*Chapter 7*

# Bicycle and Pedestrian Investment Direction

## Overview

Bicycling and walking ~~are becoming~~have become increasingly important in the Twin Cities for supporting the TPP's goal of providing access to destinations, like commuting to work or school, running personal errands, and traveling to entertainment and activity venues. ~~Bicycling~~Biking and walking also support the TPP's goal of healthier communities by providing more options that can facilitate active living choices. In addition, the region can support the TPP's goal of stewardship by making investments in bike and pedestrian infrastructure, which are more cost effective compared to investments for other transportation modes. These investments are also efficient in terms of land use in that they require less space to construct and can potentially offset development costs by reducing the need to construct parking for automobiles. The region's potential for further expanding bicycling and walking ~~in the region~~ for transportation purposes is significant.

According to data from the U.S. Census Longitudinal Employer Household Dynamics, approximately 20% of all employees who work in one of the major employment clusters in the Twin Cities live less than three miles from their workplace. About 20% of all bicycle trips in the region are less than one mile long and nearly 45% are less than three miles in length, according to the Council's 2010 Travel Behavior Inventory. So the proximity of the region's residents to their places of employment aligns well with residents' tendencies to travel by bike or walk for shorter trips.

Although bicycling can accommodate longer trips, walking ~~still~~ actually accounts for a higher percentage of all trips region wide (6.5%), than either biking (2%) or transit (3%) and ~~is imperative to~~represents the start and end of trips by any mode. The high level of importance of both walking and biking in connecting to the regional transit system should also be noted; there are many ~~more~~ residents who live within three miles of transit service but much farther from work ~~(compared to proximity to work)~~ who could take advantage of improved opportunities to combine transit with walking or biking.

Improvements to facilitate and encourage these connections (like bike lockers and storage facilities at transit stations or new local bikeway and sidewalk connections) will go a long way to expanding the reach of the transit system and in creating new opportunities for people to walk and bike for transportation. As a more comprehensive regional bicycle system and pedestrian facilities continue to develop over time ~~(including better options for bicyclists and pedestrians to get across or around physical barriers like rivers, rail corridors, freeways, and multi-lane arterial roadways)~~, walking and biking trips may continue to increase in volume and distance.

~~Based on bike and pedestrian counts from 2008 through 2013 by Transit for Livable Communities as part of the federal Non-Motorized Transportation Pilot project, biking activity increased 78% and walking increased 16% at 43 benchmark locations in Minneapolis, its surrounding suburbs, and Saint Paul. This was largely the result of investing more than $28 million over this time period in 75 miles of new on-street bikeways and off-street trails and sidewalks, along with the education and promotion programs required to take full advantage of the new improvements. [*Insert link to Bike/Walk Twin Cities Non-Motorized Transportation Pilot project report.*]~~

~~According to the 2010 Travel Behavior Inventory, walking increased 16% and biking 13% between 2000 and 2010 region wide. In the core cities of Minneapolis and Saint Paul, walking and biking grew at an even faster rate; walking increased 32% and biking 20%, respectively, during that time.~~

The regional trail system and other off-street trails have played an increasingly important role in walking and bicycling for transportation, particularly in the urban and suburban ~~developed~~ areas of the region. According to Metropolitan Council estimates, there were over 13 million visits to the 360 miles of regional trail in 2016, which represents an 80% increase over 10 years.~~there were over 11 million visits to the 300 miles of regional trail in 2012, which is a 69% increase in 10 years~~. Past studies by Three Rivers Park District ~~studies~~ have shown that ~~use by commuters~~commuter use has grown ~~by about~~as much as 7% per year on some of its urban trails.

This ~~documented~~ demand for on- and off-street bikeway facilities offers a significant opportunity for a modal shift that would help to reduce congestion, improve air quality, improve personal health, and is an attractive and marketable component for making the Twin Cities a desirable place to live~~. In addition, it~~ It is important to acknowledge that recreational bicycling is also growing, especially among young families, and that there is a corresponding need for protected or separated ~~off-road bicycle facilities~~bikeways to accommodate less experienced cyclists. In addition, ~~B~~bicycling for recreation and transportation ~~also~~ provides local economic benefits around the metro area.

~~Within and near congested activity centers, biking and walking can be effective transportation solutions because they accommodate shorter-distance trips and require less space, less infrastructure, and fewer investment dollars than other transportation modes. Because walking is fundamentally tied to the end points of any trip (no matter the mode of travel) and~~ As pedestrian planning is integral to transportation planning for all other modes, there are ~~multiple~~ references and ~~detailed~~ descriptions of pedestrian facility planning, design, and funding in other sections of this Transportation Policy Plan. ~~The specific sections for highways, transit, and land use and local planning address p~~Pedestrian planning issues are addressed as they relate to state highway funding in ~~the~~ Chapter X, ~~5 [insert link to~~ "Highway Investment Direction and Plan," ~~],~~ connect~~ing~~ to the regional transit system in Chapter X, ~~6 [insert link to~~ "Transit Investment Direction and Plan," ~~],~~ and ~~to~~ integrate land use planning and urban design best practices in Chapter X, ~~3 [insert link to~~ "Land Use and Local Planning." ~~].~~

~~While previous updates of the Transportation Policy Plan recognized that bicycling and walking were essential modes of transportation and encouraged the development of facilities to allow safe biking and walking, specific planning for these facilities was done at the local rather than regional level because of the relatively short distance of these trips.~~ In general, ~~P~~pedestrian facilities are ~~still generally~~ best planned at the local level, but the longer range of bicycle trips (and the facilities they rely on) ~~are often long enough to~~ necessarily cross ~~municipal~~ between cities or counties.~~boundaries. In fact, more than~~About 55% ~~half~~ of the region's bicycle trips ~~by bicycle (approximately 55% according to the Council's 2010 Travel Behavior Inventory)~~ are greater than three miles in length, according to the Council's 2010 Travel Behavior Inventory. The Council and its transportation partners will plan for these longer bicycle trips in order to maximize the potential impact of choosing bicycling over driving alone for transportation.

~~With the increasing interest in bicycling for transportation, an arterial backbone network of regional bicycle facilities for transportation was developed and is included for the first time in this Transportation Policy Plan. This Regional Bicycle Transportation Network will continue to be refined and updated over time. The network is intended to be supplemented by local bikeway facilities similar to the way local streets supplement principal and minor arterials for motor vehicles.~~

# ~~The~~ Existing Regional Bicycle and Pedestrian ~~System~~Facilities

## ~~System~~ Description of Facilities

Walking and bicycling are essential modes within the regional transportation system and have numerous benefits at local, regional, and global levels. These modes allow people to make ~~purposeful~~ daily trips without adding to roadway congestion and vehicle-related air pollution, including carbon and greenhouse gas emissions that ~~are affecting our~~ contribute to climate change. They make it possible to connect with bus and rail transit ~~while making active lifestyle choices by~~ and ~~allowing~~ allow ~~travelers~~ people to choose active lifestyles by ~~incorporate~~ incorporating exercise into their daily routines. ~~On a personal level, they~~In addition, walking and biking can reduce ~~the cost of~~ a household's transportation costs, ~~; on national and~~ while also providing global ~~levels, they~~ benefits such as reducing ~~reduce~~ our dependence on non-renewable energy sources.

~~Walking and bicycling trips tend to be relatively short in the region, averaging about one-quarter to one-half mile for walking, and between one and three miles for bicycling; however, more than half of the region's trips by bicycle (approximately 55% according to the 2010 regional Travel Behavior Inventory) are greater than three miles in length. The Council and its transportation partners will plan for these longer bicycle trips in order to maximize the potential impact of choosing bicycling over driving alone for transportation.~~

With the exception of a few state trails in the metro area, the ~~regional~~ region's bicycle and pedestrian ~~system~~ facilities ~~is made up~~consist of regional trails (as designated in the Council's ~~2040~~ Regional Parks Policy Plan), ~~and~~ local on-street bikeways ~~networks of~~ and off-road trails, ~~on-street bikeways,~~ and sidewalks for which local agencies have primary responsibility for planning, development, and maintenance. Due to typically short distances of walking trips ~~in particular~~, development of pedestrian facilities is most effectively addressed at the local rather than regional level. ~~It should also be noted that the~~The Metropolitan Council does not ~~operate~~ typically construct or maintain bikeways and ~~walkways~~ sidewalks, but ~~only facilitates~~ assists in planning for their development and provides some fundingfor regional trails. The Council's roles with respect to biking and walking facilities ~~is to~~include:

- P~~p~~lanning for local and regional ~~system~~ networks that strive~~s~~ to ensure continuity and connectivity between jurisdictions~~.~~
- ~~a~~Assisting in coordinated planning to determine solutions for regional barriers to biking and walking~~.~~
- Providing guidance for biking and walking facilities to support other regional initiatives, such as transit investments, livable communities investments, and equity

~~The region's pedestrian infrastructure consists of:~~

- ~~cCity sidewalks~~
- ~~sStreet intersection treatments, including traffic signal technologies that assist disabled persons~~
- ~~lLocal off-road trail systems and connections~~
- ~~neighborhood alleyways~~
- ~~uUrban plazasS~~

## Pedestrian Facilities

~~Additionally, downtown Minneapolis and Saint Paul have skyway networks that provide essential, all-weather connections between developed blocks in these high-density employment centers.~~

Many pedestrian facilities are planned and developed at ~~the site~~a project design level and constructed by private developers. Because of this ~~smaller scale~~site level focus, local jurisdictions are in the best position to ~~oversee~~ plan and implement pedestrian infrastructure projects. ~~They~~ Cities have decision-making authority over ~~community~~ land use~~, the~~ and street construction and maintenance ~~of local streets~~, and are most familiar with local conditions and needs.

The region's pedestrian infrastructure consists of:

- City sidewalks
- Street intersection treatments, including traffic signal technologies that assist disabled persons

- Local off-road trail systems and connections
- Urban plazas
- Skyways (Minneapolis and St Paul downtowns)

The Council's interest in pedestrian infrastructure is primarily to ensure ~~good~~ safe and convenient pedestrian connections to transit stops and stations, including adequate waiting areas for ~~customers~~transit users and full accommodations for the disabled or visually impaired. In addition, the Council~~'s role is to~~ encourages transit-oriented design in all transitway corridors or near bus transit centers (including transit stations and park-and-ride facilities). ~~This~~ Transit-oriented design includes the appropriate spacing and orientation of buildings ~~and structures that encourage and allow for~~to facilitate efficient pedestrian movement. Overall pedestrian safety and connectivity ~~(particularly as they relate to moving across major physical barriers)~~ are also vital components of regional multimodal transportation ~~system~~ planning.

