ROCOG

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

Long Range Transportation Plan 2045

September 2020

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Resolution No. 2020-11

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RESOLUTION CONFIRMING THE LONG RANGE TRANSPORTATION PLAN AS BEING CURRENTLY HELD VALID

WHEREAS, the U.S. Department of Transportation requires that the Metropolitan Planning Organization (MPO) designated with the authority to carry out metropolitan transportation planning in a given urbanized area shall prepare a transportation plan for that area; and

WHEREAS, the U.S. Department of Transportation further requires that the MPO annually review this transportation plan, and confirm that it is currently held valid and consistent with current transportation and land use issues; and

WHEREAS, the Rochester-Olmsted Council of Governments (ROCOG) has been designated by the Governor of the State of Minnesota as the MPO for the Rochester-Olmsted metropolitan area; and

WHEREAS, ROCOG adopted its Short and Long Range Metropolitan Transportation Plan, *2045 LRTP*, in September 2020; and

WHEREAS, *2045 LRTP* includes a transportation systems management element, a short-range transportation element, and a long-range element providing for the transportation needs of the urbanized area; and

WHEREAS, the Transportation Technical Advisory Committee of ROCOG recommends that *2045 LRTP* be considered valid and consistent with current transportation and land use issues;

NOW, THEREFORE, BE IT RESOLVED, that the ROCOG Policy Board certifies that *2045 LRTP* is currently held valid and consistent with current transportation and land use considerations.

Upon motion by Mr. Keane, seconded by Wright, this 23rd day of September 2020.

ROCHESTER-OLMSTED COUNCIL OF GOVERNMENTS

By: ______________________ Chairman

ATTEST: Ben Griffith ______________ Dated: 9/25/2020 | 12:18 PM CDT

Ben Griffith, AICP, Executive Director, ROCOG

Table of Contents

1 • Introduction & Plan Development

Overview/Summary

The Rochester-Olmsted Council of Governments (ROCOG) is the designated metropolitan planning organization for the Rochester urbanized area. As such, it is federally charged with developing a long-range regional transportation plan (also known as a Metropolitan Transportation Plan, see Figure 1-1). This plan presents the region's vision for a multimodal transportation system needed to respond to future growth and demographic trends. Incorporated within this plan is a discussion of what can be accomplished under the fiscal constraints faced by public agencies and authorities responsible for development and operations of transportation facilities and services in the ROCOG area. Nevertheless, the vision is not limited by financial restrictions, and it includes illustrative projects that meet the region's transportation needs, but whose funding sources are not yet identified.

Chapter 1 describes the scope of the ROCOG 2045 Long Range Transportation Plan (referred to hereinafter as "LRTP" or "the Plan") and the process followed in updating the Plan. The planning area, time horizon and organizational structure of ROCOG are reviewed. This chapter also discusses the history of LRTP updates and supporting policy plans and presents the long-range goals that help to drive the content of the modal elements of the Plan that are outlined briefly below.

Figure 1-1

Metropolitan Transportation Plan (MTP)

Overview

Each **metropolitan planning organization** (MPO) must prepare a Metropolitan Transportation Plan (MTP), in accordance with 49 USC 5303(i), to accomplish the objectives outlined by the MPO, the state, and the public transportation providers with respect to the development of the metropolitan area's transportation network. This plan must identify how the metropolitan area will manage and operate a multi-modal transportation system (including transit, highway, bicycle, pedestrian, and accessible transportation) to meet the region's economic, transportation, development and sustainability goals – among others – for a 20+-year planning horizon, while remaining **fiscally constrained**.

The Plan provides a description of the transportation facilities and services that can be provided over the next 25 years based on reasonably expected revenues. This description considers both facility development as well as costs to maintain and operate the transportation system, including roadway, transit, bicycle, and pedestrian facilities and services. Expected revenues fall far short of fully addressing future transportation needs and desires, but the 2045 Plan does identify a path to provide for high-priority strategic investments.

Introduction

Preparation of a Long Range Transportation Plan is mandated under federal transportation planning guidelines first established in the 1962 Federal-Aid Highway Act. All urbanized areas over 50,000 in population, in order to be eligible to receive federal funding, must maintain a "continuing, cooperative, and comprehensive transportation planning process" that results in the periodic preparation of a Long Range Plan, as well as adoption of an annual program of federally funded projects known as the Transportation Improvement Program (Figure 1-2).

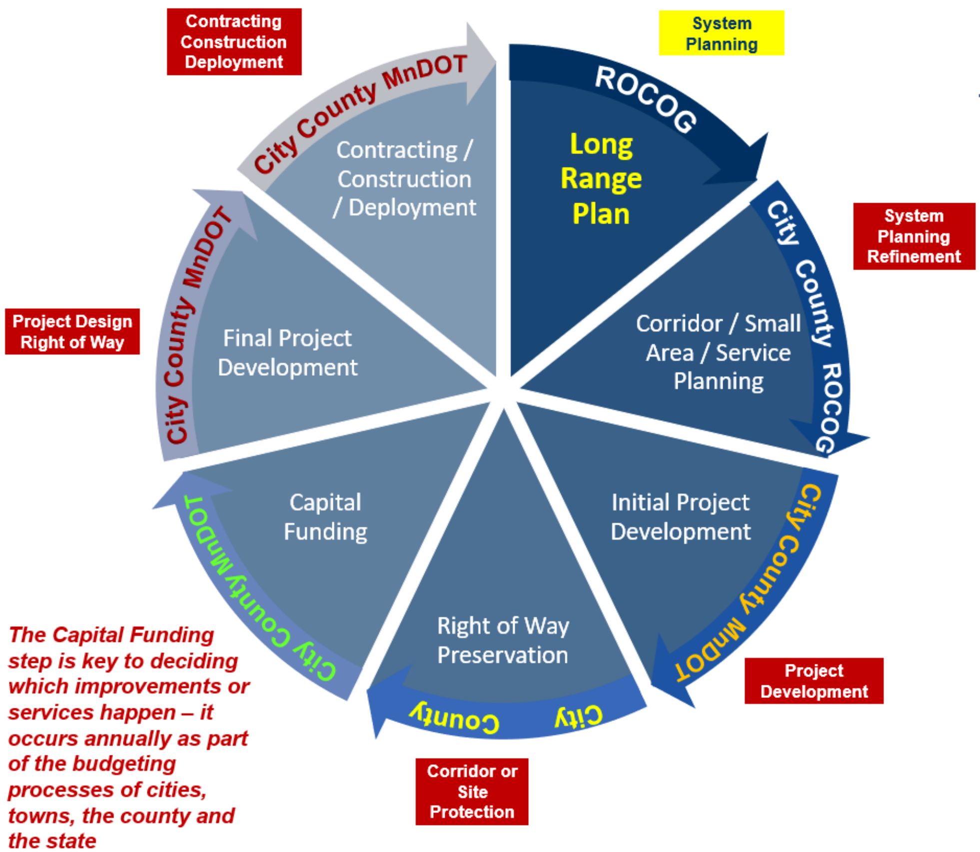
This ROCOG 2045 LRTP represents another step in the ongoing evolution of regional planning for transportation in the Olmsted County area that began in 1972 with the creation of the Rochester-Olmsted Council of Governments. The previous 2040 Long Range Transportation Plan Re-Affirmation was adopted by ROCOG in August of 2015. Under federal guidelines, the Plan needs to be updated every five years, normally with a new horizon year.

Federal guidelines also require a minimum 20-year horizon to be maintained throughout the life of the Plan. For traffic and financial forecasting, a 25-year horizon is a reasonable and realistic limit for projecting the specifics of traffic volumes or funding availability.

However, given that the life cycle of road facilities varies from 50 to 60 years (for roads) and up to 90 years for bridges, ROCOG has formulated certain aspects of this plan to reflect consideration of those longer time horizons to better guide future planning. For concerns such as corridor preservation or strategic-level planning, a longer view is considered appropriate by ROCOG since land use decisions in the near term may preclude long-term transportation options if not strategically accommodated in the development approval process. In these cases, the Plan looks at areas that may be influenced by urban growth trends over a 50 to 75-year period and considers infrastructure, such as urban rail, that may not be feasible within the 25 year plan horizon but strategically may need to be considered for its potential to address long term urban growth and travel needs. This decades-long view allows concepts such as extension of a basic arterial/collector grid, circumferential

Figure 1-2: Relationship of Long Range Plan to Transportation Facility Development Process

Transportation Planning & Development Process



What is a Long Range Transportation Plan (LRTP)?

As shown in the graphic at the left, an LRTP is just one early step in cycle of activities that leads to eventual construction of a project or initiation of a transportation service being realized.

The LRTP is updated every 5 years to provide the community an opportunity to identify changing trends in the region, anticipate future needs, and set goals for what the region hopes to achieve in next 20 or more years.

Since transportation needs or issues generally do not respect political boundaries, the LRTP provides an opportunity for a discussion among jurisdictions about common goals & working in a common direction.

One goal of the LRTP is to establish a stronger relationship between the Regional LRTP, State transportation plans, and other city and county plans to determine how transportation investment can contribute and support the land use, economic development and quality of life goals of local jurisdictions.

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arterials (beltways), or major transit supportive infrastructure to be considered at an appropriate scale. It also enables recommendations for long term expansion needs, such as right-of-way preservation, to be built into the Plan.

Influences Shaping the Future

The 2045 LRTP provides a comprehensive look at anticipated transportation system development in Olmsted County for the next 25 years. This Plan reviews and updates the current 2040 Plan Reaffirmation's project planning information and cost/revenue information by shifting the Plan's horizon year to 2045 and the base year to 2020.

Finding a balance between prioritizing the maintenance of our existing transportation system while promoting trip reliability and system resiliency in the future is key to transportation planning in the ROCOG area. It is vital that the region focuses adequate resources on maintaining and operating the existing transportation system.

Key Strategic Plans

Two significant new planning developments affect this Plan update:

- Integrated Transit Studies (ITS) to support the Destination Medical Center (DMC) Plan implementation
- *Planning to Succeed: Rochester Comprehensive Plan 2040 (P2S 2040)*

The ITS focused on how to achieve the transportation goals of the DMC Plan, which centered on reducing single-occupant auto travel to and parking in downtown Rochester. The DMC program, the largest economic development initiative in state history, provides a framework for the use of state, city, and county funding for public infrastructure to support an expected 50% increase in downtown employment and the continued success of the Mayo Medical Center as one of the premier health centers in the world. This DMC initiative is also expected to drive a significant increase in downtown housing and supporting visitor and hospitality uses in downtown Rochester. A mode shift from 10% downtown commuter transit usage today to 30% by 2035 was the ambitious goal of the DMC Plan, in recognition that with the dramatically increased employment expected in those years, downtown transportation would be hopelessly gridlocked if current auto usage patterns continued.

Providing improved transit and non-single occupant vehicle options to support this economic development vision has been identified as an important strategy for the future. Key elements of the DMC vision are expanded transit services coupled with a focused parking management strategy and expanded Travel Demand Management (TDM). "Arrive Rochester" is the City's newly formed TDM initiative, which will work with downtown employers and property owners to incentivize downtown workers to use a mode other than a private car to get to work downtown. Improved transit, TDM efforts, and the projected increase in downtown housing are expected to reduce the need for peak period, single occupant vehicle commuter vehicle travel into Rochester's urban core.

The second significant planning development to inform the ROCOG LRTP is the 2018 adoption of Rochester 's comprehensive plan, *P2S 2040*. This document provides a new look at future transit in the area, particularly as it affects work trips to the central business district. A backbone of high capacity, high frequency transit, referred to as the Primary Transit Network (PTN), envisions bus rapid transit service along a series of major arterial corridors in the city, connecting existing and future activity centers identified as part of transit-oriented land development strategy for the city.

Growth Impacts

In addition to these two significant planning initiatives, the Plan anticipates there will be instances where strategic improvement of the major road network is needed to support local growth and land use plans while enhancing connections between urban and regional areas. Olmsted County expects its population to increase from approximately 160,000 to 210,000 over the next 25 years. For the last half-century, Rochester has served as a major regional employment hub, attracting its workforce from a 40-50-mile radius in Southeast Minnesota.

Technological Advancements

ROCOG is aware of the advancement of technologies that continue to change the way people live and travel and acknowledges that technology may alter the way people go about their daily lives in the future. Rochester has been involved, along with other public partners including MnDOT, in discussions with private companies exploring autonomous transit and the chance to serve as an early testbed for these emerging technologies. The Plan supports the development, enhancement and further application of technologies to improve the travel experience.

Accessibility and Equity

The need to promote accessible and equitable transportation options will continue to be important as our aging population grows, while others continue to face barriers created by inadequate access to private travel options and transit. It will be vital to continue to maintain and look to expand the transportation system to ensure equal access for everyone.

Looking to the future, ROCOG will continue to support investments to:

- Preserve and manage the existing investment in the region's transportation system

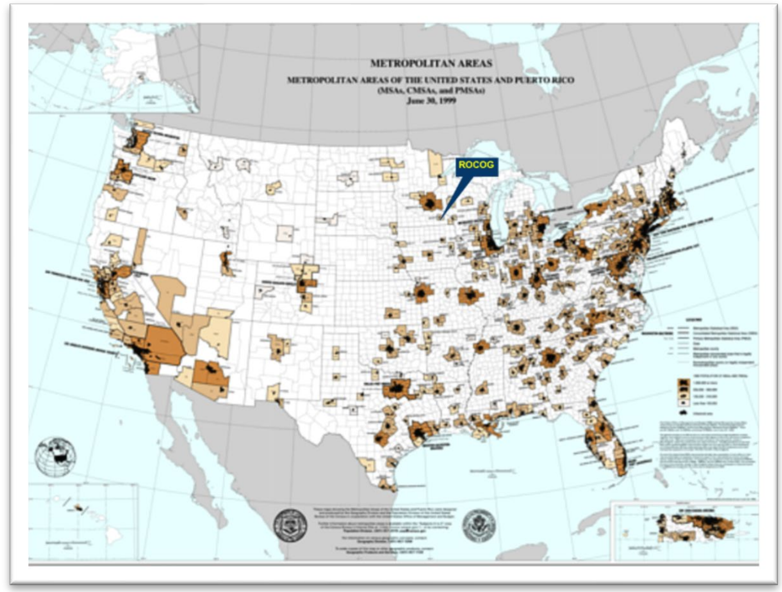
- Develop the region's potential to grow into a uniquely attractive, vibrant, and diverse metropolitan area
- Link transportation and land use planning to meet the Plan's goals for urban investment, concentrated development patterns, and smart economic growth
- Plan and build for all modes of transportation, including pedestrian, bicycle, public transit, cars, and trucks

ROCOG Organization

ROCOG is located in southeastern Minnesota (Figure 1-3) and is one of Minnesota's eight Metropolitan Planning Organizations (Figure 1-4). It is one of three that are entirely within the state, as the others are "bi-state" organizations. ROCOG was founded in 1972 following completion of the 1970 Census which found Rochester's urban area population to exceed 50,000.

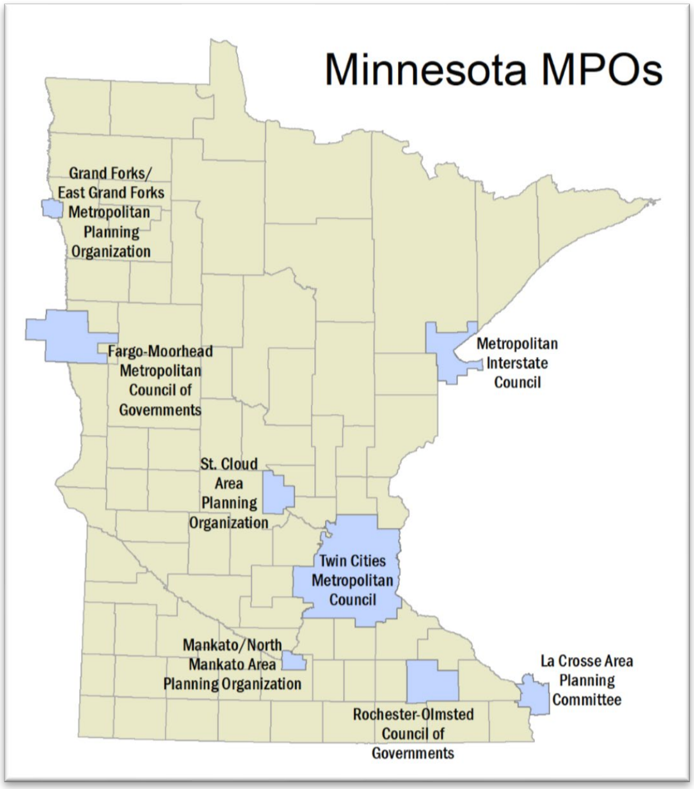
The ROCOG formal organization structure includes a Policy Board and a Transportation Technical Advisory Committee (TTAC). ROCOG also works with the City of Rochester's Pedestrian-Bicycle Advisory Committee (PBAC) and the Citizen's Advisory on Transit (CAT) for consultation during long range plan updates. Staffing for ROCOG is provided by the Olmsted County Planning Department. The 16 members of the Policy Board represent a cross section of local units of government in Olmsted County, including mostly elected officials, some government agency staff, and two resident members (see Figure 1-5). The jurisdictional delegates to ROCOG select the two (2) citizen delegates who act as voting members of ROCOG. The Policy Board is served by a Transportation Technical Advisory Committee (TTAC) composed of agency staff representing those organizations responsible for managing the major transportation systems within Olmsted County. It meets periodically during the year to discuss and coordinate transportation planning matters, with a focus on the

Figure 1-3: U.S. Metropolitan Areas



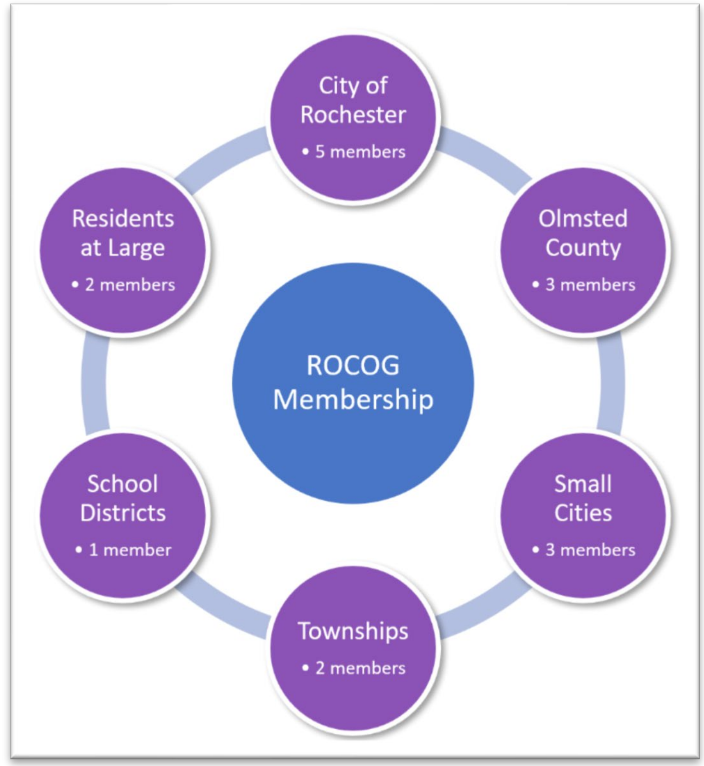
Rochester urbanized area and the adjacent area influenced by Rochester's urban growth patterns.

Figure 1-4: Minnesota MPOs



The Pedestrian-Bicycle Advisory Committee (PBAC) is an advisory committee appointed by the Rochester City Council and Mayor comprised of citizen volunteers as well as representatives of organizations such as neighborhood councils and public health. It advises the City Council and the City Engineer on planning and programming matters related to bicycle and pedestrian needs, and its members are involved directly in various initiatives related to

Figure 1-5: ROCOG Policy Board Membership



education, encouragement and the promotion of non-motorized modes of travel.

The Citizens Advisory on Transit (CAT) is a seven-member citizen advisory board appointed by the Rochester City Council and Mayor that assists in the planning and review of public transportation services within the Rochester area. In addition to planning and programming, the committee supports efforts to build community awareness of issues related to public transportation service.

Study Area and Time Horizon of the Plan

The Metropolitan Planning Area (MPA) for the Plan encompasses all of Olmsted County, including the planned urban expansion areas of the cities of Pine Island and Chatfield.

The MPA is broken into two sub-areas referred to as the Urban Study Area and the Regional Study Area, as illustrated in Figure 1-6. In the Regional Study Area, the focus is limited to those facilities or services important to the regional movement of persons and goods. The Urban Study Area focus is comprehensive in terms of considering issues and needs across the entire transportation system.

History of ROCOG Long Range Plan Updates

Prior to the organization of ROCOG in 1972, most transportation system planning in the Rochester area was done on the jurisdictional level. For example, the City of Rochester developed transportation plans in 1947 and 1960 as part of broader comprehensive planning efforts, and in 1968 through a joint effort with MnDOT. Table 1-1 lists the plans and policy reports that have been prepared and adopted by ROCOG since its establishment.

Federal/ROCOG Plan Goals

ROCOG has adopted a set of goals that describe desired future priorities for the region's transportation system and guide the preparation of the 2045 Long Range Plan, as listed in Table 1-2. ROCOG also supports the U.S. DOT Planning Factors as listed in the Fixing America's Surface Transportation (FAST) Act. The Planning Factors inform the long-range planning goals for the ROCOG planning area. It is recognized that the Planning Factors must be considered in the development of long-range transportation plans according to federal statute Title 23 § 450.306.

Figure 1-6: The ROCOG Study Area

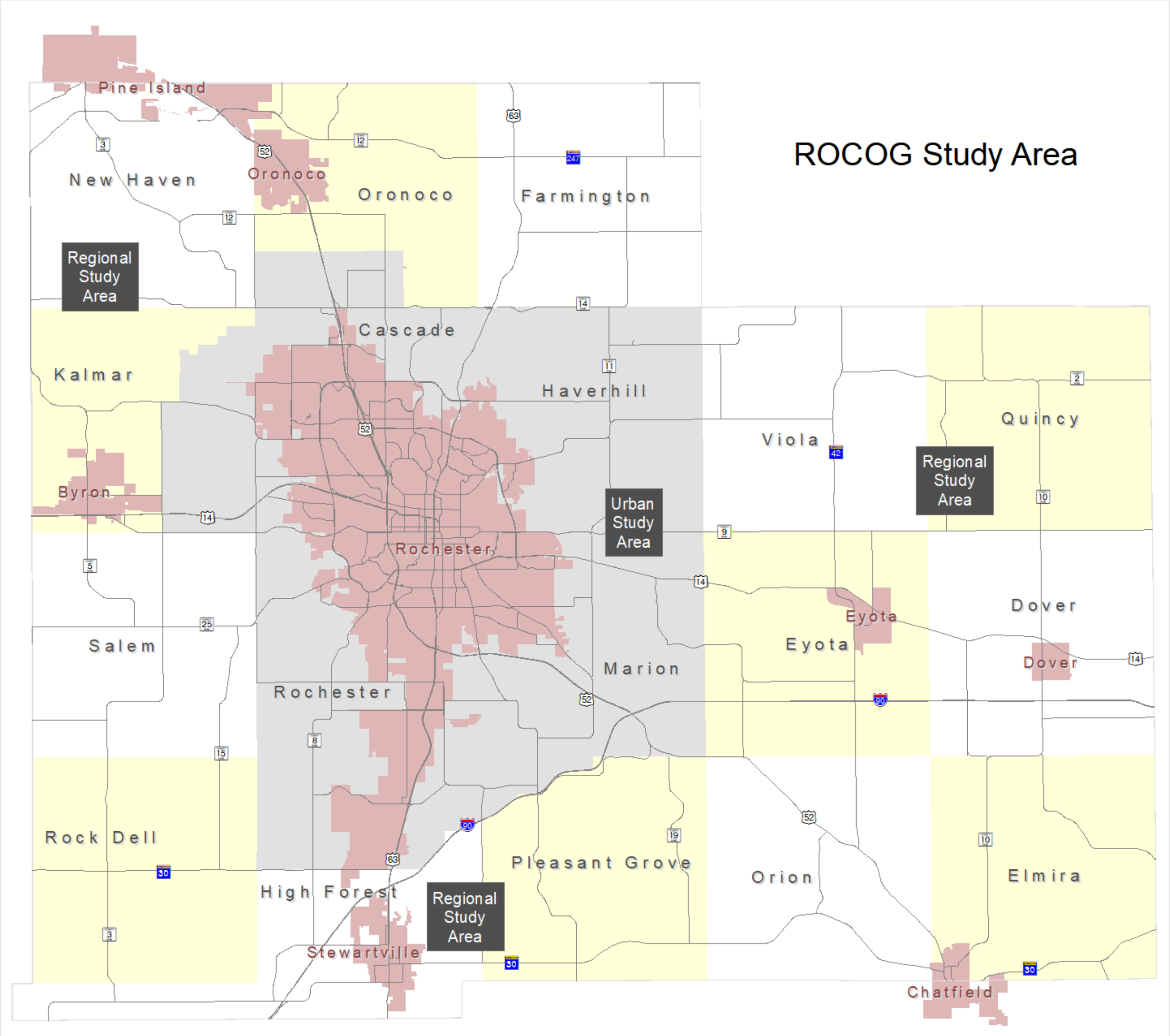


Table 1-1: ROCOG's Historic Long Range Transportation Plans and Policy Plans

Transportation LONG RANGE PLANS **Note: (xxxx) = Year Issued**
ROCOG Thoroughfare Plan (1977)
ROCOG Thoroughfare Plan Update (1982) *Downtown and Medical Campus amendments*
ROCOG Thoroughfare Plan Update (1985) *Northwest Rochester amendments*
ROCOG Thoroughfare Plan Update (1995) *Willow Creek amendments*
ROCOG Long Range Transportation Plan Update (June 1997) *Comprehensive LRTP update*
ROCOG Interim Long Range Transportation Plan Update (June 2003)
ROCOG 2035 Long Range Transportation Plan (2005) *Comprehensive LRTP update*
ROCOG 2035 Interim Long Range Plan Update (2007) *Policy Review of SAFETEA-LU Priorities*
ROCOG 2040 Long Range Transportation Plan (2010) *Comprehensive LRTP update*
ROCOG 2040 Reaffirmation Long Range Transportation Plan (2015)
ROCOG 2045 Long Range Transportation Plan (2020) *Comprehensive LRTP update*
Transportation POLICY PLANS
ROCOG Transportation Plan Policies (1977)
ROCOG Policy Directions Report (1996)

Table 1-2: ROCOG Planning Goals

ROCOG Long Range Plan Transportation Planning Goals	U.S. DOT Planning Factors*									
	Safety	Security	Connectivity	Efficiency	Accessibility	Preservation	Resiliency	Environment	Economic Vitality	Travel & Tourism
Preserve existing transportation infrastructure through systematic maintenance to sustain a state of good repair.										
Ex: Roadway and trail mill & overlay projects, replacement of bridges due to structure issues, transit vehicle replacement										
Mitigate current & future congestion by considering operational improvements or multi-modal options as well as capacity expansion.										
Ex: Expand Rochester Park & Ride system, interchange improvements @ TH 14/52, pave gravel roads in urban growth areas										
Improve safety through mitigation of high risk/high conflict locations & behaviors.										
Ex: Build interchange at TH 14/CSAH 44, convert TH 63 South from rural expressway to freeway, roundabout at TH 14/MN 42										
Provide adequate capacity and travel options to serve future 2045 urban growth areas.										
Ex: Upgrade 65 St NW west of TH 52, upgrade 48th St NE east of CSAH 33, expand city bus route network										
Improve bicycle and pedestrian connections with and through Downtown Rochester.										
Ex: Build protected bike lanes on Center Street & 3rd/4th Ave, develop future DMC Downtown City Loop and Discovery Walk										
Provide neighborhood bicycle and pedestrian connectivity to urban trail and path networks and major activity hubs outside of area downtowns.										
Ex: Chester Woods Trail connection in SE Rochester, path along north/east side of Crossroads Shopping Center, Willow Creek Trail										

ROCOG Long Range Plan Transportation Planning Goals	**U.S. DOT Planning Factors***									
	Safety	Security	Connectivity	Efficiency	Accessibility	Preservation	Resiliency	Environment	Economic Vitality	Travel & Tourism
Plan with long-range future land use as factor.										
Ex: Upgrade CSAH 44 from Valleyhigh Drive to 65th St NW, extension of 55th ST from West River Rd to CSAH 33										
Support implementation of transit system enhancements to increase transit mode share.										
Ex: Expand neighborhood bus routes, introduce new payment systems, add real time bus tracking information										
Support implementation of DMC Development Plans.										
Ex: Reflect DMC Transportation Plan elements in ROCOG Long Range Plan for federal funding, such as Downtown Rapid Transit										
Provide convenient access to goods, services, jobs and recreation for all residents regardless of socio-economic status, physical ability, and age.										
Ex: Enhance Dial-a-Ride service with complementary evening/peak taxi, close gaps in sidewalk network on major streets										
Support targeted areas of planned growth at transit supportive densities (TODs) with investment in transit and non-motorized infrastructure.										
Ex: Develop Downtown Rapid Transit, future development of Primary Transit Network, strategic siting of Park & Ride lots										
Educate, motivate and reward people through programs and services that make it easier for commuters to travel by bus, carpool, walking, and biking.										
EX: Support Arrive Rochester, preferential carpool parking, onsite locker facilities for bike commuters										
Ensure commercial passenger and freight traffic is convenient, safe and reliable.										
Ex: Improve access to/from Interstate 90 at TH 52 South interchange, improve airport access from CSAH 16/future MN 30										

***U.S. Department of Transportation (US DOT) Planning Factors**

Safety: Increase the safety of the transportation system for motorized and non-motorized users
Security: Increase the security of the transportation system for motorized and non-motorized users
Connectivity: Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
Efficiency: Promote efficient system management and operation
Accessibility: Increase accessibility and mobility of people and freight
Preservation: Emphasize the preservation of the existing transportation system
Resiliency: Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
Environment: 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
Economic Vitality: Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency
Travel & Tourism: Enhance travel and tourism

Plan Organization

The Plan is organized into four parts, with 16 chapters and appendices. Each part builds on the information in the previous part. Following this introductory chapter, the remainder of the Plan is organized as follows:

Part 1: The ROCOG Planning Region

Part 1 describes the ROCOG Planning Area, profiling the communities within the region and the state of the current transportation system.

Chapter 1 is the current chapter.

Chapter 2 presents information about the residents of the region and the local economy, including projections of population and employment growth expected to shape the future. The importance of regional commuters to the local economy is highlighted.

Chapter 3 presents summary information about the current state of the transportation system serving the ROCOG area. Network statistics on existing streets and highways, transit, facilities for pedestrians and low speed, two wheeled vehicles and commercial vehicles are presented.

Part 2: Planning Considerations

The chapters in Part 2 summarize the information that was used to inform preparation of the Plan.

Chapter 4 discusses the integration of land use and transportation planning in the Rochester region and what steps have been taken to ensure that the interrelationship between land use and transportation have been considered not only in this Plan but in other community planning projects.

Chapter 5 provides a summary of community comprehensive plans, transportation studies, and land use and economic development plans that have been considered in development of the Plan.

Chapter 6 provides a summary of public and public agency involvement that has occurred during development of this Plan.

Chapter 7 discusses existing transportation safety and security issues, current plans and programs in place to provide for safe travel during normal times as well as critical security events, and recommended programs and strategies for the future.

Chapter 8 provides an overview of technologies that are likely to influence future travel and discusses the types of actions communities should consider or take in the near term in preparation for a changing future.

Part 3: ROCOG Long Range Plan

The chapters in Part 3 focus on preparing modal plan recommendations and ways to improve the efficiency of the current travel network.

Chapter 9 introduces this section of the Plan and summarizes the key recommendations along with important factors such as metrics for the ROCOG relative to federal performance measures and a review of environmental justice considerations.

Chapter 10 presents the street and highway plan, including a policy-based highway system plan structured to account for both land use and travel needs, a summary of major preservation needs, and a list of priority projects.

Chapter 11 summarizes both existing and anticipated transit service changes envisioned for the region. Future downtown rapid transit service, a bus rapid transit system, and a robust expansion of the Rochester Park & Ride System are described.

Chapter 12 discusses active transportation modes with a focus on pedestrian and bicycle travel. It includes system plans highlighting major corridors targeted for regional and urban area bicycle travel, as well as transit related pedestrian improvement areas and other gaps in the major street network affecting pedestrian travel.

Chapter 13 highlights emerging and expanding Travel Demand Management (TDM) efforts in the Rochester area, including a review of emerging new travel options such as e-scooters.

Chapter 14 provides an overview of Transportation System Management and Operations (TSMO) efforts in the Rochester MPO area.

Chapter 15 presents a financial analysis of the various modal plans along with conclusions relative to fiscal constraints that will impact the level of investment and the types of investment activities that can be supported.

Chapter 16 concludes the Plan with a discussion of considerations that will affect its implementation.

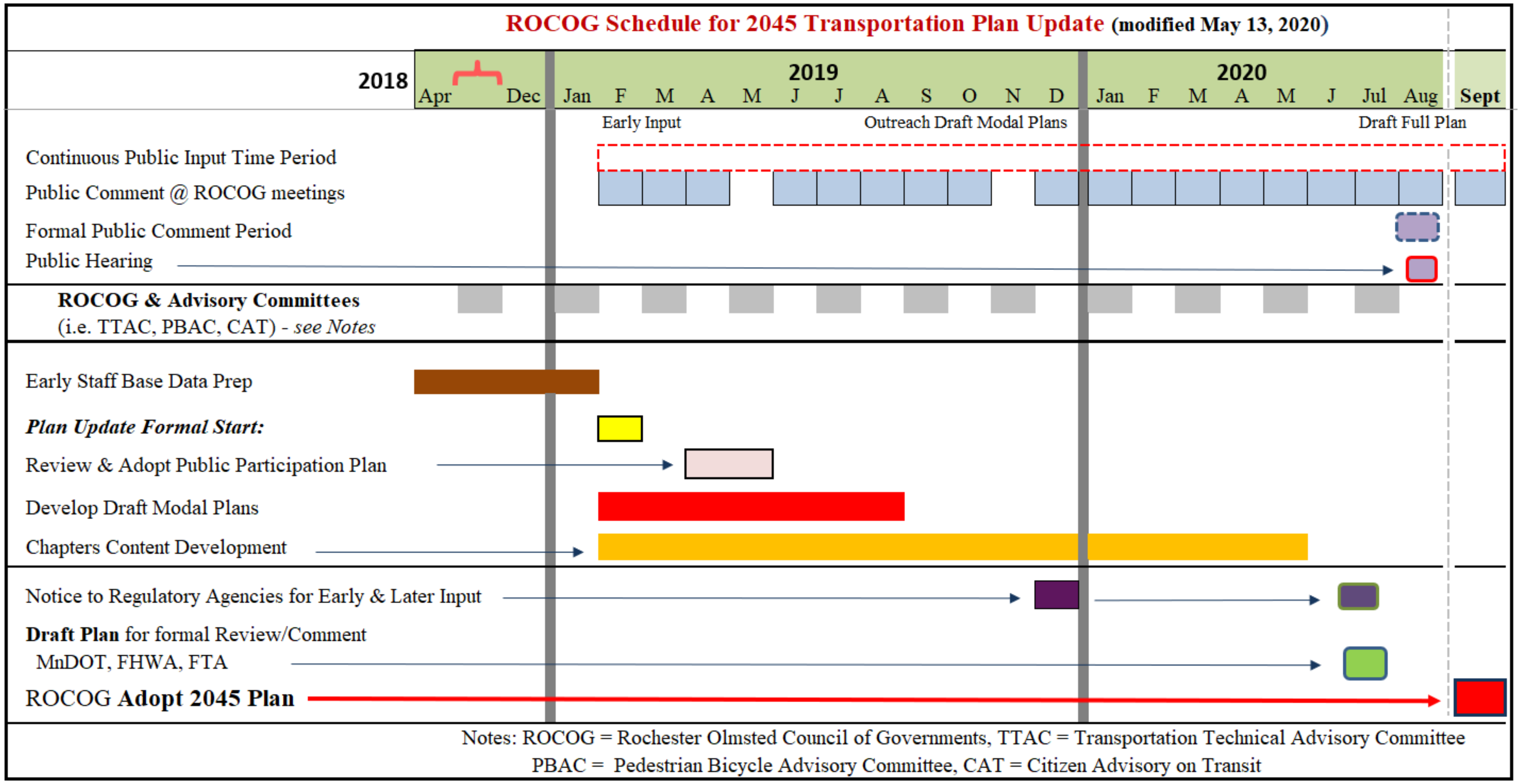
Part 4: Appendices

Part 4 includes summaries and important detailed analyses used to inform preparation of the Plan.

Plan Update Schedule

Figure 1-7 lays out the schedule used to guide the development of the ROCOG Plan.

Figure 1-7



2 • Planning Area Profile

Overview/Summary

There are a number of factors that influence the identification of future transportation investments needed to support individuals living and working in our community as well the businesses located throughout Olmsted County and those who travel to Olmsted County.

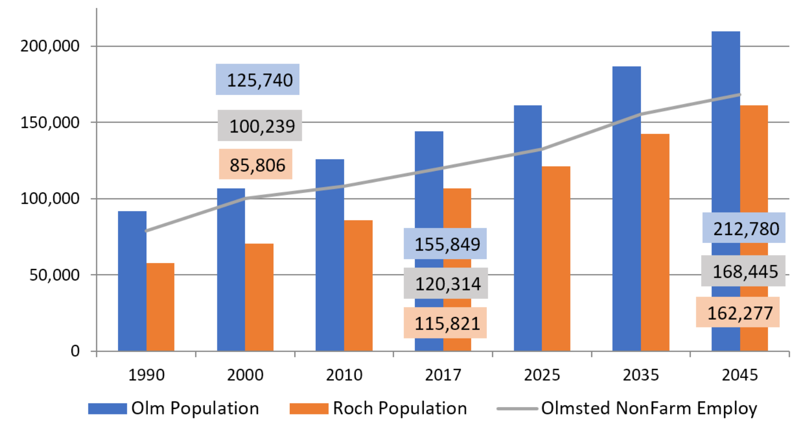
Fundamental to understanding the scope of future travel needs is a vision of how the community may change over time. Elements of this include developing an understanding of how the population of Olmsted County and its towns and cities may change over time, as well as how the local economy may change. Chapter 2 identifies key assumptions that have been made relative to demographics and the economy that inform the activities that generate travel. Chapters 4 and 5 of the Plan, found in Part II, review how these economic and demographic assumptions have informed the work of townships, cities and Olmsted County related to future land use, which is important to understanding the distribution of travel spatially across the county.

Chapter 2 provides a summary of key demographic and economic conditions within the ROCOG Metropolitan Planning Area (MPA) that influence the underlying planning assumptions utilized in development of the Plan. Included is a review of historical trends in population and employment as well important regional economic characteristics which affect travel in the region.

Rochester and Olmsted County have experienced consistent population growth for the last 30 to 40 years, seeing about 15,000 to 20,000 new residents added each decade. While the Great Recession of 2007-2009 resulted in a period of 3 to 4 years where this steady growth was interrupted, since 2012 the pattern of steady growth has resumed though at a somewhat lower level than seen prior to the recession. Rochester has accounted for most of the population growth in Olmsted County over the last generation, as the city has seen its share of county-wide population grow from about 62% in 1990 to almost 75% in 2018.

Looking to the future, the expectation is for the county to add approximately 55,000 people through the Year 2045, driven by the expected success of the Destination Medical Center (DMC) initiative and the effect that will have in spurring added demand for jobs in sectors such as retail services, leisure activities, construction, and public services. Rochester is expected to capture the largest share of that growth, but all the small cities and suburban townships are expected to see growth as well. Township growth will be concentrated in the suburban areas around Rochester, while more rural areas are expected to see some decline in overall population.

Figure 2-1: Population and Employment Forecast Summary



Rochester share of population goes from 74% (2010) to 76% (2045)

Source: Historic data: US Census, Bureau Economic Analysis; Forecasts – ROCOG

Regional commuters play a significant role in meeting labor force needs in Rochester, with approximately 35% of local jobs currently filled by workers from outside the city of Rochester. Moving those persons in and out of the metro area is one of the most significant transportation issues to address, since it largely occurs during the peak morning and afternoon travel times. Similarly, an outsize share of regional retail sales also occurs in Rochester given its role as the regional economic center for Southeast Minnesota, which also contributes to increased travel demand in the metro area.

The Rochester area is also seeing changes in household composition similar to those throughout the United States, with significant increases in single person households expected over the planning period and limited growth in traditional family households with children. An ever-growing number of single person households will be composed of persons over 65 years of age. Increases in the number of disabled and/or lower income people common in this age group add to demand for specialized transportation services.

Transportation investment is important to the economic success of the community. It is critical that transportation plans are coordinated with economic and community development efforts. Through its integration with the Olmsted County Planning Department and close working relationship with the Olmsted County Public Works Department and the City of Rochester Departments of Public Works (which includes Rochester Public Transit), Administration, and Community Development, ROCOG is involved in ongoing public and private sector development projects. This helps to create a two-way flow of information between transportation planning and other community planning efforts.

Since ROCOG is staffed by the Olmsted County Planning Department, it also benefits from staff's ongoing interaction with resource and environmental agencies. This relationship has enabled staff to build an extensive library of data on natural and cultural resources that informs the MPO's transportation planning efforts. It has also helped develop a number of initiatives addressing the impact of transportation facilities on the environment. Ongoing consultation efforts involving environmental mitigation activities are discussed in the appendices.

Introduction

Olmsted County has continued to see strong population growth in the first decades of the 21st Century, with a 25% growth rate between 2000 and 2018, compared to a statewide growth rate of 14% during the same period. Olmsted County's 9% growth rate in the 2010's to date is less than past decades, where population grew 18% in the 1990s and 15% in the 2000s.

The City of Rochester is the main population center in Olmsted County, with approximately 73% of the countywide population located in Rochester. Rochester has experienced a 9% increase in population between 2010 and 2017, lower than its growth rate in the 1990s (21%) and 2000s (24%), but still one of the stronger municipal growth rates in the state. Rochester is the 3rd largest city in Minnesota after Minneapolis and St. Paul, with an estimated 2018 population of 117,444. Olmsted County's 2018 population of 157,446 ranks as 8th largest in the state but is the largest county outside the sphere of the Minneapolis-St Paul metropolitan area.

The economy is built around health care, technology, and agriculture. The top four private-sector employers are Mayo Medical Center, IBM, Olmsted Medical Center, and Charter Communications. The Mayo Clinic and IBM together employ approximately 40,000 people in a workforce of approximately 86,000 persons.

Public-sector employment is led by Rochester Public Schools, which at 2,830 employees is the second-biggest employer in Olmsted County. In addition, the City of Rochester and Olmsted County have a combined employment of over 2,500.

The University of Minnesota-Rochester branch was established in 2007. The university currently has a student body of 500 students. It is projected to grow to 750 in the next few years and eventually 1,500 in the long term.

For over 140 years, the city of Rochester has remained the regional center for industry and commerce in southeastern Minnesota and northeastern Iowa. Olmsted County draws a significant number of workers from surrounding counties, with approximately 22% of persons who work in Olmsted County commuting from residences outside of Olmsted County.

Olmsted County and the City of Rochester are important regional retail centers, accounting for nearly 50% of sales in the seven-county area centered on Rochester. A large proportion of County retailing activity occurs in the City of Rochester, which accounts for nearly 90% of the retail sales in the county.

The high level of job growth in the county, combined with short commuting times to jobs in Rochester and local economic development initiatives, has resulted in population growth rates in small cities comparable to that in Rochester. These communities will continue to offer attractive options for households due to their convenient commuting distances to the Rochester job market, good schools, and attractive quality of life for those desiring to live in a smaller community.

Population

Table 2-1 summarizes the changes in the geographic population distribution that have occurred since 1990 in Olmsted County. By far the largest share of population growth has occurred in the City of Rochester (46,699), but small cities have been increasing in their share of the County's overall growth. Small cities have more than doubled in population since 1990, compared to the City of Rochester increasing by about 64% during that time. Due to significant annexation activity, suburban townships saw a 20% decline in population between 2000 and 2010. But suburban and rural townships have seen a rebound in population growth since 2010.

Population Projections

Table 2-2 summarizes population projections prepared by ROCOG for selected years through 2045. Olmsted County is projected to reach a population of 212,781, driven by the expectation of continued strong employment growth and expected increases in energy and housing costs that will lead more persons to locate closer to their place of work. Significant strategic economic development efforts including the DMC and Journey to Growth, a local business initiative to broaden the economic base, will provide support for growth.

Table 2-1: Population Trends 1990-2018

Jurisdictional Group	**Population**				Share of Growth			Rate of Growth		
	1990 Census	2000 Census	2010 Census	2018**	1990s	2000s	2010-2018	1990s	2000s	2010-2018
Small Cities*	10,529	13,131	16,751	18,260	14%	18%	11%	25%	28%	9%
Rochester	70,745	85,806	106,769	117,444	85%	105%	81%	21%	24%	10%
Suburban Townships	15,807	16,098	11,812	12,484	2%	-21%	5%	2%	-26%	6%
Exurban Townships	4,492	4,547	4,292	4,433	0%	-1%	1%	1%	-6%	3%
Rural Townships	4,897	4,695	4,624	4,825	-1%	-1%	2%	-4%	-2%	4%
Olmsted County	106,470	124,277	144,248	157,446				17%	16%	9%
Suburban Townships	*Cascade, Haverhill, Marion, Rochester, & Oronoco*									
Exurban Townships	*Kalmar, New Haven, High Forest, & Salem*									
Rural Townships	*All Other Townships*									

* *Border cities population include only that part in Olmsted County*

** *MN State Demographic Center "Latest annual estimates of Minnesota and its cities and townships population and households 2018"*

Table 2-2: ROCOG Population Projections

Jurisdiction	**2015**	**2017**	**2025**	**2035**	**2045**	**2015-2045 Growth**		**Share of Growth**
Rochester	112,089	115,733	128,484	147,516	162,277	50,188	45%	82%
Byron	5,320	5,426	6,194	7,244	8,724	3,404	64%	6%
Chatfield	1,241	1,228	1,466	1,705	1,894	653	53%	1%
Dover	752	755	917	1,095	1,255	503	67%	1%
Eyota	2,038	2,015	2,306	2,573	2,809	771	38%	1%
Oronoco	1,443	1,496	1,748	2,236	2,575	1,132	78%	2%
Pine Island	739	799	1,164	1,631	2,011	1,272	172%	2%
Stewartville	6,153	6,119	7,045	8,001	8,937	2,784	45%	5%
Total for Municipalities	**129,775**	**133,571**	**149,324**	**172,001**	**190,482**	**60,707**	**47%**	
Suburban Townships	12,327	12,298	12,695	13,312	13,788	1,461	12%	2%
Exurban Townships	4,447	4,401	4,432	4,428	4,298	-149	-3%	-0%
Rural Townships	4,785	4,728	4,651	4,459	4,213	-572	-12%	-1%
OLMSTED COUNTY	**151,334**	**154,998**	**171,102**	**194,200**	**212,781**	**61,447**	**41%**	

Source: ROCOG; Olmsted County Planning

Table 2-3: Population Projections in ROCOG Border Cities

Border Cities	*Growth projections for areas outside Olmsted County*						
Jurisdiction	**2015**	**2017**	**2025**	**2035**	**2045**	**2015-2045 Growth**	
Chatfield / Fillmore County	1,538	1,630	1,728	1,850	1,972	434	
TOTAL for Chatfield	2,779	2,858	3,194	3,555	3,866	1,087	39%
Pine Island / Goodhue Co.	2,524	2,602	2,810	3,070	3,331	807	
TOTAL for Pine Island	3,263	3,401	3,974	4,701	5,342	2,079	64%
TOTAL for ROCOG Cities	133,837	137,803	153,862	176,921	195,785	61,948	
Total: Olmsted + Border Cities	155,396	159,230	175,640	199,120	218,084	62,688	40%

Source: ROCOG; Olmsted County Planning

The majority of population growth is expected to occur in the City of Rochester (82% of total ROCOG area population growth), while Byron, Stewartville, and Pine Island are also expected to see significant increases relative to their existing size. Similar to the historic patterns, rural and exurban townships are generally expected to see a small decline in population, largely due to the aging of their population base, while suburban townships are projected to see some increase in resident population through 2045.

Table 2-3 shows the added growth expected in the cities of Chatfield and Pine Island which would occur outside of Olmsted County but would be considered part of the base population of the ROCOG MPA.

Population Issues

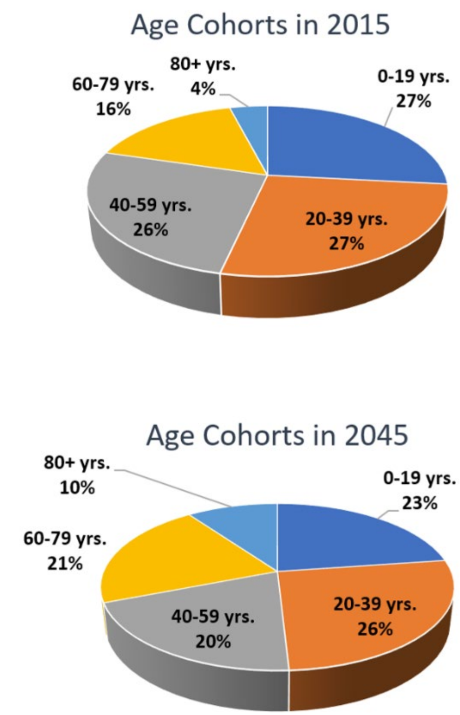
The region will continue to see growth in all age groups over time, although the greatest increase is expected to occur among those over the age of 60 as the large Baby Boomer generation completes its move into that age bracket. The number of persons over 60 is expected to nearly double over the next 25 years, as Generation X and the oldest Millennials will join the Baby Boomers in this age group during the time horizon of this Plan. This aging of the community may have a significant effect on the demand for public and private transit services as well as influencing the rise of shared ride services.

The rise in population among younger age groups will not be as dramatic as was seen in past decades due to dropping birth rates and relatively slow growth in the number of younger households in the prime family growth years. Slower household formation, smaller families among those in their prime employment and family growth years, trends toward more urban living, and less enthusiasm for car ownership among younger generations may all result in a slowing of growth in vehicular travel on a per capita basis as compared to past decades.

Figure 2-2 highlights distribution of population by age cohort based on comparison of 2015 and 2045 projections from the Minnesota State Demographic Center. These charts highlight the expected changes resulting from the aging of the post-WWII Baby-Boomer generation, with the numbers of persons over the age of 60 increasing significantly in the next 25-30 years.

This aging of the population carries potentially significant implications in terms of transportation needs, since persons in older age cohorts will typically create a higher demand for different types of transit services. For example, as reported in the American Community Survey 5-Year Estimates, approximately 29% of the 65+ population in Olmsted County had at least one disability. If this proportion stays constant, the population over 65 with at least one disability will grow from 6,270 in 2018 to 12,694 over the time horizon of this plan. This anticipated increase in the numbers of persons with a disability also highlights the need to ensure that ADA compatible transportation facilities, which includes transit vehicles and infrastructure such as sidewalks and trails, need to be designed (for new construction) or planned for upgrading (for existing facilities) to meet ADA requirements.

Figure 2-2: 2010 and 2045 Population Distribution by Age Cohort



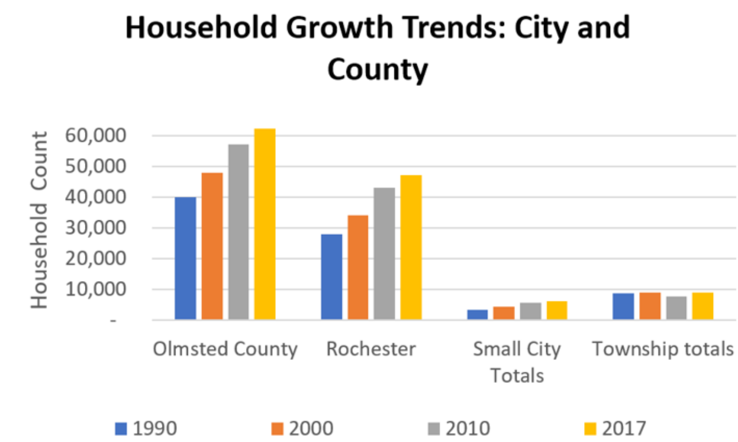
Source: Minnesota State Demographic Center

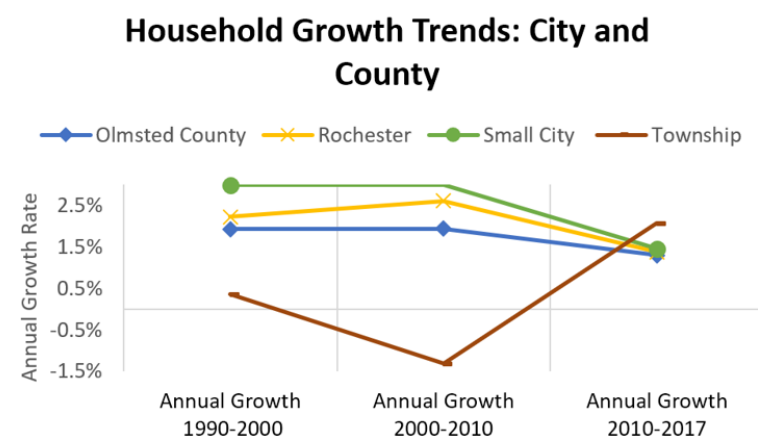
Research studies sponsored by US Department of Transportation and others have also suggested that this population change will necessitate consideration of items such as larger signage, brighter pavement markings, along with higher cost items such as possible adjustments in design, to respond to physical capabilities (or limitations) of this growing group of users. While costs are relatively minor when considering a single location, if considered on a system-wide basis they represent a significant level of investment. Maintaining these elements of the roadway infrastructure already present a funding challenge and adjusting to respond to the needs of a growing level of older drivers will only raise the level of importance of the issue in the future.

Households

Figure 2-3 highlights information on household growth trends for jurisdictions in the ROCOG Planning Area for the period 1990 through 2017. The annual rate of growth in the number of households in Olmsted County has been fairly stable since 1990, between 1% and 2%. The years since 2010 have seen an overall downturn in that rate, likely due to the effects of the Great Recession. While the City of Rochester and the small cities saw steep declines in their rate of housing growth after 2010, they still were adding housing during that period. The suburban and rural townships saw a decline in households between 1990 and 2010 but reversed this downward trajectory and saw higher housing growth rates after 2010. The exurban townships have seen consistently strong growth rates despite the Great Recession. In fact, the highest housing growth rate in the County has been in the exurban townships, with a 6% annual growth rate between 2010 and 2017.

Figure 2-3: Household Trends





Source: US Census

Given the strong relationship between households/housing units and trip generation, this pace of growth, if continued, has significant implications for future travel demand in the ROCOG area.

Household Composition

Table 2-4 summarizes projected changes anticipated through the year 2040 among different types of households. Relative to the overall 33% growth in total households expected to occur between 2017 and 2040, the number of married couple households with children is only expected to increase by 2%, while married couple households without children is projected to rise by 56%. Since households with children typically have the highest trip generation rates of all housing units, it suggests that that the aggregate level of traffic as measured at a household level may decline in the future.

There is a significant increase in single person households projected, both in the 65+ age group as well as among younger individuals. The significant rise in the proportion and number of single person households in the 65+ age group may have implications for the level of community-based transit service that will be needed in the future. These cohorts may also spur greater interest in walkable neighborhoods or mixed development areas, with greater demand for higher density, mixed use housing opportunities, including increased demand for downtown housing in particular. The Rochester Downtown Master Plan (2011) and the Destination Medical Center Plan (2015) both suggest a 100% to 200% increase in population in downtown Rochester as a result of increased growth in populations with an interest in downtown living.

Table 2-4: Projected Change in Composition of Households 1990-2040

Household Type	1990	2000	2010	Change 2010 to 2017	2017	2020	2030	2035	2040	2017 - 2040	Share of Growth
	Census	Census	Census		Census	Projected	Projected	Projected	Projected	% Change	%
TOTAL HOUSEHOLDS	40,058	47,807	58,530	162	58,692	67,360	71,290	74,950	78,320	33%	
Married couples with related children	12,473	13,365	13,287	566	13,853	13,890	14,060	14,130	14,160	2%	2%
Married couples without related children	11,441	13,728	17,258	101	17,359	22,610	24,470	25,910	27,120	56%	50%
Other families with related children	2,395	3,444	4,586	921	5,507	5,190	5,290	5,430	5,520	0%	0%

Household Type	1990	2000	2010	Change 2010 to 2017	2017	2020	2030	2035	2040	2017 - 2040	Share of Growth
	Census	Census	Census		Census	Projected	Projected	Projected	Projected	% Change	%
Other families without related children	1,428	1,780	1,910	455	2,365	2,160	2,320	2,490	2,680	13%	2%
Living alone	9,872	12,358	15,524	377	15,901	19,460	21,050	22,760	24,510	54%	44%
Living alone, age 65 and older	3,236	3,656	4,730	707	5,437	6,540	8,100	9,730	11,140	105%	29%
Other nonfamily households	2,449	3,141	3,863	-156	3,707	4,050	4,100	4,230	4,340	17%	3%
Householders ages 15 to 24	2,555	3,076	2,726	439	3,165	3,780	4,070	4,350	4,520	43%	7%
Householders ages 25 to 44	20,129	21,267	21,063	184	21,247	23,430	23,650	23,470	23,420	10%	11%
Householders ages 45 to 64	10,725	15,012	22,036	179	22,215	25,000	24,610	24,570	25,160	13%	15%
Householders age 65 and older	6,649	8,539	11,255	1,922	13,177	15,150	18,960	22,560	25,230	91%	61%

Source: Minnesota State Demographer

Social and Economic Characteristics Influencing Transportation Needs

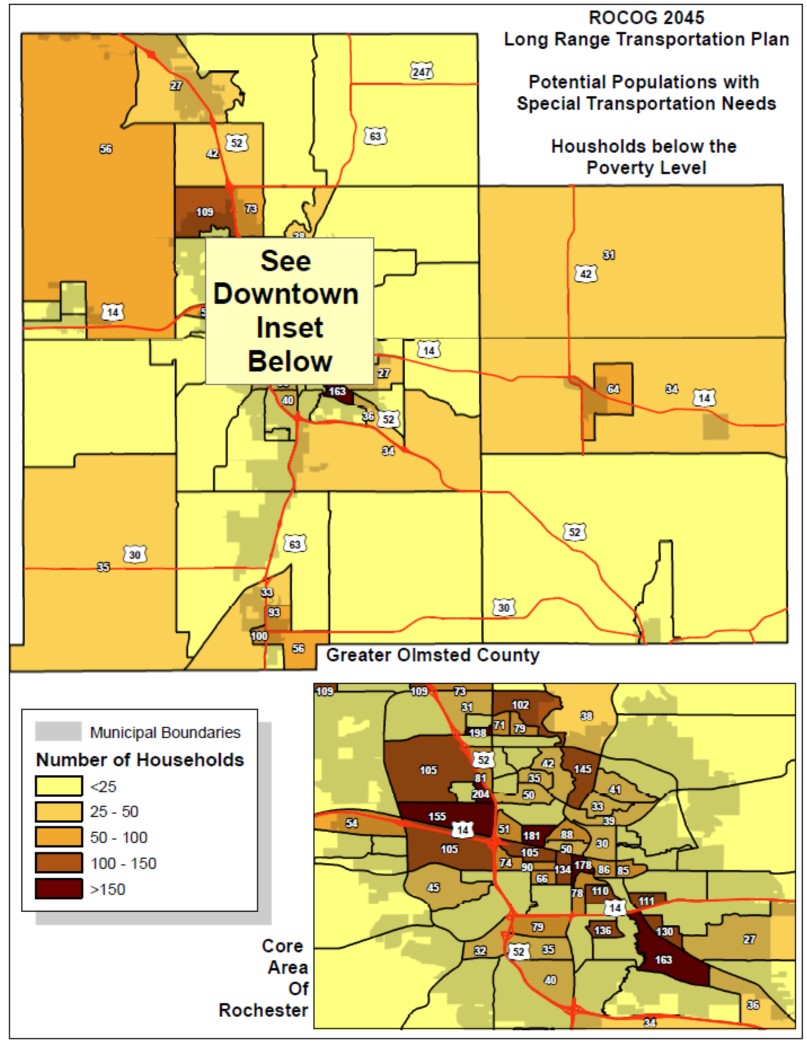
An important consideration when looking at and evaluating transportation needs is to identify particular population subgroups that may have particular challenges in meeting their daily travel or mobility needs. The following information and accompanying maps highlight three populations of concern who may need to rely more on alternative modes such as public transit or walking to meet their daily needs, and how those populations are distributed throughout the community in terms of where they live.

Household Income < Poverty Level

Low income households often face challenges in meeting basic needs, especially housing and transportation. In some cases, the lack of sufficient income combines with other factors such as disability to create even greater challenges. Figure 2-4 illustrates the location of low-income households by census block group in Rochester and Olmsted County. Statistically, we find there are:

- 5,485 low income households county-wide
- 89% are located in the City of Rochester

Figure 2-4: Households Below the Poverty Level



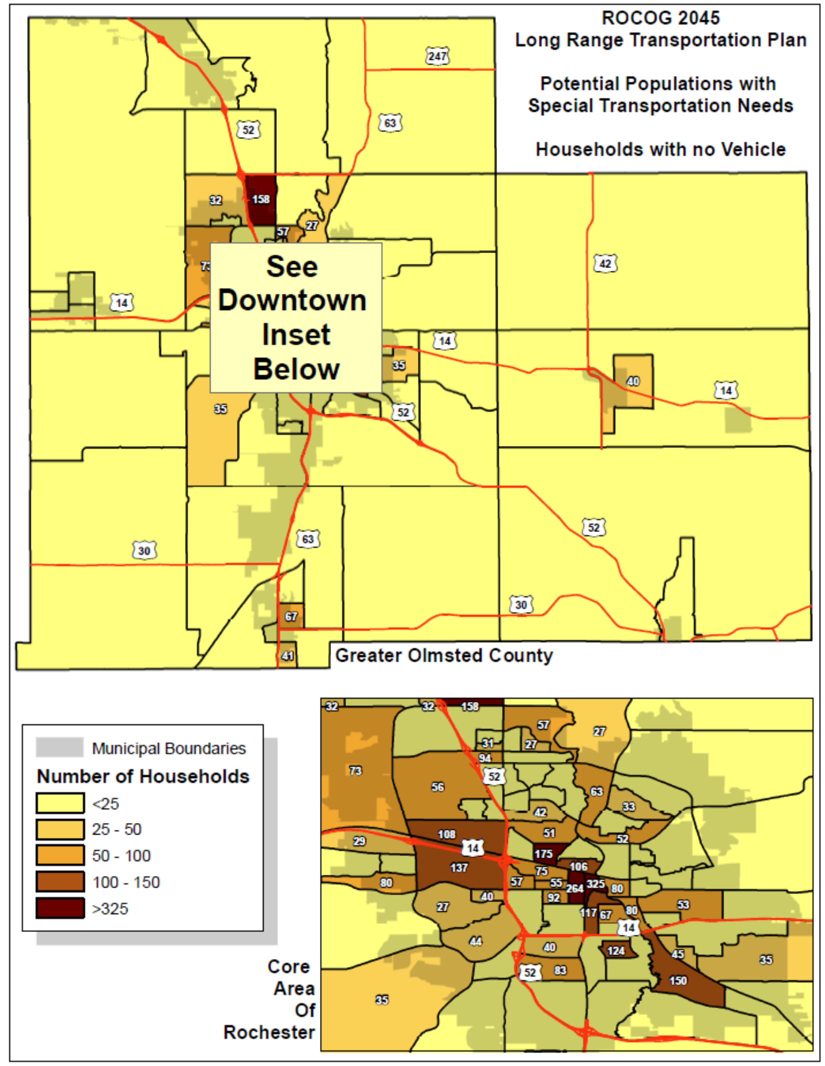
Source: ROCOG Analysis of 2012-2016 American Community Survey

Zero Vehicle Households

Households without a vehicle are another population group that face challenges in meeting everyday needs such as traveling to work, school, or the grocery store. This group tends to be heavily reliant on various transit services as well as pedestrian and bicycle facilities. The map in Figure 2-5 illustrates the distribution of households without a vehicle across Rochester and Olmsted County.

- 4,100 households county-wide do not own a vehicle
- 94% of these are in Rochester
- 1,750 are headed by persons over 65 (92% in Rochester)

Figure 2-5: Households with No Vehicle



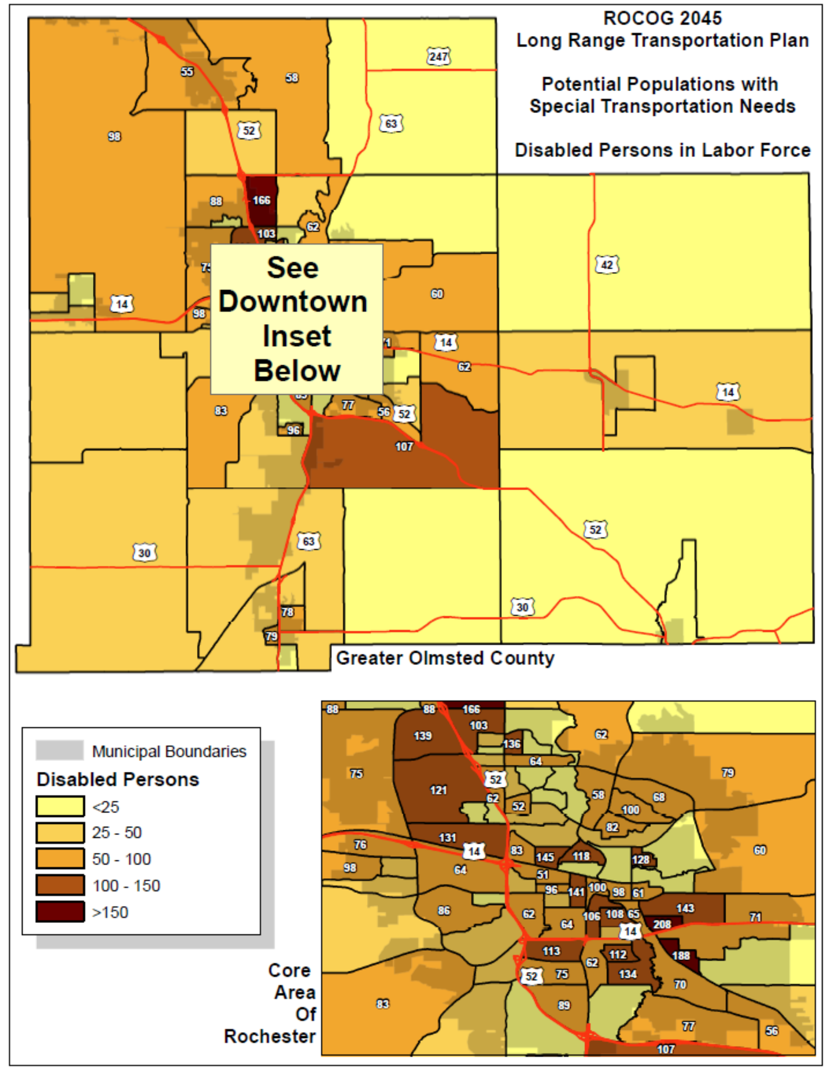
Source: ROCOG Analysis of 2012-2016 American Community Survey

LRTP 2045

Potential Populations with Special Transportation Needs: Disabled Persons in the Work Force

Disabled individuals can face special challenges in terms of travel, particularly if they are not able to afford private transportation options such as a personal vehicle with accommodation for their disability or family/friends who can provide a ride. For these individuals, transit services are particularly important. Rochester Public Transit works to serve as many disabled as possible with some level of service. The map in Figure 2-6 shows the distribution of individuals age 20-64 with a disability who are in the workforce and would potentially benefit from having transit options to get to work. There are approximately 7,000 individuals in the workforce with some type of disability, with 5,300 of those living in Rochester.

Figure 2-6: Disabled Persons in Labor Force



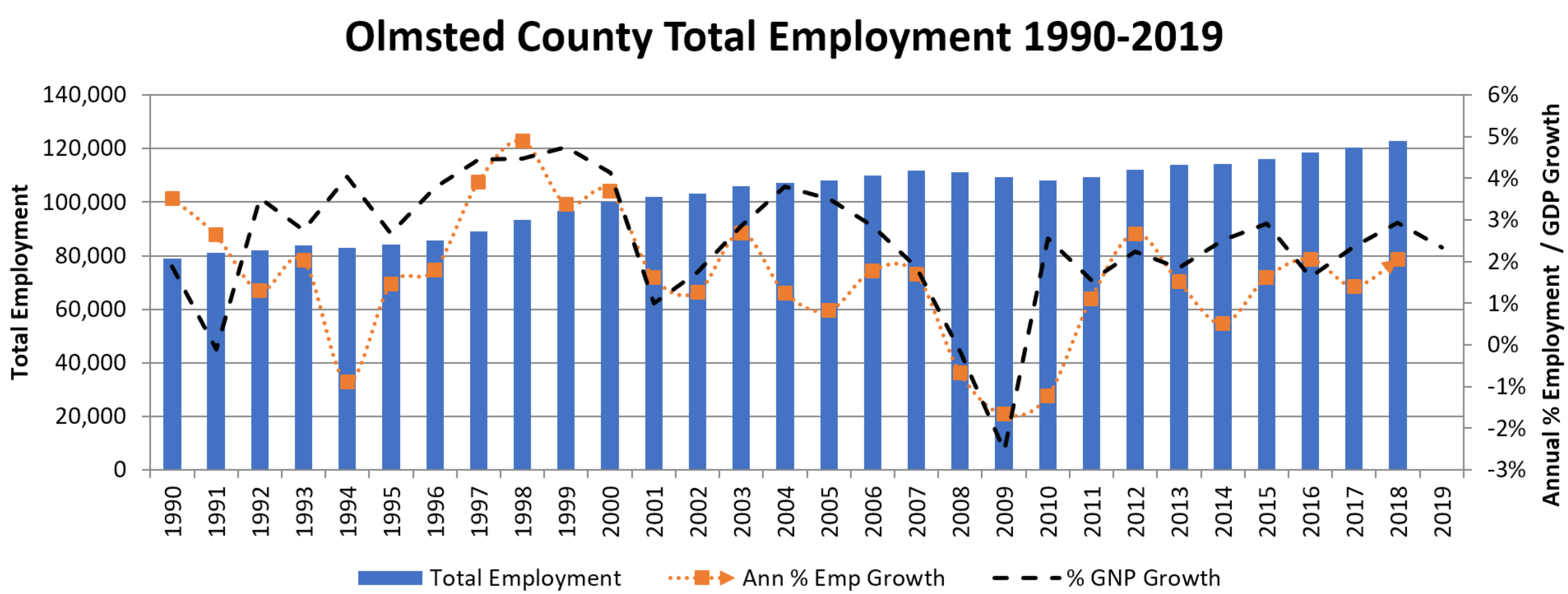
Source: ROCOG Analysis of 2012-2016 American Community Survey

Employment

Figure 2-7 illustrates that while total employment numbers in Olmsted County have remained generally on a steady upward path for the last 30+ years, the rate of employment growth from year to year has fluctuated wildly around an average annual employment growth rate of 1.74%. The highest rate of annual employment rate growth was during the dot-com boom of the mid-to-late 1990s. The lowest annual rate of employment growth was during the Great Recession of the late-2000s.

The Great Recession saw an absolute decline in the number of jobs in Olmsted County for three consecutive years (2008-2010), and the economy did not recover the nearly 5,000 jobs lost until 2014. Job growth in the local economy does not always track the national economy as measured by change in Gross Domestic Product, due likely to the large share of employment account for by health service sector, which is not given to as wide of swings in activity as production oriented sectors, such as manufacturing or technology.

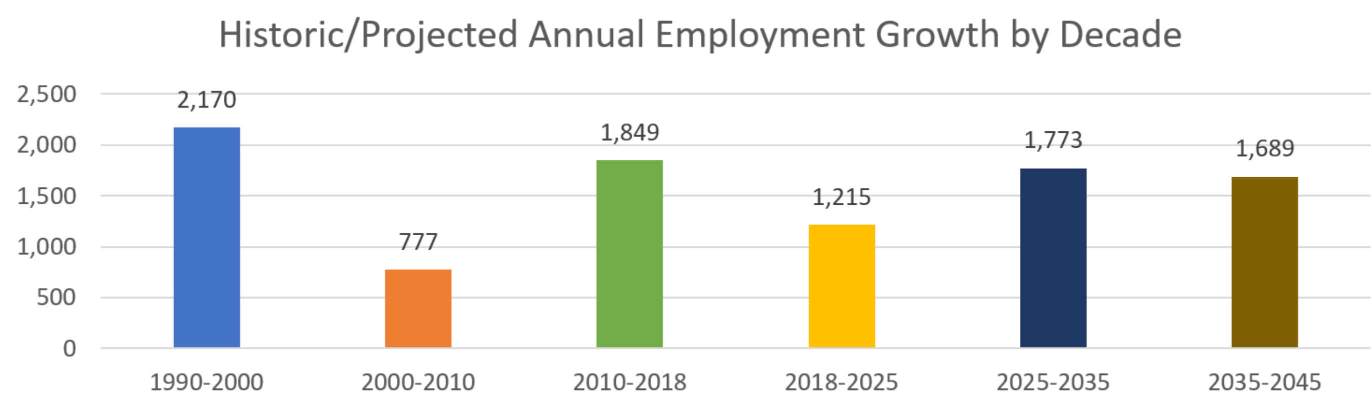
Figure 2-7: Historic Employment Growth 1990-2016 (Source: Bureau of Economic Analysis)



Growth in population has historically been driven by employment growth, with jobs filled by new residents attracted to Olmsted County from the region and state, as well as nationally and even internationally. Employment growth of 15,000 to 20,000 per decade was experienced from the 1980s through the early 2000s, up until the Great Recession began. During the recession, total employment in Olmsted County dropped by approximately 5,000 persons between 2008 and 2010, which resulted in less than half the employment growth in the decade of the 2000s than in earlier decades, as shown in Figure 2-8, which illustrates the annual change in Olmsted County employment for the 1990s and years before the Great Recession, and what has happened since the recession and projected forward to 2045.

Since 2010, job growth has recovered, with about 15,000 new jobs added from 2010 to the beginning of 2019. Looking ahead, change in the health services and health sciences sector, anchored locally by the Mayo Clinic, is expected to be the main driver of job growth that will be comparable to that seen in the 1980s and 1990s. A total increase of 45,000-48,000 jobs is expected by the year 2045. With health care being an important component of this growth, it is also expected that the number of visitors to the city (2/3 of whom travel to Rochester for health related reasons), will also see a significant increase from about 1.75 million to 3 million per year as measured by local lodging demand.

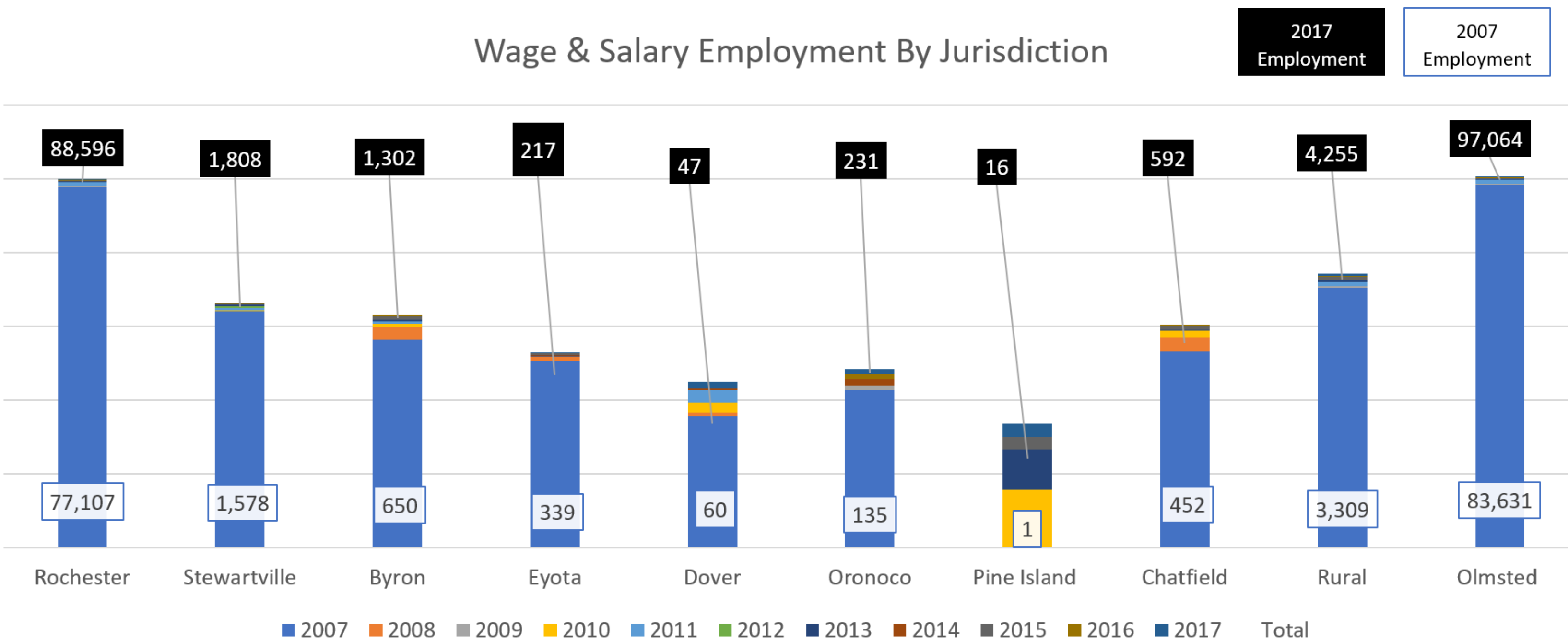
Figure 2-8: Historic/Projected Employment Growth by Time Period



Source: Historic from US Dept. of Commerce, Bureau of Economic Analysis; Projections by ROCOG

Figure 2-9 illustrates how wage and salary employment changed in each jurisdiction in Olmsted County between 2007 and 2017 as well as the level of employment in non-incorporated ("rural") areas and for Olmsted County. Byron realized the largest percentage change, while some communities were reported to have lost employment. Totals for Chatfield and Pine Island are for the Olmsted County portion of these cities only.

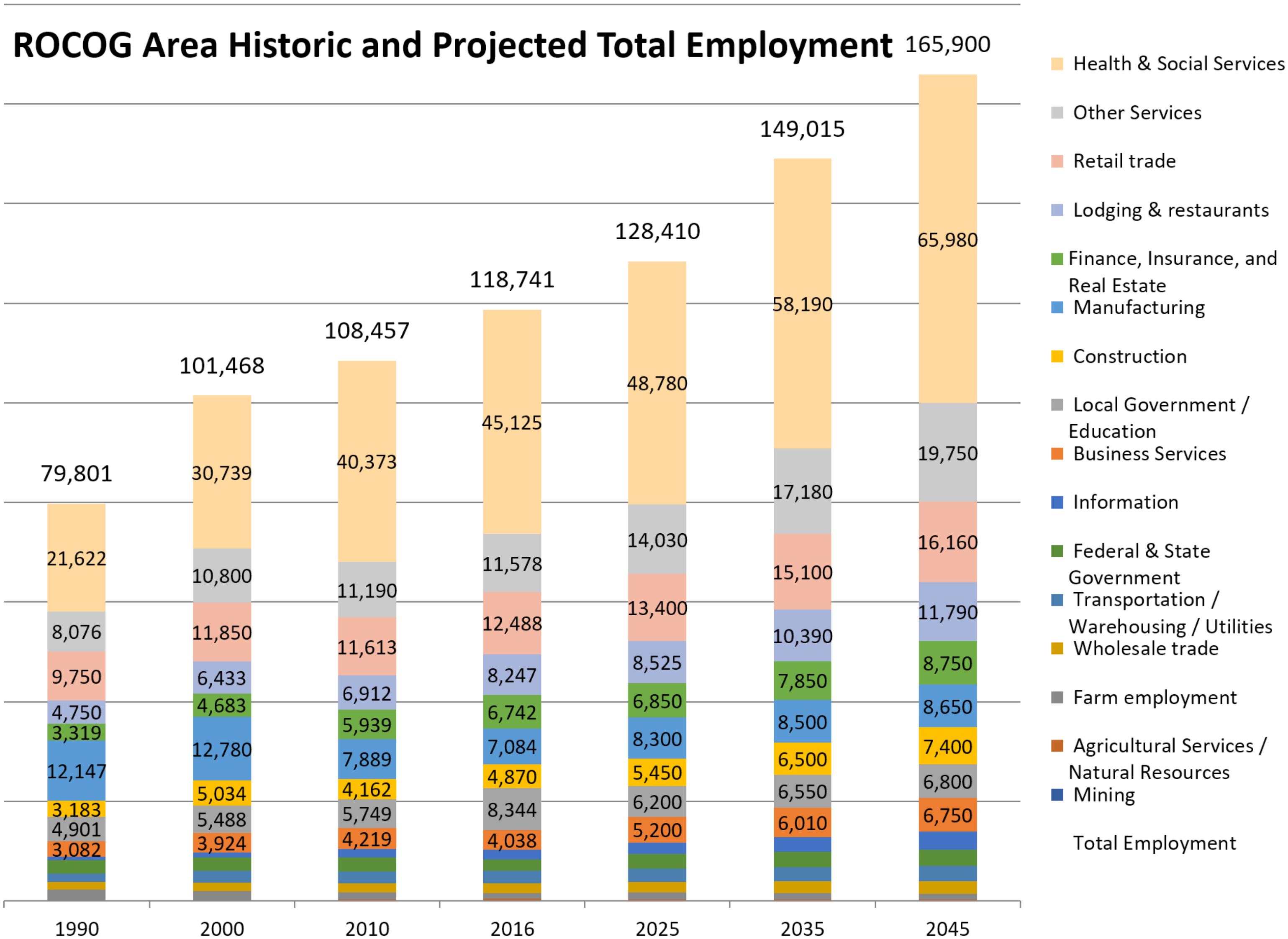
Figure 2-9: Wage & Salary Employment by Jurisdiction—2007/2017



Sources: On the Map, https://lehd.ces.census.gov/, U.S. Census

Figure 2-10 summarizes employment projections prepared by ROCOG for 2045 by major economic sector in Olmsted County. The Health Services industry, anchored by the Mayo Medical Center, is anticipated to see significant growth, along with lower levels of growth in keeping with population trends in the retailing and service sectors.

Figure 2-10: ROCOG Employment Projections

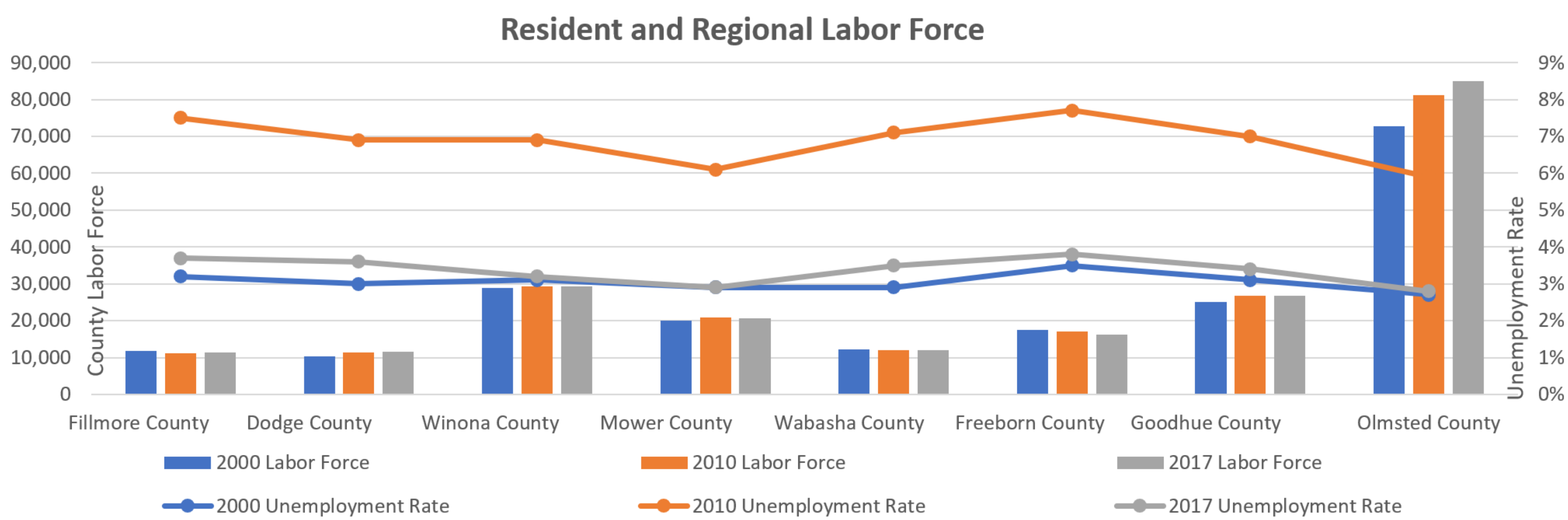


Labor Force/Commuting

A critical transportation issue for the Rochester area economy is the sourcing of labor force to fill local jobs. The labor force for the Rochester MSA is drawn from a significant geographic area that extends well beyond the boundary of Olmsted County. Some crucial facts about workers in Olmsted County and Southeast Minnesota:

- Olmsted County's share of the regional labor force grew from 58% to 67% from 2000-2017.
- Olmsted County labor force grew by 12,300 from 2000-2017.
- The labor force in surrounding southeast Minnesota counties grew by only 1,900 during that time with three counties seeing declines.
- A Southeast Minnesota League of Municipalities study projects the Olmsted County labor force will grow by 30,450 between 2015 and 2040, while the regional labor force outside Olmsted will grow by only 3,000.

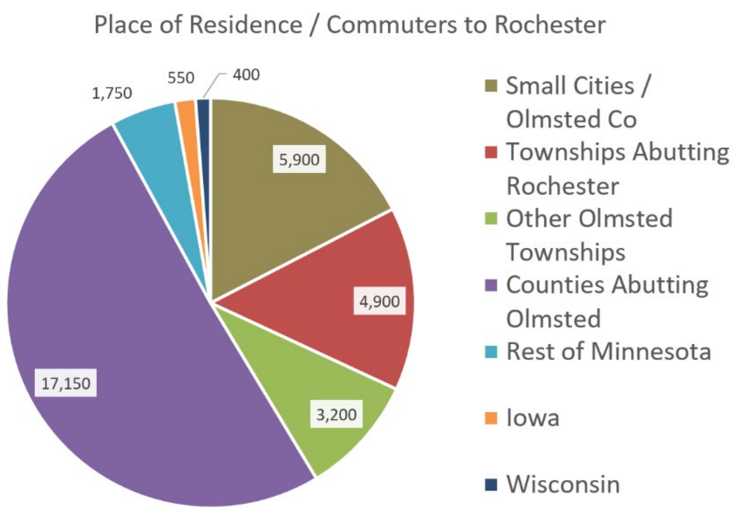
Figure 2-11: Resident and Regional Labor Force



Sources: ROCOG Analysis of U.S Census, Bureau of Labor Statistics and SE MN League of Municipalities data

Rochester and Olmsted County draw workers from throughout southeastern Minnesota to fill local jobs. The regional labor market extends into northeastern Iowa and southwestern Wisconsin. As shown in Figure 2-12, approximately 33,000 persons from across the region commute to Rochester each day for work, including about 20,000 from outside Olmsted County and 13,000 Olmsted County residents from outside of Rochester, resulting in a significant level of peak period travel demand on regional highways to Rochester.

Figure 2-12: Place of Residence/Rochester Commuters



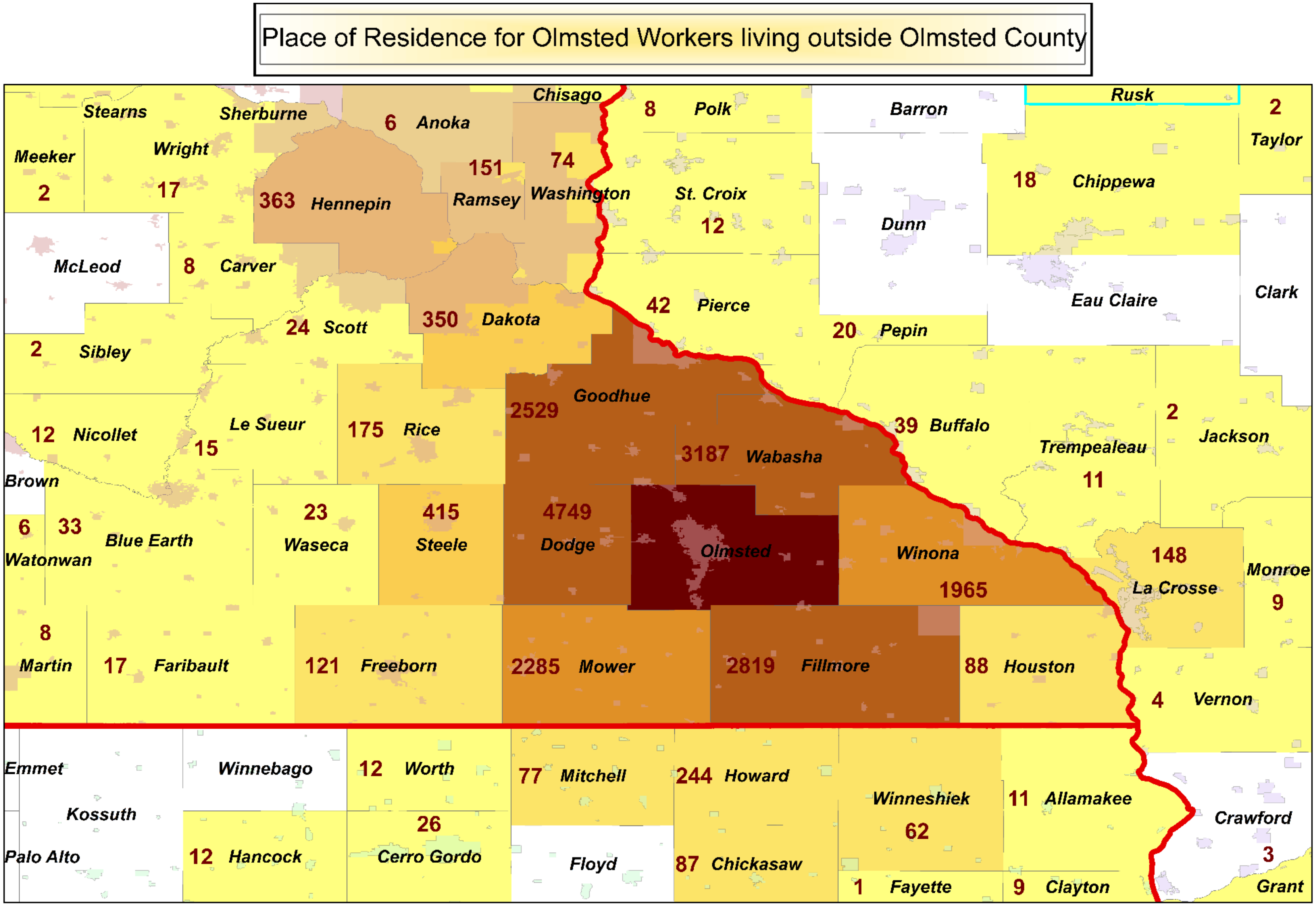
Source: American Community Survey 2012-2016

Figure 2-13 illustrates the regional scope of the labor shed that fills jobs in Rochester.

Looking ahead, the regional labor market may not be able to support a significant level of additional job growth if projections by the State Demographer and others for the southeast Minnesota labor force in counties outside Olmsted are reflective of future population growth. Limited growth in the regional labor market since 2000 has been reflected in a slowing in the number of new commuters coming into Olmsted County for work over the last decade. Figure 2-14 illustrates historical growth in commuting from surrounding counties that supply workers to Olmsted County. An increasing number of efforts are underway to bolster labor force supply, including educational and recruitment efforts to attract more young adults to stay in the region, and efforts to bring levels of in-migration from outside of Minnesota back to pre-recession levels.

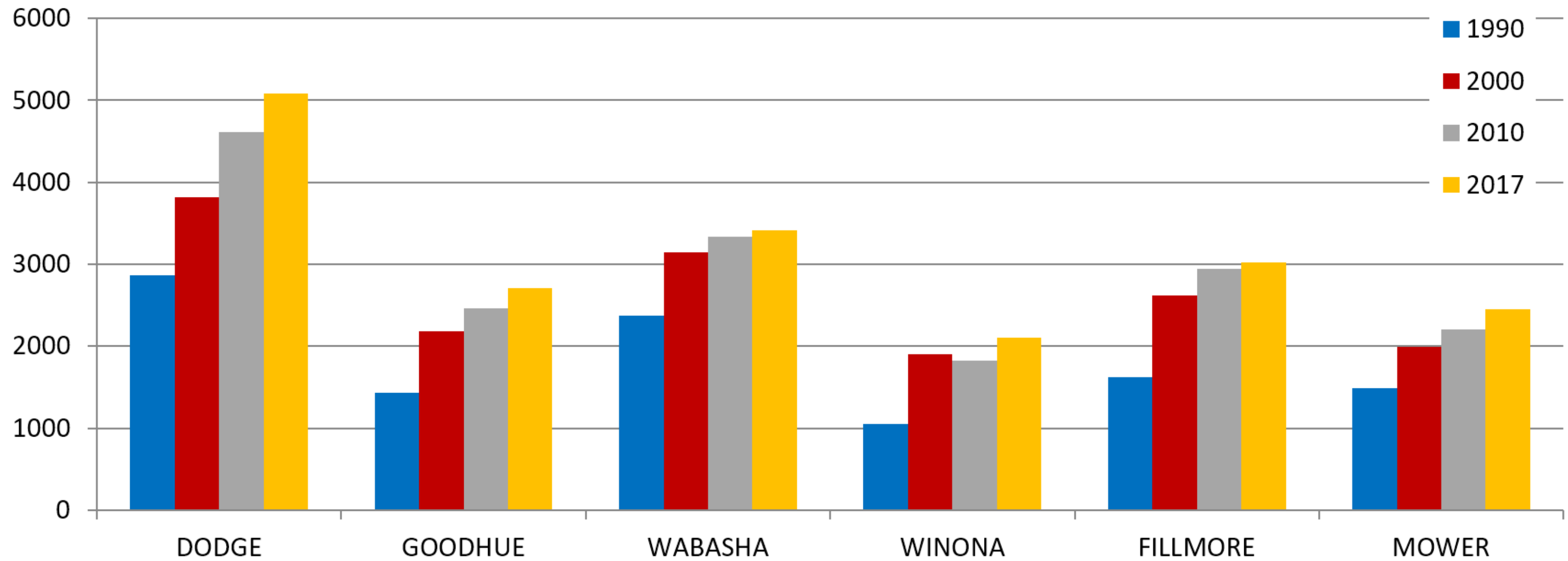
While growth in the number of regional workers with a job in Olmsted County has resumed, it has not reached the pace seen before the recession.

Figure 2-13: Regional Distribution of Commuters to Olmsted County



Source: U.S. Census 2012-2016 5 Year ACS Commuting Flows

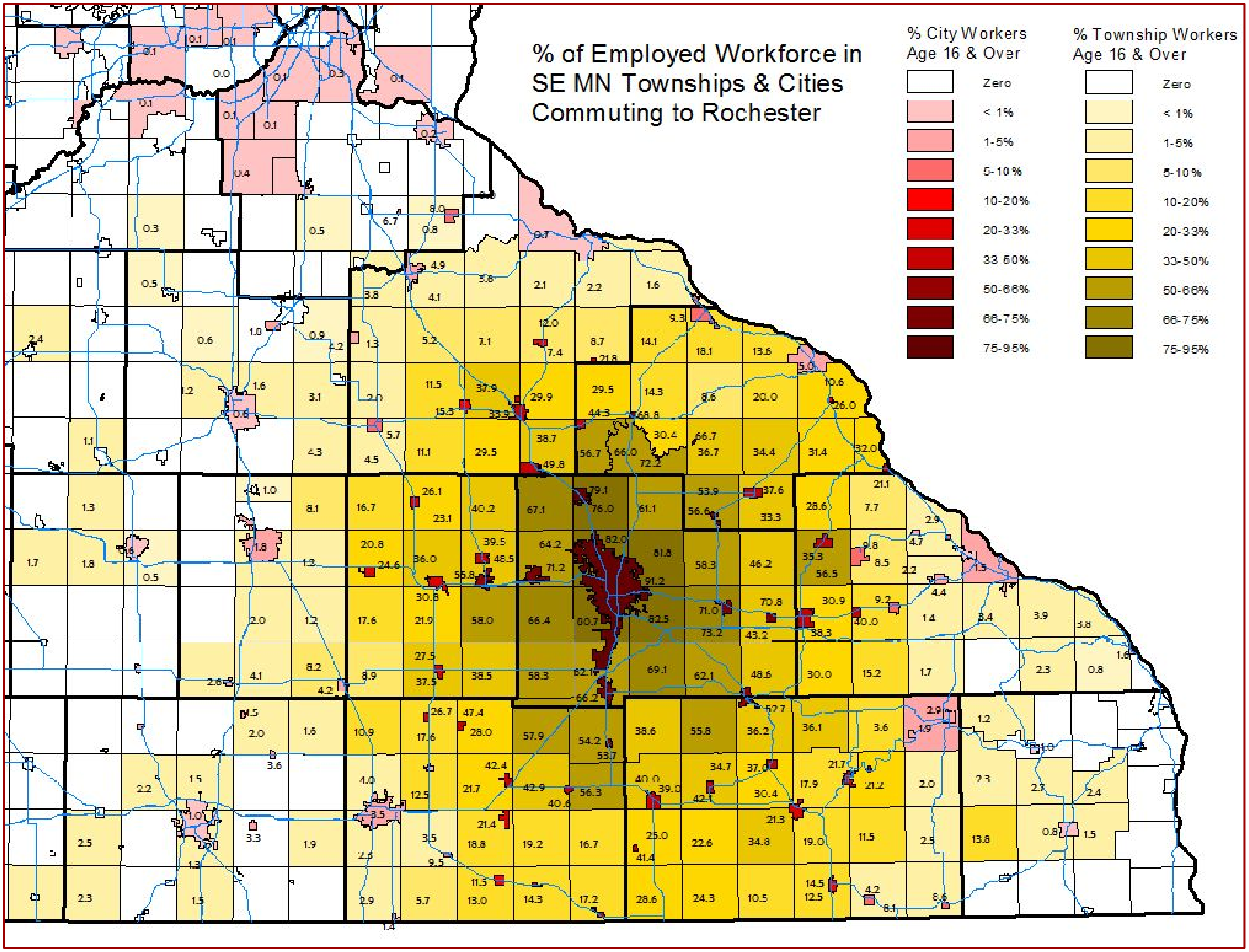
Figure 2-14: Number of Commuters to Olmsted County from Neighboring Counties



Sources: ROCOG Analysis of 2012-2016 American Community Survey; U.S Census data

The importance of the Rochester job market to regional residents is illustrated in Figure 2-15. For many cities and townships within 25-30 miles of Rochester, the proportion of resident workers with a job in Rochester typically exceeds 25-30% of the local labor force. Figure 2-15 indicates the percentage of employed residents living in various townships and cities within Olmsted and surrounding counties who work in Olmsted County. Approximately 82,000 Olmsted County residents work within Olmsted County, supplemented by over 20,000 persons who commute to Olmsted County from their place of residence outside the county. Maintaining reasonable accessibility for this workforce to Rochester is important for both the businesses in Rochester and Olmsted County, and for the local economies of the towns and cities throughout southeastern Minnesota.

Figure 2-15: Percentage of Township and Municipal Labor Force Working in Rochester



Source: 2010 US Census

Economy

Table 2-5 highlights the changes that have been occurring in the local economy by primary employment sector in terms of how:

- The share of local employment accounted for by each sector has changed
- The number of local business establishments accounted for by each sector has changed
- The share of local wages accounted for by each sector has changed

Mirroring trends seen across the country, the major changes that have occurred in the makeup of the local economy include:

- The education/health sector has grown significantly in importance
- The manufacturing sector has seen a significant decline in its contribution to economy
- Brick and mortar retail and wholesale trade sectors have declined as a share of the economy
- The leisure/hospitality sector has grown in numbers but wage growth lags

Rochester and Olmsted County have not been totally immune from some of the larger patterns of economic change that the United States has seen. Manufacturing in particular composes a noticeably smaller share of jobs and wages paid than in the past, due in no small part to the reduced footprint of IBM in the city over the last 10-15 years. The retail sector has also not been immune to changes caused by the rise of online shopping, which shows up most noticeably in the decline in the number of retail establishment in the county.

Along with the health services sector, other sectors whose share of activity has seen an uptick include the leisure and hospitality sector, which shows up primarily in terms of the number of workers and establishments, and the information services sector, which is involved in providing and maintaining the critical telecommunications infrastructure that is important to the 21st Century economy. Wages generated by the education and health sector have risen by more than 20 percentage points, while the manufacturing share of wages has dropped by more than 13 percentage points. With the expected continued growth of health services and evolution of the University of Minnesota-Rochester campus, it is anticipated that the education and health sector share of the economy will continue to expand as a share of overall economic activity.

Table 2-5: Employment Sector Shares

Employment Sector	Sector Share of Employment		Sector Share of Establishment		Sector Share of Wages Paid		Change in Sector Share		
	2000	2017	2000	2017	2000	2017	Employment	Establishments	Wages Paid
Resources and Mining	0.2%	0.3%	0.9%	1.4%	0.1%	0.2%	0.1%	0.6%	0.0%
Construction	4.9%	3.9%	12.6%	10.6%	5.3%	4.1%	-1.0%	-2.0%	-1.2%
Manufacturing	15.2%	6.9%	3.5%	3.1%	22.1%	8.9%	-8.3%	-0.4%	-13.2%
Trade	16.4%	14.2%	25.8%	21.7%	10.8%	7.3%	-2.1%	-4.1%	-3.4%
Information	1.2%	1.7%	1.8%	1.5%	1.2%	1.6%	0.5%	-0.3%	0.4%
Finance	2.9%	2.1%	10.5%	10.1%	2.7%	1.9%	-0.7%	-0.4%	-0.7%
Business Services	6.3%	5.3%	12.9%	13.3%	5.6%	4.4%	-1.0%	0.4%	-1.2%
Education / Health	38.0%	50.9%	8.9%	12.1%	43.6%	63.8%	12.9%	3.1%	20.2%
Leisure / Hospitality	8.4%	9.1%	9.9%	11.6%	3.2%	3.0%	0.7%	1.8%	-0.2%
Other Services	2.7%	2.5%	11.7%	12.5%	1.6%	1.2%	-0.1%	0.8%	-0.4%
Public Admin	3.9%	3.1%	1.5%	2.0%	3.9%	3.5%	-0.9%	0.5%	-0.4%

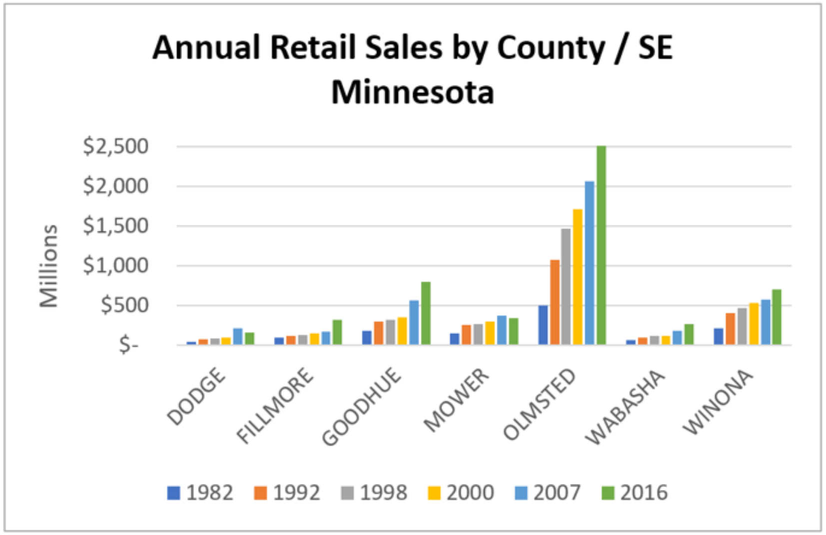
Sources: ROCOG Analysis of County Business Patterns and Bureau of Labor Statistics data

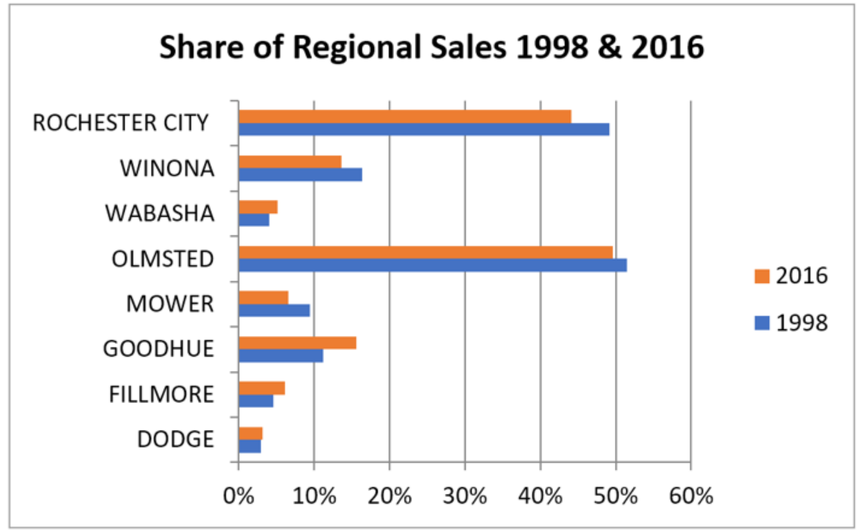
Retail Sales

An important component of the local economy is the retail sector and the role it plays in the regional economy. Figure 2-16 highlights the trends in the value of total sales of retail goods in Olmsted and surrounding counties for selected years since 1982. Olmsted County's share of regional retail sales has declined slightly from 51.5% in 1998 to 49.6% in 2016, even while the amount of sales has increased. Of those sales, retailers in the City of Rochester have historically captured between 85% and 95% of the total sales activity in Olmsted County, and just under half of the retail sales in the region. Olmsted County and the City of Rochester have adopted local sales taxes that in part help fund transportation improvements.

