2040 REGIONAL TRANSPORTATION POLICY PLAN

DRAFT PLAN

Public Comment Period: August 14 – October 1, 2014

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The 2040 Transportation Policy Plan:

Connecting communities, fostering regional prosperity

In the Twin Cities metro area, people are on the move – to work, school, shop, relax and a thousand other destinations. The highways, transit lines, walkways, and biking paths that connect our transportation system provide us access to those places and the important commercial routes that service our businesses, commuters, and the wider economy.

These networks are indispensible to our lives, our quality of life, and our future. Transportation is the engine of our prosperity, and the next 30 years call us to maintain and enhance our existing facilities, better connect people and communities, and provide more transportation choices that make our region stronger and a better place to live.

This *2040 Transportation Policy Plan* lays out a course of action to achieve that goal. It carries forward the vision of the Council's *Thrive MSP 2040* for growth and development of the region toward greater economic success and vibrancy in the decades to come.

Advancing a bold regional vision

Residents say they envision a region with more connected communities, more transportation choices, and more investments across the transportation network, as well as a transportation system that is maintained and managed effectively.

Thrive MSP 2040 calls for both greater correlation between regional transportation investments and community development and land use, and greater investment in our transportation system to provide the choices the region's residents need for the next 30 years. To advance that vision, our region needs to take these important steps:

- Invest in a way that the region can sustain over the long term to preserve, maintain and operate the existing parts of our transportation system.
- Ensure a safe and secure transportation system for all the region's users.
- Provide effective, reliable, and affordable connections among the various types of transportation within our region and beyond.
- Strengthen the performance of the region's transportation system to support the vitality and prosperity of the Twin Cities region and the state of Minnesota into the future.
- Protect the natural, cultural and built environment when planning, building and operating transportation facilities to include advancing equity for people who have been historically underserved and underrepresented in our communities, while also contributing to livable and sustainable communities.
- Use transit investments to shape development, and to respond to influences of land use on travel.
- Advance prosperity by balancing transportation planning, investment decisions, and operations across the region.

A growing, changing region

With nearly 3 million people, diverse industries and businesses, and outstanding natural and cultural amenities, the Twin Cities metropolitan area is a thriving place to live, learn, work, and do business. The area consistently ranks as one of the top-rated places in the nation, and includes a wide range of communities – small towns and rural areas, growing communities, suburban neighborhoods, and active urban districts.

And our region is growing. By 2040, the metropolitan area will add 824,000 new residents and 550,000 new jobs. Our region's population is changing as well. In 2040, the percentage of residents age 65 or older will nearly double what it is today. People of color will make up 40% of the region's population, compared with about a quarter today. As the region evolves, it will need a mix of transportation choices – driving, transit, bicycling, and walking – providing access to jobs, communities, and commercial activity to meet the demands of a growing and changing population and economy.

Today, transportation continues to play a crucial role in the region's quality of life and its economic success. Reliable, efficient, safe, and affordable transportation connects the region's residents with jobs, schools, community amenities, families, and businesses. And it supports the movement of goods and services both within the region and beyond.

Our transportation system provides a strong foundation for the future. Our extensive and well-managed roads and highways move most of the region's people and goods. But they need major investments to make necessary improvements and keep them in good repair. Additional investments in transit, as well and bicycling and walking connections, will be necessary to enable people greater access to opportunities and the region to grow in a sustainable way.

Local planning is important

For the first time, both *Thrive MSP 2040* and the Transportation Policy Plan elevate the important role of land use and development planning in support of the regional transit system. Both plans advance the outcome of guiding investments to shape the region we want in 2040 and to guide local community development.

Transit investment shapes and is shaped by local development decisions. The effectiveness of both transit and local development is as dependent on local actions as it is on the transit investment. Leveraging transportation investments to guide land use requires a long-term collaborative partnership between the Council and local governments. This partnership will assure transportation investments guide development patterns that respond to community plans for transportation, to set the stage for market response that is leveraged to do more in response to that transportation investment.

The transportation plan provides guidance to local communities on development density and local infrastructure necessary to assure the success of certain types of transportation investment.

The Transportation Policy Plan also highlights the regional bicycle system by identifying key, existing corridors and opportunities for connection to regional destinations and job concentrations. Connecting the existing local and regional bicycle network, followed by additional investment in those networks, supports the regional livability and prosperity outcomes in *Thrive MSP 2040*.

Connecting local biking and walking networks to the regional system will foster livable, prosperous communities.

Investing in the Future

As we look ahead, we will need to invest sufficiently in our transportation system to ensure our region's livability and prosperity. The Transportation Policy Plan describes two long-term investment scenarios that clarify the funding choices we face for our future transportation system. One describes what we can do with the revenue we currently anticipate through the year 2040, and the other shows what the region can achieve if additional revenue becomes available. It's clear that we cannot build the transportation system our region needs by relying solely on currently identified resources.

Under the **Current Revenue Scenario**, between 2015 and 2040 the region is estimated to receive $84 billion in transportation revenue. Of that total, $42 billion would be designated for local transportation, $11 billion for state highways, and $31 billion for transit.

For state highways, a majority of funding would be dedicated to maintenance, management, and repair of the existing metropolitan highway system. Next, priority will be given to investments that improve mobility on the existing highway system. These would include use of technology, new or extended MnPASS (high-occupancy toll) lanes, and specific enhancements to capacity. Also included would be lower-cost/high-return investments that increase access to areas of significant employment, commerce, and education and cultural activity.

For transit, the $31 billion anticipated through 2040 will be dedicated to supporting the existing transit system – including regular-route buses and trains – and building out a system of transitways. Within that funding, there is some limited funding for expansion and modernization of the bus system and support facilities. It also anticipates that the rapidly growing demand for Metro Mobility service will continue. However, this scenario would not provide any other significant expansion of regular bus service.

Through 2024, four additional METRO lines will be built: the METRO Orange Line, the extensions of both the METRO Blue and Green lines, and the future dedicated bus rapid transit line in the Gateway Corridor (contingent locally preferred alternative, see "Transit Investment Direction and Plan"). The expansion also includes four new arterial bus rapid transit lines, with the construction of the first line beginning in 2014.

A number of other corridors are currently being studied, but have not yet identified a preferred mode and route. Additional investment of at least $2.4 billion is anticipated to support improvements in these corridors likely in the later years of the plan, which include Red Rock, Riverview, and Robert Street.

If the region receives additional revenue for highway investments as a result of changes in federal or state policy, the **Increased Revenue Scenario** shows how it would be targeted:

- Up to an additional $1 billion for highway operations and maintenance
- Between $2 billion and $2.5 billion in additional funding for rebuilding the highway system
- An additional $600 million for safety and highway-related bicycle and accessible pedestrian improvements
- Between $4 billion and $5 billion for regional mobility improvements

The broader vision for transit investment beyond the revenue anticipated in the *2040 Transportation Policy Plan* includes an additional $2 – 3 billion for bus service. This increased revenue would also include an additional $5 – 6 billion in transitway expansion, which would complete the region's transitway vision and accelerate project development and construction. This includes seven additional transitways, two extensions or transitways, and the complete system of 12 arterial bus rapid transit projects throughout the region.

A livable, vibrant region for all

Thrive MSP 2040 creates a bold regional vision that elevates equity as a key outcome for the long-term prosperity of the Twin Cities region. The *2040 Transportation Policy Plan* reflects the continued commitment to defining and achieving more equitable outcomes for transportation investment.

Strategies identified in the transportation plan include using equity among criteria for prioritizing transportation funding across the system. Strategies also highlight the importance of healthy and livable communities for investment decision-making.

In addition, the plan moves the region forward in terms of its understanding of the impact the transportation system has on global climate change. The plan calls for additional evaluation of this impact, and convening partners to discuss how the region can prepare to mitigate the effects of climate change, as well as available methods to slow its progress.

Over the next several years, the Council, as the designated planning agency for the Twin Cities region, will review the plan to assess the performance of the system. The plan is updated at least once every four years.

The long-range vision established by *Thrive MSP 2040* and carried forward by the Transportation Policy Plan is the beginning of positioning this region for the next 30 years.

But together, they establish an important foundation for anticipating needs and clarifying outcomes to meet expectations for greater prosperity, choice, and access for all residents in the region.

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The 2040 Transportation Policy Plan: Connecting Communities, fostering regional prosperity

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Part 1: Transportation for a Thriving Region

A. Planning for the Twin Cities Region

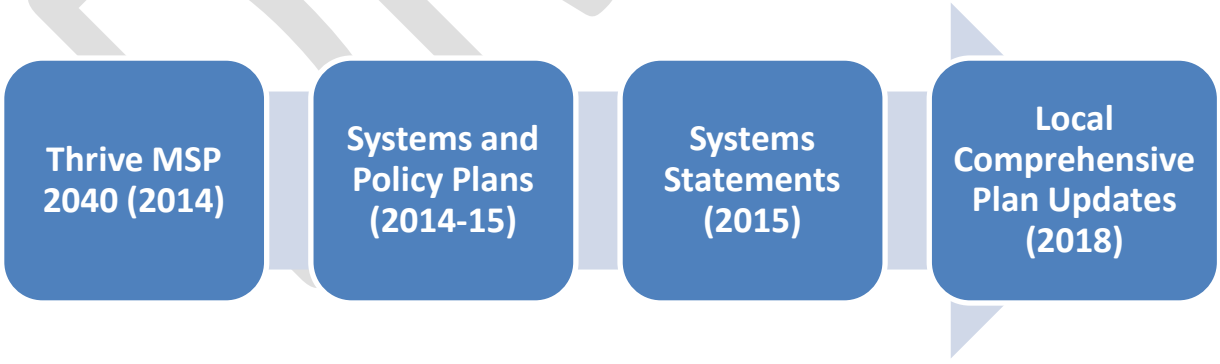
Thrive MSP 2040

Transportation, housing, land development, wastewater treatment, and other essential services are the foundations of regional economic growth and prosperity. To ensure our future well-being and quality of life, we need to plan thoughtfully to make the best use of our resources and opportunities as we improve and expand our key services and facilities.

Thrive MSP 2040, as the Metropolitan Council's long-term development guide for the seven-county Twin Cities area, provides the vision for our region's future, reflecting concerns and aspirations of residents, anticipating future needs, and meeting the region's responsibility to future generations. It serves as the keystone for coordinated planning among state, regional and local government, and promotes the partnerships and efficiencies that foster the region's prosperity, equity, and livability.

The *2040 Transportation Policy Plan* responds to *Thrive's* policy direction as it identifies transportation investments that will help the region move toward better stewardship of resources, prosperity and equity for our region's residents and more sustainable communities into the future). As it carries out the Transportation Policy Plan, the Council will collaborate with local governments and communities, be accountable for specific outcomes, and coordinate its transit, wastewater, and housing operations.

Together, *Thrive MSP 2040*, the *2040 Transportation Policy Plan*, and the Council's other regional plans will provide guidance to local communities for their comprehensive planning processes and plan updates.



5 Outcomes for the Twin Cities Region

Thrive MSP 2040 identifies five key outcomes that make up the vision for the Twin Cities region for the next 30 years:

Stewardship advances the Council's longstanding mission of orderly and economical development by responsibly managing the region's natural and financial resources and making strategic investments in our region's future.

Prosperity is fostered by investments in infrastructure and amenities that create regional economic competitiveness, thereby attracting and retaining successful businesses, a talented workforce, and consequently, increasing the wealth of the region.

Equity connects all residents to opportunity and creates viable housing and transportation options for people of all races, ethnicities, incomes and abilities so that all communities share the opportunities and challenges of the region's growth and change.

Livability focuses on the quality of our residents' lives and experiences in our region, and how places and infrastructure create and enhance the quality of life that makes our region a great place to live.

Sustainability protects our regional vitality for generations to come by preserving our capacity to maintain and support our region's well-being and productivity over the long term.

3 Principles to Guide the Metropolitan Council's Work

Thrive MSP 2040 identifies the following principles to guide the Council's activities toward achieving the plan's outcomes for the region:

Integration is the intentional combining of related activities to achieve more effective, greater results, and using a range of policy tools to address complex regional challenges and opportunities.

Collaboration recognizes that shared efforts advance our region most effectively toward shared outcomes.

Accountability represents a commitment to monitoring and evaluating the effectiveness of our policies and practices toward achieving shared outcomes, and a willingness to adjust course to improve performance.

As one of the four systems plans based on *Thrive MSP 2040*, this Transportation Policy Plan presents the transportation system's response and approach to meeting these principles and outcomes, including:

- Aligning goals and objectives with *Thrive MSP 2040* principles and outcomes
- Establishing measurable strategies that help to achieve goals and objectives
- Establishing procedures for public involvement and engagement as detailed by the Council's agency-wide outreach plan

About the Transportation Policy Plan

This Transportation Policy Plan describes issues and trends facing the region's transportation system, identifies challenges and opportunities facing the region between now and 2040, and establishes specific goals, objectives and strategies for addressing anticipated future conditions.

The Transportation Policy Plan:

- Evaluates the current transportation system in light of forecasted population, employment, and travel data
- Identifies transportation issues and challenges facing the region, including safety, aging infrastructure, and congestion
- Provides criteria for coordinating land use and transportation to maximize the value of both
- Provides guidance to communities to help structure their land use to maximize the benefits of transportation and to plan for future transportation investments
- Sets regional transportation goals and objectives and establishing strategies to achieve them
- Establishes performance measures and targets to evaluate and monitor whether *Thrive MSP 2040* and transportation system outcomes and goals are being achieved
- Set priorities for transportation project investments based on needs and challenges

The Transportation Policy Plan includes both the transportation system and aviation system plans for the Twin Cities region as required in state law.

Federal Requirements

In addition to responding to *Thrive MSP 2040*, this transportation plan includes key elements that comply with federal requirements for transportation planning. In particular, this plan contains the first phase of new requirements to use performance standards in transportation planning. It also includes analysis for portions of Sherburne and Wright counties – which the U.S. Census considers part of the metropolitan planning area, though they are not part of the Council's statutory jurisdiction.

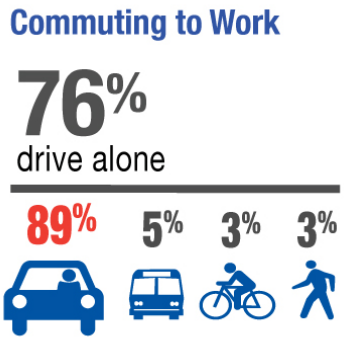
This plan also contains specific investment plans for the transportation system. It identifies how resources will be used to achieve the region's transportation goals within revenue levels anticipated through 2040 (under this plan's Current Revenue Scenario) and provides a broader vision of investments that are possible if additional revenue sources become available (Increased Revenue Scenario).

Another federal provision to which this plan responds consists of requirements for Environmental Justice. The plan seeks to not only meet these requirements but also exceed them through the Council's focus on equity for all historically underrepresented communities (including people of color and people with disabilities). However, this plan also moves toward the greater regional aspirations related to equity by focusing on benefits, beginning to incorporate equity into future priority considerations and beginning a critical regional conversation about understanding the role of transportation in achieving equity. See Part 3, Section C for more information.

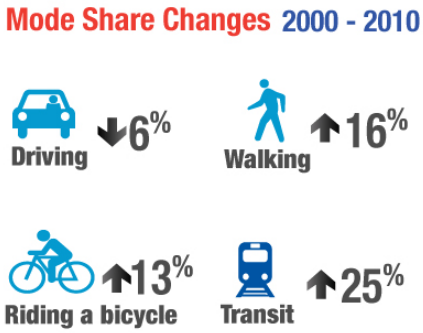
B. Travel in the Region: Yesterday, Today, and Tomorrow

How and why we travel in the region today

Driving is clearly the predominant way people get around the region. Of all trips made on weekdays, 84% were made in a car.



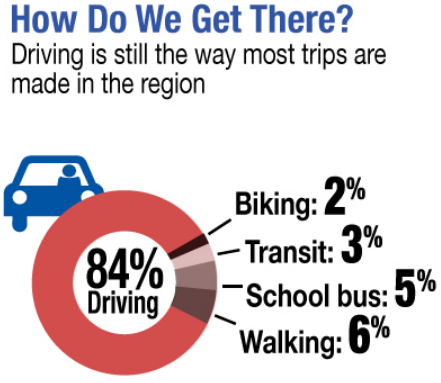
Most work commute trips are also made by car, 89%, with 76% of those driving alone.



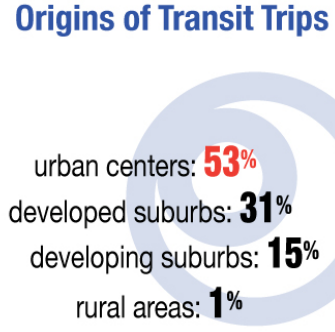
About mode and mode share
"**Mode**" means the type of transportation, for example car, bus, bicycle, etc.
"**Mode share**" is the share of all trips taken by a particular mode.

The regional Travel Behavior Inventory – conducted once every 10 years – showed that total trips taken were down slightly from 2000 to 2010. The total number of trips by all modes of transportation, including bicycling and walking, decreased from 11.6 million trips to 9.8 million trips. Car trips decreased from 7.7 million to 6.3 million trips. It is difficult to say if this trend will continue, even with Millennials postponing their decisions to obtain driver's licenses, and many opting to live in denser, more connected communities.

While the total number of trips decreased, a mode-to-mode comparison from 2000 to 2010 shows that all modes other than driving increased. The transit mode share increased the most, 25%, followed by walking, up 16%, and bicycling, up 13%.



Surprisingly, a large number of trips taken in the region, 40%, are not for work commutes but for social and recreational purposes. In fact, work commuting comes in last, accounting for only 17% of trips taken. School trips and trips to and from the work place make up 22% of driving. Shopping trips and errands constitute 21% of driving.



Where we live influences our travel mode choices

The denser the land use, the more likely people are to use transit. The two factors most significantly influencing a person's choice to use transit are income and the convenience of the transit service.

Residents are more likely to ride transit if they can

conveniently reach a transit stop with frequent, all day transit service. Of all transit trips taken, 53% were made by those living in urban centers (Minneapolis and Saint Paul); 31% by those in developed suburbs; 15% were from the suburban edge and emerging suburban edge; and one from rural areas.

Besides convenience, income levels influence transit use. For many who find car ownership cost-prohibitive, who are not able to drive, or otherwise choose not to drive, transit is necessary to get to school, work, and conduct personal business. Thirty-one percent of transit riders, or about 87,600 travelers, in the region do not own a car.

Technology and travel

Some of the decrease in travel in the last decade can be attributed to the popularity of online shopping, entertainment, and banking, as well as using technology to work from virtually anywhere. In the region, 33% of workers telecommute at least once a month. We don't completely know the full future impacts of technology on regional mobility and access, but we do know they are going to be significant. How we respond to technology—whether we embrace its full potential and consequences, and plan accordingly— can significantly affect the cost-effectiveness of and need for transportation investments.

Driver Assistance Technology

Technology that provides assistance to vehicle drivers is being tested or produced by several companies. Examples include vehicles that have automated steering, braking, and parking features.

There are significant implications with this and similar technology. Will it increase congestion because more populations who would normally not drive—elderly, young, persons with disabilities—now have access to a car? Or, as transportation consultant Denis Eirikis predicts, "Fully automated and connected vehicles will double existing road capacity because transportation planners and engineers can allow for narrower lanes, increased speed, and shorter safe following distances among vehicles."

Driverless transit vehicles are also on the horizon with a model being tested now in France for use in college and medical campuses, theme parks, planned communities, office parks, and city centers. These vehicles could help to increase mobility by connecting people to the "last mile" of their destinations. Driverless transit and paratransit vehicles also have the potential to greatly benefit persons with disabilities by increasing their mobility.

The key with these emerging technologies is to plan a flexible transportation system and consistently revisit the long-range direction so that it accommodates innovation and is responsive to market forces.

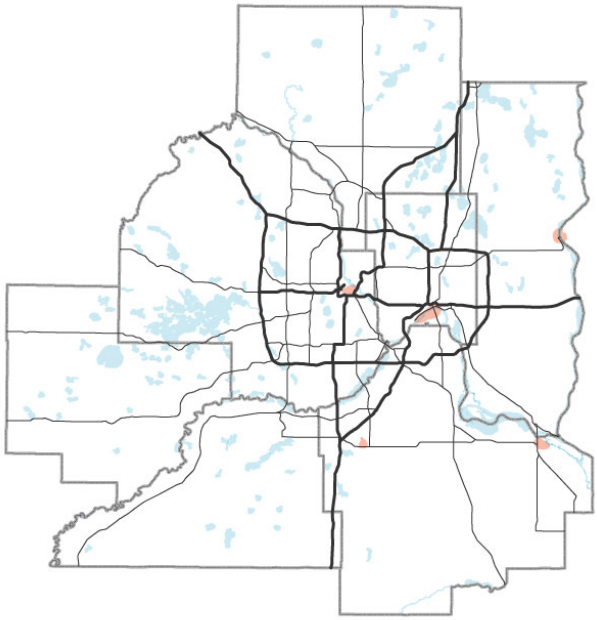
Social Networking, Mobility Apps

The power of social networking is being harnessed to increase mobility, especially when it comes to transit trip planning, car-sharing, carpooling (ridesharing) and bike-sharing. With apps and other on-line sites and tools, people can connect with others and plan trips via multiple modes, door-to-door. Car- and bike-sharing programs, especially when allowing for one-way trips, are increasing people's mobility especially when making non-routine trips during off-peak hours. Travelers are also able to access real-time highway congestion information, transit information, and directions for traveling by car, transit, bike, or on foot.

An Illustrated History of Transportation, Land Development in the Twin Cities

Technology has changed the way we get around, and the way we get around has changed how we have developed the region, including the location of housing, retail, industry, and employment. (Note: the following maps show the major highway system as a reference point, though these highways were primarily developed in the 20th century.)

1860

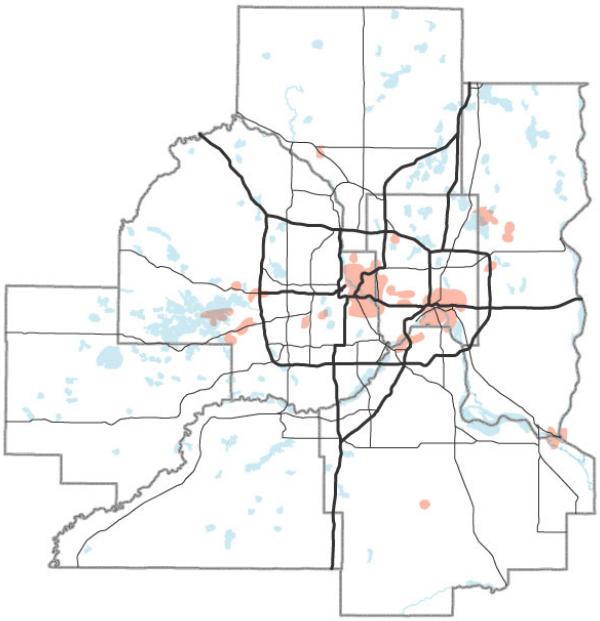


Population: 52,000

Early development in our region was marked by the establishment of Fort Snelling in 1825, and the four major activity centers along the Minnesota, Mississippi, and St. Croix rivers – the region's first highways and power plants: Hastings, St. Anthony-Minneapolis, Saint Paul, and Stillwater.

Personal mobility was by walking, horse and buggy, ox cart, ferry, and train. Freight moved by river barge and train.

1900



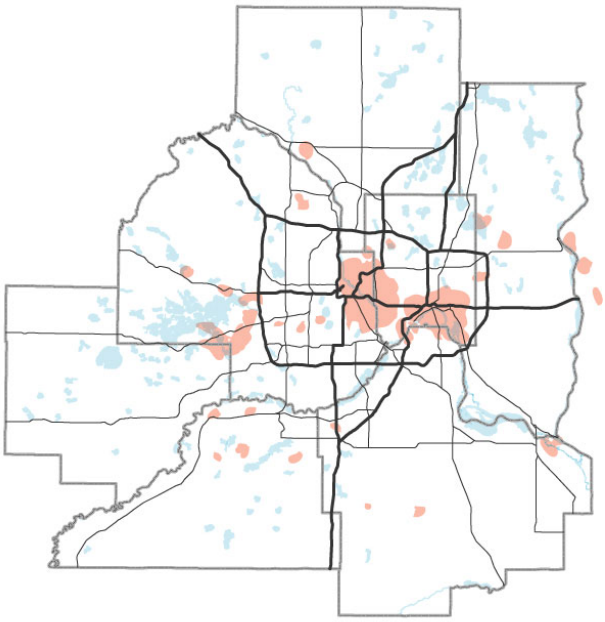
Population: 492,000

In the late 1880s, the region's flour milling industries boomed and by 1990, Minneapolis and Saint Paul were dominant urban centers. Trolleys would eventually replace horse cars, and the popular line between the two major cities, which ran along University Avenue, carried more than 27 million rides in 1890. Annual streetcar ridership was 70 million by 1900, with a 100-square-mile network radiating from the central cities.

The Twin Cities region was also among the top 10 railroad centers – rail yards, warehousing, and manufacturing hubs radiated for 20 square miles outside the central cities.

Personal mobility was by walking, bicycle, horse and buggy, streetcar, ferry, and train. Freight moved by river barge and train.

1920



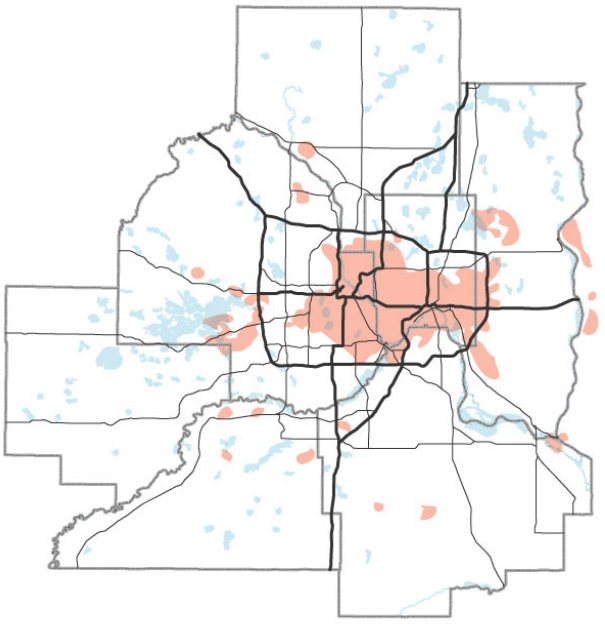
Population: 761,000

By 1914, streetcars provided 100% of all public transit in the U.S. But the 1920s era would bring technology advancements with the personal automobile and air travel. In our region, first-ring suburbs with industry would emerge, providing a greater need for community connections beyond the central cities. And White Bear Lake and Lake Minnetonka were connected by streetcar, which helped establish those cities as resort and summer home destinations.

The Minneapolis-Saint Paul International Airport was established in 1920 with its first airstrip. The region boasted 523 miles of streetcars, carrying 292 million riders per year.

Personal mobility expanded; methods included walking, bicycling, streetcars, trains, motorbuses, cars, airplanes. Freight was moved by river barge, train, and truck.

1940



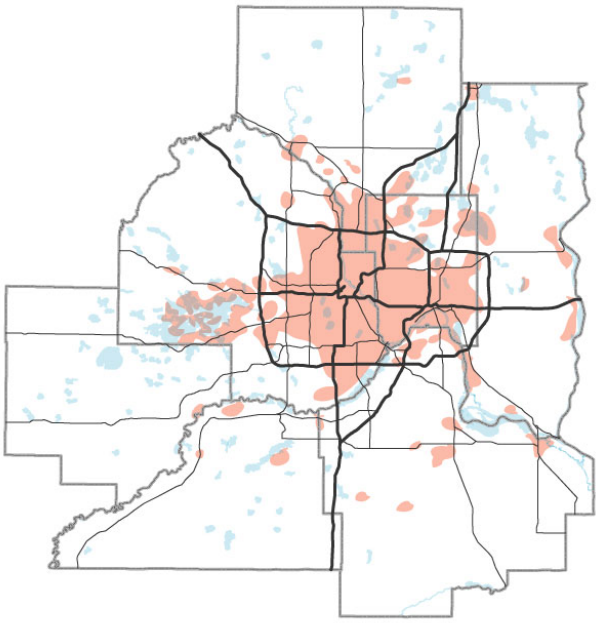
Population: 987,000

By 1940, Minneapolis and Saint Paul have grown into a single urban center, and are beginning to be surrounded by suburban communities. Rural centers, including Anoka, Shakopee, and Stillwater are also beginning to grow.

As automobile use becomes the dominant form of personal transportation, walking, bicycling, and transit use decline. Public transit ridership had dropped to 128 million by 1940.

Personal mobility included walking, bicycling, streetcars, buses, trains, cars, airplanes. Freight moved by river barge, train, truck, and plane.

1960

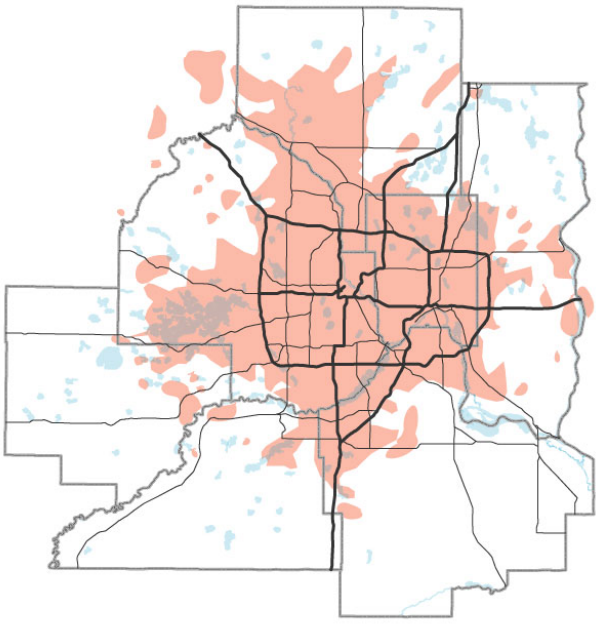


Population: 1,590,000

Following World War II, the region's two-lane roads improve and expand. What began as two-lane roads extending about 10 miles from the urban center expanded, providing access to large tracts of undeveloped land. By 1960, the region had 100 miles of limited-access highways, leading to increased use of cars and continued decreased use of walking, bicycling, and transit. Transit ridership was 86 million annually in 1960.

Personal mobility included walking, bicycling, buses, trains, cars, airplanes. Freight moved by river barge, train, truck, and plane.

1980

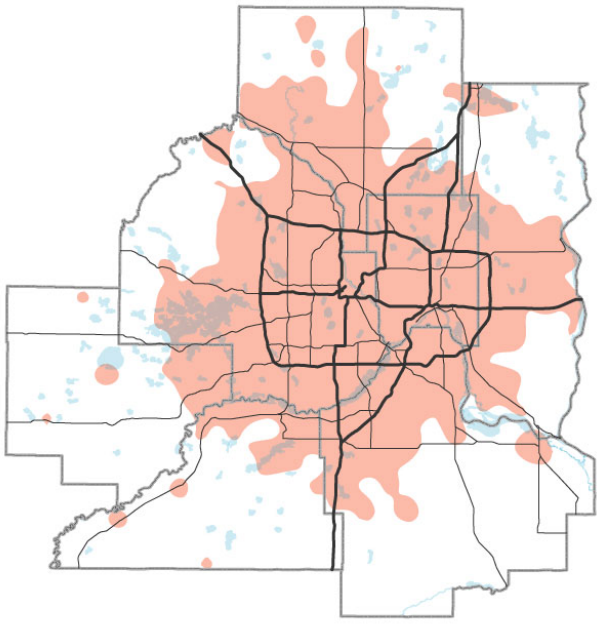


Population: 1,985,000

By 1980, cars and trucks were the dominant form of transportation in the region. The energy crisis in the late 1970s triggered a brief spike in transit use; annual transit ridership was 93 million in 1980. The region's highway system had grown to 460 miles, and travel in the region increased significantly with more women in the workforce and jobs locating along highways outside the central cities.

Personal mobility included walking, bicycling, buses, trains, cars, airplanes. Freight moved by river barge, train, truck, and plane.

2000

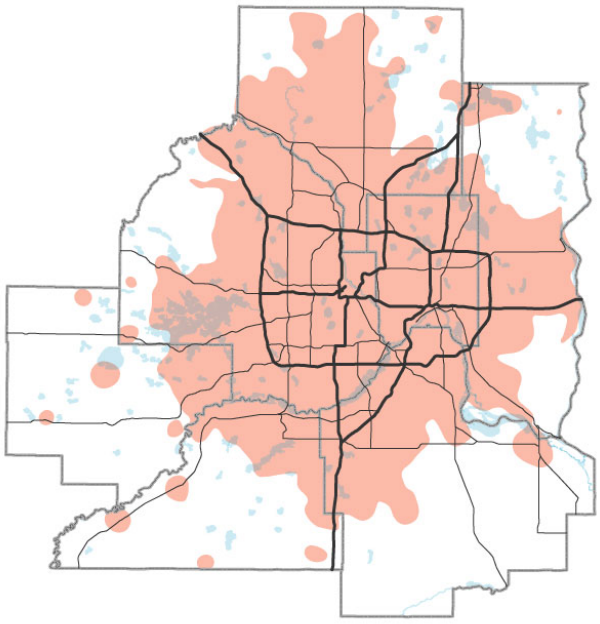


Population: 2,642,000

In the latter part of the 20th century, roads and highways continued to expand and connections improve as the region continues to grow. But those roadways were also congested – congestion grew 500% between 1980 and 2000 on the region's highway system. Transit ridership had dropped to 78 million.

Personal mobility included walking, bicycling, buses, trains, cars, airplanes. Freight moved by river barge, train, truck, and plane.

2010



Population: 2,850,000

By 2010, the region's roadway system had grown to more than 140,000 miles of highway, including city, county and township roads. Recent investments in the transit system helped ridership grow to 91 million annually. Highway investments moved away from new roads to improving the performance of the system and managing congestion.

The Great Recession nearly halted growth in the region, leading to a decrease in personal driving for the first time in decades. Walking, bicycling, and transit use all increased, particularly as a share of overall travel in the region.

Personal mobility included walking, bicycling, buses, light-rail and commuter trains, inter-city passenger trains, cars, airplanes. Freight moved by river barge, train, truck, and plane.

Recent Trends in Transportation and Land Development

The growth of the region stalled temporarily during the 2008 recession and foreclosure rates in housing contributed to a significant downturn in new construction. However, recent estimates indicate that the region has begun growing again, by an estimated 59,000 people in two years since 2010 or about 1% per year. During the same two years, new development added 11,000 new housing units and vacancy rates for rental units and owner-occupied units began declining. Multifamily construction contributed additional new housing units in that time frame. The largest increases in population occurred in Minneapolis and Saint Paul, with about 23% of the total regional growth. This was supported by a substantial increase in development in the central cities. Fully developed suburbs accounted for 35% of the region's population growth. This means that the central cities and other fully developed communities accommodated 58% of the population growth, while developing suburbs accounted for 38% of the growth.

The recent trends in growth illustrate the balance of growth in the region across types of communities. These trends also demonstrate the continued reversal of out-migration from the developed area to the developing area that has occurred in the past.

Transportation and Land Development Conclusions

The evolution of the region's growth over time illustrates several key relationships between transportation and land development:

- Until the late 1940s, the region grew in a compact, traditional neighborhood urban form.
- The introduction of the automobile and freeways greatly increased mobility and access to affordable, developable land.
- The rapid expansion of the region's developed area in an auto-centric manner has resulted in longer average trips and the diminished attractiveness of non-auto modes as modes of regional travel.
- The freeway-building era growth patterns are unsustainable. Congestion and a desire for convenient access to jobs, activities, and amenities are beginning to challenge continued expansion of the urban area through new land development.

Anticipated growth will bring 800,000 additional residents and 391,000 additional households, which present tremendous opportunities for the region. A related challenge is the necessary balance between the needs of those new residents and households and the needs of the 2.9 million residents and 1.1 million households already in this region.

C. Transportation Challenges and Opportunities for the Twin Cities Region

Our region's transportation system provides important connections between communities, jobs and activities, community amenities, and the world beyond the seven-county area. The system has been planned to support the needs of the region's residents and business and will need to provide robust options for people to go where they want to go for generations to come.

While the system is notable for its significant and well-managed highway system, which facilitates movement of most of the region's people and goods, it and other elements of the system are still changing – particularly transit, bicycle, and pedestrian infrastructure. While today's system is connecting the region's travelers and freight to the desired destinations, there is room for growth and improvement.

Ours is a growing region. This presents tremendous opportunities for additional prosperity and innovation. It also creates some challenges within the transportation system. *Thrive MSP 2040* has identified some transportation-related challenges and opportunities in the region:

- Aging infrastructure will not meet the demands of a growing population without significant investment in the near future—including roads, bridges, transit, and wastewater treatment plants.
- Financial resources are inadequate to address the region's infrastructure needs, particularly in transportation and affordable housing.
- Emerging environmental challenges will likely increase, including the consequences of climate change, such as more severe weather events.
- Pressures will increase on our natural resources, including diminishing groundwater supplies, impaired water quality and threats to ecological resources.
- Population and job growth will increase highway congestion within the region.
- Significant racial disparities continue to persist in income, employment, poverty, homeownership, education, and access to opportunities.
- An aging population will grow, with a doubling of those aged 65 and older by 2040.

By meeting these challenges, we create new opportunities to assure prosperity for all residents and businesses of the region. Transportation decisions can directly and indirectly impact and positively influence many of these challenges.

This plan has identified some key issues and challenges, and related goals and objectives to address those challenges. Within each of these challenges there are also opportunities to improve practices, efficiencies, and access for the region. The primary challenges/opportunities include the following:

- Land use and development patterns affect our stewardship of the transportation system.
- The region's population and employment are going to grow, leading to more travel.
- Highway congestion is a reality of our economic growth and can be eased and managed.

- People and businesses are demanding more and better travel options.
- Transportation investments can help sustain and strengthen our region's economic competitiveness.
- Transportation decisions impact our communities and the environment, and we should make them responsibly.
- Access to jobs and opportunity is an issue of equity.
- Traditional transportation needs are greater than the resources available. We need to innovate and make strategic decisions.

Generally, the region will focus on providing a transportation system that provides affordable options, so that the greatest benefit is felt broadly by all travelers. The first priority will be to maintain existing infrastructure. Additional investments will be focused and deliberate, to maximize the existing system through efficiencies and providing the best user experience the region can afford.

A note about recent trends in regional travel: Studies of travel behavior in the Twin Cities region reflect some impact from the 2008 recession. During the recession, the region lost a decade of job growth, and residents of the region cut their personal travel along with other discretionary spending. While analysts still do not know the full impact of the 2008 recession on the region's economy or travel behavior, trends shown by travel behavior studies for the decade from 2000 to 2010 reflect trends that were already evident in several years prior to the 2008 recession.

1. Land use and development patterns affect our stewardship of the transportation system

Our region's land use and development patterns have a direct relationship to the development of the transportation system – and that pattern will continue. For example, early urban communities were defined by how far a person could walk or ride a streetcar. The advancement of affordable, private automobiles greatly expanded the distance the average person could travel daily. This resulted in a greater rate of land consumption for urban growth throughout the second half of the 20th century. The region's suburbs primarily developed around automobiles and as a result, private automobiles are now often the only practical travel mode for most of the region's residents.

To be sure, this growth has had its benefits – it's created convenient connections between urban and natural areas, such as the ever-popular regional parks system, and sustained economic development and job creation throughout the metropolitan area. From a household perspective, it has also resulted in a high rate of homeownership for this region when compared to large metro areas across the nation.

However, the benefits of this kind of growth do not come without challenges – challenges that require a different approach to urban development. The region will continue to grow outward on its edges and upward in the redeveloping parts of the region. To the extent the region can seize these opportunities and plan for land use and development patterns that support transit, bicycling, and walking, and allow for multiple modes will determine its long-term success within reasonably available financial resources.

All investments should benefit multiple modes and support the different development patterns needed for the long-term success of the region.

2. Transportation investments can help sustain and strengthen our region's economic competitiveness

The Council's regional planning and sewers, transit, and parks help set the stage for our region's economic competitiveness. The region's industries, businesses, and workforce depend on a transportation system that is efficient, predictable, and reliable. A strong transportation system helps to keep and attract prosperous businesses and a talented workforce, and supports the mobility of all its residents, including the young, people with disabilities, and the elderly. As detailed in *Thrive MSP 2040*, our region needs to invest in a transportation system that serves the generations of today and tomorrow, while attracting talent and businesses looking for a place to prosper.

A mix of dense, compact communities and still developing communities provides important opportunities for moving freight, appropriately locating hubs and industrial areas, and assuring a diverse mix of business, industry, and activity. In addition, our connections to places beyond the region also foster our growth and economic prosperity and will be strengthened by investing in important state and upper Midwest transportation corridors, reducing the impacts of highway congestion on freight, and supporting a regional airport system with a strong national and international hub at the Minneapolis-Saint Paul airport.

A good transportation system is high on the list of employers' needs and requirements. Employers value a good transportation system both for connecting efficiently with customers and suppliers, and also for attracting and retaining a talented workforce that has a safe, pleasant, and reliable commute and high quality of life. And while historically those businesses have located in the central cities, employment has been growing outside the central cities over the past several decades, making the need for transportation choices that much greater. People throughout the region are now advocating for expanded regional transit, bicycle, and pedestrian systems, and efficient, reliable options on the highway system.

3. The region's population and employment are going to grow, leading to more travel

Recent trends show that people in the region are traveling less. In the decade from 2000-2010, the number of trips taken and the number of miles driven per person decreased. There are many reasons for these changes, including:

- Unemployment and economic uncertainty around the 2008 recession
- Fuel price volatility
- Preferences for transit and non-motorized travel among younger demographic groups
- Minimal population growth
- Low employment growth
- Growth in online commerce and communication

The multi-decade trend of employment increases (especially due to women entering the workforce) and corresponding increases in trips taken and number of vehicles per household seems to be flattening out or decreasing. Nevertheless, anticipated population and employment growth means overall travel in the region will increase. Even if people continue to make fewer trips individually (because of lifestyle choices, technology, etc.), total regional travel is expected to increase. This growth will impact those communities that are growing as well as those already established communities where the bulk of the region's population and jobs exist.

In addition, the region will experience a much greater portion of population growth than experienced in the past among the following household groups: people older than 65, households without children, and single-person households. The region will need to prepare for how this phenomenon will change travel demand.

4. Highway congestion is a reality of our economic growth and can be eased and managed

Recent analysis estimates that the forecasted population and job growth will increase highway congestion. While serving as evidence of a vibrant regional economy, congestion also has monetary and social costs: wasted time and fuel that add up to real dollars for people, businesses, and communities, as well as direct impacts on quality of life, air quality, and climate change.

Regional congestion management strategies saved Twin Cities commuters almost:

- 6 million hours of time in a car in 2011
- $122 million in time and fuel costs

Congestion can't be eliminated, but it can be managed or eased. And the Twin Cities has valuable experience in highway congestion management and mitigation. Continuing to build on our highway management and congestion mitigation experience and using tactics to integrate advancements in technology, managing and mitigating congestion, encouraging alternative travel options, and creating efficiencies in the system have been and will continue to be the primary strategic, economical, and practical approach to highway congestion in the region.

See Part 2 and the Congestion Management Process for more detail and discussion of highway congestion management.

5. People and businesses are demanding more and better travel options

In public meetings, workshops, and open houses throughout the region, Twin Cities residents, businesses, and leaders have expressed a desire for more and better choices in housing and transportation – both of which have tremendous impacts on a person's quality of life. They want more connected communities, with more robust transportation choices, including better connections between modes that allow for safe bicycling and walking to and from destinations. And external studies back them up – more compact and connected regions offer residents greater transportation options, safer and healthier communities, and greater and more equitable access to opportunity.

Anticipated growth in the numbers of people older than 65 and younger professionals also suggests additional demand for denser, more compact communities with ample access to amenities and transportation options. Both of these populations are expressing a preference for a less car-dependent lifestyle and for living in well-connected, more urban, walkable neighborhoods that are well served by transit, or transit-supportive development. Other populations that would greatly benefit from living, working, and attending school in more walkable neighborhoods are people with disabilities, with limited incomes, and the young.

See Part 2 for more detailed strategies and opportunities to provide options for a growing population and workforce.

6. Transportation decisions impact our communities and the environment, and we should make them responsibly

In the not-too-distant past, transportation projects reflected the rise in access to personal vehicles by focusing on major highway investment, which led to fewer transit options for many, and disproportionally affected communities of color, and people with disabilities and low incomes. Highways sometimes severed communities and created barriers, often failing to provide safe and convenient pedestrian and bicycle infrastructure, and other mitigating design considerations. These disproportionately negative impacts are unacceptable. Federal Environmental Justice regulations and the *Thrive MSP 2040* focus on equity will highlight the protection and enhancement of these historically disadvantaged communities wherever transportation projects are being considered.

The Twin Cities area, like most metropolitan areas across the country, has a transportation system that is negatively impacting air quality, and contributing to climate change. Transportation accounts for 25% of greenhouse house gas emissions in the region.

The Council acknowledges the state's goals for greenhouse gas reduction adopted in 2007's *Next Generation Energy Act*. By tracking regional greenhouse gas emissions, we will identify opportunities for emissions reduction in the region.

Improvements in technologies that change energy consumption and increase fuel efficiencies − largely relying on car manufacturers and federal regulation − will have the greatest impact on transportation emissions that contribute to climate change. Reducing the number of vehicle miles traveled also has a positive impact on air quality in the region. Alternative transportation options such as transit, bicycling, and walking help to remove cars from the road and also promote a more active lifestyle. Barge and rail freight provide cost-effective global access for heavier products going longer distances.

Many transportation-related air pollutants disproportionately affect people who tend to live near busy and congested highways and other major roadways. The goals and strategies in this plan − particularly the ones related to congestion management − are aimed at increasing access to transit in busy corridors and easing congestion without the construction of additional lanes. These strategies will have positive effects on air quality and their related health impacts including asthma and heart disease.

Many of those actions − where it is possible − are being mitigated. Transit advantages including MnPASS and bus-only shoulder lanes, sidewalks, bicycle and pedestrian bridges, bike lanes, noise walls, and landscaping are helping to mitigate many impacts and encourage more active lifestyles. The regional bus network provides wide geographic coverage, the light rail and bus rapid transit system is being planned and built, and Minneapolis and Saint Paul are studying the possibility of bringing streetcars back. Transportation projects are now more about providing travel options, enhancing and serving communities, and providing transportation access to populations of all ages, incomes, and abilities.

7. Access to jobs and opportunity is an issue of equity

Until the 1970s, the majority of jobs were located in Saint Paul and Minneapolis. Transportation infrastructure was oriented to bring commuters into the downtowns. Starting in the 1970s and 1980s, employment centers began to decentralize, essentially following cheap land resulting from expansion of the highway system, and were less likely to be accessible by multiple transportation modes because suburb-to-suburb transit connections were not well established.

Suburb-to-suburb transit, transit within suburban areas, and local bicycle and pedestrian systems have improved, but the nature of the suburban land form make it impossible to cost-effectively serve every neighborhood, development, or suburban employer with transit. Over the next 30 years, it will become more important to optimize the transit and supporting local pedestrian system and reduce the amount of time each rider spends reaching the desired destination.

More frequent and efficient transit service to suburban job centers supported by local bicycle and pedestrian systems will create greater prosperity for all, particularly benefiting low-income populations who may not be able to afford a personal vehicle or could otherwise spend their limited resources on other expenses, such as housing.

People in compact and connected metropolitan areas spend less of their household income on the combined costs of housing and transportation. Providing greater transportation choices will help provide greater access to opportunity for all the region's residents.

8. Traditional transportation needs are greater than the resources available. We need to innovate and make strategic decisions

There is no shortage of public projects that many would like to see completed to improve the quality of life for residents and businesses − transportation, housing, parks, wastewater treatment, and the list goes on. But the reality is that even in the best times public dollars are limited and projects must be prioritized.

First, some revenue sources are not stable. Gas tax revenues, which are a major source of roadway funding, are forecast to begin falling after 2018, largely because of the continued improvement of fuel-efficient cars, and a continuation of the more recent decline in miles driven per person may further reduce anticipated gas tax revenues. In addition, Minnesotans are keeping their vehicles longer, reducing motor vehicle registration and motor vehicle sales tax receipts, another major source of highway and transit funding.

Second, costs are rising to operate, maintain, and rebuild the transportation system we have – everything from the bus fleet to bridges to airport runways. The region also has an extensive bus transit system that serves the region's urban center relatively well, but has room for improvement – particularly in suburban areas and in the still-emerging light rail and bus rapid transit services. This plan includes an Increased Revenue Scenario that is consistent with the vision established by the Transportation Funding Advisory Committee – which notes the need for more revenue to meet identified needs.

While limited financial resources are a fact of life, this plan emphasizes the importance of improving transportation in our region through investments benefitting multiple modes, including highways with MnPASS options, local and express bus service, transitways, a regional bicycle transportation network, and a local pedestrian system with broad benefit to all travelers.

The Council will strategically advance transportation projects that promote regional balance and help all parts of the region receive investments that reflect and advance their stage and level of development.

This plan also places priority on projects that promote flexibility and the region's ability to adapt to change. We know that future advancements in technology will change, how and why people will travel and goods will move in the future. This plan continues positioning the region to support advancements in technology, incorporate them, and respond to their effects as we better understand their impact.

D. Twin Cities Region Transportation Goals, Objectives, Strategies

This plan identifies nine key challenges facing the region's transportation system and how they affect everything from economic success on a national and global scale to our quality of life. The region's transportation system can directly contribute to the vision in *Thrive MSP 2040* of a more equitable, prosperous and sustainable place to live, work, and play.

The Council – with input from businesses, the public, partner agencies, and local elected officials – have identified six broad goals for the regional transportation system, including a framework for how to achieve them. Consistent with federal requirements, the Council is also working to develop performance measures and targets have to evaluate the effectiveness of our region's actions on achieving these goals.

Following are the six transportation goals, their corresponding objectives, and a summary of the strategies that will be used to achieve them. Part 2 elaborates more specifically on the strategies each mode will use to realize the goals and objectives. Part 3 identifies the performance measures that will be used to evaluate the effectiveness of the strategies.

> ***Goals*** *are broad statements of aspiration that describe a desired future for the region's transportation system.*
>
> ***Objectives*** *represent achievable outcomes that together help to realize a goal within the timeframe of the plan.*
>
> ***Strategies*** *identify how objectives will be met through specific actions, including who is responsible.*
>
> ***Performance measures*** *are things that can be measured to determine if a strategy is working.*

Goal: Transportation System Stewardship

Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.

Objectives:

A. Efficiently preserve and maintain the regional transportation system in a state of good repair.

B. Operate the regional transportation system to efficiently and cost-effectively move people and freight.

Key Takeaways:

The transportation system is extensive and represents a significant investment over multiple generations. Most resources in this plan will be dedicated to operating, maintaining, and rebuilding what already exists.

To maximize investments, this plan supports making the system more efficient and effective and providing for the best user-experience the region can afford.

The region needs to focus on investments that have the greatest benefit for all users of the transportation system: residents, businesses, and people of all ages, abilities, and backgrounds.

The public has invested heavily in its transportation system. Its preservation, maintenance, and operation are important to protect this investment for generations to come.

Currently, approximately $275 million to $350 million of the region's state highway funds and $550 million of transit funds are spent annually for maintenance, operation, repair and replacement of the existing system, including major infrastructure such as pavement, bridges, the bus and rail fleet, park-and-rides, transit stations, stops and shelters. Climate-related severe weather events such as flooding and colder winters will continue to have impacts on regional transportation infrastructure. Continued and enhanced system maintenance, repair, and preservation will help to increase resiliency of regional infrastructure.

Maintenance includes activities such as repairing buses, maintaining landscaping, clearing snow, ice, and debris from roadways, and building and maintaining transit facilities, sidewalks and all-season trails. Preservation includes the repair or replacement of pavement, bridges, transit infrastructure and other infrastructure to support the safe and efficient use of these facilities. Operations includes MnDOT's freeway incident response (those bright green trucks that come help when people run out of gas, etc.), traffic signal operations, and operation of the regional traffic management center (including the variable message signs and advisory speeds). Transit operations include the day-to-day service of buses, light rail, commuter rail, Metro Mobility and Transit Link dial-a-ride service.

An important piece of stewardship is getting the most out of the investments made in the transportation system. During maintenance and preservation projects, there are often opportunities to integrate other improvements at a lower cost. These improvements can lead to better user experiences – for example, safer roads, less congestion, or better sidewalk connections. Initial capital improvements can also create efficiencies in long-term operations and maintenance. For example, investing in automated card-swipe technology for transit produces cost savings over the long-term by speeding up service and creating a better customer experience that attracts more riders.

System stewardship includes assessing the performance of the system and the level of satisfaction that its users are experiencing, and making adjustments as necessary to continually improve performance and service.

Measuring Performance

Examples of performance measures that could be used to measure successful stewardship of the transportation system include:

- Highway pavement conditions
- Bridge conditions
- Condition of transit fleet (buses and trains)

Related Thrive Outcome: Stewardship, Prosperity

Goal: Safety and Security

The regional transportation system is safe and secure for all users.

Objectives:

A. Reduce crashes and improve safety and security for all modes of passenger travel and freight transport.

B. Reduce the transportation system's vulnerability to natural and man-made incidents and threats.

Key Takeaways:

Safety and security are at the heart of providing a comfortable, trustworthy system and will be a focus in all areas of transportation investments.

Safety and security include identifying and addressing areas with existing safety and security concerns and building a transportation system that avoids future problems.

Increasing the safety and security of people using the region's transportation system is the most fundamental goal of all agencies that deal with the system. Providing a safe and secure transportation system requires considerations at all stages of development from planning to operations. An important part of providing safety and security is understanding which areas are more vulnerable and why. Using data and analysis to identify these areas will help the region give highest priority to the greatest risks and proactively avoid creating new vulnerabilities.

The number of fatal and serious injury traffic crashes in the region has been decreasing, but there is room for improvement. The Council will join its partners, including MnDOT, the Minnesota Department of Public Safety, the Minnesota Department of Health and local jurisdictions to advance the Toward Zero Deaths Program.

Regional transportation partners will use best practices to provide and improve safe walking and bicycling facilities, since pedestrians and bicyclists are the most vulnerable users of the transportation system.

Safety and security on transit is as much about the perception of safety, including providing environments that feel safer through lighting, design, and technology such as cameras. The region has installed cameras onboard buses and trains, and in some stations, and has its own Metro Transit police force that collaborates with local enforcement agencies to respond to incidents quickly and effectively.

The region's truck freight movement is vulnerable to all the things motorists are vulnerable to, including inclement weather and incidents. Measures to help increase truck freight safety include the regular inspection of vehicles, and driver training to ensure compliance with industry rules and regulations. Truck freight security includes electronic tracking of shipments,

sealed freight containers, vehicle-tracking technologies, and inspection of vehicles at security-sensitive facilities and destinations.

Rail freight incidents occur less frequently than truck freight incidents, but tend to have a high profile, often causing more or having the potential to cause more fatalities, injuries, and damage to property per incident. Of recent concern is the rise in oil freight trains passing through the region. The Federal Railroad Administration has developed a *National Rail Safety Action Plan* that identifies safety improvements railroad companies need to take, such as improving or eliminating at-grade crossings. Other measures include maintaining sufficient right-of-way in case there is a spill or derailment. Another important rail freight safety and security issue includes trespassing pedestrians and cyclists who are looking for short-cuts. Nationally, over 500 people die each year in trespassing-related incidents. These trespassers also pose a security threat when there are shipments of a hazardous nature such as dangerous chemicals or nuclear materials.

Measuring performance

Examples of performance measures that could be used to measure improved safety and security include:

- Number and rate of crashes
- Number and rate of serious injuries and fatalities

Related Thrive Outcomes: Stewardship, Livability, Equity

Goal: Access to Destinations

People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.

Objectives:

A. **Increase the availability of multimodal travel options, especially in congested highway corridors.**

B. **Increase travel time reliability and predictability for travel on highway and transit systems.**

C. **Ensure access to freight terminals such as river ports, airports, and intermodal rail yards.**

D. **Increase transit ridership and the share of trips taken using transit, bicycling and walking.**

E. **Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations.**

Key Takeaways:

The region will focus on providing a transportation system that offers practical and affordable options, so all users, regardless of their social or economic background, can get to the places they need to go.

This plan emphasizes the importance of improving and expanding transportation options through investments in a multimodal system of highways with MnPASS options, local and express bus service, transitways, a regional bicycle system, and a local pedestrian system.

An emphasis of the plan is providing a transportation system that connects people to jobs, activity, and opportunity and supports a regionally balanced approach to investment and prosperity.

Providing access is the fundamental purpose of transportation for people and businesses. There are ways in which access can be better provided and there are barriers to good access that need to be managed or eliminated.

Highway congestion is a reality of all transportation systems. While it is an inconvenience, it is also a sign of economic health. With both population and employment forecast to increase and a highway system that is well developed and managed, congestion management and mitigation for people and freight must include improvements to both state and local highways and practical options for multimodal travel. Examples of highway improvements include using technology to help manage the flow of traffic during rush hours and to clear incidents quickly, MnPASS lanes, and spot mobility or strategic capacity enhancements to state and local highways.

Multimodal options include a variety of transit services from bus and train service to dial-a-ride or shared ride, as well as bicycling and walking. Heavily traveled corridors will provide

advantages to transit through bus-only shoulders, ramp meter bypasses, and park-and-ride lots. MnPASS lanes are free for cars with two or more passengers, and will also be a congestion-free lane for transit. MnPASS will also provide a priced option for single-occupant vehicles and small delivery trucks. Bicycle and pedestrian infrastructure will continue to be improved throughout the region with the aim of increasing access, connectivity, and safety.

The lack of access to more frequent and convenient transit disproportionally affects historically underrepresented populations such as those with low incomes, persons with disabilities, and communities of color – populations that often can't drive or don't have access to a car. Improving transit options and accessibility for these populations increases opportunities for employment, education, and training.

Efficient freight transport through and within the region is vital to our economic competitiveness. Freight-related infrastructure such as ports and intermodal rail yards should be protected because it is expensive to relocate and recreate the facilities. Many of these facilities are located near highways for easy access through and beyond the region.

Measuring performance

Examples of performance measures that could be used to measure improved mobility and access to destinations include:

- Average annual hours of delay per capita
- Transit ridership
- Number of miles of managed lanes (MnPASS)
- Number of miles of bus-only shoulder lanes

Related Thrive Outcomes: Equity, Livability, Prosperity

Goal: Competitive Economy

The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.

Objectives:

A. Improve multimodal access to regional job concentrations identified in *Thrive MSP 2040*.

B. Invest in a multimodal transportation system to attract and retain businesses and residents.

C. Support the region's economic competitiveness through the efficient movement of freight.

Key Takeaways:

The plan directs investments so the transportation system will serve the generations of today and tomorrow and attract talent and businesses looking for a place to prosper.

This plan expands the regional transit and bicycle systems and provides reliable options on the highway system to keep the region competitive.

Our connections to places beyond the region that foster its growth and economic prosperity will be strengthened by corridors that connect us statewide and beyond, reducing the impacts of congestion on freight corridors and supporting a strong airport system with national and international connections.

A good transportation system is fundamental to a robust and thriving economy. To continue being competitive, the region must shift its focus to operating and maintaining what we have while at the same time creating a more multimodal system that provides all its residents and businesses choices in how they or their freight moves from point A to B. Providing practical options to the single-occupant car benefits everyone, including those who want to drive and never use another mode. Providing people safe and convenient transportation choices such as walking, bicycling, and transit can remove cars from highways and streets, and increases quality of life for everyone.

An integrated multimodal transportation system helps to retain and grow existing businesses and industries, and attracts new ones. It also retains and attracts talent, which the market shows is increasingly seeking a less car-dependent lifestyle. The region will focus on investing in a multimodal system that builds on its well-developed highway system to expand and better integrate transit, bicycling, and walking improvements that support and strengthen the region's economy.

Thrive MSP 2040 has identified 42 job concentrations as of 2011. These job concentrations are contiguous areas that have at least 7,000 jobs at a net density of at least 10 jobs per acre. The Council will continue to monitor employment patterns to identify new concentrations that meet these criteria. Transportation priorities should be geared toward providing good access to

these concentrations while still addressing emerging needs in other areas. Freight terminals throughout the region are also key commercial infrastructure.

As mentioned before, efficient freight movement is vital to the region's economy, especially maintaining existing freight infrastructure, which is often difficult and expensive to reproduce. Wherever possible, communities should identify and preserve land near highways for certain freight movement, particularly in existing industrial areas.

Measuring performance

Examples of performance measures that could be used to measure the state of the regional economy include:

- Average travel time to reach job concentrations during rush hour

Related Thrive Outcomes: Prosperity, Livability, Sustainability

Goal: Healthy Environment

The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.

Objectives:

A. Reduce transportation-related air emissions.

B. Reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments.

C. Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles.

D. Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations.

Key Takeaways:

The plan works toward state and regional goals for greenhouse gas and air pollutant emissions by factoring these considerations into the Council's operations and investment priorities and starting a dialogue on how all the region's partners, including local governments, can contribute to these efforts.

The plan will support a transportation system that considers the needs of all potential users while promoting the environmental and health benefits of transportation options like carpooling, transit, bicycling, and walking.

Investments in the transportation system will protect and enhance the natural, cultural, and developed environments, and will be identified through effective engagement with affected communities.

A special emphasis will be put on avoiding, minimizing and mitigating impacts on people and the environment, especially disproportionately high and adverse impacts to people of color or people with low-incomes.

There are a number of ways to define health and environment in ways that are relevant to transportation and the region's development. For example, health can include the physical well-being of people, the quality of the biophysical environment, or the potential for social capital for an entire community. Examples of environment include the natural environment, the air we breathe, the water we drink and play in, the weather we experience, the characteristics of the neighborhood we live in, and the built infrastructure of roads, bridges, buildings and the like. All of these are important and both impact transportation and react to transportation, some more than others. A healthy environment is one where impacts are considered and mitigated in as many ways as we can afford.

Transportation has an enormous impact on air quality. The region's transportation-related pollutant emissions account for:

- 68% of carbon monoxide emissions
- 40% of nitrogen oxide emissions (toxic by itself and an ozone precursor)
- 32% of volatile organic compound emissions
- 5% of particulate matter (small particles of pollution in the air that can be inhaled)

The region has been considered to be in "maintenance" or "attainment" since 1999 for all transportation-related pollutants regulated by the federal government – meaning we meet the Environmental Protection Agency's (EPA) acceptable standards for certain pollutants in the air. While the region has not exceeded the federal standards for fine particulate matter and ozone concentrations, current concentrations of those pollutants in the region reach 80% of standards. This points toward a need to further reduce transportation-related air pollution, most importantly to improve human health but also to avoid violating federal standards. Additionally, transportation accounts for one quarter of statewide greenhouse gas emissions, contributing to global climate change. The region supports state efforts to reduce all greenhouse gas emissions to 80% below 2005 levels by 2050.

The region will consider air pollutant and greenhouse gas emission information as it makes investments with a target of helping to reduce transportation's contribution, particularly by supporting transportation options such as carpooling, transit, bicycling, walking, and shipping freight by rail or barge. The region will also develop more efficient land use and development patterns that contribute to lower pollutant and greenhouse gas emissions. But all of these will be the starting point for a broader conversation with local, regional, state, and federal partners about how the region can be more sustainable in our decision-making and outcomes.

If not appropriately managed, transportation construction and operations can significantly and negatively impact communities, including noise, pollution, and inaccessibility due to lane or sidewalk closures. It is critical for regional transportation providers to coordinate with each other, communities, and other organizations such as Transportation Management Organizations (TMOs) to help mitigate the effects of construction on residents, businesses, pedestrians, bicyclists, and drivers. Some actions include:

- Signage, detours, and maintenance of access for pedestrians and bicyclists
- Incentives to construction companies for off-peak construction times such as at night or on the weekends, where appropriate
- Financial and/or marketing support to affected businesses

Transportation can play a significant role in fostering personal and community health by increasing pedestrian and bicycle infrastructure, including the connectivity of these facilities region-wide. Many residents in the region want the option of walking or bicycling to work, school, errands, and appointments but do not feel they have safe routes. The Council will continue to promote bicycle and pedestrian infrastructure including planning with communities to enhance, close gaps, and make critical connections in the system region-wide. Walkable and bikeable communities also tend to have healthier residents.

During the development of the Interstate system, communities of color and low-income communities were disproportionally affected. Many communities were severed. Streets that connected different parts of a neighborhood were interrupted by limited-access freeways. The legacy of the Interstate system has been both positive and negative as already discussed in this introduction. One of many goals moving forward is to help reestablish neighborhood connections that were lost, and design new transportation projects with an eye toward community cohesion, accessibility, and appropriate size and scale for people in- and out-side motor vehicles.

Measuring performance

Examples of performance measures that could be used to measure the state of the environment include:

- Transportation-related emissions such as carbon monoxide and particulate matter
- Vehicle-miles traveled per capita
- Number of crashes involving pedestrians
- Number of crashes involving bicycles

Related Thrive Outcomes: Stewardship, Equity, Livability, Sustainability

Goal: Leveraging Transportation Investment to Guide Land Use

The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.

Objectives:

A. Focus regional growth in areas that support the full range of multimodal travel.

B. Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement.

C. Encourage local land use design that integrates highways, streets, transit, walking, and bicycling.

D. Encourage communities, businesses and aviation interests to collaborate on limiting incompatible land uses that would limit the use of the region's airports.

Key Takeaways:

The Council will partner with local governments responsible for planning and implementing the land use and local infrastructure needed to support *Thrive MSP 2040*. Local governments will prepare comprehensive plans that address the policies in *Thrive MSP 2040* and system plans.

The plan emphasizes the importance of job concentrations and nodes along transportation corridors and the need for local governments to plan for more dense development and diverse uses especially in these areas. The plan also emphasizes the importance of freight terminals and corridors and their relationship to land use planning.

The plan will ensure that local government land use policies allow for the creation of livable communities that support stewardship and sustainability of the transportation system and the prosperity and livability of our region. This includes:

- Planning and implementing an ample system of interconnected local highways and streets
- Supporting higher expectations for land use around transit stations
- Including bicycle and pedestrian elements, and supportive tools in comprehensive plans
- Planning for the long-term needs of freight modes such trucks, barges, and railroads
- Balancing the needs of the aviation system with local land use decisions

This plan describes relationships between land use and transportation, and the importance of coordinating strategic planning for both. This coordination requires strong partnerships between the Council, MnDOT, other regional transportation partners, and local communities that plan for land use, regulate its implementation, and provide the local transportation system. These important relationships impact the sustainability and stewardship of our natural, cultural, and fiscal resources. They impact our choices for where we live, how we travel, and how we ship our freight.

To guide our growth equitably, efficiently, and sustainably, the Council will continue to collaborate with communities on their local plans to support their development and growth in ways that best meet their needs and the needs of the regional *Thrive MSP 2040* vision.

An important emphasis of *Thrive MSP 2040* is encouraging local communities to guide denser and more mixed-use development to job concentrations and nodes along corridors. This will provide greater housing options near jobs and activities that are cost-effectively supported by highways, streets, transit, bicycling, and walking, creating more livable communities where the market demands them. Local communities can also identify local centers to emphasize for this type of development.

The region is changing its focus from expanding the highway system to operating and maintaining it and investing in an expanded network of transitways supported by strong bicycle and pedestrian systems. To correspond, local governments should plan for higher intensity land use near transitways, including:

- A mix of retail and housing choices around station areas, known as transit-oriented development.
- More walkable and bikeable communities where residents can choose to use their car less (or not at all) to go shopping, get to a transit stop or station, get to work and school, and recreation areas.
- Building housing and commercial developments that are denser to create more successful and efficient transit service areas, including providing more transit service.
- Providing a mix of housing choices, including affordable options near transit to accommodate youth, the elderly, and populations looking for an alternative to driving.

Thrive MSP 2040 also emphasizes the significance, to our region's prosperity, of continuing to move freight efficiently. Our highway, railroad, river, and aviation systems will continue to be the foundation for these important freight movements. Freight infrastructure and land use – particularly riverfront and rail-accessible facilities – are difficult and expensive to reestablish.

Just as with freight-related land uses and infrastructure, the region's airports are important to the flow of commerce and people. Communities, businesses and aviation stakeholders should collaborate to:

- Limit residential and other incompatible land use encroachment near airports
- Limit negative impacts on adjacent communities including noise

Measuring performance

Examples of performance measures that could be used to measure the alignment of transportation and land use include:

- Change in population and/or employment that are between ¼ to ½ mile of a transit stop (bus, light rail, bus rapid transit, etc.)
- The number of intersections per square mile

Related Thrive Outcomes: Stewardship, Livability, Sustainability

E. How Transportation Supports the Region's Vision

***Thrive MSP 2040*: Community Designations**

The Metropolitan Council partners with local governments responsible for planning and implementing the land use and local infrastructure needed to support *Thrive MSP 2040,* the Transportation Policy Plan, the Water Resources Policy Plan, and the Regional Parks Policy Plan. Consistent with state law, local governments will prepare comprehensive plans that address the policies in *Thrive MSP 2040* and the regional systems plans for transportation (this plan), wastewater and regional parks.

To help communities in the region plan in an orderly, efficient, and economic way, and plan for transportation infrastructure that serves both local and regional development, the Transportation Policy Plan emphasizes the importance of regional coordination, including large and small commercial areas, job concentrations, manufacturing and distribution areas, and freight terminals. This plan also encourages local governments to plan for more dense development and a diversity of uses across the region, and the development of more livable communities that support stewardship and sustainability in the transportation system.

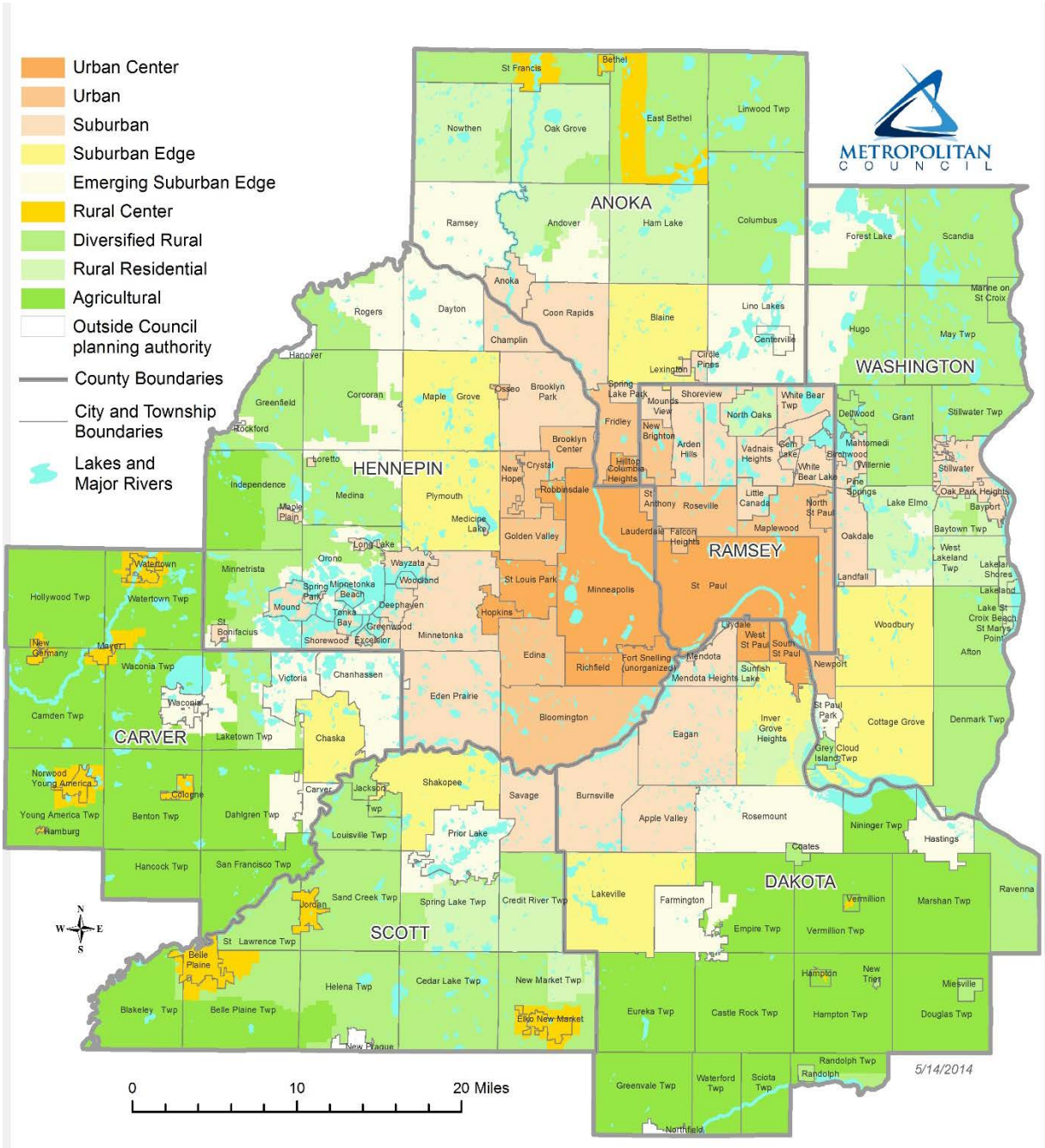
The land use policies in *Thrive MSP 2040* detail practices appropriate for certain communities. In conjunction with these designations, this Transportation Policy Plan provides guidance on transportation infrastructure, including:

- Supporting or contributing to an appropriately spaced and well-managed highway network
- Managing congestion in an innovative, cost-efficient manner with the goal of providing alternatives to travel in congested corridors
- Implementing increased transit service and a transitway system, and supporting higher expectations for land use around transit stations
- Including bicycle and pedestrian elements in comprehensive plans and the tools necessary to support them
- Planning for the long-term needs of freight modes such as trucks, barges, and railroads
- Balancing the needs of the aviation system with local land use decisions

Thrive MSP 2040 designates planning areas for the region based on the type and intensity of development, as well as future forecasted changes. For example, an agricultural area is anticipated to have little development and no projected growth in population, while an emerging urban center or suburban edge community might be projected to grow in population and jobs and may need development and transportation services to accommodate that growth. Each planning area designation has corresponding recommendations for local planning of land use, transportation, parks, housing and natural resources.

The Metropolitan Council has designated the following planning areas to help communities update their local comprehensive plans:

Figure 1-1: Community Designations Map



Urban Service Areas

Urban Center communities include the largest, most centrally located and economically diverse cities of the region. Anchored by Minneapolis and Saint Paul, the Urban Center also includes adjoining cities that share similar development characteristics such as street grids planned before World War II.

Urban communities developed primarily during the economic prosperity between the end of World War II and the economic recession of 1973-1975. These cities, adjacent to the Urban Center communities, experienced rapid development to house the growing families of the baby boom era.

Suburban communities experienced primary development in the 1980s and into the early 1990s as baby boomer families entered their prime earning years. Many of these cities fall along freeway corridors and include growth along Interstates 35W, 35E, 494, 694, and U.S. Highways 10 and 61.

Suburban Edge communities experienced significant residential growth beginning in the 1990s and continuing through the 2010s. At least 40% of the land in these cities is developed, but significant amounts of land remain for future development. These communities generally do not have large-scale agricultural areas.

Emerging Suburban Edge communities include cities and townships in the early stages of transition from rural to urban levels of development. Less than 40% of available land has been developed in the majority of Emerging Suburban Edge communities.

Rural Service Areas

Rural Center communities are local commercial, employment, and residential activity centers located in otherwise rural areas in the region. These small towns are surrounded by agricultural lands and serve as centers of commerce to the surrounding agricultural community.

Diversified Rural communities are home to a variety of farm and non-farm land uses including very- large-lot residential, clustered housing, hobby farms, and agricultural uses. Located adjacent to Emerging Suburban Edge communities in the Urban Service Area, the Diversified Rural Area protects rural land for rural lifestyles today and potential urbanized levels of development sometime after 2040.

Rural Residential communities have residential patterns characterized by large lots and this development density cannot support cost-effective urban infrastructure, such as centralized wastewater treatment, high capacity highways, or transit service.

Agricultural communities consist of areas with prime agricultural soils that are planned and zoned for long-term agricultural use. These communities are home to the bulk of contiguous lands enrolled in the Metropolitan Agricultural Preserves and Green Acres Programs or cultivated for commercial agricultural purposes.

A note about Aviation: Regional system airports are located in most of the community designations, from urban center to rural. All communities that have an airport or border an airport have the same set of issues involving compatible land use, planning and development. Communities in all designations should plan for compatible land use near airports.

A Summary of the Existing Regional Transportation System

The regional transportation system helps to advance the *Thrive MSP 2040* vision by continuing to improve operational efficiencies, providing alternatives to highway congestion, and continuing to increase travel choices available to people. The region consistently ranks high when compared to peer regions in areas of quality of life, such as the availability of regional parks and the number of bike trails, but there is always room for improvement, especially when it comes to equitable transportation access for historically underrepresented communities, economic competitiveness, and the effects of transportation communities and the natural environment.

The Regional Highway System

No other part of the transportation system has increased personal mobility more than the regional highway system. Highways support flexible and independent travel for millions of people every day. Freight transport throughout the supply chain – a critical aspect of our economy – relies predominantly on trucks using highways.

Today's highway system developed over more than 75 years as the nation realized good roads were imperative for commerce, national defense, and communications . Starting as early as 1916 and boosted by investments like the Federal Aid Highway Act of 1956, the nation's highway system was transformed. In the early 1900s roads were mostly unpaved and difficult to travel, especially during bad weather. The 1956 Act funded the Interstate system with 90% federal and 10% matching state funds. Nationally, the interstate highway system is more than 46,000 miles, all built according to federal standards for design and safety.

The benefits of this system have been immense and incalculable. Commerce, work commutes, recreational travel, and the everyday business of most people's lives, especially in rural and suburban areas, depend on a good highway system.

The highway system is also integral to moving freight within, through, and beyond the region. A large portion of freight-supporting land uses such as terminals, warehouses, and manufacturing plants are located along highways. Truck freight moves nearly 75% of all freight in and out of the region, with rail, water, and air making up the remaining 25%. The value of truck-hauled freight exceeds 80% of the total value of all freight moved in the region.

The region's highway system is well developed and classified into categories based on function, with "principal arterials" and A-minor arterials helping people and freight move the longest distances in the region. This plan addresses only these regional highways. Principal arterials are freeways and other limited access highways with the highest posted speed limits, such as Interstates 35 and 94 and U.S. Highway 10. A-minor arterials support principal arterials and access to regional job concentrations, community amenities, manufacturing and distribution areas, and freight terminals. Along with local roads, A-minors are critical to the functioning of the system. Examples of A-minor arterials include State Highway 47/University Avenue in Fridley, Columbia Heights, and Minneapolis; State Highway 5 in Chanhassen, Eden Prairie, Saint

Paul, Maplewood, Oakdale, Lake Elmo, and Stillwater; and Scott County Highway 21/Dakota County Highway 60 in Prior Lake and Lakeville.

There are 17,500 miles of roads in the region. Principal and A-minor roads make up only 2,600 of those miles (15%) and carry most of the region's motor vehicle traffic (75%), including trucks and buses.

Future investments in the regional highway system will focus on continuing to operate, maintain, and rebuild infrastructure, enhancing safety and security, and implementing affordable and multimodal congestion management strategies including expanded and new traffic management technologies, MnPASS and other advantages for transit, and improving bicycle and accessible pedestrian accommodations on highways.

The Regional Transit System

Public transportation enhances quality of life and the economic competitiveness of the region in ways that support prosperity. In urban areas, public transit is becoming increasingly essential to provide access to jobs and opportunity and conduct daily personal business. For suburban areas, public transit provides a valuable option for commuting to work. For many in rural areas who do not drive, public transit is an important life-line that connects them to jobs and opportunities that they otherwise would not have.

Providing transit service requires considerations of stewardship and sustainability because not all areas of the region can be served equally. Cost-effective regular-route transit serves denser areas or the region, whether density comes in the form of the local land use and development patterns or a park-and-ride facility (which can create density by allowing transit riders to drive to a single location for service). Many people are relocating to more urban areas to take advantage of the more frequent and accessible transit services available there. Students, young professionals, and older populations are choosing to live in areas where they can use their car less or even live without a car at all. About 44% of future population growth is projected to take place in developed portions of the region (urban centers), where transit service can be most effective, have the greatest return on investments, and be financially sustainable.

There are six types of transit service in the region. Regular-route bus service, light rail transit (LRT), bus rapid transit (BRT), commuter rail, dial-a-ride services, and public vanpools. Transit use has increased by about 25% in the last 10 years; and its share of travel has increased by about the same. In 2013, average weekday trips on transit exceeded 315,000, including trips taken with other transit providers such as contracted services or suburban providers. Or put another way, more than 155,000 people use transit every weekday.

Substantial returns on investments (national averages)[1]

- every $10 million of capital invested in public transportation yields $30 million in increased business sales
- for every $1 billion of federal investment in the nation's public transportation infrastructure 47,500 jobs are created

Since the Council adopted the previous transportation plan, the first bus rapid transit (BRT) line opened on Cedar Avenue (the METRO Red Line) in Dakota County, park-and-ride capacity has increased, and the METRO Green Line (Central Corridor light rail) opened in June 2014, connecting Minneapolis and Saint Paul. For other improvements see "Existing Regional Transportation System" in Part 2, beginning on page 66.

But the benefits of public transit – felt by people, families, communities, and the region as a whole – go beyond simply having access to specific transit service.

Real estate around transit stations and along transit corridors carries higher value than similar properties without access to transit. Transit-oriented development (TOD) with mixed-use residential and commercial amenities is able to revitalize neighborhoods in a number of ways, including:

- Giving many the option of not owning a car, potentially a considerable savings
- Supporting a mix of housing and commercial uses—apartments, townhomes, retail shops and services—that attracts a wide range of populations and fosters economic activity, social interaction, community cohesion and involvement, and physical activity
- Supporting a denser mix of housing and commercial development that can generate larger financial returns for communities; real estate is not devoted to large parking lots and other auto-oriented infrastructure but tax-generating uses

Travel Demand Management (TDM)	**Transportation Management Organizations (TMOs)**
The Council partners with cities and Transportation Management Organizations (TMO) to: • reduce travel during peak periods and in congested areas • promote alternatives to driving alone such as carpooling, transit, and bicycling • promote flexible work schedules and telecommuting • work with local governments to link TDM strategies and supportive land use policies • market new transit services like the Northstar Line, and METRO Green Line • encourage bicycling by promoting new features such as Nice Ride, and new bike lanes	Transportation Management Organizations: • are public/private partnerships in highly congested corridors • consist of employers, building owners, businesses, and local governments • work on strategies, programs, public education and information to promote alternatives to driving alone during peak travel times, including carpooling, transit, and telecommuting

Regional Bicycle and Pedestrian Infrastructure

Walking and bicycling are essential parts of the regional transportation system and have numerous benefits at the local, regional, and global levels. Walking and bicycling allow people to make trips without adding to roadway congestion and vehicle-related air pollution that is affecting climate change. These choices make it possible to connect with transit while incorporating exercise into daily routines. On a household level, they reduce the cost of transportation and improve health, and at a national level they reduce our dependence on non-renewable energy sources.

Walking and bicycling trips tend to be relatively short in this region, averaging about ¼ to ½ mile for walking and between one and three miles for bicycling. Because of these relatively short trip lengths, local governments lead development of the bicycle and pedestrian systems. Generally, the Metropolitan Council does not operate or maintain bikeways and walkways but does facilitate the planning, development, and funding. The Council's role is to plan for regional bicycle and pedestrian systems that connect between jurisdictions and travel modes, seek to find solutions to regional barriers to bicycling and walking, and improve access to jobs and opportunities for our growing and changing region.

The Regional Bike System

The region is fortunate to have significant bicycling amenities, including on-street bike lanes, as well as a network of off-road trails. The system includes about 2,650 miles of bikeways, including about 975 miles of on-road features, and about 1,600 miles of off-road trails. Twin Cities' residents have and are continuing to advocate for this system, and the federal government, state, and region have made investments that mirror this strong level of advocacy.

Since the previous transportation plan, bicycling activity has increased 78% and walking 16% as a result of efforts through a federal non-motorized transportation pilot project. In addition, the Council has been improving the inventory of bicycling amenities and how they're used.

However, gaps in the system exist, and additional amenities are planned to address growing needs for the bicycle network.

Pedestrian Infrastructure

Pedestrian infrastructure − sidewalks, trails and other amenities such as trees, lighting, and benches accessible to people of all ages and abilities − is key to making places feel easily reached, inviting, and safe. For people who do not drive, walking or traveling by wheelchair can be essential to meeting daily needs, and walking can be an important part of active living. Many opportunities for walking, such as going to the store for bread or to the nearest transit station, are thwarted by physical barriers such as a lack of sidewalks and wide and busy highway intersections.

Among actions communities can take to better accommodate pedestrians are to provide Complete Streets, designed to accommodate all users, implement accessible design standards, and coordinate projects with broad input from businesses, residents and adjacent communities.

See Part 2 for a detailed discussion of investment direction for the bicycle and pedestrian system.

The Regional Freight System

As stated previously, 75% of all intercity freight is moved by trucks on highways. The remaining 25% is moved by air, water, and rail. Most freight infrastructure is owned by the private sector. Public sector freight-related infrastructure includes highways, navigable rivers, river port terminals, and airports.

There are three river ports in the Twin Cities metro region, including the Ports of Minneapolis and Saint Paul on the Mississippi River and the Port of Savage on the Minnesota River. Freight is hauled by barge more than 1,800 miles downriver from the Twin Cities to the Port of New Orleans where it is loaded onto ocean-going ships for export to global markets. The channels, dams, and locks on navigable rivers are maintained by the U.S. Army Corps of Engineers.

Four Class I railroads operate more than 500 miles of track in the metropolitan area that link the region with major national markets and also carry a large amount of cross-country freight. Five Class III (short line) railroads operate about 160 miles of track in the region. Class III lines predominantly operate local service, generally within 100 miles of the region.

High-value and/or time-sensitive goods are shipped via the air freight system, especially when moving over long distances. The region's high-tech and biomedical companies are major air freight service customers. Minneapolis-Saint Paul International Airport (MSP) handles air freight, not only for the Twin Cities metropolitan area, but for most of Minnesota and adjacent parts of Wisconsin and the Dakotas via air freight providers such as FedEx and United Parcel Service (UPS), as well as commercial airlines. Goods shipped as "belly freight" on commercial passenger aircraft represents less than 20% on average of the overall air freight volume shipped via MSP; more than 80% is shipped via air freight carriers.

The Regional Airport System

The region has one major airport, the Minneapolis-Saint Paul International Airport (MSP), and 10 smaller airports that serve business and recreational users. The Metropolitan Airports Commission (MAC), formed by state law in 1943, is a public corporation that owns and operates MSP and six smaller regional airports throughout the metropolitan region.

MSP International ranked 16th nationally with 33 million passengers in 2012. It supports 74,800 jobs and generates $9.9 billion in economic activity, and $253 million in state and local taxes. The MAC's operating costs all come from concession revenues, lease agreements, and airline fees.

MSP is important to the region's economy. It is a critical part of the transportation system that brings over 4 million visitors to the region, including 400,000 international visitors who spend $1.9 billion annually during their stay. The regional airport system is an integral part of the freight system with 198,000 metric tons of cargo handled in 2012.

Among the smaller regional, or reliever, airports are Airlake, Anoka County-Blaine, Crystal, Flying Cloud, Lake Elmo and Saint Paul Downtown, South Saint Paul Airport and Forest Lake Airport. Reliever airports are defined by the Federal Aviation Administration (FAA) as airports designated to relieve congestion at commercial service airports and provide improved general aviation access to the overall community. Our regional system of airports generates an estimated $1.4 billion annually for the Twin Cities economy while reducing general aviation operations at MSP. Airport users at the MAC reliever airports include air taxi, business aviation, general aviation, flight training, recreational aviation, and military aviation. Each of the reliever airports is open 24 hours per day, in keeping with federal regulations.

Passenger Travel Beyond the Region

Each mode of transportation best serves a specific trip distance, providing its own unique characteristics and values for interstate and international mobility. While the vast majority of intercity passenger movements occur by automobile, Amtrak and a number of intercity bus and airlines companies serve longer-distance travelers who choose not to drive. Air travel is addressed further in the aviation section of this plan.

MnDOT is currently studying several potential new high-speed rail services to link the Twin Cities with other regions such as Rochester, St. Cloud, Duluth, and Chicago. Intercity bus service continues to remain a presence in the region, with recent innovations to attract passengers such as Wi-Fi and express services that rival private automobile travel times. The Council has a minimal role in planning intercity passenger rail or bus service, and MnDOT works with these operators and provides some subsidies to support service in Greater Minnesota.

F. Planned Investments

As with the Council's previous Transportation Policy Plan, inadequate transportation funding continues to be a major issue facing the region. If current transportation funding levels continue into the future (Current Revenue Scenario), our state highway system performance will decline as costs continue to grow and available highway revenues increase at a rate significantly below inflation. While available transit revenues under the Current Revenue Scenario will allow for continuing our existing transit services, the region is not able to improve and expand the bus system, and capital and operating funding will only allow the region to slowly grow our transitway system.

With limited transportation dollars, as with any budget, priorities must be identified. During this plan's development process, the Council consulted with regional policymakers, partner agencies and the public to identify a balanced set of investment factors or criteria that could be used to determine priorities for investments in highways, and the bus and transitway systems. These key investment factors relate directly to attaining the regional outcomes established by *Thrive MSP 2040* and the goals and objectives in this plan. Investment factors are discussed in the summary of the highway and transit investments. For more information about the investment factors, see [Link to highway and transit sections].

Two Funding Scenarios

This plan considers two funding scenarios:

1. The "Current Revenue Scenario" assumes revenues that can reasonably be expected to be available based on past experience. Under federal regulations this scenario is called "fiscally constrained." If increases in state or local taxes, or the availability of competitive funds, are assumed within the Current Revenue Scenario, the assumptions must be based on the region's past history and experience. The Current Revenue Scenario in this plan assumes only inflationary increases in the revenue sources - no increases in local, state or federal tax rates are assumed.

2. The "Increased Revenue Scenario" assumes revenues that the region might reasonably be able to attain through policy changes and decisions that increase local, state, or federal funding sources. Under federal regulations, the programs or projects in the Increased Revenue Scenario illustrate what might be achieved with additional revenues, but the projects are not considered part of the approved plan.

Figure 1-2: Regional Transportation Revenue and Spending 2015-2040

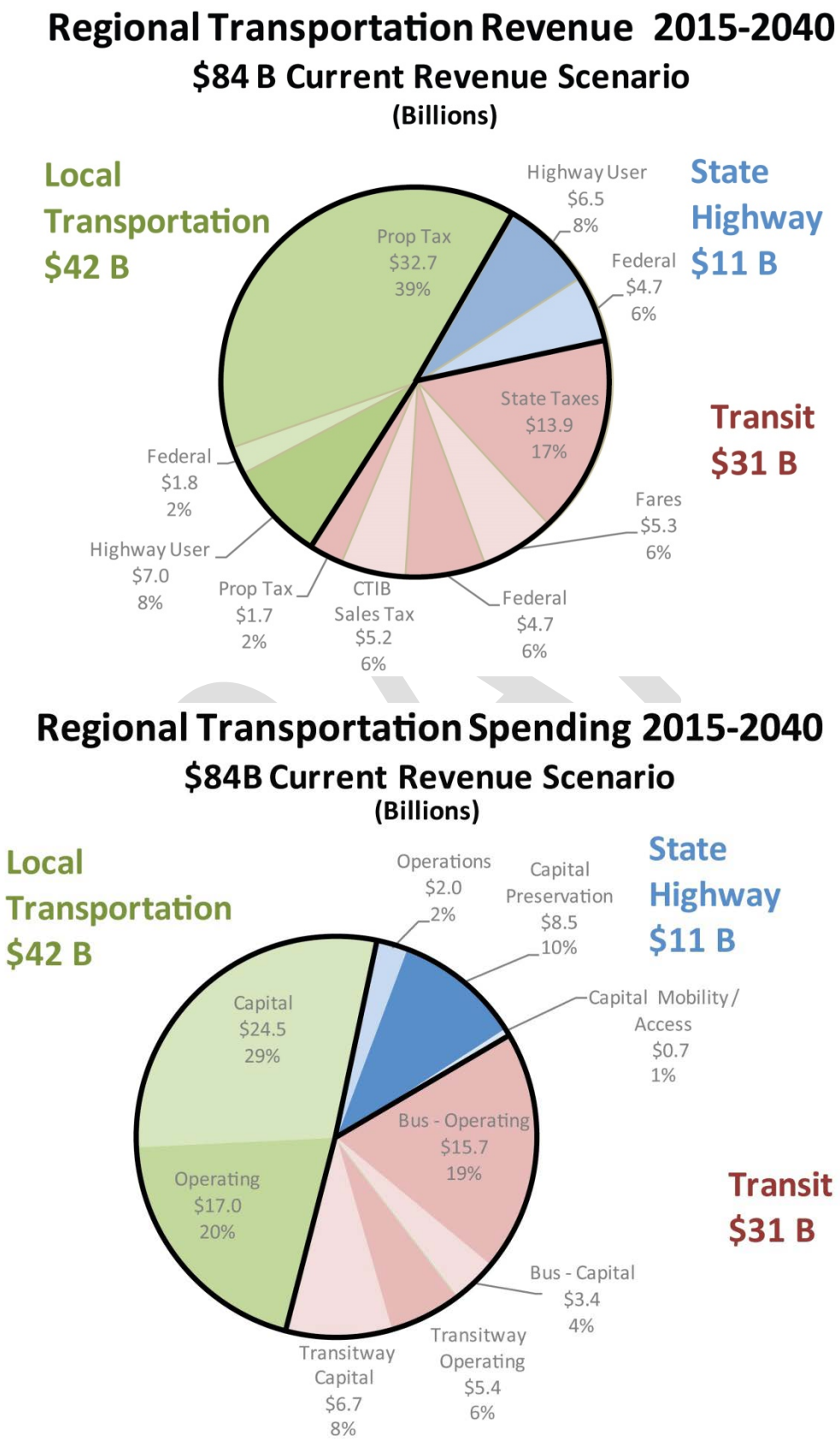


Figure 1-2 shows the metropolitan area revenues and spending estimated from 2015 to 2040 for all transportation purposes under the plan's Current Revenue Scenario. Over the 26 years of the plan, an estimated $84 billion will be available for transportation purposes region-wide. Regional transportation revenues and spending are categorized into three broad types: local transportation, state highways and transit.

- Local transportation includes revenues and spending by cities and counties on local roads and streets, and the local bicycle and pedestrian systems.
- The state highways category includes revenues and spending on the state highway system implemented and operated by MnDOT in the metropolitan area.
- The transit category includes revenues and expenditures by all regional transit providers, the Counties Transit Improvement Board and local governments for the bus and transitway systems.

Regional Transportation Revenues

Funds for regional transportation come from local, state, and federal sources and are raised through a variety of user taxes and fees, general state and local taxes and federal funding allocations or competitive programs. The general breakdown of regional transportation funding is:

- Local sources (property taxes, CTIB sales tax, fares, other): 52%
- State taxes and fees: 34%
- Federal: 14%

Over the 26 years of this plan, the various funding sources are assumed to grow at varying rates depending on the source and history of the past revenues. The details on the revenue growth assumptions can be found in the "Transportation Finance" section *(link here).*

*** Counties Transit Improvement Board (CTIB):** Starting in April 2008, five counties – Anoka, Dakota, Hennepin, Ramsey and Washington – have used a quarter-cent sales tax and a $20 per-motor-vehicle sales tax, permitted by the Legislature, to invest in and advance transit projects by awarding annual capital and operating grants. The Board works in collaboration with the Metropolitan Council and Carver and Scott counties.

***MVST:** Motor Vehicle Sales Tax. In 2006 voters approved a constitutional amendment to allocate this revenue 60% to highways and 40% to transit statewide.

Regional Transportation Spending

Transportation expenditures can be broken generally into capital and operating expenditures for each of the local transportation, state highways and transit spending categories. Capital expenditures include major construction, reconstruction and improvement or replacement of transportation facilities. For highways and local transportation, operations expenditures include ongoing maintenance activities such as snowplowing, mowing, and preservation activities that do not involve major reconstruction.

Operations activities for transit are very different from roadway activities in that transit includes the costs of the daily operations of the transit system and the necessary vehicle, driver and maintenance associated with running the services. For roadways, these types of operational expenses are typically borne by private vehicle drivers and do not appear as public expenditures. Examples of this would include the purchase costs of the private vehicles, gasoline and diesel costs, insurance and vehicle maintenance costs. If accounted for, these private costs would significantly outweigh the public roadway expenditures.

Highway Investment Summary

The "Highway Investment Direction and Plan" will continue to advance the investment direction set in the previous Transportation Policy Plan and the Minnesota State Highway Investment Plan published December 2013, including:

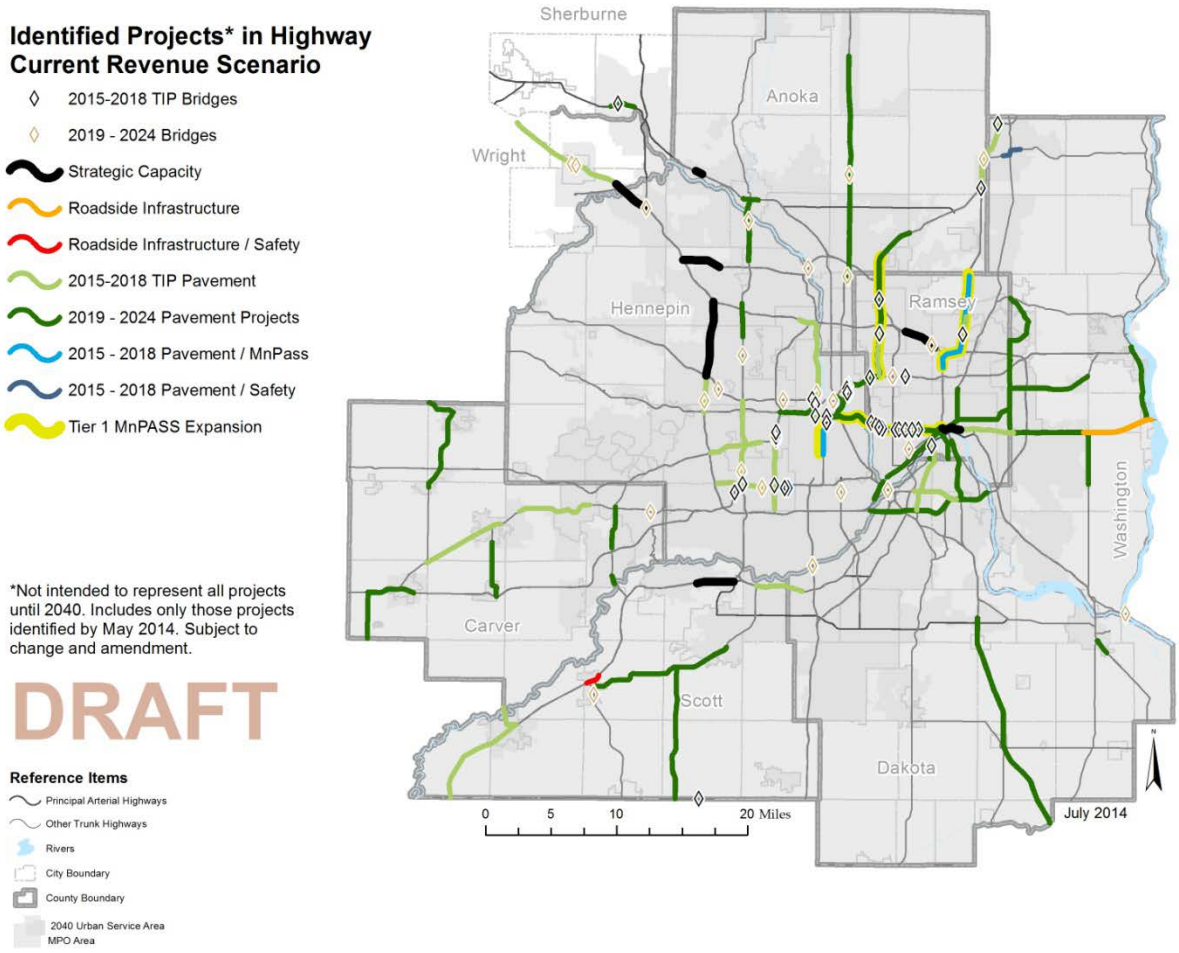
- Placing priority on safely operating, maintaining, and rebuilding the existing state highway system, including improvements to better accommodate bicycle and accessible pedestrian travel on highways, where appropriate
- Implementing mobility improvements such as traffic management technologies, spot mobility improvements, new or extended MnPASS (high-occupancy toll) lanes, and affordable strategic capacity enhancements
- Implementing lower cost/high return on investment projects to increase access to job concentrations, community amenities, and manufacturing and distribution concentrations

In the Current Revenue Scenario, as shown in Part 2 "Highway Investments," $11 billion (dollars in year of expenditure) is anticipated to be available for state highway projects for the years 2015-2040. While this is a large amount of revenue, the statewide plan concluded it will not be adequate to fully fund the core functions of operating, maintaining and rebuilding the existing state highway system. And while these core functions must be performed, they are not enough to accommodate the growing region's highway needs.

The region must clearly prioritize the investments it makes in highway mobility and access with emphasis on investments that address multiple *Thrive MSP 2040* and Transportation Policy Plan goals and objectives. For more information, see [link to highway chapter].

Figure 1-1 illustrates the highway investments that have to date been identified in the 2015-2024 timeframe. This map will be updated as additional specific investments are identified in the future, but because of funding constraints, no state highway mobility projects are anticipated after 2024. This is approximately a 20% reduction in regional mobility funds from the previous transportation plan and is a result of updated estimates for revenue and project costs.

Figure 1-3: Identified Highway Projects through 2024



Under the Increased Revenue Scenario, an additional $8 billion to $10 billion (in current dollars) above the Current Revenue Scenario spending levels would go toward the investment categories identified and would fund programs such as:

- Additional operations and maintenance funding needs, estimated at approximately $1 billion, about a 50% increase over current funding
- Increases in capital asset management (improving system performance) of approximately $2 billion to $2.5 billion, an approximately 35% increase over current spending levels
- Additional safety and highway-related bicycle and accessible pedestrian improvements at an estimated $600 million or almost a 100% increase over current spending
- Additional improvements for regional mobility and access projects of $4 billion to $5 billion, a very significant increase over current spending levels, considering the lack of mobility and access funding beyond 2024 under the Current Revenue Scenario

Table 1-1 - State Highways Investment Summary

	Current Revenue Scenario (Dollars in year of expenditure)				Increased Revenue Scenario
Investment category	2015-2024 (10 years)	2025-2034 (10 years)	2035-2040 (6 years)	2015-2040 (26 years)	2015-2040 (26 years)
Operations & Maintenance	$600 million	$800 million	$600 million	**$2 billion**	$1 billion
Capital Expenditures:					
Program Support	$400 million	$300 million	$200 million	**$900 million**	$700 million
Rebuild and Replace Assets*	$1.8 billion	$3 billion	$2.1 billion	**$6.9 billion**	$2 – 2.5 billion
Safety, Bicycle, and Accessible Pedestrian Improvements	$200 million	$300 million	$200 million	**$700 million**	$600 million
Regional Mobility Improvements**	$700 million	$0	$0	**$700 million**	$4 – 5 billion
Total Highway	**$3.7 billion**	**$4.4 billion**	**$3.1 billion**	**$11.2 billion**	**$8 – 10 billion**

M = million

* *Asset management of pavement, bridge, and other roadside infrastructure*

** *Includes traffic management technologies, spot mobility improvements, MnPASS lanes, strategic capacity enhancements*, and *highway access investments*

Transit Investment Summary

The "Transit Investment Direction and Plan" includes about $31 billion (dollars in year of expenditure) of investments under the Current Revenue Scenario. An additional $7 – 9 billion (dollars in year of expenditure) is identified for potential investments in the Increased Revenue Scenario. The following is a description of the investments in each scenario for the bus and support system and the transitway system. The Transit Investment Plan Summary is shown in Table 1-2 (below).

Current Revenue Scenario – Bus and Support System

- The region is able to operate and maintain the existing bus and support system.
- No expansion of bus service is available beyond the rapidly growing demand for Metro Mobility.
- There is limited capital expansion and modernization of the bus and support system facilities through preservation efforts and through competitive federal funds.

Current Revenue Scenario – Transitway System

Operating and maintaining the existing transitways, which include METRO Blue Line, METRO Green Line, METRO Red Line, and Northstar Line, are funded within the Current Revenue Scenario. In the first 10 years of the plan, funded transitway expansion will include:

- Building and operating four additional METRO lines and extending a fifth:
  - METRO Orange Line (I-35W South Bus Rapid Transit), opening around 2019
  - METRO Green Line Extension (Southwest Light Rail), opening around 2019
  - METRO Blue Line Extension (Bottineau Light Rail), opening around 2022
  - Gateway dedicated bus rapid transit (METRO line with color to be determined, contingent locally preferred[1]), opening around 2019
- Extending METRO Red Line Stage 2, opening around 2019
  - Building four arterial BRT lines every 2-3 years:
  - Snelling Avenue (Saint Paul, Roseville)
  - West 7th Street (Saint Paul, Bloomington)
  - Penn Avenue (Minneapolis)
  - Chicago Emerson-Fremont avenues (Hennepin County)

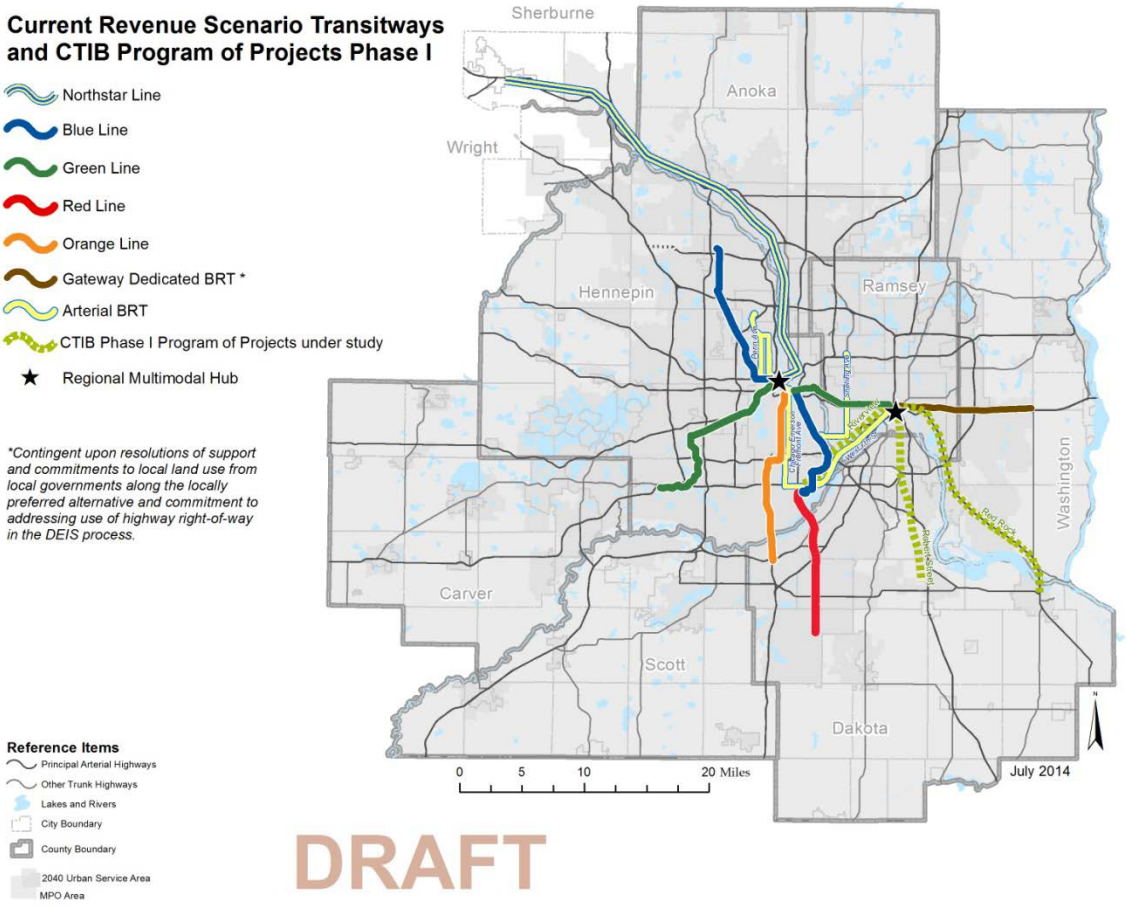
Beyond the first 10 years of the plan, the region expects to have at least $2.4 billion available for additional transitway expansion. The Counties Transit Improvement Board (CTIB) has designated a list of priority corridors in their *Phase I Program of Projects* that are under study in the corridor planning process. The undesignated revenue is expected to fund these priorities and will likely include additional local funds that will be identified when specifics are identified. The additional corridors in CTIB's *Phase I Program of Projects* are:

- Red Rock
- Riverview
- Robert Street

These projects are under study locally and will be considered in the plan when a recommendation is made through the local process. Additional acceleration options may also be possible for arterial BRT projects and modern streetcar projects.

[1] Contingent upon resolutions of support and commitments to local land use from local governments along the locally preferred alternative and addressing use of highway right-of-way (see "Highway Investment Direction and Plan").

Figure 1-4: Current Revenue Scenario for Transitways



Increased Revenue Scenario - Bus and Support System

The Increased Revenue Scenario includes a reasonable expansion of approximately $2 – 3 billion in additional revenue between 2015 and 2040. This represents about an average of 1% increase per year in bus service. The capital costs associated with bus service expansion are also included and this level of funding would also provide for opportunities to modernize the existing bus system and provide for an improved overall customer experience. The improvements in bus service under the Increased Revenue Scenario would provide for:

- Improved frequencies and hours of service on existing bus routes for more reliable, attractive service to more destinations
- Expanded bus route coverage to new areas, with an emphasis on connecting medium- and high-density residential areas with jobs and transitways
- Expanded commuter and express bus routes to new markets and improved routes where capacity is needed

Bus service expansion would be prioritized based on investment factors in the "Transit Investment Direction and Plan" and would identify opportunities for all regional transit providers.

Modernization and expansion improvements would provide for:

- Improved or expanded customer facilities including more shelters, better customer information, improved multimodal connections, and more amenities
- New and expanded park-and-rides
- Expanded bus garages, layover facilities, and operations support facilities associated with the expansion of the system

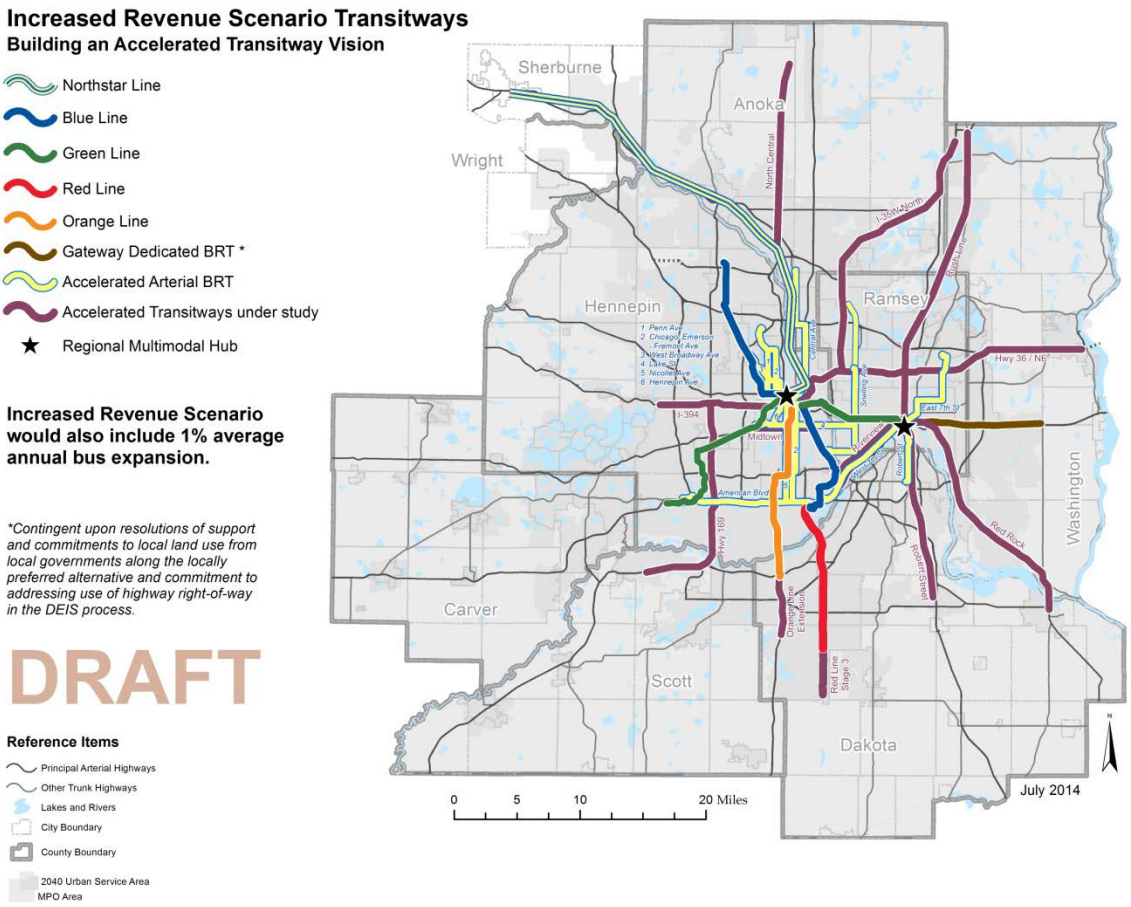
Increased Revenue Scenario – Transitway System

The Increased Revenue Scenario includes a reasonable expansion of approximately $5 – 6 billion in additional revenue for the Transitway System between 2015 and 2040. This would likely allow the region to complete the vision of a transitway system and do it on an accelerated timeline. There is a level of uncertainty in the funding estimate because many transitway projects are still in planning and because the need for operating revenue for transitways depends on the timing and type of projects that are implemented. This scenario would include:

- Accelerating the build-out of the transitways in the Current Revenue Scenario
- Afford the transitways in CTIB's *Transit Investment Framework* beyond the *Phase I Program of Projects* and additional transitways that are under study or needing to be studied:
  - Highway 169
  - Highway 36
  - I-35W North
  - I-394
  - METRO Orange Line Extension
  - METRO Red Line Stage 3
  - Midtown
  - North Central
  - Rush Line
- Implementing the complete system of 12 Arterial BRT projects including the four in the Current Revenue Scenario and:
  - American Boulevard (Bloomington)
  - Central Avenue NE (Hennepin County)
  - East Seventh Street (Saint Paul)
  - Hennepin Avenue (Minneapolis)
  - Lake Street (Minneapolis)
  - Nicollet Avenue (Minneapolis)
  - Robert Street (Saint Paul, West Saint Paul)
  - West Broadway Avenue (Minneapolis)

The technical and policy investment factors for setting transitway priorities would also be considered in an Increased Revenue Scenario. For more information, see “Transit Investment Direction and Plan.”

Figure 1-5: Increased Revenue Scenario for Transitways



Under the $7 billion to $9 billion Increased Revenue Scenario, the funding need is approximately 25% for bus and support system expansion and 75% for transitway system expansion. This is an average funding level over the 26-year period of the plan with the expectation that spending in any given year will be dependent on the identified expansion needs and costs of proposed projects.

Table 1-2: Transit Investment Plan Financial Summary

	Current Revenue Scenario (Dollars in year of expenditure)				Increased Revenue Scenario
Investment Category	2015-2024 (10 years)	2025-2034 (10 years)	2035-2040 (6 years)	**Total 2015-2040 (26 yrs)**	2015-2040 (26 years)
Bus and Support System					
Operations - Existing	$4.7 billion	$6.3 billion	$4.7 billion	**$15.7 billion**	-
Capital - Maintenance and Preservation	$960 million	$1.1 billion	$770 million	**$2.8 billion**	-
Capital – Modernization and Expansion	$210 million	$230 million	$160 million	**$600 million**	-
Subtotal Bus and Support System	$5.9 billion	$7.6 billion	$5.6 billion	**$19.1 billion**	$2 – 3 billion
Transitway System					
Operations - Existing	$980 million	$1.3 billion	$920 million	**$3.2 billion**	-
Operations – Expansion	$400 million	$1.1 billion	$790 million	**$2.3 billion**	-
Capital – Existing	$110 million	$200 million	$140 million	**$450 million**	-
Capital – Expansion	$3.7 billion	$80 million	-	**$3.9 billion**	-
Undesignated - Expansion	-	$1.2 billion	$1.2 billion	**$2.4 billion**	-
Subtotal Transitway System	$5.2 billion	$3.9 billion	$3.0 billion	**$12.2 billion**	$5 – 6 billion
Total Transit Investment	**$11.1 billion**	**$11.5 billion**	**$8.6 billion**	**$31.2 billion**	$7 – 9 billion

Local Transportation Investment Summary

Local transportation includes all projects that are implemented or operated by cities and counties on the local transportation system. This primarily includes local road and street operating and capital expenditures and also spending on bicycle and pedestrian facilities either as part of the local road projects or as standalone projects.

Local transportation operations and capital expenditures are funded by three primary revenue sources— local property taxes and assessments, highway user taxes and federal revenues. The highway user taxes are allocated to cities and counties based upon constitutional and statutory formulas that provide state-aid for the county and municipal state-aid systems. According to MnDOT's long range estimates, highway user revenues will grow over the period of the plan by 1.2% annually.

Federal revenues are allocated to cities and counties through the biennial Regional Solicitation process which allocates federal funding available to the region from the Surface Transportation Program (STP), Transportation Alternatives Program (TAP), Congestion Mitigation Air Quality (CMAQ) and Highway Safety Improvement Program (HSIP). Because these revenues are allocated through a competitive process every two years it is difficult to know how much will be available to local governments. Based upon past allocations of the federal funds along with moderate inflationary assumptions of 1.4% annually for the federal revenues, this plan estimates that approximately $1.8 billion of federal revenues will be available to local governments over the period of the plan.

It is also difficult to know how local transportation spending will grow over the period of the plan. This plan assumes local transportation expenditures will grow at the rate of inflation or approximately 2.5% annually. Because two of the three sources of local revenues are growing at a rate less than inflation, the third major source of local revenue, local property taxes and fees, will be required to grow at a rate that exceeds inflation to maintain current levels of local transportation spending.

Table 1-3: Local Transportation Investment Summary

	Current Revenue Scenario (year of expenditure dollars)			
Investment Category	2015-2024 (10 years)	2025-2034 (10 years)	2035-2040 (6 years)	**2015-2040 (26 years)**
Operating	$5.3 billion	$6.8 billion	$4.9 billion	**$17 billion**
Capital	$7.6 million	$9.7 million	$7.2 million	**$24.5 million**
Total Local Transportation	**$12.9 billion**	**$16.5 billion**	**$12.1 billion**	**$41.5 billion**

Table 1-4 includes the full summary of planned transportation investments under the Current Revenue Scenario and also the estimated level of need under the Increased Revenue Scenario, as identified in this transportation plan.

Table 1-4: Regional Transportation Planned Investments Summary

	Current Revenue Scenario (year of expenditure dollars)				Increased Revenue Scenario
Investment Category	2015-2024 (10 years)	2025-2034 (10 years)	2035-2040 (6 years)	**2015-2040 (26 years)**	2015-2040 (26 years)
Subtotal State Highways*	$3.7 billion	$4.4 billion	$3.1 billion	**$11.2 billion**	$8 – 10 billion
Subtotal Transit	$11.1 billion	$11.5 billion	$8.6 billion	**$31.2 billion**	$7 – 9 billion
Subtotal Local Transportation	$12.9 billion	$16.5 billion	$12.1 billion	**$41.5 billion**	NA*
Total Regional Transportation Spending	**$27.7 billion**	**$32.4 billion**	**$23.8 billion**	**$84 billion**	$15 – 19 billion

* Local transportation increased revenue needs have not been determined as part of the analysis for this plan. It is known that the needs are significant. If state highway needs are addressed through increases in highway user taxes it will provide benefit to local transportation funding needs.

Regional Bicycle Transportation Network

For the first time a Regional Bicycle Transportation Network is proposed as a designated component in this Plan *(link to Regional Bicycle Transportation Network map)*. The proposed network was developed through an extensive Regional Bicycle System Study conducted by the Council in 2013-2014. As shown in Figure G-1, this network is envisioned to serve as the "backbone" arterial system to accommodate bicycle trips at a regional level. It consists of two tiers for planning and implementation by cities, counties, and parks agencies:

- Tier 1 Corridors are to be known as Priority Regional Bicycle Transportation Corridors; these corridors are a subset of the overall Regional Network and should be given the highest regional priority for funding and implementation.
- Tier 2 Corridors are also known as Regional Bicycle Network Corridors and include all the remaining corridors shown in Figure G-2 that are not designated as Tier 1 corridors. These corridors should be given the second highest priority for regional transportation investment.

The intent of the proposed Regional Bicycle Transportation Network is to encourage cities, counties, and parks agencies to plan and implement an integrated and seamless network of on-street bikeways and off-road trails to most effectively improve conditions for bicycle transportation at the regional level. Because there is generally limited funding for bikeway facilities at all levels, this regional network has been developed to have the greatest potential to attract new riders. Cities, counties, and parks agencies are also encouraged to plan and

implement local bicycle facilities that connect their local bikeway networks to the regional network.

The Bicycle/Pedestrian Investment Direction section provides a definition for Critical Bicycle Transportation Links (*insert hot link to Critical Links discussion here*), which lists several criteria for identifying specific improvements that may be considered a regional priority even if located off the regional network.

Aviation

Aviation investments will continue to prioritize maintenance of existing facilities. Enhancements for the safety/security of air operations, many of which are driven by and funded by Homeland Security or FAA, and continued implementation of MSP development plan objectives are also anticipated.

Planned investments in the aviation system are demand driven, and reviewed every 5 years in the Long Term Comprehensive Plan Updates prepared for each airport. Larger projects beyond maintenance are demand driven and will not be built unless needs warrant implementation, so investments may change.

Large scale airside projects are not anticipated for the Minneapolis-Saint Paul International Airport at this time; projects over the next five to 10 years will include landside projects, especially those to balance operations between the two terminals. An Environmental Assessment has been completed for all of the projects at through the year 2020. Planned investments include a potential Terminal 2 expansion, since existing terminals are not capable of handling the passenger numbers forecasted. Additional parking is proposed along with new gates to meet the demand and balance airside and landside operations between both terminals.

Maintenance of existing facilities is also a priority at the general aviation airports, although the most recent long-term comprehensive plans also recommend runway extensions or runway relocations at Airlake Airport, Lake Elmo Airport and South Saint Paul Airport. Before these projects can be completed at these airports, an Environmental Assessment and Environmental Assessment Worksheet will need to be completed.

G. Performance Outcomes

Building on the desired outcomes for our region as identified in *Thrive MSP 2040* and discussed in the Goals and Objectives section– stewardship, prosperity, equity, livability, and sustainability – this plan also addresses federal transportation planning requirements including Environmental Justice and the development of a performance-based transportation planning and programming process as required by Moving Ahead for Progress in the 21st century (MAP-21). Key performance outcomes are summarized here. See Part 2 "Federal Requirements" for more detail and discussion

Equity and Environmental Justice

An important consideration for the Transportation Policy Plan is its impact on all populations in this region, particularly those who have been historically underrepresented, including communities of color, low-income populations, people with disabilities, and people with limited English Proficiency. Past plans were required to adhere to federal requirements for Environmental Justice; this plan further responds to additional aspirations for equity set forth in *Thrive MSP 2040*. In this plan, the terms "people of color" and "low-income households" are used to address the federal Environmental Justice requirements for "minority and low-income." Where regional approaches to pursuing equity are discussed, broader language is used, such as "all races, ethnicities, incomes and abilities."

Specific strategies and investments identified in the Transportation Policy Plan serve to create benefits or mitigate impacts to historically underrepresented populations, including communities of color, low income populations, people with disabilities, and people with limited English proficiency. The following summarizes these key strategies and investments. See Part 3, "Equity and Environmental Justice" for additional detail and discussion.

- **Public Engagement**: The Council prepared the *2040 Transportation Policy Plan* under its Public Participation Plan for Transportation Planning and has built on the extensive outreach and engagement completed for *Thrive MSP 2040*, including targeted community engagement with historically underrepresented communities.
- **Healthy and Cohesive Communities**: Historically, transportation investment decisions that encroached upon, divided, or displaced neighborhoods, cut off access to the regional transportation system or blocked multimodal options have done great harm to communities of color and low-income populations. The *2040 Transportation Policy Plan* seeks to reverse this direction by promoting the development and enhancement of healthy, connected communities.
- **Transit and Pedestrian Safety**: People of color, low-income residents, and people with disabilities currently use the regional transit and pedestrian systems at higher rates than the general population and are more likely to be vulnerable when they are traveling.
- **Provision of Options**: Key to the philosophy of the Transportation Policy Plan is the provision of options. The expansion of options to travel and to access employment and other opportunities without requiring an automobile is especially important to low-income populations, who are less likely to own or have access to a vehicle.

- **Focus on Preservation**: Many of the Transportation Policy Plan's strategies are aimed at improving the preserving the transportation system in the urban center communities, where the highest concentrations of low-income populations and communities of color are currently located.
- **Transit Service Planning**: Many of the Transportation Policy Plan's strategies are aimed at improving the preserving the transportation system in the urban center communities, where the highest concentrations of low-income populations and communities of color are currently located.
- **Spatial Analysis of Investments**: The spatial analysis of investments planned in the Current Revenue Scenario does not result in disproportionately high and adverse impacts to historically underrepresented populations.
- **Accessibility Analysis of Investments**: An analysis of changes in highway and transit accessibility to jobs under the Current Revenue Scenario revealed larger improvements to accessibility for people of color as compared to the general population and people with low incomes.

  Considering the distribution of programs, strategies, and projects identified in the Transportation Policy Plan and the location of historically underrepresented populations in the region, it can be concluded that implementing the plan does not distribute benefits or adverse effects to these populations in a significantly different manner from that affecting the region's population as a whole.

Air Quality

The federal Environmental Protection Agency has designated the Twin Cities region as a limited maintenance area for carbon monoxide. For air quality conformity analysis, this area includes the seven-county Metropolitan Council jurisdiction plus Wright County and the City of New Prague. A map of the area, is included in Appendix D. Pursuant to the Air Quality Conformity Rule, the Council certifies that this plan conforms to the State Implementation Plan and does not conflict with its implementation.

Transportation System Performance Measurement and Monitoring

The federal transportation funding reauthorization passed in July 2012, called Moving Ahead for Progress in the 21st century (MAP-21), requires that the metropolitan planning process establish and use a performance-based approach to transportation decision making to support identified national goals for safety, condition of transportation infrastructure, reduction in highway congestion, reliability of the surface transportation system, environmental sustainability, and reduced delays in federal transportation projects.

The *2040 Transportation Policy Plan* represents the region's first steps toward documenting the performance-based planning approach that this region has been implementing for decades. The required federal process to identify and develop performance measures is anticipated to be complete in early 2017. Key findings from the initial performance measurement are

summarized below. See Part 3, “Transportation System Performance Evaluation,” for more detail and discussion.

By implementing the transportation projects identified in the Current Revenue Scenario, the region is forecast to experience the following outcomes by 2040. The point of comparison is the transportation system that includes the projects in the 2014-2017 Transportation Improvement Program and no additional investments.

- Forecast vehicle miles traveled (VMT) drops almost 444,000 miles (-0.5%).
- Transit ridership increases 20,750 (+5.7% (linked trips) with boardings increasing +7.2%).
- Average trip travel time drops .2 minutes (-1.6%).
- Daily total hours of delay due to congestion drops by more than 44,000 vehicle-hours (-3.2%)

H. Regional Transportation Planning: Mandates and Requirements

State Mandated Comprehensive Guide and Related Systems Plans

The Transportation Policy Plan is based on the regional comprehensive development guide plan that the Council is required by state law (Minn. Stat. 473.145 and 146) to prepare every 10 years for Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties. This comprehensive guide, called *Thrive MSP 2040*, provides a policy framework for regional systems plans for water resources, regional parks, housing, and transportation. The Transportation Policy Plan also fulfills state requirements for land transportation and aviation plans, and incorporates and supports state goals from the Next Generation Energy Act (Minn. Stat., sec 216H.02) to reduce greenhouse gas emissions.

Mandated Federal Metropolitan Transportation Plans The Transportation Policy Plan fulfills all requirements in federal law (23 USC §134 and 49 USC §5303) for a Metropolitan Planning Organization for a region in air quality maintenance status to prepare and update a metropolitan transportation plan at least every four years. The plan also conforms to all air quality-related requirements for metropolitan transportation plan content and development in the Clean Air Act (42 USC §85)

In addition, the 2010 Census identified urbanized (developed) areas of Wright and Sherburne counties (primarily along the I-94 and U.S. Highway 10 corridors) to be included in this plan, though these areas are not otherwise a part of the Metropolitan Council's jurisdiction, which includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties.