Usable pathways are particularly important to people with disabilities, and the Americans with Disabilities Act (ADA) of 1990 requires local governments to ensure that people with disabilities can use the transportation system in an accessible and safe manner. ~~construct accessible rights-of-way~~facilities ~~to meet their needs~~. ~~Since passage of the ADA, communities have had differing levels of success in working toward the goal of universal accessibility.~~ The federal government has recently put greater emphasis on ~~providing accessible routes~~ensuring compliance with the ADA, and federal law requires that all government agencies with ~~over~~ 50 or more employees develop an ADA Transition Plan that details the steps to making the community accessible for all. Public agencies with fewer than 50 employees must still conduct a self-evaluation of facilities, programs, and services to identify any that must be modified to meet ADA requirements. Because existing sidewalks can potentially be barriers for people with disabilities due to slope, width, or other elements, they should be included in self-evaluations or transition plans.

## Bicycle Facilities

With regard to bicycling, the Twin Cities region is fortunate to have a well-developed system of on-street bicycle facilities in the core cities ~~as well as~~and a widespread network of off-road trails through many parts of the region. Over time, Twin Cities' residents have ~~more successfully~~ advocated for bicycle-friendly infrastructure more successfully than residents of most North American ~~regions of~~cities of similar size. The state and region have made investments that mirror this ~~strong~~ traditionally high level of advocacy.

~~The Council is refining the inventory and planning capabilities of Cycloplan, an extension of the bicycle trip planning resource known as Cyclopath. When fully implemented, this resource will aid the Council, cities, and counties in continuing to plan for the regional bikeways system by facilitating an integrated and efficient logging system of bicycle infrastructure improvements.~~

~~Examining the bikeway system today reveals a clear pattern of fairly well-connected bicycle trails in the newer, outer-ring suburbs that have developed since the 1980s. But the first-ring suburbs (those developed between 1950 and 1980) have tended to be the least bicycle-friendly areas because trails were not built when they were developed and the street systems were designed with little consideration for bicycling or walking. However, in recent years and thanks in part to the federal Non-Motorized Transportation Pilot Project administered through the Transit for Livable Communities Bike/Walk Twin Cities program, the network of on-street facilities has expanded greatly, especially in Minneapolis and Saint Paul. Several neighboring suburbs of Minneapolis also received funds to plan and/or construct on-street bikeways, including the cities of Richfield, Edina, St. Louis Park, Golden Valley, Brooklyn Center, Fridley, and Roseville.~~

Existing bikeways take on several characteristics in the region. On-road bicycle facilities have been developed in various forms. There are collector and arterial streets with bike lanes, roads with advisory bike lanes, roads with shared road markings (i.e., "sharrows"), and bicycle boulevards, as well as many designated bike routes that have either striped shoulders or are low-volume roads but without pavement markings. Typical bicycle transportation routes may include all of these types of bikeways. In addition, several ~~"cycletracks" or "~~protected bikeways (formerly known as cycle tracks) ~~lanes"~~ have been ~~installed or are planned within~~constructed in Minneapolis and Saint Paul. These are ~~bicycle~~ bike-only facilities within street corridors that ~~have~~ include some ~~a~~ vertical separation from traffic lanes and are intended to provide a more comfortable user experience, similar to a trail.

The other notable aspect of the bikeway system is the extensive network of off-road trails, including the regional trail system, that has been developed over more than a century to provide multi-use connections between regional parks and other major activity nodes. Many of these trails parallel the region's rivers and creeks or make use of abandoned ~~railroad rights-of-way~~rail lines.

~~While the primary purpose of the regional trail system is to serve recreational needs, a subset of the trail segments also serve as high-use transportation corridors due to their straight and direct alignments, inherited from original alignments of railroad corridors. One of the benefits of a recently completed Regional Bicycle System Study was the determination of regional trail corridor segments that were deemed essential to the bicycle transportation network (see Chapter 7). Trails such as the Midtown Greenway, Cedar Lake, Sam Morgan, and Bruce Vento regional trails can be characterized as high demand bicycle transportation corridors.~~

## Bicycle and Pedestrian ~~Improvements~~ Trends since the Last Plan

~~Development of the bicycle system is progressing both physically and institutionally. Of the 182 local city and county comprehensive plans in the region, 41 have addressed neighborhood trail~~

~~access, 19 have individual trail master plans, and 24 have addressed bicycle and pedestrian safety on roadways through traffic calming techniques and/or transportation policies.~~

## Data Collection

Pedestrian and bicycle ~~D~~data collection efforts by cities and counites ~~for walking and biking~~ have continued and are expanding~~, along with~~ in accordance to new guidance on how to conduct ~~this data collection~~these counts. The Federal Highway Administration (FHWA) updated its Traffic Monitoring Guide to include standard guidance for counting pedestrians and bicyclists. Between 2014 and 2016, MnDOT's Bicycle and Pedestrian Counting Initiative further expanded the work within the state to institutionalize this data collection. MnDOT developed a Bicycle and Pedestrian Data Collection Manual to supplement the FHWA Traffic Monitoring Guide. Other elements in MnDOT's initiative have included annual training programs for local government staff on how to conduct counts; the installation of permanent monitoring stations throughout the state, including the Twin Cities region; and the development of a MnDOT district-based portable counting equipment loan program to support MnDOT districts and local governments in conducting bicycle and pedestrian counts.

The two largest cities in the region, Minneapolis and Saint Paul, have been conducting regular bicycle and pedestrian counts for several years. According to the 2016 Bicyclist and Pedestrian Count Report from the City of Minneapolis, bicyclists at 30 benchmark locations throughout the city increased 49 percent and pedestrians at 23 benchmark locations increased 23 percent from 2007 to 2016. The City of Saint Paul conducts annual bicycle and pedestrian counts at 30 benchmark locations for bicyclists and at 25 benchmark locations for pedestrians. According to the city's count report for 2016, bicycling has increased 32 percent between 2007 and 2016 at 5 benchmark locations. For the benchmark locations the city has counted from 2013 through 2016, walking has increased by 10 percent and bicyclist has increased by 2 percent.

~~. The Bike/Walk Twin Cities effort from 2008 through 2013 monitored participation in biking and walking at 43 benchmark locations in and around Minneapolis. In addition, the University of Minnesota conducted a comprehensive data collection research study. This That study recommendeds new standards for bike and walk trip data collection, and develops a methodology for estimating annual bike trips along a facility based on a sampling of counts.~~

~~Cyclopath, an on-line wiki-based bicycle routing tool, has been designed and implemented by the University of Minnesota to assist the public in identifying suitable bicycle routes based on individual biking preferences—for example, on-street convenience/speed versus off-road protection—and desired trip origin and destination points. It has resulted in a robust set of bicycling origin and destination data, which have been directly applied to planning for a regional network of bicycle corridors.~~

## Regional Bicycle System Inventory

A new regional bicycle sytem inventory was compiled in 2016 with the help of counties and their member cities in combining all local bike plan data into unified county datasets. The Council then assembled a unified regional dataset that included most cities with existing bike plans. The data include, at a minimum, existing and planned, on-street and off-road bikeways. Some cities and counties provided more detailed data regarding bicycle facility type, which eventually will be incorporated at the regional level in collaboration with Metro GIS. The purpose of the inventory dataset is to assist local planning agencies when developing or updating local bike plans or in reviewing regional and adjacent city plans. The Council will rely on regular bicycle facility updates from the counties to keep the regional bicycle system inventory current; ideally, annual updates compiled at the end of every construction cycle are preferred.

## Bicycle Sharing System

~~was formed through the Twin Cities Bike Share Project, an initiative started in 2008. This~~ Nice Ride Minnesota is a public bike-sharing system that has been in operation in the Twin Cities since 2010.~~,~~ The system was designed to complement the transit system and to provide short connections between activity centers~~, became operational in 2010~~. ~~Between 2010 and 2013 riders have taken nearly 900,000 rides on the 1,550 bicycles at 170 stations located mainly in Minneapolis and Saint Paul. Annual rentals have grown from 101,000 to about 305,000 in that time period, an increase of more than 200%.~~ (Will update with 2016 data and the ongoing consideration of transitioning to a new system of dockless stations.)

## Protected Bikeways

The planning, programming and construction of protected bikeways is an emerging trend in the core cities of Minneapolis and Saint Paul, but other cities and counties are beginning to follow suit. Minneapolis adopted a Protected Bikeways Plan in 2015 calling for the construction of more than 30 miles of new protected bikeways by 2020. The City of St Paul completed the first leg of its downtown Capital City Bikeway four-mile loop in 2017.
(A few more details to add here…)

## Growth in Purchase and Operation of E-Bicycles (to be added)

## Winter Cycling is a "Thing" (to be added)

# Pedestrian and Bicycle Safety

Pedestrians and bicyclists are the most vulnerable travelers on our transportation networks. Increases in the number of people walking and bicycling can help improve safety by creating

greater visibility and driver awareness. Research has shown that as more people bike and walk, crash rates for these modes tend to decline.

## Crash Statistics

Within the seven-county core of the Twin Cities region, an average of 17 pedestrians and 3 bicyclists died each year, based on traffic crash data from 2013-2015. According to crash data from the Minnesota Department of Public Safety for 2013 through 2015, there were 1,159 traffic fatalities in Minnesota; over 26 percent, or 304, of these happened in the Twin Cities region. Of these 304 people who died in traffic crashes in the metro, 51 were pedestrians and 9 were bicyclists. A little over 58 percent of all traffic crashes and 28 percent of the overall traffic fatalities in the state happen in the Twin Cities region. However, the region's share of crashes looks much different for pedestrians and bicyclists because of its more urbanized area. Although the region has an average of 26 percent of the overall traffic fatalities that happen in the state, we have almost 55 percent of the state's pedestrian fatalities and almost 43 percent of the state's bicyclist fatalities.

While walking trips are 6 percent of all trips made within the region, pedestrian fatalities are a disproportionately larger percentage of the region's traffic deaths with almost 17 percent of all traffic fatalities from 2013-2015. The numbers are not as disproportionate for bicyclists, but they still are 3 percent of all Twin Cities traffic fatalities, compared to making 2 percent of all trips. Future additional analysis of crash data would provide more information about the nature of these crashes and safety issues within the region.