Sales taxes are a method for capturing some tax revenue from visitors, commuters, and others who do not live in Rochester or Olmsted County, but who utilize public infrastructure in the City or County. Olmsted County's share of regional retail sales consistently has exceeded

Figure 2-16: Olmsted County Capture of Regional Sales Activity





Sources: ROCOG Analysis of Minnesota Department of Revenue data

the county share of regional population by 7-15% over the last 25 years. All counties in the region have seen steady growth in retail sales since 1982 at rates between 125% (Mower County) and 408% (Olmsted County). These trends imply that retail customers in the region are finding more places to make their purchases outside of Olmsted County.

Coordination with Land Use and Economic Development Plans

ROCOG addresses federal guidelines calling for "…consistency between transportation improvements and state and local planned growth and economic development patterns" through many varied planning activities. ROCOG, through its affiliation with the Olmsted County Planning Department, is involved with the development of the Olmsted County General Land Use Plan, which defines planned urban service areas and resource protection areas. With its close working relationship with the City of Rochester, ROCOG also was involved in development of the city's 2018 Comprehensive Plan, which included adoption of a Growth Management Plan, as illustrated in Figure 2-17, and an updated Future Land Use Plan, as illustrated in Figure 2-18. These maps, which reflect assumptions about the extension of future municipal services, define the type and intensity of development expected to occur within the Rochester urban service area. Planning for transportation network improvements is linked to these efforts through the use of common assumptions regarding employment and population growth as well as land absorption needs to support the level of planned growth.

ROCOG, directly and through the Olmsted County Planning Department, also works with organizations and businesses regarding future economic development goals and the transportation implications of economic development initiatives. The 2010 Rochester Downtown Master Plan and Mobility Plan was a major planning effort that promises to establish the character of the major activity center in Rochester for decades to come. This project in particular has set an aggressive goal for travel demand management of reducing the rate of single-occupant-vehicle travel to the Rochester central business district by 20 percentage points over 20 years, using multiple strategies including parking changes, enhancement of alternative modes, and a changing mix of land uses to reduce private vehicular travel. The Destination Medical Center Plan, adopted in 2015, incorporated and expanded on these aggressive goals of mode shift downtown, market/land use demand, transportation investment, and other physical infrastructure needs to support an expected doubling of downtown employment and tripling of downtown population over the next 20-25 years. ROCOG, through the Olmsted County Planning Department, was directly involved in technical committee work and preparing materials for consideration by the Rochester Planning Commission and City Council.

The anticipated distribution of future growth affects planning for transportation infrastructure and services such as transit. The location of residential growth, in particular, influences peak hour travel. Figures 2-19 and 2-20 reflect assumptions about the spatial distribution of residential and employment growth which have been used in developing the ROCOG 2045 LRTP and tools such as the ROCOG traffic forecasting model.

As noted earlier, the population of Rochester is expected to grow from 117,000 in 2017 to over 162,000 by 2045. This growth in population is projected to require an additional 23,000 housing units by 2045 above current level of approximately 48,000 units.

Figure 2-17: Rochester Growth Management Plan (Source: City of Rochester)

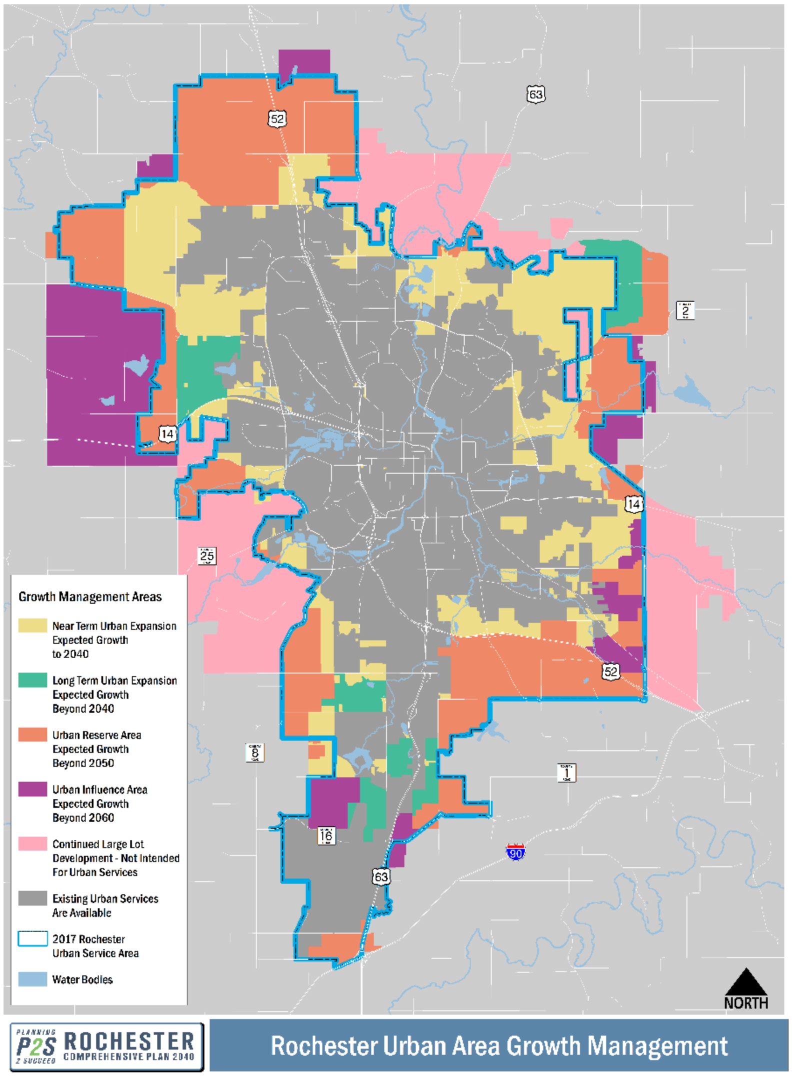


Figure 2-18: Rochester Future Land Use Plan (Source: City of Rochester)

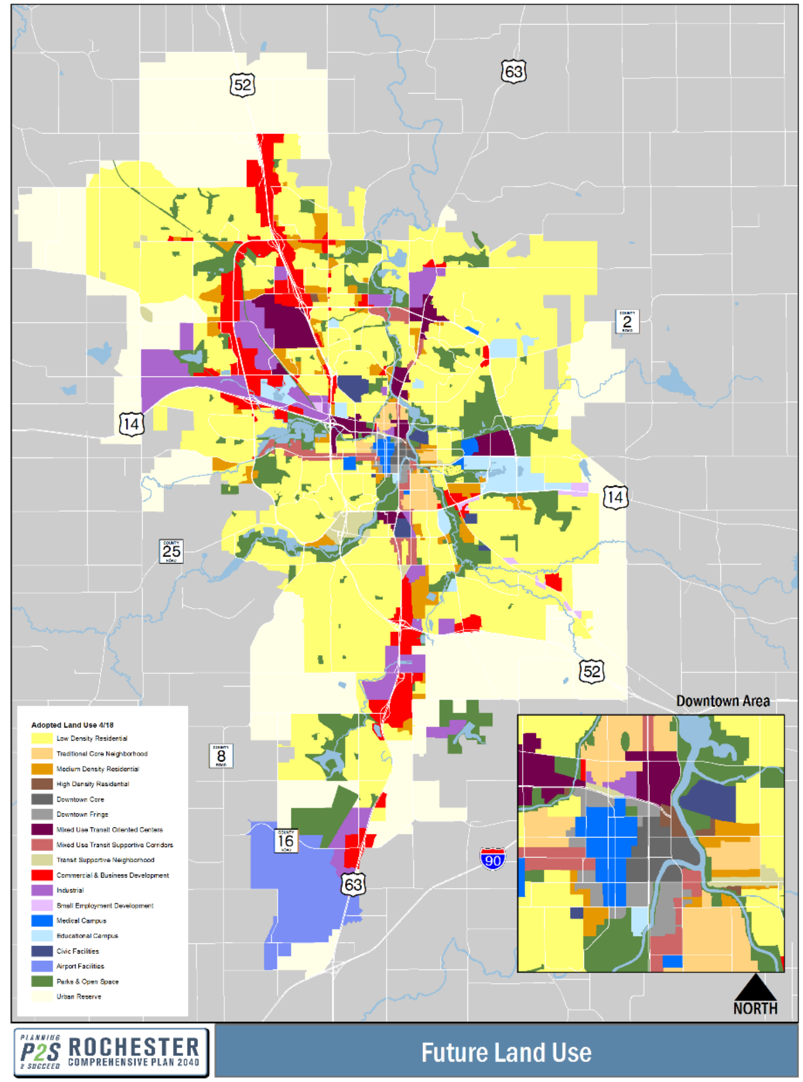


Figure 2-19: Planning Assumptions for Residential Growth in Rochester Urban Area (Source: ROCOG)

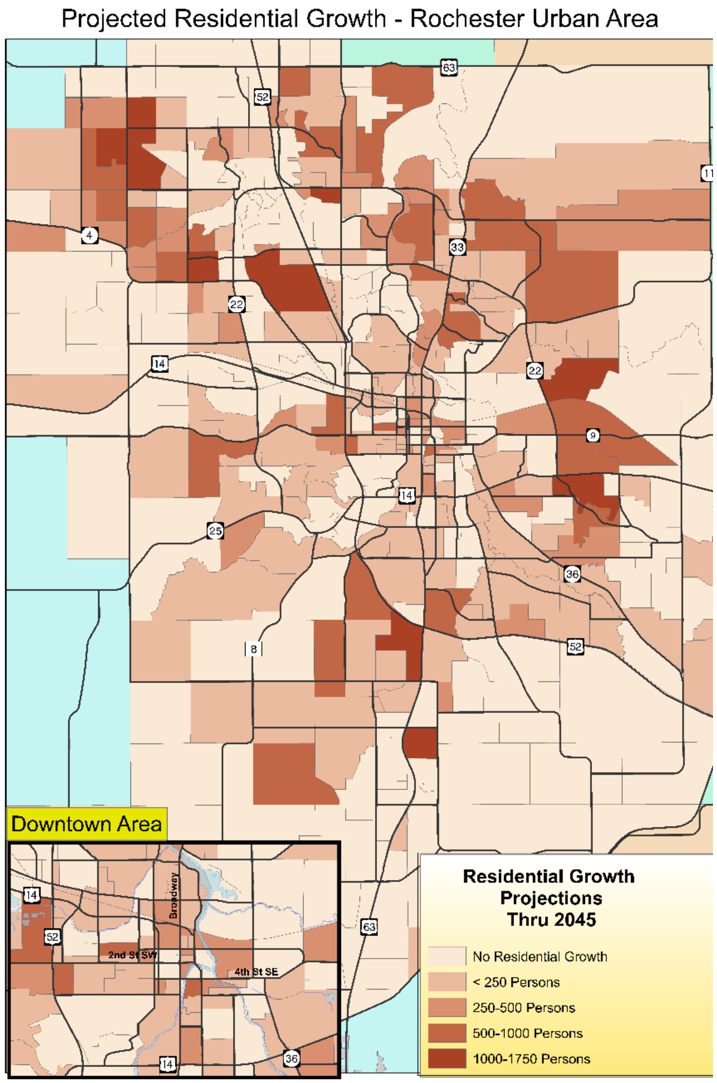
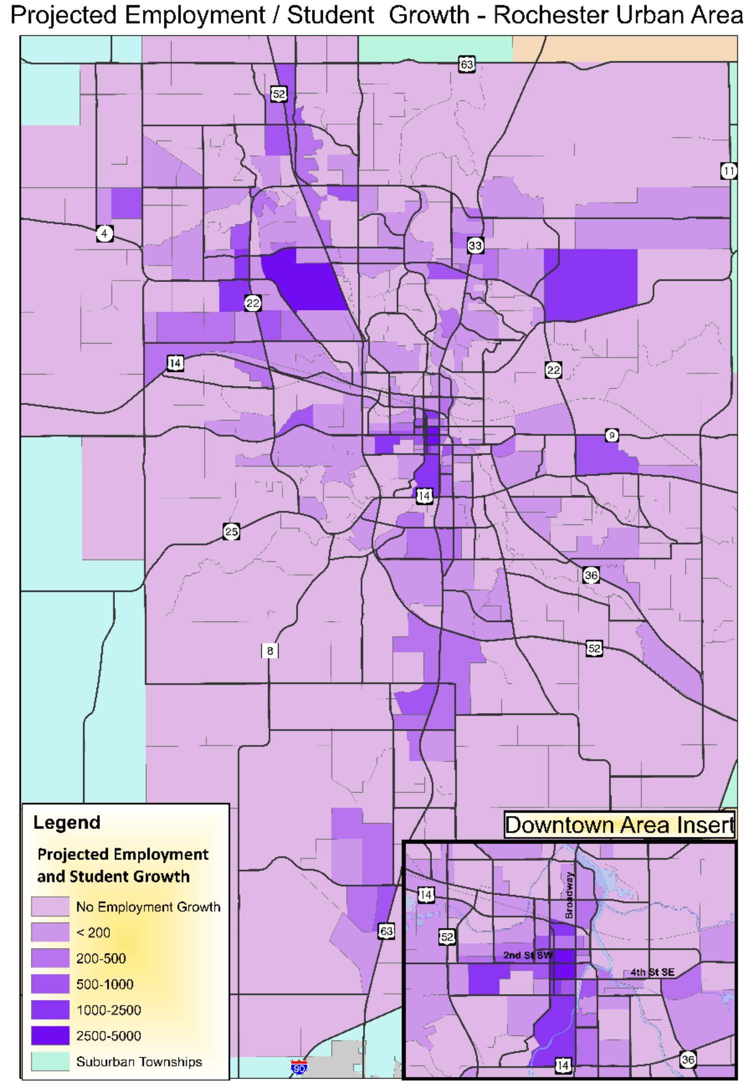


Figure 2-20: Figure 2 20: Planning Assumptions for Employment/Student Growth in Rochester Urban Area through 2045 (Source: ROCOG)



3 • Today's Transportation System

Overview

Improving and maintaining the existing transportation infrastructure and services that currently serve the needs of residents, businesses, customers, visitors and workers is one of the major responsibilities of state and local governments. To effectively plan for transportation, it is important to understand the investment that has been made in transportation and how it is utilized. This section of the Plan describes current travel levels and condition of the primary transportation modes that serve the ROCOG area, including the roadway network, transit services, pedestrian and bicycle infrastructure, and commercial vehicle travel. Providing quality transportation infrastructure is critical to the success of our local economy and the quality of life in the ROCOG area and other jurisdictions.

There are approximately 1,873 centerline miles of roadway in the ROCOG Metropolitan Planning Area (MPA), a 3% increase from the 1,820 miles reported in the 2015. Currently, state highways account for about 9% of the mileage, Olmsted County roadways about 27%, municipal roads 31%, and townships roads approximately 33%. Interstate 90, TH 52 north of I-90, TH 63 south of Rochester, and TH 14 west of Rochester are corridors on the National Highway System in the ROCOG area.

Growth in Vehicle Miles of Travel (VMT), which slowed during the recession years of 2007-2011 to an annual rate of 1.2% from 2.2% annually prior to the recession (2001-2007), has rebounded to a 2.1% annual rate of growth for the years 2011 through 2018. State highways carry approximately 56% of the VMT, with about 23% of VMT on county roads and 21% on Rochester city streets.

All jurisdictions have invested considerable funds in the maintenance and preservation of the road and bridge network. Pavement conditions across Olmsted County and Rochester have improved since the 1990s, while MnDOT faces challenges with unmet preservation needs, due partially to the impact of mega-project construction since 2000. Two such projects are the Rochester TH 52 reconstruction and the new Mississippi River crossing projects on I-90 and in Winona. The overall bridge condition has improved, with the share of bridges with a sufficiency rating of 80 to 100 having increased from 42% to 87% between 1995 and 2018.

Annual fixed route transit ridership in Rochester reached 1.8 million in 2017, with the system exceeding the pre-recession ridership peak of 1.7 million from 2008 after a period in which annual ridership dipped as low as 1.5 million in 2010. In 2018 and 2019 the system has seen continued growth, with 2.0 and 2.1 million riders, respectively, in those years. Dial-a-Ride ridership for elderly and handicapped has generally been steady over the last decade, though the introduction of evening and peak period taxi service starting in 2017 to supplement traditional reservation service provided by buses has increased ridership by about 12%. The growth in transit ridership, of which about 70% is for travel to work, has helped to hold the percentage of single occupant vehicle commuting relatively steady the last decade at about a 71% mode share.

Metrics regarding the total amount of bicycle and pedestrian travel are not available. ROCOG has participated in count efforts as part of MnDOT sponsored research efforts in recent years which are reported later in the chapter. Based on Census reported data from the 2014-2018 ACS, a total of 2500 individuals walk to work and bicycle travel accounts for over half of the reported 1100 individuals using "Other Means" to get to work in the city of Rochester.

Relative to freight travel, MnDOT has upgraded all state highways to support 10-ton travel and 60% of the Olmsted County State-Aid Highway (CSAH) currently supports 10-ton travel.

ROCOG Area Roadway Network

There are 1,850 centerline miles of highways and local roadways in the ROCOG area. As shown in Table 3-1, state highways account for about 9% of the mileage, county roadways for about 27%, and local roads for 64% mileage.

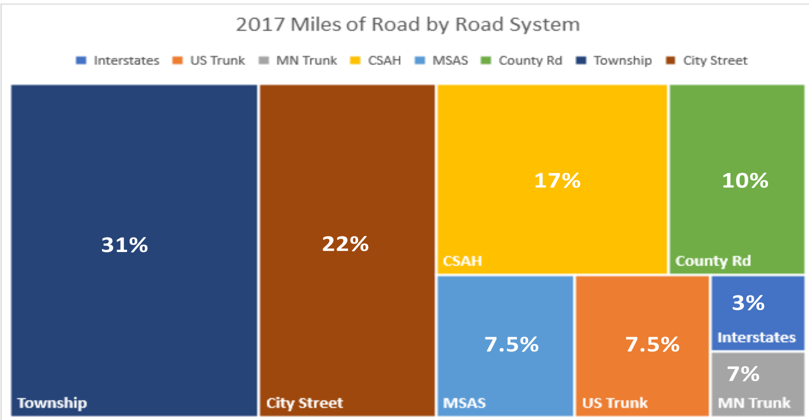
Table 3-1: Roadway Ownership in ROCOG Area

	MnDOT Miles	Olmsted Miles	Local Miles	% Local Miles
ROCOG Area	160	499	1,192	64%
% ROCOG Network	9%	27%	64%	
Township Area	129.6	451.0	608.8	51%
% Township Network	11%	38%	51%	
Rochester	21.4	36.7	472.9	89%
% Rochester Network	4%	7%	89%	
Byron	1.0	1.9	30.5	91%
Chatfield	0.8	1.3	7.5	78%
Dover	0.6	2.1	5.0	65%
Eyota	2.3	2.2	11.9	73%
Oronoco	2.0	0.0	21.9	92%
Pine Island	0.0	2.0	8.7	82%
Stewartville	2.7	2.3	24.7	83%
% Small City Network	9%	8%	83%	

Source: MnDOT Roadway Data @ http://www.dot.state.mn.us/roadway/data/

Figure 3-1 illustrates the breakdown of road ownership in the ROCOG area based on centerline mileage. Township roads and local city streets (non-MSAS) account for 53% of mileage, followed by the Olmsted County road network which accounts for about 27% of mileage.

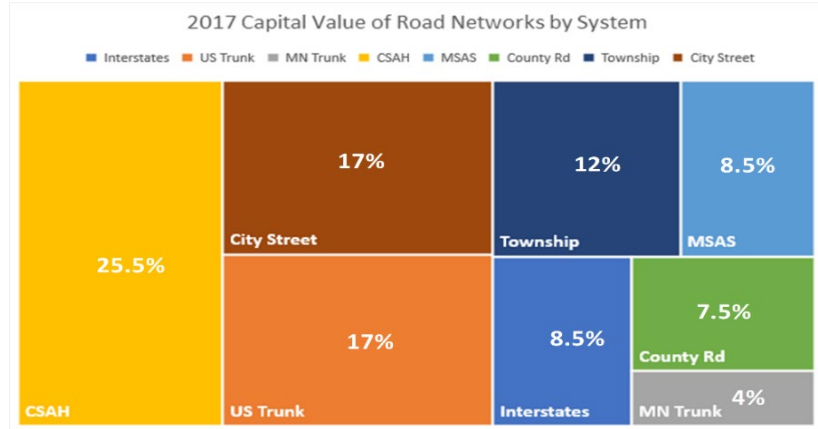
Figure 3-1: Distribution of Centerline Road Mileage by Road System



Source: MnDOT Roadway Data

However, when viewed from the perspective of capital value (based on what the estimated cost would be to construct each system today), the County State Aid Highway Network accounts for the largest share of investment, followed by US Trunk Highways and local city streets. In aggregate, roads managed by MnDOT account for about 30% of road investment, roads owned by Olmsted County for about 33%, the Rochester and small cities street networks for about 25% and township roads for about 12%. Figure 3-2 illustrates the relative breakdown of the value of different road system throughout the ROCOG area.

Figure 3-2: Capital Value of Roads by Road System

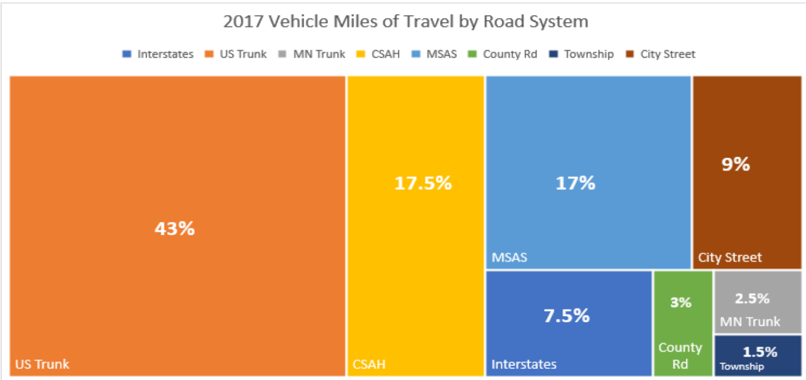


Source: ROCOG

Measured by the share of areawide vehicle miles of travel (VMT) occurring on each system, roads under MnDOT management account for approximately 53% of all travel, city roads approximately 25% of VMT, Olmsted County roads approximately 20%, and town roads the final 1-2% of vehicle travel. Figure 3-3 illustrates this in chart form.

Figure 3-4 illustrates the road network in the ROCOG Metropolitan Planning Area (MPA), indicating jurisdictional ownership of various roadways and the local city and township jurisdictions throughout the area.

Figure 3-3: VMT Distribution by Road System



Source: MnDOT Roadway Data @ http://www.dot.state.mn.us/roadway/data/

Roadway Classification

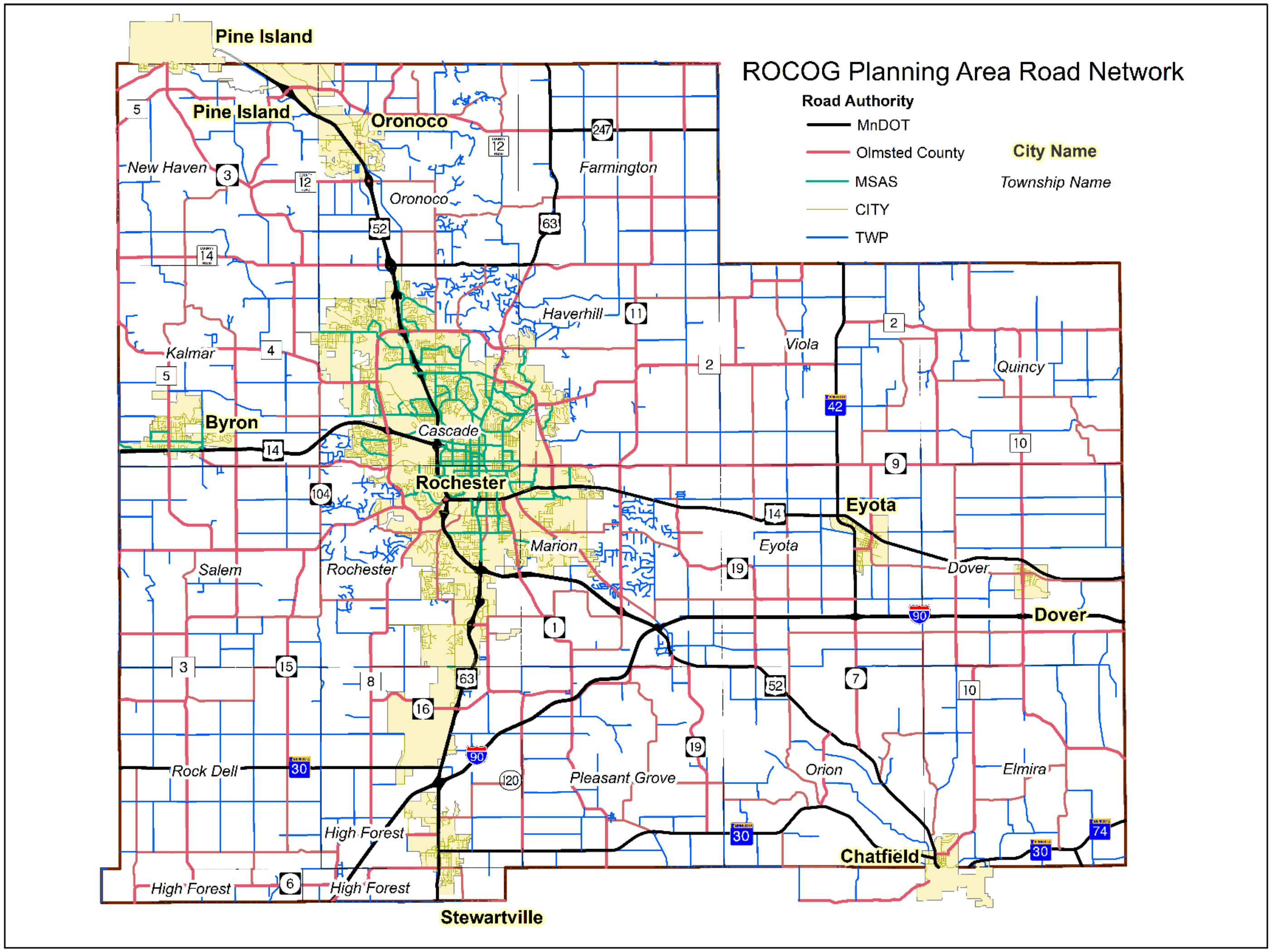
Classification of roadway networks occurs for different reasons but one of the most important to road authorities are those that have implications relative to funding eligibility. Three road classifications in particular play a significant role in this regard:

- The National Highway System (NHS) which is defined by the United State Department of Transportation and used to determine eligibility for certain federal funds set aside for the NHS
- The Federal Functional Classification System, required by the U.S Department of Transportation as a basis for reporting system data and used in part to determine allocation of federal transportation funding and identifying roadways eligible for use of these funds
- Minnesota Local State Aid highway systems, including both County and Municipal State Aid systems, towards which a dedicated portion of state Highway User Trust Funds are directed according to a formula set in state statute

Figures 3-5 through 3-7 highlight these systems. Figure 3-5 illustrates the National Highway System (NHS) in the ROCOG area, which consists of urban and rural principal arterials that connect major population centers, airports and other major terminal facilities, and major national or regional travel destinations. NHS designation also signifies roads that have been designated to have a role in meeting national defense needs. A share of federal funding must be specifically devoted by each state to improve and preserve of the NHS.

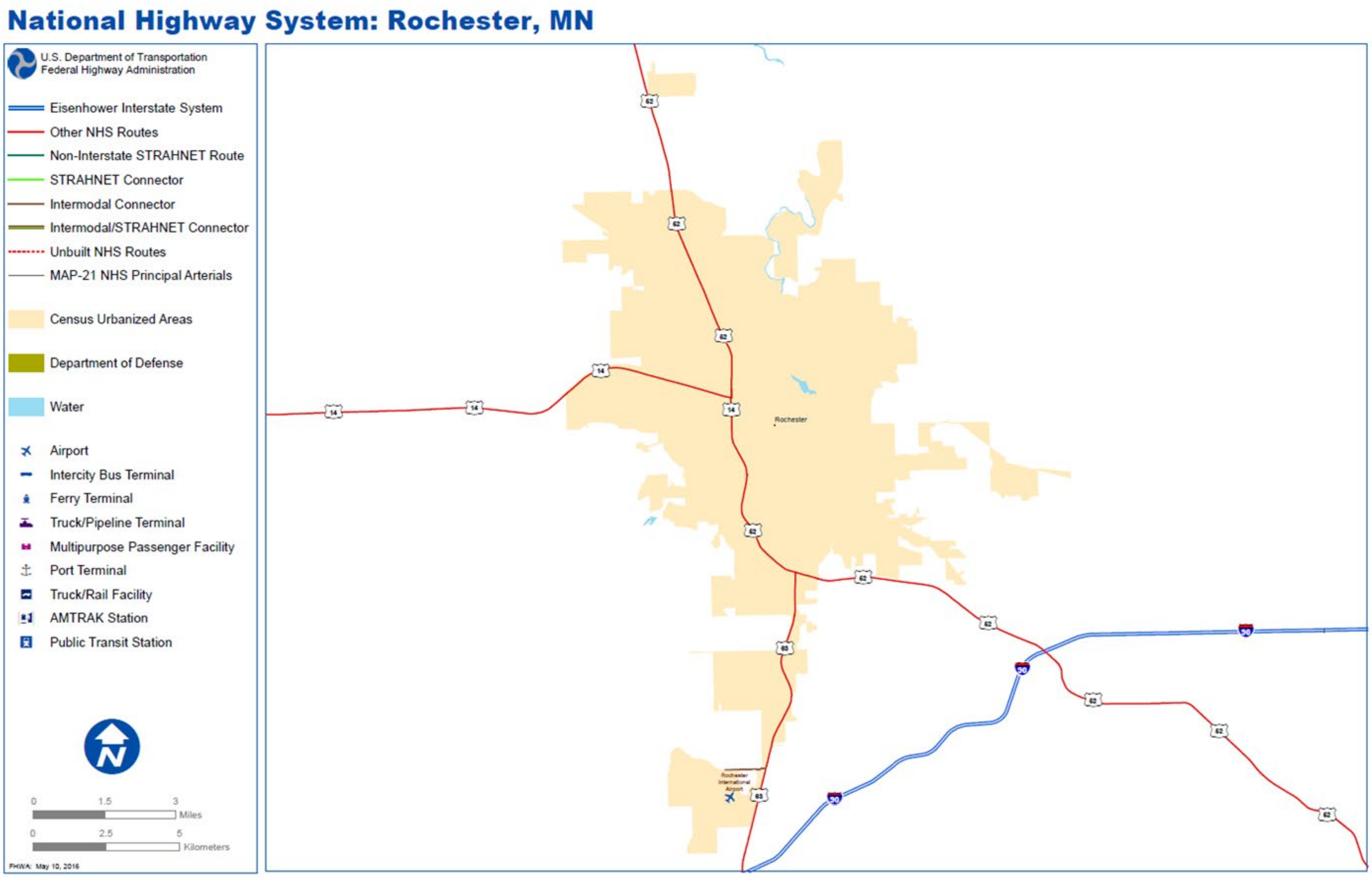
Figure 3-6 illustrates the Federal Functional Classification (FC) system in the ROCOG area. The FC system is particularly important in the programming of programmatic federal funds in that only work on Inter-state Highways as well as designated arterials and collectors on this system are eligible for federal funding. The FC system is basically a tool for understanding the existing and near-term function of the roadway system. Roadways cannot be added to the system until roads function in a different way.

Figure 3-4: Roadway Ownership in ROCOG Area



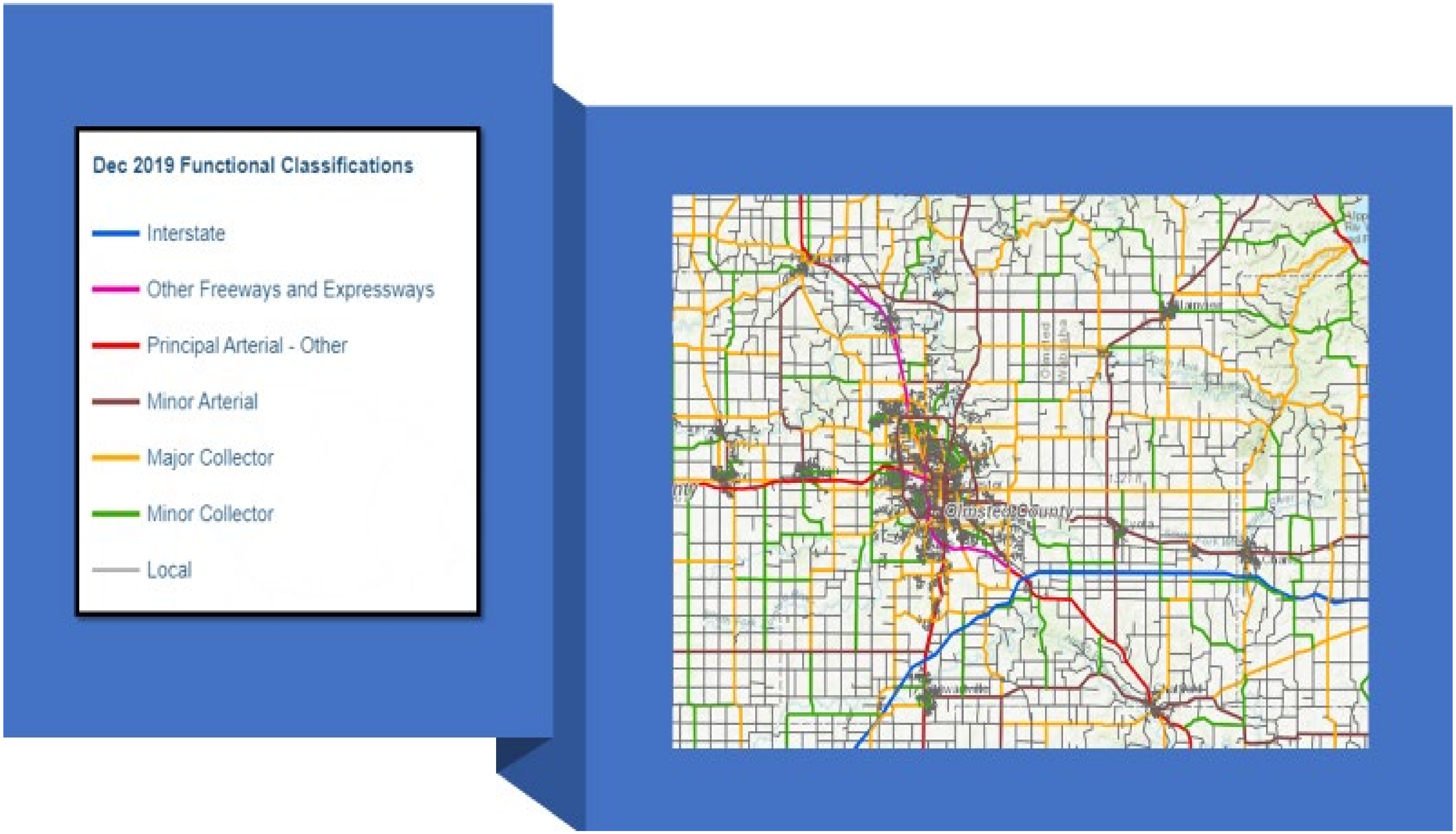
Source: ROCOG

Figure 3-5: National Highway System in the ROCOG Planning Area



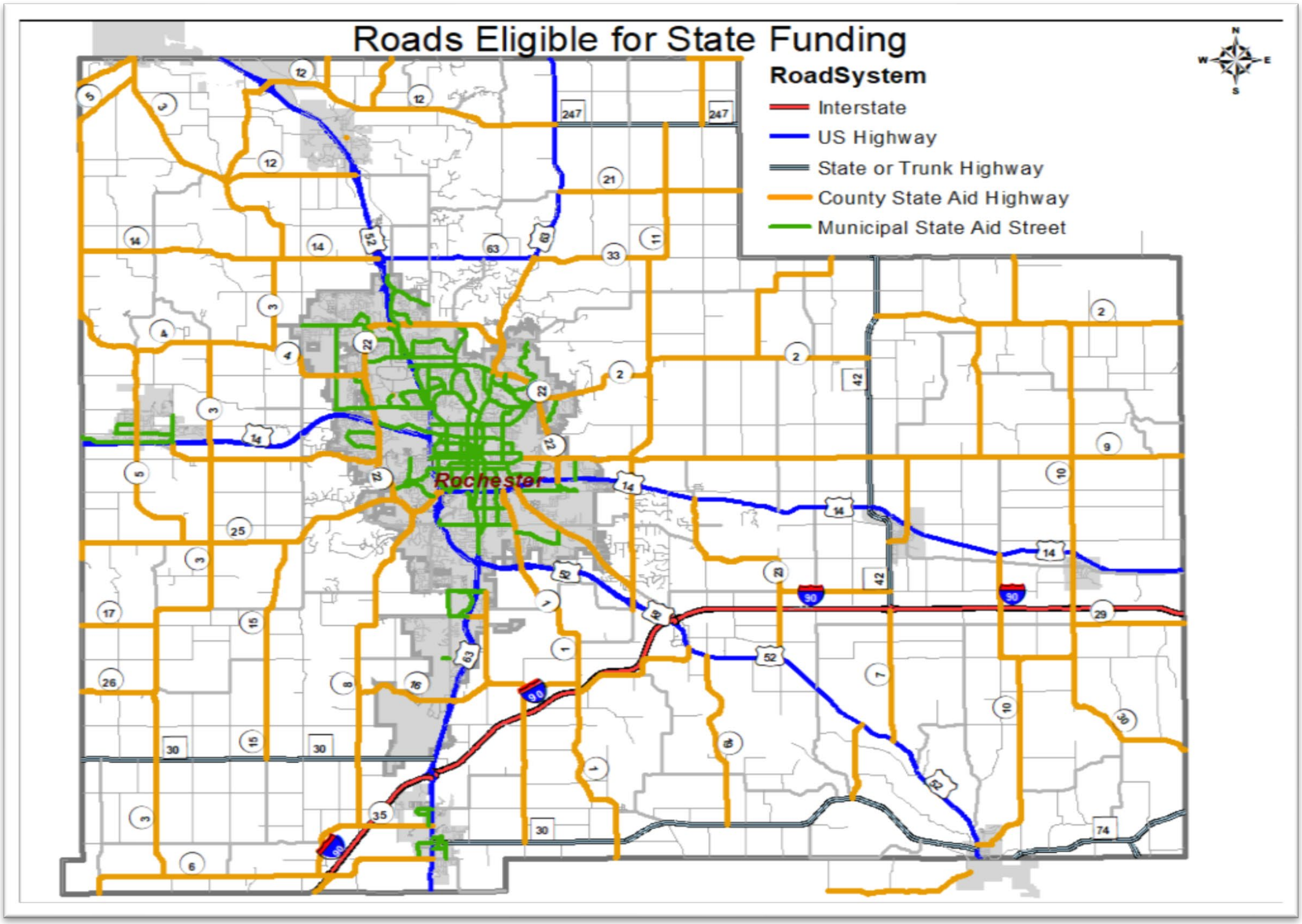
Source: MnDOT National Highway System Information page
https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/minnesota/rochester_mn.pdf

Figure 3-6: Federal Functional Classification System in the ROCOG Area



Source: MnDOT Federal Functional Classification, http://www.dot.state.mn.us/roadway/data/functional_class.html

Figure 3-7: Roadways Eligible for State and Federal Funding



Source: ROCOG GIS Division, MnDOT State Aid for Local Transportation http://www.dot.state.mn.us/stateaid/

Minnesota Municipal and County State Aid funding is targeted to municipalities over 5,000 in population as well as counties. Maintenance at the township and small city level comes from local property tax. Cities are given more flexibility to add mileage to MSAS systems, while counties must go through a statewide screening board to make changes to their system. Each jurisdiction receives an allotment of funding annually based on defined allocation formulas, with a portion of funds set-aside for maintenance purposes.

Roadway System Conditions

The condition of roadways is affected by many factors, including the age of the pavement structure, the amount of traffic that uses the roadway, environmental conditions, and the frequency of maintenance actions applied to the roadway. This section reports on the current condition of the primary roadway networks in the ROCOG MPA, including roads managed by MnDOT, Olmsted County, and the City of Rochester.

Figures 3-8 through 3-11 illustrate the age profile of road networks managed by these road authorities. The typical life cycle of pavements, particularly arterial roadways, is estimated at about 50 years. Age since first construction or last reconstruction is an indicator of roadway maintenance needs, since the passage of time affects the level of pavement deterioration and the structural base of the roadway.

Figure 3-8 illustrates the age profile of MnDOT pavements. Many of the heavily traveled urban arterials, such as TH 63 or TH 52 in Rochester, are fairly new roadways where need for replacement will not occur during the horizon of this Plan. The Interstate system in the ROCOG are was built in the 1960s and early 70s, so consideration needs to be given to possible major rehabilitation work during the horizon of the Plan.

Approximately 55% of the Rochester street network as illustrated in Figure 3-9 has been built in the last 30 years, indicating it should only require periodic preservation work such as seal coating and mill and overlay projects during the horizon of the Plan. Much of the Rochester network is composed of low volume roads (78%) typically found in neighborhoods, which potentially can be managed to allow for a 60 to 70-year life cycle before major rehabilitation is needed.

The Olmsted County network is broken into separate rural and urban profiles as shown in Figures 3-10 and 3-11. The urban network, illustrated in Figure 3-11, is generally newer, which should require less in the way of major rehabilitation work during the horizon of this Plan, but will need attention to preservation such as timely mill and overlay projects because of heavier traffic loadings. The rural system, illustrated in Figure 3-10, is generally older, but as highlighted by the large share of orange and blue color in the columns, these are typically low

Figure 3-8: MnDOT Road Network Age Profile

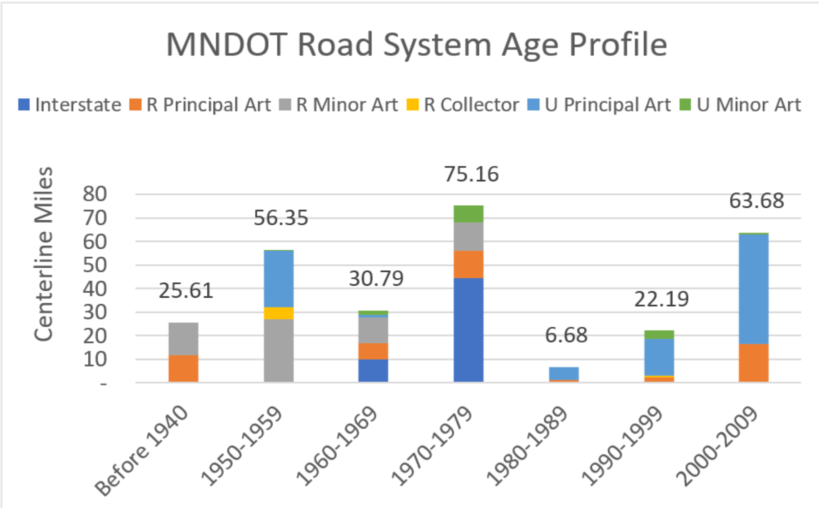


Figure 3-9: Rochester Road Network Age Profile

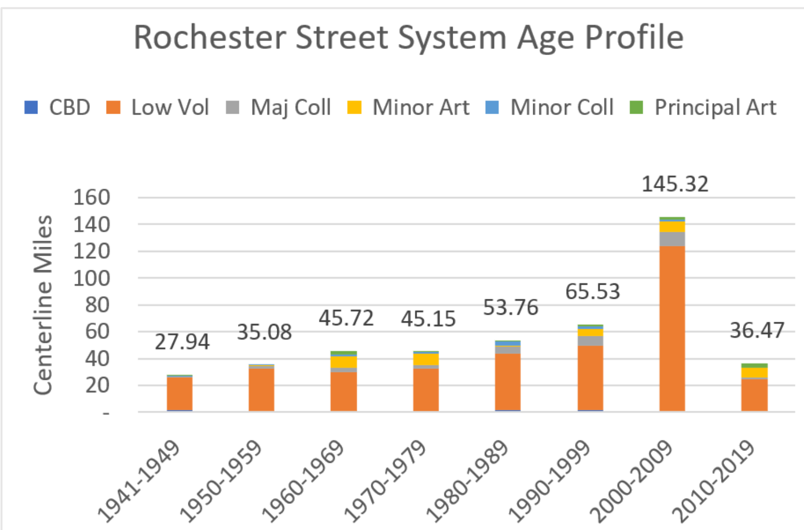


Figure 3-10: Olmsted County Rural Network Age Profile

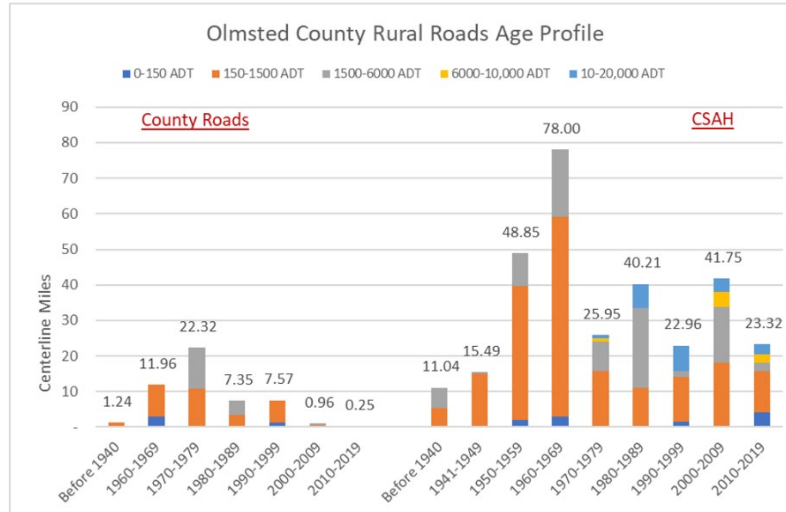
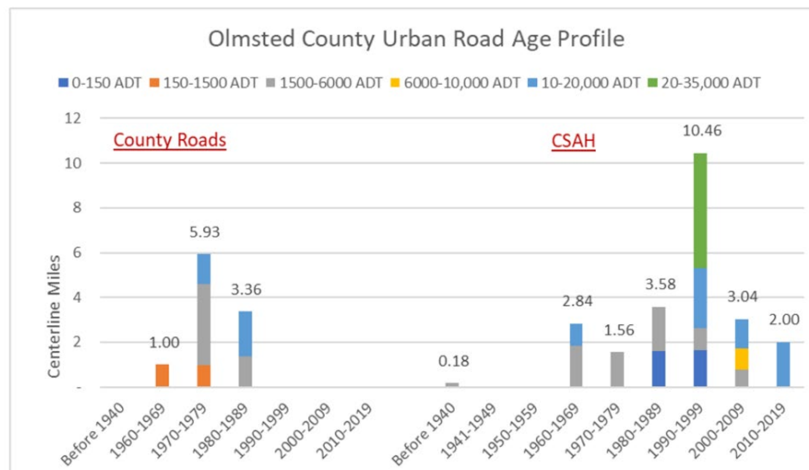


Figure 3-11: Olmsted County Urban Network Age Profile



volume roads (less than 1500 ADT), which likely can be managed through a longer 60 or 70 life cycle with proper maintenance.

Pavement Condition Trends in the ROCOG Planning Area

Figures 3-12 through 3-14 provide a profile of current pavement conditions on MnDOT, Olmsted County, and Rochester streets and highways. Maintaining the upper wearing layer of pavements is important in order to provide acceptable ride quality for users. It also provides safety and environmental benefits (such as lower noise levels during tire contact with the pavement) that are important to quality of life, particularly in more densely populated areas. Various measures are used to measure pavement quality, but generally they all provide similar qualitative reporting results wherein a pavement surface is rated on 4-point scale of Very Good to Poor. The condition of a pavement and how it is trending over a period of years is also an indicator of what type preservation activity may be needed.

Figure 3-12 provides 2018 ratings for MnDOT roadways in the ROCOG Area. MnDOT uses a family of 4 measures to judge pavement condition:

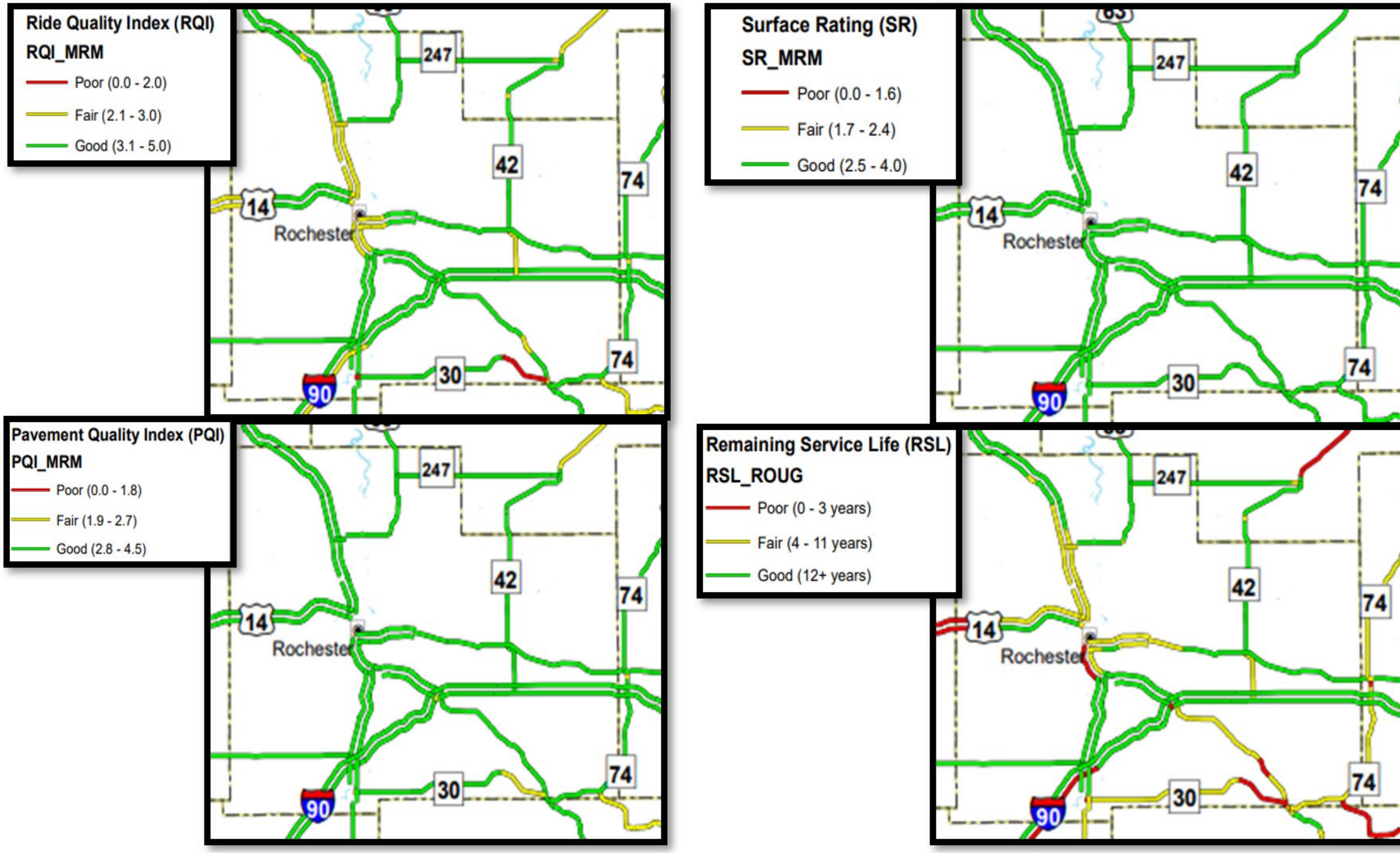
- Ride Quality provides an indication of user satisfaction
- Surface Rating quantifies that condition of the top pavement layer
- Pavement Quality Index takes these factors into account to create a single overall rating scale that can be used for prioritizing
- Remaining Surface Life (RSL) is an estimate, based on standard life cycle practice given the condition of a road, of how long before preservation work will be needed

The pavement ratings are generally Good, although as can be seen in the RSL, there are roadways (including TH 52 in Rochester and most state roads south and east of I-90 that need attention in the near term.

Figure 3-13 shows how the condition of Olmsted County roads has changed over time. In the early 2000s the county was faced with a serious backlog of preservation needs, as seen in the large share of "Poor" and "Fair" pavements in the 2003 numbers. The County spent a significant share of their roadway budget on just preservation for a period of 3-4 years, which has resulted in a more stable overall network condition, particularly for the share of road miles rated Poor.

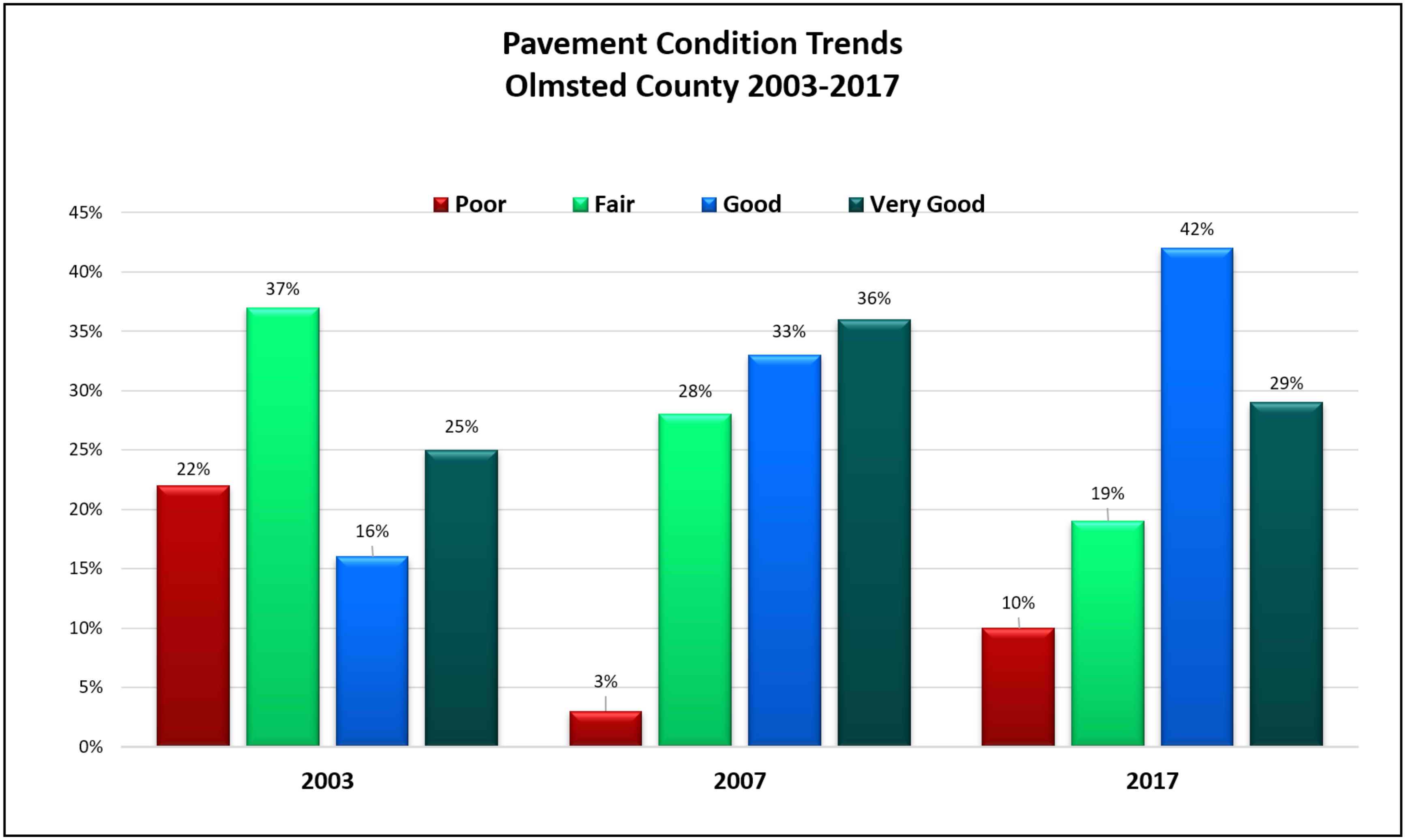
Figure 3-14 illustrates condition trendlines for Rochester's asphalt and concrete pavements for the last 10 years. Similar to Olmsted County, in the early 2000s Rochester had a significant share of roadways classified as "Poor" pavement conditions as growth pressures in the 1990s led to a significant share of roadway dollars being spent on system improvements. Rochester was able to direct

Figure 3-12: Ride Quality Index, Pavement Quality Index, Surface Rating and Remaining Surface Life of MnDOT Roadways - 2018



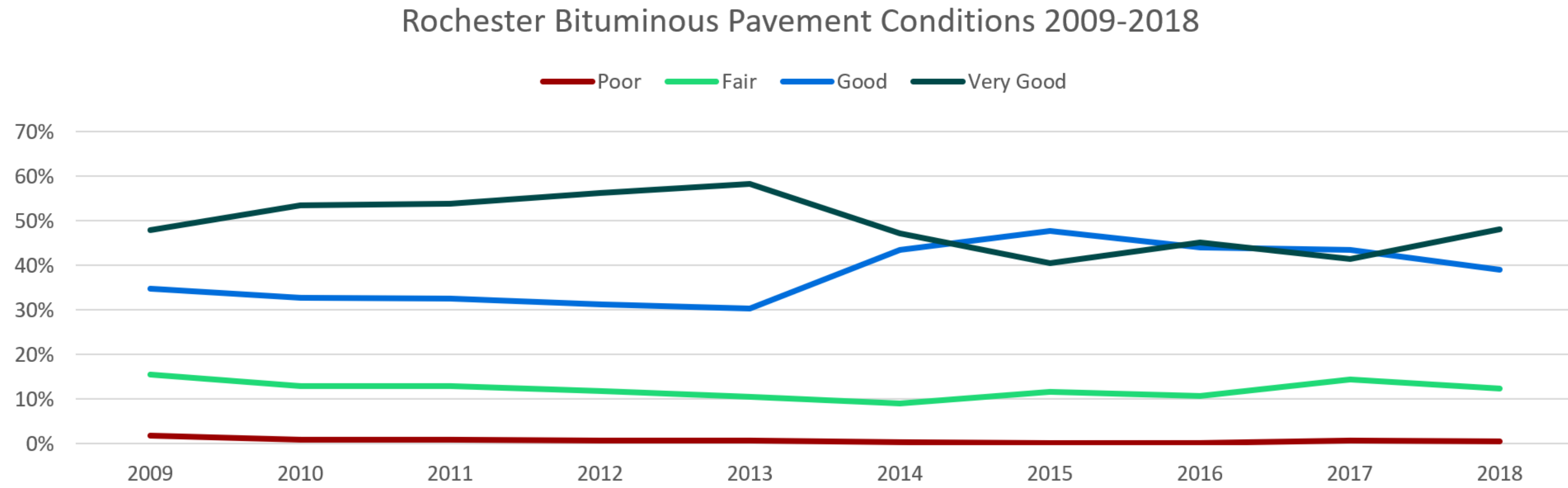
Source: MnDOT Roadway Data 2018 Pavement Management https://www.dot.state.mn.us/materials/pvmtmgmt.html

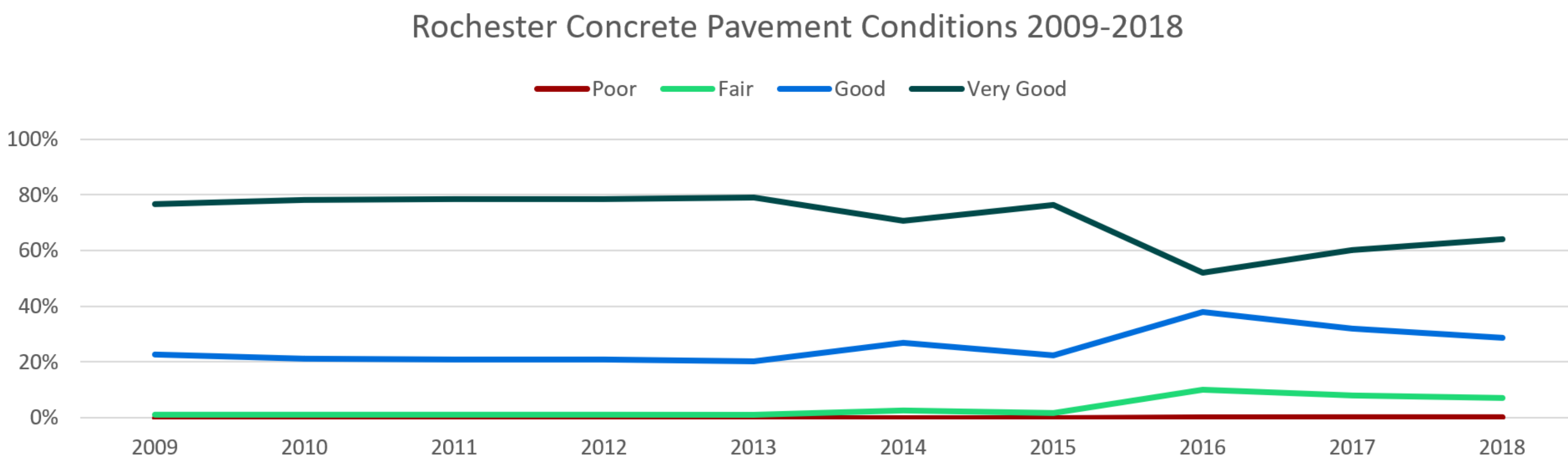
Figure 3-13: Trends of Pavement Condition in Olmsted County 2003-2017



Source: Derived from the data provided by Olmsted County Public Works on Pavement Conditions and MnDOT http://www.dot.state.mn.us/materials/pvmtmgmt.html

Figure 3-14: Trends of Pavement Condition in Rochester 2003-2017



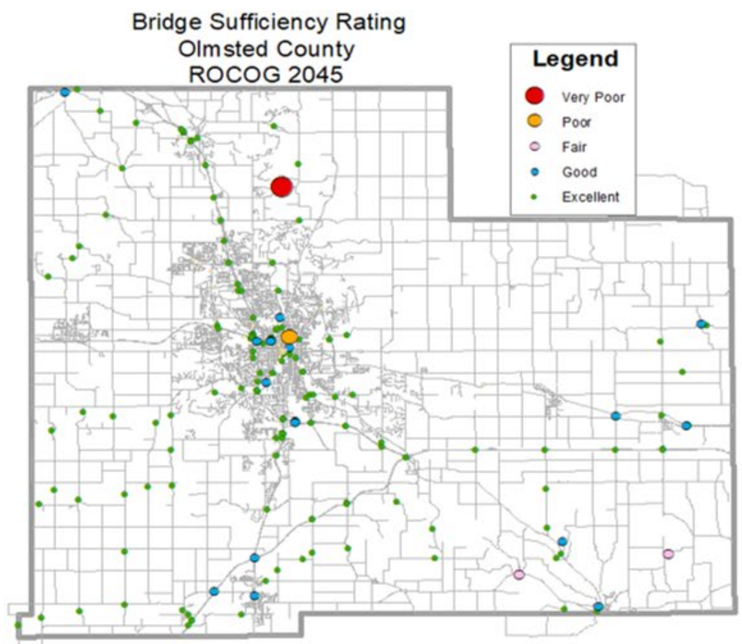


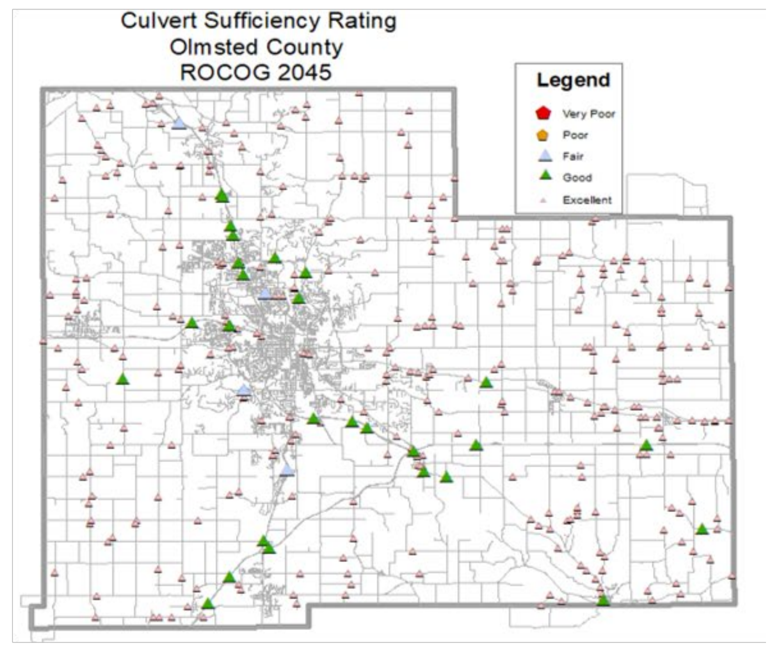
Source: Derived from data provided by Rochester City Public Works on pavement conditions more dollars into preservation in the 2000s, resulting in a more stable condition profile where the city has been able to maintain 70-80% of roadways in Good or Very Good condition over the last 10 years.

Bridge Conditions

Currently there are a total of 538 bridge and culverts in the ROCOG MPA that are part of the statewide Bridge Management System. This includes 179 bridge structures and 359 culvert structures. Of these, 357 are over 20 feet in length and thus eligible for federal bridge funding. Olmsted County is responsible for 217 of these structures, with an additional 158 managed by MnDOT. Olmsted County also assists local townships with their bridge management needs, which involve 111 structures, while 40 structures are under the ownership of municipalities. Poor bridge and culvert based on sufficiency rating at Olmsted County level is shown in Figure 3-15. Through a concentrated partnership between the state and local units of government, the structural quality of bridges has been improved over the last 25 years; however, maintaining this level of quality will require continual investment in the ROCOG MPA.

Figure 3-15: Bridge and Culvert Sufficiency Rating in Olmsted County

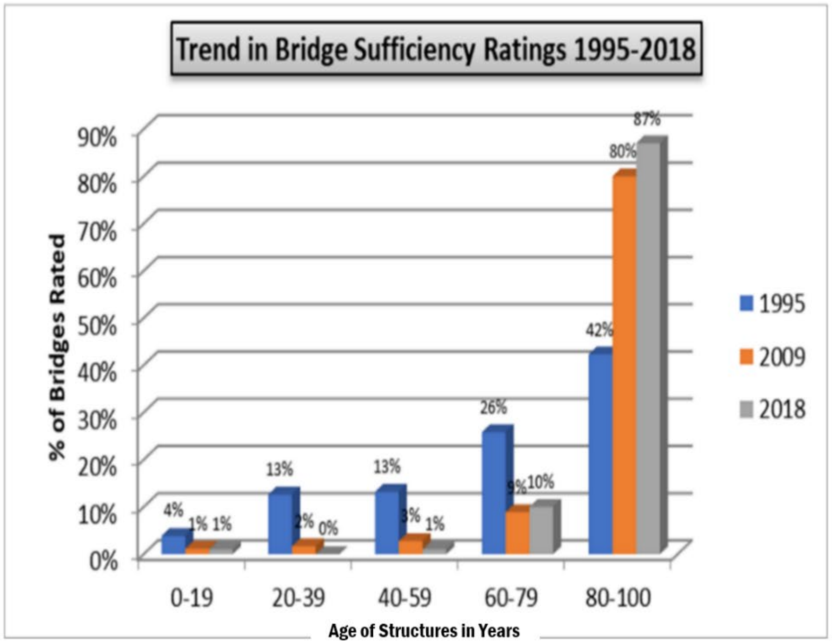


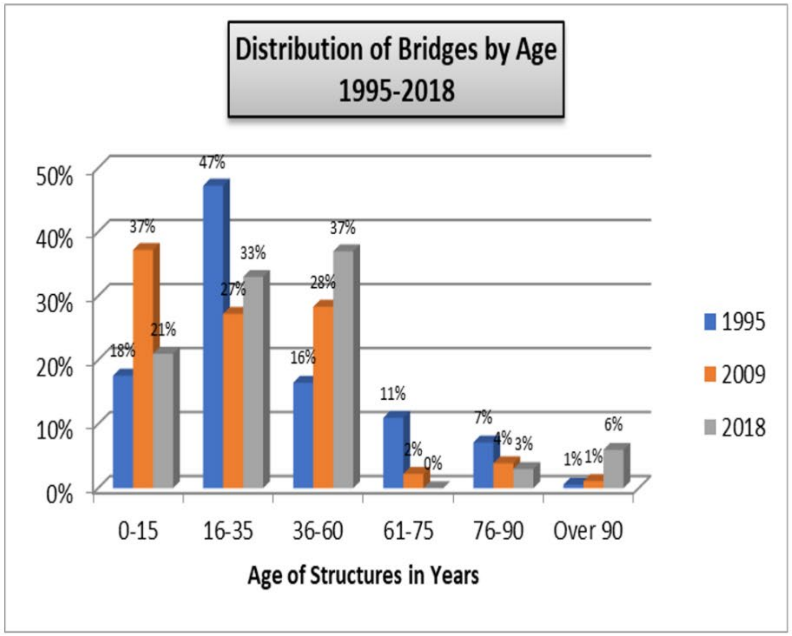


Bridges and Culverts Rating by Sufficiency and Age

Figures 3-16 shows the age and sufficiency rating of bridges from 1995 to 2018 in ROCOG area. Significant efforts have been made in the last 20 years to increase the share of bridges in "Very Good" condition (a sufficiency rating above 80), and the age profile of the bridge inventory has also improved. The number of bridges exceeding 60 years in age has been reduced significantly. Currently only 5 bridges in the county have a sufficiency rating below 40. Culverts generally are not subject to the same wear and tear as bridges and thus have a longer service life (typically lasting upwards of 90 years versus 60 years for bridge structures) and are in better condition. The structural integrity, adequacy, and safety of bridges in meeting all functional travel requires a continuous flow of federal and state funding.

Figure 3-16: Trends in Bridge Sufficiency Rating and Distribution of Bridges by Age 1995-2018

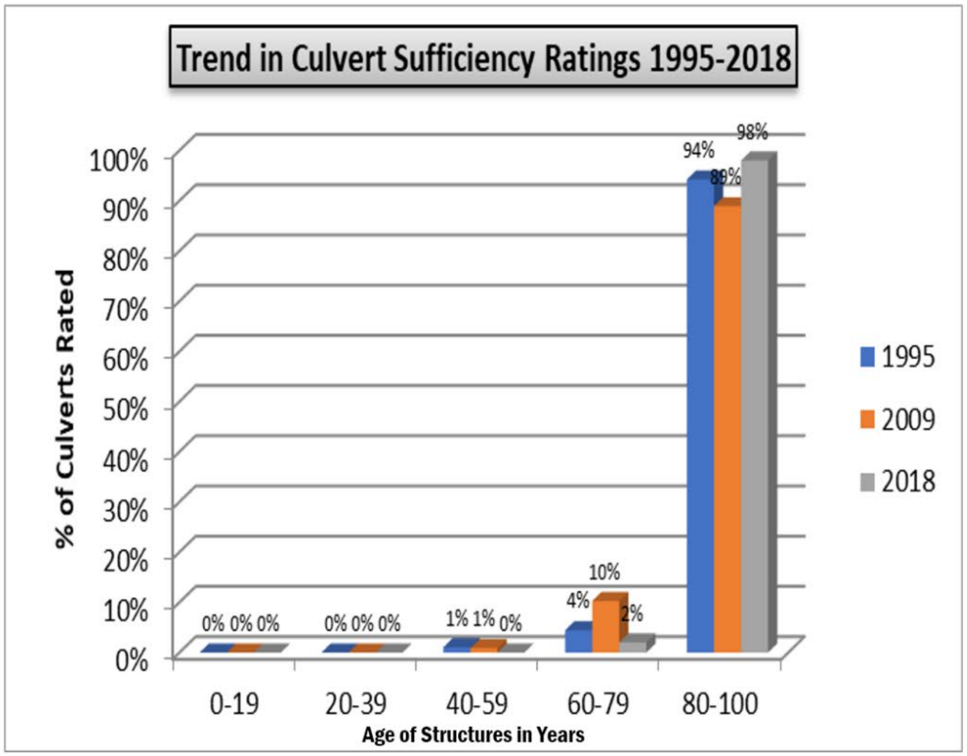


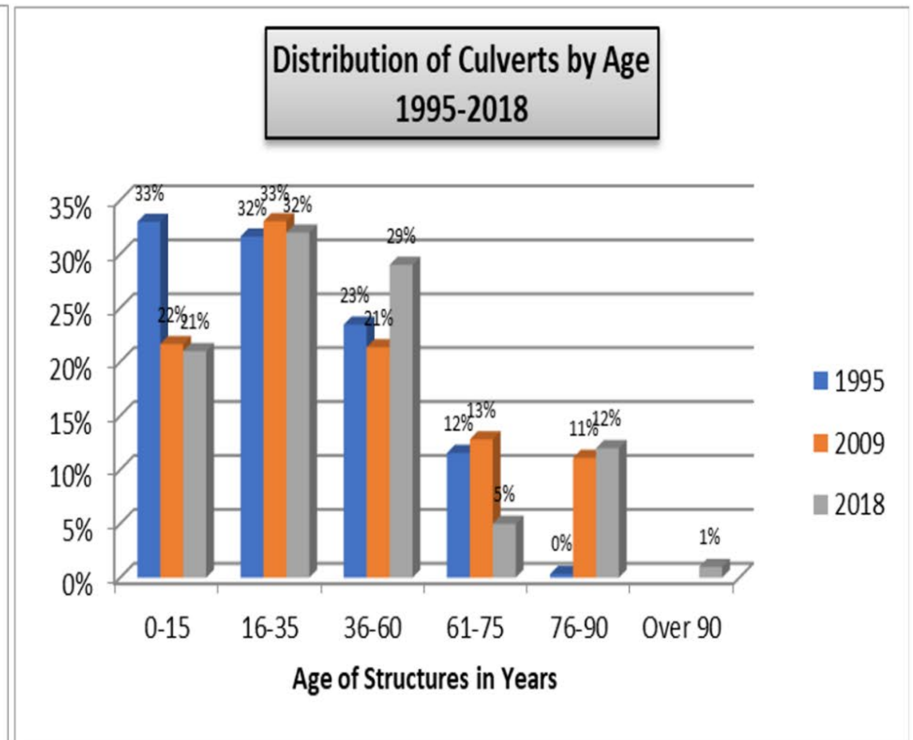


Source: Developed by ROCOG from data provided by Olmsted County, City of Rochester, & MnDOT Bridge Rating Data
https://www.dot.state.mn.us/bridge/datamanagement.html

Similarly, trends in culvert sufficiency rating and culvert age in Olmsted County are shown in Figure 3-17. 98% of culverts have a sufficiency rating of "Very Good" (between 80 and 100) in Olmsted County. Only 1% of culverts have a sufficiency rating of "Fair" (between 40-59). The culvert by age graph in Figure 3-17 shows that only 1% of culverts are over 90 years old. The majority of culverts fall in the age category of between 16 and 35 years. The culvert age group between 76-90 years has grown to 12% in 2018 which requires extra federal and state funding in a few years to improve integrity, adequacy and safety of bridge structure for public use.

Figure 3-17: Culverts by Age and Sufficiency Rating 1995-2018





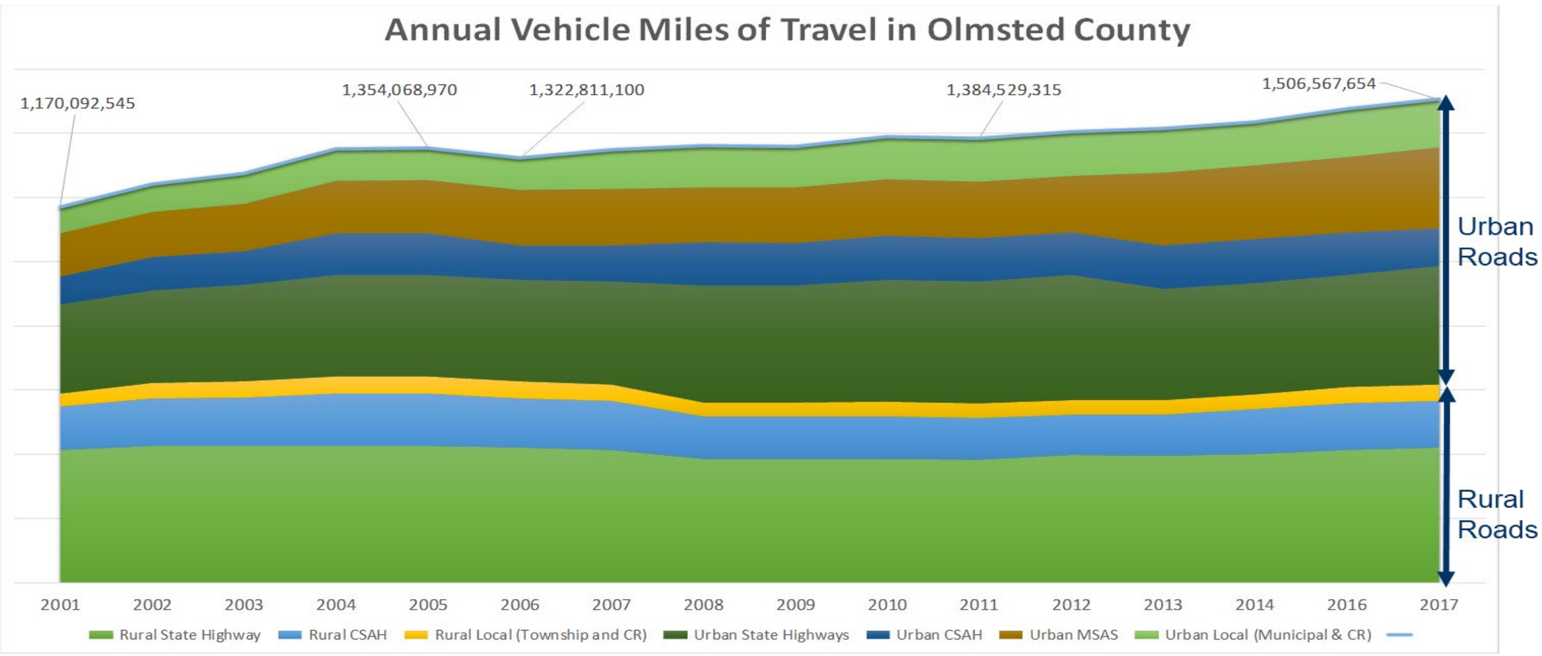
Source: Developed by ROCOG from data provided by Olmsted County, City of Rochester, & MnDOT Bridge Rating Data https://www.dot.state.mn.us/bridge/datamanagement.html

Vehicle Miles of Travel

Vehicles miles of travel (VMT) in the ROCOG area has experienced three periods of change over the last 20 years. Prior to the Great Recession starting in 2008, VMT grew at a rate of 2.2% annually from 2000 to 2007, driven by significant population and employment growth in Olmsted County, particularly in the Rochester urban area. During this period VMT increased 26% in the Rochester urban area but only 4% in the regional ROCOG area.

With the onset of the recession, VMT slowed to a 1% annual rate from 2007 to 2011, again with growth in the urban area (13% over 4 years) paired with a 9% reduction in VMT in the regional area. Since 2011, VMT growth has accelerated again to a rate of 2% annually, expanding 9% between 2011 and 2017. Unlike earlier periods, however, total VMT growth has been greater in the regional area (10%) than the Rochester urban area (8%) during this period.

Figure 3-18: Trend in Vehicles Miles of Travel Growth – ROCOG Planning Area 2001-2017



Source: MnDOT Roadway Data https://www.dot.state.mn.us/roadway/data/data-products.html#VMT

Figure 3-19 compares VMT growth against a series of metrics that are fundamental to the level of travel occurring in any region. The chart compares growth rates over different recent time periods for VMT, number of households, population, and employment.

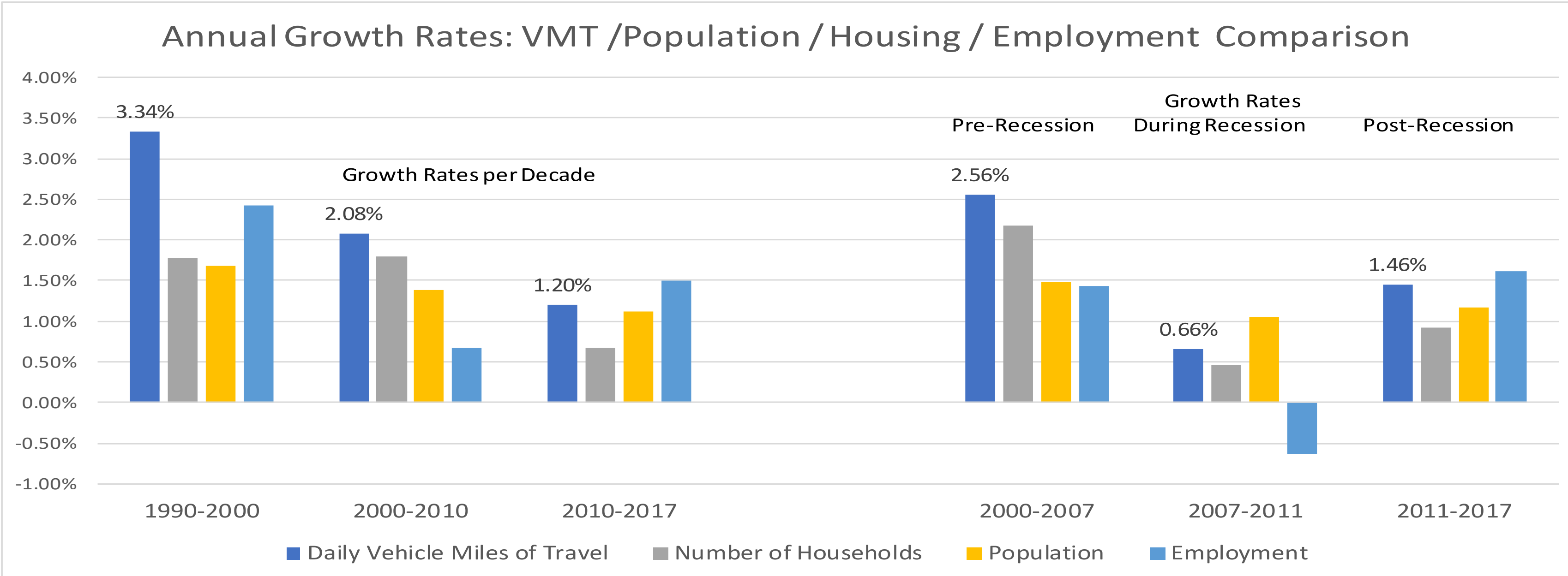
The left half of the chart compares change in these factors for the last three decades, with the 1990s representing a high-water mark for overall growth in the Rochester area. Growth in the early 2000s was strong enough to overcome the loss of jobs and slowing activity in the latter part of the 2000s, while growth has rebounded since 2010, but at a lower level. Of note during all three periods is the fact that VMT growth was stronger than growth in the other factors except for employment growth in the 2010s.

The right half of the chart breaks down the period since 2000 into three periods including pre-recession, the Great Recession itself, and post-recession. This comparison shows growth in all factors except for employment during the recession. Of note in this time frame is that VMT growth has slowed to be more consistent with the other factors, unlike earlier periods where VMT growth was always higher. While slowing VMT growth is understandable during the recession, since that time the pattern may be influenced by Rochester attracting a larger share of population and employment growth to the urban area coupled with a slowing in commuter growth (as was shown in Chapter 2), which has tempered the overall level of VMT growth.

Daily Travel in the Rochester Urban Area

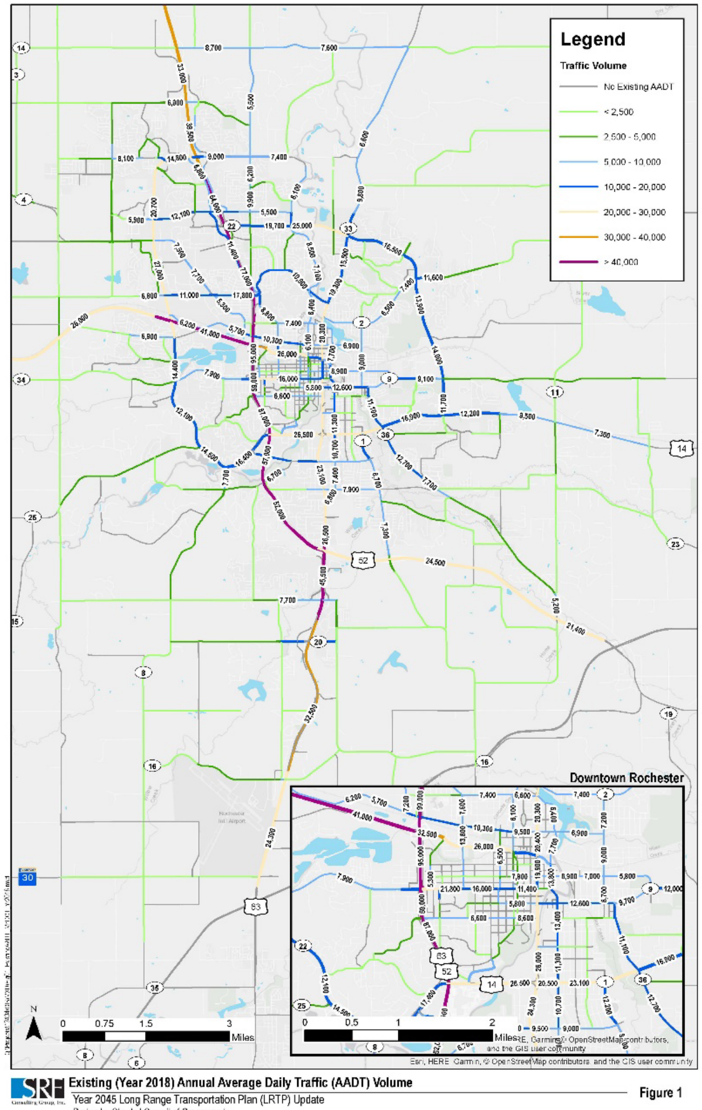
Figure 3-20 illustrates the current level of traffic occurring on Rochester area roadways based on the latest State Aid traffic counts collected by MnDOT in 2018. Figure 3-21 illustrates for the urban area the level of growth that has occurred between 2000 and 2018 on individual corridors throughout the urban area.

Figure 3-19: Comparative Trends in VMT, Population and Employment in Olmsted County



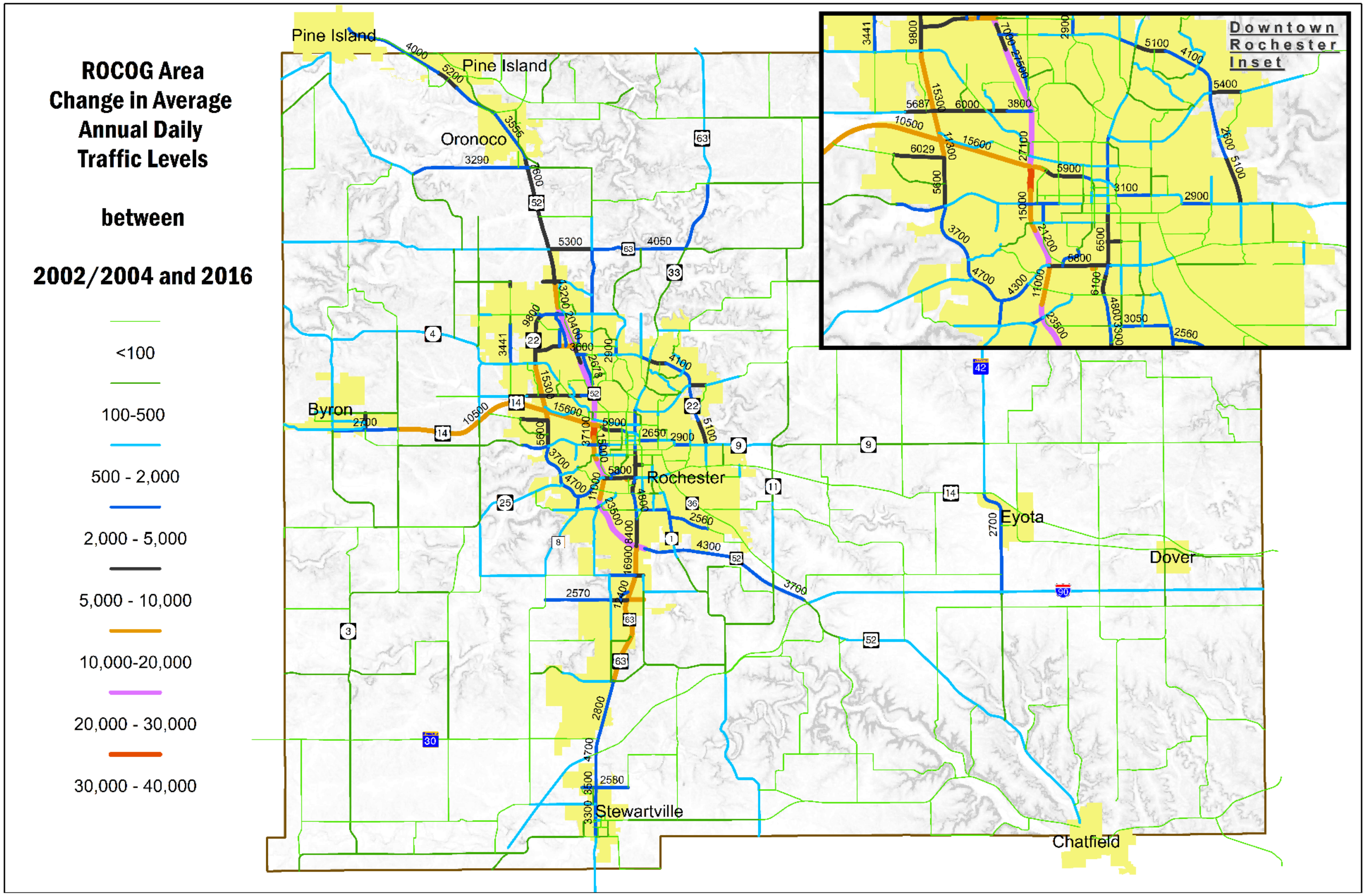
Source: MnDOT Roadway Data **https://www.dot.state.mn.us/roadway/data/data-products.html#VMT and US Census Bereau, https://data.census.gov/cedsci/all?q=olmsted%20county,%20mn**

Figure 3-20: Average Annual Daily Traffic in Rochester Urban Area – 2018



Source: MnDOT Traffic Counting Program/State Aid Traffic Count Maps

Figure 3-21: Traffic Growth on Streets and Highways in ROCOG Area – 2002/2004 to 2018



Source: ROCOG based on information from MnDOT State Aid Count Maps

Public Transit Ridership and Operating Cost

Figure 3-22 illustrates the steady growth in annual ridership that Rochester Public Transit has experienced since 2010 along with the growth in annual fixed route operating expenses. Ridership was impacted in 2009/2010 by the recession that began in 2008 but began growing again in 2011. Annual ridership reached 2.1 million in 2019, with 42% of ridership associated with direct service routes from city Park & Ride lots to downtown and 58% associated with regular route service. Annual per capita ridership is also showing an upward trend, reaching 17.12 trips per capita in 2019. Funding of fixed route transit shows operating costs reached $8.5 million in 2018. As a result of State Legislative action in 2016, an increasing share of operating costs are covered by state funding sources.

Figure 3-23 illustrates ridership and operating expenses for Rochester paratransit service for elderly and disabled known as "ZIPS" (Zumbro Independent Passenger Service). Ridership on the service has been fairly steady with a slight upward trend observed in recent years. ZIPS added taxi service for evening and peak demand periods in 2017. Operating costs have trended upward in line with general labor cost and supply cost trends.

A series of metrics for public transit are shown in Figure 3-24. Ridership has increased by over 3.5% annually, supported by an increase in both vehicle hours of service and miles of service. Key findings include:

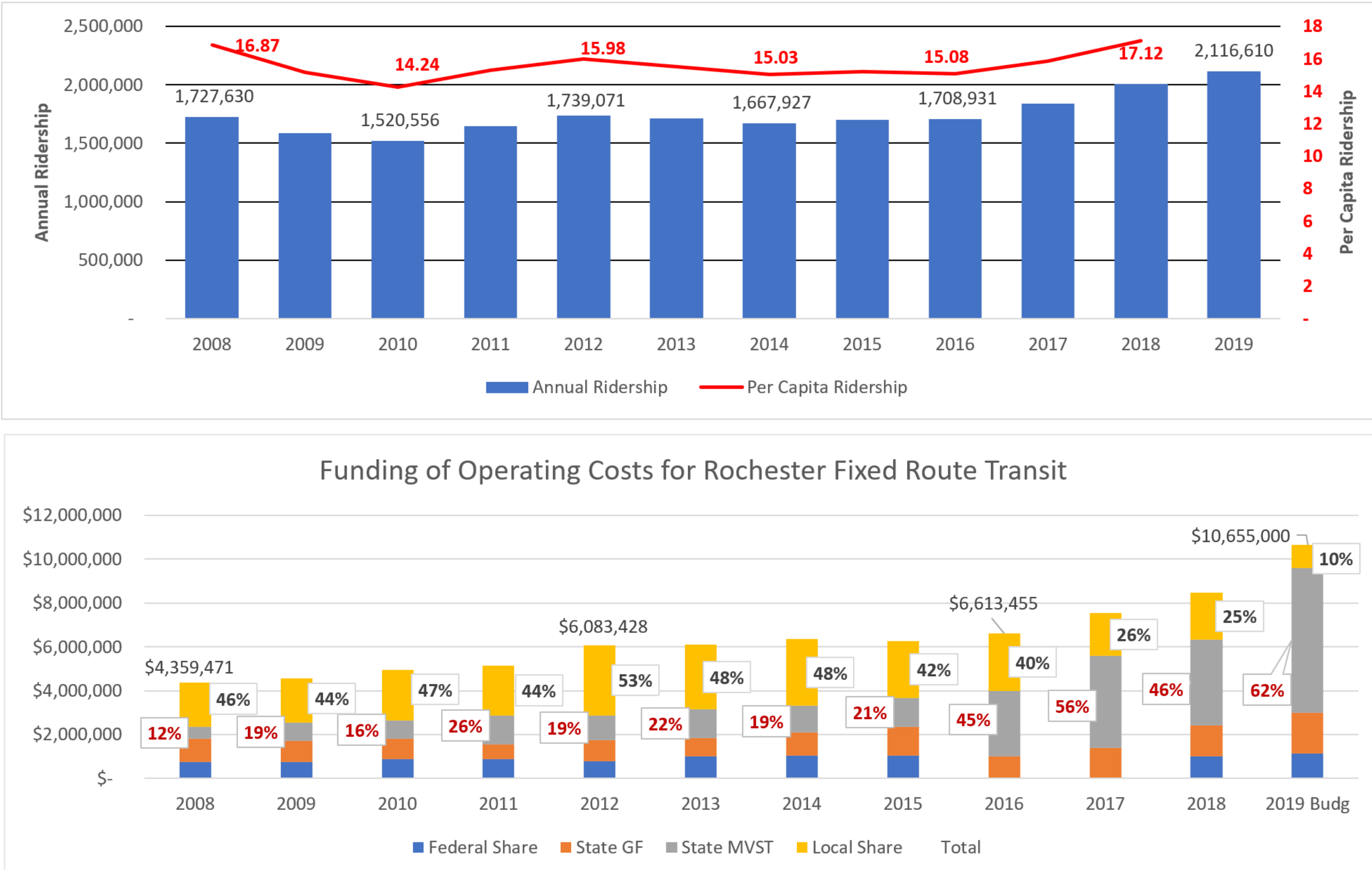
- The rate of ridership growth has exceeded the growth rate in service as measured by vehicle miles and vehicle hours of service
- The rate of growth in operating costs has tracked the combined impact of service growth and cost inflation for inputs such as fuel, labor and maintenance
- Passenger levels as measured by passengers per hour has ticked up slightly over the last 10 years

Other key transit services in the ROCOG area include private, for-profit regional commuter bus service and a regional subscription service provided by Rolling Hills bus service in the City of Rushford that serves the communities of Stewartville, Byron, Eyota and Dover. Besides public transit, there are a variety of for-profit and non-profit services operating within Olmsted County, as well as private bus/vans connected with senior and special needs housing sites, places of worship, regional shopping centers, lodging facilities and select multi-family housing projects.

Fixed Route Service/Service Area

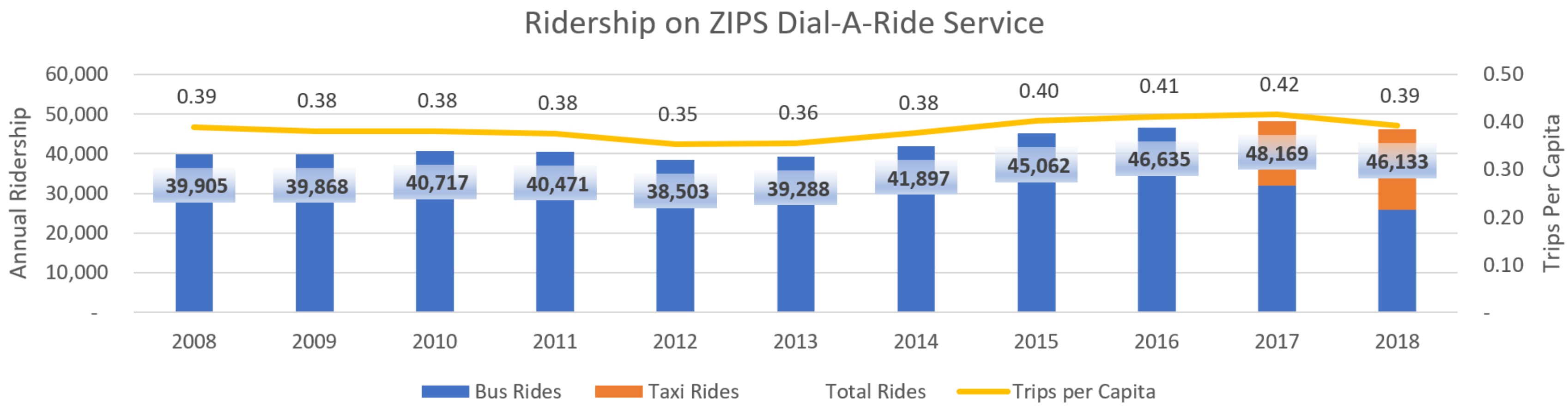
Primary service operates on weekdays from 5 AM to 8 PM with late night service until 11 PM. Weekend service is provided from 7 AM to 7 PM. The fixed route service includes 17 basic weekday routes, four evening routes

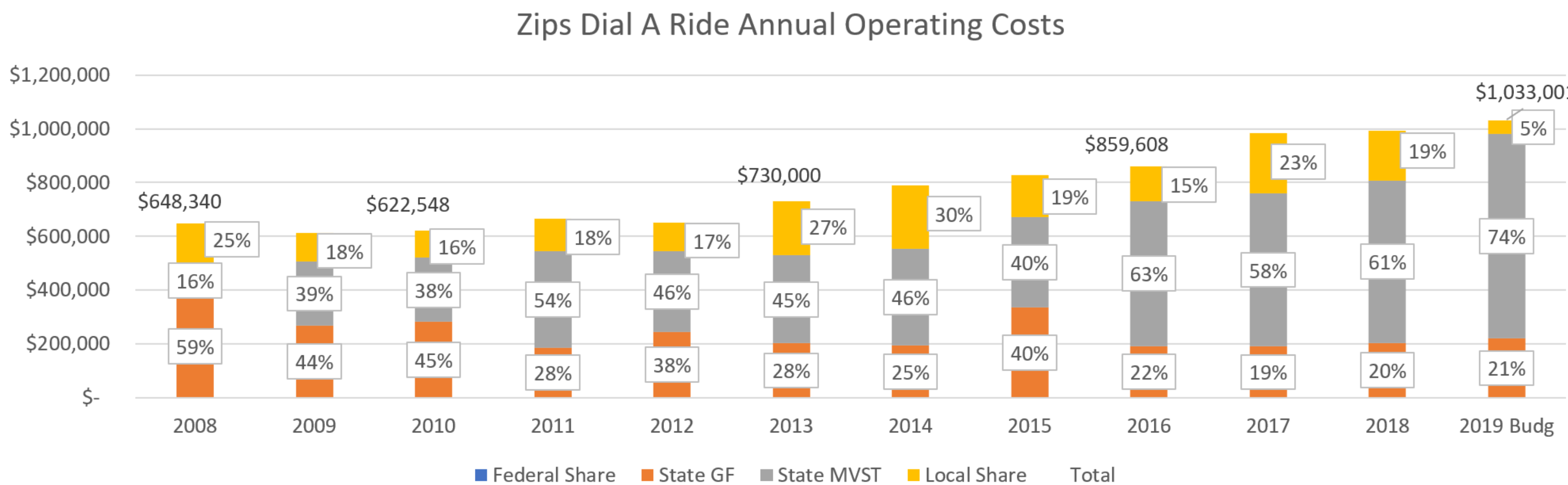
Figure 3-22: Rochester Regular Route Transit Ridership and Operations Costs/Funding



Source: Ridership from National Transit Database; operating cost breakdown from Minnesota State Transit Report

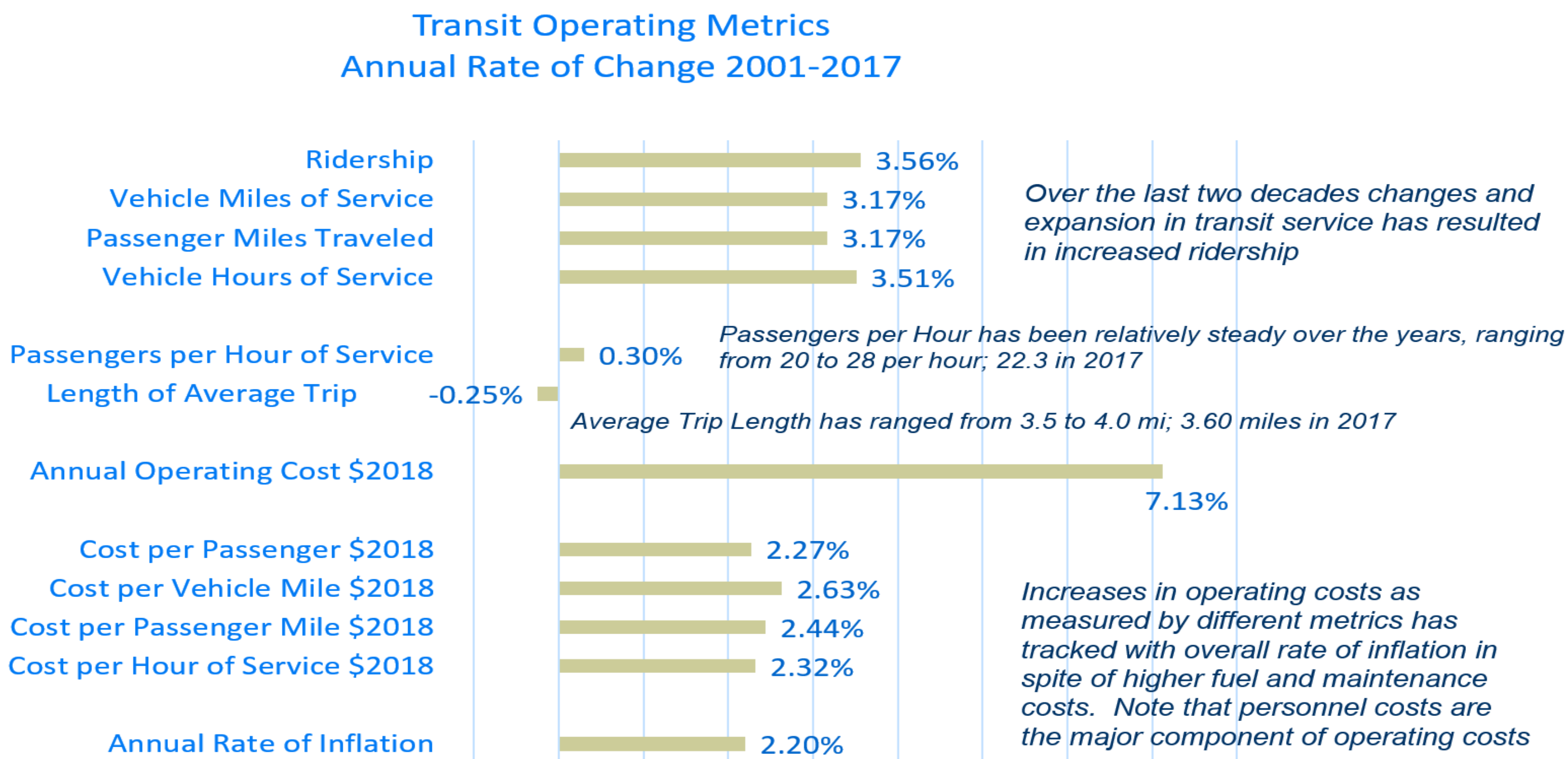
Figure 3-23: Rochester Dial-a-Ride Transit Ridership and Operations Costs/Funding





Source: Ridership from from National Transit Database; Operating Cost Breakdown from Minnesota State Transit Report

Figure 3-24: Transit Operating Metrics and Annual Rate of Change 2001-2017



Source: Data from National Transit Database and Minnesota State Transit Report and seven weekend routes. Weekday service is supplemented by two peak hour service routes and six express routes. Common headways are 30 minutes during peak periods and one hour during off-peak times.