I. The Metropolitan Council

Metropolitan Planning Organization

The 1962 Federal-Aid Highway Act required the formation of a Metropolitan Planning Organization (MPO) in areas of the country with a population greater than 50,000. These MPOs direct federal transportation and other funding to communities in their jurisdictions. Since 1967, the Metropolitan Council has been the MPO for the region that includes Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties.

Regional planning for essential services and coordinated development

In 1967, the Minnesota Legislature created the Metropolitan Council as a way to effectively and economically deal with the increasing failures of septic tank systems and resulting contamination of the region's lakes, streams, creeks, and rivers. With almost 300 separate local units of government and 33 municipal treatment plants, leaders realized that the scope of the problem was too broad and expensive for any one municipality to handle individually.

By 1979, under the Metropolitan Waste Control Commission, 21 of the most ineffective plants were closed and four new treatment plants were built. Today, the region is served by eight regional treatment plants and 600 miles of regional interceptors serving more than 100 communities. The system regularly wins national environmental awards.

At the time the Council was created, the regional bus system was privately owned, but had oversight from the Metropolitan Transit Commission (MTC). The Council supported the MTC's effort to take over, expand, and modernize the bus system in 1970.

In 1976, the Minnesota Legislature passed the Metropolitan Land Planning Act, requiring all local governments to prepare and adopt comprehensive plans that are consistent with the Council's mandated metropolitan planning guide and regional systems plans – transportation, water resources, parks, and housing policy. A development guide is prepared once every 10 years, coinciding with the census, the most recent being *Thrive MSP 2040*.

In 1974 the Legislature designated 31,000 acres of city and county parks as regional parks. Today the regional park system consists of 53,000 acres in 49 parks and reserves, 28 regional trails, and six special recreation features – all operated in partnership with local park agencies.

Four agencies merge in 1994

In 1994, the Metropolitan Waste Control Commission, the Regional Transit Board, and the Metropolitan Transit Commission all merged with the Metropolitan Council. This consolidation of essential regional planning and services allows for efficient, orderly, and sustainable regional growth.

This planning model – setting regional development standards, establishing an urban growth boundary, and coordinating growth with essential services such as wastewater treatment and transportation – is virtually unique in the nation; only Portland, Oregon, has a similar model.

J. Civic Engagement

The Metropolitan Council prepared the *2040 Transportation Policy Plan* under the Council's Public Participation Plan for Transportation Planning, which meets requirements of 23CFR§450.316 and federal guidance on Environmental Justice. This plan has built upon the extensive outreach and engagement, including targeted community engagement with historical underrepresented communities that informed *Thrive MSP 2040*. Over the course of three years, the Council engaged with thousands of the region's residents about their vision of the region.

In the future, public engagement will be strengthened under Council commitments in *Thrive MSP 2040* to develop a Public Engagement Plan that defines consultation with historically underrepresented populations, focuses on developing lasting relationships, and works toward making decisions with, and not for, people. The Transportation Policy Plans strategies under "Healthy Environment" commit the Council and its regional transportation partners to foster public engagement in systems planning and project development.

The Council has convened focus groups by reaching out to underrepresented transportation users. Additional widely advertised workshops and other opportunities have been held for the public to provide feedback on the plan. In addition to these efforts, newsletters, the Council's website, and various social media channels continue to be used throughout the process of drafting the plan.

Note: A full summary of engagement efforts related to the *2040 Transportation Policy Plan* will be included in the final version, for consideration by full Council.

Part 2: Implementing the Transportation Vision for the Twin Cities Region

Part 2 of the *2040 Transportation Policy Plan* discusses the regional transportation system in more depth. Section A reviews the existing transportation system by mode, and includes updated statistics such as transit ridership and projects completed since the last plan.

Section B discusses strategies in more detail, and describes how the system as a whole and each mode will meet the goals and objectives introduced in Part One. Where it is relevant, the plan outlines suggestions for supportive local actions.

Section C discusses how local land use decisions can maximize and attract transportation investments, and makes suggestions for local comprehensive plan updates.

Section D summarizes regional transportation finance; and sections E through I lay out the transportation investment plans for each mode.

The Region's Existing Transportation System

While this section is organized by mode, regional transportation functions as a system. Highlighted are major aspects, statistics, and functions of each mode with changes that have occurred since the last plan was released.

The Highway System

The region's highway system is well developed and classified into categories based on function, with principal arterials and A-minor arterials helping people and freight move the longest distances in the region (see Figures A-1 and A-2). This plan deals only with these regional highways, which are owned and operated by the Minnesota Department of Transportation (MnDOT), the counties, and the city of Saint Paul. Principal arterials are limited-access highways and freeways with the highest posted speed limits, such as Interstates 35 and 94 and U.S. Highway 10. A-minor arterials support principal arterials and access to jobs, education, and industry. Along with local roads, these arterials are critical to the functioning of the system. Examples of A-minor arterials include state Trunk Highway 47 (MN 47)/University Avenue, MN 51/Snelling Avenue, MN 5, and Scott County State Aid Highway 21 (Scott County 21)/Dakota County 60.

The region has 17,500 miles of roads (see Table 1). Principal and A-minor arterials make up only 2,600 of those miles (15%) and carry most of the region's motor vehicle traffic (75% of average daily vehicle miles traveled), including buses and trucks hauling freight. The remaining minor arterial, collectors, and local streets total 14,900 miles. They make up almost 85% of road mileage in the region and are the responsibility of local governments. The roadway classification system is discussed in more detail in Appendix D. The greater Twin Cities region

has the eighth largest number of centerline miles per person of road in the United States. This comparatively high amount of roadway is partly because our region has some of the least dense patterns of urban development, requiring more miles of roadway to provide access to the land uses.

To help the regional highway system effectively carry this disproportionately heavy travel load, the federal government, state, and region have invested in freeway management approaches and technology, transit advantages on highways, and the Regional Traffic Management Center. The region's freeway system is recognized as one of the nation's most efficiently managed. See the "Highway Investment Direction and Plan," the "Transit Investment Direction and Plan," and the "Congestion Management Process" for more detail and discussion of freeway management, transit advantages, and highway congestion management [insert links].

Table A-1: Regional Highways and Roads

	Total miles	% of total road miles	% of vehicle miles traveled (all)	% of vehicle miles traveled (buses)
Principal Arterial Highways	700	4%	50%	20%
"A" Minor Arterial Highways	1,900	11%	25%	33%
Other highways and roads	14,900	85%	25%	47%
Total roads	**17,500**	**100%**	**100%**	**100%**

Figure A-1: Principal Arterial System

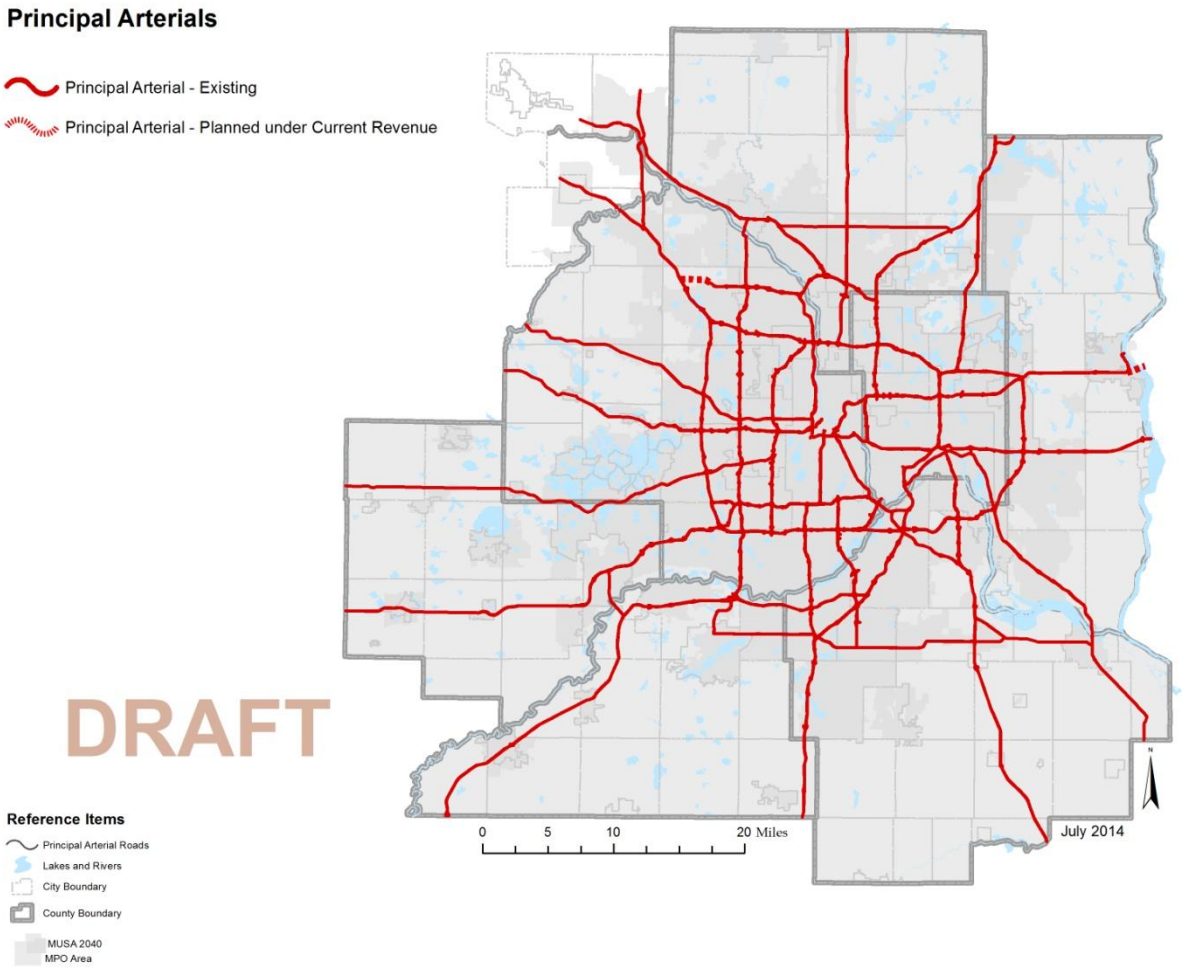
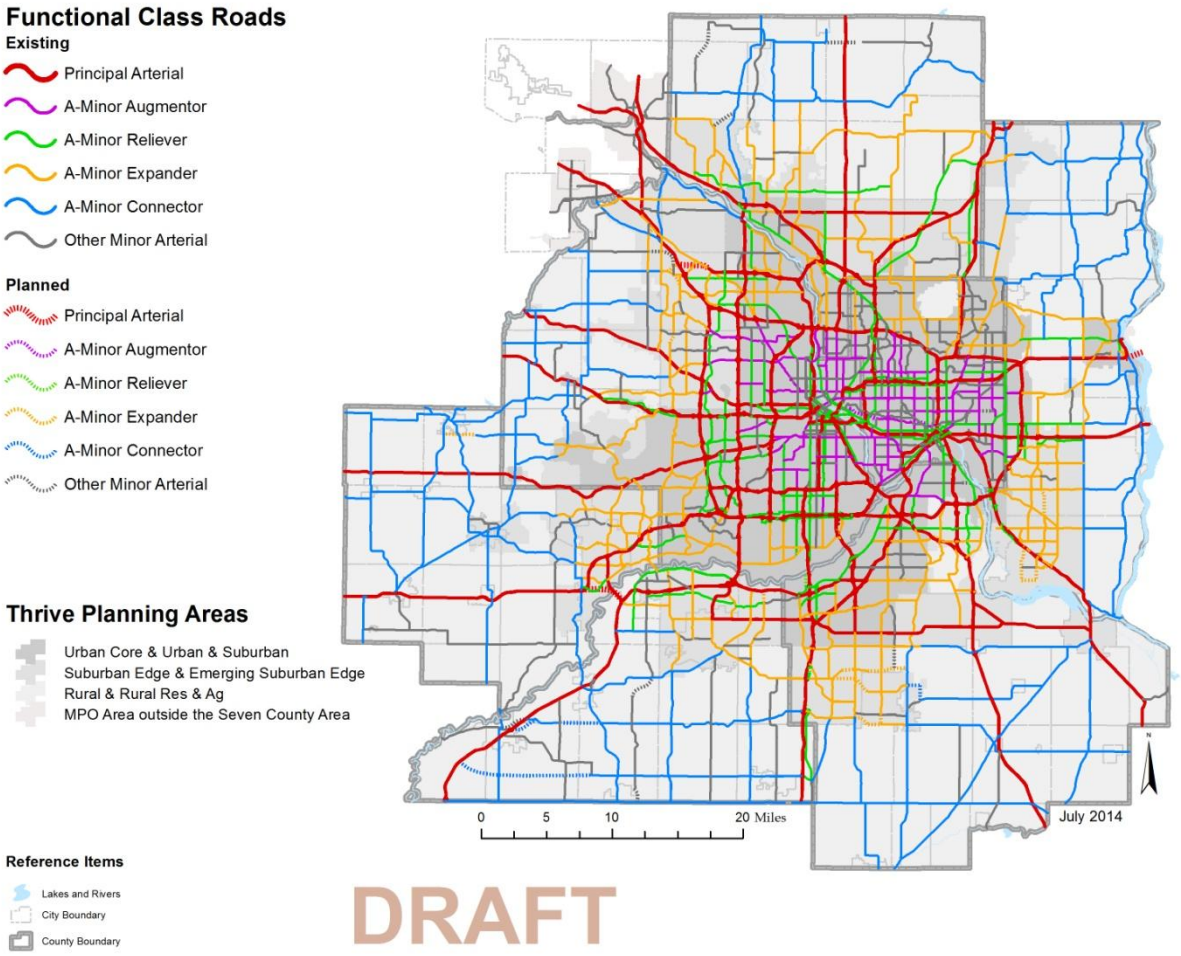


Figure A-2: Principal and A-Minor Arterial System



About 90% of the urban area's freeways, which are limited-access highways like Interstates 35 and 94, are monitored and managed electronically from MnDOT's state-of-the-art Regional Traffic Management Center (RTMC). The RTMC uses traffic management techniques and technology to:

- Additionally, lower cost-high return investments that increase access to areas of significant employment, commerce, and activity (educational and cultural).
- reduce congestion and crashes.
- increase freeway capacity and speeds during rush hours.
- provide quick response to crashes and incidents.
- provide travelers accurate, real-time information via changeable message signs and local traffic radio and TV stations.

Features of the freeway management system are summarized in Table A-2.

Table A-2: Freeway Management System Features

Count (#)	Investment*
680	Miles of fiber optic cable
585	Cameras
169	Dynamic message signs
294	Intelligent lane controls (there are also 19 older model lane controls in operation)
5,500	Loop detectors
450	Ramp meters
101	Ramp meter bypasses for transit and HOV use
300	Miles of bus-only shoulders
220	Miles of FIRST (Freeway Incident Response Safety Team) coverage
10	Miles of I-394 MnPASS lanes (17,800 transponders sold as of 12/2013)
18	Miles of I-35W MnPass lanes (12,200 transponders sold as of 12/2013)
3	511 Traveler Information Sources – Call number, website, and smartphone app
*Generally the investments recorded here are made on Metropolitan Highway System freeways	

The RTMC also manages the operation of the MnPASS system of priced managed lanes. The MnPASS system first opened in May 2005 on Interstate 394, where it replaced high-occupancy-vehicle-only (HOV) lanes. The MnPASS system expanded to the I-35W corridor south of downtown Minneapolis in September 2009, replacing the region's remaining HOV lanes. MnPASS lanes provide a reliable, congestion-free travel option during rush hour times for people who ride transit or in carpools, and single-occupant vehicles and small delivery trucks willing to pay. Single-occupant vehicles and small trucks can buy their way into the managed lanes during rush hour times as long as the target travel conditions are maintained in the MnPASS lane. Any vehicle can use a MnPASS lane for free outside rush hour times. MnDOT's RTMC maintains speeds in the 28 miles of MnPASS lanes by charging a fee for single-occupant vehicles and small trucks. The fee varies in real time according to the number of vehicles and their speeds in the MnPASS lane as measured using road scanning cameras and loop detectors. The price rises between a minimum of $0.25 to a maximum of $8.00 as more vehicles use the lane. See the MnPASS website for more information.

How the Highway System has changed since the Last Plan

A number of important highway projects were completed prior to 2010 using innovative financing techniques. But several factors slowed the pace of highway construction between 2010 and 2014 including debt limits, the Great Recession, and declining highway revenues. Below are lists of projects included in the *2030 Transportation Policy Plan,* adopted in November 2010, which have since started construction or opened to traffic. The Minnesota Laws 2008 Chapter 152 bridge improvement and 2013 Corridors of Commerce programs

advanced several of the projects. However, these funding programs are not sustainable long term.

- Highway projects opened or advancing since 2010:
    - Trunk Highway 36 (MN 36), St. Croix Bridge – new 4-lane bridge and approaches
    - Interstate 494 (I-494)/US 61 interchange and US 61 local access – replace and widen second I-494 bridge, reconstruct interchanges, reconstruct US 61
    - US 169/I-494 Interchange – replace signalized intersections with new interchange
    - MN 610 between US 169 and Hennepin County 81, also Hennepin County 81 to I-94 – construct four-lane freeway
    - US 169 north between Hennepin County 81 and Hennepin County 109 – convert expressway to freeway
    - US 52 Lafayette Bridge over Mississippi River – Chapter 152, Tier I Bridge Replacement
    - US 61 Hastings Bridge over the Mississippi River – Chapter 152, Tier I Bridge Replacement
    - I-35E from I-94 to MN 36 (including Cayuga Bridge) – Chapter 152, Tier I Bridge Replacement and construct MnPASS lane
    - I-694 and MN 51 and US 10 Interchange Reconstruction and Bridge Replacement - Chapter 152, Tier I Bridge Replacement combined with adding one through-lane
    - MN 36 and Rice Street – reconstruct interchange
    - I-94 from MN 101 in Rogers to MN 241 in St. Michael – add one lane in each direction
    - MN 100 from 36th St to I-394 – replace bridges (Chapter 152 bridges), reconstruct pavement
    - MN 101 river crossing – raise road out of floodplain and replace bridge, improve connection to Carver County 61
- Interchanges opened or advancing since 2010
    - MN 101/Hennepin County 144 (Rogers)
    - MN 7/Louisiana Avenue (Saint Louis Park)
    - MN 36/English Street (Maplewood)
    - US 169/Scott County 69 (Shakopee)
    - MN 13/MN 101 (Shakopee)
    - MN 13/Dakota County 5 (Burnsville)
    - US 212/Shady Oak Road (Eden Prairie)
    - I-494/34th Avenue (Bloomington)
    - I-394/Ridgedale Drive (Minnetonka)

- Spot mobility improvements identified through the Congestion Management and Safety Plan (CMSP) process opened or advancing since 2010

    - I-35W from 106th to MN 13 – add southbound auxiliary lane (completed with Urban Partnership Agreement)
    - I-494 at MN 55 – lengthen northbound exit ramp turn lanes and triple left turn lanes; add third lane eastbound to Fernbrook or Plymouth Blvd (to be done with I-494 general purpose lane project in Plymouth)
    - I-494 from I-35W to France Avenue – add westbound auxiliary lane between northbound I-35W loop ramp and exit to France Avenue, option to extend lane thru France Avenue
    - I-94 at MN 101 – add half-mile westbound auxiliary lane and two-lane exit with ramp becoming three-lane mainline northbound over South Diamond Lake through from Rogers at north ramp intersection; complete signal revisions & realignment (American Recovery and Reinvestment Act project)
    - I-94 from US 61 to White Bear Avenue – add eastbound auxiliary lane
    - I-94 at I-394 – restripe westbound I-94 exit to I-394 from tunnel
    - MN 13 from Yankee Doodle Road to Prior Lake – corridor tuning for 24 signals in four zones
    - I-394 – restripe eastbound exits to MN 100 and Xenia Avenue, Auxiliary Lane
    - I-494 at US 212 – interchange modification; extended westbound I-494 to westbound US 212 deceleration lane
    - MN 100 from MN 7 to I-394 – lane capacity and collector-distributor road
    - I-494 from I-35W to MN 100 – westbound auxiliary lane
    - I-494 from Lake Drive to I-694 – connect two auxiliary lanes
    - I-694 bridge over 35W – acceleration lane where it was a yield
    - I-35W from northbound I-694 to Ramsey County 96 – auxiliary lane
    - I-35 at Dakota County 50 – extend parallel acceleration lane
    - I-35W from I-694 to Ramsey County E2 – auxiliary Lane

The Public Transit System

The regional transit system consists of different types of services, programs, and related infrastructure that serve a variety of roles.

Types of Services

Six types of public transit service currently operate in the Twin Cities area:

- **Regular-route bus service** is provided on a fixed, published schedule along specific routes, with riders getting on and off at designated bus stops. Regular-route service is provided using a variety of bus types that operate local service and express service.

- **Light rail transit (LRT)** service is provided by electrically powered trains operating at high frequencies in primarily an exclusive right-of-way. LRT uses specially designed transit stations and amenities.
- **Bus rapid transit (BRT)** service is provided at high frequencies with unique buses and specially designed facilities and amenities similar to LRT.
- **Commuter rail** lines operate on traditional railroad track powered by diesel trains with limited stops. Commuter rail typically serves morning and evening commuters.
- **Dial-a-ride** is a shared-ride service that that allows customers to schedule pickup times. There are two types of dial-a-ride service in the region: general public dial-a-ride and Metro Mobility service mandated by state and federal law.
- **Public vanpools** are made up of five to fifteen people, including a volunteer driver, commuting to and from work destinations throughout the region on a regular basis in a subsidized van. Vanpools typically serve origins and destinations not served by regular-route bus service.

Currently about 216 regular routes operate in the region: 110 local and 102 express. Also in service are two light rail lines (Blue Line and Green Line), one BRT line (Red Line), and one commuter rail line (Northstar).

Transit Service Providers

A number of providers operate transit service in the region. The size, geographic service area, and service types of these providers vary, but the Council works with each provider to ensure the transit system is integrated and cohesive in addressing the region's needs. Providers include:

- Metropolitan Council
    - Metro Transit is the largest transit provider in the region and operates most of the region's regular-route bus service, and all light rail and commuter rail lines.
    - Metropolitan Transportation Services manages a variety of contracted services including regular-route bus, Metro Mobility ADA service, Transit Link general public dial-a-ride, and the Metro Vanpool service.
- Suburban transit providers operate regular route and dial-a-ride service in 12 suburban communities. These providers are: Minnesota Valley Transit Authority, SouthWest Transit, and the cities of Maple Grove, Plymouth, Shakopee, and Prior Lake.
- University of Minnesota provides regular-route bus service around and between the Minneapolis and Saint Paul campuses.
- RiverRider Public Transit provides dial-a-ride and deviated rural-route service to the contiguous urbanized portion of Sherburne County and Wright County.
- Small transit services or individual routes are occasionally operated by other local communities as unique or demonstration services.

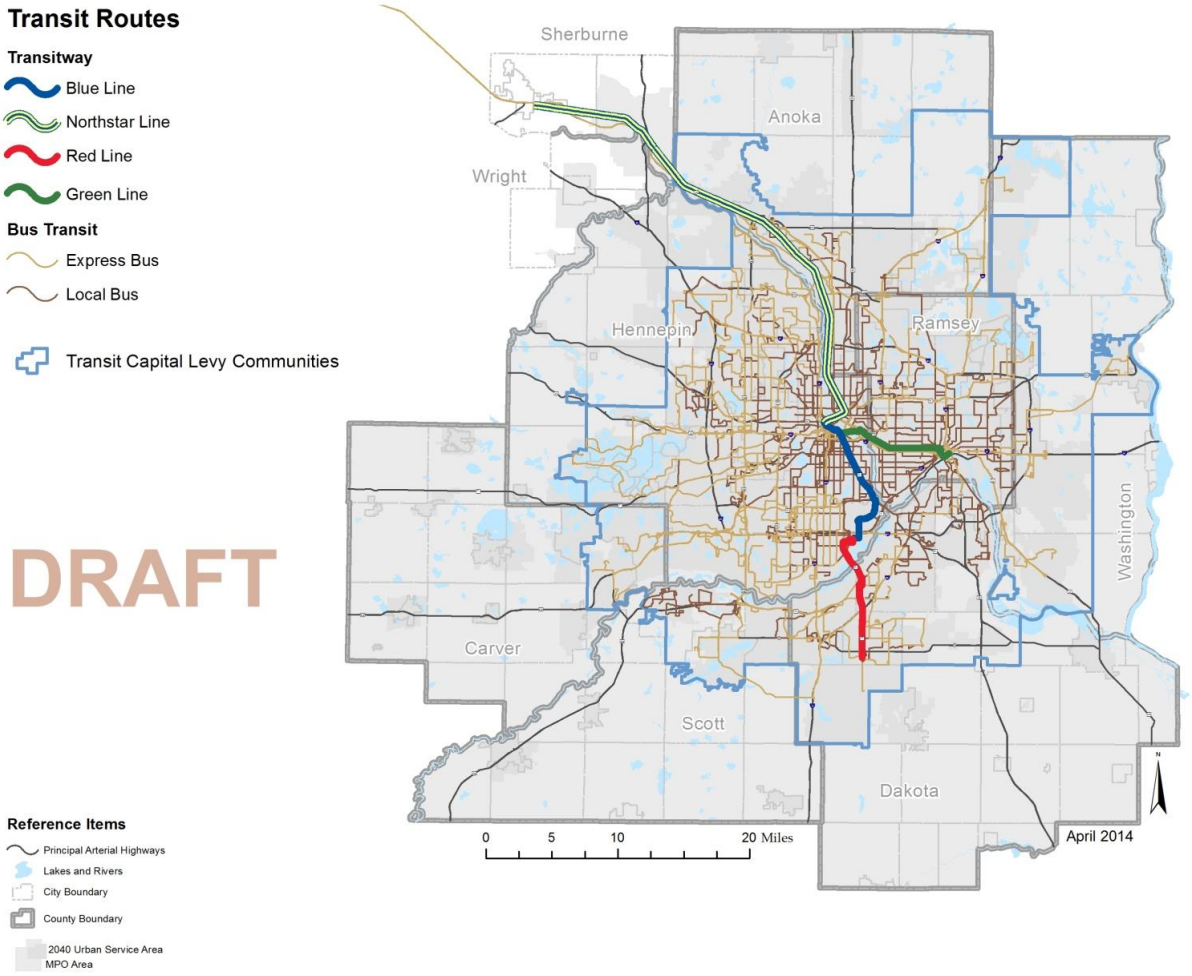
Transit Service Areas

Regular-route service is primarily provided by the Metropolitan Council and the suburban transit providers within the Transit Capital Levy Communities, the communities within the seven-county region where a property tax is levied to pay for transit capital needs. The Transit Capital Levy Communities are established in state law but have changed in response to the growing region, most recently with the additions of Lakeville, Forest Lake, Columbus, and Maple Plain.

The federal Americans with Disabilities Act (ADA) requires complementary service for certified riders who want to travel where regular-route transit service is available but are unable to use the regular-route system due to a disability. The state has established additional service areas beyond that through law.

Dial-a-ride service is provided for the general public in areas of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties where demand cannot be served on regular-route transit. Dial-a-ride service is also available in the contiguous urbanized portions of Sherburne and Wright counties.

Figure A-3: Existing Transit System by Service Type



Transit Capital and Infrastructure

The Union Depot in downtown Saint Paul serves as a multimodal hub that connects local bus service, light rail transit, intercity bus services, Amtrak passenger rail, and potential future transitways. In 2014, a second regional multimodal hub opened in downtown Minneapolis at Target Field Station, where two light rail lines serve and additional lines will come together in the future to meet the downtown Northstar commuter rail station and other services.

The regional transit system requires an average of about 1,300 regular-route buses, 74 light rail vehicles, 18 commuter rail vehicles, 6 commuter rail locomotives, and 425 dial-a-ride buses to operate.

In 2013, the region had 110 park-and-rides with nearly 30,000 spaces served by bus and rail transit. Additional spaces and facilities are planned to open in 2014. The region also has 28 transit centers with facilities that improve waiting conditions and the transfer experience

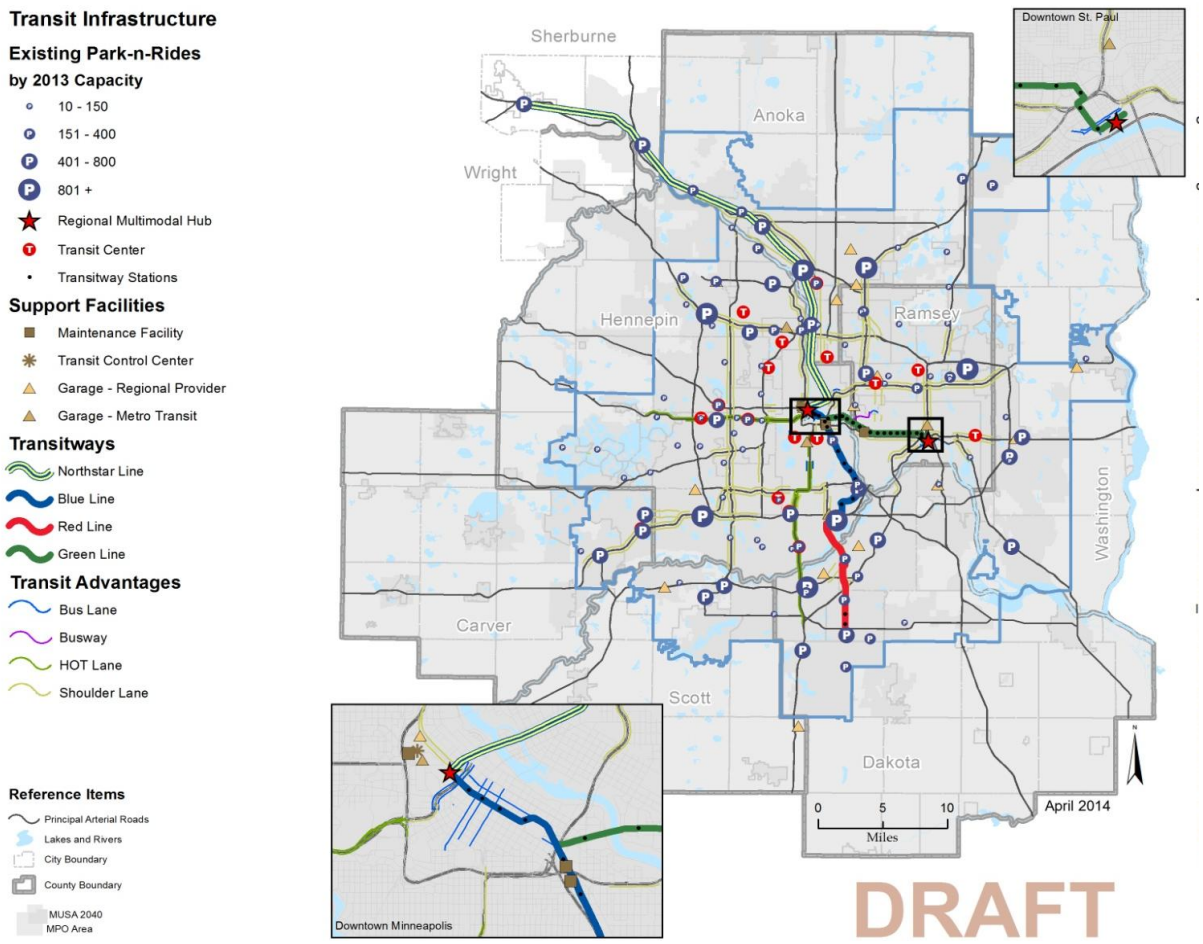
between buses and trains. With the opening on the Green Line in 2014, the region has 47 transit stations serving existing LRT, BRT and commuter rail lines.

Facilities have been built to give transit advantages over general traffic including:

- About 300 miles of bus-only shoulders
- 33 miles of bus-only lanes on city streets
- 94 highway ramp meter bypasses
- 53 miles of managed lanes
- 7 miles of exclusive busways

The region is also supported by a substantial system of transit support facilities, both public and private, that includes bus garages, maintenance buildings, rail support facilities, and operations centers.

Figure A-4: Existing Transit Infrastructure



Transit System Improvements since the Last Plan

Previous versions of the Transportation Policy Plan set a goal of doubling transit ridership by 2030 by expanding the bus system and building a network of transitways. The region has made significant progress in building capacity for future growth in the region. The bus system has expanded to new markets, particularly the reach of express service and park-and-rides, and continues to grow service in the strongest markets:

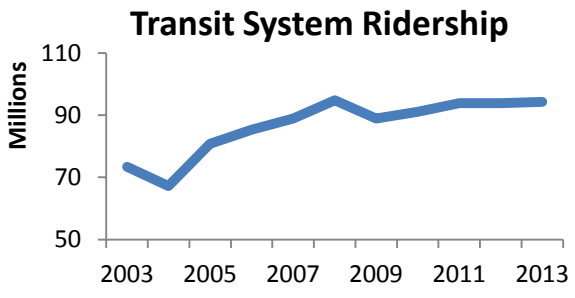
- Park-and-ride capacity has been nearly doubled since 2003, from 15,000 to 30,000, with many facilities newly built or expanded resulting in added capacity for future growth.
- The Urban Partnership Agreement built needed express bus capacity and amenities in downtown Minneapolis on Marquette and Second avenues.
- Urban and suburban local service has been redesigned to better serve new transitways as they open, particularly along light rail lines.
- A number of changes to the transit system have contributed to better performance including improved branding, smartcard fare collection technology (Go To system), low-floor and hybrid vehicles, and improved customer information.
- Transit Link was implemented in 2009 to better coordinate general public dial-a-ride service in the region.

The transitway system is also expanding:

- The all-day frequent service on light rail and highway bus rapid transit lines underwent a rebranding process that was implemented with the opening of the second line (Red Line). The system was branded as "METRO" with color designations for each line.
- METRO Blue Line (Hiawatha) opened as the first light rail line in 2004 and improvements since then have added and expanded stations to meet demand.
- Northstar opened as the first commuter rail line in 2009.
- METRO Red Line (Cedar Ave) opened as the first bus rapid transit line in 2013.
- METRO Green Line (Central Corridor) opened as the second light rail line in 2014.

The result of these improvements has been increased use and demand for transit services. In the last decade, but prior to the opening of the Green Line:

- Transit ridership has increased by about 25%.
- Productivity, measured in riders per hour, has increased by about 17%.
- Park-and-ride usage is up about 80%.



Travel Demand Management

The Metropolitan Council partners with cities and Transportation Management Organizations (TMOs) to work on travel demand management (TDM) that reduces travel demand during peak periods and in congested areas. The Council works with transit providers and TMOs to promote alternatives to driving alone, support flexible work schedules and telecommuting, and works with local communities to link TDM strategies and supportive land use policies. TMOs are public or private partnerships in highly congested locations comprising employers, building owners, businesses, and local government interests. TDM programs are often dynamic and adapt to promote new programs or services as they become available. Some examples include marketing new transit services like the Northstar Line and encouraging biking by promoting the new Nice Ride shared bike program in Minneapolis and Saint Paul.

The Regional Bicycle and Pedestrian System

System Description

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 trips without adding to roadway congestion and vehicle-related air pollution, including carbon and greenhouse gas emissions that are affecting our climate. They make it possible to connect with bus and rail transit while making active lifestyle choices by allowing travelers to incorporate exercise into their daily routines. On a personal level, they reduce the cost of transportation; on national and global levels, they reduce our dependence on nonrenewable 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. Because of these relatively short trip lengths, developing facilities for these modes is most effectively addressed at the local rather than regional level. In addition, the Metropolitan Council does not operate or maintain bikeways and walkways but only facilitates in planning their development and funding. The Council's role is to:

- plan for a regional system that strives to ensure continuity and connectivity between jurisdictions.
- seek to find solutions to regional barriers to biking and walking.

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
- neighborhood alleyways

- urban plazas

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 design level and constructed by private developers. Because of this smaller scale, local jurisdictions are in the best position to oversee pedestrian infrastructure projects. They have decision-making authority over community land use, the construction and maintenance of local streets, and are most familiar with local conditions and needs.

The Council's interest in pedestrian infrastructure is primarily to ensure good pedestrian connections to transit stops and stations, including adequate waiting areas for customers. In addition, the Council's role is to encourage transit-oriented design in all transitway corridors or near bus transit centers. This includes the appropriate spacing and orientation of buildings and structures that encourage and allow for efficient pedestrian movement.

Usable pathways are particularly important to people with disabilities, and the Americans with Disabilities Act (ADA) requires local governments to construct accessible rights-of-way 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, and federal law requires that all agencies with over 50 employees develop an ADA Transition Plan that details the steps to making the community accessible for all.

With regard to bicycling, the Twin Cities region is fortunate to have a well-developed system of on-street bicycle facilities as well as a network of off-road trails. Twin Cities residents have more successfully advocated for bicycle-friendly infrastructure than most North American regions of similar size. The state and region have made investments that mirror this strong 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, the City of Minneapolis has installed several cycletracks, which consist of a system of two-way bicycle thoroughfares, sometimes barrier-separated from busy street traffic. Several new cycletracks are planned within the city.

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.

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 "Investment Philosophy" beginning on page xx). 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 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 efforts for walking and biking have continued and are expanding. 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 study recommends 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.

The Council has been using the San Francisco County Transportation Authority's Cycletracks smartphone application since 2012. It allows cyclists to voluntarily provide individual bicycle trip data. In 2012 and 2013, about 900 cyclists provided data on nearly 6,600 trips. This represents a tremendous wealth of origin/destination and route-preference data that will be used in developing more accurate bicycle forecasting models and could help in prioritizing projects.

Nice Ride Minnesota was formed through the Twin Cities Bike Share Project, an initiative started in 2008. This public bike-sharing system, 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%.

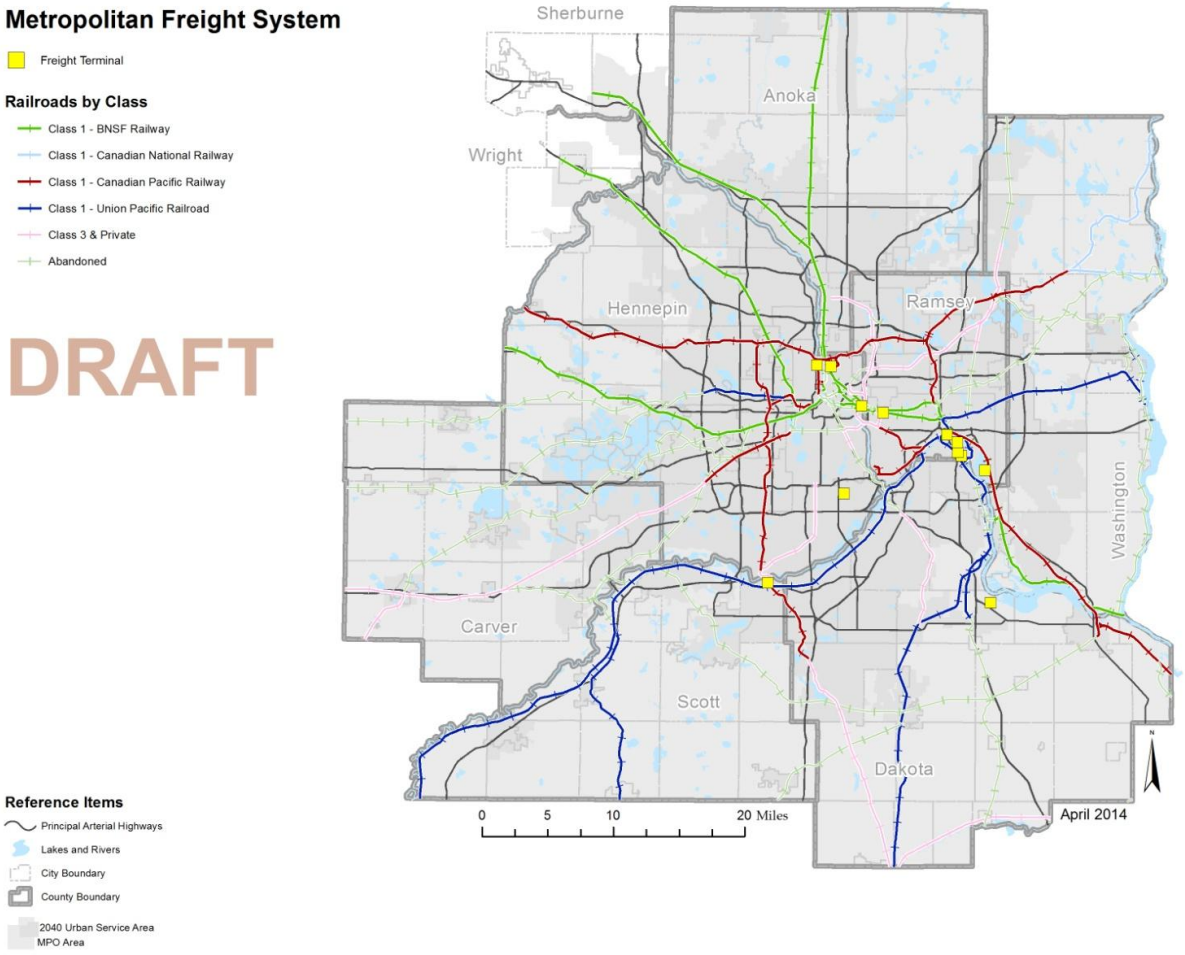
The Freight System

A safe, efficient, high-capacity freight transportation system is essential to the economic well-being of the region and the state. Producers and consumers alike rely on an effective and efficient freight system to prosper. Although regional transportation planning primarily focuses on travel within the region, the region's freight system is inseparable from goods movement nationally and internationally.

Like passengers, freight may move by many modes. Private entities own and operate many of these modes and freight terminal facilities. Public freight-related improvements are limited to those components of the transportation system operated and maintained by the public sector, such as highways and connecting roadways, navigable rivers, river port terminals, and airports. The existing freight system in this region includes several modes of freight travel and intermodal facilities.

A map of freight infrastructure in the region is shown in Figure A-5. The relative share of freight tonnage and value in Minnesota is shown in Figure A-6.

Figure A-5: Metropolitan Freight Infrastructure



Roads

Since the majority of freight in the region moves by truck, highways are a critical element of the freight transportation system and the region's economic sustainability. Interstates, freeways and other roadways, including state and county highways and city arterials, support the movement of goods through the metropolitan region. Principal arterial highway routes also provide important interregional connectors, providing access to the other major economic centers of the state such as Duluth, Rochester, and St. Cloud.

Interstate 94 provides a particularly important freight link, connecting the Twin Cities region to other parts of the Upper Midwest. Figure A-6 shows the relationship of Minnesota to the rest of the country via a heat map of truck flows. The heaviest Minnesota-connected truck activity is via the I-94/I-90 corridor to Chicago and between the Twin Cities, and then west to St. Cloud and Fargo, North Dakota, via I-94. The next highest volume truck corridor is along I-35 between Des Moines, Iowa, and Duluth, Minnesota. The I-94/I-90 corridor to Chicago is of particular

significance as volumes of freight trucked via I-94/I-90 to that city's rail and air freight hubs continues to grow.

Figure A-6: Truck Traffic – Metro and United States

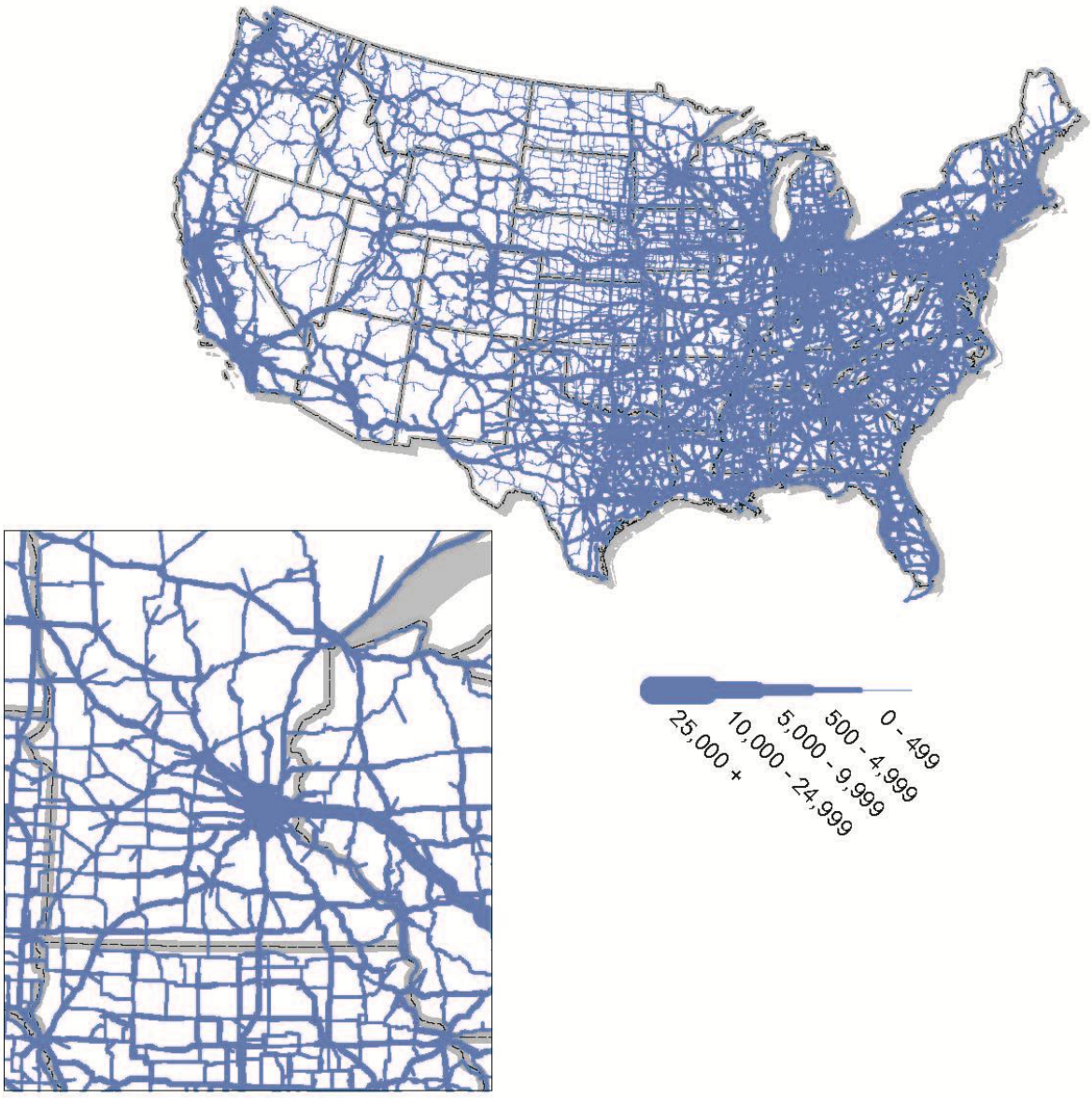
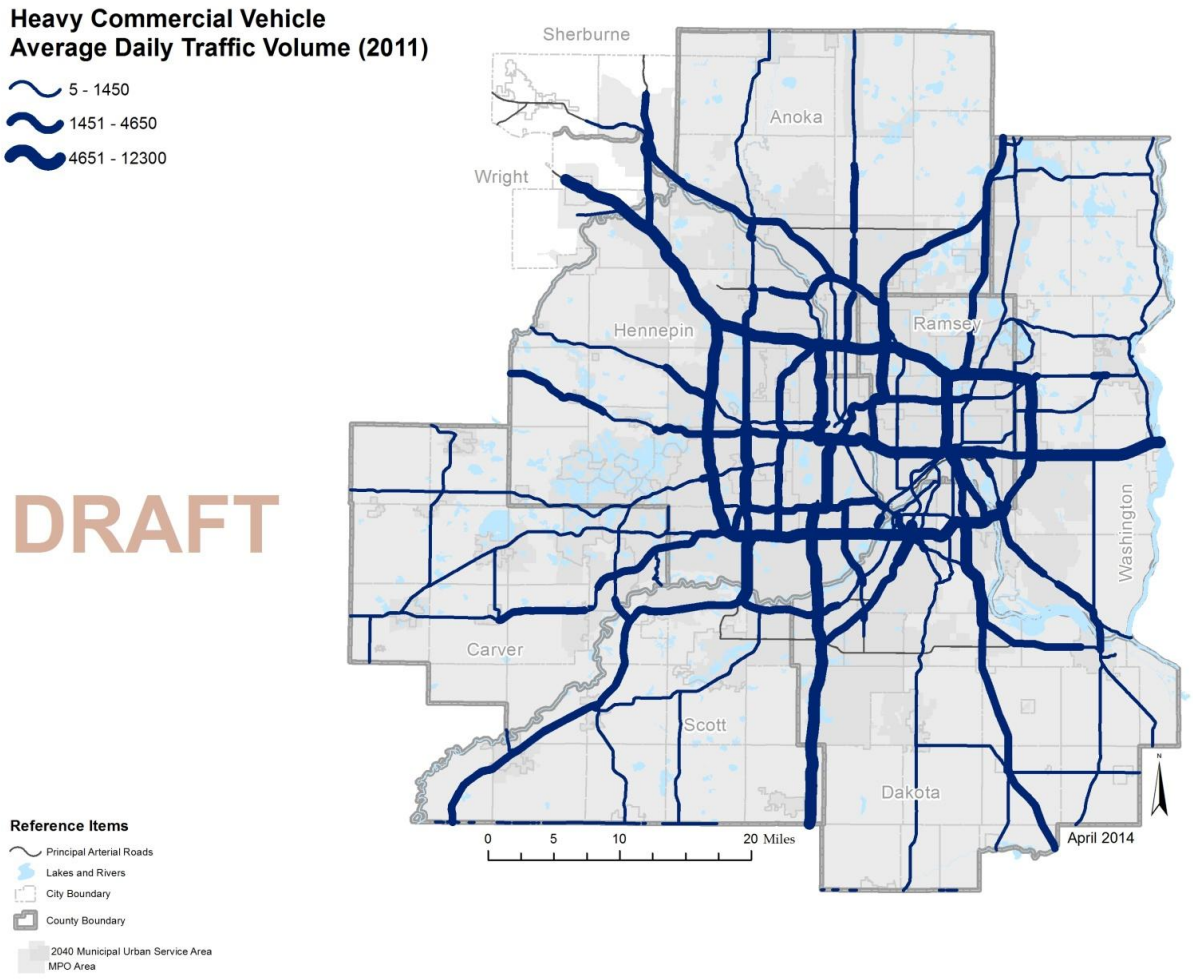


Figure A-7 depicts highway commercial traffic, illustrating the significant dependence of freight traffic on the highway system.

Figure A-7: Commercial Vehicle Traffic



Waterways

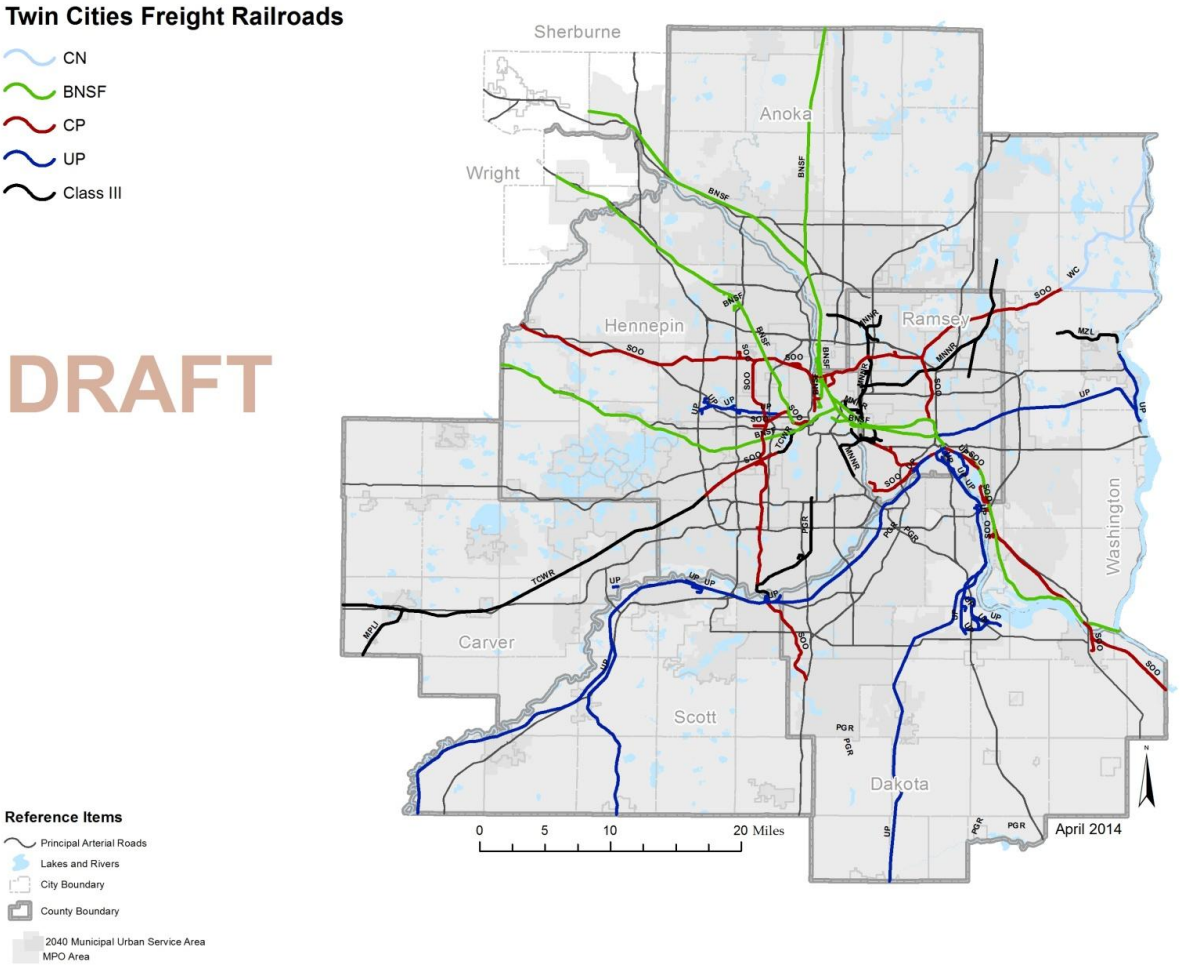
Portions of the Mississippi and Minnesota rivers in the region are navigable by barge via channels and locks maintained by the U.S. Army Corps of Engineers. Barges carry bulk commodities such as grain, minerals, fertilizer, and aggregate to domestic and international markets. Today, there are three river ports in the Twin Cities metro region, including the Ports of Minneapolis and Saint Paul on the Mississippi River, and the Port of Savage on the Minnesota River. Freight is hauled by barge more than 1,800 miles downriver from the Twin Cities to the Port of New Orleans where it is loaded onto ocean-going ships for export to global markets. Most recently, sand for fracture mining of natural gas has begun to be transported by barge down the Mississippi and up the Ohio River to Pennsylvania. The region's three river ports contain 32 active freight terminals, which collectively handle an average of about 8.4 million tons of freight annually.

Rail

Four Class I railroads operate more than 500 miles of track in the metro region: Burlington Northern Santa Fe Railway, Canadian National, Canadian Pacific Railway, and the Union Pacific Railroad Company. Class I railroads link the region with major national markets and also carry a large amount of cross-country freight.

Five Class III (short line) railroads—Minnesota Prairie Line, Progressive Rail, St. Croix Valley, Twin Cities & Western, and Minnesota Commercial Railroad—operate about 160 miles of track in the region. Class III lines predominantly operate local service, generally within 100 miles of the region.

Figure A-8: Twin Cities Freight Railroads



Container-based shipping has substantially increased the efficiency of goods movement over the last 30 years, allowing an easy transition between modes.

- There are two major intermodal container terminals in the region, serving all of Minnesota and parts of western Wisconsin, which are owned and operated by the BNSF and Canadian Pacific Railways.
- There is also a bi-modal rail terminal owned by Union Pacific Railroad and operated by Triple Crown with their unique system of "Road-Railer" containers that operate with drop-down steel wheels running directly on the rails.
- About 20 independently operated truck-rail transload/warehouse centers also support the intermodal distribution of freight in the metro area.

The railroad industry has continuously grown since the 1980s, and rail lines continue as an increasingly important component of the region's freight system, especially for bulk commodities and containers. Over the last few years an increasing number of trains traversing the region are shipping sand west to the Bakken oil fields in North Dakota, and oil east from North Dakota to Chicago and the East Coast.

Congestion occurs on portions of the regional rail system, creating seven major rail bottlenecks in the region. Hoffman Junction east of Union Depot is the most congested bottleneck in the metro area. The mainline tracks of three major Class I railroads intersect at Union Depot where it handles as much as 5% of the nation's freight rail operations (10,000 rail cars per day).

Air

High-value and/or time-sensitive goods are shipped via the air freight system, especially when moving over long distances. High-tech and biomedical companies in the region rely heavily on air freight service.

Minneapolis-St. Paul International Airport (MSP) handles air freight, not only for the Twin Cities metro area, but for most of Minnesota and adjacent parts of Wisconsin and the Dakotas. Major air freight carriers include Fed Ex and UPS as well as commercial airlines. As the headquarters for the former Northwest Airways, MSP became a major regional hub in the 1960s, and today remains a significant passenger hub for Delta Airlines, which merged with Northwest Airlines in 2009, offering direct flights to many worldwide destinations. This has made it possible for the region to continue taking advantage of "belly freight" opportunities for shipping freight in the baggage compartments of passenger aircraft.

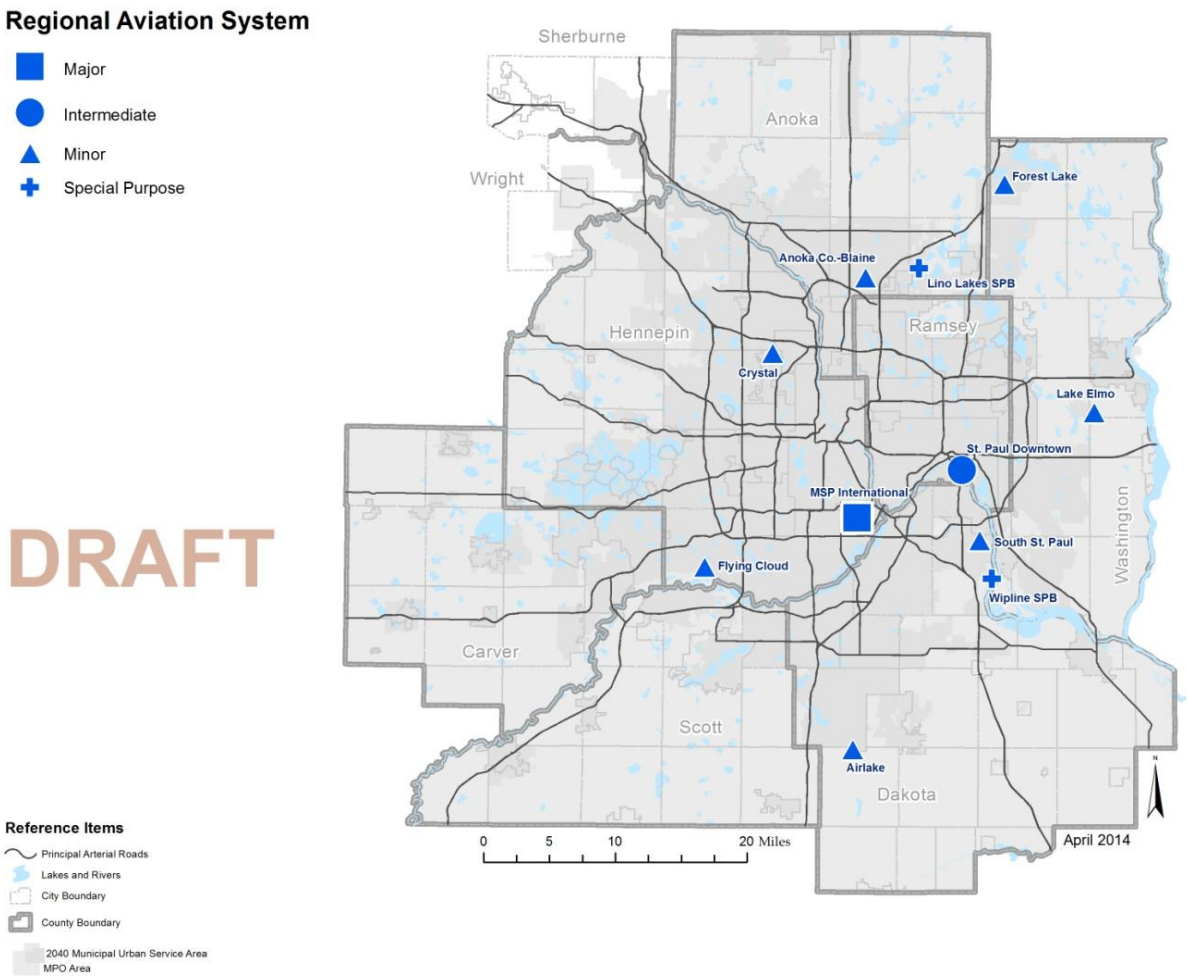
Goods shipped as "belly freight" represents less than 20%, on average, of the overall air freight volume shipped via MSP; more than 80% is shipped via air freight carriers.

The Aviation System

Air transportation provides a national and global reach for the fast movement of people and time-sensitive freight, offering significant advantages for long-distance travel and transport. It differs from other metro systems since its users are primarily going to, or coming from, destinations outside the metropolitan area, rather than traveling within the region.

The Twin Cities region is served by one commercial airport and seven reliever airports for general aviation business and recreational users, as well as two Seaplane bases and a turf runway airport. The airports are classified according to their system role as a major, intermediate, minor, or special purpose facility. Most of the system airports are part of the National Plan of Integrated Airports, making them eligible for federal and state funding.

Figure A-9: Regional Aviation System



In 2012, MSP International Airport,— as a hub serving the Upper Midwest—handled over 33 million passengers, 425,000 aircraft operations, and 198,000 metric tons of cargo.

Because of airports' unique role in interstate commerce, the federal government has significant influence on aviation. Airports are locally owned and sponsored but must meet federal development and operational certification. Air traffic control is a federally operated service provided in federally controlled airspace.

The federal budget impacts the local air-traffic-control tower system. The regional aviation system has both FAA-operated and contracted towers. Currently, contract towers have been subjected to closures due to lack of funding from the federal government, impacting the towers at Anoka-Blaine and Flying Cloud. More towers in the system may be impacted in the future unless federal funding is restored.

Ground Access to the Aviation System

Accessibility, both by air and ground, is important for air transportation efficiency. Ground access to MSP is provided from Highways 5, 77 and I-494, and via two stations on the Blue Line LRT. The interchange at I-494 and 34th Avenue was rebuilt in 2013 to improve roadway access to Terminal 2. Pedestrian and bicycle access is provided via 34th Avenue to Terminal 2, where bikers and pedestrians can also board free LRT service to access Terminal 1. Overall growth, at both the national and regional level, is expected to continue fueling future travel demand and increase current levels of both commercial airport and urban roadway congestion.

The regional system of reliever airports is geographically spaced throughout the area to conveniently serve urban development, population, and employment patterns and maximize economic benefits. Ground access to the reliever airports in the system is adequate at this time.

Passenger Travel beyond the Region

Each mode of transportation best serves a specific trip distance, providing its own unique characteristics and values for interstate and international mobility.

The vast majority of intercity passenger movements occur by automobile, especially on the National Highway System roads maintained by MnDOT and other states. The Twin Cities region is also served by Amtrak passenger rail service and a number of intercity bus companies and airlines.

Amtrak provides connections to Portland, Seattle, and Chicago. Trains arrive and depart once a day in each direction. Starting in the early 1970s, Amtrak served the region from a single station in the Midway area of Saint Paul. In mid-2014, Amtrak relocated its platform and services to the newly renovated Union Depot in downtown Saint Paul. Target Field Station along the BNSF tracks in downtown Minneapolis currently serves the Northstar commuter rail, but could also be utilized by intercity passenger trains in the future. Both Target Field Station and the Union Depot renovation have been constructed as multi-modal stations since the last Transportation Policy Plan was adopted in 2010.

MnDOT has primary responsibility for planning intercity passenger rail in Minnesota; the Council participates on advisory committees to assure that any new or upgraded rail service is consistent with other regional plans. MnDOT is currently studying several potential new high-speed rail services to link the Twin Cities with Chicago, Duluth, and Rochester. For information on these studies see the MnDOT passenger rail webpage. Other recent proposals would

increase the number of conventional-speed train trips to serve increasing demand for passenger travel to eastern Wisconsin and Chicago, as well as to and from the Bakken oil fields in western North Dakota and Montana.

Intercity bus service continues to remain a presence in the region, with recent upgrades to attract passengers. These include WiFi on buses and express services that provide bus travel times that are more competitive with the private automobile. Intercity buses are all privately operated. Providers include Megabus, Greyhound, and Jefferson Lines. Megabus serves Madison and Milwaukee, Wisconsin, and Chicago, Illinois, from the Union Depot in Saint Paul in addition to an informal stop in downtown Minneapolis. Megabus is known for curbside stops without stations so their stop locations can easily change. Greyhound provides service from the downtown Minneapolis intercity bus terminal adjacent to the I-394/7th Street parking garage and from the Saint Paul Union Depot. Jefferson Lines serves over 500 cities and towns in the Midwest, operating out of Union Depot and the downtown Minneapolis intercity bus terminal, as well as MSP airport and numerous college and suburban stops throughout the region. Although the Council has no role in planning or providing these intercity bus services, MnDOT does work with these operators and provides some subsidies to support bus service in Greater Minnesota.

See the aviation section for air travel beyond the region.

Transportation Policy Plan Strategies

Current federal transportation legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21), mandates a streamlined and performance-based process for transportation planning, implementation, and assessment that shows how it will meet national transportation goals. National goals include:

- increasing safety
- maintaining infrastructure in a state of good repair
- reducing congestion
- improving efficiency and reliability
- creating environmental sustainability, and
- reducing project delays.

The legislation also requires metropolitan regions to use a performance-based planning process when identifying how transportation funds will be allocated and to assess progress towards meeting national and regional goals.

This Transportation Policy Plan responds to this mandate in its regional transportation goals and objectives that address and go beyond federal goals to align with the region's new metropolitan development guide, *Thrive MSP 2040*. Regional transportation goals and objectives are summarized in Part 1, "Transportation for a Thriving Region" *(insert link here)*. This section elaborates on those strategies that address how the region will make progress toward achieving the transportation goals and objectives. The strategies identify specific actions, along with responsible actors, that will be taken to help achieve the region's transportation goals.

While the goals and objectives are new to this Transportation Policy Plan, many of the strategies are not entirely new; they represent re-ordered content from the 2030 Transportation Policy Plan. A large number of these strategies have existed in some form for the past several versions of the Plan, although some have been combined or re-phrased to better fit the new format of this plan. As a result, the Council and its regional transportation partners have been advancing the work described in many of them for years. The strategies are organized under a specific transportation goal, but in many instances, a strategy may work toward achieving multiple transportation goals. The term "regional transportation partners" is frequently used in the strategies to broadly include all public entities within the region with responsibility for planning, implementing or maintaining the transportation system including the Council, MnDOT, counties, cities, townships, transit providers, airport sponsors and others.

Supportive local actions indicate how local governments, primarily cities, might have a role in supporting the strategy at the local level. Generally, the supportive local actions are meant to be advisory – indicating best practices or implementation methods that might be used to support the strategy. Most of the strategies in the section "Leverage Transportation

Investments to Guide Land Use strategies" supportive local actions are already focused on local government actions, providing guidance for the development of local comprehensive plans and local transportation system planning.

The actions in these strategies reflect statutory requirements, positive actions, and best practices that advance the transportation system goals and objectives of the Transportation Policy Plan and help meet the federal requirements for a regional performance-based plan. Some of the strategies state that actors "will" do something, and others suggest that actors "should" do something. "Will" statements are positive actions that support the work of the Council and its partners in developing and implementing an effective regional transportation system. "Should" statements are recommendations directed primarily to local governments regarding their own investment and land use decisions. These strategies are provided as best practices or suggestions to guide local planning priorities and considerations. Only one strategy (F1) is a "must" statement, reflecting the statutory authority of the Council to review the transportation elements of local comprehensive plans.

A. Transportation System Stewardship

Goal:
Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.

Strategies:

A1. Regional transportation partners will place the highest priority for transportation investments on strategically preserving, maintaining, and operating the transportation system.

The regional transportation system represents an enormous public investment that is essential to our economy and quality of life. Protecting this investment means maintaining the entire system in a state of good repair. Doing so ensures that infrastructure and all facilities and equipment function well for their entire design life and minimize costs over their life cycle.

Collecting data is important to the efficient preservation, maintenance and operation of all modes and allows for making strategic and timely investments. For example, deferring pavement maintenance can result in higher long-term needed investment in the pavement. *(Insert graph of pavement investment cycle)*

Preserving and maintainting the roadway system applies to bridges and roadway pavement, on-street bicycle facilities and adjacent trails within roadway rights-of-way, as well as all roadside infrastructure such as lighting, traffic signals, noise walls, and drainage systems..

Preserving and maintaining the transit system includes maintaining and replacing vehicles and equipment at consistent intervals, preserving the function and positive customer experience at customer facilities, and maintaining efficient support facilities.

Airport-related investments by public and private sectors in the region should focus on continued development of Minneapolis-Saint Paul International Airport as a major national and international hub. Investments should maximizing the operational effectiveness and value of aviation services and airport infrastructure. For regional airports, airport sponsors should maintain and enhance existing facilities to their maximum capability before investing in new facilities.

Supportive local actions:

- Cooperate with MnDOT, regional transit providers, and regional parks implementing agencies in maintaining and operating shared and multimodal transportation facilities, including setting priorities for snow, ice and debris removal.

A2. Regional transportation partners should regularly review planned preservation and maintenance projects to identify cost-effective opportunities to incorporate improvements for safety, lower-cost congestion management and mitigation, transit, bicycle, and pedestrian facilities.

MnDOT should continue to regularly review highway maintenance and reconstruction projects to identify opportunities to integrate safety and lower-cost highway congestion management and mitigation. A similar approach should be used by cities and counties as they undertake local highway projects.

Regional transit providers should review preservation and maintenance projects to identify opportunities to improve the transit system and its integration with other systems. In addition, technology and design improvements in transit systems can be incorporated into maintenance, preservation, or replacement projects to provide a better customer experience or more efficient system.

Airport sponsors and air-service providers should establish airport business plans and agreements to deliver high-quality services at affordable prices to users. Airport sponsors should operate within a long-term financial plan that stresses maximizing non-regional funding sources to avoid or minimize financial impacts on regional taxpayers and maintaining a high bond rating for aviation improvements.

Supportive local actions:

- Plan and implement bicycle and pedestrian improvements as part of roadway projects. Where these travel options are needed and can be safely accommodated, this approach can take advantage of cost-effective opportunities to provide for pedestrian sidewalks or trails, on-street bicycle lanes, signage, improved signal timing and other improvements.
- Coordinate preservation and maintenance projects with MnDOT, regional transit providers and other affected local governments when locally planned projects affect their systems.

A3. The Council and regional transit providers will use regional transit design guidelines and performance standards, as appropriate based on Transit Market Areas, to manage the transit network, to respond to demand, and balance performance and geographic coverage.

The Council and regional transit providers will look for opportunities to reinvest resources from underperforming routes and areas to those routes meeting regional transit performance standards and demonstrating demand for additional investment. When managing the transit system, the Council and regional transit providers will consider input from local communities, existing and potential riders, and the business community and also consider the impacts and benefits to low-income groups and people of color.

The Council and regional transit providers will also look for opportunities to improve the performance of the transit system and adapt to current conditions by managing routes to meet regional transit performance standards. As the transit system continues to expand, new and improved routes and services will also be evaluated against regional transit performance standards. Transit design guidelines and performance standards are included in Appendix G.

Supportive local actions:

- Work with transit providers to identify route changes that will better suit community needs.

A4. Airport sponsors will prepare a long-term comprehensive plan (LTCP) for each airport every five years and submit it to the Metropolitan Council for review to ensure that plans for preservation, management and improvement of infrastructure at each airport are consistent with the regional aviation system plan.

Regional aviation facilities are under various types of public and private ownership. The scope, application and content of a long-term comprehensive plan is defined for different sponsors in Appendix K (*provide link to LTCP requirements here)*. If a substantial change to the approved plan is deemed necessary and cannot be addressed as part of the regular update, the long-term comprehensive plan should be amended.

B. Safety and Security

Goal:
The regional transportation system is safe and secure for all users.

Strategies:

B1. Regional transportation partners will incorporate safety and security considerations for all modes and users throughout the processes of planning, funding, construction, operation.

Crashes resulting in fatal and serious injury are the major highway safety concern. The state and counties have done much work on this issue in recent years, producing the Minnesota Strategic Highway Safety Plan (MSHSP) and county highway safety plans. These resources should be considered in developing roadway improvements.

The major transit safety concerns include addressing accidents involving transit vehicles, especially light rail and commuter rail trains. Providing safe crossing of rail transit facilities is important in designing rail systems. Regional transit providers will emphasize improvements to areas with high vehicle crash rates. Additional details on transit security are discussed in Strategy B5.

Safety is the number one priority in planning and developing aviation facilities and services. While the Federal Aviation Administration is responsible for safety of the airspace, all levels of government should work together to ensure that only appropriate land uses are allowed in runway approach areas.

Supportive local actions:

- Address safety and security considerations in planning and implementing the local transportation system.
- Adopt local ordinances controlling all tall structures 250 feet or more to minimize potential general airspace hazards.

B2. Regional transportation partners should work with local, state, and federal public safety officials, including emergency responders, to protect and strengthen the role of the regional transportation system in providing security and effective emergency response to serious incidents and threats.

Regional transportation partners should consider security needs as contained in federal directives when planning, constructing and operating facilities for all modes of transportation.

The region's highways are crucial when responding to emergencies involving fire, ambulance, disaster, and evacuation. Principal and minor arterials provide valuable alternate routes as essential redundancy for responding to emergencies. For example, I- 94, I-694 and Trunk Highways 280 and 100 provided critical highway and bus transit capacity during the I-35W bridge collapse and reconstruction.

Regional transit providers can also play an important role in emergency response, such as moving people away from a dangerous situation or area and providing safe shelter in transit vehicles or major customer facilities.

Supportive local actions:

- Participate in multi-agency efforts to plan and prepare for transportation emergency response.

B3. Regional transportation partners should monitor and routinely analyze safety and security data by mode and severity to identify priorities and progress.

The State of Minnesota – MnDOT, Department of Public Safety, and Department of Health – regional transit providers, counties, and cities are doing important work in identifying, prioritizing, and addressing traffic and transit safety issues. The Council will continue to support these traffic and transit safety efforts, including direction provided in the Minnesota Strategic Highway Safety Plan, county highway safety plans, local comprehensive plans, and regional transit provider operations. The Council will initiate a new effort to translate the data and many efforts into safety priorities that address the highest needs for all modes for the metropolitan area. Transit providers will monitor the state of good repair for facilities and other investments to ensure safety for passengers, operators, and other staff.

Supportive local actions:

- Maintain, monitor, and routinely analyze local safety and security data to identify priorities for investment and coordinate this data with regional efforts.

B4. Regional transportation partners will support the state's vision of moving toward zero traffic fatalities and serious injuries, which includes supporting educational and enforcement programs to increase awareness of regional safety issues, shared responsibility, and safe behavior.

While engineering and emergency response are important for highway safety, other important areas include education, enforcement and legislation. Efforts in these areas are typically led by agencies whose jurisdiction extends beyond transportation, but transportation entities can be important partners in these efforts. The Department of Public Safety leads state education efforts focused on giving drivers information they need to avoid hazardous driving practices and choose responsible behavior. Enforcement efforts focus on ensuring compliance with traffic laws to change driver behavior and reduce unsafe driving practices. In recent years, key highway safety education, enforcement, and legislative efforts have focused on aggressive driving, distracted driving, speeding, impaired driving, reducing the number of people traveling without seatbelts or appropriate car seats, and motorcycle driver training.

In addition to general traffic safety, local and state agencies are encouraged to coordinate with state safety efforts to educate the public in the proper use of sidewalks and crosswalks by pedestrians and proper use of shared lanes, bicycle lanes and trails by bicyclists. These safety programs include the "Safe Routes to School" programs that promote bicycling and walking safety for school students. Programs should educate motorists regarding bicycle and pedestrian roadway and trail crossing laws (including intersection and mid-block crossings), how to safely interact with bicyclists riding legally in the roadway, and to be aware of pedestrians and bicyclists.

B5. The Council and regional transit providers will provide transit police services and coordinate with public safety agencies to provide a collaborative approach to safety and security.

The transit system employs and carries large numbers of people and can be both an important system in responding to threats, and a target for serious threats. An important emphasis for the transit system is responding to safety and security concerns in a timely manner. The transit system covers a large geographic area, and many jurisdictions and incidents often occur on moving vehicles. This requires significant coordination between transit providers and public safety agencies. Most of the transit system is supported by Metro Transit Police, which is dedicated to providing police services to transit safety and security. In addition to Metro Transit Police, all regional transit providers coordinate with local public safety agencies, ensuring a safe and secure environment in and around the transit system.

The transit system also has security systems to monitor possible threats to people on and around transit vehicles and facilities. This system will continue to play an important role in improving the real and the perceived safety and security for transit employees and customers.

Supportive local actions:

- Coordinate local public safety agencies with regional transit providers to respond to incidents on the regional transit system.
- Use local public events as an opportunity to educate residents about potential security threats and natural disaster response procedures.

B6. Regional transportation partners will use best practices to provide and improve facilities for safe walking and bicycling, since pedestrians and bicyclists are the most vulnerable users of the transportation system.

Many best practice guidelines for planning and design are available for improving bicycling and walking safety and general experience. Some of the more pertinent guides include:

- *Minnesota's Best Practices for Pedestrian/Bicycle Safety* (MnDOT, 2013)
- *Best Practices Synthesis and Guidance in At-Grade Trail-Crossing Treatments* (MnDOT, 2013)
- *Guide for the Development of Bicycle Facilities*, 4th ed. (American Association of State Highway Transportation Officials, 2012)

Intersections and pedestrian crossings (including intersection crossings, mid-block crossings, and trail crossings) pose key issues for drivers, bicyclists, and pedestrians. Safe rail crossings are particularly important for transit customers at light rail and commuter rail stops, since these are some of the busiest crossing points in the region. Transit providers and local

governments should work together to design and provide effective and safe crossings, and to discourage bike and pedestrian crossings at unauthorized locations.

Supportive local actions:

- Coordinate with Metro Transit and other rail providers to improve safe crossings of rail facilities.
- Incorporate bicycle and pedestrian facilities in local plans.
- Use best practices to enhance bicycle and pedestrian safety.

B7. Airport sponsors and air service providers will provide facilities that are safe, secure and technologically current.

The regional aviation system is essential to the regional economy and should be developed, operated, and maintained to appropriate standards, to include making necessary improvements to the air traffic control system. Airport sponsors should provide facilities that are safe and secure, affordable, and technologically current for all facets of the aviation industry.

C. Access to Destinations

People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.

C1. Regional transportation partners will continue to work together to plan and implement transportation systems that are multimodal and provide connections between modes. The Council will prioritize regional projects that are multimodal and cost-effective and encourage investments to include appropriate provisions for bicycle and pedestrian travel.

Planning and design of highway and street corridors must continue to incorporate and improve the safety and mobility needs of all users, including trucks, buses, trains, pedestrians and people riding bicycles. The region and state have been pioneers in highway system management to increase multimodal efficiency. These efforts must be continued and expanded in the future. MnDOT, counties, and cities should provide advantages for transit on highways and streets, including bus-only shoulders, transit stations, bus bump-outs, transit signal priority, and ramp meter bypasses. MnDOT, counties, cities, and transit providers should provide facilities for people to safely walk or bike across highways, streets, and other major barriers in urban, suburban, and rural areas, especially on bridges.

MnDOT, counties, cities, and transit providers should also provide for people to safely walk or bike on most highways and streets in the region (see Strategy C2 below). The needs of bicyclists and pedestrians must be addressed when roadway bridges are built or rebuilt.

A strong bicycle and pedestrian system is essential to provide valuable connections to the regional transit system and improve mobility for people with disabilities. Since the experience of transit customers generally starts with walking, improvements to the pedestrian environment are essential to transit. This includes providing facilities but also considering the other elements of design and urban form that contribute to a good pedestrian experience.

Supportive local actions:

- In local comprehensive plans, coordinate the local transportation element for streets, pedestrian and bicycle facilities with county, regional, state agencies and adjacent communities.
- Continue to implement universal accessibility in all new construction and rehabilitation of transportation infrastructure to comply with the federal Americans with Disabilities Act.

C2. Local units of government should provide a system of interconnected arterial roads, streets, bicycle facilities, and pedestrian facilities to meet local travel needs using Complete Streets principles.

An interconnected, multimodal local transportation system helps reduce highway congestion, provides access to land uses, and expands travel options. Local and county governments should plan a system of multimodal interconnected collector roads and minor arterials to serve short and medium-length trips.

A local transportation system should serve the full range of types of trips. Minor arterials serve more and longer trips, sometimes at faster speeds, to help reduce demand on metropolitan highway system – also called principle arterials − and ensure that traffic does not spill over to local streets. Local streets provide a basic level of access to land, including homes and businesses. The functional classification system in Appendix D *(link here)* identifies roads by the function they serve. Cars, bicyclists, pedestrians, transit, and trucks need to be considered on all of these roads, and accommodated where appropriate.

"Complete Streets" is a term used to describe an approach to transportation planning, design, and construction that considers the needs of all potential users – motorists, pedestrians, transit vehicles and users, bicyclists, commercial freight trucks, and emergency vehicles – moving along and across roads and through intersections. The goal of complete streets, as described in MnDOT's *Complete Streets Policy and Procedures Technical Memorandum*, is to:

- Develop a balanced transportation system that integrates all modes via planning that includes each transportation mode (that is, transit, freight, auto, bicycle, and pedestrian) and
- Include transportation users of all types, ages, and abilities.

Complete Streets does not mean “all modes on all roads.” Instead, implementing Complete Streets principles ensures that the accessibility and safety of all travelers be appropriately considered and incorporated throughout any road project’s planning, design, and construction.

MnDOT, counties, and cities should continue to work together to provide facilities for people to bike or walk along most streets and highways in urban and in some rural areas, with the exception of freeways. A well-connected collector road network is important to support non-motorized modes parallel to major highways and within neighborhoods and activity centers. Local streets, especially where traffic calming measures have been implemented and traffic signals are provided at major intersections, can provide better bicycle and pedestrian comfort, air quality, and safety than highways with higher traffic volumes and speeds.

Minor arterials in suburban areas often have sufficient right-of-way to add separated off-road bicycle facilities, but in the urban core, narrower rights-of-way are more common. On-road bicycle facilities are appropriate along minor arterials where there are no effective parallel routes and the bicycle or pedestrian facility can be designed to support safe travel for all users. The addition of the bicycle or pedestrian facility should also maintain the road's function and capacity for other modes. More specific discussion of how bicycle facilities might be provided on arterial and local roads is provided in the Bicycle and Pedestrian Investment Direction.

Major transit investments like transitways and transit centers also need to be highly accessible for pedestrians and bicyclists. It is important that transit facilities are designed to integrate with existing local transportation systems and land use and to be supportive of plans for higher density development.

Supportive local actions:

- In local comprehensive plans, develop and adopt local transportation plan elements for streets, pedestrian and bicycle facilities that serve the community, provide direct connections to job concentrations, create an integrated system with adjacent communities, and implement and connect to the Regional Bicycle Transportation Network.
- Adopt a Complete Streets policy and identify roads that should be emphasized for different uses (for example, transit, bicyclists, pedestrians and freight). All roads should be designed to accommodate emergency vehicles.

C3. The Council, working with MnDOT, will continue to maintain a Congestion Management Process for the region's principal arterials to meet federal requirements. The Congestion Management Process will incorporate and coordinate the various activities of MnDOT, transit providers, counties, cities and transportation management organizations to increase the multimodal efficiency and people-moving capacity of the National Highway System.

The region has a well-developed and managed freeway system. In previous long-range transportation plans, the emphasis was to meet forecast demand by adding highway capacity. However, no region in the country has successfully "solved" highway congestion. Current trends also suggest that the transportation system is experiencing new resource, policy, technology, and local and global economic conditions that differ from those of the past.

In response, this Transportation Policy Plan recognizes that system-wide highway congestion will not be eliminated or significantly reduced. This plan, including the Congestion Management Process, emphasizes that the impacts of congestion should and can be eased by increasing the people-moving capacity of the multimodal transportation system, while minimizing future demand on the highway system. Mitigating the impacts of congestion will be achieved by implementing supportive land use policy; improving traffic management and more efficient use of existing highway system capacity, pavement, and right-of-way; implementing a MnPASS system and limited strategic highway capacity enhancements; and implementing alternatives to driving alone. Through the Congestion Management Process, MnDOT will work with the Council and other partners to monitor and evaluate congestion mitigation strategies and projects being implemented and modify the approach in the future as needed.

This plan emphasizes that limited resources must be focused on providing the most system-wide transportation benefit. Where strategic enhancements to highway capacity are considered, MnDOT and local governments will not design highway projects with the intent to eliminate congestion. Rather, highway system performance will be measured by people-carrying capacity and travel time reliability instead of more traditional measures such as level of service. Part III of the Transportation Policy Plan *(link to Congestion Management Process here)* includes a description of the Congestion Management Process.

C4. Regional transportation partners will promote multimodal travel options and alternatives to single occupant vehicle travel and highway congestion through a variety of travel demand management initiatives, with a focus on major job, activity, and industrial and manufacturing concentrations on congested highway corridors and corridors served by regional transit service.

Travel demand management (TDM) strategies emphasize reducing vehicle miles traveled and trips made driving alone. These strategies should be directed at increasing the use of travel options, easing congestion, reducing pollution, and encouraging transportation-efficient land development.

TDM strategies are most successful in areas with high travel demand and potential for using travel options. Thus, the Council and its TDM partners will focus local and regional TDM efforts on employment centers and corridors with significant investments in travel options. Travel options include transit service, transit and ridesharing advantages like MnPASS lanes, high-occupancy vehicle lanes that bypass freeway ramp meters, bus-only shoulders, and biking and walking facilities.

The Council will provide TDM technical assistance and financial incentives to transportation management organizations (TMOs), especially those located in areas with high levels of congestion. The Council and its TDM partners will also provide assistance to local units of government to implement TDM strategies and to employers and property owners. Other TDM strategies include the development of TDM plans for specific sites or new developments, telework and flexible work schedule programs, avoiding the oversupply of parking and pricing strategies for parking, and employee training programs.

Supportive local actions:

- Support, collaborate, and implement travel demand management policies, programs, and land use regulations in collaboration with other government agencies, transit providers, travel management organizations, businesses, employees, and property owners.

C5. The Council will work with MnDOT and local governments to implement a system of MnPASS lanes and transit advantages that support fast, reliable alternatives to single-occupancy vehicle travel in congested highway corridors.

MnPASS is an integral part of a multimodal transportation system, and helps people reach job concentrations faster and more efficiently. MnPASS lanes provide a reliable, congestion-free travel option for people who ride bus transit, people who ride in carpools and solo drivers who are willing to pay a fee during peak rush-hour periods. MnPASS can improve efficiency by moving more people through highway corridors during congested periods. It provides commuters and small commercial vehicles with greater travel-time reliability and choice. It encourages greater park-and-ride use and increases car and vanpooling. MnPASS also improves transit service and increases ridership, particularly on express bus service.

The Council and MnDOT will continue to implement transit advantages on the freeway system that allow transit vehicles to bypass congestion and provide a faster, more reliable travel time. The primary system of transit advantages in the region includes bus-only shoulders, ramp-meter bypasses, and MnPASS lanes. MnDOT will continue to analyze the need for new transit advantages and maintain existing transit advantages to the greatest extent possible.

Transit advantages are also used to improve local transit circulation. Examples include exclusive bus lanes, traffic signal timing and signal priority, and queue jumps. The Council and transit providers will work with local governments to determine where these improvements may be needed and identify possible implementation solutions.

In addition to moving people more expeditiously, implementing MnPASS lanes will provide benefits to local and regional freight moved by truck. MnPASS lanes will directly benefit shipments by single-unit commercial vehicles by allowing those vehicles to “buy in” to the lane to receive the benefit of an uncongested trip. The development of a MnPASS lane

system may also benefit traditional freight movements by large trucks, because additional MnPASS lanes can reduce congestion in adjacent general purpose lanes.

Supportive local actions:

- Identify opportunities for transit advantages on the local road system that improve the attractiveness of the transit system and coordinate their implementation with regional transit providers.

C6. The Council will support an interagency approach to preserving right-of-way for future transportation projects that are consistent with the Transportation Policy Plan.

Rights-of-way for future transportation infrastructure are difficult to obtain. Consequently, right-of-way should be preserved for public use ss project locations become certain and property becomes available. The Council's Right-of-way Acquisition Loan Fund (RALF) will be used to preserve right-of-way for state highway projects consistent with the Transportation Policy Plan.

Railroad right-of-way that is proposed to be abandoned provides an opportunity to use these linear corridors for transit, trails, parks, or other systems that could serve a variety of roles. The appropriate agencies that could be involved in preserving rail rights-of-way may vary depending on the short- and long-term intended role. An interagency approach to determining that role will be valuable in ensuring that all possible uses are considered.

Supportive local actions:

- Identify future transportation right-of-way needs through comprehensive planning and coordinate with other transportation providers.

C7. Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput.

MnDOT will work to address capacity problems across the region's entire principal arterial system. MnDOT and local units of government with jurisdiction over principal arterials will:

- first, address capacity issues by working to apply management improvements such as access management, improved or expanded traffic management technologies,
- second, seek spot mobility improvements identified through processes such as MnDOT's Congestion Management and Safety Plan, and
- third, identify affordable MnPASS or other strategic highway capacity enhancements if the congestion issues have not been adequately addressed.

Where possible, capacity should be added in the form of MnPASS lane capacity. MnPASS lanes also serve people who carpool or ride transit, key strategies for increasing person throughput since a bus can move as many as 90 passengers on just one vehicle.

Added capacity can be permanent or actively managed to be open only during certain hours, conditions, or for certain vehicles. All projects for expanding principal arterial capacity will implement the lower-cost/high-return approach to investments by maximizing use of available highway capacity, pavement, and right-of-way.

Traffic management technologies, spot mobility improvements identified through the Congestion Management and Safety Plan, MnPASS, strategic capacity enhancements, and regional highway access improvements to job, activity, industrial, and manufacturing centers are discussed further in the Highway Investment section. Access to principal arterials is discussed in Strategy C11.

C8. Regional transportation partners will prioritize all regional highway capital investments based on a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

All regional highway projects must address the plan goals of safety and security, transportation system stewardship, and healthy environment. After meeting these requirements, the following factors will be used to prioritize highway capital projects, including MnPASS, strategic highway capacity enhancements and access improvements:

- Improves regional economic vitality
- Improves critical regional highway system connectivity
- Increases regional highway system travel time reliability
- Supports regional population, household, and job forecasts and local comprehensive plans
- Supports regional balance of investments

When addressing highway capacity issues, regional transportation partners should work to first apply traffic management technologies to improve traffic flow without adding physical highway capacity. The next category of investment should be to investigate implementing the lower-cost/high-return approach to investments in spot mobility improvements. If traffic management technologies and spot mobility improvements do not address the highway capacity issue identified, only then should adding larger physical capacity – sometimes called expansion improvements − be explored. Expansion improvements include MnPASS lanes, strategic capacity enhancements, and highway access improvements.

The regional objective of providing a congestion-free, reliable option for transit users, carpoolers and those willing to pay through MnPASS lanes is the region's priority for expansion improvements. Strategic capacity additions to general purpose lanes should only be considered if adding MnPASS lane capacity has been evaluated and found not to be feasible, the improvement is affordable, and it is approached using the philosophy of lower-cost/high-return on investment.

C9. The Council will support investments in A-minor arterials that build, manage, or improve the system's ability to supplement the capacity of the principal arterial system and

support access to the region's job, activity, and industrial and manufacturing concentrations.

MnDOT, counties, and cities within the seven-county region have identified the roads in the minor arterial system, called A-minor arterials, that provide the most support to the principal arterial system and access to regional job, activity, industrial, and manufacturing centers. The Transportation Advisory Board has chosen to focus much of its federal funding on highway improvements on A-minor and non-freeway principal arterials. The Metropolitan Council and partners recognize four types of A-minor arterials to ensure the system is flexible and responsive to different policies and situations throughout the urban and rural parts of the seven-county region. The four types—Augmentors, Expanders, Relievers, and Connectors—are defined in Appendix D [INSERT LINK].

A-minor arterials should provide reliable travel times at reasonable travel speeds, but are not required to be high speed. They are important parts of the multimodal transportation system serving people in trucks, personal vehicles, buses, walking, and on bicycles. Access to A-minor arterials is discussed in Strategy C11, "Access to Destinations." Within the urban service area, sidewalks or multi-use non-motorized facilities should be provided along A-minor arterials. On-road bicycle facilities are appropriate on A-minor arterials where there are no effective parallel route options and the bicycle or pedestrian facility can be designed to support safe travel for all users. The addition of the bicycle or pedestrian facility should maintain the road's multimodal function, safety and capacity.

Supportive local actions:

- Many A-minor arterials are owned and operated by counties and cities. Local units of government should plan and maintain a system of A-minor arterials that provide for these local, multimodal trips.

C10. Regional transportation partners will manage access to principal and A-minor arterials to preserve and enhance their safety and capacity. The Council will work with MnDOT to review interchange requests for the principal arterial system.

Interchanges and intersections on the principal arterial system provide important access to regional job, activity, industrial, and manufacturing centers. But the safety, capacity, and utility of principal and A-minor arterials are affected in large part by how street and driveway access to these roadways is provided and managed. Adding new interchanges to existing freeways generally makes freeway performance worse, while improving intersections on non-freeways can increase highway capacity.

Decisions about access on the principal arterial system need to be thoroughly analyzed and carefully considered in coordination with MnDOT and the Council. Access spacing and the MnDOT-Council interchange review process are discussed in Appendices D and E. Appendices D and E emphasize the importance of improvements on non-freeway highways in providing benefits for regional travel. As local units of government work with MnDOT and

the Council to improve and convert intersections on non-freeway trunk highways, the following requirements are particularly important to achieve regional objectives:

- The appropriate local units of government exercising land use authority along trunk highways will be expected to incorporate access standards into their subdivision and zoning ordinances and apply the standards during their development review process
- Conversion of an at-grade intersection to an interchange should occur in sequence as part of an incremental freeway conversion. Isolated interchanges on non-freeway principal arterials are discouraged. Conversion of an at-grade intersection to an interchange must provide safety and mobility improvements to both the mainline and cross-street. The new interchange should be adjacent to an existing interchange unless MnDOT and the Council determine that the intermediate access points can be modified or managed to address safety and mobility concerns
- Principal Arterials should have interchanges only with other principal or A- minor arterials. Minor arterials should have interchanges and intersections with principal arterials, other minor arterials, or major collectors. Only concentrations of commercial, industrial, or residential land uses should have direct access to minor arterials.
- Interchange spacing should be one mile or more.

MnDOT and the counties control access on freeways and some expressways through the outright purchase of the access rights from abutting land owners. However, access to other principal and A-minor arterials is most effectively managed through local land use planning and development regulation. If considered early in the process of land development or redevelopment, the appropriate location and design of access and the supporting road network can be worked into the plans. If access is not considered until late in the design of development, it may be difficult to accommodate properly without added expense and potential disruption to the community.

Supportive local actions:

- Cities, counties and townships exercising land use authority along principal arterials and A-minor arterials will be expected to incorporate access standards in their subdivision and zoning ordinances and apply them during their development review process.
- Local access standards should be consistent with MnDOT's Access Management Manual or the appropriate county's access guidelines. Cities and townships should also consult with MnDOT or the county whenever reviewing development plans adjacent to principal arterials and A-minor arterials. For those arterials where the existing access does not conform to the standards, cities should work with MnDOT and/or the county to develop a long-term corridor plan to adjust and improve the access arrangements as opportunities arise through development or redevelopment of an adjacent property. MnDOT has developed a model access management ordinance to serve as a guide for local partners in updating their land use regulations to fully address access considerations.

C11. The Council and regional transit providers will expand and modernize transit service, facilities, systems, and technology, to meet growing demand, improve the customer experience, improve access to destinations, and maximize the efficiency of investments.

The transit system will need to continue to grow and improve to remain a competitive travel option for the region. A significant part of that growth will be expanding and improving the bus system that serves the majority of transit demand in the region. This includes both expanding geographic coverage and "thickening" the transit system by adding new routes and service frequency in areas already served by transit, including connections to transitways. There are several needs that will be addressed by expanding the bus system:

- **Meet growing demand. T**he region will add 824,000 people and 549,000 jobs by 2040, with a large portion of these in already developed communities. The region will need to invest in a bus system that serves this growing demand and supports more regional growth along transit routes.
- **Improve access to destinations.** Existing unmet needs and changing lifestyle preferences will lead to demand for better transit access to more destinations. The region will need to provide better access by improving existing service – speed, frequency, span, and connections – and expanding service to new areas. Two areas of high importance will be improving access to job concentrations and improving access to opportunities for people who rely on transit, including under-represented and low-income households. The design of the transit system will be guided by Regional Transit Design Guidelines in Appendix G.
- **Improve the customer experience.** Many transit users choose to ride because of the quality of the experience. Those who rely on transit deserve a great customer experience as well. The region will need to invest in improvements to the transit experience that address factors such as transfers, customer information, comfort, technology, safety and perceived safety and security, and amenities.
- **Maximize the efficiency of investments.** Providing regional transit service is not cheap but investments and policies can often make transit more efficient and cost-effective. The region will need to seize these opportunities to maximize the return on investments in the bus system.

Regional transit providers will address these needs by applying a variety of types and designs of transit services and facilities. This work will be guided by a number of processes and plans designed to link transit improvements to specific needs and opportunities in the community. Some improvements may also address needs on the transitway system after the initial construction of lines, including adding stations or amenities at stations. The details of these plans and processes are described in the Transit Investment Plan.

Supportive local actions:

- Work with regional transit providers to identify potential improvements to the transit system that will suit community needs.

- Focus forecasted growth at transit-supportive densities in job concentrations or nodes along corridors, supported by additional land use strategies discussed in Land Use and Local Planning.

C12. Regional transportation partners will invest in an expanded network of transitways that includes but not limited to bus rapid transit, light rail, and commuter rail. Transitway investments will be prioritized based on factors that measure a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

Transitways will play an important role in serving the growing region and supporting the economic competitiveness of the region. The region will build an expanded system of transitways that includes bus rapid transit, light rail, and commuter rail. The region also needs to address policies related to modern streetcars, an emerging mode in corridor planning around the region.

Transitways represent a substantial investment for the region and will require extensive planning and coordination to determine the appropriate mix of transitway modes and corridors. There are a number of considerations when exploring transit options in a corridor and when determining the priorities for a long-range transitway system.

The Transit Investment Plan includes technical investment factors intended to measure the expected contributions of a project against the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan. The list of factors includes ridership, access to jobs and activity, cost-effectiveness, existing land use, future land use and economic development, equity, and environment. Overall system planning will also need to consider policy investments factors such as regional balance, funding viability, community support, and technical readiness and risk when determining priorities in the plan.

Supportive local actions:

- Lead local corridor studies for potential transitway investments in coordination with regional transit providers and other agencies.
- Proactively plan land use around potential transitways that is consistent with the requirements described in Land Use and Local Planning and supported by additional land use strategies.

C13. The Council will provide paratransit service complementary to the region's regular route transit system for individuals who are certified by the Council under the Americans with Disabilities Act (ADA).

The Council and regional transit providers will provide an option for those who are not able to use the regular-route transit system due to a disability. Complementary ADA service will be provided consistent with the requirements established in state and federal law. The Council will maintain the eligibility program for this service.

C14. The Council and regional transit providers will provide coordinated transit options, including general public dial-a-ride and vanpool subsidies, in areas of the region not served by regular-route transit. Service levels for these options will be based on available resources and needs.

The Council and regional transit providers will provide dial-a-ride service in areas of the region where transit demand is not strong enough to support regular-route service. These services will be coordinated with the rest of the transit system to facilitate greater access from these parts of the region and to avoid duplication of services.

For trips where transit is not a viable option for travelers, the Council will make subsidies available for the formation of vanpools with volunteer drivers.

C15. Regional transportation partners should focus investments on completing Priority Regional Bicycle Transportation Corridors and on improving the larger Regional Bicycle Transportation Network.

A proposed regional bicycle transportation network with priority bicycle corridors was recently developed through a regional bicycle system study. This network establishes the region's priorities for planning and investment in bicycle facilities and is described in detail in the Bicycle and Pedestrian Investment Direction *(provide link here).*

Supportive local actions:

- Adopt local transportation bikeway elements that encourage community connectivity and connections to existing or planned regional bikeways.

C16. Regional transportation partners should fund projects that provide for bicycle and pedestrian travel across or around physical barriers and/or improve continuity between jurisdictions.

The natural and built environment in general and the region's transportation infrastructure in particular can create unintended physical barriers to a more prominent walking and biking culture. Freeways can be major barriers to safe and comfortable walking and cycling for transportation. The region's freight rail lines also often create formidable barriers to continuous travel, similar to rivers and streams. Bicycle and pedestrian-accessible bridges are an important element for the region to provide a friendly and safe environment for non-motorized transportation.

A definition for regional-critical links is proposed under the Bicycle and Pedestrian Investment Direction *(provide link here)* that would give regional priority to planning and funding bike and pedestrian projects that eliminate regional barriers or improve connections between jurisdictions.

Local bike networks can also be interrupted by high-traffic arterials that are difficult to cross or ride along. Overcoming many of these arterial barriers to walking and biking in the region

requires interjurisdictional coordination, since many of these arterials form the boundaries between jurisdictions. The Council supports interjurisdictional coordination to improve planning for better connections across boundaries.

Supportive local actions:

- Identify gaps or barriers in bicycle and pedestrian systems in the comprehensive planning process.

C17. Regional transportation partners will provide or encourage reliable, cost-effective, and accessible transportation choices that provide and enhance access to employment, housing, education, and social connections for pedestrians and people with disabilities.

Local agencies should use best practices in designing pedestrian facilities. Such facilities must be accessible to people of all levels of functional ability so they meet or exceed the requirements of the Americans with Disabilities Act.

Supportive local actions:

- In comprehensive plans, adopt local transportation pedestrian and bikeway elements with accessibility guidelines and planned facilities for pedestrians and wheelchair accessibility in areas with high levels of bicycle and pedestrian activity.

C18. The Council, MnDOT, regional railroad authorities, and railroad companies will pursue short- and long-term improvements to accommodate future freight and passenger rail demand.

Where rail congestion has been identified and/or future capacity constraints are anticipated on the metropolitan rail system, regional partners should conduct additional rail corridor studies to facilitate the planning and implementation of needed system improvements that will accommodate future freight and passenger rail demand.

C19. The Council and MnDOT should work together with cities and counties to provide efficient connections from major freight terminals and facilities to the regional highway system, including the federally designated Primary Freight Network.

The Metropolitan Airports Commission should pursue provisions for air cargo infrastructure and air service for the region with direct air freight connections to import/export markets that provide trade opportunities for the region's economy.

City and county roadways provide the "last mile" connections between intermodal freight terminals and the metropolitan highway system, including the National Highway System (NHS) and its subset Primary Freight Network. Coordination with local planning efforts to preserve the condition and capacity of these connector roadways will be essential to maintaining the efficient flow of freight in the region.

Supportive local actions:

- Identify and classify freight corridors in the comprehensive planning process.

C20. The Council and airport sponsors will maintain a system of reliever airports to augment the Minneapolis-Saint Paul International Airport that are accessible within reasonable travel times from all parts of the metropolitan area.

State-of-the-art facilities should be made available by airport sponsors at the region's airports, commensurate with their system role, to induce additional aviation services to use the reliever system.

D. Competitive Economy

The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.

D1. The Council and its transportation partners will identify and pursue the level of increased funding needed to create a multimodal transportation system that is safe, well maintained, offers modal choices, manages and eases congestion, provides reliable access to jobs and opportunities, facilitates the shipping of freight, connects and enhances communities, and shares benefits and impacts equitably among all communities and users.

The Current Revenue Scenario in this plan generally allows for investments to operate, maintain, and preserve the existing highway and transit systems, supported by some funding for MnPASS lanes, other strategic highway capacity enhancements, and transitway expansion. However, the Current Revenue Scenario does not allow the region to fully address highway operations, maintenance, and rebuilding needs, make the level of expansion and improvement investments needed to accommodate the expected growth in population and jobs, keep our region competitive, and provide improved choices and experiences for all users of the system.

The Increased Revenue Scenario for highways and transit provides a vision for the additional investments that could be made if a higher level of funding is achieved and that would move the region closer towards accomplishing the goals and objectives identified in this plan.

Supportive local actions:

- Identify funding needs on the local transportation system and local priorities for funding on the regional transportation system.

D2. The Council will coordinate with other agencies planning and pursuing transportation investments that strengthen connections to other regions in Minnesota and the Upper Midwest, the nation, and world including intercity bus and passenger rail, highway corridors, air service, and freight infrastructure.

Other agencies and private companies are largely responsible for planning and implementing the transportation investments that connect the region to the rest of Minnesota, the Upper Midwest, the nation, and the world. For example, MnDOT and counties are responsible for the major highway corridors that connect the Twin Cities to other regions within the state and to other states, and support cars, trucks, and private intercity bus providers such as Greyhound and Jefferson Lines. Amtrak provides intercity passenger rail, and MnDOT is responsible for planning additional intercity passenger rail services. The Metropolitan Airports Commission works with the airlines provide the region's air service connections. MnDOT works with the private freight railroads that are responsible for freight rail service and infrastructure, and also with barge companies, port authorities and the Army Corps of Engineers, which provide infrastructure and serve freight service along the Mississippi. The Council will work closely with these partners to ensure that their planned improvements are coordinated with regional investments and that regional needs are considered in the prioritization of these investments.

D3. The Council and its partners will invest in regional transit and bicycle systems that improve connections to jobs and opportunity, promote economic development, and attract and retain businesses and workers in the region on the established transit corridors.

The transit system plays a vital role in getting people to and from jobs and education opportunities and centers of activity. An expanded and improved transit system will continue to strengthen the attractiveness of regional centers of business and activity. Transit will also promote economic development and enhance the region's livability and prosperity, keeping the region competitive nationally and globally and helping to attract and retain businesses and workers. Investments in transit will be prioritized with access to jobs and activity and supporting economic development as important factors.

Priority Regional Bicycle Transportation Corridors were developed with an emphasis on connecting to regional job concentrations and to the regional transit system, where there is a high demand for bicycle travel and where opportunities for enhancing economic development and business retention are most prevalent. These corridors are introduced in the Bicycle and Pedestrian Investment Direction.

Supportive local actions:

- Give priority to projects that integrate pedestrian facilities into regional job concentrations and connect local bikeways with the Regional Bicycle Transportation Network.

D4. The Council, MnDOT, and local governments will invest in a transportation system that provides travel conditions that compete well with peer metropolitan areas.

The Twin Cities region competes with metropolitan areas throughout the nation and the world. The transportation systems in all regions are a critical factor in determining how well

they function economically, socially, and environmentally. These systems include airports, water ports, railroads, highways – principal and minor arterials – local streets, sidewalks, and trails. The Council will continue to measure the performance of its transportation system in terms of access and mobility, and its impacts compared to select peer regions nationally and internationally. The Council will also work with MnDOT and the Counties Transit Improvement Board (CTIB) to seek the latest techniques to improve transportation service in the most cost-effective and context-sensitive ways for all modes, including highways.

Supportive local actions:

- Identify local actions to improve overall capacity of critical corridors.

D5. The Council and MnDOT will work with transportation partners to identify the impacts of highway congestion on freight and identify cost-effective mitigation.

The Council and MnDOT will work to identify specific truck mobility issues and needs, and to develop operationally focused solutions for improving travel time reliability for trucks using the regional highway system.

Traffic management technologies such as ramp metering, variable speed control, and traveler information systems can help ease congestion on the highway system. The Council will work with MnDOT, counties, and cities to explore implementing additional strategies in corridors with high truck volumes to further reduce the impact of highway congestion on freight mobility, such as redirecting trucks in real time to avoid congestion caused by crashes.

Supportive local actions:

- Plan for and provide "first and last mile" highway connections to regional job concentrations and manufacturing and distribution areas.

D6. The Council, Metropolitan Airports Commission, MnDOT, and other agencies will work together to maintain a strong regional airport system, including maintaining the Minneapolis-Saint Paul International Airport as a major national and international passenger hub and reliever airports that serve business travel.

Availability of good air transportation connections is critical to maintaining a competitive state and regional economy. Public and private sector efforts in the region should focus on continued development of Minneapolis-Saint Paul International Airport as a major international hub. Maintaining a system of minor reliever airports to provide adequate alternative facilities for general aviation traffic is essential to the effective operations of Minneapolis-Saint Paul International Airport.

Supportive local actions:

- Participate in land use safety studies around airports.

D7. The Metropolitan Airports Commission should periodically update its airport economic impact studies and commercial air-service competition plan to determine facility and service improvements needed at the region's airports to foster a competitive regional economy.

Decisions by aviation partners on providing facilities and services to improve regional economic capabilities should be based on periodic updating and refinement of airport economic impact studies and surveys, a commercial air-service competition plan, and annual airport marketing programs.

Although the actual provision of air service is a business decision made by privately owned airlines, the Metropolitan Airports Commission should continue its efforts to attract more air service carriers to the region to provide competition and affordable fares for residents and businesses. Since adoption of the last Transportation Policy Plan in 2010, the Metropolitan Airports Commission has pursued several airlines to add service at Minneapolis-Saint Paul International Airport, and two new airlines (Spirit Airlines and Condor Airlines) have recently started service.

E. Healthy Environment

The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.

E1. Regional transportation partners recognize the role of transportation choices in reducing emissions and will support state and regional goals for reducing greenhouse gas and air pollutant emissions. The Council will provide information and technical assistance to local governments in measuring and reducing transportation-related emissions.

State and regional goals are to reduce greenhouse gas emissions by 15% below 2005 levels by 2015, 30% by 2025 and 80% by 2050. Currently Minnesota is not on track to meet 2015 goals. Since one quarter of statewide greenhouse gas emissions come from the transportation sector, reductions in transportation emissions will have to be part of the solution.

The Council will support efforts to reduce emissions through reductions in auto trip making and public education about the effects of transportation choices. An example of this education is Metro Transit's "Go Greener" campaign and its Trip Planner tool, which allows customers to see the greenhouse gas impact of their trip.

Many of the most effective strategies for reducing greenhouse gas emissions are accomplished through local land use decisions that reduce the number of auto trips, or by federal and auto industry action to control fuel efficiency of the vehicle fleet. The Council will use its technical expertise to identify and encourage adoption of the most effective measures to reduce air emissions. The Council will also develop a regional greenhouse gas emissions inventory.

Transportation also contributes significantly to elevated levels of regulated air pollutants such as carbon monoxide, nitrogen dioxide, ozone, and fine particulate matter and to other hazardous air toxics, all of which have negative effects on human health and quality of life throughout the region. The Council and MnDOT, in cooperation with MPCA, will continue efforts to improve air quality, reduce emissions from mobile sources, and maintain compliance with federal air quality standards.

The MAC should periodically evaluate the air quality impacts of aviation operations and report to the Council on air quality problems or issues through the MAC annual environmental review of the capital improvement program.

E2. The Council and MnDOT will consider reductions in transportation-related emissions of air pollutants and greenhouse gases when prioritizing transportation investments.

Reducing transportation-related emissions have been a consideration in selecting projects for many Council and MnDOT programs for years. The regional solicitation uses emissions reduction as one of its criteria for prioritizing projects. Emissions reduction has also become a prioritizing criteria for other transportation programs, including travel demand management, transitway expansion, highway expansion and system management. Opportunities to use federal funds for efficient emissions-reduction programs such as diesel retrofits should continue to be implemented. Consideration should be given to all types of transportation emissions and generators, including bus and truck fleets, construction vehicles, and electricity generation for light rail transit operations and electric cars. The region should not fund projects that will have a substantial negative effect on local or regional air quality.

E3. Regional transportation partners will plan and implement a transportation system that considers the needs of all potential users, including children, senior citizens, and persons with disabilities, and that promotes active lifestyles and cohesive communities. A special emphasis should be placed on promoting the environmental and health benefits of alternatives to single-occupancy vehicle travel.

The transportation system needs to meet the needs of all potential users, from the youngest to the oldest. This includes people with a broad range of abilities and backgrounds.

In recent years, elements of community design have gained attention for the way that they can encourage or discourage physical activity. Public health policy discussions have identified opportunities for bicycling and walking as one element in the fight against obesity and other health problems related to the lack of physical activity. As a result, several counties in the Twin Cities metropolitan area have incorporated active living principles into their community and health planning programs. These efforts communicate to the traveling public the individual and collective benefits to personal health and the environment of walking and biking in performing daily errands.

As regional transportation partners preserve and modernize the transportation system, they should design facilities, including signs, to accommodate older travelers with changing vision and slower reaction times. All transit vehicles in the region have been accessible for many years, and Metro Mobility provides service that complies with ADA requirements to complement regular-route transit. On roadways, partners should also continue to implement their ADA transition plans, especially at highway interchanges, intersections, and near transit access locations.

E4. Regional transportation partners will protect, enhance and mitigate impacts on natural resources when planning, constructing, and operating transportation systems. This will include management of air and water quality and identification of priority natural resources through the Natural Resources Inventory developed by the Council and Minnesota Department of Natural Resources.

Thrive MSP 2040 emphasizes the protection and enhancement of environmental quality through its outcomes of stewardship, livability, and sustainability. The Council supports work toward this end through the Natural Resource Inventory, which provides comprehensive information about environmental resources throughout the seven-county metropolitan area.

Planning and development should follow all requirements under the National Environmental Policy Act and Minnesota Environmental Policy Act for the disclosure of environmental impacts. During all phases of transportation project development, construction, and operation, regional partners and local governments should seek opportunities to not only avoid harming but also enhance the natural environment, including air quality, water quality, natural area preservation, and wildlife preservation.

Airport long-term comprehensive plans shall include a management strategy to protect groundwater quality that includes proposed policies, criteria and procedures for preventing, detecting and responding to a spill or release of contaminants on the site. The plans should identify the location, design and age of individual/group/central sewer systems on site and all well location sites, and evaluate system deficiencies and pollution problems. Airport long-term comprehensive plans shall also include detailed proposals for providing sanitary sewer services. Reliever airports should be connected to the sewer system when service is available near the airport. When connection is not practical, the airport owner and local governmental agencies must adopt and implement ordinances, including administrative and enforcement procedures that will adequately meet the need for trouble-free, on-site sewage disposal in accordance with the Council's guidelines in its Water Resources Management Policy Plan.

Airport long-term comprehensive plans should also include a plan for surface-water management that contains provisions to protect surface and groundwater. In addition to including information that must be consistent with plans of watershed management organizations and the state wetland regulations, the water management plan should include provisions to mitigate impacts from construction, restore or retain natural functions

of remaining wetlands and water bodies, and include the pretreatment of runoff prior to being discharged to surface waters.

E5. Transportation partners will protect, enhance and mitigate impacts on the cultural and built environments when planning, constructing, and operating transportation systems.

Thrive MSP 2040 emphasizes the protection and enhancement of the cultural and built environment and quality of life (including air quality and its impacts on a community's residents) through its outcomes of stewardship, livability, and sustainability. Transportation partners should plan and implement proposed highway and street design and transit routes and facilities with sensitivity to a community's vision and quality of life, including using context-sensitive design methods.

Context-sensitive design acknowledges local attributes by balancing economic, social, aesthetic and environmental objectives in addition to mobility objectives. Highway projects can often provide opportunities to incorporate many community objectives for livability and enhanced environmental quality. In addition, local A-minors should be planned and implemented in a manner compatible with a road's functional classification and surrounding land uses. Functional classification is discussed in Appendix D.

In addition, during construction and implementation of projects, transportation partners need to be aware of and plan for the access needs of the local businesses and residents.

Supportive local actions:

- Allow the market to determine necessary parking ratios (remove requirements) and support shared parking.
- Support employer travel-demand management plans and programs.
- Support the development of local ride sharing and bike sharing programs.
- Accommodate higher-density development near transit stations.
- Develop plans to improve conditions for walking and bicycling.
- Adopt development requirements and Complete Streets policies that improve circulation and access for bicyclists and pedestrians.
- Adopt development standards that increase vegetative cover and increase the reflective quality (or albedo) of surfaces.

E6. Regional transportation partners will use a variety of communication methods and eliminate barriers to foster public engagement in transportation planning that will include special efforts to engage members of historically underrepresented communities, including communities of color, low-income communities, and those with disabilities to ensure that their concerns and issues are considered in regional and local transportation decision making.

Transportation projects can affect people's daily lives in very tangible and immediate ways. Historically, some transportation projects, have disproportionately affected

underrepresented communities, often with little or no input, participation or consent from these communities.

Regional transportation partners will seek public participation using a variety of communication methods to formulate transportation policy, develop transportation plans and make transportation investment decisions. Useful communication methods include websites and social media, print media, radio, direct mailing, and public meetings and hearings. These methods should include opportunities for broad participation, comment, review, and debate of proposed plans and actions.

Regional transportation partners should also recruit representatives of groups traditionally underrepresented in regional policymaking and provide enhanced participation opportunities to encourage members of those groups to share their unique perspectives, comments and suggestions. Enhanced participation could include such steps as foreign language and sign language interpreters, focus groups, and meetings in places familiar to the groups such as their community centers and places of worship.

E7. Regional transportation partners will avoid, minimize and mitigate disproportionately high and adverse impacts of transportation projects to the region's historically underrepresented communities, including communities of color, low-income communities, and those with disabilities.

Several federal laws and regulations, including Title VI of the Civil Rights Act and the Executive Order on Environmental Justice, require federally funded transportation investments to avoid disproportionately high and adverse impacts of transportation projects to the region's minority and low-income populations. The region will not only follow those requirements to avoid adverse impacts, but go beyond them to ensure future transportation investments provide positive benefits for the region's historically underrepresented communities, including communities of color and low-income communities, and those with disabilities.

F. Leveraging Transportation Investments to Guide Land Use

The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.

All strategies in this section refer solely to actions by local governments.

F1. Local governments within the seven-county metropolitan area must prepare comprehensive plans that conform to the Transportation Policy Plan and should recognize the land use and transportation opportunities and challenges that correspond to *Thrive MSP 2040* planning areas.

- **Local governments within the Metropolitan Urban Service Area should plan for their projected growth and stage their transportation infrastructure to accommodate the needs of that growth.**

- **Local governments in the Rural Service Area should plan for transportation systems and land use patterns that are compatible with the protection of agricultural uses and the need for future sewered development.**

The partnership between regional and local planning and investment is established in the Metropolitan Land Planning Act to guide growth and change in the seven-county region of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. Long-range forecasts for population, households and employment are used by the Council, MnDOT, and local governments to plan for orderly and economical growth and the land use and system changes – transportation, wastewater treatment, housing, and parks – needed to support that growth.

Local governments have the responsibility to guide and regulate land use and provide local infrastructure. What form this takes will depend on the type of development that can be supported by regional infrastructure and other considerations described in *Thrive MSP 2040*'s Geographic Planning Areas, Land Use Policy, and Policy Plans, including the special features. Local governments should refer to these coordinated documents along with the Transportation Policy Plan when preparing their comprehensive plans.

The opportunities and challenges associated with growth vary across the region. The community designations in *Thrive MSP 2040* establish some common strategy considerations for communities of a similar type. The specific considerations related to the Transportation Policy Plan that should be included in local comprehensive plans are summarized by community designation in the Land Use and Local Planning (*link here*).

F2. Local governments should plan for increased density and a diversification of uses in job concentrations, nodes along corridors, and local centers to maximize the effectiveness of the transportation system.

Job concentrations are critically important to the regional economy. Although most of these are located along regional highways, roadways alone cannot continue to provide the access needed as highway congestion continues to increase. Employment densities are an important factor influencing how people travel and how the transportation system supports their travel.

The region's transportation system and economy will be more effective if jobs are concentrated and density is focused in nodes along corridors. Planning for density in nodes also needs to provide for a high-quality, walkable local street network, a mix of land uses, and amenities to support denser development. These coordinated efforts will support more effective transportation by reducing short auto trips or replacing them with walking and biking, increasing transit potential, and allowing for more flexible parking.

Local governments can support the regional economy and the transportation system by guiding more density and a mix of uses to job concentrations, nodes along transportation corridors, and local centers. While market conditions play a primary role in economic development, local governments set the necessary groundwork through land use regulations, the design of local transportation networks, and community development incentives.

F3. Metropolitan Council, MnDOT, and local governments will plan, build, operate, maintain, and rebuild an adequate system of interconnected highways and local roads.

Local and county governments will plan and implement a system of multimodal interconnected highways and local roads to serve the full range of trips. This system of major highways and local streets supports connections to and from our homes, schools, jobs, other states, and the world. Some roads are intended to emphasize mobility for long-distance trips, while others are intended to primarily provide access to land.

The design and spacing of this system is a critical factor in successfully supporting a variety of land use densities. More dense land uses require a denser road network, or traffic can be forced to use inappropriate alternatives. For example, an inadequate system could force through traffic to use a local street to access a job concentration, increasing safety concerns, or could force local traffic to use the limited capacity of a principal arterial for a very short trip. Appendix D discusses roadway functional classification, facility spacing, and access management.

All levels of government need to work together if [new principal arterials will be provided On surface, seems inconsistent with lower-cost/high-benefit approach.] in the region. Cities and counties have roles in both land use and transportation. Considering the limited funding available for highway investments, cities and counties should continue to enhance highway safety and capacity by working with MnDOT and the Council to plan and control access to highways.

Cities and counties may also be able to protect right-of-way to widen existing highways or to build new ones. In all cases, land use planning and development should continue to be closely coordinated with the existing and future road system. The highway system and local roads are also critically important to manufacturing and distribution areas as well as other freight generating land uses.

The Council will also work with its partners to ensure the road authority with jurisdiction over and responsibility for a road matches the role the road plays in the transportation system; for example, MnDOT should be responsible for principal arterials.

F4. Local governments will identify opportunities for and adopt guiding land use policies that support future growth around transit stations and near high-frequency transit service. The Council will work with local governments in this effort by providing technical assistance and coordinating the implementation of transit-oriented development. The

Council will also prioritize investments in transit expansion in areas where infrastructure and development patterns to support a successful transit system are either in place or committed to in the planning or development process.

Local land use and development patterns greatly impact the need for and use of transit. This plan provides for significant investments in the expansion of transit stations along transitways and potential expansion along existing and future high-frequency transit corridors. The plan acknowledges the growing demand for transit services and transit-oriented development in the region. However, for the region to be good stewards of transit investments, local governments need to be partners in addressing the challenges of planning for and supporting denser development along transit corridors.

Transit service requires medium- to high-density housing to be successful and needs to be combined with a mix of uses along a transit line or route. Transit-oriented development should be focused on nodes along corridors – such as stations – to support the success of transit service and create livable, sustainable communities. The Council will support communities planning for higher densities by providing technical guidance on how to plan for higher density, transit-oriented development.

When making transit investments, the Council will prioritize investments in communities that have infrastructure and development patterns that are supportive of a successful transit system or are committed to them in planning or implementation. More details about what makes a community supportive of transit are available in Land Use and Local Planning.

F5. Local governments should lead planning efforts for land use in transit-oriented station areas, small-areas, or corridors, with the support of the Council and other stakeholders.

Local governments should take the lead in developing plans and implementation strategies that support more effective transit investments in their communities. They are in the best position to understand the needs and desires of neighborhoods and the local business community and to set long-range plans that guide land use changes necessary to support transit investments. Local plans are the means to demonstrate local commitment to land use that is needed to support regional investments in transit infrastructure and service.

F6. Local governments should adopt policies, develop partnerships, identify resources, and consider regulatory tools to support and specifically address the opportunities and challenges related to creating walkable, bikeable, transit-friendly places.

As the Council works with communities to promote centers of development and redevelopment along transit corridors, walking and bicycling will become increasingly important and desirable ways of traveling within and between compact, mixed-use neighborhoods. Systems of safe, continuous, barrier-free bicycle and pedestrian facilities are essential to the success of transit-oriented developments.

Most of the region has evolved to meet the needs of the private automobile. As preferences are shifting toward more transportation options, communities will have to adapt their regulatory tools to accommodate these preferences. There will be opportunities to change the built environment and improve local transportation networks for pedestrian, bicyclists and transit users. These opportunities may exist in transit station areas, along transit routes, in suburban mixed-use town centers, or in rural centers.

Not all local communities will need to address these concerns in the same way. The important consideration for local governments is ensuring that there are processes in place to address opportunities now and into the future.

F7. Local governments should include bicycle and pedestrian elements in local comprehensive plans.

Pedestrian and bicycle elements of local comprehensive plans should:

- Promote safety of pedestrians and bicyclists
- Provide connections to adjacent cities and counties and their pedestrian and bicycle systems
- Address gaps and remove barriers in the existing local, county or regional systems
- Provide local connections between the Regional Bicycle Transportation Network and major regional destinations, including regional job concentrations, as identified in the Bicycle-Pedestrian Investment Direction
- Provide pedestrian and bicycle facilities within regional job concentrations, including commercial, retail, entertainment, and recreation centers
- Include programs for educating motorists, transit users, pedestrians, and bicyclists to increase awareness of and respect for the rights and responsibilities of all types of travelers

The extent to which local government plans should address bicycle and pedestrian systems depends on the community's needs for these modes. For instance, rural communities with a low density of origins and destinations within biking or walking distance may be able to accommodate these modes adequately on existing streets. Local streets and collectors are important elements of transportation because they generally have low volumes and low speeds where bicycles and motor vehicles can co-exist safely. However, each community should also consider other options for safe bicycle and pedestrian travel to the extent appropriate for their community.

F8. Local governments should adopt comprehensive plans that include policies emphasizing identifying and improving roads best suited for carrying trucks while minimizing impacts such as noise and traffic to sensitive land uses.

Planning activities for land use and freight need to be closely coordinated, and they require communities to work with the trucking industry and regional, state, and federal

transportation agencies. While freight access is vital to the region's economy and the economical viability of industrial and commercial land, truck traffic is often regarded as a nuisance to other land uses, such as residential areas and parks. Much of the region's freight traffic travels is in trucks on regional highways and arterials, but local roads provide an important link to freight generators and destinations.

As a part of the comprehensive planning process, local governments should identify and analyze truck routes, review their comprehensive plans to ensure land set aside for industrial uses is adequate and appropriate, and address zoning and code regulations that consider the needs of freight users and surrounding land uses. Roadway designs should recognize contemporary truck length so there is adequate turning radius and sufficient delivery areas, especially when rebuilding roads in the older parts of the region where original road designs assumed shorter trucks, or when introducing innovative traffic intersections such as roundabouts.

F9. Local governments should balance the needs of industrial, residential and recreational users when planning and implementing land uses along the navigable portions of the Mississippi River system to ensure sufficient access for existing and future barge transportation needs.

The Mississippi River system (which includes parts of the Minnesota and St. Croix rivers) is important for the economical movement of bulk commodities. The region's rivers are also important natural features and recreational areas. These differing uses can lead to conflicts and competing community and/or regional priorities that require balancing and coordinating uses.

The amount of land adjacent to rivers that is suitable for barge terminal uses is limited by a number of variables, such as topography and good highway access for truck-to-barge transfers. Local governments bordering the river should address the potential for freight use along the Mississippi River system in their comprehensive plans and balance that with other potential demands for use.

To aid local governments in planning for an appropriate balance of uses along the Mississippi River system, the Council will analyze existing land uses and zoning to determine:

- the land and transportation needs of river-dependent industries
- the extent to which land for industrial/manufacturing uses on the river is threatened by non-industrial development.

F10. Local governments should consider the role of railroads in promoting economic activity and identify an adequate supply of land in their comprehensive plans to meet existing and future demand for industrial uses requiring rail access.

Railroads are also important to the region's economy, providing valuable connections from the Twin Cities to national and global markets. While passenger service is one role of the rail system, movement of commodities is their main function. Commodity shipments by rail have been growing. While intermodal transfer terminals service the efficient transfer of containers between truck and rail, the demand for direct access to rail from adjacent warehouses and industries is also likely to increase.

Railroads often occupy central and important urban locations where redevelopment of adjacent industrial land use is driven by the real estate market for non-industrial or commercial uses. In comprehensive plans, local governments need to balance these potential changes with the economic and transportation benefits afforded by rail service, especially as long-distance freight movement on trucks is facing the higher fuel costs and highway congestion.

