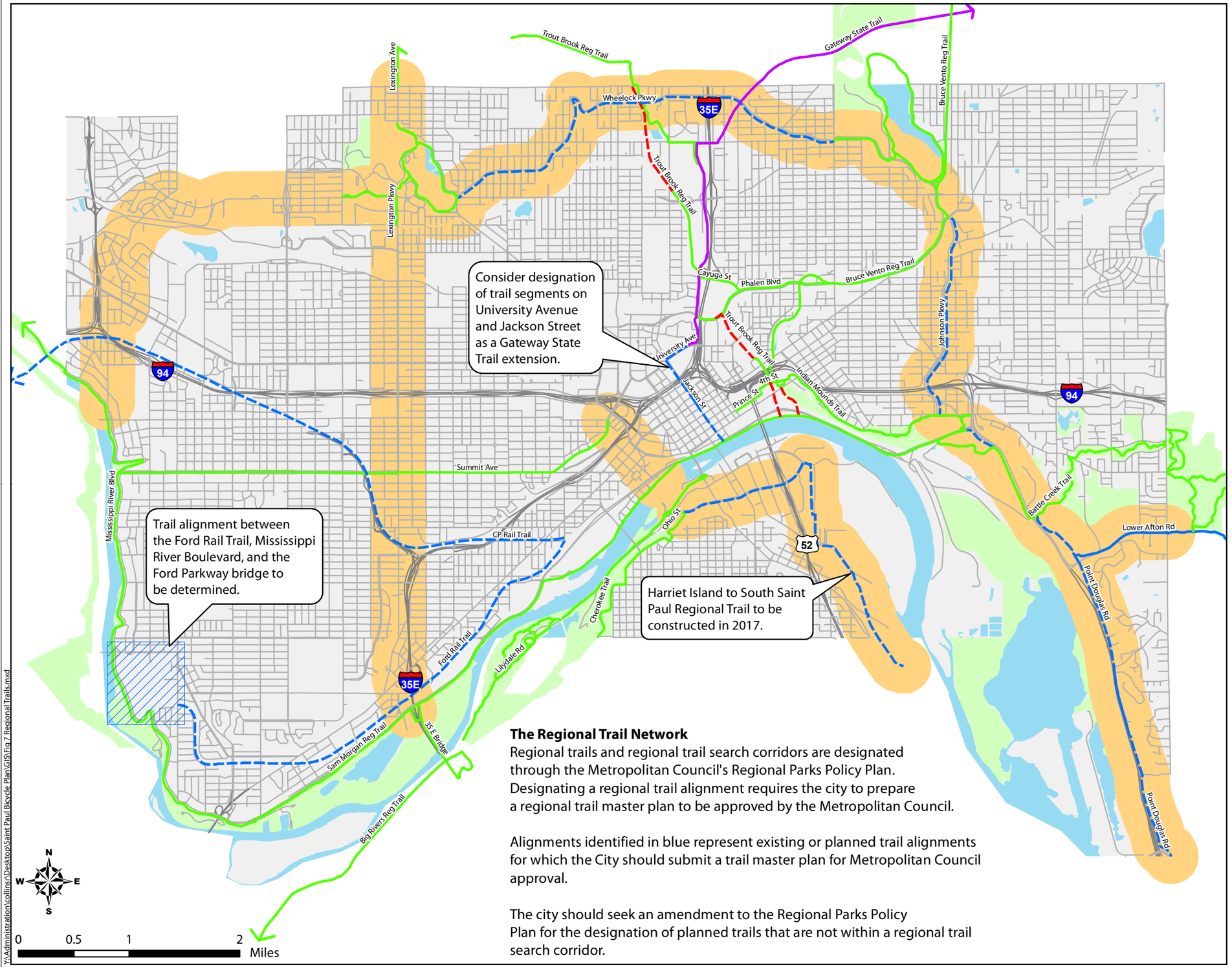
Figure 6
Regional Bicycle Transportation Network

Saint Paul Bicycle Plan



Legend

- Regional Trail Search Corridor
- Regional Park
- Existing Regional Trail or other Linear Trail within a Regional Park
- Planned Regional Trail with an approved Master Plan
- Existing Trail without an approved Master Plan
- Planned Trail without an approved Master Plan
- Gateway State Trail

The Regional Trail Network

Regional trails and regional trail search corridors are designated through the Metropolitan Council's Regional Parks Policy Plan. Designating a regional trail alignment requires the city to prepare a regional trail master plan to be approved by the Metropolitan Council.

Alignments identified in blue represent existing or planned trail alignments for which the City should submit a trail master plan for Metropolitan Council approval.