The fixed route system is currently designed as a hub and spoke system, with all routes converging at the Downtown Transfer Area. It is heavily utilized during the AM and PM peak periods, with heavy station utilization occurring about every 30 minutes as buses "pulse" into and out of the downtown station. The maximum accumulation of buses at any one time in this area averages 22 vehicles. Buses serving regional commuter routes also have designated areas for boarding and unloading adjacent to the Downtown Station within the Mayo Medical Center campus and at Saint Mary's hospital.

With the city growing in both geographic size as well as population, the number of peak hour vehicles in service has expanded by 50% in the last 13 years. Over 90% of the population of Rochester lives within ¼ mile of fixed route service. Figure 3-25 shows the coverage area in Rochester and major trip generators of transit trips.

Regional Commuter Bus Service

Rochester City Lines (RCL) is a private, for-profit carrier that provides commuter bus service to 32 communities in nine counties throughout Southeast Minnesota. They provide peak hour mass transit service and add/subtract routes based on ridership. Figure 3-26 shows the communities Rochester City Lines serves with a fleet of 31 buses. While not a true subscription service, RCL bases decisions regarding initiating or expanding service on interest expressed by individuals in the community. Once the level of expressed ridership demand has reached a point that running a bus would be financially viable, RCL will start service. All of the current routes are served by multiple vehicles, allowing a choice of trip times for residents of the communities served.

Mayo Clinic supports the service by providing a base subsidy to employees by assisting RCL in the sale of passes through bulk purchase of passes from RCL and reselling those to employees at discounted rate to help encourage use of alternative modes of transportation.

RCL has an agreement with Rochester Public Transit to allow users taking an RCL bus to Rochester to transfer for free to any local RPT route to complete their trip. RCL is looking to expand their service area in the future. They also intend to increase frequencies of their peak hour service as envisioned in the Destination Medical Center (DMC) planning.

Rochester Park and Ride System

To assist in managing the flow of traffic in and out of downtown Rochester in peak periods, the City of Rochester has established a network of remote park and

Figure 3-25: Transit Coverage Area in Rochester 2017

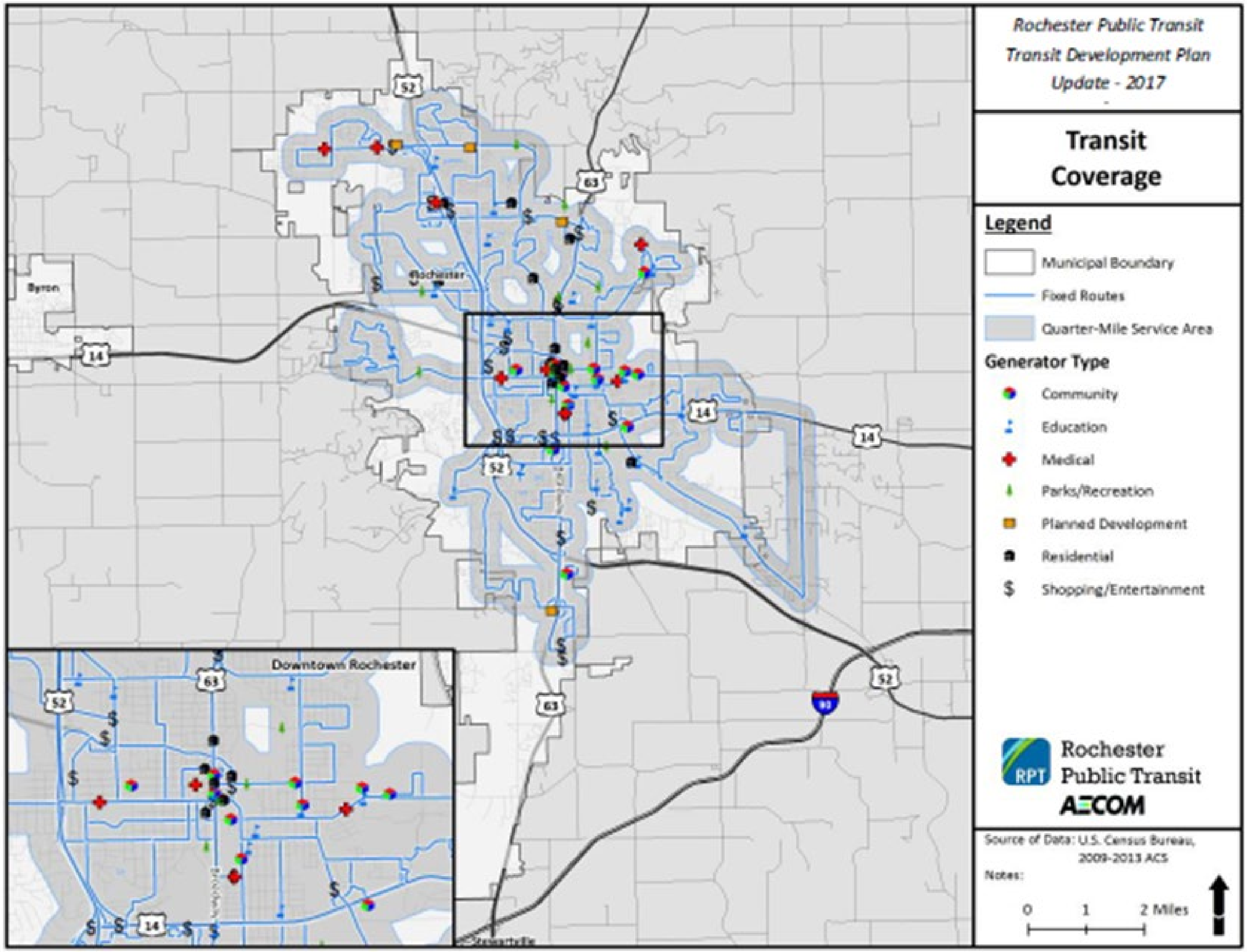
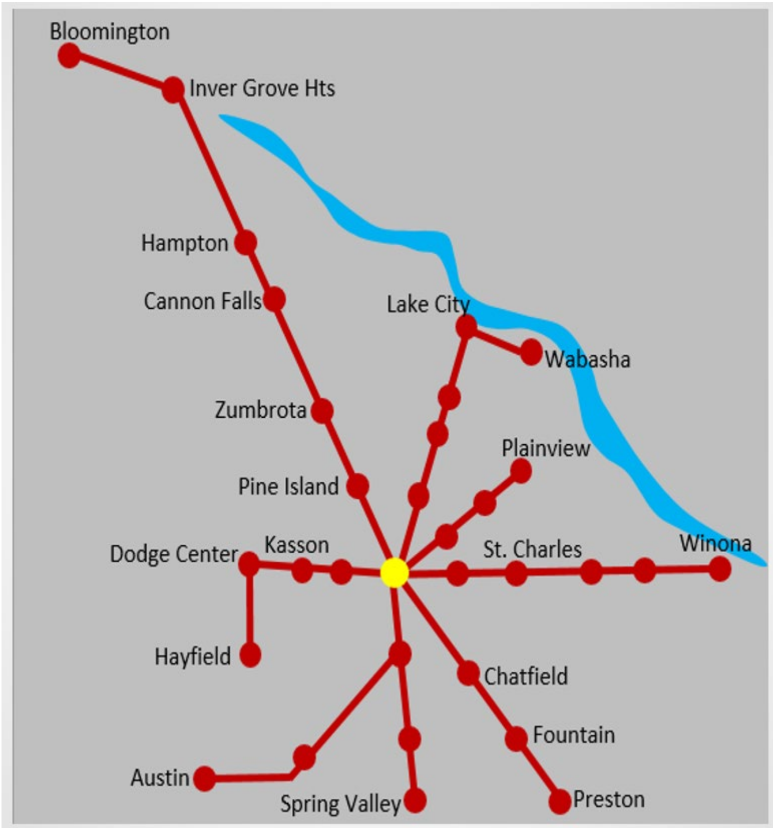


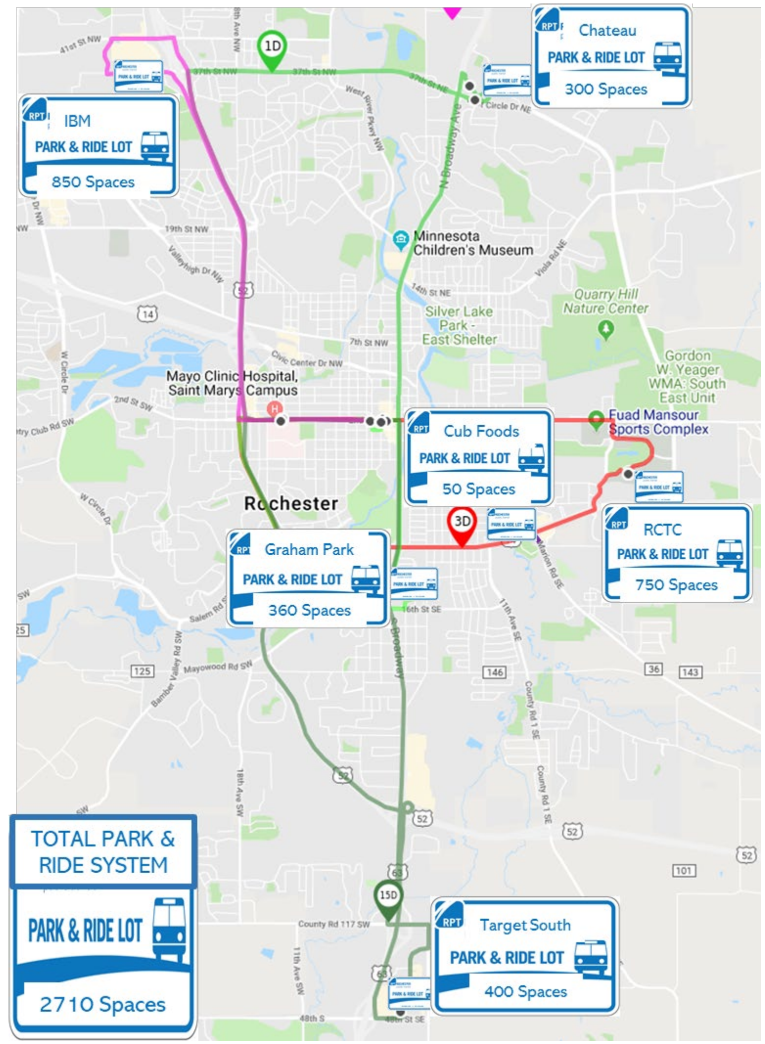
Figure 3-26: Rochester City Lines Service Area



Source: Regional Public Commuter Services, Rochester City Lines https://www.rochestercitylines.com/commuter.php

ride lots for commuters (and open to others as well) with express buses providing service to the Downtown Transit Station and St. Marys Hospital area (Figure 3-27). Park & Ride service has evolved into an important tool to minimize traffic congestion and parking needs while

Figure 3-27: Rochester Park and Ride System



Source: Rochester Public Transit website; ROCOG maintaining reliable peak period accessibility to the downtown.

A total of 2,710 spaces are currently provided at six locations around the urban area, located along major regional highways. Utilization rates are very high, averaging above 90% and in the case of some lots, including the IBM lot (NW), the Target South lot, and the Chateau Theatre lot (NE), seeing demand exceeding capacity.

This parking capacity is provided through the city leasing parking capacity from private business or landowners. Recently the rate has been $25 per space per month. Costs for the system are recovered through fees charged to users and support from employers. For example, Mayo Medical Center pays a sponsorship fee on the order of $750,000 annually to the city for providing service to their employees.

Rural Area Transit Service

Rolling Hills Transit provides reservation-based dial-a-ride bus service for the general public in a number of small cities and nearby township areas in Olmsted County including Byron, Chatfield, Dover, Eyota, and Stewartville. Service is provided curb to curb which is convenient for riders with disabilities and the public without limitations, as well as offering preschool service to the public.

This transit service is administered by the Southeast Minnesota Community Action Council (SEMCAC) under contract with Rolling Hills Transit. In addition to areas in Olmsted County, service is also provided to Dodge, Winona, Fillmore and Houston Counties. Daily service availability is summarized in Figure 3-28.

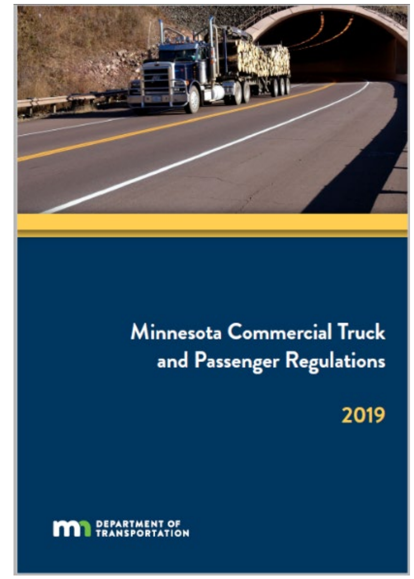
Freight

The primary mode for moving goods associated with the economy of Olmsted County is truck travel. Whether for agricultural products, building materials,

Figure 3-28: Rolling Hills Transit Service Hours

Source: Rolling Hills Transit web site

manufactured goods, or merchandise delivery to retail stores, freight trucks move the majority of goods in the ROCOG MPA. Accessibility and mobility are key concerns affecting truck travel, as they are with other vehicular traffic, though vehicle weight and size present further considerations for heavier truck travel.

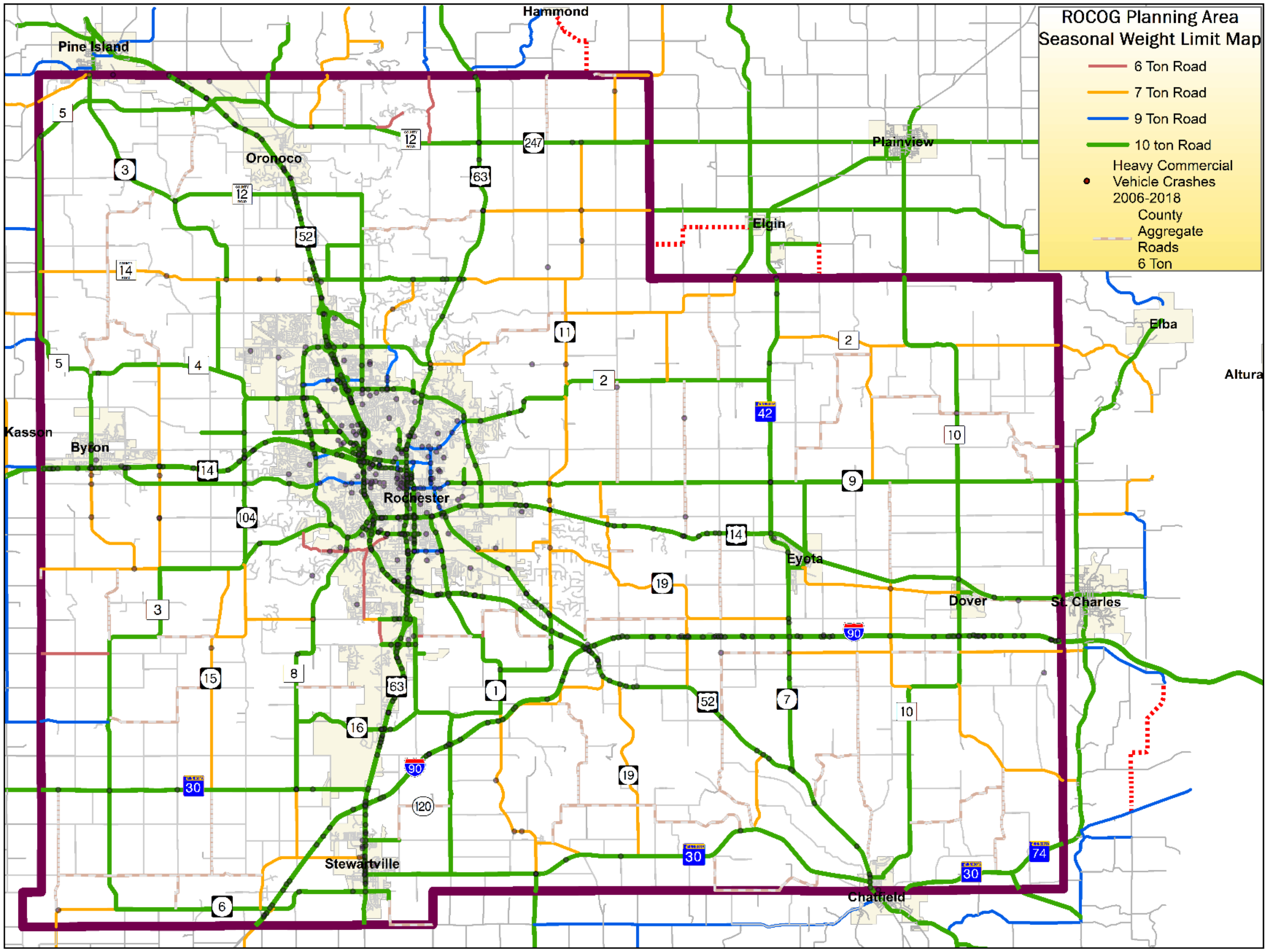


Primary roads and bridges need to be strengthened sufficiently to withstand the added loads of heavy truck travel, and geometric design features need to accommodate the restricted handling capability of large trucks.

Local municipalities, Olmsted County, and MnDOT all monitor 10-ton route needs on a regular basis. Current regional routes seasonal weight limits along with the Rochester truck route network and allowed weight limits are shown in Figure 3-29.

Figure 3-29 also illustrates the location of vehicle crashes involving heavy commercial vehicles over the last 15 years. As expected, frequency of crashes correlates with Heavy Commercial Average Daily Traffic (HCADT) levels,

Figure 3-29: Seasonal Weight Limit on State and County Roads in Olmsted County 2019



Source: ROCOG

with the majority of crashes found on the Interstate and Trunk Highway network.

The MnDOT Office of Freight and Commercial Vehicle Operations publishes the Minnesota Commercial Truck and Passenger Regulations to advance highway safety by working with providers of commercial transportation to improve and enhance the safety of their operations. MnDOT also completed a "Manufacture's Perspective on Minnesota's Transportation System" in Southeast Minnesota. MnDOT collected and analyzed information on manufacturers' perspective in its District 6 in order to:

- Better understand their perspectives and priorities
- Build relationships to better align the transportation system in the long-term with shippers' needs
- Support continuous improvement at MnDOT with ongoing input from this customer segment

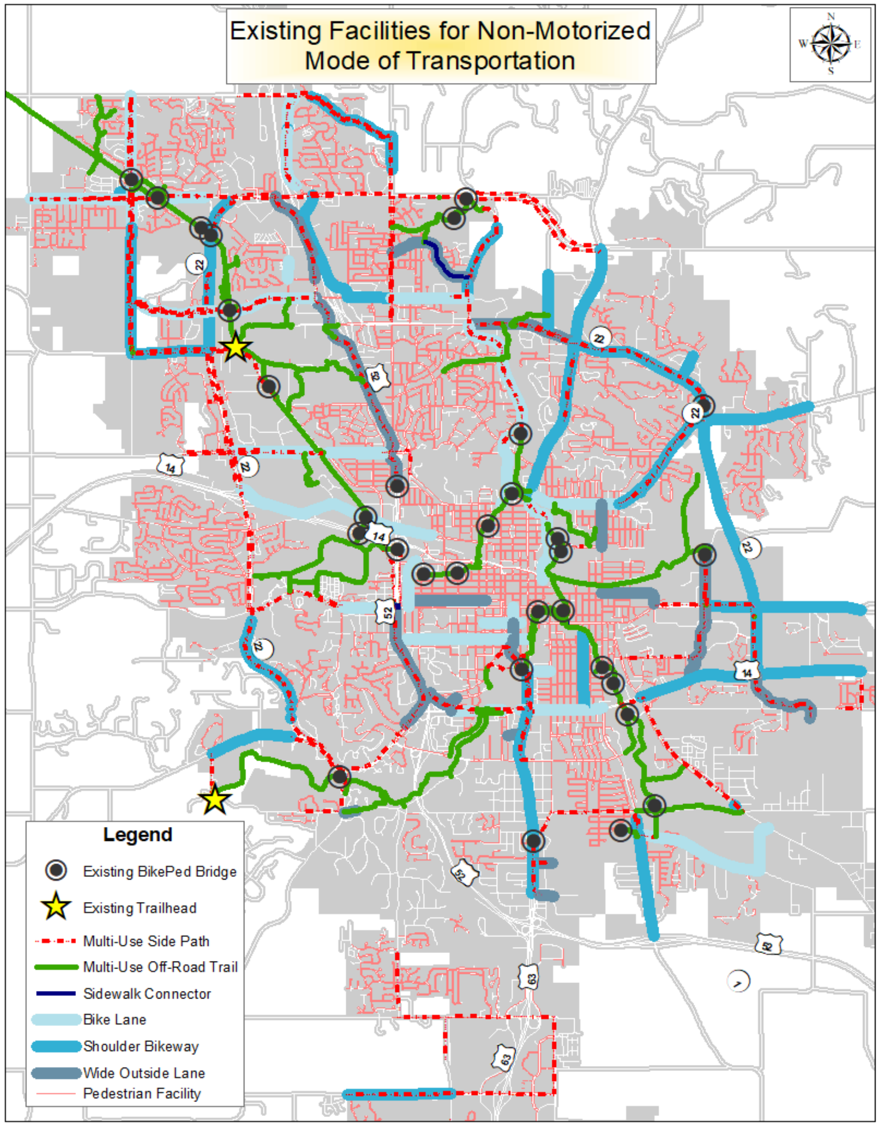
Commercial transport infrastructure represents an investment in quality transportation connections needed to serve the local and regional economy.

Bicycle and Pedestrian Facilities

Rochester has more than 125 miles of paved paths and trails, 37 miles of on-street bicycle facilities and 31 bridge structures and underpasses exclusively for bicycle and pedestrian use in the Rochester urban area. The Rochester River Trails system, which was largely constructed as part of the Rochester Flood Control Project in the 1980s and 1990s, provides a core network of trails interconnecting many subareas within the urban area. Existing non-motorized facilities in Rochester are shown in Figure 3-30.

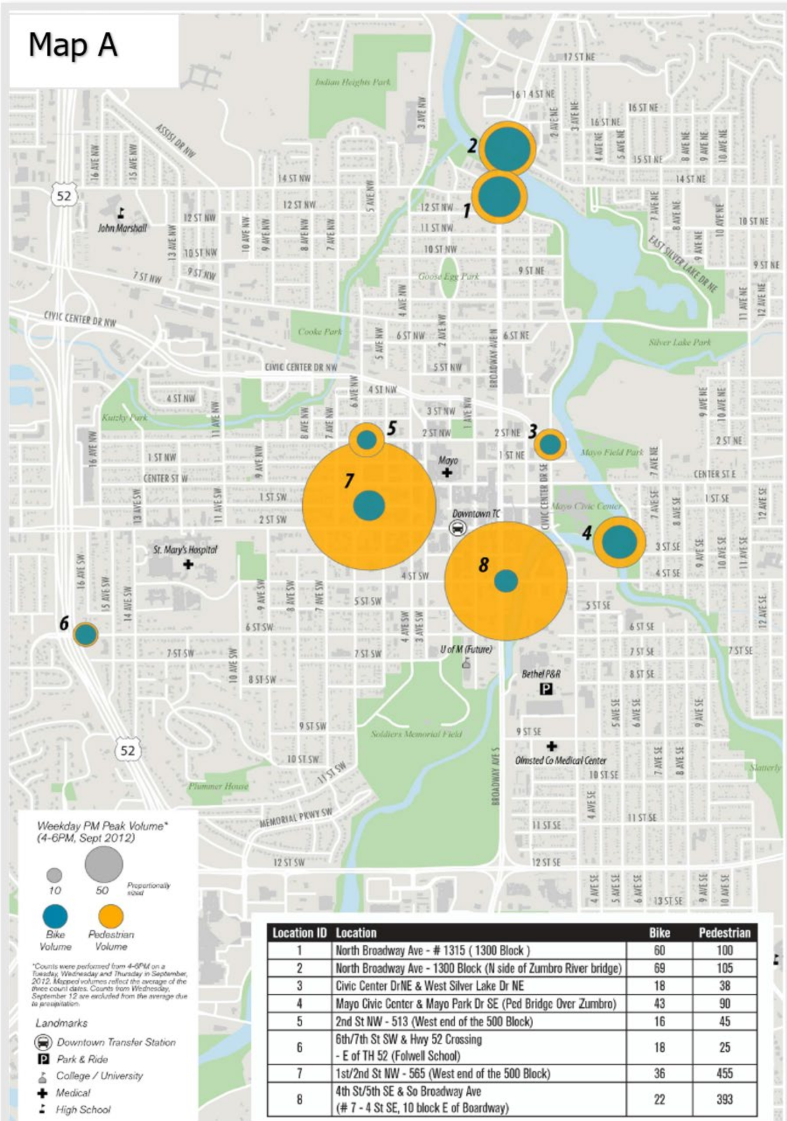
Utilization data is limited and was gathered primarily from pilot count studies organized in 2011/2012 by MnDOT focused on high activity locations. The survey counting station stations and peak hour counts are shown in Figure 3-31 (Map A). The Pedestrian and Bicycle Advisory Committee (PBAC) established by the City of Rochester in 2017 has worked with a committee comprised of City Public Works, Rochester Parks and Recreation, and ROCOG staff to develop the survey sites in and around Rochester for the regular counting of bicyclists and pedestrians. The counting sites developed by the subcommittee are shown in Figure 3-31 (Map B). The city is intending to use those potential survey sites for the future counting of pedestrian and bicyclists in and around downtown and surrounding areas of the city on a regular basis.

Figure 3-30: Existing Non-Motorized Facilities in Rochester

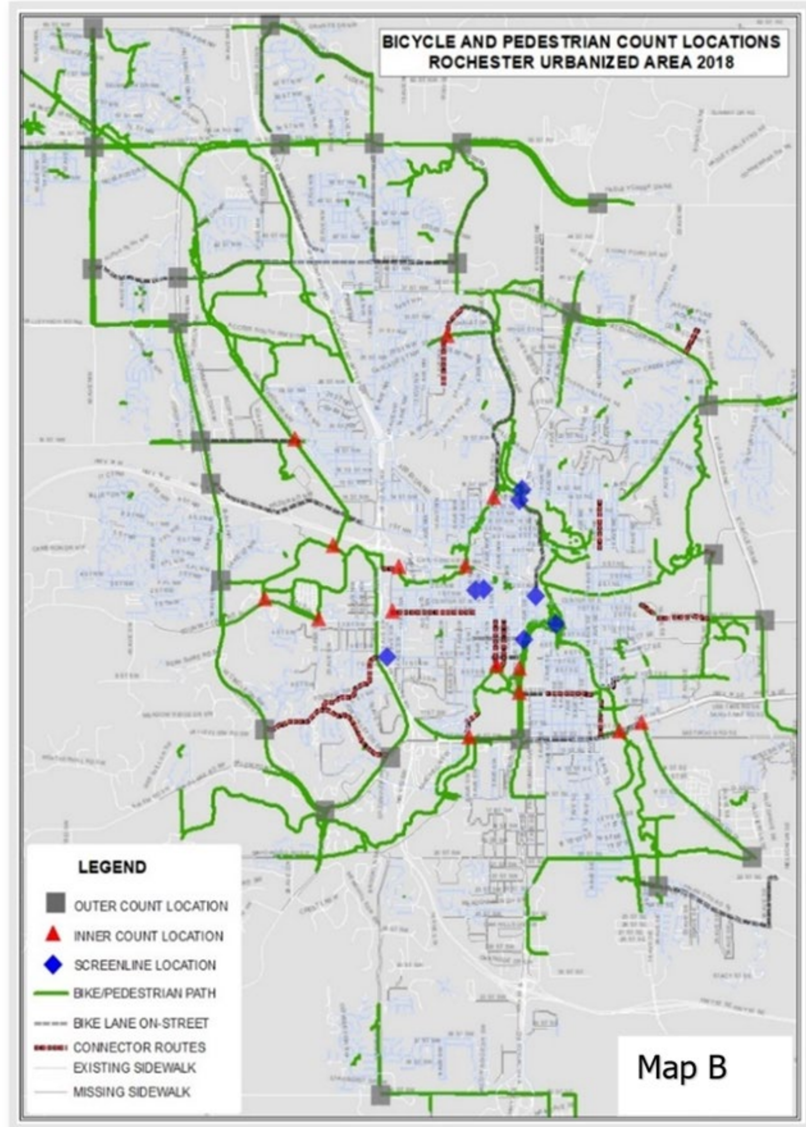


Source: Rochester Public Works and Park & Recreation Depts.

Figure 3-31: Bicycle and Pedestrian Counting Location (Maps A&B)



Location ID	Location	Bike	Pedestrian
1	North Broadway Ave - # 1315 (1300 Block)	60	100
2	North Broadway Ave - 1300 Block (N side of Zumbro River bridge)	69	105
3	Civic Center DrNE & West Silver Lake Dr NE	18	38
4	Mayo Civic Center & Mayo Park Dr SE (Ped Bridge Over Zumbro)	43	90
5	2nd St NW - 513 (West end of the 500 Block)	16	45
6	6th/7th St SW & Hwy 52 Crossing - E of TH 52 (Folwell School)	18	25
7	1st/2nd St NW - 565 (West end of the 500 Block)	36	455
8	4th St/5th SE & So Broadway Ave (# 7 - 4 St SE, 10 block E of Boardway)	22	393



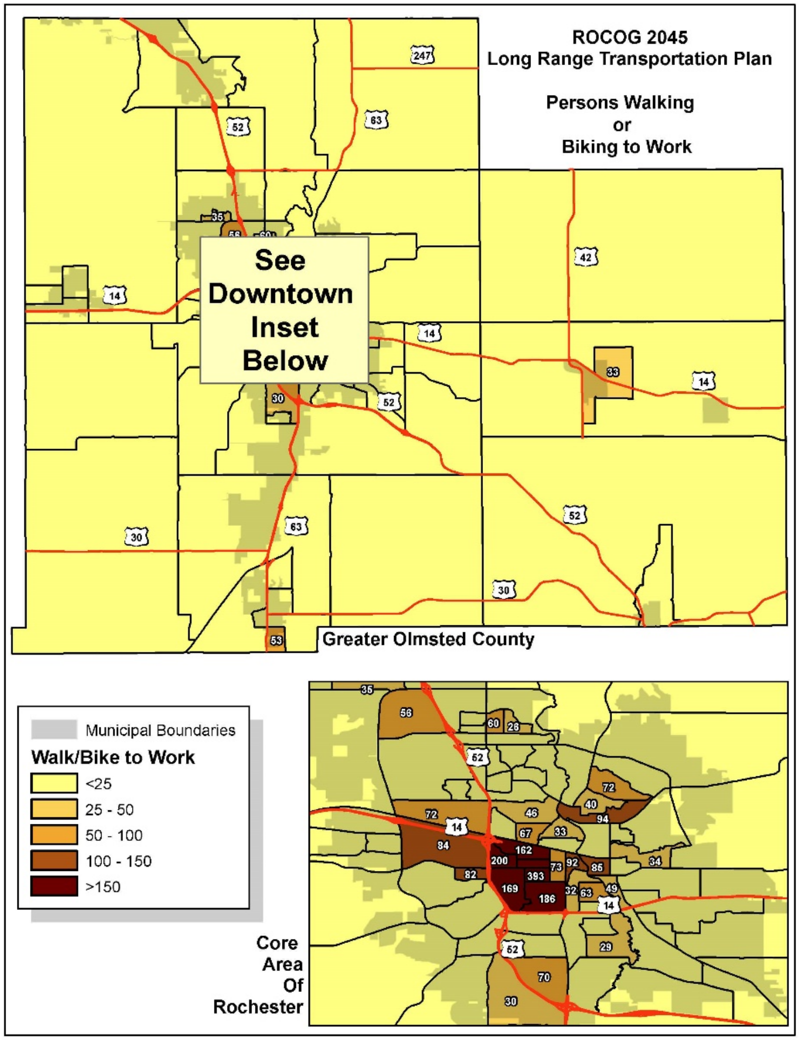
Journey to Work

Figures 3-32 through 3-34 illustrate information derived from the 2012-2016 American Community Survey Block Group data that illustrates where users of alternative commute modes reside within the ROCOG Planning area and the level of utilization in each block group area. Each graphic includes a map showing data for the greater regional ROCOG area along with an inset map for the core Rochester Area.

Figure 3-32 illustrates where persons who walk or bike to work reside. As expected, the largest concentration for such commuters is in neighborhoods adjacent to downtown Rochester. Figure 3-33 illustrates where those who use carpools or transit reside. Generally speaking, persons in the regional area will be carpoolers, while those shown in the core urban area are likely to be transit users. Figure 3-34 reflects the residence location of those who telecommute for work.

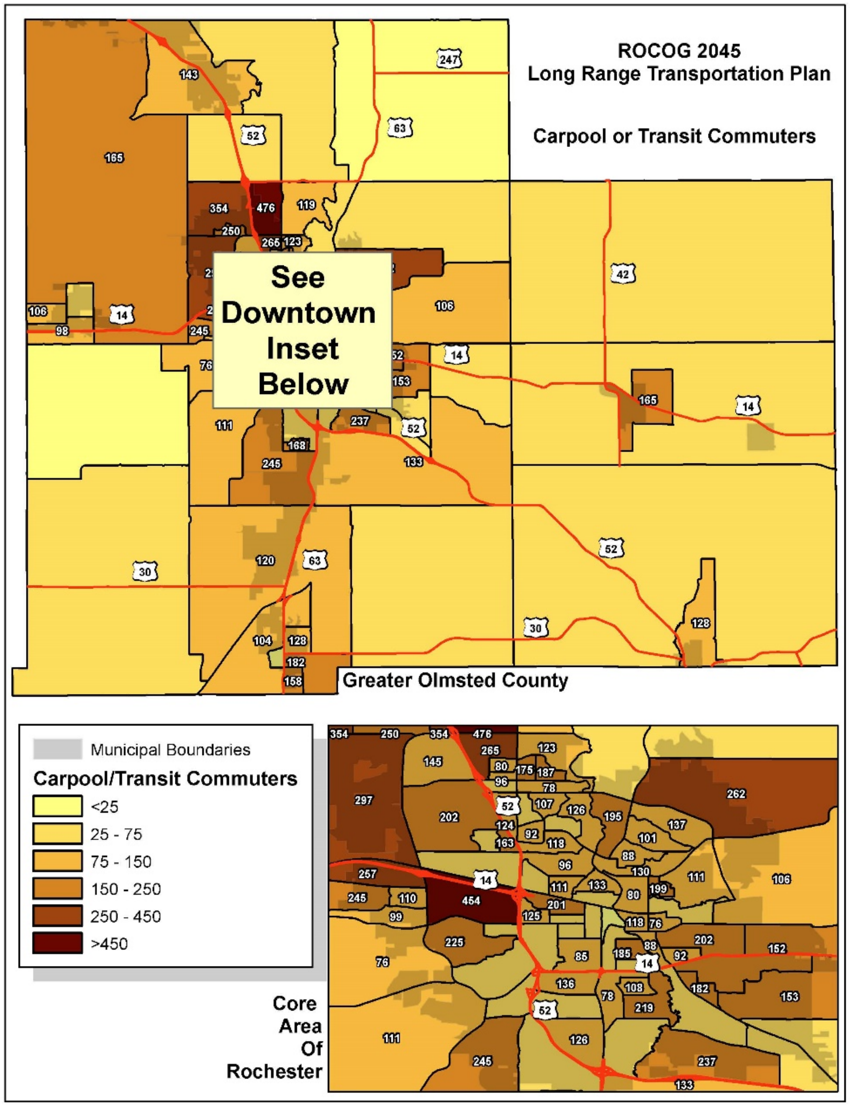
Figure 3-35 reports summary Journey to Work data for select years for Olmsted County and Rochester residents. Mode shares for various commute travel modes are illustrated in the table. Solo commuting has declined in recent years in Rochester, likely driven by efforts of the Mayo Medical Center and other downtown employers.

Figure 3-32: Walk and Bike to Work



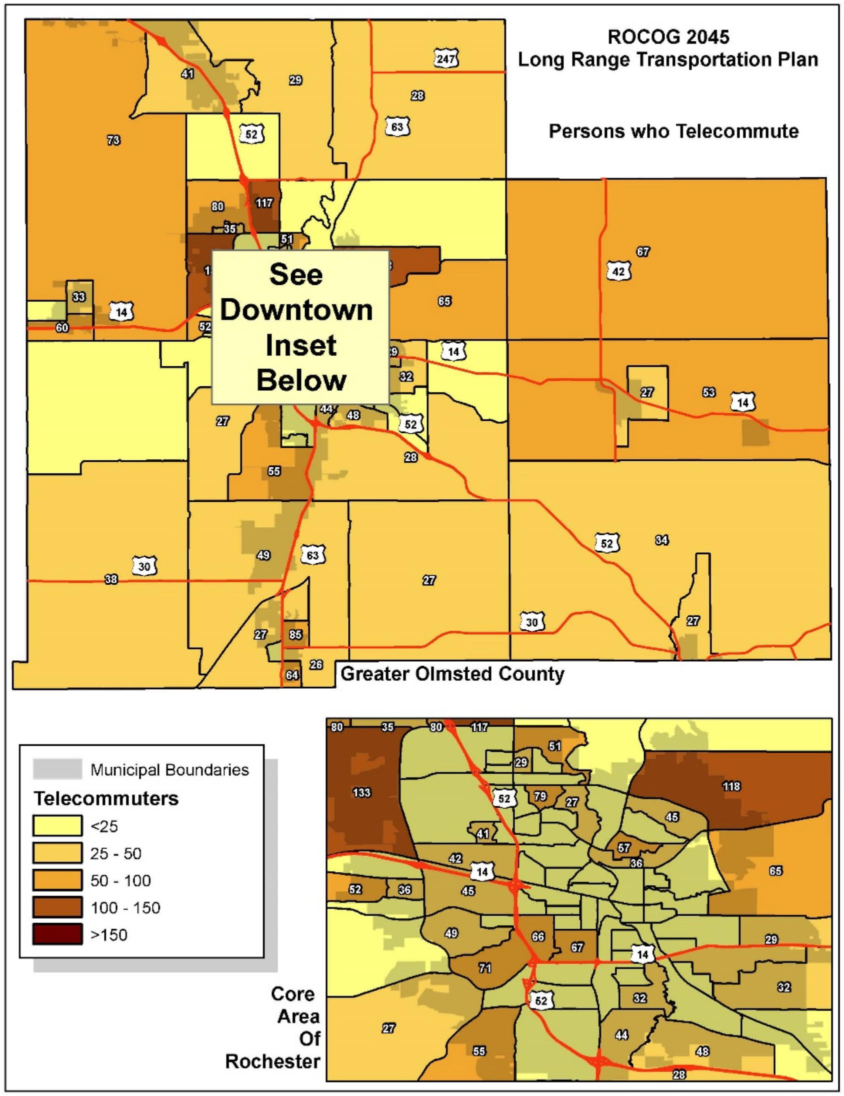
Source: 2012-2016 American Community Survey

Figure 3-33: Transit and Carpool Work Travel



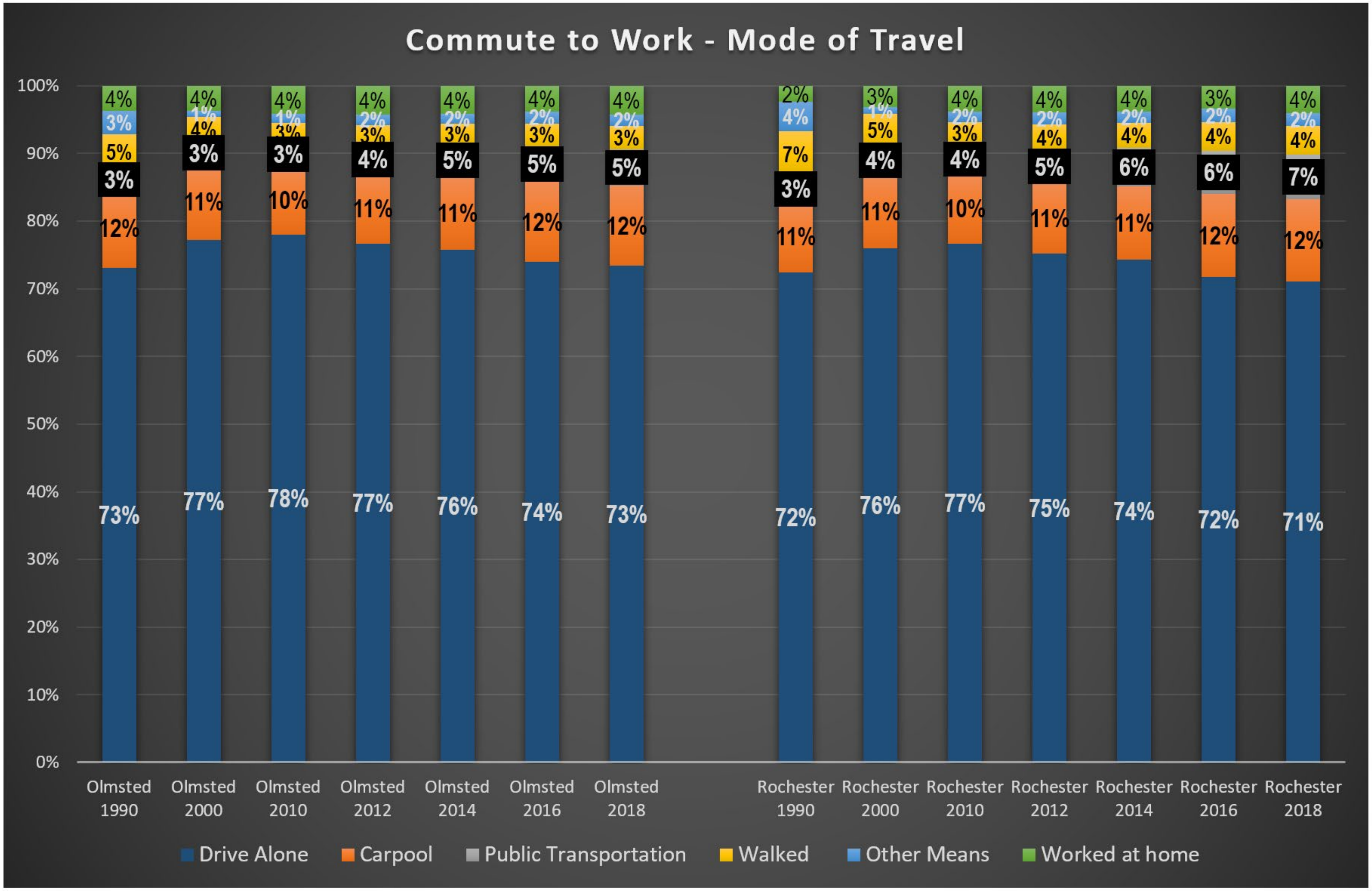
Source: 2012-2016 American Community Survey

Figure 3-34: Telecommuters



Source: 2012-2016 American Community Survey

Figure 3-35: Census Journey to Work Trends



Source: Developed from mode share data of US Census 1990-2010 and American Community Survey 2018

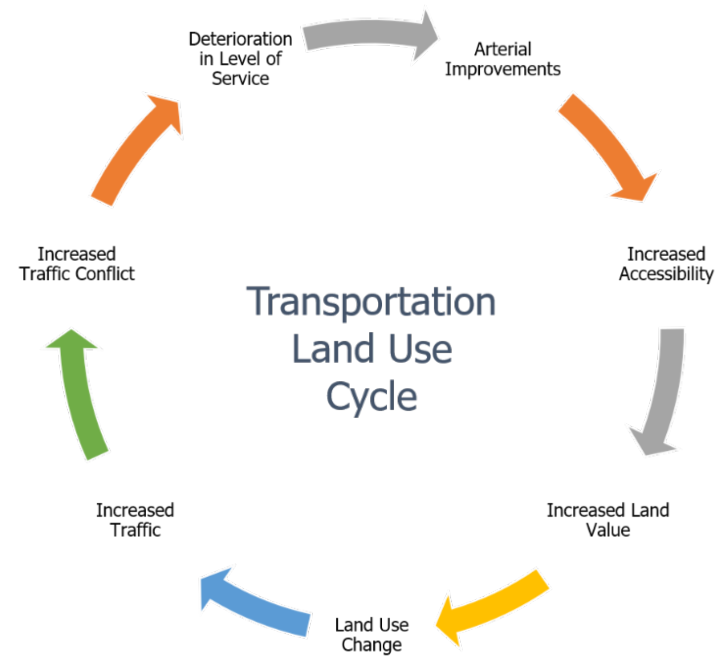
4 • The Land Use/Transportation Connection

Introduction

Throughout the ROCOG planning area, land use and transportation systems are inextricably linked. Land use and development intensity impact transportation factors such as trip generation, accessibility, and need for different modal facilities. The design and function of the transportation system, in turn, affects the character of the areas where we live and work, impacting quality of life factors such as safety, security and mobility. Ultimately, this land use/transportation relationship influences private and public economic value as well as personal decisions regarding dwelling choice, travel choice, and property investment.

Every city in Olmsted County, some of the townships, and the County itself prepare and adopt land use plans that serve as frameworks for public policy, growth strategies, and capital improvement programming. These plans also inform the expected intensity and character of travel demand, transportation design, and program features to be considered in different areas of the community, as well as the timing of future infrastructure improvements. The Transportation/Land Use Cycle (Figure 4-1) provides a visual representation of the integration of land use changes and transportation improvements in an auto-dominated built environment. The project development process should evaluate how

Figure 4-1



bicycle, pedestrian, and transit facilities fit into this structure by considering principles such as "Complete Streets" and Context Sensitive Design to examine and account for the need for all modes of transportation, not just automobiles.

To provide the type of housing, business, and travel options desired by our community, actions and decisions should foster land use patterns that can be efficiently served by well-planned transportation networks, thereby improving economic opportunity and quality of life for all residents and visitors. As part of the work leading up to adoption of the City of Rochester's 2018 comprehensive plan (P2S 2040), surveys indicated a majority of residents would like to have more diverse housing choice and walkable neighborhoods available.

Figure 4-2 provides one indication of this from a survey by the Rochester Association of Realtors. Results from the same survey (Figure 4-3), show this interest is particularly strong among growing segments of the local population, including renters, singles, and lower income households. Figure 4-4 reports survey results on the importance people attached to having alternative travel choices available near where individuals choose to live.

Translating these interests into outcomes relies on both transportation and land use investments to create the necessary infrastructure and area environment where people will be comfortable using all modes. Roadways

Figure 4-2: Mixed-Use Housing Preference

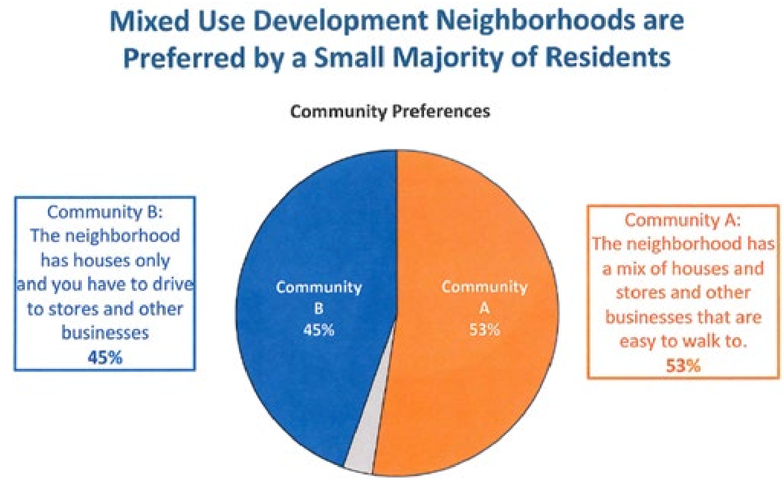


Figure 4-3: Younger Housing Preference

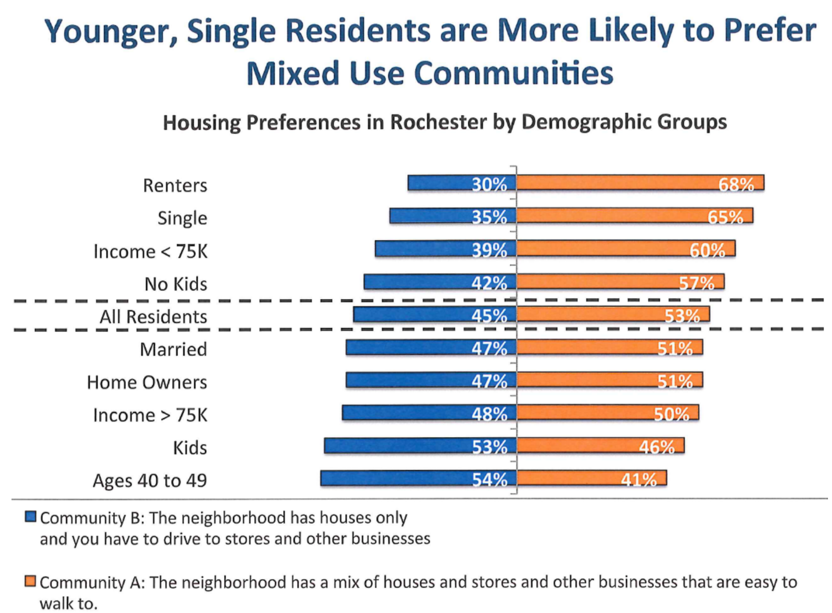
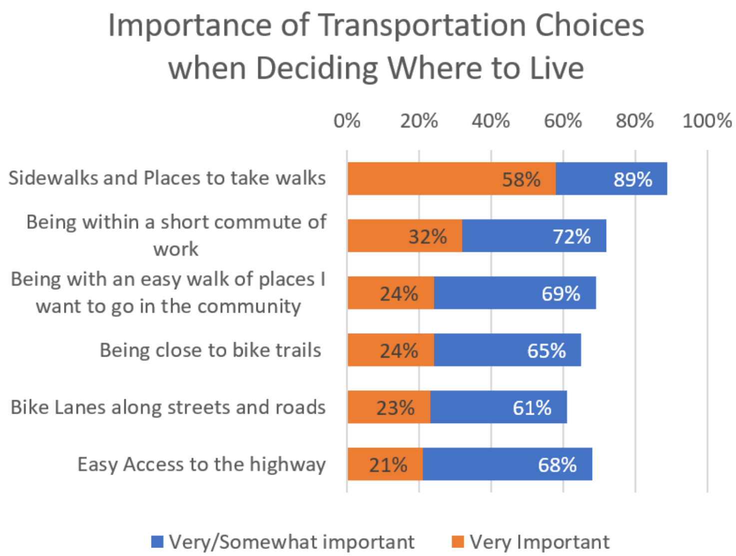


Figure 4-4: Desire for Travel Options



must be safe and reliably connect places where we live, work, and play. There is a need for major roads to facilitate convenient employee and customer travel as well as materials procurement and the shipping of goods. The mix and design of land use helps to create the conditions that will support the ridership levels needed to sustain frequent, high-quality transit service. Street design and streetscape amenities play a role as well in the attractiveness of alternatives to private vehicle travel and the economic success of residential and business districts in the community.

Of particular importance to the future success of the Rochester urban area is the role transportation can play in addressing three significant issues facing the community from a growth and development standpoint:

- **Downtown Growth:** Approximately one-third of all jobs in the Rochester urban area are located in downtown Rochester, anchored by over 30,000 employees who work for the Mayo Medical Center. An economic development initiative the community is implementing, the Destination Medical Center, is expected to expand the downtown workforce by over 20,000 in the next 20 years. Of particular concern is how to move a total workforce of over 60,000 in and out of downtown each workday in the future. Land use and transit alternatives will be a key piece of the solution.
- **Workforce Housing:** Single-family detached structures compose two-thirds of all housing in Rochester. Given concerns about the affordability of workforce housing in the community, many are exploring how to reduce the combined impact of housing and transportation costs on households. While not necessarily immediately impactful, updating land use guidelines to allow more diversity in housing styles and directing that growth to areas where transit, walking, and biking provide convenient access to daily destinations can help towards solving the workforce housing problem.

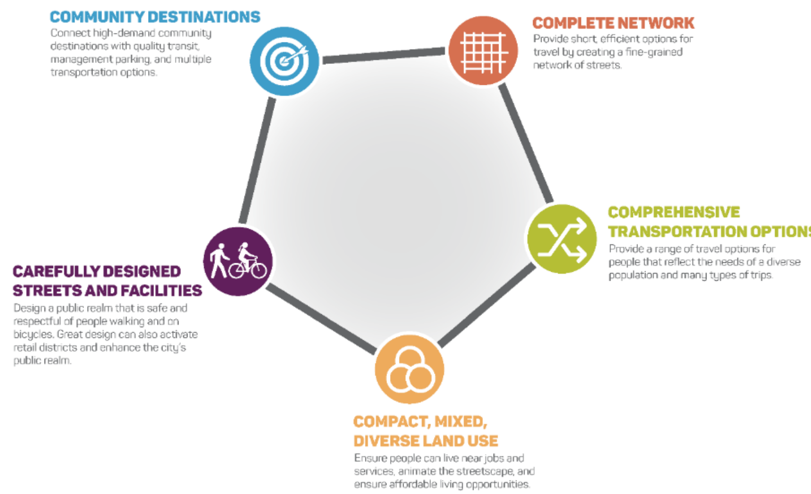
- **Aging Population:** As with most areas in the United States, the ROCOG area expects to see a significant increase in the number of individuals over the age of 65 in the next two decades. This growth is expected to drive demand for more attached and congregate housing choices, such as townhouses and condos. The ability to use transit and walking to access daily needs in these areas will be important for seniors seeking to maintain independent lifestyles.

Context for Land Use and Transportation Integration

It is often said that the best transportation plan is a good land use plan. Within the Urban Study Area of ROCOG's planning area, as was illustrated in Figure 1-6, the City of Rochester's P2S 2040 adopted a policy of integrating land use and transportation strategies to create a more balanced approach to meeting travel needs by emphasizing the following principles:

- **Compact, mixed, diverse land uses:** Provide a diverse mix of land uses that give people the choice to live near jobs and services, making it easier to live, work, shop and play without having to travel far.

Figure 4-5: Key Principles of Land Use – Transportation Integration



Source: Rochester Planning to Succeed Comprehensive Plan 2040

Higher levels of residential and employment density support more local amenities within walking and cycling distance and can support higher levels of transit service.

- **Community destinations:** Connect high demand centers and destinations with frequent, high quality transit while managing parking and providing multiple travel options; locate new emerging centers along corridors that can provide these transportation features.

- **Complete transportation network:** Provide for efficient travel, particularly in high demand areas, by developing a fine-grained network for travel. A well-connected, fine-grained pedestrian network enables shorter, more direct walking connections and is easier to serve with transit.
- **Carefully designed streets and facilities:** Design a public realm that is safe and respectful of people walking and riding bicycles. Great street design can activate business districts and enhance private investment, which will accrue benefits to the public as well.
- **Comprehensive transportation options:** Provide a range of transportation options that will provide for the needs of a diverse population and many types of trips.

This approach will enable governmental units to

- Grow their property tax base and increase tax revenues without extending infrastructure by fostering more development in key areas and infill settings, taking advantage of existing infrastructure already in place
- Encourage area-wide development towards a pattern that will result in a more cost-effective and energy efficient community with reduced climate impact
- Reduce the need for high cost investment in road widening or new roads to decrease automobile congestion hot spots by providing more travel choices during peak travel times
- Lessen the pressure for new "greenfield" urban growth featuring the low density and segregated land use patterns that have historically required extension of new infrastructure and led to a high dependency on single-occupancy automobile trips
- Encourage a pattern and style of land use that will support transportation options, enabling a more efficient and connected development patterns that can support cost-effective transit with more frequent, dependable, and quality service that captures more trips

Key Tools for Achieving a Balanced Land Use/Transportation Development Pattern

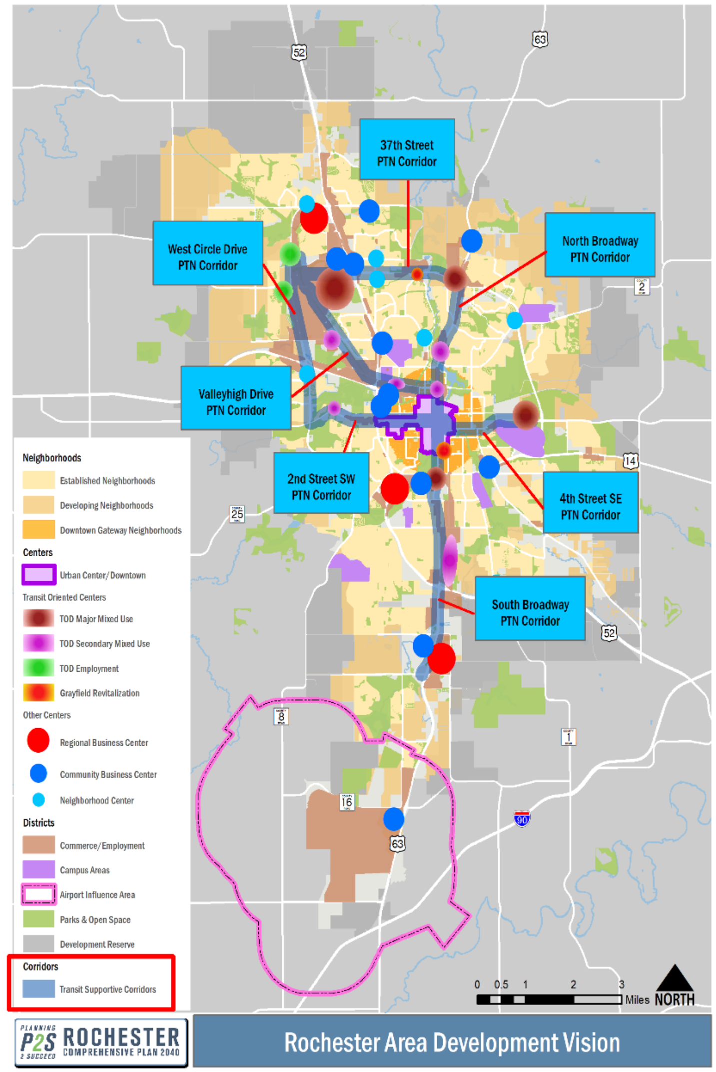
To achieve a more balanced and sustainable land use/transportation development pattern, the City of Rochester has undertaken a series of steps to establish policies to encourage consideration and implementation of the principles illustrated in the previous section.

Fundamental to the City's approach is understanding the hierarchy of city plans and implementation tools that are available to achieve these outcomes. Figure 4-7 summarizes the breadth of City plans and tools, through which the City can influence development patterns throughout their urban area.

Critical to implementation of this balanced approach was adoption of a Development Vision as part of P2S 2040, sitting at the top of pyramid in Figure 4-7, which defines key elements of a future integrated land use/transportation approach, including

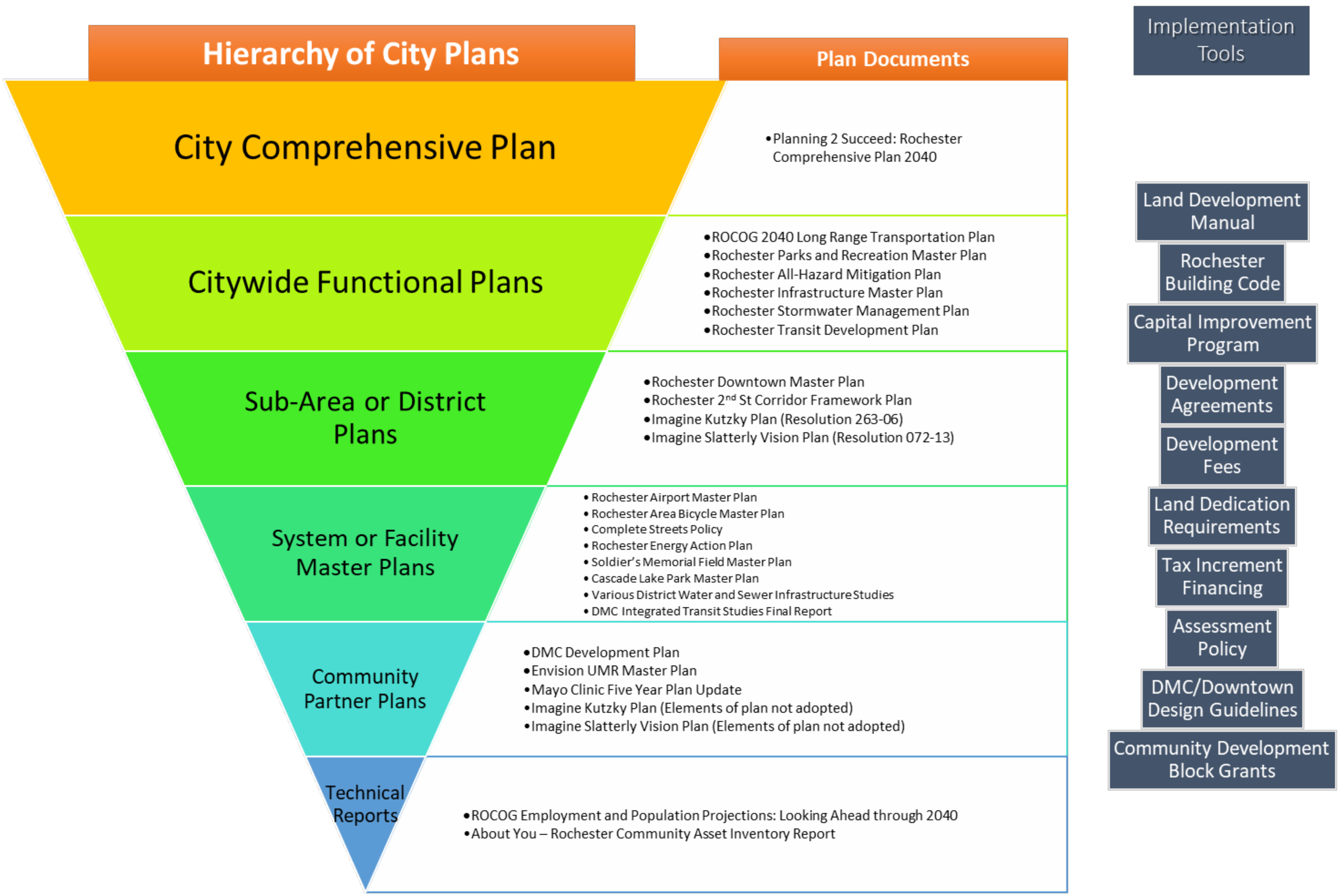
- **Land use districts** that emphasize mixed use, transit-oriented development in centers and corridors
- A **Primary Transit Network**, envisioned as more than just a service concept but an infrastructure concept that creates a core set of corridors where frequent, high quality service can be provided
- A **growth management boundary** that will limit the rate of expansion and encourage greater infill and redevelopment

Figure 4-6: Rochester's Development Vision



Source: Rochester *Planning to Succeed* Comprehensive Plan 2040

Figure 4-7: Rochester's Planning and Development Framework



The following sections describe key tools that the City has started to put in place as it strives to influence development patterns along a path to greater sustainability while meeting the needs and desires that have been expressed by its residents and businesses. Before reviewing these tools, it is critical to understand the importance of the downtown growth issues identified earlier in the Plan and the fundamental mode shift strategy that has been adopted to maintain the Rochester Central Development Core as the vibrant center of the community and region and home to the major employment base in southeast Minnesota.

Economic Development and Transportation Access

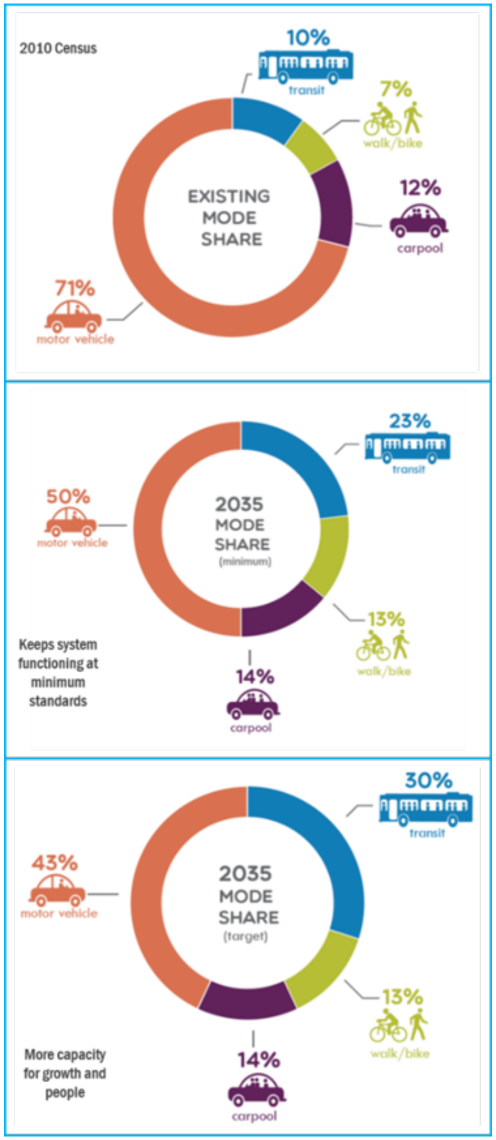
ROCOG has worked with organizations and businesses regarding broader economic development goals and the transportation implications of economic development initiatives. This has included periodic updating of campus master plans for businesses such as the Rochester International Airport, the Mayo Medical Center, IBM, and the Rochester Area University Center in the urban area.

In 2010, the *Rochester Downtown Master Plan and Mobility Plan* was the first of a series of major planning projects to establish the character of Rochester's major economic activity center for decades to come. This project was the first to identify how critical the potential impact to downtown access would be if development in the central business district (CBD) significantly intensified. To respond to this future access issue, the plan set an aggressive goal for travel demand management, targeting a reduction in single occupant commuter vehicle travel into the CBD by 20% over 20 years (Figure 4-8). Multiple strategies to encourage more transit use including parking changes, more downtown housing, enhancement of alternative modes, and a changing mix of land uses along gateway corridors to the CBD.

In 2014, Destination Medical Center (DMC), a 20-year, $5.6 billion economic development initiative, was advanced by the Mayo Clinic working with the City of Rochester, Olmsted County, State of Minnesota, and the local business community which envisions creation of a global destination for not only the continued growth in Rochester's health sector industry, but also job growth in supporting sectors such as hospitality and retail. A 50% increase in downtown employment, tripling of downtown residential population, and an estimated annual visitor base of 4 million persons will impact housing, service, and transportation needs, particularly in the CBD.

The DMC Development Plan confirmed that the ability of vehicular gateways into downtown to accommodate additional peak period traffic is limited, and the ability to expand the capacity of the roadway network to accommodate traffic growth is significantly constrained. Attempting to accommodate planned growth under

Figure 4-8: Downtown Rochester Mode Shift Target



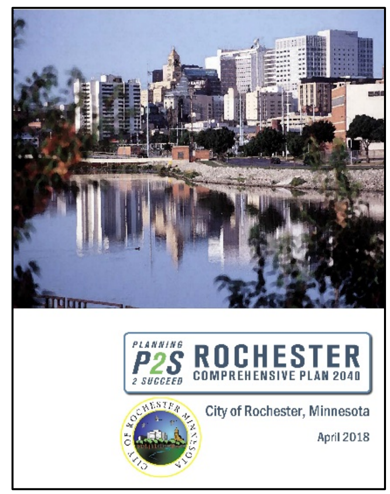
current travel patterns will lead to significant congestion and create a demand for upwards of 10,000 additional parking spaces. This would impact the ability to create a pleasant and functional street level pedestrian experience and utilize a significant amount of high value downtown land for non-productive purpose.

The Downtown Master Plan and DMC Development Plan provided the high-level visionary guidance that formed the foundation and impetus for the City to undertake updating its comprehensive plan and a number of supporting plans, policies, and development guidelines.

Planning for Integrated Land Use and Transportation

The Rochester Urban Area

P2S 2040 is the City's first full land use plan update since the late 1970s. It specifically addresses growth management and transportation policy as part of a coordinated look at how future growth and development should be managed in the Rochester urban area. The plan is built upon on a set of principles, including



integrated land use/transportation planning, fiscal sustainability, expanded housing diversity, and improved community connectivity.

An early step in development of the plan was completion of a scenario planning exercise which contrasted a trend-based scenario with two alternative scenarios based on variations of a centers and corridors strategy. The intent was to compare potential outcomes related to metrics such as VMT growth, share of residential population with good access to transit, the amount of greenfield acres converted to development, and levels of roadway congestion. Based on the outcomes of the scenario planning process and input from the public, a scenario featuring multiple transit-oriented development nodes and mixed use centers, connected by a high quality transit backbone, was selected as the overall growth strategy that would become the focus of the plan.

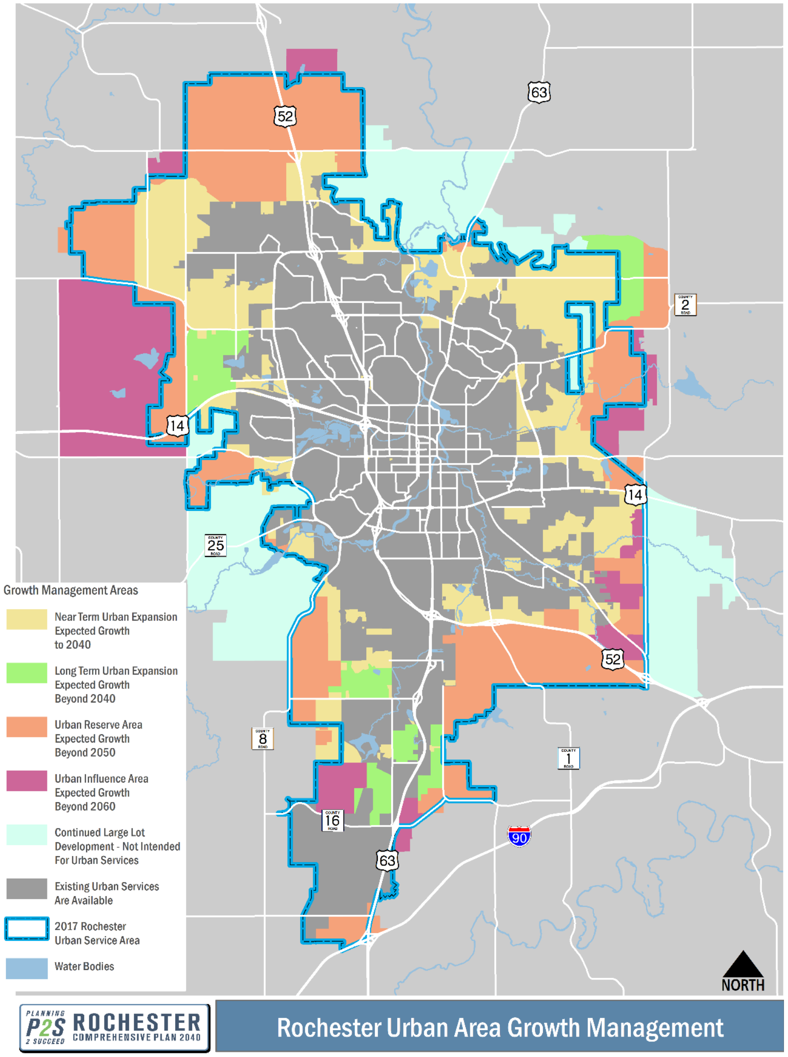
With this strategy established as the base, the City identifiedf policies and programs that would support its vision. Figures 5-9 through 5-12 highlight the key elements of the strategy that evolved. These include:

- A **growth management strategy** (Figure 4-9) which limits the outward expansion of the city to areas where existing sewer and water capacity is available, coupled with policies to encourage greater infill and development within the existing urban service area
- A **Future Land Use Plan** (Figure 4-10), featuring new Mixed Use, Transit Oriented and Community Anchor categories, strategically mapped to work in tandem with a proposed Primary Transit Network (Figure 4-11), which represents a set of corridors where investment in transit infrastructure coupled with the land use plan will allow frequent transit service to succeed
- Identification of **pedestrian priority areas** (Figure 4-12), including mapped Pedestrian Districts and Streets, to encourage pedestrian oriented development

Since the adoption of P2S 2040, the City has continued its policy evolution with various projects it has completed or has underway which will advance the concepts of mixed use, transit-oriented development (TOD) paired with transportation investment in an effort to reduce private vehicle travel into downtown Rochester. Key elements of this additional work are illustrated in Figures 4-13 through 4-16 and include the following:

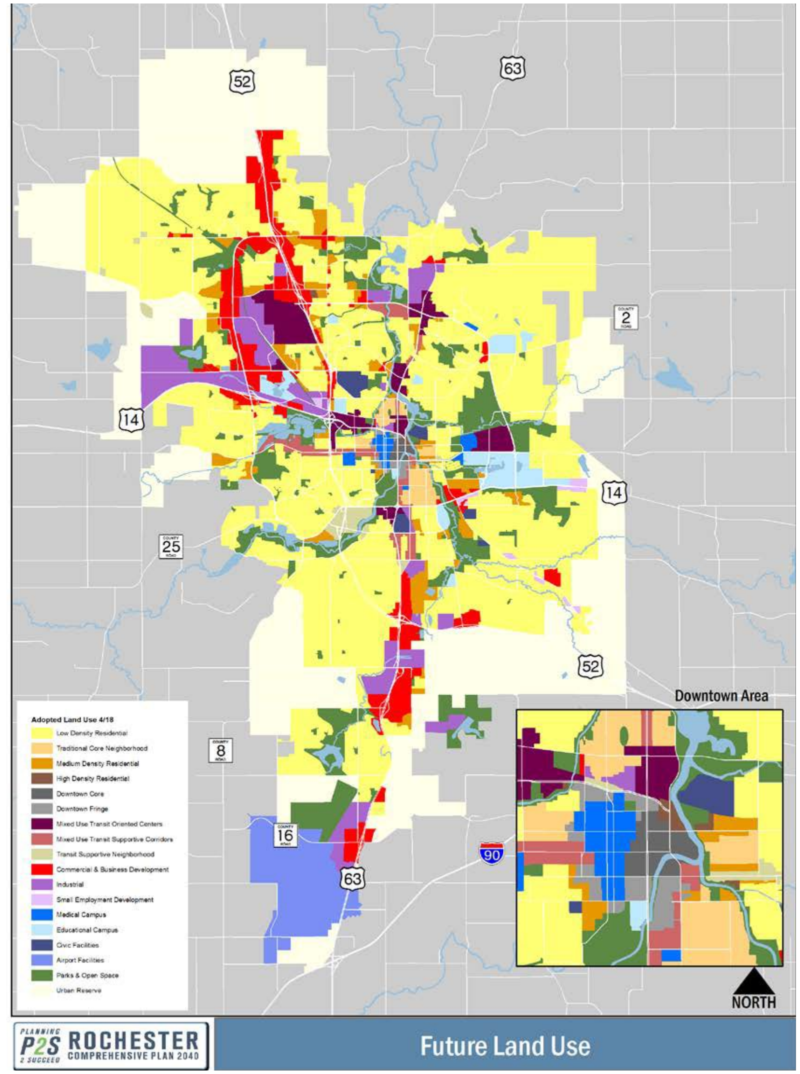
- The Downtown Mobility and the DMC Development Plan both recommended a high frequency downtown transit circulator, with modes ranging from monorail to streetcar to Bus Rapid Transit among options studied. This project, illustrated in Figure 4-13, which

Figure 4-9: Growth Management Plan



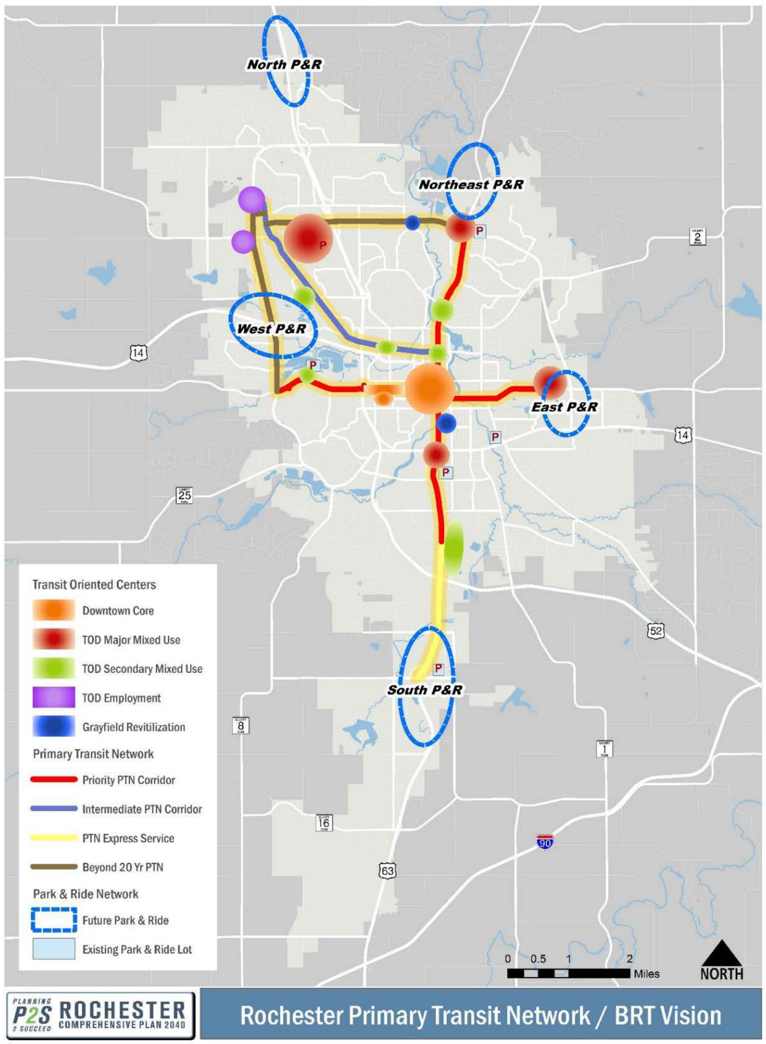
Source: Rochester *Planning to Succeed* Comprehensive Plan 2040

Figure 4-10: Future Urban Area Land Use Plan



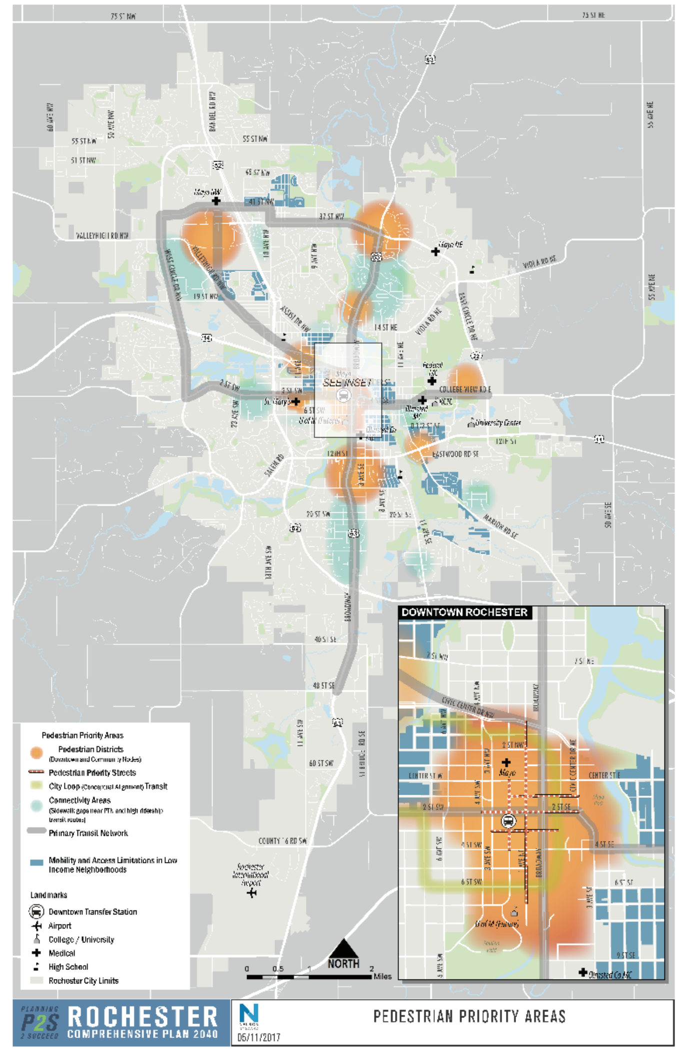
Source: Rochester *Planning to Succeed* Comprehensive Plan 2040

Figure 4-11: Primary Transit Network



Source: Rochester *Planning to Succeed* Comprehensive Plan 2040

Figure 4-12: Pedestrian Priority Areas



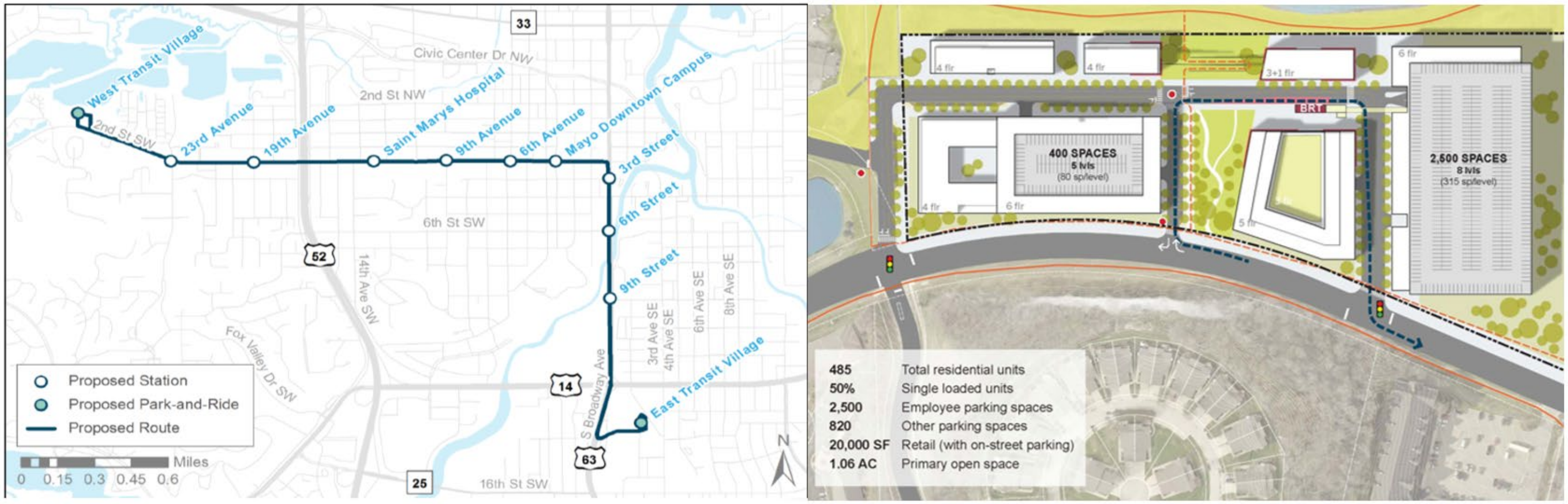
Source: Rochester *Planning to Succeed* Comprehensive Plan 2040

has come to be called the Downtown Rapid Transit Project, will be a Bus Rapid Transit service running along the 2nd St SW corridor, the main east/west spine in downtown Rochester, and a future extension anticipated south from downtown through an area to be known as the Downtown Waterfront Development area. One key purpose of this project is to facilitate a "Park Once" philosophy for downtown, wherein people are able to park near the periphery of the area and circulate through the core area without need for their automobile. Transit villages featuring mixed use housing, commercial space, and commuter parking with mobilty hub features are planned for the both ends of the Rapid Transit Line. This project is discussed in more detail in Chapters 11 and 15.

- To support the Rapid Transit corridor, the City was awarded a FTA Transit Oriented Development Planning Grant in 2019 to advance station area and corridor planning. This project (Figure 4-14) is actively moving ahead with with selection of station locations paired with future land use concepts and pedestrian/placemaking recommendations. Completion is expected in late 2020.
- As a first step towards advancing the land use vision for Primary Transit Network corridors, the City of Rochester adopted zoning amendments in early 2020 to establish transit-oriented zoning districts along the initial corridors expected to see Bus Rapid Transit service in the future: Broadway Ave, the main north-south travel spine through the city, and 2 St SW/4 St SE, the main east-west travel developing. Illustrated in Figure 4-15, the TOD zoning regulations will provide flexibility to develop the style of mixed use, diverse housing along these high profile corridors envisioned in the comprehensive plan.

Another major planning project getting started as this ROCOG Plan moves towards adoption is the Downtown Waterfront Plan (Figure 4-16). This plan will address the future redevelopment of approximately 60 acres of prime real estate immediately southeast of the CBD, adjacent to the Zumbro River and close to the proposed campus of the University of Minnesota-Rochester, a prime location of pedestrian oriented use.

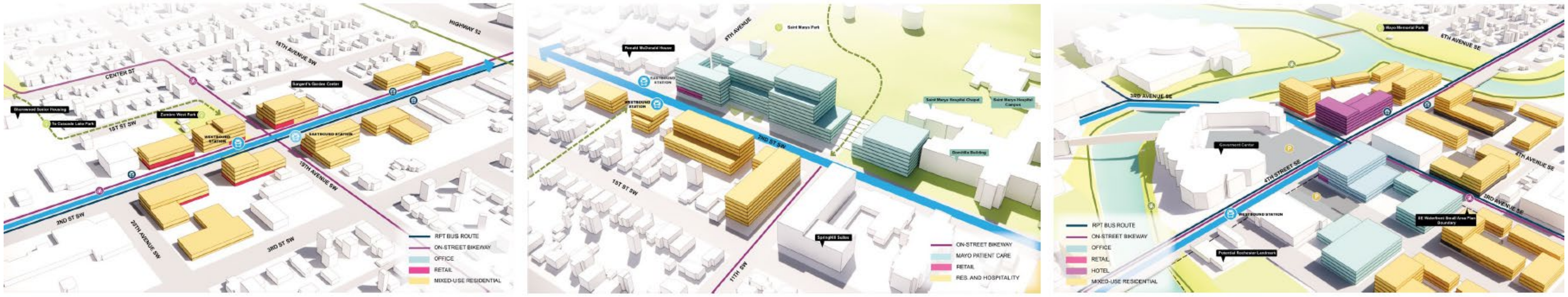
Figure 4-13: Downtown Rapid Transit Corridor/West Transit Village Concept



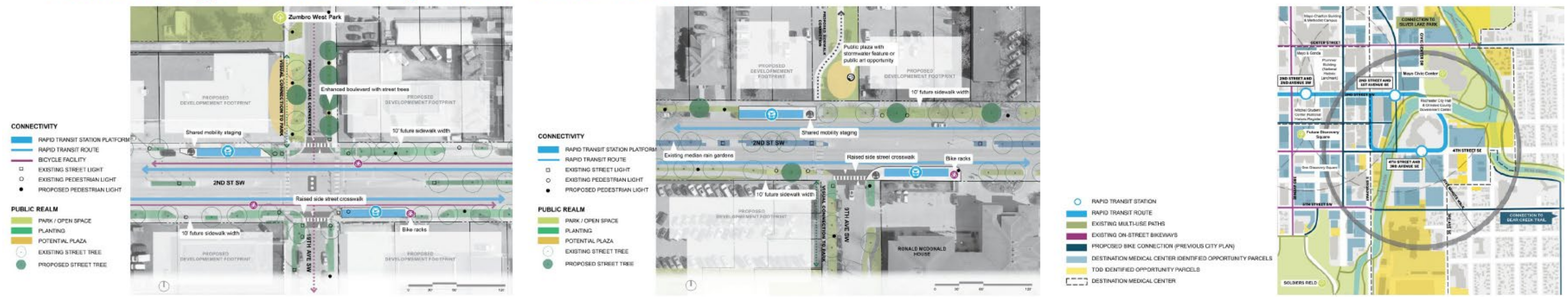
Source: Downtown Rochester High Amenity Rapid Transit website

Figure 4-14: TOD Station Area Planning for Downtown Rapid Transit Corridor

Addressing Vision and Corridor Role

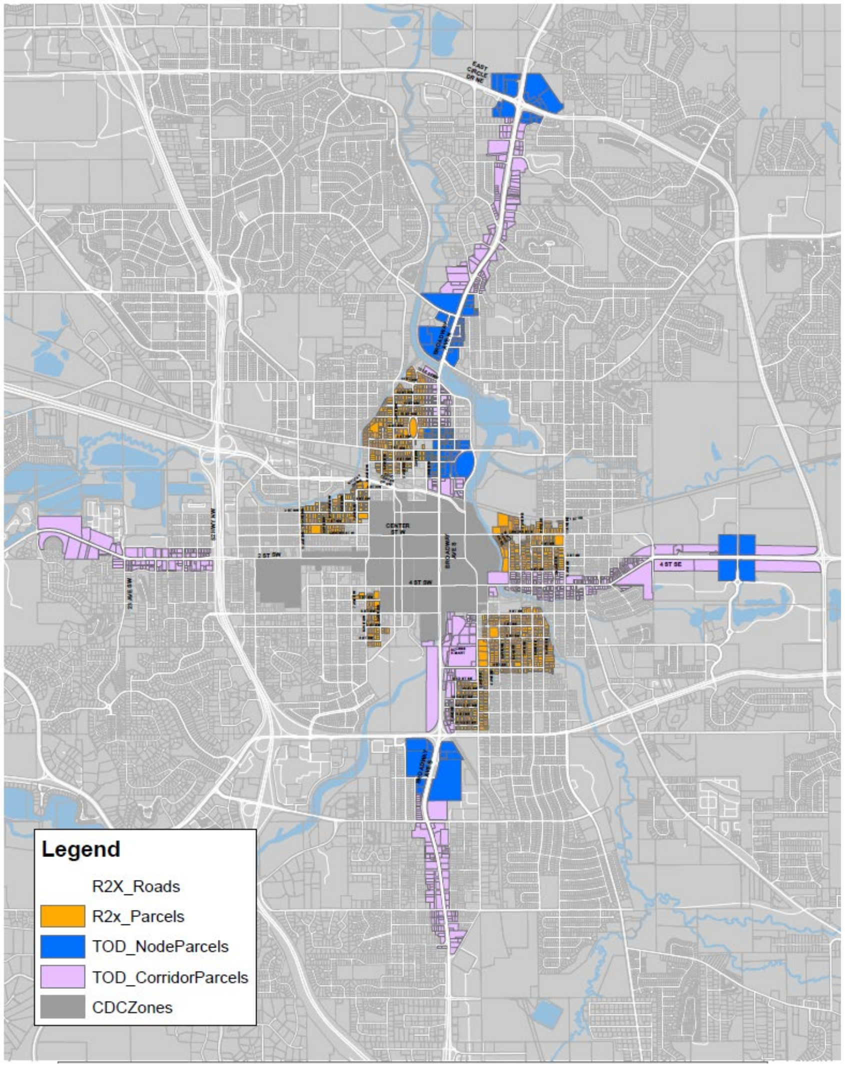


Advancing Connectivity and Public Realm



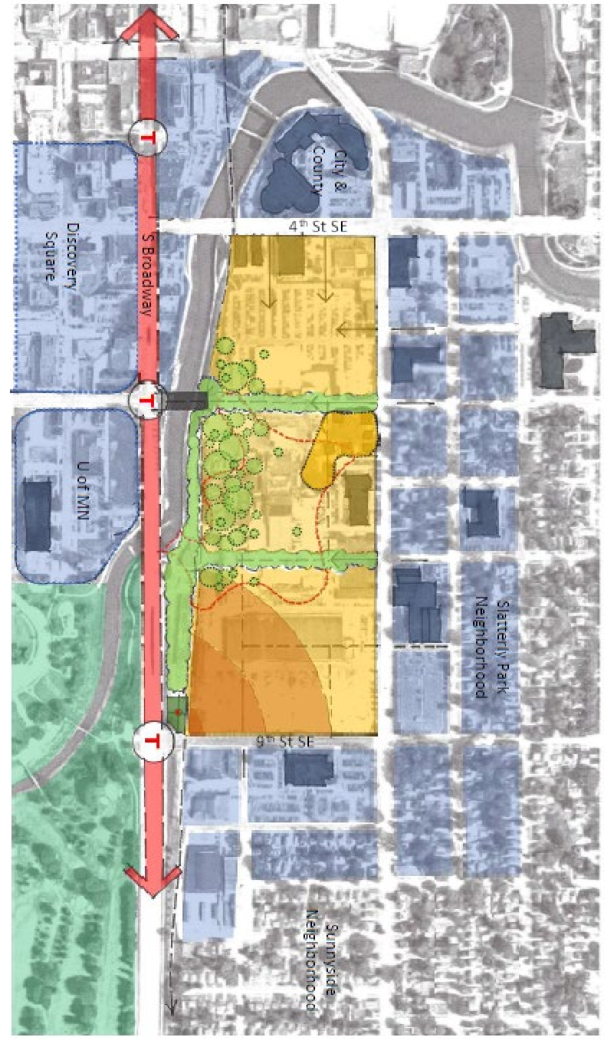
Source: New Rapid Transit for a Growing, Equitable Rochester website

Figure 4-15



Source: Item F-14, Rochester City Council Meeting Packet, June 1, 2020

Figure 4-16



Source: Item F-14, Rochester City Council Meeting Packet, June 1, 2020

Small Cities

In addition to the city of Rochester, there are seven small cities located within the ROCOG Planning Area. These communities range in size from approximately 750 to 6300 persons as shown in Table 4-1. Employment for residents of these communities who are in the workforce relies heavily on commuting to locations outside their place of residence, the primary destination being the city of Rochester. As shown in Table 4-1, local employment of the resident workforce in each community ranges from 7% to 28%, while the share of local workforce commuting to Rochester for work ranges from 46% to 75%.

Table 4-1

City	Population 2019[1]	Projected Population 2045	Households 2019	Resident Labor Force 2016[2]	Local W&S Jobs[3]	Residents Working in Home City[4]	Residents Working in Rochester	Residents Working Elsewhere
Byron	5945	8725	2214	2746	650	17%	73%	10%
Chatfield	2915	3865	1159	1538	1127	37%	46%	17%
Dover	768	1255	278	431	60	9%	56%	35%
Eyota	1978	2810	783	1039	339	25%	64%	11%
Oronoco	1522	2575	538	841	135	10%	75%	15%
Pine Island	3499	5345	1422	1875	1091	33%	53%	14%
Stewartville	6284	8940	2487	3087	1808	35%	58%	7%

[1] Population and Household Estimate from Minnesota State Demographer Annual Estimates

[2] Resident Labor Force from 2011-2016 American Community Survey, Commuting Data, Table 4

[3] Local Wage & Salary Jobs,2017, Longitudinal-Employment Household Dynamics, https://lehd.ces.census.gov/

[4] Resident Place of Work from 2011-2016 American Community Survey, Commuting Data, Table 4

These communities undertake local planning at different levels of detail. Table 4-2 summarizes the status of adopted land use and transportation plans, which for most of the communities are part of an overall comprehensive plan. Current land use plan maps and street and highway system plans are found in Chapter 5.

Table 4-2: Current Status of Small City Land Use/Transportation Plans

City	Comprehensive Plan 2019	Land Use Plan	Street & Highway System Plan
Byron	Yes – adopted in 2011	Yes	Yes
Chatfield	Yes – adopted in 2015	Yes	yes
Dover	Yes – updated in 2000	Yes	No – Illustrative ROCOG plan
Eyota	Yes – adopted in 2009	Yes	Yes
Oronoco	No	Future land use map only	No – Illustrative ROCOG plan
Pine Island	Yes – adopted in 2010	Yes	Yes
Stewartville	Yes – adopted in 2009	Yes	Yes

The majority of residential land in these communities is built as single-family detached housing, serving households and families generally at a lower price point than in the Rochester housing market. These cities, therefore, provide a more affordable housing option within a short commuting distance to Rochester's job market and retail offerings.

The street and highway network in each city is generally composed of local streets, typically anchored by a limited mileage of state or county highways that primarily serve a regional travel function. Table 4-3 breaks down the system mileage and vehicle miles of travel by system type in each community for which data is reported. In Minnesota, cities over 5000 in population will receive an allotment of State Aid Highway funding that can be targeted for use on a designated Municipal State Aid Street system. Two cities, Byron and Stewartville, meet the threshold to qualify for state funding and thus have a limited amount of street mileage on which State Aid funding can be expended.

Almost all travel in these small communities is accommodated by personal vehicles. There are no local transit services found in any small community, and regional transit is limited and consists of two components:

- Advance-reservation door to door service is provided by regional human resource agency providers. Rolling Hills Transit, located in Rushford, MN and operated by

Table 4-3: Street and Highway System Metrics

City	Total Miles of Street	Miles of Local Street	Miles of State Aid Street	Miles of State or County Road	Daily VMT Local Streets	Daily VMT State / County Roads
Byron	32	21	8	3	30,250	29,150
Chatfield	24 (9.6 in Olmsted)	18 (7.5 in Olmsted)	0	6 (2.1 in Olmsted)	4,850 (Olmsted only)	6,400 (Olmsted only)
Dover	8	5	0	3	2,000	4,550
Eyota	16.5	12	0	4.5	7,500	12,650
Oronoco	24	22	0	2	18,850	62,430
Pine Island	35 (9.2 in Olmsted)	25.5 (7.1 in Olmsted)	0	9.5 (2 in Olmsted)	4,250 (Olmsted only)	4,600 (Olmsted only)
Stewartville	29	19.5	4.5	5	18,800	41,775

SEMCAC, serves a five-county area in Southeast Minnesota and provides weekday service to Byron, Eyota, Dover, and Stewartville. Hiawathaland Transit, operated by Three Rivers Community Action, serves a three-county area north of the ROCOG area and provides service to Pine Island on weekdays. These services are not limited in terms of age or mobility and are open to all users.

- Regional commuter bus service is operated by Rochester City Lines (RCL), a private company in Rochester, which provides bus service into Rochester in the AM peak period and out from Rochester in the PM peak period. The service is primarily for commuters but is open to any user. All seven small cities are served by the RCL commuter system.

  Additional detail regarding RCL is found in Chapter 11, including a network map in Figure 11-17.

To help facilitate use of the RCL system and carpooling, a number of the small cities also have designated park and ride lots. ROCOG has recommended increased capacity in a number of these lots to handle an anticipated increase in carpooling and commuter bus use in future years. More information on the park and ride network is found in Chapter 11 with Figure 11-21 illustrating locations.

Given the small size of the communities outside of Rochester, the likelihood of there being sufficient demand for a viable local transit service is limited. As a result, an assessment of local land use plans suggests that factors such as planning for transit supportive land use is not a consideration in these communities at this time.

Due to the limited need for or viability of transit service, street and highway network planning is the primary concern in the small cities. ROCOG is not involved in the planning and layout of local street systems in the municipalities, including Rochester, except to the extent local streets interface with the county or state highway system, such as on the issue of appropriate access for local streets to the regional highway network. This is coordinated on a project by project basis. ROCOG has completed a projection of future traffic growth in the regional planning area and does not anticipate a need to consider additional capacity being added to the state/county highway network in any small community area.

In most of the small cities, the state highway generally is more of growth-limiting feature in that it skirts the existing development area (as in Pine Island, Oronoco, Eyota, Dover and Byron) with a high-speed, limited-access roadway. In cases where development patterns have migrated across the highway or are planned to do so, planning and programming for safe crossings has proceeded as needed, including installation of a roundabout in Eyota on TH 14; grade separations in Pine Island and Oronoco, current planning for interchanges in Byron; and safety enhancement of at-grade intersections in Eyota and Dover.

In Stewartville and Chatfield, the state highway (TH 63 in Stewartville, TH 52 in Chatfield) is essentially the Main Street of the community. In these communities, efforts have been made in past projects to incorporate features to minimize the impact of the corridors on land use activity the city. In Chatfield and Stewartville, the concern with the state highway corridor is seen more in the transitioning areas on the edge of the community, where a high speed rural highway enters a developing urban area and there can be intersection, access, and travel mobility conflicts present due to variations in vehicular travel speed.

Olmsted County

The Olmsted County General Land Use Plan is used to guide decisions about the general balance between areas of urban growth in the county versus preservation of rural and agricultural lands to support the continued economic viability of rural land uses throughout the county. The plan is primarily a policy plan, which includes a number of goals and objectives that speak to the integration and coordination of land use and transportation in Olmsted County. The plan includes locational criteria that are intended to be used together in a judgmental process reflecting the overall appropriateness of an area for a particular use designation.

Planning Principles

Key community values informed the adoption of planning principles. Those that speak to the land use/transportation connection include:

- **Concentrate urban and suburban development** to create an orderly, efficient, and fiscally responsible development pattern
- Encourage practices and technologies that **maximize efficiency of resource use and minimize waste**, such as converting from energy-intensive development to energy-conserving land uses and modes of transportation
- Respond to land use and resource management issues in a **flexible and proactive** way, dealing with land use related issues before they become expensive problems for the community

Urban Service Area Policies

Urban service areas consist of municipalities and the surrounding area intended to be annexed over the next 25-50 years. Integrated comprehensive transportation systems should ultimately be provided in these areas.

- **Urban Service Area Identification:** The Plan identifies urban service areas based on the following characteristics:
  - projected growth in population and employment and the related need for land for development
  - location needs of land uses
  - compatibility of land uses with surrounding land uses
  - availability, capacity, and service territories of planned urban services and infrastructure
  - land suitability based on natural features (flood plain, soils, slopes, elevation, and presence of sensitive environmental features)
  - suitability for resource uses
  - the related community land use and infrastructure policies
  - accessibility (quality of connections to regional transportation networks and to other parts of urban service areas)
  - proximity to employment centers
  - areas of existing development relying on onsite sewage treatment that are in need of urban services
- **Orderly Development:** Development should result in a compact, contiguous settlement pattern. Adjacent uses should be compatible in terms of intensity of use, traffic generation, hours of activity, noise sensitivity, and open space requirements.

- **Integrated Development:** Regulations should encourage the integration of compatible land uses in neighborhoods within urban service areas, including varied housing styles in different price and unit size ranges but with similar ranges of density. Mixtures of compatible residential and non-residential uses will lead to reduced energy use for transportation purposes by reducing trip lengths, reducing demand for auto travel, and fostering greater opportunities for transit use and non-motorized travel.
- **Commercial Development:** Commercial land uses that are characterized by high levels of employment, trip generation, customer traffic, and urban service needs should be located within urban service areas. A few rural locations with exceptional attributes, such as access to an interchange along Interstate 90, for example, may also be appropriate for these commercial uses. For commercial growth, transportation facilities must be adequate to provide effective accessibility, capacity, and mobility by multiple modes.
- **Efficient Site Design:** Land development regulations should encourage residential and non-residential site design that protects the features and natural functions of the landscape, minimizes the life-cycle costs of future public services and facilities, and encourages the use of alternatives to the private automobile. To minimize the need for travel and maximize the feasibility of efficient modes of travel such as transit, bicycling, carpooling, and walking, land development regulations should encourage mixed-use development in urban service areas.
- **Infill Development:** Land development regulations should encourage infill development of residential, commercial, and industrial areas located within urban service areas in order to make more efficient use of existing public infrastructure and developable land.
- **Paying for Growth:** New development should provide proportional financial support for community facilities, such as transportation, to the extent that the development increases the need for such facilities.
- **Traffic Impact:** Proposed land uses involving a significant change in the amount or type of traffic should be carefully reviewed for traffic generation, conflict, and safety. The process for reviewing Land Use Plan changes, zone changes, and general development plans should include a system for detailed review of traffic impacts caused by land use change and for managing access. The review should meet the requirements of City, County and Township ordinances.
- **Capital Improvement Planning:** The County should integrate land use planning and capital improvements programming decisions. Land use decisions should consider existing and future public

infrastructure impacts and needs, especially impacts on roads.

Suburban Development Area Policies

- **Efficient Site Design:** Land development regulations should encourage site design that protects the features and natural functions of the landscape, minimizes the life-cycle costs of future public services and facilities, and encourages the use of alternatives to the private automobile.
- **Traffic Impact:** Proposed land uses involving a significant change in the amount or type of traffic should be carefully reviewed for traffic generation, conflict, and safety. The process for reviewing Land Use Plan changes, zone changes, and general development plans should include detailed review of traffic impacts caused by land use change and provide for management of access.
- **Capital Improvement Planning:** Road authorities should integrate land use planning and capital improvements programming decisions. Land use decisions should consider existing and future public infrastructure impacts and needs, especially impacts on roads.
- **Intergovernmental Cooperation:** The County, township, and affected city governments should cooperate in planning for urban, suburban, and interim development areas. General development plans should be developed that identify drainage, street, and open space systems covering the areas zoned for these development types.
- **Proximity and Access:** Sites in proximity to major employment centers with adequate and safe accessibility to the existing network of improved highways are more likely to be included in the Suburban Development Area.