To aid local governments in planning for an adequate supply of land to meet existing and future demand for industrial rail access, the Council will analyze existing land uses and zoning to determine:

- the region's land and transportation needs for rail corridor-dependent industries
- the extent to which land for industrial/manufacturing uses with access to rail is threatened by non-industrial development

F11. Local governments located near all of the region's airports should address land use compatibility and air safety requirements in their comprehensive plans.

The nature of local land use development varies around airports. Only Lake Elmo and Airlake airports remain adjacent to rural land uses, while Anoka County, Eden Prairie, and Forest Lake airports are located in suburban areas. Minneapolis-Saint Paul International Airport, Saint Paul Downtown, Crystal and South Saint Paul are in the Urban and Urban Center areas, as designated in *Thrive MSP 2040*.

Joint airport and community zoning boards should be established at each of the system airports to develop and adopt an airport safety zoning ordinance to maintain effective land use and clear zones at the ends of runways. Both the Federal Aviation Administration and the state have regulations regarding appropriate land uses for varying distances at the ends of runways, both on and off the airport property.

The Council also reviews local comprehensive plan updates and plan amendments for airport and community compatibility regarding height and safety zoning, land transportation access to the airport, sewer and water service, and safety and security services.

F12.Communities affected by aircraft noise should incorporate the *Land Use Compatibility Guidelines for Aircraft Noise* into their local comprehensive plans and ordinances.

In addition to safety, aircraft noise is an issue near airports, often extending farther into the community than safety zoning. The Council has adopted land use compatibility guidelines for aircraft noise as a preventative measure to help communities control noise sensitive land uses around airports. The definition and application of the guidelines is found in Appendix L along with the most recent noise contours for each airport.

In addition, the Council reviews the long-term comprehensive plans for each airport, including whether the airport plan is compatible with land use and environmental evaluation requirements concerning metro systems, and consistency with regional policies.

F13. Local governments should minimize potential general airspace hazards by adopting federal and state regulations regarding airspace and notifying potential developers of the need to submit FAA form 7460-1 regarding structure height near an airport.

Safety is the number one priority in the planning and providing aviation facilities and services. Local ordinances for all communities should control all proposed structures 250 feet or more above ground level to minimize potential general airspace hazards. Structures over 500 feet tall should be clustered, and no new structures over 1,000 feet tall should be built in the region unless they are replacements or provide for a function that cannot otherwise be accommodated. Local governments should notify the Federal Aviation Administration before approving permits for proposed tall structures.

Land Use and Local Planning

Introduction

Transportation and land use play off each other. Transportation infrastructure gives value to land and influences its use. Land use, in turn, creates demand for transportation investment. Over time, this cycle has produced the development patterns we see in the region today. The transportation system provides access to land and development for people and freight. Land use and development patterns create the origins and destinations that directly affect the demand for travel and the relative attractiveness of different travel modes, whether auto, transit, bicycling, or walking. The demand for access and mobility will continue to grow and change, as will the region's land uses over the next 30 years. How we provide that access and mobility will strongly influence the development patterns we leave for future generations.

Before the 1950s, most of the region developed with streets and sidewalks centered on the streetcar. Beginning in the 1950s, the development of the region's highway system and later the freeway system greatly accelerated geographic access to open land available for new development . Once there is access, an area develops relative to the availability of land for future development, its sewer capacity, and consumer demand and preferences. Essentially, market supply and demand determine development patterns.

The post-1950s development patterns in the region consisted of large areas that developed at single-family home densities (about 3 to 5 units per acre), shaped in part by regional roadways and local street networks. As the reach of the urban area expanded, highways and arterial roads were extended and widened to serve the growing demand.

With the high priority given to expanding roadway capacity to serve new development, the needs of pedestrians, bicycles, and transit users received less attention during and after the 1950s. Once established, residential land use patterns evolve slowly, particularly in areas that remain stable for generations. Consequently, changing existing land uses to increase density and intensity depends largely on adding connections among parts of the street and pathway networks and accommodating alternative modes of travel.

In contrast, job-related land uses change more frequently. Over the 30-year planning horizon of *Thrive MSP 2040* and the *2040 Transportation Policy Plan*, many job-related properties will change or be replaced due to structural, functional or economic obsolescence, opening opportunities for new mixed land uses and increased residential and job-related densities. These trends underscore the importance of local governments as they exercise their key role in making decisions about land use patterns and the local transportation network linking to the regional system.

There are opportunities for all types of communities to strengthen connections between land uses and transportation as the region changes in coming years. Communities at the developing edge can look long-term to adopt transportation plans for interconnected networks of streets and pedestrian and bicycle pathways that meet current and future needs of a fully developed community. Developed suburban communities with street patterns characterized by cul-de-sacs and a loosely connected street network can look for opportunities to retrofit their transportation networks to increase street connectivity. Transit service and pedestrian and bicycle pathways can support infill development and redevelopment of existing properties. Urban area communities that developed with a grid system can look for ways to use Complete Street practices to serve infill and redevelopment opportunities and take advantage of their existing connected transportation networks.

The existing regional growth pattern does not make it possible to expand the highway system in a sustainable way to address such issues as congestion, climate change, equity, and livability. Within the last decade, changing preferences, frustrations with long and unreliable commutes, and the addition of high-quality transitways have contributed to new development, infill, and redevelopment in already developed parts of the region. The evidence is clearly visible along the METRO Blue Line light rail, which has been operating since 2004, the Northstar Commuter Rail (2009), the METRO Red Line BRT (mid 2013), and the METRO Green Line LRT (mid 2014). Development interest and higher-intensity land use are also showing up along proposed transit investments. On the local level, higher-intensity development and redevelopment is occurring throughout the already developed area and requires support with a multimodal network of local and collector streets, sidewalks, and bicycle paths. New growth is occurring, and will continue to occur, in the Suburban Edge and Emerging Suburban Edge communities, where sewered land is available. As local governments accommodate densities consistent with those established in *Thrive MSP 2040*, the resulting growth will continue to stress the regional highway system. Consequently, this travel demand will require investments in arterial roads and improvements to the regional highway system that strategically address congestion and safety and provide reliable options. However, demand for additional highway capacity to relieve congestion and to serve the Suburban Edge and Emerging Suburban Edge communities is well beyond the available resources for transportation improvements. Thus, in order to address growth that takes into account transportation investments, planning by local governments will need to focus on incorporating multimodal travel, including transit, walking and bicycling, into land use and design.

Development can best support multimodal travel when communities plan their land use with knowledge of travel behavior and transportation infrastructure. Consistent with the land use policies identified in *Thrive MSP 2040*, this means:

- Supporting growth, particularly job growth, where job concentrations exist or in nodes along regional transportation corridors, either highway or transit
- Improving local street connectivity and using design principles of Complete Streets during planning and designing

- Planning for a complementary mix of land uses along corridors and in centers
- Locating medium-to-high density developments at transit stations and along transit corridors
- Implementing travel-demand management programs and parking policies that support pedestrian and transit-friendly environments in high-activity areas, and
- Increasing overall density in nodes along corridors, in combination with the other strategies.

Another important consideration in coordinating transportation and land use is the needs of freight users. The freight system has evolved in ways similar to other aspects of regional growth, with a heavy reliance on highway and arterial road travel. These users need to be considered in implementing local land use policy.

Users of the river and rail freight system are particularly vulnerable to land use changes away from warehousing and industrial areas, especially in the already developed parts of the region. Many of these areas are evolving to serve the growing demand for housing and commercial development, but the river and freight rail systems are already in place and cannot to move to other locations, even assuming alternatives were available. The issue is important because the region's economic competitiveness depends on preserving existing areas for freight operations.

In addition, local governments need to plan for an adequate supply of land suitable for freight uses in the future and consider the connections, especially the "last mile" connections, that trucks make sometimes on local streets with potential design conflicts for freight movement. The region's airport system also creates unique challenges for local governments land use planning (see "Aviation Investment Direction and Plan" for more information).

Details about specific investments for the transportation system are discussed in the rest of Part 2.

Coordinating Thrive MSP 2040 and Transportation Policy Plan

The coordination of planning for regional growth and planning for the region's transportation systems is accomplished through the Council's *Thrive MSP 2040* and this Transportation Policy Plan. The household, population, and job forecasts developed by the Council through *Thrive MSP 2040* provide the basis for regional planning for roads and highways, transit service, and wastewater infrastructure, and also inform planning for the Regional Parks System.

The forecasts were developed and influenced by the future transportation system. As the planned transportation system changes, forecasts may change when they are updated every 10 years to reflect new trends or different patterns of investment. More information on how forecasts were developed is available in *Thrive MSP 2040*. The forecasts and *Thrive* policies and land use strategies also serve as the springboard for planning by each community for its local infrastructure and land use needs. The local comprehensive plans must coordinate key

elements: forecasted growth, planned land use, residential and employment densities and infrastructure plans.

Thrive MSP 2040 sets out seven overarching land use policies:

1. Orderly and efficient land use
2. Natural resources protection
3. Water sustainability
4. Housing affordability and choice
5. Access, mobility, and transportation choice
6. Economic competitiveness
7. Building in resilience

More details on these policies can be found in *Thrive MSP 2040* Land Use Policy.

Decisions about how communities grow and the infrastructure to support them affect one another. Regional transportation and sewer investments help shape growth patterns, vice versa. The types and locations of housing influence mobility options and travel patterns.

The relationship between land use and transportation affects key outcomes established by *Thrive MSP 2040*. For instance, land use and development patterns have an enormous impact on the environment, including transportation's contribution to air pollution and climate change. Also important is the overall, sustainable economic development of the region that provides prosperity for all parts of the region and all people in it. This section describes the important considerations for land use planning that impact the transportation system and local comprehensive planning for transportation.

Coordination of Regional and Local Comprehensive Planning

Local units of governments are on-the-ground partners in realizing the *Thrive MSP 2040* vision for growth and change, the *Thrive MSP 2040* Land Use Policy, and the Transportation Policy Plan. Under the Metropolitan Land Planning Act, local communities are required to adopt comprehensive plans that conform to the Council's three metropolitan system plans – for transportation (including aviation), wastewater treatment, and regional parks and open space. Comprehensive plans must also be consistent with the Council's policies in *Thrive MSP 2040* and its policy plans.

The local comprehensive plan is used by the region as a key element in local and regional partnerships to plan for growth across the seven-county region. Local plans ensure that adequate regional systems are planned and developed to serve growth in an orderly and efficient manner. There are also differing requirements for the different types of local governments. The majority of comprehensive planning responsibilities fall under the direction of cities and townships. This section focused primarily on those responsibilities. The unique

requirements set forth in state statute for counties vary by county. State statute also applies solely to the seven-county Metropolitan Council jurisdiction and does not apply to the broader urbanized area that is covered by this plan under federal law.

Local comprehensive plans are reviewed by the Council for conformance with metropolitan system plans, consistency with Council policies, and compatibility with adjacent and affected governmental units (see statutory provisions below). Forecasts play an important role in the local and regional partnerships to accommodate growth and to see that adequate infrastructure is planned and developed. Table C-1 is a summary of the conformance, consistency, and adjacency components of comprehensive plans that result from the Transportation Policy Plan.

Table C-1: Local Comprehensive Planning: Summary of Conformance, Consistency, and Adjacency

Conformance: A local comprehensive plan will conform with the metropolitan system plans if the local plan does not have a substantial impact on or contain a substantial departure from a system plan, based on the following provisions:

- Accurately incorporates and integrates the components of the metropolitan system plans required by Minn. Stat. sec. 473.851 to 473.871:
    1. Local plan recognizes the land use and transportation opportunities and challenges related to the community's designation in the *Thrive MSP 2040* Geographic Planning Areas. Local plan accommodates growth forecasts at appropriate densities and numbers as articulate in adopted Thrive MSP 2040 Geographic Planning Areas, and wastewater and transportation system policy plans.
    2. Local plan identifies transportation components and characteristics of the regional existing and planned multimodal system including road functional classification, transitways and transit facilities and corridors, park-and-ride facilities, regional trails and bikeways, and right-of-way preservation needs.
    3. Local plans must include airports, aviation facilities, noise and safety zones, and compatible land uses surrounding these features.
    4. Identification of existing and forecasted traffic volumes (current Average Daily Traffic), number of lanes on roadways (principal and minor arterials), allocation of Thrive MSP 2040 forecasts to transportation analysis zones (TAZs) and 2040 traffic forecasts for principal and minor arterials.
    5. Adopted station-area planning for transitways and high-frequency transit corridors in service or in advanced planning stages including density minimums, targets, and land use mix.
    6. Local plans adopt access management guidelines for principal and "A" minor arterials.
- Integrates components of the local public facilities plan as described in Minn. Stat. sec. 473.859, subd. 3.
    1. Integrates development policies, compatible land uses, forecasted growth allocated to Traffic Assignment Zones (TAZs) at appropriate densities specified in *Thrive MSP 2040* for

community designations and allocation of 2040 forecasts to TAZs for development and operation of the transit system to maximize the efficiency and effectiveness of the regional system.

Consistency: A local comprehensive plan will be consistent with Council policies and statutory requirements if the local plan:

- Addresses community role strategies for community designations contained in *Thrive MSP 2040*.
- Includes a plan for the implementation of an interconnected system of local streets, pedestrian, and bicycle facilities that is integrated with the regional system.
    1. Includes a plan for local roadway systems to minimize short trips on the regional highway system.
    2. Identifies needed local infrastructure (streets, pedestrian and bicycle facilities) to support connections to existing transitways and high-frequency bus corridors and those under project development.
    3. Identifies bicycle and pedestrian system needs and policies.
- Considers travel modes other than the car at all levels of development (site plan, subdivision, comprehensive planning) to better connect and integrate choices throughout all stages of planning. A Complete Streets policy is recommended to balance the needs of all users in transportation decision making.
- Addresses job concentrations, nodes along corridors, and locally important centers and their connection to the regional transportation system, including use of travel demand management initiatives.
- Addresses the linkage of local land uses to local and regional transportation systems including a mix of uses and increasing housing unit and employment densities in regional job concentrations, in transitway station areas, and along high-frequency bus corridors.
- Addresses the needs of freight movement in and through the community (roadway, rail and waterway). Addresses accessibility to freight terminals and facilities, especially “last mile” connections that are often local streets connecting freight facilities to principal arterials.
- Includes an implementation plan that describes public programs, fiscal devices, and other specific actions for sequencing and staging the implementation of the comprehensive plan, to accommodate growth and change consistent with TAZ forecast allocations, and to ensure conformance with regional system plans, described in Minn. Stat. sec. 473.859, subd. 4.
- Addresses official controls: Includes a Capital Improvements Program (sewers, parks, transportation, water supply and open space) that accommodates planned growth and change consistent with TAZ forecast allocations.
- Addresses state and regional goals for reducing greenhouse gas and air pollutant emissions.

Compatibility: A local comprehensive plan is compatible with adjacent and affected governmental units, including appropriate interconnection of county and local transportation networks of streets, bicycle pathways and pedestrian facilities, based on comments or concerns, or lack thereof, from these entities. A community should adequately document that it has

acknowledged the concern(s) of all adjacent and affected governmental units.

- Addresses coordination of transitway station-area and high-frequency bus corridor planning with other communities along identified corridors.
- Addresses partners in communities, counties, and the region at large to coordinate transportation, pedestrian, bicycle, and trail connections within and between jurisdictional boundaries.

The Foundation for Land Use and Transportation

The local transportation system is an essential component of the daily movement of people and freight. The foundation of the transportation system and its most basic component is the street. Streets (or roads, highways, freeways) are provided in a variety of ways to meet different needs in the region. While the MnDOT is the primary provider and maintainer of major highways (or principal arterials), local governments are the primary providers and maintainers of minor arterials and other local roads. (More details on the functional classification of roads is discussed in "Highway Investment Direction and Plan" and Appendix D.

Roads, rivers and ports, freight railroads, transit, sidewalks, trails, and airports make up our region's transportation framework. Every community in the region may not have each of these transportation elements, but every community does have roads, even though their purpose will vary depending on a community's stage and form of development. Since very early times, roads have supported our travel – whether by foot, horse-drawn wagon or buggy, or – in the 20th century – automobile and truck. In recent history and today, roads have propagated auto-oriented travel and development patterns, but they also support the transport of freight and people traveling in buses, on bicycles, by foot, and in wheelchairs or other assistive technologies. The road provides the support for all of these people and freight, along with important supplementary facilities within the road right-of-way, such as sidewalks and trails.

- For Urban Center, Urban, and Suburban communities, as defined by Thrive MSP 2040, local governments will continue providing an interconnected system of streets, sidewalks, and trails that considers all users, appropriately connects to the regional highway system, and is supported by the regional system of highways and transit.

  In these communities, changes to the regional transportation system will focus on adaptive improvements that better support the growing demand for multimodal travel while protecting the flexibility offered by automobiles and trucks. These communities, especially those developed around the automobile, will gradually redevelop to be less auto- and more pedestrian-oriented, if they choose.

- For Suburban Edge and Emerging Suburban Edge communities, local governments and developers will invest in new systems of streets, sidewalks, and trails, considering all users – people and freight – from the start, proactively planning for generations to come. This includes a more deliberate approach of designing infrastructure to the scale

of people instead of the automobile. The resulting change in development form will be driven by design, local transportation investment, and land use planning.

- Rural areas will invest in highways and streets that are flexible for a variety of uses and connect them with Rural Centers and the urban and suburban areas within the Urban Service Area identified in *Thrive MSP 2040*. In rural areas, the emphasis will be on strengthening safe connections and less on large-scale transportation capacity.

In all areas, moving freight by truck will continue to be an essential consideration in planning and implementing a local transportation system and land use. Transportation is essential to the economic vitality of the region –both to people and to businesses. A well-designed, high-quality local transportation system directly benefits the functionality and affordability of freight. Also important will be the identification of important freight-accessible land that is vital for the region to protect and support. More detail on this is available in "Freight Investment Direction" (*insert link*).

In the Urban and Suburban areas and Rural Centers, a diversity of land uses and densities creates various transportation needs. This diversity currently makes these areas attractive to some lifestyles. However, these lifestyles can change over time, and it is imperative that local governments and regional transportation providers balance their long-term approach by planning for an affordable, coordinated, multimodal transportation system.

The following sections focus on how growth can be directed toward nodes along corridors, resulting in orderly and efficient land use patterns.

Density and Diversification of Job Concentrations and Nodes along Transportation Corridors

The Metropolitan Council's *Land Use and Planning Resources Report*, completed in 2011, identifies and assesses the effectiveness of local and regional planning strategies and process for:

- reducing air pollution
- mitigating congestion, and
- reducing costs for operating, maintaining, or improving infrastructure.

The report emphasizes approaches that reduce or manage travel demand through land use and access to transportation options. The Council developed the report in collaboration with local governments.

The report showed that local land use decisions can have a significant impact on travel behavior, congestion, air quality, greenhouse gases, and livability over time and that activity centers and their characteristics play an important role in this relationship. Several strategies have the greatest impact on travel behavior:

- access to activity centers along transportation corridors
- street design and connectivity of transportation networks
- mixed land uses
- high-quality transit
- density combined with other strategies, and
- transportation management and parking.

Research concludes that density alone is not as effective as density combined with other strategies, such as connections to activity centers, a high-quality local transportation network, a mix of land uses, and transit.

This Transportation Policy Plan places increased emphasis on linking regional transportation investments to providing or improving access to regional job concentrations. Details about this strategy are found in the investment directions and plans. Local land use decisions related to job concentrations, nodes along corridors, and local centers can further support the *Thrive MSP 2040*'s outcomes of stewardship, equity, prosperity, livability, and sustainability.

The following strategies can create opportunities that make the transportation-land use connection more productive:

Intensify and diversify land uses in regional job concentrations, nodes along transportation corridors, and local centers.

Increasing densities in areas where jobs are concentrated and in nodes along transportation corridors can benefit transit, but increasing densities while diversifying the mix of land uses can lead to broader changes in travel behavior. Regional job concentrations and nodes should be target areas for greater housing densities to balance the mix of job, housing, service, and retail activity in centers. An increased mix of land uses has been shown to decrease auto trips per capita relative to single use districts, where auto travel is often the only option for people.

It will be challenging for the region to create freestanding centers of mixed-use activity that can support a level of intensity that is comparable to diversifying areas where jobs and activity are already concentrated. These areas have commercial or industrial uses that may be prone to redevelopment and are often targets for planned mixed-use land uses. But the overall mix of uses in areas where jobs are concentrated and in nodes along corridors is more important than specifically supporting new mixed-use developments. Similar strategies can also be applied to local centers, whether in rural areas or as the focus of a local comprehensive plan.

Support density and a mix of uses with transportation and urban design strategies.

Research has shown that without additional strategies that address the travel experience to, from, and within centers, density and a mix of land uses will not translate to positive benefits in

travel behavior, congestion, greenhouse gases, and air quality. There are a number of key implementation considerations for local governments:

- Provide for a dense network of arterials, local streets, sidewalks, and trails that support narrower streets and smaller intersections by distributing traffic more broadly, and create more opportunities to walk and bike. This approach will discourage the development of "super blocks" that discourage community cohesion and connectivity. Policies aligned with Complete Streets techniques are an important component of this strategy. This includes considering how truck freight access can be accommodated in the street network design, since narrower streets can cause mobility problems for trucks.
- Manage the demand for driving by exploring policies such as parking pricing, on-street parking management, shared parking facilities, and the elimination of parking minimums in zoning codes that may be requiring oversupply relative to what the market demands.
- Foster and implement good urban design through code regulations and design standards. Good urban design includes public infrastructure, such as the streetscape and public spaces, and private development including building form, mass and scale, building materials, and parking design and location.

These land use tactics for local government can be applied to regional job concentrations, nodes along corridors, and areas identified as local centers in comprehensive plans. More details on these strategies and additional resources for local governments are available in the Council's *Land Use and Planning Resources Report* [*insert link*].

Local Government Land Use Policies Supporting Transit

In "Transit Investment Direction and Plan" [*insert link*], there is a description what conditions are needed to support an effective transit system. An essential part of this discussion focuses on development patterns that occur locally and are planned and regulated by local governments. The Transit Market Areas described in "Transit Investment Direction and Plan" demonstrate that the urban core is best suited for all-day, frequent bus service, but Transit Market Areas I and II represent only about 6% of the region's land area despite generating the majority of transit trips.

Much of the region developed around cars and is not well suited to be served by local bus routes. So the challenge in serving other regional communities will be shaping land use plans to align with the potential for future transit service. This section describes the elements of land use and development patterns that facilitate better transit service and describes how local governments should plan for these elements to set the stage for a positive market response that is leveraged to do more in response to transit investment.

National experience has shown that development around transit must have both strong local government support and market demand to be successful. Land use and local development support are critical factors in prioritizing transitway investments, where the level of investment is substantial and long-lasting.

Local communities can plan for an efficient land use and development pattern that supports local transit or transitways. This is possible where local governments can influence the following factors:

- Encourage density of population and activity
- Design for a pedestrian-friendly environment
- Encourage a mixed-use land use pattern
- Develop an interconnected street network that maximizes pedestrian and bicycle access and simple route design
- Support travel options that encourage or compliment using transit
- Plan for linear growth in nodes along corridors

In a similar way that shaping land use can support transit successfully, transitways can transform land use. Regional transitway investments will need a strong partnership with local governments to support their success. Local governments will need to set the vision for land use around high-frequency bus and transitways and guide development and local infrastructure to implement this vision.

The vision and the commitment to this vision should be expressed in local comprehensive plans and/or station-area plans and supported by local government strategies and investments. While the investment in infrastructure for high-frequency bus service is not as substantial as for most transitways, the regional investment in operating these services is significant. To benefit the most from this continued regional investment, local governments will need to be strong partners in planning land use and development patterns in corridors that consider adjacent communities and potential connections to, or extensions of, existing transit service.

Generally, these connections will be most feasible in areas within and adjacent to Transit Market Area II, as described in "Transit Investment Direction and Plan" [*insert link*], although opportunities for suburb-to-suburb transit service could also be supported with strong local land use planning and implementation. An important factor for this type of service will be the focus on job concentrations.

Error! Reference source not found. Table C-2 provides details on density expectations for new residential or mixed-use development around transit stations and around high-frequency transit service using the community designations in *Thrive MSP 2040*. Densities are described as the minimum average across all areas planned for new development and redevelopment within a station area or bus corridor, expressed as housing units per net acre. The table also provides an overview of other areas that local governments should be addressing through strategies that

will support the density needed for transit, with more detail provided following the table. The Council will use various programs to support local governments in these efforts, as described later in this section.

Table C-2: Local Government Land Use Planning Coordinated with Regional Transit Investments

	Thrive MSP 2040 Geographic Planning Areas			
Density for Transit Corridors Relative to Community Designation	**Urban Center**	**Urban**	**Suburban**	**Suburban Edge or Emerging Suburban Edge**
Residential Density Average near Transitway Stations Serving Light Rail, Commuter Rail, and Highway Bus Rapid Transit – The region makes significant investments in transitways and local governments are partners in supporting these investments by enabling the market to maximize their potential. The numbers below represent average net densities near existing and new transit stations for areas that are identified for new development or redevelopment with some form of housing (housing or mixed-use).				
Minimum community-wide densities established in *Thrive MSP 2040* (*insert link to Thrive MSP 2040*)	20 units per acre	10 units per acre	5 units per acre	3-5 units per acre
Density expectations for fixed or dedicated rights-of-way transitway station area (area within 10-minute walk or ½ mile area)	Minimum: 50 units per acre Target: 75-150+ units per acre (*Link to Pics*)	Minimum: 25 units per acre Target: 50-100+ units per acre (*Link to Pics*)	Minimum: 20 units per acre Target: 40-75+ units per acre (*Link to Pics*)	Minimum: 20 units per acre Target: 40-75+ units per acre (*Link to Pics*)
Density expectations for highway BRT transitway station area (area within 10-minute walk or ½ mile)	Minimum: 25 units per acre Target: 40-75+ units per acre (*Link to Pics*)	Minimum: 12 units per acre Target: 25-50+ units per acre (*Link to Pics*)	Minimum: 10 units per acre Target: 20-40+ units per acre (*Link to Pics*)	Minimum: 10 units per acre Target: 20-40+ units per acre (*Link to Pics*)
Density expectations for arterial BRT station area (area within 5-minute walk or ¼ mile)	Minimum: 15 units per acre Target: 20-60+ units per acre (*Link to Pics*)			
Residential Density Average for All Development near Transit Service along High-Frequency Bus Corridors – These corridors will provide the highest levels of non-transitway bus service on urban and suburban arterials. Their success and ultimate implementation depends on local development patterns that support high transit demand. The numbers below represent average net densities on new				

development or redevelopment with some form of housing (housing or mixed-use).	
Density expectations for high-frequency bus corridor (area within 5-minute walk or ¼ mile)	Minimum: 10 units per acre Target: 15-60+ units per acre (*Link to Pics*)
Diversity of Activity at and around Transit Station Areas – Total activity is a vital measure of the potential for trip making and the total number of people and destinations near a transit station.	
Activity level of transitway station area (area within 10-minute walk or ½ mile)	In addition to planning for appropriate residential densities, local governments should consider planning for a level of total "activity" near stations that is supportive of transitway investments. Activity can include residential units or people, jobs, students, and retail and entertainment space that contribute to an overall level of activity. A guideline for minimum activity around a station that can be fully developed would be 7,000 total people, jobs, or students.
Other Land Use and Development Considerations near Transit and Transitway Stations – Density and activity are important, but there are other considerations in development patterns that are a part of the user experience in attracting transit riders to the system.	
Best practices for land use and development planning and implementation	• Develop a walkable street network that maximizes pedestrian and bicycle access. • Design for a pedestrian-friendly environment where streets foster an inviting experience on the way to transit. • Plan for a mixed-use development pattern at stations and in corridors that complements overall corridor development and accommodates freight movement. • Focus density in linear corridors and consider the relationship to adjacent communities and existing transit service. • Manage parking supply and provide for other options such as shared cars and bicycle facilities. • Maintain and increase affordable housing options. • Incorporate civic and public or semi-public spaces. • Protect and restore important natural resources in the station area. • Address barriers to private investment by using financing mechanisms for public infrastructure, site preparation, affordable housing, and other areas that require gap funding.

The implementation of **Error! Reference source not found.**Table C-2 will occur through a partnership of the Council, regional transit providers, and local (city and county) governments. Local governments may discover, through local comprehensive planning efforts, issues or concerns that will need to be addressed. The Council is committed to working with local

governments to plan for land use that acknowledges the challenges that a local community is experiencing while respecting the need of the region to be good stewards of public investments.

The "Transit Investment Direction and Plan" includes transitway investment factors that will consider how committed local governments are to these guidelines when determining investment priorities. These considerations are also an important factor in federal New Starts and Small Starts project evaluation. Additional information can be found in the resource list.

Strategies for Local Government Land Use Planning Coordinated with Regional Transit Investments

The greatest influence on corridor development and readiness for transit service is having a long-range vision, community buy-in, and early community identification of potential supportive changes to land use patterns. Local governments should be proactive in planning for transit service so that their plans can help shape transit investment. This will promote integrating land use with transit development for existing transit service, new service, and potential transitway station locations. Planning for station areas and corridors assists local governments in preparing for and maximizing the development benefits of transit investments.

Station-area plans need to take into account a variety of factors that may include community transportation and circulation issues, urban design guidelines, and public infrastructure that will make for a high-quality transit-oriented development. These plans provide the means to coordinate land use and transportation at the community level and with other communities served by the corridor. Development potential may be influenced by the local role a station is intended to perform and its role in regional economy.

Encourage population and activity density. Overall community density sets the background pattern for transitway and high-frequency service and potential. Planning for minimum and target densities ensures that the market for development is not diminished by government regulation. Market demand will be an important factor in how much allowable development is realized and when. The effect of the overall development pattern in a community and along corridors is the critical factor. Effective density is also closely linked to a supportive local network of streets, sidewalks and bicycle pathways and to a mix of compatible uses (*Link to Community Designations*).

Minimum densities and targets for station areas are linked to community designations and their potential relative to existing development patterns. Compact, high-density development increases the number of places within reach near a transit station. Higher densities also supply the potential ridership that can support more frequent transit service and a greater variety of routes. The result is more transportation options, less time on the road, reduced traffic congestion, and more transit-supportive development patterns. At the same time, well-designed compact development contributes to vibrant, economically healthy neighborhoods

that offer a variety of goods and services, social gathering places, recreation and entertainment opportunities, and attractive character.

Each community along a transit corridor or future transit corridor needs to create its development context for the shared corridor. At stations along transitways or high-frequency bus routes, higher densities are appropriate to increase the overall corridor density and mix of uses that make for a strong transit corridor. In addition to planning for appropriate densities, local governments should consider planning for a level of total "activity" near stations that is supportive of transitway investments. Activity can include residential units, daytime population, jobs, students, and retail and entertainment space that contribute to an overall level of activity. A guideline for minimal activity would be 7,000 total people, jobs, or students.

Plan for a mixed-use development pattern. The region is implementing a regional transit system, around which significant regional growth is expected to occur. Density, alone, cannot ensure the success of a transitway. It is important for station areas to serve a diversity of uses, scaled to meet community needs and the station's role in corridor development. Communities along a corridor should coordinate their plans and development expectations (timing, uses and scale) with each other and transit service providers. Higher development intensity should be nearest the transit station, tapering off near the edges of the defined transit-oriented development area.

Every transit journey starts with walking, so pedestrian-friendly station areas are necessary for every successful transitway. Towards this end, it is essential that local governments adopt measures in their comprehensive plans, station-area plans, and other local controls to prevent new or significantly expanded uses and building forms that are incompatible with transit use and human-scale design.

Table C-3 lists uses that are generally considered to be detrimental to the goal of creating an active pedestrian environment.[1] New standalone uses in these categories must be prohibited in the area immediately surrounding the transit station (within one block of stations) in comprehensive plans, station-area plans, and other local land use controls. Table 5 also lists building forms that are generally considered to be detrimental, and thus should be controlled with the goal of supporting an active pedestrian environment. New construction exhibiting these design features must be prohibited in the area immediately surrounding the transit station (within one block of stations) in comprehensive plans, station-area plans, design standards, and other local land use controls.

[1] *Pedestrian & Transit Oriented Design, Reid Ewing and Keith Bartholomew, Urban Land Institute, 2013. Figure 4-1, page 56.*

Table C-3: Station-Area Land Use Controls Supporting an Active Pedestrian Environment

Recommendation	Uses	Design Features
Prohibit in the Area Immediately Surrounding Transit Stations	• Surface parking lots • Distribution warehouses • Personal storage facilities • Outdoor storage facilities • Salvage yards • Animal boarding • Motor vehicle sales • Motor vehicle fueling, servicing and repairs, including car washes	• Off-street parking located between the building and the sidewalk • Drive-thru lanes located between the building and the sidewalk • Opaque surfaces of any kind constituting more than 60% of any building surface facing a street at eye level.

Pedestrian-friendly environments will possess many other design features as well. City block length, sidewalks, pedestrian level lighting, and street-oriented buildings are just some of the features that build a pedestrian- and transit-oriented district. A more complete description of desirable design features can be found in the Council's Guide for Transit-oriented Development.

Under Minnesota state law, existing uses are grandfathered in when local land use controls are changed, as long as they are not expanded. Consequently, they may continue to exist in their current form for many years. For this reason, it essential that local governments implement these minimum land use protections around transitway station areas and other transit centers as soon as the transit investments are identified during the determination of the locally preferred alternative. A transit-oriented development overlay zoning district is one way of protecting against detrimental land uses and building forms on an interim basis until more detailed station-area plans and permanent local controls can be developed and adopted. Model TOD overlay district language can be found, as an example for local governments, in the Guide for Transit-oriented Development. Station-area plans and supportive zoning are to be developed and adopted during transitway engineering to guide development around transitway stations in a pattern that is supportive of transit investments.

Develop an interconnected street network that maximizes pedestrian and bicycle access and allows for simple route design. Local connectivity for pedestrians and bicycles, along with streetscape design, are important factors for determining housing and job densities. A network of Complete Streets that are friendly to all modes with streetscape and street-level design standards or guidelines should be standard around stations and provide the necessary local system of access. Transit riders need safe and convenient routes to get to and from transit. Riders will typically walk one-half mile (about a 10-minute walk for most people) to and from transit.

Design for a pedestrian and bicycle-friendly environment. Street design guidelines should be adopted that improve the user experience for pedestrians and bicyclists by calming traffic, narrowing crossings, and improving the amenities and design of areas along and abutting the street. Design guidelines may also need to consider unique or flexible ways to accommodate freight traffic in and through these areas.

Accommodate freight movements. The design of station areas will also need to accommodate trucks that bring freight and goods into walkable, mixed-use areas. Transit-oriented developments can be served without creating unsafe conditions for pedestrians and bicyclists by designing in "back-door" service areas and secondary streets and alleys to separate truck movements from the main flow of pedestrian traffic, and by designing specific streets to accommodate the appropriate controls and vehicles for the anticipated levels of truck traffic.

Manage parking supply and support travel options. While inclusive of the car, transit-oriented development is about combining compact development composed of a variety of uses and access modes. To improve the efficiency of land use, minimum densities should be followed in conjunction with a parking strategy. The strategy should consider reduced required parking ratios, shared-parking programs, eliminating parking minimums that require more supply than is demanded, and parking design guidelines.

Maintain and increase affordable housing options. Plans for station areas and stops need to incorporate policies for mix of uses. This includes policies for a variety of housing types and affordability levels. As station area and corridor plans evolve from vision and development concepts to formally adopted elements of the local comprehensive plan, each stage needs to consider strategies to preserve existing housing affordability and the inclusion of affordable units in new residential projects. Guidance on how to develop effective affordable housing strategies is available in the Housing Policy Plan [*insert link*].

Incorporate civic and public spaces. Integrate public art and civic spaces and facilities that reflect community history and culture into station areas and include community gathering spaces use. Parks and green space are also important to include.

Protect and restore important natural resources. Important natural resources around a transit station or in transit corridors are important to protect or restore, especially when increased development intensity will put pressure on natural areas. Exploring increased density on developable land will help protect important natural resources while providing valuable access to green space in dense areas.

Address barriers to leverage private market investment. Local governments should consider using financing mechanisms for public infrastructure, site preparation, affordable housing, and other areas that require gap funding to support regional and local goals for station area development.

Council Programs Supporting Transit-Oriented Development

Metropolitan Council programs and policies can assist local governments in achieving the land use policies in *Thrive MSP 2040* and the Transportation Policy Plan. The Council's Livable Communities grant program is available to fund community investment that revitalizes economies, creates affordable housing, and links different land uses and transportation. The voluntary, incentive-based approach of the Livable Communities program leverages partnerships and shared resources to help communities achieve their regional and local goals. The Council awards grants through four categories:

- *Tax base Revitalization Account*: Cleans up contaminated sites for redevelopment that creates jobs and/or produces affordable housing.
- *Livable Communities Demonstration Account*: Supports development and redevelopment that links housing, jobs, and services and demonstrates efficient and cost-effective use of land and infrastructure.
- *Local Housing Initiatives Account*: Produces and preserves affordable housing choices for low to moderate incomes.
- *Transit Oriented Development*: Catalyzes development around light rail, commuter rail, and high frequency bus stations.

More information on these grant programs is available on the Council's website (metrocouncil.org).

The Council also recently created a transit oriented development policy in late 2013 that provides a framework for the Council to play a leadership role in planning and implementing transit oriented development throughout the region. The Council's transit oriented development department supports the implementation of this policy.

Potential Constraints to Transit-Supportive Land Use

There are a number of potential constraints to development potential around transit investments. These constraints will need to be discussed in collaboration with local governments to the extent that they may inhibit the feasibility of planning for intensive land use. Examples of these constraints include:

- Market Potential – Local governments and the region are able to set the stage for development by doing land use planning, making investments in infrastructure, and providing other forms of support. However, the most important component of land development is market potential, which takes into account a number of other factors beyond planning and infrastructure. Many of these factors cannot be controlled by government, although it is helpful to understand these constraints when doing planning. Market studies that are community-specific, corridor-specific, or even broader, are encouraged.

- Developable Land – The potential for transformation around station areas will be limited by the amount of land that can be developed or redeveloped. This may depend on site configurations, barriers to transit access, external factors such as major utility lines or natural resources areas, or other potential constraints that will depend on local conditions.

This list of constraints is not exhaustive, nor do all the constraints exist throughout the region. They are potential considerations for the realistic implementation of the land use policies in the Transportation Policy Plan.

Transitway Commitments and the Timing of Land Use Planning

It is important to acknowledge that many communities will require significant retrofitting in order to achieve development results that are supportive of transit. Transitways require a substantial planning process that can leave local governments with uncertainty about specific project details, such as station locations, and the timing of investments. The process of planning land use and transit investments will be iterative. However uncertain transit investments are, land use planning represents a long-term outlook that also informs transit planning. The following table describes the steps local governments can do prior to a transit commitment (such as a locally preferred alternative). Once a transitway or high-frequency route is in the Transportation Policy Plan, the expectations become more explicit, as described in **Error! Reference source not found.**Table C-4.

Table C-4: Local Government Land Use Planning in Relation to Transit Commitment

Local Comprehensive Plan Element	Prior to Transit Commitment	After Transit Commitment
Land Use	• Set vision for potential/future transit corridors with goals for land use patterns that can grow into transit-supportive densities and nodes of activity. • Guide medium- and high-density housing and mixed-use to areas along these corridors. • Consider potential transit alignments. • Work with agencies leading transit planning to identify important existing and planned transit opportunities.	• Adopt station area or corridor plans with an investment and regulatory framework to guide implementation. • Set density levels for new development that conform to minimums in the Transportation Policy Plan and opportunities for targeting higher densities.
Local Transportation	• Adopt community-wide policies for complete streets and pedestrian facilities and bicycle	• Implement identified segments that provide an interconnected local transportation network

	facilities. • Identify needed local transportation improvements to support land use vision in Comprehensive Plan.	serving the station or corridor. • Adopt transit-oriented development policies to guide development, including travel demand management.

This plan describes some general considerations for local governments doing this type of planning, but the Council will provide more specific guidance through an update of the *Transit-Oriented Development Guide*, the *Local Planning Handbook*, and other tools and resources. The following section includes some potential interim resources for planning around transit.

Resource List for Land Use Planning Around Transit

Transit-Oriented Development Planning Resources:

- *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*. Federal Transit Administration, August 2013. http://www.fta.dot.gov/documents/Land_Use_and_EconDev_Guidelines_August_2013.pdf
- Municipal Resource and Service Center of Washington. *Transit-Oriented Development: TOD – Guides, Studies, and Articles; TOD and Market Forces; TOD Programs; TOD Plan and Ordinance Examples; Financing TOD* *http://www.mrsc.org/subjects/transpo/transitdev.aspx*
- *Growing Station Areas—The Variety and Potential of Transit Oriented Development in Metro Boston*. Metropolitan Planning Council. June 2012. *http://www.mapc.org/sites/default/files/MAPC-TOD-Report-FINAL-web-reduced-size.pdf*

Transit Overlay Zones (including parking requirement bonus reductions):

- *Housing Innovations Program. Featured Tool: Transit Development Overlays* *http://www.psrc.org/assets/6675/hip_tod_overlay.pdf*

Affordable Housing:

- *Mixed-Income Housing Near Transit—Increasing Affordability With Location Efficiency*. Center for Transit-Oriented Development. *http://reconnectingamerica.org/assets/Uploads/091030ra201mixedhousefinal.pdf*

Corridor Planning:

- TOD 203. *Transit Corridors and TOD—Connecting the Dots*. Center for Transit-Oriented Development *RA_203_corridorsFINAL3.pdf*

Shared Parking:

- Portland Metro. *Shared Parking* *http://www.mapc.org/sites/default/files/PortlandMetro_sharedparkingreport.pdf*

Travel Demand Management:

- Denver Regional Council of Governments. *DRCOG Regional TDM Short Range Plan* (2012-2016) June 2012. https://www.drcog.org/index.cfm?page=TravelDemandManagement(TDM)

Complete Streets:

- Sacramento Area Council of Governments. *Complete Streets Resource Toolkit* *http://www.sacog.org/complete-streets/toolkit/START.html*

Bicycle and Pedestrian Planning

Bike and pedestrian infrastructure is most commonly provided by local governments and often integrated with local land use development. Local governments should consider the regional role of these local systems when doing comprehensive planning and implementing plans.

Bicycle Considerations

Bicycle infrastructure is an important consideration for both on-street and off-street options where bicycle travel is encouraged. Local governments should consider Complete Streets policies for all roads in their jurisdiction as a tool to not exclude bicycles in the design of streets. In addition to serving local travel, local bicycle systems should provide important connections to regional systems, including:

- Priority Regional Bicycle Transportation Corridors and the Regional Bicycle Transportation Network [*insert link to "Bicycle and Pedestrian Investment Philosophy"*]
- Regional Parks and Trails [*insert link to Regional Parks Policy Plan*]
- High-frequency arterial transit corridors, transitway stations, transit centers, bus stops, and park-and-ride facilities [*insert link to "Transit Investment Direction and Plan"*]

The region's bikeways would be easier to navigate with better wayfinding information for regional trails and bikeways. Wayfinding is a system of signs designed to direct cyclists to important regional or local points of interest. When planning for local trails systems and when implementing the Regional Bicycle Transportation Network, local agencies should consider including wayfinding systems to assist cyclists in finding important regional destinations and activity clusters. Routing through wayfinding can be especially effective where there are missing or unclear connections between jurisdictions.

Local governments should also identify gaps and barriers in the bicycle system through comprehensive planning and have a plan to address them. Bicycle parking and internal circulation may also need to be addressed at high-activity areas such as job concentrations, nodes, or local centers. The design, implementation, and maintenance of bicycle facilities should provide for a safe, comfortable, and convenient travel option in communities.

Pedestrian Considerations

Pedestrian connections are one of the most fundamental parts of a multimodal transportation system in the Urban and Suburban area as well as Rural Centers, where destinations and

activity are located closer together than in the rural areas. Many people start and end their trips as pedestrians. Like bicycles, a potentially important planning consideration for pedestrians is adopting and putting into practice a complete streets policy. Planning for pedestrians is also integrally related to regional system planning. Local governments should provide and maintain pedestrian access to:

- Regional Parks and Trails [*insert link to Regional Parks Policy Plan*]
- High-frequency arterial transit corridors, transitway stations, transit centers, bus stops, and park-and-ride facilities [*insert link to "Transit Investment Direction and Plan"*]

A pedestrian-friendly environment is also a key strategy for successful dense, mixed-use areas, where pedestrian activity is often the highest.

Planning for a pedestrian friendly environment goes further than just providing access and infrastructure. The pedestrian environment is integrated with design. Good pedestrian facilities incorporate best practices that provide for a safe, comfortable, and convenient space to walk. When people are walking, they experience the streetscape in a different way than faster moving modes such as a car or bus. Local governments should consider the design and form of buildings that are adjacent to the pedestrian system, the need for street greening and shade with trees and planters, lighting and other safety elements, the proximity and speed of adjacent auto traffic, crossing facilities, signage, and other relevant elements identified through local planning.

Another element for local agencies to consider when planning for areas of high pedestrian activity is wayfinding – the system of signs used to direct pedestrians to important points of interest. Local planners should consider planning and implementing wayfinding systems where there are high levels of pedestrian traffic (for example, a local or regional trail, public plazas, historic districts) and clusters of highly visited destinations. Routing through wayfinding systems can be especially effective in directing pedestrians from a prominent regional or local trail to a commercial district, neighborhood center, or areas of entertainment or special interest.

Elements of a Good Pedestrian Experience:

Well-designed, well-maintained, safe, and secure pedestrian facilities – Sidewalks are the key building block of a local pedestrian system. They should be well-designed with appropriate widths, buffered with either parking, trees, or landscaping/grass, and maintained and kept clear of debris, snow, and ice. Also important are quality lighting, connections to land use ("eyes on the street"), traffic calming considerations including reduced turning speeds of vehicles, and traffic signals that are well-timed with considerations for pedestrians. Accessibility for all users should be integral in the design of these facilities.

Access to a mix of destinations and uses – Diverse environments attract people on foot. A successful pedestrian environment provides access to a mix of complementary uses that can

include housing, neighborhood services and shopping, offices and jobs, schools, libraries, parks and civic space, and recreational facilities. This can also include connections to other modes, including bicycle facilities, transit, and well-connected parking facilities.

Manageable walking distances and crossings – A comfortable walking distance is 5 to 10 minutes or about ¼ to ½ mile (1,250 feet to 2,500 feet). The distance a person will walk varies based on the street pattern and presence of natural or man-made barriers. Wide streets and infrequent safe crossings are some of the most common barriers for pedestrians to navigate. A successful pedestrian environment addresses crossing distances by shortening them through design (for example, narrower streets, curb extensions), providing comfortable median refuges and curbside waiting areas, and creating a visual connection across the street through pavement markings, signs, or other design elements. Safe crossings can be provided at midblock locations, where appropriate, to support direct connections for pedestrians.

A human-scale and visually interesting environment – Pedestrians experience their environment at a slower, more human-scale pace than drivers. A visually interesting and inviting pedestrian environment can increase pedestrian activity. Some key elements of a human-scale environment include landscaping, signs, and benches. However, building design and open space have the largest impact on pedestrian scaled environments. Good pedestrian design includes quality architecture and varied facades (for example, number of doors and windows, architectural elements), buildings that face the street and line the sidewalk with minimal setbacks, parking located to the back or side, connections to public art and civic and open space.

Protection from climate and environment – A successful pedestrian environment recognizes that the pedestrian is exposed to the elements. This can be softened by providing trees for shade and protection from rain and wind. Buildings can be oriented and located closer to the sidewalk and design elements can provide refuge for pedestrians. A buffer between pedestrians and auto traffic reduces the impacts of noise, pollution, and dirt.

Freight and Land Use Planning

The "Freight Investment Direction" [*insert link*] includes additional information on planning for land uses that are adjacent to freight corridors or facilities. The section also discusses the importance of planning for the long-term preservation of freight facilities through planning and considering the needs of freight as land uses change over time, particularly last-mile access to mixed-use or commercial areas.

Airport and Land Use Compatibility Planning

Most of the land surrounding the system airports now consists of built up areas or land zoned for urban uses, while Lake Elmo and Airlake are the only airports that have adjacent rural land use areas. There has been a rapid transition of urban development which is enveloping land around Anoka County-Blaine and Forest Lake airports.

The Council has implemented land use compatibility guidelines for aircraft noise as a preventative measure to help communities control expanded development of sensitive land uses around airports. Communities use corrective land use measures to help mitigate noise in areas with existing development that is incompatible with designated noise levels. The definition and application of the guidelines are found in Appendix L, along with revised noise contours for each airport.

Additional details on land use compatibility planning with respect to airports and airspace considerations are provided in the "Aviation Investment Direction and Plan" [*insert link*].

Transportation Finance

Overview

This section examines the sources of funding that will be available for transportation investments within the region in the coming years and the general areas of expenditure for those revenues. In particular, this section identifies the revenues that can reasonably be expected to be available and investment spending that will occur under what is known as the "Current Revenue Scenario" and also identifies an "Increased Revenue Scenario" under which a realistic amount of additional revenue might be available.

As identified in the previous Transportation Policy Plan, uncertainty and limitations affecting transportation funding continue to be major issues facing the region. Under the Current Revenue Scenario, expectations are that the performance of the highway system will decline because revenues will not even meet the needs to operate, maintain and preserve the existing system. And while the preservation needs of the transit system are estimated to be largely met, the important regional goal of growing and improving the bus and transitway systems cannot be achieved. The Increased Revenue Scenario provides an estimate of increased revenues that might be realistically attainable and that would move the region in a direction closer to achieving the outcomes of *Thrive MSP 2040* and the transportation goals envisioned by this plan.

Two Funding Scenarios

This Transportation Policy Plan considers two funding scenarios; one representing the investments that can be funded under current revenues, and a second representing a scenario in which new revenues are obtained.

- The Current Revenue Scenario assumes revenues that the region can reasonably expect to be available based on past experience and current laws and allocation formulas. Under federal regulations, this scenario is called “fiscally constrained.” If increases in state or local taxes, or the availability of competitive funds are assumed within the Current Revenue Scenario, the assumptions must be based on the region’s past history and experiences. The Current Revenue Scenario in this plan assumes only inflationary increases in the revenue sources. No increases in local, state or federal tax rates are assumed.
- The Increased Revenue Scenario assumes revenues that the region might reasonably attain through policy changes, laws or decisions that increase local, state or federal funding sources. Under federal regulations, the programs or projects in the Increased Revenue Scenario are illustrative of what might be achieved with additional revenues, but the projects are not considered part of the approved plan.

The regional transportation revenues and spending generally fall into three primary categories: state highways, transit and local transportation.

- The state highways category includes revenues and spending on the state highway system owned and operated by MnDOT's Metro District in the metropolitan area.
- The transit category includes revenues and spending by all regional transit operators, the Counties Transit Improvement Board and local governments for the regional bus and transitway systems.
- Local transportation includes revenue and spending by the counties and cities on local roads (including any principal arterials and A-minors owned by the counties and cities) and on the local bicycle and pedestrian system.

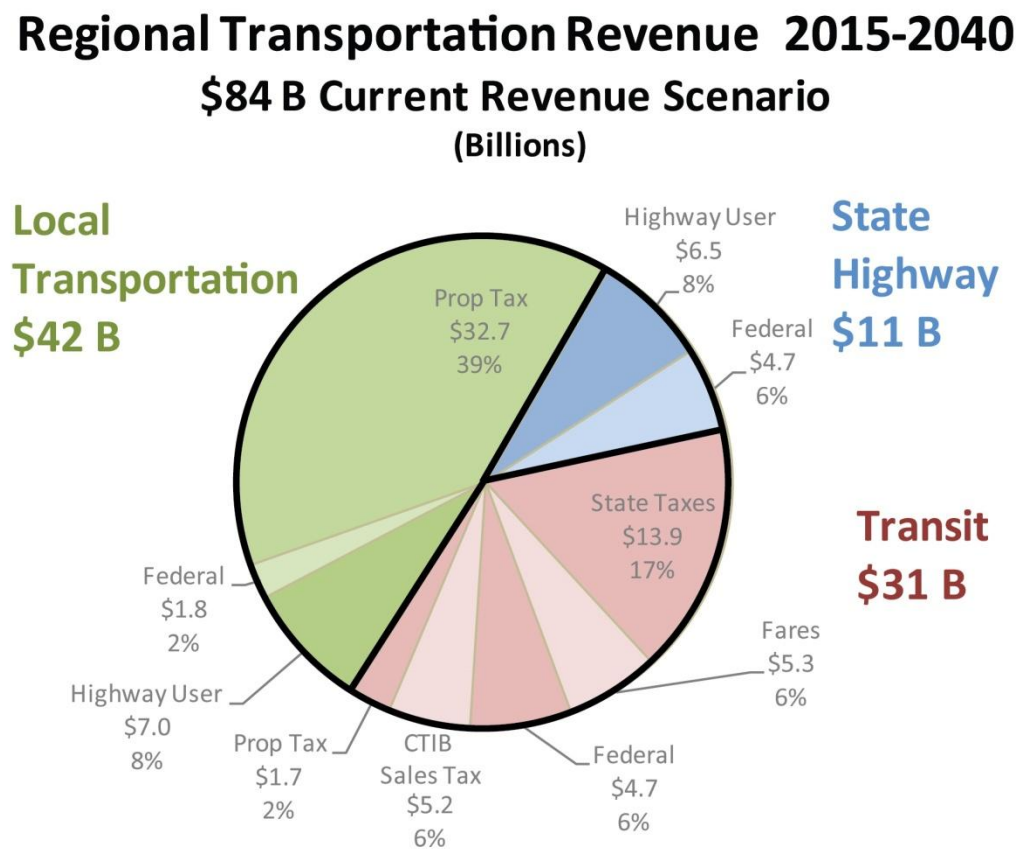
The general revenue and spending assumptions for each scenario and each transportation category (state highways, transit and local transportation) are contained in this section, while the specific highway and transit investments that can be accomplished within each scenario are detailed in the "Highway Investment Direction and Plan" and "Transit Investment Direction and Plan" sections of this Transportation Policy Plan. *[Link to Highway and Transit Investment chapters]*

Assumptions of Current Revenue Scenario

The funding assumptions used for the Current Revenue Scenario were developed cooperatively with the Minnesota Department of Transportation and Metro Transit using existing financial resources and documents where possible. Information on local transportation revenues were obtained from state-aid allocation reports, state auditor data and averaging past federal allocations.

The pie chart in Figure D-1 shows the total transportation revenues, estimated at $84 billion, are expected to be available to the region over the 26-year period of this plan (2015-2040), in year-of-expenditure dollars. Each of the major categories (state highways, transit and local transportation) will receive funding from federal, state, regional and local funding sources. The revenue sources and assumptions used for each are detailed below and are shown in Table D-1, "Metropolitan Area Projected Revenues by Funding Source and Time Period."

Figure D-1: Regional Transportation Revenue, 2015-2040



State Highways Revenues

State highways revenues are the revenues used by MnDOT for the state highway system in the metropolitan area, which includes most of the region's principal arterials and also the A-minor arterials owned by MnDOT *[Insert link to existing system description*]. MnDOT's primary sources of revenues are the state highway user tax revenues and federal revenues as described below.

Highway User Tax Revenues

In Minnesota, revenues from the state gas tax, vehicle registration tax and 60% of the motor vehicle sales tax are constitutionally dedicated to highway purposes and are collectively referred to as highway user tax revenues. The Constitution also provides that these dedicated highway user tax revenues are divided 62% to state highways, 29% to county roads and 9% to city streets.

MnDOT is responsible for tracking the highway user revenues and forecasting revenue into the future. The long-range estimates for highway user tax revenue were updated by MnDOT in 2013 as part of its work on the Minnesota State Highway Investment Plan (MnSHIP). In

predicting future highway user tax revenues MnDOT considered factors such as improvements to vehicle fuel efficiency, increases in the number of electric and hybrid vehicles and impacts of decreasing per capita vehicle miles traveled. MnDOT anticipates gas tax collections will slightly decrease over the time period of this plan (averaging -.6% annually), while vehicle registration taxes and motor vehicle sales taxes will annually increase (averaging 2.2% and 2.5% respectively). Taken together, the three highway user taxes are expected to increase by an annual average through 2040 of 1.2%.

As part of MnSHIP, MnDOT also prepared the estimate of the level of highway user tax revenues that would be allocated statewide for construction and operations purposes and also the percentage to be allocated to the MnDOT Metro District. Under this forecast, the Metro District will receive approximately 38% of the total statewide highway user tax revenues available for state construction purposes and approximately 25% of the statewide revenues available for state highways operations purposes. From 2015 to 2040, it is estimated that the Metro District will receive approximately $6.5 billion from the state highway user tax revenues.

Federal Highway Revenues

Federal transportation revenues are generated through a federal fuel tax. The revenues are deposited in the federal highway trust fund, about 85% of which are deposited in the highway account and 15% in the transit account. At the time this Transportation Policy Plan was drafted, the federal law inplace to distribute the federal revenues was known as MAP-21 - Moving Ahead for Progress in the 21st Century. Under MAP-21, there are five primary highway funding programs through which the state receives revenues - National Highway Performance Program (NHPP), Surface Transportation Program (STP), Congestion Mitigation/Air Quality (CMAQ), Transportation Alternatives Program (TAP) and the Highway Safety Improvement Program (HSIP). In order to align with the MnSHIP forecasts, all federal revenues covered by this plan are forecast to grow by an annual average rate of 1.4%.

In Minnesota, the state's NHPP funds and half of the STP funds are allocated to MnDOT for the state highway construction program. MnDOT's federal NHPP and STP funds are then allocated to the MnDOT districts along with the available state highway user tax revenues. The metro area receives 38% of the federal funds available to MnDOT for capital purposes. From 2015 to 2040, it is estimated that the metropolitan area will receive approximately $4.7 billion in federal highway funds.

Federal Highway Funds for Regional Solicitation

The remaining half of the state’s STP funds are allocated to local Area Transportation Partnerships, which involve local elected officials and members representing various modes to help determine expenditure of the funds. In the metropolitan area, the Council and Transportation Advisory Board (TAB) together serve as the Area Transportation Partnership and

are responsible for allocating the regional STP funds. Federal CMAQ, TAP and HSIP funds are also allocated to the region for distribution.

The regional STP, CMAQ, TAP and HSIP funds are allocated to specific projects in the region through a biennial process known as the Regional Solicitation. Through this process, TAB establishes project criteria and a scoring system to evaluate projects within specified categories. The Regional Solicitation has been undergoing an in-depth review and revision throughout 2013-2014. One of the purposes of the evaluation is to ensure that the criteria used in the Solicitation align with *Thrive MSP 2040* outcomes and the transportation system goals and objectives in this plan.

While state highway projects are eligible for the Regional Solicitation revenues, historically the majority of the federal revenues have been allocated to local transportation (roadway, bike and pedestrian projects) and transit projects. MnDOT's A-minor arterials and non-freeway principal arterials are eligible and may receive limited funding from the Regional Solicitation process, but for simplicity, the financial analysis for this plan assumes that none of the federal revenues available through solicitation will be allocated to MnDOT. The Regional /Solicitation revenues are accounted for within the Transit and Local Transportation revenue as described in later sections.

Transit Revenues

Transit revenues are generated by a number of sources, some of which are available only for specific transit operating or capital purposes. The transit revenues are largely used by the Council (Metro Transit, Metro Mobility, and Transit Link) and the suburban transit providers to operate and improve the existing bus and transitway systems. Some competitive state and federal revenues are also available to expand the transit system as described below.

Transit Motor Vehicle Sales Tax Revenue

Forty percent of the state's motor vehicles sales tax (MVST) revenues are dedicated to statewide transit purposes, with the Metropolitan Council receiving 36% of the MVST revenues for metropolitan area transit. The state provides a four-year forecast of expected MVST revenues (most recently FY2014-17), which was used as the basis for the MVST revenue estimates in this plan. After 2017, transit MVST revenues are forecast to increase at an annual average of 2.5% (consistent with the highway MVST forecast by MnDOT under the MnSHIP plan) over the time period of this plan. MVST revenues are primarily used for transit operating purposes but can also be used for transit capital. From 2015-2040, approximately $9.3 billion is estimated to be available from the transit MVST revenues.

State General Fund and Bond Appropriations for Transit

The state has historically provided a general fund appropriation for transit operating purposes. These revenues are in large part allocated to Metro Mobility operations and for the state's 50% share of the net costs of light rail transit operations. For the plan revenue forecasts, the state general fund appropriation is assumed to grow to meet the amount needed for these two transit operating purposes. From 2015-2040, the total amount of transit revenue from the state general fund is estimated at approximately $4.2 billion.

The state also periodically allocates revenues from state general obligation bonds for transit capital purposes. Historically the Council has received bond appropriations for transitway development, both for New Starts and other transitway projects. This plan assumes the state will continue to pay 10% of the capital costs for New Starts transitway development and also will provide an annual average of $5 million in bond proceeds for other transit capital projects. The state bond revenues are estimated at almost $500 million over the time period of this plan.

Transit Fares

The transit fare recovery ratio is a measure used nationally that compares the level of fare revenue received to the total operating costs of a transit system. A fare recovery ratio of 30% would indicate that 30% of the total operating costs are paid through passenger fares. Transit fare recovery ratios can vary significantly across service types, with services such as light rail transit recovering in the range of 35-40% of the operating costs, regular-route bus service recovering 28-33% of costs and ADA services such as Metro Mobility recovering a much smaller percentage, on the order of 10-12% of costs. Transit fare revenues are used primarily for transit operating purposes.

The Council periodically implements fare increases so that the system-wide fare recovery ratio remains fairly stable as a percent of the total system costs−currently at about 25% of system-wide costs. This plan assumes that, over time, fares will continue to grow with expenses (approximately 2.5% annually) to maintain a constant system-wide fare recovery ratio of 25% over time. This plan estimates total transit fare revenues at approximately $5.3 billion from 2015 – 2040.

Federal Transit Revenues

Under MAP-21, the region receives federal formula transit revenues through two primary programs−5307 and 5340. These programs provide formula funds for the region to use for transit capital asset management and improvement. For the purposes of forecasting the plan revenues, these programs are expected to continue in a similar form under any new federal law in the future and to grow at an annual average similar to the federal highway funds at 1.4% annually.

As indicated earlier, the region also receives federal CMAQ funds which are distributed by the TAB and Council though the Regional Solicitation. CMAQ funds must be allocated to transportation projects that improve, or reduce impacts on air quality. Historically the region has allocated approximately 80-90% of the available regional CMAQ funds to transit and travel demand management (TDM), projects. The revenue forecasts in this plan assume this allocation to transit projects will continue into the future and that, similar to other federal revenue, CMAQ funds grow at a rate of 1.4% annually. Together, the federal transit formula and CMAQ funds for transit are estimated to total almost $3.0 billion over the life of the plan.

The largest competitive federal transit program is the New Starts/Small Starts program, which can provide a significant share of major transitway projects. In the past, the region has received a 50% federal cost share for the construction of the Blue Line, Green Line and Northstar commuter rail. This plan a assumes federal funding contribution to future New Starts projects (I-35W South BRT, Southwest LRT, Bottineau LRT, Gateway BRT and any future New Starts project) will continue. The federal share may vary by project – this plan assumes a 50% federal share for all New Starts projects except the Gateway corridor where a 45% federal share is assumed as adopted by CTIB in its Program of Projects Investment Strategy. The federal New Starts funding in the first 10 years of the plan totals almost $1.8 billion, or about $180 million annually, with the assumption that the region may use grant anticipation financing if the federal contributions lags the project expenditures. As described in "Transit Investment Direction and Plan", *[insert link]* the region will aggressively pursue federal funding to allow for the accelerated development of the regional transitway system.

CTIB Transitway Sales Tax Revenues

In 2009, the legislature allowed the metropolitan counties to pass a 1/4 cent sales tax for transitway expansion and operating purposes. Five of the metropolitan counties (Anoka, Dakota, Hennepin, Ramsey and Washington) formed the Counties Transit Improvement Board (CTIB) and jointly implemented the sales tax. The sales tax proceeds are used to pay 50% of the net costs of operating regional transitways and also to contribute capital funding to constructing new and improved transitways. Typically CTIB will contribute 30% of the capital costs for a transitway but it may also choose to provide a higher share in order to accelerate transitway development. In 2013, the five-county sales tax collected approximately $105 M. This plan assumes the CTIB sales tax revenues will grow at an annual rate of 3%, totaling $5.2 billion over the time period of the plan.

Transit Property Tax Revenues

Two sources of local property tax revenues are used for transit purposes - the Metropolitan Council levies for general transit capital purposes and Regional Railroad Authorities levy for the county share of transitway development. The Metropolitan Council levies a property tax to pay for the debt service on transit bonds known as Regional Transit Capital (RTC). The Council can only issue RTC bonds when authorized by the state legislature to do so. Typically these bonds

are authorized on an annual or biannual basis. The RTC funds are used to pay the capital expenses of maintaining the existing system and also to provide the required match to federal CMAQ and other competitive federal funds. The revenue forecasts in this plan assume RTC funds will continue to be authorized at the existing level (approximately $37 M) and will grow at a rate of 2.5% annually. RTC revenues are estimated at $1.7 billion from 2015 to 2040.

County Regional Railroad Authorities (RRAs) are authorized to levy a property tax for the purpose of developing regional transitways. Typically RRA funds provide 10% of the capital costs for constructing transitways. This plan assumes that RRA property tax funds will provide the 10% amount needed for development of new transitways excluding Arterial BRT transitways. Local property tax contributions to transitways are estimated at approximately $300 million from 2015 to 2040.

Local Transportation Revenues

Local transportation revenues include revenues used by local units of government (cities and counties) on the local road, bicycle and pedestrian systems. The local road system includes local streets, collectors and minor arterials. Because the majority of local transportation spending is funded with local and state revenues, the local spending is generally not covered in the regional plan in any great detail. Only those local projects using federal funds received through the Regional Solicitation process (STP, TAP and HSIP funds) or that are regionally significant (A-minor expansion projects with a potential impact on air quality) are covered by this plan and included in the air quality analysis in Appendix F.

Local transportation revenues come from three primary sources: local property taxes, assessments and other local sources; county and city state-aid allocations from the state highway user tax revenues; and federal STP, CMAQ, TAP or HSIP revenues distributed through the Regional Solicitation process. Counties also are allowed to levy a wheelage tax (per vehicle fee) and under state statute, five of the metropolitan counties (Anoka, Carver, Dakota, Scott and Washington) receive a distribution from the state motor vehicle lease tax.

The majority of local transportation revenue is provided through local property taxes or through local assessments and fees. Frequently when a new housing development is proposed, negotiations between the developer and city can result in all or a portion of the new local roadways being provided either directly by the developer or through related fees. These types of revenues are not estimated for this plan but are generally included in the local property tax category.

As shown in Figure D-1, approximately $33 billion of the $42 billion estimated to be spent over the life of this plan for local transportation purposes will come from local property taxes, assessments or other local sources. The local property tax revenue amounts were calculated by estimating total local transportation spending and subtracting out the estimated revenue contributions from the highway user taxes and federal revenue sources.

Total local transportation spending data was gathered from information submitted by the local units of government to the state auditor and published annually. These reports include the annual reporting of transportation operating and capital expenditures for each local unit of government. Recognizing that these local transportation expenditures can vary significantly from year to year, a base-expenditure year was established by averaging calendar year 2011 and 2012 expenditures, and inflating the average at a rate of 2.5% annually over the plan period. Local wheelage tax data and motor vehicle lease tax data were obtained directly from the counties and also inflated at a rate of 2.5% annually.

Both cities and counties receive highway user tax revenues on a formula basis each year for use on the county and municipal state-aid systems. The highway user tax revenue estimates are derived from historical MnDOT state-aid allocation data and inflated annually at a rate of 1.2%, similar to the inflation rate used by MnSHIP for state highway user tax revenues. Highway user tax revenues estimated to be available for the county and municipal state-aid systems total approximately $7 billion from 2015 to 2040.

The local transportation share of federal Regional Solicitation funding was assumed to be approximately equal to the historical levels of STP, TAP and HSIP revenue that have been available to the region, as these sources of funding have primarily been awarded for local projects. The federal Regional Solicitation revenues were also inflated annually by 1.4%, similar to all federal revenues. The federal revenues estimated to be available for local transportation purposes through the Regional Solicitation total $1.8 billion over the time period of the plan.

Table D-1: Metropolitan Area Projected Revenues, 2015-2040 (year of expenditure, in millions)

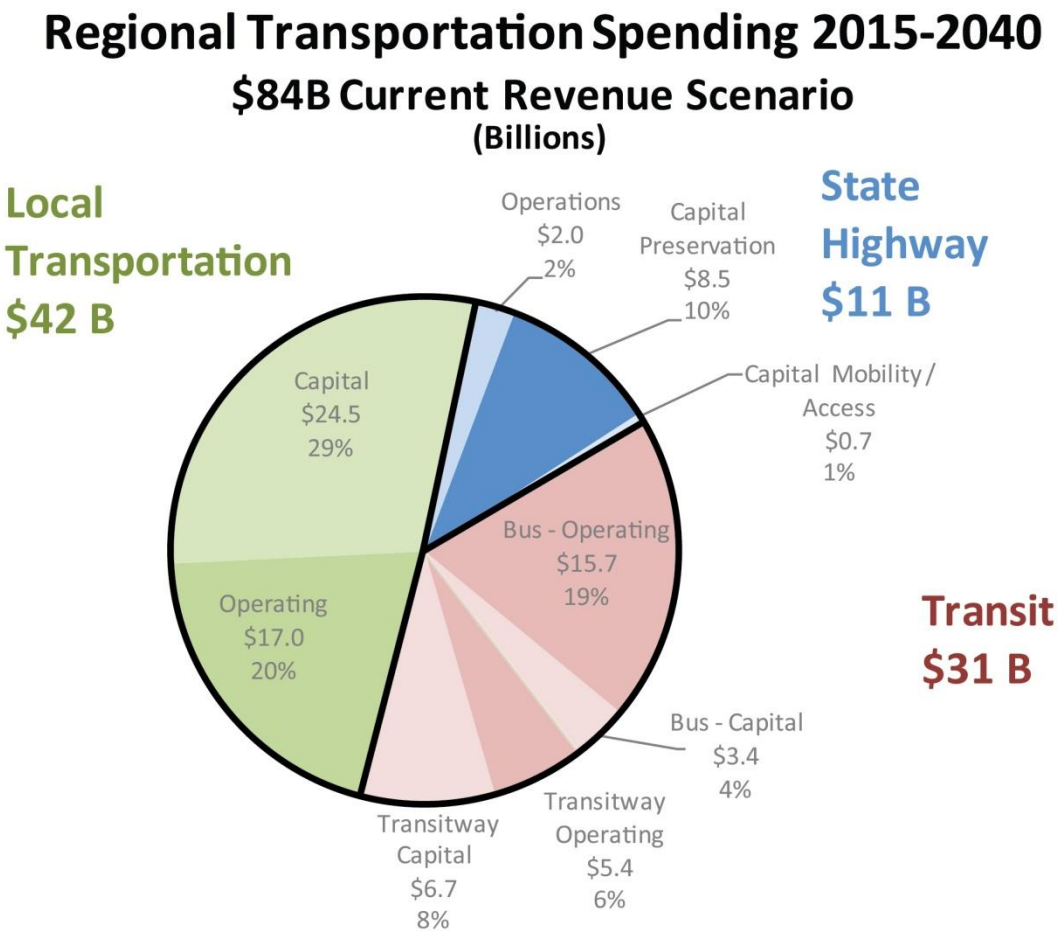
REVENUES	Calendar Years 2015-2024 (10 year)	2025-2034 (10 years)	2035-2040 (6 years)	Current Revenue Scenario
State Highway Revenues				
Highway User	2,100	2,500	1,900	6,500
Federal	1,600	1,900	1,200	4,700
Subtotal State Highway Revenue	**3.7 B**	**4.4 B**	**3.1 B**	**11.2 B**
Transit Revenues				
Motor Vehicles Sales Tax (MVST)	2,810	3,691	2,694	9,261
State General fund	1,064	1,719	1,379	4,162
State Bonds	391	58	38	486
Fares	1,509	2,171	1,601	5,280
Federal Transit (CMAQ, 5307, 5340)	1,021	1,164	780	2,965
Federal Transit (5309 - New Starts)	1,774	-	-	1,774
Other (Advertising, Greater MN Share)	128	168	122	418
Sales Tax (CTIB)	1,480	2,043	1,670	5,193
Property Tax (RTC and RRA)	768	535	390	1,693
Subtotal Transit Revenues	**11.0 B**	**11.5 B**	**8.7 B**	**31.2 B**
Local Transportation Revenues				
Highway User	2,300	2,700	2,000	7,000
Federal (STP, TAP, HSIP)	600	700	500	1,800
Wheelage Tax/Motor Veh. Lease Tax	1,500	1,700	1,200	4,400
Property Tax	8,500	11,461	8,2	28,300
Subtotal Local Transportation Revenues	**12.9 B**	**16.5 B**	**12.1 B**	**41.5 B**
TOTAL REVENUES	**27.6 B**	**32.4 B**	**23.9 B**	**83.9 B**

Spending under Current Revenue Scenario

The sections below describe the high level results for state highways, transit and local transportation spending under the Current Revenue Scenario over the time period of the plan, reflecting the estimated level of revenues previously described. The total estimated spending, $84 billion, is shown in the pie chart in Figure D-2, "Regional Transportation Spending, 2015-2040." The detail for planned spending under the Current Revenue Scenario can be found in the individual "Highway Investment Drection and Plan" and "Transit Investment Direction and Plan" sections *[Link to Highway and Transit Investments]*. In addition, Table D-2 shows the summary

of current revenue scenario spending for state highways, transit and local transportation, broken into the general categories of operations and capital spending.

Figure D-2: Regional Transportation Spending, 2015-2040



It should be noted that in comparing highway and transit spending, operations activities for transit are very different from that of roadway activities. Transit operations spending includes the costs of the daily operations of the transit system and the necessary vehicle, driver and maintenance associated with running the services. For roadways these types of operational expenses are typically borne by private vehicle drivers and do not appear as public expenditures. Examples of this would include the purchase costs of the private vehicles, gasoline and diesel costs, insurance and vehicle maintenance costs. If accounted for, these private costs would significantly outweigh the public roadway expenditures.

Spending for State Highways

The expectations for spending on state highways over the time period of the plan are as follows.

- Total state highways spending is estimated at $11 billion, split approximately 30% to operations and 70% to capital spending.
- In the first 10 years of the plan, MnDOT is largely able to meet its needs for capital asset preservation but has very limited funding for capital mobility/capacity projects ($700 million).
- Growth of the highway user tax revenues and federal revenues (estimated at 1.2% and 1.4% annually respectively) will not keep pace with inflationary pressures on operations and capital spending (estimated as 2.5% annually).
- After 2025, MnDOT will not have any revenues available for capital mobility/capacity projects and the asset preservation needs of the system will not be met.
- Levels of state highways operations spending fall short throughout the time period of the plan. Over time, operations spending decreases as a percent of the Metro District's total highway spending (at the same time as operations needs are increasing due to reduced preservation spending).

Transit Spending

The expectations for spending on Transit over the time period of the plan are as described below.

Bus and Support System Spending

- Funding needs for existing bus system operations are met throughout time period of the plan. This is largely due to growth in MVST, fares and general fund revenues, which keep pace with the inflationary growth of spending.
- No funding is estimated to be available to expand bus system operations.
- Existing bus and rail system capital preservation needs are estimated to be met over the time period of the plan.
- A limited amount of funding will be available for capital modernization and expansion of the bus system. This funding is primarily available through federal CMAQ and other competitive programs. (Modernization projects are generally defined as projects that improve the customer experience, while expansion projects add additional service or capacity to the system.)

Transitway Spending

- Existing needs for transitway operations and capital preservation (METRO Blue Line, Green Line, Red Line, Northstar commuter rail) are fully funded throughout the plan.
- Funding for transitway capital and operations expansion is available from a number of sources, including the CTIB sales tax, state bond funds, CMAQ, and federal New Starts or other competitive program sources.
- In the first 10 years of the plan, funding is available to expand the transitway system. The capital and operating expansion costs of the Green Line Extension (Southwest), Blue

Line Extension (Bottineau), Orange Line (I-35W South BRT), Red Line (Stage 2), Gateway Dedicated BRT, and four arterial BRT projects can be fully funded [*insert link to Transitway Investments section*]. There is also undesignated funding available primarily from the CTIB sales tax revenues to accelerate the development of the Robert Street and Riverview corridors as adopted by CTIB Phase I Program of Projects.

Local Transportation Spending

Spending for local transportation operations and capital projects is expected to grow with inflation over the time period of the plan. Two of the local transportation revenue sources – highway user tax revenues and federal revenues – are estimated to grow at a rate less than the rate of inflation. Consequently, local governments will be faced with the option of either increasing property tax revenue contributions to keep transportation spending at past levels or will need to drop transportation spending levels as inflationary pressures reduce the buying power of the state and federal revenues. The revenue and expenditure numbers shown in figures and tables in this section assume local transportation spending will increase with inflation and that local property tax and other local funding sources will provide the increased share.

As indicated previously, local transportation spending decisions are primarily made at the local level and identified through local comprehensive and capital planning efforts. Details on local transportation spending are not included in this plan, though the regional transportation system goals, objectives and strategies are meant to help guide local transportation planning and decision-making efforts.

Increased Revenue Scenario

The Increased Revenue Scenario is meant to provide a context for the level of transportation revenues and spending that would be needed to move the region closer to achieving the outcomes identified in *Thrive MSP 2040* and the goals and objectives of this plan. The Increased Revenue Scenario is largely based on the work of the 2012 Governor's Transportation Finance Advisory Committee (TFAC). Appointed by Governor Mark Dayton, this committee was charged with developing recommendations to reverse the decline of investment in the state's highways, roads, bridges, public transit systems and other transportation systems.

- The TFAC mission was to identify investment opportunities to support a thriving economy and high quality of life for Minnesotans over the next 20 years. TFAC concluded that to maintain what we have, and position Minnesota to be competitive for the future, the state needs to invest in its transportation infrastructure. Its goal was to identify a level of revenues that would support a transportation system that:
- Will help Minnesota businesses access labor, move products, prosper and stay in Minnesota.

- Will help Minnesota compete for jobs, talent and economic growth with other states and regions that are investing in their transportation systems.
- Is designed to handle Minnesota's growing and changing population.
- Is modern and better than ever before.
- Will be funded through balanced and sustainable means.

The TFAC work identified a level for funding needed for both state highways and metropolitan area transit. The increased funding need shown for metropolitan area state highways and transit in Table 2 is based on the TFAC identified needs, but also has been expanded to include funding needs not considered by TFAC and also an allowance for the longer time period of this plan, which extends beyond the 20 years considered by TFAC. It is important to note that the TFAC work did not account for the impacts of inflation because detailed project costs and the anticipated construction year of projects were unknown.

State Highways Increased Revenue Scenario

The TFAC work estimated that statewide MnDOT's state highway system is facing a funding gap of $12 billion or about $600 million annually for capital asset management and expansion improvements alone for state roads. This included a shortfall for metropolitan area state highways of $2 billion for state highway capital asset preservation and a shortfall of $4 billion for mobility/expansion projects. As shown in Table D-2, these figures have been increased to a $2-$2.5 billion shortfall for capital asset preservation and a $4-$5 billion shortfall for mobility/expansion due to the longer period of the plan as noted above.

The TFAC work did not include shortfalls for state highway operations or other investment areas, such as program support or bicycle and pedestrian improvements. These estimated increased funding needs shown in Table D-2 are based upon work with MnDOT Metro District to identify funding gaps and specifically for highway operations is based on MnDOT's *Highway Systems Operations Plan, 2012-2015*, published in 2011.

The total increased funding need for state highways is estimated at approximately $10 billion over the time period of the plan. This level of funding would require almost a 100% (doubling) increase in the state highway funding given that $11 billion is estimated to be available for state highways under the Current Revenue Scenario. While this level of funding need is based upon previous analysis and represents a realistic funding gap, it will require significant funding increases and policy changes in order to meet this level of need.

Transit Increased Revenue Scenario

The TFAC work estimated that the increased funding need for metropolitan area transit was approximately $4.2-$5.7 billion over a 20-year time frame or about $210-$285 million annually. This level of funding need was based upon the goal of creating an expanded bus and transitway system and accelerating the rate at which this expansion would occur. The key elements of the

expansion plan can be found in the "Transit Investment Direction and Plan" section *[Link to Transit Investment]* and is based on maintaining, modernizing and expanding the bus and support system, and also building and operating an expanded interconnected network of bus and rail transitways.

The Increased Revenue Scenario in this plan uses the TFAC level of financial need as a starting point, but also includes consideration of inflation and extending the time period to 2040. As Table 2 indicates, the total estimated new revenue need for expanding the transit system is approximately $7.0 – 9.0 billion over the 26-year period of the plan. The $7.0 – 9.0 billion funding level could be attainable based on a half-cent metropolitan area sales tax increase that was explored through TFAC, but this funding level would not allow for changing funding shares of other transit partners (for example, lowering the state or federal shares of a project or existing transit system operating costs).

Under the $7.0 – 9.0 billion Increased Revenue Scenario, the funding need is estimated to be approximately 25% for bus and support system expansion and 75% for transitway system expansion. This is an average funding level over the 26-year period of the plan with the expectation that spending in any given year will depend on the identified expansion needs and costs of proposed projects.

Local Transportation Increased Revenue Needs

Increased revenue needs for local transportation have not been determined as part of the analysis for this plan. This analysis would require a significant amount of effort to identify the specific needs and funding gaps of each local governmental unit and, in general, the local projects are not the focus of this plan.

However, it is known that the unmet transportation needs at the local level are significant and cannot be met through increases in local property taxes alone. The local transportation needs should be considered as part of any transportation funding proposal moves forward at the state legislature. If it includes increases in the constitutionally dedicated state highway user taxes, it should also provide benefit to local roadway funding needs.

Table D-2: Metropolitan Area Projected Expenses, 2015-2040 (year of expenditure, in millions)

EXPENSES	Calendar Years 2015-2024 (10 year)	2025-2034 (10 years)	2035-2040 (6 years)	Current Revenue Scenario	Increased Revenue Scenario
State Highways Expenses					
Operations	600	800	600	2,000	1,000
Capital Asset Preservation	2,400	3,600	2,500	8,500	3,300-3,800
Capital Mobility /Expansion	700	-	-	700	4,000-5,000
Subtotal State Highways Expenses	**3.7 B**	**4.4 B**	**3.1 B**	**11.2 B**	**8.3 – 9.8 B**
Transit - Bus and Support System					
Operations – Existing	4,729	6,261	4,710	15,700	-
Capital – Maint./Preservation	964	1,107	769	2,840	-
Capital – Modern. and Expansion	214	234	162	610	-
Subtotal Bus and Support System	5,907	7,602	5,641	19,150	2.0 – 3.0 B
Transit - Transitway System					
Operations - Existing	982	1,257	917	3.156	-
Operations - Expansion	398	1,085	792	2,275	-
Capital – Maint./Preservation	107	195	136	438	-
Capital – Modern. and Expansion	3,714	78	-	3,793	-
Expansion - Undesignated	-100	1,331	1,188	2,419	-
Subtotal Transitway System	5,101	3,946	3,033	12,080	5.0 – 6.0 B
Subtotal Transit Expenses	**11.0 B**	**11.5 B**	**8.7 B**	**31.2 B**	**7.0 – 9.0 B**
Local Transportation Expenses					
Operating	5,300	6,700	5,000	17,000	Excluded
Capital	7,600	9,800	7,100	24,500	Excluded
Subtotal Local Transportation Expenses	**12.9 B**	**16.5 B**	**12.1 B**	**41.5 B**	**Excluded**
TOTAL EXPENSES	**27.6 B**	**32.4 B**	**23.9 B**	**83.9 B**	**15 – 19 B**

Highway Investment Direction and Plan

Highway Investment Direction

Residents and businesses view a safe and strong highway system as an essential part of a transportation system that serves a prosperous, livable, equitable region. Highways support nearly all travel in rural areas, and contribute to the variety of travel options that the federal government, state government, and the region acknowledge is required for a sustainable metropolitan area. Virtually all people use roads, and almost all freight travels on a road sometime during its trip.

The major highways in the region are designated as principal arterials [*link to Principal Arterial map*] and together are sometimes called the metropolitan highway system. When combined with the next level of roadways – designated as A-minor arterials – the system is known as the regional highway system. (See Appendix D for definitions of these terms and discussion of highway functional classification [*link to Highway Functional Classification*].) This document will generally refer to the "regional highway system" or just the "highway system" and mean both the principal and A-minor arterials.

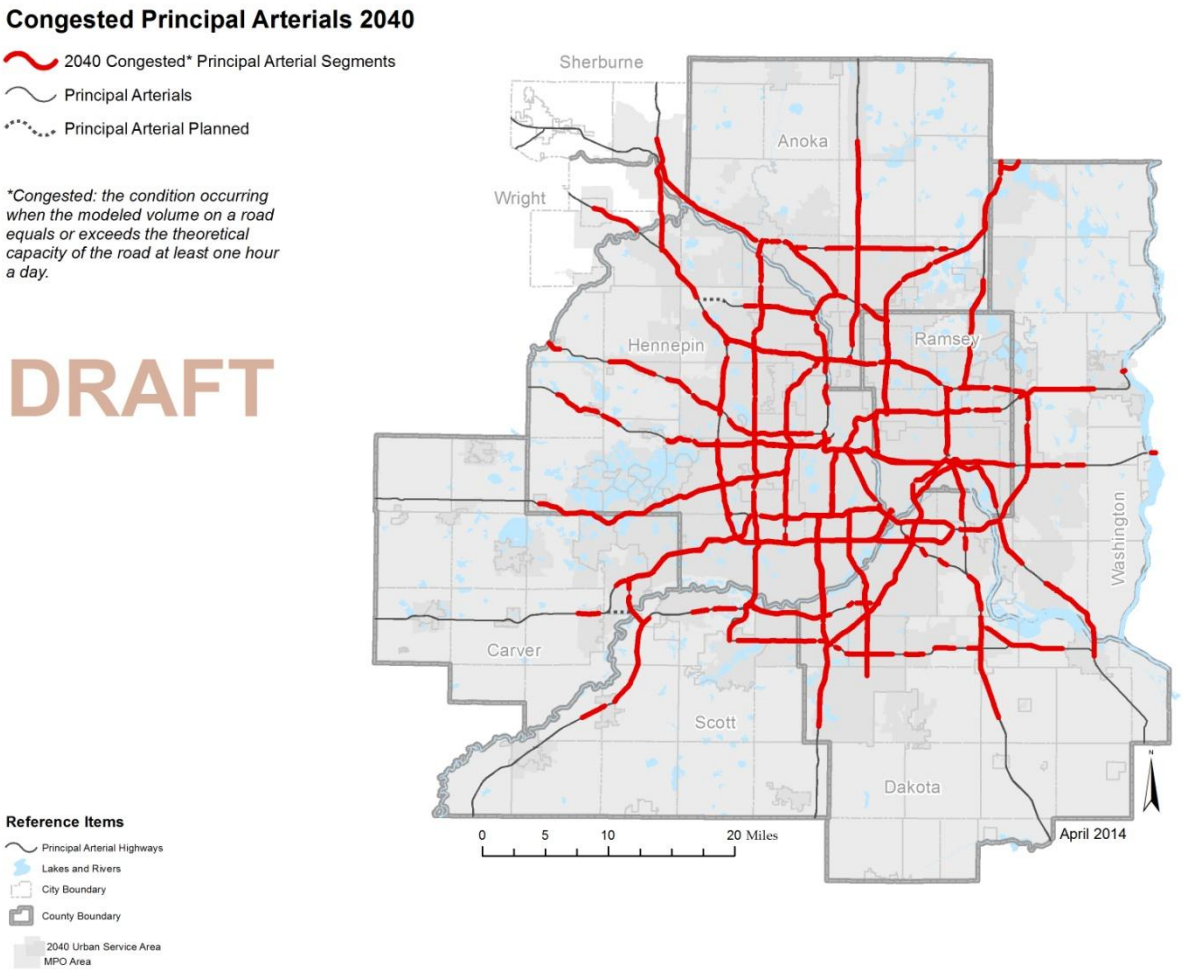
The region's highway system has developed significantly since the 1950s and is now based on a well-developed and managed freeway system. Over the course of the freeway system's development, the region's approach to improving the system has changed. One of the most basic changes was to accept that congestion on the system will be a reality, and the system must be managed and optimized to the greatest extent possible to ease congestion. A second change is the acceptance that funding for highways is limited, and will be limited for the foreseeable future. This emphasizes the need to design and build strategic projects that manage risk and provide a high return on investment. A third major change is our emerging understanding of the large amount of funding required to operate, maintain, and rebuild the system that exists, especially as costs are anticipated to grow faster than revenues.

While the region must continue to operate, maintain, and rebuild the existing system – giving priority to the federal Interstates – these investments alone will not accommodate the growing region. Anticipated population and job growth is forecast to push highway traffic to even higher levels. Table 8 shows that daily vehicle trips and miles traveled are forecast to increase 28% and 23%, respectively, by 2040. Figure 12 illustrates projected congestion on the principal arterial system in 2040. Additional investment performance outcomes are summarized in Part 3, "System Performance Measurement and Monitoring" [*insert link*].

Table E-1: Daily Vehicle Trips and Miles Traveled, 2010 and 2040

	2010	2040 Current Revenue Scenario	Change	Percent
Population	2,850,000	3,673,860	+823,860	+29%
Daily Vehicle Trips	6,600,000	9,776,000	+2,152,000	+28%
Daily Vehicle Miles Traveled	72,900,000	89,420,000	+16,520,000	+23%
Daily Vehicle Miles Traveled per Resident	25.6 miles per resident within the 7-county region	24.3 miles per resident within the 7-county region	-1.3 miles per resident within the 7-county region	-5%

Figure E-1: 2040 Congested Principal Arterials for the Current Revenue Scenario



In order to be good stewards of public investments, the region must invest in highways strategically. This means focusing on affordable, multimodal, and flexible solutions that put priority on addressing existing problems throughout the regional highway system. The investments must also consistently work toward achieving the multiple outcomes, goals, and objectives identified in *Thrive MSP 2040* and this plan. These goals and objectives include improving safety for all people and freight; managing highway travel demand; minimizing travel time; increasing trip reliability; enhancing travel options; and integrating with land use and other regional systems [*insert link to Goals and Objectives*]. Implementing these solutions will require strong integration and collaboration among the region's transportation partners.

Prioritizing investments is mandatory in today's environment of limited resources. Table 9 summarizes the highway system investment prioritization factors ranked highest by policymakers, transportation professionals, and the general public during the extensive 2040 TPP public engagement process. These factors will be used to ensure investments in the regional highway system help meet the multiple outcomes, goals, and objectives identified in *Thrive MSP 2040* and this plan. These outcomes, goals, objectives, and prioritization factors provide the foundation for this highway investment plan.

Table E-2: Regional Highway System Investment Prioritization Factors

Highway System Investment Prioritization Factor	Description of Investment Factor and 2040 TPP Goals and Objectives Advanced	Primary *Thrive* Outcome Supported				
		Stewardship	Prosperity	Equity	Livability	Sustainability
Safety and Security Operate, maintain, and rebuild	These investment factors are requirements, not prioritization factors, for all regional highway investments. These types of investments advance all goals and objectives in the Transportation Policy Plan.	#	#	#	#	#
Improves Economic Vitality	Highways provide most of the access to and within our region. These types of investments advance the "Competitive Economy" goals and objectives.		#		#	#
Improves Critical Regional Highway System Connectivity	Our region has a well-developed and managed freeway system. We need to identify and address critical regional highway connections that are missing or inadequate in the system. These types of investments advance the "Access to Destinations" goal and objectives.		#	#		#

Highway System Investment Prioritization Factor	Description of Investment Factor and 2040 TPP Goals and Objectives Advanced	Primary *Thrive* Outcome Supported				
		Stewardship	Prosperity	Equity	Livability	Sustainability
Increases Regional Highway System Travel Time Reliability	Investments like MnPASS and those made to minor arterial highways seek to provide an affordable and reliable alternative to highway congestion. These types of investments advance the "Access to Destinations" goal and objectives.		#	#		#
Supports Job/Population Growth Forecasts and Local Comprehensive Plans	Highways provide foundational access to land. The region's principal and minor arterial highways addressed in this plan provide more limited access to larger areas of land, while local streets provide direct access to parcels. These types of investments advance the "Access to Destinations" and "Transportation and Land Use" goals and objectives.		#	#	#	
Regional Balance of Investments	Highway investments should be balanced across the region and over time, and benefits shared across all communities and users, to move toward the goals and objectives of "Healthy Communities"and "Stewardship."	#	#		#	

The Highway Investments section describes 10 categories of highway investments.

Highway Investment Categories

1. Operate and maintain highway assets
2. Program support
3. Rebuild and replace highway assets
4. Specific highway safety improvements
5. Highway bicycle and accessible pedestrian improvements
6. Regional mobility improvements: Traffic management technologies
7. Regional mobility improvements: Spot mobility improvements
8. Regional mobility improvements: MnPASS system
9. Regional mobility improvements: Highway strategic capacity enhancements
10. Regional mobility improvements: Highway access investments

The first six categories of highway investment – operate and maintain; program support; rebuild and replace highway assets; specific highway safety improvements; highway bicycle and accessible pedestrian improvements; and traffic management technologies - are focused on the existing highway system. These investments improve the existing system but do not add physical highway capacity. Rather, they can increase the capacity of an existing highway; for example, traffic management technology investments improve traffic flow without adding physical capacity. Operating, maintaining, rebuilding, and replacing the existing highway system is the highest priority for highway investment. The existing highway system represents a significant public investment that, consistent with federal law, must be maintained and preserved for future generations.

As the highway system is being operated, maintained, and rebuilt to a responsible level, capacity improvements can and should be pursued. When highway capacity issues are identified, regional transportation partners should work to first apply traffic management technologies to improve traffic flow without adding physical highway capacity.

The next category of investment should be to investigate implementing lower cost/high-return-on-investment spot mobility improvements. Spot mobility improvements include smaller, lower-cost projects such as lane striping, improved signal timing, or adding turn lanes. If traffic management technologies and spot mobility improvements do not address the highway capacity issue identified, adding larger physical capacity – sometimes called expansion improvements - should be explored.

Expansion improvements include new or extended MnPASS lanes, strategic capacity enhancements, and highway access investments. The regional objective of providing a congestion-free, reliable option for transit users, carpoolers and those willing to pay through MnPASS lanes is the region's priority for expansion improvements. General purpose lane strategic capacity enhancements should only be considered if adding MnPASS lane capacity has been evaluated and found to be not feasible, the improvement is affordable, and the improvement is approached with a lower cost/high-return-on-investment philosophy.

This plan refers to the collection of traffic management technology investments, lower cost/ high-return-on-investment spot mobility improvements, MnPASS lanes, strategic capacity enhancements, and highway access investment categories as "regional mobility improvements."

In addition to the 10 types of highway investments described here, three groups of supporting strategies/investments should be actively pursued in the region and are key elements of the region's federally required "Congestion Management Process" [*insert link to " Congestion Management Process"*]:

1. Travel demand management (TDM) strategies including carpools, vanpools, staggered work hours, telework, and compressed work weeks.

2. Transit, bicycle, and pedestrian investments including new transitways, expanded and enhanced transit service, park-and-rides and enhanced bicycle facilities.
3. Land use changes including increased job and housing concentrations.

Combined, these supporting strategies can help ease congestion on the regional highway system by either reducing overall travel demand or by increasing the share of travel by modes other than the single-occupant automobile, particularly during the most congested times of the day.

Highway Investment Plan

While the investment direction in this plan applies to all of the regional highway system – both principal and A-minor arterials – this Highway Investment Plan section includes only investments on the metropolitan area's state highway system (i.e., the Minnesota Department of Transportation-owned and operated system), which is made up of the Interstate, U.S., and state trunk highways (abbreviated as "MN").

Several counties and cities also own a small part of the principal arterial system and own and operate a majority of the A-minor arterial system. Highway investments made by the counties and cities on their systems are not shown in this section since they are identified through the local comprehensive and capital improvement planning processes and are largely funded by state and local taxes, as shown in Part 2, "Transportation Finance" [*insert link*].

Within the seven-county region (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties), federal funds used on the county and city-owned highway systems are awarded through the biennial Regional Solicitation process administered by the Transportation Advisory Board to the Metropolitan Council [*insert link to " Transportation Finance"*]. The Regional Solicitation awards federal highway funding allocated to the region to projects through a prioritization process that considers the outcomes, goals, and objectives of *Thrive MSP 2040* and this policy plan.

The Regional Solicitation has historically awarded approximately $40M of federal Surface Transportation Program funds annually to local highway improvement projects across the region. The process also awards approximately $12M of federal highway safety improvement program funding annually to local road projects. Because the Regional Solicitation selects projects only three to four years in advance of construction, they are not shown in the text of this plan but are included in the regional Transportation Improvement Program (TIP) and in the regional air quality conformance analysis [*insert links*]. Federal highway funds for county and city-owned highway projects in the contiguous, urbanized areas of Wright and Sherburne counties, and Houlton, Wisconsin are allocated through other processes.

The metropolitan area is required by federal law to prepare a long-range transportation plan and a four-year Transportation Improvement Program (TIP) in which estimated revenues and

proposed investments are balanced. This *2040 Transportation Policy Plan* refers to the balanced investment plan as the "Current Revenue Scenario" (also often called the "fiscally constrained investment scenario"). Federal law also permits, but does not require, the identification of additional projects that would be funded if additional revenues were made available. This plan refers to the additional investments as the "Increased Revenue Scenario" (also often called the "illustrative scenario"). The Minnesota Department of Transportation (MnDOT), in cooperation with the Council, identified and estimated the revenues and costs for the state highway operations, maintenance, and capital investments in this plan, which are summarized in Table E-7.

The text that follows identifies and describes the 10 categories for highway investment between 2015 and 2040 and the spending that is anticipated under the Current Revenue Scenario. All of the major state and local highway projects identified to date in the metropolitan planning area – consisting of the seven-county region plus the contiguous, urbanized areas of Wright and Sherburne counties, and Houlton, Wisconsin – are listed in Appendices B, C, and E [*insert links*]. The plan then concludes by identifying potential investments under an Increased Revenue Scenario as well as additional highway investments within the greater Twin Cities region that may be needed.

Current Revenue Scenario Investments

The investments and projects included in the Current Revenue Scenario were identified through the work done for the *Minnesota State Highway Investment Plan 2014-2033* (MnSHIP) published by MnDOT in December 2013, which identified expected capital revenues and expenditures for all of the state highway system for the 20-year period. MnDOT published the plan after an extensive process integrating policy goals and objectives, technical information on system conditions, performance management, revenue projections, and consideration of key risks. It also responded to stakeholder input gathered through the effort's stakeholder and public involvement process.

The projects identified in the Current Revenue Scenario are illustrated in Figure 19 and listed in Appendices B and C. Projects in the first four years of the plan are identified with some certainty and MnDOT is actively developing them. They are also within MnDOT's projected budget and are highly likely to be delivered. The specific characteristics of projects identified in years 2019-2024 are subject to change, such as endpoints, but are likely to be delivered sometime within that timeframe. MnDOT may be pursuing preliminary study of projects shown in 2019-2024, but design, land acquisition, and environmental impact evaluation likely have not begun. Specific projects have not been identified beyond 2022.

Table E-7 shows that over the 2015-2040 period total revenues and spending for state highways are estimated at $11 billion (reported in year-of-expenditure dollars). In addition, approximately $1.5 billion in federal highway funding is forecast to be available through the

Regional Solicitation for investment on the non-freeway principal arterial and A-minor arterial system.

Operate and Maintain Highway Assets

Highway operations and maintenance is a high investment priority for the principal and A-minor arterial system. These investments are essential in achieving highway safety, access, and mobility for the traveling public and freight. Primary operation and maintenance activities include freeway and arterial traffic management; freeway incident response; pavement patching; pavement restriping; traffic signal, sign, and management system maintenance; lighting maintenance; guardrail and cable median barrier repair; snow and debris removal; roadway salting; drainage system maintenance (culverts, inlets, and underground pipes); bridge inspection and maintenance; and maintenance vehicle fleet management. Operations and maintenance costs have increased as traffic management has become more sophisticated and the average age of highway infrastructure has increased.

As shown in Table E-7, MnDOT anticipates spending approximately $2.0 billion on state highway operations and maintenance in the Current Revenue Scenario. This is the first Transportation Policy Plan to identify long-term highway operations and maintenance costs. While the information in this plan is based on the findings in MnDOT's *Highway Systems Operations Plan 2012-2015* (HSOP), all regional transportation partners acknowledge the need to continue to work together to develop better understanding of and costs for highway operations and maintenance. MnDOT and the Council, in coordination with local partners, will develop more refined costs to include in the update of HSOP, MnSHIP, and the next update of the Transportation Policy Plan [*insert link to "Work Program"*].

Photos: Snow plow and the RTMC

Program Support

Resources are also needed to support the delivery of quality highway projects. Program support activities are funded out of the capital budget and include right-of-way [land] acquisition, consultant services to supplement agency staff and provide special expertise, supplemental agreements to address unanticipated issues, and construction incentives to encourage highly desired outcomes like early completion. In the Current Revenue Scenario, MnDOT is anticipating spending about $0.9 billion on program support from 2015 to 2040 (see Table E-7). This does not include internal MnDOT resources necessary for program delivery.

Rebuild and Replace Highway Assets

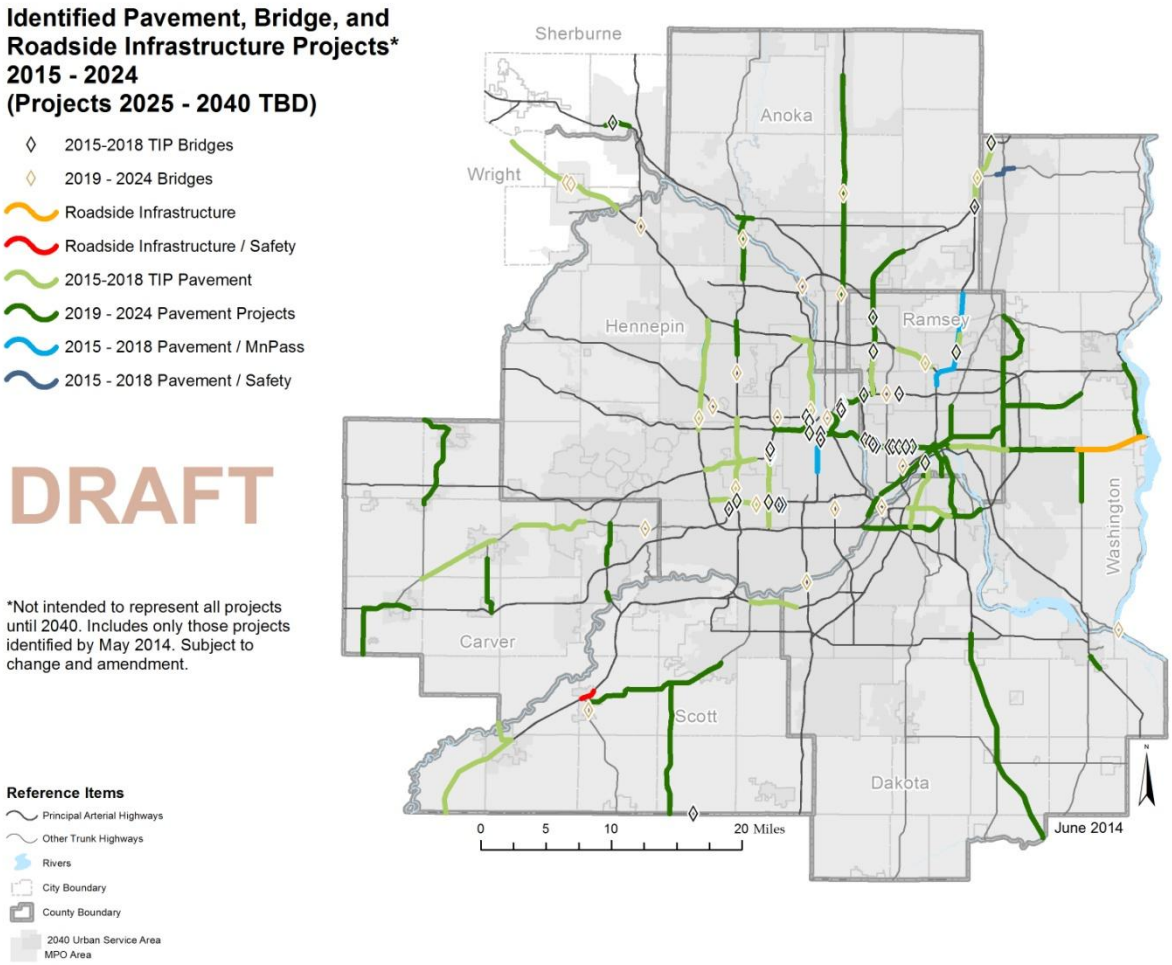
The first capital investment priority is to rebuild or replace the existing principal and A-minor arterial system. Like operations and maintenance, these investments are essential for highway safety, access, and mobility for the traveling public and freight. These kinds of activities are

often called preservation, asset management, or modernization investments. Primary highway asset management activities include pavement and bridge rehabilitation and replacement.

Rebuilding and replacement is also needed for components beyond pavement and bridges, such as drainage systems, signs, lighting, signals, and other traffic management technologies. Highway preservation efforts create opportunities to cost-effectively implement system-wide safety and congestion mitigation improvements. These include improving transit advantages, adding bicycle or pedestrian facilities, or making existing pedestrian facilities accessible to people with disabilities. See "Transit Investment Direction and Plan" and "Bicycle and Pedestrian Investment Direction" for more information [*insert links*].

As shown in Table E-7, the Minnesota Department of Transportation is anticipated to invest $6.9 billion toward rebuilding and replacing pavement, bridge, and roadside infrastructure between 2015 and 2040. This is approximately 62% of the highway funding anticipated to be available in the Current Revenue Scenario. MnDOT has identified asset reconstruction and replacement projects for the first eight years of the plan timeframe; the reconstruction and replacement projects identified are illustrated in Figure E-2 and listed in Appendices B and C. The specific characteristics of projects identified in years 2019-2024 are subject to change, such as endpoints, but are likely to be delivered sometime within that timeframe. MnDOT may be pursuing preliminary study of projects shown in 2019-2024, but design, land acquisition, and environmental impact evaluation likely have not begun, and these projects may substantively change as they are developed.

Figure E-2: Potential Pavement, Bridge, and Roadside Infrastructure Projects



Specific Highway Safety Improvements

Highway safety is a priority for the region and is being pursued through all types of highway investments. While improving highway safety is a requirement for all highway projects, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) law first called for states to develop performance-based, data-driven plans to target specific improvements to improving the safety of the traveling public. This approach has been advanced in Moving Ahead for Progress in the 21st Century (MAP-21), the current federal transportation funding law. Minnesota's highway safety plans and collaborative interagency strategies for public education, enforcement, improved emergency medical and trauma services, and engineering solutions have been remarkably successful, reducing statewide annual traffic fatalities to levels not seen since World War II even while travel has increased significantly.

There is still safety work to do and limited funding to do it. In the metropolitan area, specific highway safety investments will include proactive and reactive investments including

lower-cost/high-return-on-investment treatments, sustained crash locations treatments, and continuing participation in the Toward Zero Deaths (TZD) initiative aimed at preventing fatalities and serious injuries. Examples of these highway safety investments include adding turn lanes at intersections, especially left turn lanes; lengthening turn lanes at intersections; managing intersections on non-freeways by constructing frontage roads or reduced conflict intersections (restricting left or through movements off minor street); and installing edge-line rumble strips or cable median barrier.

In the Current Revenue Scenario, MnDOT will continue to make programmatic investments to improve highway safety; these are in addition to all other highway investments which aim to improve highway safety. As shown in Table E-7, MnDOT is anticipated to invest $0.4 billion, or about 4% of the Current Revenue Scenario. These funds will be supplemented by other safety investments funded through programs like the federal Highway Safety Improvement Program (HSIP) and local sources.

This is the first Transportation Policy Plan to identify long-term, specific highway safety improvement investments. While the information in this plan is based on the findings in MnDOT's MnSHIP, all regional transportation partners acknowledge the need to continue to work together to develop better understanding of and costs for regional highway safety projects. MnDOT and the Council, in coordination with local partners and building on previous work – including MnSHIP and county highway safety plans – will develop more refined costs to include in the updates of MnSHIP and the Transportation Policy Plan [*insert link to "Work Program"*]. These kinds of efforts will then be implemented through highway project designs. All partners acknowledge that many highway project designs need to be revisited to identify and integrate more affordable, effective safety improvements.

Photo: Reduced Conflict Intersection with overhead lighting

Highway Bicycle and Accessible Pedestrian Improvements

The region is also committed to providing facilities for people to safely bike or walk, including people with disabilities, parallel to and across the regional highway system. These bicycle and accessible pedestrian highway investments will often be made in conjunction with pavement and bridge projects, or at high priority locations as part of larger mobility projects. Examples of bicycle and accessible pedestrian investments include trails and sidewalks on highway bridges or parallel to the roadway travel lanes, accessible pedestrian signals at signalized intersections, and sidewalk curb ramps that meet or exceed Americans with Disabilities Act (ADA) standards. Federal regulations require the evaluation of need for these kinds of facilities as part of federal aid highway projects and construction. See "Transportation Strategies" and "Bicycle and Pedestrian Investment Direction" for additional discussion [*insert links*].

In the Current Revenue Scenario, MnDOT will continue to make programmatic investments in bicycle and accessible pedestrian infrastructure associated with its roads. MnDOT is anticipated

to invest $0.3 billion or about 3% of the Current Revenue Scenario (see Table E-7). These funds will be supplemented by other investments funded through the Regional Solicitation and by local partners.

This is the first Transportation Policy Plan to identify long-term highway bicycle and accessible pedestrian investments. While the information in this plan is based on the findings in MnDOT's MnSHIP, all regional transportation partners acknowledge the need to continue to work together to develop better understanding of and costs for highway bicycle and accessible pedestrian projects. MnDOT and the Council, in coordination with local partners, will develop more refined costs to include in the updates of MnSHIP and the Transportation Policy Plan [*insert link to "Work Program"*].

Photo: Accessible Pedestrian Signal

Regional Mobility Improvements: Traffic Management Technologies

Traffic management technologies smooth the effects of congestion, help improve air quality, and reduce the number of incidents throughout the highway system. These technologies are often called Active Traffic Management (ATM), Intelligent Transportation Systems (ITS), or roadway system management investments. Benefits of traffic management technologies include increases in average person throughput, improvements in overall capacity and travel time reliability, as well as decreases in primary and secondary crashes and overall travel time. Examples of traffic management technologies include traveler information systems, incident response programs, dynamic signing and re-routing, speed harmonization, ramp meters with HOV bypass lanes, traffic signals, operations, and coordination – including advanced walk signal, countdown timers, and queue warning. On freeways, full ATM implementation can be more effective when done in conjunction with other corridor-wide improvements such as the construction of a new or extended MnPASS lane. In some cases, however, more limited ATM strategies can be implemented in an effective manner, on a case-by-case basis to improve freeway and non-freeway highways.

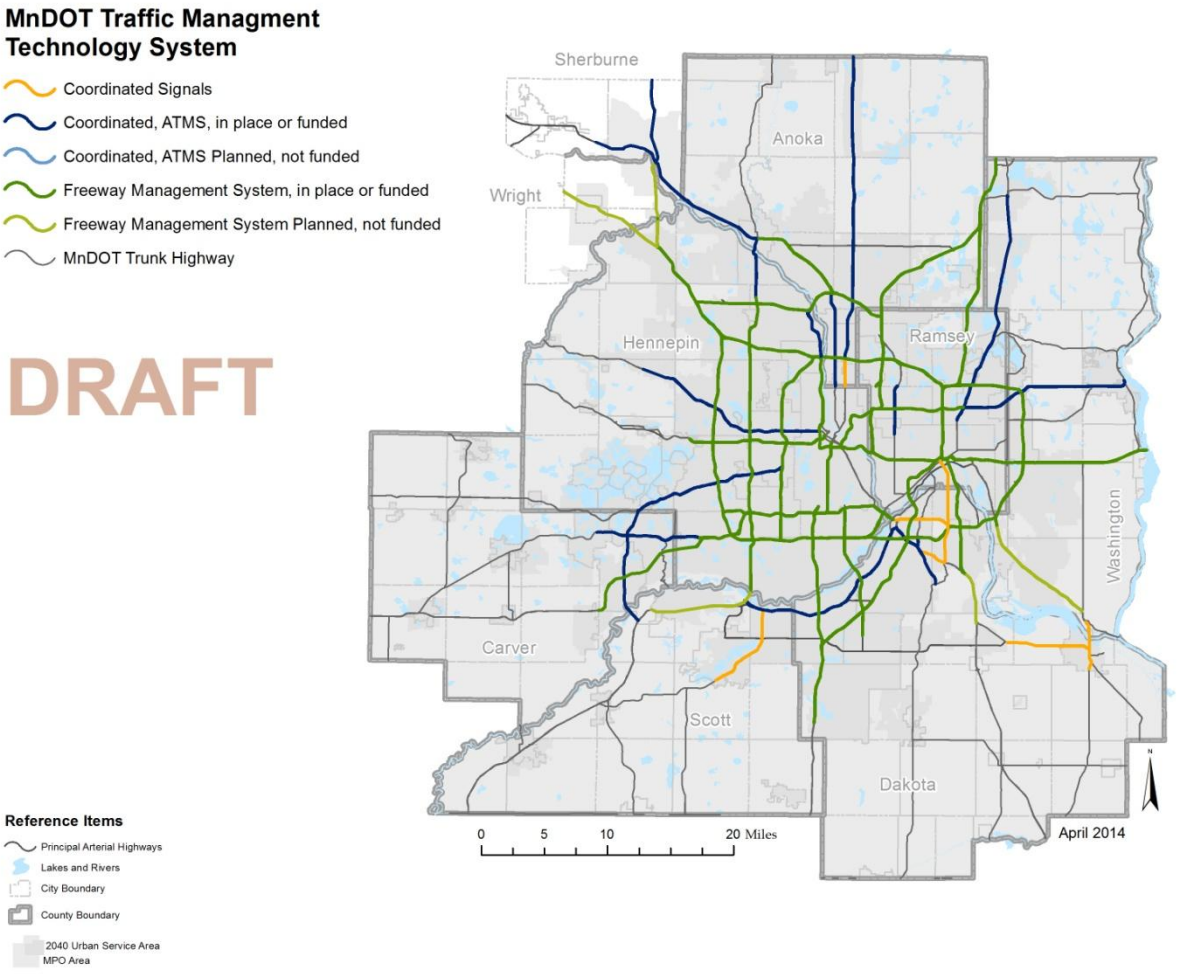
Photo: I-35W Active Traffic Management & MnPASS

Improvements for traffic management technology are illustrated in Figure E-3. Table E-7 shows that in the Current Revenue Scenario, MnDOT anticipates investing $40 million to $60 million ($4 million to $6 million per year for 10 years) in traffic management technologies. These funds will be supplemented by other transportation system management investments funded through the Regional Solicitation, by local governments, and by private businesses as businesses continue to improve consumer technologies showing real time traffic and routing recommendations.

To improve and advance the broader implementation of traffic management technologies, the Metropolitan Council will convene MnDOT and other regional transportation partners to continue exploring the feasibility of developing a regional arterial traffic management center to

complement MnDOT's freeway regional traffic management center (RTMC) [*insert link to "Work Program"*].

Figure E-3: Traffic Management Technology Improvements



Regional Mobility Improvements: Spot Mobility Improvements

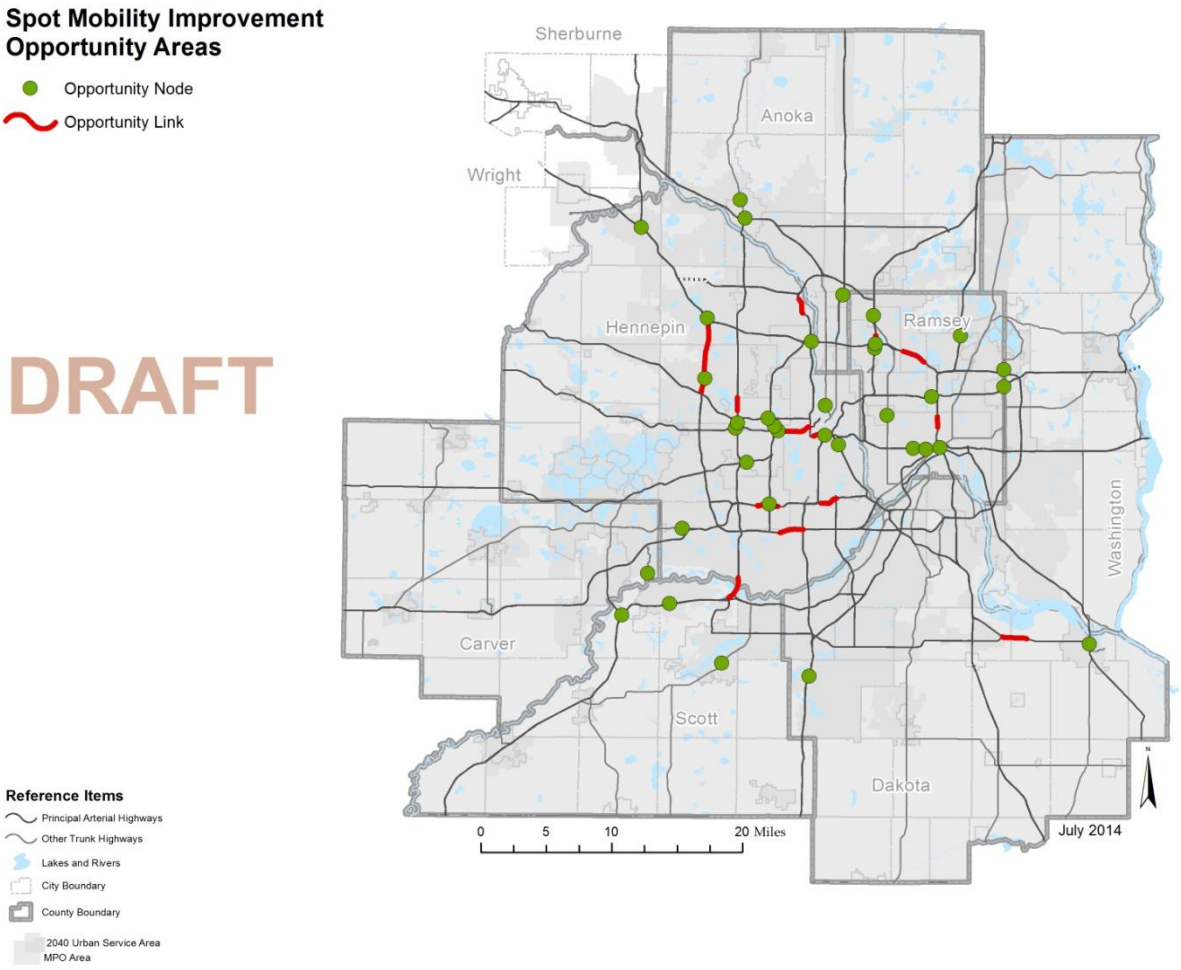
Spot mobility projects identified through MnDOT's Congestion Management and Safety Plan (CMSP) improve traffic flow by providing bottleneck relief, improving geometric design, and addressing safety hazards. These projects are generally less than one mile long, are coordinated with other funded projects, and can be implemented on shorter timeframes as compared to traditional highway capacity projects. In some instances, these types of improvements require use of flexible design principles to maximize the use of available pavement and right-of-way. MnDOT has implemented with great success some lower-cost/high-return-on-investment projects such as the widening of MN 100 at Excelsior Boulevard and the addition of a third lane on I-94 between Century and McKnight avenues. In addition, other spot mobility projects have been completed or are under development by MnDOT for implementation. Some of these

projects consist of capacity enhancement and short auxiliary lanes additions while others focus on providing transit advantages or improving roadway system management.

MnDOT worked with other regional highway partners to identify CMSP opportunity areas. In 2013, MnDOT published the results of the CMSP process identifying over 50 areas with opportunity to address congestion and safety problems using lower-cost/high-return-on-investment spot mobility improvements. The list published in *CMSP III* (2013) represents only a snapshot of candidate spot mobility improvements; the process identified an additional 350 problem locations. While the list illustrated in Figure E-4 identifies potential areas of opportunity and some of the projects have been implemented, MnDOT needs to complete additional work before most of the potential solutions can become programmed improvements. Improvements to the 50 areas were estimated to cost over $200 million. This is more than the $75 million to $125 million identified in Table E-7 ($7.5 million to $12.5 million per year for 10 years) for spot mobility investments in the Current Revenue Scenario.

The Congestion Management and Safety Plan (CMSP) process continued to advance during development and adoption of the *2030 Transportation Policy Plan* (adopted November 2010). The 2030 plan discussed and listed examples of spot mobility improvements. While MnDOT has since published the results of the latest CMSP process, a number of CMSP-related questions have been raised during the process to update the *2040 Transportation Policy Plan* that deserve further study and discussion. In addition to continuing to address and further develop many of the CMSP opportunity areas identified in this plan, MnDOT and the Council will continue to work with regional highway partners to update the CMSP at least every four years and prior to updates to MnSHIP and the Transportation Policy Plan [*insert link to "Work Program"*].

Figure E-4: Spot Mobility Improvement Opportunity Areas (Source: CMSP III, MnDOT, 2013)



Regional Mobility Improvements: MnPASS System

Priced managed lanes provide a reliable, congestion-free travel option during rush hours for people who ride transit or in carpools, and other motorists who are willing to pay. In the Twin Cities, we call this system MnPASS. Single-occupant vehicles and small trucks can buy their way into the managed lanes during rush hour times as long as the target travel conditions are maintained in the lane. Any motorist can freely use the MnPASS lanes outside of rush hour times. More information about MnPASS is available in "Transit Investment Direction and Plan" and "Freight investment Direction" discussions [*insert links*] and on the MnDOT website.

A system of MnPASS lanes can improve highway efficiency and effectiveness by moving more people through congested highway corridors during rush hours. The MnPASS system offers commuters and small trucks a choice for travel time. The choice and reliability offered by MnPASS also supports transit riders and other kinds of ridesharing, especially commuters using

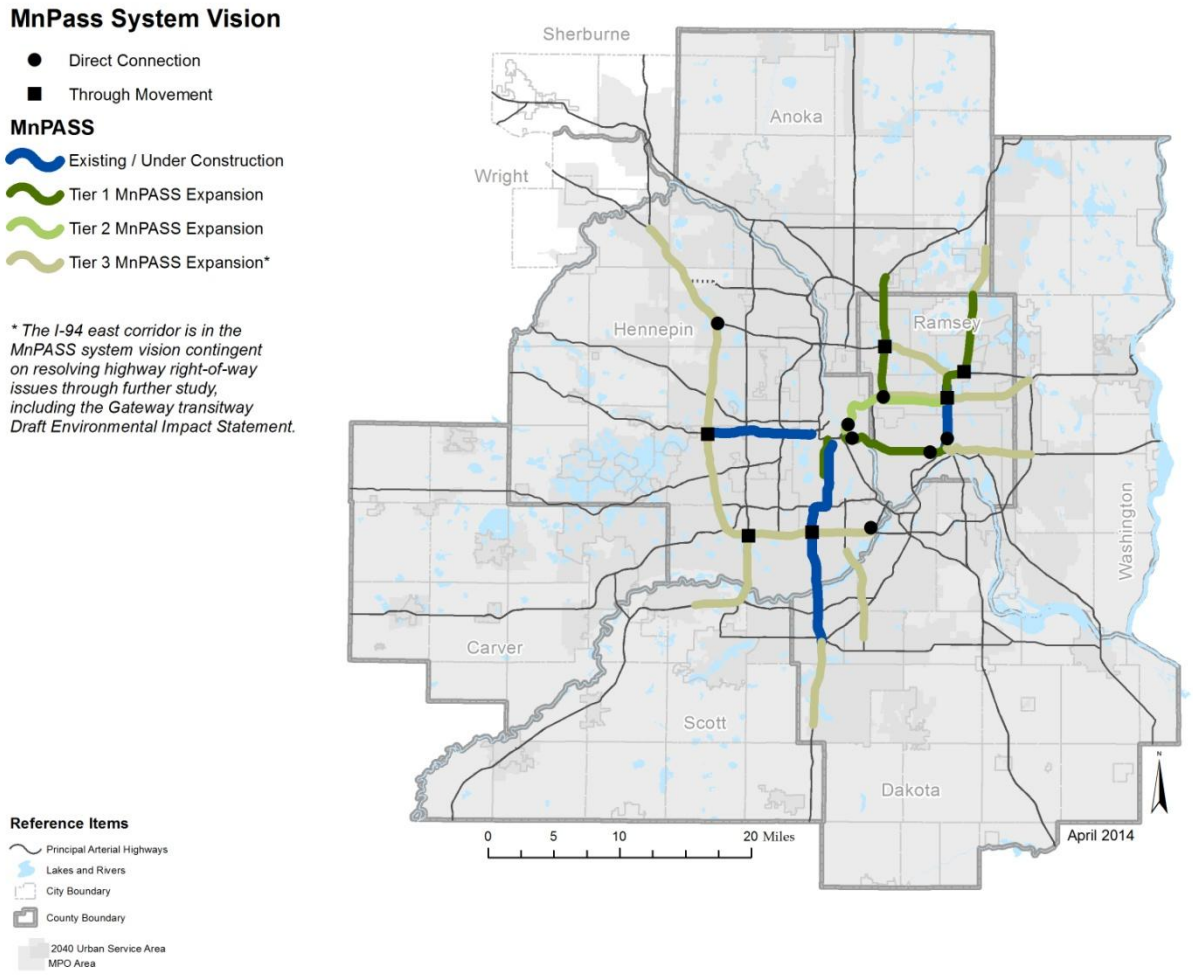
longer-distance express bus service and park-and-ride facilities. New or extended MnPASS lanes also improve the flow of traffic in adjacent general purpose lanes.

The MnPASS System Vision shown in Figure E-5 is estimated to cost $1.8 to 2.4 billion (2014 dollars). This estimate assumes most projects can be built in conjunction with major pavement and bridge reconstruction or rehabilitation projects, and with little or no new right-of-way to promote cost-effectiveness and allow for building more of the MnPASS system. In some cases, MnPASS projects may require use of flexible design principles to maximize the use of available pavement and right-of-way.

For corridors where MnPASS lanes are planned, other investments will not preclude and will lead toward a future MnPASS investment. Recent examples include:

1. Westbound auxiliary lane on Interstate 494 in Edina, Bloomington, and Richfield
2. Northbound auxiliary lane on Interstate 35W between 4th Avenue interchange and Johnson Street
3. Planned general purpose lane additions on Interstate 94 between Lexington Avenue and Rice Street
4. Planned general purpose and auxiliary lanes on Interstate 494 between Interstate 394 and Interstates 94/694

Figure E-5: MnPASS System Vision



MnPASS Corridor Status Updates

Three MnPASS corridors, I-394, I-35W south of downtown Minneapolis, and I-35E north of downtown Saint Paul are operating or under construction. Five additional projects are scheduled for construction or under active development:

1. **I-35W south of downtown Minneapolis:** MnDOT will complete the southbound I-35W MnPASS south of downtown Minneapolis in conjunction with major pavement and bridge reconstruction projects.
2. **I-35W north of Minneapolis:** MnDOT intends to align preservation efforts and MnPASS implementation on I-35W north of Minneapolis. It completed a corridor study for I-35W North MnPASS in 2013. The study recommended pursuing significant capital cost savings by integrating MnPASS lane construction with major bridge and pavement asset management projects in the corridor. The study recommended constructing the I-35W North MnPASS lanes in phases, starting with the lanes between MN 36 in Roseville and

US 10 in Arden Hills and Blaine. This first phase is included in the Current Revenue Scenario.

3. **I-94 between downtown Minneapolis and Saint Paul:** MnDOT is working to complete a corridor study for the I-94 MnPASS lane between Minneapolis and Saint Paul and has indicated the project should be included in the Current Revenue Scenario. If the I-94 MnPASS Study shows the project cannot be implemented before 2024, MnDOT will work to restore transit advantages between downtown Minneapolis and downtown Saint Paul until MnPASS is constructed in the corridor. The bus-only shoulder lanes were removed as an emergency traffic relief measure in 2007 following collapse of the I-35W bridge.
4. **I-35E north of Saint Paul:** MnDOT is working to complete a study evaluating the benefits and costs of extending MnPASS lanes on I-35E between Little Canada Road and Ramsey County Highway 96.
5. **MN 77 south of I-494:** MnDOT and Dakota County completed a managed lane study in 2014 for MN 77 south of I-494. The study recommended adding a MnPASS lane to northbound MN 77 between 138th Street in Apple Valley and Old Shakopee Road in Bloomington. The study acknowledged that the benefits of a MnPASS lane on MN 77 cannot be fully achieved without improvements to ease congestion for westbound I-494 between MN 77 and I-35W.