The city should seek an amendment to the Regional Parks Policy Plan for the designation of planned trails that are not within a regional trail search corridor.

Figure 7
Existing and Planned Regional & State Trails

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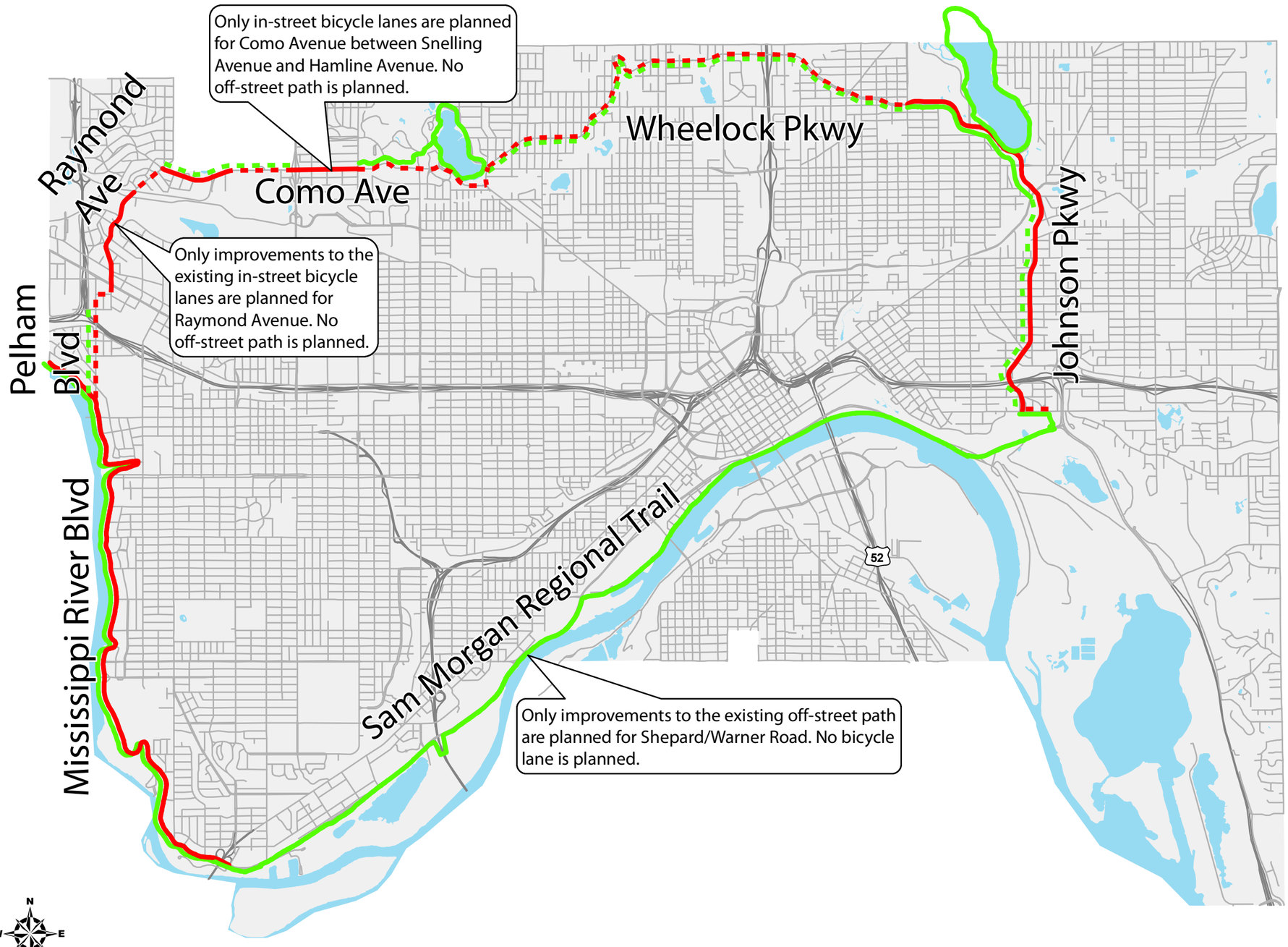
Saint Paul Bicycle Plan



Legend

- Existing Off-Street Path
- Planned Off-Street Path
- Existing In-Street Lane
- Planned In-Street Lane