Resource Protection Area Policies

- **Commercial Development:** Small commercial uses such as are accommodated in existing mixed-use areas in the County may also be accommodated as infill sites in other areas of the County. Zoning ordinances should accommodate limited larger urban-style commercial uses on rural sites with exceptional site characteristics such as:
    - Locations along existing or planned freeways where access will be provided by an interchange and not an at-grade intersection
    - At non-freeway intersection locations where total approach traffic volumes exceed 3,000 vehicles per day with a minimum approach volume on any leg of at least 1,000 ADT, and where it can demonstrated that the traffic generated by the proposed use will not create a high risk access condition, as determined using the methodology

spelled out in the MNDOT Access Management Manual

- Topography and intersection design conducive to safe access, without documented crash risk problems

- **Industrial Development:** Zoning ordinances should accommodate limited larger intensive industrial uses on rural sites with exceptional site characteristics such as at an interchange or rail corridor where it can be demonstrated that the traffic generated by the proposed use will not create a high risk access condition, as determined using the methodology spelled out in the MNDOT Access Management Manual.

Minimizing Costs of Public Facilities

- Concentrated development patterns have a number of public benefits, including reducing the total costs of public capital investment and services in comparison with "sprawl," defined as development characterized by very low-density leapfrog development. These cost reductions can take several forms, including stabilizing or reducing the expected increases in costs for public services and facilities due to the growth of the community, or by increasing the efficiency of the existing public infrastructure.
- The direct costs of sprawl are considerable for local communities and for regions. Communities that develop in an inefficient sprawl pattern may find that the costs of services increase faster than tax receipts or that service levels are reduced. Transportation systems are heavily affected by sprawl because it forces use of the car as the major mode of transportation. This places increased pressure on road systems resulting in higher costs to the public for more roads and increased maintenance.
- The Land Use Plan encourages local government to make sure that new growth pays the full costs of providing public services and infrastructure.

Integrated Solutions to Other Issues

In addition to the extensive work that is being done in terms of transit development and transit-oriented planning and development policy, ROCOG area communities are also engaged in a number of other activities that reflect ways in which the coordination of land use and transportation is occurring. The following sections provide an overview of additional programs or policies that are in place to better align land use considerations with transportation development.

Natural Environment Protection/Mitigation

In 2015, President Obama signed into law the Fixing America's Surface Transportation Act, or "FAST Act."

Section 1317 (Modernization of the Environmental Review Process) of the FAST Act focuses on accelerating project delivery to save time and money while improving environmental outcomes. The report, *Eco-logical: An Ecosystem Approach to Developing Infrastructure Projects*, reviews the ways environmental review can be modernized, simplified, and improved to achieve better outcomes.

Source: FHWA Environmental Review Toolkit

Since 2005, ROCOG has utilized a coordinated Resource and Referral Agency Review Process for plans and projects in order to provide the opportunity for review and comment during plan implementation activities, particularly on corridor planning studies. Project workshops are typically conducted early in a project study to provide the opportunity for early input. This initiative reflects an effort to implement the concept of conducting **Early Environmental Project Development (EEPD)** reviews, as recommended in the 2005 ROCOG Long Range Transportation Plan.

ROCOG, through funding provided by Olmsted County, has been able to conduct EEPD activities as part of a Corridor Preservation Program that the Olmsted County Board of Commissioners initiated per recommendation in the 2005 Plan. The 2045 Plan will include recommendations for corridors where EEPD efforts should be targeted, which will include completion of Purpose and Need statements, identification and screening of alternatives, screening of environmental impacts, and early identification of possible mitigation needs. This program is consistent with the discussion in the federal planning rules encouraging early consideration of environmental issues on projects identified in the Plan.

ROCOG Environmental Database

Environmental and natural features have shaped historical development patterns in the ROCOG planning area and will continue to influence future transportation and land use growth strategies. Land use and transportation activities can negatively affect environmental resources, with effects ranging from the localized death of individual animals to long-term damage to critical ecosystems. ROCOG has a wealth of local GIS data available regarding environmental and natural features in the ROCOG area to help professionals and decision makers make calculated decisions when recommending future street and highway infrastructure projects. As part of this plan, a high-level screening of projects identified in Chapter 10 as candidates for federal funding were evaluated using the database, as summarized in Appendix E. The features evaluated include:

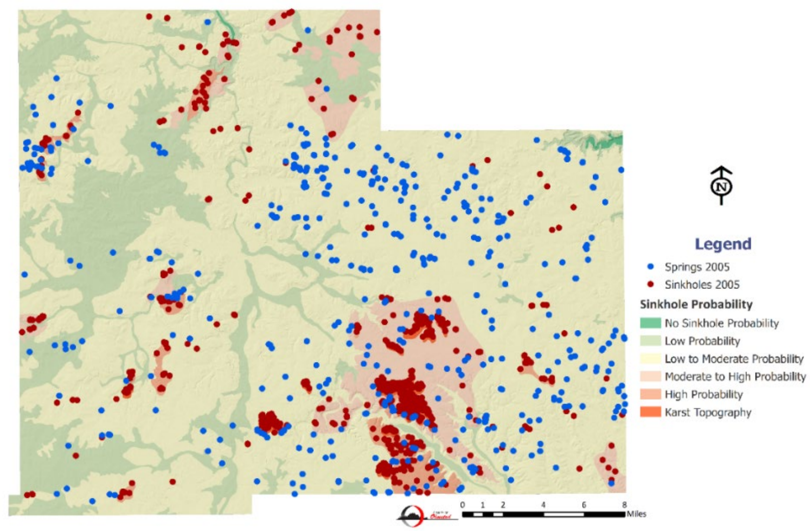
- Surface Water Resources
  - Rivers, Streams, Lakes, and Flood Control Reservoirs
  - Floodplains and Flood Prone Areas
  - Shorelands
  - Stormwater Management Systems
- Groundwater Related Resources
  - Wetlands
  - Seeps and Springs
  - Fens
  - Wellhead Protection Areas
  - Decorah Edge

- Biological Resources
  - Endangered, Threatened and Species of Special Concern
  - Rare & Native Plant Communities
- Cultural Resources
  - Parks and Trails
  - Historic Properties
  - Archaeological Resources
  - Contaminated Sites
- Landform Features of Importance
  - Sinkholes
  - Karst
  - Steep Slopes

- Erodible Soils
- Aggregate Resources

Karst Features

Data Source: Minnesota Geological Survey



Residential Affordability: The Housing + Transportation Issue

The interest in having more affordable housing choices is driven by a new understanding of the combined impact of housing and transportation costs on household finances. While lenders and housing advocates have traditionally used 30% to 35% of household income spent on housing as the threshold for housing affordability, more recent work has identified transportation costs as an integral part of the affordability discussion.

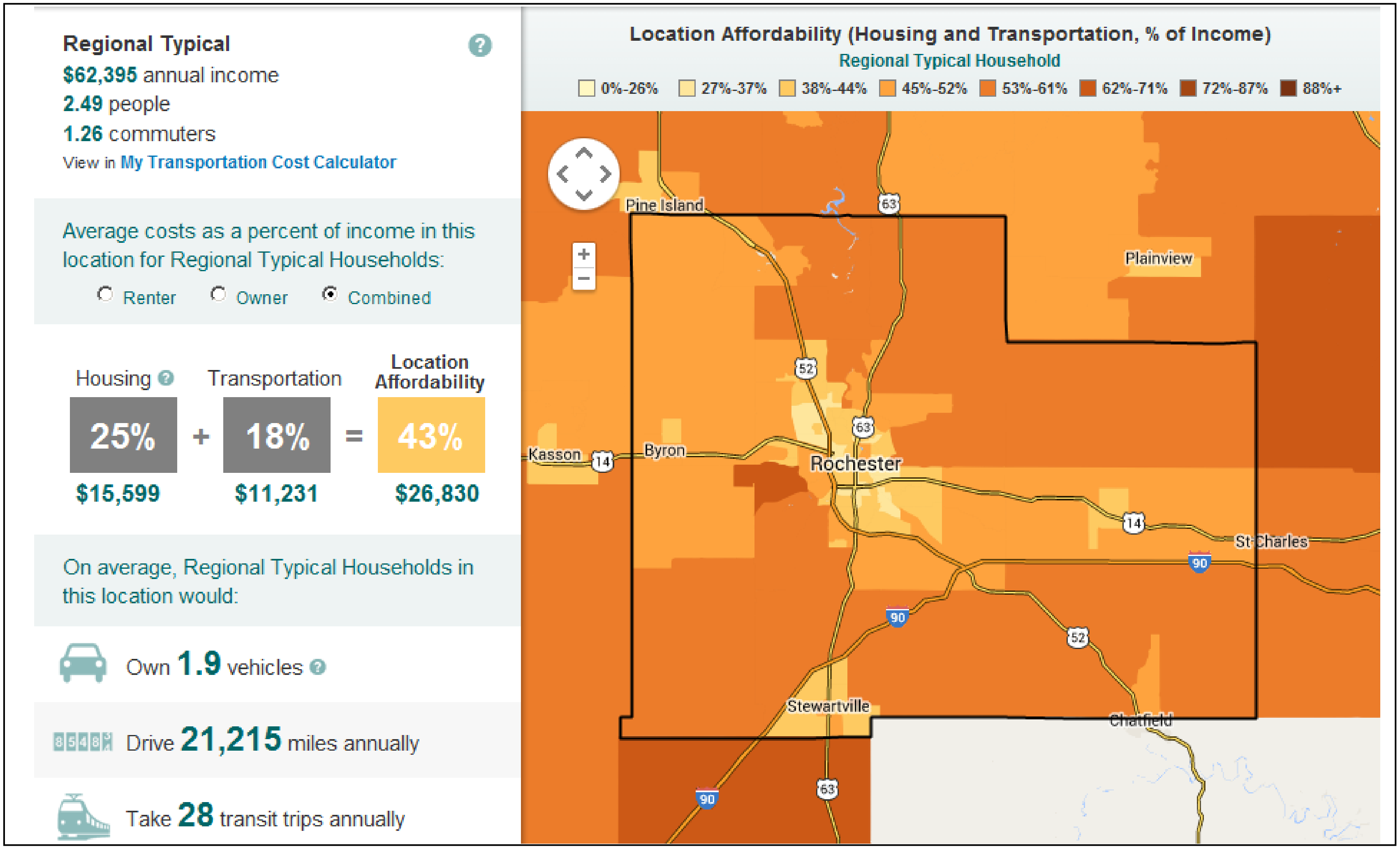
Tools from the Center for Neighborhood Technology (CNT) and the federal Partnership for Sustainable Communities, led by the U.S. Department of Housing & Urban Development (HUD), provide information at the local level regarding location affordability. Figure 4-17 illustrates the results for the ROCOG area from the CNT tool. Efforts led by the Rochester Area Foundation and the Coalition for Rochester Area Housing (https://rochesterarea.org/initiatives/housingcoalition/) are seeking ways to address this issue in the community.

Environmental Justice

According to the US Environmental Protection Agency, "environmental justice" is

> *the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.*

Figure 4-17



Regional Typical
$62,395 annual income
2.49 people
1.26 commuters
View in My Transportation Cost Calculator
Average costs as a percent of income in this location for Regional Typical Households:
Renter
Owner
Combined
Housing
Transportation
Location Affordability
25%
+
18%
=
43%
$15,599
$11,231
$26,830
On average, Regional Typical Households in this location would:
Own 1.9 vehicles
Drive 21,215 miles annually
Take 28 transit trips annually
Location Affordability (Housing and Transportation, % of Income)
Regional Typical Household
0%-26%
27%-37%
38%-44%
45%-52%
53%-61%
62%-71%
72%-87%
88%+
Pine Island
Plainview
Kasson
Byron
Rochester
St Charles
Stewartville
Chatfield
63
52
14
90

Source: Robert Wood Johnson Foundation

ROCOG adopted a Transportation Infrastructure Environmental Justice Protocol in 2016 in accordance with the USDOT rules for environmental justice and Executive Order 12898, promulgated by President Clinton in 1994. Since ROCOG receives federal transportation planning funds and is involved in planning for services and infrastructure projects that rely on federal funding, it is required to develop plans and programs in accordance with USDOT rules for environmental justice. Implementing agencies within the ROCOG area must also follow ROCOG environmental justice procedures for projects and programs relying on federal funding.

ROCOG has completed an extensive geographic analysis to identify neighborhoods with significant environmental justice populations. This data has been used in project development activities for different modes of transportation and transit development planning as well as system level assessments that are described in Chapter 9 of the Plan.

ROCOG updated its Title VI Non-Discrimination and Limited English Proficiency Plan in 2017, which is another aspect of the environmental justice directive to ensure the full and fair participation by all potentially affected segments of population, including people with Limited English Proficiency (LEP). ROCOG's 2019 Public Involvement Policy (PIP) also details these efforts, which include strategies such as public notice requirements, use of social media, and intentional outreach to traditionally underrepresented populations. Chapter 6 of the Plan describes the public participation tools and other mechanisms used to include the Title VI and environmental justice populations in planning projects.

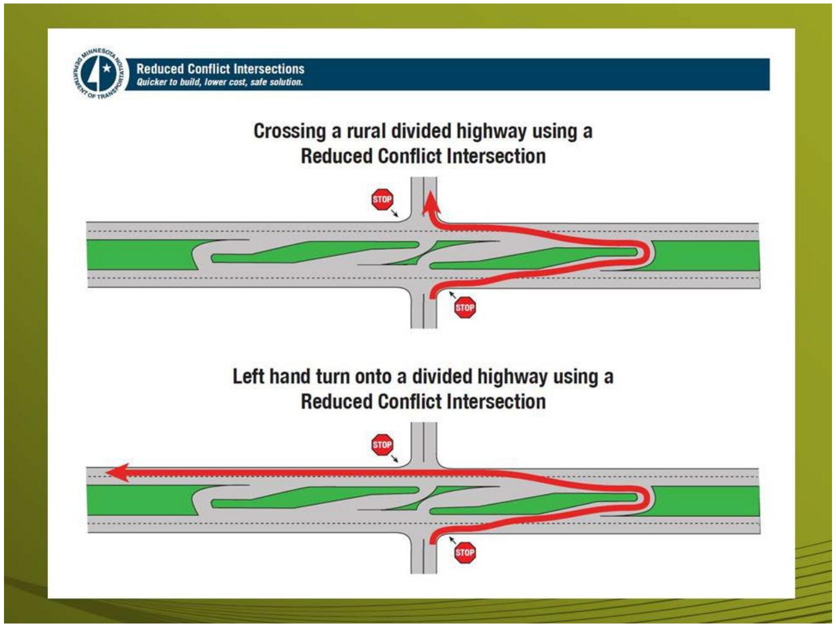
Access Management

Access Management is the proactive coordination of providing vehicular access points to land parcels adjacent to all manner of roadways. Good access management promotes safe and efficient use of the transportation network by controlling access to highways, major arterials, and other roadways. These techniques include

- Access Spacing
- Driveway Spacing
- Safe Turning Lanes

- Median Treatments
- Right-of-Way Management

Access management guidelines are important to ensure that traffic generated by planned land uses can access roadway facilities while maintaining appropriate level of safety for all modal users including pedestrians, cyclists, transit and vehicular traffic.

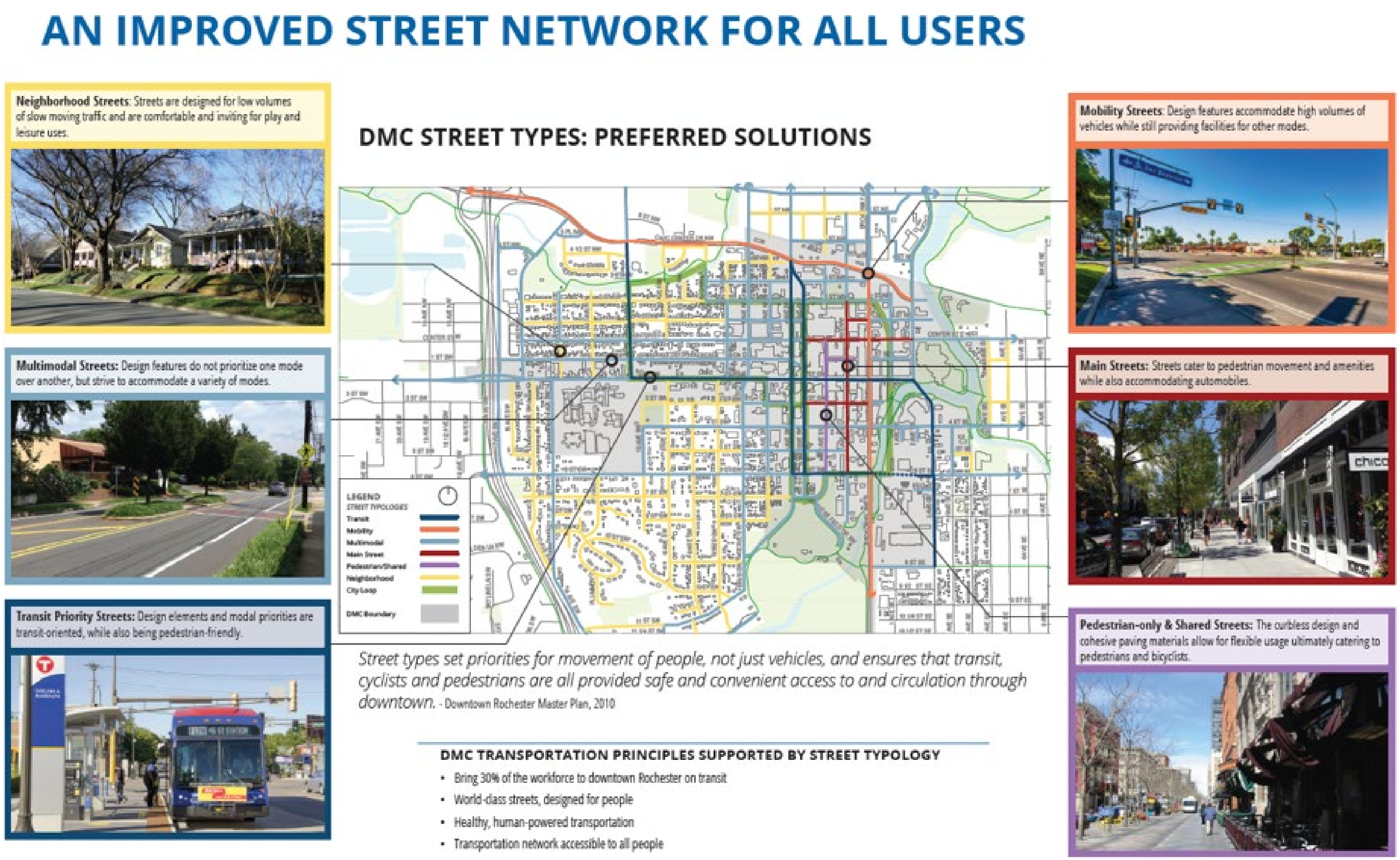


ROCOG has worked with its partners to develop and administer access management guidelines. In 2006, ROCOG assisted in the preparation of the Olmsted County *Access Management Ordinance*, which was later amended in 2013 and 2017 and continues to help the County administer the ordinance. ROCOG aided the City of Rochester in developing access management standards for inclusion in the City's *Zoning Ordinance and Land Development Manual* and assists the them with the review of major developments required to prepare Traffic Impact Reports and where proposed access issues are evaluated.

Street Typology & Street Design Guidelines

Good street design begins with an understanding of the street context and the land uses surrounding it. Street typology is a concept that attempts to marry consideration of corridor transportation needs with the land use environment found along the corridor, helping to plan appropriately for all modes of traffic and the interface with adjacent development along the frontage of property. Figure 4-18 provides an example of how street typology was applied in transportation studies associated with Destination Medical Center planning efforts. Figure 4-19 illustrates examples taken from the DMC District Design guidelines for street improvements that are consistent with the vision for this pedestrian oriented district.

Figure 4-18: Destination Medical Center District Street Typology



Source: DMC Transportation & Infrastructure Program Integrated Transit Studies, Street Use and Complete Streets Study Report, June 2018

Figure 4-19: Example from Destination Medical Center District Design Guidelines

02B

Streets and Corridors

B.01

Design Streets for Pedestrians

Background
After more than six decades of designing a public realm that cedes primacy to the car, there is renewed awareness and interest in creating a balanced street system that accommodates all modes of movement in a beautiful, safe and engaging environment. In the Rochester Downtown Master Plan and other planning documents, there is reference to "pedestrian-friendly streets" and "walkable urbanism" that reduce dependence on the car and promote walking and the use of bicycles and transit. The plans also promoted the goal of creating places for people to gather on sidewalks, in the form of outdoor cafes or places to informally meet.

In 2009, the City adopted a "Complete Streets" transportation system strategy to support these goals.

Key to the success of a vital, walkable network of streets is the quality of the streetscape — the physical elements that make the street an interesting place to be. The streetscape and the buildings that line it need to work together to create a safe and inviting place to be.

Relation to Goals
A walkable, pedestrian-friendly environment meets the overall goals of creating a healthy city (more walking), a sustainable city (less driving) and a vibrant public realm.

Performance Guideline
Design downtown and urban neighborhood streets with a balanced system that accommodates all modes of movement. Maximize sidewalk widths where possible, and provide street trees with the appropriate infrastructure (boulevards, urban vaults, etc.) to support them. Employ traffic calming strategies, such as curb extensions at intersections and mid-block where appropriate. On-street parking is recommended for convenience and to calm traffic. Where transit is present, provide high quality facilities and amenities to increase the user's comfort and security. Make all sidewalks and pedestrian pathways accessible.

50 | Rochester Destination Medical Center District Design Guidelines

B.01 | Streets and Corridors

Figure 22:
European multimodal streets accommodate all users.
Amsterdam, The Netherlands

Figure 23:
Multimodal street prioritizes pedestrians and reduces the impact of automobiles.
Buenos Aires, Argentina

Figure 24:
Curbless multimodal streets can delineate uses with changes of color or texture.

Rochester Destination Medical Center District Design Guidelines | 51

Streets and Corridors | B.01

Design Details
Sidewalk Zones and Dimensions

01 • The Primary Pedestrian Zone —This zone, where all users circulate, must accommodate users of all ages and abilities. It must be free of any intrusions such as steps, kiosks, furnishings, landscaping, etc. The minimum width is 6 feet for streets with low pedestrian use, but wider zones are recommended where space allows. An 8-foot-wide pedestrian zone is preferred where the right-of-way allows, and is essential on pedestrian destination streets.

02 • Amenity Zone (between back of curb and Primary Pedestrian Zone) — The Amenity Zone (also known as the Furnishing/Planting Zone) should employ the use of permeable paving where feasible and be no less than 4 feet wide. Lighting, furnishings and landscaping, including street trees, shall all be located in the Amenity Zone. In cases where outdoor uses (such as cafes) are proposed, the Amenity Zone may be considered by the city for such uses when space does not allow for such uses in the Building Frontage Zone; in such cases, the Amenity Zone must be 8 feet wide or more.

03 • Building Frontage Zone — This zone, located between the Primary Pedestrian Zone and the building facade, will vary in width depending on location, and site conditions (e.g if the building has a front "yard," etc.). At a minimum, it is desirable to have a 2-foot-wide Building Frontage Zone, which may be composed of a different paving material than the Primary Pedestrian Zone. If an outdoor cafe or small plaza is located in this zone, the minimum width is 8 feet (from building facade to Primary Pedestrian Zone). Pots and other landscape treatments are acceptable in this zone as well.

Figure 25:
Sidewalk zones - minimum widths

Figure 26:
Plan of sidewalk zones at corner

Figure 27:
Plan of sidewalk zones at corner with cafe

52 | Rochester Destination Medical Center District Design Guidelines

Source: Rochester Destination Medical Center District Design Guidelines, June 2017

Concluding Thought: Focus on Moving PEOPLE, Not VEHICLES

We must take the opportunity to invest in systems that change the focus from moving vehicles into and through our area to those that focus on moving people. While of particular importance relative to downtown Rochester, a focus on how we move people—and how land development patterns affect this—should inform all transportation and land use planning in the ROCOG planning area.

Amount of space required to transport the same number of passengers by car, bus, or bicycle.
Event info at www.facebook.com/Urban.Ambassadors - Photos by www.tobinbennett.com
(Des Moines, Iowa - August 2010)

5 • Drawing from Other Plans

Overview/Summary

One important function of a ROCOG Plan is to bring together pertinent parts of previous plans and plans produced by other planning entities that contribute to a ROCOG Plan Update. Jurisdictions in Olmsted County that adopt comprehensive land use plans and system level transportation plans include Olmsted County, the City of Rochester and the small cities outside of Rochester. In the case of Olmsted County and Rochester, the system level transportation plan they rely on is this ROCOG Long Range Transportation Plan, although the City of Rochester also uses the transportation sections of their comprehensive plan. This chapter summarizes the land use plans for Olmsted County and Rochester and contains the small city Thoroughfare and Land Use Plan maps, which have been prepared at the municipal level to guide investment in each of the seven communities outside the Rochester area. Most of the small city plans have been updated in the last ten years under contracts with private planning consultants.

It is also important to note that with a required update every five years, the Plan is done after, during, and just prior to a number of other on-going community, state, and federal planning work. The following sections summarize the plans that have been considered in the preparation of this ROCOG Long Range Transportation Plan.

Statewide and District Plans

The following statewide and district plans have contributed to the formation of this ROCOG plan.

Minnesota GO Family of Plans

Minnesota GO is a 50-year vision of the future of transportation in the state, across all modes, adopted in 2011. The plan recognizes the importance of a comprehensive statewide transportation system in any attempts to achieve maximum benefits in health, commerce, the natural environment, and people's overall wellbeing. Where Minnesota GO lays out the vision for a better future, the Family of Plans go into more detail about how to achieve that better future as it relates to each of the various transportation modes.

- **Statewide Multimodal Transportation Plan**
  This plan, adopted in 2017, serves as the overall

guiding document for the Family of Plans, outlining transportation priorities for the system as a whole that will inform the goals of the individual mode plans. In this way, the Statewide Multimodal Transportation Plan ensures that the various modal plans that make up the Family of Plans are working toward common, shared goals, even while each plan responds to the unique realities and challenges of each mode. Where the Minnesota GO vision identifies what the state is trying to achieve, the Statewide Multimodal Transportation Plan details how the state will achieve it. The Statewide Multimodal Transportation Plan establishes five goals for open decision-making, transportation safety, critical connections, system stewardship, and healthy communities, and identifies.

- **State Aviation System Plan**
  The State Aviation System Plan is being updated during the preparation of this LRTP. The most recent plan is from 2012. This plan sets goals in the areas of safety; mobility and access; financial opportunity and responsibility; operations; and preservation and asset management. The plan notes a significant gap between the system's capital needs and the expected funds that will be available over the 20-year span of the plan.
- **Statewide Bicycle System Plan**
  Adopted in 2016, this plan envisions a bicycle network that is safe, comfortable, and convenient for all users. The plan recognizes bicycling's important role in improving quality of life in communities throughout the state. The plan notes that support for bicycle infrastructure is strongest for those facilities that separate bicycles from auto traffic and those that serve local and regional bicycling. The plan sets goals for safety and comfort, local bicycle network connections, state bicycle routes, and increased ridership.
- **Statewide Freight System and Investment Plan**
  This plan was adopted in 2018. Following the emphasis on integrated balance among various modes in the state's freight policy, this plan establishes goals in the areas of supporting the state's economy, improving mobility, preserving infrastructure, safeguarding the people, and protecting the environment and communities.
- **Minnesota State Highway Investment Plan**
  Adopted in 2017, this plan links the Minnesota GO vision and the goals of the Statewide Multimodal Transportation Plan to the long-term development of the state's highway system by identifying financially constrained investment needs. In planning for the infrastructure projects necessary for the state's highway system to meet federal and state performance-based targets, the plan estimates about twice as much in project costs as will likely exist in

funding. The plan lays out an Investment Direction, which is not project-specific, but instead recommends categories of investment and size of investment given the limited resources expected.

- **Minnesota Walks and the Statewide Pedestrian System Plan Community Engagement Report**
  These documents together constitute the Statewide Pedestrian System Plan. Last adopted in 2016, the current plan is in the process of being updated. The plan is focused on development of safe, comfortable, convenient, and desirable places for people to walk or use a mobility device throughout the state. After identifying various obstacles to walking, the plan sets goals for universal access and use of pedestrian networks in the following categories: roadway and street design; land use and the built environment; fostering creativity and partnerships; listening and planning; Minnesota winter and year round upkeep; and building a culture of walking.
- **Statewide Rail Plan**
  Adopted in 2015, this plan addresses safety and efficiency in the state's freight and passenger rail networks as a constituent part of an integrated multimodal transportation system. The rail system is particularly important to the state's commodities industries for getting their products to market, as well as for the state's manufacturing industry which is reliant on rail for the delivery of raw materials. The rail system has further complications, relative to other modes, since it has an unusual amount of private-sector ownership and operations responsibilities to the infrastructure.
- **Greater Minnesota Transit Investment Plan**
  This plan, adopted in 2017, follows the transit vision in Minnesota GO and the transit goals of the Statewide Multimodal Transportation Plan by identifying the financing necessary to achieve 90% of the transit needs in Greater Minnesota by 2025, and strategizes when certain transit investments can be made with regard to available funds. The plan outlines a series of goals designed to meet the projected growth in annual transit rides in Greater Minnesota by 4.8 million by 2025.
- **Transportation Asset Management Plan (TAMP)**
  This 2019 plan updated the original 2014 plan, and serves as a comprehensive guide to maintaining the state's pavements, bridges, culverts, deep stormwater tunnels, overhead sign structures, high-mast light tower structures, noise walls, signals, lighting, pedestrian infrastructure, buildings, and intelligent transportation systems. The recommendations of the plan were driven by the need to increase the consideration of lifetime maintenance costs in capital project decisions, reducing agency risk, building on work that has come before, and improving data management.

Other State and District Plans

- **District Freight Plan**
  This plan is scheduled to be developed between mid-2020 and mid-2021.
- **Strategic Highway Safety Plan**
  This plan was adopted in early 2020 as a tool for building a highway culture in which traffic-related deaths and injuries are no longer acceptable (the ultimate aim of the Toward Zero Deaths effort). The plan recommends actions to be taken within 1-2 years, and other actions to be taken within 3-5 years, that will improve highway safety and result in fewer deaths on Minnesota's roads. These recommendations revolve around issues concerning inattentive drivers, impaired drivers, intersections, speed, lane departure, unbelted drivers and passengers, older drivers, pedestrians, younger drivers, work zones, commercial vehicles, and motorcyclists.
- **MnDOT District Safety Plan**
  A 2016 analysis of state highways in the MnDOT Districts in Greater Minnesota identified high-risk intersections and highway segments and proposed some strategic investments for them that would result in improved safety on rural and urban roadways in District 6.
- **Minnesota Statewide Regional Intelligent Transportation Systems (ITS) Architecture Plan**
  Updated in 2018, this plan provides guidance for implementing ITS initiatives cost-efficiently, based on stakeholder input concerning transportation needs. A key part of the implementation of ITS initiatives is sequencing them properly, since they are interrelated, and thus the implementation of some of them depends on other initiatives already being in place. The recommended initiatives further the goals of the plan:
    - Improve the Safety of the State's Transportation System
    - Increase Operational Efficiency and Reliability of the Transportation System
    - Enhance Mobility, Convenience, and Comfort for Transportation System Users
    - Improve the Security of the Transportation System; Support Regional Economic Productivity and Development
    - Preserve the Transportation System
    - Enhance the Integration and Connectivity of the Transportation System
    - Reduce Environmental Impacts
- **MnDOT District 6 Bicycle Plan**
  Adopted in 2019, this plan builds on MnDOT's 2016 Statewide Bicycle System Plan by identifying bicycle

infrastructure priorities in the 11-county region of MnDOT's District 6 in Southeastern Minnesota.

- **MnDOT District 6 10 Year Capital Highway Investment Program 2019-2028**
  This document builds on the 4-year State Transportation Improvement Program (STIP) and ROCOG's own 4-year Transportation Improvement Program (TIP) to present a ten-year program of planned street and highway improvements in the 11-county region of MnDOT's District 6 in Southeastern Minnesota.
- **MnDOT Complete Streets Policy**
  Effective in 2016, MnDOT must include considerations for modes other than automobiles in all phases of planning, project development, operation, and maintenance. The goals of the policy are to reduce conflict between various modes of transportation, while increasing the share of trips made by walking, bicycling, and transit.

Local Transportation & Land Use Plans

The following local and regional plans have contributed to the formation of this ROCOG plan:

- **Planning 2 Succeed: Rochester Comprehensive Plan 2040 (P2S 2040)**
  In 2018, Rochester adopted its first new comprehensive plan in 37 years. This plan recommended that the City of Rochester maintain its current corporate limits as much as possible as it grows, and that it encourages infill development instead of expansion into undeveloped lands currently outside the City. Significantly, the comprehensive plan promulgates the concept of nodes and corridors: concentrations of mixed residential, commercial, retail, office, and transportation uses connected by high-capacity, high-frequency transit, envisioned as bus rapid transit (BRT). This concept of nodes and corridors adapted the ambitious plans for downtown—seen already in the Downtown Master Plan and the Destination Medical Center Plan—into a scaled-up formula that applied the ethos of density and the primacy of transit to the rest of the city.
- **Destination Medical Center Development Plan**
  On March 23, 2015, The City of Rochester adopted Resolution No. 133-15 authorizing the DMC Plan as amended. This ambitious plan was prompted by questions about how the City of Rochester, Olmsted County, the state of Minnesota, and the Mayo Clinic could maintain and grow the region's position as a premier destination for medical care. This meant planning a future for Rochester that focused on patients, their companions, medical staff, and other employees in downtown Rochester. The result was a DMC Plan that saw the singular importance of the mode shift recommended in the Downtown Master

Plan and recommitted to it. The DMC Plan calls for the daily share of commuter trips downtown by private car to be reduced to 43% by 2035, down from 71% in 2015. Accomplishing this, according to the plan, would require much more development of downtown residences, so that more downtown employees could walk to work; the development of bicycle and pedestrian infrastructure downtown; and the establishment of a Downtown Circulator—a high-capacity, high-frequency transit mode that would move people from large parking reservoirs into downtown. This plan will be updated in 2020.

- **Destination Medical Center: Integrated Transit Studies**
  In 2018, the City of Rochester finished a set of four interdependent plans that explored the details necessary to realize the vision of the 2015 DMC Plan. These plans focused on the City Loop active transportation features; Street Use, Street Operations, and Complete Streets; Parking and Transportation Management Authority; and the Transit Circulator (now known as Downtown Rapid Transit). These plans were guided by the overarching principle of the DMC Plan, that downtown Rochester could only be successful with infrastructure that supported greater density along the Rapid Transit route and a lower proportion of trips made by private cars.
- **Rochester Downtown Master Plan**
  Adopted in 2010, the Downtown Master Plan identified the need to reduce the proportion of trips downtown made by private cars. A key strategy identified by this plan to achieve that goal was the establishment of parking management policies and other travel demand management measures that would provide commuters with alternatives to driving and parking a car downtown. This plan set a goal of reducing the proportion of trips to downtown made by private car to 50% by 2030. Subsequent plans (especially the DMC Plan and P2S 2040) have recognized the importance of this goal and have made it even more aggressive.
- **Rochester Transit Development Plan**
  This 5-year plan was adopted by the City of Rochester in 2017 to guide the expansion and growth of Rochester Public Transit (RPT), with the needs of the DMC project and the infill/density recommendations of Planning 2 Succeed informing the transit system's development. This plan focuses on how RPT's system could be more useful to more riders. Some of the key recommendations would expand off-peak service, allowing more riders to utilize RPT's service outside of the traditional heavy-use morning and afternoon peak hours.
- **Rochester Area Bicycle Master Plan**
  This plan was adopted by the City of Rochester in

2012 and identifies needed bicycling infrastructure that will improve system connectivity and increase the usability of the bicycle and pedestrian network for both recreation and transportation. An update to this plan is expected by the end of 2020.

- **Downtown Circulator TOD Study**
  This study is underway during the preparation of the LRTP. As an outgrowth of the DMC Plan and the Integrated Transit Studies, the TOD study will examine the proper siting and design of transit stations along the Downtown Circulator (now known as Downtown Rapid Transit) route, with emphasis on placemaking and economic development, along with optimized transit operations.
- **Downtown Transit Circulator Small Starts Grant Development**
  This study is underway during the preparation of the LRTP. As an outgrowth of the DMC Plan and the Integrated Transit Studies, the Circulator project development will recommend the mode choice and route alignment for the downtown Circulator (now known as Downtown Rapid Transit). The process thus far has resulted in a locally preferred alternative of bus rapid transit on a route from the western park-and-ride terminus along 2 St SW, and then south along Broadway Ave. to the southeastern park-and-ride terminus at Graham Park/Seneca site.
- **TH 14 West / Byron Area Corridor Analysis**
  This analysis is underway during the preparation of the LRTP. This examination of US-14 between the Cities of Rochester and Byron will result in recommendations about upgrades to interchanges and traffic capacity in this important and growing commuter corridor.
- **CR 104 Corridor Plan**
  This study, completed in 2006, recommended County Road 104/60 Ave NW in Rochester as a major arterial corridor that would form part of a beltway around the outer edge of the Rochester urban area.
- **TH 63 South Corridor Plan**
  This 2010 study was part of a larger study of improvements to access to Rochester International Airport. This study considered the implications of changes to roadways of various classifications that intersect US-63 between Rochester and Stewartville.
- **Rochester Parks and Recreation System Plan**
  This 2016 plan takes a comprehensive look at the needs of the City of Rochester parks, natural areas, and trails. Trails are identified as crucial in making the parks and recreation system accessible by the most people possible. The plan also characterizes trails as an important transportation option for public health and sustainable transportation.
- **North Rochester Transportation Study**
  This study, undertaken in 2011-2012, examined the

transportation needs in far northwest Rochester, following up on a similar study conducted in 2005-2006. Though the study was not formally completed due to budget constraints, it did result in some recommended projects for improving access to US-52 at 55 St NW and 65 St NW.

- **Broadway Corridor Study**
  This 2015 study proposed systematic improvements to the length of Broadway Ave. from 37 St NE to the interchange with US-52 in the City of Rochester. The study broke Broadway into seven zones: three north of downtown, and four south of downtown (downtown was not included in this study, as it was within the DMC boundary and was being well studied by the DMC Plan at the time). By applying complete streets guidelines to the designs and recommendations, this study envisions a cohesive design for multiple transportation modes along the length of the City of Rochester's main north-south roadway.
- **Rochester 2nd St SW Corridor Plan**
  This 2009 plan examined the expected growth along 2 St SW, between Rochester's essential institutions, the Mayo Clinic downtown and St Marys Hospital. The plan's vision for this corridor is a place designed at human scale, where pedestrian, bicycle, and transit modes are elevated in priority compared to today, and where automobile traffic is moderated.
- **Rochester Complete Streets Policy**
  Adopted in 2009, this policy explicitly recognizes the needs of pedestrians, cyclists, and transit riders, and states that they must be considered at the beginning of planning for new and reconstructed developments and street projects. The goal of the policy is to balance the long-dominant needs of motorists and freight handlers with other, traditionally unconsidered users of the road, and to make non-motorized travel in Rochester safer and more attractive.
- **Mayo Medical Center Master Plan**
  Last adopted in 2016, this plan is updated every five years. The plan itemizes the capacities of properties across the Mayo Clinic's varied properties throughout Rochester, providing this LRTP with valuable information on parking lot and Mayo patient and employee shuttle ridership.
- **Airport Master Plan**
  The Management Company of Rochester International Airport completed its most recent update of the AMP in 2009. ROCOG and MnDOT District 6 initiated a Subarea Transportation Plan and Corridor Preservation Study to address the need for improved access to Trunk Highway 63 and the upgrading or realignment of perimeter roads serving the airport. A new Airport Master Plan is underway and is anticipated to be completed by the third quarter of 2020. Once all the work is done and the Master Plan

and Airport Layout Plan are submitted to the FAA, the Master Plan will be adopted by the City of Rochester (with input from the Airport Company Board and the Airport Commission) and the Airport Layout Plan approved by the FAA. There will be one more opportunity for public input, tentatively planned for late June of 2020.

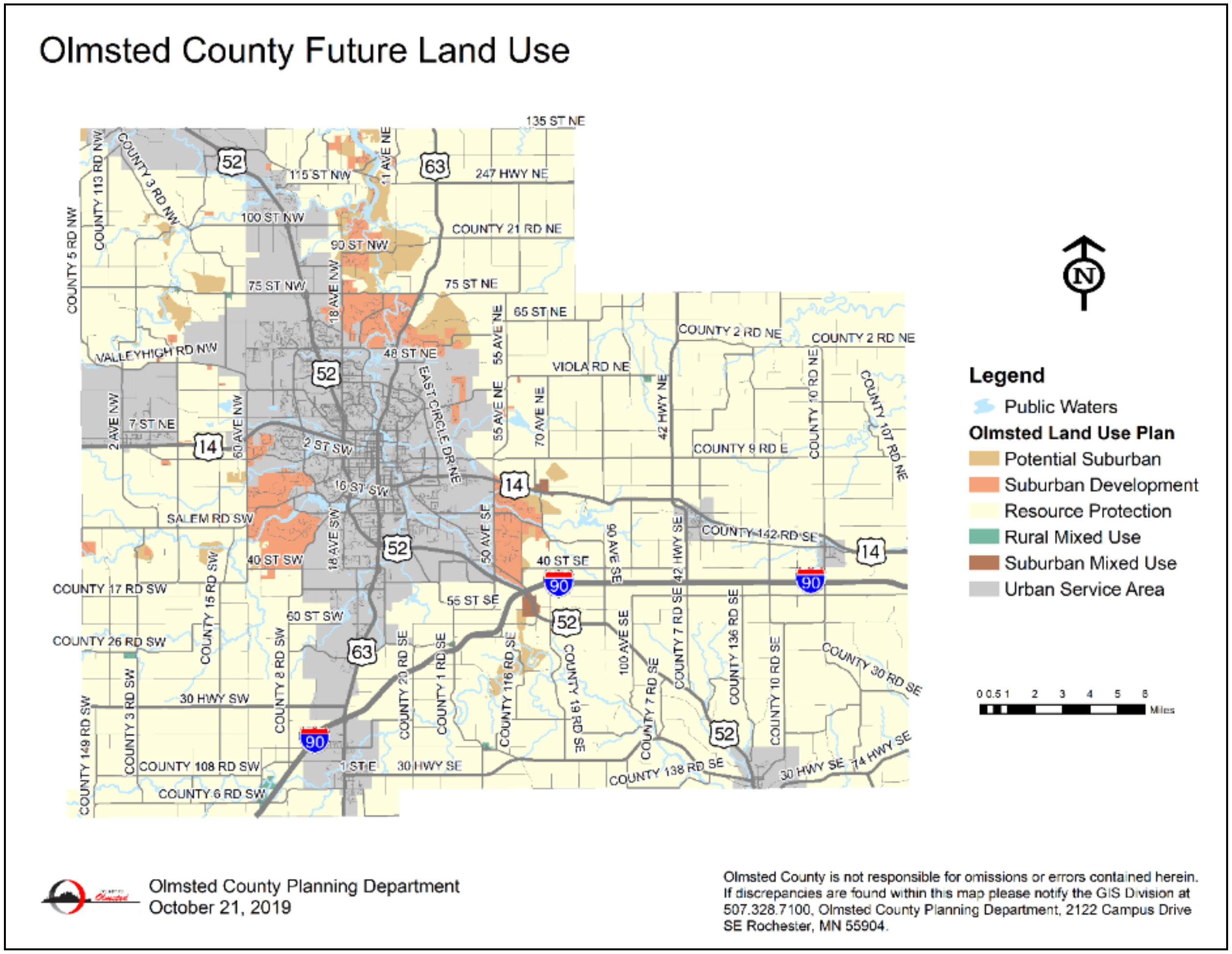
- **Regional Transportation Coordinating Council Plan**
  MnDOT completed the 2017 Regional Transit Coordination Plan for Southeast Minnesota, focusing on how to streamline dispatching, share data, and improve communication among various transportation providers in the 11-county region.
- **Olmsted County ADA Transition Plan**
  Adopted in 2018, this plan details the ways in which Olmsted County Public Works plans to make all public rights of way accessible to all users, regardless of disability.
- **County Highway Safety Plan**
  This 2009 plan was conducted as part of a comprehensive effort to identify safety priorities that will contribute to a reduction in serious injuries and deaths in crashes on County roads.
- **SE Minnesota Towards Zero Deaths Program**
  Begun in 2005, this partnership of 11 counties has worked toward reducing traffic fatalities and serious injuries by changing the culture of driving. The program emphasizes enforcement, engineering, education, and emergency medical and trauma services.
- **DNR State Trail Planning: Stagecoach Trail and Whitewater Country Trail**
  The Stagecoach Trail Master Plan of 2012 recommends linking several state trails in and west of Rochester, to be used by pedestrians, bicyclists, skaters, cross-country skiers, horseback riders, and snowmobilers on various segments along the trail. The Whitewater Country Loop State Trail Master Plan of 2008 recommends a similar connection between trails in Rochester and points farther east.
- **Olmsted County Land Use Plan**
  This 2014 plan addresses the land use projections for the coming decades, focusing on how to limit urban sprawl and thus maintain effective and efficient utility and transportation systems.
- **Journey to Growth**
  This effort, begun in 2014, was organized around the goal of diversifying the regional economy by promoting entrepreneurship and business development in areas such as manufacturing, agriculture, and technology.
- **Olmsted County Capital Improvement Plan**
  Included in the 2019-2023 Capital Improvement Plan (CIP) is a twenty-year forecast of transportation projects that will be needed in Olmsted County. While

costs are estimated for these projects, sources of funding are not yet identified.

ROCOG Area Future Land Use Plans

The Olmsted County and Rochester Land Use Plans recognize a 50-year Rochester Urban Service Area (RUSA) for planning purposes. Within the RUSA boundary

Figure 5-1: Olmsted County Future Land Use Map



the City has adopted a Future Land Use Plan as a guide to community development by providing a consistent set of policies applied to general geographic areas to guide future land use decisions. The primary purpose of the Land Use Plan is to inform the review and approval of proposals affecting land use and land development and assist in planning for future capital improvement needs. In relation to development of the transportation plan, the land use plan assists in identifying the intensity and character of travel demand, the types of design or program features to be considered in different areas of the community, and the timing of future improvement.

Rochester Downtown Master Plan and DMC Development Plan

To assist in applying the principles of the Land Use Plan and refine future plans for development, periodically the City of Rochester or other public agencies will complete major subarea or corridor plans, and private sector developers will prepare master General Development Plans for smaller areas as a first step in the city development approval process. In the last decade, two major efforts looking at future downtown development have been undertaken: (1) the Rochester Downtown Master Plan, a joint effort of the City of Rochester, the Rochester Chamber of Commerce, the Rochester Economic Development Authority and the University of Minnesota-Rochester; and (2) the Destination Medical Center Development Plan, led by the Destination Medical Center Corporation in cooperation with the City of Rochester. These plans provide high-level visionary guidance to future land use and public space development in the downtown area of Rochester as well as to needed downtown mobility improvements.

Figure 5-2: Example of Graphic Guidance from 2015 Destination Medical Center Master Plan

It is expected that employment downtown will approximately double in the next generation to over 60,000 jobs in the DMC district. In addition, downtown housing is expected to grow from approximately 1,000 units currently to as many as 3,500 units over the planning horizon, and the University of Minnesota-Rochester will develop a new campus at the south end of downtown with capacity for 5,000 students, well above the current level of 500 students they are serving in rented space in a downtown mall adjacent to the Mayo Medical Center.

Small City Land Use and Thoroughfare Plans

Most of the small cities in Olmsted County have prepared and adopted major street plans, which are illustrated in this section. In instances where a city has not prepared a transportation system plan, an illustrative Major Street Plan has been developed by ROCOG for the purpose of identifying a local major street network consistent with ROCOG's System Development Guidelines and access management principles, taking into consideration the land use plans for the community. It is recommended that those communities without an adopted or recognized plan utilize the illustrative plans included herein as a starting point and eventually develop a major street plan. Beginning on the next page are graphics illustrating the most recent land use and transportation plans that have been prepared and adopted by small municipalities in Olmsted County. The following paragraphs highlight the vintage of each plan and other notes relative to its status.

ROCOG is focused on planning for regional travel patterns, and small city land use and thoroughfare plans informed the planning of facilities and services serving regional travel needs and the identification of projects associated with these regional networks, which are primarily state and county highways and transit and active transportation facilities and services that serve regional travel.

- **Byron:** The plan for Byron is adopted as part of Byron's comprehensive plan and was last updated in 2010 (Figures 5-3 & 5-4).
- **Chatfield:** The land use plan for Chatfield was adopted as part of a Comprehensive Plan update completed in 2015 (Figures 5-5 & 5-6).
- **Dover:** The plan for Dover is an illustrative plan reflecting current municipal limits and known development plans. Plan was shown as illustrative in the ROCOG 2040 Plan (Figures 5-7 & 5-8).
- **Eyota:** The Land Use plan for Eyota was formally adopted in 2008 but had been used as a guide for a number of years prior to that (Figures 5-9 & 5-10).
- **Oronoco:** In 2012, the Rochester-Olmsted Planning Department prepared a future land use map for Oronoco (Figures 5-11 & 5-12).
- **Pine Island:** The city of Pine Island completed a Comprehensive Plan update in 2010 (Figures 5-13 & 5-14).
- **Stewartville:** The city of Stewartville adopted an updated land use plan as part of a Comprehensive Plan updated completed in 2009 (Figures 5-15 & 5-16).

Figure 5-3: Byron Area Thoroughfare Plan

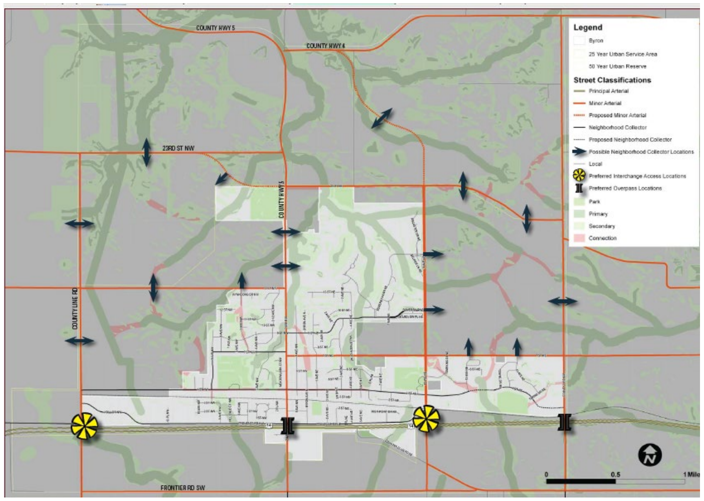


Figure 5-4: Byron Land Use Plan

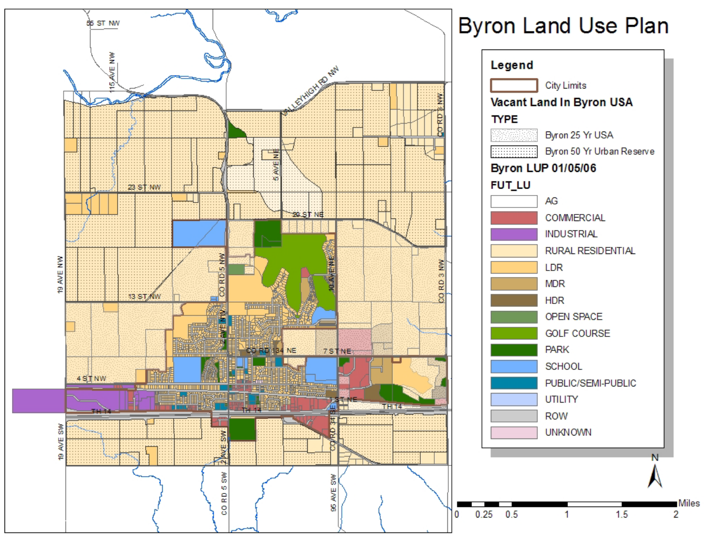


Figure 5-5: Chatfield Land Use Plan

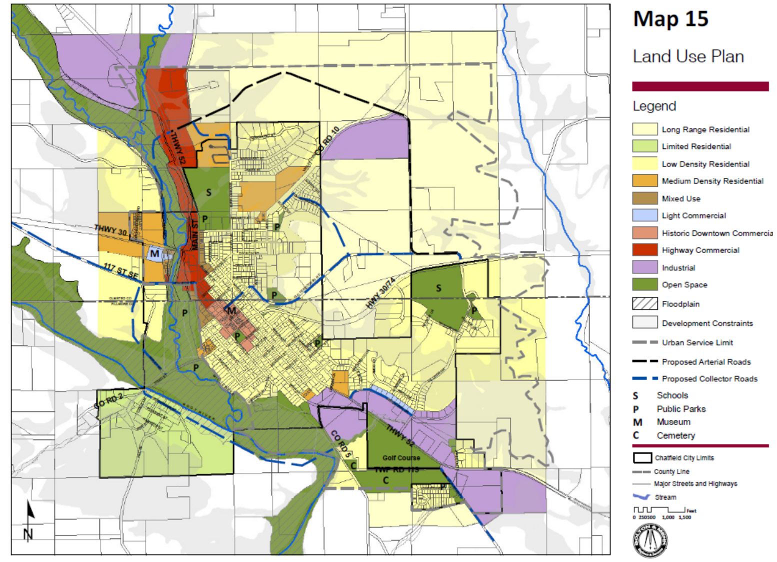


Figure 5-6: Chatfield Area Thoroughfare Plan

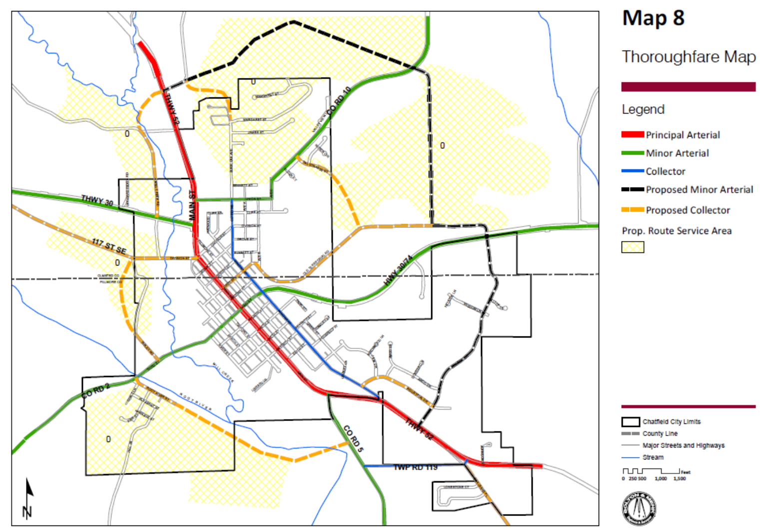


Figure 5-7: Illustrative Dover Area Thoroughfare Plan

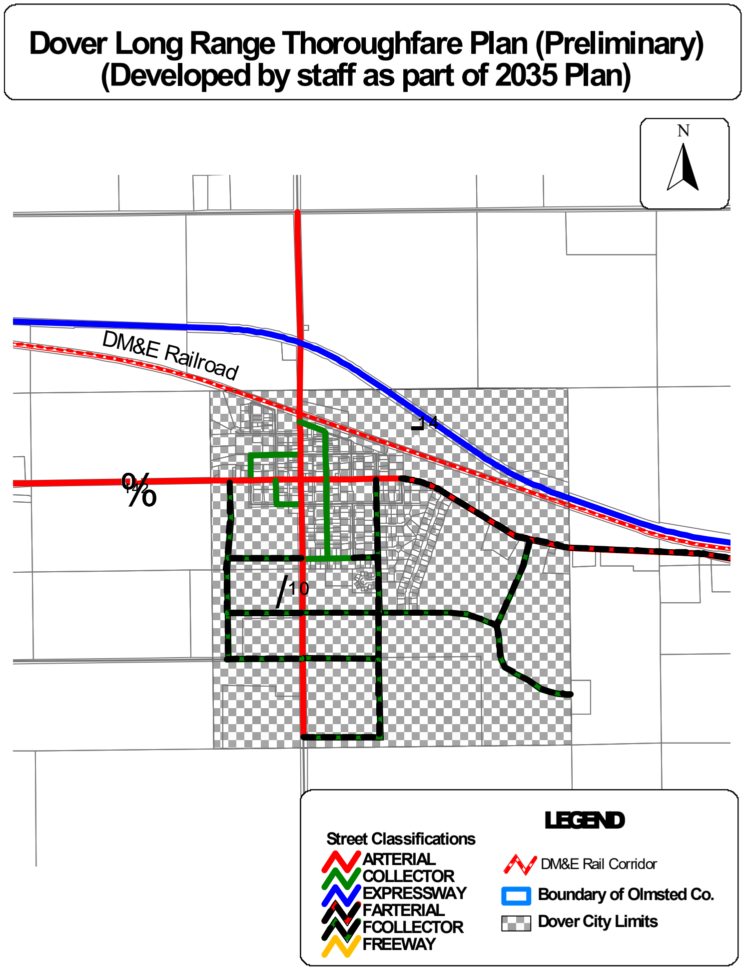


Figure 5-8: Dover Land Use Study

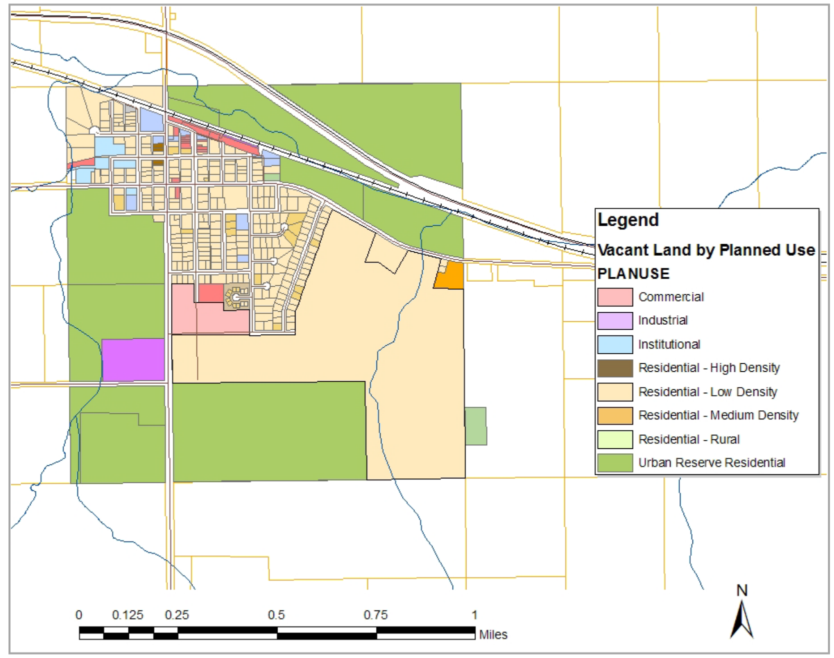


Figure 5-9: Eyota Land Use Plan

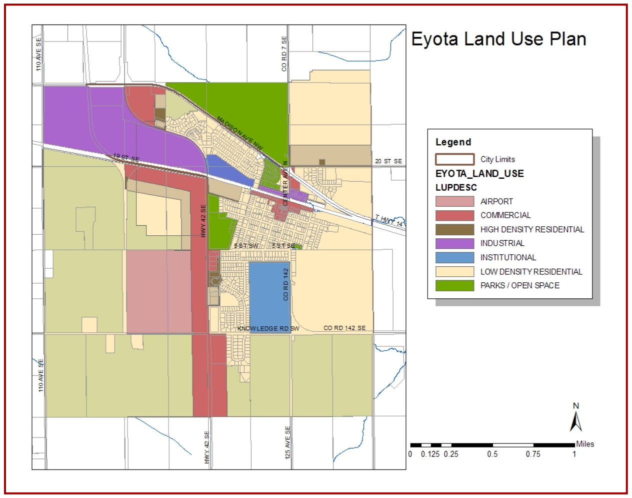


Figure 5-11: Oronoco Land Use Study

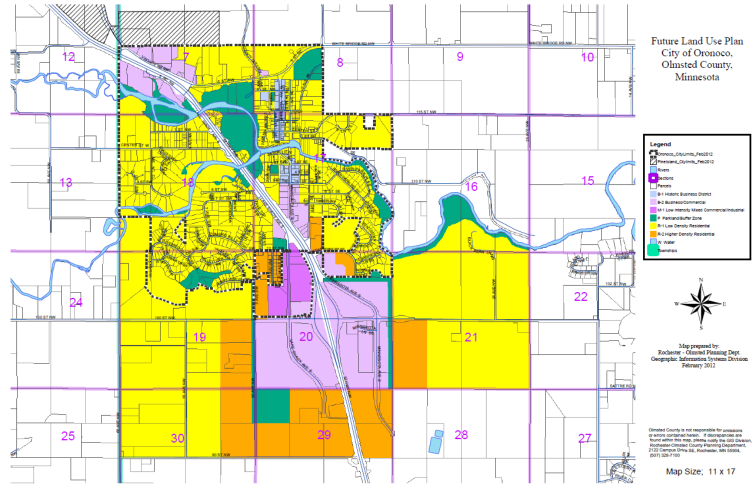


Figure 5-10: Eyota Area Thoroughfare Plan

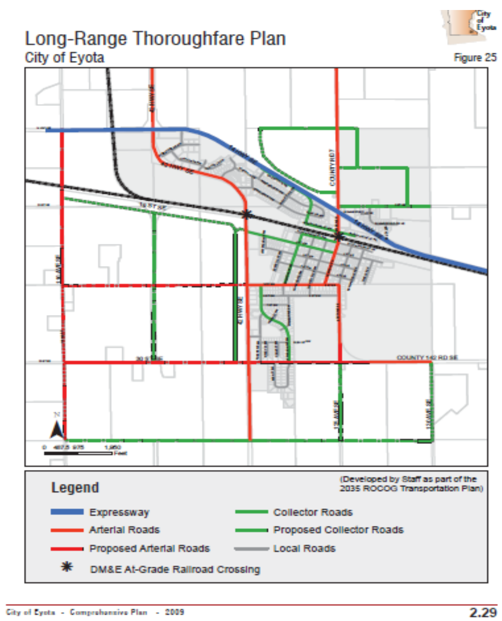


Figure 5-12: Illustrative Oronoco Area Thoroughfare Plan

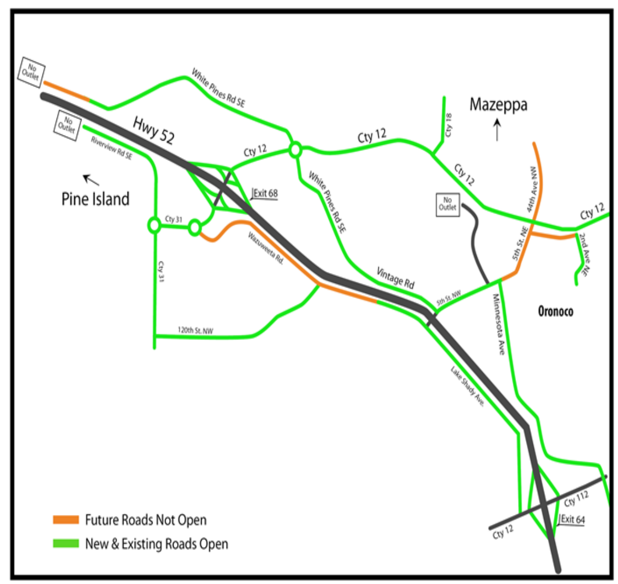


Figure 5-13: Pine Island Area Thoroughfare Plan

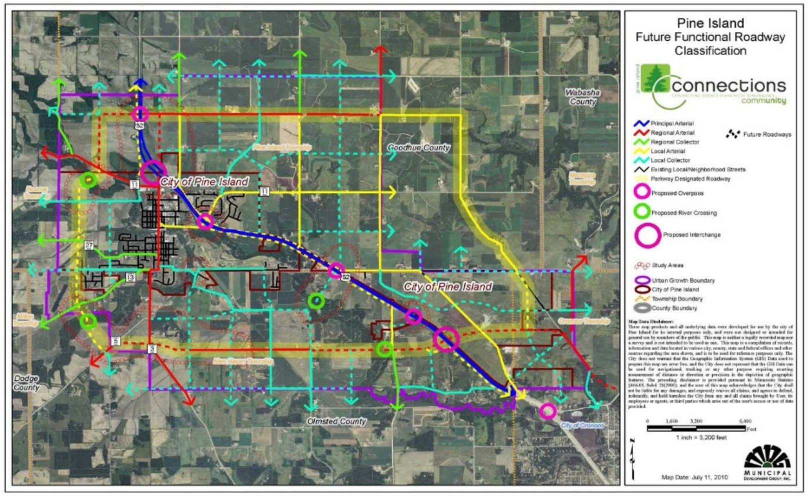


Figure 5-14: Pine Island Land Use Plan

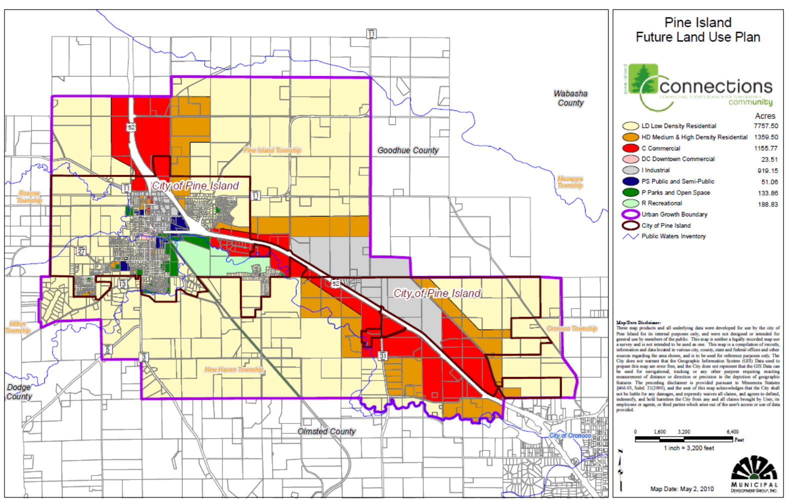


Figure 5-15: Stewartville Area Thoroughfare Plan

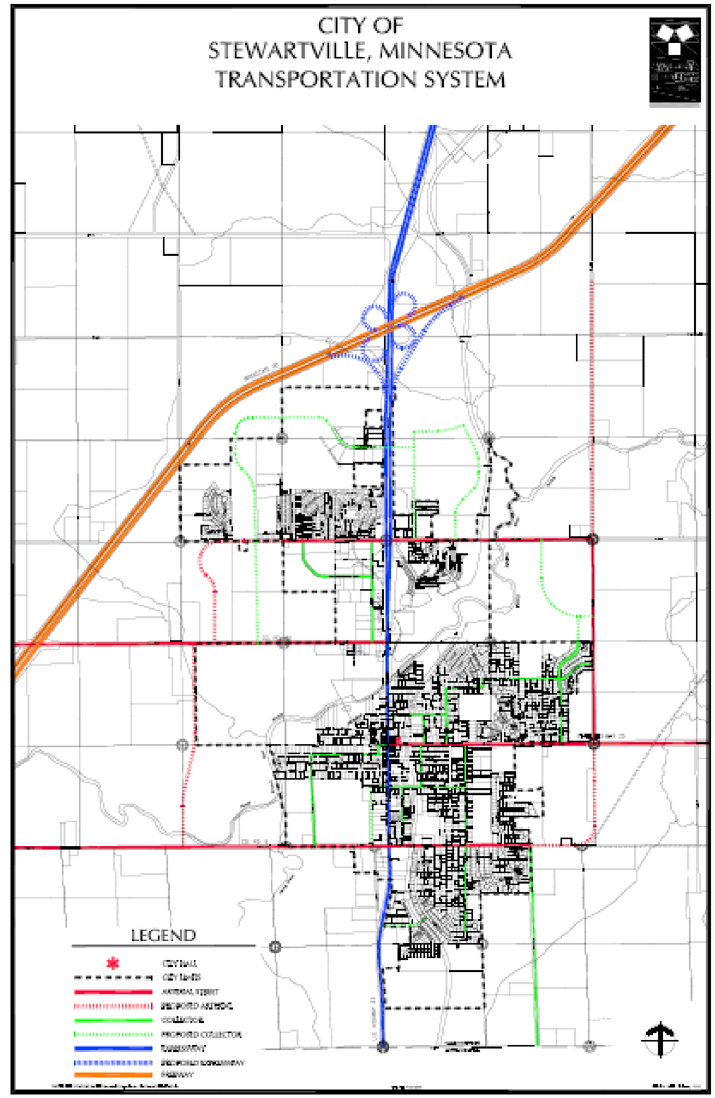
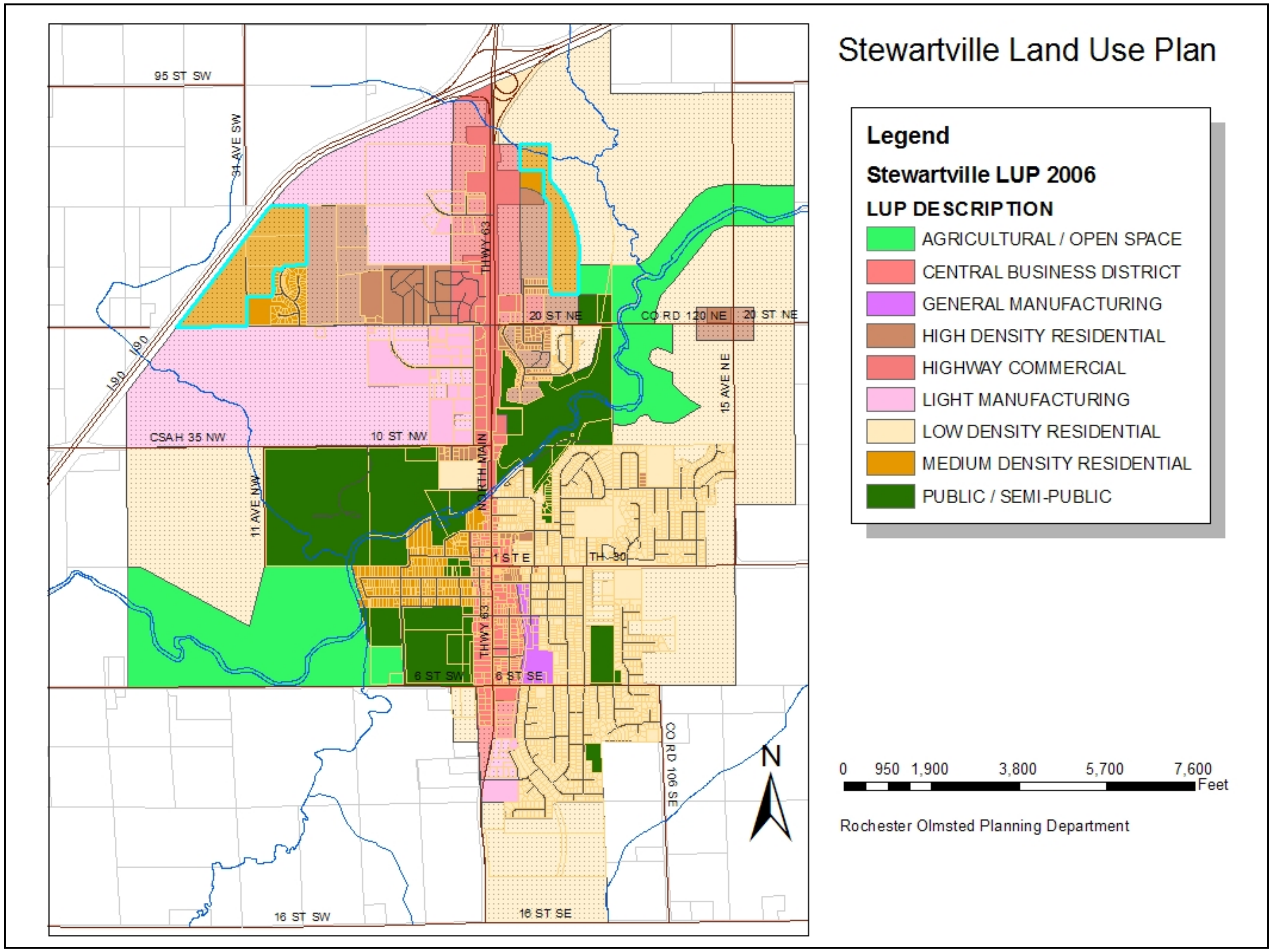


Figure 5-16: Stewartville Land Use Plan



6 • Public & Agency Involvement

Overview/Summary

Public outreach for ROCOG's 2045 Long Range Transportation Plan began in February 2019 and continued through the summer of 2020. ROCOG staff employed various means of outreach, from the traditional, in-person informational meetings to new interactive online methods. Outreach in the summer of 2020 was marked by the unique experience of social distancing requirements in response to the world-wide COVID-19 pandemic. This national and state emergency necessitated that in-person gatherings be limited in size, with participants maintaining a safe distance of at least 6 feet from each other, and often wearing masks covering the nose and mouth. Remote and online outreach was, therefore, often preferable and ROCOG staff relied on innovative methods such as ESRI StoryMaps to gather public input.

Public Involvement in Developing This Plan

Federal planning guidelines encourage the use of a proactive public involvement process to develop and adopt the long range transportation plan. ROCOG's 2019 Public Involvement Policy (PIP) includes these key elements in its public involvement vision:

- Involve the community in all MPO planning, project development, and service development activities that impact the delivery of transportation services to the citizens of this community.
- Provide multiple means for citizens to become involved in transportation planning efforts that are convenient to the citizenry and tailored to their levels of interest.
- Provide information on both broad and specific planning issues and about available public involvement opportunities.
- Inform citizens not only about planning options and alternatives but also about the constraints and political considerations that affect decisions.
- Seek broad-based community consensus on transportation plans through a collaborative process by involving and listening to the views of representatives of divergent interests and reflecting those interests in adopted plans. Area residents,

member jurisdictions, affected public agencies, representatives of transportation agency employees or unions, and public/private providers of transportation will be made aware of the activities of the MPO.

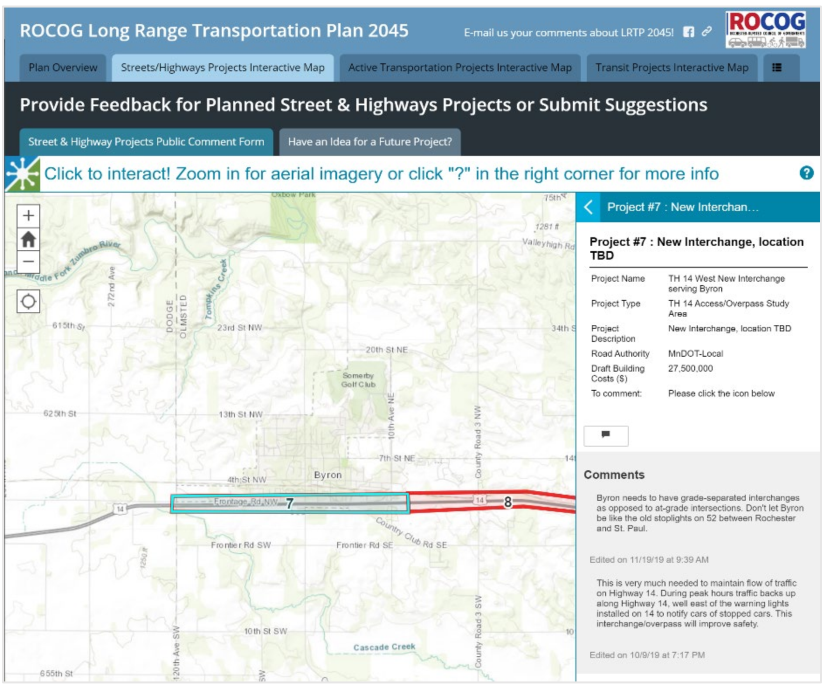
During this Plan update process, efforts were made to make information available through a number of avenues, including in-person presentations and open houses, media releases, and the web pages of ROCOG and Olmsted County. New in this round of planning was the introduction of social media outreach through ROCOG's new Facebook page, and interactive outreach opportunities provided by the use of StoryMaps, which allowed users to see more detail and provide input about proposed projects at their own pace. ROCOG also utilized local media such as the Rochester Post Bulletin to advertise availability of information and meetings. Further, ROCOG staff interacted with the Rochester Neighborhood Associations, the Diversity Council, the United Way of Olmsted County, Olmsted County Public Health educators, and the Olmsted County Community Action Program. Interpreter services were offered on request for individuals who request such accommodations (no requests were received).

ROCOG used a multi-faceted strategy of public involvement. The major elements of the public involvement plan for this planning work included:

- **Public Open Houses**
  Four open houses were held throughout this planning process to give the public the opportunity to view draft multi-modal maps and view presentation materials of the data gathered as of that point in the reaffirmation process. Comments were solicited both verbally from participants and on comment cards. The local media were also invited along with ROCOG Board members and other related ROCOG committees' members. The first two open houses were traditional, in-person events, and were held on February 26, 2019, and October 15, 2019. Due to the social-distancing requirements of the COVID-19 pandemic response, the last open house planned for

the summer of 2020 was rescheduled as a pair of online, virtual open houses. These were held on September 8 and 9, 2020.

- **StoryMaps**
  ROCOG developed extensive outreach materials using StoryMaps, which provided users an interactive experience and allowed them to make direct comments about the proposed projects in the plan. The StoryMap included maps showing the proposed projects in each of the three modes: streets and highways, active transportation, and transit. Users could view each proposed project on a current map and make comments about it. The StoryMap also included draft presentations about each of the plan chapters, which allowed the public to see the information contained in the plan as it was being developed. Finally, the StoryMap included a Survey 1-2-3 survey in which users could suggest other street/highway, active transportation, or transit projects that were not among those identified by staff and included in the maps.



- **Social Media**
  ROCOG developed a Facebook page for the first time as part of the outreach for this plan. This allowed ROCOG to better announce upcoming open houses, in-person presentations, public hearings, and other LRTP-related events. It has also provided ROCOG a better way to publicize its work in general as an MPO, and thus better explain to the public it serves the nature and role of its work.
- **Downtown Rapid Transit Outreach**
  Because Rochester's Downtown Rapid Transit (formerly known as the Circulator) project is being developed at the same time as this Long Range Transportation Plan update, ROCOG has worked closely with the City of Rochester in incorporating this major transit project in the LRTP. Outreach for inclusion of this project in the LRTP was mainly in the form of a website and community meetings run by

City of Rochester staff and their consultants and attended by ROCOG/Olmsted County Planning Department staff. ROCOG staff contact information was also readily available on the web site for further input or question/answer opportunities during the entire reaffirmation planning process.

- **Rochester Pedestrian/Bicycle Advisory Committee (PBAC)**
  PBAC worked with staff on development of Chapter 12 regarding non-motorized systems planning. This is the third plan development process where PBAC has provided input to the development of the LRTP. PBAC is also proactive in reaching out through community forums and workshops to provide a venue for community discussion on issues of importance related to non-motorized travel in the community.
- **ROCOG Transportation Technical Advisory Committee (TTAC)**
  TTAC worked with staff in the development of the Plan's chapters addressing roadway network development, safety, system management and operations, transit operations, and financing of the long-range plan recommendations.
- **ROCOG Policy Board**
  As part of an initial agreement, the Board met on their regular schedule throughout the long-range plan reaffirmation process. They commented on summaries of the draft plan chapters as they were developed and provided input and direction when needed.

- **Rochester Citizens Advisory on Transit Committee (CAT)**
  Olmsted County Planning Department staff met with this group prior to the early public forums and four more times (May and September 2019, and July and August 2020) throughout the planning process. In addition to these specific activities, the City of Rochester's Transit and Parking Division and members of CAT are proactive in working with social service agencies and at the neighborhood level to investigate the transportation needs of environmental justice

populations. The Rochester transit service attempts to provide services that meet the transportation needs of the disabled and low-income through fixed route public transit and the ADA paratransit services.

- **Public Comment Period & Public Hearing**
  A 30-day public comment period began August 19, 2020, as part of the review of the final draft plan. Copies of the plan were available at the Olmsted County Planning Department offices and on-line. Resource agencies were also given notice of this comment period for their review. A formal public hearing was held at the beginning of the public comment period to provide interested stakeholders an opportunity to address any issues or concerns with ROCOG and ROCOG staff.
- **Update of the 2045 Plan**
  Formal action to update the 2045 Long Range Transportation Plan was taken on September 23, 2020. Following that action, the full plan was posted on-line, and print copies of the plan will be made available upon request.

Major Outreach Efforts

ROCOG staff engaged in purposeful outreach efforts for this plan update, with the intention of generating more public comments than had been received in the past. The major outreach efforts included in-person outreach, digital outreach, presentations to groups, and solicitation of agency input.

In-Person Outreach

Open houses are a more traditional type of outreach that ROCOG staff employed to educate the public about the LRTP and to elicit their feedback. Four open houses were held: traditional in-person events on February 26, 2019, and October 15, 2019; and online, virtual events on September 8 and 9, 2020. Both in-person open houses were held in a large meeting room and atrium at the Olmsted County Planning Department, starting in the late afternoon and extending until the evening. All events were announced to the print and broadcast news media and posted on the ROCOG website and Facebook page.

For the in-person meetings, ROCOG staff produced posters and handouts that explained the nature of the plan and what it would contain. At the virtual open house, ROCOG staff delivered a PowerPoint summary of the plan and fielded questions from the audience.

The February 2019 open house was dedicated to presenting the background information gathered at that point about the planning area, and information about the nature of ROCOG as an MPO. This open house generated 30 comments from the public. The October 2019 open house was focused much more on getting comments about specific modal (i.e., street/highway, active transportation, and transit) projects that had been identified by that point. This open house generated 19 comments from the public. The virtual open houses in September 2020 focused on the finalized projects list and plan recommendations. Together, the virtual open houses generated 38 responses.

Pop-ups were a new type of outreach that ROCOG employed as part of this plan update. During the summer and fall of 2019, ROCOG staff brought a select number of informative posters about the modal projects to various sites and engaged attendees or passersby to get their input on proposed projects. During the pop-ups, ROCOG staff engaged dozens of people and generated nearly 100 comments. ROCOG staff set up at the following events:

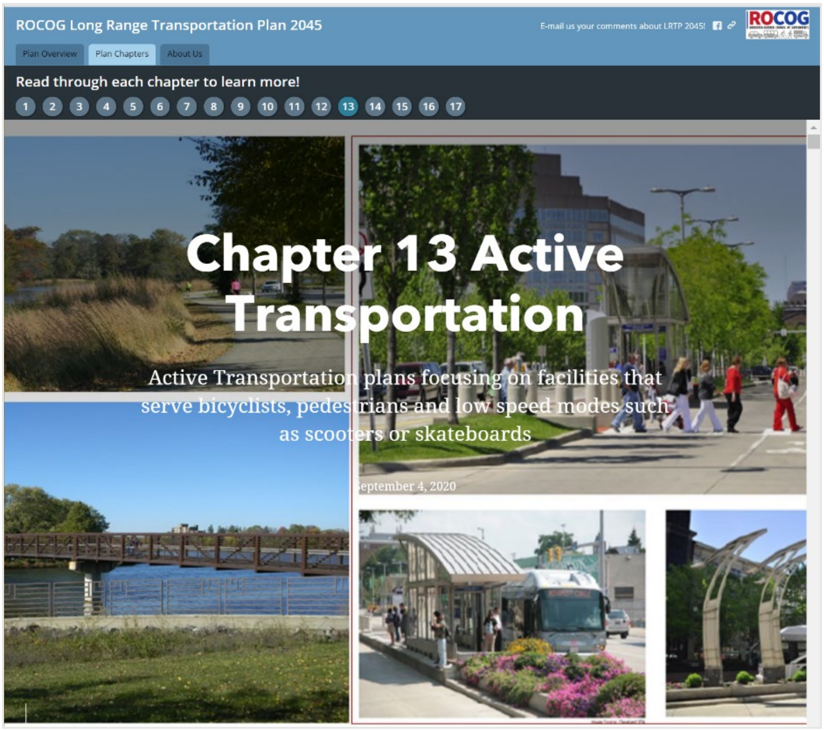
- Diversity Council Annual Celebration, Phoenix Farm, August 7, 2019
- Shoppes at University Square in the downtown skyway, September 11, 2019
- University of Minnesota-Rochester, main lobby, September 11, 2019

A fourth pop-up was originally scheduled for the Rochester Public Library, but a burst pipe caused a flood that closed the library for several days and reduced usable space in the building for several weeks after that. ROCOG staff were forced to cancel that event.

Digital Outreach

ROCOG utilized its website (rocogmn.org) to make announcements about upcoming meetings, outreach events, and general topics related to the LRTP specifically and ROCOG more generally. To this more traditional means of outreach, ROCOG added a Facebook page in 2019. Both the ROCOG website and Facebook page were not used so much to promulgate LRTP information themselves, but instead were used to point users to an innovative method of presenting the large amounts of information about the LRTP: ESRI StoryMaps.

ROCOG staff constructed StoryMaps for each chapter of the LRTP, as well as for the modal projects. Each chapter had a summary presentation that allowed for dynamic graphics to be placed along with informative text, allowing the information to be presented in a more engaging manner than would have been true with a mere PDF or Word document.



Each mode (streets/highways, active transportation, and transit) had a StoryMap that showed the proposed projects on a map of the area. Users could click on the individual projects to see more information about them and to leave comments about that particular project. The modal StoryMaps also included a survey in which users could suggest other projects that were not identified on the draft map. By the end of the fall 2019 public comment period (November 30, 2019), the StoryMaps had generated 185 comments. As points of comparison, the traditional method of waiting for the public to send in their comments resulted in eight responses (all emailed to staff); the in-person outreach in fall 2019 (see section above) and presentations to groups (see next section) totaled 141 comments from the public.

The StoryMap experience was very productive in terms of generating interest and input from the public. ROCOG staff concluded that StoryMaps are a very helpful companion effort to the traditional method of in-person outreach and presentations to groups by allowing people who attend an in-person event the opportunity to investigate the information further, at their leisure, and contribute more thoughtful comments. One piece of information ROCOG staff did not capture in this process, and which would be important to do in the next effort, was whether StoryMap users had attended an in-person outreach effort or a presentation to a group. Knowing this would give ROCOG a better understanding of how the in-person and traditional methods of outreach may have driven traffic to the StoryMaps.

During the public comment period that ended September 23, 2020, the StoryMaps generated 44 responses from the public.

Presentations to Groups

ROCOG staff produced a PowerPoint summary of the information that would be included in the LRTP and focused it on the modal projects. Staff took this presentation to various locations in the summer and fall of 2019 and solicited questions and comments from each audience. ROCOG made this presentation to the following groups:

- Pedestrian and Bicycle Advisory Committee, August 20, 2019
- Intercultural Mutual Assistance Association, September 17, 2019
- R Neighbors/Council of Neighborhoods, September 17, 2019
- Olmsted County Township Officers Association, September 26, 2019
- Citizens Advisory on Transit, September 26, 2019
- Olmsted County Planning Advisory Commission, October 3, 2019
- City of Rochester Planning and Zoning Commission, October 9, 2019
- Chamber of Commerce Transportation Forum, October 11, 2019
- One Topic, One Hour (at 125 LIVE), October 21, 2019
- County Committee of the Whole, November 19, 2019
- Rochester City Council Study Session, December 2, 2019

These presentations resulted in 33 questions and comments from the public.

In the summer of 2020, ROCOG staff made further presentations to the following groups:

- Pedestrian and Bicycle Advisory Committee, August 12, 2020
- Citizens Advisory on Transit, July 23, 2020
- Citizens Advisory on Transit, August 27, 2020

These presentations resulted in seven responses from the public.

Solicitation of Agency Input

In December of 2019, ROCOG sent an email to a list of contacts at various federal, state, and local agencies, organizations, companies, and nonprofits that might have an interest in commenting on the LRTP. The Minnesota Department of Natural Resources provided the only response: a recommendation that "impacts to natural resources be avoided and minimized to the greatest extent possible," and a thorough set of guidance on how transportation projects can work to minimize damage to vulnerable species and habitats.

Resource Agency Consultation

ROCOG works with resource agencies on plans and projects to ensure that the most up-to-date resource inventory and program information is considered during the development of areawide land use plans and transportation system plans.

Consideration of environmental resources plays a key role in development of the land use plans, including designation of urban growth areas and resource protection areas that lay the foundation of the transportation system planning that ROCOG conducts. ROCOG is involved in this land use planning effort and through those efforts seeks to gather meaningful input relevant to the transportation planning process. This in turn leads to the development of this long range transportation plan.

Other

Finally, ROCOG alerted the media, including the Rochester *Post Bulletin* newspaper, to the LRTP planning process, and the various open houses and public input opportunities throughout the planning process. ROCOG also set up a static display of posters, selected from among those presented at the open houses, at the Government Center, September 23-27, 2019. These were not staffed but were accompanied by cards with ROCOG contact information that encouraged users to visit the StoryMaps to leave their comments.

Results of Outreach

Results of the outreach effort are reported in greater detail in documents gathered in Appendix B.

First Round: February 2019

The February 2019 open house was an attempt to introduce the overall concepts of the plan to the public, and to elicit general comments and questions about the scope of the plan and the type of recommendations that would result from it upon adoption more than a year and a half later. Most of the responses from the public at the February 2019 open house were questions about the nature of the projects identified for each of the modes. The comments that were collected mainly concerned roadway improvements, active transportation infrastructure improvements, safety, transit, and general development concerns (Figure 6-1).

Second Round: Fall 2019

The fall 2019 outreach effort was much more intense, with dozens of scheduled efforts spanning in-person and digital activities. The in-person activities of presentations to groups, pop-up interviews, and an open house in October 2019 generated 42% of the responses during this outreach period. The StoryMap digital outreach effort generated another 55% of the total 334 responses (the remainder of the responses came as emails to staff).

Figure 6-2 illustrates the proportion of comments made using each method.

Figure 6-1

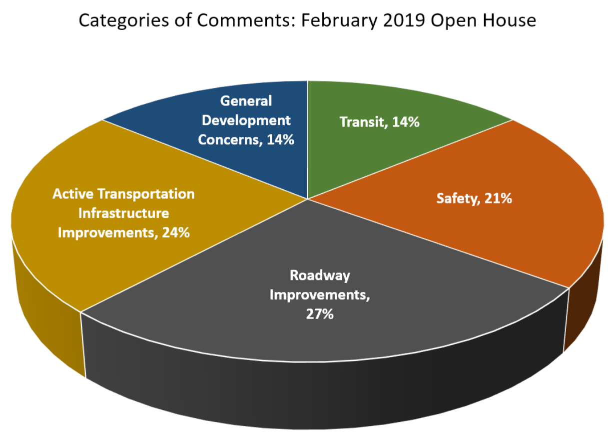
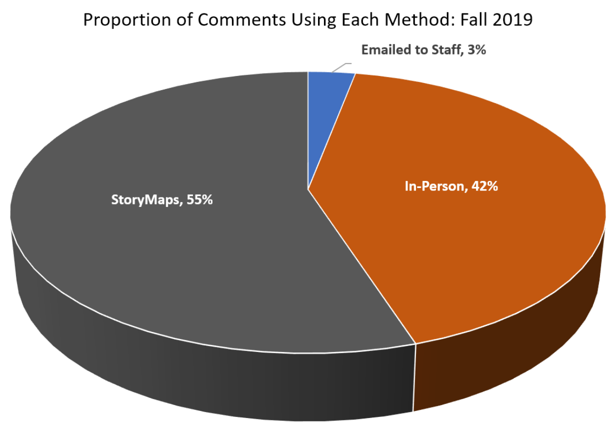
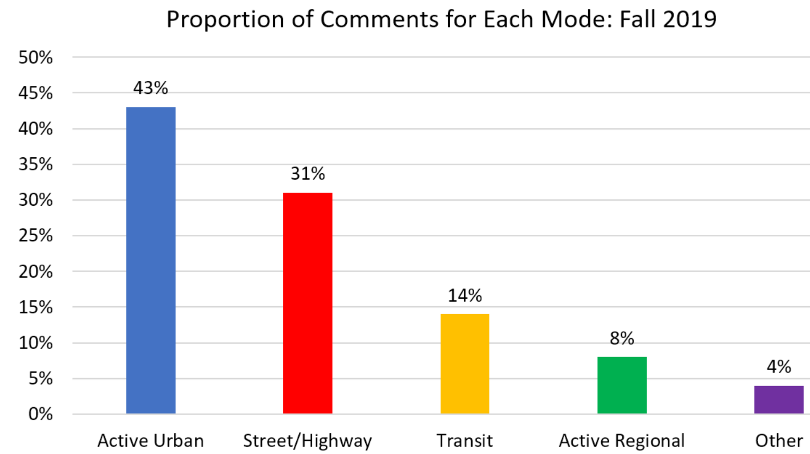


Figure 6-2



Active urban transportation was the mode that garnered the most responses, with streets/highways coming in second (Figure 6-3).

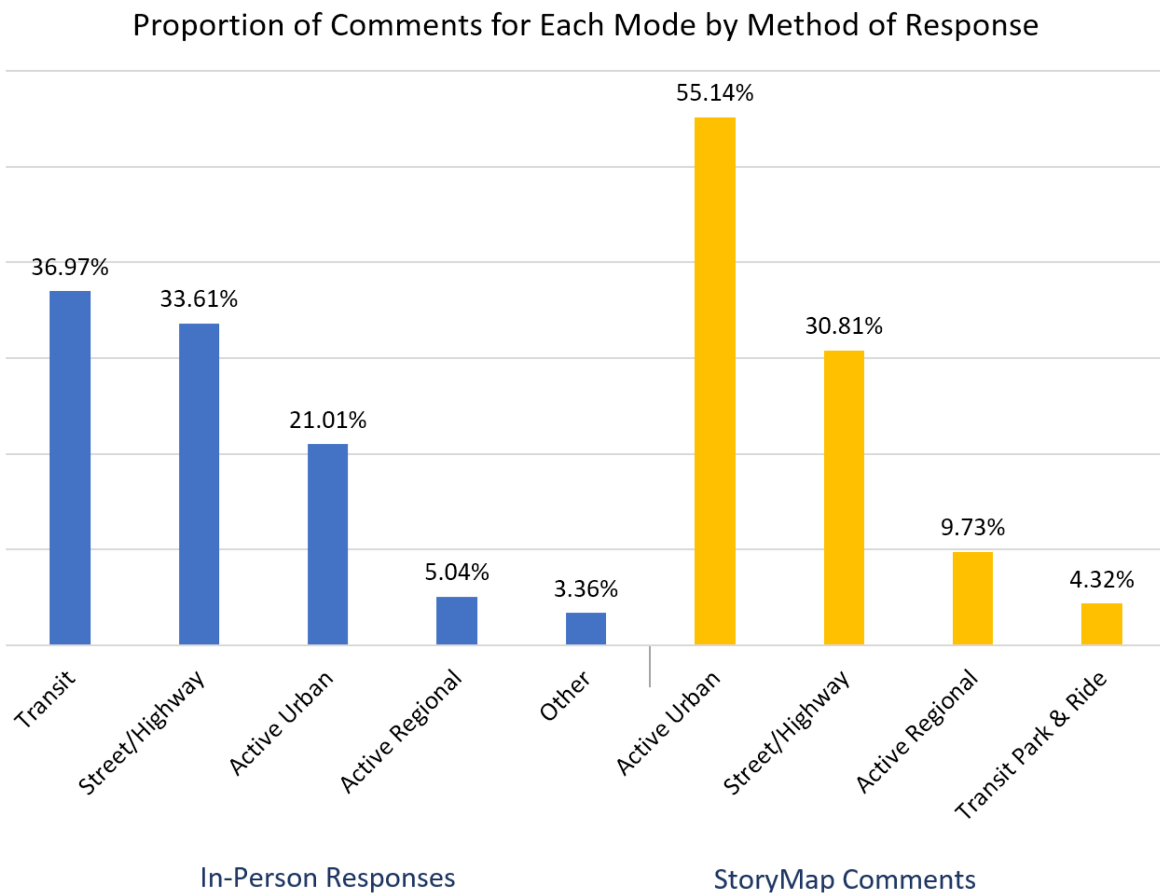
Figure 6-3



Active urban transportation also dominated the responses from StoryMaps users. In-person responses were much more evenly split among transit (with the most), streets/highways, and active transportation. Figure 6-4 shows the proportion of comments for the different modes broken down by in-person or StoryMap comments.

The Downtown Circulator (later known as Rapid Transit) was the single topic that garnered the most responses, which were mostly in-person questions since the Circulator was not presented in StoryMaps (the project development was not far enough along during the period when StoryMaps were being built and made ready for public comment). Along with the Circulator, other topics and projects showed different patterns of response from

Figure 6-4



in-person to digital outreach. When the responses to all the projects across all methods of response were analyzed, four street/highway projects in the city of Rochester emerged near the top of the responses from both in-person and online respondents. The following is a ranking of the projects with the most responses:

1. The US-14/County Road 104 future interchange (generally positive response)

2. Widening Civic Center Dr NW (evenly split responses between definitely in favor and definitely against)
3. Relocating the 55 St NW/E Frontage Rd NW intersection (mixed reactions; respondents saw pros and cons)
4. The North Broadway Ave. and 14 St NW/NE intersection (generally positive response)

Projects 1 and 4 were mostly supported because respondents saw a need to address serious safety concerns. Indeed, improving road safety was the most common need to be addressed, as identified by respondents, along with improving bike/ped connections and traffic back-up relief. There was less agreement among the public about the necessary solutions to transportation problems, and the split between in-person and StoryMap responses is reflected in the priorities of suggested solutions. The following is a ranking of the most common priorities identified, with the method of response in parentheses:

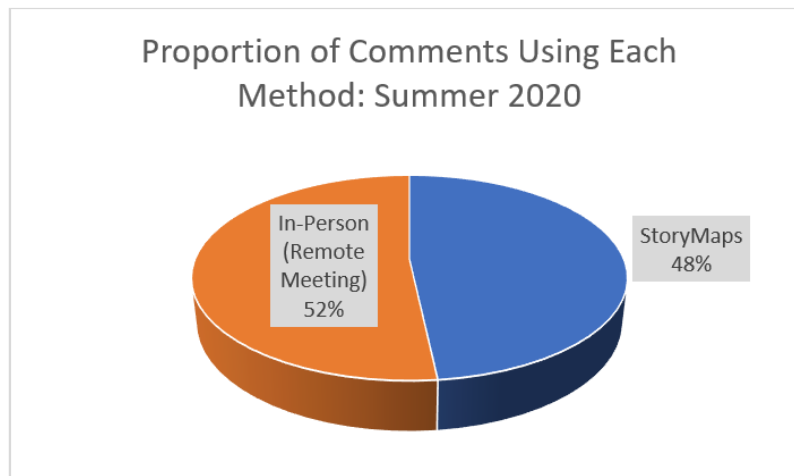
1. More transit routes/frequency (in-person)
2. Must include bicycle facilities (StoryMap)
3. New paved connection (in-person)

Third Round: Summer 2020

In August and September 2020, ROCOG took on outreach during the COVID-19 pandemic response, which limited, and in many cases prohibited, in-person gatherings of the kind typical of planning outreach efforts. All activities that would normally be conducted in-person had to be done with remote meeting technology, such as Skype, Teams, Zoom, etc. In this analysis, we will refer to meetings with different groups and virtual open houses as "in-person (remote meeting)" with the understanding that these activities are analogous to the traditional in-person meetings and open houses ROCOG would normally hold.

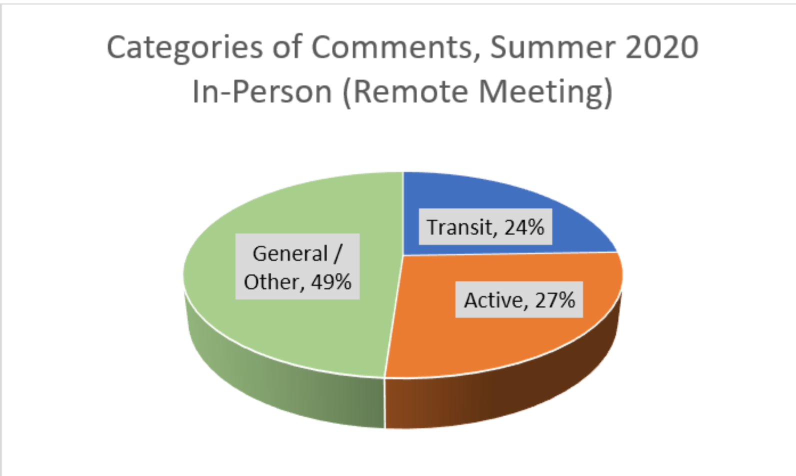
The summer 2020 outreach effort resulted in 87 responses from the public. These were split fairly equally, with 42 coming from StoryMap comments and 45 coming from in-person (remote meeting) responses during committee meetings and virtual open houses (Figure 6-5).

Figure 6-5



The in-person (remote meeting) activities generated 45 responses. The specific modes of transit and active transportation each prompted about a quarter of all responses (11 and 12, respectively). The other 22 responses were in regard to general topics about the Plan, combinations of modal use, etc. (Figure 6-6).

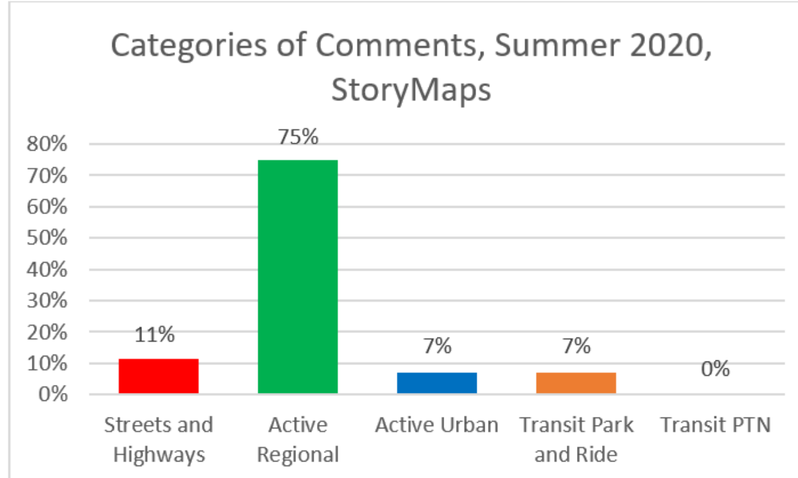
Figure 6-6



The StoryMaps generated 42 responses, and they were dominated by the 31 related to the Active Regional mode, which made up three-quarters of the responses. Streets and Highways generated five responses, and Active Urban and Transit–Park and Ride each generated three. Transit–Primary Transit Network did not generate any responses (Figure 6-7).

There was not much overlap in themes or projects between the in-person (remote meeting) responses and the StoryMap responses. StoryMap responses were project-specific, because the nature of the StoryMap commenting system basically forced users to comment on a specific project, rather than ask questions more general in nature. The in-person (remote meeting) responses, however, were allowed to be more free-form, since they did not have a structure like StoryMaps imposing an external discipline on the responses and because ROCOG staff were available to answer more general questions and any follow-ups.

Figure 6-7



The in-person (remote meeting) responses ranged across several topics. Among the transit-related responses, the most popular topic was the Downtown Rapid Transit and the BRT vehicles it would introduce to Rochester. The second-most popular transit topic was the park and ride system, particularly how it would operate in areas outside of Rochester.

The active transportation topic most popular among in-person (remote meeting) attendees was the construction of wider shoulders and off-street trails. The second-most popular topic was policies and infrastructure related to commuters and electric bike charging.

The in-person (remote meeting) activities mostly generated general responses from the audiences. The most popular topic among these general responses was how transportation planning could further the cause of racial, social, and economic equity. The second-most popular topic was how transportation planning could result in lower carbon footprints.

The StoryMap responses coalesced around bicycle safety projects that would connect users to different places in the MPA, especially in the southeast quadrant of Rochester and points beyond. The three most common projects to have comments were:

- Provide 5'-6' asphalt shoulders along CSAH 1 from 97th ST SE south to TH 30
- Construct off-road trail connecting Chester Woods County Park with Eyota and Dover
- Provide 7'-8' asphalt shoulders along CSAH 11 from CSAH 36 (Marion Rd) to TH 14

Other projects that elicited several responses were those that proposed wider shoulders on County State Aid Highways.

7 • Safety and Security Planning

Overview/Summary

Transportation safety has been and continues to be a national and statewide priority. The Fixing America's Surface Transportation (FAST) Act of 2015 continues the basic framework of the federal highway safety program first established under SAFETEA-LU in 2005. The Highway Safety Improvement Program (HSIP) remains the core Federal-Aid safety program, focused on achieving a significant reduction in fatalities and serious injuries on all public roads.

HSIP requires each state to prepare and periodically update a Strategic Highway Safety Plan (SHSP). Minnesota adopted an updated 2020-2024 SHSP in July of 2020. The Plan identifies updated Emphasis Areas that were prioritized through a data driven, collaborative process with the state's safety partners, including MPOs. The HSIP program provides federal funds to states to implement the strategies identified in the SHSP.