## Pedestrian Safety (to be added)

## Traffic Speed

The 2014-2019 Minnesota Strategic Highway Safety Plan identifies focus areas that represent contributing, and often correlated, factors for traffic crashes, and speed is one of these focus areas. As travel speed increases, so does the risk for death or severe injuries in a crash. Speed has also been highlighted as a common factor in crashes at the national level with a 2017 National Transportation Safety Board study, *Reducing Speeding-Related Crashes Involving Passenger Vehicles.* This report notes that speeding creates a "significant risk of death and injury" to travelers outside of vehicles. For the most vulnerable travelers on our transportation networks, vehicle speed relates to increased injury risk. The report cites a European Transport Safety Council study that showed 5 percent of pedestrians struck by a vehicle traveling at 20 miles per hour (mph) are killed; however, "this likelihood increases to 45 percent at 30 mph, and 85 percent at 40 mph." In Minnesota, the minimum speed limit on streets in urban districts is 30 mph. With a vehicle traveling at this speed, only about 5 out of 10 pedestrians survive being hit in a crash.

# ~~Proposed~~ Regional Bicycle Transportation Network

~~Regional Bicycle System Study~~The Regional Bicycle Transportation Network (or "RBTN" as it has come to be known) was established in the last TPP update as the official regional bikeway network that sets the region's priority vision for planning and investment. The network was based on a *Regional Bicycle System Study* analysis and prioritization of potential corridors based on factors such as bicycle trip demand, network connectivity, social equity, population and employment density, and connections to transit. Further details on the study completed in 2014 can be found on the ~~Metropolitan~~ Council's website.

## Purpose of the Regional Bicycle Transportation Network

The purpose of the RBTN is shaped by the following goals:

- Establish an integrated and seamless network of on- and off-street bikeways;
- Provide the vision for a "backbone arterial" network to accommodate daily bicycle trips by connecting regional destinations and local bicycle networks
- Encourage local and state agencies to plan and implement future bikeways in support of the RBTN vision.

In support of these overall goals, cities and counties are encouraged to plan and implement the RBTN and its connections to~~local bicycle facilities that connect their~~ local bikeway networks~~ to the regional network~~.

## Guiding Principles

A set of guiding principles for ~~developing~~ defining the Regional Bicycle Transportation Network was developed during the Regional Bicycle System Study ~~by a project advisory committee and reviewed in a series of public workshops in 2013. The following guiding principles were used~~ to ~~develop~~ identify a regional bikeways network that would:

- **Overcome physical barriers and eliminate critical system gaps.**
  Specifically addressing gaps and barriers in the regional system will improve convenience and continuity for bicyclists.
- **Facilitate safe and continuous trips to regional destinations.**
  Developing and upgrading bicycle facilities along the ~~Regional Bicycle Transportation Network~~RBTN will improve the convenience and safety of bicycling along these facilities.
- **Function as arteries to connect regional destinations and the transit system year round.**
  Emphasizing ~~Priority~~ Tier 1 ~~Regional Bicycle Transportation Corridors~~corridors (as identified in this plan) through the implementation of the ~~Regional Bicycle Transportation Network~~RBTN, will provide the needed connections to regional destinations and the regional transit system.

- **Accommodate a broad range of cyclist abilities and preferences to attract a wide variety of users.**
  Bicyclists have varying levels of comfort to ride based on facility type (on-street facility vs. off-road trail), roadway characteristics, and personal levels of experience and ability. In some urban, high demand corridors it may be appropriate to develop both an on-street facility and an off-road trail to accommodate the full range of cyclist preferences.
- **Integrate and/or supplement existing and planned infrastructure.**
  When developing the ~~Regional Bicycle Transportation Network~~RBTN, existing and planned infrastructure should be used when possible to reduce the need to purchase new right-of-way and to minimize the growing financial burden of preserving and maintaining existing facilities.
- **Provide improved opportunities to increase the share of trips made by bicycle.**
  Implementing a complete ~~Regional Bicycle Transportation Network~~RBTN that provides convenient connections to key regional destinations and the regional transit system will increase the likelihood of choosing bicycling for transportation over other travel modes.
- **Connect to local, state, and national bikeway networks.**
  Connecting to other established bicycle networks will expand the reach and effectiveness of the regional network.
- **Consider opportunities to enhance economic development.**
  New bicycling investments can be an effective tool for creating local economic development opportunities and to foster the Twin Cities' image as a highly livable region with many bike-friendly destinations.
- **Be equitably distributed throughout the region.**
  Social equity and regional geographic balance were emphasized in identifying the ~~Regional Bicycle Transportation Network~~RBTN. By focusing on population and employment concentrations, the network will be able to attract the greatest number of riders. By also applying the Metropolitan Council's identified Areas of Concentrated Poverty (where at least 50% of the residents are people of color), the network will offer equitable access to bicycling and the economic opportunities and health benefits afforded by bicycle ~~options~~infrastructure.
- **Follow spacing guidelines that reflect established development and transportation patterns.**
  The ~~Regional Bicycle Transportation Network~~RBTN corridors were developed in a way that applied spacing concepts based on urban and suburban development patterns and plans. The resulting network is denser and has greater accessibility compared to regional bikeway corridors found in other metropolitan regions.
- **Consider priorities reflected in adopted plans.**
  The ~~Regional Bicycle Transportation Network~~RBTN was developed to reflect local bicycle plans and policies that inform regional priorities.

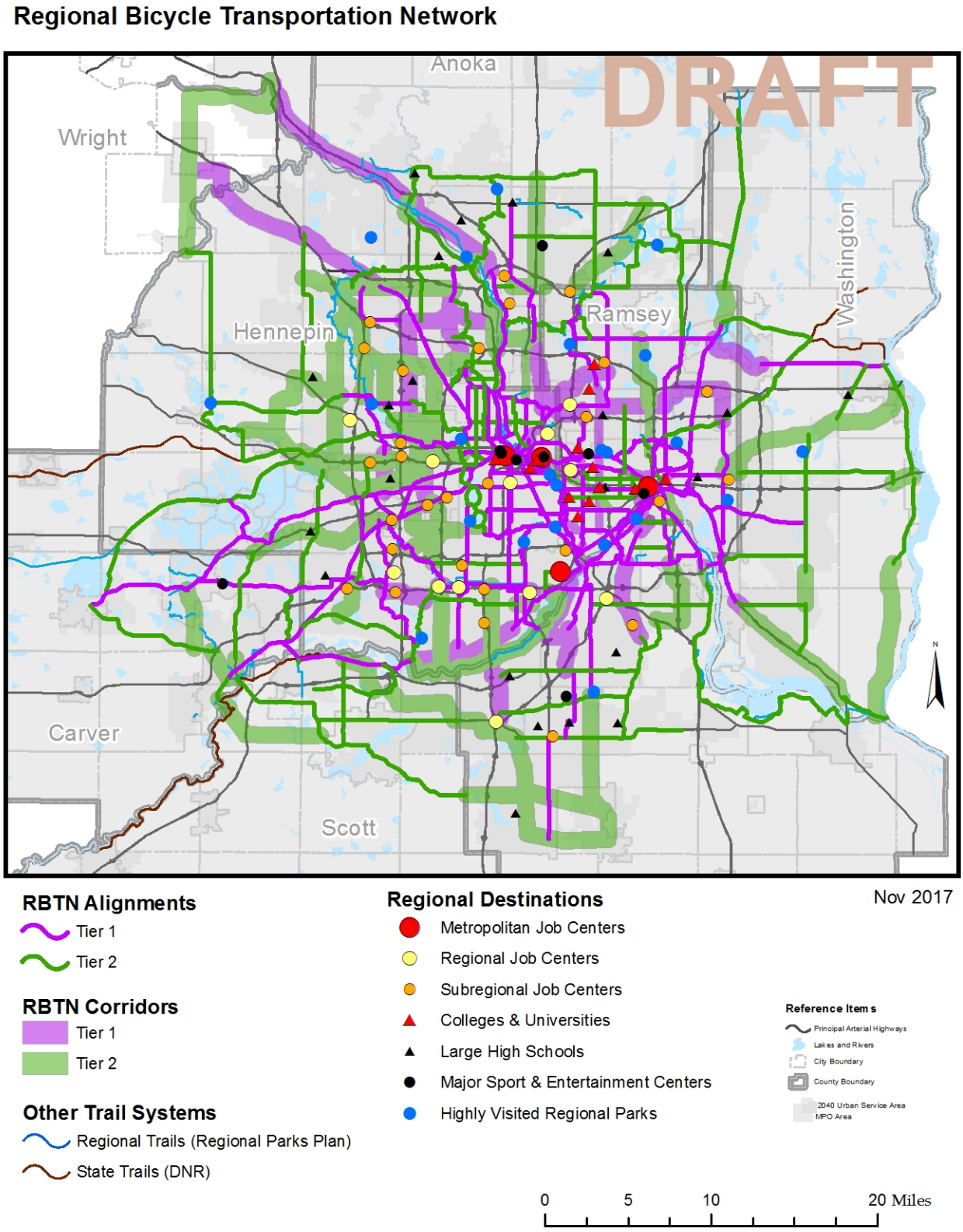
In addition to developing the initial RBTN, these guiding principles were used in reviewing potential RBTN map revisions proposed by local agencies since the last TPP update.

## Description of Corridors and Alignments

As shown in Figure X below and as a basic primer to the RBTN concept first introduced in the last Transportation Policy Plan, the RBTN consists of a series of corridors and general alignments. The corridors are established where there is existing or potentially high bicycle trip demand between regional destinations and activity centers and also connecting to moderate-to-higher density local neighborhoods or commercial areas. Corridors reflect where alignments have not yet been identified; the presence of corridors allow for local planning processes to determine the most appropriate alignment that follows the orientation of the corridor and combines on-street bikeways with off-road trails, where appropriate.

Alignments are defined where there are existing or planned bikeways, or in the absence of these, a general consensus of which road or roadways would most efficiently meet the regional corridor's intent. When alignments are identified within an existing corridor, the original corridor will dissolve and be replaced by the alignment on the RBTN map. Corridors and alignments are classified as Tier 1 or Tier 2 priorities, with Tier 1 representing the region's highest priorities for bikeway planning and investment. Tier 1 corridors and 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. High rates of bicycle travel demand, as well as current and planned population and employment densities, were heavily weighted in the Regional Bicycle System Study used to develop the RBTN.

**Figure X. Regional Bicycle Transportation Network with Cumulative Changes**



For more detail, an online interactive map can be viewed here: **(Insert link to online interactive RBTN map)**

## Regional Bicycle Transportation Network Revisions since the Last Plan

Since the last TPP update, multiple changes have been incorporated into the RBTN. First, there were dedicated alignments within existing corridors which are defined as administrative adjustments in this plan and do not require a plan update or amendment. More substantive changes that are proposed in this update include corridor centerline adjustments, corridor or alignment extensions or deletions, and new corridors or alignments. The proposed adjustments and additions are the result of direct meetings or communications with counties and cities, as well as changes proposed by local agencies and approved by the Transportation Advisory Board for the 2016 regional solicitation of federal transportation funds. Figure X shows the updated RBTN with cumulative revisions since the version published in the TPP adopted in January 2015.