In addition to these efforts, MnDOT will continue to build and develop all tiers of the MnPASS system in close coordination with all related public and private transit service and support facility planners and providers, including cities, counties, Metro Transit, suburban transit providers, Metro Mobility, and Transit Link. MnDOT has started to develop a study to add an eastbound MnPASS lane on MN 36 between I-35W and I-35E. MnDOT is also participating in the Gateway Transitway study for I-94 east of downtown Saint Paul. The I-94 east corridor is in the MnPASS system vision contingent on resolving highway right-of-way issues through further study, including the Gateway transitway Draft Environmental Impact Statement.

MnDOT and the Council will also continue to work together to further refine the MnPASS system vision. The *Metropolitan Highway System Investment Study* (MHSIS) and *MnPASS 2* studies were completed just prior to adoption of the *2030 Transportation Policy Plan* (adopted November 2010). The *2030 Transportation Policy Plan* documented the tiered priority for MnPASS investments. In the process to update the *2040 Transportation Policy Plan*, a number of MnPASS-related questions have been raised that deserve further study and discussion, including the relationship between new or extended MnPASS lanes and transit service and support facilities [*insert links to "Work Program" and "Transit Investment Direction and Plan"*].

MnPASS Investments with Current Revenues

Between 2015 and 2024, MnDOT will complete I-35W MnPASS southbound from downtown Minneapolis, extend MnPASS on I-35E between Little Canada Road and Ramsey County Road J, and add new MnPASS lanes on I-35W north of Minneapolis and on I-94 between downtown

Minneapolis and Saint Paul. These are shown as Tier 1 MnPASS lanes in Table E-3, and the summarized costs are shown in Table E-7. Because of operational and rebuilding needs in 2025 through 2040, limited available revenues, and rising cost of construction, MnDOT does not anticipate being able to construct additional MnPASS lanes after 2024.

Table E-3: MnPASS System Investment Priorities for Current Revenue Scenario

Tier	Route	From (or at)	To	Description	Estimated Cost* (year of expenditure dollars)	Investment Scenario
0	I-394	I-494	I-94 near downtown Minneapolis	MnPASS lanes	Complete	Complete
0	I-35W	I-35W/E south split	South of downtown Minneapolis	MnPASS lanes	Complete	Complete
0	I-35E	I-94	Little Canada Road	MnPASS lanes	Under construction	Under construction
1	I-35W	Downtown Minneapolis	46th Street	Complete southbound MnPASS lane in conjunction with pavement reconstruction and I-35W/Lake Street transit station	Cost in highway asset management	Current Revenue Scenario, 2015-2018
1	I-35E	Little Canada Road	Ramsey County J	Construct MnPASS lanes	$16M	Current Revenue Scenario, 2015-2018
1	I-35W	MN 36/280	US 10	Construct MnPASS lanes	Approx. $100M	Current Revenue Scenario, 2019-2024
1	I-94	Downtown Minneapolis	Downtown Saint Paul	Construct MnPASS lanes including direct connections to and from both downtowns	Approx. $100M	Current Revenue Scenario, 2019-2024

*Cost estimates include MnPASS, and may or may not include other pavement, bridge, or roadside infrastructure improvements related to MnPASS implementation and anticipated to be completed at the same time.

Regional Mobility Improvements: Highway Strategic Capacity Enhancements

In some cases, strategic capacity enhancements other than traffic management technologies, spot mobility improvements, new or extended MnPASS lanes, or capacity improvements to other modes may be needed on the highway system. These capacity enhancements may be needed on freeways and other highways. While past practice emphasized highway capacity expansion as a common response to growing traffic congestion, this plan advances the direction from the *2030 Transportation Policy Plan* adopted November 2010 by continuing to acknowledge the limited funding available to operate, maintain, rebuild, and enhance all of the transportation system, including highways, and emphasizing that capacity enhancements must be carefully developed, considered, and prioritized for funding. These strategic highway capacity enhancements can improve travel conditions for people and freight. Consistent with the Highway Investment Direction [*insert link*], additional general-purpose-lane capacity should be considered only if it is affordable; has been designed using the lower-cost/high-return-on-investment approach; maximizes use of existing pavement and right-of-way; and MnPASS has been evaluated and found not to be feasible.

On freeways, strategic capacity enhancements may include bus-only shoulder lanes, truck climbing lanes, unpriced dynamic shoulder lanes, auxiliary lanes, improvements to existing interchanges – including freeway-to-freeway system interchanges (such as I-35W/494 in Bloomington or I-94/494/694 in Oakdale/Woodbury), frontage roads or improvements to the local arterial system, and new over- or underpasses, which are bridges for roads to pass over or under a freeway without accessing the freeway. This plan supports consideration of permanent general- purpose lanes on Interstates for the purpose of correcting lane continuity in areas of the freeway system with high levels of existing congestion; this plan does not support adding permanent general-purpose capacity elsewhere on the freeway system. For highway corridors with transit advantages or where MnPASS lanes are planned, strategic capacity enhancements will not eliminate existing transit advantages or MnPASS lanes, and will not preclude and will lead toward future transit advantages or MnPASS investment. For example, unpriced dynamic shoulder lanes will minimize impacts on transit advantages including bus-only shoulders that support express or bus rapid transit services [*insert link to "Transit Investment Direction and Plan"*]. See the next section for discussion of regional highway access improvements.

Photo: Interchange such as proposed Interstate 35W/494 interchange design

Non-freeway highways are also important in carrying regional trips in a safe and efficient manner. Many of these non-freeway highways are A-minor arterials which, along with non-freeway principal arterials, play a critical role in supplementing the capacity of the freeway system. They support access to regional job concentrations, educational institutions, and industrial and manufacturing centers for motorists and people riding transit, biking, and walking. This plan supports cost-effective improvements on non-freeway highways using limited federal, state, and regional funds wisely. Special emphasis should be placed on strategic capacity enhancements that integrate preservation, safety, and modernization, including:

- Truck climbing lanes
- Lane continuity within the urban service area
- Traffic management technology implementation such as fiber optic cable to allow traffic signal interconnection and coordination
- Transit advantages
- Increasing intersection capacity by building alternative intersection designs or interchanges, frontage roads, or improvements to the local arterial system
- Providing or improving priority bicycle facilities
- Improving pedestrian facilities, including intersection accessibility for people with disabilities.

This plan supports building new A-minor arterials where needed to provide critical regional, multimodal highway connectivity within the urban service area.

Strategic capacity enhancements must be affordable, place priority on existing problems, be developed and built using the lower-cost/high-return-on-investment approach, and be prioritized for funding based on their ability to advance the *Thrive MSP 2040* outcomes and Transportation Policy Plan goals and objectives [*insert link to Highway Investment Direction*]. Strategic capacity enhancements may be identified through the preservation, safety, or CMSP project development processes, the "Congestion Management Process" [*insert link*], or the forthcoming Metropolitan Council intersection conversion study. Interchange improvements and new over- and underpasses may be identified through regional land access studies like the *Northwest Hennepin County I-94 Sub-Area Study* (2008). Construction should occur only after MnDOT and Council staff determines that the proposed project is consistent with existing plans and policies.

For interchange proposals, the evaluation process and criteria are identified in Appendix F [*insert link*]. The main purpose of the interchange proposal assessment will be to identify cost-effective projects that can be supported by the Council and MnDOT for local and regional funding. Completion of this assessment and explicit support from MnDOT will continue to be necessary to obtain funding through the Regional Solicitation process for non-freeway state trunk highway improvements.

Non-Freeway Conversion Status Updates

The Twin Cities region has a well developed and managed system of freeways. The region is also working to improve the capacity of its non-freeway system through interchanges and other types of intersection conversions. Three expressway corridors are under active study to improve capacity as well as access.

1. **MN 36:** Ramsey and Washington counties are working with MnDOT and the Council to develop interchange designs that convert MN 36 to a freeway. The improvements being identified through these efforts are not included in the current or Increased Revenue Scenarios, and should be prioritized for funding through the Metropolitan Council

Intersection Conversion Study, especially the intersections at Century and Hadley Avenues.

2. **US 10:** MnDOT and Anoka County, in cooperation with the Cities of Ramsey and Anoka and the Council, are working to complete the US 10 Access Planning Study in late 2014. While study partners agree a freeway is the proper vision for the corridor based on traffic volumes, safety concerns, and the presence of multiple modes, the study is working to identify lower-cost/high-return-on-investment projects that can be built incrementally to improve safety and operations for all travelers in the corridor. The improvements being identified through these efforts are not included in the current or Increased Revenue Scenarios and should be prioritized for funding through the Council's Intersection Conversion Study.
3. **US 169:** MnDOT and Scott County are working to implement several intersection conversions along US 169 in Scott County with the intent of improving safety and capacity in the corridor. MnDOT is making a number of safety-capacity improvements to the corridor, including the US 169-Scott County 69 intersection. The Shakopee Mdewakanton Sioux tribe is also working with MnDOT and Scott County and fully funding strategic capacity enhancements to US 169 to support the tribe's economic development. While not included in the Current Revenue Scenario, improvements are especially needed at the US 169/MN 41 intersection.

Strategic Capacity Enhancements with Current Revenues

Between 2015 and 2024, MnDOT will complete strategic capacity enhancements funded partially through the state's Corridor Investment Management Strategy (CIMS) and Corridors of Commerce programs, and with funding provided by the Shakopee Mdewakanton Sioux.

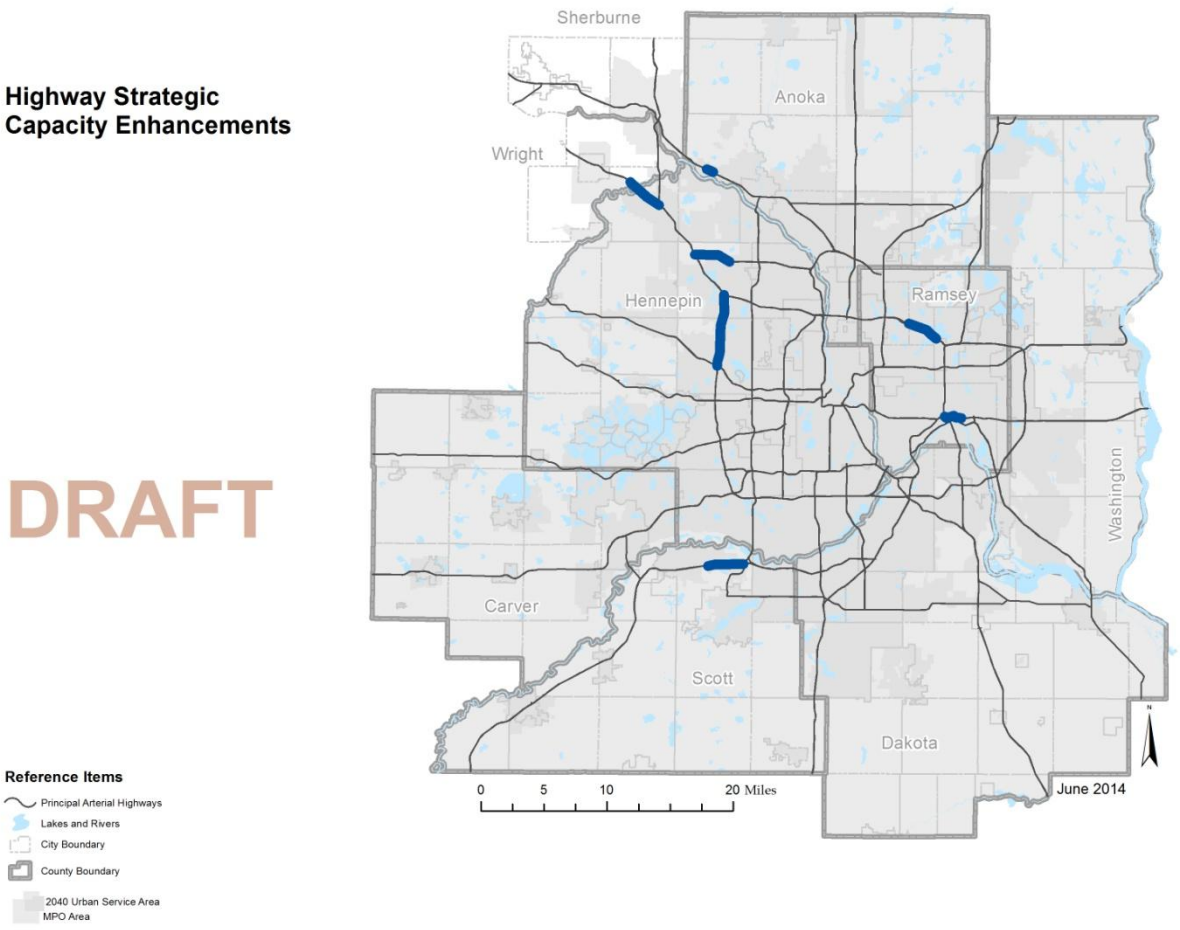
These projects are illustrated in Figure E-6, listed in Table E-4, summarized in Table E-7, and listed in Appendices B and C. Because of operational and rebuilding needs in 2025 through 2040, limited available revenues, and rising cost of construction, MnDOT does not anticipate being able to make additional strategic capacity investments after 2024.

Table E-4: Highway Strategic Capacity Enhancements

Route	From (or at)	To	Description	Estimated Cost (year of expenditure dollars)	Investment Scenario
I-494	North of I-394	I-94/694	Construct one additional lane in each direction in conjunction with pavement and bridge rehabilitation	$86 M ($36 M strategic capacity, $50 M preservation)	Current Revenue Scenario; 2015-2018

Route	From (or at)	To	Description	Estimated Cost (year of expenditure dollars)	Investment Scenario
TH 610	I-94	Hennepin County 81	Complete the four-lane freeway and connection with I-94	$131M (an additional $50M for right-of-way in Program Support)	Current Revenue Scenario; 2015-2018
I-694	Lexington Avenue	Rice Street	Construct one additional lane in each direction	$42 M ($32 M strategic capacity, $30 M preservation)	Current Revenue Scenario; 2015-2018
I-94	MN 241 in St. Michael	MN 101 in Rogers	Extend westbound ramp, add westbound lane through MN 101 interchange, and add eastbound lane between the interchanges	$46M	Current Revenue Scenario; 2015-2018
I-94	East 7th Street exit in Saint Paul	Mounds Boulevard in Saint Paul	Eastbound auxiliary lane, emergency pull-off areas, noisewall, and related roadside infrastructure	$3 M	Current Revenue Scenario; 2015-2018
US 10	Armstrong Boulevard in Ramsey		New interchange and rail grade separation	$34.4M total (MnDOT - $10M)	Current Revenue Scenario; 2015-2018
TH 169	Scott County 69/Canterbury Road	Scott County 21	Construct additional southbound lane in Shakopee	$1.5M total (MnDOT – Future operations, maintenance, and rebuilding only)	Current Revenue Scenario; 2015-2018

Figure E-6: Highway Strategic Capacity Enhancements



Freeways with grade-separated interchanges carry traffic faster and, in most cases, are safer than multilane highways with at-grade intersections and traffic signals. Many local agencies and other transportation stakeholders have expressed a desire, and pursued state and federal funding, to convert some highway intersections to interchanges to increase safety and mobility. As a work program item for the future update of the *2040 Transportation Policy Plan*, the Council and MnDOT will work with regional highway partners to analyze all intersections on the non-freeway principal arterial system within the urban service area to identify and prioritize specific intersection conversion projects [*insert link to "Work Program"*].

Regional Mobility Improvements: Regional Highway Access Investments

Highway access to jobs, education, and industry is critical to the livability and prosperity of the region. But access must be provided in a way that preserves or enhances the safety and capacity of the principal and A-minor arterial system. Proposals for interchanges on the principal arterial system must be reviewed by MnDOT and the Council and meet the criteria in

Appendix F [*insert link*], which notes the further review required by the Federal Highway Administration (FHWA) for interchange proposals on the Interstate system. In addition to solving highway capacity or safety deficiencies, new interchanges should be consistent with regional development plans and regionally approved local comprehensive plans (Wright and Sherburne County and Houlton, Wisconsin local comprehensive plans do not need to be regionally approved).New interchanges should also support development that enhances the region's economic competitiveness. See *Thrive MSP 2040* and "Land Use and Local Planning" [*insert links*] for more discussion of land use planning for housing, jobs, education, and industry within the seven-county region.

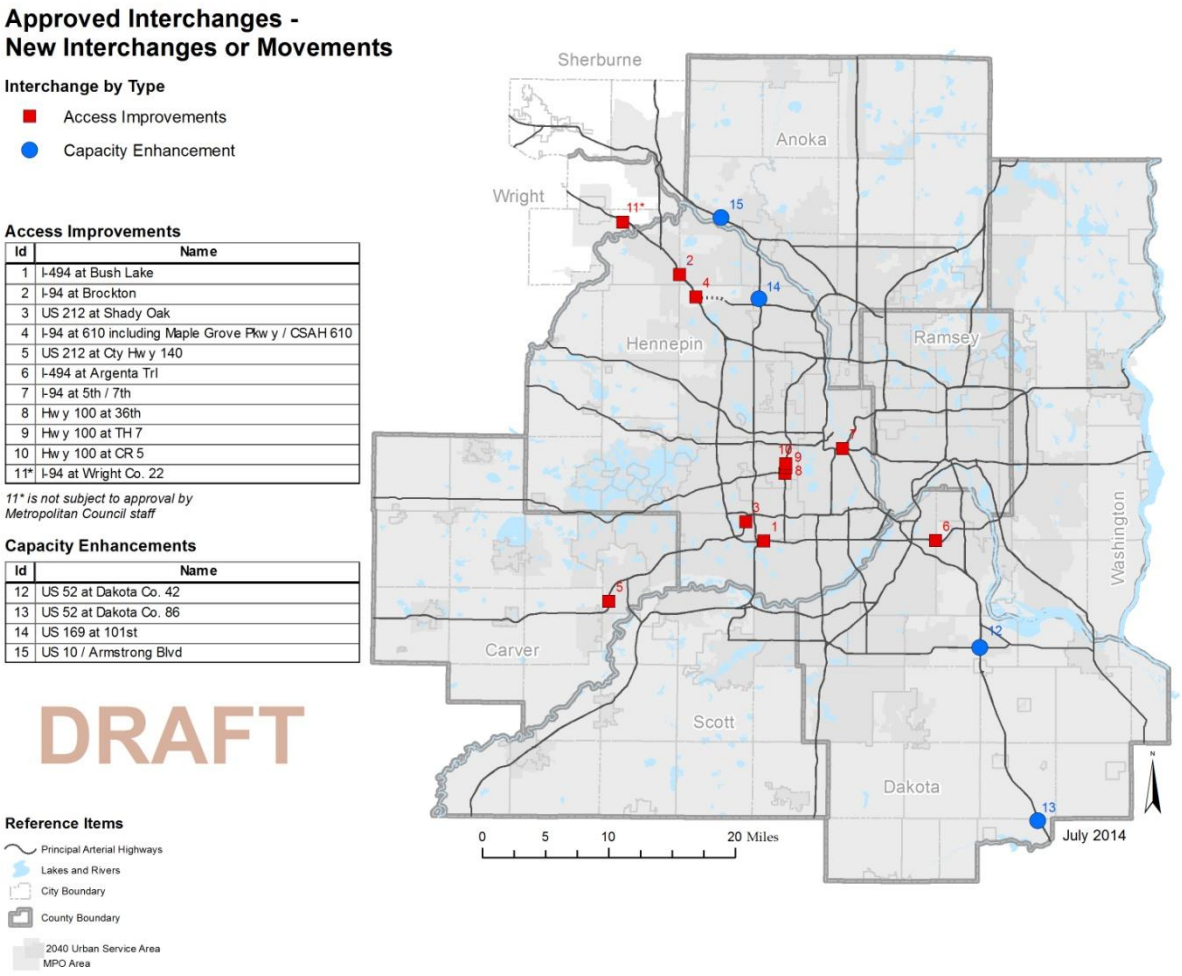
Photo: Interstate 494/Penn Avenue interchange

Between 2015 and 2024, MnDOT will contribute to the regional highway access investments funded through the state's regular and Transportation Economic Development (TED) programs. These projects are listed in Table E-5, illustrated in Figure E-7, and listed in Appendices B and C [*insert links*]. Because of operations, maintenance, and rebuilding needs in 2025 through 2040, limited available revenues, and rising cost of construction, MnDOT does not anticipate being able to contribute to regional highway access investments after 2024.

Table E-5: Regional Highway Access Investments

Route	From (or at)	To	Description	Estimated Cost (reported in year of expenditure dollars)	Investment Scenario
I-94	5th/7th Street in Minneapolis		Reconstructed interchange to close 5th Street ramp and replace it with one at 7th Street	$9.7M total (MnDOT - $6.79M)	Current Revenue Scenario; 2015-2018
US 212	Shady Oak Road in Eden Prairie		Reconstructed interchange	$7M	Current Revenue Scenario; 2015-2018
TH 100	36th Street in St. Louis Park	Barry Street	Reconstruct mainline including interchanges at MN 5, MN 7, and 36th Street	Cost in asset management	Current Revenue Scenario; 2015-2018

Figure E-7: Highway Access Investments



Freeways with grade-separated interchanges carry traffic faster and, in most cases, are safer than multilane highways with at-grade intersections with traffic signals. Many local agencies and other transportation stakeholders have expressed a desire and pursued state and federal funding to convert some highway intersections to interchanges to increase the safety and mobility. As a work program item for the future update of the *2040 Transportation Policy Plan*, the Council and MnDOT will work with regional highway partners to analyze all intersections on the non-freeway principal arterial system within the urban service area to identify and prioritize specific intersection conversion projects [*insert link to "Work Program"*].

Increased Revenue Scenario Investments

The investments identified in the Current Revenue Scenario are the region's highest highway investment priorities, but do not represent all highway investments needed to help achieve the outcomes, goals, and objectives in *Thrive MSP 2040* and this Transportation Policy Plan. The

Increased Revenue Scenario identifies a higher level of spending for highway investments that will come closer to advancing the outcomes, goals, and objectives of *Thrive MSP 2040* this Transportation Policy Plan, and the *Minnesota State Highway Investment Plan 2014-2033*.

Building on work completed in 2012 for the Governor's Transportation Finance Advisory Committee (TFAC) and supplemented with additional information from MnDOT, this plan calls for significant additional state highway investments for the 2015 to 2040 timeframe (see Table E-7). The Increased Revenue Scenario for the metropolitan area's state highway system totals $8 billion to 10 billion (constant dollars), which does not include funding needed for additional, high priority transit, local transportation, aviation, or non-highway freight transportation improvements. The total includes only anticipated public costs – operations, maintenance, and capital – for the state highway system in the metropolitan area.

While the intent in developing this Increased Revenue Scenario was to identify a practical scenario for the 2015 to 2040 timeframe, an additional $8 billion to 10 billion of increased revenue for highways is not realistic over a 26-year time period. For example, when policymakers were discussing different options for raising revenue for the needs identified through the TFAC process, the $4 billion to $6.5 billion in needs they identified for the metropolitan area's state highway system required the equivalent of more than a 40-cent rise in the gas tax over a 20-year period. The TFAC analysis did not include the additional state highway funding needs for system operations and maintenance, program support, and bicycle and accessible pedestrian improvements now included in the *2040 Transportation Policy Plan*.

An equally important message in the Increased Revenue Scenario is the ratio of funding between the investment scenarios and categories. Table E-7 shows how the $8 billion to $10 billion in increased revenues may be allocated among the 10 investment categories. Based on the best information available, funding for state highway should increase as noted as compared to the Current Revenue Scenario:

1. Operations and maintenance should increase on the order of 50% (+$1 billion)
2. Funds to rebuild and replace highway assets should increase about 35% (+$2 to $ 2.5 billion)
3. Highway safety, bicycle, and accessible pedestrian investments should increase 75% and 100%, respectively (+$0.4 billion and +$0.3 billion)
4. Regional mobility investments should increase $4 to $5 billion, a very significant increase over the spending in the Current Revenue Scenario

Note that while we draw these comparisons, the percentages are not technically correct since the Current Revenue Scenario is reported in year-of-expenditure dollars, as required by federal law, while the Increased Revenue Scenario is reported in constant dollars.

The text that follows identifies potential investments in the 10 categories for highway investment between 2015 and 2040 under an Increased Revenue Scenario. Refer to the Current

Revenue Scenario discussion for the investment category definitions [*insert link*].The lists of projects under the Increased Revenue Scenario are not intended to be exhaustive and may not identify the region's priorities for investment. As discussed throughout the Current Revenue Scenario, the Metropolitan Council, MnDOT, and other regional highway partners will continue to develop state highway projects and identify priorities as part of the transportation planning process. See the "Work Program" for discussion of select activities to be completed prior to the next update of the Transportation Policy Plan or the Unified Planning Work Program for discussion of all annual transportation planning activities performed by the Metropolitan Council [*insert links*]. This plan concludes by identifying additional highway investments within the greater Twin Cities region that may be needed.

Operate and Maintain Highway Assets

The MnDOT Highway Systems Operation Plan 2012-2015 (HSOP) identifies a shortfall in current state highway operations and maintenance spending. The HSOP showed that both traditional and risk-based estimates of current operations and maintenance needs exceed the budget anticipated for the state highway system. The Increased Revenue Scenario includes an additional $1 billion in MnDOT operations and maintenance spending (see Table E-7), which would account for both unmet needs on the existing highway system and additional needs created under this scenario due to improvements like new or additional traffic management technologies, MnPASS, and strategic capacity enhancements.

Program Support

Resources are also needed to support the delivery of quality highway projects. Under the Increased Revenue Scenario, approximately $0.7 billion would be allocated to the metropolitan area for meeting additional project delivery priorities (see Table E-7). This does not include internal MnDOT resources necessary for program delivery.

Rebuild and Replace Highway Assets

Based on work done for the Transportation Finance Advisory Committee, an Increased Revenue Scenario would yield approximately $2 to 2.5 billion for additional pavement, bridge, and roadside infrastructure investments in the metropolitan area (see Table E-7). These investments would help maintain conditions for non-Interstate routes, especially for state roads separate from the principal arterial/National Highway System, like MN 47/University Avenue, MN 65/Central Avenue, MN 51/Snelling Avenue, MN 13 and MN 5. Many of these state roads serve as important transit routes, including for the proposed arterial bus rapid transit network.

Specific Highway Safety Improvements

Under the Increased Revenue Scenario, it is estimated that approximately $0.3 billion (about 3% of the Increased Revenue Scenario) would be allocated to the greater Twin Cities region for meeting specific highway safety priorities. See Table E-7.

Highway Bicycle and Accessible Pedestrian Improvements

Under the Increased Revenue Scenario, it is estimated that approximately $0.3 billion (about 3% of the Increased Revenue Scenario) would be allocated to the greater Twin Cities region for meeting additional highway bicycle and accessible pedestrian priorities. See Table E-7.

Regional Mobility Improvements

Regional mobility improvements consist of several investment categories: (6) traffic management technologies, (7) spot mobility improvements, (8) the MnPASS system, (9) highway strategic capacity enhancements, and (10) highway access to jobs, education, and industry. Potential regional mobility improvements are summarized in Table E-7.

Regional Mobility Improvements: Traffic Management Technologies and Spot Mobility Improvements with Increased Revenues

The need for traffic management technology and spot mobility improvements on the principal and A-minor arterials greatly exceed the level of investment anticipated under the Current Revenue Scenario. As shown in Table E-7, a portion of the $4 billion to $5 billion in additional regional mobility funding would be allocated to meeting additional active traffic management and intelligent transportation system priorities. Some of these priorities are illustrated in Figures E-3 and E-4.

Regional Mobility Improvements: MnPASS Investments with Increased Revenues

The Increased Revenue Scenario includes completing the Tier 2 and 3 MnPASS projects listed in Table E-6, thereby completing the MnPASS system vision (see Table E-7). Consistent with the findings from the MnPASS 2 Study completed by MnDOT in 2010 and in conjunction with the Metropolitan Council's Metropolitan Highway System Investment Study, Tier 2 MnPASS projects should be completed before Tier 3 MnPASS projects unless subsequent corridor studies provide a basis for reprioritizing. The Tier 2 I-35W North MnPASS projects shown are consistent with recommendations from the I-35W North corridor study. Refer to the Current Revenue Scenario and Figure E-5 for more discussion of MnPASS [*insert links*].

Table E-6: MnPASS System Investment Priorities*

Tier	Route	From (or at)	To	Description	Estimated Cost for MnPASS**	Investment Scenario
0	I-394	I-494	I-94 near downtown Minneapolis	MnPASS lanes	Complete	Complete
0	I-35W	I-35W/E south split	South of downtown Minneapolis	MnPASS lanes	Complete	Complete

Tier	Route	From (or at)	To	Description	Estimated Cost for MnPASS**	Investment Scenario
0	I-35E	I-94	Little Canada Road	MnPASS lanes	Under construction	Under construction
1	I-35W	Downtown Minneapolis	46th Street	Complete southbound MnPASS lane in conjunction with pavement reconstruction and repair, noisewalls, tms, drainage, lighting, replace bridges, and I-35W/Lake Street transit station	Cost in highway asset management	Current Revenue Scenario, 2015-2018
1	I-35E	Little Canada Road	Ramsey County J	Construct MnPASS lanes	$16M	Current Revenue Scenario, 2015-2018
1	I-35W	MN 36/280	US 10	Construct MnPASS lanes	$100M	Current Revenue Scenario, 2019-2024
1	I-94	Downtown Minneapolis	Downtown Saint Paul	Construct MnPASS lanes including direct connections to and from both downtowns	$100M	Current Revenue Scenario, 2019-2024
2	I-35W	Downtown Minneapolis	MN 36/280	Construct MnPASS lanes	$160-180M	Increased Revenue Scenario
2	TH 36	I-35W	I-35E	Construct eastbound MnPASS lane	$35-60M	Increased Revenue Scenario
2	I-35W	US 10	95th Avenue in Blaine	Construct MnPASS lanes	To be developed	Increased Revenue

Tier	Route	From (or at)	To	Description	Estimated Cost for MnPASS**	Investment Scenario
						Scenario
3	TH 36	I-35W	I-35E	Construct westbound MnPASS lane	To be developed	Increased Revenue Scenario
3	TH 36	I-35E	I-694	Construct MnPASS lanes	To be developed	Increased Revenue Scenario
3	TH 77	138th Street in Apple Valley	Old Shakopee Road in Bloomington	Construct MnPASS lanes	$41M	Increased Revenue Scenario
3	US 169	Scott County 17 in Shakopee	I-494	Construct MnPASS lanes	$80-$115M	Increased Revenue Scenario
3	I-35E	Ramsey County J	Anoka County 14	Construct MnPASS lanes	To be developed	Increased Revenue Scenario
3	I-35	Crystal Lake Road/Southcross Drive in Lakeville	Dakota County 70	Construct MnPASS lanes	To be developed	Increased Revenue Scenario
3	I-94	MN 101 in Rogers	I-494/694	Construct MnPASS lanes with southbound direct connection to I-494	$70 to $95M	Increased Revenue Scenario
3	I-94***	Downtown Saint Paul	I-694/494 in Woodbury	Construct MnPASS lanes	To be developed	Increased Revenue Scenario
3	I-494	I-94/694	I-394	Construct MnPASS lanes	To be developed	Increased Revenue Scenario
3	I-494	I-394	US 212	Construct MnPASS lanes	$70 to $150M	Increased Revenue Scenario
3	I-494	US 212	MN 5/MSP Airport	Construct MnPASS lanes	$150 to $185M	Increased Revenue Scenario

Tier	Route	From (or at)	To	Description	Estimated Cost for MnPASS**	Investment Scenario
3	I-694	I-35W	I-35E	Construct MnPASS lanes	To be developed	Increased Revenue Scenario

* Tier 1 cost estimates are reported in year-of-expenditure dollars. All other cost estimates are reported in constant dollars.
** Cost estimates include MnPASS and may or may not include other pavement, bridge, or roadside infrastructure improvements related to MnPASS implementation and anticipated to be completed at the same time.
*** The I-94 east corridor is in the MnPASS system vision contingent on resolving highway right-of-way issues through further study, including the Gateway transitway Draft Environmental Impact Statement.

Regional Mobility Improvements: Strategic Capacity Enhancements with Increased Revenues

Several types of strategic regional highway capacity enhancements are needed throughout the region. These include improvements to freeway-to-freeway system interchanges, existing interchanges, and existing at-grade intersections with traffic signals on multilane highways. Regional transportation partners have identified many potential strategic capacity enhancements, including improvements to the I-35W/494 interchange in Bloomington and to the I-94/494/694 interchange in Oakdale/Woodbury. Many of these efforts are high priorities and are not included in the Current Revenue Scenario due to anticipated funding limits.

The need for improvements to existing at-grade intersections surfaced during development of the *2030 Transportation Policy Plan* adopted in November 2010. Following its adoption, MnDOT and Council staff implemented an interchange review process. The interchanges listed below were found consistent with the criteria in Appendix F, although funding for them has not been identified. This list is not intended to be exhaustive nor the region's priorities for investment. As part of the work program following adoption of the *2040 Transportation Policy Plan*, MnDOT and the Council will undertake a Principal Arterial Intersection Conversion Study to identify and prioritize at-grade intersections that should be improved to strategically enhance the capacity of the principal and A-minor arterial system. Cost estimates for these improvements need to be developed.

1. US 52 at Dakota County 42 (Rosemount)
2. US 52 at Dakota County 86 (Hampton/Randolph Township)
3. US 169 at 101st Avenue (Brooklyn Park)

Regional Mobility Improvements: Highway Access Investments with Increased Revenues

Regional transportation partners have identified many potential regional highway access investments. Some of these efforts are high priorities and are not included in the Current Revenue Scenario due to anticipated funding limits. Other proposals have been brought

forward by local partners to support the economic development they hope to see in their communities. See the previous section for discussion of strategic capacity enhancements.

Following adoption of the *2030 Transportation Policy Plan* in 2010, MnDOT and the Council implemented an interchange review process. The interchanges listed below were found consistent with the criteria found in Appendix F of the Transportation Policy Plan, although funding has not yet been identified. This list is not intended to be exhaustive nor the region's priorities for investment. As part of the work program following adoption of the *2040 Transportation Policy Plan*, MnDOT and the Council will undertake a Principal Arterial Intersection Conversion Study to identify and prioritize at-grade intersections that should be improved to enhance regional highway access. This study will reflect the outcomes, goals, and objectives in *Thrive MSP 2040* and the *2040 Transportation Policy Plan*, especially economic competitiveness. Cost estimates for these improvements need to be developed.

1. I-494 at Bush Lake Road (Bloomington)
2. I-94/MN 610 at Hennepin County 610/Maple Grove Parkway (Maple Grove)
3. I-494 at Argenta Trail (Mendota Heights, Sunfish Lake, Inver Grove Heights, Eagan)
4. I-94 at Brockton Avenue (Dayton, Rogers)
5. US 212 at Carver County 140 (Chaska)
6. I-94 at Wright County 22 (Saint Michael) - not subject to approval by Metropolitan Council staff

Highway Investment Summary

The projects identified in the Current Revenue Scenario are illustrated in Figure E-8 and listed in Appendices B, C, and E [*insert links*]. These investments are for the region's state highway system only, which is largely Interstates, U.S., and state trunk highway principal arterials owned and operated by the MnDOT.

Several counties and cities also own a small part of the principal arterial system, and own and operate a majority of the A-minor arterial system. Highway investments made by the counties and cities on their systems are not shown in this section since they are identified through the local comprehensive and capital improvement planning processes, and are largely funded by state and local taxes as shown in "Transportation Finance" [*insert link*]. All of the major state and local highway projects identified to date in the metropolitan planning area – consisting of the seven-county region plus the contiguous, urbanized areas of Wright and Sherburne counties, and Houlton, Wisconsin -- are listed in Appendices B, C, and E [*insert links*].

Projects in the first four years of the plan are identified with some certainty and MnDOT is actively developing them. Projects identified in years 2019-2024 are likely to advance, but continue to need significant development and may substantively change as they are developed. Specific projects have not been identified beyond 2024. Over the timeframe of this plan,

MnDOT anticipates investing $11 billion (year-of-expenditure dollars) in the metropolitan area's state highway system.

MnDOT is largely able to meet its highway asset rebuilding and replacement needs, but has high priority, unmet needs for all other investment categories, including operations and maintenance, specific highway safety improvements, and regional mobility. Operations and maintenance, program support, and reconstruction and replacement activities are estimated to make up between 76% to 94% of the Current Revenue Scenario. Safety, bicycle, and pedestrian investments are estimated to make up 5% to 7% of the Current Revenue Scenario.

Between 2015 and 2024 in the Current Revenue Scenario, MnDOT will also invest approximately $721 million (6% of the Current Revenue Scenario) in regional mobility improvements. These include traffic management technology, spot mobility improvement, the MnPASS system, highway strategic capacity enhancements, and regional highway access investments, known as "regional mobility improvements."

MnDOT will continue to improve and expand traffic management technologies throughout the metropolitan area and deliver spot mobility improvements identified through its Congestion Management and Safety Plan. It will also continue to expand the MnPASS system of priced managed lanes. And in response to special funding like the state's Corridor Investment Management Strategy (CIMS), Transportation Economic Development (TED), and Corridors of Commerce programs, MnDOT will complete or contribute to several strategic capacity enhancements and regional highway access projects.

As shown in Table E-7, these projects make up over 30% of the regional mobility funding available to the metropolitan area separate from Regional Solicitation funding. Because of operation, maintenance, and rebuilding needs in 2025 through 2040, limited available revenues, state trunk highway bond repayment responsibilities, and the rising cost of construction, MnDOT does not anticipate making regional mobility improvement investments in the region after 2024. Performance outcomes based on these investments are summarized in "System Performance Measurement and Monitoring" [*insert link*].

If new revenues become available, MnDOT would continue to invest in operations and maintenance in the metropolitan area. This would include addressing a backlog of priority projects as well as operating and maintaining new highway facilities, such as new or improved traffic management technologies and an expanded MnPASS system. MnDOT would also develop and deliver additional safety, bicycle, accessible pedestrian, and regional mobility improvements, such as the MnPASS, strategic capacity, and regional highway access projects discussed. These projects would help the region work toward the outcomes identified in *Thrive MSP 2040* and the goals and objectives identified in this plan. As shown in Table E-7, the investments under the Increased Revenue Scenario are estimated to cost $8 billion to 10 billion (constant dollars).

Table E-7: Highway Investment Summary 2015 to 2040 (MnDOT Spending Only)*

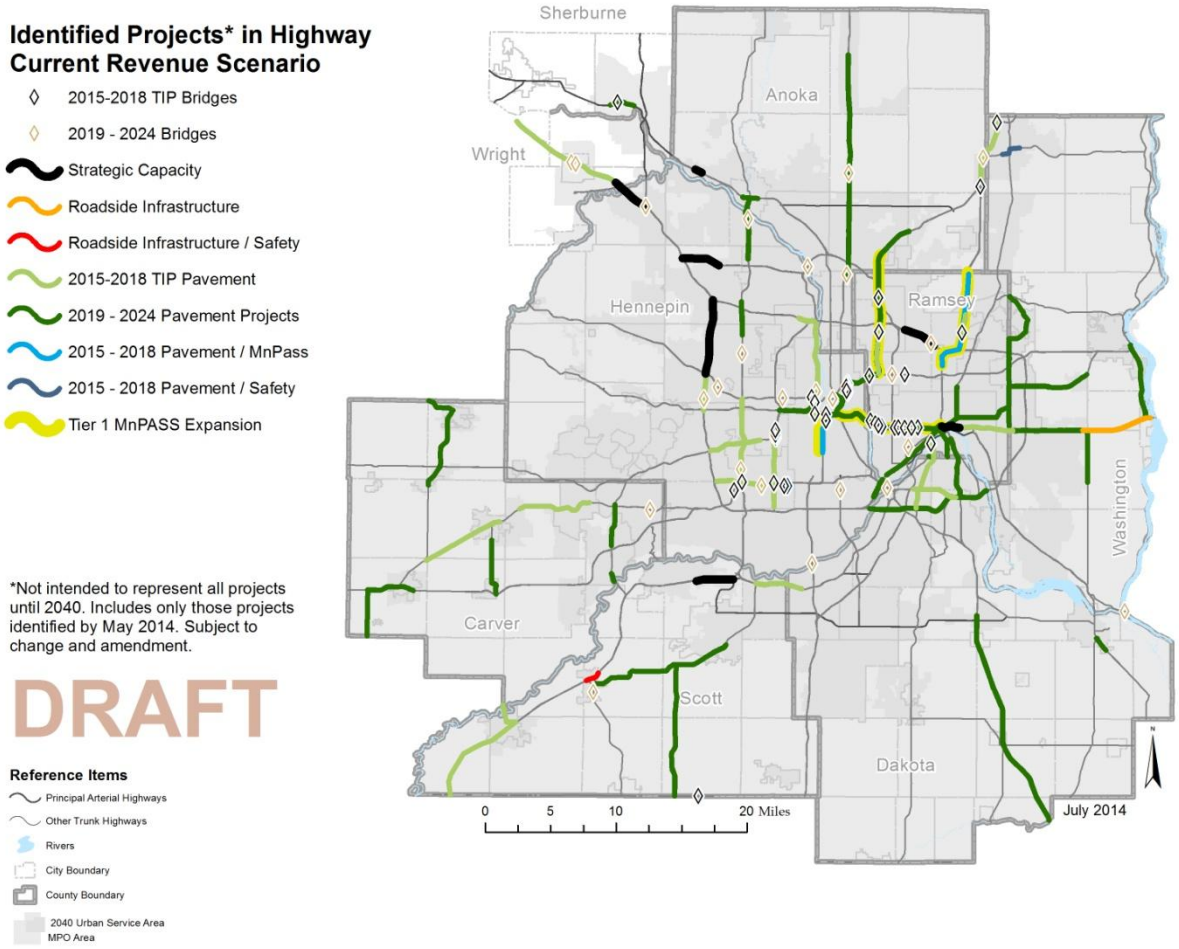
	Current Revenue Scenario** (reported in year-of-expenditure dollars)				Increased Revenue Scenario
Investment Category	**2015-2024 (10 years)**	**2025-2034 (10 years)**	**2035-2040 (6 years)**	**2015-2040 (26 years)**	**2015-2040 (26 years)**
1. Operate and Maintain Highway Assets	$0.6 B	$0.8 B	$0.6 B	$2.0 B	+ $1 B
2. Program Support	$0.4 B	$0.3 B	$0.2 B	$0.9 B	+ $0.7 B
3. Rebuild and Replace Highway Assets (Pavement, Bridge, and Roadside Infrastructure)	$1.8 B	$3.0 B	$2.1 B	$6.9 B	+ $2 to 2.5 B
4. Specific Highway Safety Improvements	$0.1 B	$0.2 B	$0.1 B	$0.4 B	+ $0.3 B
5. Highway Bicycle and Accessible Pedestrian Improvements	$0.1 B	$0.1 B	$0.1 B	$0.3 B	+ $0.3 B
Regional Mobility Improvements (sub-total 6.-10.)	Approx. $720 M	$0	$0	Approx. $0.7 B	+ $4 to 5 B
6. TMT	$40-60 M	$0	$0	$40-60 M	To be developed
7. Spot Mobility	$75-125 M	$0	$0	$75-125 M	To be developed
8. MnPASS* **	$275-325 M	$0	$0	$275-325 M	To be developed
9. Strategic Capacity* **	$225-275 M	$0	$0	$225-275 M	To be developed
10. Highway Access* **	$15-25 M	$0	$0	$15-25 M	To be developed
TOTAL*	$3.7 B ***(10 years)***	$4.4 B ***(10 years)***	$3.1 B ***(6 years)***	$11 B ***(26 years)***	+ $8 to 10 B ***(26 years)***

*Local transportation investments are identified in local capital improvement programs and local comprehensive plans per Minnesota Statutes 473.146.

**Current Revenue Scenario investments do not include $1.5 billion in federal funding for improvements to the non-freeway principal and A-minor arterial system to be identified by the Transportation Advisory Board through the Regional Solicitation. Investments funded through the Regional Solicitation must be consistent with *Thrive MSP 2040* and the Transportation Policy Plan.

***See lists of specific projects in the text and appendices B, C, and E.

Figure E-8: Potential Projects Identified To-Date in the Current Revenue Scenario



Additional Highway Needs beyond Increased Revenue Scenario

There are now, and will continue to be, highway needs in the region that are not addressed in this plan. While the region does not support attempts at building general-purpose highway capacity to eliminate congestion, there are other needs that should be recognized. Regional transportation partners have identified many other potential, long-term highway improvement projects. These kinds of projects are not listed in this plan, which does not preclude continued study of these potential improvements. Consistent with state law, these kinds of projects are often identified through the local comprehensive planning and capital improvement planning processes.

Potential projects will be prioritized for investment. Regional transportation partners must use the population, household, and employment forecasts and corresponding urban and rural land use plans adopted by the Metropolitan Council and local communities, work to develop innovative and affordable projects to address reasonably anticipated needs based on these forecasts and plans, and exercise judgment in the amount spent studying long-term highway improvements.

The limited funding available must not be diverted from more immediate needs of operating, maintaining, rebuilding, and replacing highway assets, improving safety for all people and freight, and improving or enhancing healthy environments through access management and right-of-way preservation. See Appendix D for a summary of MnDOT access management guidelines and Metropolitan Council's web site for information about the state trunk highway Right-of-Way Acquisition Loan (RALF) fund [*insert link*].

Consistent with previous Transportation Policy Plans, regional transportation providers should continue to work together on two potentially critical future river bridges. MnDOT should continue to work with Carver and Scott counties to monitor the changing needs for and identify affordable improvements to the MN 41 bridge over the Minnesota River. Hennepin and Anoka counties should also continue to work together, with MnDOT, to monitor the needs for and affordable approaches to a new A-minor arterial bridge over the Mississippi River potentially connecting the cities of Dayton and Ramsey. The project partners should work together to preserve right-of-way for bridge improvements if development pressures become imminent.

In addition to the MN 41 and Dayton-Ramsey bridges, the need for new principal or A-minor arterials to serve growth is well documented in future suburban edge and emerging suburban edge areas where land uses and the arterial grid are not densely developed. As discussed in Appendix D, principal arterials are the most efficient and safe way to accommodate longer and faster regional vehicle trips. Future principal arterial needs have been identified in Anoka County (east-west), Dakota County (east-west and north-south), Washington County (north-south), and Scott County (east-west and north-south).

1. **Anoka County** has identified Anoka County 22/Viking Boulevard from Sherburne to Chisago counties as the preferred location for its potential future principal arterial.
2. **Scott County** has identified Scott County 17/MN 13 from US 169 to MN 19 as the route for its potential future north-south principal arterial, and a future east-west principal arterial along Scott County 8/Dakota County 70 from I-35 to US 169.
3. **Washington County** has identified Washington County 15/Manning Avenue as the route for its potential future north-south principal arterial.

Since principal arterials should generally end with a connection to another principal arterial, actual endpoints can be finalized in the future. Most of these proposed future principal arterials and their supporting A-minor arterial network will be considered further in future updates of the Transportation Policy Plan when new regional forecasts based on the 2020 census have

been developed. Most of these routes are not warranted within the current planning timeframe as the urban service area, consistent with the *2030 Transportation Policy Plan*, is not forecast to expand to require them. However, Scott County 17 and Scott County 42 lie within the urban service area identified by *Thrive MSP 2040*.

As a work program item for the future update of the *2040 Transportation Policy Plan*, the Council, MnDOT, and Scott County will work together to assess the need and regional priority for additional principal arterials in this part of the region, and identify practical approaches for providing, operating, and maintaining them if justified [*insert link to "Work Program"*].

Transit Investment Direction and Plan

Transit Investment Direction

Residents and businesses view a strong public transit system as an essential part of a transportation system that will serve a **prosperous**, **livable**, **equitable** region. The federal government, state government, and the region have all acknowledged that a **sustainable** future must include a variety of options for travel within urban areas. Transit service and facilities must be located where they will bring a strong return on the investment. Park-and-ride facilities are best located in suburban and developing areas, while high-frequency bus service is best located in urban neighborhoods. In order to be good **stewards** of public investments, the region must invest in transit strategically with solutions that broadly strive toward this plan's regional goals and objectives, and integrate with land use and other regional systems. In this way, transit benefits the entire region, including places with no or limited service.

The region's transit investment plan plays a role in realizing all of the goals of the Transportation Policy Plan. However, the transit investment plan also plays roles in addressing the specific performance-based objectives. The objectives provide the foundation for investment factors that are used to set transit investments priorities. Table F-1 helps link to parts of the transit investment plan that summarize investments or guide investment decision-making.

Table F-1: Linking Transit Investment Direction and Plan to Goals and Objectives

Goal	Objectives Guiding Investments	How are these objectives reflected in the plan?
Transportation System Stewardship	A. Efficiently preserve and maintain the regional transportation system in a state of good repair. B. Operate the regional transportation system to efficiently and cost-effectively move people and freight.	This plan fully funds the existing transit system and has tools to ensure that it is managed to be efficient and cost-effective [*insert link to investment summaries*]. Investments in expansion will also consider cost-effectiveness as an investment factor to get the most out of new projects [*link to investment factors*].
Safety and Security	A. Reduce crashes and improve safety and security for all modes of passenger travel and freight transport. B. Reduce the transportation system's vulnerability to natural and man-made incidents and threats.	Safety and security are essential elements of the transit system. Their consideration should be integrated with all investments. Specific investments opportunities are also discussed in the plan [*insert link to Safety and Security*].
Access to Destinations	A. Increase the availability of multimodal travel options, especially in congested highway corridors. B. Increase travel time reliability and	Providing access is a fundamental role of the transit system. This plan has multiple considerations for increasing ridership and the availability of transit throughout the investment

Goal	Objectives Guiding Investments	How are these objectives reflected in the plan?
	predictability for travel on highway and transit systems. D. Increase transit ridership and the share of trips taken using transit, bicycling and walking. E. Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations.	factors. Equity is also an important investment factor to address gaps in opportunity that exist in the region [*insert link to investment factors*].
Competitive Economy	A. Invest in a multimodal transportation system to attract and retain businesses and residents. B. Improve multimodal access to regional job and activity centers identified in *Thrive MSP 2040*.	This plan includes transitway system investments that will make the region a more attractive place to live and do business. The plan also includes an Increased Revenue Scenario that will broaden the investments to include more bus service, allowing transit to serve more parts of the region [*insert link to investment summaries*]. Connecting to jobs is an important emphasis on the investment factors [*insert link to investment factors*].
Healthy Environment	A. Reduce transportation-related air emissions. C. Increase the availability and attractiveness of transit, bicycling and walking to encourage healthy communities and active car-free lifestyles.	This plan includes investment factors that consider the impacts on the environment, particularly pollution related to congestion [*insert link to investment factors*]. Additional impacts could be related to land use planning that encourages car-free lifestyles [*insert link to "Land Use and Local Planning"*].
Leveraging Transportation Investments to Guide Land Use	A. Focus regional growth in areas that support the full range of multimodal travel. C. Encourage local land use design that integrates highways, streets, transit, walking and bicycling.	This plan is intended to help shape the growth of the region with transit investments as catalysts for livable places. Investment factors help guide transit to areas that are adequately planning for high-density, livable places [*insert link to investment factors*].

The following are brief descriptions of the different sections of the transit investment plan.

Transit Planning Basics – An important part of understanding the transit investment plan includes understanding the many factors that influence the design of the transit system. Local development patterns and demographics – factors external to transit providers – as well as

route and network design decisions made by transit providers are important factors in of the success of a transit system. Certain factors are used to establish Transit Market Areas, a regional transit planning tool designed to match transit demand to the types and levels of service provided. Regional Transitway Guidelines help guide the planning and implementation of transitways. Local governments and transit providers need to work together to best align these factors in order to maximize the success of the transit system and its potential integration with communities.

Bus and Support System Investment Plan – The bus system will continue to be the workhorse of the regional transit system by providing the majority of transit trips, providing essential connections to transitways, and providing options throughout the entire region. The bus and support system plan includes the following elements to address current and future needs:

- Tools to manage the transit system to be cost-effective within available resources
- Alternatives that can be provided where regular-route service is not available or accessible for those with a disability
- Opportunities for expansion and improvement of bus service, and a process for identifying priorities from that vision
- Opportunities for expansion and improvement of transit facilities that better support a good customer experience and system operations
- Other elements of the transit system that support its effective, safe, secure, and reliable operation

These elements, and the processes and plans that support them, are described in more detail in Bus and Support System Investment Plan [*insert link*].

Transitway System Investment Plan – The region will also need to build, operate, and maintain a system of transitways that will improve service in high-demand corridors and connect more areas of the region with frequent, reliable transit service. Equally as important, transitways provide the permanence and attraction to developers, residents, and businesses that will help shape the high-density, mixed-use, livable development patterns that are growing in demand and that are the focus of many *Thrive MSP 2040* outcomes. Land use planning and implementation by local governments will also help shape investments in transitway corridors. The first priority will be to operate and maintain the existing transitway system. Expansion of the transitway system will be guided by investment factors that will assist the region in setting priorities for investment that have the greatest return for the region. The transitway system includes a number of options to match appropriate investments with needs throughout the region. These elements, and the processes and plans that support them, are described in Transitway System Investment Plan [*insert link*].

Investment Summary – The transit investment plan includes a financial summary that illustrates the level of investments planned across the elements in the plan within two revenue scenarios:

- A Current Revenue Scenario that identifies planned investments within reasonably expected revenue assumptions
- An Increased Revenue Scenario that identifies a level of investment needed to build out and expand the transit system

Transit Planning Basics

The transit system is a network of routes, facilities, and services that need to be well designed and managed to best achieve regional goals, including good stewardship of public resources. This is especially true in a fiscally constrained situation, where available funding only allows for implementing and operating the highest priority projects in the plan.

A number of demographic and urban design factors exist that are generally outside the control of transit providers and that help shape the design and determine the potential success of transit investments. Demographic factors are, for the most part, outside the direct control of any agency or government body, though they can be affected by agency actions over time. Urban design factors are generally managed by the land use planning efforts and development controls of local governments. A successful transit system requires the cooperation of transit agencies and local governments within their respective roles.

In addition to demographic and urban design factors, a number of transit route and network design factors guide the design of transit service and ultimately influence the overall success of the transit network. Transit providers shape these factors in the design of the transit system to manage it relative to land use.

Demographic Factors

Demographic factors are outside the direct control of transit providers but play a significant role in the design of transit service. These factors include:

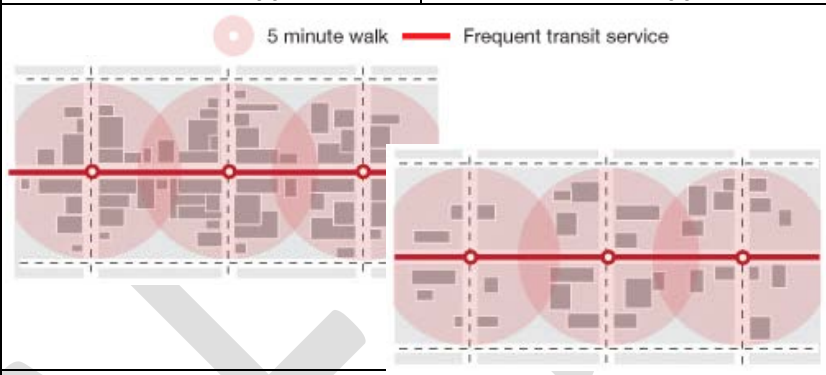
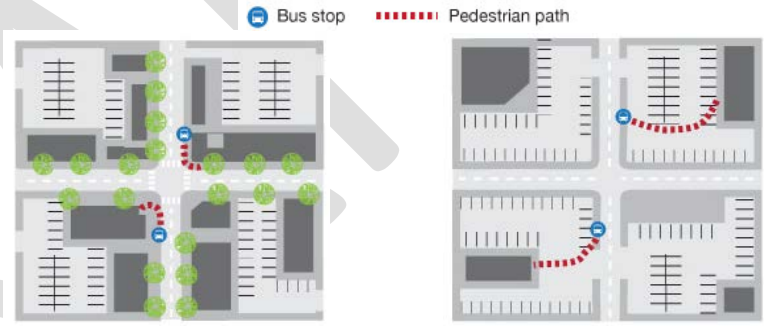
- Auto-ownership or the number of cars available in households
- Demographics such as household income, number of children, age, disability, and marital status
- Job status and unemployment rate

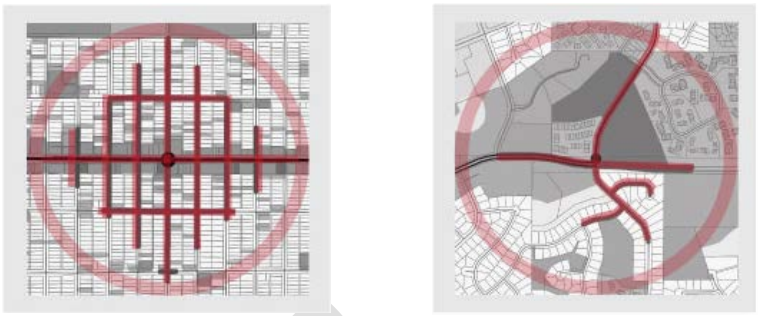
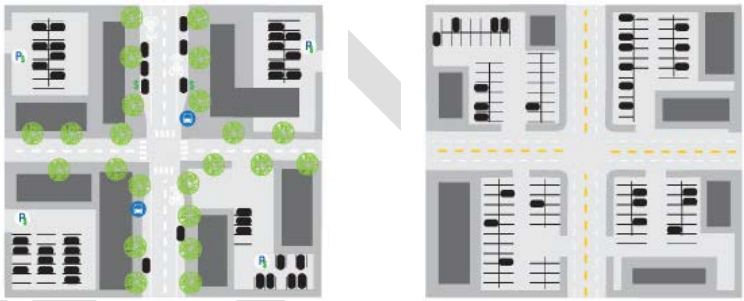
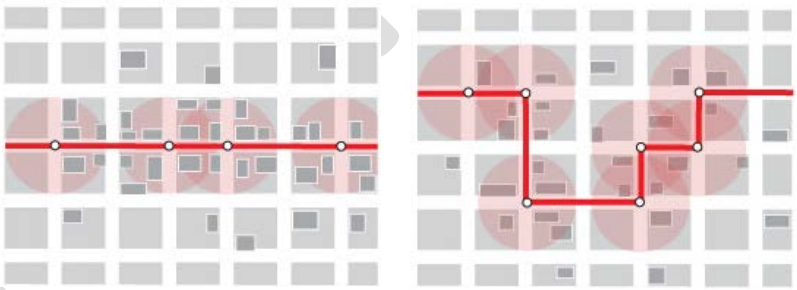
Demographic factors also include areas of concentrated poverty and racially concentrated areas of poverty, which are a special feature in *Thrive MSP 2040*. More information on these is discussed under Transit Market Areas [*insert link*].

Urban Design Factors

Urban design factors that fall within the control of local governments, such as land use, planning, and infrastructure design, also influence the design of transit services. Local governments and transit agencies need to work together to best match transit service with

local land use and maximize the opportunities for the success of the transit system. For communities that desire more transit service, local governments can choose to plan for transit-supportive land use, but the changes will take place over time. Investments in transit service will need supportive land use to be sustainable. The following factors are the primary components of effective local transit service. Express and commuter services are discussed separately.

Urban Design Factor	More Transit Supportive	Less Transit Supportive
Encourage population and activity density Density supports transit because there are more people and activities within walking distance of nodes. Additionally, people living in dense areas are more likely to use transit because better transit options can be provided in order to be more competitive with driving.		
Design for a pedestrian-friendly environment All transit users are pedestrians for at least some portion of the beginning and end of their trip. A pedestrian-friendly environment encourages transit use by providing a comfortable walking environment and minimizing the walking distance from the transit stop to front doors.		
Encourage a mixed-use land use pattern Transit is most effective when it serves a variety of trip purposes and destinations. Mixed-use development patterns encourage travel patterns with many origins and destinations throughout the day, making transit more effective and easy to provide for a variety of purposes.		

Develop an interconnected street network that maximizes pedestrian and bicycle access and allows for simple route design An interconnected street network minimizes barriers and maximizes the area that is accessible within a short walk or bike to a transit stop, allowing each stop to serve more people. In addition, it supports the design of simple, direct routes that are efficient and easy to understand.	
Support travel options that encourage or complement using transit Transit is more effective in areas where the cost of driving and parking are comparable to the cost of using transit, and alternatives like car-sharing, bicycling, and walking are available and convenient.	
Plan for linear growth in nodes along corridors A linear pattern of development along corridors is easier to serve with transit. Transit routes that are linear and consistent are most effective to provide and easier for customers to understand. This also requires coordination across community boundaries.	

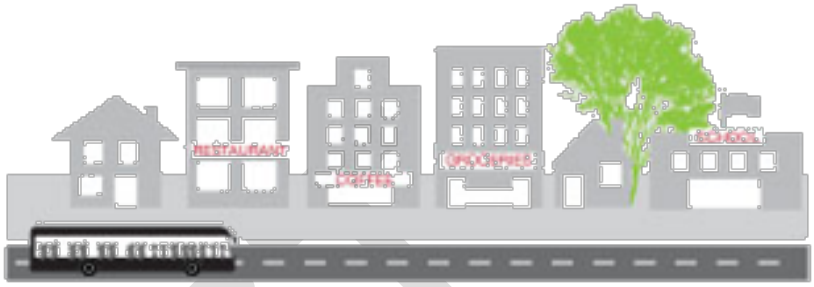
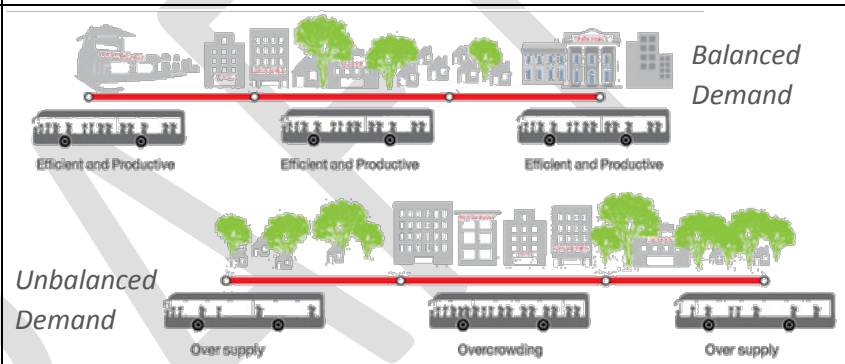
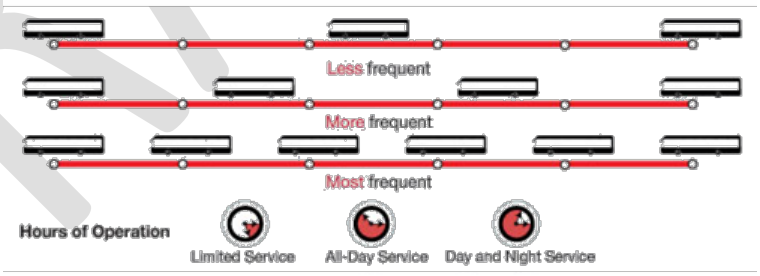
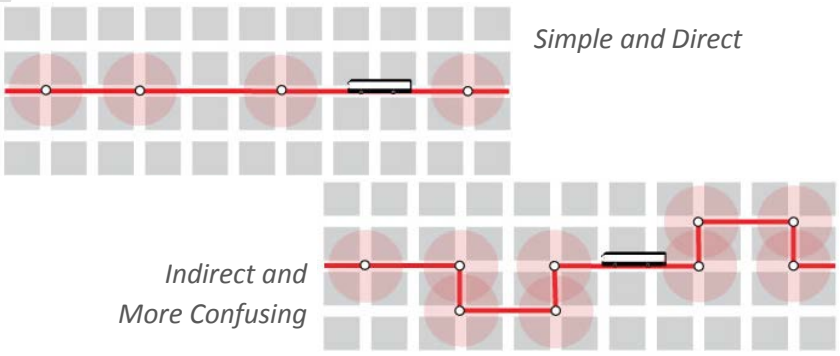
The factors listed above describe the general relationship between local land use decisions and transit planning. More detail on these factors and the considerations for local communities on land use planning around transit is available in "Land Use and Local Planning" [*insert link*].

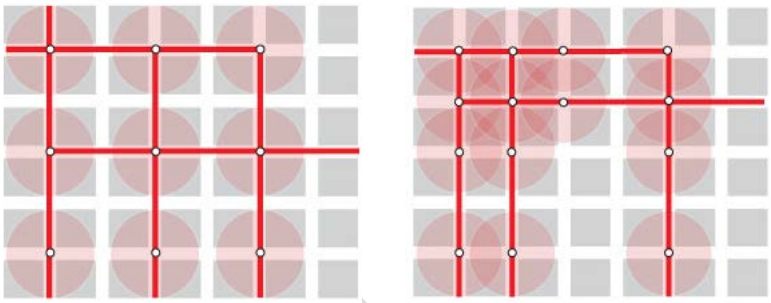
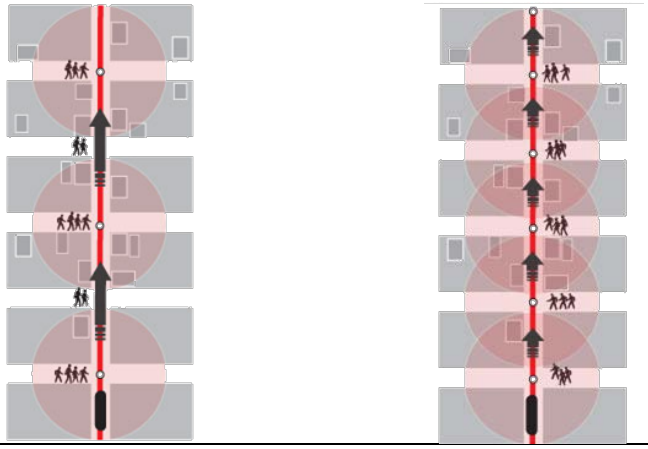
Transit Route and Network Design Factors

The quality and design of transit service is an important part of the success of transit. Regional transit providers must weigh the potential benefits of transit investments against the costs, in order to best manage the system to be cost-effective and efficient. This applies to times when the transit system is stable, when the transit system is expanding, and when the transit system is facing cuts. There are also different factors for the design of local transit service and express and commuter transit service.

Local Route and Network Design

The most important factors that transit providers look for when designing local transit routes and networks are:

Transit Design Factor	Illustration
Serve a variety of trip purposes and destinations Transit will generate higher ridership and more balanced passenger loads if it is designed to serve a number of different trip purposes along the route and throughout the day.	
Design routes with strong anchors at both ends Transit is more efficient with balanced passenger loads in each direction. Important destinations at each end help to distribute demand evenly and limit overcrowding of vehicles and over-supply of service.	
Match level of service to demand Transit will be more effective if the type and level of service provided is appropriate to the demand for transit. This allows providers to get the most out of high-demand areas while still serving lower-demand areas.	
Design simple, direct routes Transit service is more efficient to provide and easier for customers to understand when routes are designed in simple, linear patterns without complicated paths.	

Avoid duplication of service Routes should be spaced far enough apart so that they do not compete with one another for riders at the expense of service coverage in other areas.	*Less Duplication* *More Duplication* 
Provide useful customer information and comfortable amenities Transit ridership grows and the user experience is better when customers can easily understand the system and are comfortable while waiting at or leaving a stop and riding on a bus or train.	
Balance frequency and coverage An effective transit network finds a balance between providing fast, frequent routes that offer more convenience and providing coverage to more area but with infrequent, less-convenient service.	*More frequent, less coverage* *Less frequent, more coverage* 
Balance walking distance and travel speed Routes with more stops provide shorter walks to transit but at slower travel speeds. A transit network needs to balance between providing fast service with fewer stops and slower service with many stops.	*Faster service, less access* *More access, slower service* 

Commuter and Express Route Design

The factors that guide the design of express routes are somewhat different from those covered in the above section for local routes. Express routes are focused on providing fast, reliable trips into major regional centers. The most important factors for express service success are high-density origins and destinations at both ends of the route (such as at a park-and-ride and downtown) and demand management that balances parking supply and cost with the demand for parking and access for transit. The level and location of congestion can also be a substantial factor in the success of express bus services.

Transit Market Areas

An important underlying element to the transit investment plan is the definition of Transit Market Areas. Transit Market Areas are defined by the demographic and urban design factors that are associated with successful transit service. There are five Transit Market Areas as well as some unique Market Area features. The Transit Market Areas are generally associated with community designations in *Thrive MSP 2040* as follows:

- Transit Market Areas I and II are mostly Urban Center communities where urban form and density are most supportive of transit and have the largest concentrations of transit-dependent residents in the region. Transit service in these areas focuses on providing a dense network of local routes with high levels of service to accommodate a wide variety of trip purposes. Market Area II will typically have a similar route structure to Market Area I, but lower levels of service as demand warrants.
- Transit Market Area III is primarily Urban along with portions of the Suburban and Suburban Edge, and is generally characterized by overall lower density and less transit-supportive urban form along with some pockets of denser development. The primary emphasis of transit service in this area is express and commuter service with some suburban local routes providing basic coverage.
- Transit Market Area IV is primarily Suburban Edge and Emerging Suburban Edge along with portions of Suburban, and is generally characterized by consistently low-density development and an urban form that does not support frequent local transit service. Transit service in Market Area IV is primarily peak-period express and commuter service oriented to park-and-ride facilities that can effectively capture the lower density transit demand. Local trips are provided by general public dial-a-ride services.
- Transit Market Area V is generally all forms of Rural and Agricultural but does include the unique freestanding town centers of Stillwater, Waconia, Forest Lake, and Hastings; Market Area V is generally characterized by low-density development or undeveloped land not well suited for regular-route transit service.

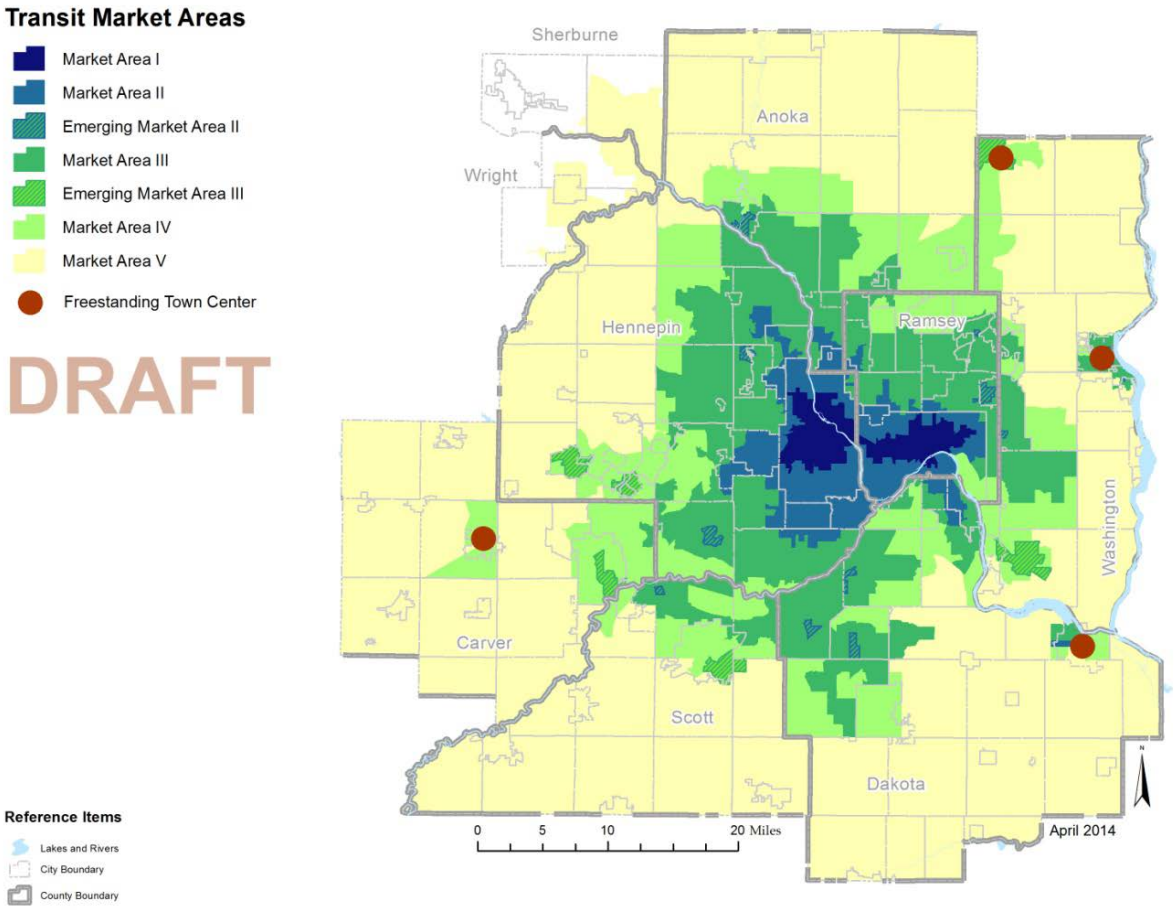
The Emerging Market overlays are unique areas of Transit Market Areas II and III where significant pockets of higher density exist but surrounding conditions still limit the success of local transit. These areas should be a focus for future development that will connect them with

areas of higher transit intensity, specifically looking at extension of existing routes or connections. Freestanding Town Centers are unique areas that grew independently of Minneapolis and Saint Paul and act as suburbs but are still separated from the urban and suburban areas by rural land. These areas typically have small downtowns of their own but also export many workers to other regional centers. Local transit services that connect to the region would not be as effective serving these areas given their location in the region, despite their relatively concentrated nature. However, these areas may still have express service demand and possible demand for small circulator services.

Two additional areas of emphasis in *Thrive MSP 2040* are important for consideration in transit service design, the special features of Racially Concentrated Areas of Poverty and Areas of Concentrated Poverty, and Job Concentrations. The areas of concentrated poverty are areas where special considerations will need to be made to elevate the opportunity of these residents to lift them out of the cycle of poverty. In transit, this often means considering higher levels of service, better amenities, or unique service types focused on providing better access to jobs or education. Job Concentrations have good potential to be served with transit because of their density and level of activity. Many of these concentrations will need to adapt and continue adding density and diversifying land uses to be truly transit-oriented. This will need to be coordinated with continued investments in transit access to these areas as well as better transit facilities.

The Transit Market Areas are shown in Figure F-1 and described in more detail in Appendix G [*insert link*]. Transit Market Areas are primarily used to design the regional bus system, but some guidance on their application to transitways is discussed in the Regional Transitway Guidelines [*insert link*].

Figure F-1: Transit Market Areas



Regular-Route System Design

For the regular-route bus system, the guidelines on transit service design in Appendix G: Regional Transit Design Guidelines and Performance Standards cover a number of topics including:

- Transit Market Areas and Service Options – the service types that are appropriate for the different Transit Market Areas
- Network Design and Access
- Route Spacing – the distance between bus routes
- Stop Spacing – the distance between bus stops on a route
- Route Structure
- Route Deviations – diversion of some or all service on a route to serve nearby land uses
- Service Levels
- Service Span – the number of hours/day and days/week a transit service operates

- Service Frequency – the average time between transit trips on a route
- Facility Siting and Design
- Bus Stop and Station Design – the siting, dimensions, and amenities of bus stops and stations
- Park-and-rides – the siting and sizing of park-and-rides

The application of these design guidelines impacts the cost and productivity of transit service. More detail on how these are used in transit investment decisions is discussed in Bus and Support System Investment Plan [*insert link*]. The full detail on these guidelines and standards is available in Appendix G [*insert link*].

In addition to these guidelines regarding the design of transit service, there are two performance standards that are used to evaluate *individual transit routes* once they are in operation. These performance standards are Subsidy per Passenger and Passengers per In-Service Hour. Performance standards are discussed in more detail in Appendix G. These measures may differ from those developed to inform the Transportation Policy Plan on the performance of the *overall transit system*, which are discussed in Part 3 [*insert link*].

Transitway Design

For transitways, the region has developed the *Regional Transitway Guidelines* (2012). These guidelines assist in the development of transitways in planning, design, or operation and establish technical best practices for nine transitway elements. These elements are:

- Service Operations
- Station Spacing and Siting
- Station and Support Facility Design
- Runningway
- Vehicles
- Fare-Collection Systems
- Technology and Customer Information
- Identity and Branding
- Project Development, Leadership, and Oversight

The guidelines are not intended to be design standards or specifications. Rather, they establish consistent, general practices that ensure transitways are developed in a consistent and equitable manner as the region's transit network continues to grow and expand. The guidelines are intended to be flexible enough so that each transitway can boast its unique characteristics and opportunities and planners can address its unique challenges. The guidelines are also intended to be a living document, evolving over time as the region's experience with transitways continues to grow. The full details on the Regional Transitway Guidelines are available from the Metropolitan Council [*insert link*].

The guidelines will be updated through a work program item [*insert link to "Work Program"*] to address outstanding issues identified in the first version, including dedicated bus rapid transit characteristics, the addition of land use guidelines, and updated best practices, as needed.

Definitions of Modernization and Expansion

This transit investment plan refers to improvement opportunities in two different categories: modernization and expansion. The application of these definitions may evolve with new opportunities and innovation.

Modernization – Modernization is the improvement of existing transit systems to better suit current needs. This could include making the systems more efficient, more effective, more user-friendly, or more environmentally friendly. Modernization is usually a capital investment but can also include increased operating investments. Examples of modernization include energy efficiency improvements at an existing facility, or additions of customer amenities at existing stops or stations.

Expansion – Expansion is the addition of something new or additional capacity in the transit system. Examples of expansion include new transit routes, new facilities that are not replacing existing ones, and added park-and-ride capacity at an existing facility.

Bus and Support System Investment Plan

Bus and support system investments include all elements of the transit system that are not specific to transitways, including: regular-route bus service, Metro Mobility, Transit Link and other dial-a-ride programs, vanpool, customer and support facilities, and other support systems. The transit system is operated efficiently and cost-effectively today because of the management tools already in place in the region. The primary role of the transit system is serving people, measured in ridership. The different investment opportunities in the transit system are aimed at serving people, whether through maintaining a route already on the streets, adding service to serve new customers, improving the user experience on transit, or making it more efficient to serve people better.

This section of the plan discusses the types of transit services that will be provided in the region and how they are managed, the facilities and amenities that support these services, and the potential for a better transit system for the people of the region. Investments in the regular-route bus system are guided by the Transit Market Areas and Regional Transit Design Guidelines discussed above. The specific details about how transitways fit into this system are discussed in Transitway System Investment Plan [*insert link*].

Transit System Management

Management of the transit system is an essential part of transit investment and stewardship of the system. A well-managed transit system ensures that public resources for transit are used as efficiently and cost-effectively as possible to meet the needs of transit customers while also considering the impacts and benefits to low-income and minority populations. The following are general descriptions of how the region will manage the transit system effectively by coordinating the efforts of multiple providers.

Route Performance Analysis

Transit providers should review their transit service annually using the performance standards outlined in Appendix G [*insert link*] to ensure that their transit services are being provided to an efficient and cost-effective standard consistent with rest of the region.

Additionally, the Council will prepare an annual Regional Route Performance Analysis that reports the performance of each route as compared to the performance standards defined in this plan. Routes that do not meet the performance standards should be reviewed for adjustment or possible elimination.

Coordination among Transit Services

Coordination among the regional transit providers is essential to ensure that the transit system functions seamlessly and offers user-friendly rider experience. Coordination efforts include identifying opportunities for timed-transfers, providing locations for transfers between dial-a-

ride services and regular routes, and connecting services offered by different providers. The Council will promote coordination of transit services through the regional transit policies and procedures, which outline procedures for fleet management, procurement, and facilities ownership and management. The Council will also encourage and facilitate communication and coordination among transit providers to ensure well coordinated schedules.

Transit Fare Structure

Regional transit fare policy will be designed to achieve a variety of goals. Fares should be simple and easy to understand to improve customer service and fare compliance. They should reflect the costs of providing service while mitigating the negative impacts to low-income and transit-reliant riders.

Fare policy should take a common regional approach to provide seamless travel for riders among providers and modes. It should promote ridership growth while maintaining or increasing the revenue recovery rate. New fare technology, including new fare media and off-board fare collection, will play an important role in transit fare policy and service delivery. Improvements in fare collection technology should ensure regional compatibility while supporting the need to modernize the fare system.

Competitively Procured Services

Contracting the operation of transit services can be an appropriate and cost-effective way to meet new service demand, demonstrate new routes or service types, provide efficiencies on certain routes, properly align service expertise with providers, or maintain service in response to fiscal pressures. Decisions about which routes should be contracted to a private provider will be based on service demand and funding levels.

Service contracts should be structured in a manner that promotes healthy competition. Metro Transit will continue to be the primary provider of regular-route transit services in its service area. The Council will review the amount of contracted service every two years. Twenty percent of regular-route bus service, measured in National Transit Database revenue hours, is the target for private contract operations.

Vehicle Fleet

The bus is the most basic element of the transit system. Buses should be comfortable, clean, and designed to meet customer needs. The region utilizes a variety of bus types to match the appropriate vehicle to the service it is providing. The existing bus fleet is over 1,700 vehicles, including dial-a-ride buses. These vehicles need to be maintained and replaced when they are past their useful life, which varies by bus type. Fleet replacement is the top capital investment priority for maintaining the existing transit system. Vehicles are also equipped with various types of equipment that allow them to better serve customers and provide more efficient operations. Innovation in equipment and general vehicle design is ongoing, and regional transit

providers will explore modern features as appropriate. The regional *Fleet Management Procedure* outlines standards and is available on the Council's website [*insert link*].

Transit Provider Operating Policies

The Council will coordinate regional policies and procedures that apply to all transit providers, and will provide for a high-quality, seamless, and coordinated regional transit system while respecting the local autonomy of individual providers. These policies and procedures will ensure that transit resources are distributed equitably and transparently and facilitate an efficient system. A list of the key operating policies for transit providers is included in Table F-2. Copies of any of these materials are available are available through the Council or directly from transit providers.

Table F-2: Transit Provider Operating Policies

Policy	Description
Regional Route Performance Analysis	All regional transit providers will submit route performance information to the Council every year for review and inclusion in the Regional Route Performance Analysis.
Transit Fare Structure	All regional transit providers will adhere to the regional fare structure and prices established by the Council unless otherwise exceptions are specifically justified and granted.
Fleet Management Procedures	The Council's fleet management procedure guides fleet decisions, including vehicle type and configuration, acquisition, use, maintenance, replacement schedule, ancillary equipment, and disposal. The policy also reflects fleet modernization, including alternative fuels such as low-sulfur diesel, bio-diesel and ethanol, and alternative vehicles such as hybrid electric. All regional providers will adhere to the procedures and policies for regional transit vehicles.
Facilities Ownership Procedures	The facilities ownership procedure establishes the requirements for owning and maintaining a regional transit facility. All public regional transit facilities will be available for use by any regional transit provider.
Procurement Procedures	All regional transit providers will follow procurement procedures that are consistent with state and federal laws and guidance, when appropriate.
Regional Service Improvement Plan	All regional transit providers must submit proposals for service improvement to the Council in order to be considered for expansion funding for transit.
Regional Operating Revenue Allocation Procedures	The region will distribute operating revenues using procedures that allocate resources to the region's priorities, including the preservation of existing transit services and documented expansion priorities.
Title VI Policy	Title VI of the Civil Rights Act of 1964 requires considerations of discrimination through public investments for transit providers.

Alternatives to the Regular-Route Transit Network

While the regular-route transit system is planned to meet the needs of the majority of transit users, some customers can be more effectively served through demand-responsive alternatives. This is typically the case for those living in areas that cannot be cost-effectively served with the regular-route transit network and for people whose disabilities prevent them from being able to use the regular-route transit system. Because these services complement the regular-route transit system, they continually adapt to the service levels provided on the rest of the system.

Metro Mobility

Metro Mobility will meet the requirements of the Americans with Disabilities Act (ADA) by providing transit service to people with disabilities certified as not able to use the regular-route transit system. Under the ADA, the region is required to provide complementary paratransit service within 3/4 of a mile of all local regular-route transit service during the same times that the service operates. Minnesota state law also requires the service to be provided in areas beyond the requirements of the ADA.

Metro Mobility continues to experience intense pressure for growth as demand for ADA service increases with the aging population of the seven-county metro area and other demographic changes. Recent history has indicated growth of up to 10% annually for the program. Each new ride requires a subsidy (at nearly $22 passenger), unlike regular-route bus service, which becomes more cost effective with additional demand. Because Metro Mobility is an essential service for the people it serves and is required under federal and state law to complement the regular-route system, the substantial growth of this program is considered as an investment in the operation and maintenance of the existing transit system, rather than transit system expansion.

Transit Link and Other Dial-a-Ride Programs

Dial-a-ride service provides a public transit option for travel that is not served by the regular-route transit network. The Metropolitan Council contracts with local governments and private companies to provide county-based general public dial-a-ride service, known as Transit Link. Although Transit Link is available to the general public, typical users are the elderly, people who do not own a car, people too young to drive, and persons with disabilities traveling outside the Metro Mobility service area. Some suburban transit providers also provide citywide dial-a-ride services with non-regional funds in place of regular-route service that would not be effective. Growth or reduction in these services will be addressed as a consideration of the overall transit system and as demand warrants. The expansion of the regular-route bus system may result in reduced demand for Transit Link, as more people will have access to regular-route service. However, the expansion of Suburban Edge and Emerging Suburban Edge communities at low densities may increase the demand for this type of service.

In Wright and Sherburne counties, dial-a-ride is the primary transit service beyond access to the Northstar Commuter rail line. The RiverRider service is available to the public on weekdays. The service is funded with local resources and state and federal transit resources from MnDOT.

Metro Vanpool

Commuter vanpools are made up of five or more people, including a volunteer driver, commuting to and from work at destinations throughout the region on a regular basis. The Metro Vanpool program provides financial assistance for vans serving locations or times not well served by the regular-route transit network.

Regular-Route Service Expansion Opportunities

The regular-route bus system includes bus service that operates on a fixed route, stopping at designated bus stops and following a consistent schedule. There are a number of different service types within the regular-route bus system designed to serve the different Transit Markets Areas. Together, the collection of regular-route services make up a network that allows people to transfer between services and access many destinations beyond a single line. More information about specific route types can be found in Appendix G [*insert link*].

The regular-route bus system will need to expand to meet growing demand and improve access to destinations, especially for those who rely on transit. Since expansion of the regular-route bus system will typically respond to development patterns and is more flexible than large investments in facilities or transitways, the needs of the system can change more frequently, especially in emerging markets. The following are general descriptions of the types of improvement opportunities for service expansion.

Local Routes

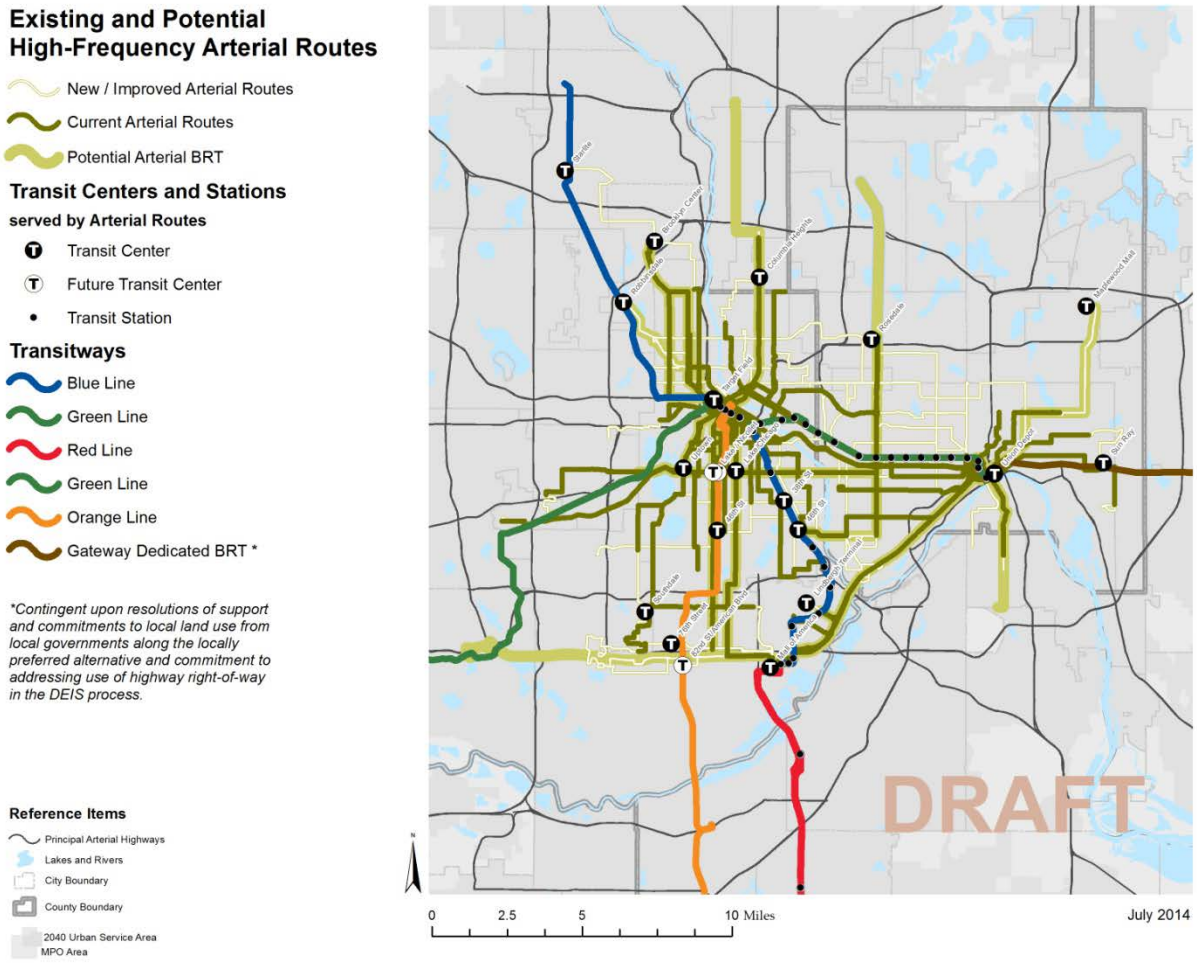
Local routes play a number of different roles and make up the basic structure of the regular-route bus system. These routes operate primarily on city streets in both the urban core and suburban areas and stop frequently, typically every one to two blocks. Local routes provide people with the highest level of access but often come with the trade-off of potentially slower, less reliable trips.

Core Local Routes – These routes generally serve urban areas along dense corridors. They comprise the basic framework of the all-day bus network, providing people with essential connections to major activity centers and transitways. Expansion of core local routes will concentrate on providing more frequent and a longer span of service on existing routes to meet growing customer demand along these corridors.

High-Frequency Arterial Routes – These are the highest-demand Core Local routes. These routes serve a significant portion of the total ridership across the transit network. High-frequency arterial routes will receive the highest level of local bus service – generally every 15

minutes or better during peak periods and every 20 minutes or better during the midday, with service seven days a week and up to 24 hours a day. These routes often have highly visible passenger facilities at major stops. High-Frequency Arterial routes that may be added or improved by 2040 are included in Figure F-2. Some of these routes are also planned for arterial bus rapid transit service as described in Transitway System Investments.

Figure F-2: Existing and Potential High-Frequency Arterial Routes



Supporting Local Routes – These routes serve urban areas on crosstown corridors that typically do not connect to a major regional center, such as one of the downtowns. They are designed to complete the grid of urban bus routes and facilitate connections to core local routes and transitways. Expansion of supporting local routes will focus on adding new routes to fill in the grid and provide better service coverage to moderately dense areas of the region. Frequency and span on existing routes will also be improved to better serve customer needs. With more intense development along these corridors, some supporting local routes may be reclassified as core local routes to reflect a more transit-supportive development pattern.

Suburban Local Routes – These routes provide access to the transit network across large portions of the lower-density portions of the transit service area, mostly in Transit Market Areas II and III. These routes tend to operate with less frequent trips and fewer hours of service. Suburban local bus service will be expanded in areas where there are coverage gaps or existing frequency or span of service do not meet expected demand. Improvements will focus on expanding suburb-to-suburb service and connections to major transfer points. Improvements will reduce the need for customers to transfer downtown to get to their destination, and improve access to jobs and other destinations outside of the urban core.

Commuter and Express

Commuter and express routes are designed primarily to bring people from urban and suburban residential areas to jobs in the region's major employment areas. These routes generally operate to serve the most common work start and end times. Future demand for commuter and express service, and associated demand for park-and-ride facilities, is determined based on analysis of population and employment trends along with a projection of future mode share for transit for commuter trips.

- As commuter and express routes generally travel longer distances over the region's highway network, they will be expanded in coordination with transit advantages to provide a congestion-free alternative in congested highway corridors. Existing routes may be improved to add reverse-commute service to connect urban residents with suburban jobs and to provide mid-day service to provide commuters the flexibility to return home if needed. An important part of express bus service is the presence of a transit advantage to bypass highway congestion. For additional details, go to the Transit Advantages discussion [*insert link*]. Express bus services can also be coordinated with highway bus rapid transit transitway [*insert link to Transitway System Investments*] services and facilities. A map of 2040 express bus service corridors and the 2030 park-and-ride system are shown in Figure F-3 under Park-and-Ride Facilities.

Service Expansion Priorities and the Regional Service Improvement Plan

To improve short- and medium-range planning efforts and prioritize transit service growth, regional transit providers should prepare a service improvement plan every two years. The plan should identify priorities for service expansion in their service territory for at least the next two to four years. Providers will be asked to submit their projects to the Council for consideration in the Regional Service Improvement Plan, which will evaluate them for prioritization. Each submittal should include a project description, resources needed for implementation, projected year of implementation, project readiness including capital facility coordination, and data for a technical evaluation.

The Regional Service Improvement Plan will evaluate proposed service improvements based on a number of factors. Specific technical measures will be determined based on data availability and methodologies developed in coordination with all regional transit providers. Table F-3

includes factors that will be the basis of the Regional Service Improvement Plan technical evaluation, and descriptions of the considerations for measuring these factors.

Table F-3: Regional Service Improvement Plan Technical Investment Factors

Technical Factors	Description and Example Measures
Cost-Effectiveness	Cost-effectiveness for transit service is typically measured relative to ridership. This region has standards for "subsidy per passenger," but other measures could also be considered.
Access to Destinations and People Served	Transit access provides opportunities for people to ride and for transit to be productive. This region has standards for "passengers per in-service hour." Additional measures could consider access to job concentrations as methodologies become more understood.
Equity	The transit system plays an important role in providing access and opportunity to a number of disadvantaged groups, including the disabled community, people of color, and low-income populations. This includes a large portion of the region's transit-dependent population.
Peak-Period Transportation Benefits	The transit system provides additional capacity to the transportation system when it is most needed, during peak travel times. This benefits the region by shifting trips and miles traveled from driving alone to riding transit; this can reduce traffic congestion. Both of these can also positively impact air quality and contributions to climate change.

The Regional Service Improvement Plan will provide the technical evaluation of submittals for service expansion and may consider other factors through discussions with transit providers. Additional factors will need to be considered by policymakers when prioritizing service expansion, including regional balance and community support. The Regional Service Improvement Plan will be updated every two years to adapt to the changing demands for bus service.

Transit Facilities Expansion and Modernization Opportunities

Transit facilities compose the built environment of the transit system. Passenger facilities range from bus stops to large and complex multimodal transit centers. Support facilities include:

- Bus garages and bus maintenance facilities
- Rail operations and maintenance facilities
- Facilities to support the cleaning and maintenance of the transit network
- Bus layover facilities

- Transit police stations
- Communications control centers
- Employee training facilities
- Administration buildings needed to keep the system operating smoothly

The network of transit facilities must be strategically improved and expanded to serve the growing transit system. Improvements to transit facilities will improve the customer experience and maximize the efficiency of transit investments.

Passenger Facility Expansion and Modernization

Passenger facilities – transit stops, transit centers, transit stations, and park-and-ride facilities – are essential to provide convenient and attractive access to transit service. Such facilities support the regular-route bus and rail system and provide transfer points for the dial-a-ride system. Passenger facilities are most successful when they are well-integrated with the surrounding landscape. Ideally, the passenger facility and surrounding context should provide a high-quality, safe, and attractive pedestrian environment, since all transit trips begin and end with pedestrian or bicycle travel. Passenger facilities also serve as an important point of transfer between transit services, including bus-to-rail transfers. Detailed guidelines for passenger facility amenities can be found in Appendix G: Regional Transit Design Guidelines and Performance Standards.

Bus Stops

Bus stops are the basic transit passenger facility. They are essential for providing customers with access to transit service throughout the transit system. Transit providers work with local communities to provide pedestrian connections and signage at each stop. While not all bus stops can have the same level of amenities throughout the system, some stops warrant an additional level of investment. Many areas of the region can benefit from improved amenities at bus stops, especially areas with high usage. An important part of improving the transit system will be looking at opportunities to improve the customer experience at existing bus stops. Every bus stop should provide a minimum level of safety, comfort, and information for customers to feel secure in using the transit system.

Basic access to transit is essential. All bus stops should be ADA-accessible. With 13,000+ stops in the network, the Council will work toward the improvement of older stops that do not meet current best practice for accessibility. Local governments and transit providers should coordinate their efforts to ensure that all regular-route transit stops are accessible year-round. This coordination is particularly important in the winter months when snow and ice create an additional barrier for all customers.

Transit Centers

Transit centers provide comfortable and convenient locations for passengers to connect to other routes and services in the system. The region has a network of transit centers that will be

maintained to anchor local transit routes and facilitate connections. Urban transit centers typically serve many local routes, while suburban transit centers typically have associated park-and-ride facilities that serve express routes and connecting local routes. Transit centers may need to be added or improved as transit services expand throughout the region.

Transit Stations

Transit stations are passenger facilities associated with transitways. They provide the public access to light rail, commuter rail and bus rapid transit services. Transit stations will generally have a similar level of investment as transit centers. More information regarding transit station investment can be found in the "Transitway System Investment Plan."

Regional Multimodal Hubs

In addition to transit stations, there are two regional multimodal hubs in the system that connect light rail and commuter rail transit to a number of other existing and planned services. The Union Depot in downtown Saint Paul is served by the Green Line, local and express bus service, Amtrak passenger rail service, and a number of intercity bus services. Target Field Station in downtown Minneapolis is served by the Green Line and Blue Line light rail, Northstar commuter rail, and other bus services that connect in downtown Minneapolis. More information regarding planned transitway connections to these hubs can be found in "Transitway System Investment Plan."

Passenger Amenities

Regional transit providers offer a range of amenities at bus stops and other passenger facilities to improve the customer experience. Passenger amenities include shelters, shelter lighting or heat, trash receptacles, seating, security cameras, good pedestrian access, bicycle parking and storage, and customer information in both static and real-time formats.

Passenger amenities create a more comfortable, accessible and attractive waiting environment for transit customers, as well as enhance customer safety. Customer information increases customer satisfaction and reassures them that they can depend on transit. Passenger amenities can also benefit the surrounding neighborhood by making transit a more attractive travel option for nearby people and businesses, and by contributing to the overall character of the streetscape. Amenities are placed at passenger facilities depending upon multiple factors including number of people served, number of limited mobility boardings, and number of transit transfers. Comfortable waiting areas and transfer facilities are particularly important at major transfer locations such as transit stations or transit centers. The placement of amenities is evaluated to ensure that the various types of amenities are located equitably across the region.

More specific policy and guidance for passenger amenities and bus stops rests with the region's transit providers. For example, Metro Transit has a policy on the prioritization and placement of shelters. Some cities have regulations on the placement of benches. The Council's work

program also includes a Metro Transit-led effort to develop Bus Stop Amenities Guidelines and Implementation Plan to detail the opportunities for improving bus stops throughout their service area [*insert link to "Work Program"*].

Park-and-Ride Facilities

Park-and-ride facilities are surface lots and structured ramps predominantly located outside of the Urban Center and served by express bus, bus rapid transit, or rail. Park-and-rides are important tools for creating the density required to provide cost-effective transit service from suburban and rural areas.

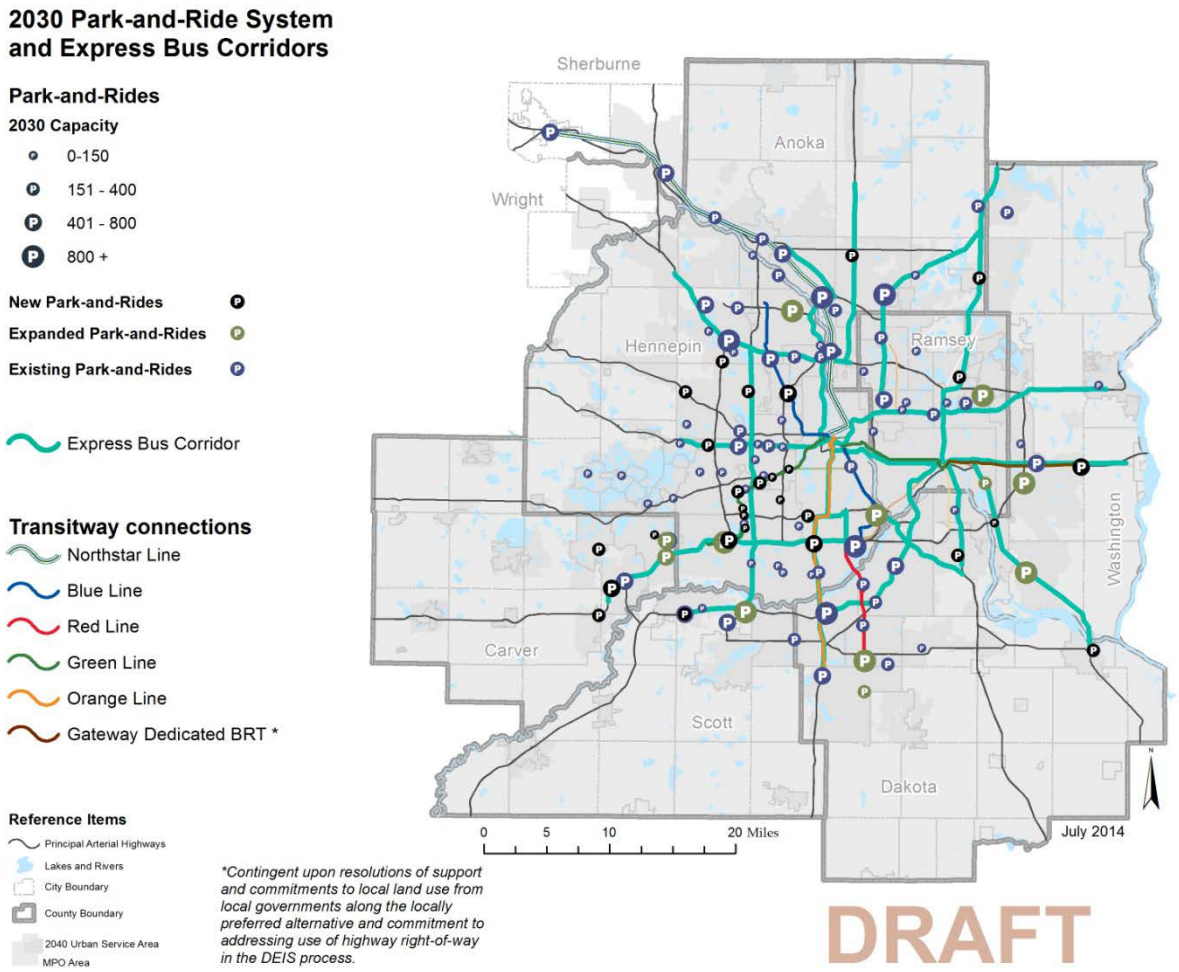
The *2030 Park-and-Ride Plan* (2010) documents the needs and recommendations for future park-and-ride facilities. The plan includes a methodology for determining facility need and integration with the transit system, analyzing market areas, and considering site selection and facility design. Park-and-rides are optimally located in a congested travel corridor, upstream of major traffic congestion, with service to major regional destinations.

Facility design takes into account the cost of construction and land acquisition; site access for vehicles, pedestrians, and cyclists; site visibility; future expansion potential; community and land use compatibility; environmental constraints; and opportunities for joint-use ventures and transit-oriented development. The region is shifting away from providing small facilities to concentrate on fewer, larger facilities with higher levels of service. Larger regional facilities serving multiple cities increase the attractiveness of the service to all residents of the region. Transit providers will continue to coordinate with local communities in planning and designing park-and-rides to integrate park-and-rides into local development patterns. Transit-oriented development and joint-use ventures associated with park-and-ride locations may become more prevalent over time as the region's transitway system and land use development matures.

Expansion of the park-and-ride system has been a focus over the last decade with usage growing annually by six to nine percent. The system today includes 96 park-and-ride facilities consisting of over 32,000 vehicle parking spaces. To meet long-term regional demand, an expanded number of park-and-rides with a total capacity of nearly 35,000 vehicle parking spaces are currently planned through year 2030 to serve transit customers using express bus service and transitways. Existing, planned expansions, and new park-and-rides through 2030 are shown in Figure 21.

Much of the existing capacity was built to serve future demand as the region grows. The park-and-ride plan will be updated to reflect any changes to forecasted demand that may have resulted from *Thrive MSP 2040* forecast updates and to reflect evolving plans being developed for transitways. An updated Park-and-Ride Plan will replace the details included in this section and Figure F-3.

Figure F-3: 2030 Park-and-Ride System and Express Bus Corridors



Support Facility Expansion and Modernization

The regional transit system must have sufficient facilities to support efficient and cost-effective transit services. For buses, these support facilities include garages and bus maintenance facilities, bus layover facilities at route terminal points, and dispatching and control centers. For rail, these support facilities include maintenance facilities, train storage facilities, layover facilities, and logistics facilities such as control centers. In addition, system-wide support facilities are needed for the maintenance of passenger facilities, transit police force, employee training, and administration. As the transit system expands, and the types of services available and the number of riders increases, support facility capacity must increase as well. Metro Transit is working to develop a system-wide plan to anticipate the support facility needs of the growing transit system.

Bus Support Facilities

As the bus fleet expands to meet anticipated ridership growth, bus garages, bus layovers and vehicle storage will need to be increased. This will be accomplished by expanding existing facilities and constructing new facilities. Maximum use of existing garage facilities should be made but bus garage expansion should precede fleet expansion. Currently, Metro Transit uses five bus garages to provide for daily maintenance and storage of vehicles, with an additional facility serving needs for more intensive vehicle repair. Other regional transit providers have support facilities as well, either through direct ownership or through agreements with private operators. These facilities support bus rapid transit vehicles as well as regular-route vehicles. These facilities also age and require maintenance, including possible long-term replacement. Their use and effective life can be maximized with maintenance and modernization efforts, including investments that result in operating efficiencies.

Bus layover facilities provide a physical space for transit vehicles to stage, an opportunity for route recovery time, and driver break rooms and restrooms. These facilities enable the system to operate cost-effectively and on time. Additional layover facilities will be needed in both downtowns, the University of Minnesota, and some suburban locations.

Rail Support Facilities

Rail support facilities presently include two light rail transit operations and maintenance facilities, a rail operations support facility, and the Northstar commuter rail maintenance facility. Additional transitway rail service will generate need for additional operations and maintenance facilities. Options to improve or expand existing facilities as well as construct new facilities will be evaluated based upon the planned transitway network, corridor-specific planning efforts, and system-wide facilities planning.

System-wide Support Facilities

Transit control centers are an essential communications, safety, security, and service link for regional transit service. Metro Transit operates two transit control centers; one supports bus operations the other supports rail operations. Control centers monitor schedule adherence and coordinate the daily activities of Metro Transit buses, service vehicles, training vehicles, and other mobile units. They also dispatch vehicles to respond to on-street incidents and to support transit police. As the bus and rail system expand, the transit control centers will also need to expand.

Facilities that headquarter maintenance crews are needed to keep passenger waiting environments clean and in good condition. As ridership grows, passenger facility maintenance capacity must expand to meet the maintenance needs of more heavily used existing facilities and of new facilities.

Transit police support facilities are composed of a central headquarters and small local substations. Administrative offices are also part of the support facilities that contribute to a

well-functioning transit system. These system-wide support facilities must have the capacity to support the transit system as it grows.

Other Transit System Improvements

Expansion of Transit Advantages

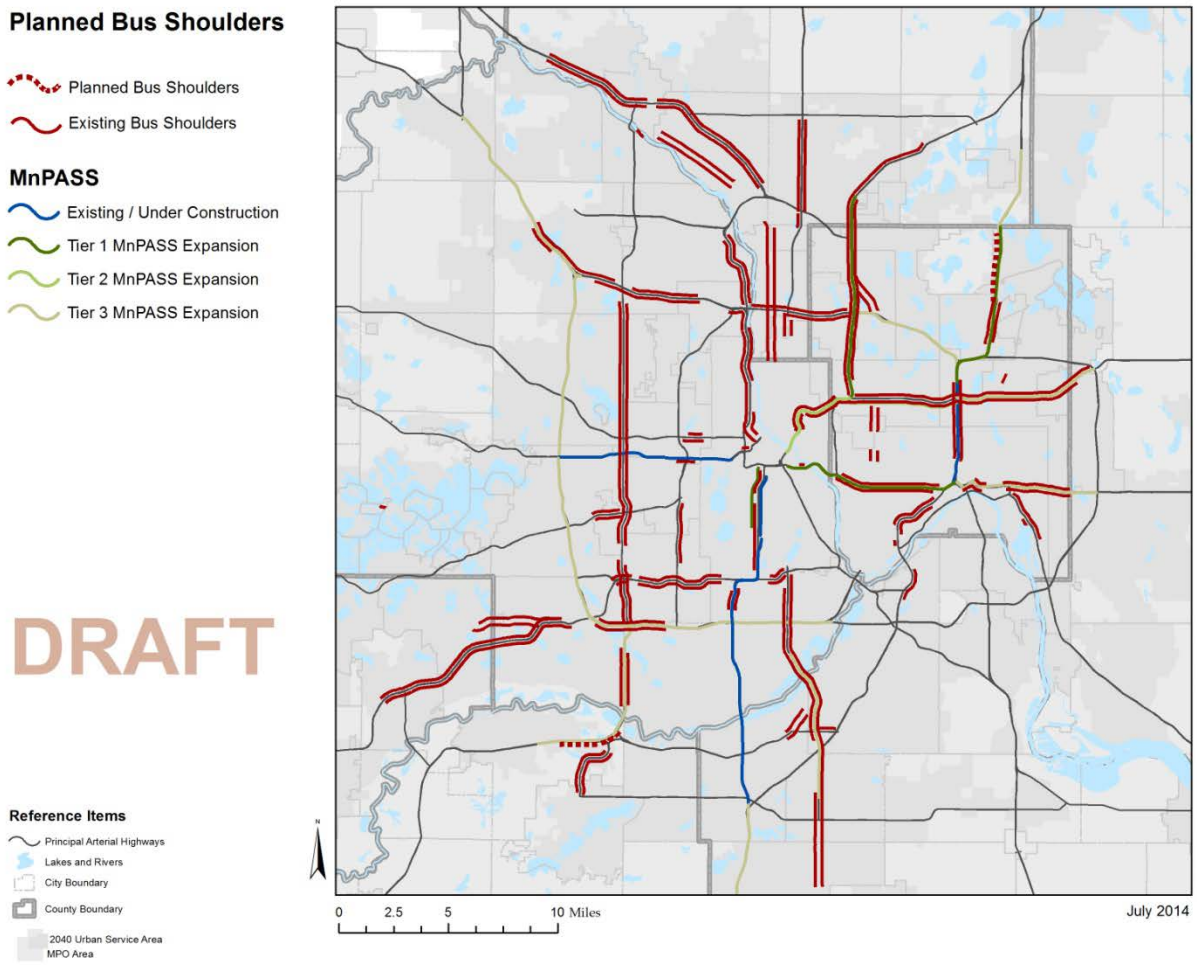
Growing congestion will make it increasingly more difficult for buses to move around the region. Right-of-way that provides a fast travel alternative for rail and bus transit should be pursued when transit volumes justify, but opportunities for implementation are limited. However, a number of roadway improvements can be made to provide transit advantages that maintain travel times and reliability. These improvements benefit transit operations and can work to relieve congestion for both transit and solo drivers alike. Current efforts to implement bus rapid transit in the region, along freeways as well as higher density urban arterial roads, provide faster, more reliable travel times, reduced waiting time for service, and attractive transit amenities and options for commuters who currently drive.

On state highways, transit advantages can include bus-only shoulders, dedicated bus lanes, MnPASS lanes, ramp meter bypasses, and transit stations adjacent to or between roadways (see Figure F-4). MnPASS lanes are highway lanes that are shared by transit, high-occupant vehicles, and single-occupant vehicles (SOVs) that opt to pay a toll to use the lane. SOV usage is controlled by varying the toll price based on real-time traffic conditions. Prices are set to maintain a consistent flow of traffic. MnPASS lanes, like those in the I-394 and I-35W corridors, provide a significant transit advantage by offering a congestion-free alternative for transit riders. This strategy can dramatically increase the overall number of people that can travel through a corridor in a given amount of time. The development of the region's MnPASS system is discussed in "Highway Investment Direction and Plan" [*insert link*].

On city streets and signalized highways, improvements include dedicated bus lanes, dynamic parking lanes, traffic signals that are coordinated with transit service and/or provide transit priority, and queue jump lanes, among others. These improvements all work to provide faster trips for customers, improve the attractiveness of transit, and significantly increase the people capacity of city streets.

While some express and local transit corridors are currently well supported by transit advantages, there are a number of locations that need improvements to maintain or improve transit travel times and reliability. In addition, opportunities to coordinate with planned road improvements, or to adequately serve planned community development projects through enhanced transit service, provide high returns on capital transit infrastructure investment. Corridors with high levels of congestion and high existing and potential transit ridership should be prioritized for new transit advantages.

Figure F-4: 2040 Transit Advantages



Marketing Transit

Marketing transit can significantly increase awareness of service and lead to higher ridership. The Council and regional transit providers will increase the value, benefits, and usage of transit services through a variety of advertising and promotional programs. Additionally, the Council will pursue opportunities for partnerships with other transit-supportive services including bicycle- and car-sharing services. Annual transit marketing plans will be developed by the Council based on input from stakeholders.

Transit providers will also form partnerships on travel demand management strategies including working with Transportation Management Organizations to broaden the awareness of transit to more businesses and employees. For additional detail, go to "Travel Demand Management" discussion [*insert link*].

Safety and Security

Working with transit providers and communities, the Council will continue to strive to provide a safe and secure environment for passengers and employees on vehicles and at transit facilities. The Metropolitan Transit Police department is an important component of this effort. Through a variety of means, the Transit Police enhance safety, increase ridership, and preserve the quality of regional transit infrastructure. These include regular patrols and rides on transit vehicles, partnerships with other law enforcement agencies and community organizations, and innovative programs such as community service officers.

Transit infrastructure is another important component of safety and security. These investments include cameras on transit vehicles and at stations, and improved lighting at transit stops and stations, among others. An important component of safety and security is good design of facilities, including the consideration of Crime Prevention through Environmental Design principles. Additionally, the Council will continue to invest in employee awareness and public education campaigns to improve transit safety.

In addition to promoting safety and security during regular transit operations, the Council and Metro Transit also have an important role in regional disaster preparedness. The Council maintains an emergency management plan to coordinate between Metro Transit and the various regional and state public safety agencies in the event of an emergency situation.

Current Revenue Scenario Bus and Support System Investments

The bus system is the largest and most important part of the transit system because it serves all parts of the region. Bus and support system investments are limited by reasonably expected resources, and opportunities to invest are dependent on these constraints. The following summarizes the components of the system that are assumed to be funded in the plan's Current Revenue Scenario. The first priority for investing in the region's bus and support system is continuing to operate and maintain the existing system.

Operate and Maintain the Existing Bus and Support System
• Operating and managing the bus network and routes consistent with Regional Transit Design Guidelines and Performance Standards • Operating Metro Mobility, including anticipated growth needed to meet demand • Operating the Transit Link dial-a-ride service and providing Metro Vanpool subsidies • Operating and maintaining the support systems for the transit system, such as shelter and public facility maintenance and customer information • Maintaining and replacing vehicles. Maintaining existing capital facilities and other equipment to support operations and a positive customer experience, including a modest expansion of bus stop amenities

Beyond ongoing operations and maintenance, opportunities for expansion and modernization of the transit system are limited and available primarily through competitive grant programs. This includes the regional solicitation, which distributes federal Congestion Mitigation and Air Quality (CMAQ) and Surface Transportation Program (STP) funds within the metropolitan area, or other federal, state, and local programs. The opportunities include:

Expand and Modernize the Bus and Support System
• Expansion of transit capital vehicles or facilities to serve new markets or provide an improved experience for existing customers, such as enhancements to customer information signage, retrofits to existing light rail stations, and placement of additional passenger waiting shelters and bike amenities • Start-up operating funding for limited expansion of transit service for demonstration purposes • Modernization of transit facilities or systems to improve the customer experience, provide more efficient transit operations, or improve the operating capabilities of regional transit providers

The opportunities for bus operating and capital expansion will be prioritized based on an evaluation through the Regional Service Improvement Plan, regional solicitation, or other more specific plans that focus on short-term regional transit needs.

Increased Revenue Scenario Bus and Support System Investments

The region will need additional resources to realize the vision for the transit system in this plan that goes beyond the limited opportunities in the Current Revenue Scenario.

Additional resources would allow the region to expand existing services and add new service to parts of the region. Expansion and modernization of transit facilities will enhance the transit customer's experience on multiple levels. Access to a bus stop or passenger facility might be improved through a better pedestrian connection, provision of secure bike storage, or a more conveniently located park-and-ride. A transit user's wait for the bus would be improved with shelters at more bus stops and more amenities at passenger facilities such as heat, light, and transit information. These passenger facilities would be in clean, good condition because investments in maintenance support facilities would be commensurate with passenger facility expansions and improvements. Once on the bus, a transit customer's ride might be more reliable or comfortable because the vehicle has been cleaned and maintained at an updated bus garage that operates at its optimal capacity. Better access to customer support, from police to transit information, would be made possible under this scenario because of investments made in support facilities.

Expand and Modernize the Bus and Support System – Increased Revenue Scenario

- An average of about 1% annual growth in the regular-route bus service over 25 years, with near-term improvements guided by the Regional Service Improvement Plan, that includes:
    - Improved local service frequencies and hours of service to attract new riders to the system and improve access and reliability for existing riders, including an expansion of high-frequency arterial routes
    - Expanded coverage of local service with an emphasis on connections between high-density residential neighborhoods, regional job concentrations, and transitways
    - Expanded commuter and express service to new markets and improved service in markets that are overcapacity
- Expanded fleet needed to expand service
- Enhanced maintenance including snow removal at transit passenger facilities and improvements including better lighting, more customer information, rehabbed aging facilities such as Sun Ray Transit Center, more and better shelters, improved multimodal connections, enhanced pedestrian connections to bus stops, and energy-efficient improvements
- Expanded or modernized transit support facilities including additional garages for increased system capacity, additional layover capacity in major regional centers, light rail support facility upgrades, bus rapid transit garage capacity, and other improvements

Like the Current Revenue Scenario, the opportunities for bus operating and capital expansion will be prioritized based on an evaluation through the Regional Service Improvement Plan or other more specific plans that focus on short-term regional transit needs.

Transitway System Investment Plan

A network of transitways is and will be a significant element of the regional transit system, both in terms of use and investment. Transitway investments are permanent and long-range. They require diligent planning to best serve the existing developed region and help guide future development in the region. This permanence also plays a strong role in the ability of transitways to focus future growth and act as a catalyst for development in the region.

The region will develop a network of transitways that considers a variety of modes including: bus rapid transit in multiple forms, light rail, and commuter rail. The region is currently examining modern streetcar as a regional transitway mode (see discussion near the end of this chapter). Each mode has unique characteristics that are cost-effectively matched to an appropriate purpose and need.

Transitway Modes

The following are general descriptions of transitway modes in the region.

Bus Rapid Transit

Bus rapid transit (BRT) is a transitway mode that uses buses while incorporating many of the premium characteristics of rail. BRT is more flexible than rail in fitting the unique opportunities and limitations of a corridor. BRT has a number of attributes that, as a whole, distinguish it from other bus services in the region.

- Service operations: BRT typically operates at service frequencies of 15 minutes or better for most of the day in both directions, and can be complemented with other services such as local or express routes.
- Running way: BRT can operate in a dedicated busway, bus lanes, MnPASS lanes, dynamic shoulder lanes, dynamic parking lanes, bus-only shoulders, or mixed traffic, depending on the characteristics of the corridor. BRT typically includes various transit advantages such as queue jump lanes to provide faster travel.
- Technology: BRT can include transit signal priority to allow buses to move more quickly and reliably through traffic signals. Customer information displays and other technology are often provided to improve the customer experience.
- Identity/brand: BRT is often uniquely branded to help distinguish it from other bus services.
- Stations: BRT stations are uniquely branded with more amenities than a standard bus stop and generally spaced further apart to provide faster travel.
- Vehicles: BRT vehicles can range from typical 40-foot transit buses to specialized vehicles with a unique look, low floors and additional doors for quicker boarding, and other customer amenities.

- Fare collection: BRT typically utilizes off-board or other unique fare collection methods that allow for quicker passenger boarding.

BRT facilities are often scalable to demand and can be added or expanded, as needed, over time. For example, an express corridor could add a MnPASS lane or other transit advantage, and then add stations and park-and-rides as demand increases. Because of this, BRT is better suited to adapt to unique corridor conditions than rail. The region is planning for three types of BRT that are matched to the conditions of the corridors: dedicated bus rapid transit, highway bus rapid transit, and arterial bus rapid transit.

Dedicated Bus Rapid Transit

Dedicated BRT is often considered the most similar to light rail in the characteristics of how it operates and level of investment. Dedicated BRT uses special roadways or lanes of roadways dedicated to the exclusive use of buses. Projects are generally similar to light rail in project length, with stations also spaced about a mile apart. Dedicated BRT has more flexibility than light rail because the dedicated guideway and stations can be shared with other services, such as express or local bus. Dedicated BRT has requirements for right-of-way and infrastructure similar to light rail, except for the train and associated propulsion and track systems. A local example of dedicated BRT infrastructure is the University of Minnesota busway, which connects the University's campuses with frequent bus service. The Gateway corridor locally preferred alternative is the first dedicated BRT transitway to be included in the plan.

Highway Bus Rapid Transit

Highway BRT provides frequent, all-day service to regional centers that are near highways and spaced further apart throughout the region, making them difficult to connect with local bus service. Highway BRT generally operates on limited access roadways where buses can use bus-only shoulders, MnPASS lanes, ramp meter bypasses, and priced dynamic shoulder lanes as transit advantages. Stations are spaced about one to two miles apart. Highway BRT service is often complemented with express bus service that uses the same facilities and is coordinated with local bus connections. Other highway BRT characteristics would be similar to dedicated BRT and light rail, such as service frequencies, fare collection, technology, and customer information. The METRO Red Line is the only existing highway BRT line operating in the system, although some capital components of the METRO Orange Line on I-35W South have been completed, such as the I-35W and 46th Street Station.

Arterial Bus Rapid Transit

Arterial BRT is an all-day, frequent service that is faster and provides a better customer experience in corridors with strong existing local bus service. These corridors are all in highly developed areas of the region where available right-of-way limits the ability to

implement services like light rail or dedicated BRT. Arterial BRT can attract a high number of new transit riders and improve the experience for a high number of existing riders. Arterial BRT generally operates in mixed-traffic on local streets with stations spaced about ½ mile apart, depending on corridor specifics, and incorporates transit advantages such as transit signal priority or queue jump lanes. Arterial BRT can be complemented with local bus service that stops more frequently. Typical amenities include improved stations and customer information, unique vehicles and branding, and fare collection that allows for faster boarding.

Since BRT is intended to be flexible, corridors may be implemented in a way that is a combination of BRT types. Dedicated BRT projects are typically more substantial investments and will likely fit into the New Starts category of federal funding. Highway BRT and arterial BRT projects will typically fit into the Small Starts category of federal funding and may be explored in a phased approach. Dedicated BRT and highway BRT lines will be considered part of the METRO system with color designations as long as the service and facilities meet certain minimum characteristics.

Light Rail Transit

Light rail transit (LRT) is an all-day, frequent service that connects dense employment and population centers with each other. It operates on tracks primarily in an exclusive running way. Vehicles are typically powered by overhead electrical wires. Stations are typically spaced about ½ to one mile apart. Typical light rail lines in this region can extend 10 to 15 miles out from the urban core and primarily serve the most densely developed areas of the region. Longer lines would generally be cost-prohibitive and better served by connecting local or express service. Light rail service operates in both directions at a high frequency. All light rail lines will be considered part of the METRO system and given color designations for customer information purposes. The initial segments of the METRO Blue Line and Green Line are operating, with extensions in development.

Commuter Rail

Commuter rail is an express transit service that primarily connects downtown employment centers to distant population centers. Commuter rail typically operates on existing freight railroad tracks to reduce infrastructure costs. Commuter rail vehicles may use diesel multiple unit vehicles or conventional diesel locomotives pulling passenger coaches. In many cases, commuter rail operates on tracks that also carry intercity passenger rail traffic operated by Amtrak or other passenger rail services, potentially sharing common stations. Lines are typically 20 or more miles in length, with stations spaced much further apart than light rail or BRT, typically about five miles apart. This spacing results in faster travel times that are competitive with auto travel. Station areas are primarily oriented to park-and-ride uses or dense housing and mixed-use development. Commuter rail services operate at 20- to 30-minute frequencies during peak periods, with limited or no midday or reverse-direction service. The Northstar Line

is the only existing commuter rail line in the transitway system and is not considered part of the METRO system of all-day, frequent transitway service.

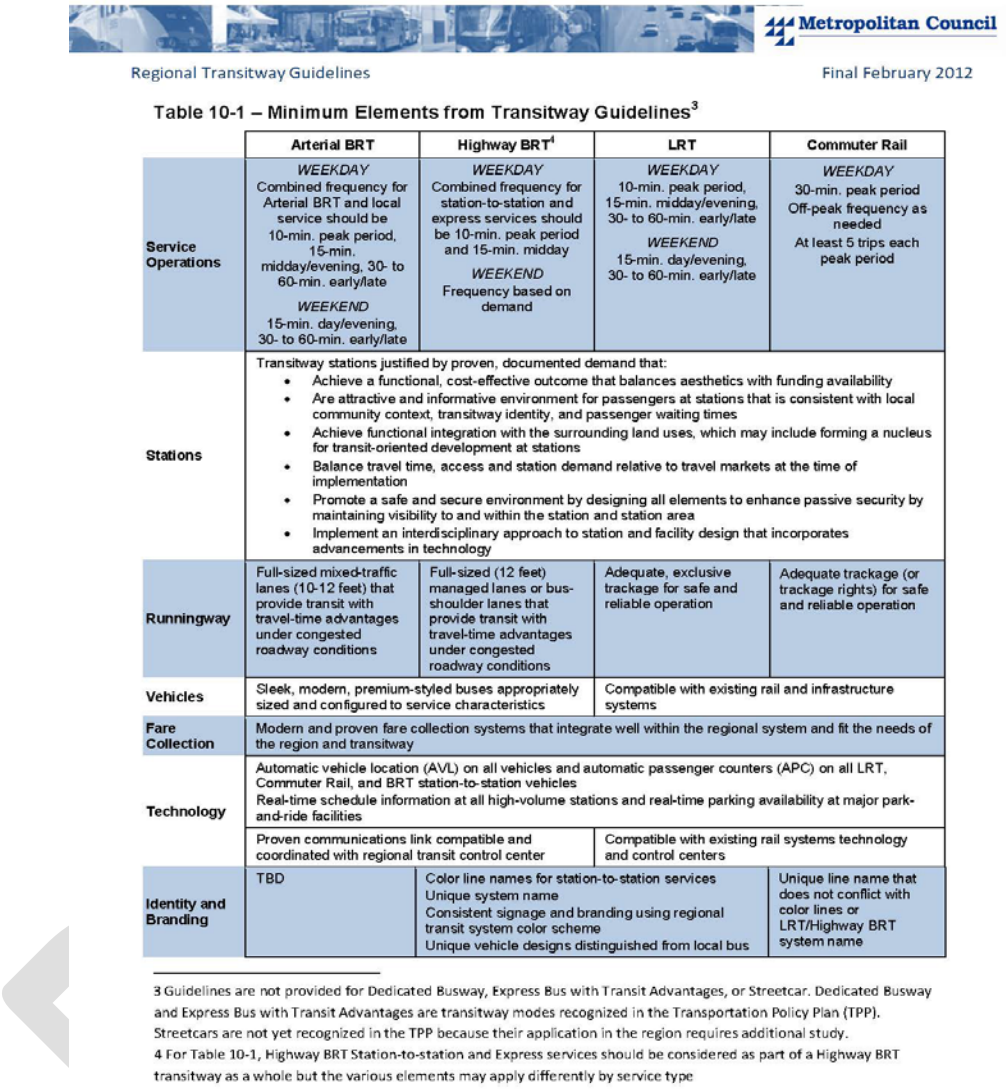
Regional Transitway Guidelines

More detailed descriptions of the characteristics of each mode are available in the *Regional Transitway Guidelines* (2012). The image in Figure 23 is an excerpt from the Regional Transitway Guidelines; it illustrates the basic characteristics of each mode. The only mode not included in this discussion is dedicated BRT, a mode that has not been developed for implementation in this region yet. An update to the Regional Transitway Guidelines is identified as a work program item and will consider addressing dedicated BRT [*insert link to "Work Program"*].