As part of efforts to facilitate safety planning across the state, MnDOT also prepares District-level safety plans and funds, in partnership with Counties, the preparation of County Highway Safety Plans (CHSP), which apply the same data driven process at the county level to understand what specific factors and conditions in a given county are important contributors to vehicle crashes. The current MnDOT District 6 Safety Plan was prepared in 2016 and the current Olmsted County Highway Safety Plan dates to 2009. A planned update of the Olmsted County Plan is expected to occur during Phase 1 of a proposed statewide project to update CHSPs across the state and is scheduled to commence by the end of 2020.

ROCOG's planning process is consistent with the State, District, and County Highway Safety Plans and with transit safety/security plans and programs. ROCOG recognizes engineering, education and enforcement as three key components of the highway safety effort, and local law enforcement, public works, emergency responders, and community education organizations are actively involved with the statewide Towards Zero Death initiative to advance and improve safety outcomes across the state.

Safety is a factor considered in the programming of funds in the MPO Transportation Improvement Program (TIP). ROCOG also reviews and comments on projects that come forward through the state managed HSIP funding process, eventually including recommended projects in the TIP. HSIP project applications are subject to a rigorous evaluation to ensure consistency with state and federal guidelines prior to funding.

Given the strong behavioral focus of many of the safety programs, the collaboration of safety partners is important to achieving beneficial outcomes. At the regional level, the key organization for coordinating information and programs is Southeast Minnesota Towards Zero Deaths, an initiative managed out of the District 6 MnDOT office. Locally, the City of Rochester, Olmsted County, MnDOT District 6, Olmsted County Sheriff, Rochester Police, and Minnesota State Patrol maintain a Safety Working Group that meets periodically to review crash incidents that involve fatal or serious injuries and coordinate education and enforcement efforts across the ROCOG area.

Transportation security was added as a primary planning element in SAFTEA-LU and is also continued in the FAST Act. 23 U.S.C. § 134 now states "The metropolitan transportation plan should include appropriate emergency relief and disaster preparedness plans policies and strategies that support homeland security (as appropriate) and safeguard the personal security of all motorized and non-motorized users".

Primary security planning and preparedness activities in the ROCOG area are generally handled by emergency management staff with MnDOT, Olmsted County, and the City of Rochester. ROCOG staff coordinated Olmsted County's 2009 All Hazard Mitigation Plan and worked with Olmsted County Emergency Management on its 2017 update. ROCOG staff and Rochester Emergency Management teamed up to lead the planning effort for Rochester's first All Hazard Mitigation Plan, also adopted in summer 2017.

A Hierarchy of Plans Guiding Safety Planning and Programming

As noted in the introduction, recent federal transportation legislation, beginning with SAFETEA-LU in 2005, directed a new framework for safety planning anchored around a focus on reducing crashes involving fatalities and serious injury. The phrasing "Towards Zero Deaths" has come to characterize the national highway safety strategy and essentially marks the vision set forth in federal legislation.

State Departments of Transportation and Public Safety are charged with leading this nationwide effort. States are required to produce and periodically update a State level Strategic Highway Safety Plan (SHSP). This new national strategy, while not minimizing the impact of design and operations as a cause of fatal and injury crashes, placed more emphasis on considering the behavioral causes of crashes in safety planning and programs.

In Minnesota, MnDOT has led the way in terms of safety planning under this new framework, preparing and updating periodically a SHSP. MnDOT is in the process of preparing its third iteration of a SHSP in 2020. MnDOT has also supported the extension of a more rigorous, data driven planning process to lower levels of its organization as well as local governments. A District 6 Strategic Safety Plan was prepared in 2016, and MnDOT provided support for development of an Olmsted County Highway Safety Plan in 2009—an update is scheduled to get underway with MnDOT support in the latter part of 2020.

An important part of the approach to highway safety planning that has evolved in Minnesota as a result of the national "Towards Zero Death" strategy is the organization of regional Towards Zero Death (TZD) Committees in each MnDOT District across the state. The TZD Committee in each MnDOT district has become a central organizing collaborative of local public works and public safety agencies, local law enforcement, private highway safety advocates and non-profit safety groups for educating and encouraging the public to practice good driving habits.

The following sections provide a summary of the highway safety activities and strategies relative to the ROCOG area that currently are being actively implemented. A summary of relevant highlights from each level of plan (state, district, county) is provided. Each planning level (state, district, county) have adopted plans organized around the idea of safety "Emphasis Areas", as described in the next section.

Emphasis Areas from the State to the County Level

At the federal level, a total of twenty focus areas have been identified as being important in the quest to reduce the number of fatal and serious injury crashes. Focus areas represent crash types or factors that contribute to crashes and are often connected to one another. These twenty factors reflect a broad cross section of behavioral, modal, design and enforcement considerations that all play a role in creating a culture of safety. The universe of emphasis areas currently recognized have been driven by work at the national level; states and their regional and local partners are asked to select particular focus areas based on a participatory planning process including agency and community interests involved in the process of improving safety outcomes.

In the 2020 draft SHSP, the focus areas have been grouped into four areas to better clarify the role of each in pushing for progress on the overall vision of zero deaths. These four groupings are:

- **Core** focus areas have been given a high degree of emphasis in the traffic safety community and will continue to be strong areas of focus. These areas factor into a large portion of fatal and serious injury crashes and require continued attention.

- **Strategic** focus areas are emerging priorities. They are rising in importance due to factors such as changes in prevalence, public/stakeholder perception, and demographics. These focus areas may require new initiatives to address changing demands.
- **Connected** focus areas represent a smaller portion of crashes compared to other focus areas, but most crashes are correlated with other focus areas.
- **Support solutions** are focus areas involving safety techniques and systems that enhance multiple strategies. Support Solutions are wide ranging and an integral part of other focus areas.

Table 7-1 illustrates how the twenty primary emphasis areas identified have been classified for purposes of the SHSP. For comparison, it also indicates which of the factors were identified in the last Olmsted County Highway Safety Plan as core areas of concern.

Table 7-1: Minnesota's Emphasis Area Hierarchy

Categories	Emphasis Area	2020 Strategic Highway Safety Plan (DRAFT)	County Highway Safety Plan (2009)
Drivers	Younger drivers	Strategic	√
	Unlicensed drivers	Connected	
	Older drivers	Strategic	
	Aggressive driving		√
	Impaired Roadway Users	Core	√
	Inattentive Drivers	Core	
	Safety awareness	Support	
	Seat belt usage	Core	√
Special Users	Pedestrians	Strategic	
	Bicyclists	Connected	√
Vehicles	Motorcycles	Strategic	
	Commercial Vehicles	Strategic	

Categories	Emphasis Area	2020 Strategic Highway Safety Plan (DRAFT)	County Highway Safety Plan (2009)
	Vehicle Safety Enhancements	Support	
Highways	Train collisions	Connected	
	Lane Departure	Core	✓
	Speed	Core	
	Intersections	Core	✓
	Head-On		
	Safer work zones	Strategic	
EMS	EMS & Trauma Systems	Support	
Management	Data Management	Support	
	More effective processes	Support	

Source: MnDOT Draft 2020-2024 SHSP; Olmsted County 2009 County Safety Highway Plan

The focus area priorities were established to ensure a data-driven outcome that will be understood and supported by everyone. Past versions of the SHSP have demonstrated through analyses that focus areas are often correlated with one another as crashes in one focus area can have a similar positive or negative effect in another area. For this reason, the priorities established in SHSP are inclusive of all the focus areas to reflect the nature of these relationships.

Minnesota Strategic Highway Safety Plan

The Draft 2020-2024 Minnesota Strategic Highway Safety Plan (SHSP) highlights Minnesota's commitment to Towards Zero Deaths, the cornerstone program aimed at reducing traffic related crashes in the state of Minnesota. The draft SHSP modifies the intermediate target for the state related to fatalities and serious injury, as shown in Figure 7-1.

Figure 7-1

The SHSP identifies a list of specific strategies for each of the focus areas identified in the Core and Strategic Focus Area groups shown in the previous section. These strategies have been selected based on input from stakeholders across the state through various events and venues as promising actions for helping the state achieve its stated goal of zero deaths and serious injuries. The strategies and supporting tactics have been further prioritized into two groups, as follows:

1. Five Year Priority Strategies—key opportunities identified to reduce the number of deaths and serious injury on Minnesota roadways
2. Year One Priority Tactics—31 specific tactics have been identified for initial 2020 efforts

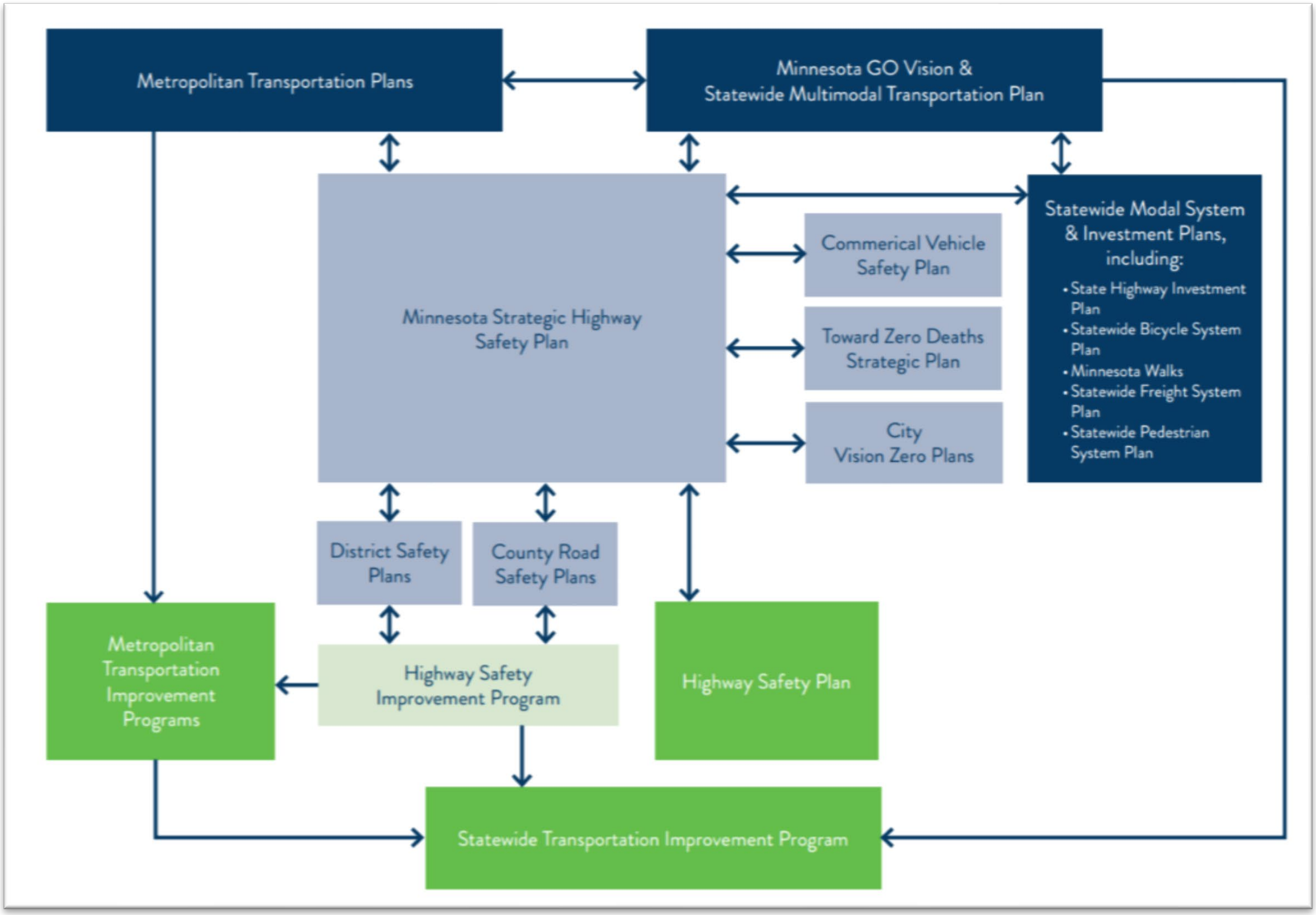
The ten Priority Strategies for the next five years include:

- Provide more enforcement and legislative actions to lower inattentive driver rates
- Provide funding, training, and technology for impaired driving law enforcement
- Improve safety through intersection roadway design changes and alternative intersections
- Update planning policy
- Utilize enforcement to reduce speeding
- Design roadways to reduce the frequency and severity of lane departure crashes
- Provide funding and training for seat belt law enforcement
- Increase public awareness of the safety risks faced by older drivers
- Increase education and awareness for drivers and pedestrians
- Improve driver education and the graduated driver license law
- Reduce speeding in work zones
- Improve motorcycle safety-related policies

These policies all dovetail with the priorities of local jurisdictions in the ROCOG Planning Area who will continue their active participation, coordinated through the Southeast Minnesota Towards Zero Deaths team, to advance the outcomes these policies strive to achieve in the name of reaching the overall goals of the SHSP.

As noted in the draft SHSP, a key aspect of implementing the SHSP is for traffic safety partners to integrate relative strategies and targets into their own plans and programs. Figure 7-2 shows where, in terms of public plans and programs, these linkages can be achieved. Particularly in regard to enforcement and education, local law enforcement and local traffic safety advocates have been active in partnering with state agencies on various efforts over the years.

Figure 7-2: Summary of SHSP Linkages to Other Plans



Source: MnDOT Strategic Highway Safety Plan

MnDOT District 6 Highway Safety Plan

In 2015, MnDOT undertook an effort to update safety plans for its eight districts across the state. The focus of this effort was to do a deeper dive on the data related to state highways across Minnesota to confirm high crash locations while conducting a systematic assessment of risk across the system. The outcome of this effort was to identify a prioritized list of safety projects based on appropriate strategies for each priority location. Figure 7-3 highlights the locations identified in the ROCOG Planning Area.

The project areas shown in Figure 7-3 fall into one of five groups

- Rural multi-lane segments
- Rural multilane/expressway
- Urban segments
- Rural intersections
- Urban intersections

Common improvements recommended for each category are listed below.

Rural 2-Lane Segments

- Shoulder rumble strips
- Paved shoulders
- Centerline rumble strips

Rural Multi-Lane Segments

- Cable median barrier
- Rumble strips both sides
- Recessed lane markings

Rural Expressways

- Cable median barrier
- Wide edge reflective markings
- Clear zone maintenance

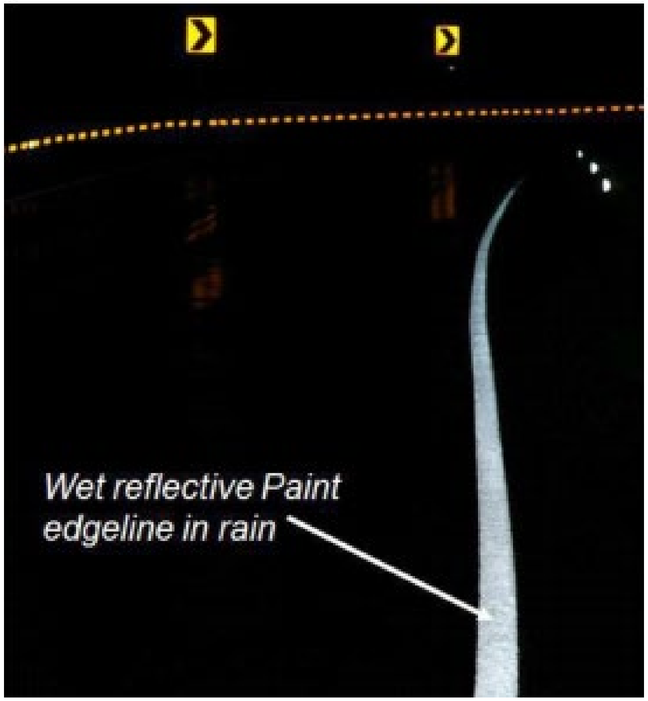
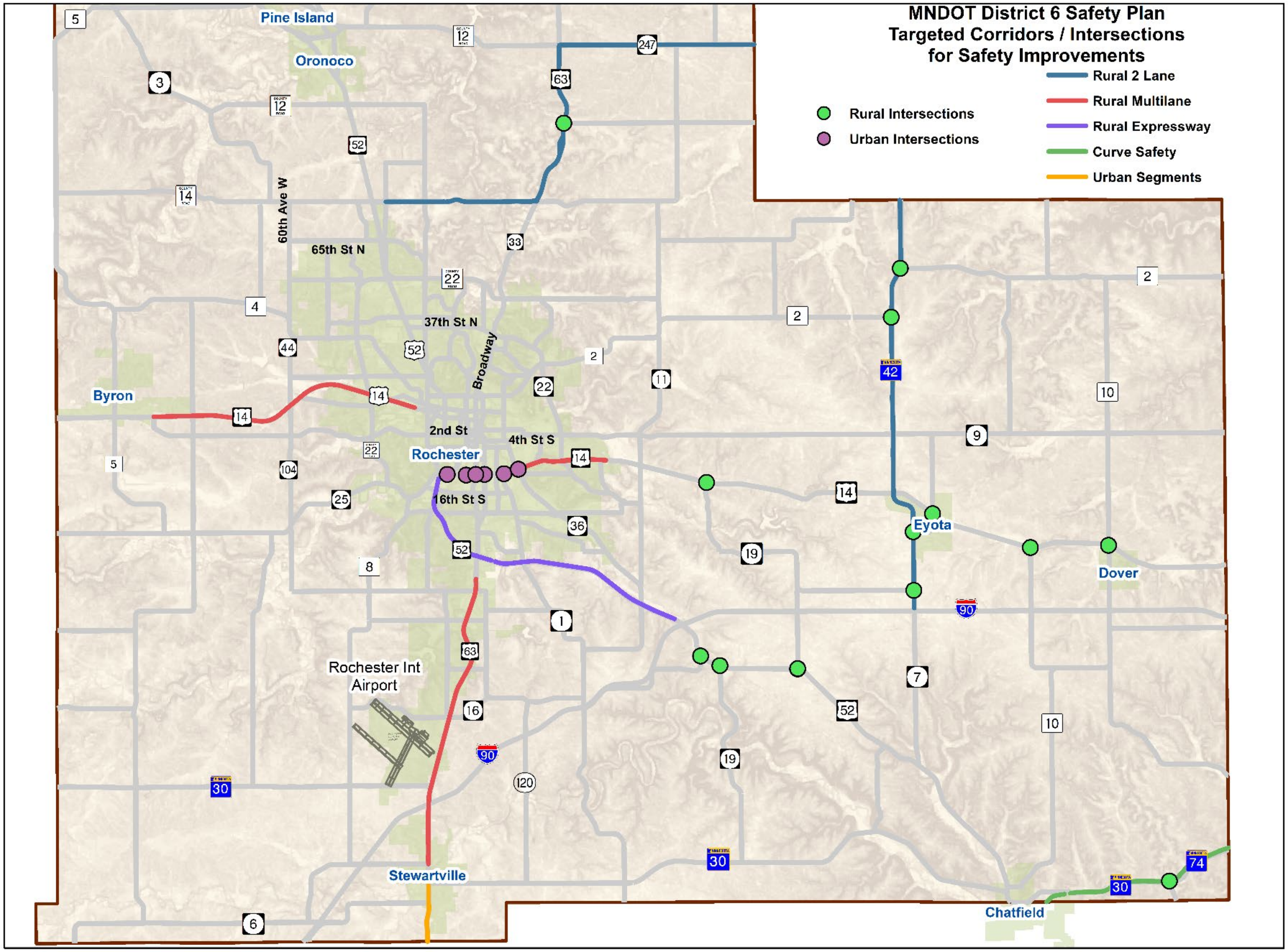


Figure 7-3: Corridors & Intersections Identified for Safety Investment in MnDOT District 6 Safety Plan



Rural Roads with Crash Risk on Curves

- Chevron or arrow boards
- Lighting

Urban Segments

- Dynamic speed feedback signs
- Traffic signal updates
- Lane conversion

Rural Intersections

- Upgraded signs and pavement markings
- Streetlights
- Mainline dynamic warning signs
- Rural intersection conflict warning systems

Urban Intersections

Two types of issues were identified for urban intersections: the risk associated with right angle crashes and the risk of crashes involving pedestrians and bicyclists.

Right Angle Crashes

- Offset turn lanes
- Red light confirmation lights

Crashes Involving Pedestrians and Bicyclists

- Installation of countdown timers
- Provision of leading pedestrian walk interval
- Curb extension
- Median refuge

Olmsted County Highway Safety Plan

The 2009 Olmsted County Highway Safety Plan was developed using the same data driven process that emerged from preparation of the first SHSP for the State of Minnesota. Based on technical analysis and discussion with local staff and community members, a set of lower cost safety projects and programs were supported.

- Increased use of edge line rumble strips, wide edge lines, and chevron warning signs were recommended for rural highway projects.
  - 38 segments involving 164 miles were targeted for the addition of edge line rumble strips
  - 18 projects involving approximately 84 miles will add wide edge lines to better delineate road lanes
  - Chevron warning signs will be placed at 22 high risk locations to alert drivers to curves ahead
- Six urban, two-way stop-controlled intersections were identified for risk reduction. Recommendations for median restriction or closure were the primary outcome from the safety study.
- Twenty-five rural two-way stop-controlled intersections were identified for risk reduction related to right angle crashes. With most crashes occurring after dusk, a package of improvements including street lighting, upgraded signs and pavement markings, and dynamic mainline warning were suggested for implementation.
- Olmsted County and ROCOG involvement in various partnerships was recommended to continue.
  - Countywide Fatal Crash Review Committee
  - Southeast Minnesota TZD
  - Safe Community Coalitions
  - Coordination with Olmsted County Public Health around efforts to educate drivers about seat belt usage, impaired driving, and speeding
  - Coordination with the Olmsted County Sheriff and other law enforcement regarding snow and ice issues and efforts to reduce red light running
- With a focus on bicycle safety, the plan recommended increased coordination with ROCOG and other local road authorities on planning for paved shoulders and off-road trails and paths in new construction and reconstruction projects along county roads.

City of Rochester Safety Planning

The City of Rochester annually reviews traffic accident data to identify those locations with five or more crashes per year in order to monitor trends and review for needed safety improvements. The City routinely reviews its roadway system to identify potential locations that would benefit from low cost safety improvements.

Improvements

- Traffic signals adjacent to the Canadian Pacific mainline were wired to the RR crossing signals to provide for RR signal preemption (allows the tracks to clear before the gates come down for safety). These locations also have battery backup systems in place to ensure the signals operate even during a power outage.
- LED flashing stop signs were installed at high crash intersections that are approaching signal volume warrants.
- Pedestrian activated flashers were installed at pedestrian crossings.
- In-street pedestrian crossing signs on 4-lane streets with high pedestrian volumes were installed as pilot projects at two locations.
- Driver feedback speed signs were installed at different school speed zones.
- Battery back-up systems for signals were installed at critical high-volume intersections.

Annual Asset Management Strategies

- Pavement marking repainting, funded at an annual level of $50,000 to $100,000 per year
- Installing Audible Pedestrian push buttons (APS) funded at $10,000 per year
- Capital Improvements Program budgeting to
  - Replace old LED signal indicators
  - Replace two older signal systems on an annual basis
- Installing pedestrian ramps at various locations, funded at $50,000 per year
- Adding Safe Routes to School infrastructure, funded at $25,000 per year

Public Transit Safety Plan

Rochester Public Transit has developed an Agency Safety Plan which is in the process of being revised in the second half of 2020 to address transit safety performance planning elements required under federal legislation. The updated plan will identify safety performance targets in addition to the following plan elements:

- Safety management policies
- Safety risk management controls and procedures
- Safety performance monitoring and measurement procedures
- Safety promotion, with a focus on employee training and education

Discussion of Transit Safety Performance targets is included in Chapter 10 in a larger discussion of performance planning and ROCOG area targets and outcomes.

Minnesota Toward Zero Deaths

Minnesota has a long history of developing and implementing programs focused on improving traffic safety. Before 2001, these activities were primarily the responsibility of individual state agencies. In response to an increasing trend in the number of traffic-related fatalities and serious injuries in Minnesota, and concerns about the effectiveness of individual safety efforts, the Minnesota Departments of Public Safety, Transportation, and Health in 2003 established the Toward Zero Deaths (TZD) program to integrate safety programs in the state.

Today, Minnesota TZD is the State's cornerstone traffic safety program, employing an interdisciplinary approach to reducing traffic crashes, injuries, and deaths on Minnesota roads. TZD aims to tie agency efforts with a common vision and mission for even greater success, with a focus on proven safety countermeasures in the areas of education, enforcement, engineering, and emergency medical and trauma services (the "4Es").

Local Coordination

Within the Rochester area, there are several agencies and organizations that work closely with the TZD program on initiatives and programming, particularly in the area of education. Recent examples include:

- Olmsted County Seat Belt Challenge involving students from seven schools
- Regional TZD event at a Rochester Honkers baseball game, where people were invited to explore emergency vehicles and visit with emergency responders
- Rochester Police and Olmsted County Sheriff Departments partnered with TZD to recognize a young traffic safety leader from John Marshall High School in Rochester who produced the video "No text is worth a death"
- The Olmsted County Sheriff's office partnered with TZD and Rochester Community and Technical College to raise awareness about distracted driving by

assisting students to create a video about the dangers of distracted driving

The Olmsted County Sheriff's Office has also partnered with the Southeast Minnesota TZD program staff to produce a series of videos to coincide with different enforcement periods that have been conducted in the District 6 areas in recent years. These have included:

- Distracted Driving

  https://www.facebook.com/OlmstedSheriff/videos/447549989329425/

  This video locally supported a Distracted Driving Community Outreach event at the greater Rochester University Center. It included a distracted driving simulator for students and the public to experience.

- Impaired Driving

  https://www.facebook.com/OlmstedSheriff/videos/568938030195708/

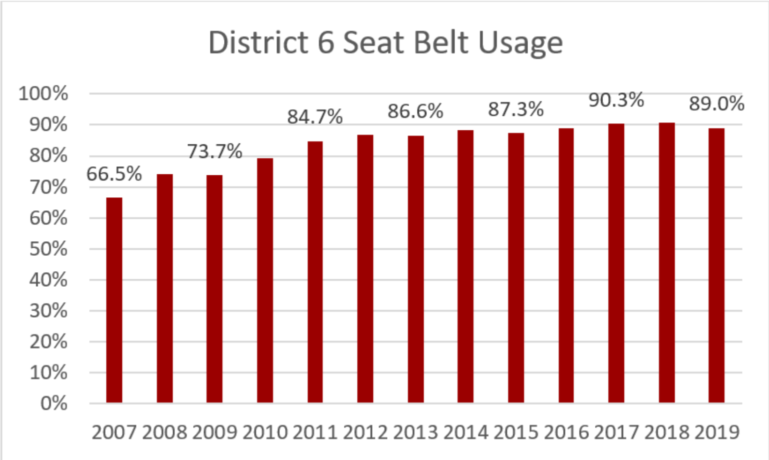
  Related to impaired driving, the Rochester Police Department received national recognition for their Drive Sober or Get Pulled Over DWI efforts. Rochester PD is one of only five law enforcement agencies in NHTSA's Region 5 to receive this recognition.

- Seat Belt Usage

  https://www.facebook.com/OlmstedSheriff/videos/2189490487794008

  Seat belt efforts have focused on educational activities along with various enforcement mobilizations. The rate of compliance has been trending upward and was 89.3% in 2019. The regional trend in seatbelt compliance is shown in Figure 7-4.

Figure 7-4: Regional Seatbelt Compliance Rates



Source: SE Minnesota TZD 2019 Annual Report

- Motorcycle Safety

  https://www.facebook.com/OlmstedSheriff/videos/351788675680333/

In addition to education events, local law enforcement has also worked with TZD and state patrol staff on enforcement activities such as the Border to Border Speed Saturation initiative. This effort targeted TH 14 throughout District 6 for one day which included outreach, use of media such as electronic message boards, and local news organizations to raise awareness about the impact of speeding.

A major area of emphasis in 2019 were efforts to promote hands free mobile phone usage when driving. The Rochester Police and Olmsted County Sheriff Offices participated in events including Safe City Nights, a local Governor's media event, and multiple other community events to get the message out about the new hands-free law adopted in 2019. These examples highlight ongoing local involvement of ROCOG area organizations in ongoing TZD efforts.

Regional TZD

The Southeast Minnesota TZD organization has two major goals identified in its Strategic Plan:

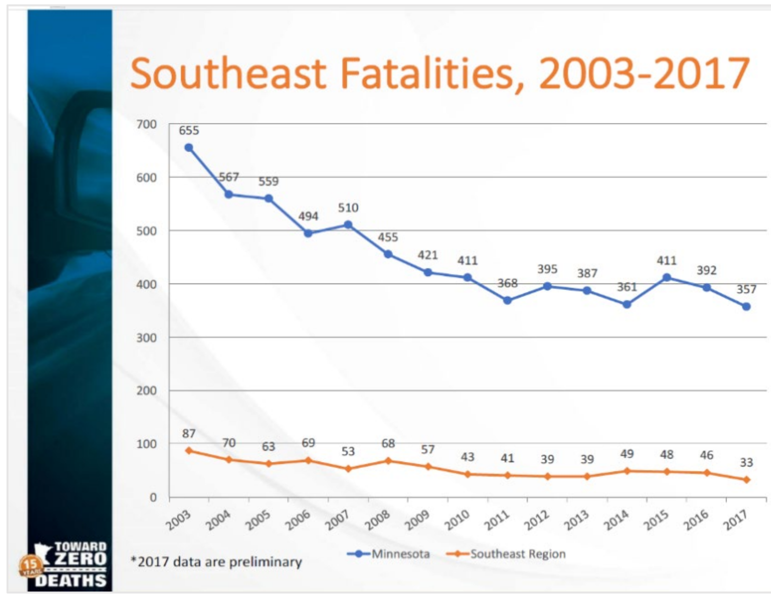
1. Reduce fatalities and serious injuries related to traffic related crashes
2. Pursue partnership goals to increase TZD awareness and partnerships across southeast Minnesota for both the general public and traffic safety professionals

With respect to Goal 1, there were 44 fatalities and 154 serious injuries reported from 2014-2018 in the SE TZD area, as shown in Figure 7-5. To reduce this number, the organization is focusing on increasing seat belt law compliance rates as a major effort in 2020.

In regard to Goal 2, the organization wants to expand engagement with local government in TZD workshops and increase education and promotion of traffic safety among city/county officials and staff. A major piece of this effort will be to promote and implement effective traffic safety initiatives through the following means:

- Develop and distribute resource materials
- Provide enforcement wave support
- Promote evidence-based countermeasure implementation
- Collect regional data and statistics
- Implement regional best practices

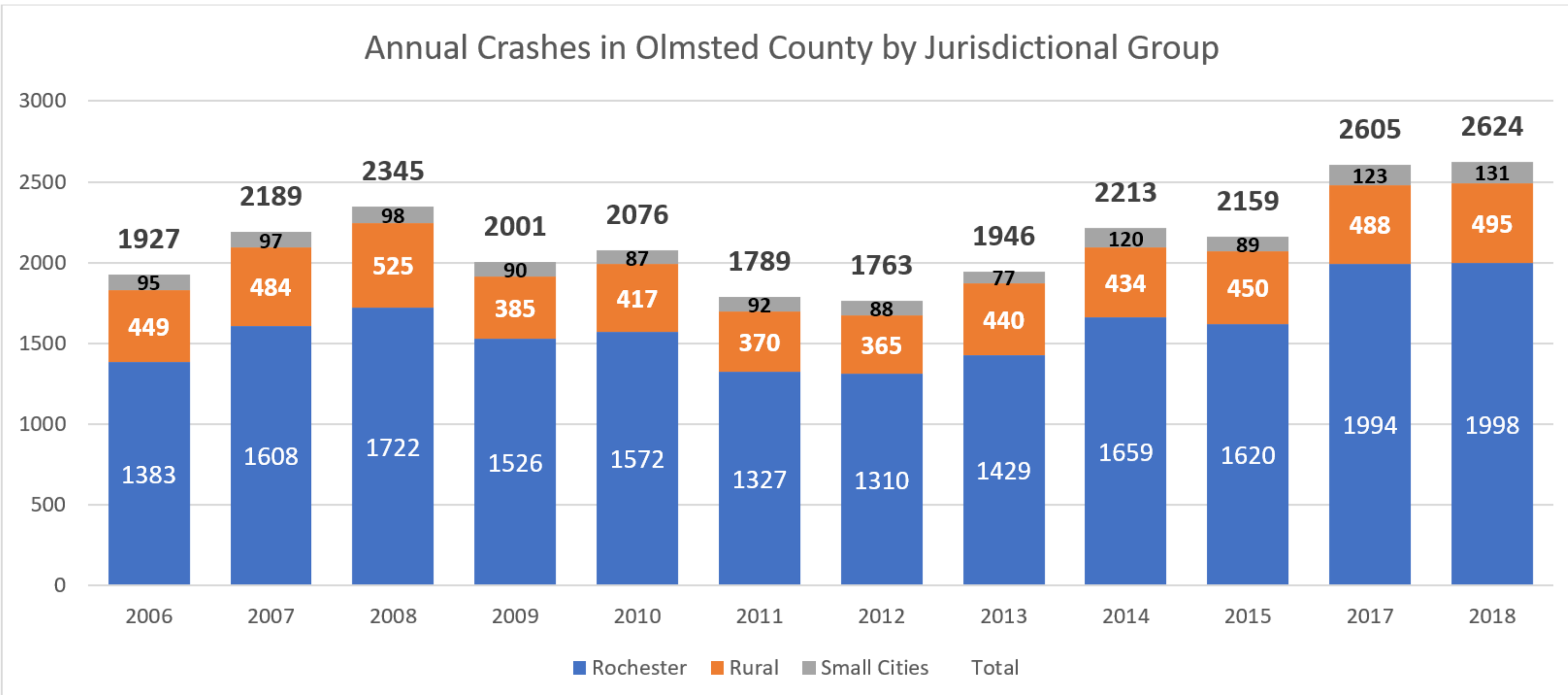
Figure 7-5: Fatalities in District 6



Crash Trends in the ROCOG Area

Figure 7-6 illustrates the trend in total crashes across Olmsted County in terms of total numbers and by general geographic area (Rochester, small cities, rural area). Noticeable was the decline that occurred during the Great Recession, which may be related to the decline in employment and economic activity that was observed to reduce vehicle miles of travel in the area during the same time period. The numbers for 2017/2018 reflect preliminary data that was obtained from MnDOT prior to the full rollout of MnCMAT2 and include some elements that result in an artificially high number of crashes that is not directly comparable to data from 2015 and earlier years.

Figure 7-6: Annual Crashes by Jurisdictional Group



LRTP 2045

Fatal and Serious

Table 7-2 reports the total number of crashes along with a breakdown of the number of fatalities and serious injuries resulting from crashes in Olmsted County and the number of crashes involving commercial vehicles.

Figure 7-7 provides a comparison of changes in crash numbers, population and vehicle miles of travel over four recent time periods in an effort to show the impact of the Great Recession on travel and crashes, as well as the impacts of the economic recovery through 2018.

Table 7-2: Total Crashes, Fatalities and Serious Injury Crashes in Olmsted County, 2006-2018

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Crashes	1927	2189	2345	2001	2076	1789	1763	1946	2213	2159	2723	2605	2624
Fatal Crash	13	14	7	12	2	8	2	11	9	14	12	7	7
Serious Injury Crash	44	52	39	29	27	26	30	17	24	28	38	48	36
Commercial Vehicle Crash	67	87	98	64	84	52	58	83	99	92	103	124	129

Figure 7-7: Comparison of Travel Growth, Crash Incidents and Population Growth in Olmsted County

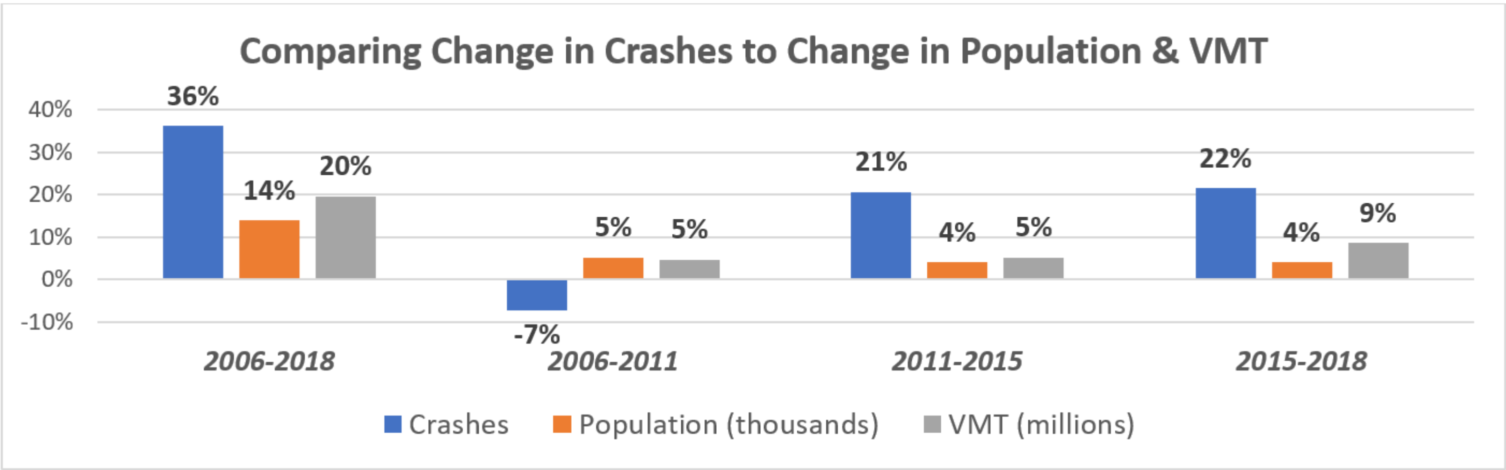


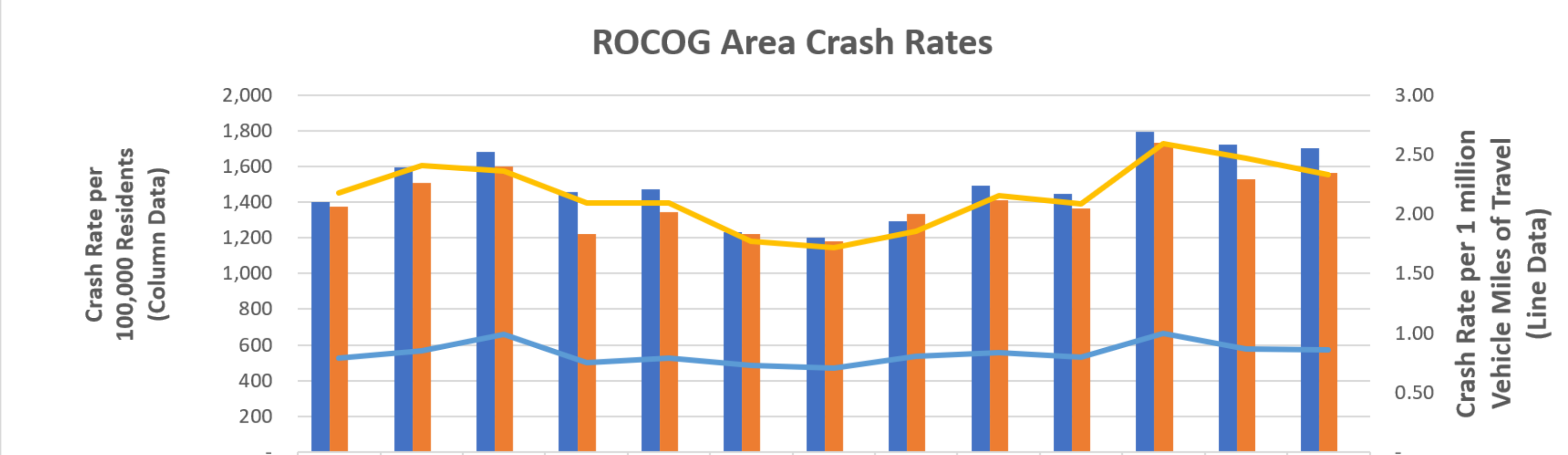
Figure 7-8 provides rate-based comparisons of crash experience in the core urban area of Rochester with experience in the Greater Olmsted County area outside the city. Data points in the chart compare crashes per 100,000 residents in each area as well as comparing the number of crashes per one million vehicle miles of travel in each area.

The column data showing the crash rate per 100,000 residents show that crash rates inside and outside of Rochester were very similar across the years.

Conversely, the line data showing the crash rate per one million vehicle miles of travel show a significant difference is observed, with the crash rate in Rochester at more than twice the rate outside the city.

Figure 7-9 reports on and compares the statewide performance target and local experience in the ROCOG Planning area relative to Fatalities per 100 million vehicle miles of travel, which is one of the standard safety performance measures required to be tracked under the federal performance planning guidelines. The chart

Figure 7-8: Comparison of Crash Rates in Rochester and Greater Olmsted County



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rochester	1,402	1,595	1,681	1,459	1,472	1,233	1,204	1,294	1,495	1,448	1,795	1,722	1,701
Remainder of County	1,375	1,506	1,602	1,224	1,345	1,224	1,182	1,333	1,413	1,365	1,735	1,526	1,565
Rochester	2.18	2.41	2.36	2.09	2.10	1.77	1.72	1.85	2.15	2.08	2.59	2.47	2.33
Remainder of County	0.79	0.85	0.99	0.75	0.79	0.73	0.70	0.80	0.83	0.79	0.99	0.87	0.86

shows the actual breakdown of rates from the City of Rochester and the Greater Olmsted County area, while the legend to the right shows the overall rate for the ROCOG Area. The 5-year rolling average for the ROCOG area, at 0.66, is comparable to the statewide rolling average for 2014-2018 of 0.648. Locally, the rate has trended downward significantly since reaching a peak in 2015.

Figure 7-9: Local Results on Federal Performance Measures Related to Fatalities

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2016
Olmsted County	2.15	2.21	1.03	1.21	1.18	1.11	0.74	1.13	1.04	0.51	0.81	0.14	1.01	0.14	0.77	0.62	0.94
Rochester			0.38	0.89	0.00	0.46	0.46	0.79	0.60	0.14	0.41	0.13	0.40	0.13	0.38	0.51	0.5

<u>Minnesota 2020 Safety Performance Target</u>

0.626

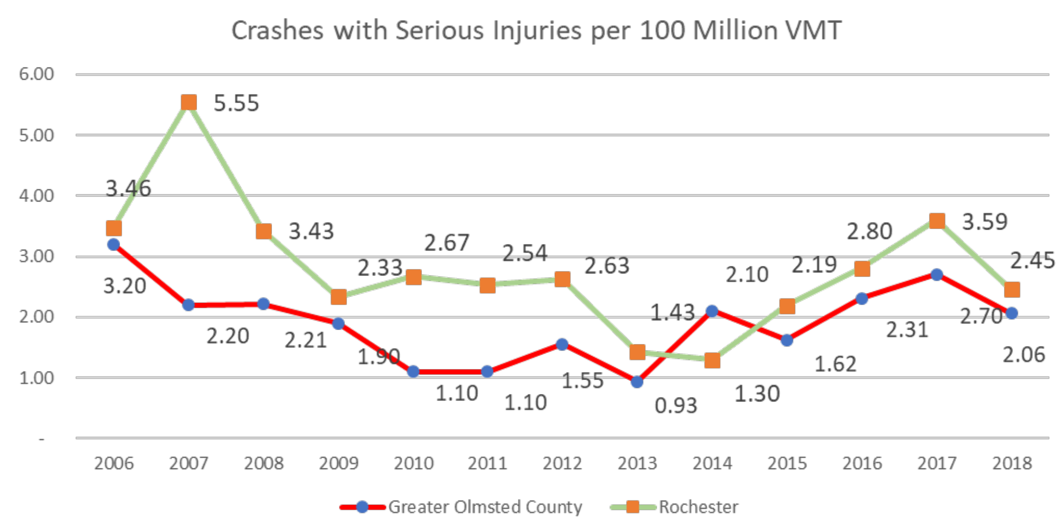
Overall ROCOG Area Rate

2014
0.63
2015
0.96
2016
0.81
2017
0.46
2018
0.44

<u>5 Year Average 0.66</u>

Figure 7-10 reports on and compares the statewide performance target and local experience in the ROCOG planning area relative to serious injury per 100 million vehicle miles of travel, which is one of the standard safety performance measures required to be tracked under the federal performance planning guidelines. The chart shows the actual breakdown of rates from Rochester and the Greater Olmsted County area, while the legend to the right shows the overall rate for the ROCOG Area. The 5-year rolling average for the ROCOG area, at 2.32, is below the state performance target of 2.85, although locally the rate has trended upward since reaching a low point in the years of 2013/2014.

Figure 7-10: Local Results on Federal Performance Measures Related to Serious Injury Crashes



Minnesota 2020 Safety Performance Target

2.854

Overall ROCOG Area Rate

2014
1.67
2015
1.92
2016
2.57
2017
3.18
2018
2.27
5 Year Average 2.32

The following tables show the distribution of crashes by crash type for all crashes and those involving bicyclists, pedestrians, and commercial vehicles for the period 2006-2018. Notice in particular the elevated percentage of crashes involving fatality or serious injury for pedestrians and bicycles in Tables 8-4 and 8-5.

Table 7-3: Crash Type Distribution – All Crashes

Distribution of Crashes by Injury Severity	All Crashes
Fatality	0.4%
Serious Injury	1.6%
Minor Injury	10.0%
Possible Injury	18.1%
No Injury	69.7%

Table 7-4: Crash Type Distribution – Bicycle Crashes

Distribution of Crashes by Injury Severity	Cycle Crashes
Fatality	1.5%
Serious Injury	4.1%
Minor Injury	45.9%
Possible Injury	43.3%
No Injury	5.2%

Table 7-5: Crash Type Distribution – Pedestrians

Distribution of Crashes by Injury Severity	Ped Crashes
Fatality	3.7%
Serious Injury	14.8%
Minor Injury	44.1%
Possible Injury	37.0%
No Injury	3.0%

Table 7-6: Crash Type Distribution – Commercial Vehicles

Distribution of Crashes by Injury Severity	Truck Crashes
Fatality	1.1%
Serious Injury	1.8%
Minor Injury	8.8%
Possible Injury	12.0%
No Injury	76.3%

Figure 7-11 provides one means of comparing the frequency of fatal or serious injury crashes by looking at the average number of days between these events for a given year. Lower numbers will represent poorer performance as crashes are happening more frequently.

Figure 7-11

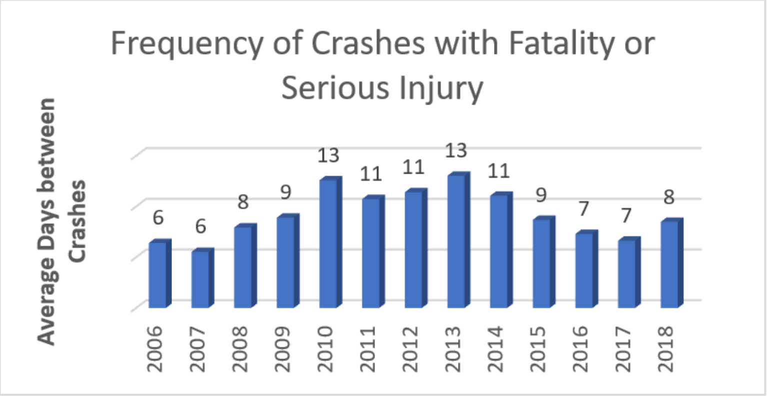
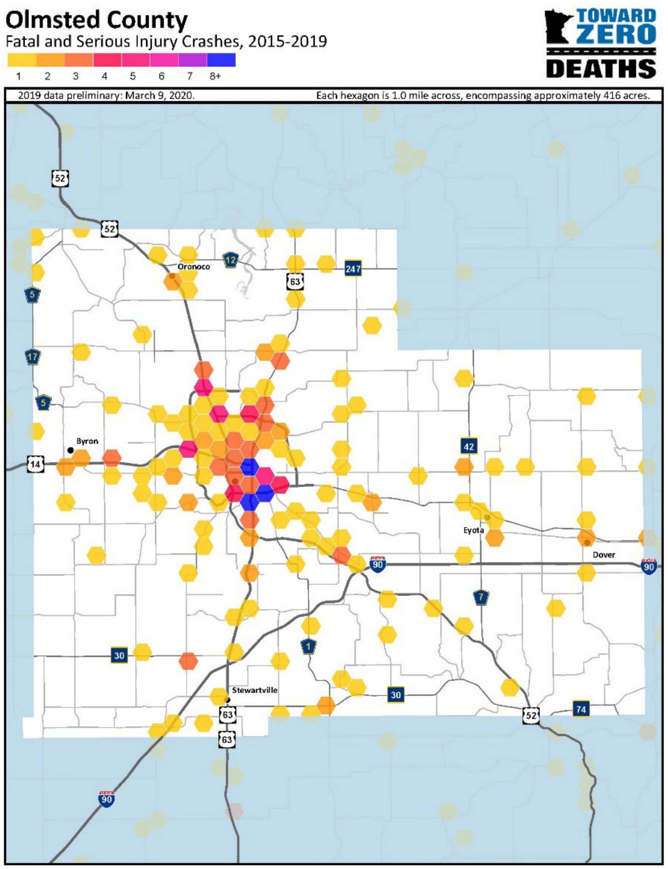


Figure 7-12 is produced by the Towards Zero Death staff and illustrates the location of crashes in Olmsted County/ROCOG Planning Area over the last five years that resulted in a fatality or serious injury. There is an observed cluster of crashes around Rochester's central business district (CBD), with one location immediately north of the CBD at the intersection of Civic Center Dr and Broadway Ave, and two locations on the south side of the CBD, along TH 14/12th St SE, where more than eight crashes involving a fatality of serious injury occurred.

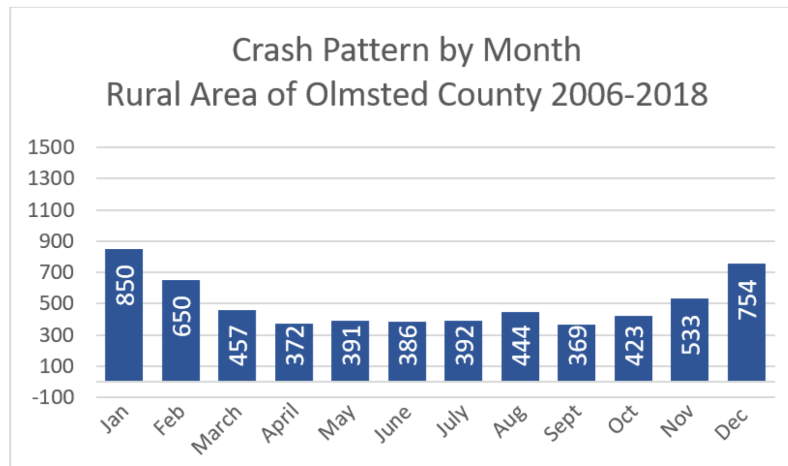
Figure 7-12: Fatal and Serious Injury Crashes



Figures 7-13 and 7-14 illustrate a pattern that was found throughout all jurisdictional levels in the ROCOG Planning Area, including the small cities (which are not reported). This pattern is the occurrence of a higher number of reported crashes occurring in the months of December and January, which is likely related to a cluster of factors including weather-related causes, less daylight hours, and more peak periods of travel due to holiday shopping.

Figure 7-13 reports rural travel data while Figure 7-14 reports data for just the city of Rochester.

Figure 7-13: Monthly Crash Pattern - Olmsted County



An interesting observation to note is that while the number of crashes occurring in the dead of winter are higher, the amount of travel occurring during that same period is noticeably lower. Figure 7-15 illustrates the monthly level of vehicle miles of travel in the ROCOG Area, which is about 25% lower in winter. This suggests crash rates observed in winter months are approaching 3 times the rate seen in the peak summer driving months.

Figure 7-14: Monthly Crash Pattern - Rochester

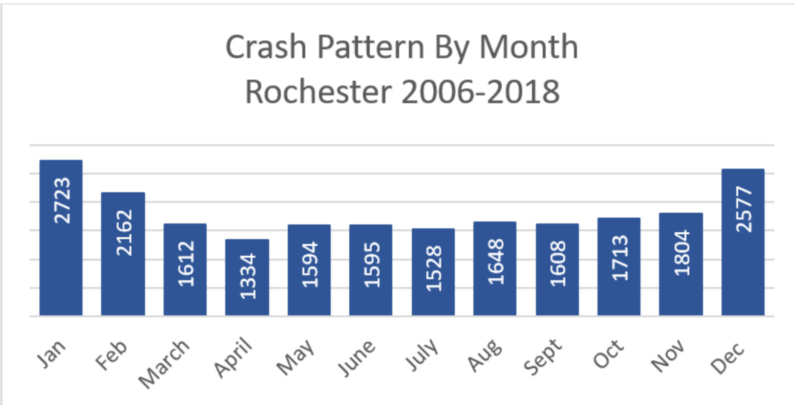


Figure 7-15: Annual Share of VMT by Month

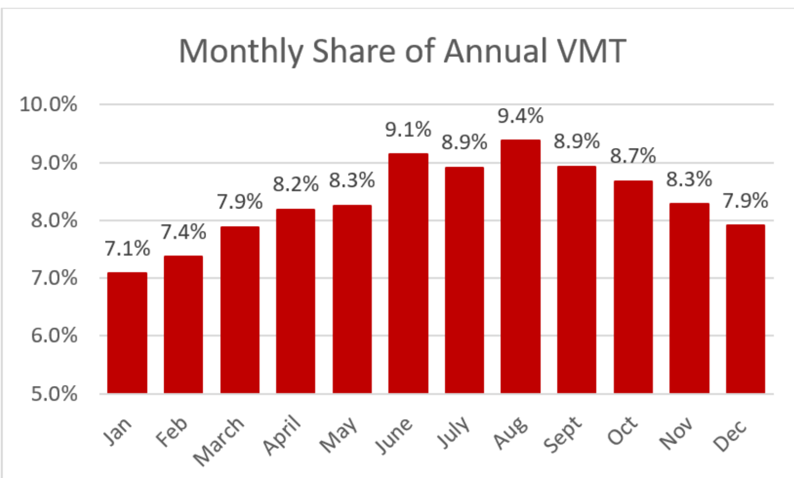
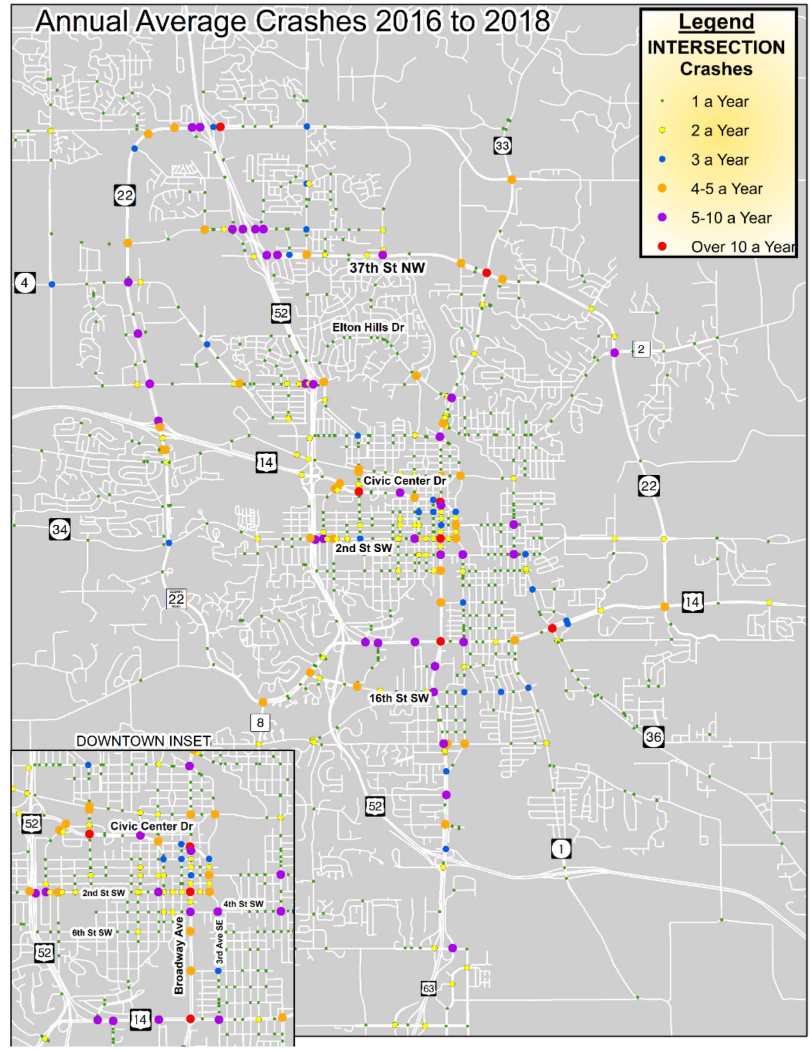


Figure 7-16: Intersection Crash Numbers – Rochester Urban Area



Crash Rate Maps

Figures 7-17 through 7-19 on the following pages represent an effort to conduct a high-level screening of road segments to identify corridors that are seeing elevated crash rates when compared to other roads with similar volume and design character. This analysis is focused on the network of roadways for which periodic annual average daily traffic (AADT) counts are collected as part of the State Aid Traffic Count Program. A total of 670 road segments are included in the traffic county database.

For the analysis, these were stratified into eight categories for which traffic count data was collated along with a three-year (2016-2018) history of traffic crashes. Crash numbers for the purposes of this analysis included both intersection crashes and non-intersection crashes, so results indicating a high crash rate need further analysis to identify whether issues along a given segment are more of an intersection problem or a non-intersection problem.

Road corridors studied were grouped into eight categories based on volume and character as listed in Table 7-7, which resulted in between 40 and 110 road segments per category. After crash rates were calculated for each group, the results within the group were ranked by decile and illustrated on the maps as shown in the legend accompanying each map.

Table 7-7: Roadway Groups for Crash Analysis

Group	Description
1	Freeways
2	High Volume Four Lane Divided Expressways
3	Moderate Volume Four Lane Arterials
4	Urban 2 & 3 Lanes Secondary Arterials and Collectors – 2500 to 10,000 AADT
5	Urban 2 & 3 Lanes Secondary Arterials and Collectors – 500 to 2500 AADT
6	Rural 2 & 3 Lanes Secondary Arterials and Collectors – 2500 to 10,000 AADT
7	Rural 2 & 3 Lanes Secondary Arterials and Collectors – 500 to 2500 AADT
8	Low Volume Collectors < 500 ADT

An appropriate path forward would be to conduct further analysis on those corridors which ranked in deciles 1-2 as exhibiting high crash rates to better understand the reason for the high rate and whether feasible mitigation measures exist to address these results.

Figure 7-17: Rochester Urban Area Crash Rate Results ("CR" = Crash Rate per MVM)

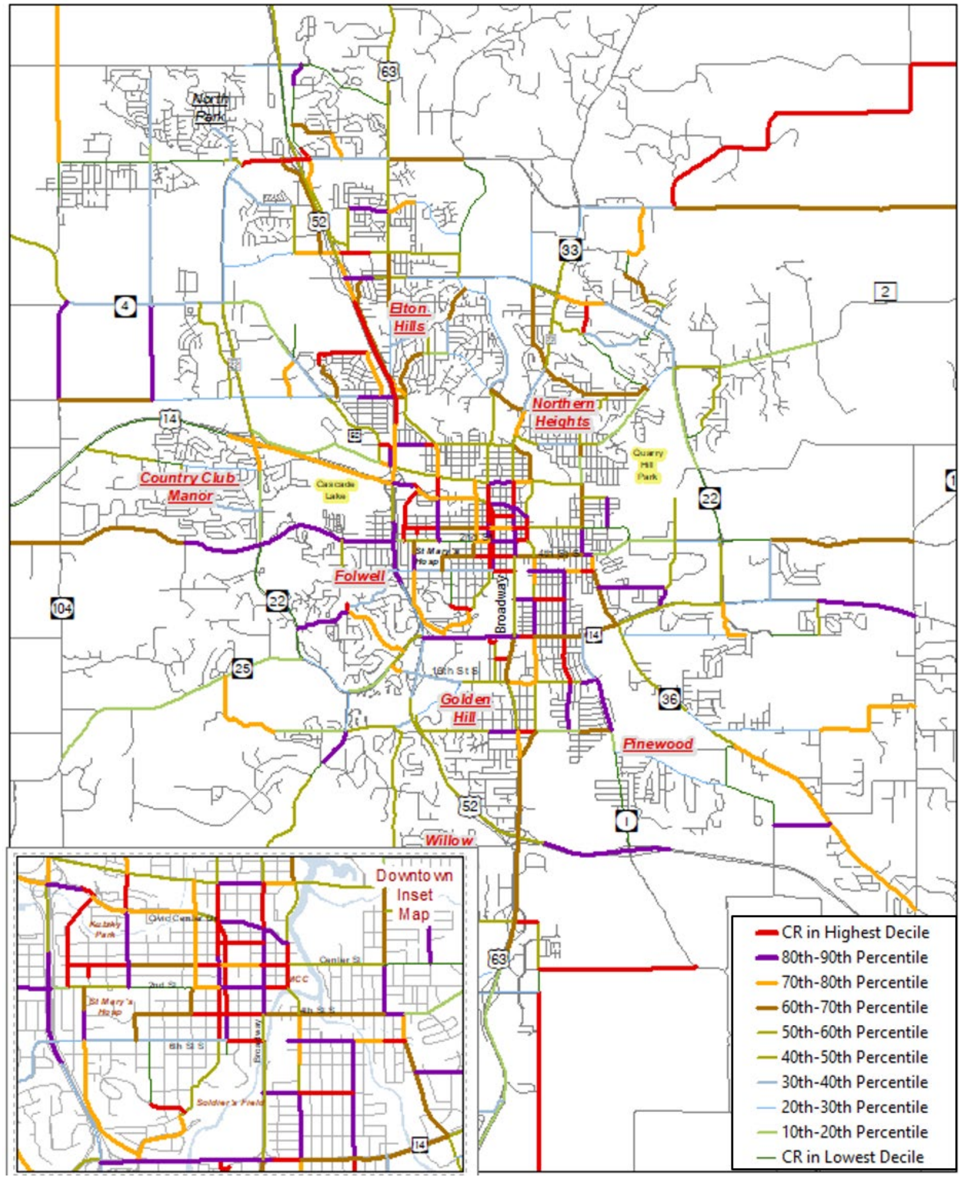


Figure 7-18: Crash Rate Map for Greater Olmsted Area

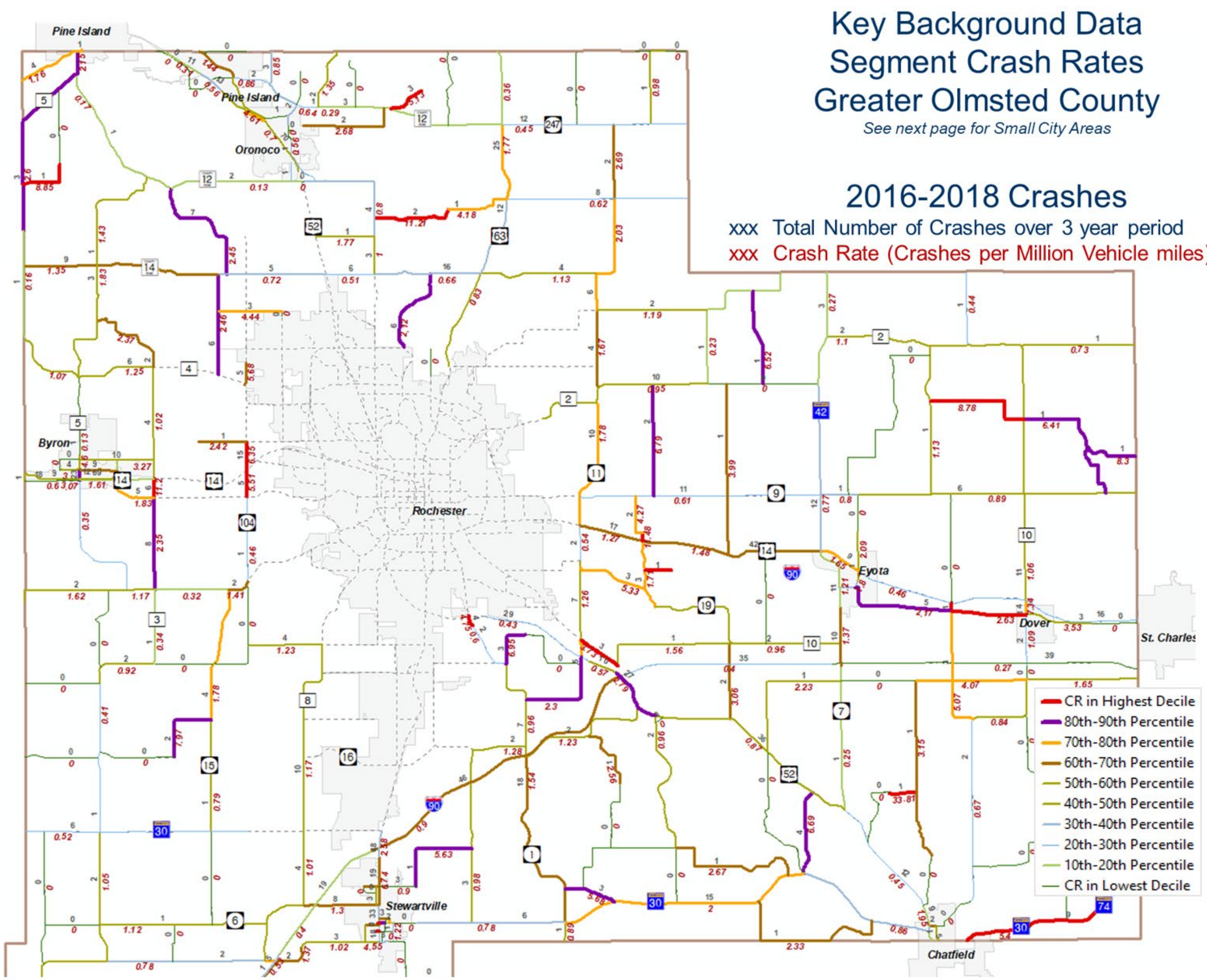
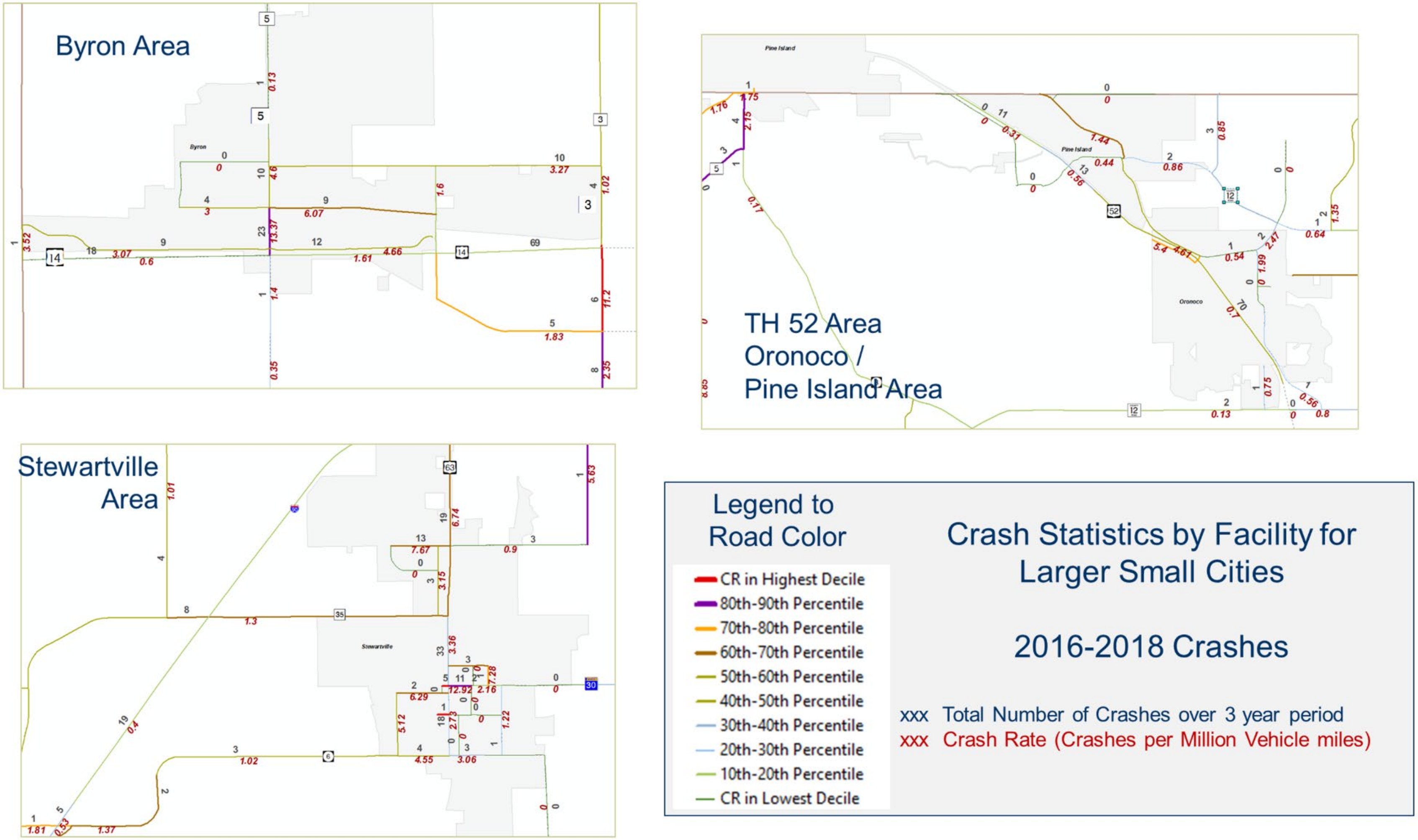


Figure 7-19: Crash Rates for Small Cities in Greater Olmsted County Area



Pedestrian Crashes

Figure 7-20 illustrates the number of pedestrian crashes per year that have occurred. This data is based on crash reports filed with the Minnesota State Patrol, which will involve only crashes with confirmed injury or a level of property damage exceeding $1000.

Figure 7-20: Pedestrian Crashes per Year

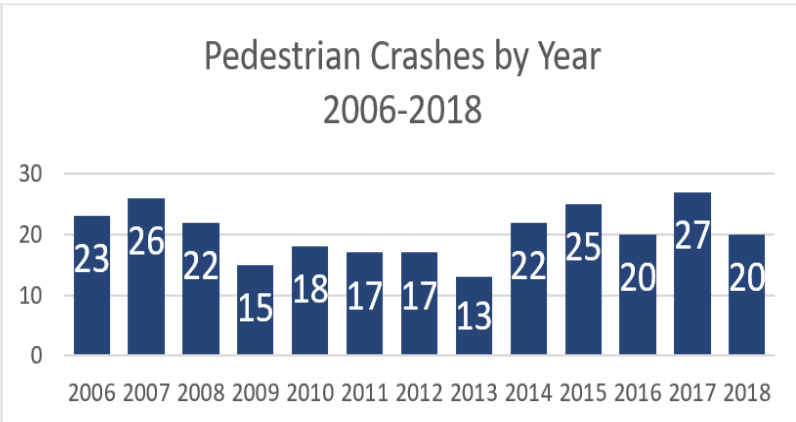


Figure 7-21 provides a second look at pedestrian injury, provided by the MIDAS data system maintained by the Minnesota Department of Health and based on reports from local emergency admissions where the cause of injury was reported as an accident involving a motor vehicle.

Figure 7-22 highlights the geographic distribution of crashes involving pedestrians in Rochester for a 12-year period between 2006 and 2018. An extended time period was used to illustrate location patterns as the number of annual crashes reported involving pedestrians is small and locations in any one year may not be representative of where issues for pedestrians are occurring.

Figure 7-21: Rate of Pedestrian Injuries per 100,000 Persons

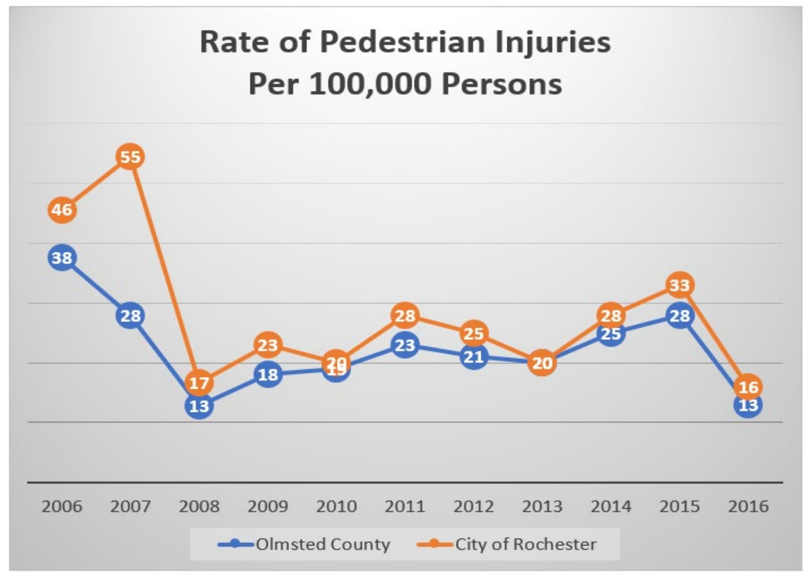
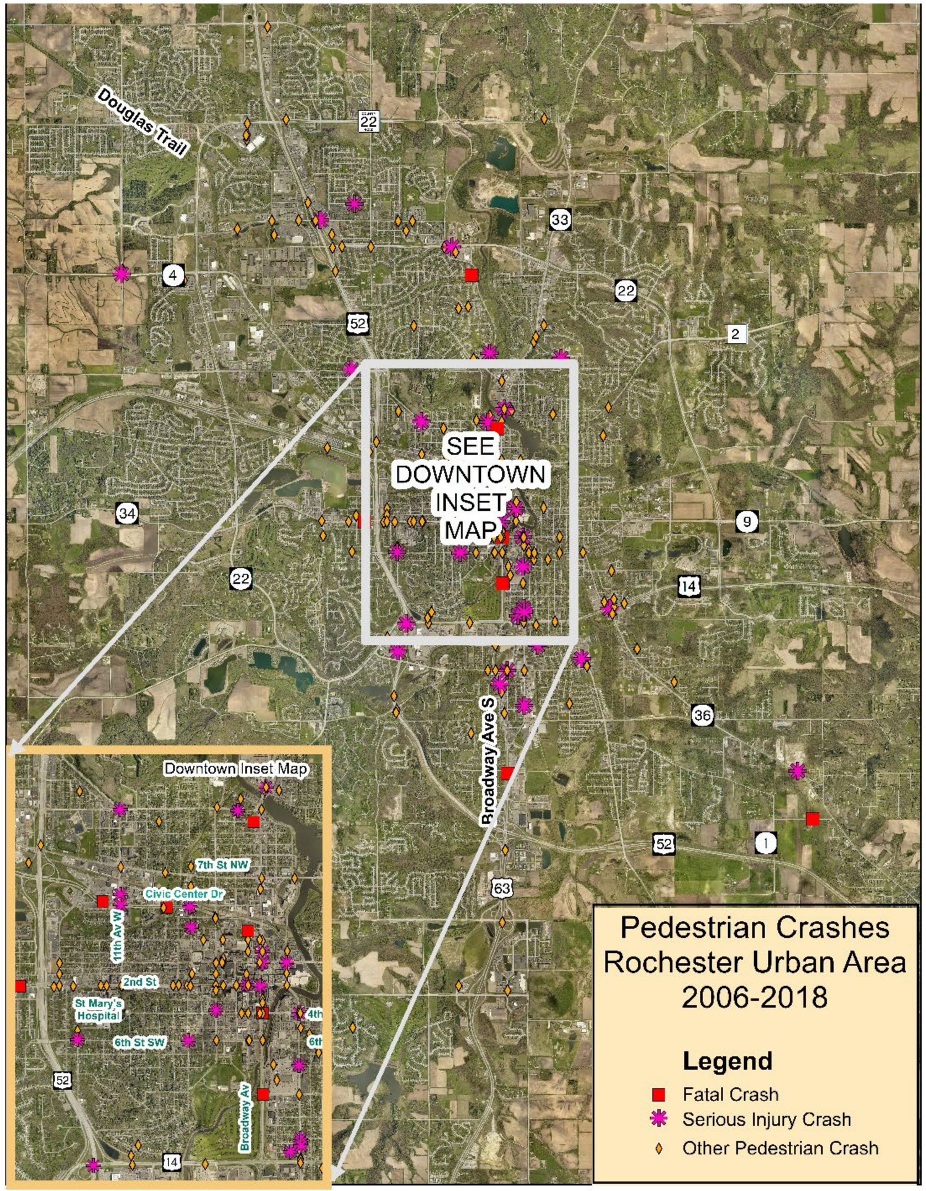


Figure 7-22: Crashes Involving Pedestrians



Bicycle Crashes

Figure 7-23 illustrates the number of bicycle crashes per year that have occurred. This data is based on crash reports filed with the Minnesota State Patrol, which will involve only crashes with confirmed injury or a level of property damage exceeding $1000.

Figure 7-23: Crashes Involving Cyclists per Year

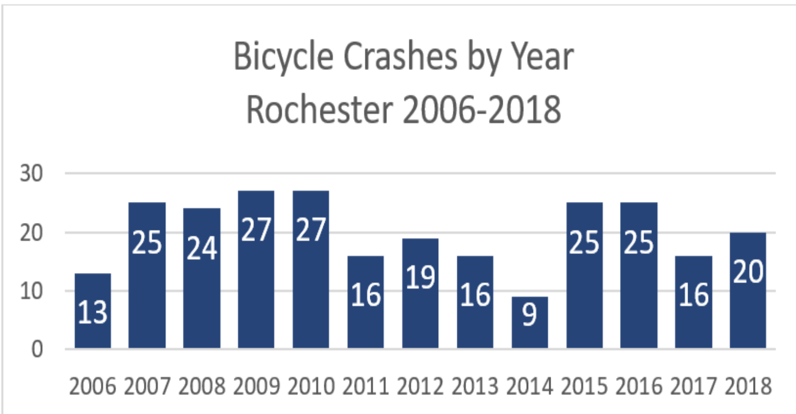


Figure 7-24 provides a 2nd look at bicyclist injury, provided by the MIDAS data system maintained by the Minnesota Department of Health and based on reports from local emergency admissions where the cause of injury was reported as an accident involving a motor vehicle.

Figure 7-25 highlights the geographic distribution of crashes involving bicyclists in the Rochester area for a 12-year period between 2006 and 2018. An extended time period was used to illustrate location patterns as the number of annual crashes reported involving bicyclists is small and locations in any one year may not be representative of where issues for bicyclists are occurring.

Figure 7-24: Rate of Bicycle Injuries per 100,000 Persons

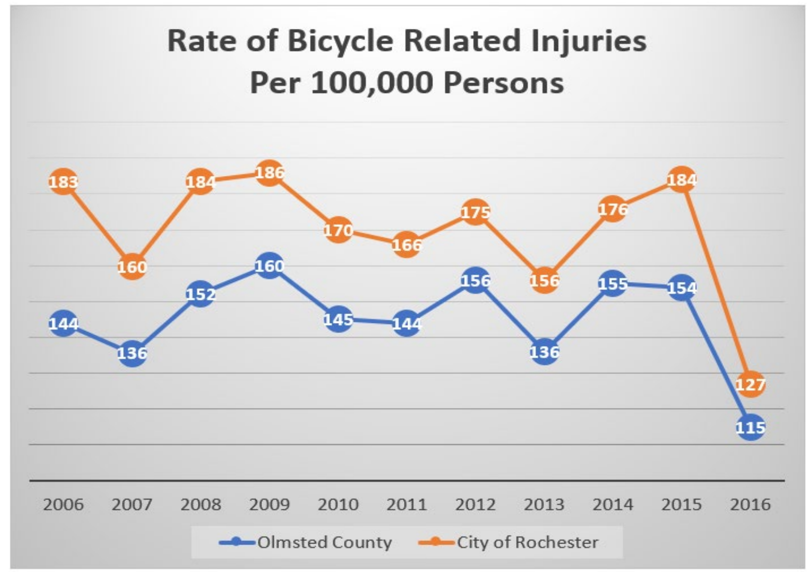
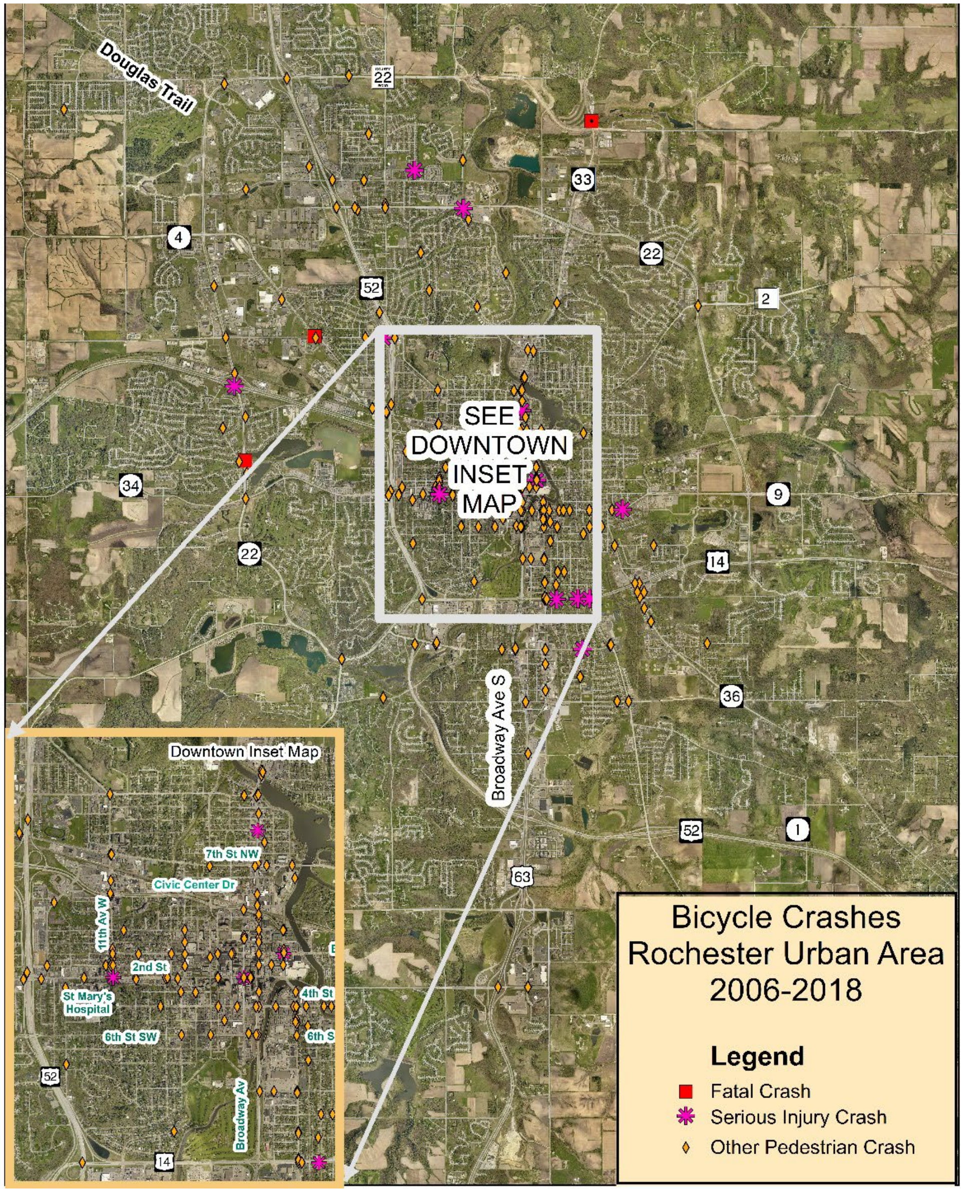


Figure 7-25: Crashes Involving Bicyclists



Commercial Vehicle Crashes in Olmsted County

Crashes involving commercial vehicles include those incidents where at least one vehicle involved was a truck with more than two axles and/or more than four tires. As shown in Figure 7-26, the majority of crashes involving commercial vehicles occur in Rochester, although the overall rate of crashes involving commercial vehicles is relatively low, at less than 5%.

Figure 7-27 illustrates where crashes involving commercial vehicles have occurred. Outside of the urban area, they are largely concentrated on the State Highway system, while in the urban area most are seen on the arterial street network. This is to be expected since these roads are built to support commercial vehicle weight limits or are designated as truck routes.

Figure 7-26: Number of Crashes Involving Commercial Vehicles by Jurisdiction

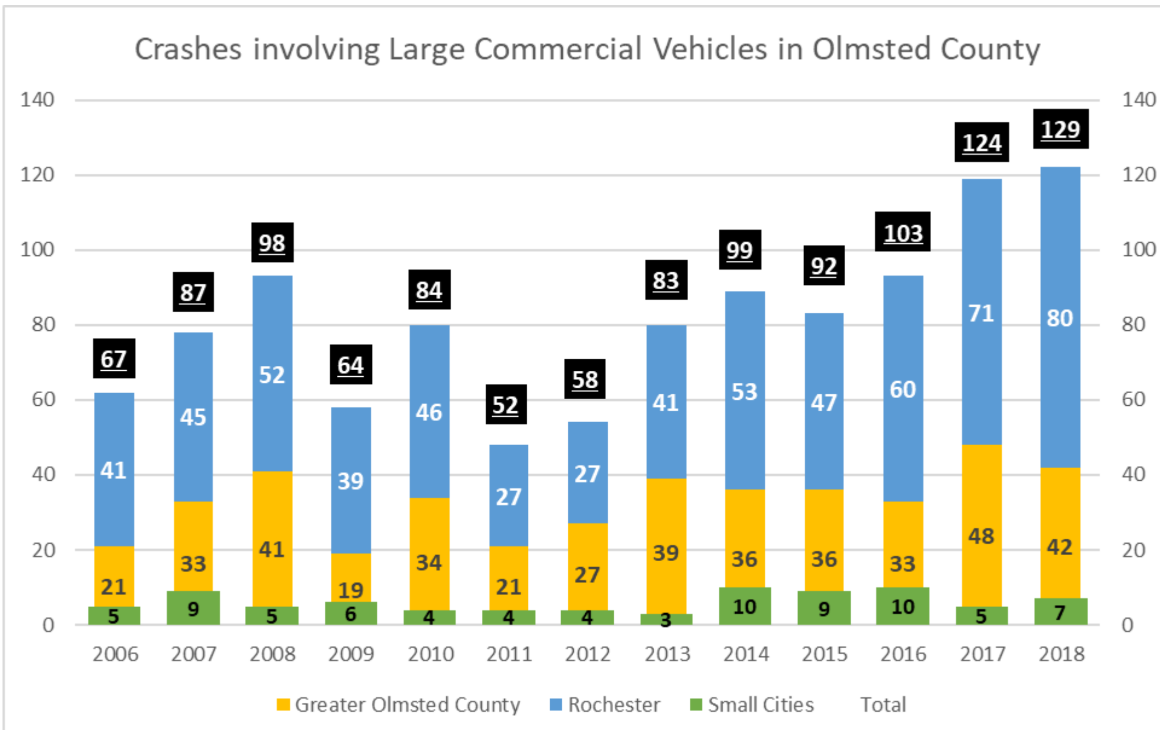
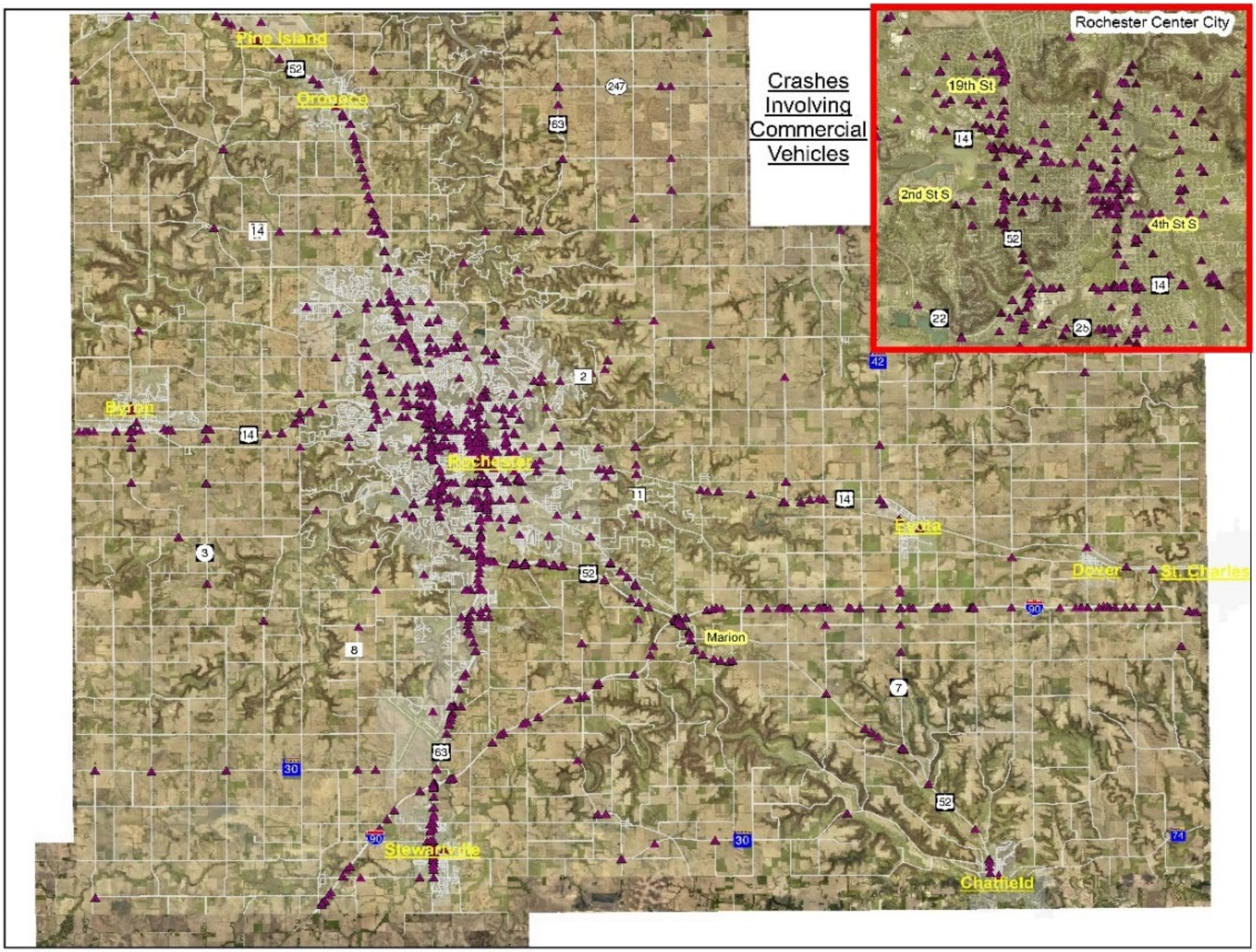


Figure 7-27: Crashes Involving Commercial Vehicles in Rochester & Olmsted County



Safety Planning Directions and Strategies for the ROCOG Area

We can significantly save lives and reduce injuries when we decrease traffic crashes and better respond to traffic emergencies. Traffic safety on the regional transportation system can be improved by creating a travel environment that is consistent with the community context, reduces risk, and incorporates safety considerations into all investment decisions.

ROCOG's planning process is consistent with the State and District Highway Safety Plans and with local transit safety/security planning and programs. ROCOG recognizes engineering, education and enforcement as three key components of safety.

The work of ROCOG and its partners in the area of highway safety reflects the approach that has become embedded in work on safety at the national, state and local level as a result of the new strategic focus first established under SAFETEA-LU in 2005 and continuing to this day. This risk-based approach differs from approaches commonly used prior to adoption of that legislation. Table 7-8 describes some of fundamental differences between the "old" (convention) and "new" (risk-based) approaches.

Table 7-8: Contrast Between Historic Conventional Approach and Current Strategic Approach to Safety

	Conventional Approach	Risk-Based Approach
What is the problem?	Try to prevent all crashes	Prevent crashes from resulting in fatalities and serious injuries
What is the appropriate goal?	Reduce the number of fatalities and serious injuries	Zero fatalities and serious injuries
What are the major planning approaches?	- Reactive to incidents - Incremental approach to reduce the problem	- Proactively target and treat risk - Systematic approach to build a safe road system
What causes the problem?	Non-Compliant road users	People make mistakes and people are physically vulnerable in crashes. Varying quality and design of infrastructure and design of infrastructure and operating speeds provides inconsistent guidance to users about what is safe road use behavior
Who is ultimately responsible?	Individual road users	Shared responsibility by individuals with system designers
How does system work?	Actions are largely composed on isolated interventions	Different elements of a safe system combine to produce a summary effect greater than the sum of individual treatments, so that if one part of system fails other parts provide protection.

To support ongoing safety planning and investment, ROCOG will focus its efforts on safety based on the following strategic directions.

Planning

- ROCOG and its partner agencies should consider establishing a process to identify high priority projects that would be eligible for funding under the various targeted safety funding programs in order to have a set of projects "on the shelf" that have demonstrated community support in advance of responding to solicitation notices.
- A website dedicated to ROCOG area transportation safety should be created, incorporating links to the regional safety reports and plans, current safety initiatives, news links, and contact information.
- Crash data should be monitored on a regular basis to review of historic crash experience and identify locations that exceed standard crash thresholds, using the MnCMAT2 Crash Mapping Tool maintained by MnDOT. Consideration should be given to establishing systematic methods of identifying critical crash locations through use of a standard set of performance measures and prioritizing critical accident locations for further detailed study.
- ROCOG should periodically review its safety planning directions and federal/state performance measures to determine if existing directions and performance measures adequately respond to highway traffic safety concerns.
- Whereas other agencies lead project design and engineering, influencing project development and design is a challenge for ROCOG, given its focus is on system and corridor planning. While there is no standard for what "great projects" look like, illustrating typologies and connecting design elements to regional goals is critical to moving the needle on safety and mobility. Early input on major roadway projects from ROCOG could provide a multi-jurisdictional perspective on the important goals a project should be designed to achieve.
- ROCOG should consider preparing Planning Area Safety Reports that would periodically present goals, emphasis areas, statistics, and initiatives to help identify the depth and breadth of safety issues in the area.

Programming and Funding

- ROCOG is responsible for evaluating and programming federally funded transportation projects on the Transportation Improvement Program (TIP). Safety benefits will continue to be a factor considered in TIP project selection.
- For Highway Safety Improvement (HSIP) projects, a rigorous evaluation is used to ensure consistency with state and federal guidelines. Where needed, ROCOG

could consider using a part of the regular federal allocation it programs to support HSIP projects if additional funding is needed to enhance project outcomes.

- With the proposed update of the Olmsted County Highway Safety Plan to be started in late 2020, Olmsted County will be positioned to pursue additional funding to implement safety improvements in targeted areas.

Education

Safety education is an ongoing effort that relies primarily on cooperation among partners in the SE Minnesota Towards Zero Deaths coalition as well as partnerships at the local level among local law enforcement, public works agencies, emergency responders, educational institutions, and community groups. ROCOG should continue to participate where possible in these efforts and would advocate for the following safety directions.

- Support and participate in the ongoing work of Towards Zero Deaths Initiative and the annual targeted focus areas established by SEMN TZD.
- Continue education and training targeting younger and older drivers as these age cohorts continually turnover as children reach driving age and adults reach senior age. Given these populations are more likely to be involved in serious injury crashes than other age groups, it is important that education targeting these groups is an ongoing endeavor.
- Support Olmsted County programs facilitated by the Olmsted County Public Health Department, such as the Healthy Communities Program, that are working to message the need for traffic safety and the safe sharing of road space among various types of users. Emphasis should be placed on pedestrians and bicyclists.

Engineering

- ROCOG and its partners should continue to identify low cost safety improvements that can help to minimize the risk of crashes due to factors such as lane departure or intersection navigation.
- Identify and promote a toolbox of strategies to reduce fatal and serious injury crashes that will help build support for such investments through dissemination of information to the public.
- ROCOG should continue to work closely with local partners on access management along the major street system by assisting in development of access management ordinances, coordinating with partners on corridor improvement studies, and providing review and comment on development applications.
- The City of Rochester works with individual neighborhood associations in the administration of a traffic calming program targeting speed management

and cut-through traffic concerns. These efforts also draw on the resources of the Rochester Police Department as most traffic calming projects include not only physical measures but education and enforcement components as well.

Enforcement

- ROCOG supports ~~the~~ targeted enforcement using well publicized enforcement saturation events and targeted enforcement to deter impaired and aggressive drivers.

Safe Routes Programs

- ROCOG should consider working with its local partners on targeted safe routes programs that go beyond the well-established Safe Routes to Schools efforts discussed in the next section, focusing on issues related to Safe Routes to Transit, Safe Routes for Seniors, and investment in targeted areas where concentrations of low income, disabled, and other disadvantaged populations live. These populations typically see higher numbers who cannot rely on private transportation to meet their daily travel needs and must depend more heavily on alternative modes. Focused work on these areas could help solve some of the daily challenges they face.

School Safety

- ROCOG has facilitated Safe Routes to School planning which has benefitted communities in terms of successfully applying for funding and implementing projects and programs. ROCOG should continue to provide services to interested partners as needs arise.
- The Rochester Public School District works closely with Rochester and Olmsted County Public Works staff on a crossing guard program and provides regular consultation on walking and bicycling routes to serve neighborhood schools.
- Olmsted County Public Health works with selected school locations on programs to teach students traffic safety skills and the benefits of walking and bicycling.

Transit

- As the public manager of transit services in the ROCOG planning area, the City of Rochester works closely with First Transit Corporation (the provider of fixed route transit in the urbanized area) and dial-a-ride providers to address safety issues related to the delivery of transit service on an ongoing basis.

Active Transportation

- The City of Rochester coordinates with the Mayo Clinic, downtown lodging establishments, and the Downtown Business Alliance to address the safety needs of the high volume of pedestrians in downtown Rochester. Most efforts involve infrastructure investment in tools such as countdown timers, ADA-compliant intersection ramps, installation of crosswalks and providing adequate pedestrian lighting.

Figure 7-28 illustrates a range of measures that have been considered and implemented in the Rochester Urban area to improve safety for pedestrians.

Figure 7-28: Common Pedestrian & Bicycle Safety Measures That Have Been Implemented in the Rochester Urban Area

ROCOG will continue to work with the City of Rochester, Olmsted County, and MnDOT to improve pedestrian and bicycle facilities to reduce conflicts between motorists and non-motorists. Of particular concern to ROCOG, given its planning focus on major road corridors, is improving conditions along high volume roads where walkers and bicyclists may be discouraged if sidewalks or paths are absent or inadequate due to minimal setback or surface width.

Transportation Security Planning in ROCOG Area

Current federal transportation legislation continues the metropolitan planning requirements on security planning that were specified in 2005's Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

Security planning involves planning and preparing for impacts on transportation system due to factors such as natural disasters (e.g. flooding, hurricanes, blizzards), terrorist attacks, shooting and hostage situations, accidents, technical failures, and cyber threats.

Although the immediate organizational response to security incidents and disasters will be the responsibility of security and public safety agencies, MPOs can promote coordinated planning through regional coordination efforts, data depository, technical support, and funding. ROCOG's staff has provided Rochester and Olmsted

County with project leadership, data, technical analysis, and document writing in their hazard mitigation planning projects. These documents can be viewed at the following locations:

City of Rochester All Hazard Mitigation Plan:

https://www.rochestermn.gov/home/showdocument?id=14140

Olmsted County Multi-Hazard Mitigation Plan

https://www.co.olmsted.mn.us/planning/ordinances/Documents/Olmsted%20County/MHMP_Olmsted_2017.pdf

Aside from this direct involvement in hazard mitigation planning, ROCOG's involvement in security planning is minimal. Transportation security planning relies on the transit agencies, MnDOT, and local and state entities for these operations. Figure 7-29 summarizes ROCOG's role and relationship to primary security planning areas undertaken in the ROCOG Area.

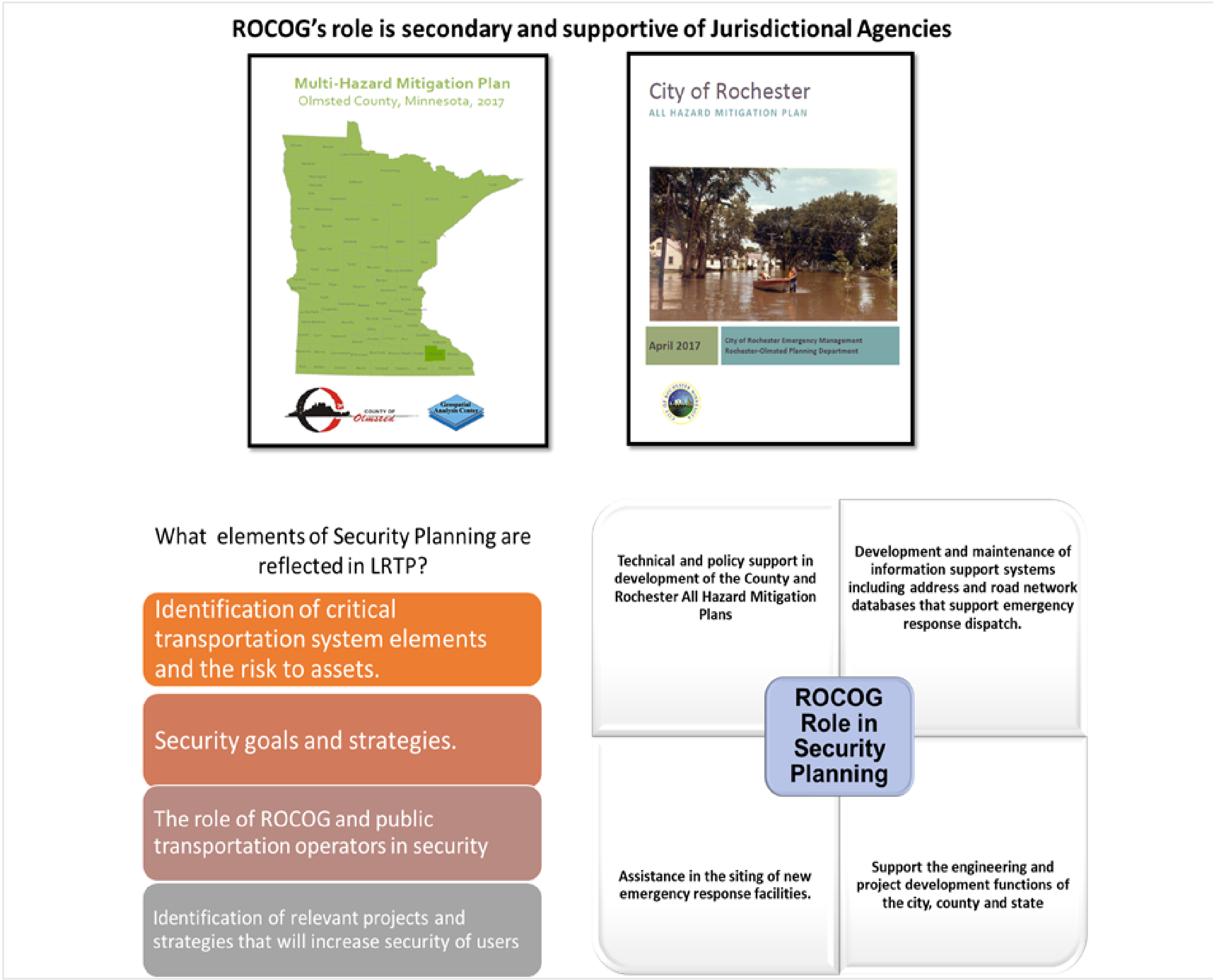
Local Assets

MnDOT has undertaken extensive efforts to plan for impacts to state managed facilities which include many of the major highways, airports and rail corridors in the regional area.

Transportation security planning focuses on protecting critical infrastructure by preventing, preparing against, expediting responses to, and aiding in recovery from major natural and man-made events. For the ROCOG Area, the infrastructure of particular interest includes:

- The Interstate highway system, particularly at key nodes, such as the I90/TH 63 and I-90/TH 52 interchanges
- Non-Interstate highways on the National Highway System (e.g., TH 52, TH 14 west of Rochester, and TH 63 south of Rochester) that serve as high capacity links for moving and evacuating vehicles and the interchanges and bridges/overpasses on these routes that connect regional highways with important local arterial routes
- The Rochester International Airport and the portion of State Highway 30 that serves as the intermodal connector for the airport to the National Highway System
- The Rochester Public Transit Downtown Transfer Area and the Public Transit Operations Center
- Important freight corridors which generally correspond with the major arterial network, as well as the Canadian Pacific rail corridor that traverses east-west through Rochester and Olmsted County
- The Rochester Traffic Management Center (TMC) and its data collection/dissemination assets

Figure 7-29: ROCOG Role in Hazard Mitigation Planning



Local Emergency Management

Emergency management activities in Olmsted County are directed by the Olmsted County Office of Emergency Management. Their Emergency Operations Center is staffed by the Olmsted County Sheriff's Department and was established to help coordinate local response to disasters.

Given Rochester's position as the 3rd largest city in the state, it established a city-level emergency management office which is responsible for their emergency preparedness operations. The office is responsible for coordinating efforts with county, state, and federal agencies during those times. The primary responsibility of Rochester Emergency Management is to implement and coordinate emergency response programs and efforts and provide training for community partners.