~~is subdivided into two tiers for regional planning and investment prioritization.~~

~~**Tier 1 and Tier 2 Regional Bicycle Transportation Corridors**~~

~~***Tier 1 Priority Regional Bicycle Transportation Corridors*** are a subset of the Regional Bicycle Transportation Network and have been identified as the highest priority for regional transportation planning and investment. The full Regional Bicycle Transportation Network with Tier 1 and Tier 2 corridors is shown in Figure 7-1 below with an interactive version available here (Insert link to interactive RBTN map as shown in Fig G1). The priority corridors/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. High rates of bicycle travel demand, as well as current and planned population and employment densities, were heavily weighted in the analysis of corridors described earlier. Tier 1 and Tier 2 corridors are further described under Investment Direction (*insert link to Investment Direction*).~~

> ~~***Tier 2 Regional Bicycle Transportation Corridors*** are the remaining corridors in the overall Regional Bicycle Transportation Network (green corridors in Figure 7-1); these corridors are assigned the second tier priority for regional transportation planning and investment.~~
>
> ~~**Tier 1 and Tier 2 Regional Bicycle Transportation Alignments**~~
>
> ~~Similar to the regional bicycle transportation corridors, there are Tier 1 and Tier 2 regional bicycle transportation alignments (shown as bold purple and green lines in Figure 7-1) where specific route alignments have been designated through the Regional Bicycle System Study process that included discussions with local agency staff. The designated Regional Bicycle Transportation Network alignments are based on local bicycle plans and in many cases (particularly in the core cities) already exist in some form and may need little or no improvement for the regional network. Other designated alignments have not been developed and are based on planned on-street and off-road route alignments or other~~

factors as discussed with local agency staff. Those regional trails that provide direct transportation connections to and between regional destinations (as identified in the Regional Bicycle System Study) were included as Tier 1 alignments (purple lines in Figure 7-1).

The *Regional Bicycle System Study* was completed in 2014 to develop a more complete understanding of how the region's on-street bikeways and off-street trails connect and how they work together to serve regional transportation trips by bicycle. The main outcomes of the study were to develop a Regional Bicycle Transportation Network [*insert link to definition*] that includes a subset of Priority Regional Bicycle Transportation Corridors [*insert link to definition*] and a definition for critical bicycle transportation links [*insert link to definition*]. Details of the study process, methodology, and analysis results can be found on metrocouncil.org [*insert link to Regional Bicycle System Study Final Report*].

Although many of these trails were located to optimize their scenic or recreational value rather than to serve transportation as their primary function, some trail user studies have indicated a shift toward greater use by commuters in recent years, particularly in the urban and suburban developed areas of the region.

One task of the Regional Bicycle System Study was to identify which regional trails within the urban and suburban areas of the region are functioning primarily for bicycle transportation and should therefore be included on the Regional Bicycle Transportation Network. As a result, many regional trails were identified as important components of this regional network.

***Geographic information systems (GIS) analysis.*** The methodology and approach for scoring and prioritizing the Regional Bicycle Transportation Network was a direct reflection of the guiding principles described earlier [*insert link to Guiding Principles discussion*]. A geographic information systems (GIS) analysis was used to evaluate each potential corridor based on measures of seven key analysis factors:

- ***Emphasis on Regional Destinations.*** A key function of a regional network is connecting regional destinations to population centers. For purposes of bike study corridor identification and evaluation, regional destinations were defined as:

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

- ***Regional Job Concentrations.*** Regional employment data were used to identify job concentrations across the region. These concentrations constitute many of the primary destination clusters that are important to serve via the Regional Bicycle Transportation Network. The threshold for any area to be recognized as a regional or sub-regional concentration was at least 7,000 jobs with a minimum density of 10 jobs per acre. The

analysis included metropolitan, regional, and sub-regional concentrations with varying job densities.

- ***Other Regional Destinations.*** Because the list of regional employment and activity centers was not all-inclusive, other destinations were added including sports venues, entertainment centers, highly-visited regional parks, colleges and universities, and large high schools. These were based on various other data sources and direct feedback received from a Project Advisory Committee and at the public workshops and focus group sessions held during the Regional Bicycle System Study. Data generated from an on-line bicycle destinations recording tool resulting from more than 200 user hits recorded during the regional bike study process, were also used to determine the list of regional destinations.
- ***Bicycle Travel Demand.*** The user route requests and cyclist origin and destination data collected via Cyclopath provided a great resource for estimating bicycle demand across the seven-county region.
- ***Connecting with Transit.*** The most meaningful connections between bicycle infrastructure and the regional transit system occur at stations on regional transitways, at major transit centers and at high-user park-and-rides. These locations offer the highest frequency of transit service and the greatest potential for the transfer and storage of bicycles.
- ***Future Population.*** Projected population densities across the region were used to ensure that the Regional Bicycle Transportation Network will serve long range transportation needs that closely match future population growth and distribution across the region.
- ***Regional System Equity.*** The relationship of the Regional Bicycle Transportation Network corridors to identified Areas of Concentrated Poverty (where at least 50% of the residents are people of color) was analyzed to ensure that the proposed identified bicycle network provided a level of equitable service to communities that may have diminished economic opportunity. Bicycling offers a flexible and cost-effective means of travel to residents of these areas unable to afford a car.

## Regional Bicycle Transportation Network

### Regional Bicycle Transportation Network Vision

The goal of the Regional Bicycle Transportation Network 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 network vision (see Figure 7-1). The network is subdivided into two tiers for regional planning and investment prioritization.

#### Tier 1 and Tier 2 Regional Bicycle Transportation Corridors

***Tier 1 Priority Regional Bicycle Transportation Corridors*** are a subset of the Regional Bicycle Transportation Network and have been identified as the highest priority for regional

~~transportation planning and investment. The full Regional Bicycle Transportation Network with Tier 1 and Tier 2 corridors is shown in Figure 71 below with an interactive version available here (Insert link to interactive RBTN map as shown in Fig G1). The priority corridors/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. High rates of bicycle travel demand, as well as current and planned population and employment densities, were heavily weighted in the analysis of corridors described earlier. Tier 1 and Tier 2 corridors are further described under Investment Direction (*insert link to Investment Direction*).~~

~~***Tier 2 Regional Bicycle Transportation Corridors*** are the remaining corridors in the overall Regional Bicycle Transportation Network (green corridors in Figure 7-1); these corridors are assigned the second tier priority for regional transportation planning and investment.~~

~~**Tier 1 and Tier 2 Regional Bicycle Transportation Alignments**~~
~~Similar to the regional bicycle transportation corridors, there are Tier 1 and Tier 2 regional bicycle transportation alignments (shown as bold purple and green lines in Figure 7-1) where specific route alignments have been designated through the Regional Bicycle System Study process that included discussions with local agency staff. The designated Regional Bicycle Transportation Network alignments are based on local bicycle plans and in many cases (particularly in the core cities) already exist in some form and may need little or no improvement for the regional network. Other designated alignments have not been developed and are based on planned on-street and off-road route alignments or other factors as discussed with local agency staff. Those regional trails that provide direct transportation connections to and between regional destinations (as identified in the Regional Bicycle System Study) were included as Tier 1 alignments (purple lines in Figure 7-1).~~

~~**Figure 7-1: Regional Bicycle Transportation Network Vision**~~

## ~~Relationship~~ Regional Bicycle Transportation Network ~~to the~~and Regional Trails ~~System~~

Many regional trails ~~were~~ have been identified as important ~~components~~ alignments within ~~of~~ the ~~Regional Bicycle Transportation Network~~RBTN. Existing and planned regional trails, as well as general regional trail search corridors, are identified in the Regional Parks Policy Plan [*insert link to Regional Parks Policy Plan*] and are designed as multi-use facilities to serve both recreation and transportation trips. ~~Regional trail corridors are designated by the Council in its 2040 Regional Parks Policy Plan. The specific~~ Regional trail alignments ~~of a regional trail is determined~~ are identified by ~~the~~ the regional park implementing ~~agency~~ agencies ~~during~~ through the development of ~~a~~ trail-specific master plans~~,~~; ~~which~~ these master plans must be consistent with the ~~regional~~ Regional ~~parks~~ Parks ~~plan~~ Plan ~~in order~~ to be approved by the Council. ~~parks plan requires that regional~~ Regional trails are required to provide connections between components of the Regional Parks System and ~~notes that they~~ are primarily multi-use recreational trails, although many trails also serve and support bicycle transportation ~~functions~~.

Regional trails were an important input in the original RBTN and while there is significant overlap between the two networks, there are also some distinct differences. For example, the RBTN is planned to facilitate bicycling for transportation, including commute trips to work and school, shopping trips, entertainment and social trips, while regional trails are planned and designed primarily for recreation. Consistent with the RBTN's focus on transportation is its emphasis on connecting regional destinations by integrating on-street bikeways and off-road trails to create the most direct route that values trip efficiency over route aesthetics. For regional trails the planning philosophy is more about connecting regional parks and trails mainly through the development of off-road facilities that are planned to maximize scenic value rather than route efficiency.

Recreational bicycling, although not the focus of ~~this~~ the Transportation Policy Plan, is significant to the region in that it represents an important entry point for many cyclists to become familiar with the regional transportation and trail systems. Ultimately, many recreational cyclists will become users of these systems for commuting and other transportation purposes.

~~The role of regional trails in connecting to and between regional destinations, as identified in the Regional Bicycle System Study, was assessed and as a result, many regional trails were identified as important components of the Regional Bicycle Transportation Network. (See also "Development of a Regional Bicycle Transportation Network" for a more detailed discussion of study methodology. insert link to "Development of a Regional Bicycle Transportation Network" above). It should be noted that there are regional~~ Regional trails ~~outside of those~~ that ~~were~~ are not included in the ~~Regional Bicycle Transportation Network~~RBTN ~~which~~ may ~~serve some~~provide a transportation function at a ~~more~~ local level, just as there are many trails and on-street bikeways ~~identified on the Regional Bicycle Transportation Network~~within the RBTN that ~~will~~ also serve recreational needs in ~~the~~ urban and suburban ~~parts~~ areas~~of the region~~.

~~While the primary purpose of the regional trail system is to serve recreational needs, a subset of the trail segments also serve as high-use transportation corridors due to their straight and direct alignments, inherited from original alignments of railroad corridors. One of the benefits of a recently completed Regional Bicycle System Study was the determination of regional trail corridor segments that were deemed essential to the bicycle transportation network. Trails such as the Midtown Greenway, Cedar Lake, Sam Morgan, and Bruce Vento regional trails can be characterized as high-demand bicycle transportation corridors.~~

In practice, the ~~Regional Bicycle Transportation Network~~RBTN, ~~the~~ regional trails ~~system~~, and all local trail and bikeway networks ~~will~~ should complement ~~one another~~each other to serve the overall bicycle transportation and recreation needs of the region.