Other Modes

Other modes may be explored through further detailed study, but their inclusion in the plan will require an amendment. A discussion of modern streetcars is included at the end of this section and will be addressed through a work program item.

Figure F-5: Excerpt of "Minimum Elements" from the Regional Transitway Guidelines



Metropolitan Council

Regional Transitway Guidelines — Final February 2012

Table 10-1 – Minimum Elements from Transitway Guidelines[3]

	Arterial BRT	Highway BRT[4]	LRT	Commuter Rail
Service Operations	*WEEKDAY* Combined frequency for Arterial BRT and local service should be 10-min. peak period, 15-min. midday/evening, 30- to 60-min. early/late *WEEKEND* 15-min. day/evening, 30- to 60-min. early/late	*WEEKDAY* Combined frequency for station-to-station and express services should be 10-min. peak period and 15-min. midday *WEEKEND* Frequency based on demand	*WEEKDAY* 10-min. peak period, 15-min. midday/evening, 30- to 60-min. early/late *WEEKEND* 15-min. day/evening, 30- to 60-min. early/late	*WEEKDAY* 30-min. peak period Off-peak frequency as needed At least 5 trips each peak period
Stations	Transitway stations justified by proven, documented demand that: • Achieve a functional, cost-effective outcome that balances aesthetics with funding availability • Are attractive and informative environment for passengers at stations that is consistent with local community context, transitway identity, and passenger waiting times • Achieve functional integration with the surrounding land uses, which may include forming a nucleus for transit-oriented development at stations • Balance travel time, access and station demand relative to travel markets at the time of implementation • Promote a safe and secure environment by designing all elements to enhance passive security by maintaining visibility to and within the station and station area • Implement an interdisciplinary approach to station and facility design that incorporates advancements in technology			
Runningway	Full-sized mixed-traffic lanes (10-12 feet) that provide transit with travel-time advantages under congested roadway conditions	Full-sized (12 feet) managed lanes or bus-shoulder lanes that provide transit with travel-time advantages under congested roadway conditions	Adequate, exclusive trackage for safe and reliable operation	Adequate trackage (or trackage rights) for safe and reliable operation
Vehicles	Sleek, modern, premium-styled buses appropriately sized and configured to service characteristics		Compatible with existing rail and infrastructure systems	
Fare Collection	Modern and proven fare collection systems that integrate well within the regional system and fit the needs of the region and transitway			
Technology	Automatic vehicle location (AVL) on all vehicles and automatic passenger counters (APC) on all LRT, Commuter Rail, and BRT station-to-station vehicles Real-time schedule information at all high-volume stations and real-time parking availability at major park-and-ride facilities			
	Proven communications link compatible and coordinated with regional transit control center		Compatible with existing rail systems technology and control centers	
Identity and Branding	TBD	Color line names for station-to-station services Unique system name Consistent signage and branding using regional transit system color scheme Unique vehicle designs distinguished from local bus		Unique line name that does not conflict with color lines or LRT/Highway BRT system name

3 Guidelines are not provided for Dedicated Busway, Express Bus with Transit Advantages, or Streetcar. Dedicated Busway and Express Bus with Transit Advantages are transitway modes recognized in the Transportation Policy Plan (TPP). Streetcars are not yet recognized in the TPP because their application in the region requires additional study.

4 For Table 10-1, Highway BRT Station-to-station and Express services should be considered as part of a Highway BRT transitway as a whole but the various elements may apply differently by service type

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Transitway Development Process

Corridor Planning and Development

The development of the transitway system and individual corridors warrants substantial study prior to investment decisions. This process is essential for gathering public input and being good stewards of public money. The following is a typical process for the development of a transitway:

1. **System Planning and Feasibility** – The Metropolitan Council will lead or collaborate on region-wide studies of transitways, in coordination with MnDOT, the Counties Transit

Improvement Board, local governments and transit providers, to guide decision-making at the regional level. Corridor feasibility studies led by local governments or transit providers should also coordinate with regional planning.

2. **Corridor Planning and Alternatives Analysis** – Corridors should undergo an analysis of alternative transitway modes or alignments through early planning work that narrows the list of alternatives down to a local recommendation for the "Preferred Alternative." The locally preferred alternative is the alternative ultimately included in the Transportation Policy Plan, a requirement for federal, state, or regional funding.
3. **Environmental Review** – Every project will undergo an environmental review, consistent with state and federal law, depending on the size and nature of a project. The environmental review will disclose potential environmental impacts of a project and identify ways to avoid or minimize them.
4. **Design and Engineering** – The design and engineering of a project will build upon preliminary work in previous steps through to full project design and engineering. This step includes work described as "project development" and "engineering" under the federal New Starts program, but also includes pre-project development work that may be required to transition a project after environmental and planning work.
5. **Construction** – The capital elements of a project will be built, tested and readied for operations. This phase also includes the expansion of vehicle fleets and other systems needed to operate the transitway.
6. **Operation** – A project begins operating during the testing phases but "revenue service" begins when it opens to the public to serve passengers.

For rail projects, these steps generally occur as a complete project where all elements are planned, designed, built, and opened for operation on the same timeline. For BRT projects, these processes can occur in phases with different elements of the project, a park-and-ride for instance, being planned, designed, built, and opened before other elements.

Throughout all of these steps, public and stakeholder participation will be an essential aspect of project work. The Council and its regional partners in transitway development, including local governments, will work together to ensure that each transitway project is developed to integrate into the transportation system and to consider the concerns of affected communities.

County governments have led the way on the early stages of many transitways, often funding and leading corridor studies. Cities and transit providers are also engaging in corridors studies. It is important that the Council, counties, cities, regional transit providers, MnDOT, and other stakeholders work together to develop these major investments in a collaborative way. Many of the details of project implementation and best practices are described in the Regional Transitway Guidelines. However, best practices will continue to evolve and project-specific issues will continue to arise in projects of this scale. Collaboration will be a key component of project development.

Transitways are major regional projects that require the coordination of many potential elements that are not directly addressed in this chapter. Table F-4 includes references to other areas of the plan and other considerations that will be used in transitway development.

Table F-4: Transitway Development Coordination References

Bus System Service and Facilities	Other elements of this plan describe how bus improvements are planned and how facilities support the development of transitways, such as park-and-rides [*insert link*].
Transit Advantages and Highways	The discussion of transit advantages [*insert link*] can often be coordinated with transitway improvements, particularly with BRT transitways.
Pedestrian and Bicycle Plans	The plan has a substantial discussion on the regional bicycle system [*insert link*]. Elements of a good pedestrian experience are also discussed in "Land Use and Local Planning" [*insert link*].
Land Use and Local Planning	Local governments play a significant role in planning local transportation and land use that connects to transitways. More discussion is available in "Land Use and Local Planning" [*insert link*] and through local comprehensive plans.
Regional Transitway Guidelines	The Regional Transitway Guidelines have a lot of information on best practices and standards for transitway design and integration into the transportation system [*insert link*].

Corridor Planning Status Updates

The following corridors are in various stages of development or study for potential transitway investments. The status of each project will be updated as they advance through major steps or once a locally preferred alternative is adopted into the Transportation Policy Plan.

METRO Red Line (Cedar Avenue BRT) The first stage of this project opened in mid-2013 with service to stations in Bloomington, Eagan, and Apple Valley. An *Implementation Plan Update* (2010) has identified future stages that will add stations and service to the line, including an extension to a number of planned stations in Lakeville. Stage 2 is included in the Current Revenue Scenario as an extension of BRT service to the Lakeville-Cedar station at 181st Street. The Implementation Plan is being updated with adoption anticipated in 2015.

METRO Orange Line (I-35W BRT) This project will connect downtown Minneapolis with communities along I-35W south of downtown. The locally preferred alternative was included in the *2004 Transportation Policy Plan*, and the State directed MnDOT and the Council to study and recommend improvements in the corridor. Metro Transit is partnering with a number of agencies to continue to plan and implement initial stations and service elements after several

capital components were completed through the 2007 Urban Partnership Agreement. This work includes station designs as well as an update to the overall project implementation plan.

METRO Green Line Extension (Southwest LRT) This project will connect Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. The project's locally preferred alternative was adopted as the Kenilworth-Opus-Golden Triangle (3A) LRT alignment in May 2010 and has progressed through the Draft Environmental Impact Statement (DEIS). The project is currently in the preliminary engineering phase and advancing work on local land use planning around proposed stations. Construction is expected to start in 2016 with an opening year of 2019.

METRO Blue Line extension (Bottineau LRT) This project will connect Brooklyn Park, Crystal, Robbinsdale, Golden Valley, and Minneapolis. The project's locally preferred alternative was adopted as the West Broadway in Brooklyn Park – Burlington Northern Santa Fe Corridor – Olson Memorial Highway (B-C-D1) LRT alignment in May 2013. It has advanced into the environmental review phase. Advanced station-area land use planning is ongoing and the region has submitted a request for entry into the FTA New Starts project development phase in 2014.

Gateway This corridor links Saint Paul, Maplewood, Landfall, Oakdale, Lake Elmo, and Woodbury. An alternatives analysis was completed in early 2013 and the project is working on a Draft Environmental Impact Statement (DEIS) with an expectation to request entry into Project Development in 2015. Concurrently with the environmental scoping analysis, a locally preferred alternative was recommended by the project's Policy Advisory Committee and the Gateway Corridor Commission. The recommended LPA is included in the Current Revenue Scenario of this plan contingent upon local resolutions of support, local land use commitments, and commitment to addressing use of highway right-of-way in the DEIS process (see "Highway Investment Direction and Plan" [*insert link*]). The contingent LPA is dedicated BRT on the Hudson Road – Hudson Boulevard (A-B-C-D2-E2) alignment that crosses to the south side of I-94 at approximately Lake Elmo Boulevard to Manning Avenue. The Gateway corridor has been identified as a funding priority for CTIB in its Phase I Program of Projects.

I-35W North This corridor links downtown Minneapolis with communities along I-35W north of downtown to Forest Lake. The corridor was studied through a feasibility study led by MnDOT in 2013. The study focused primarily on the highway managed-lane vision but included an analysis of BRT potential coordinated with that vision. As highway design work on the corridor continues, BRT implementation will be coordinated with these concepts through planning efforts.

Midtown This corridor links the existing METRO Blue Line Lake Street Station with planned METRO Green Line West Lake Station along the 29th Street Greenway through south Minneapolis. The corridor was studied through an Alternatives Analysis that concluded with a recommended locally preferred alternative of rail in the Midtown Greenway combined with the

proposed Arterial BRT on Lake Street. The recommended locally preferred alternative will be considered through a future amendment to the Transportation Policy Plan.

Nicollet-Central This corridor in Minneapolis was studied through an Alternatives Analysis that concluded in late 2013 with a recommended locally preferred alternative of modern streetcar. The LPA is under consideration for potential funding commitments in anticipation of being amended into the plan. The modern streetcar would provide circulation through the core of the city from Lake Street to at least 5th Street NE along Nicollet Avenue, Nicollet Mall, and Hennepin/1st Avenues. It would connect with the METRO Blue and Green lines in downtown. The environmental review phase is currently underway and is expected to be completed in early 2015.

Robert Street This corridor initiated an Alternatives Analysis that is looking at a highway BRT option on Highway 52 and arterial BRT and streetcar options on Robert Street from downtown Saint Paul south into Dakota County. A recommendation for a locally preferred alternative is expected in late 2014. Robert Street is a priority in CTIB's Phase I Program of Projects.

Red Rock This corridor links Hastings to Saint Paul and Minneapolis, and was studied through an Alternatives Analysis update in 2014. The analysis recommended a staged approach to developing highway BRT in the corridor. The next steps will include developing an implementation plan and ongoing strategies for investment. Transitway improvements in the corridor are a priority in CTIB's Phase I Program of Projects.

Rush Line This corridor links Saint Paul with White Bear Lake and communities beyond. An initial Alternatives Analysis was completed in 2009 and a pre-project development study is currently underway to recommend a locally preferred alternative. A commuter bus demonstration service was initiated in 2010 that provides peak-hour express service to downtown St. Paul.

Riverview This corridor connects Saint Paul with the Minneapolis-Saint Paul International Airport and the Mall of America and South Loop district in Bloomington. Initial analysis on the corridor was completed in 2000 but transitway implementation did not move forward. A pre-project development study is underway to recommend a locally preferred alternative. The Riverview corridor is a priority in CTIB's Phase I Program of Projects.

West Broadway The West Broadway corridor connects the Minneapolis neighborhoods along West Broadway to downtown Minneapolis and Robbinsdale. The corridor was studied as part of the Bottineau corridor but was not the recommended alignment. Metro Transit, the City of Minneapolis, and Hennepin County are partnering on a detailed corridor study of West Broadway that will begin in 2014. The study will analyze transit options along West Broadway and options to connect to downtown Minneapolis, to the planned Bottineau LRT corridor, and other transit services.

Arterial Transitway Corridor Study Metro Transit completed a system study on arterial BRT in 2012 that concluded with recommendations for arterial BRT in 11 corridors identified in the 2030 Transportation Policy Plan and another corridor based on work done through the Bottineau LRT project. Initial work has begun on the Snelling Avenue line, the West 7th Street line, the Penn Avenue line, and the Chicago Emerson-Fremont lines as the first four corridors for implementation. The remaining system planning is ongoing.

Highway Transitway Corridor Study This was a regional analysis of potential highway BRT investments in eight corridors throughout the region. The analysis indicated the strongest potential for highway BRT improvements in the Highway 36, Highway 169, I-94, and I-394 corridors. Other corridors in the study continued to confirm the strong demand for express service and potentially some mid-day service.

Minneapolis Streetcar Feasibility Study The City of Minneapolis completed a *Minneapolis Streetcar Feasibility Study* in 2008 that resulted in a recommendation for a streetcar network as a long-range, 20- to 50-year vision for the city. The study recommended modern streetcar on seven corridors: West Broadway/Washington Ave, Hennepin Ave S, Midtown Corridor, Nicollet Ave S, University Ave SE/4th Street SE, Chicago Ave S, and Central Ave NE.

Saint Paul Streetcar Feasibility Study The City of Saint Paul completed a *Saint Paul Streetcar Feasibility Study* in 2014 that identified a long-term vision for a streetcar network. Initial phases of the study have identified seven corridors for the long-term network: East 7th Street, Payne Ave, Rice Street, Selby Ave/Snelling Ave, Grand Ave/Cretin Ave, West 7th Street and Robert Street. The final phase of the feasibility study identified a potential 4.1-mile starter line for future study on East and West 7th Street from Randolph Ave to Arcade Street, pending the results of the Riverview corridor study.

Setting Regional Transitway Priorities

Transitways are some of the largest single transportation investments that the region is planning through 2040. The significance of these projects and the number of corridors under study will require the region to prioritize transitway investments to ensure the efficient development of a successful, regionally balanced system. *Thrive MSP 2040* and the Transportation Policy Plan have established new accountability considerations that are intended to guide the development of the region and investments in infrastructure. *Thrive MSP 2040's* outcomes and the Transportation Policy Plan's goals and objectives are important policy statements that will a clearer understanding of the results that transitway investments are intended to achieve.

The ability of the region to compete for federal New Starts and Small Starts funding will also depend on advancing competitive projects. The region will need to be aggressive but strategic about which projects are submitted to compete for federal funding. The region will also need to

be strategic about funding projects with higher levels of state or local funding if they may not compete well for federal funding.

Transitway projects already undergo a substantial analysis at the corridor level to determine the appropriate mode and alignment. Counties, cities, and transit providers are leading efforts to determine the right fit for each corridor. The information developed during these analyses should provide a common understanding for determining how a project advances the region toward its desired results. The region's desired results can also inform each corridor analysis to help determine the best result for the region, while allowing for flexibility to fit with local needs.

Setting regional transitway priorities will be a dynamic process as projects come forward for inclusion in the Transportation Policy Plan. The process will be a collaborative effort of policymakers that includes the Counties Transit Improvement Board (CTIB) and the Metropolitan Council, with involvement from cities and other stakeholders through the region's advisory committees. The process will start with gathering the appropriate technical information and allow policymakers to be strategic in deciding how a project moves forward and how it is reflected in the Transportation Policy Plan.

Providing the Technical Information

The basic technical information for a proposed transitway project will provide a common understanding for regional decision-making. Through corridor analyses, this region has substantial experience evaluating transitway alternatives with technical measures to determine the right investment. This plan is establishing the technical investment factors that will be considered. A work program item that will build on the extensive experience of the counties and other project leads will help determine specific measures. The technical investment factors and example measures that help provide context are included in Table F-5.

Table F-5: Technical Investment Factors for Setting Regional Transitway Priorities

Technical Investment Factors	Possible Measures
Ridership (Current forecast year)	• Average weekday project boardings • New weekday system linked trips on transit
Access to Jobs and Activity	• Increase in job accessibility on the transit system within 45 minutes • Number of regional job concentrations served
Cost-Effectiveness	• Annualized capital and operating cost per annual boarding • Annualized capital and operating cost per new annual system linked trip on transit
Existing Land Use	• Total population, employment, and student enrollment within ½-mile of proposed stations • Intersection density and walkability near stations

	• Number of affordable housing units within ½ mile of proposed stations; community housing performance score
Future Land use and Development	• Land use plans supportive of transitway densities, as described in "Land Use and Local Planning" • Official land use controls supporting affordable housing construction • Regulatory, infrastructure, and financing tools supportive of development including shared parking, parking requirement reductions • Strength of development market • Program for maintenance/preservation of affordable units (see Housing Policy Plan)
Equity	• Average weekday project boardings by transit-dependent households • Income and affordable housing • Opportunity access for low-income population and people of color
Environment	• Water supply – suitability and local policies supporting groundwater recharge • Air quality – emissions reduction

This list of technical factors was developed to strongly align with the federal New Starts and Small Starts program evaluations and with factors that measure the region's desired results stated in *Thrive MSP 2040* and the *2040 Transportation Policy Plan*. The work program item on Further Defining the Process for Setting Transitway Priorities will work through specific measures as well as methodologies and potential benchmarks [*insert link to "Work Program"*]. The technical information will inform decision-making by policymakers that will consider the technical information and policy factors.

Considering Policy Factors

With the technical information available, policymakers will then need to consider other factors that are more qualitative and less technical. This will require a strong collaboration that includes the CTIB and the Council, with involvement from cities and other stakeholders through the region's advisory committees. CTIB has a *Transit Investment Framework* that sets forth the Board's policies and procedures governing the award of grants from the sales tax proceeds and describes the Board's vision for a network of transitways. The sales tax is currently the most substantial regional funding source for transitways. The policy investment factors and important considerations for this analysis are included in Table F-6.

Table F-6: Policy Investment Factors for Setting Regional Transitway Priorities

Policy Investment Factors	Possible Considerations
Regional Balance	• Investment levels across the region (geographic and per capita considerations) • Investment levels that promote prosperity at the community's stage and

	level of development
Funding Viability	• Viability for revenues being considered • Timing of spending expectations and revenues available
Community Commitment	• Local government support (Resolutions of support) • Local land use and development commitments • Public support
Risk Assessment and Technical Readiness	• Potential risks through project implementation • Stage of technical readiness, project development

Transitway corridors should take these technical and policy investment factors into consideration during corridor studies, including feasibility studies and alternative analyses. The technical and policy factors will guide the region in determining how a project fits into the timing and funding options in the Current Revenue Scenario of the plan. The prioritization factors will not be used to determine consistency of CTIB's transitway grants with this plan. The technical and policy factors are informative for the region's policymakers and public to provide transparency to the decision-making process.

The investment factors highlight the importance of land use and local government development support. Transitway investments are intended to help shape development patterns, but development patterns will also help shape transit investments. In order for transitways to realize their full potential for expected development, local governments will need to provide the vision and planning for land use and local investments. The Council and CTIB are committed to expanding the transitway system; local partners will need to show commitment to transit-supportive land use in return. More information on how local governments can do this is available in "Land Use and Local Planning" [*insert link*].

Transitways will not be included in the Current Revenue Scenario until a locally preferred alternative is recommended from a local process. If a number of transitways make this recommendation simultaneously, a multi-transitway analysis may need to be conducted to consider several projects at once. This may also be explored through a regional Program of Projects approach to funding multiple projects at once and accelerating some projects. Until specific measures and methodologies can be defined through the work program item, transitway projects that come forward will be evaluated on a case-by-case basis by CTIB and the Council, with involvement from cities and other stakeholders through the region's advisory committees. This process is not intended to add steps to the transitway adoption process, but rather to add clarity to the decision-making process moving forward. The process will be integral to decision-making under an Increased Revenue Scenario, where transitway investment has the potential to be accelerated across multiple corridors.

Current Revenue Scenario Transitway System Investments

The region has many corridors under for transitway investment potential. Transitway investments are limited by reasonably expected current revenues and projects must be prioritized within these constraints. The Current Revenue Scenario includes the list of projects that have a locally preferred alternative and identified funding, but there is flexibility in the plan to add additional projects under the Current Revenue Scenario.

Existing Transitways in Operation

The first priority for investing in the region's transitway system is continuing to operate and maintain the existing transitways.

Existing Transitways in Operation
• METRO Blue Line (Hiawatha Light Rail) • Northstar Commuter Rail • METRO Red Line (Cedar Avenue Transitway) • METRO Green Line (Central Corridor Light Rail)

Beyond ongoing operations and maintenance, these corridors may require modernization or modest expansion improvements that address operational issues, unmet demand, or other unique challenges.

Transitway Expansion Assumed to be Funded within the Current Revenue Scenario

The second priority for investing in the region's transitway system is the expansion of the system in corridors that provide the strongest contributions to meeting *Thrive MSP 2040* outcomes and regional goals and objectives in this plan. The funded projects have a locally preferred alternative (if seeking federal New Starts or Small Starts funding) and an accepted funding plan. These projects are advancing through project development phases, such as final environmental clearances, design, or construction, with a tentative opening date planned.

The projects assumed to be funded are also furthest along in implementing land use strategies around transitways that further support the region's desired results. Local governments should be conducting or implementing station-area planning for these corridors as they continue to move through the transitway development process. Land use strategies are discussed in more detail in "Land Use and Local Planning" [*insert link*].

Transitway Expansion Assumed to be Funded within the Current Revenue Scenario

The transitway corridors below have a locally preferred alternative and are funded within the current revenue assumptions of the plan. They are shown on Figure 25 - Map of Current Revenue Scenario Transitways and CTIB Phase I Program of Projects.

- METRO Red Line Stage 2 (Cedar Avenue Transitway): in project development, planned to open around 2019
- METRO Orange Line (I-35W South BRT): in project development with some construction completed, planned to open around 2019
- METRO Green Line Extension (Southwest LRT): in project development, planned to open around 2019
- METRO Blue Line Extension (Bottineau LRT): in pre-project development, planned to open around 2022
- Gateway Corridor dedicated BRT[1]: in pre-project development, planned to open around 2022
- Four arterial BRT projects with one opening every 2-3 years: Snelling Avenue in design, West 7th Street in project development, Penn Ave in pre-project development, and Chicago Emerson-Fremont in planning

[1] Contingent upon resolutions of support and commitments to local land use from local governments along the locally preferred alternative and commitment to addressing use of highway right-of-way in the DEIS process (see "Highway Investment Direction and Plan").

The region has the financial capacity to fund these projects with current revenue assumptions that include federal funds, sales tax funds administered by CTIB, state funds, and local funds. Sales tax funds administered by CTIB are not assumed for arterial BRT projects. The increased operating costs associated with arterial BRT are not funded because the revenues available are only available for capital. However, arterial BRT capital investment does provide for improved customer experience and operating efficiencies in corridors with existing high levels of service.

Federal Expansion Funding in the Current Revenue Scenario

Since 2011, the region has been able to secure approximately $90 million per year in New Starts funding for capital projects. (From 2001 through 2010, the annual average was approximately $50 million.) This plan assumes a more aggressive approach to federal New Starts funding of nearly $180 million annually in the first ten years. Federal funding is assumed for 50% of the capital cost of New Starts eligible projects, an assumption the region has a history of achieving. The federal funding levels can be managed with short-term financing tools, such as grant anticipation notes, to provide higher levels of funding when needed with the federal payback occurring later. Beyond the first 10 years, no federal New Starts funding is included in the plan until specific projects are identified with a locally preferred alternative and a plan for funding the project.

The Council and CTIB will work aggressively to seek competitive federal funding beyond the historical level of federal funding to accelerate building transitways and delivering the region's vision for a system. The region will continue to plan for and prepare federally competitive projects and explore opportunities for multi-project commitments from the federal government. The region will also explore a program-of-projects approach in which some projects are locally funded to leverage federal funds for other projects.

The region also does not yet have experience pursuing Small Starts funding for a project. Small Starts funding may provide another option for the region to secure additional federal funding for smaller transitway investments, increasing the overall revenue for the region. Small Starts projects do not need to have a locally preferred alternative identified in the plan until seeking a full-funding grant agreement from the FTA, which provides for more flexibility in the timeline for projects to be amended into the Transportation Policy Plan.

Transitway Expansion in CTIB Phase I Program of Projects

The Counties Transit Improvement Board (CTIB) has adopted a list of priority corridors for implementation within current revenue assumptions. These corridors are expected to be implemented in the first 10 years of the plan once a funding plan and locally preferred alternative are determined. The corridors included below are not yet at the point of having a locally preferred alternative or a funding plan to include in the Current Revenue Scenario. In order to accelerate these transitways into the first 10 years of the plan, financing will likely need to be assumed in coordination with CTIB. A project locally preferred alternative will be considered for amendment into the plan when selected and recommended by the lead agency and local governments along a corridor. It is anticipated that these projects will be funded with a combination of federal funds, sales tax funds administered by CTIB, state funds, and local funds but the project specific sources and shares will vary.

Transitway Expansion in CTIB Phase I Program of Projects The transitway corridors below are new transitway project priorities adopted in CTIB's Phase I Program of Projects that are under study for a locally preferred alternative. They are shown on Figure F-6: Map of Current Revenue Scenario Transitways and CTIB Phase I Program of Projects.
• Robert Street • Riverview • Red Rock

In addition to these expansion corridors, CTIB's Phase I Program of Projects identifies transitway improvement opportunities in existing and planned corridors. These improvement projects are not full transitway implementations, but may enhance existing transitways or advance elements of future transitways, such as incremental improvements in BRT corridors.

The Red Rock corridor is prioritized for transitway improvements that move the corridor toward a future transitway.

Acceleration Opportunities within the Current Revenue Scenario

Arterial Bus Rapid Transit Acceleration Opportunities

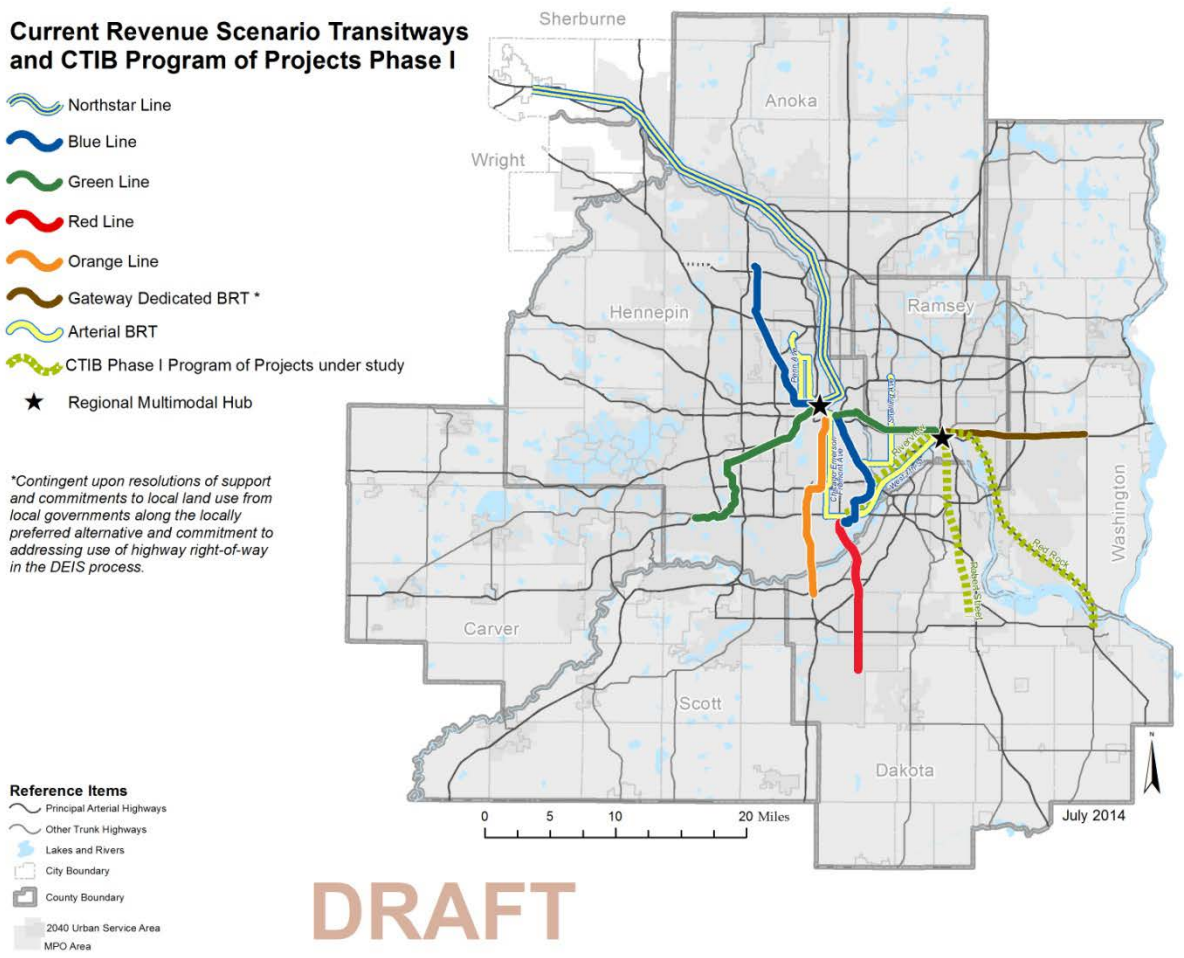
The Current Revenue Scenario assumes four arterial BRT projects will begin construction in the first 10 years of the plan, funded by a combination of federal CMAQ, state bond, and Council regional transit capital funding. There is financial capacity in the Current Revenue Scenario to fund additional arterial BRT projects beyond the first 10 years should the region establish a track record of securing CMAQ and state bond allocations for arterial BRT projects. Additional arterial BRT projects are not yet included in the Current Revenue Scenario as the next 10 years will be key to assessing this funding assumption.

Modern Streetcar Acceleration Opportunities

A number of transitway studies are exploring the modern streetcar alternative as a possible addition to the regional transitway system. While this plan acknowledges that a broader discussion on modern streetcars needs to occur at the regional level, there are opportunities for projects to move forward on a case-by-case basis.

The City of Minneapolis recommended modern streetcar as the locally preferred alternative in the Nicollet-Central corridor. Subsequent to 2013 legislative authority, the City of Minneapolis established a Value Capture District specific to this project to allow the City to issue bonds for up to $60 million toward project implementation. These potential revenues are not assumed in the Current Revenue Scenario, but present a significant opportunity to pursue federal, state and other local funding to advance the Nicollet-Central modern streetcar. Operating funding for the project has not been identified. A project seeking a Small Starts grant agreement (or "Expedited Grant Agreement") to begin construction is required to identify operating funds through the federal application process. If the city identifies all the capital funding for the project, the project and its revenues can be added to the preceding list of expansion projects assumed to be funded within the Current Revenue Scenario, pending a policy discussion of the source of operating funding.

Figure F-6: Map of Current Revenue Scenario Transitways and CTIB Phase I Program of Projects



Increased Revenue Scenario Transitway System Investments

In order to complete the region's vision of a transitway system and do it on an accelerated timeline, the region will need additional funding for transitways. Increased funding will allow the region to:

- Accelerate the build-out of the transitways included in the Current Revenue Scenario
- Afford the transitways in CTIB's *Transit Investment Framework* beyond the Phase I Program of Projects
- Afford additional transitways not in CTIB's *Transit Investment Framework* that are under study or needing to be studied for mode and alignment by other partners
- Implement the complete system of 12 arterial BRT projects

Additional Transitways under Increased Revenue Scenario

Under the Increased Revenue Scenario the transitway corridors listed below – along with accelerating the Current Revenue Scenario transitways and the CTIB Phase I Program of Projects – could reasonably be implemented by 2040. These corridors are in various stages of planning and will need to complete a locally preferred alternative recommendation to be considered for prioritization and funding. The Council will continue to work with the appropriate partners in the planning of these potential transitway investments and with local governments working on land use planning. The complete transitway vision is shown on Figure F-7: Map of Increased Revenue Scenario Transitways – Building an Accelerated Transitway Vision.

- Highway 169
- Highway 36
- I-35W North
- I-394
- METRO Orange Line Extension
- METRO Red Line Stage 3
- Midtown
- North Central[1]
- Rush Line

- Arterial BRT projects[2]:
  - American Boulevard
  - Central Avenue NE
  - East 7th Street
  - Hennepin Avenue
  - Lake Street
  - Nicollet Avenue
  - Robert Street
  - West Broadway Avenue

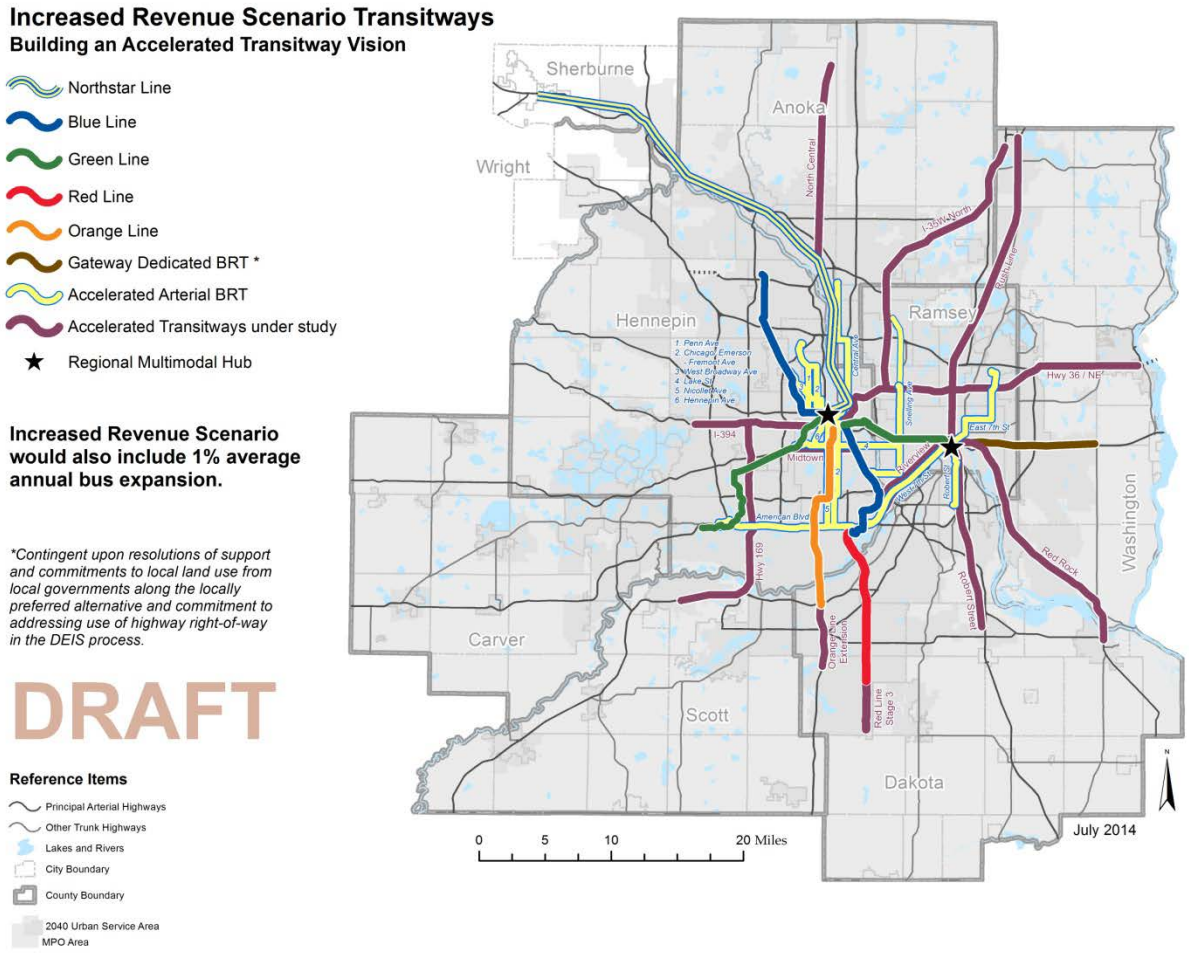
[1] CTIB identified corridor, not currently under study for transitway investment.
[2] Several arterial BRT corridors are also under consideration for other modes.

The most important next step for this tier of transitways is continued study at a corridor level to progress toward a specific locally preferred alternative recommendation (if seeking federal New Starts or Small Starts funding) to the Council. While a recommendation does not guarantee funding in the plan, it does put the region in a position to better understand the needs of each project and consider them for available resources along with other potential projects.

These corridors will need to go through the technical and policy investment factor prioritization identified previously [*insert link to Setting Regional Transitway Priorities*]. The region will conduct an analysis of potential transitway recommendations when they are ready, following the adoption of this plan. Because implementation of these corridors is not available under current revenues until after 2024, any prioritization efforts will need to consider the long-term implications of prioritization as well as the near-term possibilities should increased revenues become available.

Local governments along these corridors should be working on land use studies and planning that would maximize the potential of transitways while recognizing that they are still in the planning phases. These projects still provide an opportunity to adapt the transportation decisions with the land use visions of local communities.

Figure F-7: Map of Increased Revenue Scenario Transitways – Building an Accelerated Transitway Vision



Modern Streetcars

Modern streetcar is an all-day, frequent service that operates in urban areas with high transit demand. Modern streetcars are under consideration in a number of corridors. Modern streetcars typically operate in mixed traffic, similar to a local bus route. They typically stop every few blocks and operate at shorter distances than LRT with an emphasis on high-frequency service with high accessibility. Typical modern streetcar lines are less than four miles long while light rail lines are typically around ten miles long. They travel more slowly than light rail transit because light rail operates primarily in its own dedicated right-of-way and stops approximately every mile, while streetcars usually operate in mixed traffic and stop more frequently. Modern streetcars attract new transit riders and may offer some travel time advantages over local buses, such as faster boarding, faster fare collection, and intersection signal priority – similar to the transportation benefits BRT can offer. Modern streetcar service is particularly suitable for

high-density, mixed-use areas with short average passenger trip lengths, areas where improved transit will benefit a high number of existing riders, and as an attraction for new or infrequent transit users like shoppers or visitors. Modern streetcars also have demonstrated promise for supporting high-density, mixed-use, walkable development in urban cores where people can live without a car and become regular and frequent transit users.

A number of recent and ongoing studies are considering modern streetcars for further planning or implementation. The most advanced of these studies is the Nicollet-Central modern streetcar locally preferred alternative recommendation to the Council that was approved by the City of Minneapolis. Modern streetcar is also under consideration in studies of the Robert Street corridor, Midtown corridor, and West Broadway Corridor. The cities of Minneapolis and Saint Paul also completed city-wide feasibility studies with resulting long-term streetcar networks proposed for each city. More detail is discussed under Corridor Planning Status Updates.

The number of studies considering modern streetcar illustrates the positive support for it as a new transit mode in the region. The Council is continuing to collaborate with local units of government and regional transit planning partners to determine the role of modern streetcars in the regional transit system. This continued effort is described in the "Work Program" [*insert link*].

Transit Investment Plan Financial Summary

The previous sections of this chapter described in detail the expected investments under the current and Increased Revenue Scenarios for both the bus and support system and transitway system investments. This section summarizes the two scenarios by providing a brief, high-level financial summary of all of the planned transit investments.

Current Revenue Scenario Financial Summary

Table F-7 is a financial summary of the Current Revenue Scenario for both the bus and support system and transitway system investments.

Table F-7: Current Revenue Scenario Summary of Funded Investments (Year or Expenditure Dollars)

	2015-2024 (10 years)	**2025-2034** (10 years)	**2035-2040** (6 years)	**Total 2015-2040** (26 years)
Revenues	**$ 11,009 M**	**$ 11,548 M**	**$ 8,675 M**	**$ 31,232 M**
Bus and Support System Investments				
Existing				
Operating	$ 4,729 M	$ 6,261 M	$ 4,710 M	**$ 15,700 M**
Capital	$ 964 M	$ 1,107 M	$ 769 M	**$ 2,840 M**
Modernization	$ 107 M	$ 117 M	$ 81 M	**$ 305 M**

Expansion				
Operating	-	-	-	-
Capital[1]	$ 107 M	$ 117 M	$ 81 M	**$ 305 M**
Total Bus and Support System	**$ 5,907 M**	**$ 7,602 M**	**$ 5,641 M**	**$19,150 M**
Transitway System Investments				
Existing				
Operating	$ 982 M	$ 1,257 M	$ 917 M	**$ 3,156 M**
Capital	$ 107 M	$ 195 M	$ 136 M	**$ 438 M**
Expansion				
Operating	$ 398 M	$ 1,085 M	$ 792 M	**$ 2,275 M**
Capital Improvements	$ 144 M	-	-	**$ 144 M**
Transitway Projects:				
- CCLRT Debt and FTA Cash Flow	$ 192 M	$ 50 M	-	
- METRO Red Line Stage 2	$ 74 M	-	-	
- METRO Orange Line	$ 150 M	-	-	
- METRO Green Line Extension	$ 1,559 M	-	-	
- METRO Blue Line Extension	$ 999 M	-	-	
- Gateway Dedicated BRT[2]	$ 469 M	-	-	
- Snelling Ave. ABRT	$ 16 M	-	-	
- West 7th St. ABRT	$ 27 M	-	-	
- Penn Ave ABRT	$ 36 M	-	-	
- Chicago-Fremont ABRT	$ 49 M	$ 28 M	-	
Transitway System Expansion – Undesignated[3]	($ 100 M)[4]	$ 1,331 M	$ 1,188 M	**$ 2,419 M**
Total Transitway System	**$ 5,102 M**	**$ 3,947 M**	**$ 3,033 M**	**$ 12,082 M**
Total Investments – All Categories	**$ 11,009 M**	**$ 11,548 M**	**$ 8,675 M**	**$ 31,232 M**

[1] May include operating funding for initial start up of new services, typically up to three years.

[2] Contingent upon resolutions of support and commitments to local land use from local governments along the locally preferred alternative and commitment to addressing use of highway right-of-way in the DEIS process (see "Highway Investment Direction and Plan").

[3] Undesignated revenue primarily includes sales tax administered by CTIB and CMAQ and state bond funds. CTIB funds are expected to be committed to Phase I Program of Projects priorities that do not yet have an LPA. CMAQ and state bond funds are expected to fund future arterial BRT projects.

[4] Will be addressed through financing mechanisms in coordination with CTIB.

The following are the major financial conclusions of the Current Revenue Scenario.

- The region is able to operate and maintain the existing bus and support system.
- No expansion of bus service is available beyond the rapidly growing demand for Metro Mobility.

- There is limited capital expansion and modernization of the bus and support system facilities through preservation efforts and through competitive federal funds.
- The region is able to operate, maintain, and improve the existing transitways that include METRO Blue Line, METRO Green Line, METRO Red Line, and Northstar.
- In the first 10 years of the plan, funded transitway expansion will include building and operating four additional METRO lines, including the region's first dedicated BRT[1], and building three arterial BRT lines and beginning construction on a fourth.
- The region expects to invest at least an additional $2.4 billion in building and operating additional transitway expansion for CTIB Phase I Program of Projects and other acceleration opportunities. This is primarily funded with sales tax revenues and assumptions for future arterial BRT projects but may include additional matching funds as project plans are finalized.

Increased Revenue Scenario Financial Summary

The Increased Revenue Scenario is based on both analyzing the need to build out and expand the bus and support system and transitway system, and considering what might be an attainable level of new revenue for transit in the region. In 2012, the Governor's Transportation Finance Advisory Committee (TFAC) looked at this issue in detail and concluded that building a competitive regional economy would require approximately $5 billion to $5.8 billion in new metropolitan area transit revenue.

The Increased Revenue Scenario in this plan uses the TFAC level of financial need as a starting point, but also includes consideration of inflation (the TFAC recommendation was in constant 2015 dollars) and extending the time period to 2040 (TFAC was a 20-year analysis to 2032). As Table 21 indicates, the total estimated new revenue need for expanding the transit system is approximately $7 – 9 billion over the 26-year period of the plan. The $7 – 9 billion funding level could be attainable based on a half-cent metropolitan area sales tax increase that was explored through TFAC. But this funding level would not allow for changing funding shares of other transit partners (in other words, lowering the state or federal shares of a project or existing transit system operating costs).

Under the Increased Revenue Scenario, the funding need is estimated to be approximately 25% for bus and support system expansion and 75% for transitway system expansion. This is an average funding level over the 26-year period of the plan with the expectation that spending in any given year will be dependent on the identified expansion needs and costs of proposed projects.

[1] Contingent upon resolutions of support and commitments to local land use from local governments along the locally preferred alternative and commitment to addressing use of highway right-of-way in the DEIS process.

As indicated earlier, expansion of the bus system is only able to occur under the Increased Revenue Scenario – only very limited bus capital expansion is funded in the Current Revenue Scenario. Table F-8 shows that under a reasonable expansion of the bus and support system approximately $2 – 3 billion in additional revenue would be required between 2015 and 2040. This estimated level of funding need represents about an average of 1% increase per year in bus service. The capital costs associated with bus service expansion are also included. This level of funding would also provide for opportunities to modernize the existing bus system and provide for an improved overall customer experience.

The $5 – 6 billion estimate for transitway system expansion would likely allow the list of corridors in the transitway Increased Revenue Scenario to be fully implemented based on rough project estimates as they are known today. There is a level of uncertainty in the funding estimate because many transitway projects are still in planning, and because the need for operating revenue for transitways depends on the timing and type of projects that are implemented.

Table F-8: Increased Revenue Scenario Summary of Potential Revenues and Investments (Year or Expenditure Dollars)

	2015-2040 (26 years)
Revenues	**$ 7.0 – 9.0 billion**
Bus and Support System	**$ 2.0 – 3.0 billion**
Transitways	**$ 5.0 – 6.0 billion**

Bicycle and Pedestrian Investment Direction

Overview

Bicycling and walking are becoming increasingly important in the Twin Cities for commuting to work or school, running personal errands, and traveling to entertainment and activity venues. The 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 short trips.

Although bicycling can accommodate longer trips, walking still accounts for a higher percentage of all trips region wide (6.5%), than either biking (2%) or transit (3%) and is imperative to the start and end of trips by any mode. The high level of importance of both walking and biking to connect to the regional transit system should also be noted; there are many more residents who live within three miles of transit service (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 travel barriers like rivers, freeways, and rail corridors), walking and biking trips may continue to increase in volume and distance.

Based on bike and pedestrian counts recorded in 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 trails 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 11 million visits to the 300 miles of regional trail in 2012, which is a 69% increase over the past 10 years. Three Rivers Park District studies have shown that use by commuters has grown by about 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 is important to acknowledge that recreational bicycling is also growing, especially among young families, and that there is a corresponding need for protected or off-road bicycle facilities to accommodate less experienced cyclists. 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 especially effective as 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 pedestrian planning is integral to transportation planning for 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 transportation address pedestrian planning issues as they relate to state highway funding [*insert link to "Highway Investment Direction and Plan"*], connecting to the regional transit system [*insert link to "Transit Investment Direction and Plan"*], and to land use planning and urban design best practices [*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. Pedestrian facilities are still generally best planned at the local level, but bicycle trips are often long enough to cross municipal boundaries.

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 in much the same way local streets supplement principal and minor arterials for motor vehicles.

Proposed Regional Bicycle Transportation Network

Regional Bicycle System Study

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*].

A set of guiding principles for developing a regional bicycle transportation network was developed by a project advisory committee and reviewed in a series of public workshops in 2013. The guiding principles listed below were used to develop 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 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 Regional Bicycle Transportation Corridors (as identified in this plan) through the implementation of the Regional Bicycle Transportation Network 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, 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 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. 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 Racially Concentrated Areas of Poverty (RCAPs), the network will be able to offer equitable access to bicycling and the economic and opportunities and health benefits afforded by bicycle options.
- **Follow spacing guidelines that reflect established development and transportation patterns.** The Regional Bicycle Transportation Network 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 was developed to reflect local bicycle plans and policies that inform regional priorities.

Development of a Regional Bicycle Transportation Network

A number of available data sets and mapping systems were used as base inputs for developing a Regional Bicycle Transportation Network.

Cyclopath. Cyclopath is a local online bicycle route mapping tool developed by the University of Minnesota. The tool assists bicyclists to find suitable bicycle routes and enables users to provide feedback about the condition and connectivity of the existing bikeways network. The Cyclopath base network provided a valuable starting point for developing a "universe" of potential regional bicycle corridors because it included the street and highway network in its entirety, in addition to existing off-road trails. Cyclopath user route requests also provided a robust dataset of origins and destinations which was used to analyze bicycle demand in specific corridors. About 190 corridor segments were identified for the initial "universe" of potential bicycle corridors which were winnowed down to a set of corridors for a Regional Bicycle Transportation Network based on the analysis summarized below.

Regional Trails System. One important base input for identifying a Regional Bicycle Transportation Network was the network of existing and planned regional trails that are designated by the Metropolitan Council as part of the Regional Parks System. The Council oversees long range planning and provides funding assistance for the acquisition and development of regional parks and trails, which are owned and operated by ten regional park implementing agencies.

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. 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 a 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 discussed earlier [*insert link to Guiding Principles discussion*]. A geographic information systems (GIS) analysis was used to evaluate each potential corridor based on measures for each of the following 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 the bike study corridors development 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 by 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 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 final list of regional destinations.

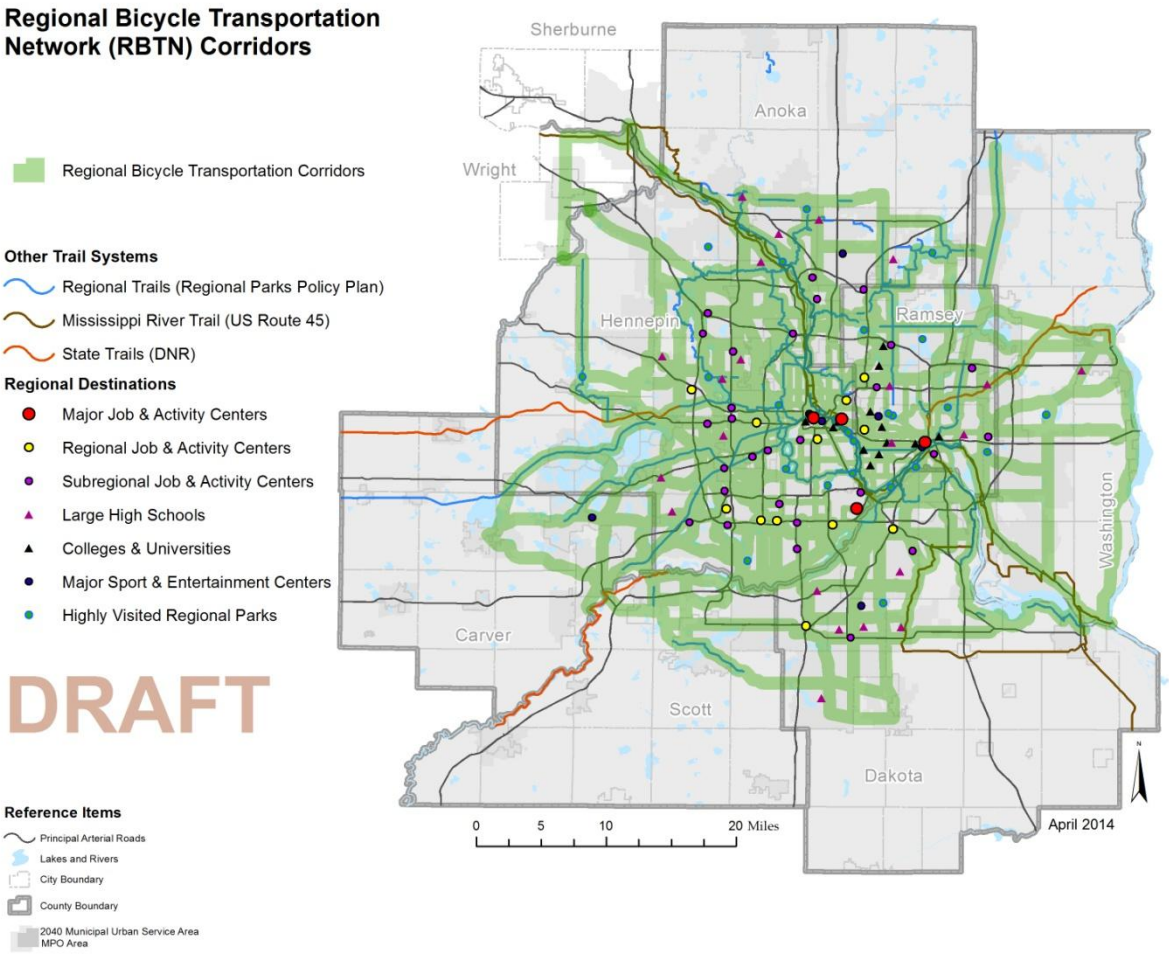
- ***Bicycle Travel Demand.*** The user route requests and cyclist origin and destination data collected via Cyclopath provided a great resource for estimating bicycle demand across the seven-county region.
- ***Connecting with Transit.*** The most meaningful connections between bicycle infrastructure 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 capacity 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 are closely matched to future population growth and distribution across the region.
- ***Regional System Equity.*** The relationship of the Regional Bicycle Transportation Network corridors to identified Racially Concentrated Areas of Poverty (RCAPs) 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

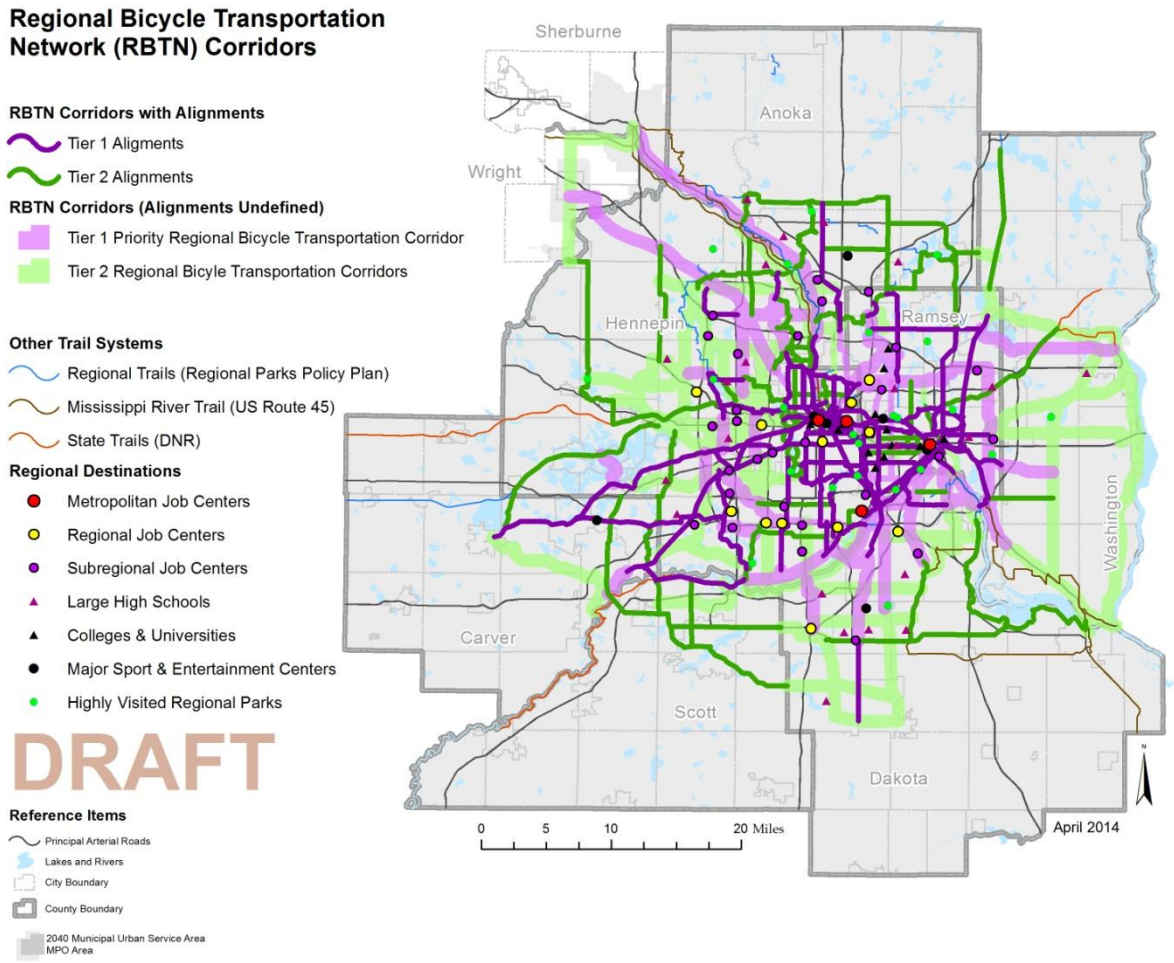
The intent of the proposed Regional Bicycle Transportation Network (Figure G-2) is to encourage planning and implementation of future bikeways by cities, counties, parks agencies, and the state that will integrate a seamless network of on-street bikeways and off-road trails to most effectively improve conditions for bicycle transportation at the regional level. The proposed bicycle network corridors shown in Figure G-1 are intended to serve as the "backbone" arterial system for biking in the region. The Regional Trails System is highlighted to depict its relationship to the Regional Bicycle Transportation Network corridors and also to highlight the overlap between bicycle recreation and bicycle transportation networks. Cities and counties are encouraged to plan and implement local bicycle facilities that connect their local bikeway networks to the regional network.

Figure G-1: Regional Bicycle Network and Regional Trails System



Priority Regional Bicycle Transportation Corridors are a subset of the Regional Bicycle Transportation Network and have been identified as the highest priority for regional planning and investment. The full Regional Bicycle Transportation Network with Priority Regional Bicycle Transportation Corridors is shown in Figure G-2. The priority corridors 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 single-occupant vehicles. High rates of usage, as well as current and planned population and employment densities, were heavily weighted in the analysis of corridors described earlier. These high priority corridors are considered Tier 1 corridors for implementation and investment (further described under investment priorities) [*insert link to Investment Direction*]. The remaining corridors in the overall Regional Bicycle Transportation Network are Tier 2 Regional Network Corridors; these corridors will be the second tier priority for regional planning and investment.

Figure G-2: Regional Bicycle Transportation Network with Priority Corridors



Defining Critical Bicycle Transportation Links

There are several types of barriers that can disrupt the connectivity of the Regional Bicycle Transportation Network and isolate communities and key destinations. The links overcoming these barriers are defined as Critical Bicycle Transportation Links.

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

- Serve to 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)
- 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 can be addressed by:

- Providing a missing link between improved segments of the Regional Bicycle Transportation Network.
- Improving bikeability within a Regional Bicycle Transportation Network 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 a minor arterial 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 a 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, and the overall bikeability and convenience of, local and regional bicycle systems.

Removing or Circumventing a Physical Barrier. Physical barriers to biking can be either natural or man-made and include major rail corridors, rivers and streams, and freeways or multi-lane highways. 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 useful parallel alternative within a reasonably bikeable distance.

By their nature, projects to remove physical barriers can prove particularly costly, and opportunities 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.

Implementing the Regional Bicycle Transportation Network

Local Planning for the Regional Bicycle Transportation Network and Regional Priority Bicycle Transportation Corridors

The broad regional network and priority corridors shown in Figure G-2 (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. In planning these alignments and developing specific projects, agencies

should consider all the guiding principles for regional bicycle corridors [*insert link to Guiding Principles discussion*] but with special attention to the following 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.
- **Facilitate safe and continuous trips to regional destinations.** Planning for the development of bicycle facilities along the Regional Bicycle Transportation Network, as well as for connections between the Regional Bicycle Transportation Network 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 from ages 8 to 80 with 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 even 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 conventional or buffered 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 assuring that scarce dollars for bicycle infrastructure can be efficiently invested to provide a complete regional network in a shorter timeframe.
- **Consider opportunities to enhance economic development.** When planning specific alignments for the regional bicycle corridors, local bicycle planners should work closely with their economic development and land use planners to identify opportunities 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 Network Alignments on Highways

While the region supports continuity for regional bicycle corridors and direct access to destinations located along highways, these desires need to be balanced with other, competing priorities including safety for all users, mobility for all transportation modes, and cyclist bikeability and convenience over a range of experience levels and preferences. This balance is especially needed on highways, including A-minor arterials without sufficient right of way to provide an off-road facility [*insert link to "Highway Investment Direction and Plan"*].

Some highways serve as the only practical and effective crossing over a major barrier (for example, a river, freeway, multi-lane highway, or railroad corridor). In these situations, 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, or limited right-of-way to provide designated on-street bicycle facilities, it will be appropriate to route the bicycle facility away from the highway when a nearby, parallel local street is available. Alternatively, regional transportation partners could work together to plan and build new, continuous bicycle facilities that cross barriers on local streets with less traffic and lower speeds, thereby accommodating 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. 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)

In addition to off-road trails, the following on-street bicycle facility types are suggested for projects to improve the Regional Bicycle Transportation Network and are listed in ascending order of complexity:

- **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 should be placed appropriately along the route.
- **Bicycle Boulevards:** In urban and some suburban areas, bicycle boulevards are an appropriate treatment to improve a designated regional bicycle corridor. Bike boulevards are low volume, lower speed streets and roadways that are designed to give cyclists priority over vehicles. These facilities typically apply relatively low-cost treatments, such as signs and pavement markings, and traffic speed and/or traffic volume management devices. Bicycle boulevards can be especially effective in providing a more bicycle-friendly alternative to a parallel running high volume arterial street or highway.

- **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 side of the street between the general traffic lane and right 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.
- **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 accommodate younger and less-experienced cyclists.
- **Cycle Tracks:** Cycle tracks are bicycle facilities that provide an exclusive travel lane and are physically-separated and protected from general traffic lanes, parking lanes and sidewalks. There are one-way and two-way cycle track designs and in areas where on-street parking is allowed, they are most typically placed between the parking lane and the sidewalk. Cycle tracks are usually developed in very urban and densely developed locations like commercial downtown districts in large cities.

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 or 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 annually will be available to the region through the TAP. Bicycle and pedestrian facilities are also eligible for funding under the federal Surface Transportation Program (STP) and the region has a history of funding larger bicycle facility projects using STP 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 funds available to the region through a biennial Regional Solicitation. As described in "Transportation Finance" [*insert link*], the solicitation is undergoing an evaluation and revisions to assure that it is consistent with the outcomes and principles of *Thrive MSP 2040*, the Transportation Policy Plan, and the requirements of MAP-21. The revised solicitation will allocate federal funds through three modal categories: roadway, transit and bicycle and pedestrian projects. Each solicitation will determine the amount of federal funds

spent in each of the modal categories; however, it is assumed that at a minimum the full amount of available TAP funds will be allocated to bicycle and pedestrian projects.

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 parks 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 trails and bikeways 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, 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. Between 1993 and 2011, there were about $204 million in stand-alone bicycle and pedestrian projects constructed with federal Regional Solicitation funds (for example, Transportation Enhancements and Surface Transportation Program funds). However, only about 37% of total project funding requests were implemented with this level of funding available over that time period.

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

Investment Direction

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.

The Transportation Advisory Board solicits applications for federal funding for these improvements from the Transportation Alternatives Program (TAP) and Surface Transportation Program (STP) and may 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.

Regional Bicycle Transportation Network

Projects proposed to enhance 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** (as previously shown in Figure G-2) 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** (also shown in Figure G-2) should be given the second highest priority for transportation investment. These corridors provide transportation connectivity to outlying regional destinations within

and beyond the urban/suburban areas and serve to connect priority regional bicycle transportation corridors.

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.

Other Key Investment Prioritization Factors for Pedestrian and Bicycle Projects

Opportunities for Pedestrian Improvements. 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, and 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 the use of persons with different physical abilities.
- Metropolitan, regional, and sub-regional job concentrations defined in *Thrive MSP 2040*

Safety. Evaluation criteria will favor infrastructure and operations 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 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.

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

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.

2040 Freight Investment Direction

Overview

The transportation of freight plays a critical role in supporting the region's economy, competitiveness, and quality of life, enabling the region to stand out as an important business and transportation hub. With a safe, efficient, reliable, and robust freight transportation system, the region's residents have access to the goods and materials they need to live and work, and businesses would not be able to distribute their products to customers or receive shipments needed to manufacture items.

As described in Part 1 of this plan, the growth of the Twin Cities region for the past 150 years has always been tied to its function as a major trade center. While the region does not carry a major share of national freight movement when compared to major shipping ports such as Los Angeles or rail hubs such as Chicago, the Twin Cities region is the primary freight hub for Minnesota and the upper Midwest. The metro region is a major distribution hub for goods produced and consumed in Minnesota, Wisconsin, North and South Dakota and eastern Montana. The region offers freight connections to national and international markets for businesses throughout Minnesota.

As a freight hub, the Twin Cities region is at the center of many of the mobility and access issues affecting the freight transportation system in Minnesota. Because of this broad reach, the Metropolitan Council does not plan for freight within the region by itself, but works closely with the Minnesota Department of Transportation (MnDOT) and other partners to ensure that the regional freight system continues to support a thriving and sustainable economy for the entire state and beyond.

The federal government's role in freight planning expanded in 2011 with the adoption of the surface transportation bill known as Moving Ahead for Progress in the 21st Century (MAP-21), which includes a new National Freight Policy, and provisions for a designated National Freight Network that will focus on improving freight roadway connections between major metropolitan areas. The Federal Highway Administration was also directed to establish freight system performance measures for states and regions to utilize such as truck travel time and reliability.

The Twin Cities region is fortunate to be served by four modes of freight transportation, each with its own role in moving goods into, out of, through and within the region. These modes include:

- **Roadways** serve freight carried in trucks, including long-haul trucks traveling through the region, connections to river ports and rail yards, direct truck service to and from distribution facilities and freight-generating industries such as manufacturers and processing plants, as well as deliveries to a variety of businesses and retail establishments and directly to consumers' homes.

- **Railroads** move a variety of commodities, especially heavy bulk goods and containerized freight. The region's railroads provide important local and regional connections to the national railroad network, serving national markets and coastal ports for international trade.
- **Barges** provide water transportation over the inland river system and offer less costly and higher-volume shipping options than other modes, which is particularly beneficial for long-distance bulk freight. A number of key industries rely on the affordability provided by water freight transportation.
- **Air** freight services allow regional businesses to ship low-weight, high-value and/or time-sensitive goods to both domestic and international markets.

Other chapters of this long-range plan explain the existing freight system in the region and future public investments to be made in two of these four freight modes, roadways and air. Many freight-related improvements will be the responsibility of private entities that own and operate the transportation modes and freight terminal facilities. Freight railroads are privately owned so each rail company makes its own plans for future infrastructure investments. The Army Corps of Engineers maintains and operates the Mississippi River waterway system, including the Minnesota River and St. Croix River, so the federal government is responsible for investment decisions on locks, dams, and channel dredging on these vital waterways.

Challenges and Opportunities

While Part 1 of this plan discussed general challenges and opportunities for transportation within the region, there are some challenges unique to the freight system.

Freight Capacity and Congestion

Economic and population growth in the metropolitan area continues to increase the amount of freight movement in the region. Deregulation of motor carriers and railroads have also added to the total amount of freight through increased competition and lowered shipping costs. Together, these forces will continue to increase the size of and need for an efficient freight transportation system.

All goods movement relies on a high-capacity freight transportation system. Freight shippers, carriers, and other users have expressed concern that the freight system is not adding capacity to meet growing freight needs in the region. Some freight modes are already hampered by an existing lack of capacity. In particular, truck movement in the region is impacted by recurring highway congestion, in addition to that caused by incidents such as weather and crashes. Freight motor carriers have taken steps to avoid driving in peak-congestion periods when possible, but the growing duration and extent of congested highways and local roads reduces the efficiency and competitiveness of the region's freight system. The significant growth of the Bakken oil field area in North Dakota and Montana has also caused significant congestion on the east-west rail mainlines through the northern part of the country. Undersized terminal

facilities, restrictive or outdated bridges, limited track capacity, and a lack of options for alternative routes and interchanges also contribute to rail congestion.

High Fuel Costs

The cost of fuel used in freight movement, including diesel and jet fuel, has varied but generally has increased in recent years. Some goods movement may shift from trucks to (comparatively fuel-efficient) rail or barge modes, but limited rail and waterway coverage to national markets and few intermodal terminal connections may dampen any shift away from trucks. In addition, Class I railroads in the region are already operating near capacity on some corridors.

Demand for ethanol as a passenger automobile fuel has also grown as gasoline prices spiked in recent years. Since Minnesota is a leading producer of ethanol, significant quantities of ethanol must be transported through the state. Ethanol is a caustic fuel that cannot be transported by pipeline, so shipment of ethanol places further demand on limited rail and highway capacity within the state and the metro region.

Connectivity

Freight connectivity is another issue in the region. Some major freight truck and intermodal terminals within the region have poor connections to major highways. Although the metropolitan highway system is designed for loads of 10-tons per axle, some of the rural areas within the seven-county region have an underdeveloped 10-ton road network. These roads are important for freight connections from farms and other businesses in rural areas in the region.

Exacerbating the connectivity issue is the steady growth of large semi trucks for expanded parcel and local delivery networks. Many minor arterials and collector streets in the urbanized area were designed for smaller delivery trucks, and newer traffic control strategies like roundabouts and curb bump-outs are not always designed with consideration for the turning radius needs of these larger trucks.

Freight Safety

Increased concern over safety affects the freight system. Trucking is a regulated industry with strict operating rules that improve safety for freight movement and motorists, but continued enforcement and inspection of vehicles, a state responsibility, is critical to ensuring safe roads, bridges, and highways. Trucking companies develop and implement driver training and apply performance measures to monitor safety and compliance with regulations.

For railroads, safety is also a primary consideration. While the rail freight industry enjoys lower accident and fatality rates than the truck industry, rail accidents are high-profile events with serious liability concerns for the railroad and safety concerns for the public and railroad employees. The recent surge of highly volatile Bakken crude oil moving in unit trains through the region has multiplied the possible risks involved in this essential transport, with eight daily trains by early 2014 and more expected in the future.

To improve rail safety, the Federal Railroad Administration has developed a National Rail Safety Action Plan. The plan identifies a number of possible actions for the nation's freight and passenger railroads to improve safety, including the implementation of grade-crossing improvements, application of in-vehicle safety devices, and strengthening railcars used in transporting hazardous materials. New technologies and careful routing will allow railroads to identify potential risk factors and make routing decisions that maximize rail safety.

Finally, adequate right-of-way adjacent to rail tracks is an important safety feature to provide a clear space in the event of a derailment or material spill. Encroachment on rail property by adjacent properties or other interests increases the risk of accident and injury.

Freight Security

Security is a major concern in freight transportation. Security includes the protection of goods and commodities as well as safeguards against potential threats of terrorism. Nationwide, initiatives to improve freight security have included electronic tracking of shipments, sealed freight containers, vehicle-tracking technologies, and inspection of vehicles at security-sensitive facilities and destinations.

Rail trespassing is a safety concern as well as a security concern. Rail bridges and corridors are sometimes attractive (though illegal) shortcuts for pedestrians and cyclists, with sometimes fatal results. Nationally, over 500 people die each year in railroad trespass-related incidents. In Minnesota, more people die from pedestrian/rail accidents than from vehicular/rail accidents. Unlike the policies in 48 other states, state and local law enforcement statutes in Minnesota do not support railroad policing of their own property to address this problem.

Rail is also the mode of choice for many hazardous materials, including dangerous chemicals and nuclear material, and rail trespassers pose a security threat to these shipments.

Freight Terminals and Adjacent Land Uses

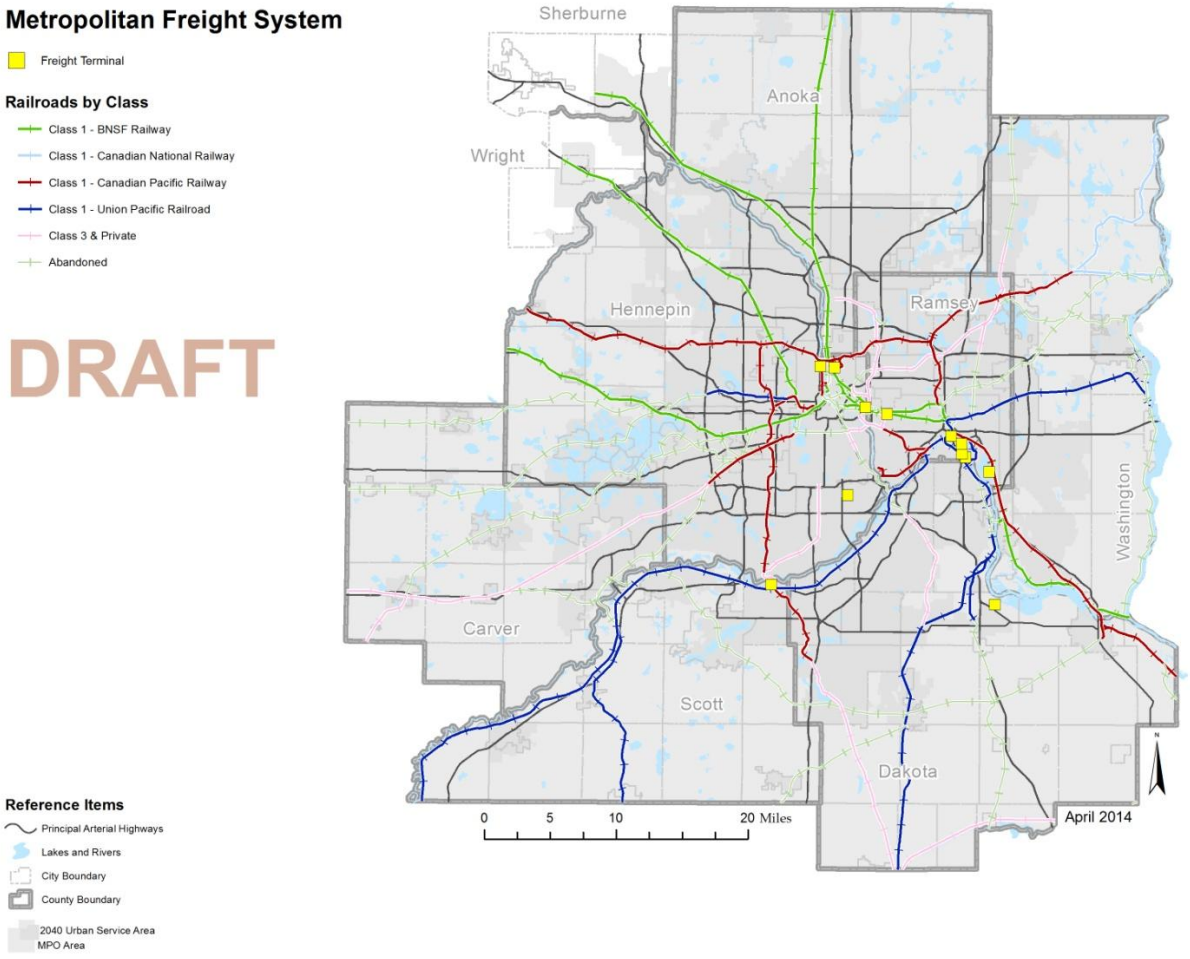
Trucking terminals can be located in a wide variety of locations, as long as they have roadway connections, and are often specifically located in industrial areas to be near potential shippers and away from housing and other incompatible land uses. However, terminals for rail and barge freight modes are limited to locations which are adjacent to a navigable river or a rail line. Over the last few decades in the Twin Cities there has been increasing competition for land adjacent to the Mississippi River system. Many industrial uses have been redeveloped into residential or park land as demand for industry adjacent to the river has declined. The Mississippi River Critical Area identifies an Urban Diversified district whose purpose is to maintain the present diversity of uses, including the transportation use of the river. However, some cities report that there has been pressure from regulators to constrain these historic and important industrial uses. The Council will continue to work with local units of government, the Department of Natural Resources and park agencies to balance these various uses, as there remains a need for

freight activities adjacent to the rivers, especially in Saint Paul and the Savage/Burnsville areas on the Minnesota River, to handle commodities that are most efficiently carried by water.

To address congestion, environmental impacts, and the state's competitiveness, railroads remain a viable alternative for many of our transportation needs. One train can take over 400 trucks off the highway system, at one-fifth of the fuel use and one-third of the cost. However, the growth of intermodal rail/truck movement over the past three decades has also increased conflicts between the rail intermodal container terminals and adjacent residential neighborhoods. This is of particular concern in the Shoreham area of northeast Minneapolis and the midway area of Saint Paul.

The Council will continue to work with MnDOT to study ways to minimize the external impacts of these essential freight activities. With respect to the inherent tension between industrial and residential/commercial uses, it is worthy to note that railroad operations are unique in that, as interstate common carriers, they are regulated by the federal government and not by state and local governments. However, local governments do retain powers over the truck traffic generated by these terminals through local police powers (including traffic routing), land use zoning, and the design, construction, and maintenance of highway connectors.

Figure H-1: Freight Terminals and Infrastructure



Future Direction of Freight by Mode

Trucks on Roadways

Within this region, freight will continue to move primarily by truck. Many freight shippers and commercial/industrial land uses are located adjacent to the region's principal arterials, all of which are National Highway System (NHS) routes, allowing trucks direct and convenient access to safe, high speed travel corridors. The Interstate System in particular, is vital to the movement of freight and goods through and within the region, although a significant amount of freight also uses A-minor arterials, especially for local travel and deliveries within the region.

This *2040 Transportation Policy Plan* includes a "Highway Investment Direction and Plan" that focuses its limited financial resources in general categories [*insert link*]. Investments in all of these areas will benefit truck movements on highways.

Operations and maintenance are critical, especially snow removal to assure timely all-weather freight delivery. Rebuilding and replacing both bridges and pavement is very important for freight movement. Bridges which have weight restrictions caused by their poor condition can greatly affect trucks, which may have to spend a significant amount of time and fuel costs detouring to alternative crossings. Recent freight research with businesses in western Minnesota showed that poor pavement quality can cause significant damage to cargo such as precision instruments and high tech machinery, in addition to damaging the truck itself.

Regional mobility improvements are also important for trucks. The implementation of traffic management technologies on regional highways, such as traveler information systems, incidence response programs, traffic signal operations and coordination, queue warning systems, and the dynamic rerouting of trucks along congested corridors may reduce breakdowns in traffic flow. These in turn will benefit freight by maintaining delivery schedules and improving safety for trucks and other vehicles.

Implementing spot mobility improvements will also be critical to relieving congestion. Some of these improvements, like truck climbing lanes and auxiliary lanes between freeway interchanges, can alleviate some of the specific congestion problems trucks can create for other vehicles when accelerating up to the same speed as general traffic.

The highway investment plan also calls for the development of a system of MnPASS lanes such as those already developed along I-394 and I-35W. While the planned network of MnPASS lanes on the freeway system is not based directly on specific freight-related congestion points, implementing managed lanes will have multiple benefits to local and regional freight moved by truck. MnPASS lanes will directly benefit shipments by single-unit commercial vehicles (dual-axle trucks less than 26,000 pounds), vans, pickups and courier cars because those vehicles are allowed to “buy in” to the lane to receive the benefit of an uncongested trip. These vehicles are already using the I-394 and I-35W MnPASS lanes and this practice will likely continue for future MnPASS corridors. This is especially beneficial to air freight companies like Fed Ex and UPS which transport freight for the biomedical, high-tech and other industries that rely on expedited deliveries of high-value, time-sensitive products.

The development of a MnPASS network may also benefit traditional freight movements by large trucks because MnPASS lanes can free up capacity and increase traffic flow in adjacent general purpose lanes. By delaying the frequency and reducing the duration of breakdowns in general purpose lanes, the total hours of corridor congestion can be minimized, thereby improving conditions for moving freight.

Funds for strategic capacity improvements are limited, but the highway investment plan does specify that highway improvements that would provide access to job centers and/or freight terminals may be considered for potential investment.

Rail and Intermodal

There has been a surge in rail traffic in and through the Twin Cities area in the last five years due to the development of the Bakken oil fields in North Dakota and eastern Montana. The Bakken area has very few pipelines but is served by the BNSF and CP Railroads, which enable oil to be shipped through the Twin Cities to Chicago and points east via rail. Westbound shipments to the Bakken area include sand used for hydraulic fracturing of the wells, much of which originates in Wisconsin and southeastern Minnesota and thus must travel through the Twin Cities to North Dakota.

Since new pipeline construction involves a long process of design, permitting, and construction, and the oilfields are substantial enough to support many years of significant production growth as well as decades of continued production, this heavy demand for rail transport is expected to continue. The railroads, especially the Burlington Northern Santa Fe, will continue to make investments in the system to resolve the delays caused by this significant new commodity movement. These investments will also be critical to passenger rail movements to and within the Twin Cities as these delays are impacting Amtrak and Northstar passenger rail performance as well as freight rail performance for other goods.

The safety of this Bakken crude-by-rail flow has also caused an associated concern for community safety in the region. Bakken crude is a highly volatile material, classified by the U.S. Department of Transportation as a hazardous material requiring specialized testing, handling, and rail equipment regulated by the Federal Railroad Administration (FRA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA).

The volume of these crude oil shipments has increased the amount of hazardous material moving by rail in the metro region 400%, and may increase further since the Twin Cities is a key gateway from North Dakota to the refineries in the East. This has heightened the need for rail safety measures and inspections, better emergency response training for local fire and police departments, and a renewed emphasis for planning sufficient spatial separation between transportation and industrial corridors and residential and employment concentrations.

Rail traffic also includes container-based shipping which has substantially increased the efficiency of goods movement since containers can be moved between modes without the need to repack goods. The region's two primary rail-truck intermodal terminals, the Canadian Pacific Shoreham Yard in Minneapolis and the Burlington Northern Santa Fe Midway Hub in Saint Paul are operating near full capacity. Physical restrictions at these current sites have translated to growing congestion in their operations, in turn raising rates for containers destined to or originating from the Twin Cities, and driving container transloading to compete with facilities as far away as Chicago and Kansas City. This has resulted in additional truck traffic, especially on the interstate highways, in the metro area and the Upper Midwest.

While the Canadian Pacific, the Burlington Northern Santa Fe, and the Union Pacific are all considering intermodal terminal facility expansions, the status of Minneapolis/Saint Paul as a

second tier destination for container traffic in the eyes of major shipping lines has delayed planning and investment. Public/private initiatives, including those of Export MSP and the Minnesota Grain Shippers Association, are working to develop a solution; these efforts are consistent with the regional outcomes expressed in the *Thrive MSP 2040* emphasis on economic competitiveness.

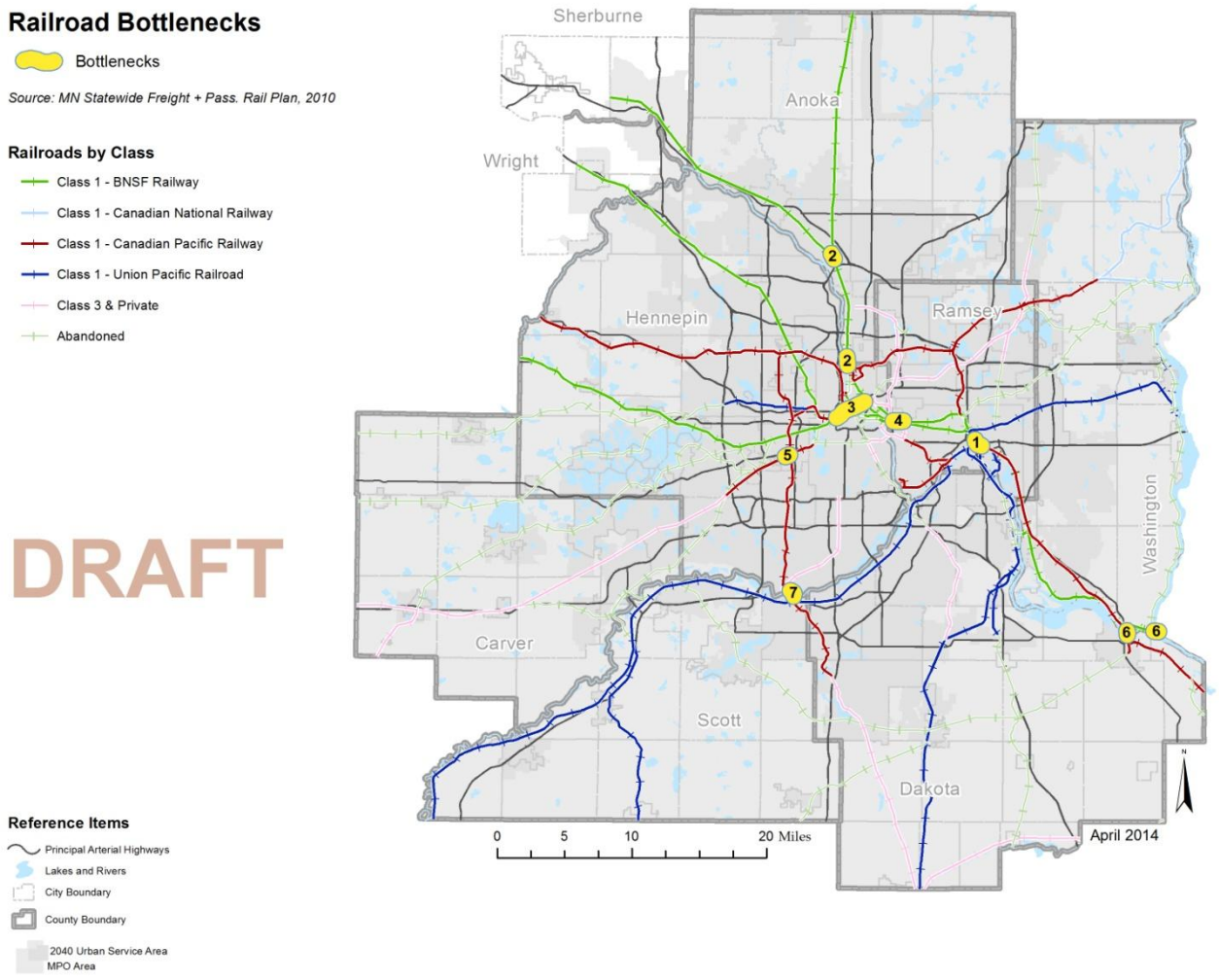
The *Minnesota Comprehensive Statewide Freight and Passenger Rail Plan* (2010), prepared in cooperation with the Council, has also identified a list of significant rail bottlenecks in the metro region as shown in Figure H-2, including virtually all the river crossings and several yards and junctions. The foremost bottleneck is Hoffman Junction, in the Dayton's Bluff area east of downtown Saint Paul. This junction handles up to 120 freight train movements daily, as well as Amtrak passenger rail with its access to Saint Paul Union Depot. Six railroads regularly operate in parallel through this network and handle freight at several nearby rail yards. This confluence of track also directly serves the Port of Saint Paul. Five percent of the entire nation's rail traffic travels through this single junction on a daily basis. This traffic is expected to grow by 40% through 2030.

After completion of the State Rail Plan, Ramsey County Regional Railroad Authority commissioned the *East Metro Rail Capacity Study* (2012) that outlines a phased framework for public and private expansion for this rail complex over the next 20 years to handle this projected growth in rail traffic. The Council cooperated in this project and supports the continued project development concepts outlined in the study, including cooperative planning with the partner railroads and supporting applications for federal and state funding for the public portions of the project work.

A significant recent trend regarding the regional freight rail system is that there is, and will continue to be, greater competition between freight and passenger demands for rail service within the limited capacity constraints of established freight rail corridors. Rail studies and planning similar to that done in Hoffman Junction will be needed in other sub-areas and corridors of the region before potential expansions and additions to passenger rail service.

As a result of the state’s vision for enhanced and expanded passenger rail service in corridors shared with freight rail operations, there is a need for long-term partnering between public agencies and rail carriers to plan, fund, and implement rail system improvements that will achieve public sector goals for passenger rail transportation while maintaining the ability of the private railroads to safely operate existing and future freight rail service.

Figure H-2: Railroad System Bottlenecks



Considering the potential growth in freight and passenger rail, communities with rail corridors should expect continued and potentially increased railroad operations. The Metropolitan Council will work with its partners to preserve linear rights-of-way for transportation purposes in the event any rail line is abandoned, if appropriate to do so. However, about half of the railroad mileage that existed in the Metro area in 1990 has since been abandoned and few excess or redundant lines remain in the system, so communities should expect few additional railroad abandonments.

River Barges

The region's river port terminals are currently concentrated in Saint Paul and Minneapolis along the Mississippi river, and in Savage/Burnsville on the Minnesota River. Some are private terminals on private land, while others are private terminals on land leased from the City of Minneapolis and the Saint Paul Port Authority. The head of navigation on the Mississippi was

traditionally at St Paul, but construction of the Upper Lock at St Anthony Falls allowed development of the Minneapolis Upper Harbor in north Minneapolis in the 1960s. In recent years, traffic through the St. Anthony locks has been below a million tons each year, leading Minneapolis to close their Public Terminal, one of three users in the Upper Harbor. The Army Corps threshold for a lock closure on a tributary, or at the end of navigation, has typically been 1 million tons, which is not currently achieved by these remaining businesses, and in spring of 2014, Congressed passed the Water Resources Reform and Development Act of 2014, which requires that the Upper Lock close by spring 2015.

Thus, Saint Paul and Savage will be the only remaining riverport terminal areas in the region, making preservation of riverfront land for barge terminals increasingly important in those areas, especially in Saint Paul. Saint Paul is expected to continue as the single largest river traffic generator on the Upper Mississippi above St. Louis, and in 2013, for the first time, the port handled more cargo inbound to the Twin Cities than outbound, reflecting growth and diversification in the commodities being handled by this mode.

Air

The freight terminal area of Minneapolis-Saint Paul International Airport was relocated and rebuilt during the last decade when construction of the new north-south runway displaced the previous freight area. The new area is conveniently accessed off of State Highway 77 at 66th street, and can also be reached via secured access onto the airport property near 34th Avenue and Post Road. The interchange at I-494 and 34th Avenue was rebuilt in 2013. Due to these recent upgrades there are currently no plans for future major investment in air freight facilities during the next 20 years, although there may be minor improvements for freight resulting from ongoing upgrades to the airfield and passenger facilities.

Previous Freight Planning Activities

Several previous plans influenced the development of this regional freight section and provide more detail on the expected future of freight in the region. The *Minnesota Statewide Freight Plan* (MnDOT, 2005, http://www.dot.state.mn.us/ofrw/PDF/MN_SFP_Final_Report_05.pdf) identified freight transportation system deficiencies and provided a policy framework and a set of recommendations for planning and programming solutions.

The *Minnesota Comprehensive Statewide Freight and Passenger Rail Plan* (2010) provides additional guidance for rail initiatives and investments, including a vision for effective utilization of the rail network and its future development, and identified rail bottlenecks in the region.

The *Statewide Multimodal Transportation Plan* adopted by MnDOT in 2012 encourages greater accessibility and more efficient movement of goods throughout the Twin Cities metropolitan area and Minnesota (http://www.dot.state.mn.us/minnesotago/SMTP.html). It aims to improve freight operations and connections for better access to the transportation system and to define priority networks for all modes based on connectivity and accessibility.

In 2013, MnDOT completed the first-ever Minnesota *Statewide Ports and Waterways Plan* (http://www.dot.state.mn.us/ofrw/waterways/pwp.html). The plan includes an overview and history of Minnesota's waterways, industry shipper profiles, and an inventory of facility conditions for metro region ports and locks, as well as for facilities throughout the state's Mississippi River navigable waterway.

In addition to these plans, the *Twin Cities Metropolitan Region Freight Study* (http://www.dot.state.mn.us/ofrw/freight/metrofreightstudy.htm) completed jointly by MnDOT and the Council in 2013, provides more details about freight in the region.

Aviation Plan and Investments

Overview

Aviation connects the Twin Cities region to the rest of the nation and the world beyond. Although federal law does not require that a region's long-range transportation plan include an aviation element, state law defines aviation as a metropolitan system and requires the Council to prepare an aviation system plan.

Minnesota Statutes (473.145) directs the Council to prepare a metropolitan development guide that addresses "… the necessity for and location of airports…" More specifically, Minnesota Statutes 473.146, subd. 3.8 requires the Council to adopt a long-range comprehensive transportation policy Plan that includes "a long-range assessment of air transportation trends and factors that may affect airport development in the metropolitan area and policies and strategies that will ensure a comprehensive, coordinated, and timely investigation and evaluation of alternatives for airport development."

The Twin Cities Regional Aviation System is a well developed aviation system that requires continued protection, maintenance, and enhancements to support the Twin Cities economy and transportation infrastructure. The Twin Cities region is served by one major airport with commercial air service − Minneapolis-Saint Paul International Airport − and seven reliever airports for general aviation, business and recreational users. Also parts of the system are two seaplane bases and a turf runway airport. The airports are classified according to their role within the regional aviation system as a Major, Intermediate, Minor or Special Purpose facility. Most of the system airports are part of the National Plan of Integrated Airports (NPIAS), which makes them eligible for federal and state funding.

Minneapolis-Saint Paul International Airport, as a hub serving the Upper Midwest, handled over 33 million passengers, 425,000 aircraft operations and 198,000 metric tons of cargo in 2012. The relievers handled approximately 340,000 aircraft operations in 2013. The regional airports are working reasonably well; long-term comprehensive plans for all of the individual airports are updated periodically to detail specific needs for preservation and expansion. These plans need to be consistent with system policies and plans, but they also inform future system planning.

Roles and Responsibilities

Aviation roles and responsibilities vary between various levels of government. Federal, state, regional and local units include the Federal Aviation Administration (FAA) of the U.S. Department of Transportation (US DOT), MnDOT's Office of Aeronautics, the Metropolitan Council, Metropolitan Airports Commission (which owns most of the system airports) and other airport owners/operators, such as the Cities of South St. Paul and Forest Lake. The role of the

federal government in aviation is especially worth noting, as it is significantly different from the federal role in other transportation modes like transit and highways, where it is primarily the funder of facilities owned and operated by others.

Federal Aviation Administration – a division of US DOT – is charged with:

- providing design standards for all public airports developed with federal funds
- prioritizing planning and investments funded under the Airport Improvement Program
- regulating civil aviation activities within national airspace, including navigation and air traffic control
- preparing national airports and airspace plans
- licensing pilots
- certifying aircraft
- approving airport plans, and environmental mitigation programs.

MnDOT – Office of Aeronautics – is charged with:

- promoting aviation service in and through the state
- preparing/maintaining a state airport system plan
- providing input to federal government on Minnesota aviation needs. and
- providing safety, financial, technical and regulatory services to airports and users.

Metropolitan Council is charged with:

- preparing a guide for the orderly and economic development, private and public, of the Twin Cities area
- prepares and maintains a regional aviation system plan
- reviews MAC's airport, environmental and capital plans/programs
- reviews community plans and public/private projects for compatibility with regional airports and aviation policies
- provides coordination, funding and technical assistance.

Metropolitan Airports Commission is charged with:

- promoting aviation
- owning major and most reliever airports in metro area
- operating those airports on a day-to-day basis
- preparing plans and implements projects for individual airports under its jurisdiction
- managing noise mitigation program.

The Metropolitan Airports Commission was established by the state to operate the region's airports in the 1940s, long before the establishment of the Metropolitan Council in 1967.

Other airport owners/operators – Forest Lake and South St. Paul also own and operate reliever airports in the region. South St. Paul is a long-established airport, while the Forest Lake facility was started as a private airport with turf runways, but is now owned by the City. Two private special-purpose airports (private seaplane bases) remain in the region.

Statutory directives establish oversight, plan review, and coordination requirements for the Council, communities, Metropolitan Airports Commission and other governmental units, as follows:

Minn. Stat. 473.181, 611, 616, 655. MAC plans and development must be consistent with the Council's metropolitan development guide. This statute directs an airport operating authority to recognize the broader goals, policies, processes established by a multi-purpose entity.

Minn.Stat. 473.641, 653. MAC shall not take actions that change Council classifications of airports. This indicates that a system plan is a legal document, and that roles and functions of facilities established in an adopted plan cannot occur without due process.

Minn. Stat. 473.165. Council reviews and approves all long-term airport plans of the MAC. This is a statutory requirement specific to the MAC and contained in both Council and MAC enabling laws.

Minn. Stat. 473.171. Council reviews applications for federal or state funds. This occurs when the Council reviews the MAC's annual capital improvement program and reviews MnDOT Aeronautics' five-year capital improvement program.

Minn. Stat. 473.621. Council reviews, and in some cases must approve, certain projects of the MAC annual capital improvement program.

Minn. Stat. 473.175, 851, 872. Communities are required to prepare comprehensive land use plans for Council review and, if necessary, modification.

Minn. Stat. 473.192. Provides authority to communities to adopt and enforce ordinances and controls to implement the Council's land use compatibility guidelines for aircraft noise.

Airport Classifications, System Role, and Function

All airports are subject to the rules of airspace sovereignty and federal government controls. Airports in the metropolitan and state system are part of a national plan of integrated airport systems, and are classified according to their role and function in the particular system. The role and function of an airport within the overall system is an important policy and technical step in the aviation planning process.

While a region typically has only one or two commercial service airports, a series of reliever airports geographically distributed around the region is needed to provide facilities that "relieve" demand for smaller planes to use the larger commercial airports. General aviation aircraft users are restricted by policy at Minneapolis-Saint Paul International Airport and general aviation users, especially for small piston-powered aircraft, are constrained by landing fee costs and air-traffic control requirements. General aviation users are encouraged to use the

reliever airports, and improvements at those airports are intended to attract these users away from Minneapolis-Saint Paul International Airport.

Airports in the Twin Cities Regional Airport System are classified by a number of different methods. Table I-1 summarizes the roles of the various airports in the regional system.

- At a national level, many of these airports are classified in the FAA's National Plan of Integrated Airport Systems (NPIAS).
- Minnesota has a state level classification method, applied to all system airports in the state, as defined in Commissioner's Order Number 587, Order Amending the Airport System of the State of Minnesota, October 30, 2003. State plans usually include more airports than the national plan.
- The Metropolitan Council uses a separate system in this Regional Aviation System Plan to reflect metropolitan region airport considerations.

Table I-1: Airport Classifications

Airport	Federal NPIAS	State	Regional
MSP International	Commercial Service - Primary	Key	Major
Saint Paul Downtown	Reliever	Key	Intermediate
Flying Cloud	Reliever	Key	Minor
Anoka County-Blaine	Reliever	Key	Minor
Crystal	Reliever	Intermediate	Minor
Lake Elmo	Reliever	Intermediate	Minor
Airlake	Reliever	Intermediate	Minor
South Saint Paul	Reliever	Intermediate	Minor
Forest Lake	N/A	Landing Strip	Minor

Periodic re-evaluation is necessary to see if the system has the right type of airports, in locations providing the right type and level of services in a cost-effective and compatible manner.

The advent of the very light business jets, in addition to the growth of the existing larger-scale corporate business aircraft fleet and increasing fractional ownership, is the main driver of growth in general aviation. Thus, plans and investments have gone forward at Saint Paul Downtown, Anoka County-Blaine, and Flying Cloud airports that upgrade capabilities for the business users. Continued emphasis on business jet aircraft at these minor airports is recognized in the airport's designated role and investment needs.

In 2009 a regional aviation system technical report was completed that included aviation forecasts and a review of all categories, including a peer review of the role and number of reliever airports in this region against similar metropolitan areas. The analysis concluded that no changes are necessary to regional airport classifications or system roles. Table I-2 summarizes the characteristics of the various airports in the regional system.

Table I-2: Airport Functional and Operational Characteristics/Classification of Metro Region Airport System Facilities

Facility Classification	Functional Characteristics			Operational Characteristics		Airport Compatibility Area *
	System Role	Users Accommodated	Air - Service Access Provided	Primary Runway Length	Instrumentation Capability	Compatibility Considerations
Major Airport						Airport Compatibility Area requirements for airport system functioning: Regional Airspace Protection Airport Airspace and land use safety zoning Land Use Guidelines for Aircraft Noise Local Infrastructure and Services Sewer Service Water Service Storm Water Road Access Police-Fire Non-Aviation Users
MSP International	Commercial Air Service Hub	Scheduled Passenger & Cargo, Charter, Air Taxi, Corporate G.A., Military	International, National, Multi-State, Regional	8,001 - 12,000 ft, Paved	Precision	
Intermediate Airport						
Saint Paul Downtown	Corporate Jet Reliever	Air Charter, Air Taxi, Corporate Jet, Military, G.A.	International, National, Multi-State, Regional	5,001 - 8,000 ft, Paved	Precision	
Minor Airport						
Anoka Co. -Blaine	Business Jet Reliever	Air Taxi, Business Jet	Nat'l./Multi-State	5,000 ft, Paved	Precision	
Flying Cloud	Business Jet Reliever	Air Taxi, Business Jet	Nat'l./Multi-State	5,000 ft, Paved	Precision	
Airlake	G.A. Reliever	Rec./Training/Business	Multi-State/State	4,098 ft, Paved	Precision	
South Saint Paul	G.A. Reliever	Rec./Training/Business	Multi-State/State	4,001 ft, Paved	Non-Precision	
Crystal	G.A. Reliever	Rec./Training/Business	Multi-State/State	3,263 ft, Paved	Non-Precision	
Lake Elmo	G.A. Reliever	Rec./Training/Business	Multi-State/State	2,850 ft, Paved	Non-Precision	
Special Purpose						
Forest Lake Airport	Recreational/ Business	Recreation/Training	State, Region	2,650 ft Turf	Visual	Variable by Facility
Surfside Seaplane Base	Recreational/ Business	Rec./Training/Per. Bus.	Multi-State/State	6,500 ft Water	Visual	
Wipline Seaplane Base	Recreational/ Business	Training/Business	Nat'l/Multi-State	8,000 ft Water	Visual	
Hospital Heliports	Emergency Services	Business	State, Regional	Variable by facility	Variable by facility	

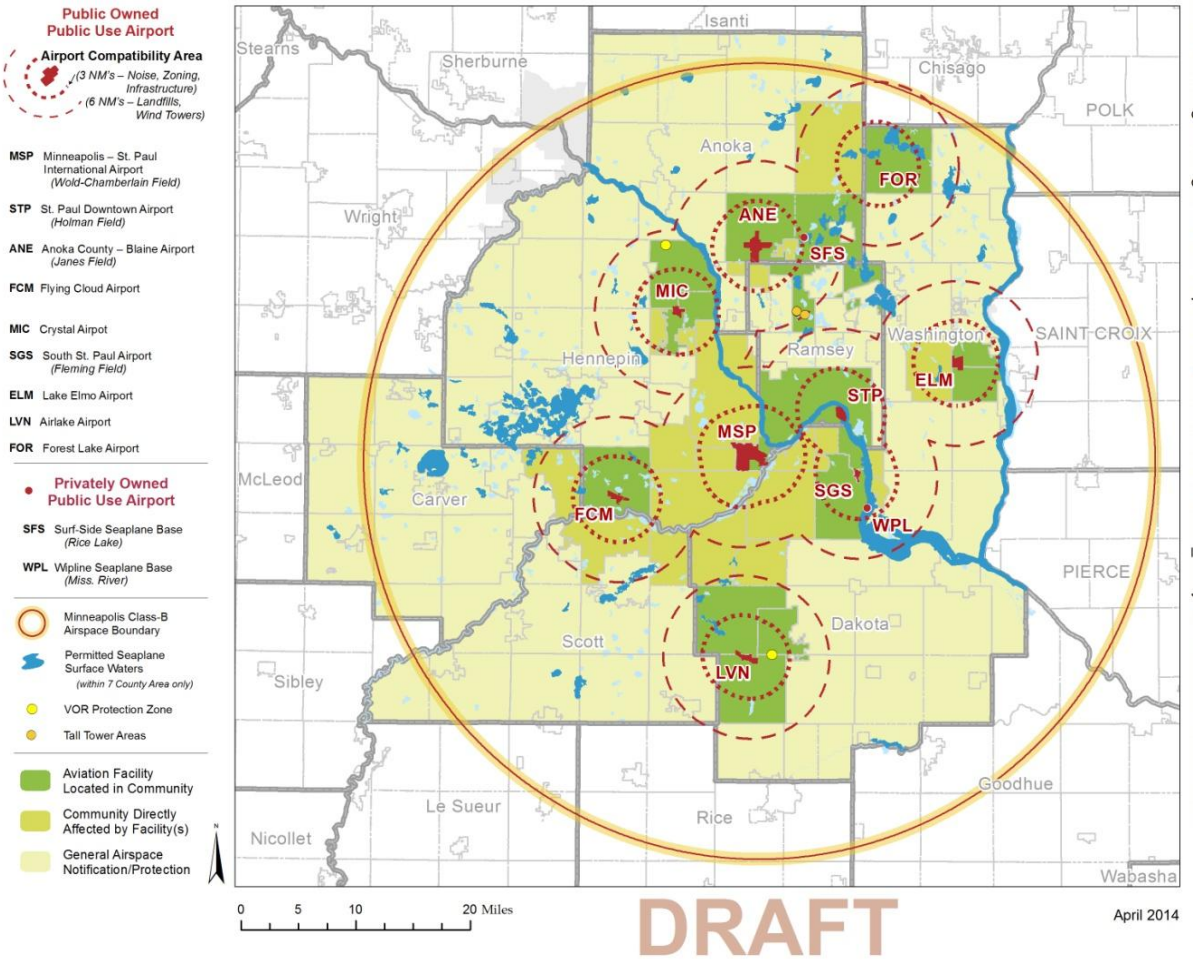
*Airport Compatibility Area is defined as a radius area 3 nautical miles and 6 nautical miles off the ends of the existing and planned runways of the nearest system airport; within 3 nautical miles it addresses general land use compatibility issues, and out to 6nm it also addresses sanitary landfills, and wind-generation facilities.

Airport Service Areas

Accessibility, both by air and ground access to the airport, is important to efficient use of air transportation. While the region has only one major commercial airport, the regional system of minor airports reflects the region's geographic distribution of urban development, population and employment patterns to maximize economic benefits.

Thrive MSP 2040 provides forecasts for when and where growth is likely to occur, including type and density of development. The region is well served by a geographically dispersed pattern of long-established Minor airports. Airport service areas have been identified for the Major, Intermediate and Minor system airports, shown in Figure I-1. Based on Thrive forecasts, no new general aviation airports are proposed. Public airports in the collar counties would provide future capacity for growing areas on the edge of the seven-county region.

Figure I-1: Airport Service Areas



Airport Capacity

Capacity of the regional aviation system is usually determined by several interrelated components: the airspace structure and facilities, airport airside facilities, airport landside facilities and aircraft mix.

Airside Capacity

Airside facilities include runways, taxiways, and aprons for the movement and parking of aircraft. Airside capacity is determined by various factors including prevailing wind, orientation of runways to the winds and to each other if multiple runways, number and type of taxiways, mix of aircraft using the airport, operational characteristics of the based aircraft, and weather conditions. The FAA has established a definition of general airport capacity called the annual service volume (ASV) that takes these variables into account for each particular airport. The ASV for a given airport is the annual level of aircraft operations that can be accommodated with minimal delay. For airports with operations below the ASV, delay is minimal, usually less than four minutes per operation. Delay levels above four minutes can result in rapidly increased congestion, operating costs and increased operational complexities.

FAA recommends that planning for improvements begin when an airport is projected to reach 60% of ASV; when an airport's operations reach about 80% of ASV project programming and implementation should be initiated. Airside development capacity additions are likely to come from a combination of runway improvements, air-traffic management procedures/equipment and aircraft on-board technology improvements under the FAA NextGen airport capacity program.

Current long-term comprehensive plans for the reliever airports indicate airside capacity in those airports is adequate. At Crystal airport, two runways are in the process of being closed; however, the airport itself is still needed as it contributes to overall system capacity and geographic balance among the reliever airport service areas.

Landside Capacity

The capacity of an airport's landside facilities usually refers to the number of gates and parking aprons at the Major and Intermediate airports, and the number of hangar spaces and transient apron/tie-down spaces at the other Minor airports.

Land side capacity at most of the system's general aviation airports is defined by the availability of aircraft storage hangars. Hangar storage is necessary because of security concerns, aircraft ownership/operational requirements, and effects of the Minnesota seasons. The most current estimates of existing hangar spaces and percent of capacity utilized are presented in Table I-3. Existing hangar spaces are generally adequate and with current economic conditions, additional space is available, especially in T-hangars. Future hangar capacity conditions have been improved with development of new building areas at Anoka County-Blaine, Flying Cloud, and South Saint Paul Airports. Provision for additional building area development has been included

in the long-term comprehensive plans for Lake Elmo and Airlake airports, with some possibility of building area redevelopment at Crystal airport. Hangars are usually privately owned and maintained on land leased from the airport operators, so provision of adequate space for hangars is an airport responsibility, while maintenance of the hangars themselves is not an airport responsibility.

Table I-3: Estimated Utilization of Landside Capacity

Airport	Hangar Spaces	Based Aircraft*	Percent of Capacity
MSP International	No Estimate	24**	Policy Limited
Anoka Co. - Blaine	510	459	90
Crystal	382	251	66
Flying Cloud	450	450	100***
South Saint Paul	N/A	241	N/A
Forest Lake	22	26	100+
Saint Paul Downtown	159	124	78
Airlake	160	175	100+
Lake Elmo	256	227	89
* Includes military aircraft at some airports ** GA only *** Indicates that some aircraft are accommodated using outside storage			

Maintaining the airport system infrastructure will be a continuing challenge for the community. Impacts and opportunities at individual airports have been assessed in updates of each airport's long-term comprehensive plan through 2030. Growth in flight activity for general aviation is essentially flat as depicted in Table I-4, but growth is projected to continue for commercial activity through 2030.

Table I-4: Summary of Regional System Based Aircraft and Forecasted 2030 Activity

Activity	2008	2015	2020	2030	Average Annual Growth
Total G.A. Based Aircraft	1,913	2,046	2,007	1,993	0.2%
Total G.A. Operations	641,550	612,680	639,540	663,940	0.1%
MSP Enplaned Passengers (Base Case Forecast)	25,936,600	31,229,600	35,998,600	47,896,300	(2008-2030) 2.8%
MSP Aircraft Operations	450,000	507,000	546,900	630,800	1.5%

Long Term Comprehensive Plans

Airport sponsors are required to prepare a 20-year long-term comprehensive plan (LTCP) for each airport in the system. The LTCP is intended to integrate all information pertinent to planning, developing and operating an airport in a manner that reflects its system role and compatibility with its environs. The details on scope and emphasis of a long-term comprehensive airport plan should reflect the airport's system role and the objectives for each plan content category. Full requirements for an LTCP are described in Appendix K [*insert link*].

Plans should be reassessed every five years and updated according to Table I-5. The reassessment involves reviewing the new forecasts against prior forecasts and actual airport activity, checking the progress of implementation efforts (for example, individual project planning, environmental evaluations, and capital program), and identifying any other issues or changes that may warrant continued monitoring, interim action or establish a need for a plan update. The LTCP does not replace any other planning or reporting requirements of another governmental unit.

If a change to the plan cannot be accommodated during its scheduled update, the LTCP, or parts of it, should be amended. An amendment should be prepared and reviewed by the Council prior to project inclusion in the corresponding year's capital improvement program.

Table I-5: Update Schedule for Long-Term Comprehensive Plans

Metro Area Public Use Airports	Plan Status	5-year Update
Minneapolis-Saint Paul Int'l.	2030 LTCP Approved June 2010	2015
Saint Paul Downtown	2030 LTCP Approved April 2010	2015
Anoka County-Blaine	2030 LTCP Approved April 2010	2015
Flying Cloud	2030 LTCP Approved April 2010	2015
Airlake	2025 LTCP Approved October 2008	2014
Crystal	2025 LTCP Approved October 2008	2014
Lake Elmo	2025 LTCP Approved October 2008	2014
South Saint Paul Municipal	Community CPU Approved 2009	2014
Forest Lake Municipal	Community CPU Approved 2009	2018
Lino Lakes Seaplane Base	Community CPU Approved 2009	2018
Wipline Seaplane Base	Community CPU Approved 2009	2018

Environmental Compatibility

The planning, development and operation of the region's aviation facilities should be conducted to minimize impacts upon the cultural and natural environment, regional systems and airport communities. Airport sponsors should have a surface water management plan, which is consistent with plans of the applicable watershed management organizations and the state wetland regulations. Airport sponsors should also protect groundwater quality, and should identify the location, design and age of individual/group/central sewer systems on-site and all

well location sites. The airport sponsors should also provide sanitary sewer to system airports when such service is available. All airports in the system, except Airlake and Lake Elmo, are within the MUSA and currently have sewer service.

In areas around an airport, or other system facilities, land uses should be compatible with the role and function of the facility.

One preventative measure that communities can use in ensuring compatible land use is to create compatible zoning ordinances near airports. MnDOT-Aeronuatics is currently reviewing airport zoning ordinances from the aviation perspective. This review will provide recommendations to update state airport zoning ordinance in 2015. Communities need to work with the airport sponsors and participate in Joint Airport Zoning Boards (JAZB). These boards work in a collaborative fashion to accommodate both community and airport needs in the zoning process. Further information on JAZB's and the zoning process can be found in Appendix L [*insert link*].

Airport noise programs, and the application of land use compatibility guidelines for aircraft noise, are developed within the context of both local community comprehensive plans and individual airport long-term comprehensive plans (LTCPs). Both the airport and community plans should be structured around an overall scheme of preventive and corrective measures. Appendix L discusses, in greater detail, the current land use measures and status of the noise compatibility program [*insert link*]. For additional noise related information, refer to the individual airport LTCP for noise modeling and operational documentation, the Council's *Local Planning Handbook* for communities and the *Builder's Guide* for acoustic requirements concerning construction of new single-family detached housing in noise policy areas.

Aviation Investment Plan

For airports in the regional aviation system to meet their facility and service objectives, performance and function, continued investment in system airports will be needed over the 20-year planning period. This section gives an overview of the airport facility, airport issues and planned investments for each regional system airport as found in the long-term comprehensive plans. In addition, it is important to understand the funding process and sources available to airports to implement recommendations and airport capital improvement programs, even though the aviation investments reflected in this plan are not required by federal law to be fiscally constrained.

On an annual basis, the Council reviews the MAC capital improvement plan (CIP) for consistency with regional systems and policy. This review also provides oversight of the improvement program, and the Council approves specific projects that meet dollar thresholds. The review process for the capital improvement plan is defined in Appendix J [*insert link*].

Aviation Funding Sources

Historically, federal, state, and local funding sources all contribute to the support of airports in the Twin Cities Regional Aviation System. Because of changes in both the general aviation and the commercial aviation industries, levels of federal and state funding that historically have been available for airport development are shrinking. Maintaining historic levels of funding is vital to the airports that support the economy of the metropolitan region.

Federal

The FAA operates the Airport Improvement Program, which provides grants to public agencies, and in some cases to private owners and entities, for the planning and development of public-use airports that are included in the National Plan of Integrated Airport System (NPIAS). For Minneapolis-Saint Paul International Airport, the grant covers 75 percent of eligible costs (or 80% for noise program implementation). For all other airports in the regional system, the grant covers a range of 90% to 95% of eligible costs, based on statutory requirements.

The Airport Improvement Program was established by the Airport and Airway Improvement Act of 1982. Funding for this program is generated from a tax on airline tickets, freight way bills, international departure fees, general aviation fuel, and aviation jet fuel. The FAA uses these funds to provide 95% funding at eligible airports for eligible items under the grant program.

Under the program, funds must be spent on FAA-eligible projects as defined in FAA Order 5100.38, “Airport Improvement Program (AIP) Handbook.” In general, the handbook states that:

- An airport must be in the currently approved National Plan of Integrated Airport Systems (NPIAS).
- With the exception of the two Special Purpose Airports and Forest Lake Airport, all of the Twin Cities metro system airports qualify as NPIAS airports and are eligible for AIP funding
- Most public-use airport improvements are eligible for 95% federal funding.
- General Aviation terminal buildings, T-hangars, and corporate hangars and other private-use facilities are not eligible for federal funding.

In addition, revenue-producing items typically are not generally eligible for federal funding, and all eligible projects must be depicted on a FAA-approved Airport Layout Plan. Other sources of FAA funding include Facilities and Equipment (F&E) funding for facilities such as air traffic control towers and some runway instrumentation. This funding is separate from the Airport Improvement Program and typically requires no local match. Federal noise funds (Part 150 funds) may also be available for noise mitigation with an 80% federal and a 20% state and/or local share.

In 2001, a non-primary entitlement program was authorized. This program provided up to $150,000 in FAA grant funds each year to general aviation airports that were listed in the NPIAS and were not a primary airport providing airline service for passengers. Under this program, the FAA pays 95% of all engineering, inspection, testing, land acquisition, administrative, and construction costs for projects that are eligible. The sponsor or state pays a local 5% match. When this program was last renewed, certain revenue-producing items of work, like T-hangars and fuel facilities, could be funded by this program once all safety-related improvements had been completed.

State

Minnesota's state-funded aeronautics system consists of 136 airports throughout the state. By law, revenues from the taxes on aviation fuel, aircraft registration, and airline flight property (hangars, re-fueling equipment, etc.) are dedicated to the state airports fund, which is the primary state funding source for aeronautics. Money in the fund is appropriated biennially to MnDOT as part of the transportation budget.

Although the airport sponsor is responsible for project design and construction management, many project-related costs, including consultant services, are eligible for state and/or federal aid as described below.

- **Airport Construction Grant Program**: The State Construction Grant Program funds most capital improvements at state system airports based on a determination that the improvement is a justifiable benefit to the air-traveling public. Airports that are in the NPIAS are eligible for federal funding. State funding participation at NPIAS airports is 70% of eligible costs. State funding at non-NPIAS airports is 80% of eligible costs. Projects that have revenue-generating potential are funded at 50%. This program also funds airport maintenance equipment at a two-third state/ one-third local participation rate.
- **Airport Maintenance and Operation Program**: The State Airport Maintenance and Operation Grant Program provides two-third state reimbursement to the state system airports for their documented, routine maintenance expenses up to a certain ceiling amount that is categorized by airport infrastructure.
- **Hangar Loan Revolving Account Program**: The State Hangar Loan Revolving Account Program provides an 80% interest-free loan to state system airports for building new hangars. The loans are paid back in equal monthly installments over 10 years. Payment receipts, as they become available, are then loaned out again to other airports needing hangars.

Local and Sponsor Funding

Local and sponsor funding is used to make up the balance of the grant-eligible project costs after FAA and MnDOT participation. Sponsor funds are generated by the airport from fuel sales,

lease fees, and similar incomes, or from the local governing body. Sources of sponsor funding largely depend upon which of three types an airport is.

- **Municipal Airports** – These airports are owned by counties, cities, or other local municipalities. Sponsor funding includes the sources of revenue from the airport (fuel sales, rents, etc.) as well as any funding external to the airport that the municipality chooses to provide, such as municipal bond revenues and municipal taxes. Municipal airports in the Twin Cities airport system are Forest Lake and South Saint Paul.
- **Private Airports** – These airports can fund projects from their revenue streams (for example, fuel sales, rents). The owners may also be a source of funding, although this typically is more limited. Surfside and Wipline Seaplane Bases are examples of private airports.
- **Metropolitan Airports Commission (MAC)** – Airports owned by the MAC can be funded by revenues generated at any of the MAC-owned airports. This cross-funding helps airports adequately support the system by funding the facilities they need to perform their mission. However, in recent years, MAC philosophy has shifted toward a more self-sufficient system for the reliever airports. The MAC also has the authority to issue bonds to support the funding of airport projects.

Other Funding

A potential source of funds for airport improvements is from private investors. Private investors may construct needed facilities as part of a lease agreement with the airport that will allow time to amortize their investments. This type of funding is particularly suitable for corporate hangar development and other privately owned projects. These types of projects are not eligible for FAA or state funding. However, this funding source does allow non-municipal sponsors/investors to leverage funding capabilities not available to the airport. This source of funding was recently used for an Fixed Base Operator building at Anoka County Blaine airport.

The combination of these funding sources allow the airports in this mature regional airport system to maintain and, when justified, enhance their facilities to serve their customer's needs and allow them to be as financially self sufficient as possible.

Planned Investments

Minneapolis-Saint Paul International Airport

Based on existing conditions and the capacity demands placed on the facility as passenger numbers grow, development activities are needed that focus enhancing the arrival curb, passenger processing facilities, parking and international arrival facilities at Terminal 1, and gate capacity at Terminal 2 to accommodate existing seasonal demand and new carrier entrants at Minneapolis-Saint Paul International Airport. In general, the terminal environment at Minneapolis-Saint Paul International Airport will also need enhancement in the form of gates,

ticket counters, passenger check-in areas, security screening checkpoints, and baggage claim areas.

Environmental analyses associated with the Minneapolis-Saint Paul International Airport 2020 improvements were conducted in compliance with both the National Environmental Policy Act (NEPA) and the Minnesota Environmental Policy Act (MEPA). Guidance was provided by the FAA's policies and procedures for considering environmental impacts: FAA Order 5050.4B, "NEPA Implementing Instructions for Airport Actions" and FAA Order 1050.1E, "Environmental Impacts, Policies and Procedures" and MEPA's Minnesota Environmental Review Program.

Preparation of a federal Environmental Assessment and state Environmental Assessment Worksheet began in September 2010 and was concluded in March 2013 with a Finding of No Significant Impact by the FAA and in April 2013 with a Negative Declaration on the need for an EIS by the MAC.

Reliever Airport Investments

In general the development programs at the reliever airports focus on rehabilitation of pavement in aircraft operational areas (runways, taxiways, aprons). Projects vary from year to year, depending on available funding and airport needs. In 2013, pavement rehabilitation was completed at ANE, LVN and 21D. The following list shows other general projects that are being considered at the reliever airports.

- Obstruction removal
- Land acquisition
- Arrival/departure building
- Perimeter fencing
- Install AWOS [spell out]
- Runway pavement and taxiway
- Hangar development

Table I-6 shows the cost of the planned investments at the regional airports. The table is in 2010 dollars and will be updated for current years (2014) costs.

Table I-6: Planned Investments at Regional Airports

Airport	2010-2015	2016-2020	2021-2025	2026-2030
MSP International CIP LTCP (cost range)	 $112,160,000 $377,616,750 - $444,255,000	 - $819,300,550 – $963,883,000	 - $665,626,500 - $783,090,000	 - $190,570,000 - $224,200,000
Saint Paul Downtown	$10,457,143	$5,300,000		
Anoka County-Blaine	$6,950,000	$1,300,000		
Flying Cloud	$5,600,000	$2,000,000		
Crystal	$2,550,000	negligible		

Lake Elmo	$3,700,000	$2,600,000	$1,300,000	
Airlake	$4,500,000	$1,200,000	$6,900,000	$900,000
South Saint Paul	$3,813,123	negligible		
Forest Lake	$5,869,800	Short-term funding needs likely to shift into out years unless federal funding under NPIAS		

Individual Airport Investments

Minneapolis-Saint Paul International Airport

Figure I-2: Minneapolis-Saint Paul International Airport

Airport Data:

	Existing (2010)	2020	2025	2030
Based Aircraft				
Operations	425,332	546,936	592,849	630,837
Land Area	2,930 Acres			

Airport Issues:

The aviation industry is volatile and the MAC needs to be flexible to continue to provide state of the art facilities. Recently, airlines have consolidated, shifted strategies with their aircraft fleet, adopted new security protocols and implemented new technologies for more efficient

operations. Monitoring and planning for these changes as well as technology upgrades and variations in growth rates for different aviation activities will be needed.

Figure I-3: Regional Airports – Saint Paul, Blaine, Crystal, South Saint Paul

Downtown Saint Paul Airfield

Airport Data:

	Existing (2010)	2020	2025	2030
Based Aircraft	105	128	132	**XX**
Operations	158,783	130,056	137,310	**XX**
Land Area	540 Acres			

Airport Issues:

Downtown Saint Paul Airfield (Holman Field) is located across the river from downtown Saint Paul. Issues concerning this airport revolve around land use compatibility and obstructions. The airport has sufficient capacity for future demand. The airport is used as an alternate for Minneapolis-Saint Paul International Airport, in case of capacity/emergency scenarios at Minneapolis-Saint Paul International Airport. The air traffic control tower located at the airport is an FAA tower.

Anoka County-Blaine Airport

Airport Data:

	Existing (2010)	2020	2025	2030
Based Aircraft	455	433	414	**XX**
Operations	79,111	75,793	79,560	**XX**
Land Area	1,900 Acres			

Airport Issues:

Anoka County- Blaine Airport is located in the southern part of Anoka County and the city of Blaine, approximately 12 miles from downtown Minneapolis and 12 miles from downtown Saint Paul. The air traffic control tower located at the airport is a contract tower and future funding for these towers is not guaranteed. Other issues at Anoka-Blaine airport include non-aeronautical land uses and noise complaints around the airport.

Crystal Airport

Airport Data:

	Existing (2010)	2020	2025	2030
Based Aircraft	293	327	330	**XX**
Operations	85,948	108,342	115,730	**XX**
Land Area	436 Acres			

Airport Issues:

Crystal Airport is located in Hennepin County, approximately seven miles northwest of downtown Minneapolis. The issues at this airport include landside development compatibility, additional hangar space, and removal of off airport obstructions. The air traffic control tower located at the airport is a contract tower and future funding for these towers is not guaranteed. Other issues at Crystal Airport include land uses and noise complaints around the airport.

South Saint Paul Airport

Airport Data:

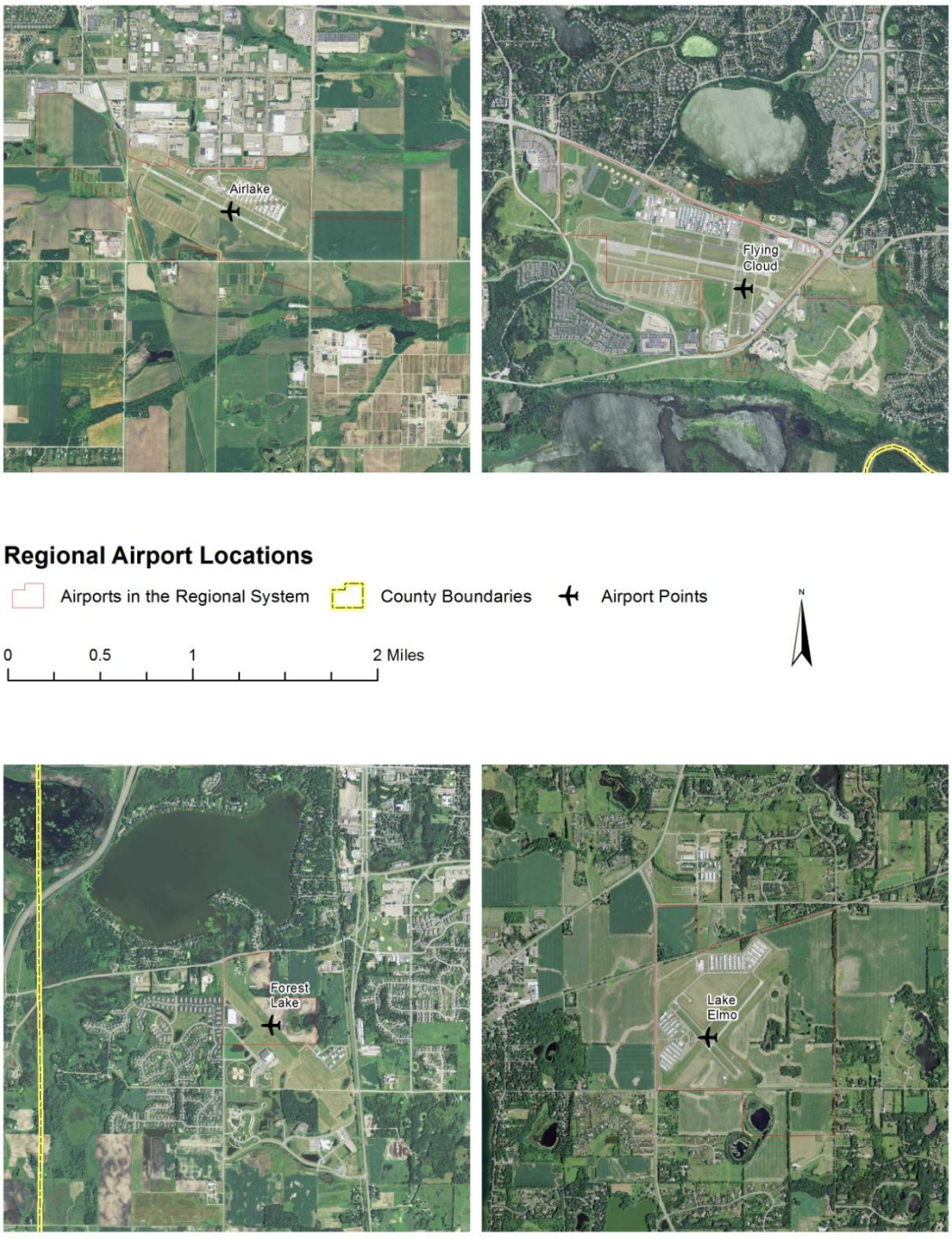
	Existing (2013)	2020*	2025*	2030*
Based Aircraft				XX
Operations	51,000			XX
Land Area	270 Acres	270	270	270

*No forecast Data

Airport Issues:

South Saint Paul Airport is located in South Saint Paul approximately seven miles south of downtown Saint Paul. The airport is owned and operated by the City of South Saint Paul. There is no air traffic control tower and the airport is designated a minor airport in the regional aviation system. Issues at South Saint Paul include obstruction removal, runway length, landside development and land use compatibility. (Note: The long-term comprehensive plan for this airport is currently being finalized so this airport profile may be revised upon its release.)