MnDOT Flash Flood Vulnerability and Adaptation Assessment Pilot Project

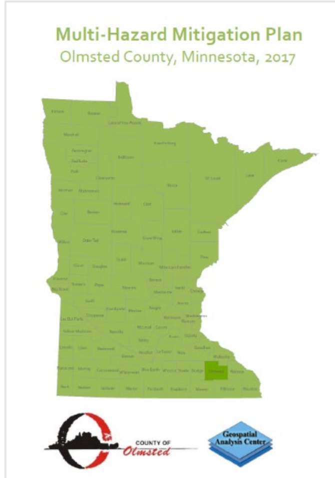
Flooding presents a challenge to fulfilling the Minnesota Department of Transportation's (MnDOT) mission to, "Plan, build, operate, and maintain a safe, accessible, efficient, and reliable multimodal transportation system." Climate change challenges assume and call for new approaches to understanding vulnerabilities across the highway system and at specific transportation facilities so that appropriate actions and adaptations can be taken to minimize expanding risks. This project, one of 19 Federal Highway Administration (FHWA) climate vulnerability pilot studies nationwide, is looking at the effects of climate hazards on the transportation system and represents a starting point for developing these new approaches. The focus of the pilot study was on flash flooding risks to the highway system. While flooding is not the only threat to the state's highway system posed by climate change, it is likely to be one of the most significant and has already caused extensive disruptions to the transportation system in many areas. Recognizing this, MnDOT planners and engineers have long considered minimizing the risk of flash flooding in the siting and design of the state's roadway network.

Olmsted County Multi-Hazard Mitigation Plan 2017

In 2009, under the leadership of the Olmsted County Homeland Security and Emergency Response Coordinator, the first Countywide All Hazard Mitigation Plan (AHMP) was completed in accordance with the requirements set forth in Section 104 of the Disaster Mitigation Act of 2000.

The Olmsted County Emergency Management Office, with the assistance of the University of Minnesota Duluth Geospatial Analysis Center, updated the plan to reflect evolving risks and threats and new knowledge about best practices in preparedness, response, recovery and mitigation. The intent of the 2017 Multi-Hazard Mitigation

Plan (MHMP) is to reduce the actual threat of specific hazards by limiting the impact of damages and losses.



Risk Assessment and Mitigation Strategies

The hazard mitigation plan is built upon the principle of building disaster-resistant communities by protecting lives and reducing the future impacts of hazards including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. A risk assessment was completed involving quantifying the potential loss resulting from disaster by assessing the vulnerability of buildings, infrastructure, and people. The major transportation related risk factor that was identified was road washouts, with the following list representative of the major county roads impacts, while also noting that many gravel township roads are also subject to washout, though risk related to townships roads is normally limited to a fairly small population. The county roads flagged for attention included:

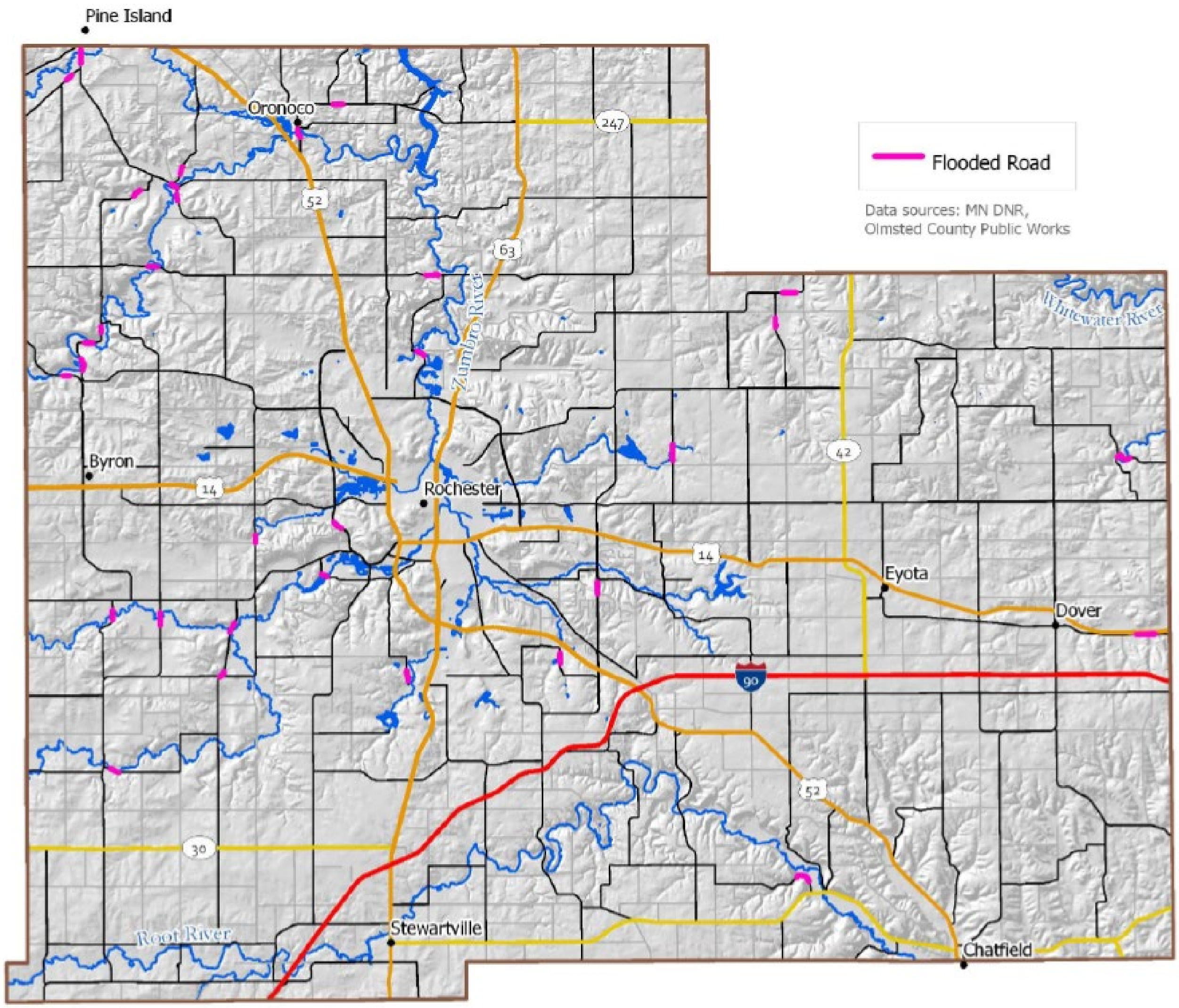
- Multiple areas on CR 105 NW
- The intersection/bridge on CR 3 at CR 12 NW
- The bridge on CR 31 NE
- CR 5 NW just north of CR 4 NW
- CR 142 SE west of the county line
- The bridges and roadways on CR 107 at CR 152 NE
- CR 139 SE just north of Highway 30 SE
- CR 101/40th Ave SE south of 37th St SE
- CR 119 NE north of Silver Creek Rd NE
- CR 102 NE south of 65th St NE
- CR 24 east of 97th Ave NE
- CR 150 SW south of CR 25
- CR 3 SW south of CR 25
- CR 126 SW east of CR 3 SW

Figure 7-30 illustrates the location of these facilities in Olmsted County.

The primary transportation-related mitigation measures the MHMP plan identified and mitigation measures recommended included the following:

- **Flooding**
  The plan recommends maintaining an inventory of roads, bridges, and culverts where flooding has been an issue and identifying required mitigation measures to reduce future flood damages. This is considered a "HIGH" priority, targeted for completion by 2021. A complementary mitigation action recommended related to the flooding issue is the subsequent programming of projects to mitigation flood damage

Figure 7-30: Location of Frequent Road Flooding on the County Road Network



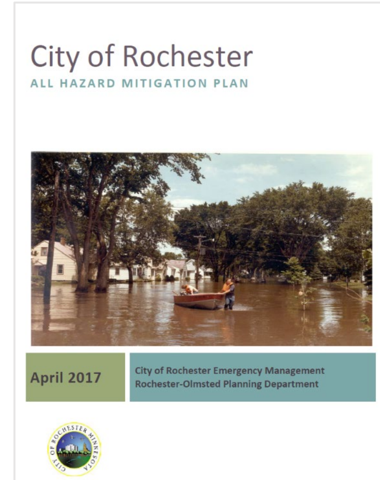
Source: Olmsted County 2017 All Hazard Mitigation Plan potential such as raising road elevations, modifying culverts, and creation of retention facilities.

- **Erosion-Landslides & Karst**
  The MHMP recommends a study of unstable slopes to include an inventory of such areas and development of a plan to address unstable slopes, particularly near public roads and other critical facilities. This is considered a “HIGH” priority targeted for completion by 2021.
- **Dam Failure**
  Dam failure is a very infrequent event in Olmsted County, but when it does occur can pose life, property, and the environment. There have been instances where road washouts have occurred due to dam failure. More frequent inspection paired with robust flood warning systems and, when warranted, flood upgrading are key mitigation strategies.

Rochester All Hazard Mitigation Plan

Rochester is charged with the protection of the health, safety, and welfare of their residents and visitors. Natural and human related events such as tornadoes, hazardous chemical spills, and terrorist attacks may result in the loss of life, property, infrastructure and income. While mitigation strategies and efforts cannot eliminate all threats and hazards, the City of Rochester endeavors to limit their potential physical, economic, and social impacts as much as possible.

Risk assessment is important to assess the hazards and threats to community assets in order to establish policies and actions that serve to mitigate their potential impact. The risk assessment completed for the Rochester AHMP identified the following transportation related concerns:



- **Winter Storms**
  Winter Storms can provide a danger to life and property when traveling due to decreased visibilities and ice-covered roadways, putting drivers at greater crash risk and pedestrians at greater risk of personal injury from falls. Conditions associated with winter storms also can impact emergency response while affecting transit systems.
- **Flood Risk**
  Due to washout or overtopping of roads, floods create hazards to life and property.
- **Landslides**
  Landslides can affect access and traffic safety during storm events while also adding to costs of infrastructure repair.
- **Train Derailment**
  Train derailment is a local risk, though limited given

the low number of trains that travel through Rochester each day. A derailment can cause traffic and emergency response disruption and, depending on materials being hauled, can create problems from hazardous materials release.

- **Natural Gas**
  Natural gas over pressurization leading to explosion is a risk since much of the underground natural gas infrastructure serving the community is found in right of ways. An explosion poses significant risk to property including transportation infrastructure and can disrupt travel patterns for a period of time if it occurs.

The Rochester AHMP lays out an extensive set of mitigation measures for these various risks including local planning and regulation measures, education and awareness programs, preparedness support, and natural systems protection.

ROCOG Implementation Directions and Strategies Related to Security

Strategy #1: Work with the Olmsted County and Rochester Emergency Management officials and other agencies and organizations involved in emergency management and homeland security on the following transportation related issues based on priorities established in cooperation with local partners.

- Assist in development of key evacuation routes from important activity areas and include an assessment of improvement needs in future Long-Range Plan Updates
- Assist in preparation of alternate route/detour planning to facilitate response to closing major transportation arteries
- Assist in preparation of demographic profile information and a geographic inventory of transportation-disadvantaged populations that may need assistance during a disaster to facilitate evacuation and determine if current deployable assets will be available and adequate, including
  - Assessment of the number of people who may not be able to self-evacuate
  - Planning of staging areas for pickup and drop-off
  - Assistance in targeted community outreach on emergency preparedness to populations such as those with limited English proficiency

Strategy #2: Continue to support Homeland Security/Emergency Management functions. This will include:

- Continued maintenance of geographic information system (GIS) electronic base-map for use by dispatchers and emergency management personnel

- Continued assistance in preparing workshop materials for training exercises and continue to participate in emergency management workshops
- Continued assistance to agencies such as the Rochester Fire Department and Gold Cross Ambulance in facility siting and other studies of emergency management needs as needed

Strategy #3: Identify and collaborate with other state and local agency efforts and/or private sector efforts to enhance security planning for the transportation system.

Strategy #4: Work to provide safe and secure facilities and transportation infrastructure for residents, visitors, and commerce in the ROCOG planning area through efforts to reduce injuries, fatalities, and property damage for all modes of transportation. Minimize security risks at airports, rail stations, rest areas, on roadways and bikeways, and at public transportation facilities.

8 • Future Trends and Technology

Introduction

The future of transportation as we presently know it is undergoing massive change. Breakthroughs in computer automation, artificial intelligence, engineering, communications and materials design are all leading to rapid changes in how we will travel. Technology is also changing the ways in which we shop or have items delivered. For example, Figure 8-1 illustrates a robot delivery service in Washington, D.C. These emerging technologies will dramatically alter how we plan for transportation now and in the future. The COVID-19 pandemic has forced us to rethink how transportation may change due to the learned experiences and effects of the pandemic on society, especially how it affects public transit.

Transportation Can Change Quickly

The impact of new mobility technologies on cities could be as significant as the invention of the automobile. The question is not "if" but "when". The timing will be driven in part by funding, policy development, and infrastructure design. Millions of dollars are at stake as new technologies and service models are introduced and adapted to the transportation sector.

Figure 8-1

Is Transportation Ready for Disruption?

Most of the transportation sector has not yet seen the disruption to its longstanding service provision model that other sectors have experienced through the introduction of new technologies. The transportation sector benefits from a particular set of circumstances that have helped insulate it up to now. Some of these include:

- The cost and time to develop transportation infrastructure

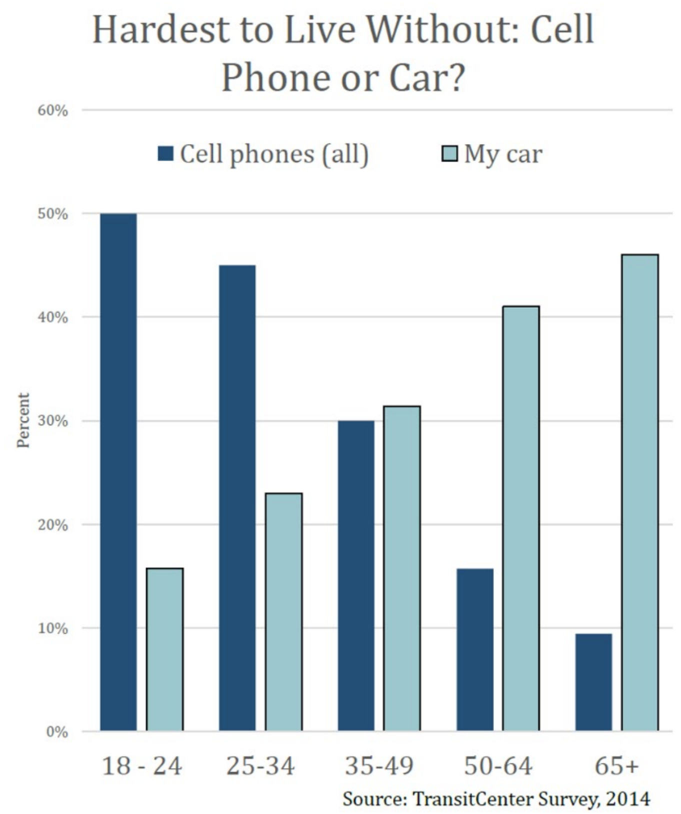
- The cost and complexity of entry into the market
- The regulatory environment
- The difficulty of taking on relatively large and (usually) well-established businesses

New technologies are already breaking down barriers. Uber is an example of a company born from innovative technology, in this case big data analytics, that is now challenging the taxicab industry on a global scale. Uber is moving into personal transportation modes such as electric scooters and bicycles, as well as meal delivery. The COVID-19 pandemic has seen Uber used for deliveries of groceries and prescriptions to those unable to leave their homes. Many more start-up businesses have ideas with the potential to reshape how we see and use transportation and to fundamentally change customers' expectations.

Societal Preferences

Young people are getting their first drivers licenses later and later, if at all, decreasing demand and delaying new car purchases as they rely more and more on transit, bicycles, scooters, and walking as their primary means of transportation. This trend is illustrated in Figure 8-2, which compares how individuals in different age categories felt that life would be harder: without a cell phone or without a car.

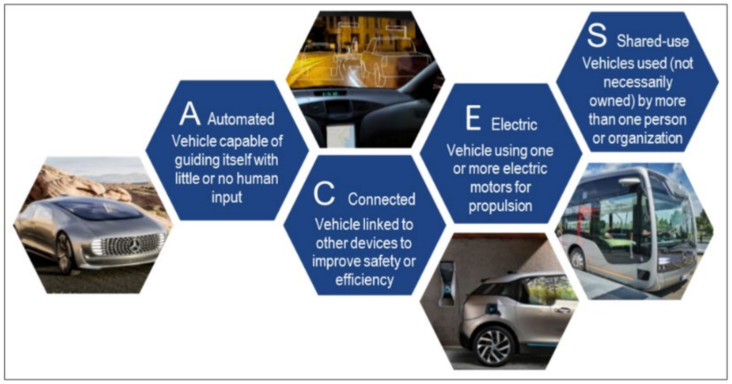
Figure 8-2



What is Shaping the Future of Mobility?

The Florida Department of Transportation (FDOT) coined the acronym "ACES" to help describe future trends in the automotive industry: Automated, Connected, Electric and Shared (Figure 8-3). A brief description for each letter follows.

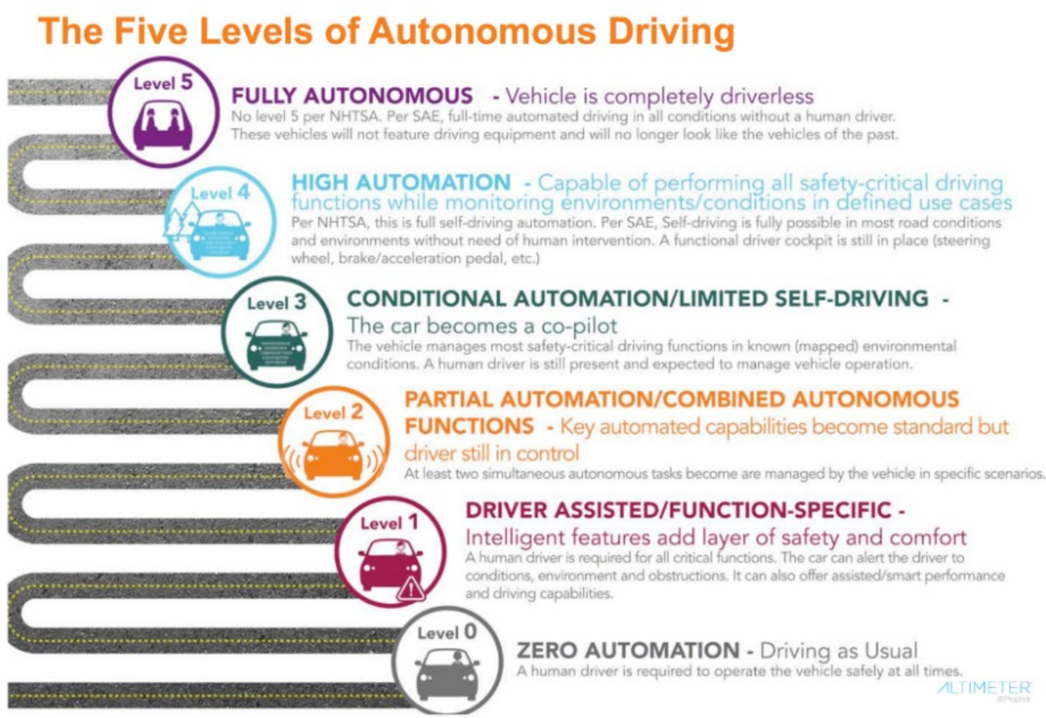
Figure 8-3



Automated Vehicles

Automated (or Autonomous) Vehicles ("AV" or "AVs") use sophisticated computer programming, cameras, and sensors to take control over some, or all, aspects of a driving task. There are five levels of autonomous driving as shown in Figure 8-4. Commonly available features of

Figure 8-4



Level 2 and 3 automation already available in a variety of vehicles currently available include:

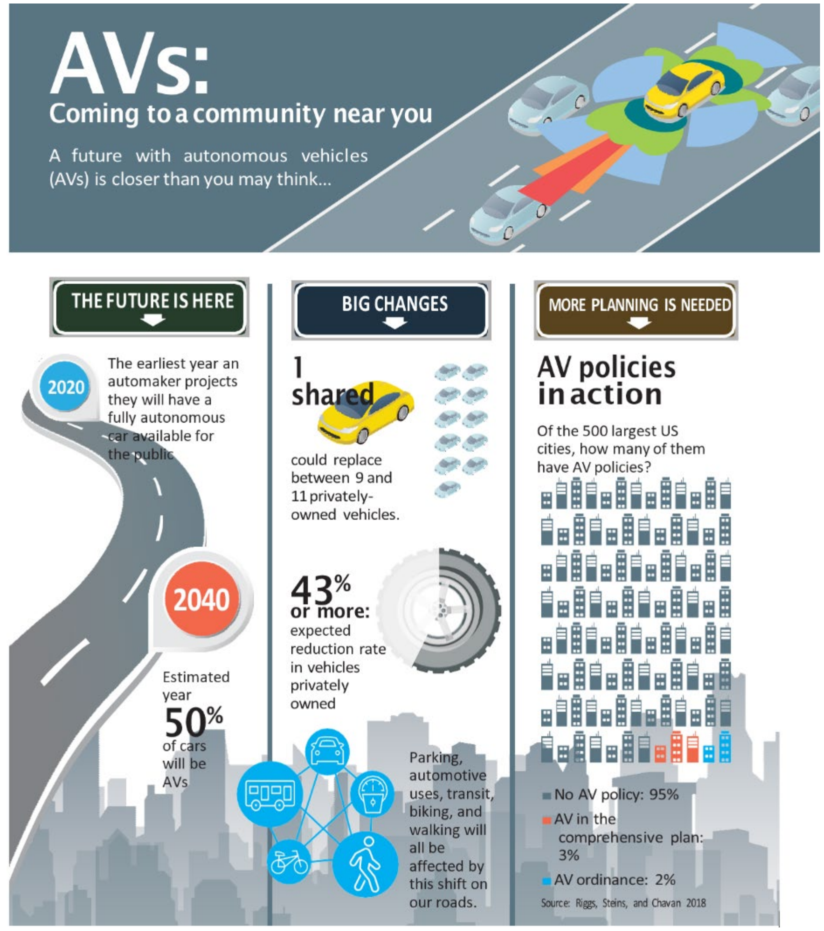
- Adaptive cruise control
- Self-parking features
- Lane keeping assist systems
- GM Super Cruise / Tesla Auto-Pilot
- V2I – signal systems (Audi, BMW, Apps)

The impact of AVs on transportation and society has the potential to be huge, but it is difficult to measure at present, due to many unknown factors. The chart in Figure 8-5 provides some estimates which would appear to only scratch the surface of that potential. Colleges and universities around the world are currently studying AVs, and state and federal agencies are completing policy studies and recommendations at an increasing rate in order to prepare and help guide us into the future.

Connected Vehicles

Connected Vehicles ("CV" or "CVs") use different technologies that allow vehicles to communicate with each other, infrastructure (such as traffic signals), pedestrians, cyclists, and other objects, such as trains and smartphones. CVs can provide information and alerts to drivers and other vehicles; this has the potential to reduce crashes, improve traffic flow, and save energy.

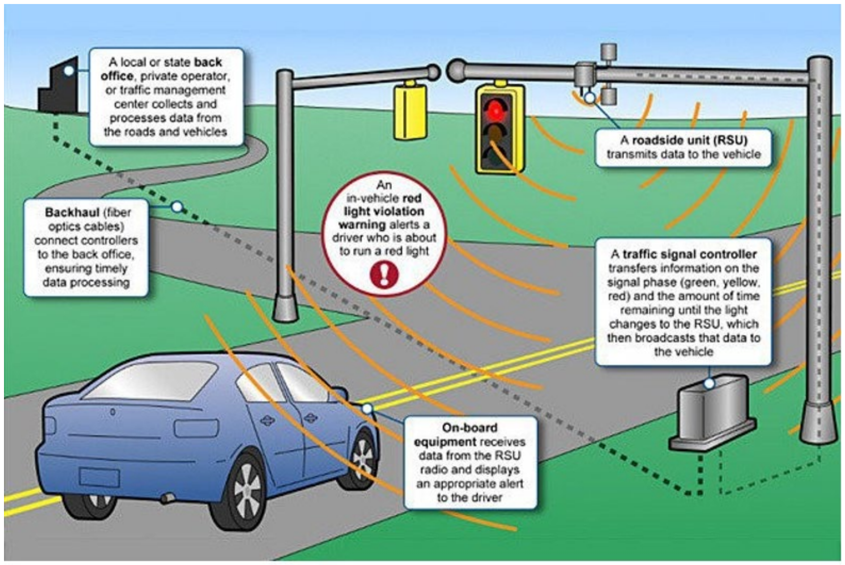
Figure 8-5



Vehicle to Vehicle (V2V) applications exchange information between vehicles regarding forward collision warning and left turn assist applications.

Vehicle to Infrastructure (V2I) applications exchange information between vehicles and infrastructure to notify drivers of upcoming traffic signal changes and lane departure assist. Figure 8-6 highlights some key V2I features.

Figure 8-6



U.S. Government Accountability Office (GAO) from Cooney 2016

Vehicle to People (V2P) applications exchange information between highway infrastructure, vehicles, pedestrians, and bicyclists to, for example, provide collision alerts to pedestrians, bicyclists, and drivers.

Automation and connectivity are complementary. Cooperative automation uses V2V and V2I connectivity, enhances the safety and efficiency of automated driving systems, and provides greater situational awareness and efficiency.

Many research organizations have developed what is referred to as “the five levels of autonomous driving” in one form or another. The five levels as depicted in Figure 8-4 is the one most often referenced in numerous MnDOT research and policy publications.

Electric Vehicles

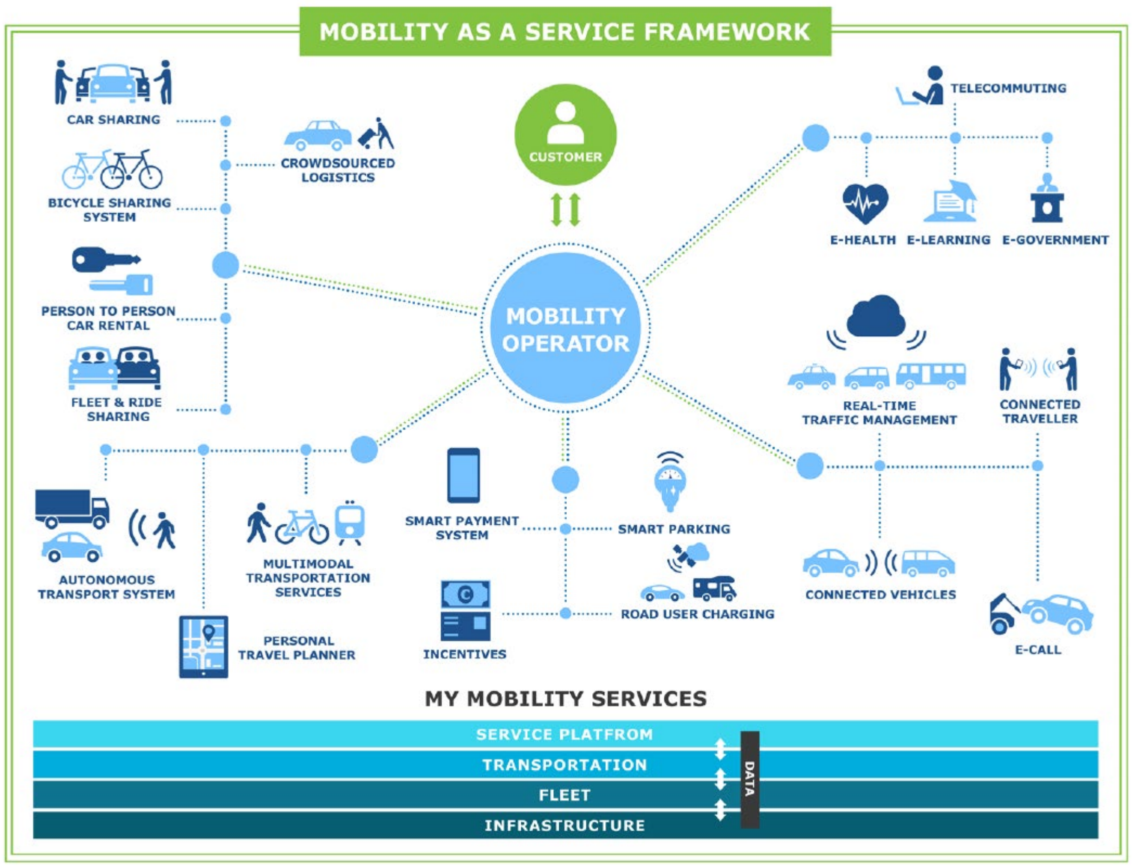
Why the interest in Electric Vehicles (“EV” or “EVs”)? If AVs evolve as a shared-use model, the lower maintenance and operating costs of EVs will be attractive to fleet operators. There is an expectation among industry experts that energy economics will drive vehicles towards electric as generation costs and battery costs drop, which could be as much as 70% of all new cars by 2050. Technology is innovating around the need for faster and more convenient recharging, including possible in-roadway recharging. Lastly, electric cars can help address environmental concerns such as emissions and noise.

Most states around the country struggle with how EVs should pay for their fair share of roadway infrastructure and as such, each state utilizes various tax and fee structures to remedy the situation. Lack of electric charging infrastructure is often the most-cited reason why most Americans are not completely sold on EVs while most European countries have made it an incentive to own an EV.

Shared Vehicles

Shared mobility is the idea that transportation services, such as transit, bike sharing, scooters, ridesharing and other modes of transportation are shared among multiple users. Mobility as a Service (MaaS) allows users to arrange various modes of transportation into a single trip, such as a bike share to a public transit stop, and then a rideshare to an ultimate destination. A future where there is less need for personal vehicles could become a reality when a package of MaaS solutions integrating travel options, as shown in Figure 8-7, becomes a reality.

Figure 8-7



With expanded availability of various transportation services, there could be a significant change in the way people travel. Fewer people may choose to own a private vehicle, either due to social behavior or the costs of technology. The future is uncertain about when ubiquitous availability of MaaS will occur, but it is showing up in larger metropolitan areas across the country and around the world.

Potential Benefits of Connected and Automated Vehicles

According to MnDOT's *Governor's Advisory Council on Connected and Automated Vehicles Executive Report* (December 2018), there are five major potential benefits that can already be seen by Minnesotans from Connected and Automated Vehicles (CAVs):

- Increased safety
- Greater mobility and equity
- Economic and workforce development
- Efficiency
- Maximized health and environment

Increased Safety

In 2019, an estimated 38,800 people were killed on U.S. highways, including 364 in Minnesota. Nearly 94% of these fatalities were caused by human factors, such as distracted driving, speeding, and impaired driving. Autonomous driving has the ability to save lives by reducing the effect of poor personal choices on travel.

Greater Mobility and Equity

CAVs may reduce transportation barriers for persons with disabilities, reduced driving skills due to aging, low income communities, and others who are transportation-challenged. CAVs could provide Minnesotans broader access to live, work, and play where they choose, regardless of income, race, geography, disability, age, and other factors that historically have created barriers to access and personal mobility.

Economic and Workforce Development

Minnesota is competing in a global market. This technology provides Minnesota with an opportunity to maintain a competitive business edge, both nationally and internationally, in the movement of goods, services and people.

Efficiency

CAVs may reduce traffic congestion and improve traffic flow at intersections, work zones, and during adverse weather conditions. Electronic communication among vehicles, without the ambiguity of horns or hand signals, allows for much closer following distances than human-piloted cars can safely accomplish. Rerouting traffic may also assist in incident management.

Maximize Health and Environment

CAVs could help the State rethink the way we plan communities to maximize health and sustainable multimodal transportation. CAVs may reduce greenhouse gas emissions and other air pollutants with the expansion of electric vehicles.

Other Technology Applications

Freight Truck Applications

The prospect of self-driving trucks, especially for long-haul, cross-country use, and automated platooning (vehicles traveling in close proximity to each other, nose-to-tail, at highway speeds), as shown in Figure 8-8, offer potential cost savings to shippers. Additionally, there are safety benefits that would result from this technology, which would include a reduction of fatigued truck drivers on the road.

Automated Delivery Vehicles

In dense urban settings, automated delivery vehicles are being tested. Several large metropolitan areas are already using automated delivery vehicles to deliver meals, as well as groceries and other household items. In some communities, these delivery vehicles have been a lifeline during the COVID-19 pandemic, introducing new ideas on how to best utilize these vehicles now and in the future.

Figure 8-8

LRTP 2045

Projected Timeframes for Autonomous Driving Adoption

Projections vary widely as to how soon we'll begin to see CAVs in our communities. Level 5 CAVs (see Figure 8-6) could be available in as little as five years, or they could be decades away since the technology is still undergoing development and refinement. Additionally, cities and states are reviewing and determining the regulations for such automation.

Early adoption will most likely be in the form of shared fleets, including small-scale autonomous transit and freight delivery. Realizing many of the potential benefits will require significant fleet turnover, this could take years. More than likely, the transition will be slow and incremental, depending primarily on the construction and/or reconstruction of transportation infrastructure, policy development at the state and local levels, and financial considerations.

Implications of a Mixed Fleet

Human drivers will likely share the road with CAVs for quite some time. Mixed fleets will create unique challenges for drivers unfamiliar with the behavior of AVs, and AVs will constantly be learning and adapting to humans through increased machine capabilities. Some ideas to help minimize transitional impacts include:

- Dedicated lanes for CAVs on highways, similar to today's HOV (High Occupancy Vehicles) lanes
- Equipping human-operated vehicles with technologies to communicate with AVs
- Managing the early development of CAVs to give drivers time to acclimate to the technology

The reality of integrating CAVs into highway traffic will more than likely feature a combination of all of the above.

General Considerations

Some experts believe large numbers of AVs will never be seen on the road. However, experts believe that 80% of the technology needed for AVs has already addressed the easy questions—but the remaining 20% will be extremely difficult to solve. Some of the challenges include:

- Teaching Artificial Intelligence (AI) systems to anticipate what other cars, drivers, pedestrians, bicyclists, and scooter users will do is proving to be extremely difficult.
- Responding under difficult precipitation conditions, such as snow, ice, and rain have yet to be mastered. The testing center in Baudette, Minnesota has hosted numerous experimental and training activities for winter driving.

- The impacts of deficient infrastructure such as faded signage or potholes and how an AV will react to such conditions are still being studied.
- The accuracy of digital mapping for lane navigation is still not where it should be in order for AVs to operate within centimeters of normal parameters.

Responding to these issues by designing AVs to be more cautious may actually cause more problems while a mixed fleet of autonomous and human-driven vehicles exist. Environments that can be tightly controlled are most likely to be where AVs will operate for the near-term. College and hospital campuses as well as some small portions of highly urbanized downtown areas will probably be most suitable for testing and deployment in the coming years.

How Might Travel Change with CAVs

Those who are familiar with the ongoing discussions regarding CAVs and AVs generally reference two visions for a world with CAVs: Utopian and Nightmare.

Utopian Vision

CAVs are mostly owned by businesses providing mobility services. Individuals may purchase their own vehicle but will likely share their vehicles when they're not using them. AVs complement mass transit and active transportation, reducing the total number of cars on the road, increasing safety and mobility options, and freeing up public space currently used for parking. Transit is fast, reliable and competitively priced with single or shared ride services, focused on the line-haul portion of routes with high ridership while driverless vehicles dynamically provide first-mile and last-mile solutions at lower cost than traditional transit service.

Nightmare Vision

AVs induce longer commutes and sprawling development, reduce investment in high-capacity transit, and reduce walking and cycling. Cars are mostly privately owned, but even when people use mobility services, they do not share rides. Parking needs remain about the same due to similar private ownership model as currently exists. Public transportation is limited and, for the most part, exists to support low-income individuals as people come to rely even more on their own vehicles.

Infrastructure

Depending on the evolution of driverless vehicles (and connected vehicle technology), local infrastructure will need to keep up. Local governments may need to update and reconfigure signage, speed limits, and signal timing. Reconfiguration of roadways and parking spaces will be the most expensive and probably last area to address. The poor condition of our current infrastructure presents AVs with recognition problems, making it difficult for them to operate effectively. Painted and repainted pavement markings and the pavement condition itself can confuse AVs' sensor and navigation systems, such as the examples shown in Figure 8-9.

The condition of signage due to vandalism and low to no sign maintenance as shown in Figure 8-10 also make it difficult for AVs' on-board machine recognition sensors to "read" posted signs. One possible solution would be the incorporation of QR (Quick Response) Codes into roadway signage for faster and easier recognition by sensors installed on CAVs, as shown in Figure 8-11.

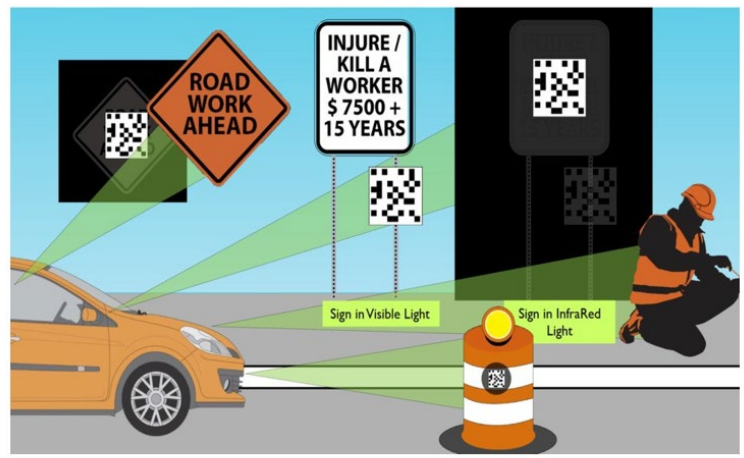
Figure 8-9

Shutterstock

Figure 8-10

FHWA (left) and Shutterstock (two images on the right)

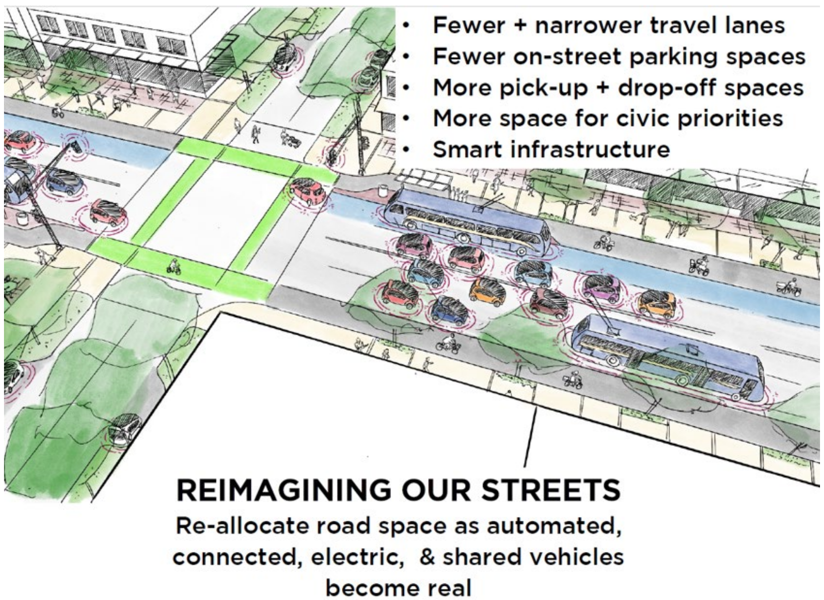
Figure 8-11



Roadway Design

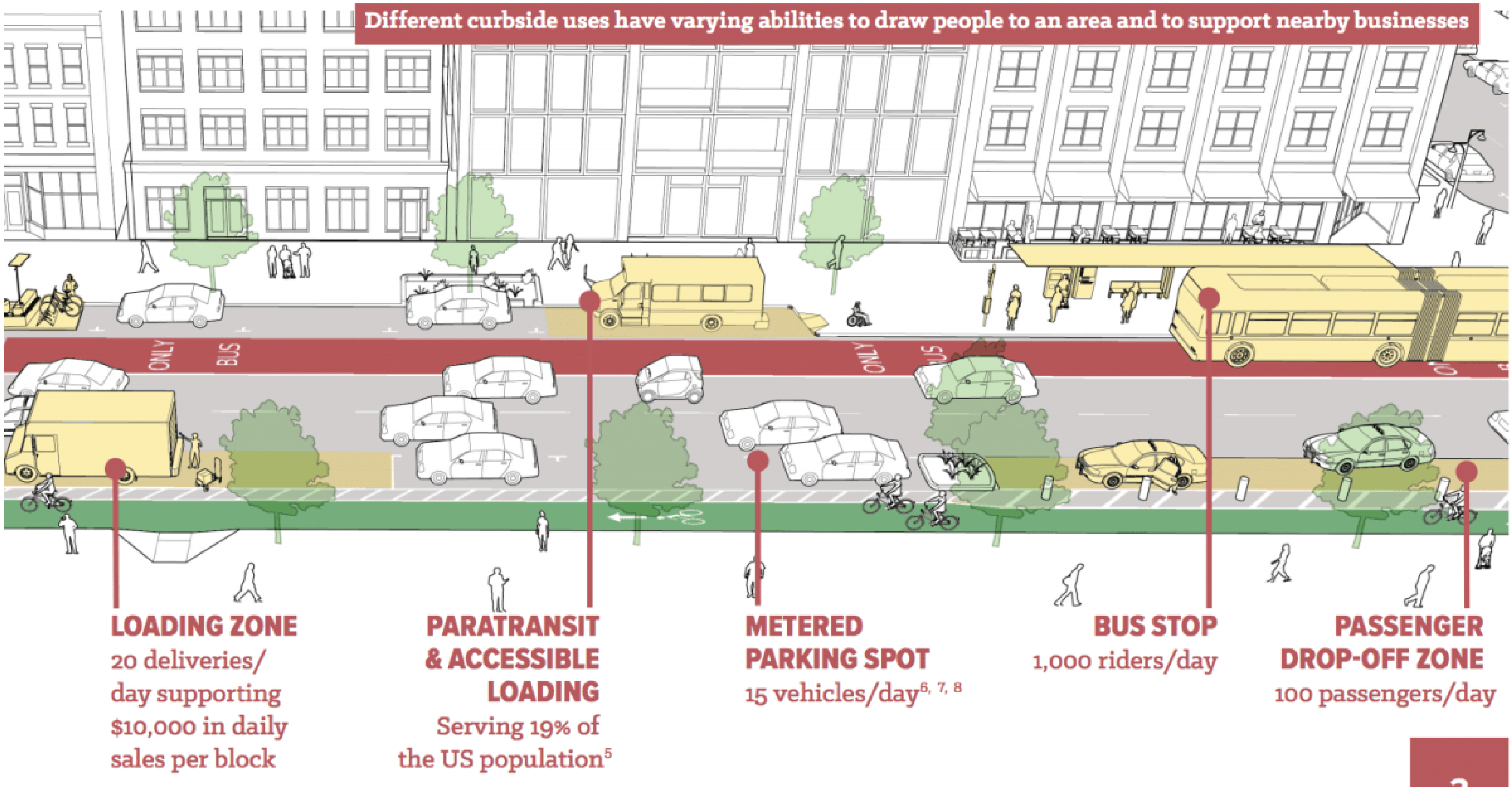
What could our roads look like in the future? Figure 8-12 may give us an idea. With constantly evolving technology and materials science, there are some general assumptions. First, travel lanes could be reduced since AVs should be able to maintain minimal variances. However, this could only be fully accomplished when all vehicles would be automated or when the margin for human error is significantly reduced. There would probably be a need for fewer lanes of traffic, reducing roadway widths, which could allow for increased sidewalk widths and other public spaces. Improvements in technology will mean that more data will need to be collected and made instantly available to CAVs, calling for the installation of sensors, cameras, communication technology, fiber optic cabling, and "smart" traffic signalization.

Figure 8-12



What most experts do agree on is that curb management will become a much more important issue within denser parts of urban areas. As more deliveries, drop-offs, pick-ups, alternative travel options, and transit stops all jockey for position along the curb. Curb space will become very valuable and highly sought-after real estate. An emerging industry is the use of on-line apps that can be used to manage and price curb space for all these various users. CAVs also offer the potential to decrease the need for on-street parking, thus reducing the vehicle footprint in cities, freeing up much needed public space for a wide variety of uses. As we have seen with restaurant re-openings during the COVID-19 pandemic, increased space within the public right-of-way could lend itself to a number of alternative uses that could improve the general livability and environment of our cities. Figure 8-13 provides a glimpse of just a few of the curbside features which will likely become more and more important as the way transportation is delivered evolves.

Figure 8-13



Source: NACTO Curb Appeal

Different Visions of Impacts on Transit

Autonomous Vehicles Replace Transit

Some have speculated that AVs could replace traditional transit vehicles, with transit agencies serving as more of a broker of services in terms of providing trip planning assistance and vouchers for trips. However, the basic geometry of moving a large number of people into an area such as a central business district suggests some type of transit service will still be needed. This service, however, could be fulfilled in the future by autonomous buses like the one shown in Figure 8-14, probably at a lower overall cost if the need for drivers is reduced and the transit fleet is electrified.

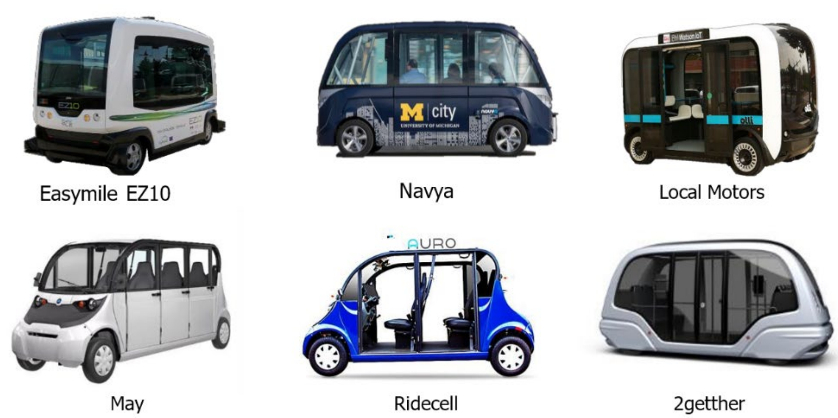
Figure 8-14

Autonomous Vehicles Complement Transit

A service model where AVs complement bus routes can be envisioned. Buses still provide service on higher ridership routes, then connect to new mobility hubs. At these hubs, riders would transfer to/from smaller autonomous shuttles or cars for their first-mile/last-mile connections.

In this model neighborhood or district circulators can feed riders to traditional transit corridors. Testing in some areas of Europe and Asia has shown that small automated shuttles can provide that vital first-mile/last-mile link from isolated areas to more populated areas and regular transit service connections, especially for the disabled and elderly who cannot drive themselves. Some examples of automated shuttles currently undergoing testing around the United States, even in Rochester (Local Motors), are shown in Figure 8-15.

Figure 8-15



Meeting in the Middle on Transit

Historically, the emphasis of transit has been to provide the capacity for moving large numbers of people on high demand corridors. The role autonomous vehicles will play in meeting this demand probably will lie somewhere between total replacement of transit and limited use.

Flex routes in low-demand areas utilizing automated shuttles to feed into high capacity fixed-route service could increase ridership. A network of neighborhood transfer hubs could facilitate transfers. During off-hours, weekends and holidays, scheduled fixed-route service could be reduced and shuttles could be utilized for more direct transport. This mix of transit options could also equate to less need for paratransit since the elderly and mobility-challenged would have options to connect them to fixed-route service. As transportation evolves, growth in ride sharing, bike and scooter usage, and other shared travel options could drive some form of fare integration where all services share a common payment app. This is already being done in Washington, D.C. and other areas around the country.

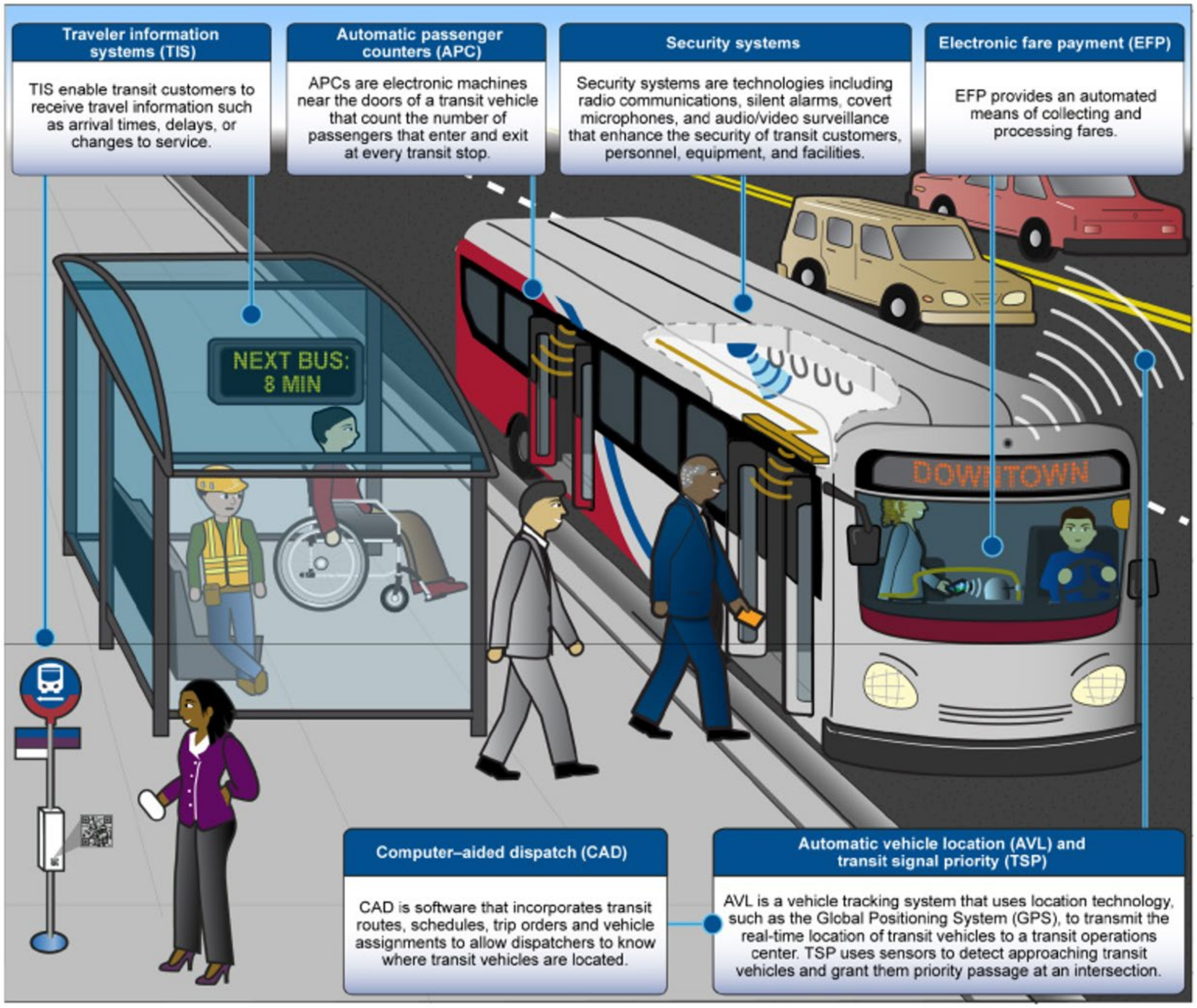
As driverless vehicles become more popular, everything from service coverage to vehicle types to labor requirements stand to change in the transit industry. Transit agencies will need to rethink their services, labor needs, and fare structure in order to stay competitive in the new transportation environment. Both connected and automated vehicles offer transit services many options for moving people around their communities.

While some experts believe these advances in transportation will replace transit systems, others believe they will complement and expand them. Figure 8-16 provides a glimpse of just a few of the features which can enhance transit users' experiences, some of which are currently available. Driverless buses could utilize transit staff to provide security, customer service to those transit users who may need it, as well as assistance to the elderly and disabled.

Local Government Considerations

There are several factors that will influence the level of vehicular travel demand and congestion in the future. The level of shared ride utilization and the competitiveness of public transportation will be a major factor in determining how many vehicles are on the streets and the impacts of a changed mobility landscape. Of concern is the willingness of people to live further from their jobs and other services if they are not required to physically drive and services provide convenient door to door service. At the same time, having more travel options would provide the elderly, disabled, low-income, and youth populations with more travel choices. The role of shared mobility and CAVs and the impacts of these technologies will depend on the regulatory environment that emerges. Table 8-1 identifies key areas of interest for shared mobility policy development at the local government level.

Figure 8-16



Source: GAO analysis of Department of Transportation documents. | GAO-16-638

Table 8-1

FACTORS	Shared Mobility as an Environmental Benefit (maximum governmental support)	Shared Mobility as a Sustainable Business (moderate governmental support)	Shared Mobility as a Business (minimum governmental support)
Allocation of Rights-of-Way to Shared Mobility Services	Allocate public rights-of- way on a case-by-case basis or through more informal processes, such as nonbinding council resolutions.	Jurisdiction that once allocated public rights-of-way through an informal process formalizes this process.	Jurisdiction maintains a formalized and established process for the allocation of public rights-of-way, including to allocate among multiple operators.
Fees and Permits	Recognizing the social and environmental benefits of shared mobility, jurisdiction provides public rights-of-way free of charge or significantly below market cost.	Fees based on cost recovery of providing rights-of-way associated with providing on-street parking (e.g., fees based on foregone meter revenue). In other instances, fees may be reduced to reflect environmental goals, such as charging at a reduced car-pooling rate for car-sharing parking.	Fees are based on a cost-recovery or profit-based methodology. This could include permit costs, lost meter revenue, and administrative expenses for program management.
Signage, Markings, and Installation	Jurisdiction pays for the sign installation and maintenance, striping, and markings associated with the shared modes.	Jurisdiction pays for the installation, and the operator pays for the maintenance of signage, striping, and markings.	Jurisdiction requires shared operators to pay for the installation and maintenance of signage, striping, and markings.
Social and Environmental Impact Studies	Jurisdiction requires that shared operators study and document local social and environmental impacts at regular intervals.	Jurisdiction may require shared mobility operators to study and document local social and environmental impacts on a one-time basis or at regular intervals.	Jurisdiction does not require any social and environmental impact studies of shared mobility.
Public and Stakeholder Involvement	Informal process, if any, led by the jurisdiction to elicit public input into the location and scaling of shared modes on public rights-of-way. For example, staff may internally determine the location and number of car-sharing parking spaces or public bike-sharing stations without public comment.	Informal process where the jurisdiction and shared mobility operator seek public input into the locations of shared services through public notification and staff management of possible public concerns.	Highly formalized process where shared mobility operators are responsible for obtaining public input and approval on the locations of services through neighborhood councils, commissions, or formal hearings.

Source: APA PAS Report 583, Planning for Shared Mobility (2017)

Similarly, how governments regulate autonomous vehicles is still under development and will be evolving as the technology advances and becomes available. The chart in Figure 8-17 provides one view of how these responsibilities may be divided among federal, state and local governments.

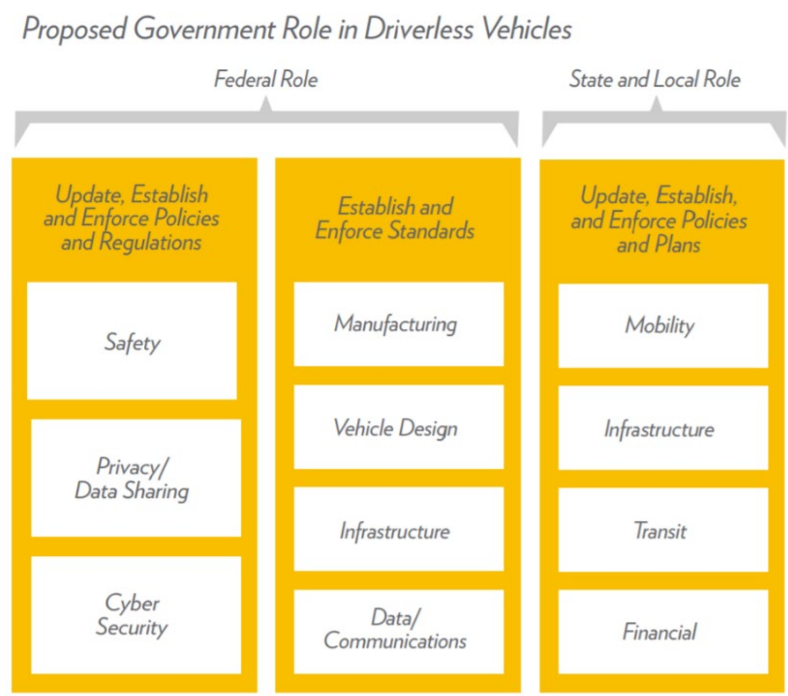
The State of Minnesota has been a leader in this area, both in testing autonomous vehicles on the road and with MnDOT producing guidance documents on how to develop a framework of regulations for autonomous vehicles. It is expected that this will continue in the years to come.

Other communities and states have begun to think about the impact of CAV's on their day to day operations and changes that will be needed to accommodate these new vehicles. A study by the FDOT Office of Policy Planning lists a range of physical improvements that may be needed to realize the potential of CAVs in Figure 8-18.

Potential Financial Impacts of Autonomous Vehicles

The widespread use of autonomous vehicles may have potentially significant financial consequences for both state and local governments. Taxes, registration fees, parking revenue and development costs and enforcement costs are examples of revenues and costs likely to be impacted, as illustrated in Figure 8-19.

Figure 8-17



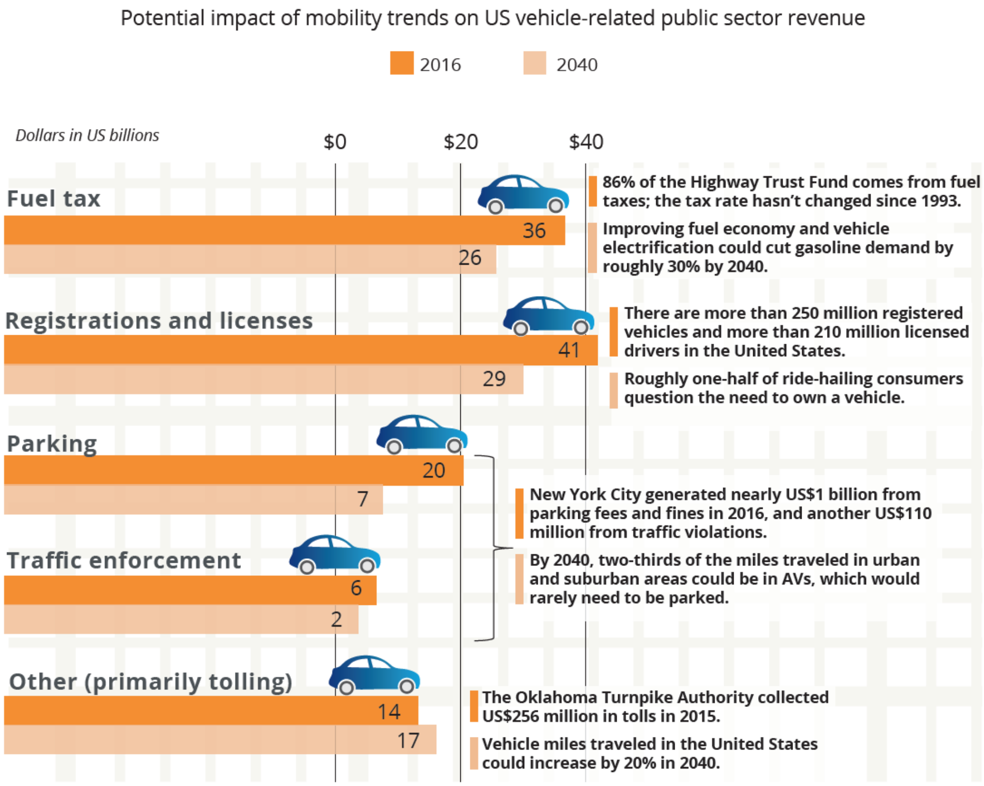
Source: Driving Towards Driverless: A Guide for Government Agencies

Local governments may need to identify new sources of revenue to pay for infrastructure improvements that will be required for CAVs. It is generally thought that traditional transportation revenue streams will likely decline, as has been illustrated by the ongoing discussions about how to charge electric vehicles for their use of public roads when they do not pay gasoline taxes.

Figure 8-18

Road Maintenance (State of Good Repair)	• Lane marking improvements/maintenance for machine vision • Pavement Lane marking maintenance improvements for safe automated vehicle operation improvements
Travel Lanes (Capacity)	• Conversion of on-street parking to other uses • Designation/planning of AV-only limited access arterial lanes or AV only transportation zones
Curb Management (Shared Mobility)	• Designated pick-up/drop-off zones • Curb space value capture policy plans
Parking (Land Use/Urban Design)	• Activity center master plans to guide conversion of parking • Conversion of public parking facilities • ACES parking priority • Electric vehicle charging stations and related support systems
Transit (Trunk and Feeder)	• Transit plans to guide investments in urban corridors • Dedicated high-occupancy AV expressway and arterial lanes • Mobility hubs • First/last mile or paratransit partnership opportunities
Freight (Long-Haul and Local)	• Dedicated AV truck corridors • Suburban/weigh station truck terminals • Intermodal terminal automation • Lane management and restrictions planning • Platooning policies
Smart Cities (Internet of Things)	• V2I roadside units • Traffic signal prioritization • Traffic signal interconnects • Transportation operations management centers/upgrades • Transportation data processing centers • Fleet management facilities

Figure 8-19



Source: Deloitte analysis based on data from the Federal Highway Administration, United States Census Bureau, the CIA World Fact Book, the Congressional Research Service, and *Governing* magazine. These estimates should be considered notional, assume policies remain unchanged, and do not account for operating expenses.

The issue of maintaining revenues in a system where the goal is "user pays" will be an important discussion going forward. A major factor yet to faced is what will be the cost of the infrastructure improvements that will be needed to accommodate CAVs. To realize the benefits of this technology, there will be a need for the installation of new sensor, communications and control technology required for CAVs to function. A report by the Dakota County, Minnesota Office of Performance and Analysis entitled "Autonomous Vehicles Issues and Trends" was completed in 2017 which include Table 8-2, providing some basic cost estimates to start the conversation.

Table 8-2

Item	Quantity	Per Unit Cost	Total Costs
Dedicated short-range communications roadside units	10 intersections	\$13,100 to \$21,200	\$131,000 to \$212,000
Signal controller upgrade	10 intersections	\$3,200	\$32,000
Backhaul communications	1 system (10 intersections)	\$30,000 to \$40,000	\$300,000 to \$400,000
Transit vehicle aftermarket onboard unit	5 vehicles	\$10,000	\$50,000
Connected/Automated Vehicles Project Total		\$513,000 to \$695,000	

Conclusion

The future of transportation is evolving rapidly and will require input by a variety of transportation officials, elected leaders, MPOs, and others in developing a framework for how to regulate and operate in this new environment. While the State of Minnesota is a leader in research and policy development regarding autonomous vehicles, it is also a leader in implementing advanced transportation technologies into its transportation system. The COVID-19 pandemic of 2020 has clearly shown that there are other factors beyond anyone's control that can affect transportation. The lessons learned from COVID-19 will be implemented going forward and have added another item to consider when making decisions on public transportation policy and planning.

Strategic Directions for ROCOG

With technology development and the application of technology to transportation needs changing constantly, it seems at times that planning for the future of CAVs, MaaS, and Shared Mobility is a difficult endeavor with little to be gained until greater clarity is achieved in terms of what technologies and services will eventually rise to the top. However, in the near term, there are some actions small organizations like ROCOG can undertake to help prepare for a transportation future that will likely be different than today as a result of changes to come in communications, data and information services, and mobility technology, along with societal response to these changes. Strategic directions include:

- ROCOG should continue to monitor advances and deployment in future mobility technology and trends and periodically bring these forward for community discussion as a means to identify early warning signals of potential issues for local government. This includes monitoring developments at the federal and state government level as well as what is happening in the private sector.
- ROCOG should participate with local partners in pilot projects to help understand the potential implications of new services or technology.
- Local leaders should consider their short and long-term infrastructure in light of what may be needed to support and integrate CAV technology and Shared Mobility. This will likely require broader consideration of investment in things like data storage and processing capacity, sensor networks and broadband, and ensuring that streetscapes and rights-of-way can best accommodate AVs. As new patterns of transit evolve, cities should preserve flexibility in planning.

9 • Overview of Modal Plans

Introduction

This chapter provides an introduction to Part 3 of the Plan. This part of the plan includes chapters discussing:

- Major street and highway network
- Transit systems
- Active transportation
- Financial assessment of each mode looking at revenues that have been historically available to support these modes and expected costs looking forward to 2045

Each chapter highlights recommended projects as well as investment in preservation activities needed to support infrastructure already in place.

The Plan seeks to advance coordinated development and enhancement of a multi-modal transportation system, expanding travel options individuals will have available to meet their daily travel needs. The modal plans discussed in the following chapters provide a strategic framework plan to help guide transportation and land use decisions and public investments for years to come.

This chapter also provides information related to federally required performance planning measures, targets, and current data observations as to how systems in the ROCOG area are performing. An Environmental Justice assessment discusses how populations of minority and low-income persons are served or potentially affected by projects identified as candidates for federal funding. The chapter ends with an introduction to how project prioritization is used to identify federal projects, discussed more fully in Chapter 10, and general financial planning outcomes, which is the topic of Chapter 15.

Key System Development Outcomes

Major street and highway corridors are the backbone of the physical infrastructure that is discussed in the Plan, serving not only vehicular traffic, but also much of the active transportation infrastructure and transit infrastructure and service in the community. The multiple purposes that street and highway corridors serve need to be considered throughout the planning, design, and capital investment process whenever a project to improve or preserve a corridor is anticipated.

It's important to consider the following outcomes when identifying and advancing projects in the planning phase:

- Design **networks** by taking connectivity and access to destinations into account. This means identifying the connections essential for local, regional, statewide, national or global travel so persons can reach the destinations important to them in a safe and convenient manner.
- **Incorporate multiple modes** of travel, where feasible, to provide safe, reliable and economical transportation choices.
- Assess transportation investment by considering the **land use context** within which a project will be located and whether the project can be designed to further enhance the attractiveness and viability of land use activities occurring within the corridor.
- Enhance economic competitiveness through providing **reliable access** to employment centers, educational opportunities, services, and other basic needs.
- Utilize **preservation projects as an opportunity** to implement missing elements of complete corridors such as pedestrian or bicycle enhancements or transit infrastructure where feasible.
- Consider whether better **management of existing capacity** can address travel demand needs before investing in additional roadway capacity.
- Improve **safety and security** for all modal users of street corridors.
- Enhance **environmental outcomes** and expand economic travel options for underserved populations

System Elements

Figure 9-1 visually illustrates the range of transportation networks and systems that ROCOG supports in planning and programming of federal funds.

Highlighted Actions

Development of complete networks and complete corridors are fundamental to the vision of the plan. Certain elements of the network will have greater importance than others due to the service they provide or the impact they have as "city-shaping" infrastructure. The following subsections highlight proposed regionally significant infrastructure improvements identified in the plan.

Highways

Chapter 11 highlights preservation and improvement needs on the major street and highway system in the ROCOG area. Significant projects include:

- Construction of new and upgraded interchanges on the National Highway System (NHS), particularly on TH 14 West starting at TH 52 in Rochester and extending to the Olmsted County boundary in Byron

Figure 9-1: Elements of the ROCOG Area Transportation System

RPT: Rochester Public Transit

ZIPS: Zumbro Independent Passenger System

RCL: Rochester City Lines (private)

- Improvements to regional gateway corridors entering downtown Rochester, including North and South Broadway Avenue, Civic Center Dr connecting to TH 52 northwest of the CBD, and 2nd St SW at its connection to TH 52
- Development of primary arterial corridors to provide service in planned NW and NE urban growth areas identified in the 2018 Rochester Growth Management Plan

Transit

- Development of Downtown Rapid Transit corridor connecting proposed transit villages/mobility hubs west and southeast of downtown Rochester to help minimize growth of commuter traffic in downtown Rochester
- Significant expansion to the capacity of the Rochester Park & Ride Network
- Development of a Bus Rapid Transit network in Rochester to anchor fixed route transit service in the future

Active Transportation

- Expand the River Trails network to provide connections to south Rochester and flood control reservoirs east and west of the city
- Complete connections to future State trails

Performance Planning for the Three Transportation Modes

With the enactment of MAP-21 and the FAST Act, performance planning requirements were introduced as a new component of the MPO 3-C planning process. Performance planning is a national initiative that will coordinate goals developed by the FHWA and FTA with performance measures targets adopted by the states and their respective MPOs. 23 CFR 450.306(d) identifies that the metropolitan transportation planning process shall support national goals identified in 23 U.S.C. 150(b) including safety, infrastructure condition, congestion, system reliability, and freight movement. In the ROCOG Planning Area, MnDOT and ROCOG have been coordinating development and adoption of performance targets in a phased approach, beginning in 2017 with safety performance targets. Since that time, performance targets have also been developed for NHS pavement and bridge condition as well as travel and freight reliability. As of the adoption of this plan, work is underway by Rochester Public Transit on development of performance targets addressing transit asset management and transit safety.

Table 9-1 outlines the basic steps that have been followed in the coordination process between MnDOT and ROCOG to establish performance targets. To date the reporting of progress on performance outcomes has been included annually in the ROCOG Transportation Improvement Program (TIP), beginning with the 2018-2021 TIP. Consistent with 23 CFR 450.324(f)(4), reporting on system performance in relation to established performance targets for the ROCOG Planning Area is documented for the first time in the Plan in Tables 9-2 through 9-5.

Table 9-1: Development and Documentation of ROCOG PM Targets/Outcomes

Performance Target Development Step *By Authority: 23 CFR 450.324(f)(3) and (4)*	Notes
Coordination with MnDOT on development of Performance Target(s)	MPO's have coordinated with MnDOT in a phased process to development PM targets since 2017. ROCOG has adopted targets established through this process.
Development of outcome information for ROCOG Planning Area is provided by MNDOT system performance reports.	MnDOT reports are issued at least bi-annually.
Annual adoption of new or updated targets and documentation of latest information on performance planning results	Reporting is included in the Transportation Improvement Program annually
Discussion of progress achieved in meeting targets (from Plan to updated Plan).	The ROCOG 2045 Long Range Plan adopted in 2020 will be first plan to report baseline data and early year outcomes in meeting targets. Future plans will provide updated system reporting, assessment of trends and proposed recommendation for meeting targets.

Table 9-2 reports on 2020 safety targets that have been established cooperatively by MnDOT and Minnesota MPO's. Targets are adopted by ROCOG annually as part of the TIP approval.

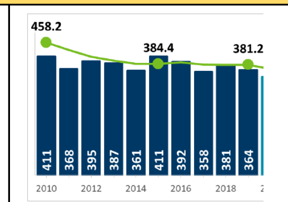
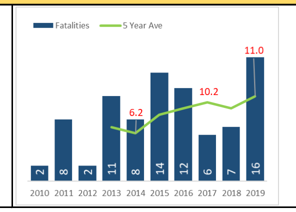
Table 9-2 shows the historical pattern of performance outcomes for the last five years in regard to the rate of fatalities and serious injuries, and the last 9 years in regard to absolute number of fatalities and serious injuries. The legend for the tables is as follows:

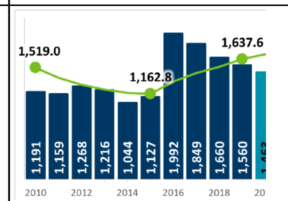
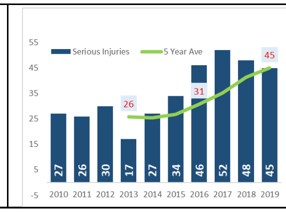
- √ Met Target
- X Did not Meet Target

Absolute numbers for the ROCOG area are included for information purposes only. Annual rates as well as five year rolling average rates are shown for comparison purposes.

Table 9-2: Summary of Performance Targets and Outcomes for Safety Measures

<table>
<tr><th colspan="4">Joint MnDOT / ROCOG Performance Planning Outcomes for ROCOG Area</th></tr>
<tr><th>Measure</th><th>2020 Target</th><th>State Data</th><th>ROCOG Area</th></tr>
<tr><th colspan="4">SAFETY PERFORMANCE MEASURES</th></tr>
<tr><td>Annual Number of Fatalities</td><td>375.4
Statewide

No Specific ROCOG Area Target / ROCOG data for information only</td><td></td><td></td></tr>
<tr><td>Fatalities per 100 million vehicles mile of travel</td><td>0.626</td><td colspan="2">
<table>
<tr><th></th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr>
<tr><th colspan="6">ANNUAL FATALITY RATE PER 100 MILLION VEHICLE MILES OF TRAVEL</th></tr>
<tr><td>MN</td><td>√ 0.07</td><td>X 0.66</td><td>√ 0.60</td><td>X 0.63</td><td>√ 0.60</td></tr>
<tr><td>ROCOG</td><td>X 0.96</td><td>X 0.81</td><td>√ 0.40</td><td>√ 0.44</td><td>X 1.01</td></tr>
<tr><th colspan="6">FIVE YEAR ROLLING AVERAGE RATE PER 100 MILLION VEHICLE MILES OF TRAVEL</th></tr>
<tr><td>MN</td><td>√ 0.544</td><td>√ 0.546</td><td>√ 0.528</td><td>√ 0.518</td><td>√ 0.512</td></tr>
<tr><td>ROCOG</td><td>√ 0.603</td><td>X 0.650</td><td>X 0.701</td><td>X 0.634</td><td>X 0.725</td></tr>
</table>
</td></tr>
<tr><td>Number of Serious Injuries</td><td>1741.2
Statewide

No Specific ROCOG Area Target / ROCOG data for information only</td><td></td><td></td></tr>
<tr><td>Serious Injuries per 100 million vehicles mile of travel</td><td>2.854</td><td colspan="2">
<table>
<tr><th></th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr>
<tr><th colspan="6">ANNUAL SERIOUS INJURY RATE PER 100 MILLION VEHICLE MILES OF TRAVEL</th></tr>
<tr><td>MN</td><td>√ 1.94</td><td>X 3.38</td><td>X 3.08</td><td>√ 2.75</td><td>√ 2.50</td></tr>
<tr><td>ROCOG</td><td>√ 2.33</td><td>X 3.11</td><td>X 3.44</td><td>X 3.03</td><td>√ 2.84</td></tr>
<tr><th colspan="6">FIVE YEAR ROLLING AVERAGE RATE PER 100 MILLION VEHICLE MILES OF TRAVEL</th></tr>
<tr><td>MN</td><td>√ 2.03</td><td>√ 2.30</td><td>√ 2.47</td><td>√ 2.59</td><td>√ 2.73</td></tr>
<tr><td>ROCOG</td><td>√ 1.89</td><td>√ 2.13</td><td>√ 2.39</td><td>√ 2.76</td><td>X 2.95</td></tr>
</table>
</td></tr>
<tr><td>Combined number of pedestrian & bicycle fatalities & Serious Injuries</td><td>317
Statewide

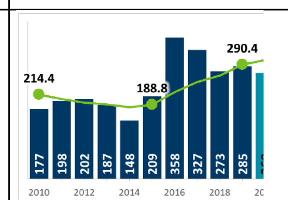
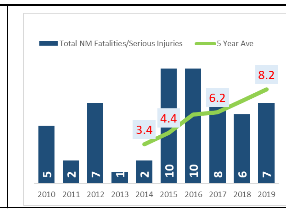
No Specific ROCOG Area Target / ROCOG data for information only</td><td></td><td></td></tr>
</table>

Table 9-3 reports on performance of Interstate and non-Interstate highways on the NHS system in regard to the percentage of pavements and bridges that are in good and poor condition. For all historic reporting periods except bridges in good condition in 2019, performance targets were exceeded.

The legend for the tables is as follows:

- √ Met Target
- X Did not Meet Target

Table 9-3: Summary of Performance Targets and Outcomes for NHS Pavement and Bridge Conditions

Measure	2020 Target	ROCOG Area				
NATIONAL HIGHWAY SYSTEM PAVEMENT AND BRIDGE CONDITIONS		2015	2016	2017	2018	2019
% of Interstate Highway Pavement in Good Condition	55% Percentage of Interstate Pavements that are in Good Condition			√ 78.4	√ 84.5	√ 77.4
% of Interstate Highway Pavement in Poor Condition	2% Percentage of Interstate Pavements that are in Poor Condition			√ 0.00%	√ 0.00%	√ 0.00%
% of Non-Interstate Highway Pavement in Good Condition	50% Percentage of Non-Interstate Pavements that are in Good Condition			√ 54.08	√ 66.30	√ 67.60
% of Non-Interstate Highway Pavement in Good Condition	4% Percentage of Non-Interstate Pavements that are in Poor Condition			√ 0.37%	√ 0.1%	√ 0.1%
% of NHS Bridges in Good Condition	50% Percentage of Bridges on the National Highway System that are in Good Condtion	√ 61.83%	√ 62.55%	√ 62.55%	√ 58.18%	X 48.50%
% of NHS Bridges in Poor Condition	4% Percentage of Bridges on the National Highway System that are in Poor Condtion	√ 0.00%	√ 0.00%	√ 0.00%	√ 0.00%	√ 0.00%

Table 9-4 summarizes outcomes for the percentage of person miles of travel that is reliable on the Interstate and non-Interstate NHS system in the ROCOG Area, along with truck travel time reliability on Interstate Highways. For all reporting periods performance in the ROCOG Area has met the established target.

The legend for the tables is as follows:

- √ Met Target
- X Did not Meet Target

Table 9-4: Summary of Performance Targets and Outcomes for NHS Reliability and Truck Travel Reliability

Joint MnDOT / ROCOG Performance Planning Outcomes for ROCOG Area								
Measure	**2020 Target**	**ROCOG Area**						
NATIONAL HIGHWAY SYSTEM RELIABILITY/INTERSTATE TRUCK TRAVEL RELIABILITY								
			2014	2015	2016	2017	2018	2019
Percentage of person-miles on Interstates that is reliable	80% Percentage of person-miles of travel on the Interstate Highway System that are reliable	ROCOG Area	100	100	100	100	100	100
Percentage of person-miles on Non- Interstates that is reliable	75% Percentage of person-miles of travel on the Non-Interstate Highway System that are reliable	ROCOG Area	86.8	80.4	80.7	94	99.9	100
Truck Travel Time Reliabiilty on Interstate Highways	1.5 Truck Travel Time Reliability Index (TTTR) Index rating	ROCOG Area	1.18	1.13	1.13	1.11	1.13	1.18

Rochester Public Transit is currently in the process of finalizing performance targets for transit asset management and transit safety. Table 9-5 identifies the performance measures for which targets are in development. The last column in Table 9-5 provides a qualitative summary of current performance of RPT relative to the measures that are under development. It is expected that final targets will be selected early in 2021.

Table 9-5: Performance Planning Outcomes for Transit Asset Management and Safety

Joint MnDOT / ROCOG Performance Planning Outcomes for ROCOG Area		
Measure	**2020 Target**	**ROCOG Area**
TRANSIT ASSET MANAGEMENT AND TRANSIT SAFETY		
Transit Asset Management	MnDOT and public transit agencies in MN currently engaged in setting performance targets for the following measures: - Percent of Non-Revenue vehicles that have met or exceeded Useful Life Benchmark (ULB) - Percent of Transit Facilities (non-vehicle structures) with an asset class rated below 3 on FTA's Transit Economic Requirements Model - Percent of Revenue Vehicles that have met or exceeded their ULB	Currently Rochester Public Transit (RPT) has no non-revenue vehicles exceeding UBL or non-vehicle facilities with an asset class rating below 3 RPT currently has no revenue vehicles that exceed its internal ULB of 17 years but 17% of current fleet exceeds Federal ULB of 15 years; these vehicles all programmed for replacement in 2020-2022 period
Transit Safety	MnDOT and public transit agencies in MN currently engaged in setting performance targets for the following measures: - Total number of tansit related reportable fatalities and rate per vehicle revenue miles of travel - Total number of transit related reportable injuries and rate per vehicle revenue miles of travel - Total number of reportable events and rate per vehicle revenue miles of travel - Mean distance between major mechanical failures	RPT has reported no fatalities and only 1 injury/reportable event during the last five years of operations on the fixed route Bus system and no fatalities or injuries on the ZIPS ADA/Paratransit System. For the fixed route system, the rate vehicle revenue miles between major mechanical failures has been 73,291 miles and for the ZIPS paratransit system the rate has been 36,900 vehicle revenue miles between mechancial failures

Discussion of Performance Planning

After the full rollout of federal performance measures is completed at the state level, guidelines stated that future Metropolitan Transportation Plans must discuss progress toward meeting the targets adopted by MPOs. Tables 9-2 through 9-5 provide historic and current baseline information that has been gathered during the initial phase-in period of performance targets by MnDOT and ROCOG, with additional targets for transit assets and safety still in development.

Future plans will provide updates to this baseline information which will provide the benefit of additional years of data to establish meaningful trend information regarding progress being made as data from over several multi-year time periods will become available. Since ROCOG currently follows the lead of MnDOT in terms of most performance planning efforts, the State's progress on certain performance targets effectively informs the progress that ROCOG is making on certain targets. This is particularly noteworthy on certain safety measures such as the absolute annual number of fatalities and serious injuries among motorists and non-motorists, where the small sample size observed in the ROCOG Planning Area has resulted in a very erratic trendline, at least in the early years of performance measurement.

2045 Plan Projects and Performance Targets

This section provides a list of the Regionally Significant projects from this 2045 Plan and which performance measures are meant to be affected by the project's implementation. Projects identified as candidates for implementation in the years 2020-2029 are considered Short Range projects, and projects anticipated to occur in the 2030-2045 timeframe are considered Long Range projects (Table 9-6).

Projects are identified individually for the short-range group, whereas the long-range group has general groups of projects. Also note that the transit safety target has yet to be designated, with Rochester Public Transit working on development of transit safety targets which are expected to be adopted in 2021.

Table 9-6: Regionally Significant Projects and Performance Impact

Years	Government Agency	Perf Measures➲ Project Description↓	Safety	Transit Asset Management	NHS Pavement Condition	NHS Bridge Condition	NHS Performance	Freight Interstate Movement	Transit Safety
Short Range									
2020 to 2029	Rochester	Annual Rochester Transit Operations		X			X		
2020 to 2029	Rochester	Rapid Transit Station Development	X	X			X		
2020 to 2029	Rochester	Annual Replacement Buses		X					X
2020 to 2029	Rochester	Annual Expansion Buses		X			X		
2020 to 2029	Rochester	Permanent Park & Ride Sites	X	X			X		
2020 to 2029	Olmsted	CR 101 Upgrade 2 lane gravel to Expressway / CSAH 1 to 20	X				X		
2020 to 2029	Olmsted	48 St NE-Upgrade 2 lane gravel to Arterial / CSAH 33 to 11	X						
2020 to 2029	Rochester	65 St NW Arterial: Reconstruct TH 52 to 50 Av NW	X				X	X	

Years	Government Agency	Perf Measures➲ Project Description↓	Safety	Transit Asset Management	NHS Pavement Condition	NHS Bridge Condition	NHS Performance	Freight Interstate Movement	Transit Safety
2020 to 2029	Rochester	North Broadway Rebuild / 14th St to Elton Hills Dr	X						X
2020 to 2029	Rochester	20 St SW Collector: South Broadway to CR 125 Reconstruct	X						X
2020 to 2029	Rochester	50 Av NW: 19 St to CSAH 4 / new arterial corridor	X						
2020 to 2029	Rochester	19 St NW Arterial Ashland Dr to 50 Av Reconstruct	X				X		
2020 to 2029	Rochester	19 St NW Arterial: 50 Av to 60 Av Reconstruct	X				X		
2020 to 2029	Olmsted	CSAH 44: 65 St to 75 St & 60th Ave to TH 52- Upgrade 2 lanes gravel to 2 lane Expressway	X		X		X	X	
2020 to 2029	Olmsted	CSAH 44: 55 St to 65 St- Upgrade 2 lanes gravel to 2 lane Expressway	X		X		X	X	

Years	Government Agency	Perf Measures➲ Project Description↓	Safety	Transit Asset Management	NHS Pavement Condition	NHS Bridge Condition	NHS Performance	Freight Interstate Movement	Transit Safety
2020 to 2029	Olmsted	CSAH 44: 19 St to CSAH 4-Upgrade 2 lanes local to 2 lane Expressway	X		X		X	X	
2020 to 2029	Rochester	Extend Members Parkway Minor Collector	X						
Long Range									
2030 to 2045	Rochester	24 Street – Highway Projects	X		X	X	X	X	
2030 to 2045	Rochester	1st Phase Primary Transit Network (Broadway Ave Bus Rapid Transit)							X
2030 to 2045	Rochester	35 Active Transportation Projects	X						

Environmental Justice Assessment

Building on the previous section, which reviewed proposed regionally significant projects for their potential impact on system performance, this section provides an analysis looking at the potential for disproportionate impact of these projects on minority and low income communities, consistent with the guidance provided under Executive Order 12898 issued under the Clinton Administration. This high-level assessment looks at the relation of project locations to areas of residence for environmental justice populations.

Definition of Environmental Justice (EJ) from the U.S. Department of Transportation

"Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level with respect to the development, implementation and enforcement of environmental laws, regulations and policies. DOT is committed to ensuring a fast, safe, efficient, accessible, and convenient transportation system for communities nationwide. In doing so, DOT comprehensively incorporates environmental justice (EJ) considerations into all of the Department's programs, policies, and activities. By ensuring opportunities for minority and low-income communities to influence the transportation planning and decision-making processes through enhanced engagement and meaningful input, the Department actively prevents disproportionately high and adverse effects of transportation projects on minority and low-income communities".

It should be noted that for transit, the analysis was limited to the project area of the planned transit infrastructure for a proposed Downtown Rapid Transit system and the phases of Bus Rapid Transit system to be known as the Primary Transit Network that are anticipated to occur in the 25 year Plan horizon.

Rochester Public Transit fixed route service will continue to provide local transit service to all Rochester urban neighborhoods that currently exist and those that will develop in the future. In addition, the paratransit service area that is provided today currently exceeds both the existing geography of Rochester and the expected growth area of Rochester by the year 2045.

Distribution of Environmental Justice Populations

In completing the assessment of the impact of proposed federally funded projects on environmental justice populations, it is necessary to identify where such populations reside. For the purposes of this assessment, ROCOG used data from the American Community Survey 5 year estimates for the period of 2014-2018 at the Block Group level to map areas of interest (https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-data.html). This analysis considered both minority populations and low income populations; results are mapped illustrating block groups where only a minority threshold population was identified, block groups where only a low income threshold population was identified, and block groups within which both minority and low income thresholds were identified.

The first step in the process was to determine the threshold values for identifying block groups of interest. Table 9-7 reports the results of this analysis.

Table 9-7: Environmental Justice Population Thresholds

Minority Population Calculation			
Geography	Total Population	Minority Population	Percentage E.J. Population
ROCOG Planning Area	153,065	29,766	19.4%
Rochester Urban Area	123,232	28,241	22.9%
Regional Area	29,833	1,525	5.1%
Low Income Population Calculation			
Geography	Total Population	Low Income Population	Percentage E.J. Population
ROCOG Planning Area	153,065	13,490	8.8%
Rochester Urban Area	123,232	11,892	9.7%
Regional Area	29,833	1,598	5.4%

Minority population for purposes of calculating the minority threshold represents the different between the total population and the reported "Not Hispanic or Latino: White Alone" total population. For purposes of calculating the percentage of low income, the threshold represents the number of persons for whom "Poverty Status is determined based on income in the past 12 months", divided by the total population. The Planning Area results were chosen to use for selecting block groups where minority and low income populations exceeded a threshold value of 19.4% for minority populations and 8.8% for low income individuals; separating the planning area into urban and rural areas had very limited impact on which block groups were identified.

Figure 9-2 maps results for the entire ROCOG Planning Area and Figure 9-3 maps results for the Rochester Urban Area.

Environmental Justice Population Involvement in Plan Development

ROCOG staff conducted outreach aimed at getting input from diverse groups of people in the Rochester area. A special effort was made to reach out to low-income and minority populations by partnering with groups that work closely with these populations. ROCOG contacted the following organizations who potentially would be helpful in reaching out to members of low-income and minority populations:

- Adult Learning Center - Brookside
- Community Learning Center
- Diversity Council
- Elder Network
- Hiawatha Homes
- Hope Coalition
- Intercultural Mutual Assistance Association
- Rochester Public Transit
- Rolling Hills Transit
- Semcac Family Planning

Figure 9-2: Block Groups Exceeding Minority or Low-Income Thresholds—ROCOG Planning Area

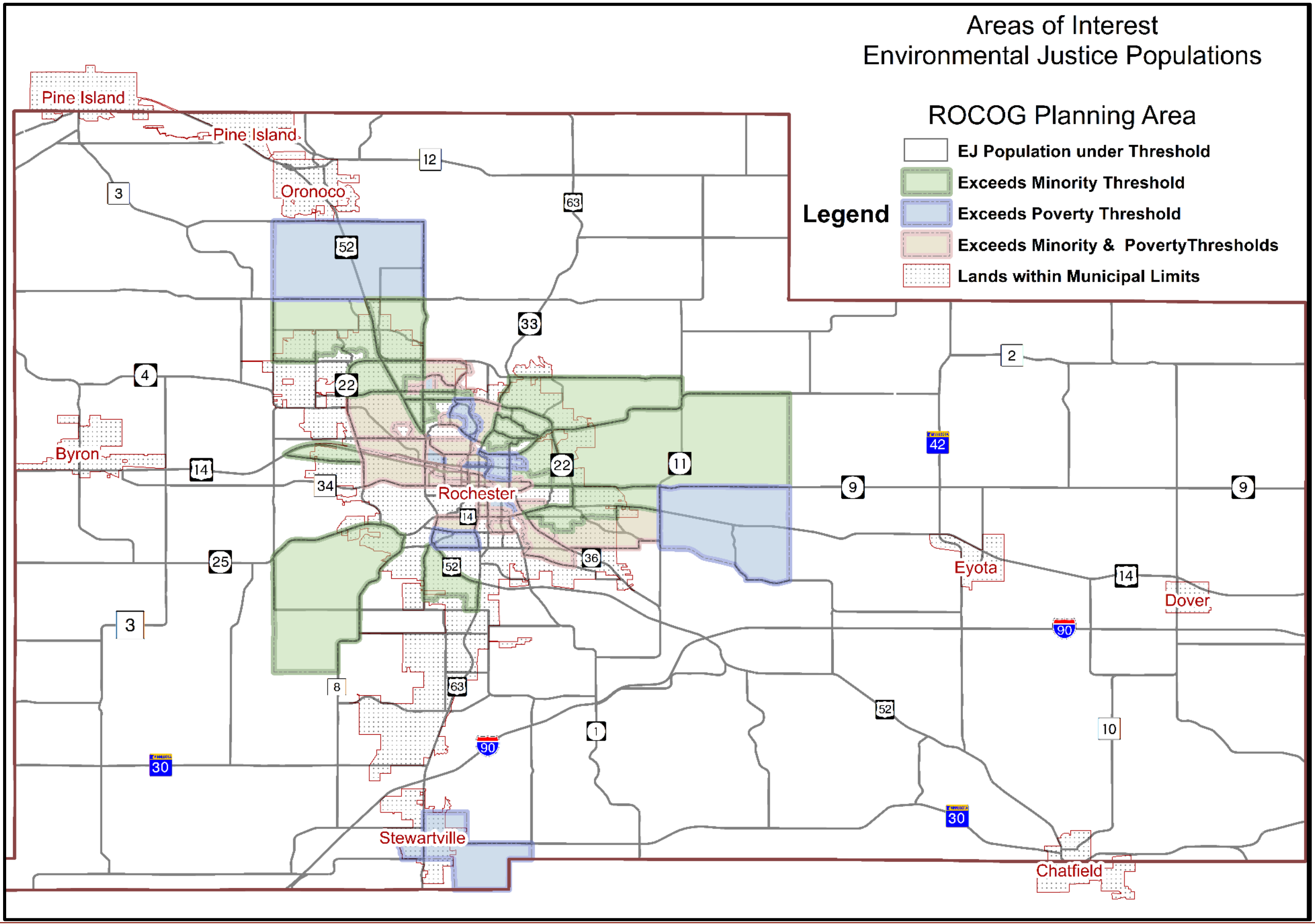
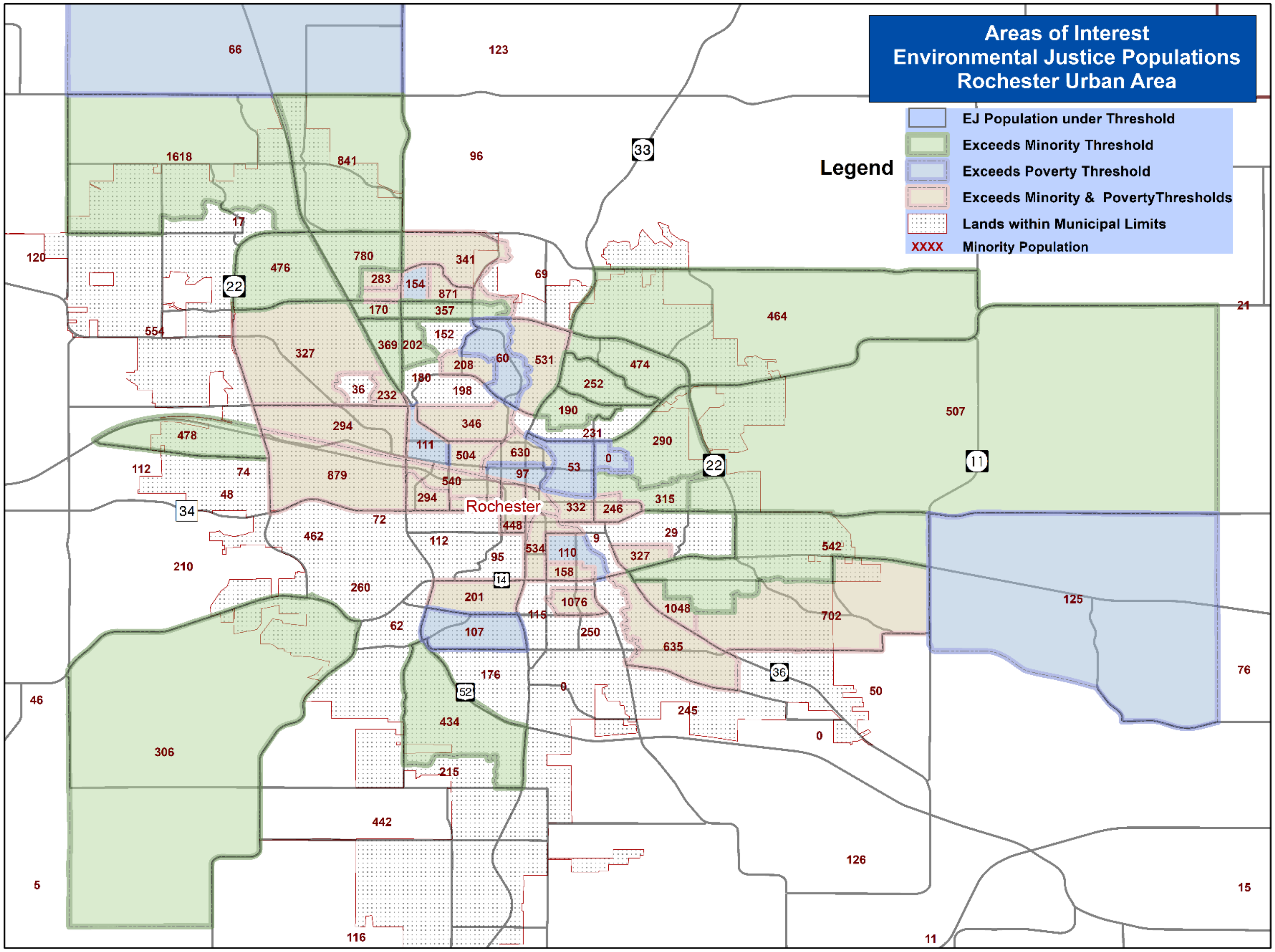


Figure 9-3: Block Groups Exceeding Minority or Low-Income Thresholds—Rochester Urban Area



- Southeast Minnesota Area Agency on Aging
- Southeast Minnesota Center for Independent Living
- Southeast Minnesota Together
- Southern Minnesota Initiative Foundation
- Three Rivers Community Action
- Women's Resource Center

The Diversity Council and the Intercultural Mutual Assistance Association (IMAA) were two groups that responded to the opportunity to work with ROCOG in soliciting this input. ROCOG staff attended various Diversity Council events as well as attending meetings of the IMAA to discuss the LRTP and take questions and comments. The IMAA also allowed ROCOG to display posters about the LRTP and distribute comment cards at their office the entire month of September 2019.

Comments and questions with regard to streets and highways tended to be focused on major highway congestion at intersections and interchanges in Rochester, especially US-14 where it meets US-52 and West Circle Dr NW. People also suggested the need to improve roadway operations near downtown and on Broadway Ave (north and south of downtown).

On transit, there was a lot of interest in the BRT systems envisioned for Rochester over the next 20-25 years. Overall, the responses were positive about the idea of living and working in Rochester without the need to own a car. Another general comment was support for the idea of being able to travel downtown without having to find a place to park a car.

For active transportation, the major themes that were expressed were connecting pedestrian and bicycle paths into useful systems for people to travel around the city and region, and safety in the sense of the need to reduce conflict between users of various modes.

Assessment of Projects relative to Environmental Justice Populations

Figures 9-4 through 9-6 provide high-level mapping illustrating the location of potential federally funded projects relative to environmental justice (EJ) populations in the Rochester urban area. A more detailed assessment of potential impacts and mitigation needs relative to specific projects will be required during the project development phase when more detailed environmental assessment is completed. Relative to the modal maps on the following pages:

- Figure 9-4 maps potential major street and highway projects in relation to Census Block Groups where EJ populations exceed threshold population levels calculated for Rochester. Based on a qualitative assessment, there is no disproportionate high and adverse impact expected from any of anticipated federally funded street and highway project locations illustrated. Many of the project locations are in urban fringe areas showing a high percentage of EJ population in areas that are in fact sparsely populated suburban areas. Among projects located in more dense urban locations, the North Broadway project is located in an area of commercial and service business with little direct impact to residential properties. The 20th St SW project is one corridor where attention will need to be paid to potential EJ population impacts, though lot sizes in this area are larger and may provide greater opportunity for mitigation.

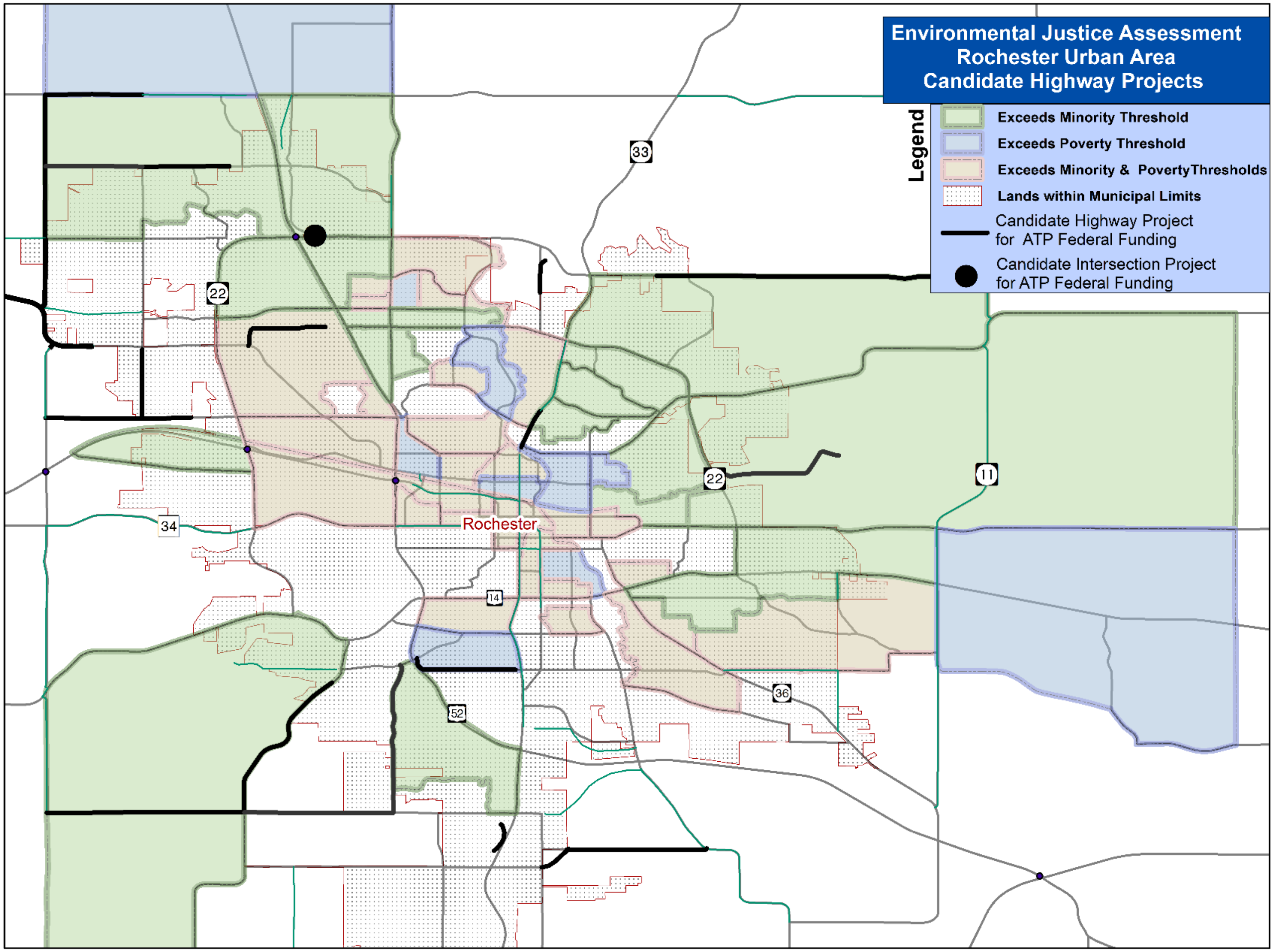
- Figure 9-5 illustrates city transit routes along with proposed corridors for anticipated Bus Rapid Transit service, with 750' to 1000' route buffers mapped. Existing route service planned for expansion in 2020 was delayed due to the COVID-19 pandemic but will expand service into a number of block groups areas identified on the fringe of the city where EJ populations are found to reside in higher numbers. Generally, all areas within the cities are well served with transit, although off peak frequency is generally limited to between 30 and 60 minute service.
- Figure 9-6 illustrates active transportation infrastructure focusing on trail and path facilities. The city, with approximately 140 miles of existing infrastructure, provides most neighborhoods with a minimum level of access to the city trail and path system. Planned improvements corridors have been identified to fill in most of the network gaps currently found to exist, which will improve access for EJ populations. Rochester's policy since the early 1990's has provided for sidewalks on all new streets, with most gaps existing in older areas originally developed in adjacent townships prior to annexation to the city; ROCOG prepared a study in 2016 looking at these areas and are recommending non-motorized infrastructure improvements to address this issue.

Relationship of Plan's Financial Analysis with Project Selection in the Transportation Improvement Program

ROCOG adopted a policy in 2017 guiding how projects would be selected for federal funding that ROCOG programs in the annual Transportation Improvement Program (TIP).