Figure 8
Planned Grand Round Improvements

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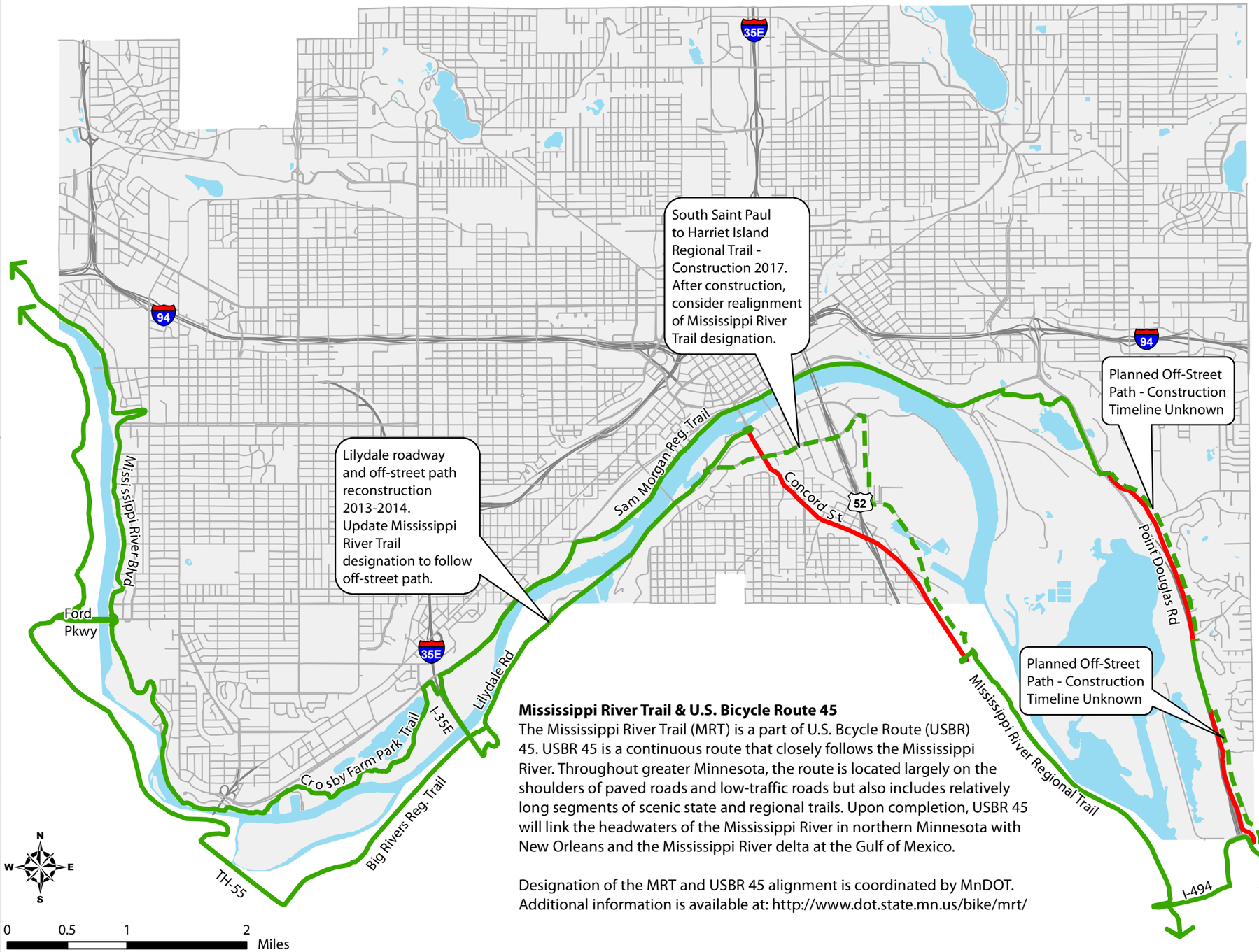
Saint Paul
Bicycle Plan



Legend

- Off-Street Path
- In-Street Route
- Planned Off-Street Path

Mississippi River Trail & U.S. Bicycle Route 45

The Mississippi River Trail (MRT) is a part of U.S. Bcycle Route (USBR) 45. USBR 45 is a continuous route that closely follows the Mississippi River. Throughout greater Minnesota, the route is located largely on the shoulders of paved roads and low-traffic roads but also includes relatively long segments of scenic state and regional trails. Upon completion, USBR 45 will link the headwaters of the Mississippi River in northern Minnesota with New Orleans and the Mississippi River delta at the Gulf of Mexico.

Designation of the MRT and USBR 45 alignment is coordinated by MnDOT. Additional information is available at: http://www.dot.state.mn.us/bike/mrt/

Figure 9
Mississippi River Trail
(U.S. Bicycle Route 45)

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