Figure I-4: Regional Airports – Airlake, Flying Cloud, Forest Lake, Lake Elmo



Flying Cloud Airport

Airport Data:

	Existing (2010)	2020	2025	2030
Based Aircraft	420	406	101	XX
Operations	124,567	106,030	113,876	XX
Land Area	543 Acres			

Airport Issues:

Flying Cloud Airport is located approximately 14 miles from downtown Minneapolis, the airport is considered by the MAC to be a primary reliever airport for Minneapolis-Saint Paul International Airport. Issues at Flying Could Airport include airfield design issues, (Runway Safety Area and Object Free Area deficiencies). The air traffic control tower located at the airport is a contract tower and future funding for these towers is not guaranteed. Other issues at Flying Cloud Airport include non aeronautical land uses to procure additional revenue and land use and noise complaints around the airport.

Airlake Airport

Airport Data:

	Existing (2012)	2020	2025	2030
Based Aircraft	225	237	239	XX
Operations	65,000	99,421	105,500	XX
Land Area	595 Acres			

Airport Issues:

Airlake Airport is located in Dakota County, approximately 20 miles south of Minneapolis and 16 miles south of Minneapolis-Saint Paul International Airport. The main issues at Airlake Airport include tenant access to municipal systems for sanitary sewer and water. MAC should pursue agreements to move Cedar Avenue or the railroad to allow for an extension of the runway, and plan for more landside capacity. This airport does not have an air traffic control tower. MAC should pursue non-aeronautical revenue opportunities.

Lake Elmo Airport

Airport Data:

	Existing (2010)*	2020*	2025*	2030*
Based Aircraft	N/A	N/A	N/A	XX
Operations	N/A	N/A	N/A	XX
Land Area	330 Acres	330	330	330

*No Data

Airport Needs/Issues:

As the city of Lake Elmo continues to grow, there will be land use compatibility issues off the runway end at Lake Elmo Airport. The Long Term Comprehensive Plan for the Airport will address the issue of extending or relocating the runway for future use. The City and MAC have been working with each other, and will continue to coordinate with regards to planning and land use compatibility issues in and around the airport.

Forest Lake Airport is located in northern Washington County. Built as a private airport, it is now owned by the City of Forest Lake. Although this airport was added to the regional system in 2010, it will require significant investment to fully function as a reliever airport. The airport is not currently in the National Plan of Integrated Airport System, but is continuing to work toward inclusion. The issues at Forest Lake airport include obstruction removal, perimeter fencing, and provision of both airside and landside improvements. As adjacent land is developed, compatibility of land uses must be carefully monitored. Currently, there is no funding plan for the planned investments.

An Emerging Issue: Unmanned Aerial Vehicles

Unmanned aerial vehicles (UAVs) are starting to emerge as a new technology for farmers, commercial operators and the general public. At the time of this plan, the FAA is currently in the Notice of Proposed Rule Making for public operation of UAVs. The existing regulations prohibit the general public from operating UAVs in Class B airspace, which is essentially most of the metropolitan area. Unmanned aerial vehicle regulations and legislation will be followed in the near future.

Work Program

The Metropolitan Council will carry out or participate in many studies and plans over the next three years. This is not an exhaustive list of all work to be completed by the Council, but rather a list of projects that will contribute to the work of the Council and will likely require coordination among agencies. Several ongoing work items that are regularly conducted by the Council are not included here. The studies listed here will be used to gather additional information and perform further analysis to inform future revisions to this policy plan. The next scheduled update of the Transportation Policy Plan, as required by state and federal law, is due in 2018.

Highway Related Studies

Highway Operations and Maintenance Costs

This is the first Transportation Policy Plan to identify long-term highway safety, bicycle, and accessible pedestrian costs. The information in this plan is based on the findings in the *Minnesota State Highway Improvement Program* (MnSHIP) from the Minnesota Department of Transportation (MnDOT). All regional transportation partners acknowledge the need to continue to work together to develop a better understanding of and costs for safety, bicycle, and accessible pedestrian projects. MnDOT and the Metropolitan Council, in coordination with local partners and building on previous work, will develop more refined costs to include in the updates of MnSHIP and the Transportation Policy Plan

Arterial Traffic Management Center

Optimizing traffic flow on minor arterials can be an effective strategy to alleviate congestion and reduce air quality emissions. Many metro areas have established an arterial traffic management center to oversee and coordinate operation of minor arterials, similar to MnDOT's Regional Traffic Management Center, which oversees freeway operations in this metro area.

Minor arterials come under the jurisdiction of many agencies, including MnDOT, counties and cities, an arrangement that complicates coordination of arterial traffic signals and safety across jurisdictions. Preliminary discussions have been held on the need for, and feasibility of, establishing such a center in this region. Work will be done to further assess the feasibility of such a center with the partners that operate the systems, as well as transit agencies and emergency providers that also have an interest in signal timing, including priority and preemption.

MnPASS System Plan Update

The *Metropolitan Highway System Investment Study* and *MnPASS 2* studies were completed just before the Council adopted the *2030 Transportation Policy Plan* in November 2010. The Transportation Policy Plan documented the tiered priority investments. In the process to update the 2040 TPP, a number of MnPASS-related questions have been raised that deserve further study and discussion in the region. The Council and MnDOT will carry out an analysis intended to be the foundation for a revision of the *MnPASS System Plan*, with input from regional transportation partners. At this time, a few questions about the work being considered include the following:

- Are additional corridors feasible candidates for MnPASS?
- Which of the feasible corridors would require exceptions to Interstate design standards and for what reasons?
- Does the work done to date on Express Bus with transit advantages and Highway bus rapid transit require modification of the MnPASS Plan or its application? Should MnPASS priorities be modified given the new *Thrive* policy direction and 2040 regional forecasts?

Principal Arterial Intersection Conversion Study

Freeways with grade-separated interchanges carry traffic faster and, in most cases, are safer than expressways, which are multi-lane highways with at-grade, signalized intersections. Many local agencies and other transportation stakeholders have expressed a desire and pursued state and federal funding to convert some expressway intersections to interchanges to increase the safety and mobility for all people and freight.

As a work program item for the future update of the *2040 Transportation Policy Plan*, the Metropolitan Council and MnDOT will work with regional highway partners to analyze all intersections on the non-freeway principal arterial system within the urban service area to identify and prioritize specific intersection conversion projects

This study proposes conducting an analysis of the non-freeway principal arterials in the region to identify and prioritize specific intersection conversion projects. Building on and incorporating the access study completed by MnDOT and its local partners for U.S. Hwy. 10, this ranking of importance of each highway intersection and/or highway segment will allow the region and its partners to form a common vision for the future and estimate a cost for these important highways. It will also allow the region to state its support for specific projects seeking funding from local, state, and federal sources – for example, the regional solicitation and potential state funding programs for interchange.

Important study considerations include:

- Consistency with the region's *Thrive MSP 2040* outcomes and policies

- Consistency with MnSHIP
- Consistency with local comprehensive plans
- Policies that need to be addressed in the Transportation Policy Plan
- Highway operational/safety issues, and
- Broad policy approaches such as lower-cost/high-benefit improvements and possible active traffic management applications.

Congestion Management and Safety Plan

The *Congestion Management and Safety Plan* (CMSP) process continued to advance during development and adoption of the *2030 Transportation Policy Plan* (adopted November 2010). The *2030 Transportation Policy Plan* discussed and listed examples of spot mobility improvements. While MnDOT has since published the results of the latest CMSP process, a number of CMSP-related questions arose during the process to update the *2040 Transportation Policy Plan* that deserve further study and discussion.

In addition to continuing to address and further develop many of the CMSP opportunity areas identified in this plan, MnDOT and the Metropolitan Council will continue to work with regional highway partners to update the Congestion Management and Safety Plan at least every four years and prior to updates to MnSHIP and the TPP.

Transit Related Studies

Further Defining the Process for Setting Transitway Priorities

This Transportation Policy Plan adds the framework of a two-step process for determining regional priorities for undesignated funding for transitway expansion in the plan. The framework will require detailed definition of the process for setting transitway priorities, implementation steps, factor weighting, measures, methodologies, and potential benchmarks. The Council will collaborate with key funding partners, including the Counties Transit Improvement Board, on this work and build on the work through federal criteria, the Program of Projects, and corridor studies.

Update of the Park-and-Ride Plan

The regional *2030 Park-and-Ride Plan* will need to be updated to reflect the substantial work that has been completed on the system and the possible changes to demand based on 2040 demographic forecasts. The update will look at the long-term needs for the park-and-ride system and identify general areas for expansion based on travel sheds or markets. This update will be coordinated with all transit providers in the region.

Update of the Regional Transitway Guidelines

The *Regional Transitway Guidelines* were completed in 2012 as a starting point for establishing consistency in project planning and delivery across multiple agencies. In developing this first version, it was acknowledged that additional updates may be needed to update the information or address new topics such as dedicated bus rapid transit or land use best practices. This update will be coordinated with relevant stakeholders.

Update of the Regional Service Improvement Plan

Every two years, regional transit providers will prepare a short-term service improvement plan that identifies their priorities for transit service expansion over the following two to four years. A regional committee will review and prioritize proposed transit expansion projects using the technical factors listed in "Transit Investment Direction and Plan." The committee will recommend a *Regional Service Improvement Plan* for approval by the Metropolitan Council.

Bus Stop Amenities Guidelines and Implementation Plan

Metro Transit will lead an effort to further define standards for bus stop amenities and improvement opportunities. This work will build off the detail available in Appendix G and include standards guiding investments in bus stop amenities, areas of specific investments, and approximate funding needs. The guidelines will not address larger stations such as light rail or bus rapid transit stations or major park-and-ride or transit center facilities. The focal point will be on the standalone bus stops that are located throughout the Metro Transit service area.

Modern Streetcar Regional Policy Discussion

The "Transit Investment Direction and Plan" acknowledges the emergence of modern streetcars as a mode under consideration in a number of corridors around the region. Modern streetcars are not included as a transitway mode because the region will need to have a dialogue on the role of streetcars in the transit system and potential funding options for the long-term investment in a system.

The Metropolitan Council will lead a dialogue with regional partners, including cities and counties, that will inform the *2040 Transportation Policy Plan* on how streetcars should be reflected in the plan. An introduction and list of policy questions related to modern streetcars is included in the "Transit Investment Direction and Plan."

Land Use and Transportation

Update of the Guide for Transit-Oriented Development

The "Land Use and Local Planning" section of the *2040 Transportation Policy Plan* outlines key requirements and policy considerations for local governments when planning land use around

the transit system. The Council will collaborate with local governments to update the more detailed technical guidance on transit-oriented development to reflect the latest best practices and policy considerations. The *Guide for Transit-Oriented Development* was first developed in 2006.

Bicycle and Pedestrian Related Studies

Implementing Cycloplan for Updating the Regional Bicycle System Inventory

Cycloplan is an extension of the regional, on-line bicycle trip planning resource known as Cyclopath. It is designed for use by local agency planners to update the regional bicycle system inventory with data from city and county bicycle plans and newly constructed projects.

Metropolitan Council staff will work with local agencies and MnDOT to define a universal set of regional map attributes and will then make available this new on-line tool to local practitioners. This work will culminate with a revised and updated regional bicycle system map inventory to be published to the Council's web site for access by the general public.

Refining the Regional Bicycle Transportation Network

To further refine the Regional Bicycle Transportation Network (RBTN) established in this plan, Met Council will work with local agencies and MnDOT to:

- Identify specific bikeway alignments within the broad corridors established in the Regional Network
- Using the definition for Critical Bicycle Transportation Links provided in this plan, identify specific locations of critical gaps and barriers to be overcome, and opportunities to improve or eliminate them, and adjust the RBTN alignments, as needed.
- Identify segments of the RBTN that have existing bicycle facilities and include data on facility type by location.

Freight Related Studies

Regional Industrial Lands Assessment

The Council will analyze existing land uses and zoning along the Mississippi River system and in major metro rail corridors to determine (1) the land and transportation needs of waterway and rail corridor-dependent industries and (2) the extent to which developable land for industrial/manufacturing uses may be threatened by non-industrial development. This information will then be used by local agencies in preparing their 2018 comprehensive plan updates.

Aviation Related Studies

Evaluation of the Regional Aviation System

The 2009 aviation system technical report should be updated before the adoption of the next Transportation Policy Plan in 2018. The update will include an analysis of the system changes and improvements since 2009, system performance evaluation, and local and national system forecasts and trends. This study will also look at the impacts of the recent Long-Term Comprehensive Plans that will have been adopted by the Council for the regional aviation system. This study could be financed in part through a planning grant from the Federal Aviation Administration.

Performance Measures and Data-Related Studies

Identifying and Refining Performance Measures for Planning and Programming

A number of the potential performance measures identified in developing the *2040 Transportation Policy Plan* require further development and/or refinement before they can be used in this or future policy plans. Also, the performance measures set by the U.S. Department of Transportation (USDOT) are scheduled to be released in 2015. After the Minnesota Department of Transportation has set state targets for those measures, the Metropolitan Council will have approximately six months to set targets for the region.

Considering the issues involving performance measures, a work group should be established or identified to assist Council staff in the developing and refining useful performance measures and in developing and selecting targets for the USDOT performance measures. In recommending performance measures, the work group will consider the availability of data and provide input on how the data is, or should, be obtained and analyzed.

Data Collection to Support Performance-Based Planning and Programming

This Transportation Policy Plan starts the work needed to prepare a performance-based regional transportation plan as required by MAP-21. The state and region will finalize the performance measures that will be used in the coming months. While existing data will be used to the extent possible, new and/or different data will be needed. This task recognizes the coordination and costs that will be involved in obtaining the needed data for the regional highway system. The Council will work with MnDOT, the counties and the cities to ensure the needed data is collected in the most cost effective manner. This work will begin soon since some data needs are now known.

2020 Travel Behavior Inventory

Every 10 years, in conjunction with the United States Census, the Metropolitan Council conducts a battery of surveys to find out where, how, when, how often, and why people in the region travel. The surveys are used to provide policymakers and researchers the most current data about travel in the region. They are also used to develop updates to the region's travel demand forecasting models, which are used to forecast traffic and transit ridership for all major projects. Data is collected through interviews and surveys.

Recent events with the economy, the housing market, and the price of fuel have shown that a survey once every 10 years may not capture data in an accurate and timely manner. The Council will evaluate the need for a more frequent TBI data collection schedule, along with the benefits and problems related to a more frequent effort. Nevertheless, planning for the next Travel Behavior Inventory, even if it is conducted in 2020, will need to begin in the 2018-2019 timeframe.

2015 Transit On-Board Survey

A random sample of transit system riders on bus, light rail transit, and commuter rail are given surveys to fill out describing their trip. This helps the region gather more detailed information about the travel patterns of transit users.

Safety Planning and Priorities in the Region

Significant safety planning has been done in the region through MnDOT's *Toward Zero Deaths* initiative and development of an updated statewide *Strategic Highway Safety Plan* that is expected to be adopted in the summer of 2014. MnDOT also partnered with each county in the state to develop County Road Safety Plans, which were recently completed for the counties in the Twin Cities region. To assist with the goal of improving safety for all users of the system in the region, the Council will review statewide and local safety plans, crash data, and other safety planning efforts to identify safety needs and priorities for all modes within the region, in coordination with other local partners.

CMAQ Performance Plan

MAP-21 established requirements for a Congestion Management/Air Quality performance plan (CMAQ), which applies to metropolitan planning organizations with a population of over one million in air-quality nonattainment or maintenance areas. The Council will work with MnDOT on this plan as well as their annual CMAQ report to the USDOT. Performance measures and target setting for emissions and traffic congestion reduction for the CMAQ program will be established through rulemaking, which is tentatively scheduled for late 2015. Results from rulemaking are expected to include the following:

- Completion and updates expected biennially

- Baseline levels for traffic congestion and on-road mobile source emissions
- A progress report on achievements in reaching performance targets described in 23 U.S.C. 150(d)
- A description of the projects identified for CMAQ funding and a projection of how these projects will contribute to achieving the emission and traffic congestion reduction targets pursuant to 23 U.S.C. 150(d)
- A separate report assessing the progress of the projects under the previous plan in achieving the air quality and congestion targets of the previous plan
- Submission of this plan with the CMAQ annual report for that year, which is submitted by MnDOT

Strategies for Reducing Greenhouse Gas Emissions

A central issue of *Thrive MSP 2040* and the *2040 Transportation Policy Plan* is the reduction of greenhouse gases in line with state goals from the Next Generation Energy Act. A study is proposed that would, on a regional level, inventory sources of greenhouse gas emissions, identify direct and indirect transportation sources and suggest specific strategies that would be effective in reducing emissions long- and short- term. The study would look at existing transportation and land use strategies, as well as examine other local, regional, statewide, and national possibilities and help to define the role the region can take in advancing them.

Equity

Equity Analysis for Transportation

The Council's *Choice, Place and Opportunity: An Equity Assessment of the Twin Cities Region* (2014) analyzed the region and its investments to understand patterns of need and opportunities. To fully integrate equity into the transportation planning process, the Council will conduct additional analysis on transportation-related issues. Two potential areas for study are safety outcomes by race and income and spending on preservation and maintenance and condition of transportation facilities by race and income. To aid in using equity as a factor in setting priorities for transportation investments, the Council will also develop more robust methods of analyzing the benefits and impacts of these investments by race and income.

Part 3: Federal Requirements

Part 3 of the *2040 Transportation Policy Plan* responds to federal planning requirements contained in the Moving Ahead for Progress in the 21st Century (MAP-21) legislation and other requirements for transportation planning in federal statute, regulation, or guidance and provides references to other sections in this policy plan or to other Council documents that address the requirements. Portions of this section respond to guidance from other sources, including, but not limited to, the equity discussion as directed by the Metropolitan Council, and the air quality discussion as directed by the Minnesota Pollution Control Agency (MPCA).

Transportation System Performance Evaluation

Background

MAP-21 instituted a requirement that the metropolitan planning process establish and use a performance-based approach to transportation decision making to support national goals. Federal law established performance goals in seven areas:

- Safety – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- Infrastructure Condition – To maintain the highway infrastructure asset system in a state of good repair.
- Congestion Reduction – To achieve a significant reduction in congestion on the National Highway System.
- System Reliability – To improve the efficiency of the surface transportation system.
- Freight Movement and Economic Vitality – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental Sustainability – To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- Reduced Project Delivery Delays – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

There are no performance goal areas established for the other transportation systems in federal law.

Surface Transportation Performance Measures and Targets

The Secretary of Transportation, in consultation with state departments of transportation, metropolitan planning organizations, and other stakeholders, shall define performance measures and standards to be used to assess the impact of system investments on the goal areas. At this time, the anticipated date of release of the definitions of United States Department of Transportation (USDOT) performance measures is in the first half of 2015.

MnDOT will have one year to set performance targets that reflect the USDOT-defined measures to use in tracking progress towards attainment of critical outcomes. The state may set different performance targets for urbanized and rural areas. Under the guidance of MAP-21, the selection of performance targets by MnDOT is coordinated with the relevant metropolitan planning organizations to ensure consistency, to the maximum extent practicable.

Subsequent to MnDOT setting targets, the Metropolitan Council, as the metropolitan planning organization, is required to establish targets for the USDOT-defined performance measures not later than 180 days after the date MnDOT establishes performance targets.

Transit Performance Measures and Targets

The Secretary of Transportation is also required to establish performance measures based on state-of-good-repair standards for measuring the condition of transit capital assets including equipment, rolling stock, infrastructure, and facilities. These measures will apply to all recipients of federal transit funding. In October 2013, Federal Transit Administration (FTA) released an Advance Notice of Proposed Rulemaking on the performance measures. This advance notice requested input on FTA's potential approaches to define and measure "state of good repair." These approaches are, as follows:

- Asset age;
- Asset condition;
- Asset performance; or
- A comprehensive (combined) approach.

Three months after the release of the final performance measures (anticipated in the first half of 2015); each recipient shall establish performance targets for the measures. Annually, the recipients shall submit a report that describes progress toward meeting the performance targets and the targets set for the next fiscal year.

After public transit providers set targets, the Council, as the metropolitan planning organization, is required to establish targets for the USDOT-defined performance measures no later than 180 days after the date public transit providers set targets. The selection of regional performance targets is to be coordinated with public transit providers to ensure consistency.

Placeholder Performance Measures

The American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on Performance Management has recommended performance measures to the USDOT for their consideration in defining the performance measures related to surface transportation. Until the USDOT releases their performance measures, these AASHTO-recommended performance measures are used as placeholders to begin restructuring the Transportation Policy Plan to a performance-based planning process.

These performance measures address six of the national goal areas. No performance measure has been suggested by the AASHTO committee for transit state-of-good-repair, but a reference is included to identify that a measure for this area will need to be included when defined. The AASHTO recommended performance measures are as follows:

Safety

- Number of Fatalities – Five-year moving average of the count of the number of fatalities on all public roads for a calendar year. Data comes from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS).
- Fatality Rate – Five-year moving average of the number of fatalities divided by the five-year moving average of vehicle miles traveled (VMT).
- Number of Serious Injuries – Five-year moving average of the count of the number of serious injuries on all public roads for a calendar year. Data comes from NHTSA's FARS.
- Serious Injury Rate – Five-year moving average of the number of serious injuries divided by the five-year moving average of VMT.

Pavement Condition

- Interstate Pavement in Good, Fair, and Poor Condition based on the International Roughness Index (IRI) – Percentage of 0.1-mile segments of interstate pavement mileage in good, fair, and poor condition based on the following criteria: good if IRI<95, fair if IRI is between 95 and 170, and poor if IRI is greater than 170.
- Non-Interstate National Highway System Pavement in Good, Fair and Poor Condition based on the International Roughness Index (IRI) – Percentage of 0.1-mile segments of non-interstate National Highway System pavement mileage in good, fair and poor condition based on the following criteria: good if IRI<95, fair if IRI is between 95 and 170, and poor if IRI is greater than 170.
- Pavement Structural Heath Index – Percentage of pavement which meet minimum criteria for pavement faulting, rutting and cracking.

Bridges

- Percent of Deck Area on Structurally Deficient Bridges – National Highway System bridge deck area on structurally deficient bridges as a percentage of total National Highway System bridge deck area.
- National Highway System Bridges in Good, Fair, and Poor Condition based on Deck Area – Percentage of National Highway System bridges in good, fair and poor condition, weighted by deck area.

Freight

- Annual Hours of Truck Delay (AHTD) – Travel time above the congestion threshold in units of vehicle-hours for trucks on the Interstate Highway System.
- Truck Reliability Index (RI80) – The RI is defined as the ratio of the total truck travel time needed to ensure on-time arrival to the agency-determined threshold travel time (e.g., observed travel time or preferred travel time).

System Performance

- Annual Hours of Delay (AHD) – Travel time above a congestion threshold (defined by State DOTs and MPOs) in units of vehicle-hours of delay on Interstate and National Highway System corridors.
- Reliability Index (RI80) – The Reliability Index is defined as the ratio of the 80th percentile travel time to the agency-determined threshold travel time.

Congestion Mitigation and Air Quality (CMAQ)

- Criteria Pollutant Emissions – Daily kilograms of on-road, mobile source criteria air pollutants (VOC, NOx, PM, CO) reduced by the latest annual program of CMAQ projects.
- Annual Hours of Delay (AHD) – Travel time above a congestion threshold (defined by State DOTs and metropolitan planning organizations) in units of vehicle-hours of delay reduced by the latest annual CMAQ program of projects.

Transit Capital Assets State of Good Repair

- To be added when FTA releases a Notice of Proposed Rule Making.

Existing Transportation System Performance and Performance of Highway and Transit Investment Plans

The following material reports on the previously described MAP-21 performance measures used as placeholders and the performance of the investment plans for the highway system and the transit system in 2040. The performance is evaluated (using 2040 traffic forecasts for both scenarios) as a comparison between the:

- Existing system plus the programmed improvements (the current *2014-2017 Transportation Improvement Program*) and
- Improvements included in the Current Revenue Scenario for the highway and transit investment plans.

In addition to the measures identified and required by the USDOT under the provisions of MAP-21 (which are included in this section), measures more relevant to the issues facing the Twin Cities region are also included. Many of the measures can apply to several of the goals of this plan and they are grouped under the goal areas for which they are most applicable.

Transportation System Stewardship Performance Measures

Pavement Condition

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, livability, and sustainability.

The International Roughness Index (IRI) is a measure of smoothness and ride quality. This standard simulates a standard vehicle traveling down the roadway and is equal to the total anticipated vertical movement of this vehicle accumulated over the length of the section. IRI is typically reported in units of inches per mile (vertical inches of movement per mile traveled). If a pavement is perfectly flat, the IRI would be zero (no vertical movement of the vehicle). The thresholds for the three breakpoints are as follows:

- Good: IRI Less than 95
- Fair: IRI greater than or equal to 95 and less than or equal to 170
- Poor: IRI greater than 170

MnDOT provided 2012 data for the trunk highway system based on their ride quality index (RQI). The RQI is based on the IRI. In Minnesota, the IRI is converted to RQI so that the roadway user's opinions regarding what roughness is unacceptable can be taken into account.

Table A-1: 2012 Urbanized Area Roadway Miles of Trunk Highway System by RQI Pavement Condition

System	Good	Fair	Poor	Total
NHS – Interstate	317.7	137.5	11.2	466.4
NHS – Non-Interstate	538.3	185.6	33.1	757.0
Non-NHS	248.0	163.1	41.2	452.3
Total	1,104.0	486.2	85.5	1,675.7

Table A-2: 2012 Urbanized Area Percent of Roadway Miles of Trunk Highway System by RQI Pavement Condition

System	Good	Fair	Poor	Total
NHS – Interstate	68.1%	29.5%	2.4%	100%
NHS – Non-Interstate	71.1%	24.5%	4.4%	100%
Non-NHS	54.8%	36.1%	9.1%	100%
Total	65.9%	29.0%	5.1%	100%

Recent trend analysis: This measure is difficult to interpret with only one data point, however, some observations can be made. First, focusing on the National Highway System, the interstate system has the lowest number of roadway miles in poor condition. But the non-interstate National Highway System has a higher number of miles and percent of miles in good condition. The non-National Highway System state trunk highway system does suffer from poorer overall pavement condition. The amount of that portion of the state trunk highway system in poor condition is almost four times that of the interstate system. It also has fewer miles in good condition.

Bridge Condition

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, livability, and sustainability.

Table A-3: Percent of Deck Area on Structurally Deficient National Highway System and Non- National Highway System Bridges in Urbanized Area

Year	NHS Bridges	Non-NHS Bridges
2008	3.2%	8.2%
2009	3.1%	8.2%
2010	3.1%	8.2%
2011	3.1%	9.9%
2012	3.0%	10.0%

Recent trend analysis: The condition of bridges on the National Highway System improved slightly between 2008 and 2012. The percent of deck area of structurally deficient National Highway System bridges declined over the period. However, the percent of deck area of structurally deficient non-system bridges rose over the same period.

Extent and Duration of Congestion by Lane-Miles

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, livability, and Sustainability.

Table A-4: AM Plus PM Miles of Directional Congestion

Year	Severe Congestion (Congested Two or More Hours)	Moderate Congestion (Congested One to Two Hours)	Low Congestion (Congested for Less than One Hour)	Total
2012	85	128	113	325
2011	73	125	121	319
2010	82	127	117	326
2009	55	107	114	276
2008	51	104	108	263
2007	82	112	111	305
2006	64	97	107	267
Source: *Metropolitan Freeway System 2012 Congestion Report* – Total may not equal sum of Severe, Moderate, and Low Congestion due to rounding.				

Table A-5: AM Plus PM Percent of Miles of Directional Congestion

Year	Severe Congestion (Congested Two or More Hours)	Moderate Congestion (Congested One to Two Hours)	Low Congestion (Congested for Less than One Hour)	Total
2012	5.6%	8.4%	7.5%	21.4%
2011	4.8%	8.1%	7.9%	21.0%

2010	5.4%	7.3%	7.7%	21.5%
2009	3.6%	7.5%	7.5%	18.2%
2008	3.4%	8.6%	7.1%	17.3%
2007	6.3%	6.8%	8.6%	20.9%
2006	4.9%	7.1%	8.2%	18.3%
Source: *Metropolitan Freeway System 2012 Congestion Report* – Total may not equal sum of Severe, Moderate, and Low Congestion due to rounding.				

Recent trend analysis: The amount of congestion in the region has remained fairly constant over time. Roads experiencing moderate to low levels of congestion have shown more of a rise over the reporting period than have the roads with severe congestion.

Investment plan analysis: The Current Revenue Scenario results in an overall decrease in the number of lane-miles of the National Highway System experiencing congestion in both the AM (-2.6%) and PM (-3.3%) peak periods. However, the lane-miles experiencing low levels of congestion (up to one hour) increase, but are offset by a larger decrease in the more severe levels of congestion (2 or more hours congested).

Average Annual Aircraft Delay at Minneapolis-St. Paul International Airport

Thrive MSP 2040 relationship: This measure supports two Thrive outcomes: stewardship, prosperity.

Table A-6: Average Annual Aircraft Delay at Minneapolis-St. Paul International Airport

Year	Average Delay in Minutes
2013	NA
2012	4.0
2011	4.6
2010	5.1
2009	5.6

When calculating the average delay per aircraft operation, airport-attributable delay is estimated by comparing a flight's actual air and taxi times with estimated unconstrained times. The total cumulative amount of delay experienced by all scheduled flights in the database is then divided by the total number of flights in the database for the same time period. The output is usually expressed in minutes of delay per operation.

Recent trend analysis: The average delay between 2009 and 2012 has declined by over one and a half minutes.

Safety and Security Performance Measures

Number of Fatalities and Serious Injuries

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Table A-7: Number of Fatalities and Serious Injuries

5-Year Period	Urbanized Area 5-Year Rolling Average Traffic Fatalities	Urbanized Area 5-Year Rolling Average Traffic Serious Injuries
2012 through 2008	114.6	491.4
2011 through 2007	126.2	535.4
2010 through 2006	133.8	600.8
2009 through 2005	145.8	680.6
2008 through 2004	155.2	788
Source: MnDOT		

Fatality and Serious Injuries Rates

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Table A-8: Fatality and Serious Injuries Rates

5-Year Period*	Urbanized Area 5-Year Rolling Average Traffic Fatalities over 5 Year Period per 1B VMT	Urbanized Area 5-Year Rolling Average Traffic Serious Injuries over 5 Year Period per 1B VMT
2012 through 2008	4.2	17.9
2011 through 2007	4.6	19.5
2010 through 2006	4.9	21.9
2009 through 2005	5.3	24.8
2008 through 2004	5.7	28.9
Source: MnDOT		

Recent trend analysis: The number and rate of both fatalities and serious injuries have fallen continuously throughout the reporting period. This measure should continue to be monitored to ensure further reductions.

Investment plan analysis: The Current Revenue Scenario results in an overall decrease of just under 440 crashes (-0.7%) in the annual total number of crashes.

Transit Incidents

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Metro Transit reported the following data for its system:

Table A-9: 2012 and 2013 Transit Incidents

Accident Classification	2012	2013
Total Traffic Collisions	1,188	1,041
Traffic Accidents per 100,000 miles	3.96	3.37
Total Customer Accidents	297	324
Customer Accidents per 100,000 miles	0.99	1.05

Four major incidents were reported to the National Transit Database for 2013 in which 11 persons were injured. This data also covers transit providers other than Metro Transit or Metro Mobility.

Recent trend analysis: Incidents involving buses have shown a decline over the two year period (-8%).

Crashes Involving Bicycles per Capita

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Table A-10: Number and Rate of Crashes Involving a Bicycle

Year	7-County Crashes Involving Bicycles*	Wright and Sherburne County Urbanized Area Crashes Involving Bicycles*	Total Crashes Involving Bicycles*	Rate of Crashes Involving Bicycles per Capita (1000)
2013	660	2	662	NA
2012	739	2	741	0.25
2011	707	1	708	0.24
2010	643	4	647	0.22
2009	713	6	719	0.24
2008	702	6	708	0.24
2007	780	3	783	0.27
2006	690	4	694	0.24
Source: Minnesota Crash Mapping Analysis Tool (MnCMAT) *Crashes are reported if they occur on a public road, involve a fatality or serious injury, or result in $1,000 or more of property damage. These requirements may result in the under-reporting of bicycle incidents.				

Recent trend analysis: The number of crashes involving bicycles and the rate per capita is erratic due to the small sample size. Generally, the trend in the number of crashes is more evident as declining if a five-year rolling average is used as with traffic fatalities and serious injuries. Then the number of crashes involving bicycles falls from an average high of 708 in the first 5-year period to a low of 693 in the most recent 5-year period.

Access to Destinations Performance Measures

Annual Hours of Delay and Delay per Capita

***Thrive MSP 2040* relationship:** These measures support several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

The TTI Urban Mobility Report calculates total annual person-hours of delay. However, these are system-wide and not focused solely on the National Highway System.

Table A-11: Annual Delay

Year	Annual Person-Hours of Delay	Annual Person-Hours of Delay per Capita
2011	60,788,000	23.33
2010	60,193,000	24.18
2009	56,808,000	21.06
2008	64,572,000	22.05
2007	61,122,000	22.05
2006	62,438,000	24.29
Source: 2012 Urban Mobility Report; Texas Transportation Institute		

Recent trend analysis: The per capita rate of annual hours of delay was erratic between 2006 and 2011. Between 2006 and 2009, the number of person-hours of delay and the delay per capita generally declined. However, between 2009 and 2011, both measures have increased. These measures should continue to be monitored.

Recent trend analysis: Annual person-hours of delay displayed some erratic behavior over the reporting period. However, it has shown a decline over most of the period, but started to increase again between 2010 and 2011. This measure should continue to be monitored.

Reliability Index

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: prosperity, equity, livability, and sustainability.

The TTI Urban Mobility Report calculates the Freeway Planning Time Index (PTI) at both the 95th and 80th percentile points. Computed with the 95th percentile (PTI95%) travel time it represents the amount of time that should be planned for a trip to be late for only 1 day a month. Computed with the 80th percentile (PTI80%) travel time it represents the amount of

time that should be planned for a trip to be late for only 1 day a week. A PTI of 3.00 means that for a 20-minute trip in light traffic, 60 minutes should be planned. For 2011, these values were as follows:

- PTI95% – 3.14 (20-minute trip would take 62.8 minutes)
- PTI80% – 1.79 (20-minute trip would take 35.8 minutes)

Recent trend analysis: With only one year of data to work from, it is impossible to reach any conclusions regarding this measure. However, this data should be monitored and the system as a whole studied to determine if the apparent high level of the Planning Time Index is due to any controllable conditions. It should be mentioned that the region is just barely above the average for large regions in the TTI Urban Mobility Report. The average 95th percentile Freeway PTI for large regions was 3.12 (versus 3.14 in the Twin Cities) and the 80th percentile was 1.66 (versus our 1.79).

MnPASS Corridor Use

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Table A-12: Corridor Use by Vehicles

Direction	Time of Day	Location	SOVs (includes HOVs using GP lanes)	HOVs	Tolled	Transit	Average Vehicle Occupancy
I-394							
Eastbound	AM	Penn Ave	5,013	960	955	88	1.16
Westbound	PM	Penn Ave	5,985	758	547	79	1.16
Eastbound	AM	Louisiana Ave	3,720	593	523	69	1.17
Westbound	PM	Louisiana Ave	5,400	358	327	64	1.15
I-35W							
Northbound	AM	Black Dog Rd	4,088	850	577	29	1.18
Southbound	PM	Mn River	5,050	902	272	21	1.28
Northbound	AM	Lake Street	6,859	646	312	88	1.10
Northbound	PM	Lake Street	4,967	644	62	5	1.25
Source: MnDOT I-35W and I-394 HOV/MnPASS Reports 2013-3rd Quarter; Hour reported is hour serving most people.							

Table A-13: Corridor Use by People

Direction	Time of Day	Location	People in SOVs (includes HOVs using GP lanes)	People in MnPASS Lane as HOVs	People in MnPASS Lane as Tolled	People in Transit in MnPASS Lane
I-394						
Eastbound	AM	Penn Ave	5,067	2,016	955	2,852
Westbound	PM	Penn Ave	6,308	1,592	547	2,479
Eastbound	AM	Louisiana Ave	3,876	1,245	523	2,174
Westbound	PM	Louisiana Ave	5,896	752	327	1,906
I-35W						
Northbound	AM	Black Dog Rd	4,141	1,785	577	820
Southbound	PM	Mn River	5,800	1,894	272	583
Northbound	AM	Lake Street	6,946	1,357	312	2715
Northbound	PM	Lake Street	5,705	1,352	62	68
Source: MnDOT I-35W and I-394 HOV/MnPASS Reports 2013-3rd Quarter; hour reported is hour serving most people.						

Number of Person Trips by Mode

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Table A-14: Person Trips by Mode

Person Trips by Mode	Forecast 2010 Existing to 2040 Current Revenue Scenario	2040 Current Revenue Scenario Compared to TIP Scenario
Non-Motorized	45.1%	-0.02%
Drive Alone	29.0%	-0.48%
Carpool	22.9%	0.12%
Transit	85.1%	5.66%
Total	28.6%	-0.04%
Source: Regional Travel Demand Forecast Model		

Investment plan analysis: The percent change between forecast 2010 and the forecast current revenue scenario is largely driven by the overall growth of the region. The greater growth in non-motorized person trips and transit person trips is a function of increased population, households, and employment in the center cities and the implementation of the transit improvements listed in the plan. The Current Revenue Scenario shows the benefits of the planned improvements, but holding the level of population, households and employment

constant at 2040 levels between the two alternatives. This shows a decline in single-occupant vehicles and an increase in multi-occupant vehicle person trips. It also shows an increase in the level of transit person trips.

Transit Ridership

***Thrive MSP 2040* relationship:** This measure supports several Thrive outcomes: stewardship, equity, livability, and sustainability.

Table A-15: Annual Regional Transit Ridership, 2006-2011

Year	Annual Ridership
2011	93,915,000
2010	91,065,300
2009	88,930,900
2008	94,769,700
2007	88,943,300
2006	85,308,100
Source: *2012 Transportation System Performance Evaluation*	

Recent trend analysis: Transit ridership has generally shown an upward trend between 2005 and 2011, basically staying on the track needed to reach the goal of doubling ridership by 2030.

Investment plan analysis: The modeled change in transit boardings between 2010 and the 2040 Current Revenue Scenario is largely driven by the overall growth of the region and increases over 99%. The Current Revenue Scenario exhibits a higher use of transit with over 7% more boardings than the Transportation Improvement Program scenario.

Competitive Economy Performance Measures

***Thrive MSP 2040* relationship:** These measures support several Thrive outcomes: prosperity, equity, livability, and sustainability.

Freight – Annual Hours of Truck Delay (AHTD)

Need to develop database to generate measure – will probably use National Highway System travel time data set provided by FHWA.

Freight – Truck Reliability Index (RI80)

Need to develop database to generate measure – will probably use National Highway System travel time data set provided by FHWA.

Network Travel Time – Average

Investment plan analysis: The modeled travel time the average vehicle trip takes rose 3 minutes between 2010 and the 2040 Current Revenue Scenario, an increase of over 22%. The Current Revenue Scenario exhibits a slight decline of -1.6% in average travel time when compared to the Transportation Improvement Program scenario.

Average Travel Time to Job Centers – AM Peak Period

- Data to be added

Average Travel Time to Regional Job Centers in Midday Period

- Data to be added

Healthy Environment Performance Measures

***Thrive MSP 2040* relationship:** These measures support several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Total Average Weekday Vehicle Miles Traveled

Investment plan analysis: Current Revenue Scenario exhibits a decrease in VMT with 444,000 fewer vehicle miles traveled (-0.5%) when compared to the Transportation Improvement Program scenario.

Criteria Pollutant Emissions

Investment plan analysis: MOVES201b was used to estimate the air pollutant emissions from mobile sources for carbon monoxide, oxides of nitrogen, sulfur dioxide, volatile organic compounds, and PM2.5. The Current Revenue Scenario results in less modeled air pollutant emissions in each of these categories when compared to the Transportation Improvement Program scenario. The change for each pollutant is as follows:

Pollutant	Difference from TIP Scenario
Carbon Monoxide	-4.8%
Oxides of Nitrogen	-1.7%
Sulfur Dioxide	-5.1%
Volatile Organic Compounds	-1.5%
PM2.5	-1.2%

Green House Gas Emissions from Mobile Sources

Investment plan analysis: MOVE201b was used to estimate the emissions from mobile sources for atmospheric carbon dioxide and CO2 equivalents. The Current Revenue Scenario results in 1.7% less modeled emissions in each of these categories when compared to the Transportation Improvement Program scenario.

Leveraging Transportation Investments to Guide Land Use Measures

***Thrive MSP 2040* relationship:** These measures support several Thrive outcomes: stewardship, prosperity, equity, livability, and sustainability.

Change in Population/Employment within Half Mile of Light Rail Transit Station

This measure will largely be based on an analysis of future trends and an analysis of Comprehensive Plans after the next round of updates.

Change in Population/Employment within Half Mile of Bus Rapid Transit Station

This measure will largely be based on an analysis of future trends and an analysis of local comprehensive plans after the next round of updates.

Summary of Investment Plan Impacts

As previously stated, the impacts of the investments proposed in the *2040 Transportation Policy Plan* are measured against the Transportation Improvement Program scenario. Although targets for the measures use have not been defined, the direction of the trend of the measures is sufficient to determine the general positive or negative impacts of the proposed improvements. The findings are as follows:

- Congestion – The investment plans result in an overall decrease in the number of lane-miles of the National Highway System experiencing congestion in both the AM (-2.6%) and PM (-3.3%) peak periods.
- Mode Choice – Mode choice shows a decline in single-occupant vehicles and an increase in multi-occupant vehicle person trips. It also shows an increase in the level of transit person trips.
- Transit Ridership – The Current Revenue Scenario exhibits a higher use of transit with over 7% more boardings than the Transportation Improvement Program Scenario.
- Safety – The investment plans result in an overall decrease of the annual total number of crashes experienced, a decrease of just under 440 crashes (-0.7%).
- Travel Time – The Current Revenue Scenario exhibits a slight decline, -1.6%, in average travel time from the Transportation Improvement Program scenario.
- Total Vehicle Miles Traveled – The Current Revenue Scenario exhibits a slight decline in VMT from the Transportation Improvement Program Scenario of 444,000 fewer vehicle miles traveled (-0.5%).Criteria Air Pollutants – The Current Revenue Scenario results in less modeled air pollutant emissions for carbon monoxide, oxides of nitrogen, sulfur dioxide, volatile organic compounds, and PM2.5.
- Green House Gas Emissions – The Current Revenue Scenario results in 1.7% less modeled emissions in each of these categories when compared to the Transportation Improvement Program Scenario.

Generally, the Current Revenue Scenario results in more transit trips and fewer single-occupant vehicle trips. This results in less congestion and less travel time (primarily in the peak period). The change in mode also works to reduce the vehicle-miles-traveled and the resulting air pollutant emissions.

Work Plan Tasks

Several measures have been identified as needing additional data or further refinement before they can be used. This includes all of the performance measures that USDOT is required to develop in MAP-21 as these will not be released in final form until 2015.

Given these issues with performance measures, a work group should be established or identified to assist Council staff in the development and refinement of useful performance measures and in the development and selection of targets for the USDOT performance measures. In recommending performance measures the work group will consider the availability of data and provide input on how the data is, or should, be obtained and analyzed. Possible measures falling into this group include (but are not limited to) the following:

- Truck delay
- Truck Reliability Index
- Pavement condition of A-minor arterials
- Congestion of A-minor arterials
- MnPASS corridor usage
- Change in population/employment in the vicinity of LRT and BRT stations
- Extent and usage of bus-only shoulders
- Transit asset management
- Extent and usage of bicycle facilities
- Extent and usage of pedestrian trail facilities

Congestion Management Process (CMP)

Federal regulations (U.S.C. Title 23, Sec. 134) require that the transportation planning process in a Transportation Management Area "address congestion management through a process that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under this title and chapter 53 of title 49 through the use of travel demand reduction and operational management strategies."

The Congestion Management Process (CMP) incorporates and coordinates the various activities of the Council, MnDOT, transit providers, counties, cities and Transportation Management Organizations (TMOs) in increasing the efficiency of the multimodal transportation system, reducing vehicle use by providing alternate modes, and providing lower-cost safety and mobility projects where feasible. It relies on the policy guidance and strategies included in the region's Transportation Policy Plan. The CMP will ensure that the key objective of mitigating congestion impacts is achieved and that congestion mitigation investments are properly monitored and evaluated.

The CMP ensures coordination of activities under the umbrella of the well-established and federally required continuing, comprehensive, and cooperative (3C) metropolitan transportation planning process in which all the above stakeholders participate. The Council, the Transportation Advisory Board and its Technical Advisory Committee provide the necessary forums to coordinate the CMP activities.

The *2030 Transportation Policy Plan* (adopted November 2010) included the required CMP, but the elements of the suggested process were spread throughout the document. This iteration brings all of the federally suggested steps into one section for clarity. Federal guidance outlines an eight-step process for the development and implementation of a CMP.

- Develop regional congestion management objectives
- Identify area of application and define system/network of interest
- Develop multimodal performance measures
- Collect data and monitor system performance
- Analyze congestion problems and needs
- Identify and assess strategies
- Implement selected strategies/manage system
- Monitor strategy effectiveness

The CMP assumes that it will not be possible to eliminate congestion on the principal arterial system or even to significantly reduce it through general-purpose-lane expansion because of financial and physical constraints and desired outcomes for the region's social and natural environments. Instead, the principal arterial system must be managed and optimized to the greatest extent possible. The CMP recognizes that congestion in principal arterial general

purpose lanes should and can be mitigated if travel alternatives are provided such as MnPASS lanes, transit services and facilities, bicycle and pedestrian facilities, and travel demand patterns are changed with support from appropriate local land use policies. It recognizes the new and innovative investment approach implemented in the *2030 Transportation Policy Plan* (2030 TPP) that allocated limited resources for the most system-wide benefit.

In essence, the CMP emphasizes five alternatives to congestion in general purpose principal arterial lanes. Each alternative will be discussed in a later section:

- Highway system management
- Intelligent transportation systems
- Travel demand management
- Transit opportunities
- Land use policy

Step 1: Congestion Management Objectives

The *2040 Transportation Policy Plan* and the 2030 TPP both include goals and/or objectives addressing highway congestion management and the region's desires for future congestion. These goals and objectives clearly lay out the philosophy and principles for the Congestion Management Process. This process recognizes that eliminating congestion is not feasible. The direction the region has taken, and will continue to take in managing congestion is to provide and encourage use of alternatives to congested travel where congestion is worst and work to reduce the uncertainty in trip duration that results from congestion.

2040 Transportation Policy Plan

The *2040 Transportation Policy Plan* has three goals that are strongly oriented towards managing highway congestion:

Transportation System Stewardship – Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.

Access to Destinations – People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.

Competitive Economy – The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.

A fourth 2040 TPP goal tangentially involves congestion management, aligning with conditions that affect the variability and reliability of travel time.

Safety and Security – The regional transportation system is safe and secure for all users.

Congestion management is further discussed in the objectives for the TPP goals. The first two objectives under the goal of Access to Destination speak directly to this point:

- "Increase the availability of multimodal travel options, especially in congested highway corridors.
- "Increase travel time reliability and predictability for travel on the highway and transit systems."

The second objective for Transportation System Stewardship states:

- "Operate the regional transportation system to efficiently and cost-effectively move people and freight."

The third objective for Competitive Economy states:

- "Support the region's economic competitiveness through the efficient movement of freight."

The first objective for Safety and Security states:

- "Reduce crashes and improve safety and security for all modes of passenger travel and freight transport."

The second objective for Safety and Security states:

- "Reduce the transportation system's vulnerability to natural and man-made incidents and threats."

2030 Transportation Policy Plan

The CMP in the 2030 TPP identified five goals, many of which were carried forward in one form or another into the *2040 Transportation Policy Plan*:

- Increase people-moving capacity
- Provide alternatives to traveling in congested conditions
- Implement strategic and affordable investments to manage existing facilities
- Increase trip reliability for corridor users
- Encourage increased transit use

Step 2: Area and Network Affected by Congestion Management Process

Transportation Policy Plan goals and objectives help define the geographic coverage of the CMP and the network of interest. The Access to Destinations goal indicates that its area of focus is

not only the region, but also the connections to areas outside the region (and beyond). One of the related objectives directs the focus to congested corridors.

This indicates that the CMP should cover the region as a whole, as well as the connections to areas beyond the seven-county region. The CMP focuses on congested principal arterials and the A-minor arterials that support them. Functional classifications are discussed in Appendix D.

Figure B-1: Principal and A-Minor Arterial Highways

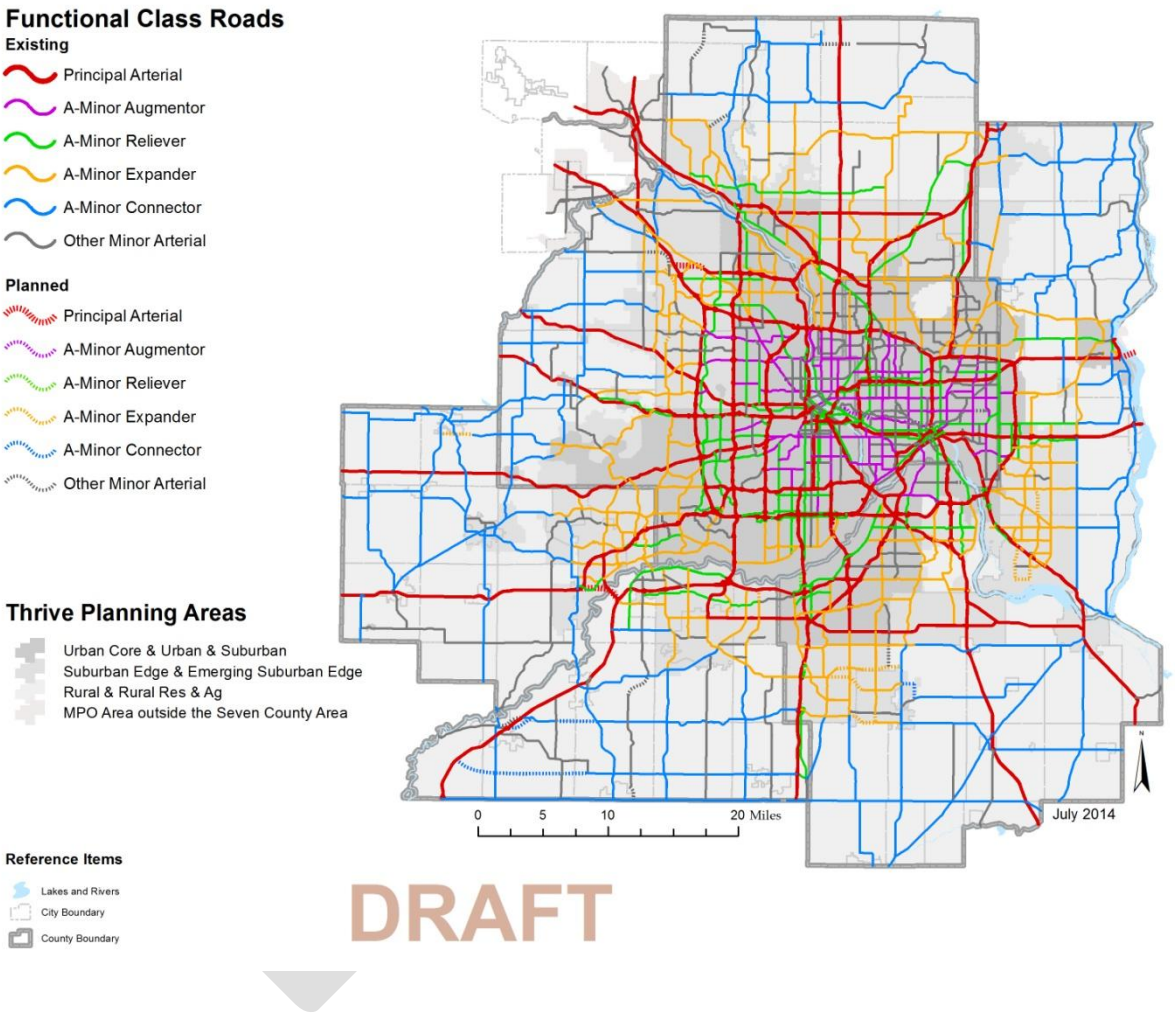
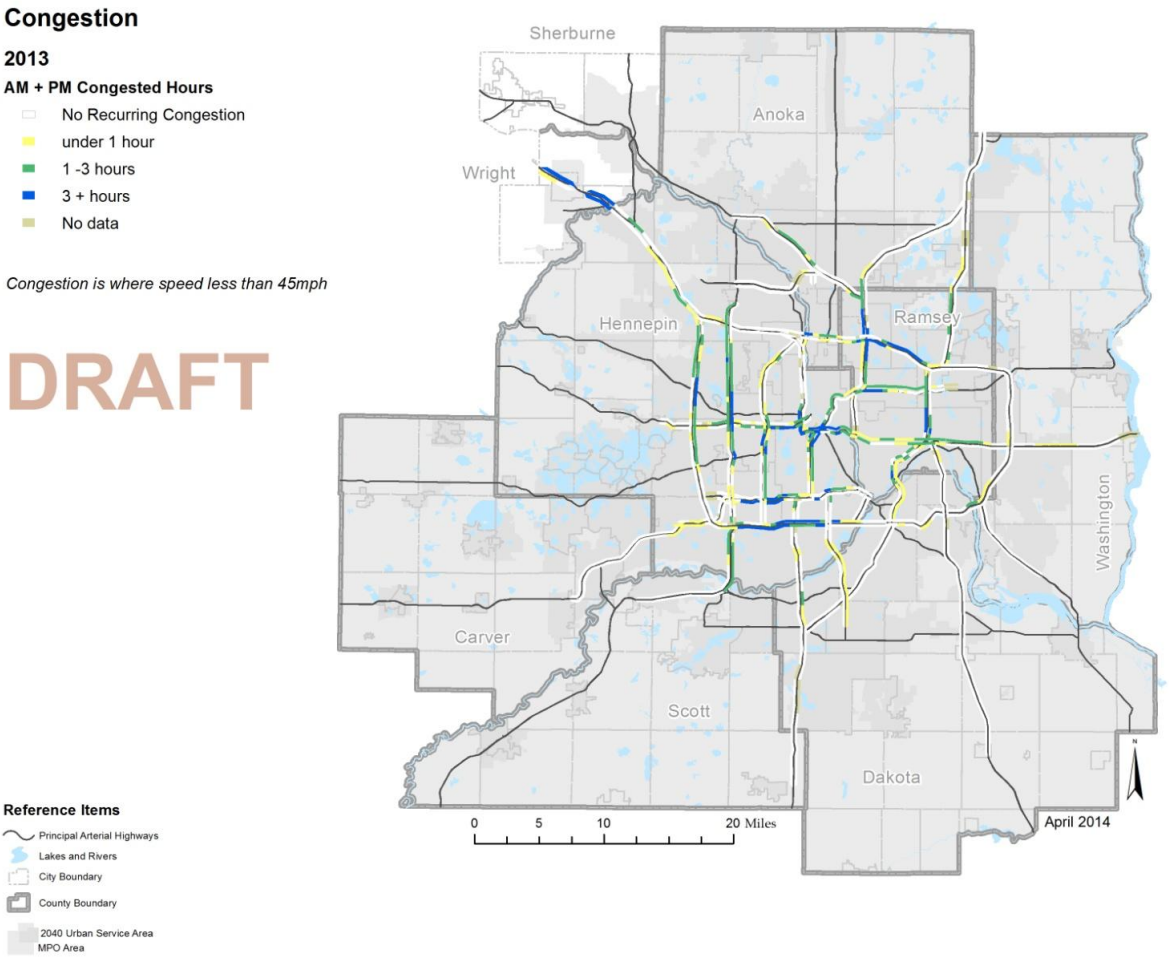


Figure B-2: 2013 Metro Freeway Congestion



Non-freeway principal and A-minor arterials are also part of the Regional Highway System. This portion of the roadway network is not covered by the monitoring systems implemented through the MnDOT Regional Traffic Management Center (RTMC). Also, the majority of the roads that fall into this category are under city or county jurisdiction. MnDOT operates a number of non-freeway trunk highways in the metropolitan area. Metro District Traffic Engineering is primarily responsible for the design, operation, and maintenance of Metro District's traffic control devices and providing traffic engineering support and expertise to other functional offices and road authorities to create a safe and efficient transportation system. They do not currently produce an annual congestion report as does the RTMC. However, they are currently working with the University of Minnesota to produce a similar congestion report with completion anticipated in 2015.

Given these data limitations, the collection of data on existing congestion and the ongoing monitoring of system performance will be implemented in phases. Data collection and ongoing monitoring are both currently conducted by MnDOT for the MnDOT principal arterials. This

resource is the base upon which further expansions of collection and monitoring efforts will build.

Step 3: Multimodal Performance Measures

Performance measures are a critical component of the CMP and are used to characterize current and future conditions on the multimodal transportation system in the region. They serve multiple purposes that intersect and overlap in the context of the CMP, including:

- Characterize existing and anticipated conditions on the regional transportation system;
- Track progress toward meeting regional objectives;
- Identify specific congested locations to address;
- Assess congestion mitigation strategies, programs, and projects; and
- Communicate system performance to decision-makers and the public.

Performance measures are used at two levels: regional and local. At the regional level, they measure performance of the regional transportation system. But at the local level, they identify specific locations with congestion problems and measure the performance of individual segments or system elements.

It is important that the measures used address the four major dimensions of congestion:

- Intensity – The relative severity of congestion that affects travel. Intensity has traditionally been measured through indicators such as V/C ratios or LOS measures that consistently relate the different levels of congestion experienced on roadways.
- Duration – The amount of time the congested conditions persist before returning to an uncongested state.
- Extent – The number of system users (SOV, HOV, transit, commercial vehicles) or components affected by congestion, for example the proportion of system network components that exceed a defined performance measure target.
- Variability – The changes in congestion that occur on different days or at different times of day. When congestion is highly variable due to non-recurring conditions this has an impact on the reliability of the system. Conditions which may contribute to high variability in travel times and low reliability include (but not limited to):
    - Incidents
    - Weather
    - Special events
    - Inadequate base capacity
    - Work zones
    - Random fluctuation in demand
    - Traffic control devices

Performance measures were reviewed and prioritized using input from city, county and state agency staff and policymakers involved in the *2040 Transportation Policy Plan*. The

performance measures proposed for use and continued development in the Congestion Management Process are as follows:

- Intensity, Extent and Duration of Congestion
- Reliability Index
- Annual Hours of Delay
- Annual Hours of Delay per Capita
- Corridor Person Throughput by Mode
- MnPASS Lane and Corridor Use by Vehicles
- Total Vehicle-Miles Traveled (VMT)
- Total VMT per Capita
- MnPASS Delay and Reliability versus General Purpose Lanes

Five performance measures were used in the CMP in the 2030 TPP and are also carried forward in this CMP:

- Person Throughput
- Travel Time Savings
- Cost Effectiveness
- Reductions in Trip Delays in Managed Lanes
- Transit Suitability Assessment

Step 4: Collect Data and monitor system performance

Data for the performance measures selected for use in the CMP are all available for the instrumented principal arterial system from existing sources or are a product of the regional travel demand model. The primary source of data for the principal arterial system is the large database maintained by MnDOT's RTMC. For many years, MnDOT has been monitoring congestion levels on the principal arterials in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties. Annually MnDOT releases the Metropolitan Freeway System Congestion Report. The most current report was released in January 2013 and is based on 2012 data (see Figure B-2). Table B-1 tabulates the miles of directional congestion observed in the region over the last decade. MnDOT also reports quarterly on the performance of the HOV/MnPASS lanes on I-35W and I-394. These reports aggregate data by vehicles and people for the MnPASS and general purpose lanes.

MnDOT evaluates 758 directional miles of the Twin Cities urban freeway system to tabulate the AM and PM percentages of directional congestion. The definition of a congested condition used by MnDOT is based on speed. A section of road is considered to be congested if it operates at speeds below 45 miles per hour for any length of time during the AM and PM peak periods. Mainline detectors are located in each lane of a freeway at approximately one-half mile intervals. Individual lane detectors located at a given location along the same direction of the freeway constitute a station. For the purpose of the MnDOT report, if any station's detectors experience congestion at any given time, the station is identified as congested.

More detailed information on the detector system is available in MnDOT's Metropolitan Freeway System Congestion Report. The following tables generated from data in MnDOT's report tabulate the directional miles of congestion into three categories: severe, moderate, and low. These are defined as follows:

- Severe – Congested for more than two hours
- Moderate – One to two hours congested
- Low – Congested for less than one hour

Table B-1: AM Plus PM Miles of Directional Congestion

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Severe	83	72	83	64	82	51	55	82	73	85
Moderate	105	105	94	97	112	104	107	127	125	128
Low	106	104	101	107	111	108	114	117	121	113
Total	293	280	277	267	305	263	276	326	319	325

The Regional Travel Demand Model is also used to evaluate the impact of potential road and highway improvements on the system. This modeling tool is built on a large database of information on regional travel patterns and behavior collected through the *2010 Travel Behavior Inventory*. Data on transit system performance and usage is provided by Metro Transit and suburban transit providers through regular reports and supplemented by the Regional Travel Demand Model for information on potential improvements to the transit system.

The data required to model the highway and transit networks include the following items:

- Roadway classifications
- Number of lanes
- Freeflow speeds
- Bus routes and schedules
- Light rail transit routes and schedules
- Commuter rail route and schedule

The Metropolitan Council maintains the socioeconomic and demographic database at a Transportation Analysis Zone (TAZ) level covering the 7 counties in the Twin Cities planning area plus 13 counties surrounding the planning area. The data tabulated by TAZs include:

- Population
- Households
- Retail employees

- Non-retail employees

Using these data elements to monitor system performance will be an ongoing annual task to support the planning and programming process implemented through the Metropolitan Council and Transportation Advisory Board.

Step 5: Analyze Congestion Problems and Needs

This section discusses the level of congestion experienced and forecast for the Twin Cities planning area. Congestion levels are first benchmarked against congestion in peer regions using data from the Texas Transportation Institute's Urban Mobility Report. This report provides a consistent set of data across the regions included in the report and provides data back to 1982.

Comparison to Peer Regions

The Texas Transportation Institute regularly produces the Urban Mobility Report. This report provides an in-depth analysis of congestion and its impacts for 101 urban areas. The urban areas are categorized (based on population) as follows:

- Very Large Urban Areas – over 3 million population (15 areas included in study)
- Large Urban Areas – over 1 million and less than 3 million population (33 areas included in study)
- Medium Urban Areas – over 500,000 and less than 1 million population (32 areas included in study)
- Small Urban Areas – less than 500,000 million population (21 areas included in study)

The Twin Cities region is one of the areas covered in-depth in the study and is categorized as a "Large Urban Area" in the Texas Transportation Institutes Urban Mobility Report. This report is a primary data source for the *2012 Transportation System Performance Evaluation* (TSPE) produced by the Metropolitan Council prior to each major revision of the TPP. By state statute, this evaluation report is required to:

- evaluate the area's ability to meet the need for effective and efficient transportation of goods and people;
- evaluate trends and their impacts on the area's transportation system;
- assess the region's success in meeting the currently adopted regional transportation benchmarks; and
- include an evaluation of the regional transit system, including a comparison with peer metropolitan regions with regard to key operating and investment measurements.

The Transportation System Performance Evaluation identifies 10 peer regions which are also used here to put the travel and congestion levels of the Twin Cities region into a larger perspective:

- Baltimore
- Milwaukee
- Cincinnati
- Pittsburgh
- Cleveland
- Portland, OR
- Dallas – Fort Worth
- Seattle
- Denver – Aurora
- St. Louis

Table Fed-17 provides a comparison of the population, daily vehicle-miles-traveled (total and per capita), and travel time index for the Twin Cities region and the 10 peer regions.

Table 16: Comparison of Daily VMT and Travel Time Index

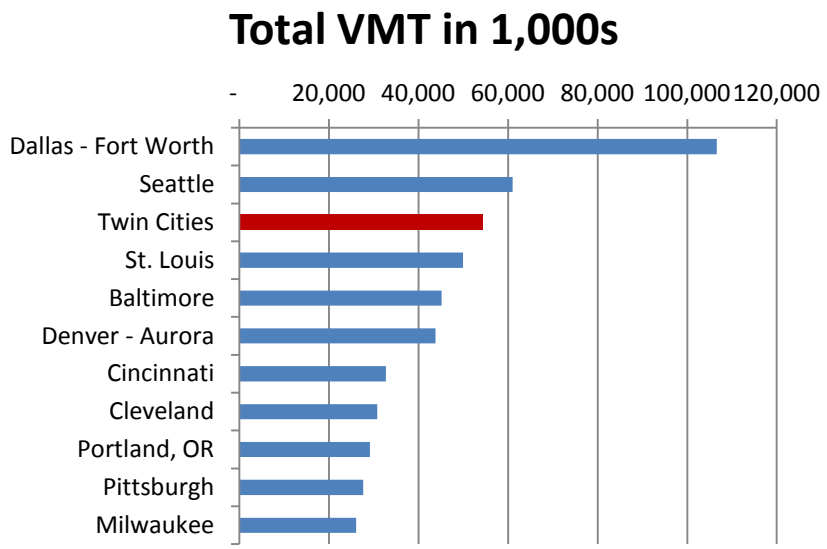
Metropolitan Area	2011 Population (1000s)	2010 Urbanized Land Area (Square Miles)	2011 Daily VMT (Freeway + Arterial) (1000s)	2011 Daily VMT per Capita	2011 Travel Time Index
Twin Cities	2,757	1,022	54,302	19.7	1.21
Baltimore	2,523	717	45,143	17.9	1.23
Cincinnati	1,717	788	32,693	19.0	1.2
Cleveland	1,700	772	30,791	18.1	1.16
Dallas-Fort Worth	5,260	1,779	106,612	20.3	1.26
Denver-Aurora	2,348	668	43,780	18.6	1.27
Milwaukee	1,496	546	26,085	17.4	1.15
Pittsburgh	1,761	905	27,649	15.7	1.24
Portland, OR	1,925	524	29,123	15.1	1.28
Seattle	3,286	1,010	61,035	18.6	1.26
St. Louis	2,343	924	49,950	21.3	1.14
Peer Average	2,436	863	45,286	18.6	1.22
Large Area Average	1,609	NA	29,692	18.5	1.20
Source: Texas Transportation Institute, *2012 Urban Mobility Report* and 2010 US Census					

The Twin Cities' peer regions evaluate mobility and congestion performance measures as part of their CMPs. However, comparing these measures across regions is difficult given the many different measures and methodologies used to evaluate congestion. The Texas Transportation Institute annually publishes the Urban Mobility Report that assesses 101 urban areas across the country. This provides a consistent set of performance measures that can be used to compare the Twin Cities against its peer regions.

Travel Estimates

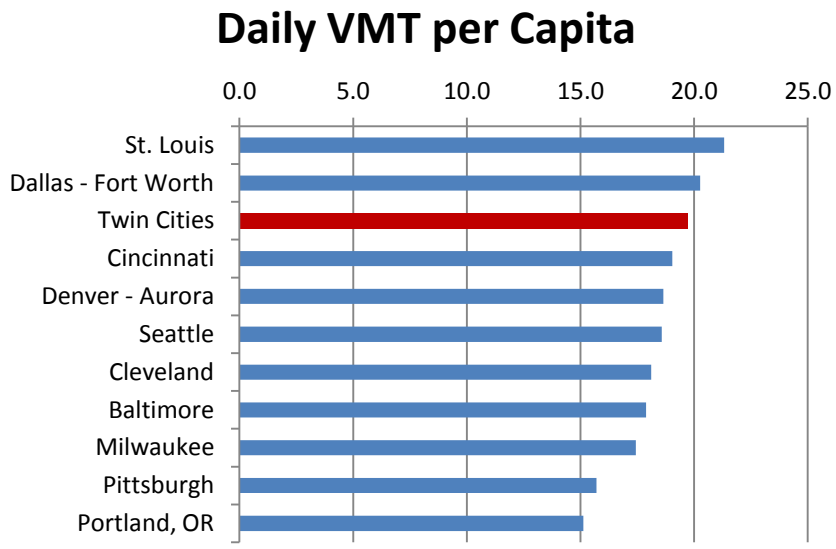
In terms of total travel, the Twin Cities region comes in third among its peers, with the Dallas-Ft. Worth region producing far more daily vehicle-miles-traveled. The VMT reported ranges from a daily high of over 106,612,000 VMT to 28,085,000. The average of the region's 10 peers is 45,286,000 daily VMT compared to 54,302,000 daily VMT produced in the Twin Cities region. This represents a rate 20% greater than the peer average.

Figure B-3: Vehicle Miles Traveled



However, the Dallas-Ft. Worth region (despite being considered a peer due to its mid-continent location, lack of constraining barriers, and similar travel mode options) is categorized by the TTI report as a "Very Large Urban Area" with a population of over 3 million. Normalizing the VMT data by the population provides a slightly different relationship to the Twin Cities region.

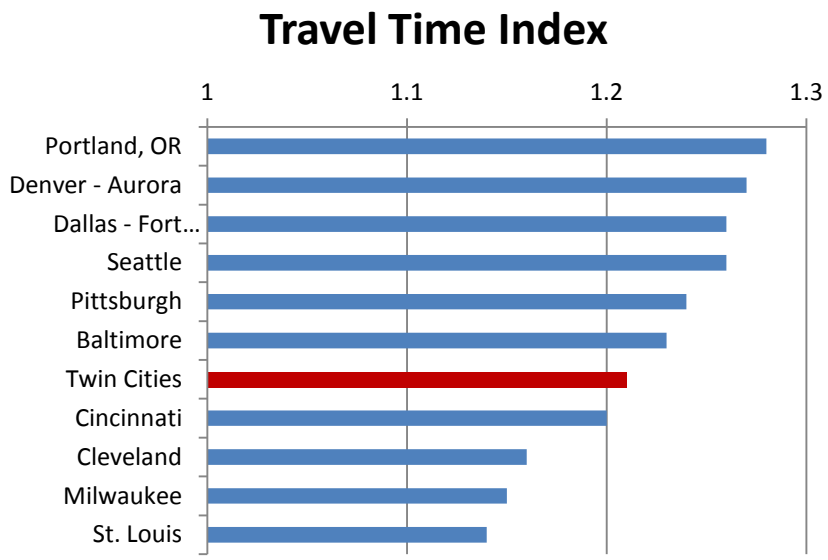
Figure B-4: Daily Vehicle Miles Traveled per Capita



The Twin Cities still ranks third, but here the values range from a high of 21.3 VMT per capita to a low of 15.1 VMT per capita. The average of the region's 10 peers is 18.6 VMT per capita compared the Twin Cities' 19.7. This represents a rate only 6% higher than the peer average.

Despite this greater level of VMT production (in both terms of total VMT and VMT per capita) the road and highway system of the Twin Cities region performs well relative to its peers. The Urban Mobility Report Travel Time Index (TTI) compares peak-period travel time to free-flow travel time. It includes both recurring and incident conditions. Thus if a region has a Travel Time Index of 1.2, a 20-minute trip in free-flow conditions can be expected to take an average of 24 (20 times 1.2) in the peak period.

Figure B-5: Travel Time Index



In this measure, the Twin Cities region falls to 7th place. The values for the TTI ranges from a high of 1.28 to a low of 1.14, with a peer average of 1.22. The TTI for the Twin Cities falls just below this at 1.21.

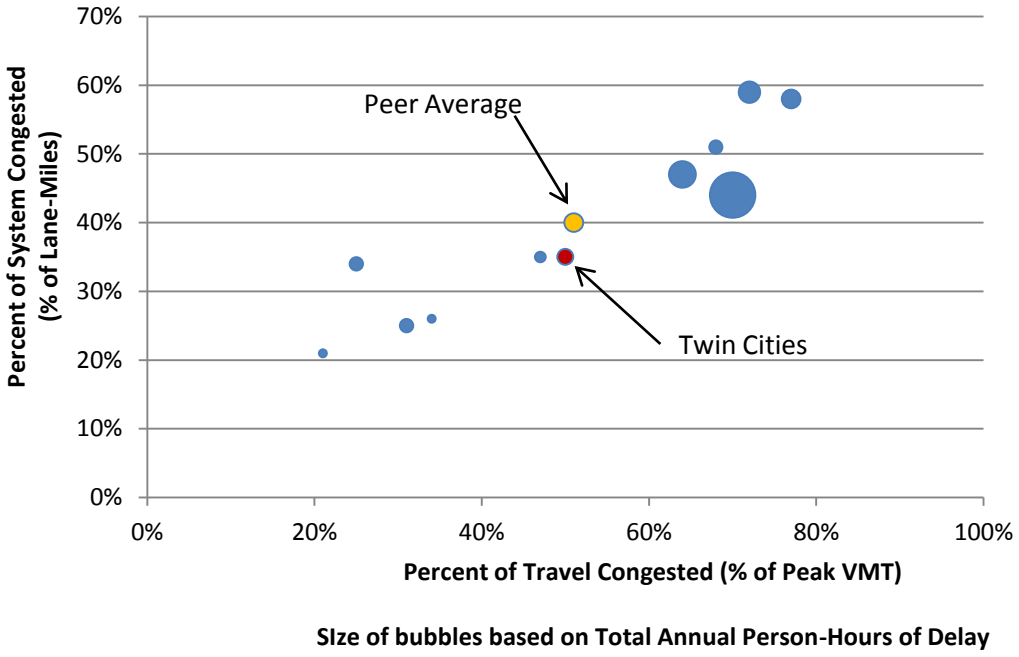
System Congestion

Figure B-6 presents three indicators of total congestion for the Twin Cities Region and its 10 peer cities:

- The percent of peak travel that is in congested conditions (x-axis);
- The percent of the system that is congested (y-axis); and
- Total delay (bubbles are sized based on total annual person-hours of delay)

The Twin Cities is shown in red and the average for the 10 peer cities is shown in orange. By percent of travel or congested system, the Twin Cities exhibits a fairly average level of congestion, actually falling below the trendline for the data. Among the region's peers, five generally exhibit higher measures of congestion and five have lower levels of congestion. Of the five that exhibit higher congestion measures, only one (Portland) generates fewer annual hours of delay (14% less) due to congestion. But then, Portland has 30% less population than the Twin Cities according to the Urban Mobility data.

Figure B-6: Measure of Systemwide Congestion among Peer Regions



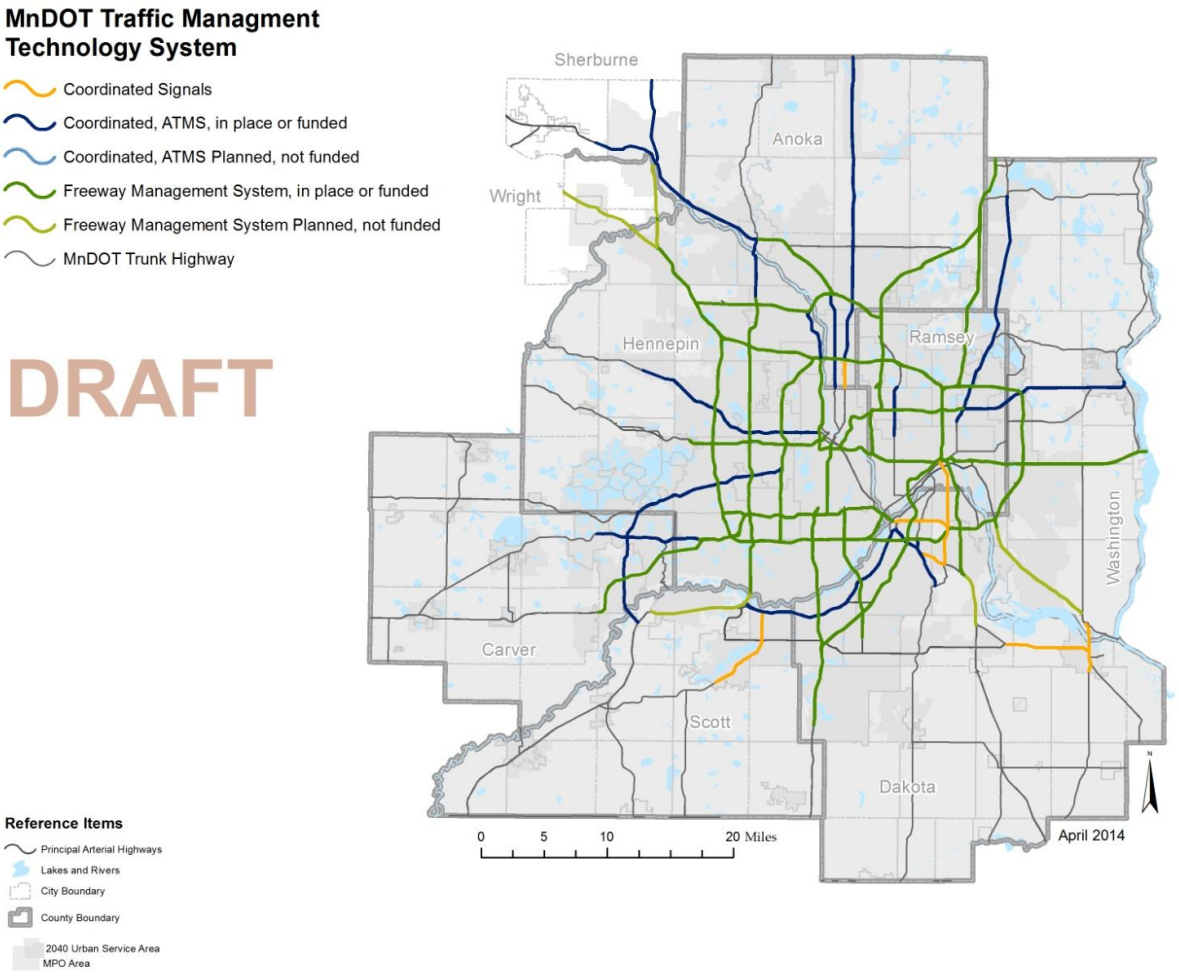
Step 6: Identify and Assess Strategies

Highway System Management

Highway system management is the umbrella of infrastructure strategies to improve traffic operations from the supply side of capacity. The approach for this region, as recommended through the *Metropolitan Highway System Investment Study* (MHSIS) (September, 2010) and other studies discussed later, includes a number of existing or innovative strategies such as:

- Implementing traffic operational improvements using Active Traffic Management (ATM) and Intelligent Transportation Systems (ITS) applications (see Figure B-7)
- Developing spot mobility improvements which include lower-cost/high-benefit projects to improve existing traffic flow, geometric design, and eliminate safety hazards (see Figure B-8)
- Implementing a system of MnPASS lanes to provide a congestion-free option for people who ride transit, carpool, or are willing to pay. (See Figure B-9)
- Building strategic capacity enhancement projects

Figure B-7: Active Traffic Management System



Highway mobility and congestion issues are best addressed by first using ATM strategies, which are generally lower cost and provide a higher return on investment. If the ATM strategies have been exhausted, spot mobility improvement options should be evaluated to determine whether they can cost-effectively address the mobility and congestion issues at a specific location. If a larger, longer-term lane capacity solution is needed, the potential for implementing MnPASS lanes should be evaluated. Only after exhausting or ruling out these strategies, should other strategic capacity enhancements be considered because of their higher cost/lower return on investment. Within all of these strategies, the following principles should be applied to improve efficiencies, optimize return on investment and minimize disruption to the traveling public:

- Perform improvements when preservation work is occurring in the corridor (i.e. opportunity-driven approach)
- Utilize existing infrastructure and right-of-way to the fullest extent possible
- Utilize performance-based design principles to the fullest extent possible

- Strive for shortest implementation timeframe possible
- Implement complete streets policies and transit advantage improvements to the fullest extent possible

The Twin Cities region is particularly well positioned to mitigate congestion and preserve a high level of regional mobility because the strategies proposed can build on improvements already in place. These include an actively managed freeway system equipped with electronic surveillance (i.e. fiber cable, loop detectors and cameras) on about 90% of the urban freeways. In addition, the region has the advantage of a sophisticated Regional Traffic Management Center (RTMC) that can be expanded to handle new traffic management applications. Other existing elements include an extensive bus-only shoulder system and two corridors with dynamically priced HOV/MnPASS lanes.

In addition, several implemented lower-cost/high-benefit projects have been publicly praised and have provided MnDOT with additional experience in flexible design applications. Examples include traffic restoration projects done in conjunction with the reconstruction of the I-35W bridge over the Mississippi River; shoulder conversions to through lanes on TH 100; adding through lanes and modifying interchange ramps on I-94 east of Saint Paul; the performance-based design of the I-694/Highway 10/Snelling Avenue interchange; the I-494 westbound auxiliary lane between I-35W and France Avenue; and signal timing to improve traffic flow on various highways in the metropolitan region.

The MnPASS lanes on I-394 and I-35W have proven very effective in improving highway and transit efficiency during peak congested periods. MnPASS lanes:

- Expand the people-moving capacity of the freeway system
- Offer commuters a faster, more reliable choice
- Improve bus transit service and increase ridership
- Improve park-and-ride use and increase car/vanpooling

The all-electronic dynamic pricing used in the MnPASS lanes will enable them to sustain the highway and transit benefits they provide for a long period of time.

Expanding the reliability and people-moving capacity of the freeway system is most effectively accomplished by adding MnPASS lanes. Select strategic capacity enhancements also can be effective options, including additional bus-only shoulder lanes, unpriced dynamic shoulder lanes, auxiliary lanes, improvements to existing interchanges, and new bridges for roads to pass over or under the freeway without accessing the freeway. Consideration must be given to the effect of such improvements on land use, travel demand, short- and long-term return on investment, and highway segments both upstream and downstream of the enhancement. The *2040 Transportation Policy Plan* does not anticipate building additional general purpose lanes on the freeway system.

Figure B-8: Congestion Management and Safety Plan

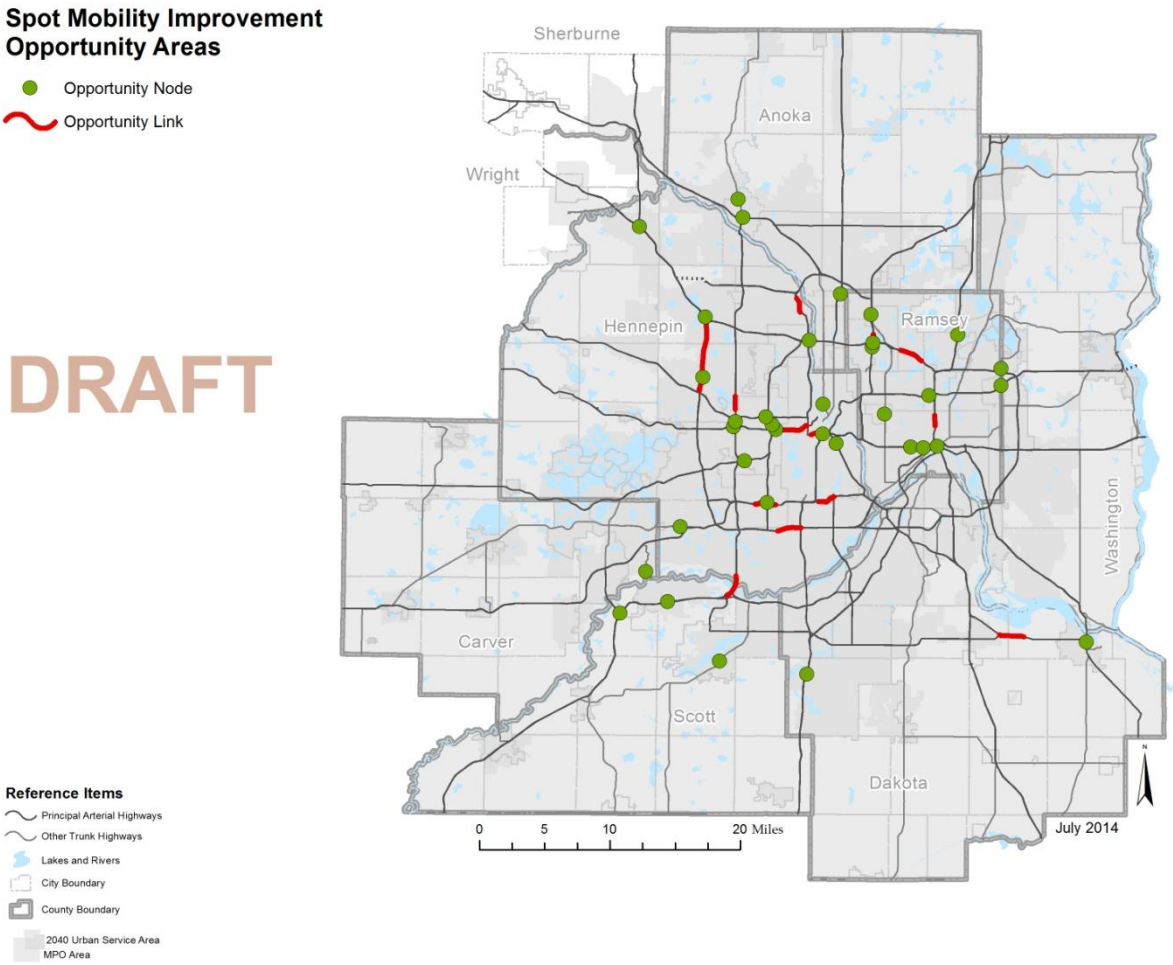
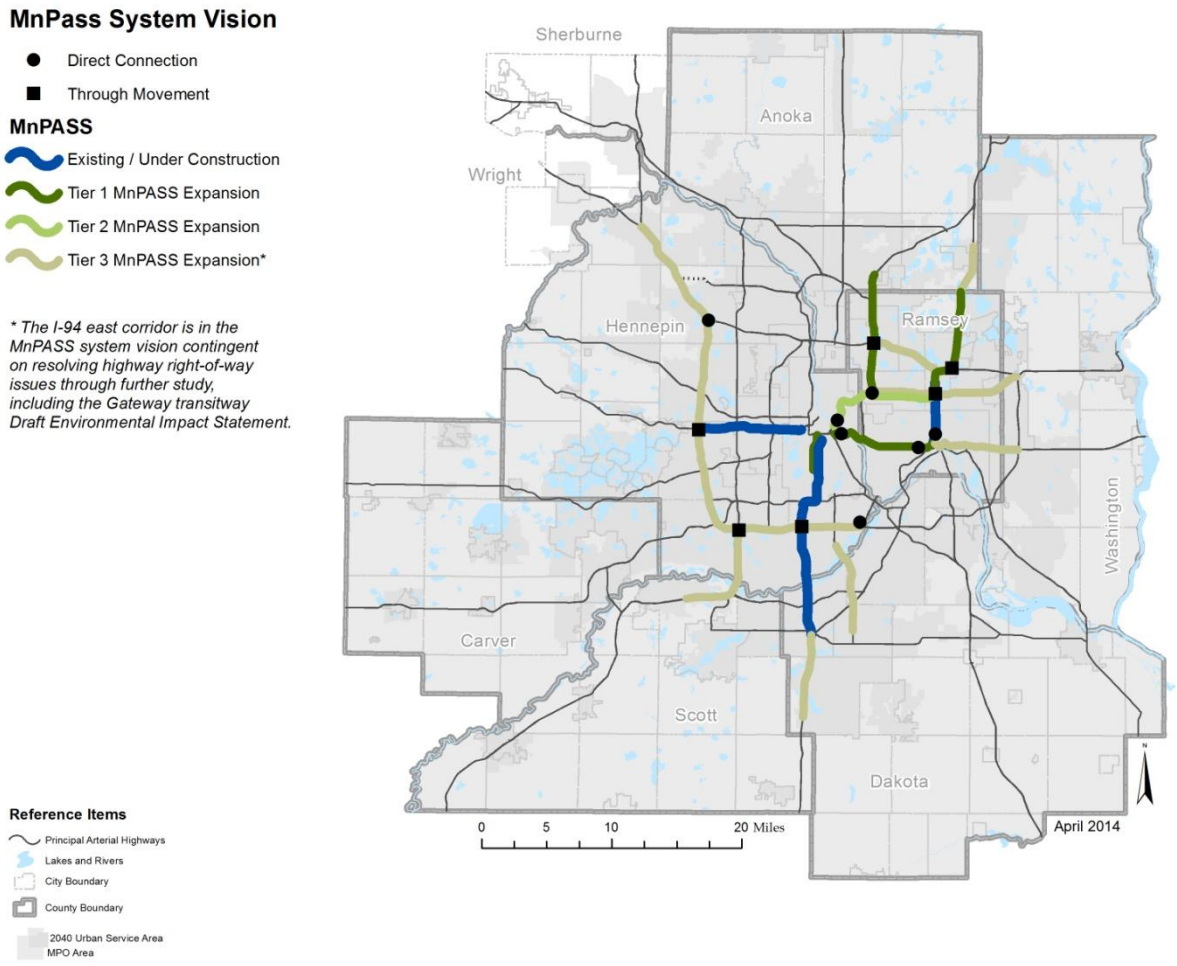


Figure B-9: MnPASS System



Local comprehensive plans identify planned improvements for the principal arterial system owned by counties and for most of the supporting minor arterial system.

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) activities have been managed by MnDOT under the Minnesota Guidestar name. Since its inception in 1991, Minnesota Guidestar has performed a broad range of ITS activities including needs assessments, research and development, full-scale operational testing, and deployment of ITS strategies and technologies. Minnesota Guidestar has been a key player in advancing ITS technology and programs to help achieve statewide and local transportation objectives. This success continues because of Minnesota Guidestar's strong partnerships with the public sector, the private sector, and academia. It is because of these partnerships that Minnesota Guidestar has successfully produced innovative and unique programs and projects, some of which are described below.

Minnesota Guidestar Strategic Plans were issued in 1997, 2000, 2006 and 2010. These plans have provided statewide and local strategic direction to Minnesota Guidestar and have initiated more than 200 ITS programs, projects, and activities over the years.

Some of the more recent projects include the following:

Arterial Real-Time Traveler Information Commercial Probe Data Project (2012)

This project is intended to demonstrate an innovative, non-infrastructure-based, relatively low-cost approach to collect real-time traffic data on metro area arterials and in a rural interstate construction work zone, and provide real-time traffic information to motorists. Data provided will augment traffic data currently being collected by MnDOT to provide a broader picture of traffic conditions in the metro area and on rural freeways. Also, this project plans to validate the accuracy and reliability of traffic non-infrastructure-based data collection on a major state arterial and rural interstate construction work zone.

Arterial Travel Time Monitoring System Using Bluetooth Technology (2011)

This project will demonstrate how the use of Bluetooth technology can share cost-effective real-time and accurate travel time information along Minnesota's arterials, and will also demonstrate how travel time information might be used to measure performance of arterial traffic management and operations.

Deployment of Arterial Travel Time Information Demonstration Project (2009-2011)

The Arterial Travel Time Information Demonstration project will help determine how arterial travel time information should be displayed on dynamic message signs and websites (such as 511) through input from focus groups and customer surveys.

ICM Integrated Corridor Management (2006-2013)

Minnesota is one of the eight locations selected by the USDOT to pilot the development of integrated corridor management (ICM) strategies. The Minnesota ICM Corridor is located along the I-394 Corridor on the west side of the Twin Cities. The focus of ICM is to develop strategies that, when implemented, help reduce congestion throughout the freeways, arterials, and transit networks.

ITS During Major Urban Reconstruction (2007-2010)

The ITS During Major Urban Reconstruction project is striving to give the Crosstown Commons project and other major urban projects safety improvements for motorists and construction personnel as well as greater use of alternative routes, more real-time information and reduced speeds during key phases.

Travel Demand Management (TDM)

Travel demand management (TDM) consists of ongoing programmatic strategies to reduce drive-alone vehicle trips and vehicle miles traveled during peak congestion times, special events, and for construction project areas. TDM strategies provide incentives for people to more effectively use existing transportation resources and infrastructure. The desired outcome of these strategies is to promote mobility and reduce congestion by reducing trips and miles of travel by single-occupant vehicles (SOV). TDM includes the most effective strategies to facilitate the movement of people by modes such as carpooling, vanpooling, transit, bicycling, and walking. TDM also supports flexible employment arrangements that do not require peak-period travel (flexible schedules) or would allow employees to avoid the commute altogether by working from home (telecommuting). Reducing SOV trips and miles traveled, particularly in the morning and afternoon peak travel periods, should also produce health and environmental benefits (lower levels of air pollution and reduced energy use). Linking TDM with supportive land use patterns and development decisions can also reduce SOV trips.

The region's objectives for travel demand management are to:

- Increase the use of alternative transportation modes such as walking, bicycling, public transit, carpooling, vanpooling, and flexible work arrangements, such as telecommuting, to reduce vehicle miles traveled.
- Ease congestion during the peak periods, special events, and construction.
- Reduce air pollution and energy consumption related to transportation.
- Make more efficient use of transportation infrastructure and services.
- Reduce the necessity of car ownership when other travel choices exist.
- Promote transportation-efficient land development.
- Provide "reverse commuting" assistance for urban commuters to employment locations not served by transit.

The Council will work to implement these TDM objectives where appropriate through a combination of efforts with Metro Transit and transportation management organizations (TMOs). TMOs are public or private partnerships in highly-congested locations comprising employers, building owners, businesses, and local government interests that are established to mitigate peak traffic congestion and promote travel by modes other than single-occupant vehicles.

The Council will provide TDM technical assistance and financial incentives to TMOs, especially those located in areas with high levels of congestion. The Council and its TDM partners will also provide assistance to local units of government to implement TDM strategies and to employers and property owners/managers wishing to develop their own TDM plans.

Where appropriate, the Council will work with local governments to explore how modifying parking policies could encourage park-and-ride usage, vanpooling, and carpooling. The Council will also support its partners in local government to encourage parking spaces to be unbundled

from building leases in order to make the cost of providing space for parking more transparent in congested areas.

A recently completed TDM Study (discussed later in this chapter) provided the following key recommendation that will strengthen the link between TDM and congestion management: focus local and regional TDM efforts on employment centers and corridors with significant investments in multimodal options.

These significant multimodal investments include expanded transit service, MnPASS lanes, bus-only shoulders, and biking/walking facilities. These investments will typically be applied in the most congested corridors via recommendations from the *Metropolitan Highway Strategic Investment Study*, MnPASS-2, and CMSP.

Transit System

The TDM and highway investment strategies to manage congestion are also supported by investments in the transit system. A better-managed overall transportation system will facilitate the region's objectives of increasing the mode share of travel using modes other than single-occupant vehicles. Expanding the transit system and accommodating more non-motorized travel will give area travelers more mobility options. This Transportation Policy Plan includes an expansion of the transit system that considers investments in both the bus system and the transitway system. The bus system expansion is guided by several planning elements, including the Regional Service Improvement Plan and Park-and-Ride Plan, and identifies opportunities for local, high-frequency, and express service expansion. Prioritization for these investments includes the consideration of the location and extent of congestion and the availability of transit advantages to bypass congestion.

The transitway system expansion includes plans for expanded light rail, commuter rail, and bus rapid transit in a variety of forms. Prioritization for transitway investments includes the consideration of an investment's ability to shift riders from driving to transit and provide reliable trips. Other factors included in prioritization will indirectly consider the impacts on congestion, and corridor-specific planning may still address congestion as a local concern.

Transitway planning will also be strongly coordinated with land use planning through the Council's local comprehensive plan review process. The Council will require or support more intense land uses near transit investments to increase the potential for transit use in growing areas of the region.

Land Use Policy

Connecting land use decisions to transportation investments will support the objective of increasing the use of transit, walking, and biking, which helps to minimize the growth in congestion. Land use with sufficient activity and density, including walkable streets and a local transportation network, can best support transit options. A well-connected local and collector

roadway network will also support regional highways by keeping local travel off of highways and making walking and bicycling more attractive options for local travel. This supportive road network, in addition to investments in alternatives to the automobile, will support more travel-efficient land development that allows people to live and work within a reasonable commute time and to avoid congestion.

Land use strategies derived from *Thrive MSP 2040* that serve to bolster transit ridership and thereby contribute to congestion management include:

- Coordinate transportation investments and land development to create an environment supportive of travel by modes other than the automobile including travel by transit, walking and bicycling.
- Coordinate transportation investments and land development along major transportation corridors to intensify job concentrations, increase transportation links between job concentrations and medium-to-high density residential developments, and improve job-to-housing connections.
- Transitways and the arterial bus system should be catalysts for the development and growth of major employment centers and residential nodes to form an interconnected network of higher density nodes along transit corridors.
- Intensify population density in nodes along transportation corridors, especially along existing and potential transit corridors.
- Intensify employment clusters with transit and pedestrian infrastructure.

Step 7: Implement Selected Strategies/Manage System

The CMP is guided by the technical analysis and direction provided by six major planning efforts conducted by the Council and MnDOT in 2009, 2010, and 2012. Their findings and recommendations are the basis for the investment priorities contained in the fiscally constrained 2040 highway plan. They also are the basis for the development of a long-range list of potential investments from which additional projects could be drawn should funds materialize beyond the highway revenues projected in this plan. These six planning efforts, described below, provide the underlying problem identification, solution development, and analysis to support the strategies being implemented through the 2040 TPP and the CMP.

Metropolitan Highway System Investment Study (MHSIS) (2010)

This study had a planning horizon beyond the fiscally constrained 2030 TPP and carried out a comprehensive evaluation of Active Traffic Management (ATM) strategies, managed lanes, and strategic capacity enhancements to address congestion problems on principal arterials throughout the Metropolitan Highway System. It also included a specific project evaluation and prioritization process as the basis for the fiscally constrained plan discussed in the Highways portions of Part 2 of this plan.

The study used five performance goals and associated performance measures for evaluating managed lanes and targeted capacity expansion projects:

Table B-3: MHSIS Performance Goals

Goal	Performance Measure
Increase people-moving capacity	Person throughput
Provide alternatives to traveling in congested conditions	Travel time savings
Implement strategic and affordable investments to manage existing facilities	Cost effectiveness
Increase trip reliability for corridor users	Reductions in trip delays in managed lanes
Encourage increased transit use	Transit suitability assessment

This evaluation scheme was discussed with various stakeholders at 10 workshops throughout the region. The purpose of this exercise was to develop a better understanding of the relative ranking of these five performance goals and their performance measures.

These performance measures will be used along with those defined earlier in this section, through the CMP, to evaluate the effectiveness of implemented investments and to reassess priorities, if necessary.

Major Corridor Reassessments

MnDOT has also conducted, in conjunction with the MHSIS, the reassessment of 12 major capacity projects in the Metropolitan Highway System which had been included in the *2004 Transportation Policy Plan*, but excluded from the 2009 version because they exceeded the financial constraints of the plan.

Based on this analysis, MnDOT is recommending that alternative options for managing congestion in these corridors be considered. Common themes of this reassessment include proposing lower-cost options that can accomplish a large portion of the benefits expected from the larger projects, the use of managed lanes options and strategic capacity investments and the coordination of different types of improvements (preservation, bridge replacement, and safety, ATM) to maximize synergy.

Specific recommendations of this reassessment are further discussed in the Highway portions of Part 2 of this document.

MnPASS System Study 2 (2010)

The purpose of this study was to develop a prioritized list of potential candidate corridors for additional MnPASS lanes that can be implemented in the short term (2-10 years). A total of 13 candidate corridors were considered and submitted to an initial screening. This step was followed by traffic and revenue analysis as well as conceptual engineering analysis and cost estimation of the most promising projects.

A subsequent detailed performance evaluation was performed to establish implementation priorities. Measures included travel time reliability, person trip throughput, travel time reduction, change in congested vehicle miles travelled, and transit suitability. This *MnPASS System Study 2* performance evaluation scheme was consistent with the methodology used in the MHSIS.

Preliminary results from the MnPASS 2 study were used to establish MnPASS lane priorities in the Fiscally Constrained 2030 Plan in Chapter 6: Highways. These results are carried forward into the *2040 Transportation Policy Plan* as well (see Figure B-9). Managed lane projects implemented in the short term will be re-evaluated through the CMP using the same performance measures described above to determine longer term MnPASS lane investment priorities.

Congestion Management and Safety Plan (CMSP)

The CMSP defines a process and criteria to identify and prioritize lower-cost/high-benefit highway construction projects that provide mobility, safety and efficiency benefits. Phase III of the CMSP was undertaken to identify a list of lower-cost/high-benefit projects that seek to maximize mobility and reduce crash risk at key congestion and safety problem locations. The most recent phase of the plan (phase III) of the plan was completed in 2013. It also defines a project-specific framework for before and after studies to help evaluate those projects once implemented to better understand the potential effectiveness of different tools in mitigating congestion and safety projects. Typical lower-cost/high-benefit projects remove bottlenecks and safety hazards with flexible design solutions that can be accommodated within the existing right-of-way.

Initially, the CMSP identified problem locations on the existing Metropolitan Highway System both for a.m. peak hours and p.m. peak hours. Typical problem locations include areas where existing freeway traffic volumes make it difficult to accommodate new merging traffic from other roads, and where mainline freeway traffic back-ups occur because of not enough capacity on the exit ramps. Other problem areas include excessive freeway mainline weaving and freeway ramp-to-ramp weaving as well as locations where a mainline lane is dropped. As traffic volumes increase over time, congestion and safety problems are magnified at those locations and their impacts propagate to increasingly longer segments of the system.

The evaluation measures for these lower-cost/high-benefit projects include increased traffic flow rate (i.e. vehicles per day and per peak period), peak period miles of congestion, peak period travel speed, crash reduction by severity and benefit/cost ratio. Figure B-8 illustrates potential project locations identified through the CMSP process.

Travel Demand Management Evaluation and Implementation Study (2010)

The purpose of this study was to outline a clear process for selecting, funding, and implementing travel demand management (TDM) strategies, and also structuring and evaluating the Twin Cities TDM program. The local TDM partners were engaged during the study through a formal advisory committee, including state, regional, and local organizations.

The TDM study builds upon a very successful venture in promoting and implementing TDM strategies in this region over more than three decades. It includes eight broad TDM goals and a detailed list of recommended strategies for each of those goals.

Key TDM goals from the study include:

- Allocating future Congestion Mitigation and Air Quality (CMAQ) funding for TDM based on monitored performance and sound estimates of impacts
- Developing additional funding sources to expand the regional TDM program
- Evaluating regional program performance over time by annually tracking vehicle miles reduced due to TDM efforts
- Focusing local and regional TDM efforts on employment centers and corridors with significant investments in multimodal options.

A-Minor Arterial System Evaluation Study (2012)

The purpose of the *A-Minor Arterial System Evaluation Study* was to evaluate if the Twin Cities metropolitan area's A-minor arterial system has and continues to successfully supplement the principal arterial system. In doing so, the study considered if the original purpose of the A-minor arterial system aligned with regional policy in 2012. It also examined the system's funding – federal, state, and local – to identify the role of federal funding, including those funds awarded through the Regional Solicitation process.

The study's findings and recommendations showed that the region's A-minor arterial system has successfully supplemented the principal arterial system and this original purpose continues to align with current regional policy. In addition, the study recognized the A-minor arterial system supports important access to regional job and activity centers and freight terminals for freight, transit, and people walking and on bicycles. Finally, the study found that federal funding, including monies awarded through the Regional Solicitation, plays a small but important part in developing and enhancing the system. The study's findings and

recommendations identified the changes needed to allow the A-minor arterial system to continue to fulfill its important roles in the highway system.

Specific 2040 Transportation Policy Plan Strategies

Consistent with the structure set in other section of this Transportation Policy Plan, strategies are presented in their goal areas:

A. Transportation System Stewardship

Strategy A1. Regional transportation partners will place the highest priority for transportation investments on strategically preserving, maintaining, and operating the transportation system.

Strategy A2. Regional transportation partners should regularly review planned preservation and maintenance projects to identify cost-effective opportunities to incorporate improvements for safety, lower-cost congestion management and mitigation, transit, bicycle, and pedestrian facilities.

Strategy A3. The Council and regional transit providers will use regional transit design guidelines and performance standards, as appropriate based on Transit Market Areas, to manage the transit network, to respond to demand, and balance performance and geographic coverage.

C. Access to Destinations

Strategy C3. The Council, working with MnDOT, will continue to maintain a Congestion Management Process for the region's principal arterials to meet federal requirements. The Congestion Management Process will incorporate and coordinate the various activities of MnDOT, transit providers, counties, cities and transportation management organizations to increase the multimodal efficiency and people-moving capacity of the National Highway System.

Strategy C4. Regional transportation partners will promote multimodal travel options and alternatives to single occupant vehicle travel and highway congestion through a variety of travel demand management initiatives, with a focus on major job, activity, and industrial and manufacturing concentrations on congested highway corridors and corridors served by regional transit service.

Strategy C5. The Council will work with MnDOT and local governments to implement a system of MnPASS lanes and transit advantages that support fast, reliable alternatives to single-occupancy vehicle travel in congested highway corridors.

Strategy C7. Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput.

Strategy C8. Regional transportation partners will prioritize all regional highway capital investments based on a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

Strategy C9. The Council will support investments in A-minor arterials that build, manage, or improve the system's ability to supplement the capacity of the principal arterial system and support access to the region's job, activity, and industrial and manufacturing concentrations.

Strategy C10. Regional transportation partners will manage access to principal and A-minor arterials to preserve and enhance their safety and capacity. The Council will work with MnDOT to review interchange requests for the principal arterial system.

Strategy C11. The Council and regional transit providers will expand and modernize transit service, facilities, systems, and technology, to meet growing demand, improve the customer experience, improve access to destinations, and maximize the efficiency of investments.

Strategy C12. Regional transportation partners will invest in an expanded network of transitways that includes but not limited to bus rapid transit, light rail, and commuter rail. Transitway investments will be prioritized based on factors that measure a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

Strategy C19. The Council and MnDOT should work together with cities and counties to provide efficient connections from major freight terminals and facilities to the regional highway system, including the federally designated Primary Freight Network.

D. Competitive Economy

Strategy D1. The Council and its transportation partners will identify and pursue the level of increased funding needed to create a multimodal transportation system that is safe, well maintained, offers modal choices, manages and eases congestion, provides reliable access to jobs and opportunities, facilitates the shipping of freight, connects and enhances communities, and shares benefits and impacts equitably among all communities and users.

Strategy D2. The Council will coordinate with other agencies planning and pursuing transportation investments that strengthen connections to other regions in Minnesota and the Upper Midwest, the nation, and world including intercity bus and passenger rail, highway corridors, air service, and freight infrastructure.

Strategy D4. The Council, MnDOT, and local governments will invest in a transportation system that provides travel conditions that compete well with peer metropolitan areas.

Strategy D5. The Council and MnDOT will work with transportation partners to identify the impacts of highway congestion on freight and identify cost-effective mitigation.

F. Leveraging Transportation Investments to Guide Land Use

Strategy F2. Local governments should plan for increased density and a diversification of uses in job concentrations, nodes along corridors, and local centers to maximize the effectiveness of the transportation system.

Strategy F4. Local governments will identify opportunities for and adopt guiding land use policies that support future growth around transit stations and near high-frequency transit service. The Council will work with local governments in this effort by providing technical assistance and coordinating the implementation of transit-oriented development. The Council will also prioritize investments in transit expansion in areas where infrastructure and development patterns to support a successful transit system are either in place or committed to in the planning or development process.

Strategy F5. Local governments should lead planning efforts for land use in transit-oriented station areas, small-areas, or corridors, with the support of the Council and other stakeholders.

Step 8: Monitor Strategy Effectiveness

The CMP must include clear steps for on-going monitoring and evaluating of the performance of the multimodal transportation system in order to quantify congestion levels on the Metropolitan Highway System, identify and evaluate alternative strategies, and assess the effectiveness of implemented improvements. Those efforts are further discussed in this section.

The ongoing data collection and system performance evaluation will primarily be the responsibility of MnDOT for the highway system with important contributions from the Council for transit and TDM-related data.

MnDOT has been formally collecting and processing congestion data since 1993. The data is collected through surveillance detectors in roadways, cameras, and field observations. About 90% of the urban freeway system is equipped with electronic surveillance systems. MnDOT's RTMC collects and analyzes the data from about 3,000 detectors embedded in mainline lanes and an additional 2,200 detectors on freeway ramps. The data collected by MnDOT and law enforcement agencies permit the estimation of daily and peak period traffic volumes, vehicle miles traveled, speeds, lane density, levels of service, delays, travel times, and vehicle occupancy, as well as safety data such as number of fatalities and type A injuries, crash rates and severity rates.

On an annual basis, MnDOT publishes a Metropolitan Freeway System Congestion Report that evaluates the 758 directional miles of the Twin Cities urban freeway system to develop the a.m. and p.m. percentages of directional miles of congestion (i.e. speeds below 45 mph). Speed data are based on the median value of data collected at detectors locations, at 5 minutes intervals for the 5:00 a.m. to 10:00 a.m. and the 2:00 p.m. to 7:00 p.m. time periods. Median values, rather than averages, are used to mitigate the effects of temporary lane closures, significant

traffic incidents, and other one-time traffic events not related to daily commuting traffic patterns.

Expanded efforts in the area of traffic management with the increased emphasis on ATM strategies will require MnDOT management to ensure that adequate staff and resources for the operation of the RTMC are available. There may also be additional resource needs for MnDOT maintenance.

MnDOT monitoring and reporting will need to be expanded to include their Trunk Highways that are on the A-minor arterial system, work that is currently underway. Data collection will also have to be coordinated with the counties and cities of the region that have A-minor arterials under their jurisdiction.

Metro Transit, the Metropolitan Transportation Services (MTS) division of the Council, and other transit providers collect transit data on all bus and rail routes in the region. This data set includes ridership numbers that can be aggregated at the corridor level to identify reductions in automobile traffic, transit levels of service (vehicle miles and vehicle hours), operating cost, fare revenues, and subsidy levels. This transit data, updated annually by the MTS, is used to produce a Transit System Evaluation every two years.

Metro Transit also collects TDM data, including records of registration of carpools and vanpools as well as participation in special programs. These include events such as the Commuter Challenge, in which during a three-month period in 2008 more than 15,000 commuters pledged to try transit, bike, walk, or rideshare; and the 2009 Bike2Benefits program, in which 2,900 members logged an estimated 375,000 bike and bike-plus-transit miles.

Metro Transit also manages data for the four Transportation Management Organizations (TMOs), updating the RidePro database which includes, among other data, information on the Guaranteed Ride Home program, carpool and vanpool parking registration, and employer outreach contacts.

Additional On-Going Work Plan Elements for CMP

Monitor and integrate data and measures on A-minor arterial system, in the jurisdiction of both MnDOT and other agencies. Methods and data for measuring and reporting congestion on the A-minor arterial system used by MnDOT, the counties and cities need to be reconciled. To integrate into a complete picture of congestion in the region, the measures need to be aggregated in a consistent manner. The Council will need to work with the relevant agencies to gather this information and combine into a coherent database.

Develop goals for performance measures. On the final adoption of performance measures by the USDOT, the Council will need to work with MnDOT in the development of the state targets for the system performance measures, and then adopt targets for the region. At that time it would also be appropriate to review the congestion related performance measures included in

the *2040 Transportation Policy Plan* and CMP to determine targets, trends or benchmarks for those measures.

Develop data distribution methods that are user friendly and timely. To fully integrate the CMP into the decision making process to all involved agencies, a more accessible and user-friendly method of accessing the information on both historic and current congestion needs to be developed and made available.

Assess corridors using performance measures included in this CMP for inclusion in next CMP. Past work by the Council and MnDOT (PA Study, MHSIS, CIMS, and CMSP) provided information on congestion and needs on a corridor level. The principal arterial corridors and the related A-minor arterial system need to be re-evaluated based on performance measures in the *2040 Transportation Policy Plan* and CMP.

Equity and Environmental Justice

Introduction

An important consideration for the *2040 Transportation Policy Plan* is its impact on all populations in the Minneapolis-Saint Paul region, particularly those who have been historically underrepresented in regional planning efforts, including communities of color, low-income populations, persons with disabilities, and persons with limited English proficiency. Past plans were required to adhere to federal requirements for environmental justice; this plan further responds to additional aspirations for equity set forth in *Thrive MSP 2040*. This section describes the plan's responses to both federal requirements and regional aspirations.

Federal guidance for evaluating impacts is derived from Title VI of the Civil Rights Act of 1964 as well as Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-income Populations. Under the executive order, transportation plans and programs (1) must provide a fully inclusive public outreach program; (2) should not disproportionately impact minority and low-income communities, and (3) must assure of the receipt of benefits by minority and low-income populations. The TPP addresses these three principles and they were considered throughout the decision-making process. These principles must also be considered in the project design and implementation phases for future specific projects.

Regional guidance for pursuing equity is outlined in *Thrive MSP 2040,* the Metropolitan Development Guide required by Minn. Stat. 473.145. Thrive elevates equity to one of five fundamental outcomes of the regional vision. Equity connects all residents to opportunity and creates viable housing and transportation options for people of all races, ethnicities, incomes, and abilities so that all communities share the opportunities and challenges of growth and change. For our region to reach its full economic potential, all of our residents must be able to access opportunity. Our region is stronger when all people live in communities that provide them access to opportunities for success, prosperity, and quality of life.

In the following pages, the terms "people of color" and "low-income households" are used to address the federal environmental justice requirements for "minority and low-income." Where regional approaches to pursuing equity are discussed, broader language is used, such as "all races, ethnicities, incomes and abilities."

Identification of Populations

Thrive MSP 2040 identifies equity to extend across people of all races, ethnicities, incomes, and abilities. It identifies Racially Concentrated Areas of Poverty (RCAP), defined as contiguous areas of one or more census tracts in which at least 50% of the residents are people of color and at least 40% of the residents live in households with incomes below 185% of the federal poverty line, as particularly vulnerable areas along with Areas of Concentrated Poverty, which

are defined as other contiguous areas where at least 40% of residents live in households with incomes below 185% of the federal poverty line.

Federal guidance on Environmental Justice identifies low-income populations and people of color as protected populations, regardless of location. This guidance defines people of color as all persons who are not white/non-Latino. While Environmental Justice applies regardless of population size, identifying concentrations of potentially affected populations is useful for application to system-level planning.

For the purposes of regional analysis, regional averages were calculated at the Census tract level for low-income populations and people of color using the five-year estimates from the American Community Survey for 2008-2012. This method is consistent with past practice in previous Transportation Policy Plans; it is also consistent with the methodology used by Metro Transit in performing Title VI service equity analysis. Under this analysis, 23.4% of the region's population are people of color and 9.7% of the region's population live in households with incomes below 100% of the federal poverty line. These regional averages are used to identify Census tracts with populations above the regional averages.

Analysis of Plan Investments and Strategies

Qualitative

Specific strategies and investments identified in the Transportation Policy Plan serve to create benefits or mitigate impacts to historically underrepresented populations, including communities of color, low-income populations, persons with disabilities, and persons with limited English proficiency.

Public Engagement

The *2040 Transportation Policy Plan* was prepared under the Council's Public Participation Plan for Transportation Planning, which meets requirements of 23CFR§450.316 and federal guidance on Environmental Justice. The TPP has built upon the extensive outreach and engagement, including targeted community engagement with historical underrepresented communities that informed *Thrive MSP 2040*. Over the course of two years, the Council engaged with thousands of the region's residents about their vision of the region. In the future, public engagement will be strengthened under Council commitments in *Thrive MSP 2040* to develop a Public Engagement Plan that defines consultation with historically underrepresented populations, focuses on developing lasting relationships, and works toward making decisions with, and not for, people. Transportation Policy Plan Healthy Environment strategy E6 commits the Council and its regional transportation partners to foster public engagement in systems planning and in project development.

Healthy and Cohesive Communities

Historically, transportation investment decisions that encroached upon, divided, or displaced neighborhoods, and cut off access to the regional transportation system or blocked multimodal options have done great harm to communities of color and low-income populations. Healthy Environment strategies E3, E4, E6, and E7, and Access to Destinations strategies C4 and C17 require regional transportation partners to consider the needs of all users, promote cohesive communities, protect and enhance the cultural and built environment, and avoid adverse impacts on communities of color and low-income populations. Air pollution concentrations are disproportionately higher in many low-income communities. Healthy Environment strategies E1 and E2 continue the region's commitment to reduce air pollutant emissions and their impact on human health.

Transit and Pedestrian Safety

People of color, low-income residents, and persons with disabilities currently use the regional transit and pedestrian systems at higher rates than the general population and are more likely to be vulnerable when they are traveling. Safety and security strategies B5 and B6 focus on safety and security of the transit system and pedestrians, which will benefit these populations.

Provision of Options

Key to the philosophy of the Transportation Policy Plan is the provision of modal options. Since low-income residents are less likely to own or have reliable access to automobiles, expansion of travel options that provide access to employment and other opportunities is especially important to these residents. Access to Destinations strategies C1, C2, C3, Competitive Economy strategies D3, Healthy Environment strategy E3, and Transportation and Land Use strategies F3, F4, F5, F6 all emphasize the multimodal nature of the system and the importance of connections.

The TPP calls for significant expansion of the transitway system. Important prioritizing criteria for transitways include providing access to regional jobs and activity centers from throughout the region, including historically underrepresented communities and promoting equity through increased access to opportunity.

A major focus of highway investments in the TPP is the expansion of the MnPASS system (Access to Destinations strategy C5). The high-occupancy toll lanes on the MnPASS system give all users, including low-income users, a potential option to avoid severe congestion. Survey data from existing MnPASS lanes shows that they are broadly supported and used by users of all income levels. Despite the price, MnPASS can provide high-value travel time insurance which can be especially valuable to more vulnerable populations. The provision of MnPASS lanes as well as bus-only shoulders provides transit users greater access to employment and other opportunities.

The TPP calls for the implementation of more pedestrian access, particularly in job concentrations through Access to Destinations strategies C2, C4, C16, C17 Healthy Environment strategy E3, and Transportation and Land Use strategies F5 and F6.

Focus on Preservation

The TPP emphasizes preservation and maintenance of the existing system through Transportation System Stewardship strategies A1 and A2. While an equity assessment of historical preservation and maintenance investments and system condition has not been performed, higher concentrations of low-income populations and people of color can be found in older areas of the region which would benefit from an increased focus on preservation.

Transit Service Planning

Many of the TPP's strategies are aimed at preserving and improving the transportation system in the core of the region, where the highest concentrations of low-income populations and communities of color and can be found. Transportation System Stewardship strategy A3 calls for transit service to be aligned with Transit Market Areas; vehicle availability is a component of the definition of Transit Market Areas. Access to Destinations strategies C13 and C14 call for continued provision of paratransit and dial-a-ride service to benefit persons with disabilities and those without access to vehicles throughout the region. Equity is a factor in bus expansion prioritization in the Regional Service Improvement Plan. In compliance with federal Title VI and Environmental Justice guidance, transit providers perform equity analysis of any major service or fare changes on people of color, low-income residents, and people with limited English proficiency.

Spatial Analysis of Investments

The following series of figures identifies the populations of color and low-income residents in the Twin Cities region, as well as the highway, bicycle system and transit investments within those areas.

Figure C-10: Population and Existing Highway System

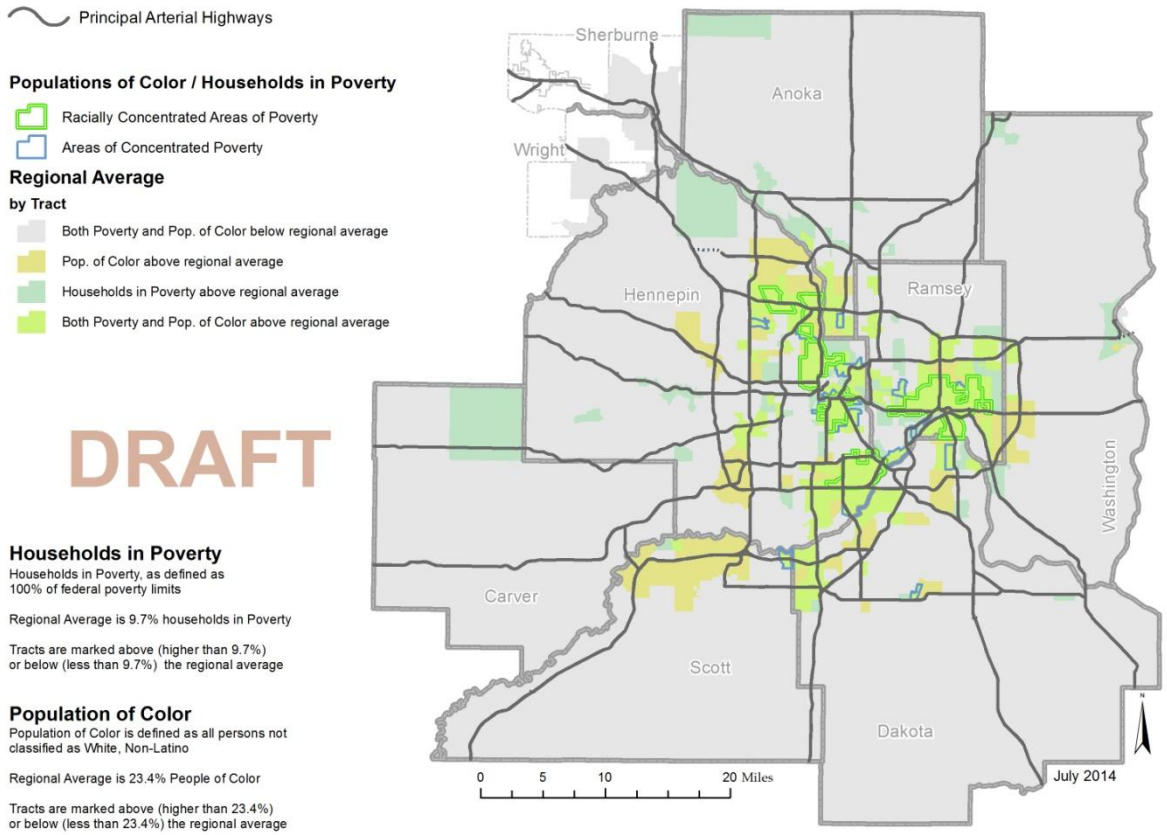


Figure C-2: Population and Existing Transit System

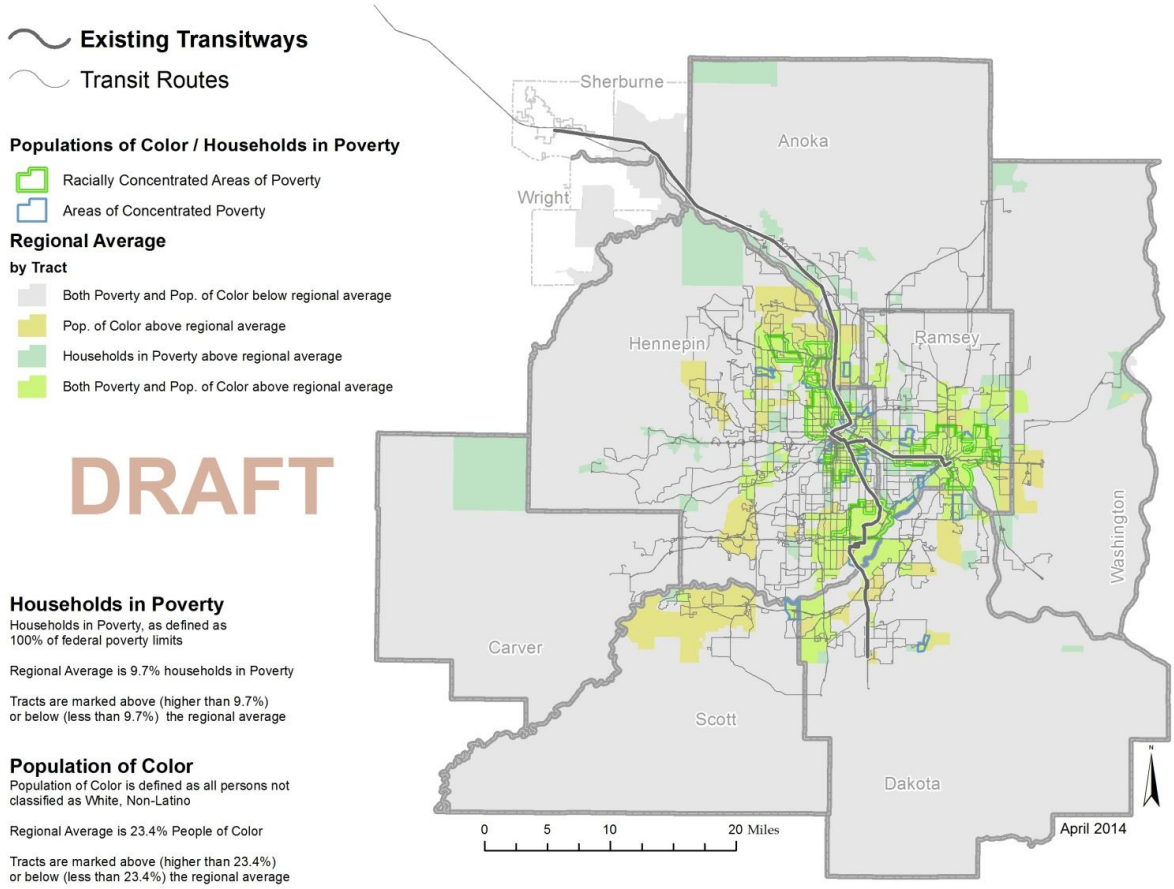


Figure C-3: Population and Regional Priority Corridors for Bicycle Infrastructure

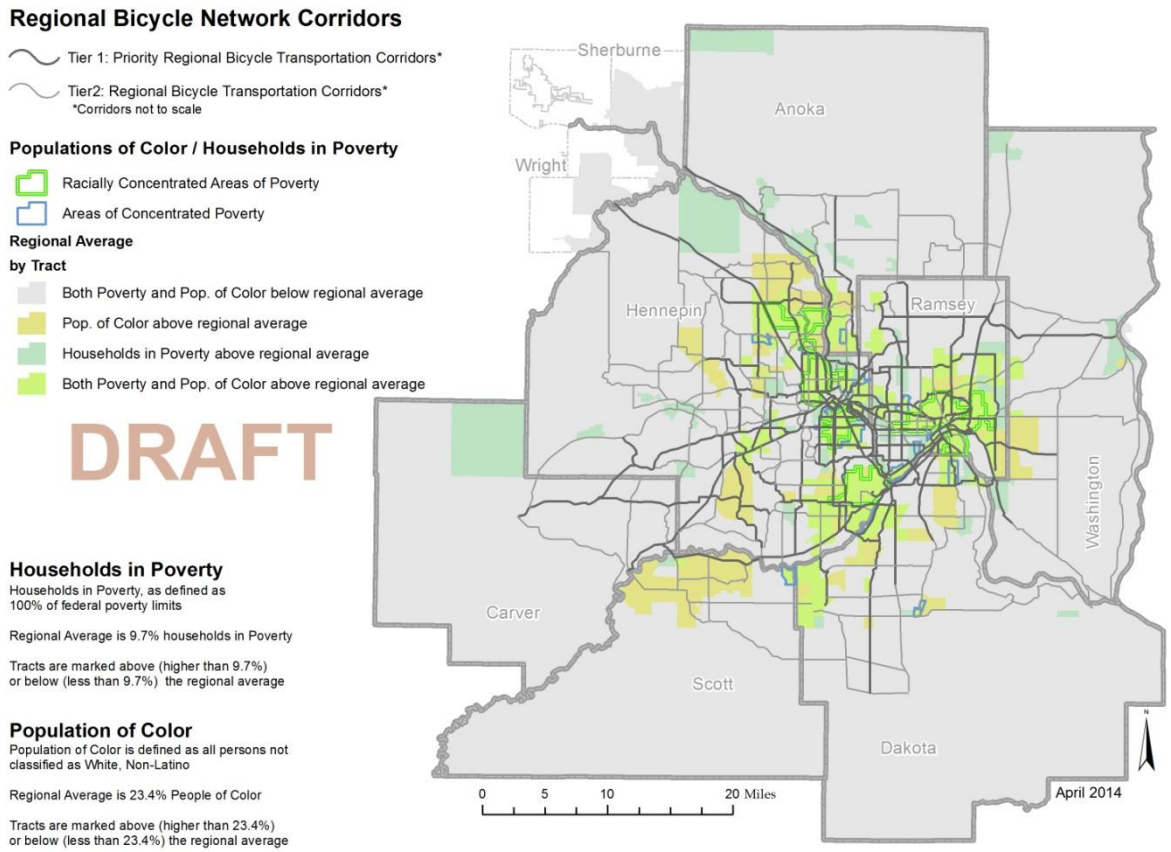


Figure C-4: Population and 2040 Highway Investments (Current Revenue Scenario)

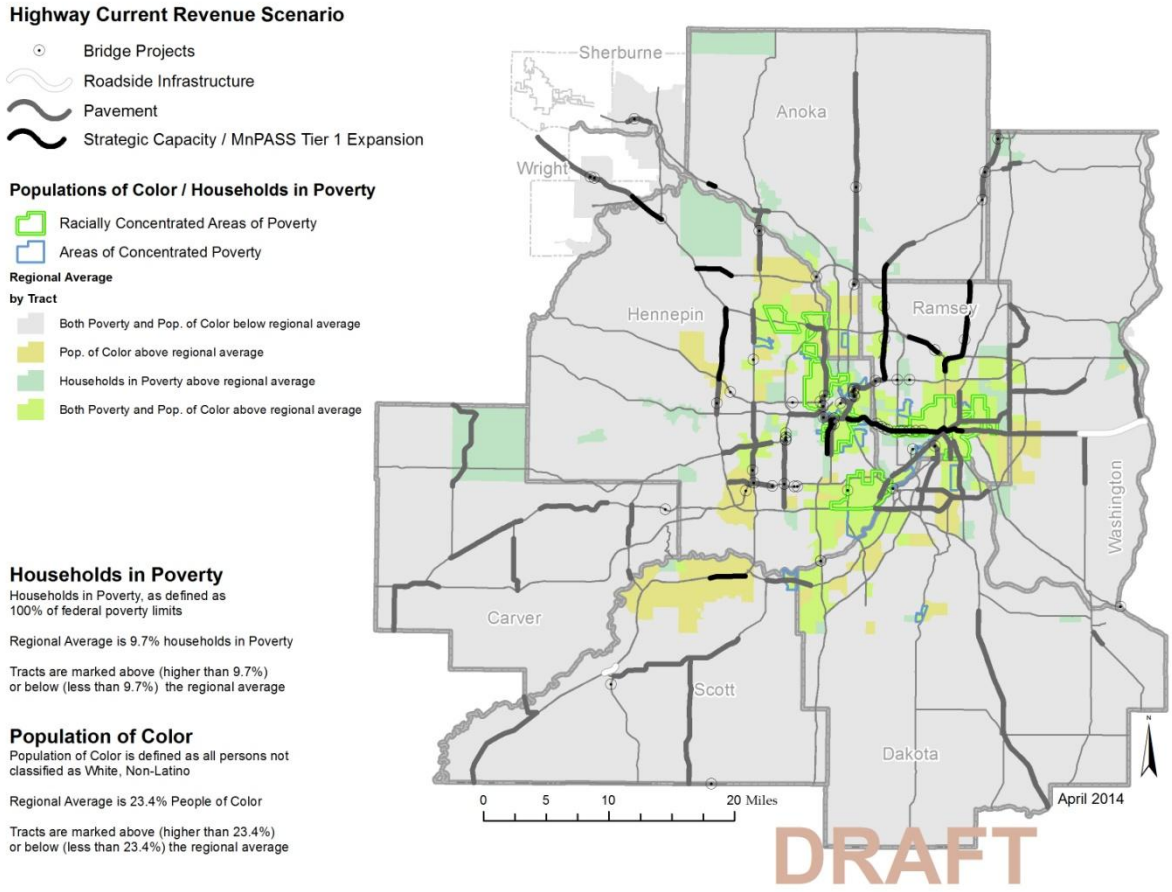
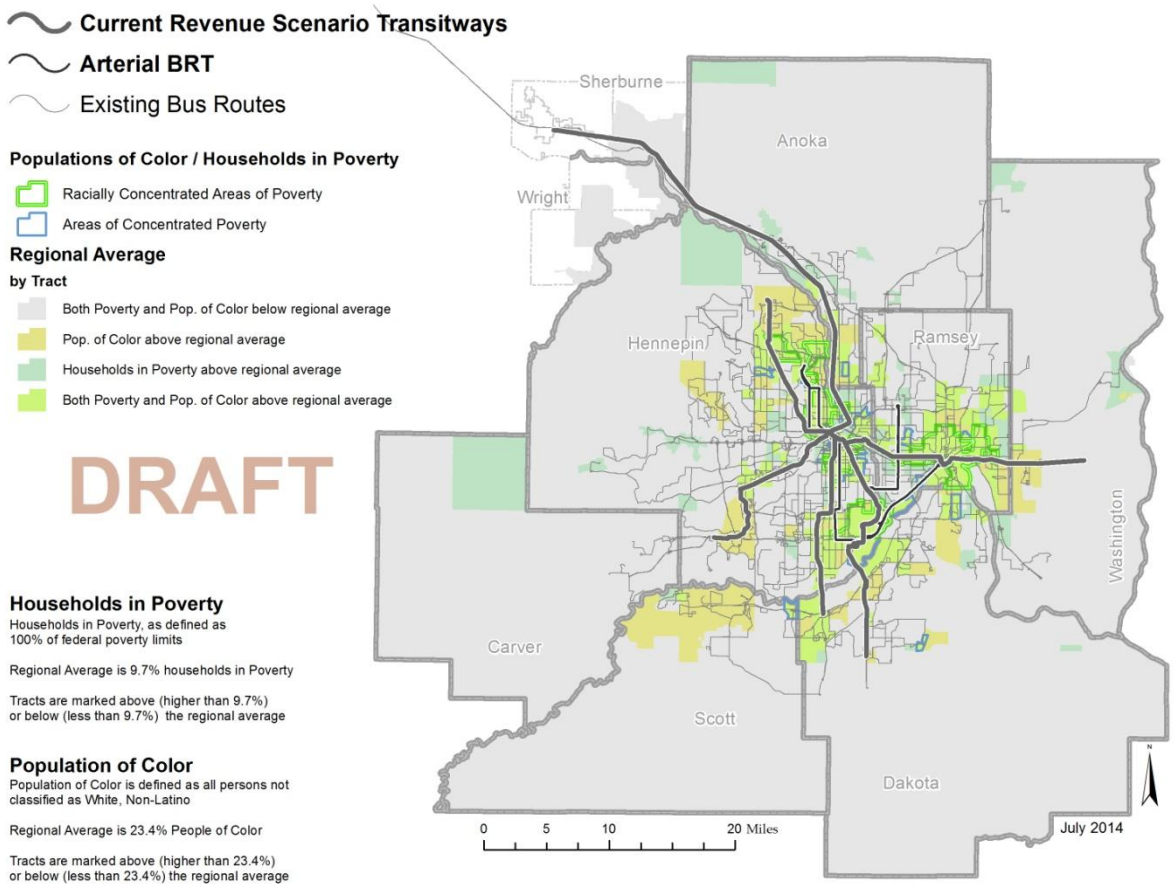


Figure C-5: Population and 2040 Transit Investments (Current Revenue Scenario)



Quantitative Analysis of Plan Investments and Strategies

A spatial analysis reveals where projects are located. Highway and transit investments provide benefits to people living well beyond the immediate area of the project, and in some cases provide little benefit to people living immediately alongside. One way of capturing the benefits is through accessibility, in this case measuring cumulative access to employment within a reasonable time period for the general population, for minorities, and for low-income populations. Employment can be used to represent access to a wide variety of other opportunities, and future analyses may calculate access to those opportunities explicitly.