~~The proposed bicycle network corridors shown in Figure 7-2 are intended to serve as the "backbone" arterial system for biking in the region. Existing and planned regional trails are highlighted to depict their relationship to the Regional Bicycle Transportation Network~~

~~corridors and to highlight the overlap between bicycle recreation and bicycle transportation networks.~~

~~Figure 7-2: Regional Bicycle Transportation Network and Regional Trail System~~

## ~~Defining~~ Critical Bicycle Transportation Links

There are several physical barriers to bicycle transportation ~~types of barriers~~ that ~~can~~ disrupt the connectivity of ~~the Regional Bicycle Transportation Network~~ regional and local bikeway networks and act as major obstacles for residents trying to access ~~isolate communities from~~ key destinations. The links overcoming these barriers are defined as critical bicycle transportation links.

~~**Critical Bicycle Transportation Links.** These perform one or more of the following~~

Critical bicycle transportation links serve to:

- ~~Serve to close~~Close a gap in the Regional Bicycle Transportation Network or connect a local bikeway to a major regional destination~~.~~,
- Improve continuity and connections between jurisdictions (on or off the regional network), OR
- Improve or remove a physical barrier (on or off the regional network)

### Closing a Gap in the Regional Bicycle Transportation Network~~.~~

Gaps in the ~~Regional Bicycle Transportation Network~~RBTN can be addressed by:

- Providing a missing link between existing or improved segments of the Regional Bicycle Transportation Network.
- Improving bikeability within an ~~Regional Bicycle Transportation Network~~RBTN corridor to better serve all bicycling skill and experience levels within the corridor (for example, providing a safer, more protected on-street facility; improving traffic signals, signage, and pavement markings at busy intersections; or adding a bike route parallel to a highway or arterial roadway along a lower-volume neighborhood collector or local street).
- Providing a short (up to one mile) but critical link connecting a local bikeway to the Regional Bicycle Transportation Network, a major regional destination, a major transit-oriented development, or to a high-volume, multimodal transit station.

### Improving Continuity and Connections between Jurisdictions~~.~~

There are many cases around the region where an existing bikeway may stop at one city's border and not carry through to an adjacent city or county. Creating more consistent,

continuous and connected bikeways will improve access ~~to~~between local and regional bicycle ~~systems~~ networks, ~~and~~ as well as the convenience and overall experience of bicycling. ~~bikeability and convenience of, local and regional bicycle systems~~.

### Removing or Circumventing a Physical Barrier~~.~~

Physical barriers to biking can be natural or man-made and include major rail corridors, rivers and streams, freeways or ~~multi-lane arterial roadways~~expressways. In 2017, the Council conducted a *Regional Bicycle Barriers Study* to begin addressing the need for bikeway improvements across the region's physical barriers. This study is described in more detail below. Projects that remove or provide more bikeable options around or across physical barriers (for example, providing grade-separated crossings where appropriate) can arise in a number of ways. Planning work may underscore the need for a local bikeway to improve options through a major barrier.

Additionally, major roadway infrastructure projects can provide opportunities to create bicycle connections across one or several barriers, particularly in instances where there is not a usable parallel alternative within a reasonable biking distance. For roadway bridges crossing the region's major rivers, see the major river barrier crossings assessment below.

By their nature, projects to remove physical barriers can prove particularly costly and the potential to enhance such connections may be opportunity driven with respect to major highway, bridge, and transitway projects. Given the significant expense of building connections like bridges or underpasses and their anticipated long life, it is important to consider the inclusion of bicycle infrastructure in all projects that improve options to cross or get around these physical barriers, even if the full potential of the bicycle connection is not evident at the time of construction.

# Addressing the Region's Physical Bicycle Barriers

In beginning to address the region's physical bicycle barriers, particularly as they relate to the definition of critical bicycle transportation links, Council staff performed a general review of the region's major river crossings and conducted a *Regional Bicycle Barriers Study* to address the other regional physical barriers to bicycling. The region's primary rivers (Mississippi, Minnesota and Saint Croix Rivers) were not analyzed in the Regional Bicycle Barriers Study because of the large differences in approach and scale that would be required for these major rivers compared to the other smaller and less challenging barriers that were evaluated through the study. Also, there are many different and non-bicycle related factors that are the primary drivers for developing new bridge crossing projects. That said, this plan recognizes the major rivers as the longest and most challenging physical barriers to bicycling in the region.

## Major River Barrier Crossings Assessment

The Council conducted a high-level assessment of the existing roadway bridges and existing or planned stand-alone bikeway bridges crossing the region's primary rivers. The Twin Cities has

three primary rivers that run throughout the region that represent major barriers to all transportation modes. These include the Mississippi, Minnesota, and Saint Croix Rivers which serve as the boundary lines between cities, counties, and in the case of the Saint Croix, the Wisconsin/Minnesota state line. There are currently 38 roadway bridges and five independent stand-alone bicycle/pedestrian bridges that cross these major river barriers. As shown in Table X, of the 38 roadway bridges, 29 have existing bikeways, four have planned bikeways, and five have none existing or planned bicycle facilities.

**Table X. Major River Crossings by Bridge Type**

| Bridge Type | Existing Bikeway | Planned Bikeway | None existing or planned | Total |
|---|---|---|---|---|
| Road bridges | 28 | 4 | 6 | 38 |
| Rail bridges | 0 | 3 | 0 | 3 |
| Stand alone bike-pedestrian bridges | 5 | 1 | 0 | 6 |
| Total | 33 | 8 | 6 | 47 |

In addition to five existing stand-alone bicycle bridges, there are 4 stand-alone or rail bridge-adjacent bicycle crossings planned in Minneapolis, Stillwater and the Town of Carver. Figure X shows the locations of all major river roadway crossings, and all existing and planned independent bikeway crossings of the major rivers.

**Figure X. Major River Bicycle Barrier Crossings**

Because of high construction costs, long implementation timeframes, typically long distances between bridge crossings, and a much shorter range of bicycle trips compared to vehicle trips (average of under 3 miles, regionally) all of these crossings are designated as *major river barrier crossings*. Guidelines for applying this new designation of *major river bicycle barrier crossings* are further discussed in the "Investment Direction" section provided later in this chapter.

## Regional Bicycle Barriers Study

In 2017, the Council conducted a *Regional Bicycle Barriers Study* to begin addressing the need for bikeway improvements across the region's physical barriers. The study defined physical barriers to include secondary rivers and streams, rail line corridors, and freeways and expressways. Freeways are highways with full access control meaning motorists do not encounter any cross-road intersections. Expressways, for this study, were defined to include the region's non-freeway prinicipal arterials that comprise of at least four lanes and are divided by a median. These highways differ from freeways in that they do have cross-road intersections with traffic signals and some partial stop sign-controlled intersections with right turn in and out only access.

The purpose of the study was to identify the region's major physical barriers to bicycle transportation and to analyze and prioritize points along these barriers having the greatest potential need for new or improved bicycle crossings. A series of potential barrier crossing points were identified and analyzed; the actual points were determined with assistance from a technical advisory work group of bike transportation professionals and advocates, from input received from two live focus group sessions with area cyclists representing a variety of backgrounds, and from results of an interactive, on-line map questionnaire. The study included bicycle barrier crossing locations already identified in local plans, points within or on RBTN corridors or alignments, plus additional points based on the spacing criteria shown in Table X. Points on local networks and regional facilities were considered equally in the analysis. Preferred spacing distances between bikeable crossings were determined by the study's technical work group and ranged from ½-mile between crossings in urban centers to two miles between crossings in the region's rural areas.

**Table X. Bicycle Barrier Crossing Spacing Criteria**

| Thrive Planning Area | Preferred Maximum Spacing | Example Cities |
|---|---|---|
| Urban Center | ½-mile | Minneapolis, St Paul, Richfield, Hopkins, South St Paul |
| Urban | ¾-mile | Golden Valley, Roseville, Maplewood, Crystal, Edina |
| Suburban, Suburban Edge, Emerging Suburban Edge | 1 mile | Blaine, Woodbury, Maple Grove, Eagan, Lakeville |

| | | |
|---|---|---|
| Diversified Rural, Rural Residential, Agricultural | 2 miles | Grant, Afton, Ham Lake, Lake Elmo, Independence |

Analysis factors included safety and existing conditions, bicycle trip demand, bike network connectivity, and social equity. -More information on the detailed analysis process for the study can be found here: (insert live link to Reg. Bike Barriers Study tech memos and final report prior to release for public comment)

Ultimately, the study determined a series of bicycle barrier crossing improvement areas along identified regional bicycle barriers; these areas are displayed as circles and grouped into three priority tiers in Figures xx and xx below for freeways/expressways and railroads/streams, respectively. The area circle diameters vary by aggregated Thrive planning area and correspond to the preferred barrier crossing spacing distances described previously in Table X.