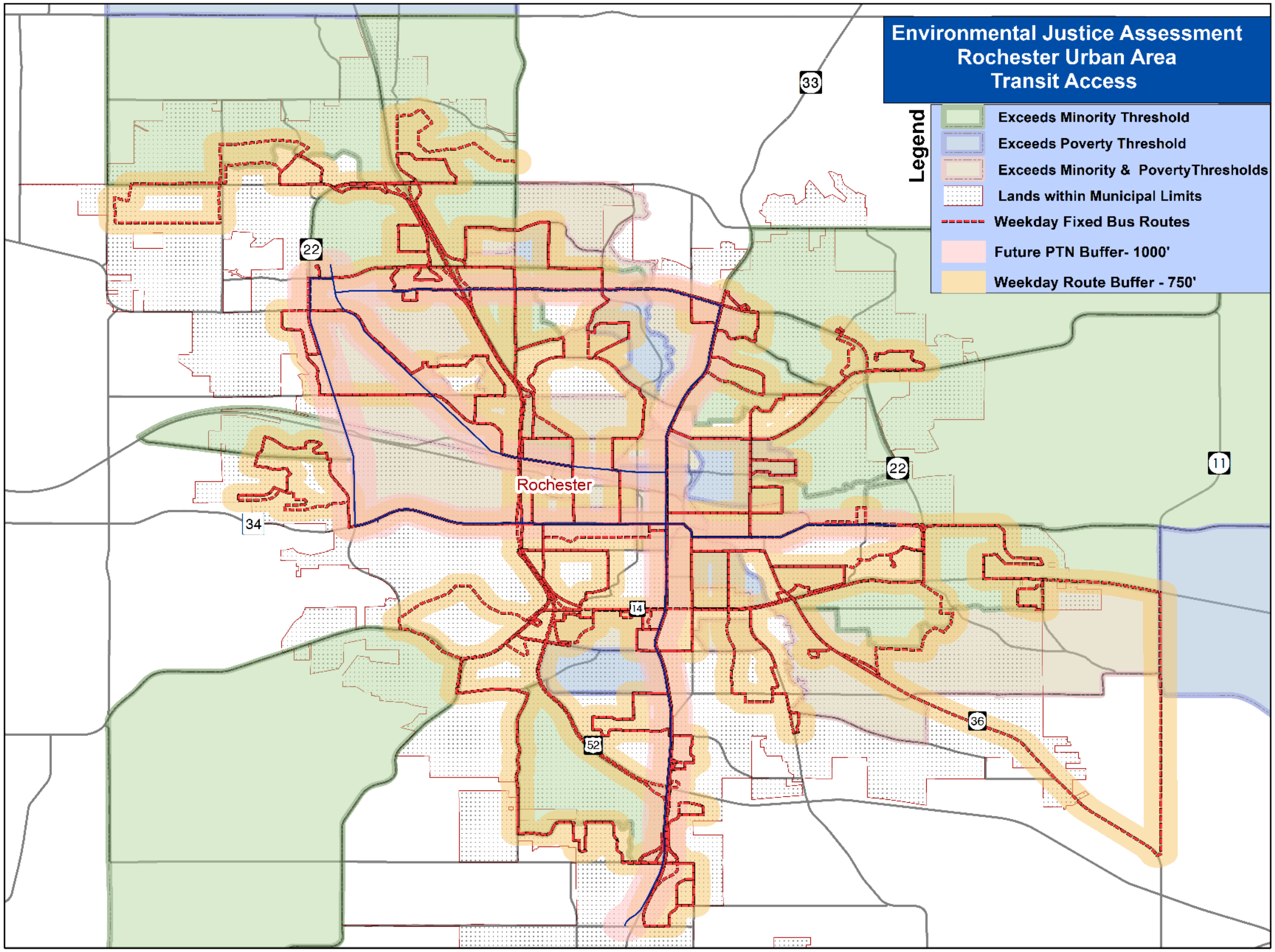
- The selection policy relies on the creation and periodic updating of a slate of projects (referred to as the "ROCOG-ATP Project List") developed by ROCOG and the jurisdictions eligible to receive federal funding.
- ROCOG, at the time this plan was adopted, has responsibility to program $2.37 million dollars of federal Surface Transportation Block Grant funding annually, out of an average of approximately $14 million in federal funding that has on average been programmed over the last 10 years by ROCOG and the Area Transportation Partnership. (Based on

Figure 9-4: Environmental Justice Assessment – Candidate ATP Highway Projects



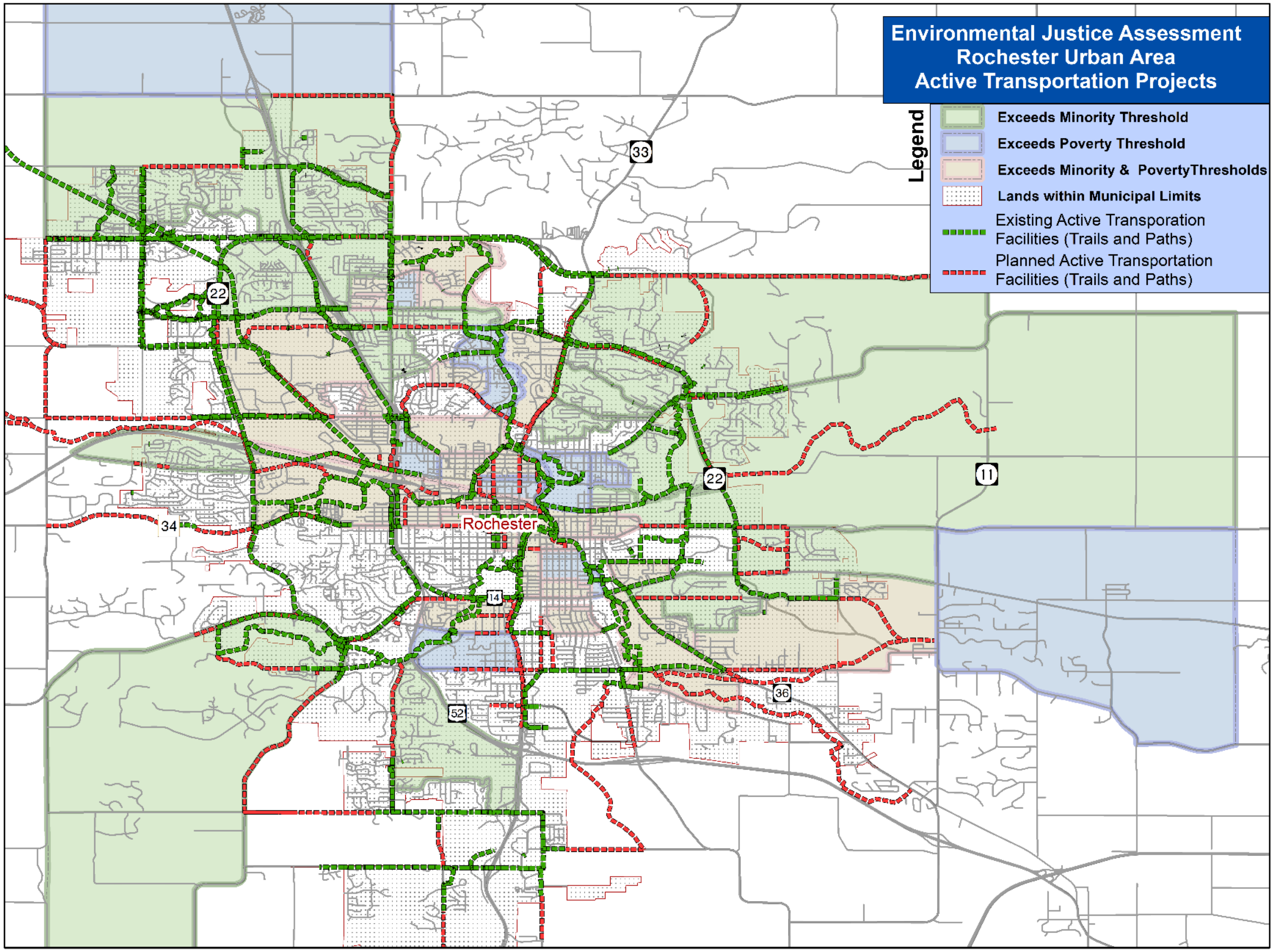
Source: Block Group data from 2013-2017 American Community Survey

Figure 9-5: Environmental Justice Assessment – Fixed Route Transit/Planned Bus Rapid Transit



Source: Block Group data from 2013-2017 American Community Survey

Figure 9-6: Environmental Justice Assessment – Active Transportation Facilities



Source: Block Group data from 2013-2017 American Community Survey

analysis of the annual ROCOG TIP's for fiscal years 2009 through 2019)

- This federal funding represents about 25% of the average annual investment by MnDOT, Olmsted County, and Rochester in roadways in Olmsted County over the last 10 years (Based on data included in Chapter 15 of the 2015 ROCOG Long Range Transportation Plan and analysis).

At the time the policy was adopted, it was stipulated that an interim project list would be developed for the annual 2019 and 2020 project selection, and during the update of the LRTP, the ROCOG – ATP Project List would be updated and synched with the financial plan included in the LRTP for use until the next plan update in 2025.

Under federal regulations that guide metropolitan area transportation planning, "project selection" and "prioritization" are actions that occur during the annual TIP process. Prioritization is not referenced as an action or activity required during the LRTP process as guided by 23 U.S. Code § 134 and 23 CFR Title 23 Part 450).

- The LRTP, however, is to include a financial plan that discusses system-level estimates of revenues anticipated to be available for investment and the cost of potential programs or projects. This information forms the basis of an analysis leading to definition of a "Fiscally Constrained Plan" that demonstrates the amount of investment (grouped by categories) that can be supported by historically available funding or potential new revenue sources for which there is high certainty of availability in the future.
- Projects subsequently programmed for federal funding in the TIP must be consistent with the described Fiscally Constrained Plan.
- The LRTP can include a supplemental list of "illustrative projects" that could be completed if additional funding can be secured.

Given that ROCOG only programs a limited share of federal highway funding ($2.37 million) out of an average of $14 million annually programmed in the ROCOG Area, and MnDOT, Olmsted County, and Rochester invest on average $40 million dollars annually above this level of federal funding, it is incumbent on ROCOG to facilitate collaborative discussion among these entities as to what is feasible within a fiscally constrained plan while respecting the priorities of the agencies and jurisdictions responsible for project implementation.

The ROCOG-ATP Project List

This Plan (in Chapter 10) identifies a ROCOG-ATP Project List identifying projects to be considered for future federal funding in the ROCOG Transportation Improvement Program. Development of the project list is part of a project selection policy adopted by ROCOG in 2017.

The ROCOG-ATP Project List is intended to serve as a bridge between the larger list of preservation and improvement projects and programs identified in the LRTP and the projects ultimately selected for possible federal funding by ROCOG during the annual development of the TIP.

The $2.37 million dollars reflects ROCOG's 30% share of federal Surface Transportation Block Grant Program (STPBG) funds that are allocated to MnDOT District 6. STPBG funds are not the only federal transportation funds that flow to the ROCOG area; they are the only federal funds for which ROCOG has project selection responsibility. Among the authorities that have responsibility for programming federal transportation funds include:

- ROCOG
- District 6 Area Transportation Partnership
- MnDOT Transit Office
- MnDOT Office of Transportation System Management
- MnDOT State Aid for Local Transportation
- MnDOT Office of Traffic Engineering
- Federal Highway Administration
- Federal Transit Administration

Prioritization of Projects

"Prioritization" of projects is recognized in federal MPO planning regulations in reference to the action of an MPO Policy Board (such as ROCOG) or state department of transportation when it is acting to select projects for inclusion in the four-year TIP. The definition of the TIP found in the federal Code of Regulations Title 23, Chapter 450 is:

"**Transportation improvement program** (TIP) means a prioritized listing/program of transportation projects covering a period of 4 years that is developed and formally adopted by an MPO as part of the metropolitan transportation planning process, consistent with the metropolitan transportation plan, and required for projects to be eligible for funding under title 23 U.S.C. and title 49 U.S.C. chapter 53".

Prioritization is further described as "the cooperative process among States, MPOs, and transit agencies for identifying projects and strategies from the Metropolitan Transportation Plan (MTP) that are of sufficiently high priority as to be included in the TIP."

The definition of the TIP contrasts with the description of the Metropolitan Transportation Plan that states "MTP means the official multimodal transportation plan addressing no less than a 20-year planning horizon that the MPO develops, adopts, and updates through the metropolitan transportation planning process". The strategic investment direction provided in the MTP is to align with the programming and selection of projects in the TIP that advances the goals and implement strategies first presented in the MTP.

So, while ROCOG does not select and prioritize projects for the majority of federal or state transportation funds that flow into the area, ROCOG does have a strategic role in projects selected for inclusion in the TIP. These projects should reflect the goals and strategies first identified in the MTP and be consistent with the level of fiscal resources available for implementation.

Financial Planning in the LRTP

Chapter 15 presents a financial planning element that is intended to establish the reasonableness and credibility of the long-range plan. The LRTP, which has a 20-year planning horizon, must include a financial plan that estimates how much funding will be needed to implement identified programs or improvements, as well as operate and maintain the transportation system, over the life of the plan. Relative to the TIP, projects which are selected and programmed for funding need to be consistent with recommendations of a "Fiscally Constrained" long range plan. **Fiscal constraint** is defined in federal guidelines as follows:

"Financially constrained or fiscal constraint means that the metropolitan transportation plan, TIP, and STIP includes sufficient financial information for demonstrating that projects in the metropolitan transportation plan, TIP, and STIP can be implemented using committed, available, or reasonably available revenue sources, with reasonable assurance that the federally supported transportation system is being adequately operated and maintained."

This Plan will include information on the funding sources and anticipated level of revenue the MPO can reasonably expect to be available. It will include revenues from FHWA and FTA, state government, local or regional government or semi-public entities, the private sector, and user charges. An MTP must demonstrate that there is a balance between the expected revenue sources for transportation investments and the estimated costs of the projects and programs described in the Plan.

The planning regulations provide for the accommodation of projects which may be considered beyond the ability of existing revenue streams to fund by allowing for the identification of an "illustrative" project list. Illustrative projects are defined to mean "additional transportation projects that may be included in a financial plan for a MTP, TIP, or STIP if reasonable additional resources were to become available." Many competitive grant programs, such as federal Small Starts or BUILD grants, or state programs such as Corridors of Commerce or MnDOT Transportation – Economic Development (TED) grants, are examples of additional resources that could be referenced to support the inclusion of projects as illustrative projects in the MTP.

10 • Major Street & Highway System Plan

Introduction

Chapter 10 presents an overall policy framework for development of the major streets and highway network in the ROCOG planning area. In addition to providing a system plan which identifies the desired functional character of existing and future major roadway corridors, this chapter also describes:

- System development policy
- Facility level design and operating policy
- Short- and long-range project improvement needs
- The magnitude of future system preservation needs
- Regionally significant highway projects identified as candidates for future federal funding

The Functional Designation map is the tool that frames the Plan's policies regarding system development and facility level design and operating character. Various classes of arterial and collector roadways, along with interstate/interregional corridor classifications, establish the framework for identifying the balance between the level of access and level of mobility a corridor is intended to provide. Additional system and facility development policies provide guidance on accommodations for various modes of travel including transit, pedestrian, and low speed or non-motorized wheeled vehicles such as bicycles.

The Functional Designation map includes a second level of information referred to as "land use context"; land use context is important for understanding more refined design and operational policy decisions that typically occur during project development, as not every class of roadway functions or operates the same in every type of land use environment. A major arterial in a rural area will be significantly different than a major arterial in downtown Rochester; the use of land use context designations helps to clarify this difference and structure the system and facility development policies based on the land use environment present in a project area. The benefit of classification and guidelines/standards is to provide a level of certainty as far as the function of the roadway infrastructure when parties, whether public or private, plan investments in new land development and business operations in a specific corridor area.

This chapter also includes discussion about system improvement needs as well as system preservation needs. System improvement needs fall into various classes, depending on their location and the expected travel function a roadway serves. There will be projects, for example, important to regional travel movement such as commuting, freight and goods movement, and travel between communities, while another set of projects will be important to addressing future growth needs within a local community. The relative balance of regional or through-service a corridor provides versus local travel will in turn influence design and operational decisions and impact other factors such as how a project may be funded.

System preservation recognizes that one of the most effective uses of street funding is for the preservation of facilities that are already in place. Adequate spending on maintenance and preservation is estimated to provide $4 to $6 in economic benefit for every direct dollar spent on maintenance. The emphasis on maintenance and preservation that has been seen at every level of government over the last 10-15 years has noticeably improved the overall condition of the area roadway network. The discussion included herein provides a look at the magnitude of funding that would be needed to fully fund future preservation needs over the horizon of the Plan.

This chapter concludes with a discussion of planning strategies or activities that can aid in ensuring that future system development is not foreclosed by future actions of others that may impact needed improvements. Strategies related to corridor preservation and an opportunity-based approach to ensuring adequate right-of-way will be available are discussed. The use of official right-of-way maps, special setback requirements, advanced acquisition programs, and corridor level access management plans are among the tools to be considered as part of a corridor preservation program.

Alignment of Street/Highway Objectives with Goals of the Plan

Moving people and freight, while providing benefits to the economy, quality of life, and environment can be enhanced by emphasis on reliable and safe travel that provides desired multi-modal access to users in the community. The goals of the Plan provide broad guidance on the outcomes which the community is striving to achieve. The objectives described below each identify a general course of action meant to guide the selection of strategies and actions within the realm of TSMO that will help to achieve the stated goals of the plan.

The objectives identified will help to influence and guide decisions in the areas of planning, programming, and project development, as well as inform day to day system operations and maintenance activities.

Given the expense and difficulty of adding capacity on existing arterial corridors, and the demand for future capacity, it is clear that strategic investment in operational improvements will continue to be important in the future. Looking forward, the important role of additional ITS investments and emerging and future technologies, such as connected vehicle technology, hold promise and need to be considered as deployable technology emerges.

Table 10-1 refines the overall goals for the Plan, as described in Chapter 1, to more specifically identify a supporting set of objectives.

Table 10-1: Street and Highway Objectives and Alignment with Plan Goals

Street and Highway Network Objectives	ROCOG Long Range Transportation Planning Goals
• Use a data-driven process to identify preservation needs and prioritize data-supported maintenance projects over expansion projects	Preserve existing transportation infrastructure through systematic maintenance to sustain a state of good repair
• Increase travel time reliability and predictability for travel on highway and transit systems through use of lower cost traffic management projects • Strategically increase vehicle capacity on the roadway system where needed to resolve network bottlenecks • Increase the availability of multimodal travel options, especially in congested highway corridors	Mitigate current & future congestion by considering operational improvements or multi-modal options as well as capacity expansion
• Make investments based on a complete streets framework which supports the convenient and safe travel of all ages and abilities as appropriate to a facility's community context • Reduce conflicts at high-risk locations by systematically implementing both reconstruction and rapid implementation of low cost, high-impact engineering countermeasures as warranted	Improve safety through mitigation of high risk/high conflict locations/behaviors

Street and Highway Network Objectives	ROCOG Long Range Transportation Planning Goals
• Extend a network of interconnected arterial roads, local streets, bicycle facilities, and pedestrian facilities to meet local travel needs in urban growth areas as urban expansion occurs • Identify potential congestion or capacity impacts from growth in new development areas on existing roadways and prioritize improvements to address emerging issues	Provide adequate capacity and travel options to serve future 2045 urban growth areas
• Address remaining ADA barriers and gaps in the sidewalk system according to the ADA Transition Plans • Prioritize the visibility and safety of pedestrians and cyclists at intersections • Expand the travel network for two-wheeled, low speed vehicles as opportunities arise through the street reconstruction process to re-allocate right-of-way space	Improve bicycle and pedestrian connections with and through Downtown Rochester
• Plan for efficient and practical options for people walking, biking and using micromobility options or transit throughout the street design process • Partner with developers, utilities and property owners to provide high-quality pedestrian and public realm improvements • Prioritize visibility and safety of pedestrians at intersections and midblock crossings for all ages and all users	Provide neighborhood bicycle and pedestrian connectivity to urban trail and path networks and major activity hubs outside of area downtowns
• Support advanced planning activities such as corridor planning and sub-area studies including consideration of land use to aid in strategic decision-making regarding improvements to major streets • Support the preservation of right-of-way needed for future transportation projects	Plan with long-range future land use as a factor
• Use street design to provide safe routes to transit with strategies such as enhanced pedestrian amenities, quality roadway pavement, and safe intersection crossings	Support implementation of transit system enhancements to increase transit mode share

Street and Highway Network Objectives	ROCOG Long Range Transportation Planning Goals
• Improve alternative multi-modal access to the Destination Medical Center (DMC) District • Consider placemaking and beautification in any street reconstruction projects in the DMC District	Support implementation of DMC Development Plans
• Design for people first, not a single mode; most trips consist of at least two transportation modes and users experience mobility in a series of linked conditions and moments through a network serving multiple modes of travel • 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	Provide convenient access to goods, services, jobs and recreation for all residents regardless of socio-economic status, physical ability or age
• In areas planned for transit – oriented or pedestrian-oriented development use the project development / street design process to incorporate features supportive of transit and pedestrian travel that can help knit together a corridor of individual developments with a cohesive identity	Support targeted areas of planned growth at transit supportive densities (TODs) with investment in transit and non-motorized infrastructure
• Maintain safe and convenient accessibility to key generators of commercial passenger and freight traffic	Ensure commercial passenger and freight traffic is convenient, safe and reliable

ROCOG Functional Designation Map

As the key transportation network for serving both local and regional travel needs, the major street and highway system plays an important role in achieving the economic, development, and livability goals of the community and region. The full build-out street and highway network plan seeks to further these goals by guiding the development of the major street system, relying on the mapping of street classifications for both existing and planned non-local roadways, along with associated project development guidelines, to define the character of different roadway types.

The Functional Designation Map is intended to account for development occurring throughout areas shown on the City of Rochester's growth management map and

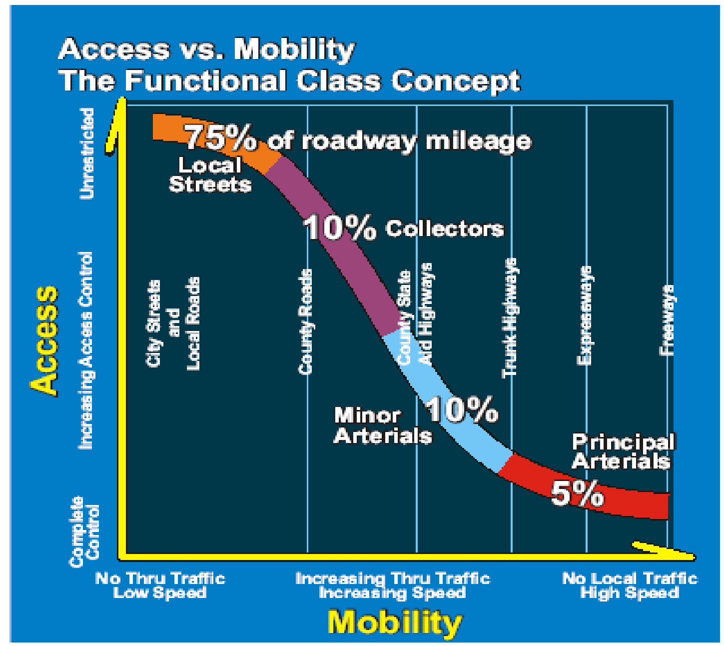
Olmsted County's land use map as having the potential for significant change of land use in the future, irrespective of timeframe. This allows ROCOG to provide a supportive policy basis for right-of-way preservation beyond those areas planned for suburban or urban development in the next 20 years if the long-term vision for an area is ultimately some level of urbanization. Conversely, later sections in this chapter addressing improvement needs focus on expectations over the next 20 years forming the basis for fiscal constraint analysis.

The Functional Designation Map includes two types of information.

- The function of roadways is defined in fairly standard terminology which identifies various classes of interregional, arterial, and collector streets. These classifications provide guidance on the relative balance of mobility and land access functions the roadway is intended to serve as well as the primary trip types the corridor will be designed to accommodate.
- Land use context is designated throughout the planning area. Land use contexts can range from rural to suburban to various classes of urban, with a distinction between small city urban areas and Rochester urban areas. These classifications help refine street planning guidance found in this chapter, as any classification of street, whether it be an arterial or collector, will function and operate somewhat differently depending on whether the road is located in a rural, suburban, or urban area.

Network classification is based on the premise that there is a hierarchy of roads in any regional network, each of which provide different degrees of access and mobility. Figure 10-1 highlights how a typical road network will usually be organized in terms of the percentage of streets in each class.

Figure 10-1: Functional Classification Concept



Generally, a small proportion of major arterial roads will be needed to primarily serve a mobility function, while a much larger percentage of local roads will serve an access function.

Classification of major streets is also important as a programming tool, helping to guide design decisions, capital improvement programming, and planning for corridor preservation. Corridor classification also influences land use decisions, such as right-of-way dedication needs, location and frequency of permitted access, and the desired operational features and characteristics of a roadway.

The proposed Functional Designation Map replaces the classification system used in earlier ROCOG Plans that had relied on three maps (Functional Designation/Street Design/Land Use Overlay). In this plan, the function of those three maps is combined into one, supplemented with data in the Street Planning Guidance section, and reflecting the following considerations

- The Functional Designation Map focuses solely on roadways that serve regional and major urban travel demands. The ROCOG street system map will no longer classify streets serving a local subarea access function such as neighborhood collector streets since most local jurisdictions now include guidance on local streets into local plans and regulations.
- ROCOG Functional Designation is NOT the same as the Federal Functional Classification of roads, which controls which roadways are eligible for federal funding and is often referred to during the TIP development process. The federal map classifies roads based on current or near-term function with a horizon generally of up to five years. The ROCOG Functional Designation Map has a horizon of 20-25 or more years and is focused on ultimate corridor function.
- Relative to the street design guidance in prior plans, the goal has been to address design in a less prescriptive manner with more flexibility afforded to road authorities to meet policy goals. This recognizes that in most instances some level of corridor engineering evaluation is needed/completed before major design elements are ultimately defined.

System Development Guidelines

Table 10-2 provides general system development guidance in terms of the density of primary and secondary roads needed to adequately serve different types of land use environments. These guidelines are important in areas undergoing a transition in development density, such as from rural to urbanizing, since they imply a denser network of major streets in urban development areas as opposed to rural development areas.

This intensification of the roadway grid implies that existing rural roads, which may have been functioning as secondary travel corridors, will need to transition to a primary corridor as areas urbanize. New corridors may need to be preserved in future growth areas where no road corridor currently exists. Application of these guidelines occurs in both the long-range planning process as well as the development planning process as specific land use changes are considered.

Table 10-2: General Road Network Spacing Guidelines

Land Use Environment	Major High Speed & High Capacity Roads	Primary Through Roads	Secondary Through Roads	Local Streets
Rural Areas	6 to 12 Miles	4+ Mile	1 to 2 miles	As needed to provide land access
Suburban Areas	3 to 6 Miles	1 to 2 Miles	1/2 to 1 Mile	As needed to provide land access
Developing Areas	2 to 3 Miles	1/2 to 1 Mile	1/4 to 1/2 Mile	As needed to provide land access
Core Urban Areas	2 to 3 miles	¼ to ½ mile	1/8th to ¼ mile	As needed to provide land access

In addition to these general spacing guidelines, additional system development principles are identified for specific facility types. These include:

Roads Built as Freeways/Expressways

- Frontage or backage roads should be provided in conjunction with all new commercial or industrial development and where possible in areas undergoing redevelopment along freeway or expressway corridors.
- Supporting arterial or collector routes consistent with the spacing suggested for Secondary Through Roads in Table 10-2 should be developed parallel to freeways and expressways to serve as reliever routes that will keep short and medium length local trips off the major road system and help distribute traffic to and from the designated access points along the limited access freeway or expressway facility.

Arterials

- Lack of continuity in the arterial street system will tend to place burdens on adjacent collector streets resulting in unintended travel on local thoroughfares and neighborhood streets. Efforts should be made to create continuous arterial street corridors ending at connections with similar or higher-level streets.

- Arterial roadways should go around, rather than through, residential neighborhoods. Residential neighborhoods will typically cover an area of about ½ mile in diameter with 500-750 households. Since 500 households can be expected to generate about 5000 trips per day, street patterns developed to minimize flows to an acceptable level on interior local streets with residential frontage (around 1000 vehicles per day) suggests there needs to be about 5 local street connections for a neighborhood to disperse traffic to major streets through a combination of residential collector and local streets. Local collector streets should intersect arterials or higher order streets at a relatively uniform spacing of one-half to one-quarter mile in order that good progression can be maintained on the arterial network if future signalization is required.

Collectors

- Collector streets are designed to distribute traffic within a commercial district or employment area or across several adjoining neighborhoods within an area of city. Continuity through a district or neighborhood and connectivity with adjacent lands should be provided to address the following street network considerations:
    - The collector and local street network should provide sufficient connectivity so that trips to destinations within a mile of origin could be made on the local and collector street system. Without sufficient continuity and connectivity, these trips may be forced onto the arterial street system, robbing capacity from that system for through trips as well as local trips with a start or end outside of the immediate area.
    - Collector streets should provide relatively direct through routes to provide efficient access for bus routes, minimizing indirection of travel and providing adequate accessibility for transit users in the area.
- The plan assumes that not all collector routes will be pre-defined but instead can be established when the development patterns in an area are defined through a general development plan process.
- Whereas the arterial street system in developing areas is generally established along what had been the historic one-mile township grid, there should be within the square mile a minimum of one east/west and one north/south collector corridor provided when development at the lowest density levels is proposed. At higher densities, one-third mile spacing of collectors may be needed to provide adequate access.

Roadway Classification Categories

Figure 10-2 lists and Table 10-3 describes the proposed roadway classification used on the 2045 Long Range Transportation Plan Functional Designation Map. Roadways are classified according to a simplified system reflecting prior ROCOG Plans but with fewer categories as only two subclasses are used for each major category. Roads assigned a subclass of "Maintain" (indicated by "M" in Figures 10-2, 10-4 and 10-5) are anticipated to not change significantly over the 20-year horizon of the Plan, with the principal work associated with these roads being preservation of the existing pavement. Roads assigned to a subclass of "Improve" (indicated by an "I" in each respective figure) are expected to see future changes which may include major safety or operational improvements, capacity addition, or significant multi-modal improvements, any of which are significant enough to require some level of construction activity and possible right-of-way impacts.

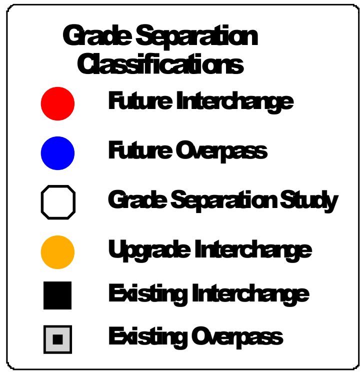
Three new secondary categories are included in this Plan:

- Commercial/Industrial Access Road
- 2050 Arterial Corridors
- 2050 Collector Corridors

Figure 10-2: Major Functional Designation Map Classifications

Commercial/Industrial Access Roads are added as a class to recognize the importance of certain roadways to the local economy in providing first/last mile access in delivering freight and goods as well as commuter access to areas of commercial or industrial development.

The 2050 Arterial and Collector classes of roadways are mapped in areas that are outside of a near term urban growth areas but within areas that cities have identified for long term growth beyond the year 2045. Areas where these corridors are mapped largely are found in Post-2050 growth areas mapped by Rochester, Byron, and Oronoco around their current planned urban service areas. Mapping of these corridors should assist with issues related to the preservation of future corridors if interim or rural development is proposed in an area where long term a major street may be needed to facilitate future urban growth.



Interchanges and Grade Separation

The Functional Designation Map assigns different classes of grade separation to locations, primarily along the National Highway System (NHS), where interchanges or overpasses exist or are planned to provide access to the NHS. While primarily designating interchanges and overpasses, the map also identifies locations where future railroad grade separations are planned.

The category labeled as "Grade Separation Study" identifies locations where a definitive decision regarding future construction of a grade separation structure is still in discussion or the subject of future study. These locations will need further planning, engineering, environmental, or concept design work before a final decision regarding construction of an interchange or overpass is made.

Table 10-3: Roadway Network Category Descriptions

Classification	Description	Examples
Interstate and Interregional Corridors	• Serve inter-city, inter-regional or interstate higher speed travel, with minimal interruption to traffic flows and a high level of continuity to minimize indirection of travel between regional origins and destinations. • Serve as primary freight routes, handling movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel.	Interstate 90 Trunk Highway 52 north of I-90 Trunk Highway 14 West

Classification	Description	Examples
Strategic Arterials	• On a regional basis, strategic arterials supplement the Interstate/Interregional System by providing connections to smaller cities and other important economic activity centers not on the interregional system. • The major function of strategic arterials is to provide for the mobility of traffic. Service to abutting land is a secondary concern. The speed limit on strategic arterials can range from 30 to 65 mph depending on the land use environment in which they are located, with lower speeds in urban areas. • By nature of their size, most small urban areas will not generate internal travel warranting an urban strategic arterial network. The strategic arterial system for these small urban areas will largely consist of extensions of rural strategic arterials into and through an area. • In larger urban areas, strategic arterials are of regional importance, carrying high volumes of higher speed traffic, including through traffic, with limited service to abutting land and design characteristics such as medians and limited traffic signalization to enhance traffic flow.	**Regional:** Trunk Highway 63 North of Rochester Trunk Highway 14 east of TH 52 **Urban:** East and West Circle Drive TH 63 north of TH 52
Primary Arterials	• Primary arterials provide service to trips of moderate length at a somewhat lower level of travel mobility than Interregional Corridors or Strategic Arterials. This system distributes travel to smaller geographic areas than the travel sheds typically associated with the higher order systems. • On a regional basis, primary arterials serve trip lengths characteristic of intra-county service. Travel served will primarily be between significant traffic generators (either individual uses or concentrations of development) or will be part of a collection function routing travel to higher-level routes. Regional primary arterials are roadways generally not of statewide importance but of countywide importance. • On a regional basis, primary arterials should be spaced at such intervals, consistent with population density, that all developed areas of the county are within a reasonable distance of a primary arterial or higher order highway.	**Regional:** CSAH 4 CSAH 9 CSAH 1 **Urban** 2nd St SW 4th Ave SW/NW 4th St SE

Classification	Description	Examples
	• While primary arterials allow for the integration of both local and regional travel, the majority of traffic on the system is not typically low-speed local access traffic. Arterials should be managed to provide safe and efficient through movement, while providing some access to abutting lands. • On an urban basis, primary arterials serve to connect major activity centers or sub-areas not served by higher order streets. Major commercial streets will typically be of a primary arterial classification. Arterials are important in providing the "last mile" link for commuters and freight service to major employment areas within cities. Such facilities will typically carry local bus routes and provide important network connectivity and continuity, but ideally should not penetrate identifiable neighborhoods.	
Secondary Arterials	• Secondary Arterials are similar in function to primary arterials but carry lower volumes, serving trips of shorter distances and with a higher degree of property access. Corridors will typically be shorter length routes that serve important mobility functions within urban or regional subareas. • Secondary arterials will improve the connectivity of the overall network on a localized basis and will typically provide access to a mixture of land uses. In non-residential or higher density residential areas, these routes will be important for truck and transit accessibility. They serve secondary traffic generators such as community business centers, neighborhood shopping centers and multi-family residential areas.	**Regional:** CSAH 15(Rock Dell/Salem) CSAH 19(Pleasant Grove) CR 142(Dover to Eyota) CR 112(Oronoco) **Urban:** 16th St SW/SE 41st St NW
Primary Collectors	• Primary collector streets typically provide land access and traffic circulation among multiple adjacent residential neighborhoods and within commercial districts and industrial areas. They distribute traffic movements from such areas to the arterial street system and keep local area movements off the major road system. Collectors typically do not accommodate through traffic and are not continuous for any great length.	**Regional:** CR 105(Kalmar) CSAH 30(Elmira) CR 117 (Salem/Rochester) **Urban:**

Classification	Description	Examples
	• In rural areas primary collectors should be spaced at intervals, consistent with population density, to collect traffic from local roads and provide service to insure all properties are within a reasonable distance of a collector or higher order road. • Primary collectors are predominantly two-lane roads, with at-grade intersections. Individual access for every lot should be discouraged unless lots are of sufficient frontage to provide adequate spacing between driveways. The cross section of a collector street may vary widely depending on the type, scale and density of the adjacent land uses. This type of roadway differs from the arterial system in that: ► On-street parking is typically permitted; ► Posted speed limits typically range between 30 and 35 mph. ► Traffic volumes typically range between 2,000 and 7,000 vehicles ► In the central business district, and in other areas of like development and traffic density, the collector system may (and desirably will) complete a grid of streets in combination with arterial streets to form a logical network for traffic circulation.	11th Ave SW in Willow Creek Center St Pinewood Road
Commercial/ Industrial Access	• Commercial-Industrial Access Roads are mapped in limited circumstances to recognize the importance of certain roadways to the delivery of freight and goods or as commuter access, serving multiple businesses in areas of commercial or industrial development with significant employment or commercial vehicle traffic.	Maine St SE between 48th St & St. Bridget's Rd Scott Dr NW between 19th St and 26th St
2050 Arterial and Collectors	• 2050 Arterial and Collector roadways are mapped in areas that are beyond planned urban or suburban growth but within areas where long term urban or suburban development beyond the horizon of this plan is anticipated. These corridors will ultimately serve a function similar to a Primary Arterial or Collector. Mapping of these corridors at this time is for the purpose of providing a policy basis for establishing right of way protection for future major street	34th St NW between CSAH 3 and CSAH 33 50th Ave NW between CSAH 14 and CSAH 12

Classification	Description	Examples
	corridors, which can happen as part of a corridor study or during the land development approval process of local governments.	

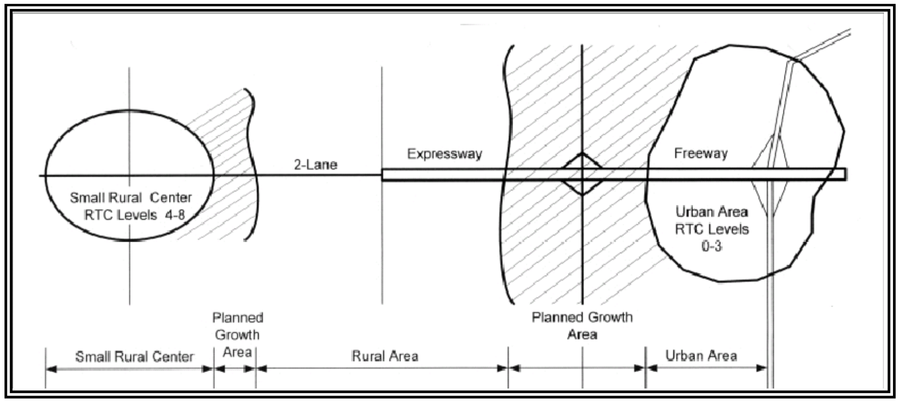
Table 10-4: Grade Separation Category Descriptions

Facility Type	Description
Future Interchange	Planned location of a future interchange, typically found on interstate/interregional highways, providing access between two similar high-level roadways or between an interstate/interregional corridor and a regional or urban major arterial that provides access to the local community. Interchanges typically provide for all movements
Future Overpass	Planned location of a future structure providing continuity for an arterial or primary collector road across an access-controlled interstate/interregional highway in order to provide for local circulation needs but not the interchange of traffic
Grade Separation Study	A location where further study of interchange or overpass needs is anticipated
Upgrade Interchange	An existing interchange where capacity or safety improvements are needed to improve service provided by the interchange
Existing Interchange or Overpass	Existing interchanges or overpasses are locations where a facility is already in place, but no further capacity enhancement of safety measures is anticipated to be needed over the horizon of the plan
Rail Crossing	Locations that have been identified as potential locations where construction of a grade separated rail crossing is anticipated SHOULD rail traffic levels increase so significantly as to cause increased rail/vehicular conflict, crashes, or congestion on a regular basis; given the low level of rail traffic currently seen through Olmsted County, rail crossing locations are considered in this plan as illustrative-only at this time

Land Use Context Categories

The concept of land use context is used in this Plan as a factor in determining the proper class of street planning guidelines to apply regarding management of roads and highways. It is based on the premise that corridors may pass through multiple land use areas, ranging from rural to dense urban conditions, as illustrated in Figure 10-3. By tying functional designation not only to roadway function but also the surrounding land use environment, design and operational guidelines can be tailored to the character of the surrounding area through which the roadways pass.

Figure 10-3: Illustrative Example of Changing Land Use Character Along a Corridor



Land use context is used in the Plan to help describe modal expectations as far as the need for and level of accommodation to be provided for transit, pedestrian, and bicycle travel. Other features linked to land use context include

- Operations in terms of desirable Level of Service thresholds for major streets (a lower level of service is typically acceptable in denser urban development areas)
- Preferred signal spacing (greater spacing between signals is typically preferred in suburban areas)
- Access connection spacing (spacing requirements are typically greater in rural or suburban areas)

A total of ten land use classifications are used in the plan as illustrated in Figure 10-4. Table 10-5 describes the classifications found on the Functional Designation Map.

Figure 10-4: Land Use Context Classifications

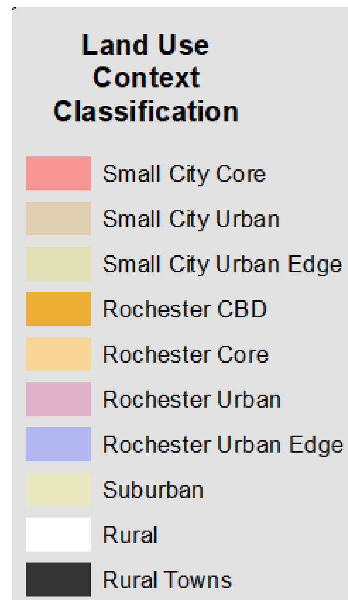
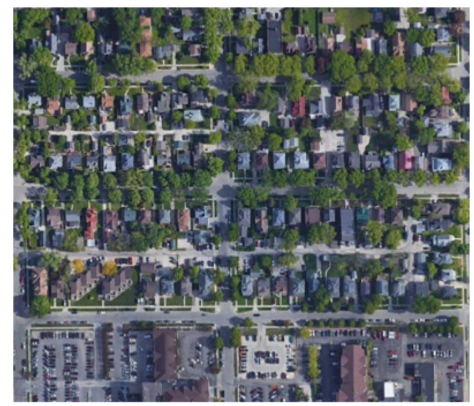
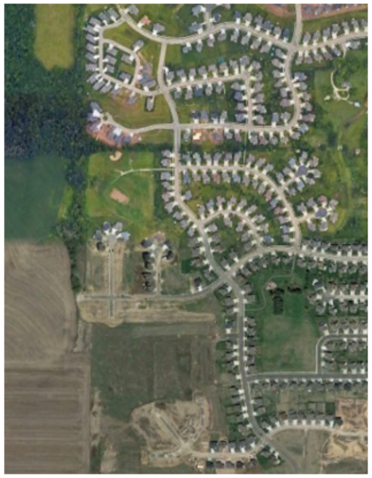


Table 10-5: Land Use Context Categories

Classification	Description	Examples
Rural	Rural land use is a medium to large size, occasionally or sparsely settled area predominantly composed of agricultural or other resource-dependent uses. Very limited, scattered single lot development of housing or small commercial use may be permitted and areas of native use such as forests and waterways are found throughout. Major roads are typically higher speed with limited access, serving longer travel to regional destinations, with access provided via a widely spaced paved or gravel road grid.	
Rural Town	A Rural Town is a small, lightly developed area located at the intersection of two rural roads, typically in an unincorporated or very small community. Uses can be mixed but they are primarily residential with small commercial or industrial uses housed in buildings of small (1-2 story) size with moderate setbacks. Rural towns are generally served by a primary state or county highway "main street" that service predominantly regional traffic and provide connection for local residents to other cities and towns in the region.	
Suburban	Suburban development areas consist of large-lot residential development at low densities with limited commercial and industrial use on scattered sites. Uses of a rural nature such as crop production, animal husbandry, and mineral extraction operations may be found in these areas but are not expected to be long term or permanent uses. Development is reliant on vehicle travel with primary travel service provided by the regional network of state or county highways. Local access is predominantly provided by a network of paved or gravel township roads.	

Classification	Description	Examples
Rochester CBD	The Rochester CBD serves the highest intensity and greatest diversity of uses found in the planning area including multi-unit residential, commercial, office, civic, entertainment and institutional uses. Block patterns are regular served by a grid street network, with buildings close to the street. This area has the greatest level of multi-modal connectivity, with a fully developed pedestrian system and the highest level of access to transit found in the planning area. Because of its development density and diversity of uses, this land-use pattern generates a high prevalence of non-motorized trips, including walking, transit, and bicycling. Traffic of all types is expected to be medium to high volume. While the need for mobility through these areas does exist, it is far exceeded by the need for internal circulation within the zone. Vehicle parking is typically in structures.	
Rochester Core	The Rochester Core consists primarily of long-established residential neighborhoods incorporating a variety of moderate density housing located within walking distance of the Rochester CBD. Small retail and service businesses are found at scattered locations along collector or arterial streets. Development is generally compact with an interconnected grid of streets and sidewalks. Access to transit is good, as many city routes connecting the CBD to the greater urban area traverse the core area. Strategic Arterial highways that serve as gateways to the CBD do penetrate this area and generally feature continuous, auto-oriented commercial frontage at a scale of 1-2 story buildings with off-street parking provided.	
Rochester Urban Area	Lands in the Rochester Urban Area account for the largest share in the urbanized area and contain a wide variety of moderate to low intensity residential and non-residential use of moderate size (1-3 story). The majority of residential use is composed of single-family neighborhoods featuring limited areas organized around a historic grid street pattern and most areas organized around the more typical curvilinear street pattern	

Classification	Description	Examples
	common to post-World War II development. Non-residential use is found scattered throughout the area, generally located along major regional or urban arterial street corridors or in business districts situated at locations with good access to the major highway network. Mixed use development is limited, mostly composed of multi-family rental housing located near (but not integrated with) non-residential land use. Most predominant land uses (residential, commercial, industrial) are isolated and buffered from other use types. Transit service is more limited in these areas, and typical distances between residential origins and non-residential destinations makes pedestrian travel less attractive. On-street parking is more common, particularly in residential and small-scale business areas, and access from main roads is typically limited and moderately spaced.	
Rochester Urban Edge	The Rochester Urban Edge is an area of low intensity development, with a relatively low diversity of uses, similar in current character to the Rural Area classification but unique in that it's proximate to the Rochester urban service area and could be served with municipal sewer and water services in the future with relative ease. The Urban Edge is intended to serve as reserve for future urban expansion within and beyond the 25-year horizon of this plan; the ability to extend urban services into this area would be expected to materialize under normal conditions in a 10 to 30-year timeframe. Travel in this area will be predominantly auto-oriented in the near term and over time will transition from more of a rural-style travel environment to an urban-style travel environment as expansion occurs. Use of strategies aimed at protecting lands from development that may be needed for future right-of-way is important in these areas.	

Classification	Description	Examples
Small City Core	While smaller and less dense than the Rochester Urban Zones, the Small City Core is similarly characterized by a high diversity of use types, including, office, retail, civic, and cultural facilities, with structures typical of late 19th to early 20th century mid- to low-rise development oriented toward the street with minimal setbacks. Parking is often provided on-street along the main thoroughfare, with additional parking at the rear of the building accessible by alleys or other minor streets. As in Rural Towns, the “Main Street” in the core is often a state or county highway that serves both local trips as well as longer regional pass-through trips. While the need for mobility through these areas exists, it is somewhat exceeded by the need for internal circulation within the zone.	
Small City Urban Area	The Small City Urban Area will be characterized predominantly by residential neighborhoods, sometimes mixed with retail, restaurant, office or institutional uses such as local schools. Block sizes are regular and, depending on distance from the core, will transition from more of a historic grid layout closer to the core to a more contemporary curvilinear layout in newer areas. Small establishments sometimes occupy principal corners in the older areas. Primarily, however, commercial and business establishments will be located along major streets, often state or county highway corridors, in a strip pattern or pods of development with good access to the major street network.	
Small City Urban Edge	The Small City Urban Edge is a transitional area where future urban growth is expected but where current use is more represent of what is seen in rural areas, with rural style agricultural use still predominating along with infrequent, scattered residential or commercial use. These areas are expected to transition over time to urban style development as expansion occurs and access to urban services becomes available over a 10 to 30-year period.	

Figure 10-5: Functional Designation System Plan (ROCOG Planning Area)

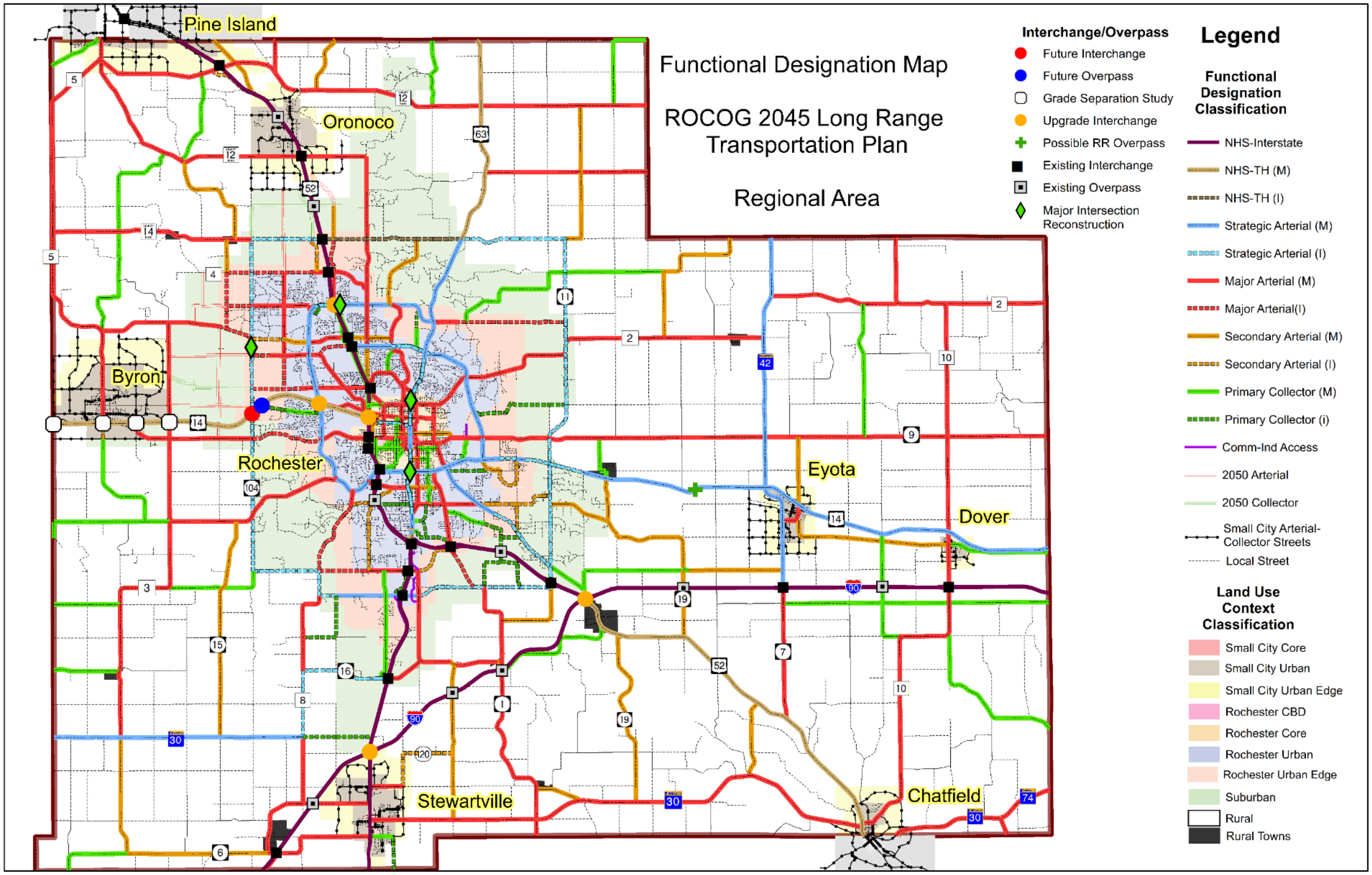
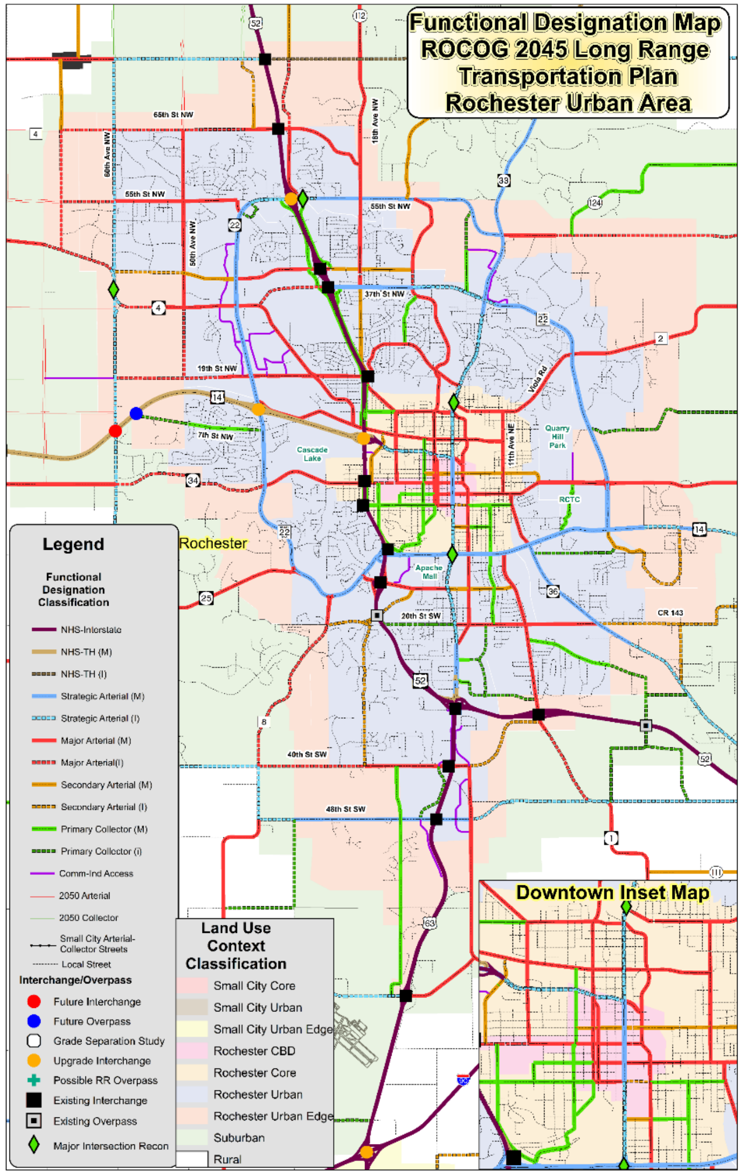


Figure 10-6: Functional Designation System Plan (Rochester Urban Area)



LRTP 2045

Overview of Street Network Guidelines

Network planning establishes a framework for the transportation system and distinguishes the functional role and desired character of individual roadways in the network. The roadway designations illustrated in Figures 10-5 and 10-6 established the high level functional role of major roadways in the ROCOG Area network; the Street Network Guidelines in this section will refine the expectations for various roadway designations in terms of multi-modal and intermodal service and character, reflecting the land use context in which a roadway is located. The principles and guidelines in this section discuss the following considerations:

- The 1st Principles of **Travel Service** define the primary travel character of a roadway, based on its functional designation and land use context it is located in. These guidelines will identify whether roadway features will encourage mobility or accessibility, which modes are of primary importance in a given type of land use area, and provide a target travel speed for vehicular traffic.
- The 2nd Principles of **Sizing Factors** establish basic parameters that impact right-of-way needs, such as anticipated number of travel lanes, whether use of a median should be considered, and how other general considerations such as drainage and topography affect right-of-way needs.
- The 3rd Principles discuss **Basic Modal Accommodations**, which identify the basic level of modal improvement to plan for based on potential combinations of roadway designation and land use. Guidelines are provided for the primary modes of vehicular, pedestrian, and bicycle travel.
- The 4th Principles identify **Modal Overlays**, which are mode-specific improvement recommendations found in this Plan or other plans that need to be considered in addition to the basic accommodation needs discussed under the 3rd Principles.

In practice, network planning guidelines can help to resolve issues regarding the function and character of a roadway. Ideally, the network planning considerations laid out in this section will inform decisions at an early alternatives-analysis phase of project development and will be considered in community planning projects addressing matters such as future land use, economic development, and environmental resource management. Consideration of these network planning guidelines desirably will lead to solutions that balance the demand for vehicle throughput with accommodation for other modes and support for adjacent development.

In planning for major improvements, it is important to think beyond today's needs and consider the potential long-term benefits of a project. While planning timelines are often set at 20-25 years, a project may need to function for 50 years or more. Dedicating space to transit or bike lanes, for example, may garner opposition because traffic models predict increases in auto traffic that pre-empt using space for other needs. However, as areas build out, traffic volumes may actually stabilize or decline slightly over time as land use patterns mature, with a greater mixture of uses or development intensity that supports increased walking, biking, and transit use.

The implications for right-of-way needs suggested by the guidance found in this section is likely to be accommodated most easily in rural, suburban, and developing urban areas, where greater opportunity for adjusting right-of-way width still exists. In fully developed or redeveloping areas where right-of-way may be constrained, it may be necessary to compromise on certain features in order to improve the travel service provided. Recognizing this, the plan suggests priorities for constrained roadway corridors in developed areas.

The guidelines herein are designed to meet the need for flexibility by generally avoiding the use of numerical values in order to allow project designers to balance the needs of multiple modes, utility installation, environmental mitigation, and community space needs. This flexibility is intended to encourage consideration of how individual elements work together during project development rather than how well they meet a strict set of minimum dimensions.

An important concept addressed is **modal emphasis**. Modal emphasis is the identification of which travel modes should be emphasized in the design of the cross-section for a roadway. It is important to note that modal emphasis does not mean that other travel modes are excluded; these secondary modes will be accommodated to provide a minimum level of acceptable service while primary modes are accommodated at a higher level of service. While there may occasionally be cases where some modes are excluded (such as on a freeway), the basic principle advocated in this Plan is to assume there is at least a minimum level of accommodation made for all travel modes within a travel corridor, recognizing that some of those accommodations may need to be on a parallel, nearby corridor.

Additional guidelines related to operational features of major roads such as signal spacing, median opening spacing, and spacing of public street connections on major roadways are found in Chapter 14, Transportation System Management and Operations, where general policy on property access is discussed as well as vehicular Level of Service for use in planning and design.

1st Principles: Travel Service

In a regional travel network, different roadways will serve different primary functions. Certain roadways will function to move traffic smoothly through an area or deliver significant volumes of traffic to major destinations such as central city areas, while other roadways will primarily provide accessibility between destinations within a community or subarea district while also serving to move traffic from mobility corridors to its final destination. A travel network can best achieve the goals of safely and efficiently moving people and goods while supporting other community goals when the functions of mobility and accessibility area appropriately balanced for all modes in the region.

Achieving balance in the system requires providing accommodation for various modes of travel and consideration of roadway design factors affecting walking, bicycling, transit, and freight service with equal levels of rigor as for general traffic. For example, instead of focusing solely on vehicle Level of Service (LOS), designing for all users means looking at levels of delay, capacity, and comfort for transit and non-motorized users as well as vehicle traffic. In addition to adequate capacity and safe design for expected vehicle volumes, the need for transit infrastructure, walkways and bikeways, along with the use of community space in the right-of-way, needs to be considered in the context of different land uses found in fully urbanized, urbanizing, suburban, and rural land use environments.

The following paragraphs discuss the three primary "First Principles" of travel service that will help to define the character of major roads within the planning area. These First Principles include:

- Mobility/accessibility
- Modal emphasis
- Target speed

Tables 10-7 through 10-9 identify for each combination of roadway functional designation and land use context designation expectations for these three travel service factors.

Mobility/Accessibility

A key characteristic that helps to shape the design of the traveled way is how the balance between mobility and accessibility is addressed. The relative emphasis given to these two factors will reflect consideration of the expected mix of modes, the volume of people movement, and the general lengths of trips handled by a corridor, which in turn is impacted by factors such as land use.

Mobility is how far you can go in a given amount of time. **Accessibility** is how much you can get to in that time.

In locations where there is a lot of activity and a lot of destinations people travel between fairly frequently, accessibility will be a prime consideration, with the ability to move about safely and reliably by various modes within a district or neighborhood an important consideration. Mobility takes precedence where travel distances to destinations are greater, leading to the objective of minimizing the amount of unproductive time needed to traverse those greater distances for work, shopping, recreation, and other trip purposes safely and conveniently. A well-designed multimodal system will strive to balance between mobility and accessibility to reliably support a variety of different trip types.

Modal Emphasis

The second travel service principle is the concept of designing roadways around modal emphasis. Modal emphasis is defined in these guidelines as giving greater consideration in design of a facility to those elements that serve particular travel modes. It is important to highlight that modal emphasis does not imply certain travel modes are excluded – the goal is to accommodate all modes to the degree possible along a roadway – but not all modes are necessarily emphasized to the same degree. In certain cases, modes may need to be excluded (such as pedestrian or bicycle travel on a freeway), but in doing so, accommodation of those modes should be considered during project development in the larger travel corridor that serves similar travel origins and destinations.

In Tables 10-7 through 10-9, modes are classified as primary or secondary to clarify the importance attached to each for each combination of roadway classification and land use area. The modes of travel considered in terms of modal emphasis are:

- General vehicle travel
- Pedestrian
- Transit
- Low speed personal mobility (bicycles/scooters)
- Commercial truck traffic

Target Speed

The final travel service principle considered is target speed. Target speed is considered to be the speed range at which vehicles should operate on a roadway in a specific context, compatible with adjacent land use and the level of multimodal travel activity in an area. It may be the most influential design control and the control that provides the most flexibility, particularly in urban areas.

Motorists make decisions on how fast to drive based partially on posted speed limit signs and partially on physical cues in the environment (e.g., trees, parked cars, etc.). If higher speeds feel natural and instinctive, people are likely to drive at higher speeds due to the intuitive cues provided by design of the roadway.

Using street design for communicating desired operating speed means designing to a target speed, or the speed at which the community desires motorists to travel. Incorporation of appropriate design features can help achieve a successful design where design speed, target speed, and the speed limit begin to converge.

Among the types of features that can help achieve an appropriate target speed are:

- Physical measures such as curb extensions and medians to narrow the traveled way;
- Setting signal timing for moderate progressive speeds from intersection to intersection;
- Using narrower travel lanes that cause motorists to naturally slow; or
- Using design elements such as on-street parking to create side friction.

Street Character Guidelines

Tables 10-7 through 10-9 identify basic street character priorities for the factors of mobility vs accessibility, modal priority, and target speed. Each factor is rated on a continuum from low to high; the significance of the ratings as applied to early project planning is as described in Table 10-6.

Table 10-6: Description of Street Character Guideline Ratings

Characteristic	Low	Moderate	High
Mobility	Modal ease of movement is limited either by design or level of travel to support economic activity or quality of life goals with connectivity to an area	Expect to see ease of movement on a travel corridor periodically interrupted by activity level in area or convergence of moderate to high travel demand	Ability to travel relatively freely along a travel corridor so as to be able to minimize travel time or maximize reliability of travel through the corridor
Accessibility	Generally, will see less than 5 modal access connections per mile on each side of roadway	Generally, will see from 5 to 15 modal access connections per mile on each side of roadway	Generally, will see more than 15 modal access connections per mile on each side of roadway
Modal Significance	For a given mode expect to see limited use with relatively few origins/destinations generating travel in the area	Expect to see moderate levels of modal travel but roadway is not critical for meeting mobility or access function	Roadway is important for mobility or access for a given mode with normal to high use expected
Target Speed	Typical Operating speed below 35 MPH	Typical Operating Speed is between 35 and 45 MPH	Typical operating speed is above 50MPH

Table 10-7: Street Character Guidelines for Rural and Suburban Areas

RURAL/REGIONAL AREA		Rural	Rural Town	Suburban
National Highway System Non-Freeway	Mobility/Accessibility	MOB: High / ACC: Low	MOB: High / ACC: Mod	MOB: High / ACC: Low
	Modal Significance	High: Veh/Trk Low: Ped/Bike	High: Veh/Trk Mod/Low: Ped Bike	High: Veh/Trk Mod/Low: Ped Bike
	Target Speed	High	Moderate	Mod-High
Strategic Arterials	Mobility/Accessibility	MOB: High / ACC: Low	MOB - High / ACC-Mod	MOB - High / ACC-Low
	Modal Significance	High: Veh/Trk Low: Ped/Bike	High: Veh/Trk Mod/Low: Ped Bike	High: Veh/Trk Mod/Low: Ped Bike
	Target Speed	High	Moderate	Mod-High
Major Arterials	Mobility/Accessibility	MOB: High / ACC: Mod	MOB - Mod / ACC-Mod	MOB - High / ACC-Mod
	Modal Significance	High: Veh/Trk Low: Ped/Bike	High: Veh/Trk Mod/Low: Ped Bike	High: Veh/Trk Mod/Low: Ped Bike
	Target Speed	High	Moderate	Mod-High
Secondary Arterials	Mobility/Accessibility	MOB: High-Mod / ACC:Mod	MOB - Mod / ACC-Mod	MOB - Mod / ACC-Mod
	Modal Significance	High: Veh Moderate:Trk Low: Ped/Bike	High: Veh Mod:Trk Ped Low: Bike	High: Veh Moderate: Trk Ped Bike
	Target Speed	High	Moderate	Mod-High
Primary Collectors	Mobility/Accessibility	MOB: Mod / ACC:Mod	MOB - Mod / ACC-High	MOB - Mod / ACC-Mod
	Modal Significance	High: Veh Moderate:Trk Low: Ped/Bike	High: Veh Mod:Trk Ped Low: Bike	High: Veh Moderate: Trk Ped Bike
	Target Speed	Mod-High	Moderate	Moderate

Table 10-8: Street Character Guidelines for Small City Areas

SMALL CITIES		Small City Core Area	Small City Urban Area	Small City Edge Area
National Highway System Non-Freeway	Mobility/Accessibility	MOB: Mod / ACC:Mod	MOB - Mod-High / ACC-Mod	MOB: High / ACC-Mod-Low
	Modal Significance	High: Ped Veh Trk Low: Bike	High: Veh Trk Mod: Ped Bike	High: Veh Trk Mod-Low: Ped Bike
	Target Speed	Low	Moderate	High
Strategic Arterials	Mobility/Accessibility	Not Applicable	MOB: Mod-High / ACC-Mod	MOB: High / ACC-Mod
	Modal Significance		High: Veh Trk Mod: Ped Bike	High: Veh Trk Mod-Low: Ped Bike
	Target Speed		Mod-High	High
Major Arterials	Mobility/Accessibility	MOB: Mod-Low / ACC-Mod	MOB-Mod / ACC Mod	MOB: Mod-High /Acc Mod
	Modal Significance	High: Ped Veh Trk Mod: Bike	High: Ped Veh Trk Mod: Bike	High: Veh Trk Mod-Low: Ped Bike
	Target Speed	Low	Mod	Mod-High
Secondary Arterials	Mobility/Accessibility	Not Applicable	MOB-Mod / ACC Mod-High	MOB: Mod /Acc Mod
	Modal Significance		High: Ped Veh Trk Mod: Bike	High Veh Moderate Ped Bike Trk
	Target Speed		Mod	Mod-High
Primary Collectors	Mobility/Accessibility	MOB: Low / ACC-High	MOB-Mod / ACC Mod-High	MOB: Mod /Acc Mod
	Modal Significance	High Ped Veh Moderate Bike Trk	High Ped Veh Moderate Bike Trk	High Veh Moderate Ped Bike Trk
	Target Speed	Low	Mod	Mod-High

Table 10-9: Street Character Guidelines in Rochester Urban Area

ROCHESTER URBAN AREA		Rochester CBD	Rochester Core	Rochester Urban	Rochester Edge
National Highway System Non-Freeway	Mobility/Accessibility				Mob: High / Acc: Mod
	Modal Significance	Not Applicable	Not Applicable	Not Applicable	High:Veh/Trk Mod: Bike / Low:Ped
	Target Speed				Mod-High
Strategic Arterials	Mobility/Accessibility	Mob: Mod-Low / Acc: Mod	Mob: Mod / Acc: Mod	Mob: Mod-High / Acc: Mod-Low	Mob: High / Acc: Low-Mod
	Modal Significance	High: Transit - Ped - Veh Mod: Trk Low:Bike	High: Transit - Ped - Veh Mod: Bike - Trk	High: Veh Trk Mod: Transit Bike Ped	High: Veh Trk Mod: Bike / Low:Ped
	Target Speed	Low-Mod	Low-Mod	Moderate	Mod-High
Major Arterials	Mobility/Accessibility	Mob: Mod-Low / Acc: Mod-High	Mob: Mod / Acc: Mod-High	Mob: Mod-High / Acc: Mod	Mob: High / Acc: Low
	Modal Significance	High: Veh-Ped - Transit Mod-Low: Trk -Bike	High: Veh-Ped Mod: Transit Bike Trk	High: Veh Ped Mod: Trk Bike Trnst	High: Veh - Trk Mod: Bike / Low:Ped
	Target Speed	Low	Low	Moderate	Mod-High
Secondary Arterials	Mobility/Accessibility	Mob - Low / Acc Mod-High	Mob: Low-Mod / Acc: Mod-High	Mod: Mod / Acc : Mod	Mob: Mod-Low/ Acc: Mod
	Modal Significance	High: Ped Bike / Mod: Veh Low: Transit-Trk	High: Ped Bike / Mod: Veh Low: Transit-Trk	High: Veh Ped Bike Mod: Transit / Low: Trk	High: Veh Mod-Low: Bike-Ped
	Target Speed	Low	Low	Moderate-Low	Moderate
Primary Collectors	Mobility/Accessibility	Mob: Low / Acc - High	Mob: Low / Acc - High	Mob: Mod / Acc: High	Mob: Mod / Acc Mod
	Modal Significance	High: Ped - Bike / Mod: Veh Low: Transit - Trk	High: Ped Bike / Mod: Veh Low: Transit-Trk	High: Veh Ped Bike Mod: Transit / Low: Trk	High: Veh Mod-Low: Bike-Ped
	Target Speed	Low	Low	Moderate -Low	Moderate-Low

2nd Principles: Sizing Factors

The second set of street planning principles relates to issues that establish the basic right-of-way needs for roadways. The amount of right-of-way available or which needs to be acquired has implications for the ability to provide for multiple modes of travel as well as meeting other community priorities such landscaping or other amenities. Generally, right-of-way will be easier to establish in newly developing or redeveloping urban areas, suburban areas, and rural areas; in fully developed urban areas, the challenge of accommodating various corridor uses will be greater. The discussion in this section highlights the key factors that influence right-of-way needs in general, and also provides guidance on how to balance or prioritize needs in areas where available right-of-way is limited.

Among the key factors that come into play when assessing right-of-way needs include:

- The number of needed vehicular travel lanes
- Space for auxiliary travel lanes such as turn lanes
- Support space for vehicular travel, typically taking the form of shoulders in rural areas or space for functions such as loading/unloading, transit boarding, and on-street parking in urban areas, as well as the use of medians where appropriate
- Space for active transportation users including pedestrians and bicyclists
- Space for amenity or environmental functions such as landscaping or drainage

This multiplicity of demands demonstrates the importance of having sufficient right-of-way for responding to various travel and community needs, and the factors that may need to be compromised when right-of-way is largely fixed by existing development patterns.

Travel Lanes

The size of a roadway is strongly influenced by the intensity and type of anticipated travel demand expected in the corridor. It is common practice to size roadways to accommodate the travel demand that is anticipated to occur up to 20-25 years from the time it is constructed. The selection of this time period represents a balance between achieving the greatest benefit from a projects service life within reasonable planning limits, since making frequent incremental changes to a roadway design over a period of years is likely to be prohibitively expensive. Since it is generally most cost-effective to provide roadway capacity in large increments, a longer time horizon is desirable when planning for road construction.

The land use that occurs along a roadway corridor, while not generally responsible for the majority of travel on the roadway, will affect vehicular traffic capacity, travel by pedestrians and bicyclists, and need for on-street parking. The amount of traffic that can be managed on a roadway is dependent upon factors such as the presence of parking, frequency of driveways and intersections, intersection traffic control, and roadway alignment. The data in Table 10-10 presents the approximate Annual Average Daily Traffic volumes that can be accommodated by non-freeway roadways.

The differences between the two columns in Table 10-10 reflect that the traffic a road can accommodate varies and is a function of not only physical features such as intersection frequency and parking, but also operational elements including the level of access management, operating speeds, the relative levels of through traffic and access traffic, and the level of traffic management implemented such as signal coordination and signal timing.

Table 10-10: Approximate Volumes for Planning Future Roadway Improvements

Road Type	Standard Management	Enhanced Management*
Two-Lane Road	Up to 12,000 VPD	Up to 15,000 VPD
Three-Lane Road	Up to 18,000 VPD	Up to 22,500 VPD
Four-Lane Road	Up to 24,000 VPD	Up to 30,000 VPD
Five-Lane Road	Up to 35,000 VPD	Up to 43,500 VPD

*Volumes that can be achieved with adequate road design, access control and other capacity enhancing measures.

VPD – Vehicles Per Day

In addition to vehicle travel, it is important to consider right-of-way needs for other types of travel as well. Answering the following questions can help ascertain what accommodations will or should be made for various other modes of travel.

- **Land uses:** What pedestrian, bicycle, or transit generators are located along the roadway? Are there large shopping destinations? Large employers? Public facilities? Are there visitor destinations? How might existing land use patterns change based on approved or planned development? Is there a redevelopment plan for the area? What land use changes are planned or anticipated to occur?
- **Travel patterns:** What percentage of the expected vehicular trips are local? Are there unique travel patterns or modes served by the corridor? Will new or emerging transportation services or technologies influence trip-making?
- **Safety data:** How many and what types of crashes are occurring along the roadway?
- **Types of pedestrians:** Are there generators or attractors that would suggest that younger or older pedestrians or other special user groups will be using the roadway (e.g., schools, elderly care facilities, assisted living centers)?
- **Types of bicyclists:** Is the roadway a critical link for the local or regional bicycle network? Does the roadway connect to or cross trails or bicycle facilities? Are bicyclists using the roadway to access shopping, employment, or recreational destinations?
- **Transit:** What type of transit service exists or is planned for the area? Where are transit stops located? Can pedestrians reach these stops from either side of the street without significant diversion of their trip? Are transit stops accessible using the network of existing bicycle and pedestrian facilities?

- **Freight:** What is the percentage and volume of heavy trucks using the roadway? Are there destinations that require regular access by heavy trucks or other large vehicles? Is the roadway part of a designated freight corridor? Where does loading and unloading occur along the roadway?

Medians

Medians are another element of roadway design that need to be considered when assessing the need for right-of-way. Medians are the center portion of a roadway that separates opposing directions of travel. Medians vary in width and purpose and can be raised with curbs or painted and flush with the pavement. Medians are used to achieve a range of objectives when designing a street, including:

- Reducing traffic conflict at intersections or access connections
- Separating opposing traffic flows for increased safety
- Storing left turning and U-turning vehicles at intersections
- Providing a pedestrian refuge area to improve crossing safety
- Creating a focal point or identifiable gateway into a community, neighborhood, or district by means such as creating tree canopies over travel lanes, providing space for attractive landscaping or space for lighting and urban design features

Raised medians should be considered during the construction, reconstruction, and improvement of all multi-lane strategic arterials and major arterials where posted speeds equal or exceed 40 mph. More specifically, medians should be considered where:

- Forecasted average daily traffic is anticipated to be 28,000 vehicles per day during the 20-year planning period; **or**
- The annual vehicular accident rate is greater than the statewide annual average accident rate for similar roadways; **or**
- Pedestrians are unable to safely cross the roadway, as demonstrated by an accident rate that is greater than the statewide annual average accident rate for similar roadways; **and/or**
- Topography and horizontal or vertical roadway alignment result in inadequate left-turn intersection sight distance and it is impractical to relocate or reconstruct the connecting approach road or impractical to reconstruct the highway in order to provide adequate sight distance.

Depressed medians are preferred in rural areas and on urban corridors where speed limits will exceed 45 MPH. Medians can serve as an integral part of an access management strategy for a roadway to improve safety and multimodal operational efficiency.

Road Improvements in Developed Corridors

Proposed work on major roadways in areas that are fully developed frequently raise concerns from citizens about potential design changes to the street on which they live, own a business, or frequently travel. The types of changes or decisions that are made regarding arterial and collector streets range from regulation of access to improvements that will enhance different modes of travel or expand the number of lanes on the facility.

In developed areas, substandard right-of-way is a significant concern that may preclude the minimum desired design. When this occurs, it is necessary to prioritize which design elements should be provided for within the limited right-of-way available. Table 10-11 provides a summary of the suggested priorities that should be given to different kinds of improvements on existing roadway corridors in developed areas with substandard right-of-way.

Table 10-11: Improvement Priorities in Corridors with Substandard Right-of-way Width

Priority for Improvement in Existing Substandard Corridors

Land Use Overlay Zone	Upgrading to Current Design Standards	Adding Turn Lane Capacity	Providing Adequate # of Travel Lanes	Retaining On-Street Parking	Installing Median on Undivided Roads	Adding Sidewalks or Paths	Controlling Access
Planned Freeways							
Urban	High	N/A	High	N/A	N/A	N/A	Very High
Rural	High	N/A	High	N/A	N/A	N/A	Very High
Expressways							
CBD/Core	High	Very High	Medium	Low	Medium	High	Very High
Urban	High	Very High	High	Low	High	High	Very High
Rural	High	Very High	Medium	N/A	Medium	N/A	Very High
Other Strategic & Major Arterials							
CBD/Core	High	Very High	Medium	Low	Medium	High	High
Urban	Medium	Very High	Medium	Low	Low	HIgh	High
Rural	Medium	High	Low	N/A	Low	N/A	High
Secondary Arterial and Primary Collectors							
CBD/Core	Medium	High	Low	Medium	N/A	High	Medium
Urban	Medium	High	Low	Medium	N/A	Medium	Low
Rural	Medium	Medium	Low	N/A	N/A	N/A	Low

3rd Principles: Basic Modal Accommodations

The principle of **basic modal accommodation** provides a flexible framework to inform community planning and project development processes, taking into account land use context, road functions, and user needs. The guidance provided in Tables 10-12 through 10-14 provides information to inform planning of a roadway's basic design by helping to define the role of the roadway within the local, city, and regional transportation network as it relates to the needs of various roadway user groups and their expected use of a corridor.

Roadway planning requires an understanding of the function of a roadway within its current and expected future context and the needs of the potential roadway users. The Basic Modal Accommodation Matrix presented in Tables 10-12 through 10-14 assists by identifying a recommended baseline level of improvement for different users considering roadway function and land use context. These recommendations are a starting point to assist in identifying basic travel needs and allocating space to different users on a given roadway. This process can assist in providing input to the purpose and need of a project which will assist in establishing the conceptual framework of a project. Specific needs of individual user groups may be subject to further refinement by modal overlays as discussed later in this section. Modal overlays refer to plans that have been developed specific to a mode (such as a bicycle master plan) or specific to an area (such as a downtown master plan).

Balancing modal needs is a central element of planning for future travel demand. It is understood that there is the possibility that desired facilities may not be able to be provided for all every on every roadway. There will be instances where the mobility needs for some groups require adjustments and/or consideration of alternative routes as well as possible revisions to modal overlay plans. On high-speed, high volume arterials, for example, bicycles and pedestrians may need to be accommodated on a parallel roadway with lower speeds or volumes where the proper designs could be attained to accommodate their mobility needs. Likewise, a corridor with limited right-of-way providing important connectivity for bicycle mobility may require the presence of bicycle facilities that would lower speeds and possible reductions in space devoted to vehicle travel and storage.

Guidance in the Basic Modal Accommodation Matrix is organized by functional designation and land use context. Tables 10-12 through 10-14 establishes baseline parameters for vehicular, pedestrian, and bikeway needs to ensure that projects are consistently planned with all users in mind.

Consideration of multiple modes of transportation (vehicles, pedestrians, bicyclists, transit vehicles and users, and local delivery needs) in the planning and

Table 10-12: Basic Modal Accommodation in Rural/Suburban Areas

RURAL/REGIONAL AREA		Rural	Rural Town	Suburban
National Highway System Non-Freeway	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Shared Shoulder	Shared Shoulder	Shared Shoulder
	Medium/High Ped Volume	N.A.	N.A.	N.A.
	Skilled/Confident Cyclists	Shared Shoulder	Shared Lane/Shoulder	Shared Shoulder
	All Age/All Ability Cyclists	Trail/Path Only	Shared Shoulder/Path	Trail/Path Only
Strategic Arterials	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Shared Shoulder	Shared Shoulder	Shared Shoulder
	Medium/High Ped Volume	N.A.	N.A.	N.A.
	Skilled/Confident Cyclists	Shared Shoulder	Shared Lane/Shoulder	Shared Shoulder
	All Age/All Ability Cyclists	Trail/Path Only	Shared Shoulder/Path	Trail/Path Only
Major Arterials	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Shared Shoulder	Shared Shoulder	Shared Shoulder
	Medium/High Ped Volume	N.A.	N.A.	N.A.
	Skilled/Confident Cyclists	Shared Shoulder	Shared Lane/Shoulder	Shared Shoulder
	All Age/All Ability Cyclists	Trail/Path Only	Shared Shoulder/Path	Trail/Path Only
Secondary Arterials	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Shared Shoulder	Shared Shoulder	Shared Shoulder
	Medium/High Ped Volume	N.A.	N.A.	N.A.
	Skilled/Confident Cyclists	Shared Lane/Shoulder	Shared Lane/Shoulder	Shared Lane/Shoulder
	All Age/All Ability Cyclists	Trail/Path Only	Shared Shoulder/Path	Trail/Path Only
Primary Collectors	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Shared Shoulder	Shared Shoulder	Shared Shoulder
	Medium/High Ped Volume	N.A.	N.A.	N.A.
	Skilled/Confident Cyclists	Shared Lane/Shoulder	Shared Lane/Shoulder	Shared Lane/Shoulder
	All Age/All Ability Cyclists	Shared Shoulder/Path	Shared Shoulder/Path	Shared Shoulder/Path

Table 10-13: Basic Modal Accommodation in Small City Areas

SMALL CITIES		Small City Core Area	Small City Urban Area	Small City Edge Area
National Highway System Non-Freeway	Vehicular Thru Lanes	2-4 Lanes	2-4 Lanes	2-4 Lanes
	Rare/Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Shoulder/Walk
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Standard Walk/Path
	Skilled/Confident Cyclists	Bike Lane	Wide Outside Lane (WOL)	WOL or Shoulder
	All Age/All Ability Cyclists	Shared Path or Trail	Shared Path or Trail	Shared Path or Trail
Strategic Arterials	Vehicular Thru Lanes	Not Applicable	2 Lanes	2 Lanes
	Rare/Low Ped Volumes		Standard Walk/Path	Standard Shoulder/Walk
	Medium/High Ped Volume		Standard Walk/Path	N.A.
	Skilled/Confident Cyclists		Shared Shoulder	Shared Shoulder
	All Age/All Ability Cyclists		Shared Path or Trail	Shared Path or Trail
Major Arterials	Vehicular Thru Lanes	2-4 Lanes	2-3 Lanes	2 Lanes
	Rare/Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Shoulder/Walk
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Standard Walk/Path
	Skilled/Confident Cyclists	Bike Lane	Wide Outside Lane (WOL)	WOL or Shoulder
	All Age/All Ability Cyclists	Shared Path or Trail	Shared Path or Trail	Shared Path or Trail
Secondary Arterials	Vehicular Thru Lanes	Not Applicable	2 lanes	2 lanes
	Rare/Low Ped Volumes		Standard Sidewalk	Standard Shoulder/Walk
	Medium/High Ped Volume		Wide Sidewalk	Standard Walk/Path
	Skilled/Confident Cyclists		Shared Travel Lane	Wide Outside Lane
	All Age/All Ability Cyclists		Shared Path or Trail	Shared Path or Trail
Primary Collectors	Vehicular Thru Lanes	2 lanes	2 lanes	2 lanes
	Rare/Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Shoulder/Walk
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Standard Walk/Path
	Skilled/Confident Cyclists	Wide Outside Lane	Shared Travel Lane	Shared Travel Lane
	All Age/All Ability Cyclists	Shared Path or Trail	Shared Path or Trail	Shared Path or Trail

Table 10-14: Basic Modal Accommodation in Rochester Urban Area

ROCHESTER URBAN AREA		Rochester CBD	Rochester Core	Rochester Urban	Rochester Edge
National Highway System Non-Freeway	Vehicular Thru Lanes	Not Applicable	Not Applicable	Not Applicable	2-4 Lanes
	Rare / Low Ped Volumes				Standard Shoulder/Walk
	Medium/High Ped Volume				Standard Walk/Path
	Skilled/Confident Cyclists				Shared Shoulder
	All Age/All Ability Cyclists				Shared Path or Trail
Strategic Arterials	Vehicular Thru Lanes	4-6 Lanes	4-6 Lane	2-4 Lane	2-4 Lanes
	Rare / Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Walk or Path	Standard Walk or Path
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Wide Walk or Path	Wide Walk or Path
	Skilled/Confident Cyclists	Bike Lane	Bike Lane	Shared Shoulder	Shared Shoulder
	All Age/All Ability Cyclists	Protected Lane or Path	Protected Lane or Path	Path or Trail	Path or Trail
Major Arterials	Vehicular Thru Lanes	2-4 Lanes	2-4 Lane	2-4 lane	2-3 Lane
	Rare / Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Walk or Path	Standard Walk or Path
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Wide Walk or Path	Wide Walk or Path
	Skilled/Confident Cyclists	Bike Lane	Bike Lane	Bike Lane	Shared Shoulder
	All Age/All Ability Cyclists	Protected Lane or Path	Protected Lane or Path	Protected Lane or Path	Path or Trail
Secondary Arterials	Vehicular Thru Lanes	2-4 Lanes	2-3 Lane	2-3 Lane	2 Lane
	Rare / Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Walk or Path	Standard Walk or Path
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Wide Walk or Path	Wide Walk or Path
	Skilled/Confident Cyclists	Bike Lane	Bike Lane	Bike Lane	Wide Outside Lane
	All Age/All Ability Cyclists	Protected Lane or Path	Protected Lane or Path	Protected Lane or Path	Path or Trail
Primary Collectors	Vehicular Thru Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes
	Rare / Low Ped Volumes	Standard Sidewalk	Standard Sidewalk	Standard Walk or Path	Standard Walk or Path
	Medium/High Ped Volume	Wide(M) to Enhanced (H)	Wide Sidewalk	Wide Walk or Path	Wide Walk or Path
	Skilled/Confident Cyclists	Bike Lane	Bike Lane	Wide Outside Lane	Shared Lane
	All Age/All Ability Cyclists	Protected Lane or Path	Protected Lane or Path	Protected Lane or Path	Path or Trail

design of all modes of transportation has been part of federal, state and local policy and practice for decades, although with mixed success. There has been increasing interest in building better approaches, including policy, planning and design processes to assist in "Completing our Streets." The guidance in the Basic Modal

Accommodation Matrix is intended to be used along with the information found in other sections in this chapter on travel service, sizing and modal overlays to provide comprehensive input to the early phases of project development. Doing so will help to define a balanced range of potential design alternatives for consideration during the early conceptual stage of the design process.

The following section provides a separate discussion of freeways, which are handled as a standalone subset of the larger roadway network given the stricter control of design parameters applied to the freeway design and development process.

Freeways

Freeways are a very specific type of travel facility that provide the highest level of mobility, providing regional connectivity serving interstate and interregional travel at high speeds with access to adjacent land areas generally provided by interchanges. The use of freeway design is normally limited to cases where the unique nature of a freeway is warranted, such as the Interstate Highway System, or where a significant level of through traffic occurs in conjunction with traffic volumes exceeding 25-30,000 in a rural area or 40-45,000 in an urban area.

Planning a freeway project will in most cases involve a federalized development process with in-depth environmental review. The street planning guidance in this chapter is intended for lower class facilities.

However, as there are a limited number of corridors (specifically TH 63 south of TH 52 and TH 14 west of TH 52) envisioned to be upgraded to freeways in the future, general street planning principles are provided here for these existing and future freeway corridors:

- High mobility – low accessibility
- Primary modal emphasis: vehicular traffic
- Secondary modal emphasis: transit
- Target speed: Above 60 mph
- Travel lanes: travel lane capacity is approximately 15,000-20,000 AADT per lane
- Median is required
- No pedestrian or bicycle travel
- Accommodation for maximum size freight vehicles required

4th Principles: Modal Overlays

In addition to the basic objectives for modal accommodation on various classes of roadways as laid out in the previous section, consideration also needs to be given to various mode or area specific plans that provide additional detail regarding goals for the accommodation of specific modes in specific corridors. This plan uses the term **modal overlays** to identify these mode or area specific resources that should be consulted for additional guidance on modal development in particular travel corridors or community subareas.

MODAL OVERLAYS

All streets must be safe for everyone to use and consider how to incorporate green infrastructure and stormwater management best management practices.

However, some streets may have additional enhanced emphasis to provide a higher level of accommodation to one or more modes of travel, such as pedestrians, transit riders, bicyclists, or drivers.

The modal overlays complement the basic guidance on modal accommodation found in this chapter. Where a roadway has been identified in one of the modal overlay resource documents listed in Table 10-15, consideration should be given to the service level or design guidance found in that document as part of the early project development process. Modal overlays generally will supersede the basic modal accommodation guidance provided in the previous section of this chapter.

The modal overlays that are identified for the purposes of the ROCOG Street Design Guidance are identified in Table 10-15.

Table 10-15: ROCOG Modal Overlays

Overlay	Source
Pedestrian Priority	ROCOG 2045 Long Range Plan Chapter 13, Figure 13-16 Primary Transit Network Pedestrian Infrastructure Priorities
Pedestrian Priority	Rochester 2018 Comprehensive Plan Section 2, Figure 2-34 Pedestrian Priority Map
Transit Priority	ROCOG 2045 Long Range Plan Chapter 12, Figure 12-2 Downtown Rapid Transit Corridor Also see New Rapid Transit for a Growing, Equitable Rochester – Transit Oriented Planning Study – August 2020
Transit Priority	Rochester 2018 Comprehensive Plan Section 2, Figure 2-14 Primary Transit Network
Transit Priority	2017 Transit Development Plan Figure 9-2 High Frequency Network
Bicycle Priority	ROCOG 2045 Long Range Plan Chapter 13, Figure 13-12 Active Transportation System Plan – Rochester Area Chapter 13, Figure 13-14 Regional Active Transportation Plan

Overlay	Source
Bicycle Priority	Rochester Area Bicycle Master Plan (2020 Update in Progress)
Bicycle Priority	Rochester 2018 Comprehensive Plan Section 2, Figure 2-40 Priority Bike Network
Freight Priority	Rochester Truck Route Network Rochester 2018 Comprehensive Plan Section 2, Figure 2-45
DMC District	Destination Medical Center Transportation & Infrastructure Program – Integrated Transit Studies – Executive Summary https://www.rochestermn.gov/home/showdocument?id=21067 Figure 8: DMC Street Typology Figure 10: City Loop (Ped/Bicycle Priority) Figure 11: Bicycle Network (Bicycle Priority)

The following paragraphs on pedestrian priority, bicycle priority and transit priority discuss how the incorporation of modal enhancement should be reflected in project development and how it may vary along subsegments of a corridor. For example, a roadway may be designated for transit emphasis. In some segments of the corridor, that may require that a travel lane be designated exclusively for transit use. In other segments, transit emphasis can be achieved through modest changes to signal operations or intersection design.

Pedestrian Priority Corridors

Pedestrian priority corridors are areas where land use, built environment, and demographic factors contribute to high levels of pedestrian activity. In such areas, the community may expect that street design or operations varies from basic design standards to serve the increased level of pedestrian activity.

At a minimum, more width probably will need to be allocated to the amenity zone, sidewalk zone, or building frontage zone of the right-of-way, and streets operations should enhance pedestrian convenience (such as shorter cycle lengths at traffic signals). Other streetscape design features—such as pedestrian-scale street lighting, space for outdoor activity and wayfinding—are also typical priorities in these areas. Where trade-offs are needed, actions such as removal of on-street parking or providing greater building setbacks may be needed.

Bicycle Priority Corridors

Bicycle priority corridors will generally be locations designated on the Active Transportation Network Plan of Chapter 12 as regional or major city bikeway corridors. In these locations, accommodation of bikeways for riders of all ages and all skill levels generally is the goal.

Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people.

Bikeway designs will generally reflect a street's motor vehicle volumes and speeds, as well as factors such as traffic mix, grades, and access/parking conditions. Sometimes, building bikeways will require trade-offs to be made for the safety for people using all modes of transportation. In such instances, it may be appropriate to consider parallel streets as the location for a bicycle priority facility when a similar level of service can be provided, or to consider narrowing of vehicle travel lanes or removal of on-street parking in order to build comfortable and convenient bikeways.

Intersection Design should also be a consideration in bicycle priority corridors. People biking are most vulnerable at intersections. Where space allows, protected intersections or adequate street buffers should be accommodated.

Transit Priority Corridors

Transit priority corridors highlight those corridors where capital investment in transit infrastructure will support high capacity or high frequency service providing an enhanced level of reliability and comfort with sufficient frequency to help make transit a convenient travel choice.

The transit capital investment corridors identified in the Plan are those where there is an expectation that bus rapid transit (BRT) or rapid bus service will be developed. These include the Downtown Rapid Transit BRT System, the Primary Transit Network (PTN) BRT system, and potential rapid bus service extensions off the PTN serving future high capacity park and ride sites. These corridors will benefit from investments like transit-priority signals, queue jumps/bypass lanes and transit lanes at key locations, along with space for transit stop amenities and enhanced station area infrastructure for pedestrians. Where design and operations trade-offs are needed, transit reliability and access should be given priority on these transit capital investment corridors. The following factors should be considered in deciding when and where to make these types of investments.

- **Bus Volume:** Transit-only or BRT lanes are typically more useful when there are higher volumes of buses using the dedicated lanes.
- **Speed:** The transit-only or BRT lane provides an increase in transit operating speed (for the distance of the lane or in the corridor) or improves service reliability.

Freight Priority Corridors

As the ROCOG region continues to grow and consumer choices continue to evolve, the demand for the movement and delivery of goods will also grow. The growth of e-commerce (purchases made online and delivered to homes and businesses) will continue to play an important role in the growing demands of goods movement. Nationally, package volume handled by the United States Postal Service has more than doubled in the past decade from 3.1 billion in 2010 to 6.2 billion in 2018.

The increased demand for goods will also increase demands on our city streets. As the volume of freight moving through and to the Rochester area grows, there is a need mitigate potential impacts to safety, congestion, and the environment as a result of this increased traffic.

MnDOT, Olmsted County, and local municipalities all undertake planning to manage the impact of heavy vehicle traffic on their respective roadway networks. Rochester has an adopted truck route network, while Olmsted County and MnDOT both have made extensive investments in the upgrading of a network of corridors to serve 10-ton traffic. Chapter 3 of this plan identifies existing truck routes on the highway network, and Chapter 10 includes recommendations for the upgrading of corridors not currently rated for 10-ton traffic to 10-ton status.

In addition, accessibility to freight origins and destinations should also be considered, with first, last and transfer mile routes evaluated as needed particularly in areas of non-residential land use generating significant freight traffic. When considering initiation of a project development process, references identifying freight priority corridors and last mile access should be consulted to identify the need for appropriate design standards for heavy commercial vehicle traffic.

Right-of-Way Reservation

Right-of-way, as defined for the purposes of this Plan, is a strip of land used or intended to be used for roads, walkways, bikeways, boulevards, utilities, transit accommodations or other transportation uses benefiting the public at large. Guidelines on minimum right-of-way (ROW) widths for major roadway design classes are identified in Table 10-16.

Table 10-16 serves as a starting point for the determination of right-of-way needs, and for many lower volume or lower classification roads will likely provide adequate guidance for planning purposes. For freeways higher classification roads such as strategic arterials and roads carrying volumes > 30,000 AADT, additional consideration should be given to the travel service, sizing, and modal accommodation principles found in this

Table 10-16: Minimum Right-Of-Way Widths

				MIDBLOCK RIGHT OF WAY (1)			
				Swale/Ditch Drainage		Curb & Gutter Drainage	
Design Class	Projected Volumes	Lanes Needed	Type of Median	Flat Terrain	Steep Terrain	Flat Terrain	Steep Terrain
Freeway	<70,000	4		200	225	160	180
	<135,000	6		220	240	200	220
Limited Access Expressway							
	2-10,000	2		100	120	*NA*	*NA*
	20-40,000	4+LTL	Undivided	120	140	*NA*	*NA*
			Raised	140	160	130	150
			Landscaped	180	200	*NA*	*NA*
	Over 40,000	6+LTL	Raised	180	200	150	175
			Landscaped	200	220	*NA*	*NA*
Other Roads and Streets (2)							
	2-10,000	2		100	120	75	90
	10-20,000	2+LTL		110	130	90	110
	20-30,000	4+LTL	Undivided	120	140	100	120
			Raised	140	160	120	140
	30-40,000	5		140	160	130	150
	Over 40,000	6+LTL	Undivided	160	180		
			Raised	175	200		

Footnotes
(1) Add 10 feet for each Non-Motorized Path
(2) If On-Street Parking is to be permitted, add 6 feet for Parallel Parking Lanes and 12 feet for Angled Parking lanes

section before a final determination on right-of-way width is made. The reservation of right-of-way for the ultimate width of roadways should be based on long-term needs defined by objectives for mobility, accessibility and community character.

Right-of-way widths will vary depending on the type of stormwater management utilized and values in Table 10-16 are representative of mid-block conditions on relatively flat terrain with two 5’ walkways and, for divided facilities, a 20’ raised or 30’ depressed medians on expressways or a 10’ raised or 20’ depressed median on other roadways.

Additional right-of-way width is recommended where conditions dictate the need for additional area. Common situations where additional right-of-way should be secured include:

- **Steep Terrain:** Where topographic conditions such as steep terrain are present, additional right-of-way shall be provided in order to provide an adequate clear zone with safe slope gradients and backslopes constructed at grades that will provide for stability of the slope and ease of maintenance. The width required to provide adequate recovery area and slope stability is related to the design speed of the roadway and the severity of natural slope conditions. Additional right-of-way needed to address terrain factors will range from 10 to 50 feet on one or both sides of the roadway corridor.
- **Non-Motorized Paths:** Where jurisdictional bikeway or walkway plans indicate development of a separated path in lieu of a sidewalk for pedestrian and bicycle use, an additional 5 to 15 feet of right-of-way or easement (depending on jurisdictional policy) may be needed to accommodate each path facility.
- **Turn Lanes:** On major streets and roads additional width should be acquired for turn lane development in the vicinity of intersections.

Right-of-Way in Urban Core Areas

Expressways and arterial roads in fully developed Central Business District (CBD) and Urban Core land use context zones have historically been developed on rights-of-way narrower than those dictated by current needs, often flanked by buildings with minimal setbacks and a mix of land uses. In such cases, roadway improvements are likely to consist primarily of retrofit measures that result in a reallocation of the existing roadway space, with only very limited widening. Because of the economic impact that would be experienced in attempting to secure additional right-of-way width throughout the length of a fully developed non-freeway corridor in CBD or Core Areas, plans for improvement projects generally minimize the need for additional right-of-way along the length of the corridor, though widening for turn lane improvements may be needed at intersections or major driveways.

When considering land development proposals along fully developed corridors, the mid-block ROW requirements in Table 10-16 generally are not relevant to the consideration of whether additional right-of-way is needed. The most pressing right-of-way need in such corridors may be the ability to acquire an additional 10-12 feet in the proximity of intersections to permit the introduction of turn lanes where none currently exist. Development proposals on properties located at or near higher volume intersections should be reviewed, keeping in mind there may be a need to introduce turn lane improvements if none exists; a site layout, therefore, should be designed to accommodate an area for such improvement in the future.

Rural & Suburban Roadway Reservation Corridor

In rural and suburban areas, a number of county and state roadways are constructed on 66’ rights-of-way, which initially provided adequate width for the limited function these roadways served in the early years after construction. Travel volume increases due to regional growth, along with increased truck volumes, has led to evolving road designs that require additional right-of-way for shoulders, drainage and recovery areas. There is a need to plan for future upgrading of these corridors to improve safety, even though funding constraints make the timing for improvement to be when a road needs to be rebuilt for structural reasons, typically 50 to 70 years after its initial construction.

We can anticipate that in the intervening years prior to reconstruction, development activity in rural and suburban areas will continue, involving the construction of new agricultural buildings, renovations of existing buildings, or construction of new homes on larger acreages. To minimize future disruption to any new development that occurs, it would be prudent for zoning authorities to establish setback guidelines that reflect right-of-way needs based on current design standards. In order to achieve this, the Plan recommends a minimum **roadway reservation corridor** be established along all county and state highways in rural and suburban areas with substandard rights-of-way for the purpose of establishing an interim boundary, measured from the centerline of the existing roadway, from which all future building setbacks would be measured. Table 10-17 establishes recommended guidelines for the width of the roadway reservation corridor related to the classification of the roadway. These setbacks will minimize future impacts to private property as a result of road reconstruction, permit adequate width drainage facilities to be constructed, and provide an increased level of public safety by introducing greater separation between roadways and structures consistent with modern clear zone and recovery area design requirements.

Table 10-17: Rural and Suburban Roadway Reservation Corridors for Substandard Roads

Roadway Classification	Expressway		Super 2	Other Arterials & Collectors		Local County & State Roads
	<10,000 ADT	>10,000 ADT	All	< 10,000 ADT	>10,000 ADT	All
Roadway Reservation Corridor Width	50'	60'	55'	50'	55'	50'

Right-of-Way Implementation Strategies

- **Strategy 1:** ROCOG will encourage its partner agencies to use the Long Range Transportation Plan to provide guidance to landowners, developers, local jurisdictions and public agencies on the expected design characteristics of major roadways throughout the ROCOG planning area.
- **Strategy 2:** ROCOG partner jurisdictions will consult guidelines on recommended right-of-way width for each road classification and apply these as a base for estimating right-of-way needs on new corridors or existing corridors proposed for major upgrade.
- **Strategy 3:** ROCOG partner jurisdictions will consult the guidelines to guide future right-of-way acquisition along existing corridors where adjacent land uses are established but existing right-of-way is substandard. The focus in such cases should be on the need to acquire the minimum right-of-way necessary to meet the functional service needs of the roadway, such as

the addition of turn lanes or raised medians in order to provide additional traffic capacity at intersections or improve safety in the corridor.

- **Strategy 4:** When developing major street projects, ROCOG partner agencies should consult the street planning guidance of this chapter and, to the extent possible, incorporate features recommended such as travel lanes, medians, modal accommodation and modal networks, respecting the land use land use context within which a corridor is located.
- **Strategy 5:** ROCOG partner jurisdictions should coordinate with landowners to reserve right-of-way for major street corridors through site planning or general development planning processes. Right-of-way dedication requirements and land acquisition policies should be adopted in land development regulations of local jurisdictions.
- **Strategy 6:** ROCOG partner jurisdictions should consult building setback requirements for major rural or suburban roadways designed to preserve sufficient setback for new structures under a building permit and/or zoning certificate process when no associated subdivision activity is occurring.
- **Strategy 7:** ROCOG will work with partner jurisdictions to identify corridors that would benefit from right-of-way protection activities, such as official mapping, where needed to preserve right-of-way corridors for future transportation system projects.

Factors to consider in determining which corridors should be a priority for corridor management are:

- Has the need to improve the corridor been identified as a priority by the local community or by MnDOT or Olmsted County?
- How important is the corridor to the local and regional transportation system (i.e., truck route, commuter route, economic development, etc.)?
- What is the immediacy of land development in the corridor?
- Are there other opportunities to prevent development on land that would be needed for future right-of-way?
- What is the risk of foreclosing location options entirely?
- What is the level of support for the project?

Street Improvement Needs

Major street and highway improvement needs are identified in the Plan for purposes of advancing the planning and development process illustrated in Figure 1-1 of Chapter 1, which highlights that the LRTP is an early first step in the cycle of activities that leads to an eventual project being realized. Projects were identified based on the assessment of high-level parameters such as traffic forecasts, crash experience, support for future land use plans, and community needs such as economic development.

The projects identified have been reviewed with ROCOG's planning partners, technical and policy officials, and have been presented to the public. Projects are presented on the following pages in seven groups, with a general location map and a summary table provided for each group. Figure 10-7 illustrates the information that is found in the summary table. Along with individual projects, there are also three program groups presented, including:

- Intersection Improvement Program
- 10-Ton Route Upgrade Program
- Regional Highway Shoulder Upgrade Program

Consideration of project groups and programs in the context of financial constraint is found in Chapter 15 of the Plan. Outside of identifying which projects are considered candidates for ROCOG federal funds, projects are not prioritized as that is ultimately a lead agency action influenced by any number of factors outside the purview of this Plan.

Figure 10-7: Information Found in Project Summary Tables

When shaded in black, this column indicates the project has been prioritized as a candidate for federal funding by ROCOG

"Primary Roadway" identifies the major street or highway on which the project will occur

Endpoint 1 and 2 identify the endpoints of the project along the Primary Roadway

"Project Type" provides a general description of the work proposed

"Lead Agency" indicates the road authority who be responsible for leading the project

"Estimated Cost" is a planning level estimate of project cost in today's dollars

Where the "Discretionary Grant $$ Sought" column is shaded in red / bronze, it indicates that funding will be needed from grants or sources other than gas tax or local property tax.