Highway and Transit Accessibility

The number of jobs reachable within 30 minutes from home by each household in the region was calculated by the regional model, and this was aggregated across the region for the general population, for people of color, and for low-income households. While the overall population of

color will increase from 23% to 40% by 2040 and the distribution will change as well, data limitations required that this analysis be performed assuming existing distributions of population by race and income. The analysis shows that cumulative aggregate accessibility by automobile increases under the current revenue (fiscally constrained) scenario by 2% over the TIP scenario for the general population, by 4% for people of color. By transit, cumulative aggregate accessibility by increases under the current revenue scenario by 33% over the TIP scenario for the general population, by 37% for the people of color.

Statement of Environmental Justice Compliance

After analyzing the distribution of programs, strategies, and projects identified in the *2040 Transportation Policy Plan*, and the location of historically underrepresented populations in the region, in can be concluded that any benefits or adverse effects associated with implementing the plan are not distributed to these populations in a manner significantly different than to the region's population as a whole.

During the project selection and project development processes, individual programs and projects will be further evaluated for potential disproportionate and adverse effects on these population groups.

Inclusion in Regional Solicitation

In the past year, the Transportation Advisory Board and the Council have conducted an evaluation of how the region distributes federal transportation funding through its competitive process. The recommendations from this evaluation will result in the design of a new solicitation. Based on *Thrive MSP 2040* and goals of the Transportation Policy Plan, equity, including affordable housing, will be included in the new solicitation as a prioritization criterion or set of measures.

Title VI Compliance

Title VI of the Civil Rights Act of 1964 provides that no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

New federal guidance on Title VI implementation now requires that MPOs submit a Title VI report that includes:

- A demographic profile of the metropolitan area that includes identification of the locations of minority populations in the aggregate;
- A description of the procedures by which the mobility needs of minority populations are identified and considered within the planning process;
- Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data, at Census tract or block group level, and charts that

analyze the impacts of the distribution of state and federal funds in the aggregate for public transportation purposes, including federal funds managed by the MPO as a designated recipient;
- An analysis of impacts that identifies any disparate impacts on the basis of race, color, or national origin, and, if so, determines whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact.

These items are included in the Council's *Title VI Compliance and Implementation Plan* [*insert link*], adopted on April 30, 2014.

Work Program Items

While Environmental Justice analysis has been required in regional transportation planning for decades, new federal guidance as well as the adoption of *Thrive MSP 2040* has elevated equity and the role of transportation planning in advancing equity.

Some work in this arena has already begun. *Choice, Place and Opportunity: An Equity Assessment of the Twin Cities Region* (2014) analyzed the region and its investments to understand patterns of need and possibilities. Continuing work by regional partners such as the Partnership for Regional Opportunity are moving ahead to address equity problems in a broad collaboration. The Council will continue to participate in such activities to inform strategic use of its investments.

More work will be required to fully integrate equity analysis into the center of the planning process. Toward this end, the Council will engage in the following activities:

- Update its Public Engagement Plan.
- Study potential disparities in preservation and maintenance spending and transportation facility condition by race and income.
- Study potential disparities in safety outcomes by race and income.
- Develop more robust methods of analyzing the benefits and impacts of transportation investments by race and income to aid in using equity as a prioritization factor.
- Continue to advance the understanding and role of transportation in achieving equity in the region by collaboration with public, private and non-profit partners.

Air Quality

Clean Air Act Conformity Determination

The Minneapolis-Saint Paul region is within an EPA-designated limited maintenance area for carbon monoxide. A map of this area, which for air quality conformity analysis purposes includes the seven-county Metropolitan Council jurisdiction plus Wright County and the City of New Prague, is included in Appendix E. The term "maintenance" reflects the fact that regional CO emissions were unacceptably high in the 1970s when the National Ambient Air Quality Standards (NAAQS) were introduced, but were subsequently brought under control. A second 10-year maintenance plan was approved by EPA on November 8, 2010, as a “limited maintenance plan.” Every Transportation Policy Plan (TPP) or Transportation Improvement Program (TIP) approved by the Council must be analyzed using specific criteria and procedures defined in the Conformity Rule to verify that it does not result in emissions exceeding this current regional CO budget. A conforming TIP and TPP must be in place in order for any federally funded transportation program or project phase to receive FHWA or FTA approval.

The analysis described in the appendix has resulted in a Conformity Determination that the projects included in the 2040 TPP meet all relevant regional emissions analysis and budget tests as described herein. The 2040 TPP conforms to the relevant sections of the Federal Conformity Rule and to the applicable sections of Minnesota State Implementation Plan for air quality.

Specific federal requirements of a conformity determination can be found in Appendix E.

Public Involvement & Interagency Consultation Process

The Council remains committed to a proactive public involvement process used in the development and adoption of the plan as required by the Council's Public Participation Plan for Transportation Planning.

An interagency consultation process was used to develop the Transportation Policy Plan. Consultation continues throughout the public comment period to respond to comments and concerns raised by the public and agencies prior to final adoption by the Council. The Council, MPCA, and MnDOT confer on the application of the latest air quality emission models, the review and selection of projects exempted from a conformity air quality analysis, and regionally significant projects that must be included in the conformity analysis of the plan. An interagency conformity work group provides a forum for interagency consultation on technical conformity issues, and has met in person and electronically over the course of the development of the 2040 TPP.

Project Lists & Assumptions

As required by the Conformity Rule, projects listed in the TPP were reviewed and categorized through the interagency process to identify projects exempt from a regional air quality analysis as well as regionally significant projects. Regionally significant projects were identified according to the definition in the Conformity Rule: "Regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel." Junction improvements and upgraded segments on non-principal arterials less than one mile in length are not considered to be regionally significant, although they are otherwise not exempt. The exempt air quality classification codes used in the “AQ” column of project tables of the TIP are listed in Appendix E along with additional requirements for exemption. A complete list of regionally significant projects included in the 2040 TPP, including projects in the 2015-18 TIP and regionally significant local projects can be found in Appendix E.

Emissions Test

In 2010, the EPA approved a Limited Maintenance Plan for the maintenance area. A limited maintenance plan is available to former non-attainment areas which demonstrate that monitored concentrations of CO remain below 85% of the eight-hour NAAQS for eight consecutive quarters. MPCA CO monitoring data shows that eight-hour concentrations have been below 70% of the NAAQS since 1998 and below 30% of the NAAQS since 2004.

Under a limited maintenance plan, the EPA has determined that there is no requirement to project emissions over the maintenance period and that “an emissions budget may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result.” No regional modeling analysis is required; however, federally funded projects are still subject to “hot spot” analysis requirements.

The limited maintenance plan adopted in 2010 determines that the level of CO emissions and resulting ambient concentrations continue to demonstrate attainment of the CO NAAQS. The following additional programs will also have a beneficial impact on CO emissions and ambient concentrations: ongoing implementation of an oxygenated gasoline program as reflected in the modeling assumptions used in the State Implementation Plan; a regional commitment to continue capital investments to maintain and improve the operational efficiencies of highway and transit systems; adoption of *Thrive MSP 2040*, which supports land use patterns that efficiently connect housing, jobs, retail centers, and transit-oriented development along transit

corridors; and the continued involvement of local government units in the regional 3C transportation planning process, which allows the region to address local congestion, effectively manage available capacities in the transportation system, and promote transit supportive land uses as part of a coordinated regional growth management strategy. For all of these reasons, the Twin Cities CO maintenance areas will continue to attain the CO standard for the next 10 years.

Transportation Control Measures

Pursuant to the Conformity Rule, the Council certifies that the 2040 TPP conforms to the State Improvement Plan and does not conflict with its implementation. All Transportation System Management (TSM) strategies which were the adopted Transportation Control Measures (TCM) for the region have been implemented or are ongoing and funded. There are no TSM projects remaining to be completed. There are no fully adopted regulatory new TCMs nor fully funded non-regulatory TCMs that will be implemented during the programming period of the TIP. There are no prior TCMs that were adopted since November 15, 1990, nor any prior TCMs that have been amended since that date. Details on the status of adopted Transportation Control Measures can be found in Appendix D.

Compliance with National Ambient Air Quality Standards

The Environmental Protection Agency has established National Ambient Air Quality Standards for six pollutants known to cause harm to human health and the environment, known as criteria pollutants. Criteria pollutants are particulate matter, lead, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide. The pollutants, along with other pollutants known as air toxics, are monitored by the Minnesota Pollution Control Agency. The following sections list the region's compliance status for regulated pollutants in 2013. The region is currently in compliance with all national ambient air quality standards.

Particulate Matter

Highest measured annual average fine particulate matter concentrations were 9.8 $\mu g/m^3$, 82% of the federal standard of 12 $\mu g/m^3$. Daily concentrations were 24 $\mu g/m^3$, or 69% of the federal standard of 35 $\mu g/m^3$. Daily coarse particulate matter concentrations are 58 $\mu g/m^3$, or 39% of the federal standard if 150 $\mu g/m^3$. The region meets federal standards for particulate matter. However, the Environmental Protection Agency periodically revises its standards and if they are tightened, the region may be at risk of exceeding standards.

Lead

Highest measured lead concentrations in the region were 0.111 µg/m^3, or 74% of the federal standard of 0.15 µg/m^3. This is due to non-transportation sources at one location; elsewhere concentrations are much lower.

Ozone

Highest measured 8-hour ground level ozone concentrations were 67 ppb, or 89% of the federal standard of 75 ppb. The region meets federal standards for ozone. However, the Environmental Protection Agency periodically revises its standards and if they are tightened, the region may be at risk of exceeding standards.

Nitrogen Oxides

Highest measured annual nitrogen dioxide concentrations were 8 ppb, or 15% of the federal standard of 53 ppb. One-hour concentrations were 44 ppb, or 44% of the federal standard of 100 ppb. The region meets federal standards for nitrogen oxides. However, the Environmental Protection Agency has released a new standard for near-road concentrations. The Minnesota Pollution Control Agency is currently monitoring but data on compliance with federal standards is not yet available.

Sulfur Dioxide

Highest measured one-hour sulfur dioxide concentrations were 14 ppb, or 19% of the federal standard of 75 ppb. The region meets federal standards for sulfur dioxide.

Carbon Monoxide

Highest measured one-hour carbon monoxide concentrations were 4.6 ppm, or 13% of the federal standard of 35 ppm. Eight-hour concentrations were 2.8 ppm, or 31% of the federal standard of 9 ppb. The region meets federal standards for carbon monoxide.

Federal Planning Factors

23 USC 134(h) and 49 USC 5303(h) require Metropolitan Planning Organizations (MPOs) to consider and implement projects, strategies, and services that address eight planning factors through their metropolitan planning process. Each of these planning factors is represented in *Thrive MSP 2040*—the Council's overall regional development guide—and is addressed in the goals, objectives, and strategies of the *2040 Transportation Policy Plan*.

Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

Goals and Objectives

Competitive Economy – "The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state" along with its associated objectives.

Strategies

Competitive Economy D1, D2, D3, D4, D5, D6, D7.

Increase the safety of the transportation system for motorized and non-motorized users.

Goals and Objectives

Safety and Security – "The regional transportation system is safe and secure for all users" along with its associated objectives: "Reduce crashes and improve safety and security for all modes of passenger travel and freight transport" and "Reduce the transportation system's vulnerability to natural and man-made incidents and threats."

Strategies

Safety and Security B1, B3, B4, B5, B6, B7.

Increase the security of the transportation system for motorized and non-motorized modes.

Goals and Objectives

Safety and Security – "The regional transportation system is safe and secure for all users" along with its associated objectives: "Reduce crashes and improve safety and security for all modes of

passenger travel and freight transport" and "Reduce the transportation system's vulnerability to natural and man-made incidents and threats."

Strategies

Safety and Security B2, B3, B5, B7.

Increase accessibility and mobility of people and freight.

Goals and Objectives

Access to destinations – "People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond" along with its associated objectives:

- A: "Increase the availability of multimodal travel options, especially in congested highway corridors."
- B: Increase travel time reliability and predictability for travel on highway and transit systems."
- C: "Ensure access to freight terminals such as river ports, airports, and intermodal rail yards."
- D: "Increase transit ridership and the share of trips taken using transit, bicycling and walking."
- E: "Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations."
- Leveraging Transportation Investments to Guide Land Use – "The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability" along with its associated objectives:
- A: "Focus regional growth in areas that support the full range of multimodal travel."
- B: "Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement."
- C: "Encourage local land use design that integrates highways, streets, transit, walking, and bicycling."
- Healthy Environment – "The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments" along with its associated objective C: "Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles."
- Competitive Economy – "The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state" along with its associated objective C: "Support the region's economic competitiveness through the efficient movement of freight."

Strategies

Transportation System Stewardship A2, A3; Access to Destinations C1-C20; Competitive Economy D1,D2, D3, D4, D5; Healthy Environment E3; and Leveraging Transportation to Influence Land Use F2, F3, F6, F7,F8, F9.

Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.

Goals and Objectives

Healthy Environment – "The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments" along with its associated objectives:

- "Reduce transportation-related air emissions."
- "Reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments."
- "Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles."
- "Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations."

Leveraging Transportation Investments to Guide Land Use – "The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability" along with its associated objectives:

- "Focus regional growth in areas that support the full range of multimodal travel."
- "Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement."
- "Encourage local land use design that integrates highways, streets, transit, walking, and bicycling."

Strategies

Healthy Environment E1, E2, E3, E5, E6, E7; Leveraging Transportation to Influence Land Use F1, F2, F3, F4, F5, F6, F7, F8, F9.

Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

Goals and Objectives

Access to Destinations – "People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond" along with its associated objectives:

- A: "Increase the availability of multimodal travel options, especially in congested highway corridors."
- C: "Ensure access to freight terminals such as river ports, airports, and intermodal rail yards."
- E: "Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations."

Leveraging Transportation Investments to Guide Land Use – "The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability" along with its associated objectives:

- A: "Focus regional growth in areas that support the full range of multimodal travel."
- B: "Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement."
- C: "Encourage local land use design that integrates highways, streets, transit, walking, and bicycling."

Healthy Environment – "The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments" along with its associated objectives:

- C: "Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles."
- D: "Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations."

Competitive Economy – "The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state" along with its associated objectives:

- A: "Improve multimodal access to regional job concentrations identified in *Thrive MSP 2040.*"

- B: “Invest in a multimodal transportation system to attract and retain businesses and residents.”
- C: “Support the region’s economic competitiveness through the efficient movement of freight.”

Strategies

Access to Destinations C1, C2, C3, C4, C5, C11, C12, C13, C14, C15, C16, C17, C20; Competitive Economy D2, D3; Healthy Environment E3.

Promote efficient system management and operation.

Goals and Objectives

Transportation System Stewardship – “Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets” along with its associated objective B: “Operate the regional transportation system to efficiently and cost-effectively move people and freight.”

Strategies

Transportation System Stewardship A1, A2, A3; Access to Destinations C7, C8, C9, C10, C 11, C12, C15, C17, C19.

Emphasize the preservation of the existing transportation system.

Goals and Objectives

Transportation System Stewardship – “Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets” along with its associated objective: “Efficiently preserve and maintain the regional transportation system in a state of good repair.”

Strategies

Transportation System Stewardship A1, A2, A3.

Other Federal Requirements

Coordinated Action Plan for Public Transit & Human Services

The current plan was adopted February 12, 2013. This plan is required for project selection for some MAP-21 formula transit grant programs. It documents existing resources; identifies gaps in transportation services; and establishes goals, strategies, and criteria for delivering efficient, coordinated services to elderly, underemployed, or otherwise financially disadvantages persons and persons with disabilities. This plan is updated every four years.

Environmental Streamlining – Planning & Project Development Linkage

Early integration of project planning and the environmental review and approval process improves the likelihood that projects and services can be implemented in a timely and environmentally sensitive manner. MAP-21 stresses the need for integrating the planning and environmental process, and promotes a streamlined process for reviews and permitting.

Thrive MSP 2040 and other policy documents of the Council strongly support protection and enhancement of the environment. In developing the *2040 Transportation Policy Plan* and other system plans, the Council closely followed the direction established in *Thrive MSP 2040*. The Council, together with the DNR, has developed the Natural Resources Inventory and Digital Atlas [*insert link*] that is made available to local governments and other stakeholders involved in planning and implementing transportation investments. The Natural Resources Inventory provides comprehensive information about environmental resources throughout the seven-county metropolitan area.

The integration of the planning and development process will vary for projects included in the *2040 Transportation Policy Plan* and for those already in the design phase. For many projects, the planning and environmental processes have progressed to such a stage that little will change based on this update.

Almost all highway projects and most transitway projects are on existing roadway or railroad rights-of-way. Environmental approvals will be necessary but are significantly different than if the projects were proposed on new rights-of-way.

Many of the corridors included in this plan are already undergoing detailed analysis and environmental review, and in some corridors, environmental documentation has already been completed. This plan has and will continue to help focus the analysis and shorten the process by defining the number of corridors and the types of transit technologies to be studied.

Environmental Mitigation

Thrive MSP 2040 emphasizes the protection and enhancement of environmental quality through its outcomes of stewardship, livability, and sustainability. The Council supports work toward this end through the application of the Natural Resource Inventory, which provides comprehensive information about environmental resources throughout the seven-county metropolitan area.

The Transportation Policy Plan emphasizes environmental mitigation and enhancement through its Healthy Environment goal. In particular, strategy E4, “Regional transportation partners will protect, enhance and mitigate impacts on natural resources when planning, constructing, and operating transportation systems. This will include management of air and water quality and identification of priority natural resources through the Council/DNR Natural Resources Inventory," commits transportation partners to protecting and enhancing the natural environment. Strategy E5, "Transportation partners will protect, enhance and mitigate impacts on the cultural and built environments when planning, constructing, and operating transportation systems," commits to protecting and enhancing the cultural and built environment. Other strategies emphasize the importance of reductions in transportation-related air emissions, and in the central role of environmental justice in transportation planning.

Implementation of all projects in this plan will be accompanied by appropriate environmental review and mitigation.

Consultation and Cooperation

Collaboration is a principle of *Thrive MSP 2040* and is reflected in how the Council develops and implements the *2040 Transportation Policy Plan*. The plan was developed in consultation with technical staff and policy makers throughout the region. In particular, two work groups were formed for the preparation of this plan. The Partner Agency Work Group consisted of technical staff from each county, from cities in different parts of the region, from the Counties Transit Improvement Board, the Metropolitan Airports Commission, the Minnesota Pollution Control Agency, the Minnesota Department of Natural Resources, suburban transit providers, and different units of the Metropolitan Council and MnDOT. The Policy Maker Task Force provided overall policy direction on plan development and consisted of five members of the Metropolitan Council, three members of the Transportation Advisory Board, one member of the Counties Transit Improvement Board, and one member from MnDOT. In addition, during the preparation of the plan, input was sought from individual counties and cities, from MnDOT, from Council advisory committees including the Transportation Advisory Board, Technical Advisory Committee, Land Use Advisory Committee, Transportation Accessibility Advisory Committee, and from local and state historic and natural resource protection agencies.

The Council has a memorandum of understanding with the Minnesota Department of Transportation, titled “Metropolitan Transportation Planning Responsibilities for the Twin Cities

Metropolitan Area." It describes Council and MnDOT responsibilities for metropolitan planning in the region. The Council publishes the *Transportation Planning and Programming Guide for the Twin Cities Metropolitan Area,* which describes the transportation planning process and the roles of various parties and stakeholders in collaboration and decision-making [*insert link*].

Prior to the adoption of this plan, the U.S. Census Bureau, based on 2010 Census data, expanded the urbanized area—which under federal law the metropolitan transportation planning process must cover—to areas outside the traditional jurisdiction of the Council. The Council, MnDOT, Wright County, Sherburne County, and the cities of Albertville, Elk River, Otsego, St. Michael, and Hanover worked together to develop a memorandum of understanding describing how the metropolitan transportation responsibilities would be met in this expanded urbanized area. It also describes future collaboration between the Council, as the Metropolitan Planning Organization, and representatives of the extended area.

Public Participation

Federal law requires that citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties are provided with a reasonable opportunity be involved in the transportation planning process. This requirement is satisfied through the Council's Public Participation Plan for Transportation Planning, adopted on December 22, 2006.

Appendix A: Glossary

A-minor arterials	Roadway designation developed by and used only within the seven metropolitan counties to identify the most important minor arterials in the region. Principal and A-minor arterials are eligible for federal highway funding through the Transportation Advisory Board Regional Solicitation. A-minor arterials are more significant to the region than other minor arterials and are owned and operated by MnDOT, counties, and cities. A-minor arterials are further classified into one of four types: Reliever, Augmentor, Expander, or Connector. See expanded definitions in Appendix D.
Above mean sea-level (AMSL)	Method of defining elevation of a particular site, usually in relation to other sites, all using the similar base elevation.
Access to destinations/opportunities	Generally, the ease with which an area can be reached. Technically, it is the relative time that is required to get from an origin to a destination.
ADA accessible	A facility that provides access to people with disabilities using design requirements of the Americans with Disabilities Act (ADA).
Active traffic management (ATM)	A group of existing and future infrastructure technologies used to monitor and respond to freeway traffic in real time. Includes existing equipment such as cameras, ramp meters, loop detectors, and variable message signs, as well as more state-of-the-art technology such as queue detection and warning systems, speed harmonization, and dynamic re-routing systems.
Air access	Refers to provision of open competition for air service to an airport.
Air cargo	Freight, parcels and mail carried in the belly-hold of passenger aircraft, on an all-freight airline or express carrier.
Air carrier	A scheduled, certificated airline operation that provides commercial passenger and cargo services.
Air operation	Either a landing or take off movement.
Air traffic control (ATC)	Control of aircraft flight activities through human or automated direction using electronic aids to maintain safety and efficient movement of aircraft.
Air traffic control tower (ATCT)	A facility at an airport used by ATC to control arriving and departing air traffic to/from a specific airport and associated airspace.
Aircraft fleet	All the aircraft operated by a particular airline or otherwise delineated by type, geographical location, etc.
Aircraft mix	Generally denotes type of aircraft in a fleet, aircraft operating at an airport, etc.
Airfield	That part of the airport containing the runways, taxiways, and safety areas associated with aircraft operations; also called “airside” area.

Airport	Identifies a defined property area for land based aircraft operations with turf or paved runways, as distinct from seaplane bases with water lanes, or heliports.
Airport capacity	The number of aircraft movements the runways of an airport can process within a specified period of time with the average delay to aircraft kept to an acceptable limit. Usually defined on an annual or peak period basis.
Airport functional classification	Methodology used to categorize an airport for purposes of determining its role and functions in a system.
Airport influence area (AIA)	The general geographic area around an airport that encompasses the major arena of aircraft operational and development interaction between an airport and its surrounding land uses. The area is defined as a radius area 3 nautical miles off the physical ends of existing and planned runways of the nearest system airport to the affected community. Size of an AIA varies according to the airport's role and function.
Airport layout plan (ALP)	A specific packet of drawings depicting the airport facility in sufficient detail for FAA approval of project level decision making.
Airport sponsor	Defines airport owner, airport operator, or other legal entity authorized as eligible by the Federal Aviation Administration (FAA) to enter into agreements for federal funding of projects.
Airports system plan	A plan, normally multi-county in scope, that identifies the functional roles of all existing and proposed aviation facilities through time. A system plan includes a policy package, forecasts and capacity analysis, and a generalized development program. Used to set and coordinate overall planning, funding and implementation priorities for system facilities.
Airspace	That portion of the nation's air resource available for air navigation and landing and takeoff of aircraft. Usually defined by imaginary surfaces in height control ordinances/maps, air traffic control and navigational fixes.
Airstrip	Describes a single runway, usually a turf runway, usually a privately-owned property, with operating restrictions, most often without services and allowed under a conditional use permit from the local governmental unit.
Airway	Generally defined as an imaginary low or high altitude flight track established along defined compass headings and altitudes.
Alternatives analysis (AA)	A study of a corridor or travel shed to determine viable transit alternatives. These studies examine potential alignments and modes, including enhanced bus service. All alternative analyses include both bus and rail options. Bus options include improvements to highways and roads that would provide transit advantages, such as bus-only shoulders, signal priority or preemption, dynamic shoulder lanes, dynamic parking lanes, ramp meter bypass lanes, high-occupancy vehicle or high-occupancy toll lanes, or other advantages. Land use and zoning needs are also evaluated. While alternatives analyses are no longer a federal requirement, they are still a valuable planning tool and informative for environmental review processes.

Airport improvement program (AIP)	Federal funding program administered by FAA for airport development and planning.
Airport service volume (ASV)	The theoretical number of aircraft operations that can be handled by an airport in a year. This measurement depends upon runway layout (number, type, direction), instrument landing capability, average weather conditions, the presence of an air traffic control tower and related factors.
(ADA)	Civil rights legislation passed in 1990. The ADA sets design guidelines for accessibility to public facilities, including sidewalks, trails, and public transit vehicles by individuals with disabilities.
Apron	A paved or hard surface area available for temporary aircraft parking or servicing activity. Usually found at an FBO or a hangar area.
Auto occupancy	The number of persons per automobile, including the driver.
Aviation	All elements of air transportation besides airports, to include aircraft industry, airspace resources, aircraft, pilots, users, air traffic control and navigation system, airlines, air service, airport facilities, etc.
Aviation easement	An airspace easement over a particular area usually for purposes of aircraft overflight or safety enhancement.
Based aircraft	Aircraft that are stored, hangared or tied-down at one particular airport, usually for at least a continuous 6-month period, and use the airport as their primary base of operations.
Bike lane	A portion of a roadway or shoulder designed for exclusive or preferential use by bicyclists. Bicycle lanes are distinguished from the portion of the roadway or shoulder used for motor vehicle traffic by physical barrier, striping, marking, or other similar device.
Bike-walk streets (or "bicycle boulevard")	A shared roadway, typically a local residential street, which has been optimized for bicycle traffic. Bike/walk streets accommodate auto travel but literally give priority to cyclists and pedestrians. These streets use traffic calming techniques, signage, lighting, and other amenities to provide a safe, quiet, and direct route for bicyclists and pedestrians.
Bus lanes	Lanes designated solely for buses. These lanes are typically provided in downtowns and allow buses to travel with reduced impacts from automobiles.
Bus-only shoulders	A system of highway shoulder lanes that MnDOT has identified and signed as being available for bus use to avoid congestion. Speeds are limited to 35 mph for safety.
Bus and Support System	The Bus and Support System is the phrase used to describe the elements of the transit system that are not specific only to transitways. The Bus and Support System includes most of the supporting infrastructure for the

	transit system and all of the components of the regular route system and alternatives to the regular route system, including any facilities shared with the transitway system such as bus garages supporting the bus rapid transit system.
Bus rapid transit (BRT)	A transitway mode that uses bus vehicles but incorporates characteristics of light rail or commuter rail to improve bus speed, reliability, and identity. These characteristics can include specialized vehicles, unique and improved stations, signal preemption or priority, off-board fare collection, improved signage and other features that allow vehicles to operate faster and more reliably than local or express buses. BRT can be run on a dedicated right-of-way or in mixed traffic. Typically, service frequencies are every 15 minutes or better on the core portions of the line.
Busways	A special roadway designed for exclusive use by buses. It may be constructed at, above, or below grade and may be located in separate rights-of-way or within roadways. Variations include grade-separated, at-grade, and median busways.
Carbon monoxide maintenance area	Most of the Twin Cities area is part of a maintenance area designated by the U.S. Environmental Protection Area (EPA) for carbon monoxide emissions from transportation sources. This designation and area affected is based on national air quality standards. A portion of this area extends into eastern Wright County.
Carpool	When two or more people share a private vehicle. At times, vehicle-sharing is facilitated by government.
Code sharing	A practice where airlines use the same computer reservation codes to provide "seamless" ticket/price services, usually to take advantage of economies in hub airport connections.
Collector streets	A class of roadways in the federal functional classification system. These are streets that connect neighborhoods and connect neighborhoods to regional business concentrations. (See Appendix D for functional classification criteria and characteristics.)
Commuter rail	A passenger railroad that carries riders within a metropolitan area, typically between urban areas and their suburbs. They typically operate on freight rails or dedicated tracks. Propulsion is provided either by diesel locomotives or by self-propelled Diesel Multiple Units, which combines the engine function into one or more of the passenger railcars. Typically there are a small number of stations and multiple departure times primarily in mornings and evenings. Stops are typically five miles or more apart and route lengths extend more than 20 miles.
Complete Streets	The planning, scoping, design, implementation, operation, and maintenance of roads in order to reasonably address the safety and accessibility needs of users of all ages and abilities. Complete streets considers the needs of motorists, pedestrians, transit users and vehicles, bicyclists, and commercial and emergency vehicles moving along and across roads, intersections, and crossings in a manner that is sensitive to

	the local context and recognizes that the needs vary in urban, suburban, and rural settings.
Congestion	Overloading of roadway with vehicles. (See "Level of Service.")
Congestion Management Plan	A systematic process for evaluating and developing transportation strategies and plans for addressing existing and future traffic congestion.
Congestion Management and	A study of potential roadway project solutions under development by the Minnesota Department of Transportation (MnDOT) that will address congestion and/or safety hot spots through lower-cost/high-benefit improvements.
Congestion Mitigation and Air Quality improvement program	CMAQ is a categorical funding program created under MAP-21. It directs funding to projects that contribute to meeting national air quality standards and further reducing transportation-related air pollution.
Congestion pricing	User fees that are charged to manage traffic and reduce congestion, also called "value pricing." Typically higher prices reduce the use of priced lanes. This technique can be used to ensure free-flow conditions in priced lanes.
Context sensitive design	Roadway standards and community design practices that are flexible and sensitive to community values, balancing economic, social, aesthetic and environmental objectives; includes appropriate design, size, and scale.
Corridor studies (highway)	Typically, highway corridor studies focus on a segment of a particular travel corridor or travel shed. Land use, access issues, capacity, level of service, geometrics and safety concerns are studied; alternatives analyzed and recommendations made. Corridor studies are usually prepared with the participation and cooperation of the affected communities and governmental agencies. Recommendations for improvements are often incorporated into the local comprehensive plans of the participating cities and continue to be used by implementing agencies as improvements in the corridor are made.
Corridor studies (transit)	Focus on transit alternatives within a travel corridor or travel shed. Studies typically examine all potential alignments and modes (light rail, commuter rail, bus rapid transit, express bus or other alternatives). Studies examine these alternatives against a set of criteria, typically (but not restricted to) factors such as mobility improvements, operating efficiency and effectiveness, environmental impacts, economic development impacts, readiness and cost-effectiveness.
Cost-sharing	A contractual arrangement whereby a local unit of government or other governmental body enters into an agreement to pay for part of a physical facility or a service; includes subscription transit service.
Counties Transit Improvement Board (CTIB)	The joint powers board created to oversee the distribution of the ¼ cent sales tax imposed by certain counties in the region for transitway expansion.

Cross-wind runways	Runways constructed to allow an airport to be used when the wind is blowing across the main-wind runway.
Current revenue scenario	One of two funding scenarios (see "Increased revenue scenario") in this plan that assumes revenues that can reasonably be expected to be available based on past years. Under federal guidelines this scenario is called "fiscally constrained." Under this scenario no new funding or funding sources are assumed and the preservation, maintenance and operations of the regional highway system will not be met over time. Under this scenario, the preservation, maintenance, and operation of the transit system will be met, but the regional goal of expanding, modernizing, and improving regional transit cannot be achieved.
Cyclopath	A web-based application developed by the University of Minnesota that allows bicyclists to create, edit, and rate their own bike routes on a regional base map.
Cycloplan	An extension of Cyclopath for use by cities, counties, and planning departments to: Establish and/or enhance their bikeways data Have access to user data and region-wide data Respond to issues raised by users of Cyclopath
Deadhead	The portion of trip that does not carry passengers. This can be the portion of a trip when a transit vehicle travels between the garage and the start or end point of a route or when a vehicle travels between routes.
Decibel (dB)	A unit of sound measurement measured on the "A" scale.
Demand-responsive service	See Dial-a-Ride.
Dial-a-Ride (also demand-responsive service)	A public transit service using passenger cars, vans or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. Typically, the vehicle may be dispatched to pick up several passengers at different pick-up points before taking them to their respective destinations and may even be interrupted en route to these destinations to pick up other passengers. These vehicles do not operate on a fixed schedule or route.
Dynamic parking lane	A parking lane on a street that is used for regular traffic during peak periods. In non-peak periods, it reverts back to a parking lane.
Dynamic shoulder lanes	Highway shoulder lanes used for vehicle traffic during peak periods. In non-peak periods, lanes are not available for travel but are used for break-downs; dynamic shoulder lanes can be priced at a flat fee, dynamically priced based on real-time congestion, or toll free.
Enplanements	The total number of passengers at a specific airport boarding an aircraft. This includes passengers originating at that airport, and those making connections by changing planes at that airport; it does not include passengers that stay on their plane for through flights. Passengers that

	originate at a particular airport usually return to their starting point, thus doubling the annual enplanements approximates the total number of passengers handled at the facility.
Environmental Impact Statement (EIS) and Draft Environmental Impact Statement (DEIS)	A document that must be filed with the federal government when a "major Federal action significantly affecting the quality of the human environment" is taken. These studies typically include a statement of the purpose and need for the project, a description of the affected environment, a range of alternatives to the proposed action and an analysis of the environmental impacts of each of the possible alternatives. The law requiring this is the National Environmental Policy Act. (NEPA) Major highway and transit projects are required to develop these studies and follow these processes.
Environmental Quality Board (EQB)	A state board that defines which projects require what level of environmental review and coordinates what agencies, groups, citizens need be involved in the particular review.
Essential air service (EAS)	Federal program to subsidize air service to small communities where local demand is usually not sufficient to attract sustainable and reliable service.
Expansion	Expansion is the addition of new or added capacity to the transportation system and can occur in different forms and different modes. • For highway capacity, expansion is defined in this plan and for air quality conformity purposes as adding a multi-use or managed lane of a mile or more in length. Construction of two or more consecutive interchanges is also capacity expansion. • For transit, expansion includes added capacity on existing routes, the addition of new routes, expanded or new transit facilities, and new transitways.
Extended MPO Area	Those portions of Wright, Sherburne and St. Croix (Wis.) counties that are within the MPO planning area boundary as required by federal law, but outside the Metropolitan Council boundaries as defined in Minnesota Statutes.
Fare	The amount paid for a transit trip. Fares vary by the type of trip and service.
Federal Air Regulation (FAR)	Rules and regulations issued by the FAA in administration of its regulatory functions, these regulations carry the force of law and are binding on all aviation activities within FAA purview. • FAR Part 77 – establishes criteria and defines "objects affecting navigable airspace," serving as a means to protect airport area airspace needed for safe flights. • FAR Part 150 – defines noise control and compatibility planning for airports in accordance with FAA criteria and funding requirements.
Federal Aviation Administration	

(FAA)	Federal part of DOT that deals with the air transportation mode and all aspects of pilot licensing, airport certification, aircraft certification, aviation rules and regulations, safety, operation, air traffic control, navigational system, fees and taxes, security, airline operations, etc.
Federal Communications Commission (FCC)	Controls communications facilities, frequencies and power output of electronic transmissions for radio, TV and microwave services. These facilities/activities share the airspace with aviation and FAA review is required prior to implementation.
Federal inspection facility (FIS)	Portions of international airports are designated for international arrivals and departures; the inspection facilities allow for federal services in processing of passengers and goods.
Fixed Base Operator (FBO)	Usually a private leasehold business providing facilities and services on the airport (e.g. fuel, maintenance, hangaring, etc.) for aircraft based at the airport and transient users.
Functional classification	Federal taxonomy for roadways based on their primary function – mobility for through trips or access to adjacent lands. In the Twin Cities, a four-class system (described in Appendix D) is used to designate roads (principal arterials, minor arterials, collectors and local streets). The major arterials are classified as either "A" minor arterials or "B" (or "other") minor arterials.
General aviation (GA)	All aviation activity other than that of the scheduled air carriers and the military. G.A. includes single-and twin-engine aircraft with gross weights ranging from 2,000 to 60,000 pounds.
Global alliance	Groupings of airlines providing connectivity on a global scale; current groupings include Star, Oneworld, and SkyTeam.
Global positioning system (GPS)	A government sponsored and operated, satellite based, navigation system providing real-time geographical referencing for all modes of transportation on a global basis.
Goal	Broad statements of aspiration that describe a desired future.
Grade separation	Separation of vehicle, pedestrian, or bicycle traffic at different levels with crossing structures like underpasses or overpasses; interchanges are also an example.
Ground access	Term for describing pathways, typically road and rail, for all rubber or steel-wheel vehicles providing service to the airport.
Heliport	An identifiable area including facilities on land or on a structure used or intended for the exclusive use of helicopter landings or takeoffs. The facilities may include services, can be freestanding or located within an airport.
High-occupancy toll (HOT) lanes	Lanes that allow high-occupancy vehicles and public transit vehicles to travel free and allows single-occupant vehicles to use these lanes through

paying a toll. Tolls can be fixed or dynamically based on real-time traffic congestion.

High-occupancy vehicle (HOV) lanes Highway lanes reserved for vehicles carrying more than one person. These lanes are officially denoted with a diamond marking and are sometimes called “diamond lanes.” Public transit is also allowed to use these lanes, providing it a time advantage over congested conditions.

High speed passenger rail A type of intercity passenger rail that operates at speeds significantly faster than current passenger rail. Speeds are in excess of 90 mph in the United States and in excess of 125 mph in the European Union.

Hub A geographical area – the Standard Metropolitan Statistical Area (SMSA) – that may have more than one airport in it. (This definition of hub should not be confused with the definition being used by the airlines in describing their "hub and spoke" route structure.) The classification scheme used for hubs by the FAA is defined below:

Hub Classification	Percent of National Total Enplaned Passengers
Large	1.00 or more
Medium	0.25 to 0.9999
Small	0.05 to 0.249
Non-hub	Less than 0.05

Hybrid electric bus A bus that operates at times on electrical power and at times on diesel fuel. Typically the electrical engine is powered by the energy created through braking or from power generated from the diesel engine.

In-Service Hour The time from when the transit vehicle begins its first trip at the first time point to the time the transit vehicle completes its last trip at the last time point excluding recovery time and any double-back between trips.

Increased Revenue Scenario One of two funding scenarios (see also Current Revenue Scenario) explored in this plan that assumes revenues that can realistically be attained through local, state, and federal sources. Under federal guidelines this scenario is called “non-fiscally constrained.” Under this scenario, more of the regional transportation goals beyond system maintenance and operations for both transit and highways would be achieved.

Infrastructure Fixed facilities, such as roadways or railroad tracks; permanent structures or improvements.

Instrument approach An electronically aided landing approach to a runway, often used under marginal or poor weather conditions. The approach to an airport’s runway is flown primarily by reference to instruments to a prescribed "decision height." At this height, the pilot makes positive visual reference to the airport, or its approach lights, or terminates the approach and begins climbing back to a higher altitude (missed approach).

Instrument flight rules (IFR) Rules as prescribed by Federal Air Regulations for flying by instruments. Often used when weather conditions, visibility or ceiling fall below those prescribed for Visual Flight Rules. Pilots must be instrument rated to fly in

	IFR conditions and aircraft must have required on-board equipment to be able to perform operations under IFR rules.
Instrument landing system (ILS)	A non-visual, precision approach to a runway utilizing electronic equipment at the airport to provide lateral guidance to the runway centerline and to give positive vertical reference to the glide path to the runway end.
Integrated noise model (INM)	A computer software program specifically designed for calculating and displaying acoustic information on individual aircraft operations or entire annual operations of a large airport; the FAA designated model for use in its Part 150 noise compatibility program.
Intelligent Transportation System (ITS)	The development or application of technology (electronics, communications, or information processing) to improve the efficiency and safety of surface transportation systems. ITS is divided into five categories that reflect the major emphasis of application: Advanced Traffic Management Systems Advance Traveler Information Systems Advanced Public Transportation Systems Automatic Vehicle Control Systems Commercial Vehicle Operations
Intermediate airport	An airport whose system role is to provide facilities and services primary to corporate-business users of aircraft usually weighing less than 75,000 lbs.
Intermodal (freight)	"Seamless" delivery of freight from one mode to another. Modes may include truck, rail, air or barge.
Intermodal (transit)	A location where different transportation modes come together, typically locations where persons can transfer among light rail, commuter rail, buses, bicycles, pedestrians, and/or automobiles.
Itinerant aircraft	Aircraft that is not based at a particular airport but is visiting or passing through from another facility usually more than 20 nautical miles away.
Joint zoning board (JZB)	Terminology used in Minnesota statutes that allows an airport authority in an urban setting to form a board between the authority and airport-affected communities to address height control and land use type/density off-airport for safety of persons flying and persons on the ground within prescribed areas around an airport.
Job concentration	Job concentrations are contiguous areas that have at least 7,000 jobs at a net density of at least 10 jobs per acre.
Level-day-night (LDN)	A method of measuring and plotting the amount of noise in a community, and includes an additional penalty for nighttime noise. The LDN is normally averaged over a one-year period.

Level of service

As related to each mode, the different operating conditions that occur on a facility when accommodating various traffic volumes. It is a measure of quality of service provided by a facility. It is expressed as levels of service "A" through "F." Level "A" represents the best operating conditions and Level "F" the worst.

Light rail transit (LRT)

Electrically powered trains primarily operating in an exclusive right-of-way, with frequent, all-day service and stops approximately one mile apart.

Linear right-of-way

A narrow, well-defined corridor of contiguous land dedicated to or preserved for transportation purposes.

Livable Communities Act (LCA)

The Minnesota Legislature created the Livable Communities Act (LCA) in 1995. The LCA is a voluntary, incentive-based approach to help the metropolitan area address affordable and lifecycle housing needs while providing funds to communities to assist them in carrying out their development plans. The Council awards LCA grants to participating communities in the seven-county area to help them: (1) clean up polluted land for redevelopment, new jobs and affordable housing; (2) create development or redevelopment that demonstrates efficient use of land and infrastructure through connected development patterns; and (3) create affordable housing opportunities.

Local flight operations

Refers to those activities by aircraft that:

- Operate in the local traffic pattern or within sight of the airport;
- Execute simulated instrument approaches or low passes at the airport (i.e., "touch and goes");
- Arrive from or depart to a local practice area located within a 20-mile radius of the airport. Most instructional/training operations are local.

Local streets

A class of roadways in the federal functional classification system that provide land access. (See Appendix D for functional classification criteria and characteristics.)

Local transit routes

These routes operate primarily on city streets in both the urban core and suburban areas and stop frequently, typically every one to two blocks. Local routes provide people with the highest level of access but often come with the trade-off of potentially slower, less reliable trips.

Core Local Routes – These routes generally serve urban areas along dense corridors. They comprise the basic framework of the all-day bus network, providing people with essential connections to major activity centers and transitways.

High-Frequency Arterial Routes – These are the highest-demand Core Local routes. These routes serve a significant portion of the total ridership across the transit network. High-frequency arterial routes will receive the highest level of local bus service – generally every 15 minutes or better during peak periods and every 20 minutes or better during the midday, with service seven days a week and up to 24 hours a day. These routes often have highly visible passenger facilities at major stops.

Supporting Local Routes – These routes serve urban areas on crosstown corridors that typically do not connect to a metropolitan regional job or activity center, such as a downtown. They are designed to complete the grid of urban bus routes and facilitate connections to Core Local Routes and transitways.

Suburban Local Routes – These routes provide access to the transit network across large portions of the lower density portions of the transit service area, mostly in Transit Market Areas II and III. These routes tend to operate with less frequent trips and fewer hours of service.

Long-term comprehensive airport plan (LTCP)

Overall plan for an individual airport. It integrates information pertinent to planning, environmental considerations, developing and operating an airport. Also includes forecasts of aviation demands, facility requirements, and general recommendations for development over a 20-year period.

Low-cost carrier (LCC)

Recent popular term describing primarily new entry airlines since de-regulation that have cost structures and airfares lower than the legacy air carriers, thereby spurring competition and often lower fares.

Main-wind runway

A runway that is aligned with the prevailing winds and often designated as a primary runway for operations when multiple runways exist at the airport.

Major airport

An airport whose primary air service access area is international and national in scope. Its role in the airport system is to provide facilities and services primary to air carrier and regional commuter users. Also called a commercial-service airport.

Major heliport

A full-service facility complete with landing and navigational aids, refueling capabilities and hangar, maintenance and passenger terminal facilities. This heliport is designed for all forms of helicopter services.

MAP-21

P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21) is the first multi-year transportation authorization enacted since 2005 and signed by President Obama on July 6, 2012. MAP-21 funds surface transportation and infrastructure programs at over $105 billion for fiscal years (FY) 2013 and 2014.

Metro Mobility

A service of the Metropolitan Council that provides door-to-door dial-a-ride transit service for persons with disabilities that prevent them from using the fixed-route bus and rail system.

Metro Transit

A service of the Metropolitan Council that provides rail transit and the largest amount of regular route bus service in the region.

Metropass

A program where employers provide discounted transit passes to employees. Employers get tax breaks for participating in the program.

Metropolitan Airports Commission (MAC)

An airport authority established for the Twin Cities area by the state legislature in 1943 to promote aviation in and through the area, operate a

	system of public airports and ensure provision of air passenger and cargo services.
Metropolitan Highway System	The system of highways intended to serve the region. Only principal arterials, which include interstate freeways, are part of the Metropolitan Highway System. The plan defines the Metropolitan Highway System to include the interstate freeways and other, non-freeway principal arterials.
Metropolitan Highway System Investment Strategy (MHSIS)	A major study of the Metropolitan Highway System that explored ways to best address long range regional transportation needs with reasonable forecasts of available state and federal funding sources.
Metropolitan Land Planning Act (MLPA)	The sections of Minnesota Statutes directing the Council to adopt long-range, comprehensive policy plans for transportation, airports, wastewater services, and parks and open space. It authorizes the Council to review the comprehensive plans of local governments, which they are to review and update at least once every 10 years.
Metropolitan Planning Area	The geographic area for which a Metropolitan Planning Organization plans and provides services. (Also see "MUSA.")
Metropolitan Urban Service Area (MUSA)	The geographic area in which the Metropolitan Council ensures regional services and facilities under its jurisdiction.
Minneapolis-Saint Paul International Airport (MSP)	A three-letter designator used on a national basis to identify a particular airport, for example, DFW = Dallas-Fort Worth
Minor airport	An airport whose system role is to provide facilities and services primarily to personal, business and instructional users.
Minor arterials	A class of roadways in the federal functional classification system. The minor arterials are further divided into regional classes as either "A" minor arterials or "B" or "other" minor arterials. (See "A" minor arterials.)
Minor heliport	Small-scale facility with minimal amenities that do not include refueling capabilities, navigational aids or tie down spaces.
Mixed use	A single building containing more than one type of land use or a single development of more than one building and use, where the different land uses are in close proximity. Mixed-use is common in local land use planning designations and zoning regulations.
MnPASS lanes	Highway express lanes that are priced for single-occupant users with prices varying by levels of congestion throughout the day. Drivers must subscribe and use a transponder in their car. Transit buses, carpoolers and motorcycles can use the lanes any time for free.
Mobility	The ability of a person or people to travel from one place to another.

Mode	Type of transportation, for example car, bus, bicycle.
Mode share	The share of one of the types of transportation as a percentage of all transportation types. Driving continues to have the largest mode share of all transportation types in the region.
Modernization	Modernization is an improvement to existing infrastructure or services that improves the functionality (for example the user experience, energy efficiency, or cost-effectiveness).
Motor Vehicle Sales Tax (MVST)	MVST is the 6.5 percent sales tax applied to the sale of new and used motor vehicles. Under a constitutional amendment passed in 2006, MVST revenues must be dedicated exclusively to highway and transit purposes.
Multi-use paths	A bikeway that is physically separated by a roadway or shoulder by the use of an open space buffer or physical barrier. A shared-use path can also be used by a variety of non-motorized users such as pedestrians, joggers, skaters and wheelchair users.
Multimodal	Including or pertaining to multiple modes of transportation, This can be used to describe a transportation system, transportation project, or a travel trip.
National Highway System (NHS)	A transportation system consisting of approximately 155,000 miles of highway that provide an interconnected system of principal arterial routes serving major population centers, major transportation facilities, major travel destinations, interstate and interregional travel and meeting national defense requirements.
National plan of integrated airports (NPIAS)	Airports classified by the Federal Aviation Administration (FAA) that are in the national airport system. Distances for air or sea travel are usually defined in terms of nautical miles rather than statute miles. One nautical mile is 6,070.097 feet; one statute mile is 5,280 feet.
New or restructured transit service	Significant change in service, including establishment of a new mass transportation service, addition of new route or routes to mass transportation system, a significant increase or decrease in service on or realignment of an existing route, or a change in the type or mode of service provided on specific, regularly scheduled route.
New Starts	A federal transit funding program for major capital expansion projects, typically commuter rail, light rail or dedicated busways. The program pays up to 50% of a project's cost.
NextGen (next generation)	Term used by FAA for its next generation of air traffic control.

Nice Ride Minnesota	A bike-sharing program in the Twin Cities. Users rent bikes from established stations and pay subscriptions or hourly fees for use.
Nighttime	Usually a defined period for noise modeling and/or noise mitigation, curfews and enforcement purposes.
Noise abatement	The attempt to reduce the amount and level of noise on and around airports, especially during takeoffs and landings, partly through special operational restrictions and proper land-use planning for areas affected by aircraft noise.
Objective	Represents achievable outcomes that together help to realize a goal within the timeframe of the plan.
Off-board fare collection	Collection of transit fares before a rider gets on a transit vehicle, generally by paying the fare to a ticket agent or an automated fare validator. Off-board fare collection speeds up loading time.
Off-peak period	Time of day outside the peak period. (See peak period.)
Operational improvement	A capital improvement consisting of installation of traffic surveillance and control equipment, computerized signal systems, motorist information systems, integrated traffic control systems, incident management programs, and transportation demand and system management facilities, strategies and programs.
Other minor arterials	Part of the regional roadway taxonomy of the federal minor arterial roadways class. Sometimes called "B" minor arterials, these roads are not as significant as the "A" minor arterials but fulfill an important mobility role within the region. (See "A" minor arterials.)
Paratransit services	Transit service that provides generally more flexible service than regular-route transit, using a variety of vehicles, such as large and small buses, vans, cars and taxis. Paratransit can serve a particular population, such as people with disabilities, or can be assigned to serve the general population. Paratransit is frequently provided in less densely populated areas, and used at times and in areas where trip demands are less concentrated, such as during weekends and evenings in suburban settings. Paratransit services are of several types: • Car and van pooling intended primarily to serve the work trip. • Demand-Response: Any type of public transportation involving flexibly scheduled service that is deployed upon a person's request for a trip. • There are two types of demand response: • Dial-a-ride service: The most common type of paratransit, service is provided by advance request pickup and drop off at desired or designated destinations. Dial-a-ride may deploy vans, small buses or shared-ride taxis. • Flexible fixed-route or deviation service. Either point deviation or route deviation where vehicles stop at specific locations on a regular schedule but do not have to follow a set route between the stops.

	Vehicles can deviate from the route to pick up or drop off passengers upon request.
Park-and-ride	A place where passengers park their cars and board some form of transit. There may be a transit station or transit center attached to a park-and-ride.
Passenger facility charge (PFC)	A domestic charge allowed by the U.S. at commercial service airports; funds are used primarily for capital projects at the specific airport.
Peak hour	The hour during the peak period when travel demand is highest. In the Twin Cities, peak hours are generally 7 to 8 a.m. and 4:30 to 5:30 p.m.
Peak period	The time between 6:30 and 9 a.m. and between 3 and 6 p.m. on weekdays when traffic is usually the heaviest.
Performance measure	An accountability tool that measures progress toward achieving goals and objectives. Performance measures also are used as a form of feedback.
Person throughput	The number of persons that pass a point on a roadway in a specified period of time. Person throughput includes all passengers in vehicles and is a key performance measure for the highway system.
Platform hour	The time from when the transit vehicle pulls out (leaves from the vehicle storage facility) to the time the transit vehicle pulls in (returns to the vehicle storage facility), i.e., in-service plus recovery plus deadhead time.
Preservation	Preservation activities are directed toward the elimination of deficiencies and major cost replacement of existing facilities. Preservation is not meant to include work that will increase the level of service by the addition of traffic lanes.
Principal arterials	A class of roadways in the federal functional classification system. These high-capacity highways make up the Metropolitan Highway System. (See Appendix D for functional classification criteria and characteristics.) These airports are privately owned, but available for public use without needing prior permission to land.
Project Development and Pre-Project Development	Project Development is a specific term used in the federal New Starts process to describe the initial phase in which a project has become eligible for federal New Starts funding. Project Development includes the completion of the environmental review process and combines previous steps of Preliminary Engineering and Final Design under SAFETEA-LU. Since the Project Development phase has a two-year time limit in the federal process, a phase called “Pre-Project Development” describes work that may be completed in anticipation of, but prior to, entering Project Development.
Queue jump (also queue jump lane)	A lane on a street that lets transit vehicles bypass a congested intersection.

Ramp meters	Signals on freeway ramps that smooth traffic flow to increase road capacity and safety. Many metered ramps within the region have bypasses for buses and carpools.
Ramp meter bypass	A lane at ramp meters that let certain vehicles like transit vehicles or high-occupancy vehicles bypass the ramp meter.
Real-time information	Transit service information that reflects actual operating conditions and is provided as actual time as compared to the scheduled time. Often, on-time arrival information available at bus stops or via the web.
Record of decision (ROD)	Final federal determination documentation on environmental impact statement and related analysis needed prior to funding and implementation of a project.
Regional airport system plan (RASP)	A system plan where geographical or operational scope includes large urban areas that are multi-county or multi-state in size and interaction.
Regional balance	Balancing projects geographically throughout the region.
Regional Highway System	All highways serving the region, including principal arterials and "A" minor arterials.
Regional jet (RJ)	Term associated with aircraft usually with 50 seats or less; since de-regulation this definition is blurring, as new aircraft (e.g. EMB 195) are coming into service with up to 110 seats, the current bottom-end of airlines' "mainline" sized aircraft.
Regional railroad authority	Each county in the region has a regional railroad authority to preserve rail corridors, preserve right-of-way if rail lines are abandoned, and develop rail transportation options. The county board sits as the regional railroad authority.
Regional Traffic Management Center (RTMC)	MnDOT's freeway management center fully-equipped with electronic surveillance technology such as cameras, loop detectors, and freeway ramp meters used to monitor current traffic congestions, adjust ramp meters in real time, and dispatch incident response vehicles to crash or vehicle breakdown sites.
Regional transportation partners	Broadly include all public entities within the region with responsibility for planning, implementing or maintaining the transportation system including the Council, MnDOT, counties, cities, townships, transit providers, airport sponsors and others.
Regionally significant project	Regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit

	facilities that offer an alternative to regional highway travel. Junction improvements and upgraded segments less than one mile in length outside the principal arterial system are not considered to be regionally significant, although they are otherwise not exempt.
Regular-route transit	Services provided on a repetitive, fixed schedule basis along a specific route with vehicles stopping to pick up and deliver passengers to specific locations; each trip serves the same origins and destinations. Both rail and buses can provide regular-route transit. Also referred to as fixed-route transit. (See commuter and express or local transit routes for more detail.)
Rehabilitation	Roadway improvements intended to correct conditions identified as deficient without major changes to the cross section. These projects consist of removal and replacement of base and pavement, shouldering and widening and drainage correction as needed without changing the basic boundaries of the roadway.
Reliever airport	An airport whose primary purpose is to serve general aviation and at the same time relieve congestion at a major airport having a high density of scheduled certificated airline traffic. It performs this function by providing services that attract and divert general aviation activity away from the major airport.
Revenue hour	The time from when the transit vehicle begins its route at the first time point to the time the transit vehicle completes its route at the last time point including the time the transit vehicle is in recovery (laying over).
Reverse commute	Transit service from the core cities to an employment location in suburban locations, typically in a direction opposite to the heaviest flow of traffic.
Ridesharing	A paratransit service with two or more riders in the vehicle, consisting usually of a prearranged car pool, van pool or subscription bus.
Right-of-Way Acquisition Loan Fund (RALF)	This program grants interest-free loans to communities within officially mapped highway corridors to purchase property threatened by development. The loan is repaid when the property is purchased by the highway construction authority. The Minnesota Legislature established the RALF program in 1982. It is funded by a property tax levied by the Metropolitan Council and funds are loaned out on a revolving basis.
Routes: Commuter and express transit routes	Commuter and express routes are designed primarily to bring people from urban and suburban residential areas to jobs in the region's major employment centers. These routes generally operate to serve the most common work start and end times. Express routes generally operate on the highway system with limited or no stops between park-and-rides and major employment centers.
Route deviation	A transit service operating on a fixed route from which vehicles may deviate to pick up or drop off passengers. Requests for route deviation may come by phone via radio contact with the driver or may be requested

	by a passenger upon boarding. Generally, this strategy utilizes a small vehicle.
Routine maintenance	Roadway maintenance consisting of snow and ice control, mowing, sweeping, periodic applications of bituminous overlays, seal treatments, milling, crack routing and filling and base repair. These treatments are intended to help ensure the roadway can be used to the end of its design life.
Run-up	Usually an engine testing procedure conducted at an engine maintenance facility or an on-aircraft test performed at a specific site on the airport to minimize effects of full engine power applications.
Runningway	The linear component of the transit system that is part of the right-of-way and required to operate the transit vehicles, including ancillary structures or equipment.
Runway	Any prepared landing and takeoff surface of an airport.
Runway incursion	An unauthorized physical presence on a runway surface by a person, vehicle or aircraft as a violation of rule, ordinance or air traffic control procedures/approval.
Runway protection zone (RPZ)	A federally defined clear area beyond the end of a runway, under control of the airport owner, in which the presence of structures or other obstructions are controlled to permit safe flight for takeoff and landing operations.
Runway use system (RUS)	An air traffic control method for operating an airport in a safe and efficient manner while still meeting aircraft noise operation abatement objectives.
Rural area	The rural area is defined in *Thrive MSP 2040* and is divided into four specific geographic planning areas: Rural Centers/Rural Growth Centers, Diversified Rural Communities, Rural Residential Areas and Agricultural Areas.
	A marker painted on a street, usually a bicycle, to indicate that bicyclists may use the full traffic lane and share the lane with vehicles.
Shoulder	The part of a highway that is contiguous to the regularly traveled portion of the highway and is on the same level as the highway, generally reserved for breakdowns and emergency vehicles. Some shoulders in the Twin Cities are designated for bus utilization called “bus-only shoulders.”
Signal preemption	A technology that triggers the green go-ahead on meters or traffic lights to allow transit vehicles to more quickly move through freeway ramp entrances or intersections.
Small Starts	A federal program for funding transit infrastructure. This program funds projects that are $250 M or less in capital costs and is a subset of the “New Starts” program.

Special-purpose aviation facility	A facility open to public-use, including heliport, seaplane base or airport landing area, whose primary geographic and service focus is normally state and metropolitan in scope. Personal, business and instruction uses are accommodated at these facilities. Gliders have been mostly accommodated at private-use airports in the metropolitan area.
Single-occupant vehicle (SOV)	A vehicle with only one occupant, the driver.
State airport system plan (SASP)	A plan of each airport's role, inclusion in the NPIAS, data files, development program, funding agreements, and implementation measures required by the FAA for airports normally within the boundary of each state.
Strategy	Identifies how objectives will be met through specific actions, including who is responsible.
Statute mile	A measure of distance for ground travel defined as 5,280 feet.
Suburban Transit Providers	Provide regular-route and dial-a-ride service in 12 suburban communities. These providers are: Minnesota Valley Transit Authority, SouthWest Transit Authority, and the Cities of Maple Grove, Plymouth, Shakopee, and Prior Lake. The City of Minnetonka has also opted-out but has chosen to leave its service with the Metropolitan Council instead of starting its own service.
Surface Transportation Program (STP)	One of the core federal highway funding programs. STP provides flexible funding that may be used by states and localities for projects on any federal-aid highway, including the national highway system, bridge projects on any public road, transit capital projects, and intra-city and intercity bus terminals and facilities.
System statement	The system statement informs each community how it is affected by the Metropolitan Council's policy plans for four regional systems - transportation, aviation, water resources (including wastewater collection and treatment), and regional parks and open space. System statements include forecasts of population, households and employment.
Telecommuting	The elimination or reduction in commuter trips by routinely working part or full time at home or at a satellite work station closer to home.
Thrive MSP 2040	Thrive MSP 2040 is the vision and planning framework for the Twin Cities region for the next 30 years. It reflects regional concerns and aspirations, anticipates future needs, and addresses our responsibility to future generations. This long-range plan is required to be updated by the Metropolitan Council every 10 years under state law. The policies in Thrive MSP 2040 drive the systems and policy plans developed by the Council: the Transportation Policy Plan, the Water Resources Policy Plan, the Regional Parks Policy Plan, and the Council's first Housing Policy Plan update in nearly 30 years. More information can be found at: http://www.metrocouncil.org/Planning/Projects/Thrive-2040.aspx

TIGER	The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program, provides opportunities for investment in road, rail, transit and port projects that promise to achieve critical national objectives. Since 2009, Congress has dedicated more than $4.1 billion in six rounds to fund projects that have a significant impact on the nation, a region or a metropolitan area.
Throughput	The number of vehicles/persons that pass a point on a roadway over a specified period of time. Person throughput includes passengers of vehicles while vehicle throughput only includes vehicles.
Tolls	A fee collected for the use of a road.
Traffic calming	Techniques such as speed bumps, narrow lanes and traffic circles used to slow traffic primarily in residential neighborhoods.
Traffic signal control systems	The degree of traffic management of an arterial is grouped and defined as follows: • Fixed time: The traffic signals on an arterial are controlled locally through a time clock system. In general, the progression of a through band (the amount of green time available along an arterial at a given speed) along the arterial in the peak direction is determined by past experience and is not a function of immediate traffic demand. • Semi-actuated: The traffic signals along the arterial are designed to maximize the green time on the major route in the major direction. Timing and through band are based upon historical records. Use of green time on the minor leg depends on real-time demand and maximized based upon total intersection delay. • Interconnection: A traffic signal system in which data collected at individual signals is shared with a central processor or controller. Adjustments in traffic signal control can be made based upon incoming data as opposed to historical data. • Optimization: The process in which a traffic signal or system is modified to maximize the amount of vehicles passing through the intersection for all approaches or on the major road in the peak direction. • Real-time adaptive control: An advanced traffic control system that incorporates current technologies in communications, data analysis, and traffic monitoring to provide real-time traffic control of arterials, corridors or roadway networks.
Transit advantages	Facility improvements that offer travel-time benefits to multi-occupant and transit vehicles. Examples include bus-only shoulders, bus lanes, HOV/HOT lanes, priced dynamic shoulders, ramp meter bypasses, signal preemption, transit centers, transit stations, and major park-and-ride lots.
Transit centers	A transit stop or station at the meeting point of several routes or lines or of different modes of transportation. It is located on or off the street and is designed to handle the movement of transit units (vehicles or trains) and the boarding, alighting, and transferring of passengers between routes or lines (in which case it is also known as a transfer center) or different modes

	(also known as a modal interchange center, intermodal transfer facility or a hub).
Transit market area	The Twin Cities have been divided into five areas depending on their land use and development characteristics. These characteristics determine the types and levels of transit service that are appropriate for efficient and effective services. (See Appendix G for a full description of the Twin Cities market areas.)
Transit-oriented development	The concentration of jobs and housing around transit corridors, hubs and daily conveniences. TOD is moderate to higher-density development located within easy walking distance of a major transit stop, generally with a mix of residential, employment and shopping opportunities designed for pedestrians without excluding the auto. (Additional information about transit-oriented development can be found in the Council's online handbook, the Guide for Transit-Oriented Development.)
Transit stations	Facilities provided at light rail, commuter rail and bus rapid transit stops and in some cases for major suburban bus transit centers that serve as the central transit facility within a community.
Transit system management	Transit system management is the ongoing analysis, modification, and improvement of the transit system to maximize its performance and cost-effectiveness.
Transit taxing district	The portion of the Twin Cities metropolitan area where property is taxed to support transit services as defined in Minnesota State Statute 473.446 or who have joined the Transit Taxing District under Minnesota State Statute 473.4461.
Transit trip	A person trip as a passenger of a public transit vehicle.
Transitways	High-demand travel corridors that offer improved transit service that includes bus rapid transit, light rail or commuter rail.
Transportation Advisory Board (TAB)	The Transportation Advisory Board, established in accordance with Minn. Stat. 473, Sec. 146, is part of the Metropolitan Council and is a forum for deliberation on transportation-related issues among state, regional and local officials and private citizens. The TAB advises the Council in preparing transportation plans and provides coordination and direction to the agencies responsible for implementing the plans.
Transportation Improvement Program (TIP)	A four-year multimodal program of highway, transit, biking, walking and transportation enhancement projects and programs proposed for federal funding in the seven-county Twin Cities metropolitan area. The TIP must include capital and non-capital transportation projects proposed for funding under Title 23 United States Code (USC) (highways) and Title 49 USC (transit). The TIP must also contain all regionally significant transportation projects that require an action by the Federal Highway Administration (FHWA) or the Federal Transit Authority (FTA).
Transportation Management	

Organization (TMO) or Association (TMA)	Nonprofit organizations formed in highly congested areas to deal with common transportation concerns, particularly alleviating congestion, improving employee commutes and increasing access to customers.
Transportation Policy Plan (TPP)	This document, which is one chapter of the Metropolitan Council's Metropolitan Development Guide, as provided for in Minn. Stat. 473, Sec. 145 and 146. Section 145 states: "The Metropolitan Council shall prepare and adopt...a comprehensive development guide for the metropolitan area." This chapter deals with the transportation needs of the seven county area.
Transportation Security Administration (TSA)	Transportation security unit under the U.S. Department of Homeland Security; created as a result of terrorist attacks on Sept. 11, 2001.
Transportation System Plan (TSP)	MnDOT's 20-year plan that identifies regional investment priority categories for the Minnesota Highway System.
Travel Behavior Inventory (TBI)	A set of surveys identifying travel patterns and characteristics of people and vehicles within the metropolitan area. In the Twin Cities, the first study was done in 1949 and has been repeated every 10 years since.
Travel Demand Management (TDM)	Consists of programmatic strategies to reduce drive-alone vehicle trips and vehicle miles traveled during peak congestion times, special events, and for construction project areas. TDM strategies provide incentives for people to reduce overall demand for roadway capacity by using alternative travel modes such as transit, biking, and walking. TDM strategies also include flexible employment arrangements that do not require peak-period travel (flexible schedules) or would allow employees to avoid the commute altogether by working from home (telecommuting). Travel demand management is also referred to as transportation demand management.
Trip	A one-way journey made by one person from any origin to any destination
Trunk highway	A highway under jurisdiction of MnDOT.
	Radio communications equipment mostly used at uncontrolled general aviation airports. Allows pilots to communicate with each other in vicinity of the airport, activate airport runway lights, and provide air-to-ground communications.
Urban Partnership Agreement (UPA)	A program by the federal government to explore the use of priced lanes on highways. The Twin Cities received a UPA grant and is completing a set of improvements on I-35W, Cedar Avenue and in downtown Minneapolis to implement a priced lane and improve transit.
Vanpool	A paratransit service provided by a publicly or privately provided van on a scheduled or unscheduled basis with at least five riders.
Vehicle trip	A one-way journey made by an auto, truck or bus to convey people or goods.

Vehicle miles traveled (VMT)	The number of miles traveled by vehicles on the roadway system, regardless of the number of people in the vehicles.
Very light jet (VLJ)	Recent new category of personal business jet aircraft certified by FAA. Aircraft weighs less than 11,000 lbs maximum weight and seats 6 or less persons.
Visual flight rules (VFR)	"See-and-be-seen" flight rules. Used during good weather conditions under which an aircraft can be operated by visual reference to the ground, to other aircraft and distances from clouds.
Very high frequency omni-directional radio (VOR)	A ground radio station that provides a pilot of a properly equipped aircraft with his or her location in reference to that station.
VOR approach	A landing approach to a runway using the VOR as a reference point and directional guidance to the runway.

Appendix B: Transportation Improvement Program for the Twin Cities Region

The federally required Transportation Improvement Program (TIP) for the Greater MSP region – as defined by the U.S. Census Bureau and the Metropolitan Council to consist of the seven counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington, the contiguous urbanized areas of Wright and Sherburne counties, and a portion of Houlton, Wis. – is updated each year by the Transportation Advisory Board and the Metropolitan Council. The federal transportation bill, Moving Ahead for Progress in the 21st Century (MAP-21), requires that all federally-funded transportation projects within the Greater MSP region be included in the four-year TIP. The TIP is prepared by Metropolitan Council staff with assistance from the Minnesota Department of Transportation. It is a fiscally constrained four-year program for project delivery, which means anticipated revenues and estimated project costs balance over the four year period covered by the TIP.

The current Transportation Improvement Program is available on the Metropolitan Council Web site at: http://www.metrocouncil.org/Transportation/Planning/TIP.aspx

Appendix C: Long-Range Highway and Transit Capital Project List

Appendix C was developed and is being provided at the request of the U.S. Department of Transportation Federal Highway and Federal Transit Administrations in response to conversations conducted as part of the Metropolitan Council's four-year federal audit of the metropolitan transportation planning process. This appendix consists of a list of potential major capital highway and transit projects, consistent with federal requirements. The projects included in this list would be planned and implemented by either the Minnesota Department of Transportation (highways) or the Metropolitan Council/Metro Transit (transit). This list does not include projects on the local highway or transit systems; consistent with state and federal law, those projects are identified through the local comprehensive planning process for county- and city-owned highways, and through specific facility plans for transit including the Park-and-Ride Plan and the *Regional Service Improvement Plan*. All known regionally significant local projects are included in Appendix B, Transportation Improvement Program, and Appendix E, Additional Air Quality Information (*insert link*).

The *2040 Transportation Policy Plan* marks the first time Appendix C is being provided. This is a planning document that is intended to be changed through updates and amendments to the Transportation Policy Plan. Appendix C is not a project programming document and cannot be interpreted as a programming document. Appendix C summarizes known projects included the current revenue scenario; this is the long-range transportation planning scenario where known project costs are equal to or less than anticipated revenues (also called the fiscally constrained plan in federal regulations). Appendix C summarizes the project's primary investment category (*link to" Highway Investment Direction and Plan" and "Transit Investment Direction and Plan"*), project location (called "Route"), project description, estimated cost in year of expenditure dollars, and approximate implementation timeframe.

This list is intended to be exhaustive for Highway MnPASS, Strategic Capacity Enhancements, Regional Highway Access, and Transitways only. When new projects are identified for funding in these four categories, they must be amended into the Transportation Policy Plan, this appendix, and any other applicable sections of the plan. The projects listed in the other categories are examples of the types of projects to be funded in these categories and in the timeframes identified. Some projects in these other categories may require plan amendments prior to funding and construction. For more information contact Metropolitan Council long-range transportation planning staff.

Long-Range Highway Capital Projects 2015-2024

The Minnesota Department of Transportation provided the list of projects to be included in the Current Revenue Scenario for the 2040 Transportation Policy Plan. The list was based on work done initially for the Minnesota State Highway Investment Plan 2014-2033 (MnSHIP) published in December 2013, and updated with more current project information when it was available. Projects are assigned to timeframes: 2015-2018 (the first Transportation Improvement Program in the 2040 TPP); 2019-2024; or the first 10 years of the plan, 2015-2024. To date, MnDOT has not identified any projects beyond 2024 to be included in the Current Revenue Scenario because all anticipated funding will be dedicated to operating, maintaining, and rebuilding the Interstate and state highway system and these kinds of projects are not identified more than eight years in advance of construction. This list is not intended to be exhaustive for all categories except MnPASS, Strategic Capacity Enhancements, and Regional Highway Access. For all other categories, the 2040 Transportation Policy Plan Highway Investment Direction and Plan anticipates funding that exceeds anticipated project costs identified here. Unallocated revenue does not apply for Regional Mobility Improvements; based on current revenue estimates, MnDOT anticipates no Highway Regional Mobility Improvements in the metropolitan area after 2024.

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US169	OVER US212/MN62 IN EDEN PRAIRIE/EDINA-REDECK BRIDGES 27079 AND 27080, NEW APPROACH PANELS	$2,320,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	I94 NB ON RAMP OVER GLENWOOD AVE IN MPLS-REPAIR BRIDGE 27728	$11,385,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	AT HENNEPIN/LYNDALE TUNNEL (BRIDGE 27832) AND EB I94 UNDER I35W TUNNEL (BRIDGE 27834) IN MPLS-TILE REPAIR	$4,655,000	2015-2018
3. Rebuild and Replace Highway Assets	I35W	FROM 46TH ST TO I94 IN MPLS - MANAGED LANE COMPLETION, PAVEMENT RECONSTRUCTION AND REPAIR, NOISEWALLS, TMS, DRAINAGE, LIGHTING, REPLACE BRIDGES 9731, 9733, 27842, 27843, 27867, 27868, 27869, 27870, 27871, 27872	$121,000,000	2015-2018
3. Rebuild and Replace Highway Assets	I35W	FROM HENNEPIN AVE TO JOHNSON ST IN MINNEAPOLIS - REDECK BRIDGES 27885, 27886, 27985, 27989, 27994, GUARDRAIL	$2,045,000	2015-2018
3. Rebuild and Replace Highway Assets	MN100	FROM 36TH ST TO CEDAR LAKE RD IN ST. LOUIS PARK - REPLACE BRIDGES 5308(27303), 5309 (NEW PED BRIDGE 27304), 5462(27305), 5598(27306), OVERLAY AND JOINT REPLACEMENT BRIDGE 27109, RECONSTRUCT MAIN LINE PAVEMENT AND INTERCHANGES, AUX LANES AND NOISE WALLS	$62,570,000	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	MN36	OVER LEXINGTON AVENUE IN ROSEVILLE-REPLACE BRIDGE 5723 AND APPROACHES, SIGNALS, TMS, ADA, GUARDRAIL, STORM SEWER AND PONDS	$13,600,000	2015-2018
3. Rebuild and Replace Highway Assets	MN149	OVER MISSISSIPPI RIVER IN ST PAUL - REDECK & APPROACH WORK ON BRIDGE #62090	$14,180,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	FROM JUST E OF DALE ST TO JUST W OF PELHAM BLVD IN ST PAUL - REPAIR BRIDGES 9379, 9381, 9452, 9457, 9663, REDECK BRIDGES 9383, 62813, 62845 AND MILL AND OVERLAY BRIDGE 9387	$6,685,000	2015-2018
3. Rebuild and Replace Highway Assets	I35E	OVER GOOSE LAKE RD AND BNSF RR IN VADNAIS HEIGHTS-REPLACE BRIDGES 9567 (NEW 62729) AND 9568 (NEW 62730) INCLUDING REPLACEMENT AND PROFILE ADJUSTMENTS OF PAVEMENT ON BOTH SIDES OF BRIDGE, GUARDRAIL, DRAINAGE, TMS	$9,475,000	2015-2018
3. Rebuild and Replace Highway Assets	I35W	FROM JUST S OF I694 IN NEW BRIGHTON TO JUST S OF RAMSEY CR E2 IN ARDEN HILLS - REPLACE BRIDGES 9570 & 9599 AND APPROACHES, GUARDRAIL, RETAINING WALL AND PONDING	$10,705,000	2015-2018
3. Rebuild and Replace Highway Assets	I35W	AT RAMSEY COUNTY RD H (T.C. ARSENAL ENTRANCE) IN ARDEN HILLS - REPLACE BRIDGE #9582 AND RAMP RECONSTRUCTION	$6,470,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	FROM JUST E OF DALE ST TO JUST W OF PELHAM BLVD IN ST PAUL - REPAIR BRIDGES 9379, 9381, 9452, 9457, 9663, REDECK BRIDGES 9383, 62813, 62845 AND MILL AND OVERLAY BRIDGE 9387	$6,685,000	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	I35W	REPAIR/REPLACE BRIDGE #02804 OVER I-35E SOUTHBOUND	$2,500,000	2015-2018
3. Rebuild and Replace Highway Assets	MN62	REPAIR/REPLACE BRIDGE #7263 FRANCE AVE OVER MN 62	$1,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN62	REPAIR/REPLACE BRIDGE #7264 OVER VALLEY VIEW RD	$1,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN55	REPAIR/REPLACE BRIDGE #94277 OVER BASSETT CREEK	$2,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN100	REPAIR/REPLACE BRIDGE #9500 OVER MN 62	$6,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN36	REPAIR/REPLACE BRIDGES #62853, 6277, 6276 OVER CLEVELAND AVE AND ON-RAMP FROM I-35W	$5,200,000	2015-2018
3. Rebuild and Replace Highway Assets	MN 19	ON MN 19 OVER STREAM, REPLACE BRIDGE 8844	$231,150	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US10	REPLACE BRIDGE #5955 2.7 MILES WEST OF TH169 OVER ELK RIVER/LAKE ORONO	$8,320,000	2015-2018
3. Rebuild and Replace Highway Assets	US8	REPAIR/REPLACE BRIDGE #82815 OVER I-35	$2,500,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	OVERLAY AND REHAB BRIDGE #86817 OVER WRIGHT CSAH 19 IN ALBERTVILLE	$2,684,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	OVERLAY AND REHAB BRIDGE #86818 OVER WRIGHT CSAH 19 IN ALBERTVILLE	$2,684,000	2019-2024
3. Rebuild and Replace Highway Assets	MN55	REDECK/REPAIR BRIDGE #5891 OVER CO RAILROAD EAST OF HWY 100	$4,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN55	REDECK/REPAIR BRIDGE #6721 OVER UP RAILROAD EAST OF COUNTY ROAD 6	$1,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN62	REDECK AND REPAIR SUBSTRUCTURE BRIDGE 27083 OVER MN 62	$2,000,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	MN55	REHABILITATE RAILING ON BRIDGE 4190	$3,100,000	2019-2024
3. Rebuild and Replace Highway Assets	MN610	REOVERLAY BRIDGE 27239 OVER THE MISS. RIVER	$1,800,000	2019-2024
3. Rebuild and Replace Highway Assets	MN21	REDECK/REPAIR BRIDGES #9124 AND #9123	$3,200,000	2019-2024
3. Rebuild and Replace Highway Assets	US10	REPAIR BRIDGE #82010 OVER ST CROIX RIVER	$1,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN77	REPLACE BRIDGE #9195, E 66TH STREET OVER MN 77	$2,900,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	REPAIR/REDECK BRIDGE #27945 OVER I-94	$2,600,000	2019-2024
3. Rebuild and Replace Highway Assets	I35W	REPLACE BRIDGE #5983 OVER MINNESOTA RIVER (YEAR 1 OF 3)	$30,000,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	I694	REPAIR SUBSTRUCTURE AND REDECK BRIDGE #6580 OVER I694	$3,000,000	2019-2024
3. Rebuild and Replace Highway Assets	US169	REPLACE BRIDGES #6890, #6891, OVER ELM CREEK	$1,000,000	2019-2024
3. Rebuild and Replace Highway Assets	I35E	REDECK BRIDGE 62865 OVER JEFFERSON AVE	$3,500,000	2019-2024
3. Rebuild and Replace Highway Assets	MN65	REPAIR/REPLACE BRIDGES #6817, #9417 OVER COON CREEK	$1,600,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	REPAIR BRIDGE #10009 EAST BOUND OVER RAILROAD WEST OF MN 101	$2,000,000	2019-2024
3. Rebuild and Replace Highway Assets	US169	REPAIR/REDECK BRIDGE #27551 OVER US 169	$1,600,000	2019-2024
3. Rebuild and Replace Highway Assets	I35W	REPLACE BRIDGE #5983 OVER MINNESOTA RIVER (YEAR 3 OF 3)	$20,000,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US169	REPLACE BRIDGE 27568 OVER NINE MILE CREEK, AND REPAIR SEVEN OTHER CORRIDOR BRIDGES	$47,600,000	2019-2024
3. Rebuild and Replace Highway Assets	MN65	REPAIR BRIDGES #9263, #9264 CSAH 10 OVER MN 65	$2,600,000	2019-2024
3. Rebuild and Replace Highway Assets	MN51	REDECK/REPAIR BRIDGE #'S 9012 AND 9013 OVER TH36	$5,600,000	2019-2024
3. Rebuild and Replace Highway Assets	I494	REDECK BRIDGE #27654 CARLSON PKWY OVER I-494	$1,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN65	REHAB BRIDGE # 2440 OVER MISSISSIPPI RIVER IN MPLS	$33,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN97	REPLACE BRIDGE 02806 OVER I-35	$2,200,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	REDECK/REPAIR BRIDGE #27796 OVER I-94	$3,000,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	I35W	REPLACE BRIDGE #5983 OVER MINNESOTA RIVER (YEAR 2 OF 3)	$30,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN100	FROM JUST N I494 IN EDINA TO 36TH ST IN ST LOUIS PARK-CPR AND DIAMOND GRINDING	$10,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN13	FROM E OF US 169 IN SAVAGE TO JUST E OF WASHBURN AVE IN BURNSVILLE-MILL AND OVERLAY	$5,000,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	WRIGHT CO. CSAH 75 AT MONTICELLO TO THE CROW RIVER BRIDGE (EB ONLY), MILL AND OVERLAY	$3,960,000	2015-2018
3. Rebuild and Replace Highway Assets	I494	FROM I394 IN MINNETONKA TO I94/I494/I694 INTERCHANGE IN MAPLE GROVE - UNBONDED CONCRETE OVERLAY, CPR, RIGHT SIDE DYNAMIC SHOULDER, SIGNING, STRIPING, DRAINAGE, TMS, NOISE WALLS, REDECK AND WIDEN BRIDGES 27973, 27974, 27975, 27976, 27977, 27978, REDECK #2	$48,000,000	2015-2018
3. Rebuild and Replace Highway Assets	MN110	JUST E I35E IN MENDOTA HTS TO I494 IN INVER GROVE HTS-RECLAMATION/WHITE TOPPING	$6,000,000	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	I94	FROM MOUNDS BLVD IN ST PAUL TO E OF MN120 IN WOODBURY AND ON US61 FROM JUST N BURNS AVE TO W JCT MN5 IN ST PAUL-UNBONDED CONCRETE OVERLAY, REPAIR BRIDGES 62706, 62861, 62862, 62838 AND 62870, DRAINAGE, SIGNALS, LIGHTING, SIGNING, GUARDRAIL, TMS AND ADA	$32,520,000	2015-2018
3. Rebuild and Replace Highway Assets	I94	FROM NICOLLET AVE IN MPLS TO W SHINGLE CREEK BRIDGE 27909 IN BROOKLYN CENTER-MAJOR CPR AND DIAMOND GRINDING, DRAINAGE	$23,355,000	2015-2018
3. Rebuild and Replace Highway Assets	I35E	FROM RAMSEY CR E IN VADNAIS HTS TO JUST S OF RAMSEY CSAH 96 IN WHITE BEAR LAKE-MILL & OVERLAY, MILL & CONCRETE UNBONDED OVERLAY, DRAINAGE, LOOP DETECTORS, GUARDRAIL, CONSTRUCT SLOPE, MILL & OVERLAY, CABLE MEDIAN BARRIER,TEMP BYPASS, & RR AGREEMENT	$4,940,000	2015-2018
3. Rebuild and Replace Highway Assets	MN5	FROM JUST E OF SCANDIA RD IN LAKETOWN TWP TO ROLLING ACRES RD/BAVARIA RD IN VICTORIA - MILL & OVERLAY, DRAINAGE, GUARDRAIL	$5,490,000	2015-2018
3. Rebuild and Replace Highway Assets	MN25	LITTLE ROCK TO SOUTH OF GENOLA, MILL AND OVERLAY	$3,100,000	2015-2018
3. Rebuild and Replace Highway Assets	MN5	FROM JUST E OF JCT MN25 IN CAMDEN TWP TO JUST EAST OF BIRCH ST IN WACONIA- MILL & OVERLAY, GUARDRAIL, ACCESS MANAGEMENT, DRAINAGE	$3,325,000	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US169	JUST NORTH OF MN62 IN EDINA TO MN55 IN GOLDEN VALLEY -CPR WITH DIAMOND GRINDING AND MILL AND OVERLAY, DRAINAGE	$16,515,000	2015-2018
3. Rebuild and Replace Highway Assets	MN7	MILL AND OVERLAY, EAST OF I-494 TO WEST OF LOUISIANA AVE	$4,500,000	2015-2018
3. Rebuild and Replace Highway Assets	MN62	MAJOR CONCRETE PAVEMENT REPAIR, DIAMOND GRIND, AND MEDIUM MILL AND OVERLAY, BEACH ROAD TO TRACY AVE	$6,000,000	2015-2018
3. Rebuild and Replace Highway Assets	I35	UNBONDED CONCRETE OVERLAY, SOUTH OF 35E/W SPLIT TO US 8	$27,000,000	2015-2018
3. Rebuild and Replace Highway Assets	I694	MEDIUM MILL AND OVERLAY, WEST OF LEXINGTON AVE TO EAST OF RICE ST	$4,000,000	2015-2018
3. Rebuild and Replace Highway Assets	US10	RECONSTRUCTION, JOPLIN ST. TO NORFOLK AVE. IN ELK RIVER	$14,800,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	MEDIUM MILL AND OVERLAY, NICOLLET AVE TO MN 280	$8,020,213	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	MN25	MEDIUM MILL AND OVERLAY, CSAH 30 TO CARVER/WRIGHT CO LINE	$4,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	UNBONDED OVERLAY. EAST OF JAMACA TO CSAH 15	$6,750,000	2019-2024
3. Rebuild and Replace Highway Assets	US952A	MEDIUM MILL AND OVERLAY, MN 65 TO JCT I-35W	$1,500,000	2019-2024
3. Rebuild and Replace Highway Assets	I494	REPAIR/REPLACE BRIDGES #9217E, #9217W OVER MN RIVER	$5,700,000	2019-2024
3. Rebuild and Replace Highway Assets	I35W	UNBONDED OVERLAY, CR J TO SUNSET AVENUE	$13,837,303	2019-2024
3. Rebuild and Replace Highway Assets	US10	REPLACE BRIDGE #9700 AND REPAIR SIX ADDITIONAL BRIDGES BETWEEN MIN STREET AND EAST OF 7TH AVE	$15,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN95	MEDIUM MILL AND OVERLAY, W OF JCT TH 94 AND OLD CSAH 15 TO BAILEY ROAD	$2,500,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	I494	CONCRETE PAVEMENT REPAIR AND MEDIUM MILL AND OVERLAY FROM HARDMAN AVE TO MN RIVER	$22,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	UNBONDED OVERLAY, EAST OF POST ROAD TO HENNEPIN COUNTY/RAMSEY COUNTY LINE	$7,500,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	THICK OVERLAY FROM MN 120 TO WISCONSIN BORDER	$34,548,030	2019-2024
3. Rebuild and Replace Highway Assets	MN120	MEDIUM MILL AND OVERLAY, 4TH ST TO MN 244	$5,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	THIN MILL AND OVERLAY, FROM MUNSTER AVE TO US 52	$4,000,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	MAJOR CONCRETE PAVEMENT REPAIR AND DIAMOND GRIND, WESTERN AVE TO MOUNDS BLVD	$6,069,946	2019-2024
3. Rebuild and Replace Highway Assets	US52	MEDIUM MILL AND OVERLAY, NORTH OF COUNTY ROAD 86 TO CSAH 42	$10,837,393	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US952A	THIN MILL AND OVERLAY, ROBERT ST FROM ANNAPOLIS TO I-35E	$3,000,000	2019-2024
3. Rebuild and Replace Highway Assets	US52	UNBONDED OVERLAY, GOODHUE/DAKOTA COUNTY LINE TO NORTH OF COUNTY ROAD 86	$8,653,433	2019-2024
3. Rebuild and Replace Highway Assets	US212	MEDIUM MILL AND OVERLAY, MN 5 TO CSAH 34	$4,871,928	2019-2024
3. Rebuild and Replace Highway Assets	I94	MEDIUM MILL AND OVERLAY, MN 280 TO WESTERN AVE	$9,003,642	2019-2024
3. Rebuild and Replace Highway Assets	MN282	RECLAMATION, TH 21 TO TH 13	$7,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN13	RECLAMATION AND MILL AND OVERLAY, TH 282 TO EAGLE CREEK AVE	$5,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	MEDIUM MILL AND OVERLAY, JCT 120/CENTURY AVE TO EAST OF JAMACA	$4,250,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	MN284	MEDIUM MILL AND OVERLAY, TH 212 TO SIERRA PARKWAY	$2,750,000	2019-2024
3. Rebuild and Replace Highway Assets	I35W	THIN MILL AND OVERLAY, PORTLAND AVENUE TO WASINGTON AVENUE	$2,274,232	2019-2024
3. Rebuild and Replace Highway Assets	MN65	MEDIUM MILL AND OVERLAY, CSAH 10 TO 153RD AVE	$12,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN41	MEDIUM MILL AND OVERLAY, HUNDERTDMARK RD TO TH 5	$2,500,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	MEDIUM MILL AND OVERLAY, SIBLEY/CARVER COUNTY LINE TO US 212	$2,250,000	2019-2024
3. Rebuild and Replace Highway Assets	MN13	MEDIUM MILL AND OVERLAY, TH 19 TO MN 282	$6,500,000	2019-2024
3. Rebuild and Replace Highway Assets	MN316	MEDIUM MILL AND OVERLAY, NORTH OF MICHAEL AVE TO US 61	$1,182,129	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US52	MEDIUM MILL AND OVERLAY AND CONCRETE PAVEMENT REPAIR, I-494 TO LAFAYETTE BRIDGE	$6,053,103	2019-2024
3. Rebuild and Replace Highway Assets	MN41	SOUTH OF 2ND STREET TO CSAH 61 (OLD 212)	$1,353,902	2019-2024
3. Rebuild and Replace Highway Assets	MN244	MEDIUM MILL AND OVERLAY, JCT TH 120/TH 244 TO MN 96	$3,000,000	2019-2024
3. Rebuild and Replace Highway Assets	I394	PAINT BRIDGES IN CORRIDOR FROM US 100 TO I94	$8,500,000	2019-2024
3. Rebuild and Replace Highway Assets	MN95	MEDIUM MILL AND OVERLAY, I-94 TO SOUTH OF TH 36	$3,750,000	2019-2024
3. Rebuild and Replace Highway Assets	MN5	MEDIUM MILL AND OVERLAY, US 52 TO MN 120	$4,000,000	2019-2024
3. Rebuild and Replace Highway Assets	I35W	MAJOR CONCRETE PAVEMENT REPAIR AND DIAMOND GRIND, 4TH STREET TO NEW BRIGHTON AVE	$5,319,882	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US169	CONCRETE PAVEMENT REPAIR AND MEDIUM MILL AND OVERLAY FROM 101ST AVE TO US 10	$9,119,197	2019-2024
3. Rebuild and Replace Highway Assets	I35W	THICK OVERLAY, NEW BRIGHTON AVE TO MN 36	$9,281,109	2019-2024
3. Rebuild and Replace Highway Assets	I35W	MED/THICK MILL AND OVERLAY, I-694 TO NORTH OF COUNTY RD J	$9,765,645	2019-2024
3. Rebuild and Replace Highway Assets	MN65	WHITETOPPING, 153RD AVE TO 217TH AVE	$15,897,928	2019-2024
3. Rebuild and Replace Highway Assets	US169	REDECK/REPAIR BRIDGES #27550, #27523 OVER US 169	$2,500,000	2019-2024
3. Rebuild and Replace Highway Assets	MN7	REPAIR BRIDGES #27033, #27193, #27068	$1,000,000	2019-2024
3. Rebuild and Replace Highway Assets	MN13	MEDIUM MILL AND OVERLAY, TH 13 TO MN 149	$3,000,000	2019-2024

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
3. Rebuild and Replace Highway Assets	US61	MEDIUM MILL AND OVERLAY, WEST OF TH 5 TO PARKWAY DRIVE	$2,250,000	2019-2024
3. Rebuild and Replace Highway Assets	I94	MANNING AVE IN WOODBURY TO ST. CROIX RIVER IN LAKELAND TWP-REPAIR, REPLACE & LINE LARGE PIPES	$4,560,000	2015-2018
		MnDOT Subtotal for Rebuild and Replace	***$1,041,548,165***	
4. Highway Safety Improvements	US169	BETWEEN MN 282 AND MN 21 IN JORDAN - RECONSTRUCT MAINLINE INCLUDING MEDIAN J-BARRIER AND REPLACE MEDIAN DRAINAGE STRUCTURES AND PIPES	$6,430,000	2015-2018
		MnDOT Subtotal for Special Safety Projects	***$6,430,000***	
8. MnPASS	I35E	Construct MnPASS lanes in both directions between Little Canada Road and Ramsey County Road J	$16,000,000	2015-2018
8. MnPASS	I94	Construct MnPASS lanes in both directions between Cedar Ave in Mpls and Marion in St. Paul	$100,000,000	2019-2024
8. MnPASS	I35W	Construct MnPASS lanes in both directions between MN 36/280 and US 10	$100,000,000	2019-2024
		MnDOT Subtotal for MnPASS	***$216,000,000***	

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
9. Strategic Capacity Enhancements	I494	In addition to pavement, bridge, and roadside infrastructure investments, construct one general purpose lane in each direction between Trunk Highway 55 and I-94/694, and operational improvements in other locations between I-394 and I-94/694	$86,000,000	2015-2018
9. Strategic Capacity Enhancements	MN610	Construct two lanes in each direction, including connections to I-94	$131,000,000	2015-2018
9. Strategic Capacity Enhancements	I694	In addition to pavement, bridge, and roadside infrastructure investments, construct one general purpose lanes in each direction between Lexington Avenue and east of Rice Street	$42,000,000	2015-2018
9. Strategic Capacity Enhancements	I94	Construct an eastbound auxiliary lane between MN241 in St. Michael and MN101 in Rogers; extend the third westbound lane from east of MN101 to MN241	$46,000,000	2015-2018
9. Strategic Capacity Enhancements	I94	Construct and eastbound auxiliary lane between East 7th Street and Mounds Boulevard in St. Paul	$3,000,000	2015-2018
9. Strategic Capacity Enhancements	US10	Construct interchange at Armstrong Boulevard, including grade-separation from railroad tracks	$34,400,000	2015-2018

Highway Investment Category	Route	Project Description	Estimated Cost to MnDOT (Year of Expenditure)	Timeframe
9. Strategic Capacity Enhancements	US169	Construct additional southbound lane in Shakopee between Scott County 69/Canterbury Road and Scott CSAH 21	$0 (no capital cost to MnDOT)	2015-2018
		MnDOT Subtotal for Strategic Capacity Enhancements	***$342,400,000***	
10. Regional Highway Access	I94	Remove 5th Street ramp to downtown Minneapolis and replace with access to 7th Street	$6,790,000	2015-2018
10. Regional Highway Access	US212	Improve Shady Oak Road Interchange in Eden Prairie	$7,000,000	2015-2018
		MnDOT Subtotal for Regional Highway Access	***$13,790,000***	
		MnDOT Total for Identified Projects 2015-2024	**$1,620,168,165**	

Long-Range Transit Capital Projects 2015-2024

The Metropolitan Council (including Metro Transit), Counties Transit Improvement Board, and the suburban transit providers worked together to develop the list of transit projects included in the current revenue scenario. The list of projects includes only those projects for which potential funding sources, transit mode, and route alignment are identified in the plan. The plan anticipates funding that exceeds anticipated project costs identified in the Transitway System Investments category. Transitway projects will be added to this list through future plan updates and amendments. For multi-year projects with expenditures outside the 2015-2024 timeframe, this appendix lists the total estimated project cost, including already spent funds.

Bus and Support System capital preservation and Transitway System capital preservation costs are included as broad project categories. Specific project estimates will be developed through Capital Improvement Programs for regional transit providers.

Transit Investment Category	Route	Project Description	Estimated Cost (Year of Expenditure)	Timeframe
Bus and Support System	System-wide	Bus and Support System capital maintenance and preservation estimates including fleet replacement and overhauls, facility capital preservation, and other capital preservation.	$964,000,000	2015-2024
Bus and Support System	System-wide	Bus and Support System modernization and expansion projects to be determined through competitive regional process approximately every two years. Transitway improvements are also eligible through this process.	$214,000,000	2015-2024
Transitway System	System-wide	Transitway System capital maintenance and preservation estimates including fleet replacement and overhauls, facility capital preservation, rail system preservation, and other capital preservation.	$107,000,000	2015-2024
Transitway Improvements	System-wide	Transitway System improvements include expanded existing facilities or interim improvements to future transitways that are incremental and identified on an as-needed basis.	$144,000,000	2015-2024
Transitway System	METRO Orange Line	16-mile highway bus rapid transit improvement (six new stations planned, buses, technology) on I-35W south from Minneapolis to Burnsville.	$150,000,000	2015-2024
Transitway System	METRO Green Line Extension	16-mile light rail extension of the Green Line with plans to include 16 new stations from Minneapolis to Eden Prairie.	$1,653,000,000	2015-2024
Transitway System	METRO Blue Line Extension	13-mile light rail extension of the Blue Line with plans to include 11 new stations from Minneapolis to Brooklyn Park.	$999,000,000	2015-2024
Transitway System	Gateway Dedicated Bus Rapid Transit	12-mile dedicated bus rapid transit line with plans to include 11 new stations from Saint Paul to Woodbury.	$469,000,000	2015-2024

Transit Investment Category	Route	Project Description	Estimated Cost (Year of Expenditure)	Timeframe
Transitway System	METRO Red Line Extension	3-mile extension of the Red Line with plans to include 3 new stations from Apple Valley to Lakeville.	$74,000,000	2015-2024
Transitway System	Snelling Avenue Arterial Bus Rapid Transit	Bus rapid transit improvements in an arterial bus corridor running primarily along Snelling Avenue in Saint Paul from 46th Street Station on METRO Blue Line to Roseville.	$25,000,000	2015-2024
Transitway System	West 7th Street Arterial Bus Rapid Transit	Bus rapid transit improvements in an arterial bus corridor running primarily along West 7th Street in Saint Paul from downtown St. Paul to Bloomington.	$27,000,000	2015-2024
Transitway System	Penn Avenue Arterial Bus Rapid Transit	Bus rapid transit improvements in an arterial bus corridor running primarily along Penn Avenue and Highway 55 in Minneapolis from downtown Minneapolis to Brooklyn Center Transit Center.	$36,000,000	2015-2024
Transitway System	Chicago Emerson-Fremont Arterial Bus Rapid Transit	Bus rapid transit improvements in an arterial bus corridor running primarily along Chicago/Portland Avenues, American Boulevar and Emerson and Fremont Avenues from Mall of America Transit Station in Bloomington to Brooklyn Center Transit Center.	$48,600,000 ($28,600,000 in 2025-2034 timeframe)	2015-2024
		Total for Identified Transit Projects 2015-2024	**$4,910,600,000**	**2015-2024**

Appendix D: Functional Classification Criteria and Characteristics, and MnDOT Access Guidance

Functional classification identifies the role a highway or street plays in the transportation system. Some highways are intended to emphasize mobility for longer distance trips, while other roads are intended to primarily provide access to land. Planners and engineers have developed functional classification categories based on the number and types of trips that roads carry, the surrounding land uses, and the stage of urban or rural development. Functional classification informs roadway design decisions that affect the road's function like roadway speed, width, and intersection spacing and control. Functional classification can also be considered when identifying the multimodal role of a road, including truck, bus transit, bicycle, and pedestrian use and accommodation. Highway and street projects should implement designs including multimodal accommodations that are compatible with a road's functional classification and surrounding land uses.

The main functional classes used in the metropolitan area are used nationwide and described in the Federal Highway Administration's (FHWA) *Highway Functional Classification Concepts, Criteria and Procedures, 2013 Edition*[1]. They consist of urban and rural designations for four main classes of roads: principal arterials (which include all freeways), minor arterials, collector roads, and local roads. The FHWA definitions of urban and rural are different from those used in Thrive MSP 2040. The FHWA definitions are based on population density from the US Census; Thrive MSP 2040 definitions are based on the availability of regional sanitary sewer service. For the purpose of this appendix, the Thrive MSP 2040 definitions are used. Statewide functional classification analysis and reporting must use the FHWA urban and rural definitions.

In addition to the FHWA classifications, the region has identified the most important minor arterials in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties. These A-minor arterials supplement the principal arterial system and support access to regional job concentrations and freight terminals. Within these seven counties, principal and A-minor arterials are eligible to compete for federal funds through the Transportation Advisory Board's Regional Solicitation.

This appendix to the Transportation Policy Plan identifies criteria and characteristics for use in assigning roadway functional classification. Criteria are the primary tool for identifying roadway function. Characteristics are intended to be supplementary information. When a decision about the functional classification of a road is not clear based on the criteria provided, characteristics may be used as supplementary decision factors. Functional classification system criteria are

[1] http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/

presented in Tables D-1, D-3, D-4 and D-6. Functional classification system characteristics are shown in Tables D-2, D-5, and D-7.

This appendix also includes a summary of Minnesota Department of Transportation (MnDOT) intersection spacing and control guidelines for federal, state and interstate highways in the metropolitan area. The MnDOT access management guidelines were developed for the entire state; MnDOT's functional classification category for the metropolitan area is summarized in Table D-8 and at http://www.dot.state.mn.us/accessmanagement/index.html.

Principal Arterials

The emphasis of principal arterials is on moving large volumes of traffic over long distances rather than providing direct access to land. They connect the region with other areas in the state, the nation, and the world. Principal arterials also connect regional concentrations and freight terminals within the metropolitan area. Principal arterials should support the longest trips in the region, including intercity bus, express bus, and highway bus rapid transit services.

Principal arterials consist primarily of interstate freeways and other freeways or expressways. Most are owned and operated by MnDOT, but some are under the jurisdiction of Anoka, Dakota, Ramsey, and Scott counties or the City of Saint Paul. The Metropolitan Highway System, as defined in the Transportation Policy Plan, is composed of all principal arterials in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties.

Principal arterial spacing and access spacing vary based on the density of surrounding development. Table D-1 shows principal arterial spacing varies from two to three miles in the most densely developed parts of the region to six to 12 miles in rural areas. Where an urban or suburban level of development is planned, spacing of principal arterials or future principal arterials may be two to three miles. Table D-1 also shows access spacing to principal arterials; non-interstate freeways provide land access somewhat more frequently than interstate freeways. At present, principal arterials connect with other principal and minor arterials, and select collectors and local streets. In the future, new connections to principal arterials should be limited to other principal and A-minor arterials, or to select minor arterials in Wright and Sherburne counties where A-minors are not identified.

Principal arterials are not intended to serve pedestrian and bicycle travel directly and they often act as barriers to bicycle and pedestrian travel in the centers and neighborhoods through which they pass. Adequate pedestrian and bicycle crossings separate from general traffic lanes are an important consideration along principal arterials.

Minor Arterials

The minor arterial system supplements the principal arterial system and provides connections to the principal arterial system. Minor arterials also support access to major traffic generators, including regional job concentrations and freight terminals, and between rural centers within

and just outside the region. Minor arterials should serve medium-to-short trips, including arterial bus rapid transit, limited-stop bus, and local bus service.

In the urban service area the emphasis of minor arterials is on supplementing principal arterial mobility as opposed to providing direct access to land, and only concentrations of commercial, industrial, or residential land uses should have direct access to them. Minor arterials should connect to principal arterials, other minor arterials and collectors. Connections to some local streets are acceptable.

The spacing of minor arterials and access along them vary based on the density of surrounding development. Table D-3 shows minor arterial spacing varies from one-fourth mile to three-fourths mile in the most densely developed parts of the region, to every one to two miles in the emerging suburban areas. Where an urban or suburban level of development is planned, minor arterials should be spaced every one-half mile to two miles. The criteria and characteristics in Table D-3 and Table D-5 apply to all minor arterials. The A-minor arterials are grouped into four categories – Augmentors, Relievers, Expanders, and Connectors – and are described in Table C-4.

Minor arterials are designed to carry higher volumes of general traffic than other local roads and these design characteristics often create a barrier for bicycle and pedestrian travel. Priority should be placed on addressing these barriers in areas with pedestrian traffic, such as within regional job concentrations, within local centers, and along major transit routes.

Collector Roads

Mobility and land access are equally important on the collector road system. The collector system provides connections between neighborhoods and from neighborhoods to regional job concentrations and local centers. It also provides supplementary connections between major traffic generators within regional job concentrations. Direct land access should primarily be to development concentrations. Connectors typically serve short trips of one to four miles. Collectors connect primarily to minor arterials, other collectors, and local streets.

Major and minor collectors should be identified in the urban and rural areas. Major collectors serve higher density job and activity centers and freight terminals that are not on the arterial system, and they serve longer local trips, including local bus service. Minor collectors serve shorter local trips and lower density land uses. Spacing in regional job concentrations and local centers may vary from one-eighth to one-half mile. In urban center and urban communities, collectors are needed one-fourth to three-fourths mile apart. In communities with suburban designations, spacing may range from one-half to one mile and may service existing development, but one-fourth to three-fourth mile spacing may be required in the future. Major collectors should be spaced farther apart than minor collectors.

Collector roads can be good candidates for bicycle routes because they serve shorter trips that bicyclists make and generally have more compatible traffic speeds and volumes as compared to

arterials. Collectors in the urban service area should include pedestrian accommodations and may be candidates for traffic calming, especially where pedestrian traffic is greatest, such as within regional job concentrations and local centers and along transit routes. For more information on bicycle and pedestrian accommodations, refer to the Strategies and Bicycle and Pedestrian Investment Direction discussions. *[Insert links.]*

Local Roads

Local roads connect blocks and land parcels, and the primary emphasis is on land access. In most cases, local roads connect to other local roads and collectors. In some cases, they connect to minor arterials. Local roads serve short trips at low speeds. In the urban center, local roads could be are spaced as close as 300 feet, while in the rural area, one-mile spacing may be adequate.

Local roads serve local travel for pedestrians and bicyclists. Transit is occasionally a consideration for local roads, depending on the surrounding land uses.

Table D-1: Functional Classification System Criteria for Principal Arterials

	Interstate and Freeway Principal Arterial		Other Principal Arterial	
Criterion	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
Place Connections	Connect regional job concentrations and freight terminals within the urban service area.	Connect the urban service area with urban areas and major cities in Minnesota and other states.	Connect regional job concentrations and freight terminals within the urban service area.	Connect the urban service area with major cities in Minnesota and other states.
Spacing	Within urban community designations: 2-3 miles Within suburban community designations: Spacing should vary in relation to development density of land uses served, 2-6 miles	6-12 miles Closer spacing may be required to connect portions of the urban service area to each other or to Rural Centers.	Urban community designations: 2-3 miles. Suburban community designations: Spacing should vary in relation to development density of land uses served, 2-6 miles	6-12 miles Closer spacing may be required to connect portions of Rural community designations to each other or to Rural Centers.
Operations	Designed for speeds of 45 miles per hour or more			
System Connections and Access Spacing*	To other Interstate freeways, other principal arterials and selected A-minor arterials. Connections between principal arterials should be of a design type that does not require vehicles to stop. Access at distances of 1-2 miles.	To other Interstate freeways, principal arterials, and selected A-minor arterials. Access at distances of 2-6 miles.	To Interstate freeways, other principal arterials, and selected A-minor arterials. Connections between principal arterials should be of a design type that does not require vehicles to stop. Intersections should be limited to 1-2 miles.	To Interstate freeways, other principal arterials, and selected A-minor arterials. Intersections should be limited to 2 miles or more.
Trip-Making Service	Trips greater than 8 miles with at least 5 continuous miles on principal arterials. Express and highway bus rapid transit trips		Trips greater than 8 miles with at least 5 continuous miles on principal arterials. Express and highway bus rapid transit trips	
Mobility vs. Land Access*	Emphasis is on mobility for longer trips rather than direct land access. No direct land access should be allowed.	Emphasis is on mobility rather than land access. No direct land access should be allowed.	Emphasis is on mobility for longer trips rather than direct land access. Little or no direct land access within the urbanized area.	Emphasis is on mobility rather than land access. Little or no direct land access.

***The key objective is stated under "Operations" heading in this table.**

Table D-2: Functional Classification System Characteristics for Principal Arterials				
	Interstate and Freeway Principal Arterial		Other Principal Arterial	
Characteristic	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
System Mileage	FHWA suggests statewide mileage for Interstate and other freeway principal arterials at 1 – 5% of system	FHWA suggests statewide mileage for Interstate and other freeway principal arterials at 1-5% of system	FHWA suggests statewide mileage for other principal arterials at 4-9% of system	FHWA suggests statewide mileage for other principal arterials at 2-6% of system
Percent of Vehicle Miles Traveled	FHWA suggests 17-43% of statewide VMT	FHWA suggests 18-45% of statewide VMT	FHWA suggests 16-33% of statewide VMT	FHWA suggests 15-31% of statewide VMT
Intersections	Grade separated	Grade separated	Grade separated desirable where appropriate. At a minimum, high-capacity controlled at-grade intersections	High-capacity controlled at-grade intersections
Parking	None	None	None	None
Large Trucks	No restrictions	No restrictions	No restrictions	No restrictions
Management Tools	Ramp metering, preferential treatment for transit, interchange spacing	Interchange spacing	Ramp metering, preferential treatment for transit, access control, median barriers, traffic signal progression, staging of reconstruction, intersection spacing	Access control, intersection spacing
Typical Average Daily Traffic Volumes	25,000-200,000+	5,000-50,000+	15,000-100,000+	2,500 - 25,000+
Posted Speed Limit	45-70 mph	55-70 mph	40-65 mph	Legal limit
Right-of-Way	300 feet	300 feet	100 - 300 feet	100 - 300 Feet
Transit Accommodations	Transit advantages that provide priority access and reliable movement for transit in peak periods where needed	None	Transit advantages that provide priority access and reliable movement for transit in peak periods where possible and needed	None

Table D-2: Functional Classification System Characteristics for Principal Arterials				
	Interstate and Freeway Principal Arterial		Other Principal Arterial	
Characteristic	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
Bicycle and Pedestrian Accommodations	On facilities that cross or are parallel to the principal arterial, with greater emphasis along transit routes and in activity centers. Crossings should be spaced to allow for adequate crossing opportunities	On facilities that cross or are parallel to the principal arterial	On facilities that cross or are parallel to the principal arterial, with greater emphasis along transit routes and in activity centers. Crossings should be spaced to allow for adequate crossing opportunities	On facilities that cross or are parallel to the principal arterial

This table summarizes characteristics for existing roadways to be used in evaluating functional classification and should not be used as design guidelines.

Table D-3: Functional Classification System Criteria for Minor Arterials		
	Minor Arterial (A-minor or other)	
Criterion	**Urban Service Area**	**Rural**
Place Connections	Provide supplementary connections between regional job concentrations, local centers, and freight terminals within the urban service area	Connect the urban service area with cities and towns in Minnesota outside the Twin Cites region. Connect rural growth centers inside the Twin Cities region and comparable places near the Twin Cities region
Spacing	Regional job concentrations: 1/4-3/4 mile Urban community designations: 1/2-1 mile Suburban community designations: 1-2 miles	Rural Areas: As needed, in conjunction with the major collectors, provide adequate interconnection of places identified in "Place Connections" criterion
System Connections	To most Interstate freeways and other principal arterials, other minor arterials, collectors, and some local streets	To most Interstate freeways and other principal arterials, other minor arterials, collectors, and some local streets
Trip-Making Service	Medium-to-short trips (2-6 miles depending on development density) at moderate speeds. Longer trips accessing the principal arterial network. Local, limited-stop, and arterial bus rapid transit trips	
Operations	Designed for speeds less than 45 miles per hour	Designed for speeds ranging from 45 to 55 miles per hour
Mobility vs. Land Access*	Emphasis on mobility for longer trips rather than on direct land access. Direct land access limited to concentrations of activity including regional job concentrations, local centers, freight terminals, and neighborhoods.	Emphasis on mobility for longer trips rather than on direct land access

Table D-3: Functional Classification System Criteria for Minor Arterials		
	Minor Arterial (A-minor or other)	
Criterion	**Urban Service Area**	**Rural**
***The key objective is stated under "Operations" heading in this table.**		

Table D-4: Additional Criteria for A-Minor Arterials				
Criterion in addition to Table D-3	**Relievers**	**Augmentors**	**Expanders**	**Connectors**
Purpose	Provide supplementary capacity for congested, parallel principal arterial	Supplement the principal arterial system in more densely developed or redeveloping areas	Supplement the principal arterial system in less densely developed or redeveloping areas	Provide safe, direct connections between rural centers and to principal arterials in rural areas without adding continuous general purpose lane capacity
Location in Thrive MSP 2040 Community designations	Urban service area: Consists of urban center, urban, suburban, suburban edge, and emerging suburban edge community designations as defined in Thrive MSP 2040	Urban center and urban community designations	Urban, suburban, suburban edge, and emerging suburban edge community designations	Rural community designations. One end may be outside the seven county area or may be in the urban service area
Existing System	400 miles	200 miles	650 miles	680 miles

See the Metropolitan Council Web site for a current map of the A-minor arterial system.

Table D-5: Functional Classification System Characteristics for Minor Arterials		
	Minor Arterial (A-or other)	
Characteristic	**Urban Service Area**	**Rural**
System Mileage	FHWA suggests statewide mileage for minor arterials in urbanized areas at 7-14% of system	FHWA suggests statewide mileage for minor arterials in rural areas at 2-6% of system
Percent of Vehicle Miles Traveled	FHWA suggests 14-27% of statewide VMT	FHWA suggests 7-14% of statewide VMT
Intersections	Traffic signals, roundabouts, and cross-street stops	Roundabouts and cross-street stops
Parking	Restricted as necessary	Restricted as necessary

Table D-5: Functional Classification System Characteristics for Minor Arterials		
	Minor Arterial (A-or other)	
Characteristic	**Urban Service Area**	**Rural**
Large Trucks	Candidates for local truck network, large trucks restricted as necessary	Candidates for local truck network, large trucks restricted as necessary
Management Tools	Traffic signal progression and spacing, land access management/control, preferential treatment for transit	Land access management/control
Typical Average Daily Traffic Volumes	5,000-30,000+	1,000-10,000+
Posted Speed Limit	30-45 mph	Legal limit
Right-of-Way	60-150 feet	60-150 feet
Transit Accommodations	Transit advantages for reliable movement where needed	None
Bicycle and Pedestrian Accommodations	On facilities that cross or are parallel to the minor arterial, with greater emphasis along transit routes and in activity centers. Crossings should be spaced to allow for adequate crossing opportunities	On facilities that cross the minor arterial

This table summarizes characteristics for existing roadways to be used in evaluating functional classification and should not be used as design guidelines.

Table D-6: Functional Classification System Criteria for Collectors and Local Streets				
	Collector		Local	
Criterion	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
Place Connections	Connect neighborhoods and centers within the urban service area. Major collectors provide supplementary connections of major traffic generators within job and activity centers.	Provide supplementary connection between rural centers inside the Twin Cities region and comparable places near the Twin Cities region.	Connect blocks and land parcels within neighborhoods and within commercial or industrial developments.	
Spacing	Job concentrations: 1/8 - 1/2 mile Urban community designations: 1/4 - 3/4 mile Suburban community designations: 1/2 - 1 mile	Rural Areas: As needed in conjunction with minor arterials, to provide adequate connections for places identified in "Place Connections" criterion. In addition, minor collectors should	As needed to access land uses.	As needed to access land uses.

Table D-6: Functional Classification System Criteria for Collectors and Local Streets				
	Collector		Local	
Criterion	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
	Minor collectors should be spaced more closely than major collectors.	be designated at an average spacing of not less than 4 miles.		
System Connections	To minor arterials, other collectors, and local streets. Major collectors may connect to principal arterials under exceptional circumstances	To minor arterials, other collectors, and local streets.	To a few minor arterials. To collectors and other local streets.	To a few minor arterials. To collectors and local roads.
Trip-Making Service	Short trips (1-4 miles depending on development density) at low-to-moderate speeds. Major collectors may support longer trips accessing the arterial network including local bus transit and bicycle trips.		Short trips (under 2 miles) at low speeds, including bicycle and pedestrian trips. Longer trips accessing the collector or collector and arterial network.	
Mobility vs. Land Access	Equal emphasis on mobility and land access. Direct land access predominantly to development concentrations.		Emphasis on land access, not on mobility. Direct land access predominantly to residential land uses.	Emphasis on land access, not on mobility. Direct land access predominantly to agricultural land uses.

Table D-7: Functional Classification System Characteristics for Collectors and Local Streets				
	Collector		Local	
Characteristic	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
System Mileage	Suggested federal statewide range for major and minor collectors: 3-16%	Suggested federal statewide range: 8-19% for major collectors, 3-15% for minor collectors	Suggested federal statewide range: 62-74%	Suggested federal statewide range: 62-74%
Percent of Vehicle Miles Traveled	Suggested federal statewide range for major and minor	Suggested federal statewide range: 10-23% for major	Suggested federal statewide range: 9-25%	Suggested federal statewide range: 8-23%

Table D-7: Functional Classification System Characteristics for Collectors and Local Streets				
	Collector		Local	
Characteristic	**Urban Service Area**	**Rural**	**Urban Service Area**	**Rural**
	collectors: 2-13%	collectors, 1-8% for minor collectors		
Intersections	Four-way stops and some traffic signals	Local street traffic should be required to stop	As required	As required
Parking	Restricted as necessary	Unrestricted	Permitted as necessary	Permitted as necessary
Large Trucks	May be candidates for local truck network, large trucks restricted as necessary	May be candidates for local truck network, large trucks restricted as necessary	Permitted as necessary	Permitted as necessary
Management Tools	Number of lanes, traffic signal timing, land access management	Land access management	Intersection control, cul-de-sacs, diverters	
Typical Average Daily Traffic Volumes	1,000-15,000	250-2,500+	Less than 1,000	Less than 1,000
Posted Speed Limit	30-40 mph	35-45 mph	Maximum 30 mph	Maximum 30 mph
Right-of-Way	60-100 feet	60-100 feet	50-80 feet	50-80 feet
Transit Accommodations	Cross-sections and geometrics designed for use by regular-route buses, transit advantages for reliable movement, where needed	None	Normally used as bus routes only in nonresidential areas	None
Bicycle and Pedestrian Accommodations	On, along, or crossing the collector with higher emphasis along transit routes and in activity centers. Crossings should be spaced to allow for adequate crossing opportunities	On, along, or crossing the collector	On, along, or crossing the local road	On, along, or crossing the local road

This table summarizes characteristics for existing roadways to be used in evaluating functional classification and should not be used as design guidelines.

Table D-8: Summary of MnDOT Public Street Spacing Access Guidelines for Interstate, U.S., and State Highways in the Twin Cities Metropolitan Area *

		Public Street Spacing		
Functional Classification	**Facility Type or Community Designation****	**Primary Full-Movement Intersection**	**Secondary Intersection**	**Signal Spacing**
Principal Arterial	Interstate Freeway	Interchange Access Only		None
	Non-Interstate Freeway	Interchange Access Only		None
	Rural	1 mile	1/2 mile	Only at Primary Intersections
	Suburban	1/2 mile	1/4 mile	Only at Primary Intersections
	Urban	300-600 feet, dependent on block length		1/4 mile
Minor Arterial	Rural	1/2 mile	1/4 mile	Only at Primary Intersections
	Suburban	1/4 mile	1/8 mile	Only at Primary Intersections
	Urban	300-600 feet, dependent on block length		
Collector	Rural	1/2 mile	1/4 mile	Only at Primary Intersections
	Suburban	1/8 mile	Not Applicable	1/4 mile
	Urban	300-600 feet, dependent on block length		1/8 mile

*** This table is a summary of MnDOT Access Guidance for the Metropolitan Area. This chart does not reflect all the MnDOT guidance. Agencies should work with MnDOT, the appropriate county highway authority, and the local land use authority when planning new or modified access.**

****Community Designations are from Thrive MSP 2040, they are not MnDOT designations.**

Appendix E: Additional Air Quality Information

This appendix contains additional background information supporting the Metropolitan Council's determination in Part 3, Section D that the 2040 Transportation Policy Plan conforms to the requirements of the Clean Air Act.

Attainment History

The U.S. Environmental Protection Agency's (EPA) 40 CFR Parts 51 and 93, referred to together with all applicable amendments as the "Conformity Rule," requires the Metropolitan Council to prepare a conformity analysis of the region's Transportation Policy Plan. Based on an air quality analysis, the Council must determine whether the Transportation Policy Plan conforms to the requirements of the 1990 Clean Air Act Amendments with regard to National Ambient Air Quality Standards (NAAQS) for mobile source criteria pollutants. Under consultation procedures developed by the Minnesota Interagency and Transportation Planning Committee, the MPCA reviews the Council's conformity analysis before the Plan is approved for public review; a letter describing the MPCA's review is on page 6 of this appendix.