**Figure xx: Regional Barrier Crossing Improvement Areas: Freeways and Expressways**

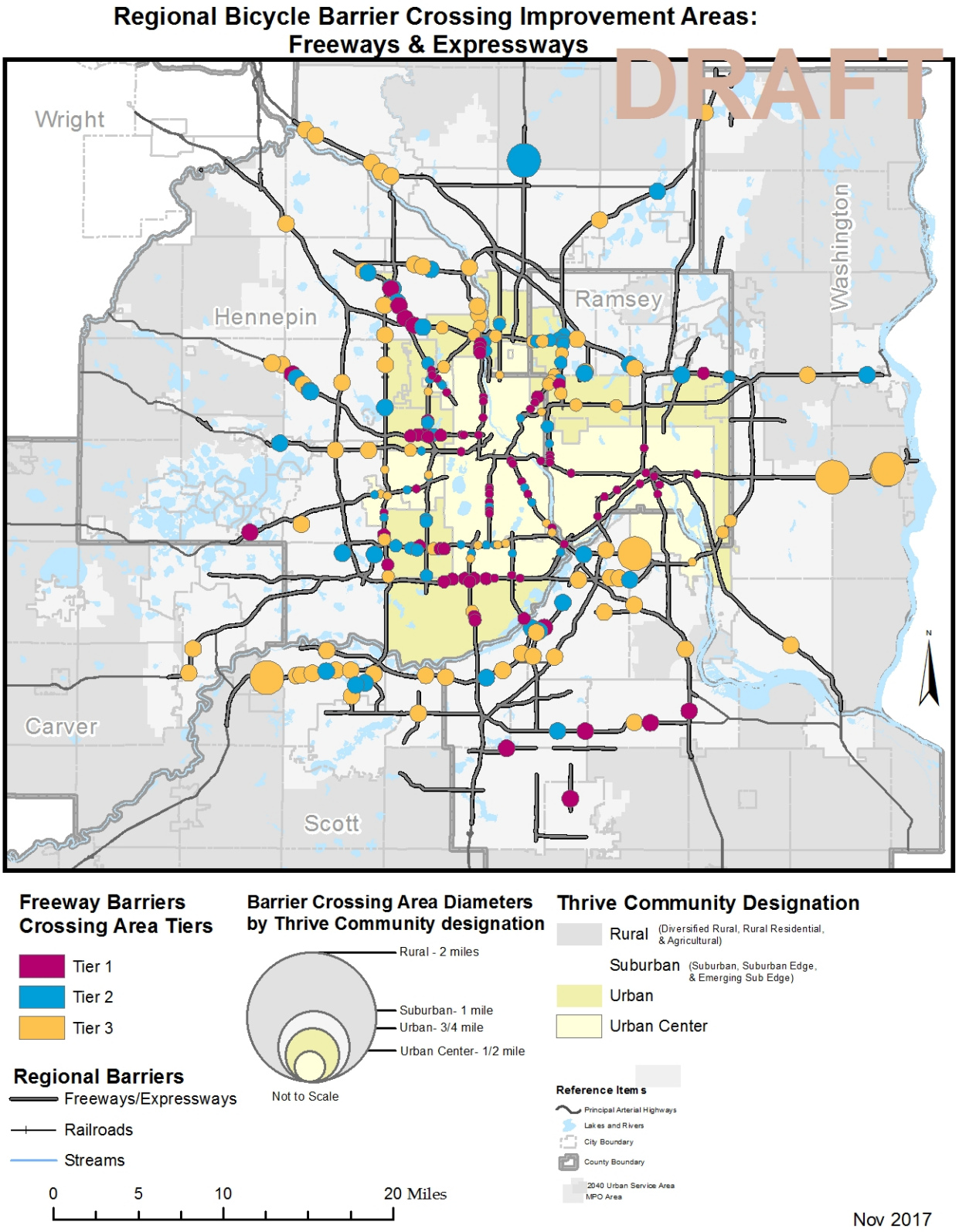
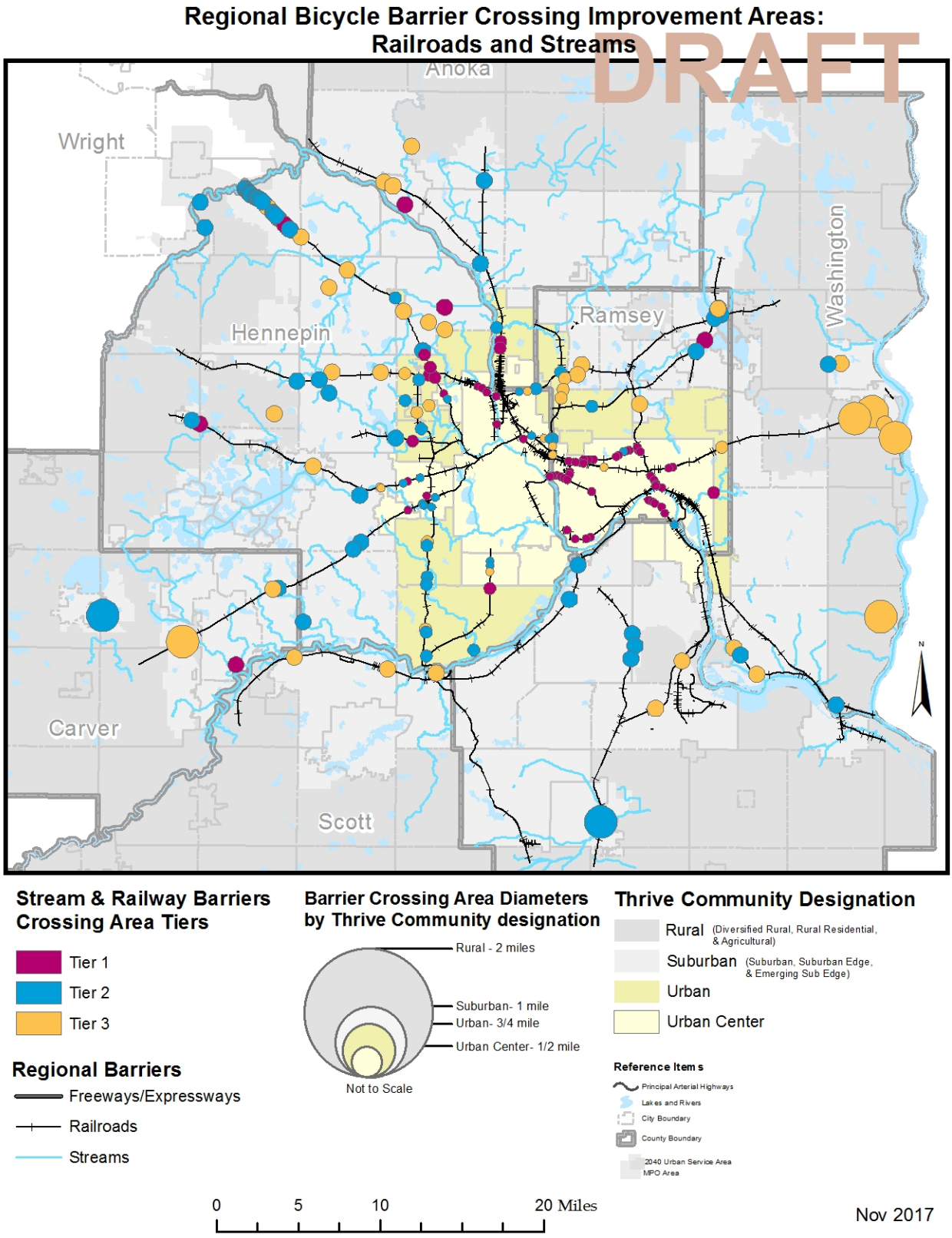


**Figure xx: Regional Barrier Crossing Improvement Areas: Streams and Railroads**



In the region's suburban and rural areas there are fewer opportunities to incorporate improved bikeway crossings in roadway projects compared to more urban areas, and less certainty about where new or improved barrier crossings should be ideally located. To help mitigate this reality, the mapping scheme in Figures X and XX affords cities and counties more flexibility in siting specific barrier crossing projects by applying larger circles. In more densely developed urban areas where there is an abundance of planned barrier crossings and a dense road grid with many opportunities to develop barrier crossing projects, the mapping scheme applies smaller improvement area circles. Guidelines for applying the tiered barrier crossing improvement areas shown in these maps are further discussed in the "Investment Direction" section provided later in this chapter.

# Implementing the Regional Bicycle Transportation Network

## Local Planning for ~~the~~ Regional Bicycle Transportation Network Corridors and Alignments

The broad ~~regional priority~~RBTN corridors shown in Figure 7-1 (one-mile wide in suburban/rural areas, one half-mile wide in the core cities) are intended to allow flexibility among local government agencies to tailor specific alignments for bikeway facilities through the local planning process. When specific alignments are designated through the local planning process, the regional corridor will be replaced on the ~~Regional Bicycle Transportation Network~~RBTN map with the preferred alignment. These ~~revisions~~ new alignment designations ~~to the Regional Bicycle Transportation Network map will be~~are ~~performed~~ periodically added to the RBTN map as an administrative task and will not require a TPP amendment.

In planning for specific ~~Regional Bicycle Transportation Network~~RBTN alignments and developing bikeway improvement projects, agencies should consider all the guiding principles for regional bicycle corridors described previously but with special attention to the following subset of principles that are most effectively planned at the local level:

- **Overcome physical barriers and eliminate critical system gaps.** More attention and planning will be needed at the local level to identify existing gaps in the Regional Bicycle Transportation Network and opportunities to eliminate or divert from physical barriers. The Metropolitan Council will assist locals in planning for this critical element in developing the ~~Regional Bicycle Transportation Network~~RBTN.
- **Facilitate safe and continuous trips to regional destinations.** Planning for the development of bicycle facilities along the ~~Regional Bicycle Transportation Network~~RBTN, as well as for connections between the ~~Regional Bicycle Transportation Network~~RBTN and local bikeway systems, should be coordinated with Metropolitan Council staff.
- **Accommodate a broad range of cyclist abilities and preferences to attract a wide variety of users.** Local roadway conditions and geometry, along with the available off-

road trails network will largely determine what alignments and facility treatments may be feasible within an established regional bicycle corridor. Local agencies should try to accommodate cyclists of all ages and for the full range in abilities from novice to avid cyclist by providing a range of off-street and on-street bicycle facilities. In some urban, high demand corridors, it may be desirable to provide both an on-street bike facility (like a bike lane) and a parallel off-road trail. In most corridors with space for only an on-road facility, a buffered or protected bike lane may be the optimal solution to attract the widest range of cyclists.

- **Integrate and/or supplement existing and planned infrastructure.** Wherever possible, it is desirable to construct bicycle facilities along existing roadways or implement trails on corridors with minimal requirements for new land acquisition. This is important to ensure that scarce dollars for bicycle infrastructure can be efficiently invested to complete the regional network in a shorter timeframe.
- **Consider opportunities to enhance economic development.** When planning specific alignments within the regional bicycle corridors, local bicycle planners should work closely with their economic development and land use planners to identify opportunities for the bikeway project to enhance and/or serve as a catalyst to community development programs and projects. Connecting residential neighborhoods with shopping, entertainment, and work centers should be a major consideration when developing bicycle facility improvement projects.

## Placement of Regional Bicycle Transportation Network Alignments on Roadways

When identifying roadways and highway corridors appropriate for implementing specific alignments for regional bikeways, it is imperative that transportation agencies coordinate and collaborate in their planning activities. This will help to ensure that trade-offs between opportunities for implementing a bikeway and the physical constraints of the roadway corridor are fully considered. To that purpose, for major corridor studies and projects, meetings and other opportunities for engaging the public will be critical to inform the project development process.

The provision of safe and comfortable bicycle facilities in the roadway corridor should be the goal in order to achieve continuity for regional bicycle corridors and to facilitate direct access to corridor destinations. Planning for cyclist bikeability and convenience over a range of experience levels and abilities is an important focus for any major roadway project. Other competing priorities, including safety for all users and mobility for all transportation modes, will also need to be considered. This balancing of priorities is especially needed on highways, including A-minor arterials without sufficient right of way to provide an off-road facility ~~[*insert link to "Strategy C2"*]~~.