Specifically, the Minneapolis/Saint Paul Metropolitan Area is within an EPA-designated carbon monoxide limited maintenance area. A map of this area, which for air quality analysis purposes includes the seven-county Metropolitan Council jurisdiction plus Wright County and the City of New Prague, is shown below. The term "maintenance" reflects the fact that regional carbon monoxide emissions were unacceptably high in the 1970s when the NAAQS were introduced, but were subsequently brought under control through a metro-area Vehicle Inspection and Maintenance Program completed in the 1990s. The EPA then re-designated the area as in attainment of the NAAQS for carbon monoxide in 1999 and approved a "maintenance plan" containing a technical rationale and actions designed to keep emissions below a set region-wide budget. The maintenance plan was updated in 2005, when changes to the emissions rates approved by EPA necessitated an update of the approved carbon monoxide budget as well. A second 10-year maintenance plan was approved by EPA on Nov. 8, 2010, as a "limited maintenance plan." Every Transportation Policy Plan or Transportation Improvement Program approved by the Council must be analyzed using specific criteria and procedures defined in the Conformity Rule.

Federal Requirements

The *2040 Transportation Policy Plan* meets the following Conformity Rule requirements:

Inter-agency consultation: The Minnesota Pollution Control Agency (MPCA), Minnesota Department of Transportation (MnDOT), Environmental Protection Agency (EPA), and Federal Highway Administration (FHWA) were consulted during the preparation of the Plan and its conformity review and documentation. The "Transportation Conformity Procedures for

Minnesota" handbook provides guidelines for agreed-upon roles and responsibilities and inter-agency consultation procedures in the conformity process.

Regionally significant and exempt projects: The analysis includes all known federal and nonfederal regionally significant projects. Exempt projects not included in the regional air quality analysis were identified by the inter-agency consultation group and classified.

Donut areas: No regionally significant projects are planned or programmed for the City of New Prague. Regionally significant projects were identified for Wright County to be built within the analyses period of the Plan and incorporated into the conformity analysis.

Latest planning assumptions: The published source of socioeconomic data for this region is the Metropolitan Council's *Thrive MSP 2040*. The latest update to these forecasts was published in May 2014.

Public Participation: The Transportation Policy Plan was prepared in accordance with the Public Participation Plan for Transportation Planning, adopted by the Council on Feb. 14, 2007. This process satisfies federal requirements for public involvement and public consultation.

Fiscal Constraint: The Transportation Policy Plan addresses the fiscal constraint requirements of the Conformity Rule. Chapter II-D of the policy plan documents the consistency of proposed transportation investments with already available and projected sources of revenue.

The Council certifies that the plan does not conflict with the implementation of the State Implementation Plan, and conforms to the requirement to implement the Transportation System Management Strategies, which are the adopted Transportation Control Measures (TCMs) for the region. All of the adopted TCMs have been implemented.

The Transportation Policy Plan includes the 2015-2018 Transportation Improvement Program projects. Moreover, any Transportation Improvement Program projects that are not specifically listed in the plan are consistent with the policies and purposes of the plan and will not interfere with other projects specifically included in the plan.

There are no projects which have received NEPA approval and have not progressed within three years.

Although a small portion of the Twin Cities Metropolitan Area is a maintenance area for PM-10, the designation is due to non-transportation sources, and therefore is not analyzed herein.

List of Regionally Significant Projects

Pursuant to the Conformity Rule, the projects listed in the Transportation Policy Plan (see Appendix C) were reviewed and categorized using the following determinations to identify projects that are exempt from a regional air quality analysis, as well as regionally significant projects to be included in the analysis. The classification process used to identify exempt and

regionally significant projects was developed through an interagency consultation process involving the MPCA, EPA, FHWA, the Council and MnDOT. Regionally significant projects were selected according to the definition in Section 93.101 of the Conformity Rules:

"Regionally significant project means a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sports complexes, etc., or transportation terminals as well as most terminals themselves) and would normally be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel."

Junction improvements and upgraded segments less than one mile in length are not normally coded into the Regional Travel Demand Forecast Model, and therefore are not considered to be regionally significant, although they are otherwise not exempt. The exempt air quality classification codes used in the "AQ" column of project tables of the Transportation Improvement Program are listed in Exhibit F-4. Projects which are classified as exempt must meet the following requirements:

- The project does not interfere with the implementation of transportation control measures.
- The project is exempt if it falls within one of the categories listed in Section 93.126 in the Conformity Rule. Projects identified as exempt by their nature do not affect the outcome of the regional emissions analyses and add no substance to the analyses. These projects are determined to be within the four major categories described in the conformity rule.

The inter-agency consultation group, including representatives from MnDOT, FHWA, MPCA, EPA, and the Council, reviewed list of projects to be completed by 2040 including the following:

- Existing regionally significant highway or transit facilities, services, and activities;
- Regionally significant projects (regardless of funding sources) which are currently:
  - under construction or undergoing right-of-way acquisition, or;
  - come from the first year of a previously conforming Transportation Improvement Program, or;
  - have completed the NEPA process, or;
  - listed in the 2015-2018 Transportation Improvement Program, or;
  - listed in the Transportation Policy Plan (Appendix C), or;
  - identified for Wright County.

Each project was assigned to a horizon year (open by January of 2020, 2030 or 2040) and categorized in terms of potential regional significance and air quality analysis exemption as per Sections 93.126 and 93.127 of the Conformity Rule, using the codes listed in this appendix. The resulting list of regionally significant projects for 2015 and 2020 is shown below.

Horizon Year 2020

Rebuild and Replace Highway Assets

- I-35W: from MN36/MN280 in Roseville to just N I694 in Arden Hills/new Brighton-Auxiliary lanes
- I-35W MnPASS Southbound from downtown Minneapolis to 46th St.
- TH 100: from 36th St to Cedar Lake Rd in St. Louis Park - reconstruct interchanges including constructing auxiliary lanes
- I-35E from 80th St E to I35/I35E/I35W junction and on I-35W from North of Main St to I35/I35E/I35W junction and on I-35 from I35/I35E/I35W junction to North of US 8 – bituminous mill and unbounded concrete overlay

Strategic Capacity Enhancements

- I-94: EB from 7th St Exit to Mounds Blvd in St Paul- add auxiliary lane
- TH 55: from N Jct MN149 to S Jct MN149 in Eagan- widen from 4-lane to 6-lane
- I-494 SB from I-94/I-694 to Bass Lake Road: add auxiliary lane
- I-494 from CSAH 6 to I-94/I-694: Construct one additional lane in each direction
- I-494 from TH 55 to CSAH 6, construct one auxiliary lane
- I-494 NB from I-394 to Carlson Pkwy, construct auxiliary lane
- I-694 from Lexington Ave to east of Rice St: Construct one additional lane in each direction
- I-94 from TH 241 in St. Michael to TH 101 in Rogers: Extend westbound ramp, add westbound lane through TH 101 interchange, and add eastbound lane between the interchanges
- TH 610 from I-94 to Hennepin County 81: Complete 4-lane freeway

Regional Highway Access | Horizon Year 2020

- US 10 at Armstrong Blvd in Ramsey: New interchange and rail grade separation
- US 52 at Dakota CSAH 86 in Randolph Township – grade separated crossing
- I-94 at 5th/7th Street in Minneapolis- reconstruct interchange to close 5th street ramp and replace it with one at 7th street.

Transitway System

- METRO Orange Line
- METRO Green Line extension
- Arterial BRT along Snelling Ave in Saint Paul from 46th St. Station on METRO Blue Line to Roseville
- Arterial BRT along West 7th Street from downtown Saint Paul to Bloomington

Regional Solicitation Selected Projects

- St. Paul Pierce Butler Rte: from Grotto St to Arundel St at Minnehaha Ave-extension on a new alignment as a 4-lane roadway

- 105th Ave: extension to 101st Ave W of I-94 in Maple Grove
- Lake Street and I-35W – Minneapolis purchases ROW, begin engineering and construction
- TH 149: from TH 55 to just N of I-494 in Eagan-reconstruct from 4-lane to 5-lane
- Anoka CSAH 11: from N of Egret Blvd to N of Northdale Blvd - reconstruction of CSAH 11 (Foley Blvd) as a 4-lane divided roadway
- Hennepin CSAH 34: from W 94th St to 8500 Block in Bloomington - reconstruction of CSAH 34 (Normandale Blvd) as a 4-lane divided roadway
- Hennepin CSAH 53: from just W of Washburn Ave to 16th Ave in Richfield-reconstruct to a 3-lane section center turn lane, raised concrete median, signal replacement, sidewalks, on-road bikeways
- Hennepin CSAH 81: from N of 63rd Ave N to N of CSAH 8 in Brooklyn Park - reconstruct to a multi-lane divided roadway
- Hennepin CSAH 35: from 67th St to 77th St in Richfield-reconstruct including transit, bicycle, and pedestrian facilities
- Scott CSAH 17: from S of CSAH 78 to N of CSAH 42 - reconstruct as a 4-lane divided roadway
- Anoka CSAH 116 from east of Crane St through Jefferson St – reconstruct to 4-lane divided roadway

Projects Outside of Metropolitan Planning Area, Inside Maintenance Area

- I-94: from MN 25 to CSAH 18 – reconstruction including addition of auxiliary lanes

Horizon Year 2030

MnPASS Investments | Horizon Year 2030

- I-35W from MN 36 to US 10 – construct MnPASS Lane
- I-94 from Cedar Avenue to Marion Street – construct MnPASS Lane

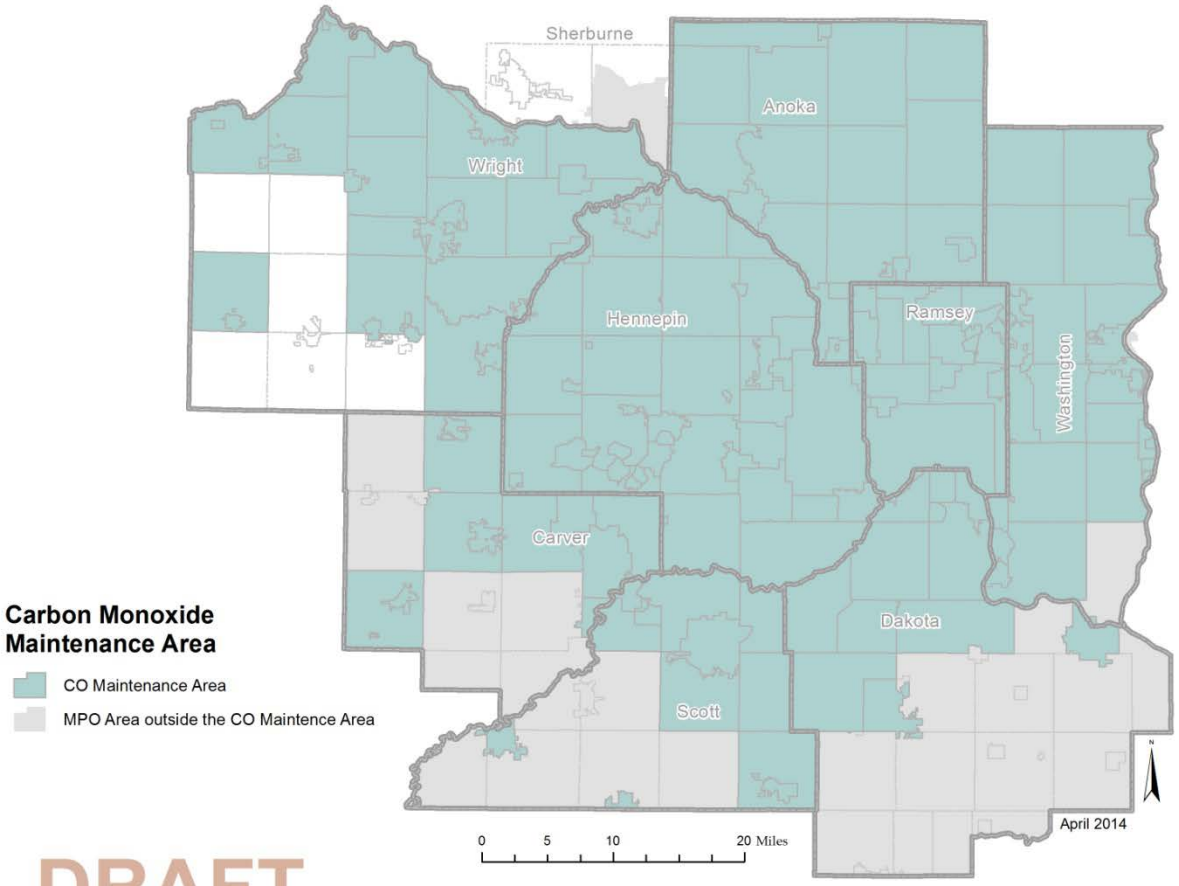
Transitway System | Horizon Year 2030

- METRO Blue Line extension
- Gateway dedicated BRT
- Arterial BRT along Penn Ave in Brooklyn Center and Minneapolis
- Arterial BRT along Chicago Avenue and Emerson and Fremont avenues in Brooklyn Center, Minneapolis, Richfield, and Bloomington
- METRO Red Line Stage 2 improvements including extension of BRT service to 181st Street in Lakeville.

Horizon Year 2040

- No projects identified

Figure E-1: Carbon Monoxide Maintenance Area



DRAFT

Letter from MPCA

Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300
800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

July 25, 2014

Ms. Arlene McCarthy
Director
Metropolitan Transportation Services
Metropolitan Council
390 North Robert Street
St. Paul, MN 55101

RE: Air Quality Conformity Analysis for the 2040 Transportation Policy Plan

Dear Ms. McCarthy:

The Minnesota Pollution Control Agency (MPCA) has completed its review of the 2040 Transportation Policy Plan (Plan) submitted by the Metropolitan Council (Council). The Minnesota Interagency Air Quality Conformity Consultation Committee, with representatives from the MPCA, Council, Minnesota Department of Transportation (MnDOT), Federal Highway Administration (FHWA), and the U.S. Environmental Protection Agency (EPA), was consulted during the preparation of the Plan. Several ongoing communications also occurred along with periodic meetings, draft reports, e-mails, and phone calls.

On November 8, 2010, the EPA approved a Limited Maintenance Plan for the Twin Cities maintenance area. Under a Limited Maintenance Plan, the EPA has determined that there is no requirement to project emissions over the maintenance period and that "an emissions budget may be treated as essentially not constraining for the length of the maintenance period". The EPA made this determination because it is unreasonable to expect that the Twin Cities maintenance area would experience so much growth in that period that a violation of the carbon monoxide National Ambient Air Quality Standards would result. No regional modeling analysis is required; however, federally-funded projects are still subject to "hot spot" analysis requirements.

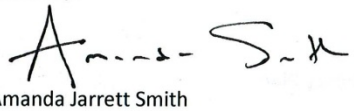
I have examined the document for conformity with a checklist of requirements from the joint Federal Transportation Conformity Rule of the EPA and the U.S. Department of Transportation. Based on this information, the MPCA has determined that the projects included in the 2040 Plan meet all relevant regional emissions analysis and budget tests as required by the Conformity Rule.

Therefore, the 2040 Plan fully meets and conforms to the relevant sections of the Federal Transportation Conformity Rule and to the applicable sections of the Minnesota State Implementation Plan for Air Quality.

The MPCA appreciates the opportunity given to review this document as part of the EPA's Transportation Conformity Rule consultation process, and for the great work done by the Council's staff in completing this analysis in a timely fashion. The MPCA also appreciates the cooperation of the interagency consultation group with their immediate assistance in resolving all policy and technical issues with respect to the Plan's Air Quality Conformity determination.

If you have any questions, please contact me at 651-757-2486 or by e-mail at amanda.smith@state.mn.us.

Sincerely,



Amanda Jarrett Smith
Air Policy Planner
Environmental Analysis and Outcomes Division

AJS:je

cc: Jonathan Ehrlich, Metropolitan Council
Elaine Koutsoukos, Metropolitan Council
Patricia Bursaw, MnDOT and TAC Chair
Karl Keel, City of Bloomington, F&P Chair
Brian Isaacson, MnDOT
Susan Moe, FHWA
Michael Leslie, EPA
J. David Thornton, MPCA
Shannon Lotthammer, MPCA
Frank Kohlasch, MPCA
Mary Jean Fenske, MPCA
Innocent Eyoh, MPCA

Status of Transportation Control Measures

Pursuant to the Conformity Rule, the Council reviewed the Transportation Improvement Program and certifies that the Transportation Improvement Program conforms to the State Implementation Plan and does not conflict with its implementation. All transportation system management strategies that were the adopted transportation control measures for the region have been implemented or are ongoing and funded. There are no transportation management strategy projects remaining to be completed. There are neither fully adopted new regulatory transportation control measures nor fully funded non-regulatory measures that will be implemented during the programming period of the Transportation Improvement Program. There are no prior control measures that were adopted since Nov. 15, 1990, nor any prior measures that have been amended since that date.

A list of officially adopted transportation control measures for the region may be found in the Nov. 27, 1979, Federal Register notice for EPA approval of the Minneapolis-St. Paul Carbon Monoxide Maintenance Plan, based on the 1980 Air Quality Control Plan for Transportation, which in turn cites transit strategies in the 1978-1983 Transportation Systems Management Plan. It is anticipated that the Transportation Air Quality Control Plan will be revised in the near future. The following lists the summary and status of the currently adopted transportation control measures:

Vehicle Inspection and Maintenance Program (listed in the Transportation Control Plan as a potential strategy for hydrocarbon control with carbon monoxide benefits). This program became operational in July 1991 and was terminated in December 1999.

I-35W Bus/Metered Freeway Project. Metered freeway access locations have bus and carpool bypass lanes at strategic intersections on I-35W. A revised metering program became operational in March 2002. The 2030 Transportation Policy Plan calls for the implementation of Bus Rapid Transit in the I-35W corridor. As part of the Urban Partnership Agreement (UPA) additional transit lanes have been added to Marquette and 2nd Ave in Minneapolis, and transit capacity in the I-35W corridor has been enhanced through dynamic priced shoulder lanes.

Traffic Management Improvements (multiple; includes State Implementation Plan amendments):

Minneapolis Computerized Traffic Management System. The Minneapolis system is installed. New hardware and software installation were completed in 1992. The system has been significantly extended since 1995 using CMAQ funding. Traffic signal improvements were made to the downtown street system to provide daily enhanced preferred treatment for bus and LRT transit vehicles in 2009.

St. Paul Computerized Traffic Management System. St. Paul system completed in 1991.

University and Snelling Avenues, St. Paul. Improvements were completed in 1990 and became fully operational in 1991.

Fringe Parking Programs. Minneapolis and St. Paul are implementing ongoing programs for fringe parking and incentives to encourage carpooling through their respective downtown traffic management organizations.

Stricter Enforcement of Traffic Ordinances. Ongoing enforcement of parking idling and other traffic ordinances is being aggressively pursued by Minneapolis and St. Paul.

Public Transit Strategies (from the 1983 Transportation Systems Management Plan):

Reduced Transit Fares. Current transit fares include discounts for off-peak and intra-CBD travel. Reduced fares are also offered to seniors, youth, Medicare card holders, and persons with disabilities.

Transit Downtown Fare Zone. All transit passengers can ride either the Minneapolis or Saint Paul fare zones for 50 cents. Since March 2010 passengers can ride Nicollet Mall buses for free within the downtown zone.

Community-Centered Transit. The Council is authorized by legislation to enter into and administer financial assistance agreements with local transit providers in the metropolitan region, including community-based dial-a-ride systems. A regional restructuring of dial-a-ride service, now called Transit Link, occurred in 2010.

Flexible Transit. Several routes in the region are operated offering flexible, on-demand stops. Also, Metro Mobility, as well as the dial-a-ride services mentioned above, operates with flexible routes catered to riders' special needs.

Total Commuter Service. The non-CBD employee commuter vanpool matching services provided by this demonstration project, mentioned in the 1983 Transportation Systems Management Plan as well as the Transportation Control Plan, are now administered by the Van-Go! program, a service of the Metropolitan Council.

Elderly and Handicapped Service. ADA Paratransit Service is available for people who are unable to use regular route transit service (or have extreme difficulty doing so) because of a disability or health condition. ADA Paratransit Service provides "first-door-through-first-door" transportation in 89 communities throughout the metropolitan area for persons who are ADA-certified. The region's ADA paratransit service is provided by four programs: Metro Mobility, Anoka County Traveler, DARTS, and H.S.I. (serving Washington County). In addition, every regular-route bus has a wheelchair lift, and drivers are trained to help customers use the lift and secure their wheelchairs safely. LRT trains offer step-free boarding, and are equipped with designated sections for customers using wheelchairs. In addition, all station platforms are fully accessible.

Responsiveness in Routing and Scheduling. Metro Transit conducted a series of Transit Redesign "sector studies" to reconfigure service to better meet the range of needs based on these identified transit market areas. Service is now re-evaluated as needed.

Central Business Districts Parking Shuttles. The downtown fare zones mentioned above provide fast, low-cost, convenient service to and from parking locations around the central business districts.

Simplified Fare Collection. The fare zone system in place at the time of the Transportation Systems Management Plan has since been eliminated. Instead, a simplified fare structure based on time (peak vs. off-peak) and type (local vs. express) of service has been implemented, with discounts for select patrons (e.g. elderly, youth). Convenient electronic fare passes are also available from Metro Transit, improving the ease of fare collection and offering bulk savings for multi-ride tickets.

Bus Shelters. Metro Transit coordinates bus shelter construction and maintenance throughout the region. Shelter types include standard covered wind barrier structures as well as lighted and heated transit centers at major transfer points and light rail stations.

Rider Information. Rider information services have been greatly improved since the 1983 Transportation Systems Management Plan was created. Schedules and maps have been re-designed for improved clarity and readability, and are now available for download on Metro Transit's website, which also offers a custom trip planner to help riders choose the combination of routes that best serve their needs. Bus arrival and departure times are posted in all shelters, along with the phone number of the TransitLine automated schedule information hotline. Some shelters and stations have real-time “next trip” information. Schedule and real-time data is shared with private web and smartphone developers to provide more information to riders.

Transit Marketing. Metro Commuter Services, under the direction of Metro Transit, coordinates all transit and rideshare marketing activities for the region, including the work by five Transportation Management Organizations (TMOs) that actively promote alternatives to driving alone through employer outreach, commuter fairs and other programs. Metro Commuter Services also conducts an annual Commuter Challenge, which is a contest encouraging commuters to pledge to travel by other means than driving alone.

Cost Accounting and Performance-Based Funding. Key criteria in the aforementioned Transit Redesign process includes service efficiency (subsidy per passenger) and service effectiveness (passengers per revenue hour). Metro Transit uses these metrics to evaluate route cost-effectiveness and performance and determine which routes are kept, re-tuned or eliminated.

"Real-Time" Monitoring of Bus Operations. The regional Transit Operations Center permits centralized monitoring and control of all vehicles in the transit system.

Park and Ride. The *2030 Park-and-Ride Plan* provides guidelines intended for use in planning, designing, and evaluating proposed park-and-ride facilities served by regular route bus transit. The guidelines can also be used for park-and-ride lots without bus service and at rail stations. The Metropolitan Council administers capital funding to transit operating agencies building, operating and maintaining park-and-ride facilities. In 2013, the region served 106 park-and-ride facilities with a capacity of 31,088. Average usage in 2013 was 63 percent.

Hennepin and First Avenue One-Way Pair. These streets in downtown Minneapolis were re-configured subsequent to the 1980 Air Quality Control Plan for Transportation to address a local carbon monoxide hot-spot issue that has since been resolved. The streets reverted to a two-way configuration in 2009.

The above list includes two transportation control measures that are traffic flow amendments to the State Implementation Plan. The MPCA added them to the State Implementation Plan since its original adoption. These include, in St. Paul, a carbon monoxide Traffic Management System at the Snelling and University Avenue.

While not control measures, the MPCA added two additional revisions to the State Implementation Plan that reduce carbon monoxide: A vehicle emissions inspection/maintenance program, implemented in 1991, to correct the region-wide carbon monoxide problem; and a federally mandated four-month oxygenated gasoline program implemented in November 1992. In December 1999 the vehicle emissions inspection/maintenance program was eliminated.

The MPCA requested that the USEPA add a third revision to the State Implementation Plan, a contingency measure consisting of a year-round oxygenated gasoline program if the carbon monoxide standards were violated after 1995. The USEPA approved the proposal. Because of current state law that remains in effect, the Twin Cities area has a state mandate year-round program that started in 1995. The program will remain regardless of any EPA rulemaking.

Exempt Projects

Certain transportation projects eligible for funding under Title 23 U.S.C. have no impact on regional emissions. These are "exempt" projects that, because of their nature, will not affect the outcome of any regional emissions analyses and add no substance to those analyses. These projects (as listed in Section 93.126 of the Conformity Rules) are excluded from the regional emissions analyses required in order to determine conformity of the Transportation Policy Plan and Transportation Improvement Programs.

The following is a list of "exempt" projects and their corresponding codes used in column "AQ" of the Transportation Improvement Program. Except for projects given an "A" code, the categories listed under Air Quality should be viewed as advisory in nature, and relate to project specific requirements rather than to the air quality conformity requirements. Ultimate responsibility for determining the need for a hot-spot analysis for a project rests with the U.S.

Department of Transportation. The Council has provided the categorization as a guide to possible conformity requirements.

Projects that Do Not Impact Regional Emissions

Safety

- S-1: Railroad/highway crossing
- S-2: Hazard elimination program
- S-3: Safer non-federal-aid system roads
- S-4: Shoulder improvements
- S-5: Increasing sight distance
- S-6: Safety improvement program
- S-7: Traffic control devices and operating assistance other than signalization projects
- S-8: Railroad/highway crossing warning devices
- S-9: Guardrails, median barriers, crash cushions
- S-10: Pavement resurfacing and/or rehabilitation
- S-11: Pavement marking demonstration
- S-12: Emergency relief (23 U.S.C. 125)
- S-13: Fencing
- S-14: Skid treatments
- S-15: Safety roadside rest areas
- S-16: Adding medians
- S-17: Truck climbing lanes outside the urbanized area
- S-18: Lighting improvements
- S-19: Widening narrow pavements or reconstructing bridges (no additional travel lanes)
- S-20: Emergency truck pullovers

Transit

- T-1: Operating assistance to transit agencies
- T-2: Purchase of support vehicles
- T-3: Rehabilitation of transit vehicles
- T-4: Purchase of office, shop, and operating equipment for existing facilities
- T-5: Purchase of operating equipment for vehicles (e.g., radios, fareboxes, lifts, etc.)
- T-6: Construction or renovation of power, signal and communications systems
- T-7: Construction of small passenger shelters and information kiosks
- T-8: Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals and ancillary structures)

- T-9: Rehabilitation or reconstruction of track structures, track and trackbed in existing rights-of-way
- T-10: Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet
- T-11: Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR 771

Air Quality

- AQ-1: Continuation of ridesharing and vanpooling promotion activities at current levels
- AQ-2: Bicycle and pedestrian facilities

Other

- O-1: Specific activities that do not involve or lead directly to construction, such as planning and technical studies, grants for training and research programs, planning activities conducted pursuant to titles 23 and 49 U.S.C., and Federal-aid systems revisions
- O-2: Engineering to assess social, economic and environmental effects of the proposed action or alternatives to that action
- O-3: Noise attenuation
- O-4: Advance land acquisitions (23 CFR 712 or 23 CRF 771)
- O-5: Acquisition of scenic easements
- O-6: Plantings, landscaping, etc.
- O-7: Sign removal
- O-8: Directional and informational signs
- O-9: Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures or facilities)
- O-10: Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes

Projects Exempt from Regional Emissions Analyses that May Require Further Air Quality Analysis

The local effects of these projects with respect to carbon monoxide concentrations must be considered to determine if a "hot-spot" type of an analysis is required prior to making a project-level conformity determination. These projects may then proceed to the project development process even in the absence of a conforming transportation plan and Transportation Improvement Program. A particular action of the type listed below is not exempt from regional emissions analysis if the MPO in consultation with the MPCA, MnDOT, EPA, and FHWA (in the case of a highway project) or FTA (in the case of a transit project) concur that it has potential regional impacts for any reason.

Channelization projects include left and right turn lanes and continuous left turn lanes as well as those turn movements that are physically separated. Signalization projects include reconstruction of existing signals as well as installation of new signals. Signal preemption projects are exempt from hot-spot analysis. A final determination of the intersections that require an analysis by the project applicant rests with the U.S. DOT as part of its conformity determination for an individual project.

Projects Exempt from Regional Emissions Analyses

- E-1: Intersection channelization projects
- E-2: Intersection signalization projects at individual intersections
- E-3: Interchange reconfiguration projects
- E-4: Changes in vertical and horizontal alignment
- E-5: Truck size and weight inspection stations
- E-6: Bus terminals and transfer points

Non-Classifiable Projects

Certain unique projects cannot be classified, as denoted by "NC." These projects were evaluated through an interagency consultation process and determined not to fit into any exempt or intersection-level analysis category, but they are clearly not of a nature that would require inclusion in a regional air quality analysis.

Traffic Signal Synchronization

Traffic signal synchronization projects (Sec. 83.128 of the Conformity Rules) may be approved, funded and implemented without satisfying the requirements of this subpart. However, all subsequent regional emissions analysis required by subparts 93.118 and 93.119 for transportation plans, Transportation Improvement Programs, or projects not from a conforming plan and Transportation Improvement Program, must include such regionally significant traffic signal synchronization projects.

Regionally Significant Projects

The following codes identify the projects included in the "action" scenarios of the air quality analysis:

- A-20: Action Year 2020
- A-30: Action Year 2030
- A-40: Action Year 2040

Appendix F: Highway Interchange Request Criteria and Review Procedure

Background

The evaluation criteria and review procedures for highway interchange requests have been established by the Metropolitan Council to meet the objectives of Access to Destinations Strategy 11: Regional transportation partners will manage access to Principal and A-minor arterials to preserve and enhance their capacity and safety.

The Council will work with MnDOT to review interchange requests for the principal arterial system using the procedures outlined in this Appendix.

These criteria and procedures are based on work originally done in 1979 by a joint committee of the Transportation Advisory Board and the Metropolitan Council. They have been revised and simplified over time to reflect policy changes, revised state and federal laws and regulations and experience with applying the criteria. The most recent changes reflect the differing circumstances of adding/modifying an interchange on an access controlled freeway, or adding an interchange to a highway where other access is provided through at grade intersections.

Procedures

An applicant has the responsibility to prove that new interchange or additional interchange capacity is required. Typically this will require a detailed analysis of existing and forecasted highway access needs. Therefore, informal discussion of interchange requests with MnDOT and Council staff is encouraged before the applicant initiates a potentially expensive and time-consuming study.

The following steps should be taken to obtain Council approval to add or expand a principal arterial system interchange:

- A request for an interchange addition or expansion is made to the joint MnDOT/Council Interchange Planning Review Committee. If the committee determines that the interchange requires review, the applicant must respond to each of the criteria shown below. The committee will review the proposal's consistency with the criteria in this section and provide a letter with findings.
- If the interchange is on an interstate freeway, the applicant, in coordination with MnDOT and following MnDOT's policies, should submit an interstate Access Request to Federal Highway Administration (FHWA).
- A comprehensive plan amendment should be submitted to the Council including the requested interchange and supportive surrounding land uses and street

network. Council staff will evaluate response to all qualifying and technical criteria and the consistency of the proposed interchange with regional and local plans.

- In addition, prior to acquiring land for or constructing the proposed interchange, the applicant should submit a request to the Council for approval of controlled access highway construction pursuant to MN. Stat. 473.166.

Types of Interchange Requests

Two types of interchange requests are commonly seen on the principal arterial system:

Type A: New or modified interchanges on existing freeways. These are distinguished by requesting new access to the system where none had previously been provided, or modifying interchanges to provide new movements or wider ramps. When these are evaluated, they are further divided into three types which receive differing levels of review: a new interchange or new access at an existing interchange, major geometric revisions at an existing interchange, and minor geometric changes at an existing interchange.

Type B: New interchanges on a multi-lane highway with traffic signals. These requests are conversions of existing at-grade intersections to interchanges. These interchanges will often be part of a staged conversion of the multi-line highway with traffic signals to a freeway design, with the elimination of minor access points between the new interchanges resulting in more restricted access to a principal arterial, as opposed to providing access where none previously existed.

Qualifying Criteria: Type A (New or Modified Interchange on Existing Freeway)

1. Additional interchange capacity should be considered only when it supports *Thrive MSP 2040* and the Transportation Policy Plan, and local comprehensive plans approved by the Metropolitan Council.

Discussion: This is a critical objective. In addition to solving highway capacity deficiencies, new interchanges or major interchange modifications should be consistent with regional plans and regionally approved local plans, and should support land uses shown in these local plans. In most cases, a new interchange should be in the Metropolitan Urban Service Area or a rural center.

2. Need for additional capacity or safety improvements must be demonstrated and documented before a new interchange, new ramps or expanded ramp capacity are considered.

Discussion: Subjective arguments alone should not be used to justify interchange design revisions. Volume forecasts and capacity calculations are required to document the need for a design revision. Volume and capacity figures should be consistent with Council-approved land use plans and with the transportation element of those local plans.

3. Freeway interchanges should only connect to other principal arterials or to an A-minor arterial as defined in the functional classification system adopted by the Transportation Advisory Board and approved by the Metropolitan Council.

4. New or expanded interchanges are not to be provided if the need for additional capacity is justified only as a convenience for short trips; to compensate for lack of an adequate complementary minor arterial or collector system; to compensate for deficient minor arterial or frontage road capacity; or to correct collector or minor arterial capacity deficiencies caused by poor design or excessive access to adjacent parcels.

Discussion: The purpose of the principal arterial system is to serve regional trips, not to substitute for inadequate local access and circulation capacity.

5. When an interchange is to be constructed or expanded, the operational integrity of the mainline and associated weaving sections must be maintained. The new or expanded interchange must be acceptable in terms of route design and standards as specified by the MnDOT, conforming to such factors as basic number of lanes, lane continuity, lane balance, lane drops, continuity of mainline levels of service and other general design criteria.

Discussion: Highway design standards should be maintained to the greatest extent possible. Operational integrity is measured by the forecasted level of service and safety considerations, including freedom or ease of lane changing and vehicle spacing on the through lanes of a freeway or arterial.

6. Interchanges on the principal arterial system should be spaced at a minimum of one mile (center to center). If it is determined appropriate to locate an interchange at less than one mile apart or modify an existing interchange, the safe operation of the main roadway must be maintained.

Discussion: Experience has shown that interchanges spaced less than one mile apart have inadequate weaving distance and require special design features such as auxiliary lanes to maintain safety. Outside of urban center, urban, and suburban areas, other principal arterials or A-minor arterials are typically not needed closer than 2 miles due to the lack of intense development.

Qualifying Criteria: Type B (Multi-lane Highway with Traffic Signals to Freeway)

1. Additional interchange capacity should be considered only when it supports *Thrive MSP 2040* and the Transportation Policy Plan, and local comprehensive plans approved by the Metropolitan Council.

Discussion: In addition to solving highway capacity or safety deficiencies, new interchanges should be consistent with regional plans and regionally approved local plans, and should

support development in desirable locations. New interchanges should be built in sequence as part of a conversion. If the eventual vision of the highway is not a freeway, alternative designs to an interchange should be considered.

2. Need for additional capacity or safety improvements must be demonstrated and documented before a new interchange, new ramps or expanded ramp capacity are considered.

Discussion: Subjective arguments alone should not be used to justify interchange design revisions. Volume forecasts and capacity calculations are required to document the need for a design revision. Volume and capacity figures should be consistent with Council-approved land use plans and with the transportation element of those local plans. New interchanges should be adjacent to an existing interchange unless the intermediate access can be modified or managed to address safety concerns.

3. Principal arterial system interchanges should only connect principal arterials to other principal arterials or to an A-minor arterial as defined in the functional classification system adopted by the Transportation Advisory Board and approved by the Metropolitan Council.

4. When a new interchange is planned, an adequate complementary minor arterial or collector system and frontage system should be planned to serve local trips and access currently served by the highway.

Discussion: The purpose of the principal arterial system is to serve regional trips, not to substitute for inadequate local access and circulation capacity.

5. When an interchange is to be constructed or expanded, the operational integrity of the mainline and associated weaving sections must be maintained. The new interchange or related system change must be acceptable in terms of route design and standards as specified by the MnDOT or the implementing agency, conforming to such factors as basic number of lanes, lane continuity, lane balance, lane drops, continuity of mainline levels of service and other general design criteria.

Discussion: Highway design standards should be maintained to the greatest extent possible. Operational integrity is measured by the forecasted level of service and safety considerations, including freedom or ease of lane changing and vehicle spacing on the through lanes of a freeway or arterial.

6. Interchanges on the principal arterial system should be spaced at a minimum of 1 mile (center to center). If it is determined appropriate to locate an interchange at less than 1 mile apart or modify an existing interchange, the safe operation of the main roadway must be maintained.

Discussion: Experience has shown that interchanges spaced less than one mile apart have inadequate weaving distance and require special design features such as auxiliary lanes to

maintain safety. Outside of urban center, urban, and suburban areas, other principal arterials or A-minor arterials are typically not needed closer than 2 miles due to the lack of intense development.

Technical Criteria: Development

An interchange may be warranted when access to new urban development cannot be adequately or safely served by existing or new minor arterials or by existing ramps at an adjacent interchange. New local urban development must be provided with good local arterial access before principal arterial system access is considered. Local comprehensive plans should establish the level of development expected (land use element) and the local arterial system (transportation element) proposed to serve the expected development pattern.

Interchange additions or revisions to support new development must be subordinate to current, adopted corridor plans for the route. Regional travel demand for the principal arterial system will take precedence over local or land parcel development and related access needs. Access needs should be evaluated as part of an overall corridor plan.

The proposed ramp configuration may not serve a single development exclusively. Legal and policy requirements dictate that a public highway facility may not be designated for the sole benefit of a property owner.

Public benefits, as well as estimated costs of the interchange, should be evaluated.

Local governments and the owners and developers of properties that would benefit from an additional interchange should share the cost of additional construction or right-of-way to the extent that they receive tangible benefits.

Technical Criteria: Design

Interchange ramp configuration and design should be based on traffic forecasts developed and adopted by the Metropolitan Council and the MnDOT. Regional traffic forecasts are based on socioeconomic data developed for the entire region. Local units of government may submit revised forecasts based on more detailed land development plans, but such forecasts must be analyzed and accepted by MnDOT and the Council before they are used to evaluate design changes.

Traffic backups resulting from interchange ramp designs must occur on cross streets and frontage roads rather than on the principal arterial. If traffic backups at an interchange are unavoidable for short periods, the design should ensure that they occur on the slower-speed, lower-function roadways.

A-minor arterial roadways connecting with the proposed interchange must be adequate for the anticipated volumes on the interchange. An interchange justification must demonstrate that

the connecting and other supporting roadways critical to its safe and adequate operation are or will be available at the time the interchange is open to traffic.

Ramp configurations must be capable of being signed for safe and expeditious movement.

Interchange ramp configuration and design should provide for preferential treatment of transit and rideshare vehicles.

If local cross-street improvements or functional classification changes are needed in conjunction with the interchange, their construction must be coordinated with construction of the interchange. Local cross-street improvements necessary for safe and adequate operations should be part of the initial interchange design.

Appendix G: Regional Transit Design Guidelines and Performance Standards

Transit Market Areas

Demand for transit service varies across the region. This applies to the time of day that transit is used, the number of trips taken, and the purpose of trips taken on transit. While this variation in transit demand is driven by a number of factors, it is primarily due to differences in development density, urban form, and demographics. To account for these differences in the planning and evaluation of transit service, the region is divided into five distinct Transit Market Areas representing different levels of potential transit demand.

Transit Market Areas are a tool used to guide transit planning decisions. They help ensure that the types and levels of transit service provided, in particular fixed-route bus service, match the expected demand in a given area. For example, transit service in a suburban community where the automobile is the most convenient mode for the majority of trips might focus on the work commute, providing express bus service to downtown. Transit service in a dense urban core neighborhood might need to accommodate a broader variety of transit service needs that can be met by providing frequent, all-day service to a variety of destinations.

Transit Market Index

Transit Market Areas are determined using a Transit Market Index which in turn is based on a combination of measures of density, urban form, and automobile availability.

Population and Employment Density

Population and employment density are strong indicators of transit demand. Higher density areas generate more transit demand for the simple reason that they have more people living and working within the fixed area within walking distance of any transit stop. Additionally, people living and working in high density areas are more likely to take transit than those living in low density areas. This is because automobile use is often inconvenient because of congestion and parking costs and because residents typically have less need for a car since there are more destinations within walking distance.

In the Transit Market Index, population and employment densities are calculated separately by dividing the total population and total jobs in a census block group by the developed land area of the block group.

Intersection Density

Block size and urban form are important factors in transit demand. Areas with smaller blocks tend to have more traditional street-grids and provide a more walkable environment for pedestrians. The Transit Market Index measures urban form using intersection density; it is the total number of three-, four-, and five-way intersections in a block group divided by the total

developed area. Intersections are weighted by the number of intersecting roads, such that a five-way intersection has more weight than a three-way intersection.

Automobile Availability

For any number of reasons transit is the only means of mobility for many people in the region. Areas with a more people who rely on transit will tend to generate greater demand for transit. The Transit Market Index measures reliance on transit by calculating the availability of automobiles by block group. Automobile availability is calculated by subtracting the total number of automobiles available in a census block group from the total population aged 16 or over. This value then divided by the total developed land area of the block group.

Calculating the Transit Market Index

The four measures included in the Transit Market Index were found to have a strong relationship to existing transit demand in our region. Their respective weights in the Transit Market index formula are determined based on their relative impact on transit demand. The Transit Market Index (TMI) is calculated for each block group as follows:

$$TMI = 0.64 * (Population\ Density) + 0.23 * (Intersection\ Density) + 0.20 * (Employment\ Density) + 0.11 * (Automobile\ Availability)$$

Block groups are separated into the five Transit Market Areas based on Transit Market Index values. See Table G-1 for the index value ranges for each market area. Block groups with the highest Transit Market Index values are assigned to Market Area I while those with the lowest index value are assigned to Market Area V.

Data Sources

Table G-1 shows the data sources used to calculate the Transit Market Index measures for each block group.

Table G-1: Transit Market Index Data Sources

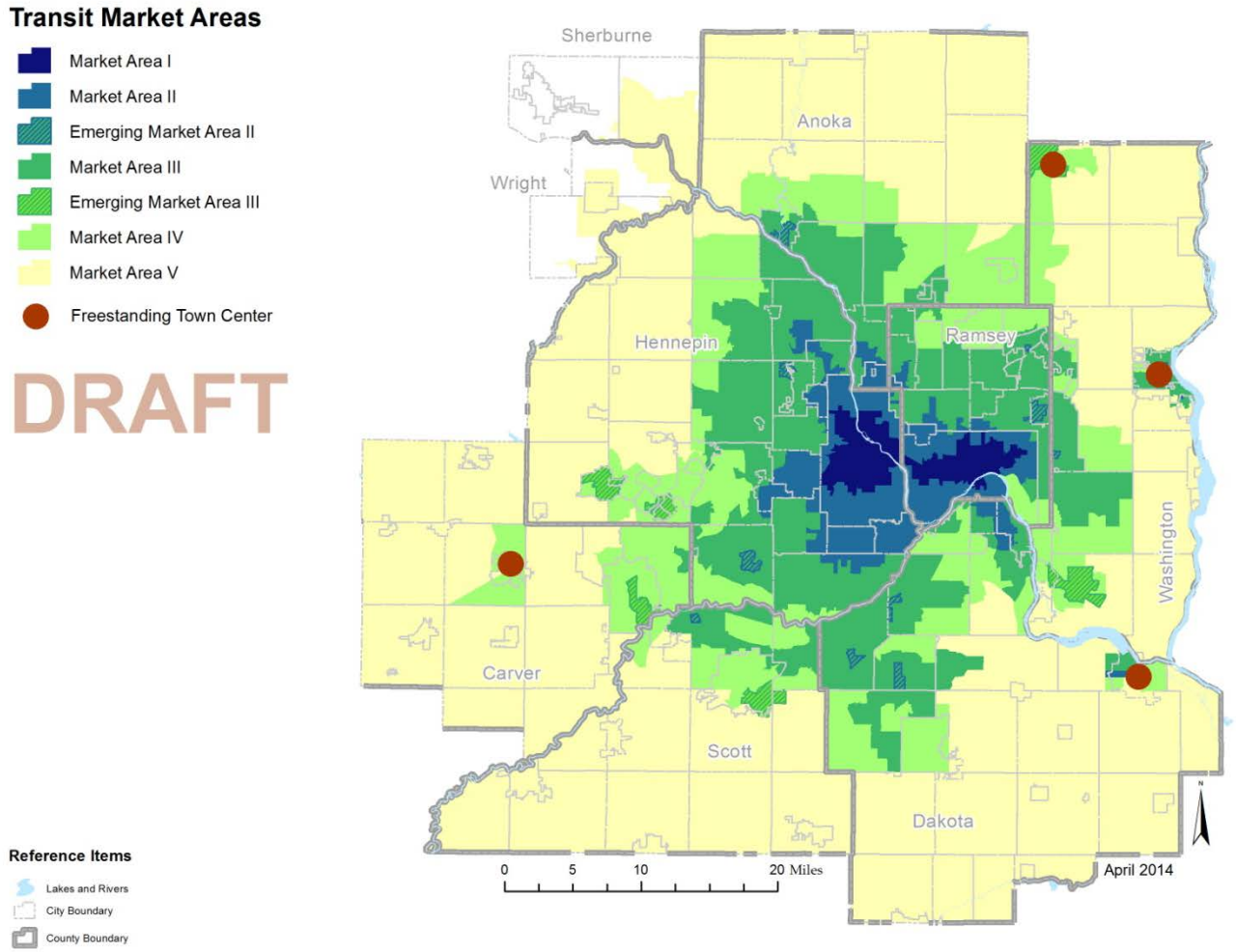
Measure	Data Source
Population	U.S. Census Bureau; Census 2010
Employment	U.S. Census Bureau; Longitudinal-Employer Household Dynamics Program; LODES Data
Automobile Availability	U.S. Census Bureau; American Community Survey, 2012 ACS 5-Year Estimates

Intersection Density	NCompass Technologies; Street Centerline Data
Developed Acres (used to calculate density)	Metropolitan Council; 2010 Generalized Land Use Survey

Adjacency and Connectivity

While the Transit Market Index is calculated at the block-group level, individual block groups do not exist in isolation. Transit demand in any block group is influenced by the characteristics of neighboring block groups. Another way of looking at this is that connected areas of transit demand will have higher overall ridership potential than similar areas that are disconnected. To account for this effect, the Transit Market Area of each block group takes into account the index values of neighboring block groups.

Figure G-1: Transit Market Areas



Transit Market Area Characteristics

Transit Market Area I

Transit Market Area I has the highest density of population, employment, and lowest automobile availability. These are typically Urban Center communities and have a more traditional urban form with a street network laid out in grid form. Market Area I has the potential transit ridership necessary to support the most intensive fixed-route transit service, typically providing higher frequencies, longer hours, and more options available outside of peak periods.

Transit Market Area II

Transit Market Area II has high to moderately high population and employment densities and typically has a traditional street grid comparable to Market Area I. Much of Market Area II is also categorized as an Urban Center and it can support many of the same types of fixed-route transit as Market Area I, although usually at lower frequencies or shorter service spans.

Transit Market Area III

Transit Market Area III has moderate density but tends to have a less traditional street grid that can limit the effectiveness of transit. It is typically Urban with large portions of Suburban and Suburban Edge communities. Transit service in this area is primarily commuter express bus service with a limited amount of fixed-route local service. General public dial-a-ride services are available where fixed-route service is not viable.

Transit Market Area IV

Transit Market Area IV has lower concentrations of population and employment and a higher rate of auto ownership. It is primarily composed of Suburban Edge and Emerging Suburban Edge communities. This market can support peak-period express bus services if a sufficient concentration of commuters likely to use transit service is located along a corridor. The low-density development and suburban form of development presents challenges to fixed-route transit. General public dial-a-ride services are appropriate in Market Area IV.

Transit Market Area V

Transit Market Area V has very low population and employment densities and tends to be primarily Rural communities and Agricultural uses. General public dial-a-ride service may be appropriate here, but due to the very low-intensity land uses these areas are not well-suited for fixed-route transit service.

Non-contiguous Market Areas:

Emerging Market Overlay

The Emerging Market Overlay identifies locations within Transit Market Areas III and IV that have a higher potential for transit usage than the rest of the market areas surrounding them. These areas are currently too small or non-contiguous to support a higher level of transit

service. Focusing growth in and around these areas to connect to other areas of higher potential transit use will present good opportunities for future transit improvement.

Freestanding Town Centers

Freestanding Town Centers are areas that historically grew independently of Minneapolis and St. Paul and are still separated from the urban and suburban areas of the metro by rural land. Because of their concentrated downtowns laid out in a traditional urban form, these areas have a Transit Market Index value that would indicate Market Area III or higher. However, their relatively small population and land area, as well as their distance from other transit-supportive land uses, limits the potential for local fixed-route transit.

Typical Transit Service Types

Table G-2 shows the typical transit service types and levels that are most appropriate for the different transit market areas. The service types listed here are general descriptions for each market area; specific implementation of transit service will depend on available resources, specific analysis of local transit demand and existing ridership, complementary and competing services, and other factors. Detailed analysis of specific communities and locations may determine that other types and levels of service are more appropriate.

Table G-2: Transit Market Area Transit Demand and Typical Services

Transit Market Area	*Transit Market Index Range*	*Propensity to Use Transit*	*Typical Transit Service*
Market Area I	TMI greater than 256.0	Highest potential for transit ridership	Dense network of local routes with highest levels of service accommodating a wide variety of trip purposes. Limited stop service supplements local routes where appropriate.
Market Area II	TMI between 128.0 and 256.0	Approximately 1/2 ridership potential of Market Area I	Similar network structure to Market Area I with reduced level of service as demand warrants. Limited stop services are appropriate to connect major destinations.
Market Area III	TMI between 64.0 and 128	Approximately 1/2 ridership potential of Market Area II	Primary emphasis is on commuter express bus service. Suburban local routes providing basic coverage. General public dial-a-ride complements fixed route in some cases.

Market Area IV	TMI between 32.0 and 64.0	Approximately 1/2 ridership potential of Market Area III	Peak period express service is appropriate as local demand warrants. General public dial-a-ride services are appropriate.
Market Area V	TMI less than 32.0	Lowest potential for transit ridership	Not well-suited for fixed-route service. Primary emphasis is on general public dial-a-ride services.
Emerging Market Overlay	Varies.	Varies. Typically matches surrounding Market Area.	Varies. Typically matches surrounding Market Area.
Freestanding Town Center	TMI at least 64.0	Varies. Typically matches surrounding Market Area.	Varies. Potential for local community circulator as demand warrants. Some peak period commuter express service may be appropriate

Transitways

Transitways are unique transportation corridors with specific, detailed planning processes that result in appropriate levels of service for specific corridors. The detailed planning work on transitway corridors leads to unique applications of transit service design standards and specific types of service unique to each corridor. See the Regional Transitway Guidelines for more information about planning Arterial Bus Rapid Transit (BRT), Highway BRT, Light Rail Transit (LRT) and Commuter Rail

General Public Dial-a-Ride

General public dial-a-ride service is provided by the Metropolitan Council through Transit Link. Transit Link service is open to the general public and operates where regular-route transit service is not available. It is intended to augment the regular-route network and is only available for trips that cannot be accomplished on regular routes alone. Transit Link trips may drop-off passengers at major transfer points to complete their trip on the regular-route network.

ADA Paratransit Services

ADA paratransit service is public transportation for certified riders who are unable to use the regular fixed-route bus due to a disability or health condition. In the Twin Cities region, the Metropolitan Council oversees all ADA paratransit services. Metro Mobility contracts with ADA paratransit service providers, who provide customers with “first-door-through-first-door” transportation.

ADA Eligibility

Eligibility for ADA services is determined using federal guidelines established by the Americans with Disabilities Act (ADA). A person may be eligible for ADA Paratransit Service if any of the following conditions apply:

- The individual is unable to independently navigate the fixed-route transit system because of a health condition or disability (OR)
- The individual is unable to independently board or exit fixed-route vehicles due to a heath condition or disability (OR)
- The individual is unable to propel to or from a bus stop within the fixed-route service area due to a health condition or disability.

ADA Service Span and Coverage

The ADA paratransit service coverage area and hours of service are determined by several factors including Federal and State requirements. Per the Federal requirements, ADA paratransit service must operate within a minimum of 3/4 mile of the local fixed-route network and for the same hours of the day that the fixed-route network operates.

To meet this requirement, Metro Mobility matches the fixed-route hours of service delivery for Weekday, Saturday, and Sunday/Holiday service in each community where fixed-route service is available.

In addition to Federal requirements, the State of Minnesota requires Metro Mobility to provide service to all communities within the transit capital levy district. Metro Mobility is available to eligible residents living in these areas by providing 12 hours of service on Weekdays, and on an as-space-is-available bases on Saturdays and Sundays/Holidays.

Route Types

For the purposes of the Regional Transit Design Guidelines and Performance Standards, routes in the regional transit network are classified based on their mode and role within the overall network. All of the routes classified below are fixed-route service operating along an established path with a published schedule and designated stops.

Core Local Bus

Core Local routes typically serve the denser urban areas of Market Areas I and II, usually providing access to a downtown or major activity center along important commercial corridors. They form the base of the core bus network and are typically some of the most productive routes in the system.

Some Core Local Bus routes are supplemented with a limited stop route designed to serve customers wishing to travel farther distances along the corridor. Limited stop routes make fewer stops and provide faster service than the Core Local routes.

Supporting Local Bus

Supporting Local routes are typically designed to provide crosstown connections within Market Areas I and II. Typically these routes do not serve a downtown but play an important role connecting to Core Local routes and ensuring transit access for those not traveling downtown.

Suburban Local Bus

Suburban Local routes typically operate in Market Areas II and III in a suburban context and are often less productive that Core Local routes. These routes serve an important role in providing a basic-level of transit coverage throughout the region.

Commuter and Express Bus

Commuter and Express Bus routes primarily operate during peak periods to serve commuters to downtown or a major employment center. These routes typically operate non-stop on highways for portions of the route between picking up passengers in residential areas or at park-and-ride facilities and dropping them off at a major destination.

Arterial Bus Rapid Transit

Arterial bus rapid transit (BRT) lines operate in high demand urban arterial corridors with service, facility, and technology improvements that enable faster travel speeds, greater frequency, an improved passenger experience, and better reliability. Design guidelines for arterial BRT can be found in the *Regional Transitway Guidelines*.

Highway Bus Rapid Transit

Highway bus rapid transit (BRT) lines operate in high demand highway corridors with service, facility, and technology improvements providing faster travel speeds, all-day service, greater frequency, an improved passenger experience, and better reliability. Design guidelines for highway BRT can be found in the *Regional Transitway Guidelines*.

Dedicated Bus Rapid Transit

Dedicated bus rapid transit (BRT) lines operate in dedicated right-of-way for the exclusive use of buses in high demand corridors. Service, facility and technology improvements are similar to light rail. It provides faster travel speeds, all-day service, greater frequency, an improved passenger experience, and better reliability. Design guidelines for dedicated BRT have not yet been developed. An update to the *Regional Transitway Guidelines* is identified as a work program item and will consider addressing dedicated BRT.

Light Rail

Light rail operates using electrically-powered passenger rail cars operating on fixed rails in dedicated right-of-way. It provides frequent, all-day service stopping at stations with high levels of customer amenities and waiting facilities. Design guidelines for light rail can be found in the *Regional Transitway Guidelines*.

Commuter Rail

Commuter rail operates using diesel-power locomotives and passenger coaches on traditional railroad track. These trains typically only operate during the morning and evening peak period to serve work commuters. Design guidelines for commuter rail can be found in the *Regional Transitway Guidelines*.

Transit Design Guidelines

Transit Design Guidelines are intended to guide the appropriate allocation of transit resources and ensure regional coordination and consistency. The design guidelines are organized by Transit Market Area and/or Route Type. These guidelines are representative of the general types of transit service that are appropriate to implement, however exceptions often exist based on specific local circumstances and available funding.

Stop Spacing

Stop spacing guidelines must balance between providing greater access to service with faster travel speeds. More stops spaced closer together reduce walk distances to transit but also increase travel times. In general, the average distance people are willing to walk to access transit services is ¼ mile for local bus service and ½ mile for limited stop bus service and transitway service. Table G-3 shows the recommended stop spacing guidelines that seek to balance between access and speed.

Table G-3: Stop Spacing

Route Type	***Typical Stop Spacing:***
Core Local Bus*	1/8 to 1/4 mile
Supporting Local Bus	1/8 to 1/4 mile
Suburban Local Bus	1/8 to 1/4 mile
Arterial BRT	1/4 to 1/2 mile
Highway BRT	1/2 to 2 miles
Light Rail	1/2 to 1 mile
Commuter Express Bus	Market Specific**
Commuter Rail	5 to 7 miles
* Local routes with limited stop service will have a typical stop spacing of 1/4 to 1/2 mile.	
**In downtowns and local pickup areas, stop spacing will follow the standards for local routes. Along limited stop or non-stop portions of the route, stop spacing will be much greater.	
An allowable exception to standards may be central business districts and major traffic generators. These guidelines are goals, not a minimum or maximum.	

Route Spacing

Route spacing refers to the distance between two parallel routes. Route spacing guidelines seek to balance service coverage with route productivity and transit demand. Routes that are spaced too close together will have overlapping service areas and compete for riders, reducing the

productivity of both routes. Routes spaced too far apart will lead to coverage gaps. Generally areas with lower transit demand will have routes spaced farther apart. Table G-4 shows the route spacing guidelines by route type and market area. Commuter Express bus and transitway routes are determined on a case by case basis according to specific transit market conditions. Please see the Regional Transitway Guidelines for more details about transitway planning.

Table G-4: Route Spacing

Route Type	***Market Area***				
	Area I	***Area II***	***Area III***	***Area IV***	***Area V***
Core Local Bus*	1/2 mile	1 mile	Specific**	NA	NA
Supporting Local Bus	1 mile	1-2 miles	Specific**	NA	NA
Suburban Local Bus	NA	2 miles	Specific**	Specific**	NA
*Local limited stop routes do not follow a route spacing guideline. They will be located in high demand corridors.					
** Specific means that route structure will be adapted to the demographics, geography and land use of a specific area.					

Span of Service

Span of service refers to the periods of the day that transit is in service. Service span guidelines are typically based on the role a route type plays in the overall transit network. Route types designed to primarily serve commuters generally operate only in peak periods, while route types that serve a broader set of trip purposes generally have a longer span of service. Table G-5 shows the recommended hours of service by route type.

Table G-5: Span of Service

Route Type	***Weekday***				***Weekend***	
	Peak	***Midday***	***Evening***	***Owl***	***Saturday***	***Sunday***
Core Local Bus*	●	●	●	○	●	●
Supporting Local Bus	●	●	●	○	◑	◑
Suburban Local Bus	●	●	◑	○	○	○
Arterial BRT	●	●	●	○	●	●
Highway BRT	●	●	●	○	●	●
Light Rail	●	●	●	○	●	●
Commuter Express Bus	●	○	○	○	○	○
Commuter Rail	●	○	○	○	○	○
Service Provided ●; Service Typically Provided ◑; Service As Demand Warrants ○						
Peak - 6:00am to 9:00am and 3:00pm to 6:30pm; Midday - 9:00am to 3:00pm; Evening - 6:30pm to 1:30am; Owl – 1:30am to 5:00am; Saturday – Saturday Service; Sunday – Sunday/Holiday Service						
*Local limited stop routes will operate primarily in the peak period.						

Minimum Frequency

Minimum frequency refers to the average number of minutes between transit vehicles on a given route or line traveling in the same direction. Routes serving areas of higher transit

demand will tend to have higher frequencies. Table G-6 shows the recommended minimum frequency by route type and market area.

Table G-6: Minimum Frequency

<table>
<tr><th rowspan="2">Route Type</th><th colspan="5">Market Area</th></tr>
<tr><th>Area I</th><th>Area II</th><th>Area III</th><th>Area IV</th><th>Area V</th></tr>
<tr><td>Core Local Bus</td><td>15” Peak
30” Offpeak
30” Weekend</td><td rowspan="3">30” Peak
60” Offpeak
60” Weekend</td><td rowspan="3">60” Peak
60” Offpeak
60” Weekend</td><td>NA</td><td>NA</td></tr>
<tr><td>Supporting Local Bus</td><td>30” Peak
30” Offpeak
30” Weekend</td><td>NA</td><td>NA</td></tr>
<tr><td>Suburban Local Bus</td><td>NA</td><td>NA</td><td>NA</td></tr>
<tr><td>Arterial BRT</td><td colspan="3" rowspan="3">15” Peak
15” Offpeak
15” Weekend</td><td>NA</td><td>NA</td></tr>
<tr><td>Highway BRT</td><td>NA</td><td>NA</td></tr>
<tr><td>Light Rail</td><td>NA</td><td>NA</td></tr>
<tr><td>Commuter Express Bus</td><td colspan="2">30” Peak</td><td colspan="2">3 Trips each peak</td><td>NA</td></tr>
<tr><td>Commuter Rail</td><td colspan="2">NA</td><td colspan="3">30” Peak</td></tr>
<tr><td colspan="6">Additional service may be added as demand warrants and these guidelines apply primarily to the peak direction.</td></tr>
</table>

Accessibility

Accessibility refers to how well the transit network is meeting the travel needs of its users and potential users. People use transit to reach destinations they wish to visit, e.g. work, school, shopping, among many others. Accessibility measures how easily or difficult transit users can reach desired destinations using the transit network. This is related to, but distinct from mobility, which measures the overall distance people are able to travel on the network. By taking into account the destinations that people are able to access via that network, measures of accessibility can provide a more complete measure of the overall usefulness of the network to its users.

The Metropolitan Council views accessibility as an important tool to measure and evaluate the regional transit network and land use patterns. Efforts to develop and implement appropriate measures of accessibility are ongoing.

Passenger Amenities

Regional transit providers offer a range of amenities at bus stops and other passenger facilities to improve the customer experience. Passenger amenities include shelters, shelter lighting or heat, trash receptacles, seating, security cameras, good pedestrian access, bicycle parking and storage, and signage both static and real-time, indicating route, schedule, frequency and other information.

Passenger amenities create a more comfortable, accessible and attractive waiting environment for transit customers. Features such as shelter lighting and good pedestrian access enhance

passenger safety. Transit travel may be completed more easily with access to transit service information or secure bike parking. Passenger amenities can also benefit the surrounding neighborhood by making transit a more attractive travel option for nearby land uses and by contributing to the overall character of the streetscape.

Table G-7 identifies the standard amenities that are included with various facility types. Some amenities are always provided and others are occasionally provided depending on the size, location, or use of the facility.

Table G-7: Passenger Amenities

Facility Type	***Shelter***	***Light***	***Heater***	***Trash Receptacle***	***Stand Alone Bench***	***Security Cameras***	***Pedestrian access***	***Bike parking***	***Secure bike storage***	***Customer information***	***Real-time Customer Information***
Transit Centers	●	●	●	●	●	◑	●	◑	◑	●	◑
Park-and-rides	●	●	◑	◑	◑	◑	◑	◑	◑	●	◑
Rail Stations	●	●	●	●	●	●	●	●	◑	●	●
Bus Stop	◑	◑	◑	○	○	○	●	◑	◑	◑	◑
Always Provided ●; Occasionally Provided ◑; Not Provided ○											
In some cases transit providers lease park and-rides and some shelters are owned and maintained by other entities. In such cases, providers may not offer all the customer amenities identified above.											

In addition to these standard amenities, transit providers occasionally provide - or partner with other organizations to provide - more unique amenities including custom shelters, landscaping, and public art. These amenity options are generally considered where they are integrated into a larger initiative such as a transitway, Transit Center, downtown bus stop, Transit Oriented Development project, or park-and-ride owned and maintained by a regional transit provider. The design of custom shelters, landscaping and public art should address ease of maintenance, repair and replacement.

Bus Stop Shelters

Bus stop shelters provide seating and protection from bad weather for customers and are particularly important to senior citizens, parents with small children, and persons with disabilities. The costs of shelter placement and ongoing maintenance limit the number of bus stops that can include shelters. Metro Transit considers the following factors to prioritize the bus stops where shelters are placed:

- High number of total passenger boardings, typically 40 or more boardings per day at bus stops located in Minneapolis and St. Paul and 25 or more boardings per day at bus stops located in suburban communities. This factor prioritizes shelter placement at bus stops where the most passengers are waiting, relative to the amount of transit service generally available in the community.
- High number of limited mobility boardings, to ensure that people vulnerable to inclement weather are protected.

- Stop location relative to minority and low-income census block groups to ensure regional equity goals are achieved.
- High number of transit transfers, to provide shelter where it is more likely that passengers are including a wait time in their transit trip.

Further, bus stop locations must be capable of supporting transit shelters. Factors such as sidewalk and right-of-way space, topography, land use compatibility and proximity to bus boarding locations are considered. Transit providers may consider locating shelters where ADA improvements are scheduled to maximize capital improvement investments. Requests from the community to place or remove shelters are considered in context of the quantitative analysis used to prioritize shelter locations.

Customer Information

Customer information at passenger facilities, including basic signage, maps, and schedules and real-time information, is an important component of transit service. Transit information can provide customers with basic route information such as a map of the route and the destinations along the route, a schedule, and real-time information about when the next bus will arrive. This type of information increases customer satisfaction and reassures them that they can depend on transit. New technologies play an important role in the deployment of customer information, and the Council will continue to expand a network of customer information systems using proven and cost-efficient technology at key locations, such as transit stations and centers, online and on mobile devices.

Transit Performance Standards

Performance standards are used to evaluate the relative productivity and efficiency of the services provided. To be responsible and dynamic, a transit system must consistently measure and adjust service in unproductive routes and address insufficient service in productive areas. These standards serve as indicators of route performance and call attention to routes that may need to be adjusted. The use of multiple performance standards provides better insight into the operational and financial performance of individual services and allows transit providers to balance the cost and ridership of each route with its role in the regional transit network.

Productivity

Productivity is measured as the number of Passengers per In-Service Hour. It is the total number of passengers carried divided by the in-service time. A high number of passengers per in service hour means a route is serving more people with the resources provided. The passengers per in-service hour standard establishes a minimum threshold of route performance. It is calculated at both the route and trip level. Table G-8 shows the minimum passengers per in-service hour by route type.

Table G-8: Passengers per In-Service Hour

Route Type	Route Average*	Minimum per Trip**
Core Local Bus	≥ 20	≥ 15
Supporting Local Bus	≥ 15	≥ 10
Suburban Local Bus	≥ 10	≥ 5
Arterial BRT	≥ 25	≥ 5
Highway BRT	≥ 25	≥ 5
Light Rail	≥ 70	≥ 50
Commuter Express Bus	Peak ≥ 20; Off-peak ≥ 10	Peak ≥ 15; Off-peak ≥ 5
Commuter Rail	≥ 70	≥ 50
General Public Dial-a-Ride	≥ 2	N/A
*Route average represents the average passengers per in service hour over the entire day. Individual hours may fall below standard.		
**Minimum per trip represents the minimum passengers per in service hour for individual trips on a route. Multivehicle trips, such as three-car trains, will be treated as a single trip.		

Routes and trips that do not meet these minimum standards should be reviewed for potential changes to increase ridership or reduce service. Very poor performing routes may be considered for elimination.

Cost Effectiveness

The cost effectiveness of a route is measured by the subsidy required to operate the route per passenger. Subsidy is calculated as the difference between the total cost of providing service minus revenue from passenger fares. Since different types of routes are expected to have different levels of performance, each route's subsidy is compared to the average subsidy of its peers. This standard identifies routes that are not operating within the range of peer routes and focuses corrective action for those services. Subsidy thresholds are determined by calculating the non-weighted subsidy per passenger average within each route type. Table G-9 shows the subsidy thresholds and possible corrective action.

Table G-9: Subsidy per Passenger

Threshold Level	*Subsidy per Passenger*	*Monitoring Goal*	*Possible Action*
1	20 to 35 percent over peer route average	For quick review	Minor modifications to route
2	35 to 60 percent over peer route average	For intense review	Major changes to route
3	Greater than 60 percent over peer route average	For significant change	Restructure or eliminate route

Appendix H: National and State Airport Classification

The National Plan of Integrated Airports (NPIAS) is constantly updated as state and local airport and system plans are completed and accepted by the FAA. Table H-1 indicates the current mix of airports for the region included in the 2013-2017 national plan and officially eligible for federal airport funding. Current national plan information is summarized below.

Table H-1: Current Mix of Airports Included in National Plan

Airport	Hub Type	Role		Year 5 Based Aircraft
		Current	Year 5	
Buffalo		GA	GA	50
Cambridge		GA	GA	47
Faribault		GA	GA	75
Le Sueur		GA	GA	57
Princeton		GA	GA	45
Red Wing		GA	GA	57
Rush City		GA	GA	41
St. Cloud		P	P	109
Winsted		GA	GA	33
Airlake		Reliever	Reliever	165
Anoka Co.-Blaine		Reliever	Reliever	494
Crystal		Reliever	Reliever	288
Flying Cloud		Reliever	Reliever	491
MSP International	Large	P	P	162
Lake Elmo		Reliever	Reliever	249
St. Paul Downtown		Reliever	Reliever	125
So. St. Paul		Reliever	Reliever	218
New Richmond		GA	GA	221
Osceola		GA	GA	69

Other airports, in addition to those in the National Plan of Integrated Airports (NPIAS) shown in Figure H-1, are part of the Minnesota State Airport System Plan (SASP) as depicted in Figure H-2. Several near-by airports in adjacent states are included to indicate where some Minnesota communities may access air service. Some of the ambiguities between the state and metro system designations are based upon state-wide requirements and laws and rules that apply only to the metro area; thus, the metro airport classifications are depicted on the map as a separate group without classification.

The existing Regional Airport System Plan (RASP) for the metropolitan area is depicted in Figure H-3; it identifies key parts of the system involving the hub airport, reliever airports, and special purpose facilities.

Figure H-1 National Plan of Integrated Airports

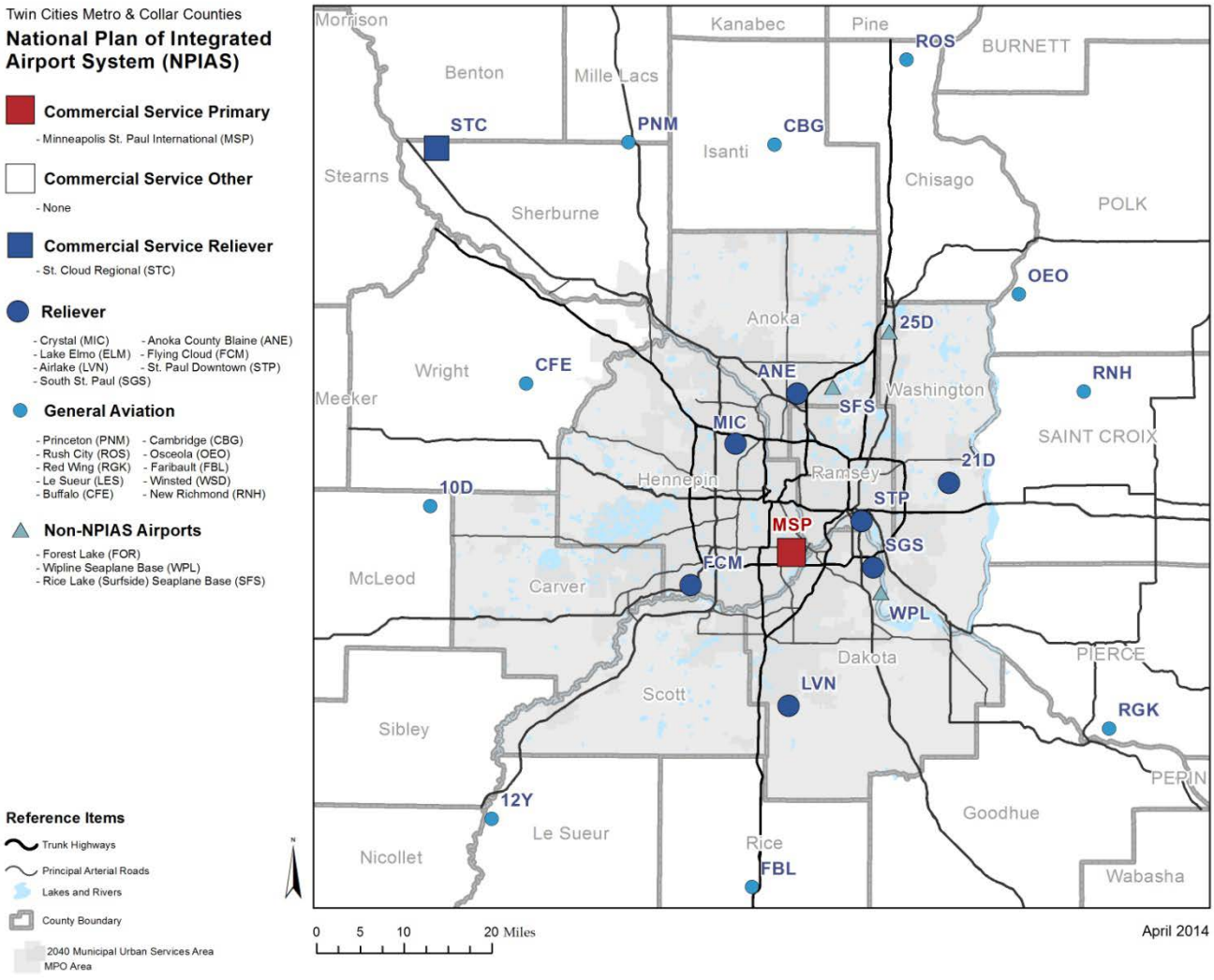


Figure H-2: Minnesota State Airport System Plan

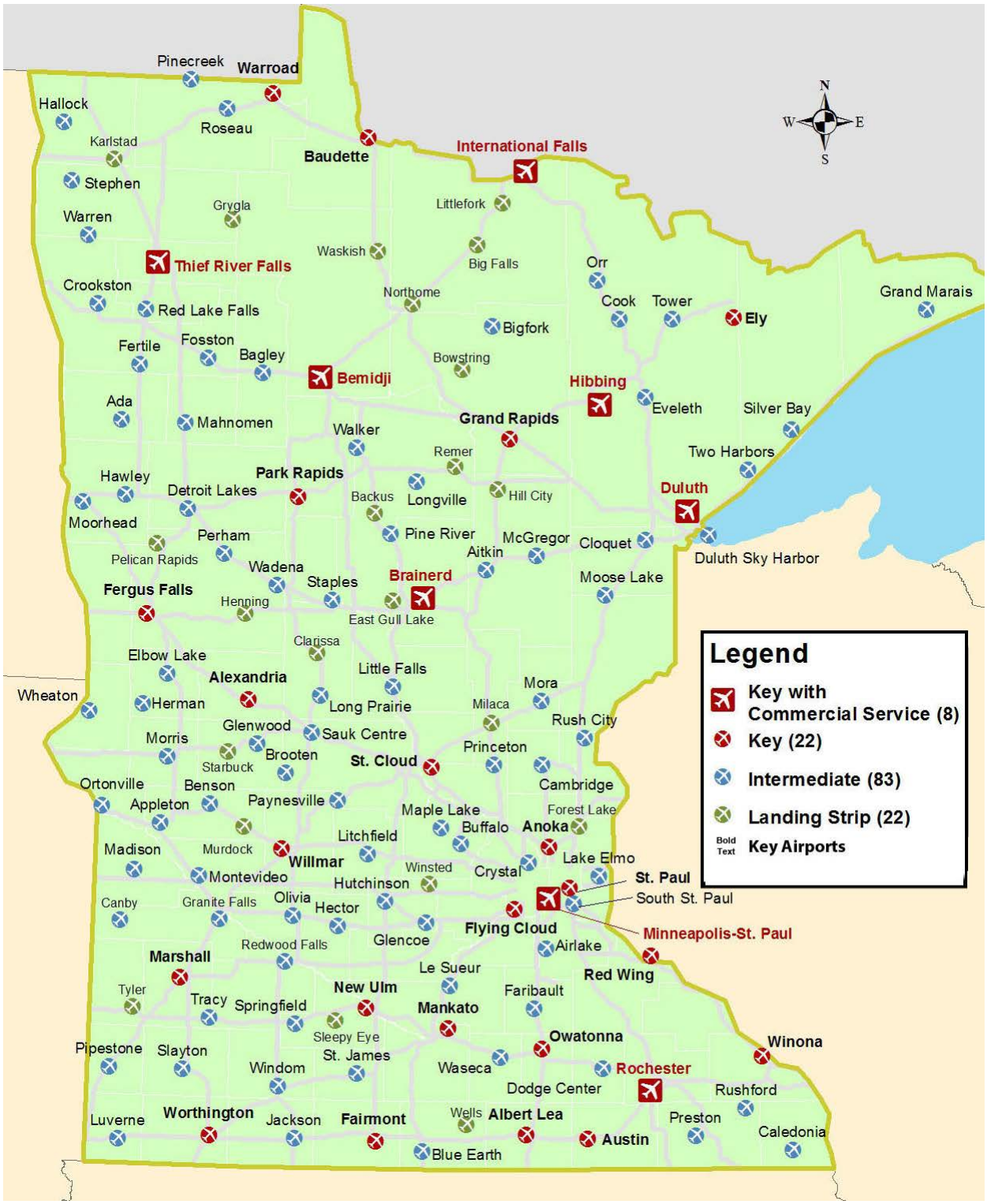
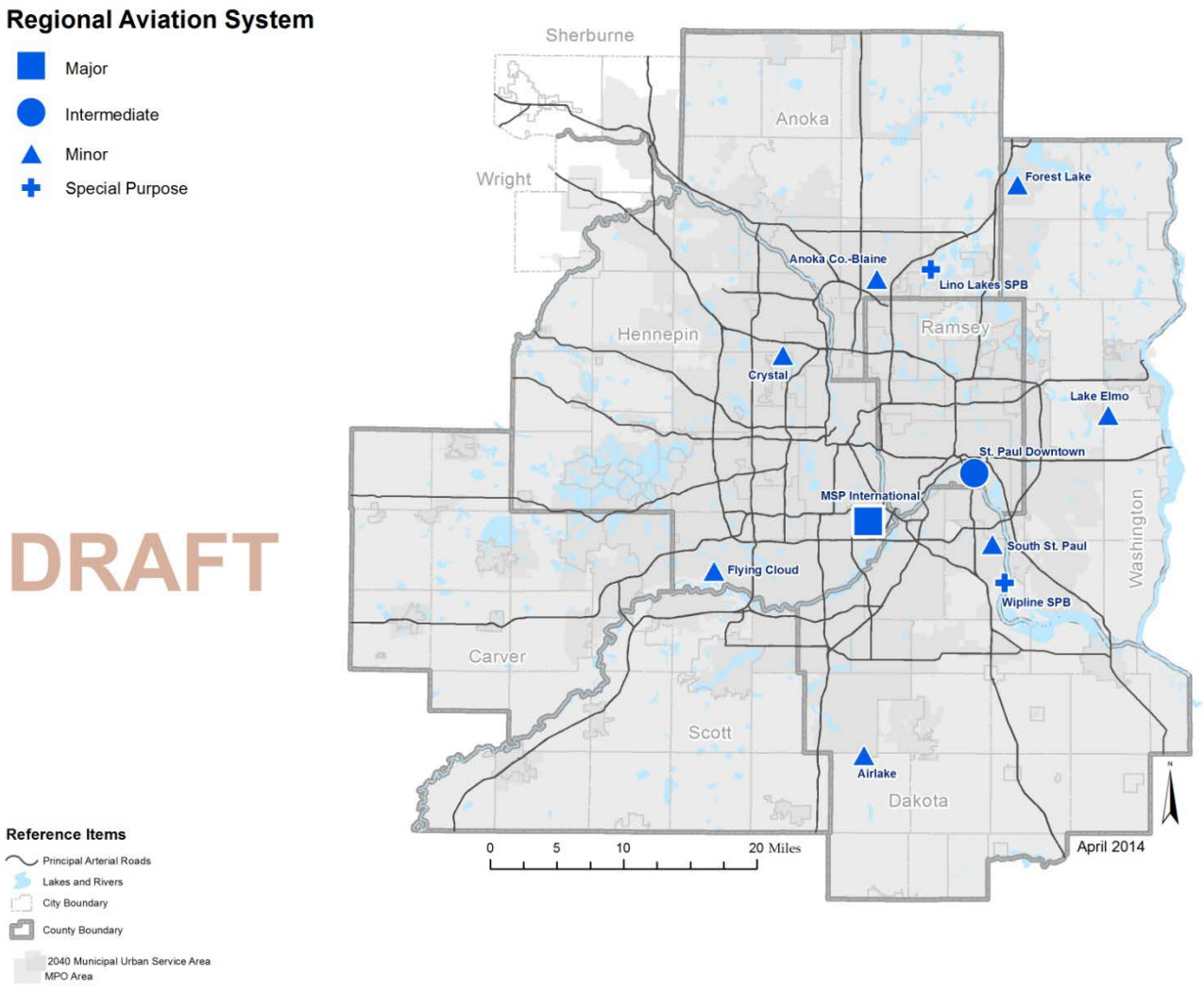


Figure H-3: Existing Regional Airport System Plan



Appendix I: Regional Airspace

All of the open sky covering the United States, from less than an inch off the ground all the way to outer space, is part of America's airspace. This airspace resource is recognized in both the Minnesota state airports system plan and the Minneapolis-St. Paul Metropolitan regional aviation system plan. All of this airspace is divided into several standardized types ranging from A through G, with A being the most restricted and G the least restrictive as depicted in Figure I-2.

Coordination and proper planning are required to make efficient and safe use of the airspace between the different classes of airports and air-transportation users. At lower altitudes this airspace is shared with the nation's communications industry and others that requires airport and airways protection from potential obstructions to air navigation, or activities that disrupt aviation communications and navigation/landing aids. Each type of airspace has its own required level of air traffic control services and its own minimum requirements for pilot qualifications, aircraft equipment, and weather conditions. In addition, there is other airspace reserved for special purposes called special use airspace.

Within the United States, airspace is classified as either controlled or uncontrolled. Controlled airspace will have specific defined dimensions (e.g. altitude ranges or vertical boundaries, and an applicable surface area or horizontal boundaries). Within controlled airspace air traffic control services are provided to all pilots operating under instrument flight rules, because they are flying solely by reference to instrument indicators. The services are also provide to some pilots operating under visual flight rules even though they are using points on the ground to navigate.

Class A airspace covers the entire United States at altitudes between 18,000 and 60,000 feet mean sea level. All jet routes are in this airspace that is used primarily by jets and airliners traveling over long distances between major cities. Air traffic in this airspace operates under IFR rules and must maintain radio contact with en route air traffic control. As aircraft transition from a jetway route to lower altitudes they are handed off to a specific destination airport's air traffic control. In most cases they will be arriving to an airport with an air traffic control tower that is surrounded by a Class B, C, or D airspace.

Figure I-2 depicts all airspace requirements, and Class B airspace extends from the surface to 10,000 feet and out to 30 nautical miles and is structured like an upside-down wedding cake. Class B airspace surrounds the nation's busiest airports, such as Minneapolis-St. Paul International Airport. At the outer limits of the Class B airspace, from the surface to 10,000 feet MSL at MSP, there is a Mode-C Veil. This is an imaginary vertical surface that delineates where an aircraft must have a Mode-C transponder so ATC can track their flight. Visual flight rules transition routes are specific designated flight paths used by air traffic control to route visual flight rules traffic through Class B airspace. Visual flight rules flyways are general flight paths

through low altitudes for general aviation to fly from one ground-based radio beacon to another across the U.S. It helps pilots plan flights into, out of, through, or near complex Class B terminal airspace, especially where instrument flight rules routes occur.

Class C airspace extends from the surface to 4,000 feet above ground level for a 20 nautical mile distance from the airport. This airspace surrounds other busy airports that have radar services for arriving and departing aircraft. No Class C airport airspace is designated in the Twin Cities metro area airspace.

Class D airspace surrounds airports with operating air traffic control towers and weather reporting services. This airspace extends from the surface to 2,500 feet above ground level within 4.3 nautical miles (5 statute miles) of the airport. In the metro area the Anoka County-Blaine, Crystal, Flying Cloud and St. Paul Downtown Airports have a Class D airspace designation. These airports have part-time air traffic control tower and their airspace reverts to Class E airspace areas when the towers are not in operation.

Class E airspace includes all other controlled airspace in the United States that is not designated as class A, B, C, D or G. This airspace extends to 18,000 feet MSL from various altitudes and can be extended to the surface. Class E airspace also surrounds airports with weather reporting services in support of instrument flight rules operations, but no operating control tower. In the Twin Cities area the Airlake Airport is such a facility.

Class F designated airspace is not used in the United States.

Class G airspace is uncontrolled; it includes all airspace in the United States not classified as Class A, B, C, D, or E. No air traffic control services are provided and the only requirement for flight is certain visibility and cloud clearance minimums. Most of the airspace below 1,200 feet above ground level is Class G airspace.

Special Conservation Area includes airspace surrounding national parks and wildlife refuges. In the Twin Cities region the St. Croix National and Scenic Wild River is such an area and pilots are requested to maintain a minimum altitude of 2,000 feet above ground level whenever possible. One objective is to avoid bird strikes and another is to minimize noise intrusion on wildlife and tranquility for user experience in protected natural settings.

Special Use Airspace

Special Use Airspace is where aeronautical activity must be limited, usually because of military use or national security concerns. (Note: None of the following airspace areas occur within the Twin Cities region.) Special Use Airspace includes the following:

- Prohibited areas (e.g. Camp David)
- Restricted areas (military activities including Controlled Firing Areas)
- Warning areas (extends outward from 3 nm off the coast).
- Military operations areas (established for military training activities)
- Alert areas (e.g. established for areas with a high volume of pilot training)

Other Airspace Areas

Other Airspace Areas are designated usually as temporary limitations for specific events and include:

- Airport Advisory Areas
- Military Training Routes
- National Security Area
- Temporary Flight Restrictions

Figure I-1: U.S. Airspace at a glance

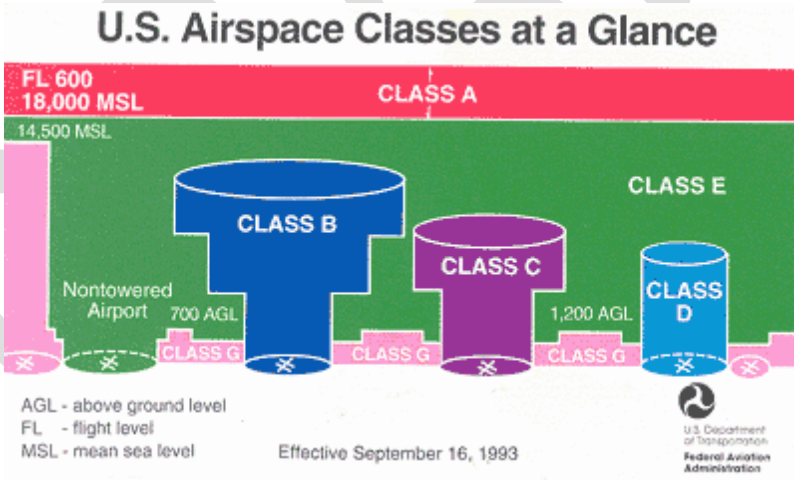
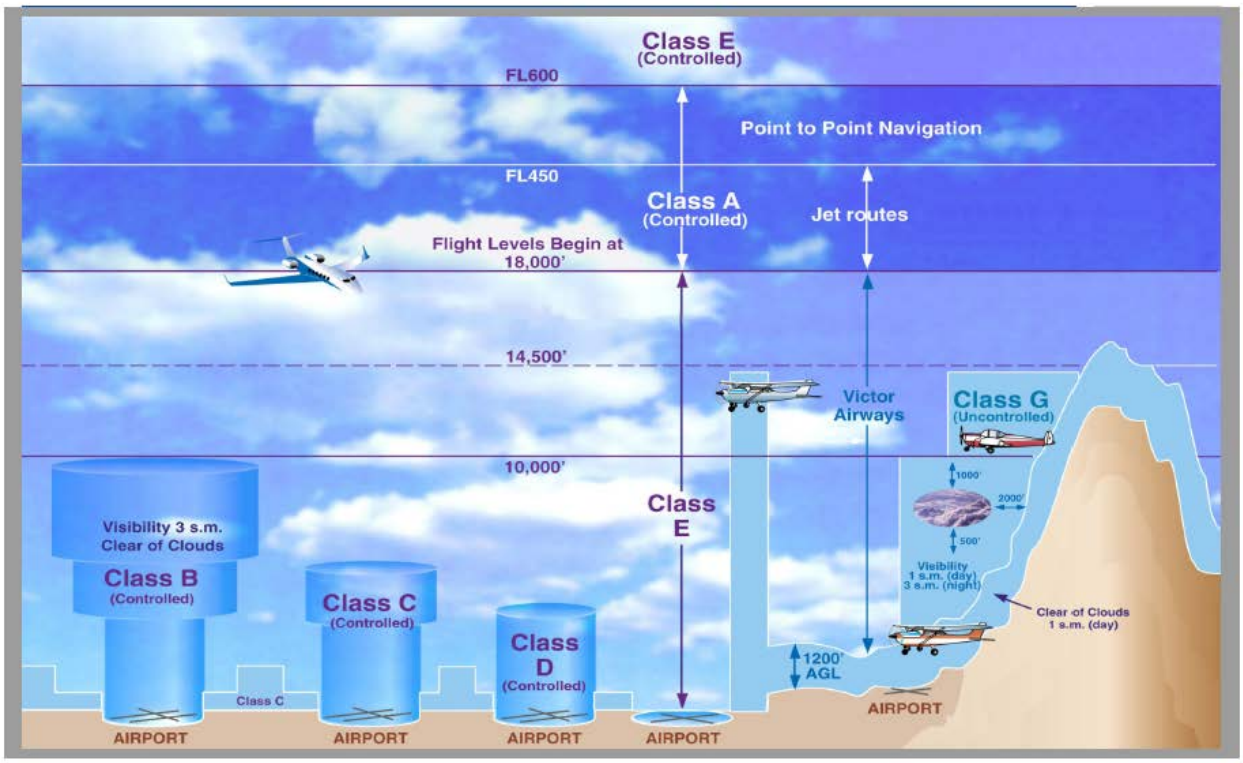


Figure I-2: Class B Airspace



Source: FAA and HNTB Corporation

Appendix J: Metropolitan Airports Commission Capital Investment Review Process

The overall aviation planning process for the Twin Cities metro area is discussed in the planning process section of the TPP Chapter 10. In Figure 10-19 the various local planning elements are depicted by shading, and include the capital improvement plan. Additional detail on the local capital investment agency review process is provided in this appendix.

Authority

As defined under state statutes for the Council and the Metropolitan Airports Commission, the capital investments made at the region's public-use airports are reviewed and commented upon, or under some conditions require approval, by the Metropolitan Council. For municipal or privately-owned, public-use airports the Council coordinates with MnDOT Aeronautics through their 5-year capital improvement program. This program is updated annually and is used in for identifying project eligibility and defining state and federal funding participation levels/schedule in the Statewide Transportation Improvement Program. The Metropolitan Airports Commission prepares a capital improvement program for the metro area airports they own and operate.

The Council reviews annually the Metropolitan Airports Commission capital improvement program under the following key legislative authorizations:

- MS 473.165, Council Review: Independent Commission, Board, Agency

Sd1

The Metropolitan Council shall review all long-term comprehensive plans (LTCP's) of each independent commission [Metropolitan Airports Commission], board, or agency prepared for its operation and development within the metropolitan area but only if such plan is determined by the Council to have an area-wide effect, a multi-community effect, or to have a substantial effect on metropolitan development. Each plan shall be submitted to the council before any action is taken to place the plan or any part thereof, into effect.

- MS 473.171, Council Review: Applications for Federal, and State Aid

Sd1 Federal

The Council shall review all applications of a metropolitan agency, independent commission, board or agency, and local governmental units for grants, loans or loan guarantees from the U.S. or agencies thereof submitted in connection with proposed matters of metropolitan significance, all other applications by metropolitan agencies, independent commission, boards and agencies and local governmental units for grants, loans, or loan guarantees from the United

States or any agency thereof if review by a regional agency is required by federal law or the federal agency, and all applications for grants, loans or allocations from funds made available by the United States to the metropolitan area for regional facilities pursuant to a federal revenue sharing or similar program requiring that the funds be received and granted or allocated or that the grants and allocations be approved by a regional agency.

Sd2 State

The council shall review all applications or requests of a metropolitan agency, independent commission, board or agency, and local governmental units for state funds allocated or granted for purposed matters of metropolitan significance, and all other applications by metropolitan agencies, independent commissions, boards, agencies, and local governmental units for state funds if review by a regional agency is required by state law or the granting state agency.

- MS 473.181, [Additional] Council Review Powers

Sd5 Airports

The Council shall review Metropolitan Airports Commission capital projects pursuant to section 473.621, Sd6. The plans of the Metropolitan Airports Commission and the development of the metropolitan airports system by the commission shall, as provided in sections 473.611, Sd5 and 473.655, be consistent with the development guide of the Council.

- MS 473.621, Powers of [Metropolitan Airports Commission] Corporation

Sd6 Capital projects, review

All Minneapolis-St. Paul International Airport capital projects of the commission requiring expenditure of more than $5 million shall be submitted to the Metropolitan Council for review. All other capital projects of the commission requiring expenditure of more than $2 million shall be submitted to the Metropolitan Council for review. No such project that has a significant effect on the orderly and economic development of the metropolitan area may be commenced without the approval of the Metropolitan Council.

In addition to any other criteria applied by the Metropolitan Council in reviewing a proposed project, the council shall not approve a proposed project unless the council finds that the commission has completed a process intended to provide affected municipalities the opportunity for discussion and public participation in the commission's decision-making process. An "affected municipality" is any municipality that (1) is adjacent to a commission airport, (2) is within the noise zone of a commission airport, as defined in the Metropolitan Development Guide, or (3) has notified the commission's secretary that it considers itself an "affected municipality."

The council must at a minimum determine that the commission:

- provided adequate and timely notice of the proposed project to each affected municipality;
- provided to each affected municipality a complete description of the proposed project;
- provided to each affected municipality notices, agendas, and meeting minutes of all commission meetings, including advisory committee meetings, at which the proposed project was to be discussed or voted on in order to provide the municipalities the opportunity to solicit public comment and participate in the project development on an on-going basis; and, considered the comments of each affected municipality.

Sd7 Capital project

For purposes of this section, capital projects having a significant effect on the orderly and economic development of the metropolitan area shall be deemed to be the following:

- the location of a new airport,
- a new runway at an existing airport,
- a runway extension at an existing airport,
- runway strengthening other than routine maintenance to determine compliance with Federal Air Regulation, Part 36,
- construction or expansion of passenger handling or parking facilities which would permit a 25 percent or greater increase in passenger enplanement levels,
- land acquisition associated with any of the above items or which would cause relocation of residential or business activities.
- MS 473.614, Environmental Review

In addition to overall NEPA and MEPA environmental requirements the Metropolitan Airports Commission has the following state directives concerning preparation of environmental documentation in relation to development and implementation of capital improvements.

Sd1 Capital Plan; environmental assessments

The commission shall prepare an assessment of the environmental effects of projects in the commission's seven-year capital improvement program and plan at each airport owned and operated by the commission. The assessment must examine the cumulative environmental effects at each airport of the projects at that airport, considered collectively. The commission need not prepare an assessment for an airport when the capital improvement program and plan for that airport has not changed from the one adopted the previous year or when the changes in the program and plan will have only trivial environmental effects.

Sd2 Capital Program: Environmental Assessment Worksheets

The commission shall prepare environmental assessment worksheets under chapter 116D, rules issued pursuant thereto, on the environmental effects of projects in the commission's capital

improvement program at each airport owned and operated by the commission. The scope of the environmental assessment worksheets required by this section is limited to only those projects in the program for an airport that meet all of the following conditions:

- The project is scheduled in the program for the succeeding calendar period.
- The project is scheduled in the program for the expenditure of $5M or more at MSP, or $2M or more at any other airport.
- The project involves (i) the construction of a new or expanded structure for handling passengers, cargo, vehicles, or aircraft; or (ii) the construction of a new or the extension of an existing runway or taxiway.

After adopting its capital program, the commission may amend the program by adding or changing a project without amending or redoing the worksheets required by this subdivision, if the project to be added or the change to be made is one that the commission could not reasonably have foreseen at the time it completed the worksheets.

For the purpose of determining the need for an environmental impact statement (EIS), the commission shall consider the projects included in the scope of a worksheet as a single project and shall assess their environmental effects collectively and cumulatively. The commission's decision on whether an environmental impact statement is needed must be based on the worksheet and comments. The commission may not base a decision that an EIS is not needed on exemptions of projects in state or federal rules. The commission is not required to prepare an EIS on an individual project, or to include a project in the scope of an EIS that the commission determines is needed, if the project is shown in the worksheet to have trivial environmental effects or if an EIS on the project has been determined to be adequate under state law.

The commission may incorporate into worksheets information from the commission's log-term plans, environmental assessments prepared under subdivision 1, or other environmental documents prepared on projects under state or federal law.

Sd2a Environmental Impact Report

Notwithstanding the provisions of subdivision 2, the commission shall prepare a report documenting the environmental effects of projects in the Minneapolis-St. Paul International Airport 2010 LTCP. Environmental effects of and costs associated with, noise impacts, noise mitigation measures, and land use compatibility measures must be evaluated according to alternative assumptions of 600,000, 650,000, 700,000 and 750,000 aircraft operations at the Minneapolis-St. Paul International Airport.

Sd3 Procedure

The environmental assessments required under subdivision 1 and the EAW's required under subdivision 2 must be prepared each year before the commission adopts its capital improvement plan and program.

The commission shall hold a public hearing on each environmental assessments and EAW before adopting the capital improvement plan and program. The commission may consolidate hearings.

The initial environmental assessments and EAW's must be completed before the commission adopts its capital improvement program for calendar years 1989-1995.

Sd4 Other Environmental Review

Nothing in this section limits the responsibility of the commission or any other governmental unit or agency, under any other law or regulation, to conduct environmental review of any project, decision, or recommendation, except that the EAW's prepared under subdivision 2 satisfy the requirements under state law or rule for EAW's on individual projects covered by worksheets prepared under subdivision 2.

Review Materials

The Metropolitan Airports Commission and the Council prepare various materials for their respective policy bodies and to facilitate coordination with standing committees, advisory groups and the public. The Metropolitan Airports Commission process is depicted in schematic form in Figure J-1, indicating the flow of various work /review elements in development of the capital improvement program and relationship of Metropolitan Council and EQB reviews.

Figure J-1 Development of MAC Capital Improvement Program

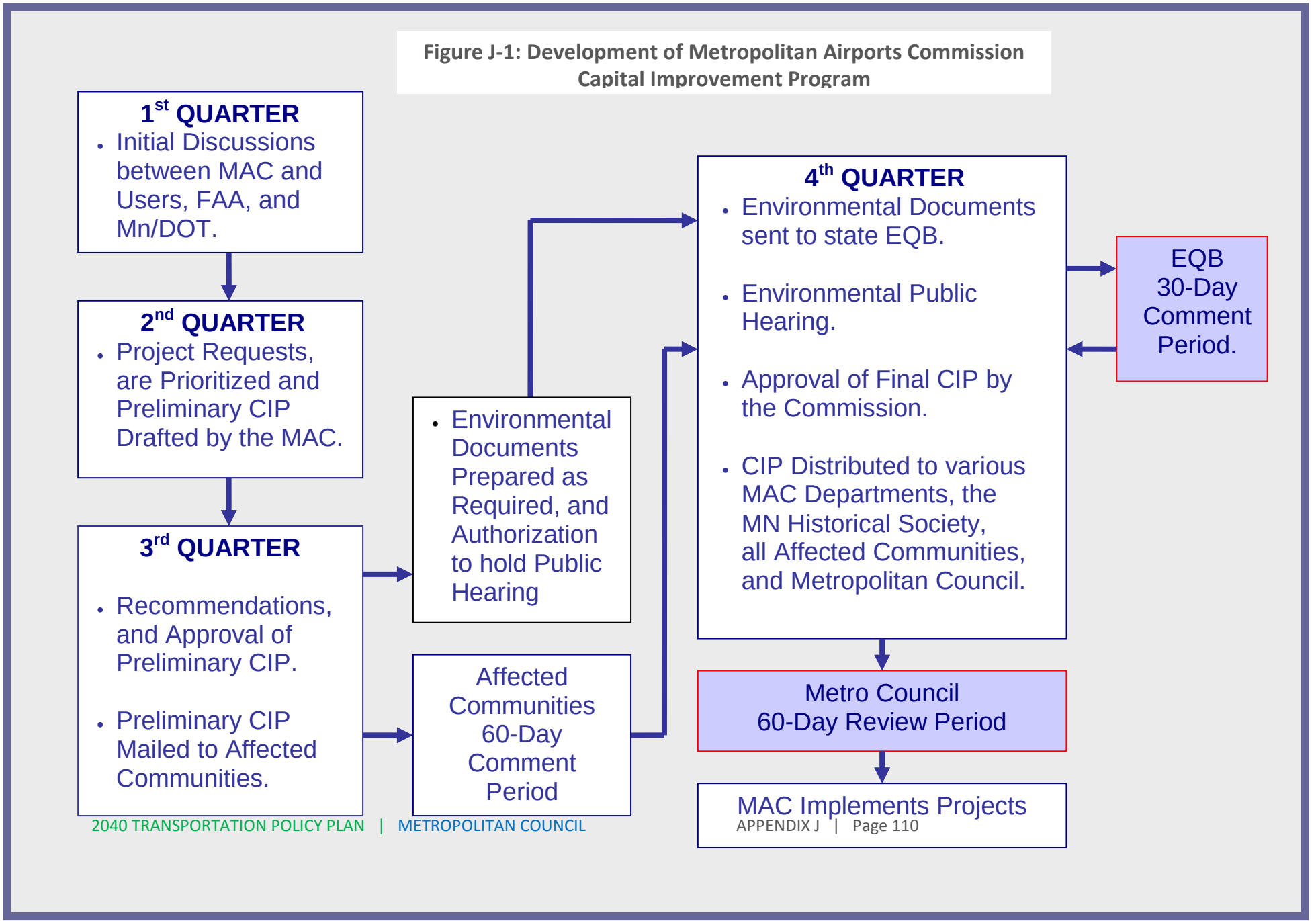


Figure J-2 indicates the actual review schedule that has been programmed for calendar year 2014. This same process is repeated annually with some slight change to the dates involved for specific actions. The review dates for the Council's Technical Advisory Committee (TAC) and the Transportation Advisory Board (TAB) are also included. The Metropolitan Airports Commission capital improvement program is reviewed within the capital review process in relation to the current long-term comprehensive airport development plan (LTCP), environmental evaluation or required environmental assessment worksheet or environmental impact statement, and project criteria as defined in the statutes.

Figure J-2: Annual Capital Improvement Program Review and Implementation Process

METROPOLITAN AIRPORTS COMMISSION CAPITAL IMPROVEMENT PROGRAM	RESPONSIBILITY	2014 SCHEDULE
PROJECTS DEFINITION		
Initial Capital Improvement Program (CIP) Discussions	Airport Development	January
Requests for CIP Projects to Airport Dev.	Departments	Feb. 1 – June 1
Dev. Project Scopes/Costs/Prioritization	Departments/Airport Development/Consultants	Feb. 1 – July 31
Develop Draft Preliminary CIP	Airport Development	Feb. 1 – July 31
PROJECTS ENVIRONMENTAL REVIEW		
Prepare AOEEs and EAWs as required	Environment	July 31-Oct. 15
Notice of FD&E Meeting mailed to affected Communities	Airport Development	September
FD&E Recommendation of Preliminary CIP to MAC for	Airport Development	September
Environ. Review/Authorization to hold P.H. on AOEE"s &	Airport Development	September
EAW's.	Airport Development	September
FD&E Minutes of Sept. Meeting and Notice of Sept.	Airport Development	September
Commission Meeting mailed to Affected Communities	Environment	October
MAC Approval of Preliminary CIP for Environmental	Environment	October
Review/Authorization to hold P.H. on AOEE's and EAW's	Airport Development	October
Preliminary CIP Mailed to Affected Communities	Environment	November
AOEE's and EAW's to Environmental Quality Board (EQB)	Environment	November
Public Hearing Notice Published in EQB Monitor, starting	Metropolitan Council	November
30-Day Comment Period	Affected Communities	November
Minutes of Sept. Commission Meeting mailed to	Tech. Advisory Committee	December
Affected Communities	Airport Development	December
Public Hearing on AOEE's and EAW's at Nov. FD&E	Airport Development	December
Committee Meeting	Airport Development	December
Thirty-Day Comment Period on AOEE's and EAW's ends	TAB – Policy Committee	December
Metro Council - TAC -Aviation Advisory Task Force	Transp. Advisory Board	December
Final Date for Affected Communities Comments on		
Preliminary CIP to MAC		
Metro Council -Technical Advisory Committee (TAC)		
Notice of December FD&E Meeting mailed to Affected		
Communities		
Recommendation by FD&E to Commission on Final CIP		
Minutes of December FD&E Meeting and Notice of Dec.		
Commission Meeting mailed to Affected Communities		
Metropolitan Council - Transportation Advisory Board		

PROJECTS PLANNING and FINANCIAL REVIEW		
Approval of Final CIP by Commission	Airport Development	December
Notification of Commission Action to EQB	Airport Development	December
CIP Distributed to MAC Departments, Met Council, State Historical Society and Affected Communities	Airport Development Transportation Committee	December January(NewYr)
Metropolitan Council – Transportation Committee	Metropolitan Council	January(NewYr)
Metropolitan Council	Airport Development	January(NewYr)
Minutes of December Commission Meeting mailed to Affected Communities		

Note: 1) All dates are tentative and subject to change. 2) Shaded items represent actions/dates which pertain to the Affected Communities as defined in Minnesota Statutes § 473.621, Sd. 6 as amended. 3) FD&E = Metropolitan Airports Commission Finance, Development and Environment Committee. 4) AOEE = Assessment of Environmental Effects. 5) EAW = Environmental Assessment Work Sheet. 6) EQB = Minnesota Environmental Quality Board

The Council does not officially review the Metropolitan Airports Commission annual operating budget or bonding proposals, but may use information from these documents to help clarify capital improvement program proposals and their implementation. Figure J-3 is the form designed by the Council to directly reflect those statutory criteria and is used by the TAC Aviation Advisory Task Force in its initial review of the capital improvement program. This is an initial review in that final comments by affected communities may not have been received or addressed by the Metropolitan Airports Commission prior to mailing to the TAC advisory task force. In most instances the Metropolitan Airports Commission 30-day review comment period is just ending, and proposed capital improvement program funding information is not completed and acted upon by the Commission.

Comments on the AOEEs and EAWs are addressed administratively by staff letter to the Metropolitan Airports Commission during the 30-Day EQB review period. The latest capital improvement program changes to come out of the review process at this time are often addressed verbally at the full TAC if they are different than the initial action item submitted for review. Final action by the Commission's Finance, Development & Environment Committee (FD&E), including any changes different from the information provided to the TAC, are addressed in reviews by the TAB Policy Committee and the full Transportation Advisory Board. Comments/recommendations made by the TAB are the forwarded for consideration by the Council's Transportation Committee report to the full Council for action.

Figure J-3: Criteria for Initial Review of the 2013 Capital Improvement Program

2013 Capital Improvement Program	**Prior Reviews / Actions**		**Capital Review Criteria ***							
	LTCP	AOEE***	**(A)**	**(B)**	**(C)**	**(D)**	**(E)**	**(F)**	**(G)**	**(H)****
PROJECT LISTINGS BY AIRPORT	Approved (Yes/No) Current [?]	EA-EAW - Prepared EIS - Reviewed NPDES - Approved Legislative Requirement Regulatory Requirement	Project meets the dollar threshold at: MSP = $5M Relievers = $2M	Location of a New Airport	New Runway at an Existing Airport	Runway Extension at an Existing Airport	Runway Strengthening Other than Routine Maintenance	New or Expanded Passenger Handling or Parking Facilities for > 25% capacity increase.	Land acquisition associated with the other criteria, or that would cause relocation of residential or business activities.	Project information made available by the MAC to affected municipalities for their review.
MSP INTERNATIONAL										
ST. PAUL DOWNTOWN - Runway Safety Area	•									**Y**
FLYING CLOUD -Sanitary Sewer & Watermain Extensions	•									**Y**
CRYSTAL	•									**Y**
ANOKA CO.-BLAINE	•									**Y**
LAKE ELMO	•									**Y**
AIRLAKE - South Building Area	•									**Y**

If an AOEE or EAW is required for projects in the annual Capital Improvement Program the following form in Figure J-4 indicates the types of environmental categories that are examined and whether it has an environmental effect or cumulative effect for a particular airport. The AOEE or EAW, along with the capital improvement program, provide more detailed information that is required if the project has an environmental effect.

Figure J-4: Types of Environmental Categories Used in Reviews

Project Description	Are the Effects of the Project Addressed in an Approved EAW, EA or EIS?	Environmental Categories Affected by the Project													
		Air Quality	Compatible Land Use	Fish, Wildlife and Plants	Floodplains and Floodways	Hazardous Materials, Pollution Prevention and Solid Waste	Historical, Architectural, Archaeological and Cultural Resources	Light Emissions and Visual Effects	Parks, recreation Areas and trails	Noise	Water Quality (Storm, Waste and Ground Water)	Wetlands	Infrastructure and Public Services	Farmland	Erosion and Sedimentation
MSP Projects															
Project X	Yes 2010 LTCP FEIS, May 1998	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Reliever Airport Projects															
Airport X	Yes Expansion FEIS June 2004	Effect*	Effect*	No Effect	No Effect	No Effect	Effect*	No Effect	No Effect	Effect*	Effect*	No Effect	No Effect	No Effect	No Effect
Airport Y															
Airport Z															

* All required mitigation is being completed as part of the project.

Appendix K: Airport Long Term Comprehensive Plans

Plan Context

The 20-year long-term comprehensive airport plan (LTCP) is intended to integrate all information pertinent to planning, developing and operating an airport in a manner that reflects its system role and compatibility with its surrounding environs. The plan content guidelines apply to major, intermediate and minor airports; therefore some flexibility for emphasis or level of detail on certain plan elements will be necessary.

Plans should be reassessed every five years and updated according to the review schedule defined later in this appendix. The reassessment involves reviewing the new forecasts against prior forecasts and actual airport activity, checking the progress of implementation efforts (e.g. individual project planning, environmental evaluations, and capital program), and identifying any other issues or changes that may warrant continued monitoring, interim action or establish a need for a plan update.

The LTCP does not replace any other planning or reporting requirements of another governmental unit. The scope and emphasis of a long-term comprehensive airport plan should reflect the airport's system role and the objectives for each plan content category as described below.

Plan Content

Airport Development

Objective: To portray the type and location of airport physical and operational development in a systematic fashion, reflecting both the historical and forecast levels of unconstrained aviation demand. The plan should include:

Background data including a description of previous planning studies and development efforts; each item described should contain a synopsis of pertinent dates, funding sources, objectives and results.

An overview of historical and forecast aviation activity (number of based aircraft, aircraft mix, number of annual and peak hour aircraft operations) and the demand compared to the existing and proposed facilities.

An airport map showing land use areas, by type, within the airport property boundary or under airport control. Maps showing airport development phasing based upon key demand and capacity levels. A description of facilities staging, by phase, for specific land use areas. A copy of

the latest FAA-approved airport layout plan (ALP) with associated data tables as described in FAA AC 150/5070-6.

Airport and Airspace Safety

Objective: To identify planning and operating practices required to ensure the safety of aircraft operations and protect the regional airspace resource. The plan should include:

An airport map depicting the airport zoning district, land use safety zones and a description of the associated airport zoning ordinance as required under MS 360.061-360.074 and defined in MN Rules 8800.2400. This map should contain appropriate topographical reference and depict those areas under aviation easements.

An airport area map showing the FAA FAR Part 77 airspace surfaces, including an approach and clear zone plan as described in FAA AC 150/5070-6.

A map of aircraft flight tracks depicting the local aircraft traffic pattern and general description of operating parameters in relation to the physical construction and operational development phasing of the airport.

Airport and Aircraft Environmental Capability

Aircraft on-ground and over-flight activities described within a historical and forecast context, including seasonal and daily traffic. Maps of aircraft noise impact areas depicted by contours of DNL noise levels for annualized aircraft activity.

Description of adopted Noise Abatement Operations Plan and/or operational abatement measures being implemented.

Description of land use measures and proposed strategy for off-airport land uses affected by aircraft noise as defined in the Land Use Compatibility Guidelines for Aircraft Noise. Description of aircraft, ground vehicle and point-source air pollution emissions within a historical and forecast context, including definition of the seasonal and daily operating environment. Identify existing and potential air-quality problem area(s).

Description and map of existing drainage system including natural drainage-ways and wetlands by type. Provide map and description of proposed surface water management plan for water quantity and quality including proposed facilities, storage volumes, rates and volumes of runoff from the site, and pollutant loadings associated with planned airport site facilities (as identified in SPCC and SWPPP) that could affect surface water quality. Proposed mitigation measures and facilities (during construction and long-term) to avoid off-site flooding and minimize polluting of surface waters. A description of measures to mitigate the potential impact or compensate for the loss or alteration of wetlands.

Description of the types of potential groundwater contaminants present on the site and proposed measures for the safe handling, storage and disposal of these substances to protect ground water, including description of the Metropolitan Airports Commission and private operators roles for managing these materials.

Projection of the annual average volume of wastewater to be generated for the next 20 years by five-year increments from terminals, operators and the proposed facilities (description and map) for handling and treating wastewater including public sewer service, private treatment plants and individual on-site sewage disposal systems. Include a description of proposed management for private facilities and roles of the Metropolitan Airports Commission and private operators in implementation.

Description of recommended air, water and noise control plans, including monitoring programs.

Compatibility with Metropolitan and Local Plans

Objective: To identify demand and capacity relationships between airport and community systems and define a management plan for maintaining compatibility. The plan should include:

Description of historical and forecast ground traffic activities, including average and peak-flow characteristics on a seasonal, daily, and peak hour basis. Map showing location of ground access points, parking areas and associated traffic counts. Definition of potential problem areas and plan for traffic management.

Description of water supply, sanitary and storm sewer and solid waste systems. Definition of historical and forecast use levels and capacities. Depictions of locations where airport systems interface with local or regional systems. Identification of potential problem areas and the plan(s) for waste management.

Description of other airport service needs (for example, police and fire) that may require changes in agreements or types/levels of governmental and/or general public support.

Implementation Strategy

Objective: To establish the type, scope and economic feasibility of airport development and recommended actions to implement a compatible airport and community plan. The plan should include:

- Description of the overall physical and operational development phasing needed over the next 20 years.
- A capital improvement plan to cover a seven-year prospective period. The first three years of the development plan should be project-specific, and the other four years of the plan, including projects of more than four years duration and new

projects, may be aggregate projections. Estimates of federal, state and local funding shares should be included for all projects included in the plans.
- Identification of the planning activities needed for implementation of the comprehensive airport plan.

Plan Amendment

The LTCP is to be prepared on a regular basis for each affected airport as defined in the LTCP review schedule. The document should be prepared to meet the plan content information discussed previously. In the event that a change to the plan cannot be accommodated during its scheduled update the LTCP, or parts thereof, should be amended. Proposed amendments are assumed to have required planning and environmental work substantially in progress. An amendment should be prepared and reviewed by the Council prior to project inclusion in that year's capital improvement program. Examples of potential amendments include, but are not limited to the following items:

- Projects meeting the capital review thresholds of $5 million at the Minneapolis-St. Paul International Airport, and $2 million at reliever airports,
- Changes requiring an update to FAA airport layout plan,
- Runway changes
- Projects having potential off-airport effects

Reliever Airport Non-aviation land use changes. This involves land use parcels on-airport that are not being released by the FAA for sale, but remain as part of the airport property and are made available by the airport operator through lease agreements with private parties to enhance revenues to the airport sponsor . The size of parcels and lease period may vary considerably; location and use of potential parcels were not part of individual LTCP reviews. Council review objectives are:

- to monitor such parcel changes for purposes of maintaining its overall land use database
- to know the location and use of the parcels in relation to the approved LTCP
- to appraise airport operators of any recent local or metro system changes they may not be aware of that may need additional review/coordinated
- to establish an administrative review process in coordination with airport sponsors for review of non-aviation land use change proposals

Figure K-1: Update Schedule for Airport Long-Term Comprehensive Plans

METRO AREA PUBLIC USE AIRPORTS	PLAN STATUS	5-YEAR UPDATE
Minneapolis-St. Paul Int'l.	2030 LTCP Approved June 2010	2015
St. Paul Downtown	2030 LTCP Approved April 2010	2015
Anoka County-Blaine	2030 LTCP Approved April 2010	2015
Flying Cloud	2030 LTCP Approved April 2010	2015
Airlake	2025 LTCP Approved October 2008	2014
Crystal	2025 LTCP Approved October 2008	2014
Lake Elmo	2025 LTCP Approved October 2008	2014
So. St. Paul Municipal	Community CPU Approved 2009	2018
Forest Lake Municipal	Community CPU Approved 2009	2018
Lino Lakes Seaplane Base	Community CPU Approved 2009	2018
Wipline Seaplane Base	Community CPU Approved 2009	2018

Appendix L: Aviation Land Use Compatibility Guidelines

The regional Land Use Compatibility Guidelines for Aircraft Noise have been prepared to assist communities in preventative and corrective mitigation efforts that focus on compatible land use. The compatibility guidelines are one of several aviation system elements to be addressed in the comprehensive plans and plan amendments of communities affected by aircraft and facility operational impacts. The Metropolitan Land Planning Act, requires all local government units to prepare a comprehensive plan for submittal to the Metropolitan Council for review; updated plans will be due in December 2018. The new plans will reflect the *Thrive MSP 2040* vision, and the 2015 Metro Systems Statements. The following overall process and schedule applies:

- In 2015, after adoption of the new *2040 Transportation Policy Plan*, the Council transmits new Systems Statements to each metro community.
- Within nine months after receipt of the Systems Statements each community reviews in comprehensive plan and determines if a plan amendment is needed to ensure consistency with *Thrive MSP 2040*. If an amendment is needed the community prepares a plan amendment and submits it to the Council for review.
- Each community affected by aircraft noise and airport owner jointly prepare a noise program to reduce, prevent or mitigate aircraft noise impacts on land uses that are incompatible with the guidelines; both operational and land use measures should be evaluated. Communities should assess their noise impact areas and include a noise program in the 2018 comprehensive plan update.
- Owners/Operators of system airports should include their part of the noise program in preparation or update of each airports long-term comprehensive plan. See Table L-1 Noise Impacted Communities for listing of noise-impacted communities.
- Council reviews community plan submittal and approves, or requires a plan modification.
- Airport owner submits long-term comprehensive airport plan or plan update for Council review and approval. A schedule for updates of long-term comprehensive plans is included in Appendix K as Table K-1.

Airport Noise

The airport section of the land use compatibility guidelines assume:

- Federal and Manufactures programs for reduction of noise at its source (engines, airframes),
- Airport operational noise abatement measures plan/in place,
- Community comprehensive plans reflect compatible land use efforts occurring through land acquisition, "preventive" land use measures, or "corrective" land use measures.
- Availability of a Council noise policy area map (from the most recently approved long-term comprehensive plan) for the facility under consideration. The noise policy exposure maps identify where, geographically, the land use compatibility guidelines are to be applied.

Preventive and Corrective Land Use Measures

Airport noise programs, and the application of land use compatibility guidelines for aircraft noise, are developed within the context of both local community and comprehensive plans, and individual airports long-term comprehensive plans. Both the airport and community plans should be structured around an overall scheme of preventive and corrective measures. Table L-2 Current Land Use Measures depicts the current land use measures adopted in conjunction with development of the MSP noise compatibility programs.

The status of noise compatibility programs at other system airports, in relation to the land use measures adopted at Minneapolis-St. Paul International, are also included to indicate the extent of the current noise control effort on a system-wide basis. Other land use measures may also need to be considered at reliever system airports. The level and extent of noise impacts vary widely between the airports and therefore not all land use measures may be appropriate for each specific airport, in addition, the level of noise abatement emphasis may need to be different for neighborhoods with the same community.

The compatibility guidelines indicate that some uses be "discouraged." Prior to applying the guidelines the comprehensive plan or plan amendment needs to assess what has been or can be done to discourage noise sensitive uses. This should be done when the overall preventive and corrective land use guidelines (contained in Table L-2) are defined and described below. All new land uses are categorized according to whether they are considered new/major redevelopment or new/in-fill/redevelopment.

The land uses are listed in Table L-3 Land Use Compatibility Guidelines for Aircraft Noise as specific categories grouped to reflect similar general noise attenuation properties and what the normally associated indoor and outdoor use activities are. The listing is ranked from most to lease sensitive uses in each category based upon the acoustic properties of typical land uses by the standard land use coding manual. The Council has prepared a builder's guide to assist in determining acoustic attenuation of proposed new single-family detached housing, which is discouraged, but may be allowed by communities in zone 4 and the buffer zone.

Table L-1: Noise Impacted Communities

Airport	Community
MSP International*	Minneapolis, Bloomington, Richfield, Mendota Heights, Mendota, Eagan, Burnsville
St. Paul Downtown	St. Paul
Anoka County- Blaine	Blaine
Flying Cloud	Eden Prairie
Crystal	Crystal, Brooklyn Park, Brooklyn Center
Airlake	Eureka Twp., Lakeville
South St. Paul	South St Paul, Inver Grove Heights
Lake Elmo	Baytown, West Lakeland, Lake Elmo

* As defined under MS 473.621, Sd 6.

Table L-2: Current Land Use Measures

Preventive Land Use Measures		
	MSP International Airport Communities	**Other Regional Airport Communities**
Amend local land use plans to bring them into conformance with regional land use compatibility guidelines for aircraft noise.	YES	YES
Apply zoning performance standards.	YES	YES
Establish a public information program	YES	YES
Revise Building code.	YES/MS 473.192	YES/MS 473.192
Fair property disclosure policy.	YES/Usually applied by developer or builder.	YES/Usually applied by developer or builder.
Dedication of aviation easements/releases.	YES	YES
Transfer of development rights.	NO	NO
Land banking (acquisition of undeveloped property)	NO	NO

Corrective Land Use Measures		
	MSP International Airport Communities	**Other Regional Airport Communities**
Airport Developed property Within RPZs Within Runway Safety Zones Within DNL 70	 YES YES YES	 YES FCM&STP Airports
Part 150 sound insulation program.	YES	NO
Property purchase guarantee	NO	NO
Creation of sound barriers Walls Berms Ground runup enclosures	 YES YES YES	 YES (Proposed in the FCM and ANE LTCPs)

Table L-3: Land Use Compatibility Guidelines for Aircraft Noise

Land Use Category	Compatibility with Aircraft Noise Levels									
Type of Development	New Development and Major Redevelopment					Infill Development and Reconstruction or Additions to Existing Structures				
Noise Exposure Zones	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	Buffer Zone*	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	Buffer Zone *
Land Use Category Residential Single / Multiplex with Individual Entrance Multiplex / Apartment with Shared Entrance Mobile Home	 INCO INCO INCO	 INCO INCO INCO	 INCO COND INCO	 INCO PROV COND		 COND COND COND	 COND COND COND	 COND PROV COND	 COND PROV COND	
Educational, Medical, Schools, Churches, Hospitals, Nursing Homes	INCO	INCO	INCO	COND		COND	COND	COND	PROV	
Cultural / Entertainment/Recreational Indoor Outdoor	 COND COND	 COND COND	 COND COND	 PROV COND		 COND COND	 COND COND	 COND COND	 PROV COMP	
Office / Commercial/Retail	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Services Transportation-Passenger Facilities Transient Lodging Other medical, Health & Educational	 COND INCO COND	 PROV COND PROV	 PROV PROV PROV	 COMP PROV COMP		 COND COND COND	 PROV COND PROV	 PROV PROV PROV	 COMP PROV COMP	

Land Use Category	Compatibility with Aircraft Noise Levels										
Type of Development	New Development and Major Redevelopment					Infill Development and Reconstruction or Additions to Existing Structures					
Noise Exposure Zones	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	Buffer Zone*	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	Buffer Zone *	
Services Other Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP		
Industrial/Communication / Utility	PROV	COMP	COMP	COMP		PROV	COMP	COMP	COMP		
Agriculture Land/Water Areas / Resource Extraction	COMP	COMP	COMP	COMP		COMP	COMP	COMP	COMP		

NOTE: COMP = Compatible; PROV = Provisional; COND = Conditional; INCO = Incompatible.

New Development: Major Redevelopment or Infill/Reconstruction

New Development - means a relatively large, undeveloped tract of land proposed for development. For example, a residential subdivision, industrial park, or shopping center.

Major Redevelopment - means a relatively large parcel of land with old structures proposed for extensive rehabilitation or demolition and different uses. For example, demolition of an entire block of old office or hotel buildings for new housing, office, commercial uses; conversion of warehouse to office and commercial uses

Infill Development - pertains to an undeveloped parcel or parcels of land proposed for development similar to or less noise-sensitive that the developed parcels surrounding it. For example, a new house on a vacant lot in a residential neighborhood, or a new industry on a vacant parcel in an established industrial area.

Reconstruction of Additions to Existing Structures - pertains to replacing a structure destroyed by fire, age, etc. to accommodate the same use that existed before destruction, or expanding a structure to accommodate increased demand for existing use (for example, rebuilding and modernizing an old hotel, or adding a room to a house). Decks, patios and swimming pools are considered allowable uses in all cases.

Definition of Compatible Land Use

The four land use ratings in land use compatibility Table L-3 are explained as follows:

COMP/Compatible - uses are acoustically acceptable for both indoors and outdoors.

PROV/Provisional - uses that should be discourage if at all feasible; if allowed, must meet certain structural performance standards to be acceptable according to MS 473.192 (Metropolitan Area Aircraft Noise Attenuation Act). Structures built after December 1983 shall be acoustically constructed so as to achieve the interior sound levels described in Table L-4. Each local government unit having land within the airport noise zones is responsible for implementing and enforcing the structure performance standards in its jurisdiction.

COND/Conditional - uses that should be strongly discouraged; if allowed, must meet the structural performance standards, and requires a comprehensive plan amendment for review of the project under the factors described in Table L-3.

INCO/Incompatible - Land uses that are not acceptable even if acoustical treatment were incorporated in the structure and outsides uses restricted.

Noise Policy Areas

A noise policy area is defined for each system airport and includes - aircraft noise exposure zones, a (optional) buffer zone; and, the preventative and corrective land use measures that apply to that facility.

Noise Exposure Zones:

Zone 1 - Occurs on and immediately adjacent to the airport property. Existing and projected noise intensity in the zone is severe and permanent. It is an area affected by frequent landings and takeoffs and subjected to aircraft noise greater that 75 DNL. Proximity of the airfield operating area, particularly runway thresholds, reduces the probability or relief resulting from changes in the operating characteristics of either the aircraft or the airport. Only, new, non-sensitive, land uses should be considered - in addition to preventing future noise problems the severely noise-impacted areas should be fully evaluated to determine alternative land use strategies including eventual changes in existing land uses.

Zone 2 - Noise impacts are generally sustained, especially close to runway ends. Noise levels are in the 70-74 DNL range. Based upon proximity to the airfield the seriousness of the noise exposure routinely interferes with sleep and speech activity. The noise intensity in this area is generally serious and continuing. New development should be limited to uses that have been constructed to achieve certain exterior to - interior noise attenuation and that discourage certain outdoor uses.

Zone 3 - Noise impacts can be categorized as sustaining. Noise levels are in the 65-69 DNL range. In addition to the intensity of the noise, location of buildings receiving the noise must also be fully considered. Aircraft and runway use operational changes can provide some relief for certain uses in this area. Residential development may be acceptable if it is located outside areas exposed to frequent landings and takeoffs, is constructed to achieve certain exterior-to-interior noise attenuation, and is restrictive as to outdoor use. Certain medical and educational facilities that involve permanent lodging and outdoor use should be discouraged.

Zone 4 - Defined as a transition area where noise exposure might be considered moderate. Noise levels are in the 60-64 DNL range. The area is considered transitional since potential changes in airport and aircraft operating procedures could lower or raise noise levels. Development in this area can benefit from insulation levels above typical new construction standards in Minnesota, but insulation cannot eliminate outdoor noise problems.

Noise Buffer zones - Additional areas that can be protect at option of the affected community; generally, the buffer zone becomes an extension of Noise zone 4. At MSP, a one-mile buffer zone beyond the DNL 60 has been established to address the range of variability in noise impact, by allowing implementation of additional local noise mitigation efforts. A buffer zone, out to DNL 55, is optional at those reliever airport with noise policy areas outside of the MUSA.

Table L-4: Structure Performance Standard*:

Land Use	Interior Sound Level**
Residential	45dba
Educational/Medical	45dba
Cultural/Entertainment/Recreational	50dba***
Office/Commercial/Retail	50dba
Services	50dba
Industrial/Communications/Utility	60dba
Agricultural Land/Water Area/Resource Extraction	60dba

* Do not apply to buildings, accessory buildings, or portions of buildings that are not normally occupied by people.

** The federal DNL descriptor is used to delineate all the system airport noise policy zones.

*** Special attention is required for certain noise sensitive uses, for example, concert halls.