Some highways serve as the only practical and effective crossing over a major barrier (such as, rivers, freeways, multi-lane highways, and railroad corridors). In these cases, safe bicycle and

pedestrian accommodations should be provided on the highway segment that crosses over (or under) the barrier. On some highways with high traffic volumes, an intensive mix of trucks and buses, and limited right-of-way to provide designated on-street ~~bicycle~~ bike facilities, it may be appropriate to route the ~~bicycle~~ facility away from the highway when a nearby, parallel local street is available. This condition occurs more frequently on A-minor arterials in highly-developed, urban corridors than on A-minors in less developed, suburban or rural corridors; however, this will not always be the case and each corridor should be planned to address its unique issues and needs from both a local and regional perspective. As an alternative to locating regional bikeways along major highways, regional transportation partners could work together to plan and build new, continuous bicycle facilities that cross barriers via the local street system; with their lower traffic volumes and slower speeds, local streets can be improved to accommodate a broader range of cyclist abilities.

## ~~Bicycle~~ Facility Types that Meet Regional Bicycle Corridor Functionality

There is a range of bicycle facility treatments, both off road and on street, which may be applied in different parts of the region to accomplish the function of regional bicycle corridors and to maximize their attractiveness to potential bicyclists. Local planners will need to consider their community's local corridor context (for example, urban, suburban, rural) to determine the feasibility of an off-road trail facility, or to identify which on street bikeway type would be most appropriate for the specific corridor at hand. For the bicycle facility types described below, the following resources may be useful for more information about practical applications and design guidelines:

- Minnesota's Best Practices for Pedestrian/Bicycle Safety, MnDOT
- NACTO Urban Bikeway Design Guide, Second Edition, National Association of City Transportation Officials
- Bikeway Facility Design Manual, MnDOT
- Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials (AASHTO)
- Small Town and Rural Multimodal Networks, Federal Highway Administration (FHWA)
- Pursuing Equity in Pedestrian and Bicycle Planning, FHWA
- Accessible Shared Streets: Notable Practices and Considerations for Accommodating Pedestrians with Vision Disabilities, FHWA

In addition to off-road trails, the following list of on-street bicycle facility types provides a few suggested examples for implementing the Regional Bicycle Transportation Network and are listed in ~~ascending~~ descending order of complexity:

- **Protected bikeways ~~or~~ (previously known as "cycle tracks"~~cycle tracks~~):** Protected bikeways ~~or cycle tracks~~ are on-road or off-road facilities that are physically separated from lanes of moving traffic. ~~Cycle tracks~~They can be designed as on- or off-road facilities and are often times separated from general traffic lanes with a vertical element such as a bollard or an elevated curb. There are one-way and two-way cycle track

designs and in areas where on-street parking is allowed, they can be placed between the parking lane and sidewalk. ~~Cycle tracks~~Protected bikeways have been developed mostly in densely developed urban locations like commercial downtown districts in large cities.

- **Buffered bicycle lanes:** Buffered bike lanes are conventional lanes that are combined with a buffer space designated with pavement markings that separate vehicle traffic from bike lane traffic. This treatment type may be appropriate for urban and suburban areas on streets with high traffic volumes, high speeds, and or high volumes of trucks or buses. Buffered bike lanes may also be appropriate along medium-to-high volume roads with lower speeds to help meet the needs of younger or less-experienced cyclists.
- **Conventional bicycle lanes:** Bike lanes can facilitate a safer and more comfortable trip for cyclists by providing a dedicated space for on-street bicycle travel. These facilities are most often placed on the right-hand sides of the street (so they flow with traffic) between the general traffic lane and the curb or parking lane and are designated through pavement striping and markings and/or signage. These facilities are one of the more common treatment types in urban areas and are also suitable in suburban areas along medium or high-volume streets.
- **Bicycle Boulevards:** In urban and some suburban areas, bicycle boulevards may be an appropriate treatment to improve a designated regional bicycle corridor. Bike boulevards are low volume, lower speed roads that are designed to give cyclists priority over motorized vehicles. These facilities typically apply relatively low-cost treatments, such as signs and pavement markings, along with traffic speed and/or traffic volume management devices such as speed "bumps" or traffic "islands" at intersections. Bicycle boulevards can be especially effective in providing a more bicycle-friendly alternative to a parallel running, high volume, arterial street or highway.
- **Wide paved shoulders:** On some roadways, especially in the rural areas of the region, this may be the most feasible treatment. To make these facilities more prominent to cyclists and motorists, "Bike Route" or "Share the Road" signs and/or pavement markings may be added appropriately along the route.

## Future Spacing of new RBTN Corridor/Alignment Additions

In addition to reviewing any proposed new RBTN corridors and alignments for consistency and compatibility with the guiding principles, the Council will apply the spacing criteria identified as the maximum preferred distance between regional bicycle barrier crossings as the *minimum distance between RBTN corridor centerlines and/or alignments.* These criteria will be applied based on the Thrive Community Designation groupings as follows:

**Table X. Preferred Minimum Spacing for Regional Bicycle Transportation Network Facility Additions**

| Thrive Planning Areas | Preferred Minimum Spacing (between RBTN facilities) | Example Cities |
|---|---|---|
| Urban Center | ½-Mile | Minneapolis, St Paul, Richfield, Hopkins, W St Paul |
| Urban | ¾-Mile | Golden Valley, Roseville, Maplewood, Crystal, Edina |
| Suburban, Suburban Edge, Emerging Suburban Edge | 1 Mile | Blaine, Woodbury, Maple Grove, Eagan, Lakeville |
| Rural Residential, Diversified Rural, Agriculture | 2 Miles | Grant, Afton, Ham Lake, Lake Elmo, Independence |

# Investment Direction

## Potential Funding Sources

### Federal Funding Sources

~~The 2012 federal transportation act Moving Ahead for Progress in the 21st Century (MAP-21) established a new program, Transportation Alternatives Program (TAP), to provide for a variety of non-motorized transportation projects that were previously eligible activities under separately funded programs including Transportation Enhancements, Safe Routes to School, and the Recreational Trails program.~~

~~Under MAP-21, approximately $7 million will be available to the region annually through the TAP.~~ With the 2015 federal transportation legislation Fixing America's Surface Transportation (FAST) Act, two of the federal transportation funding programs available to the region changed. The Surface Transportation Program is now the Surface Transportation Block Grant Program (STBGP). The previous Transportation Alternatives Program, which was a core source of funding for bicycle and pedestrian facilities in the region, is now the Surface Transportation Block Grant Set-aside Program. Bicycle and pedestrian facilities ~~are~~ remain ~~also~~ eligible for funding under the federal Surface Transportation Block Grant Program (STBG~~P~~) and the region has a history of funding larger bicycle facility projects using ~~STP~~ STBG funds. Congestion Mitigation Air Quality (CMAQ) funds are also eligible for bicycle and pedestrian projects that can demonstrate an air quality benefit, though the region has not traditionally used CMAQ funds for these purposes.

In the Twin Cities region, the Transportation Advisory Board (TAB) is responsible for allocating ~~the~~ federal ~~TAP, STP and CMAQ~~ transportation funds available to the region through a biennial Regional Solicitation. As described in the Transportation Finance section [*insert link*], the solicitation was evaluated and revised to ensure it is consistent with the outcomes and principles of *Thrive MSP 2040*, the Transportation Policy Plan, and the requirements of ~~MAP-21~~the FAST Act. The ~~revised~~ solicitation process ~~will~~ allocates federal funds through three modal categories: roadways (including multimodal elements), transit and travel demand management projects, and bicycle and pedestrian ~~projects~~facilities. Within the bicycle and pedestrian facilities category, there are three main project types: multiuse trails and bicycle facilities; pedestrian facilities; and Safe Routes to School infrastructure projects. Each solicitation will determine the amount of federal funds spent within each modal category; however, it is assumed that at a minimum the full amount of available ~~TAP~~ STBG Set-aside Program funds will be allocated to bicycle and pedestrian ~~projects~~facilities.

### State and Local Funding Sources

MnDOT uses state highway funds to improve the trunk highway system with accommodations for bicyclists and pedestrians. These investments are often made as part of larger highway pavement and bridge projects and may include trails and sidewalks parallel to the roadway or as part of a reconstructed bridge structure, as well as bike lanes in some urban corridors or wide paved shoulders in rural areas. See the Highways Investment Plan section for more on anticipated future highway funding levels for bicycle and pedestrian improvements on the trunk highway system [*insert Link to discussion of bike/ped facilities in "Highway Investment Direction and Plan"*].

Regional trails identified by the Council in its Regional Parks Policy Plan are eligible for funding through the Council's regional parks capital improvement program (CIP). The Parks CIP is funded with state bonds, Metropolitan Council bonds and Parks and Trails Legacy Fund appropriations. The state's Parks and Trails Legacy Fund represents a dedicated funding source for outdoor recreation, to be used for parks and trails of state or regional significance. Regionally significant trails in the metro area are those defined in the Regional Parks Policy Plan. The Metropolitan Council disburses state funds to partially finance the costs of operating and maintaining the regional parks system. Regional park implementing agencies also use their local funds for constructing, maintaining, and operating regional trails.

City, county, and park agency funds have been integral to supporting the development, maintenance, and preservation of local multi-use trail and bikeway systems. These funds typically derive from local property taxes for trail system improvements and from property assessments in the case of city street improvements. Like MnDOT, counties and cities may also use their roadway state aid revenues from the state gas tax to invest in bicycle and pedestrian facilities as part of roadway and bridge reconstruction projects on county and municipal state aid roads.

## Regional Funding Needs

The local funds identified above make up the bulk of revenue supporting bicycle and pedestrian networks and will continue to be critical to the provision of pedestrian and bicycle infrastructure so that these local investments can effectively complement and round out the regional system. However, as a result of diminishing tax revenues and the increasing costs of ongoing maintenance (including winter snow removal to accommodate year-round use), preservation, and rehabilitation needs for bicycle and pedestrian facilities, there is a large shortfall of dollars available to fund existing system needs. Current revenues are also inadequate to fund new infrastructure needs including the vision for the Regional Bicycle Transportation Network and the local bikeways systems needed to supplement the regional network.

The Council recognizes that, as with other modes, there are significantly more needs for bicycle and pedestrian infrastructure than there are available funds. As shown in Table X, ~~B~~between ~~1993 and~~ 2011 and 2016~~,~~ there were about $~~204~~ 90 million in stand-alone bicycle, pedestrian and safe routes to school ~~and pedestrian~~ projects ~~constructed~~ funded with federal ~~Regional Solicitation~~transportation funds through the Regional Solicitation directed by the Transportation Advisory Board. ~~(including Transportation Enhancements and Surface Transportation Program funds).~~ However, only about ~~37~~40% of total project requests were funded ~~with this level of funding available~~ over the three, 2-year cycles over ~~that~~ this time period. On average, about 15.2% of the total regional funds available were allocated to bicycle and pedestrian funding categories per two-year regional solicitation cycle. This does not include, however, funds that were allocated to roadway and bridge projects that included bicycle and pedestrian facilities.

**Table X. Regional Solicitation Project Funding Summary, 2011 – 2016**

| Year | Funded (in $M) | Funds Requested (in $M) | % of Requests Funded | Total Fed. $$ to Region ($M) | % of Total to Bike/Ped |
|---|---|---|---|---|---|
| 2011 | $ 26.23 | $ 74.95 | 35.0% | $ 177.89 | 14.7% |
| 2014 | $ 27.70 | $ 63.33 | 43.7% | $ 189.50 | 14.6% |
| 2016 | $ 36.22 | $ 86.43 | 41.9% | $ 221.17 | 16.4% |
| Total | $ 90.15 | $ 224.70 | 40.1% | $ 588.56 | 15.3% |

As a result of ~~this~~ a general ~~scarcity~~ shortage of funds to ~~support biking and walking~~meet bicycle and pedestrian facility needs, any new state transportation funding package should include additional funding for bicycle and pedestrian infrastructure, with priority for implementing the ~~Regional Bicycle Transportation Network~~RBTN to support bicycling for transportation.

## Regional Solicitation

The Council, through its Transportation Advisory Board's Regional Solicitation process, makes specific categories of federal transportation funds available to local governments on a competitive basis ~~for pedestrian and bicycle facilities and safety programs.~~ Local governments may apply for stand-alone bicycle and/or pedestrian facilities, or these facilities may be included as part of related roadway projects.

The Transportation Advisory Board solicits applications for federal funding for these improvements through three project categories: roadways including multimodal elements, transit and travel demand management projects, and bicycle and pedestrian facilities. Bicycle and pedestrian projects are generally funded from the Surface Transportation Block Grant Set-aside Program, but funds from the Surface Transportation Block Grant Program or the Congestion Mitigation and Air Quality program are also eligible to be used for bicycle and pedestrian facilities. ~~Transportation Alternatives Program (TAP) and Surface Transportation Program (STP) and can provide funds from the Congestion Mitigation/Air Quality program, if it chooses.~~

The sections that follow list and describe the basis for the region's priorities for investment in bicycle and pedestrian infrastructure through the Regional Solicitation for federal transportation funds. Additional funding for bicycle and accessible pedestrian highway infrastructure through MnDOT is described in the Highways Investment Direction and Plan ~~under current revenue (insert link to Chapter 5) and increased revenue scenarios~~.

### Regional Bicycle Transportation Network

Projects proposed to enhance existing or complete new segments or connections of the Regional Bicycle Transportation Network will be given priority for federal transportation funding, provided that operations and maintenance commitments are made by the project applicant for the entire segment of proposed bikeway and any adjoining segments within the applicant's jurisdiction. The network is subdivided into two tiers for regional planning and investment prioritization:

- **Tier 1~~, Priority~~ Regional Bicycle Transportation Corridors and Alignments** (as previously shown in Figure ~~7-1~~X) should be given the highest priority for transportation funding; these are the corridors and alignments determined through the *Regional Bicycle System Study* (2014) to provide the highest transportation function by connecting the most regional activity centers through the developed urban and suburban areas of the region.
- **Tier 2~~,~~ Regional Bicycle Transportation Network Corridors and Alignments** (also shown in Figure ~~7-1~~X) should be given the second highest priority for transportation investment. These corridors and alignments provide transportation connectivity to outlying regional destinations within and beyond the urban/suburban areas and serve to connect ~~priority~~ Tier 1 regional bicycle transportation corridors~~/~~ and alignments.

~~**Critical Bicycle Transportation Links**~~

~~Potential bicycle facility improvement projects can be defined as critical bicycle transportation links if the planned improvement performs one or more of the following functions:~~

1. ~~Serves to close a gap in the Regional Bicycle Transportation Network; this includes improving bikeability and convenience for all age/experience levels within urban, high demand corridors that may already have a continuous bikeway facility (for example, adding an off-road trail where there is only an on-street bike lane in an urban high-demand corridor, or adding a bike lane where only a trail exists).~~
2. ~~Improves continuity and/or connections between jurisdictions (whether it is on or off the regional network); this includes extending a specific bikeway facility treatment across jurisdictions to improve consistency and inherent bikeability and convenience for all cyclists.~~
3. ~~Provides an alternative that crosses or gets around a physical barrier including a river or stream, railroad corridor, freeway, or multi-lane highway.~~

~~Bicycle facility improvements meeting any of the above criteria for critical bicycle transportation links will be considered a regional priority for planning and regional investment.~~

## Major River Bicycle Barrier Crossings and Regional Barrier Crossing Improvement Areas

This TPP Update establishes new regional designations for major river bicycle barrier crossings and regional bicycle barrier crossing improvement areas and recommends these new designations be incorporated into the Regional Solicitation of federal transportation funds, and also in local and state funding programs, where relevant.

### Major River Bicycle Barrier Crossings

Because roadway and stand-alone bicycle/pedestrian bridges crossing the Mississippi, Minnesota and Saint Croix Rivers are relatively infrequent outside of the Minneapolis and Saint Paul downtowns and the University of Minnesota campus, and thereby provide limited access and great inconvenience for the much shorter bicycle trips compared to vehicles, all of the region's existing roadway bridges and existing or planned bike/ped bridges are designated as *major river bicycle barrier crossings.* Given this designation, projects that add new or upgrade existing bicycle facilities to current standards on roadway bridges crossing the region's major rivers should be given additional points in the regional scoring process for federal transportation funding. Projects applying for regional funds in the "Multi-Use Trails and Bicycle Facilities" category that construct new, or upgrade existing, stand-alone bicycle-pedestrian bridges crossing these major rivers should be given the highest priority for federal transportation funds within this category.

### Regional Barrier Crossing Improvement Areas

A series of tiered *regional barrier crossing improvement areas* were identified along the region's freeways/expressways, rail lines, and secondary rivers and streams through the Regional Bicycle Barriers Study described previously. The areas are designated in Figures X and XX with buffered circles of varying diameters (based on Thrive community designation) and grouped into three prioritized tiers for regional investment based on the study analysis. The circle areas represent barrier segments along which future barrier crossing improvement projects may receive additional points in the regional solicitation project selection for TAB-directed federal transportation funding. Roadway bridge projects that add new or upgrade existing bicycle facilities to current standards rivers should be given additional points in the regional scoring process for federal transportation funding. Projects applying for regional funds in the "Multi-Use Trails and Bicycle Facilities" category that construct new, or upgrade existing, stand-alone bicycle-pedestrian bridges crossing these major rivers should be given a high priority for federal transportation funds within this category and scored relative to the Tier1, Tier 2, or Tier 3 barrier crossing improvement circle designations defined in the Regional Bicycle Barriers Study.

## Other Key Investment ~~Prioritization~~ Factors for Pedestrian and Bicycle Projects

### Qualifying Requirement for Amercans with Disabilities Act Compliance

A new qualifying requirement for the 2018 Regional Solicitation specifies that public agencies must either have, or be substantially working toward, completing a current ADA self-evaluation or transition plan that covers public rights of way, as required under Title II of the Americans with Disabilities Act. While all individual transportation projects must comply with ADA requirements, this new self-evaluation or transition plan requirement ensures that public agencies are also addressing the requirement to identify their facilities and services that must be modified to ensure they are fully complying with ADA requirements.

### Prioritization Factors

***Opportunities for Pedestrian Improvements.*** Regional funding priority will be geared toward stand-alone pedestrian projects that are connected to transit service or regional job concentrations. These include:

- Along existing or potential high-frequency arterial bus routes in the urban core and suburban communities.
- Transit-oriented developments around existing or programmed transitway stations.
- Existing transit stations, transit centers, or frequent-service park-and-ride locations that are within a reasonable walking distance to residential development or activity centers,

or metropolitan job concentrations like the downtowns and the University of Minnesota.

- Projects that are included as part of a community's Americans with Disabilities Act (ADA) transition plan and/or demonstrations of best practices in design for use by people of all ages and levels of mobility.
- Metropolitan, regional, and sub-regional job concentrations defined in *Thrive MSP 2040*

***Safety.*** Regional evaluation criteria will favor infrastructure projects that significantly improve safety for bicyclists and pedestrians while maintaining or enhancing the ease of bicycling or walking. Funding can also be provided to projects that do not improve network connectivity but significantly improve the safety of bicycling or walking (including users of all ages and levels of mobility) or that address an identified safety problem. An example of this type of project would be improvements to intersections that receive a high level of bicycle and/or pedestrian traffic but which were not originally designed with bicycle/pedestrian safety in mind.

***Cost Effectiveness.*** Bicycle and pedestrian projects should be cost-effective to construct and to maintain. When determining the right solution for a safety or connectivity problem, local agencies should first consider methods that use existing right-of-way and infrastructure to improve the desirability of biking or walking before considering the construction of entirely new facilities that would require new right-of-way and/or increase operations and maintenance costs.

***Continuity and Connections between Jurisdictions.*** Regional evaluation criteria should favor projects that improve continuity and/or connections between jurisdictions. This would include extending a specific bikeway facility treatment across jurisdictions to improve consistency and inherent bikeability and convenience for all cyclists. Creating more consistent, continuous and connected bikeways improves access between local and regional bicycle networks, as well as improving the overall bicycling experience.

***Multimodal Projects.*** Roadway projects submitted for federal funding should include features that benefit all users of the transportation system including pedestrians and bicyclists (including users of all ages and levels of mobility) in addition to vehicular modes. Regional evaluation criteria should favor roadway projects that meet the needs of pedestrians and bicyclists with an emphasis on safety and barrier removal. In addition, evaluation criteria for stand-alone bicycle and pedestrian improvements should favor projects that support compact mixed-use transit-oriented development within employment centers and those that provide direct connections to high-service transit facilities.

***Bicycle Connections to Transit.*** Regional evaluation criteria should favor local bicycle projects that connect to an existing or planned regional transitway or a bus transit stop or station location. These potential connections should be emphasized in the project development process in order that local opportunities to facilitate multimodal trips via bicycles and transit can be maximized.

***Reconstruction of Existing Facilities.*** In addition to building new facilities for bicyclists and pedestrians, local jurisdictions are encouraged to apply for Regional Solicitation funds for reconstructing existing facilities where the project would improve the bikeway or pedestrian path to a quality level superior to that of the existing facility and where facilities have been properly maintained. Projects considered for federal funding should also have an approved plan for maintenance or a maintenance agreement to ensure that the facility remains in good repair and is passable.