Use the Map ## to find the project location on the project group map

Map ##	ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Miles of Corridor Improvement	Estimated Cost	Discretionary Grant $$ Sought
National Highway System Access Upgrade Projects							**$ 174,530,000**	
1-1	5	TH 52	TH 14 West		Improve Interchange	*MNDOT*	$ 35,350,000	
1-2	1	I-90	TH 52	Bridge/Ramps	Improve Interchange Phase 1	*MNDOT*	FUNDED 2021	
1-3		I-90	TH 52	Bridge/Ramps	Improve Interchange Phase 2	*MNDOT*	$ 13,200,000	
Rochester CBD Strategic Arterial Gateway Projects						Total w/o Rapid Transit Projects	**$ 97,420,000**	
4-1	4	North Broadway Av	Civic Center Dr	14th St North	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 18,950,000**	DMC
4-2		N Broadway Av	14 St NE	Northern Heights Dr	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 10,810,000**	
4-3	4	S Broadway Av	14th St S	28 St S	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 17,230,000**	DMC
		Spot Safety and Mobility Programs					**$ 5,530,000**	
		Safety Evaluation			MNDOT District Safety Plan	See Chap 8 / Page 8	**$ 7,200,000**	HSIP

Group 1: National Highway System Access Upgrade Projects

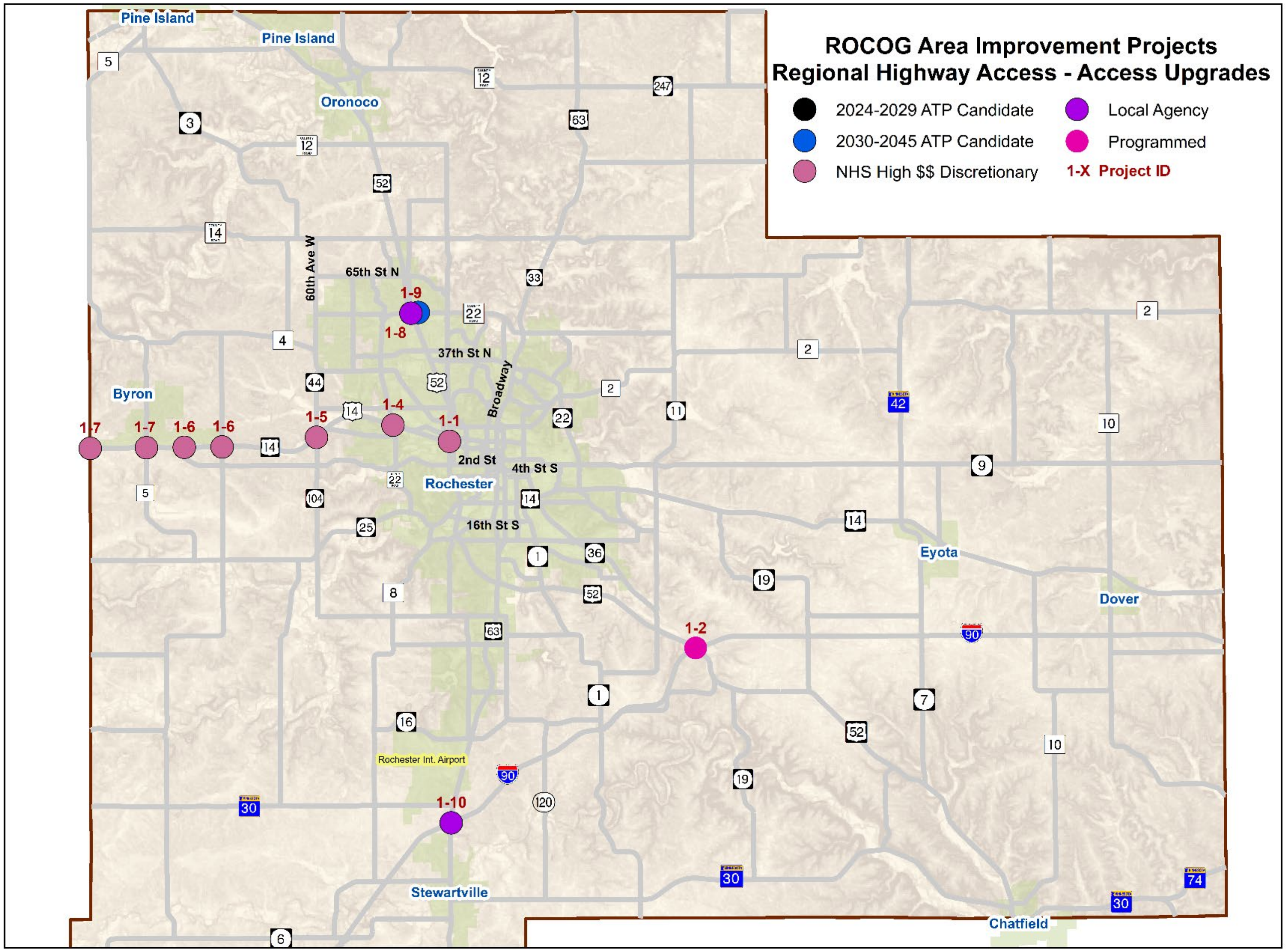
Group 1 reflects projects identified on the National Highway System (NHS) that are intended to improve local access to/from the NHS through improvements to existing interchanges or construction of new interchanges. Aside from three projects, two of which are programmed through the STIP, all the remaining projects are identified currently as illustrative projects as the scale of funding needed is beyond the scope of current budgets to accommodate. It is expected that all these projects will likely need some level of discretionary funding in order to move ahead.

Table 10-18: National Highway System Access Improvement Projects

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre- tionary Grant $$ Sought
National Highway System Access Upgrade Projects							**$ 174,530,000**							
1-1		TH 52	TH 14 West		Improve Interchange	*MNDOT*	$ 35,350,000	X		X	X			
1-2		I-90	TH 52	Bridge/Ramps	Improve Interchange Phase 1	*MNDOT*	FUNDED 2021							
1-3		I-90	TH 52	Bridge/Ramps	Improve Interchange Phase 2	*MNDOT*	$ 13,200,000	X						
1-4		TH 14 W	CSAH 22		Improve Interchange	*MNDOT*	$ 33,630,000	X	X					
1-5		TH 14 W	CR 104		Construct Interchange	*MNDOT*	$ 38,850,000	X	X					
1-6	Under Study	TH 14 West Corridor	East Core Area Grade Separation		Interchange A in Byron Area	*MNDOT*	$ 19,000,000	X	X					
1-7		TH 14 West Corridor	West Core Area Grade Separation		Interchange B in Byron Area	*MNDOT*	$ 20,500,000	X	X			X		
1-8		CSAH 22	Bandel Road NW		Intersection Relocation	*Olmsted*	$ 6,000,000		X	X				
1-9		CSAH 22 N (55 St NW	TH 52 E Front Rd	TH 52 W Front Rd	Interchange Enhancement	*Olmsted*	$ 8,000,000	X	X					
1-10		I-90	TH 63		Phase 2 Interchange Upgrade	*MNDOT*	FUNDED 2021							

NOTE: Rows highlighted in gray related to TH 14 West Corridor were under study at the time of plan adoption, but general consensus had been arrived at that two new interchanges in the ROCOG area will be developed. Estimated costs may change based on the final interchange concept.

Figure 10-8: Location Map/Group 1 - National Highway System Access Improvement Projects



Group 2: Interregional Corridors Safety/Mobility/Access Projects

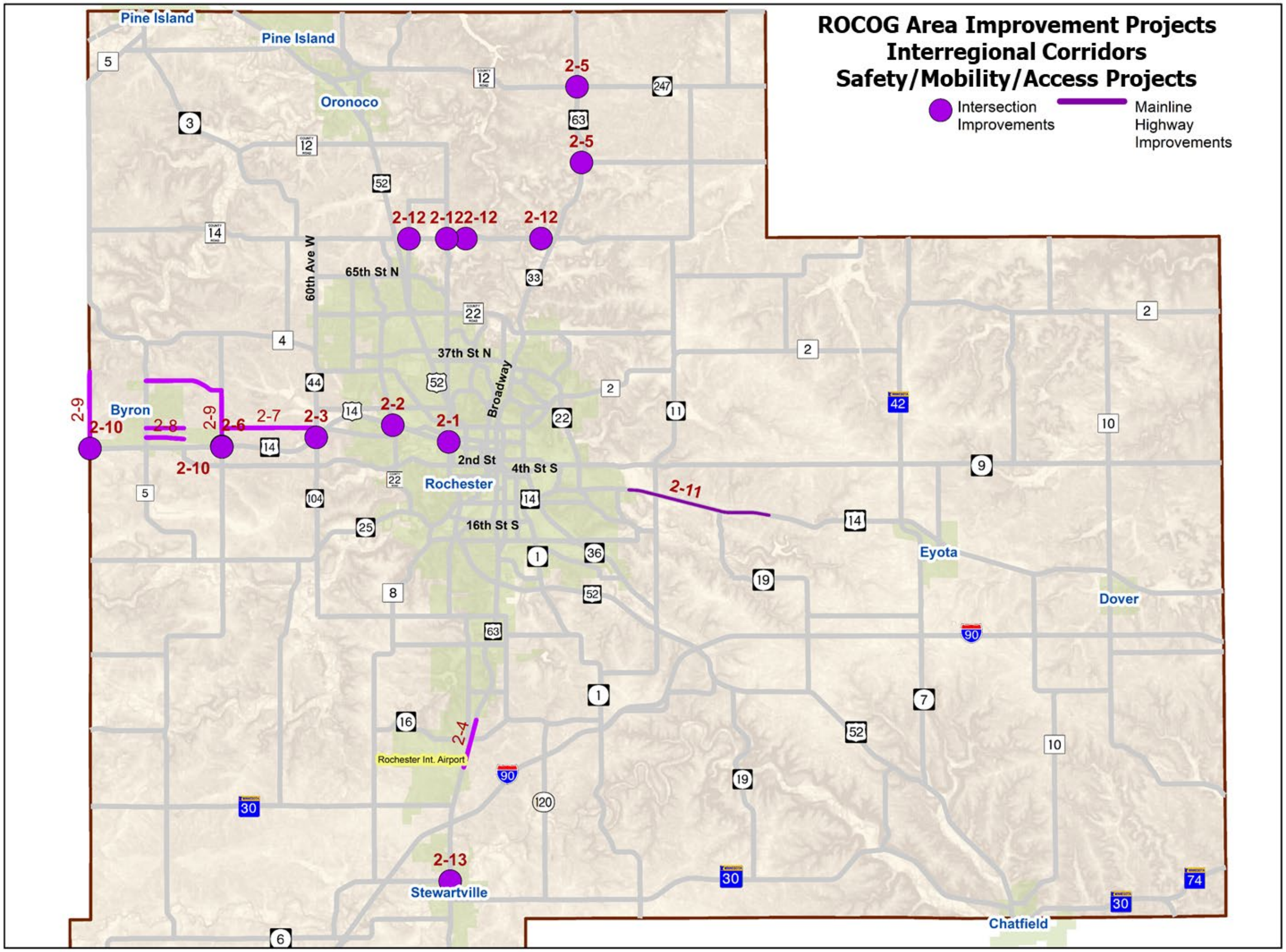
Group 2 includes projects on state highways that server an interregional travel function which are intended to improve safety or mobility or protect the through travel function of a corridor by implementing access management improvements along the corridor. There are a number of interim safety projects proposed at current or future interchange locations in anticipation that it may be a number of years before Group 1 projects occur.

Table 10-19: Interregional Corridors Safety/Mobility/Access Projects

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Interregional Corridors Safety/ Mobility / Access Projects							**$ 52,660,000**							
2-1		TH 52	TH 14 West		Interim Interchange Safety Project	*MNDOT*	**$ 1,500,000**	**X**						
2-2		TH 14 W	CSAH 22		Interim Interchange Safety Project	*MNDOT*	**$ 1,500,000**	**X**	**X**					
2-3		TH 14 W	CR 104		Interim Intersection Safety Project	*MNDOT*	**$ 2,000,000**	**X**	**X**					
2-4		TH 63 S	60th St S	80th St S	Mainline Access Replacement	*MNDOT*	**$ 5,130,000**	**X**		**X**				
2-5		TH 63 N	CSAH 14 E	MN 247	Access Mitigation	*MNDOT*	**$ 500,000**	**X**						
2-6	Under STudy	TH 14 West Corridor	Suburban Grade Separation		Overpass Construction	*MNDOT*	**$ 16,000,000**	**X**	**X**					
2-7	Under STudy	TH 14 West Corridor	14th ST NW		TH 14 Connectivity Improvements	*Local*	**$ 2,500,000**	**X**	**X**					
2-8	Under STudy	TH 14 West Corridor	7th St / 4th St		TH 14 Connectivity Improvements	*Local*	**$ 1,980,000**	**X**	**X**			**X**		
2-9	Under STudy	TH 14 West Corridor	CSAH 5 / CSAH 15		TH 14 Connectivity Improvements	*County*	**$ 16,830,000**	**X**	**X**					
2-10	Under STudy	T 14 West Corridor	CSAH 3 / County Line Rd		Interim Intersection Safety Project	*MNDOT*	**$ 500,000**	**X**	**X**					
2-11		TH 14 E	40th Av SE	0.8 mi E of CSAH 19	Access Mitigation	*MNDOT*	**$ 2,000,000**	**X**						
2-12		TH 63 N	CR 154	CSAH 33	Access Mitigation	*MNDOT*	**$ 1,720,000**	**X**	**X**					
2-13		TH 63 S	CSAH 35		High Cost Intersection	*MNDOT*	**$ 500,000**	**X**	**X**			**X**		

NOTE: Rows highlighted in gray related to TH 14 West Corridor were under study at the time of plan adoption, but general consensus had been arrived at that an overpass and various local road connectivity upgrades would be needed. Final corridors and costs may change based on final adopted plan

Figure 10-9: Location Map/Group 2 – Interregional Corridors Safety/Mobility/Access Projects



LRTP 2045

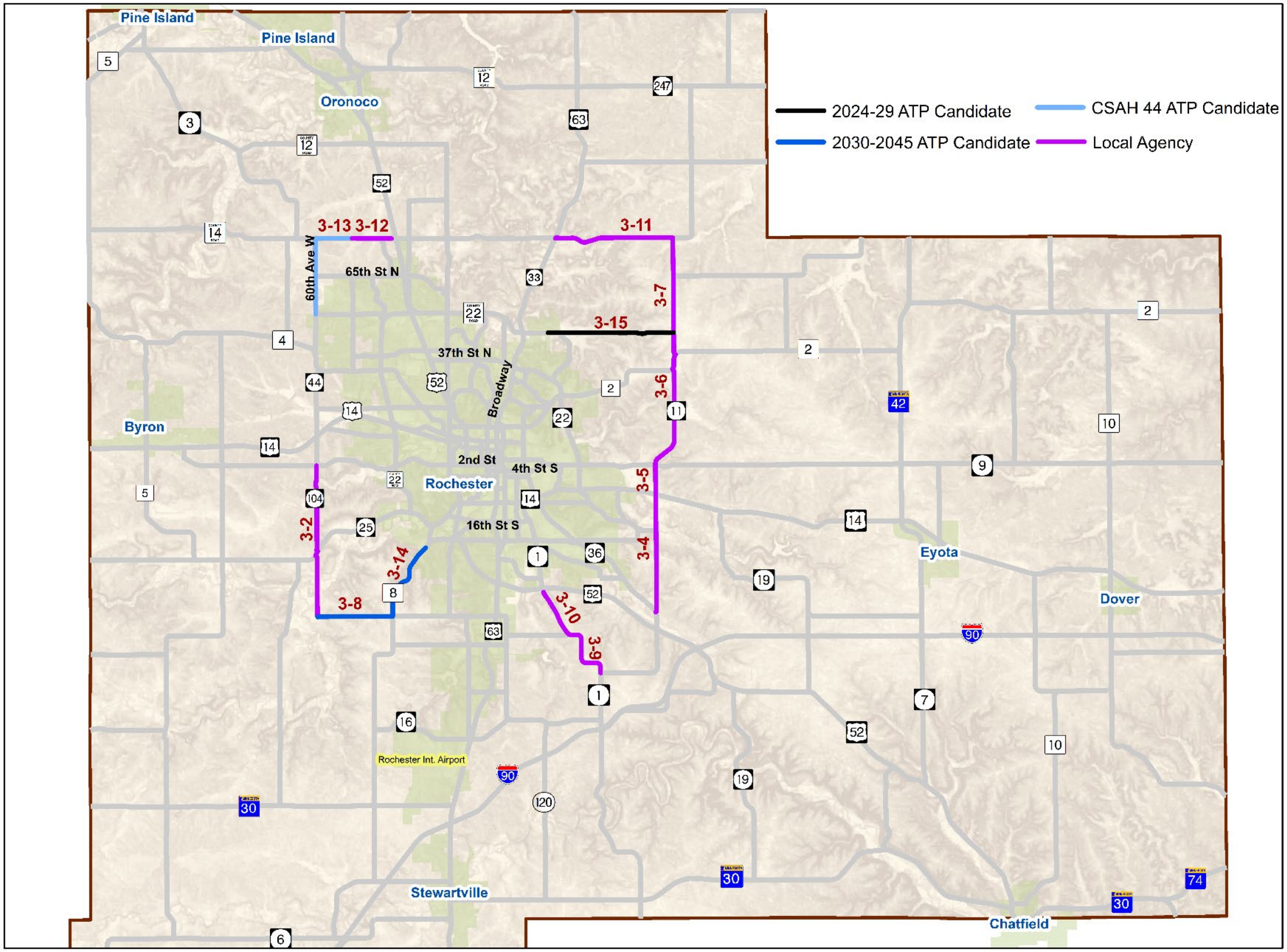
Group 3: Regional Arterials Safety/Mobility Projects

Group 3 reflects projects found on regional arterials, typically Olmsted County roads, where safety/mobility upgrades are anticipated that will provide improved travel lanes, shoulder areas, recovery areas, grades or other measures that will modernize these corridors to accommodate growth in higher speed rural/suburban traffic that has occurred or is anticipated in the future.

Table 10-20: Regional Arterial Safety/Mobility Projects

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Regional Arterials / Safety - Mobility Projects							**$ 39,540,000**							
3-1	■	CSAH 44	55 St NW	65 St NW	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 3,050,000**		**X**	**X**				
3-2		CR 104	CSAH 34	CR 117	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 4,410,000**		**X**					
3-3	■	CSAH 44	65 St NW	75 St NW	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 3,120,000**		**X**					
3-4		CSAH 11	CSAH 36	TH 14	Safety / Shoulder Enhancement	*Olmsted*	**$ 720,000**		**X**					
3-5		CSAH 11	TH 14	CSAH 9	Safety / Shoulder Enhancement	*Olmsted*	**$ 170,000**		**X**					
3-6		CSAH 11	CSAH 9	CSAH 2	Safety / Shoulder Enhancement	*Olmsted*	**$ 760,000**		**X**					
3-7		CSAH 11	CSAH 2	CSAH 14 E	Safety / Shoulder Enhancement	*Olmsted*	**$ 700,000**		**X**					
3-8	■	CR 117	CR 104	CSAH 8	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 4,160,000**		**X**					
3-9		CSAH 1	CR 101	CR 111	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 410,000**		**X**					
3-10		CSAH 1	TH 52	CR 101	Suburban Safety/Access Upgrade	*Olmsted*	**$ 780,000**		**X**	**X**				
3-11		CSAH 14 E	TH 63 N	CSAH 11	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 730,000**		**X**					
3-12		CSAH 14 W	TH 52 W Frntge	50 Av NW	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 2,130,000**		**X**					
3-13	■	CSAH 14 W	50 Av NW	60 Av NW	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 2,130,000**		**X**					
3-14	■	CSAH 8	CR 125	CR 117	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 5,300,000**		**X**					
3-15	■	48 St NE	CR 124	CSAH 11	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 10,970,000**		**X**					

Figure 10-10: Location Map/Group 3 – Regional Arterial Safety/Mobility Projects



LRTP 2045

Group 4: Rochester CBD Strategic Arterial Gateway Projects

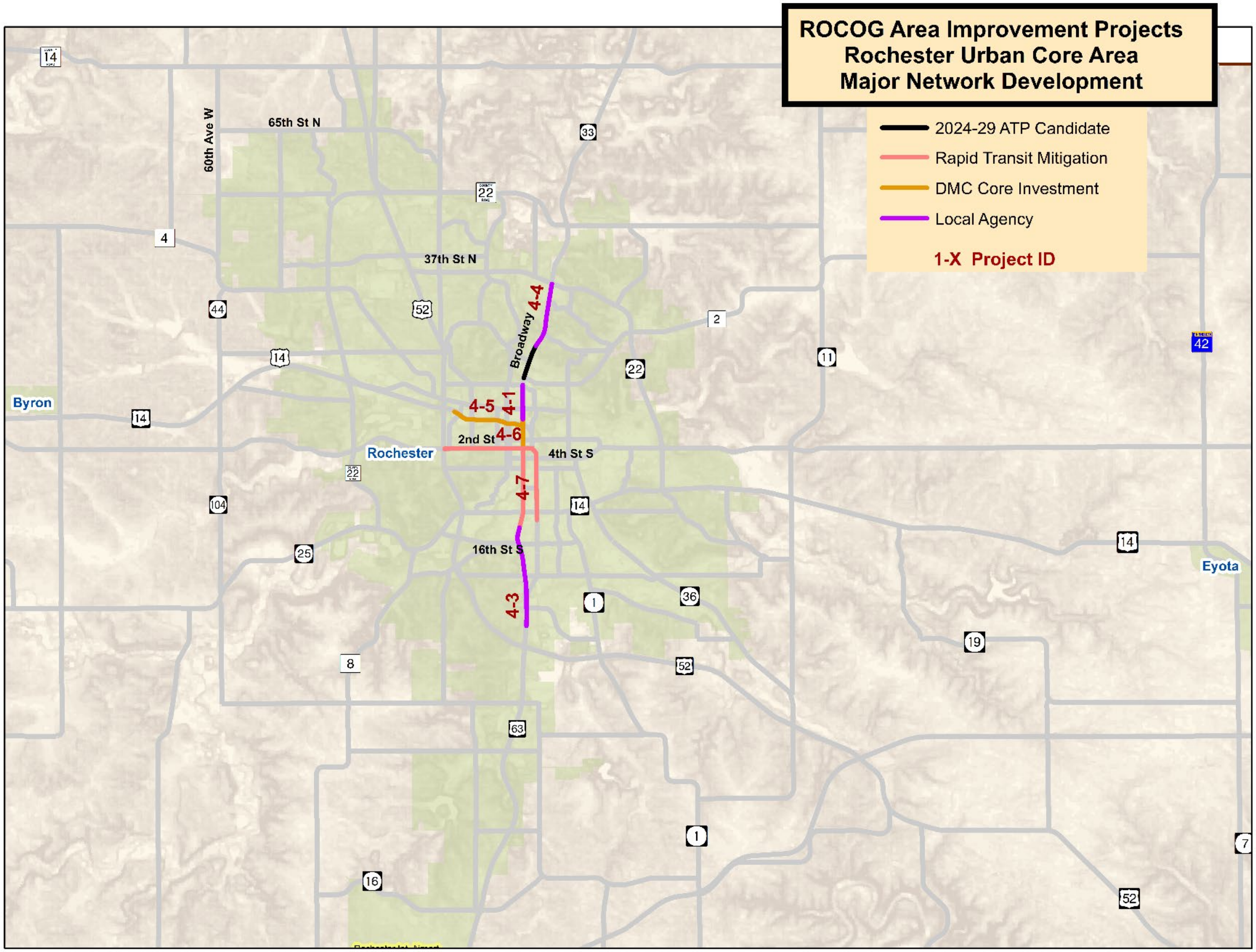
Group 4 reflects projects anticipated on the major strategic arterial corridors that serve downtown Rochester. The need for anticipated improvements on these corridors has been identified in previous studies including the 2016 Broadway Corridor Study, as well as in the DMC Integrated Transit Studies and DMC Development Plan. Aside from Civic Center Dr, which is expected to be impacted primarily by increasing vehicular traffic, the other corridors (aside from the Downtown Rapid Transit Corridors) probably involve no change in number of travel lanes but improvements to support other modes and a high level of attention to traffic flow management over time to accommodate some level of growth in traffic. These projects are not considered illustrative but are flagged as projects where discretionary funding may be pursued to limit the impact of these higher cost projects on local budgets.

Table 10-21: Rochester CBD Strategic Arterial Gateway Projects

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Rochester CBD Strategic Arterial Gateway Projects							**$ 97,420,000**	**Total w/o Rapid Transit Projects**						
4-1		North Broadway Av	Civic Center Dr	14th St North	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 18,950,000**			**X**	**X**		**X**	**DMC**
4-2		N Broadway Av	14 St NE	Northern Heights Dr	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 10,810,000**			**X**	**X**		**X**	
4-3		S Broadway Av	14th St S	28 St S	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 17,230,000**		**X**	**X**			**X**	**DMC**
4-4		N Broadway Av	Northern Heights	37 St NE	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 16,160,000**			**X**			**X**	**DMC**
4-5		Civic Center Dr	N Broadway Av	16 Av NW	Urban Core Capacity Project	*Rochester*	**$ 21,390,000**			**X**	**X**			**DMC**
4-6	Under Study	2nd St SW	TH 52 W Frntge	Broadway	Transit Mobility Corridor	*Rochester*	**$ 107,000,000**							FTA Small Starts
4-7		DMC South Gateway	2nd St South	14th St South	Transit Mobility Corridor	*Rochester*	**$ 96,000,000**							FTA Small Starts
4-8		DMC Broadway Ave	2 St South	6 St North	Major Arterial Multi-Modal / Safety Modernization	*Rochester*	**$ 12,880,000**			**X**	**X**			**DMC**

Projects highlighted in gray reflect Phases I/II of Rochester Downtown Rapid Transit project and are included here for information purposes

Figure 10-11: Location Map/Group 4 – Rochester CBD Strategic Arterial Gateway Projects



Group 5: Support for Rochester Urban Area Growth Management Plan

Group 5 reflects a larger number of projects that are anticipated to support 2020-2045 future growth areas identified in P2S 2040, as well as continued development that is occurring in areas beyond the city's growth management area in areas designated in the *Olmsted County General Land Use Plan* for suburban residential development. These projects involve a combination of upgrades to existing corridors that were originally built as township roads, which now need to be modernized and upgraded to support service to emerging urban and suburban growth areas. These corridors will serve as the arterial and collector street network backbone in these emerging growth areas. This work can include a combination of actions such as paving gravel roads, adding active transportation facilities, improving management of stormwater runoff, intersection upgrades and enhanced street lighting. Projects on roads that in the future are anticipated to be city streets will likely be partially funded by private development interests through development fees in addition to public dollars. Advancement of projects on this list will depend in part on the pace and location of new development, with projects driven by emerging need materializing as new residential and commercial development occurs.

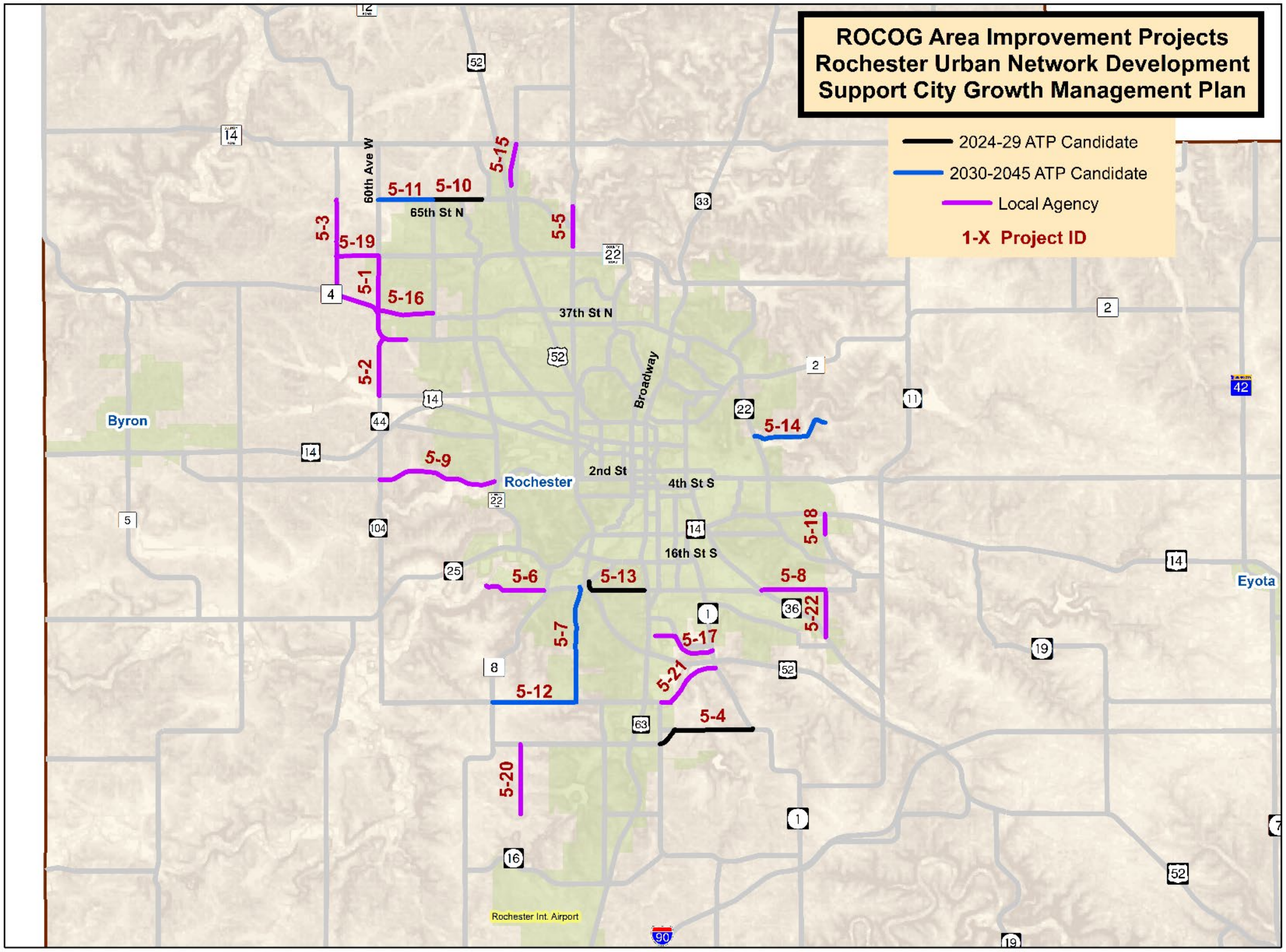
Table 10-22: Projects Supporting Rochester Urban Area Growth Management

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre- tionary Grant $$ Sought
Support for Rochester Urban Area Growth Management Plan							**$ 89,240,000**							
5-1	■	CSAH 4/CSAH 44	55 Av NW	CSAH 3	Urban Safety / Mobility Upgrade	*Olmsted*	**$ 10,660,000**		**X**					
5-2		CSAH 44	19 St NW	CSAH 4	Urban Safety/Mobility Upgrade	*Olmsted*	**$ 2,260,000**		**X**					
5-3		CSAH 3	CSAH 4	65 St NW	Suburban Safety Enhancement	*Olmsted*	**$ 390,000**		**X**	**X**				
5-4	■	CR 101	CSAH 20	CSAH 1	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 4,240,000**		**X**					
5-5		CR 112	CSAH 22	Overland Dr	Urban Multimodal Enhancement	*Olmsted*	**$ 150,000**		**X**	**X**				
5-6		CR 125	CSAH 8	CSAH 25	Urban Safety/Mobility Upgrade	*Olmsted*	**$ 2,230,000**		**X**	**X**				

Table 10–22 (continued): Projects Supporting Rochester Urban Area Growth Management

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Support for Rochester Urban Area Growth Management Plan							**$ 89,240,000**							
5-7		CR 147	40 St SW	CR 125	Urban Safety/Mobility Upgrade	*Olmsted*	**$ 6,190,000**		**X**	**X**				
5-8		CR 143	CSAH 36	40 Ave SW	Suburban Safety/Mobility Upgrade	*Olmsted*	**$ 260,000**		**X**	**X**				
5-9		CSAH 34	CR 104	CSAH 22	Urban Safety/Mobility Upgrade	*Olmsted*	**$ 1,230,000**		**X**	**X**				
5-10		65 St NW	TH 52 W Frntge	50 Av NW	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 9,210,000**			**X**			**X**	
5-11		65 St NW	50 Ave NW	60 Av NW	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 6,090,000**			**X**			**X**	
5-12		40 St SW	18 Av SW	CSAH 8	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 3,290,000**		**X**	**X**				
5-13		20 St SW	S Broadway Av	CR 125	Urban Collector Safety/Mobility Upgrd	*Rochester*	**$ 10,030,000**		**X**					
5-14		Silver Creek Rd	CSAH 22 E	40 Ave NE	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 8,840,000**			**X**				
5-15		TH 52 E Frontage Rd	65 St NW	TH 63 N	Urban Grid Expansion	*Rochester*	**$ 4,600,000**						**X**	
5-16		41 St/Badger Hills Dr	50 Av NW	60 Av NW	Urban Grid Expansion	*Rochester*	**$ 5,660,000**			**X**			**X**	
5-17		30 St SE	3 Av SE	CSAH 1	Urban Grid Expansion	*Rochester*	**$ 6,300,000**		**X**	**X**			**X**	
5-18		40 Av SE	TH 14 E	Eastwood Rd	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 80,000**			**X**				
5-19		55 St NW	CSAH 44	75 Av NW	Urban Grid Expansion	*Rochester*	**$ 1,680,000**			**X**			**X**	
5-20		31 Av SW	48 St SW	60 St SW	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 2,720,000**			**X**				
5-21		40 St SE	TH 63 S	CSAH 1	Urban Grid Expansion	*Rochester*	**$ 2,990,000**			**X**			**X**	
5-22		40 Av SE	CR 143	CSAH 36	Suburban Safety Enhancement	*Rochester*	**$ 140,000**			**X**				

Figure 10-12: Location Map/Group 5 – Support for Urban Area Growth Management Plan



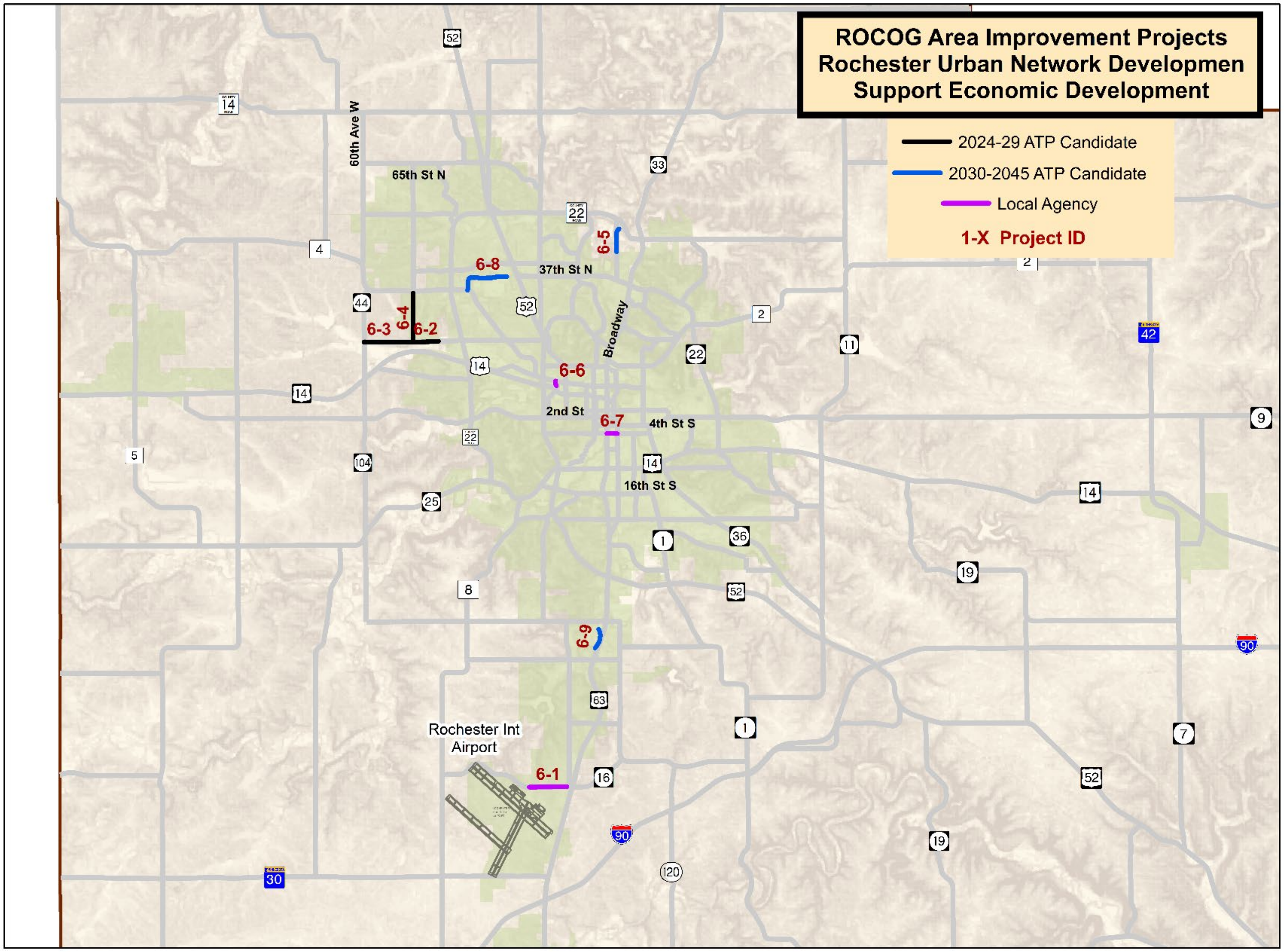
Group 6: Support for Economic Development

Projects in Group 6 were identified in areas where access for commercial or industrial development will be improved or where a project promises to enhance the street grid in a predominantly non-residential or mixed-use development area. None of these projects are considered illustrative, but one project (improvement of MN 30 Airport Access) is anticipated as a project where Airport Improvement Funds or other discretionary funding could be pursued for a project.

Table 10-23: Projects Supporting Economic Development

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Support for Economic Development							**$ 48,010,000**							
6-1		MN 30	TH 63 S	Braatas Dr	Corridor Modernization	*MNDOT*	**$ 2,790,000**	X		X	X			Various
6-2	■	19 St NW	Ashland Dr	50 Av NW	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 2,830,000**			X				
6-3	■	19 St NW	50 Av NW	CSAH 44	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 6,070,000**			X				
6-4	■	50 Av NW	19 St NW	CSAH 4	Urban Grid Expansion	*Rochester*	**$ 6,070,000**			X				
6-5	■	East River Rd	44 St NE	CSAH 22 N	Suburban Safety/Mobility Upgrade	*Rochester*	**$ 6,770,000**			X				
6-6		16 Av NW	Civic Center Dr	7 St NW	Urban Grid Enhancement	*Rochester*	**$ 2,270,000**			X				
6-7		6 St SE	S Broadway Av	3 Av SE	Urban Core Grid Enhancement	*Rochester*	**$ 6,720,000**			X	X		X	DMC
6-8	■	37 St NW - IBM Campus	TH 52 W Frntge	Valleyhigh Dr	Arterial Grid Expansion	*Rochester*	**$ 8,400,000**			X				
6-9	■	Commercial Dr	40 St SW	48 St SW	Urban Grid Expansion	*Rochester*	**$ 6,090,000**			X				

Figure 10-13: Location Map/Group 6- Support for Economic Development



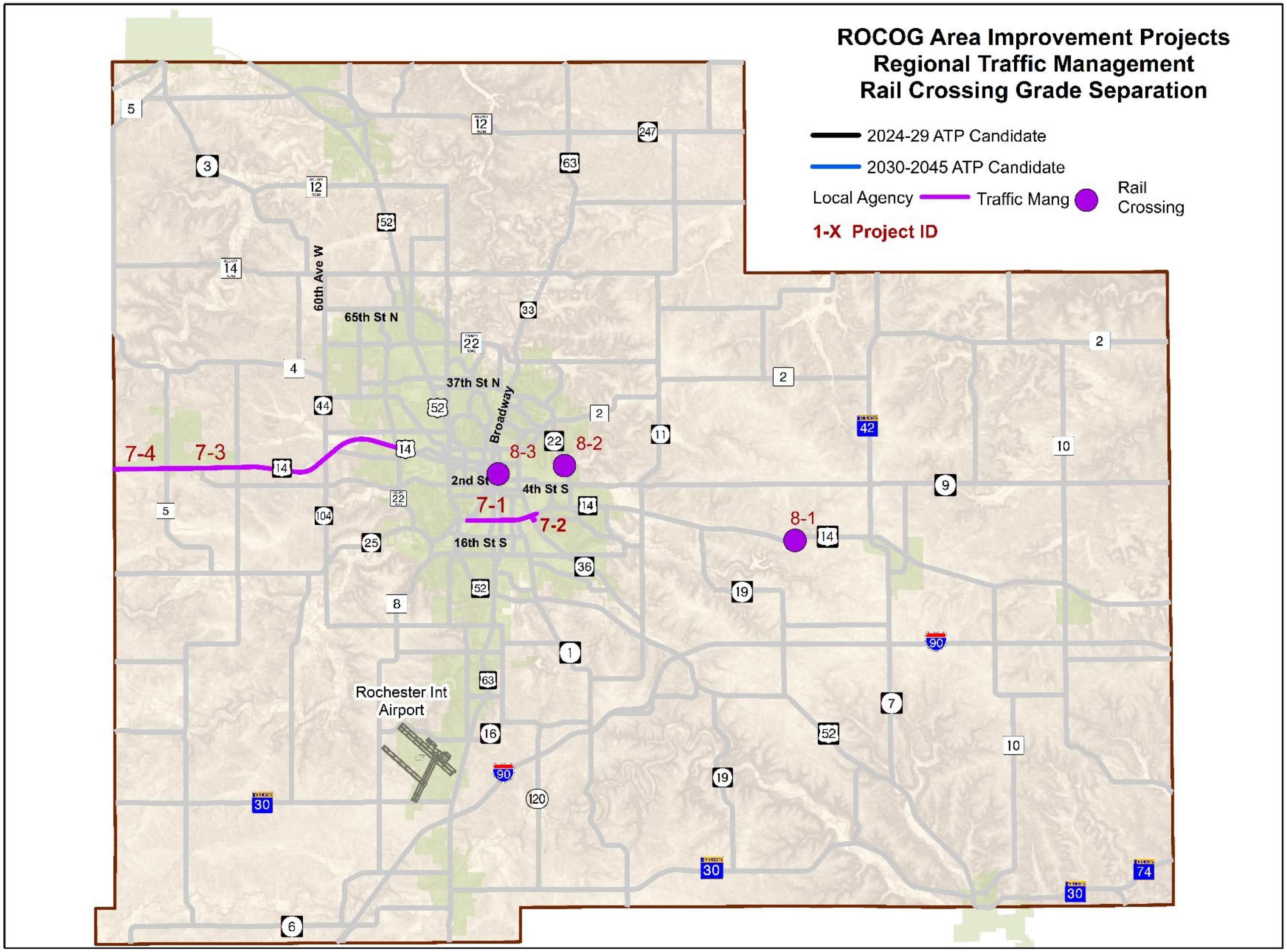
Group 7/8: Traffic Management & Rail Crossing Projects

Projects in Group 7 are generally lower cost traffic management projects involving installation of communications, information, and warning equipment to help aid the flow of traffic on these corridors. The CSAH 36 is a project anticipated to include a typical construction component which would be likely to involve median or edge curbing to provide a higher level of traffic flow control. The rail crossing projects are all illustrative and would be anticipated to involve some level of discretionary or rail-related funding if a need for any of these projects actually would materialize. While the need for the rail crossing projects is low and expected to remain so long as rail traffic remains minimal, flagging the projects in the plan can help to guide other planning in the vicinity of the crossings.

Table 10-24: Group 7/8 – Traffic Management and Rail Crossing Projects

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Lead Agency	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre-tionary Grant $$ Sought
Regional Traffic Management Subgroup							**$ 2,250,000**							
7-1		TH 14 (S)	TH 52	CSAH 36	TSMO	*MNDOT*	**$ 50,000**	**X**						
7-2		CSAH 36	TH 14 E	Eastwood Rd	Urban Safety / Access Mang Upgrade	*Olmsted*	**$ 500,000**		**X**	**X**				
7-3		TH 14 West	CSAH 5	CSAH 22	Install Traffic Management Equip	*MNDOT*	**$ 700,000**	**X**						
7-4		TH 14 West	CSAH 5	Kasson	Install Traffic Management System	*MNDOT*	**$ 1,000,000**	**X**						
Rail Crossing Subgroup							**$ 44,700,000**							
8-1		TH 14 E	CP Rail	Crossing	New Rail Overpass	*MNDOT*	**$ 17,190,000**	x						**Rail**
8-2		CSAH 22 E	CP Rail	Crossing	Rail Crossing Safety	*Olmsted*	**$ 15,280,000**		x					**Safety**
8-3		West Silver Lake Dr	CP Rail	Crossing	Rail Crossing Safety	*Rochester*	**$ 12,230,000**			x	x			**Funding**

Figure 10-14: Location Map/Group 7/8 –Traffic Management & Rail Crossing Projects



Street & Highway Network Improvement Program Groups

In addition to the specific project groups summarized on the previous pages, the Plan also identifies four program groups that call for investment in highway system features. It is expected that not all the locations identified as candidate improvement areas will occur during the next 25 years; improvements are likely to occur as opportunity arises as part of system preservation projects or where significant changes in traffic conditions occur.

The four programs identified include:

- Intersection Improvement Program
- 10-Ton Route Improvement Program
- Regional Highway Shoulder Upgrade Program
- District 6 Highway Safety Program

Table 10-25 highlights the estimated cost for all the program project areas that were identified. For 10-ton route improvements and regional shoulder upgrades, the dollar costs are based on the incremental cost of adding the improvements as part of a larger preservation projects; for example, paving gravel shoulders as part of a larger mill and overlay project adds incremental costs that would be less than a free-standing shoulder paving project.

Figure 10-14 identifies locations for the Intersection Improvement Program. A screening process was used that analyzed projected 2045 traffic volumes to determine whether unacceptable levels of delay or conflict would occur at locations currently operating under two way stop control. Depending on results, intersections were grouped into one of 3 categories:

- **High cost intersections** where signalization or use of a roundabout intersection appear to be needed in the future
- **Moderate cost intersections** where improvements such as turning lanes or enhanced level of intersection warning device installation may be needed
- **Low cost intersections** where minimum improvements such as improved intersection lighting or signage would likely be sufficient

Figure 10-15 highlights corridors identified as part of the 10-Ton Route Improvement Program. A set of criteria were used to identify candidate locations. The criteria utilized were:

- Corridor provides connection to 9/10-ton route in adjacent county
- Corridor Volume > 750
- Corridor improves connectivity to State 10-ton network

- Corridor provides improved first mile /last mile service to a rural agricultural/rural business area currently not within 1-2 miles of a 10-ton route
- Corridor helps to create a bypass route for rural heavy commercial traffic around the city of Rochester.

Figure 10-16 identifies corridors identified for the Regional Highway Shoulder Improvement Program. The criteria used to identify corridors were:

- Volume > 750
- Corridor is coincident with existing or planned 10-ton network and corridor has seen heavy commercial vehicle crashes not at an intersection in the past
- Corridor is coincident with planned regional Shoulder Bikeway Network;
- Corridor has a functional designation of arterial

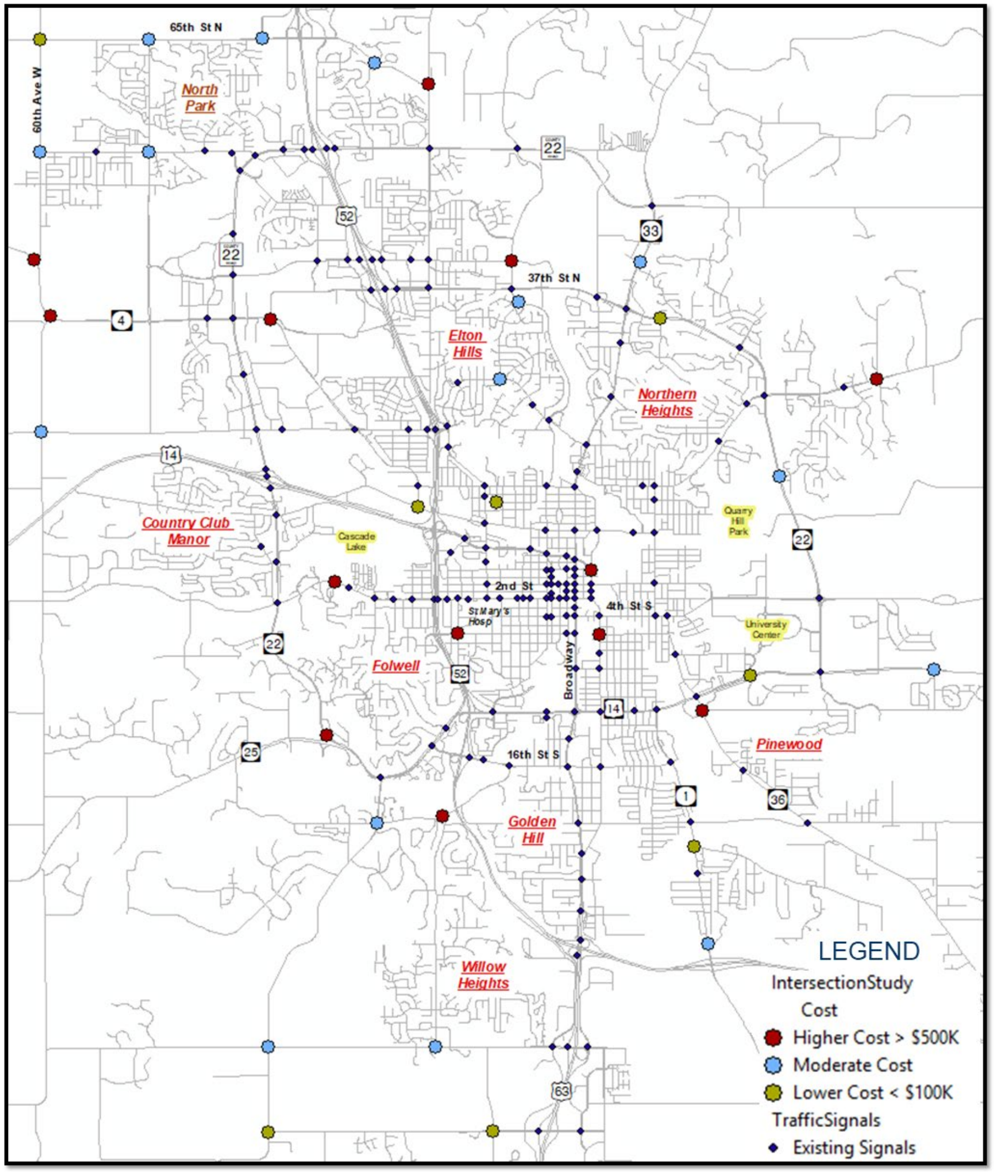
The final program group identified is the District 6 Highway Safety Program. The 2016 District 6 Highway Safety Plan identified locations, shown in Figure 10-17, where safety investment, ranging from high cost improvements such as potential signalization to low cost measures such as curve warning signage, were warranted.

The aggregate cost of these safety improvements is reported in Table 10-25. Discussion of the costs of these improvement programs in the context of Fiscal Constraint is found in Chapter 16.

Table 10-25: Spot Safety and Mobility Program Costs

Map ##	ROCOG/ ATP Candidate Project	Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Miles of Corridor Improvement OR # of Locations	Estimated Cost	MNDOT	Olmsted	Rochester	DMC	Small City	Private	Discre- tionary Grant $$ Sought
		Spot Safety and Mobility Programs					**$ 5,530,000**							
		Shoulder Enhancement Program			MnDOT Highway Shoulder Enhancement	19 Miles	**$ 2,040,000**	**X**						
					Olmsted Roads Shoulder Enhancement	32 miles	**$ 3,490,000**		**X**					
		Intersection Improvement Program			MNDOT Locations	3	**$ 430,000**	**X**						
		"Locations" refers to intersections where agency will participate in funding			Olmsted County Locations	18	**$ 3,830,000**		**X**					
					Rochester Locations	32	**$ 7,550,000**			**X**				
		10 Ton Route Network Enhancement			Olmsted County Roads	41.5 Miles	**$ 9,630,000**		**X**					
		Safety Evaluation			MNDOT District Safety Plan	See Chap 8 / Page 8	**$ 7,200,000**	**X**						**HSIP**

Figure 10-15: Intersection Improvement Program Locations



In the legend of the map the terms categories are defined as follows:

- **High cost intersections** where signalization or use of a roundabout intersection appear to be needed in the future
- **Moderate cost intersections** where improvements such as turning lanes or enhanced level of intersection warning device installation may be needed
- **Low cost intersections** where minimum improvements such as improved intersection lighting or signage would likely be sufficient

Figure 10-16: 10-Ton Route Improvement Program – Recommended Highway Upgrades

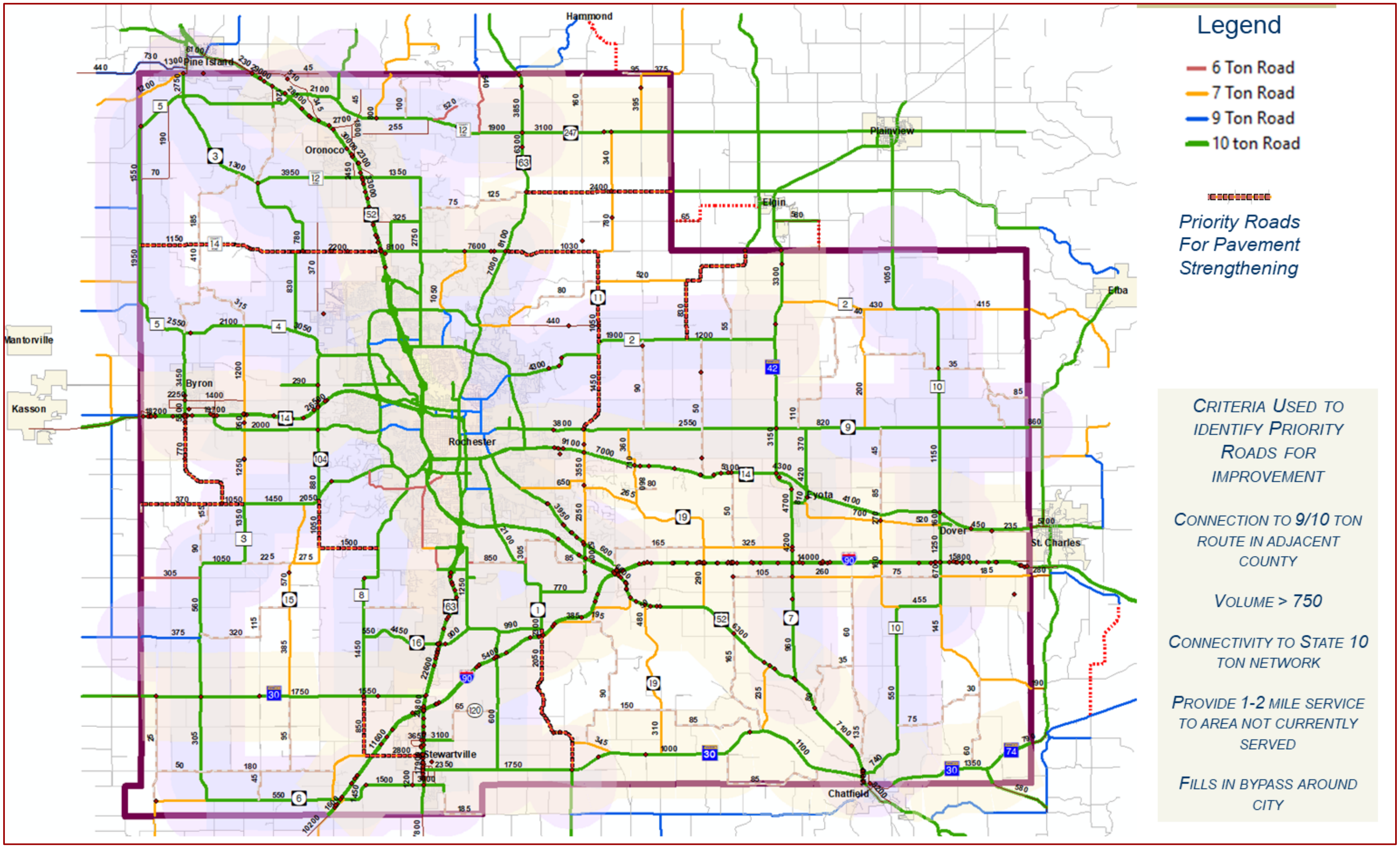


Figure 10-17: Regional Shoulder Improvement Program

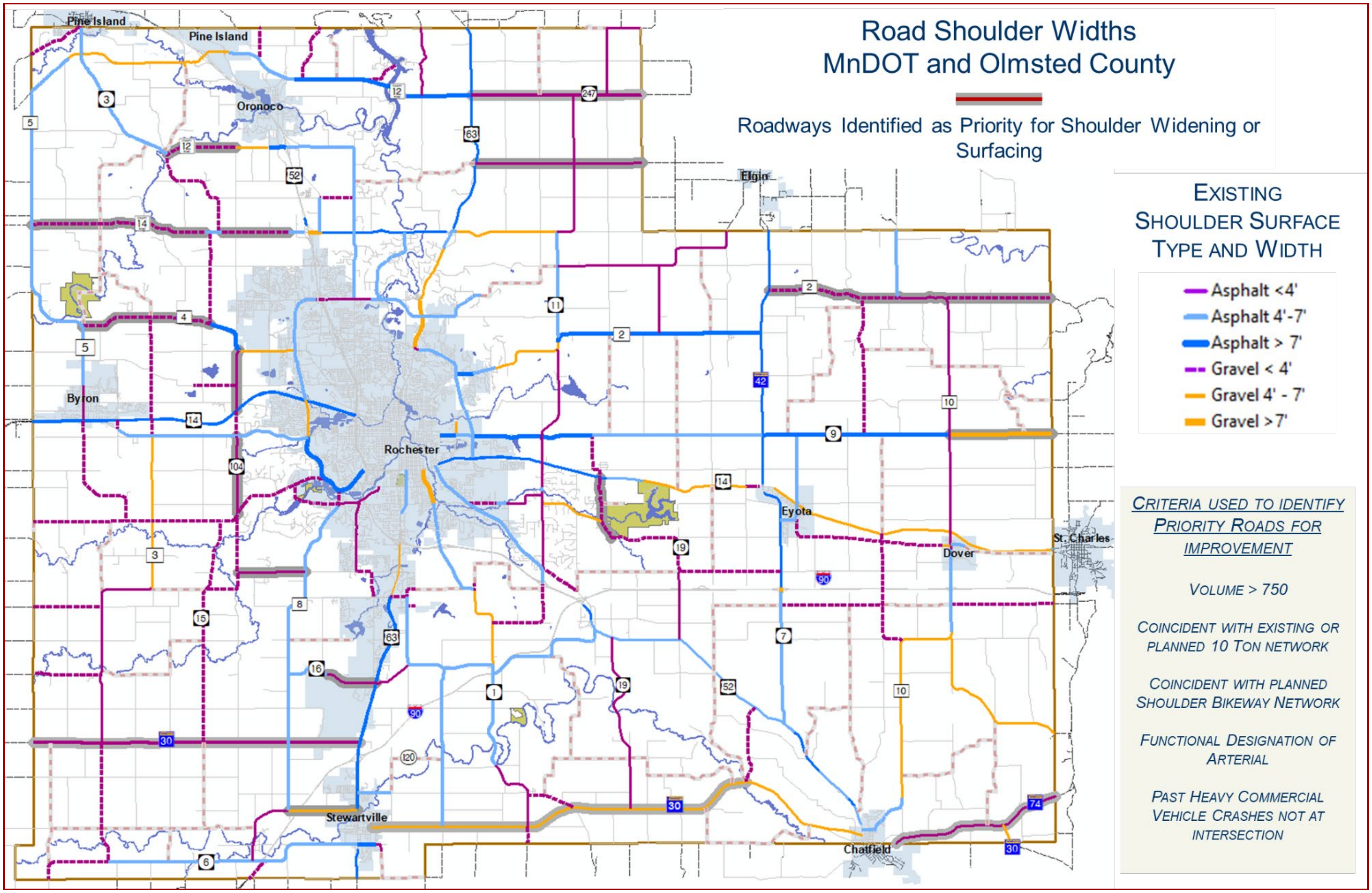
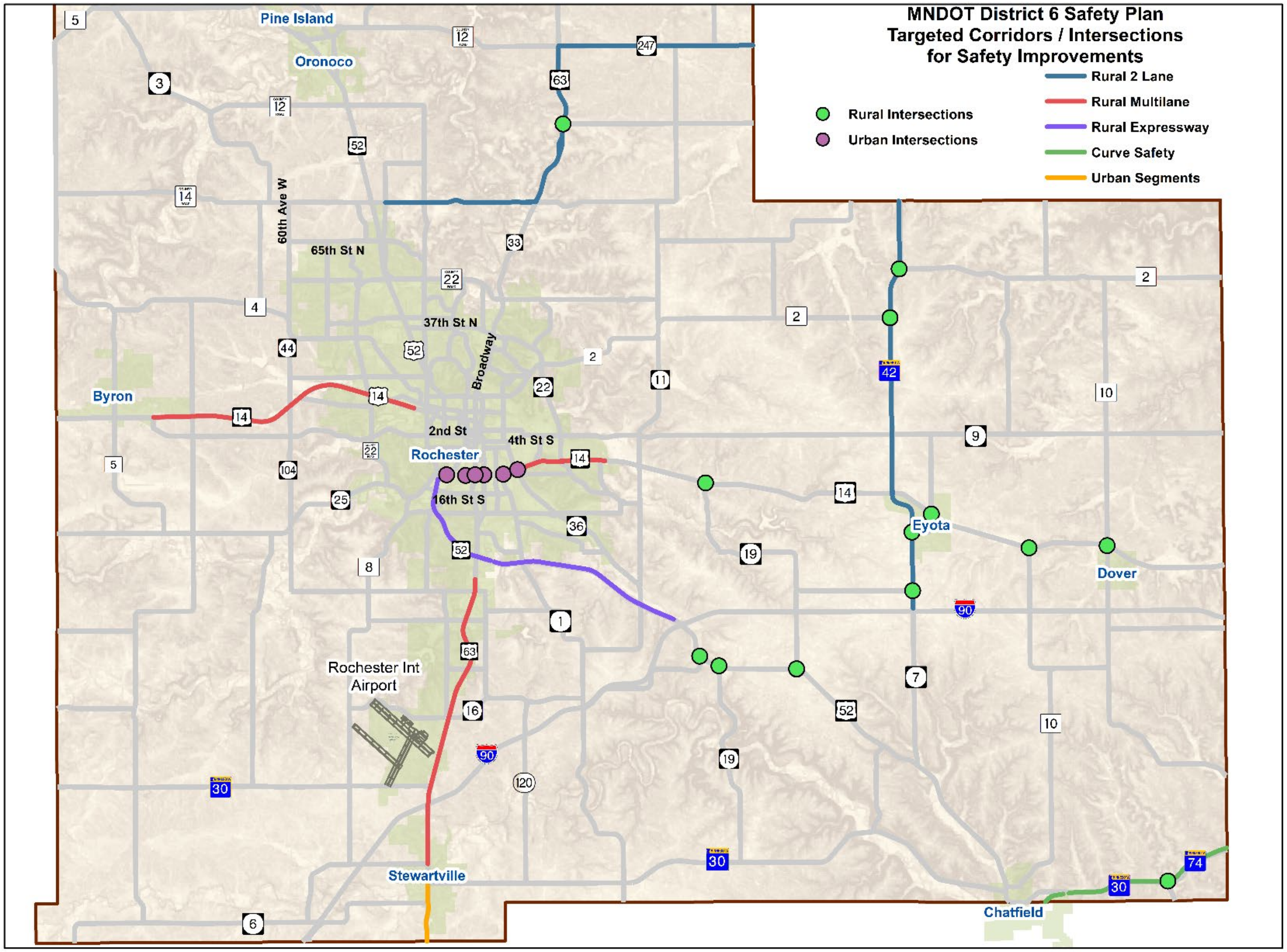


Figure 10-18: MnDOT District 6 Highway Safety Plan – Improvement Locations



Street Preservation Needs

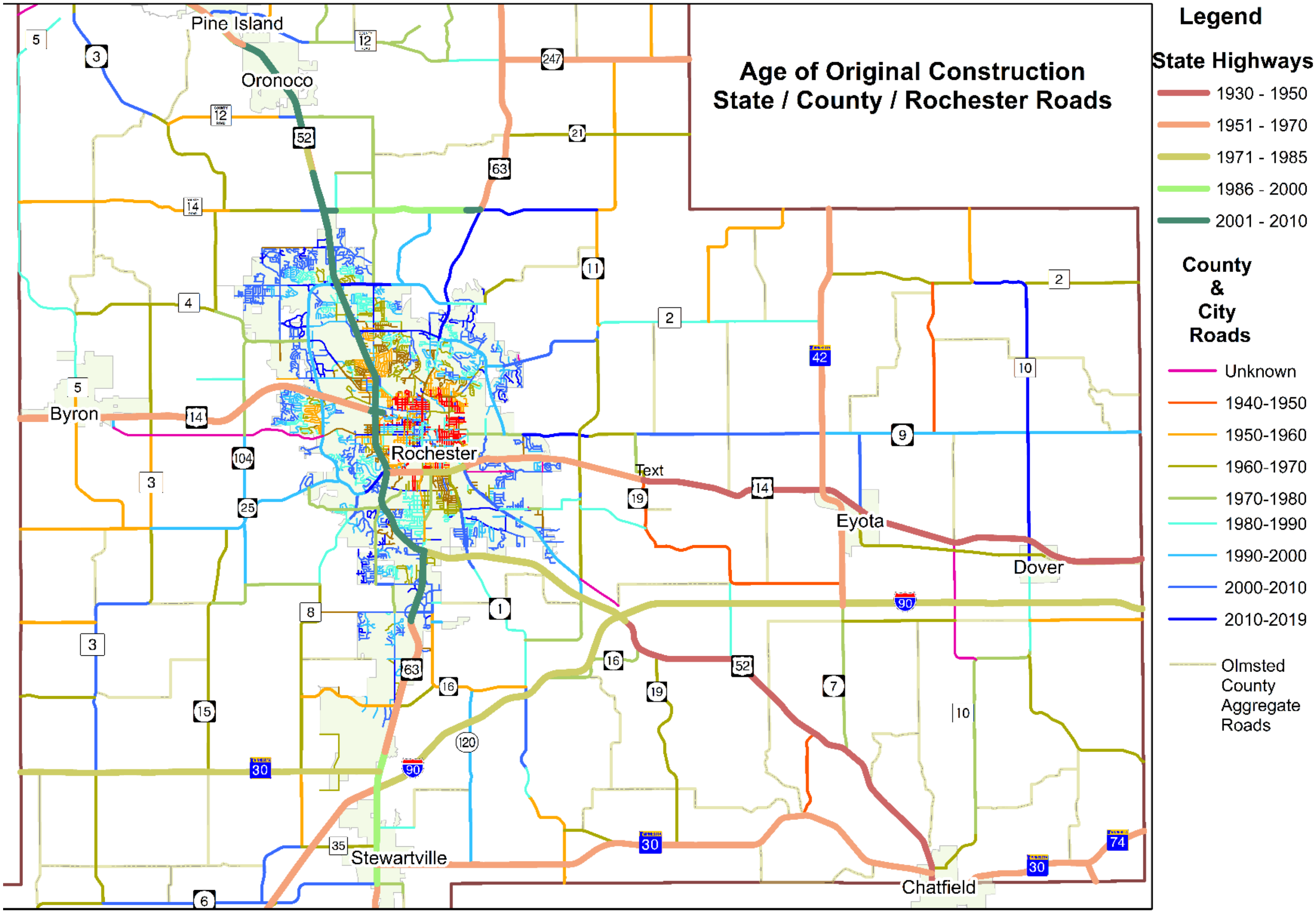
A significant consideration in the financial analysis of the plan is the funding needed for preservation and maintenance of the existing network of roadways and bridges in the ROCOG Planning Area. MnDOT, Olmsted County, and Rochester are responsible for keeping 1,134 centerline miles of street, composed of 2,546 lane miles of roadway with an estimated capital value of $3.4 billion, in reasonably good operating condition for travel in the planning area.

The primary discussion of street system preservation is found in Chapter 15 where it is discussed as part of the financial analysis. Table 10-26 provides some basic metrics of the street network and an estimate of what percentage of each agency's road network will need reconstruction by 2045. Overall, it is estimated that 50% of the current road network will have reached its design life and need reconstruction during the next 25 years. Primary roads built before 1995 and secondary roads built before 1975 are prime candidates for reconstruction based on a 50-year design life for primary roads and 70 years for secondary roads (design life assumptions are explained more fully in Chapter 15). Table 10-26 indicates that MnDOT faces the most significant reconstruction burden, with 75% of primary roads and 99% of secondary roads likely to be candidates for reconstruction. Approximately half of the Olmsted County system will reach its expected design life during this time as will 55% of major roads but only 28% of secondary roads (which would include most neighborhood streets) of Rochester.

Table 10-26: Age/Expected Reconstruction Need on MnDOT – Olmsted County – Rochester Roads

	MnDOT		Olmsted		Rochester		Description of % Factors
Total Lane Miles (LM)	488		797		990		
Primary Road LM	348	71%	130	16%	280	28%	% of Total Lane Miles
Built Since 1995	86	25%	66	51%	124	44%	% of Primary Road Lane Miles
Built Before 1995	262	75%	64	49%	156	56%	% of Primary Road Lane Miles
Secondary Road LM	140	29%	668	84%	709	72%	% of Total Lane Miles
Built Since 1975	1	1%	342	51%	509	72%	% of Secondary Lane Miles
Built Before 1975	139	99%	326	49%	200	28%	% of Secondary Lane Miles

Figure 10-19: Year of Original Construction/Reconstruction of Current Road Network



Bridge Preservation Needs

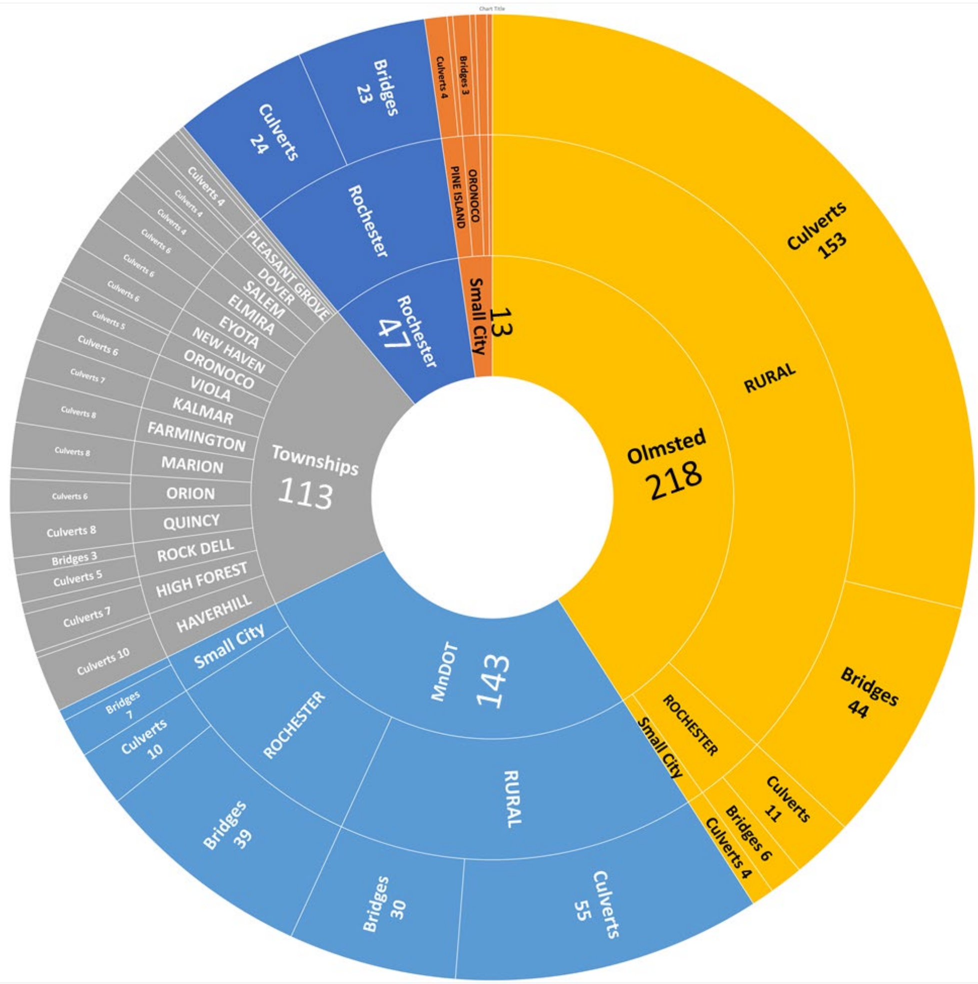
There is a total of 534 bridge structures in the ROCOG planning area that must be maintained to insure ongoing connectivity of the road network. Figure 10-19 illustrates the ownership pattern. Olmsted County owns 41% of the structures plus has the responsibility for managing work on the Township Bridge Network, accounting for another 21% of structures.

Figure 10-20 indicates the results of an analysis by ROCOG indicating bridges expected to need reconstruction or major rehab work over the next 25 years. Table 10-27 reports the number of structures in each category for each jurisdiction. As with street preservation needs, the cost of future work is discussed in Chapter 15.

Table 10-27: Bridge Preservation Needs

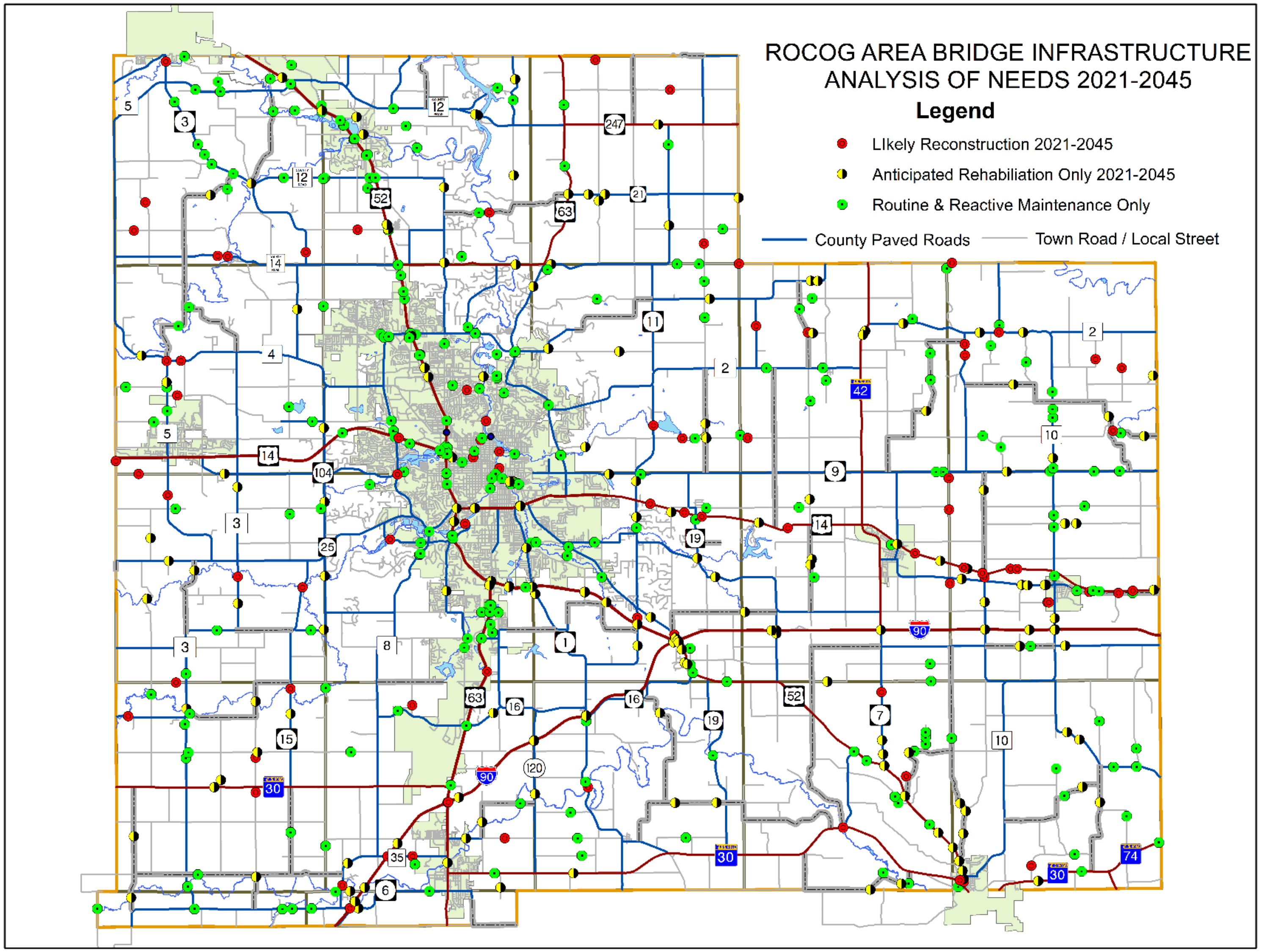
Jurisdiction	Estimated Reconstruction Needed	Estimated Major Rehab Needed
MnDOT	19	69
Olmsted	30	93
Rochester	8	5
Townships	26	20
Small Cities	2	4

Figure 10-20: Distribution of Bridge Structures by Owner in ROCOG Area



**Rochester has additional 37 Skyway/Plaza/Trail Structures*

Figure 10-21: Results of ROCOG Bridge Network Analysis Estimating Reconstruction or Major Rehab Needs Through 2045



11 • Transit and Commuting

Overview/Summary

This chapter is a summary of current and near-term transit planning recommendations and key long-range transit focus in the ROCOG area. The recent Rochester comprehensive plan update and the Integrated Transit Studies that evolved from the Destination Medical Center Plan greatly helped to shape this chapter. ROCOG and staff have been and are involved in these and similar on-going studies as noted in this chapter, since all of these coordinated studies contribute to long-range transit planning in the Rochester and Olmsted County region.

The ROCOG area's transit systems today are organized around urban and regional commuter fixed route and express services, along with urban and regional demand responsive bus service. In the future it is anticipated these services will be expanded and enhanced and supplemented with a high capacity transit service in a selected number of key corridors/subareas. This will include Bus Rapid Transit (BRT) service serving the Rochester greater downtown area and a Primary Transit Network (PTN) serving the main corridors of Rochester.

Park and ride express service will expand and be enhanced with permanent sites replacing the current leased site model. Southern Minnesota commuter service will be increased in response to greater commuter ridership and to meet job growth in the downtown Rochester area. Finally, land use will transform over time in the core of Rochester and along the PTN corridors to support greater mode shift from single occupancy auto to transit trip-making.

Principal Planning Support Documents

2014 Destination Medical Center Plan

An economic development program proposed by the Mayo Clinic in 2012 known as the "Destination Medical Center" (DMC) promises the prospect of $3.5 billion dollars in investment by the Mayo Clinic in Rochester over the next 20-25 years, along with an anticipated $2.5 billion expected in private investment in supporting land use and activities serving the Mayo Clinic and its patients. The Minnesota State Legislature approved legislation that provided financing mechanisms to raise up to $585 million in public investment to support the DMC initiative, contributed from the State of Minnesota, Rochester, and

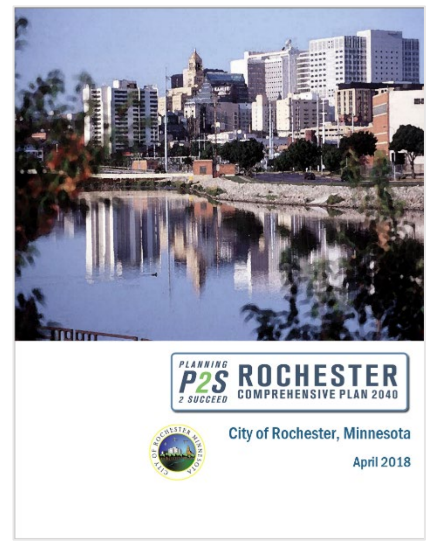
Olmsted County. The State Legislature established a Destination Medical Center Corporation (DMCC), which is charged along with the City of Rochester in managing the planning and expenditure of the $585 million in public investment.

The DMC is a major economic development initiative that will drive significant new job growth and tax base for future generations. It also supports a major downtown-focused travel shift from the auto to transit. The DMC will significantly increase and accelerate the demand for private development and public infrastructure in the Greater Rochester market. The target of the DMC is to support growth in employment on the order of 35,000-40,000 jobs over 20-25 years and to double the visitation from Mayo Clinic patients/companions, business travelers, convention/event goers and other visitors to the city, and particularly the downtown core.

As part of the tenets of the legislation, the DMCC has created an agency called the Economic Development Agency (EDA). The EDA and their consultants will work closely with the Rochester Community Development Department and City Administration to coordinate the DMC Development Plan implementation with the City's comprehensive plan's components and regional transportation planning studies in general.

Rochester 2018 Comprehensive Plan Update

The Rochester-Olmsted Planning Department completed *Planning to Succeed: Rochester Comprehensive Plan 2040* (P2S 2040) in 2018. This project consisted of two main elements:



- An update of various comprehensive plan elements was completed with a primary focus on future land use, capital facilities, affordable housing needs and options, and the management of environmental and cultural resources. Further analysis will include the ability of the City to meet future financial needs in a fiscally sustainable manner, considering the ongoing costs of existing infrastructure and services while absorbing the short- and long-term costs of new growth.

- A long-term transit framework was created. Examples of framework elements include:
    - Explore long-term transit system alternatives to help reach the goal established in the Rochester Downtown Master Plan that calls for reducing the share of downtown travel demand by single occupant vehicle travel from a current level of 70-75% to 50% over 25 years
    - Develop a downtown high capacity rapid transit service anchored by two or more transit villages with significant parking reservoirs
    - Refine the feasibility and service characteristics of high capacity arterial transit service in the City of Rochester to serve the travel demand generated by the Downtown/DMC District, creating the Primary Transit Network
    - Redevelop the existing park & ride service to provide for permanent parking facilities replacing the current leased sites

The rationale for an aggressive mode share split goal of 50% single occupant vehicle travel into downtown (rather than the current 70%) is that the significant downtown growth anticipated under the Rochester Downtown Master Plan and DMC initiatives will, if travel mode shares remain unchanged, necessitate the need for significant investment in terms of land in non-productive parking facilities. In addition, this future traffic will significantly increase congestion on downtown streets, impacting not only motorists but leading to a significant impact on the pedestrian environment in downtown Rochester.

Rochester 2017 Transit Development Plan

The objective of the updated Rochester Transit Development Plan was to include a variety of evaluation and recommendations of program goals and objectives, operations/service design, capital improvements, funding, management structure, marketing, and related policy issues. The study addressed internal and external factors influencing the use of public transit, including parking supply and policy, fares, schedules, route design, amenities, marketing, land use, etc. The plan included a 5-year short range element and a longer 10-year element.

Principal Transit Components

The Downtown Rapid Transit System

(Note: The name of this service formerly generalized as "The Downtown Circulator" was later changed by the City of Rochester to be called "Rapid Transit". However, the Letter for Entry into the FTA program was using the term Circulator at the time of its writing.)

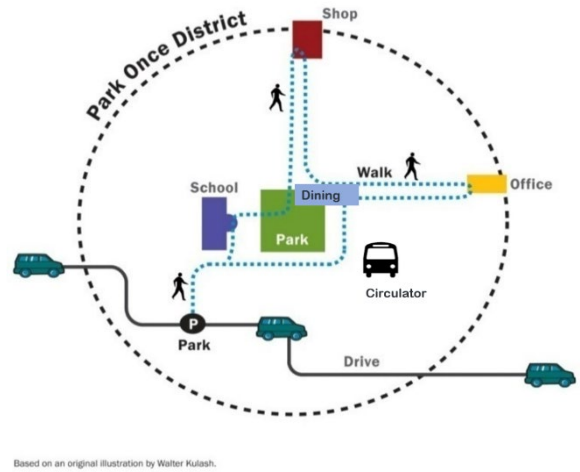
The Downtown Rapid Transit system is a planned high frequency transit service designed to provide connections between major activity hubs downtown along with connection to two major mobility hubs/transit villages west and southeast of downtown. The service is envisioned to provide service every 8 to 15 minutes in peak periods and 10 to 20 minutes in off-peak periods using bus rapid transit vehicles and service design.

The service will connect Mayo Medical Center facilities, Mayo Civic Center, many downtown hotels and housing as well as the planned Mobility Hubs/Transit Villages which will provide commuter parking integrated with mixed use commercial and residential development.

Create a Park-Once Downtown Environment

A key principle of downtown development is the concept of a Park Once District, conceptually highlighted in Figure 11-1, which is intended to permit individuals to park their vehicle at a location when they arrive downtown (or on the fringes of downtown) and then move about downtown during the day without further need for their auto until the end of their stay. The frequency and accessibility afforded by the Rapid Transit System should free up high value downtown land for uses other than off-street parking. This Rapid Transit system is a key strategy of the DMC Plan.

Figure 11-1



This strategy will help to eliminate the need for as many as 6,000 to 8,000 parking stalls in the downtown core, freeing land for tax-producing, developable space. Enhanced branding for the park-once system, parking wayfinding for drivers and pedestrians, and incorporation of real-time parking information are all elements of the parking system that will be added to increase efficiency and enhance the visitor experience.

The Locally Preferred Alternative (LPA) For the Rochester Rapid Transit System

A letter dated December 10, 2019 from the City of Rochester to the Federal Transit Administration contained the following excerpts:

> “The City of Rochester, in close coordination with regional partners, submits this request for entry into the Small Starts Project Development phase for the Rochester Downtown Circulator BRT Project, referred to as "the circulator" and "the project".

The locally preferred alternative (LPA) is an approximately four-mile BRT route that will run from the Mayo Clinic West Parking Lot to downtown Rochester via 2nd Street SW, making intermediate stops at major intersections, as well as St Marys Hospital. At the St. Marys station, a transit center will be constructed on the north side of 2nd Street SW along with a pedestrian tunnel providing access between the hospital and transit center. 2nd Street SW will be reconstructed in this area to accommodate these infrastructure investments. In downtown Rochester, the circulator will serve stations at 2nd Street and 2nd Avenue SW (Gonda Building) and at 2nd Street SW and S Broadway Avenue before proceeding south along S Broadway Avenue, where it will serve the proposed future University of Minnesota-Rochester campus. The eastern terminus will potentially be located south of 12th Street SE on property owned by Olmsted County and will include the site preparation and construction of a 1,000-car parking structure. The alignment and terminus options are shown in Figure 11-2.

On May 4, 2020, the Rochester City Council voted in favor of a phased implementation of the LPA. The first phase of the project would consist of the BRT route from the West Transit Village along 2 St SW in both directions. But instead of turning south on Broadway Ave toward the East Transit Village, the first phase would use 2 St SE, 3 Ave SE, 4 St SE, and Broadway Ave as a loop at the eastern end of the alignment, as indicated in Figure 11-3.

The phased implementation recognized that establishing the east-west movement along the 2 St corridor would be easier to accomplish, while the north-south movement along South Broadway Ave presented challenges for siting the East Transit Village and other considerations resulting from traffic impacts in that corridor. An alignment connecting to an east or southeast transit village with large parking reservoir is still intended as part of the Downtown Rapid Transit project, but that leg of the project will be in a later phase of implementation.

Downtown Area Commuter Parking/Transit Villages

As noted in Figure 11-2, the endpoints of the Downtown Circulator west and south of downtown Transit Villages/

Figure 11-2: Locally Preferred Alternative for Rochester Downtown Rapid Transit

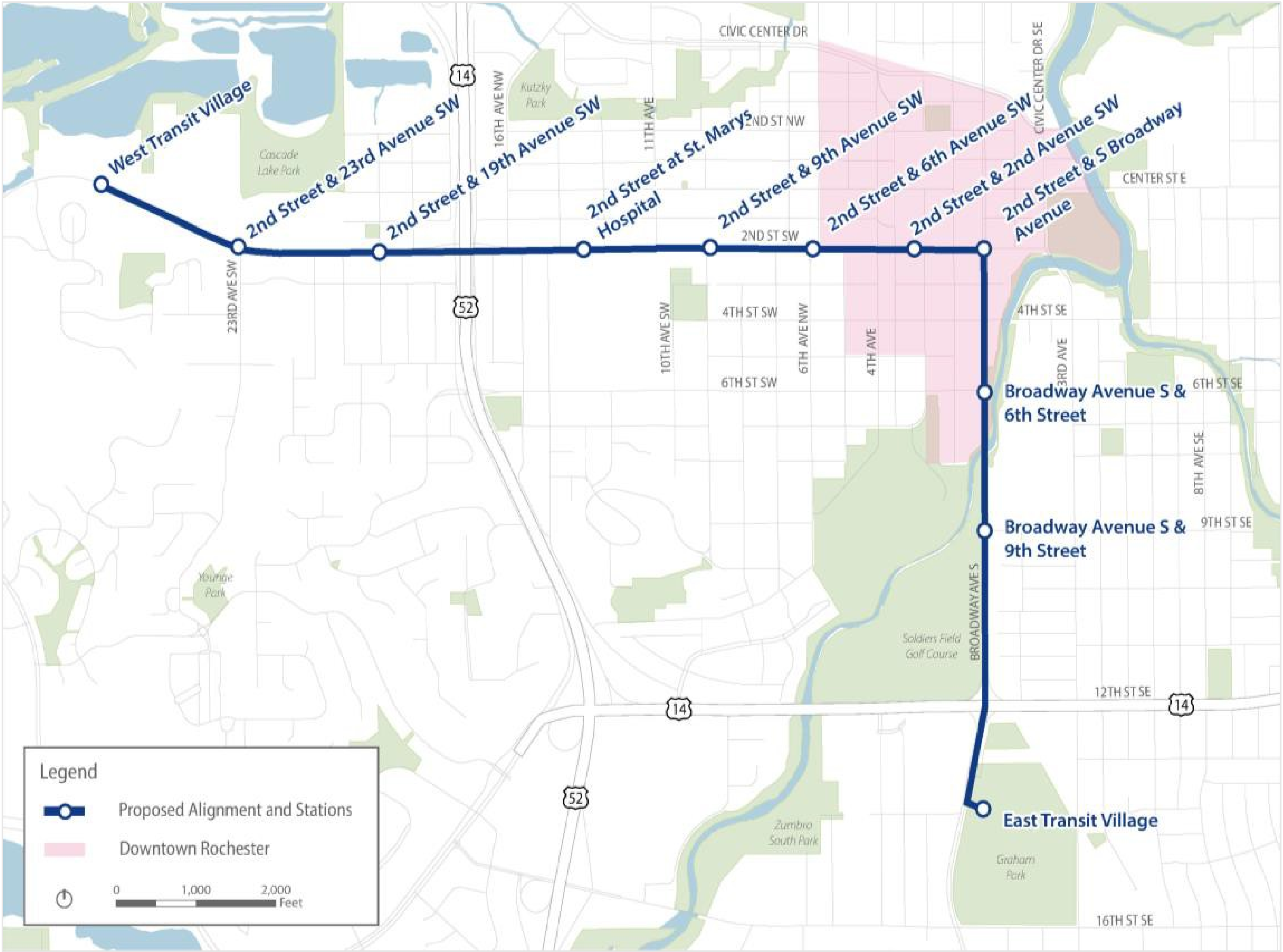
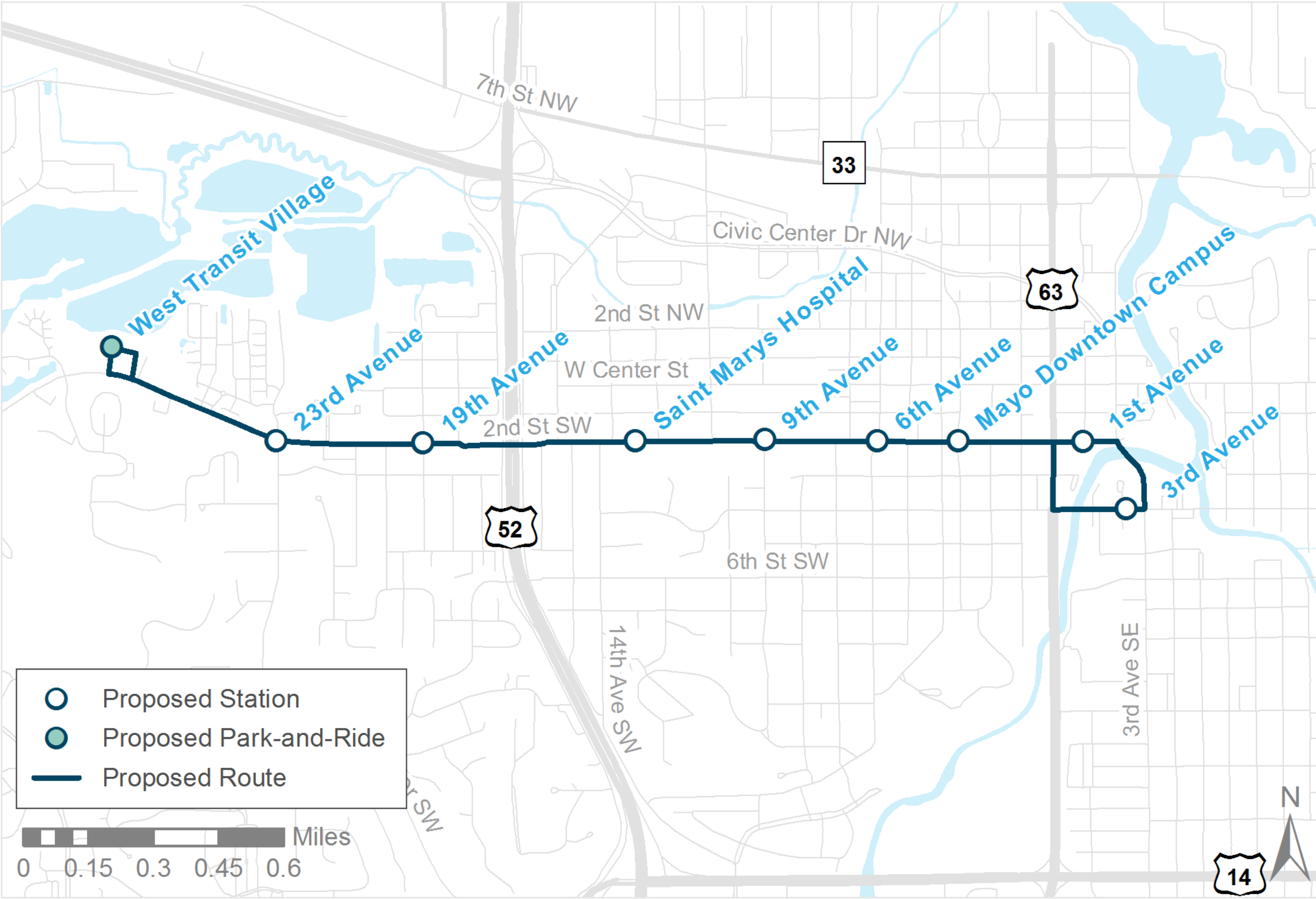


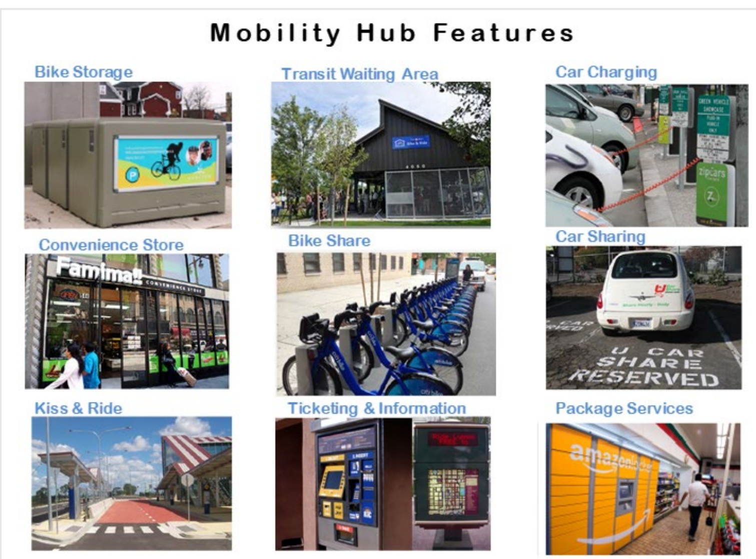
Figure 11-3: Proposed Phase 1 of Rochester Downtown Rapid Transit



Mobility Hubs are envisioned to provide major parking reservoirs for people traveling to destination downtown, combined with mixed used development that will provide housing and space for business with easy connection to downtown. Figure 11-4 highlights some potential development concepts for these sites, envisioned to be located at the Mayo West Park and Ride lot on 2nd St SW, and in the vicinity of the former Seneca/Graham Park on South Broadway.

The "Mobility Hub" element of the Transit Villages highlights the incorporation of services or features targeting commuters and others living in the immediate vicinity of the site to encourage their use of Downtown Rapid Transit.

Figure 11-4



LPA Capital and Operating Cost Estimate

At this time, it is expected that the total capital investment from all sources for the original LPA would be approximately $203 million in year of expenditure (2023) dollars, placing it in range for the Small Starts program as a corridor-based bus project. The City of Rochester currently estimates that 49 percent of the project cost would be requested from Small Starts. The annual cost of operating and maintaining the circulator in the configuration of the original LPA is anticipated to be $4.04 million, with an hourly operating cost per revenue hour of $118.37 and 34,140 annual revenue hours expected.

The first phase of the LPA, having only one transit village, at the west terminus, and fewer stations along the entire route, is estimated to have a total capital cost of about $107 million and an annual operating and maintenance cost of $2.94 million.

Need for the Project

Downtown Rochester is expected to grow dramatically; employment is expected to grow by approximately 65 percent and population by 30 percent over the next 20 years. Both the City of Rochester's *Downtown Master Plan* and the *DMC Development Plan* identify a major increase in transit mode share to accommodate this growth and state a goal of carrying 23 to 30 percent of all commuters on transit. As a result, transit ridership on both the local and regional transit systems is expected to nearly double, requiring more transit capacity.

The following factors contribute to the need for the project:

- Growth in local and regional travel associated with the implementation of the *DMC Development Plan*
- Limited ability of the existing transportation network to support local and regional economic development priorities
- Congested downtown entry points and primary streets resulting from continued reliance on personal automobiles
- Parking program and policies that encourage the use of private automobiles
- Constrained transit system capacity and need to optimize/coordinate multiple existing services (RPT, Rochester City Lines [RCL], Mayo, and private shuttles)

Primary Transit Network

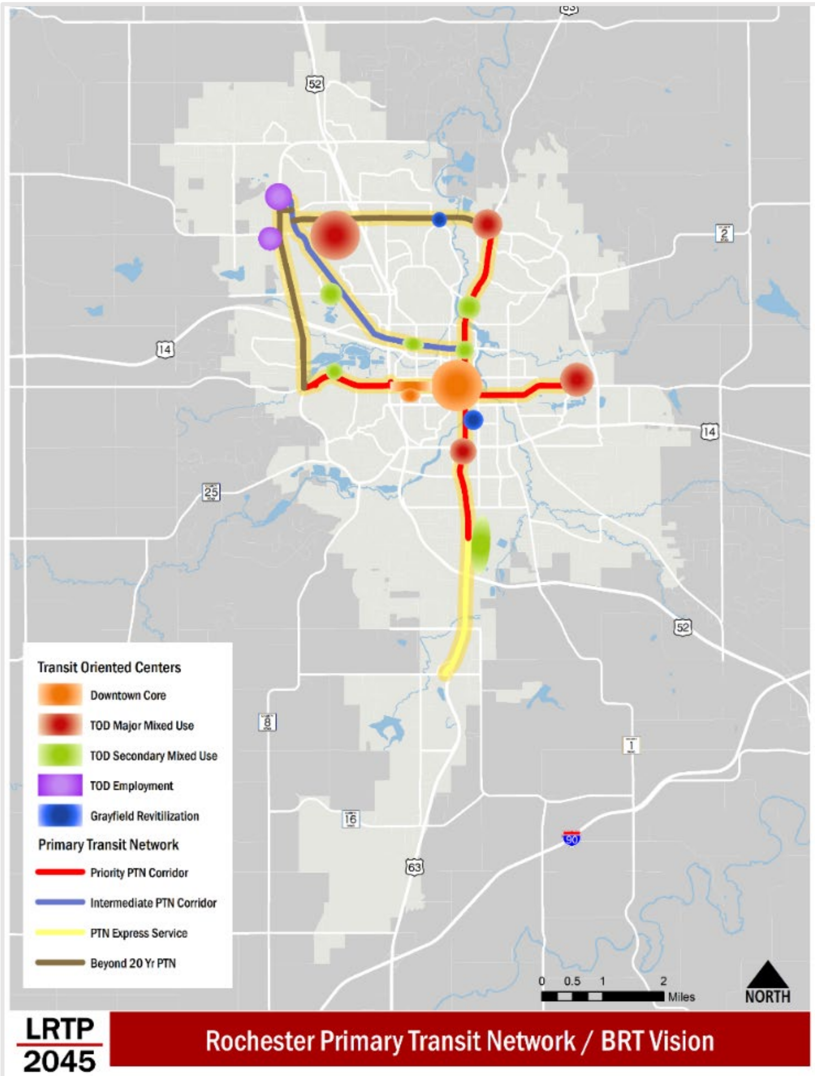
A Primary Transit Network (PTN) is planned for Rochester that will provide enhanced high frequency service to commuters, transit dependent households, students, one-car households and major origin/destinations in the core of Rochester. The PTN is introduced to Rochester as the framework for development of an identifiable transit infrastructure intended to create a sense of permanence that will attract private investment to growth-oriented transit corridors and nodes. The PTN will help guide growth in Rochester along a network of transit corridors where high-amenity transit services will connect major destinations and mixed-use nodes.

The Plan envisions a core network of Transit Supportive Corridors served by the PTN as illustrated in Figure 11-5. Broadway Avenue North and South along with 2nd St SW and 4th St SE will create a network touching every quadrant of the city, expanding ultimately in the long term along 7th St NW/Valleyhigh Dr, 37th St, and West Circle Dr to connect major development hubs throughout northwest Rochester.

The type of transit service along PTN corridors will be Bus Rapid Transit (BRT), the same type as used for the Downtown Rapid Transit System. However, while the Rapid Transit System will be only one route operating between two mixed-use transit village termini downtown, the PTN will be a separate system of multiple routes operating throughout the City.

The Rapid Transit System, PTN, and existing Rochester Public Transit bus service will provide three distinct but interrelated transit services that serve different ridership needs. In addition, city land development policies have

Figure 11-5



been amended to facilitate pedestrian friendly, transit supportive levels of growth along the core Broadway/2nd St/4th St spines, which should generate synergies between the prospect of investment in the PTN and land use that can make viable a more active lifestyle less dependent on private vehicle travel.

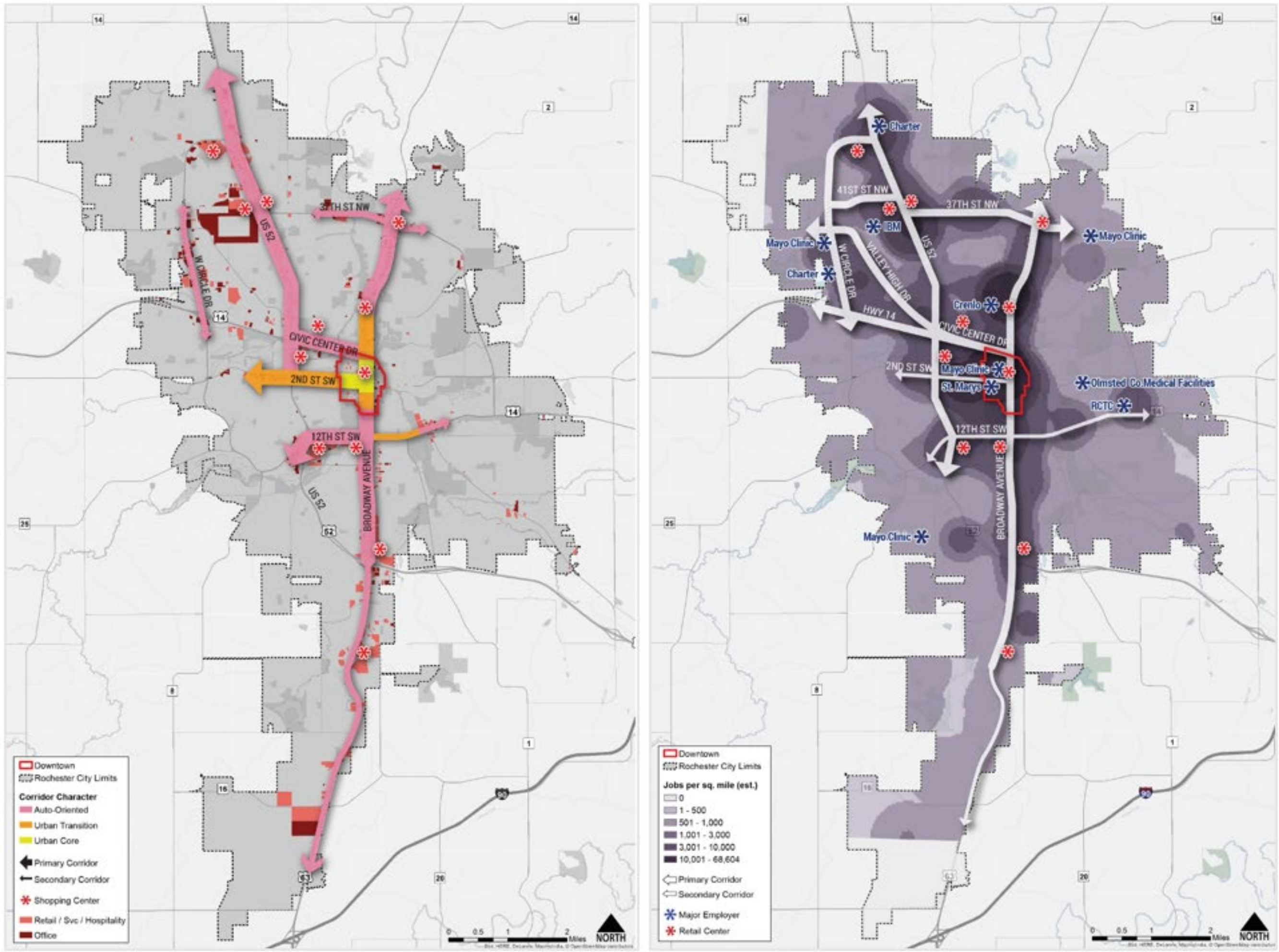
The Primary Transit Network was formulated through the P2S 2040 update process and was endorsed by ROCOG. Figure 11-6 shows two of the types of analysis done during the P2S 2040 project to provide a basis for the routes eventually selected for the Primary Transit Network.

BRT Service Characteristics

The Federal Transit Administration currently defines BRT as a bus system that meets the following criteria:

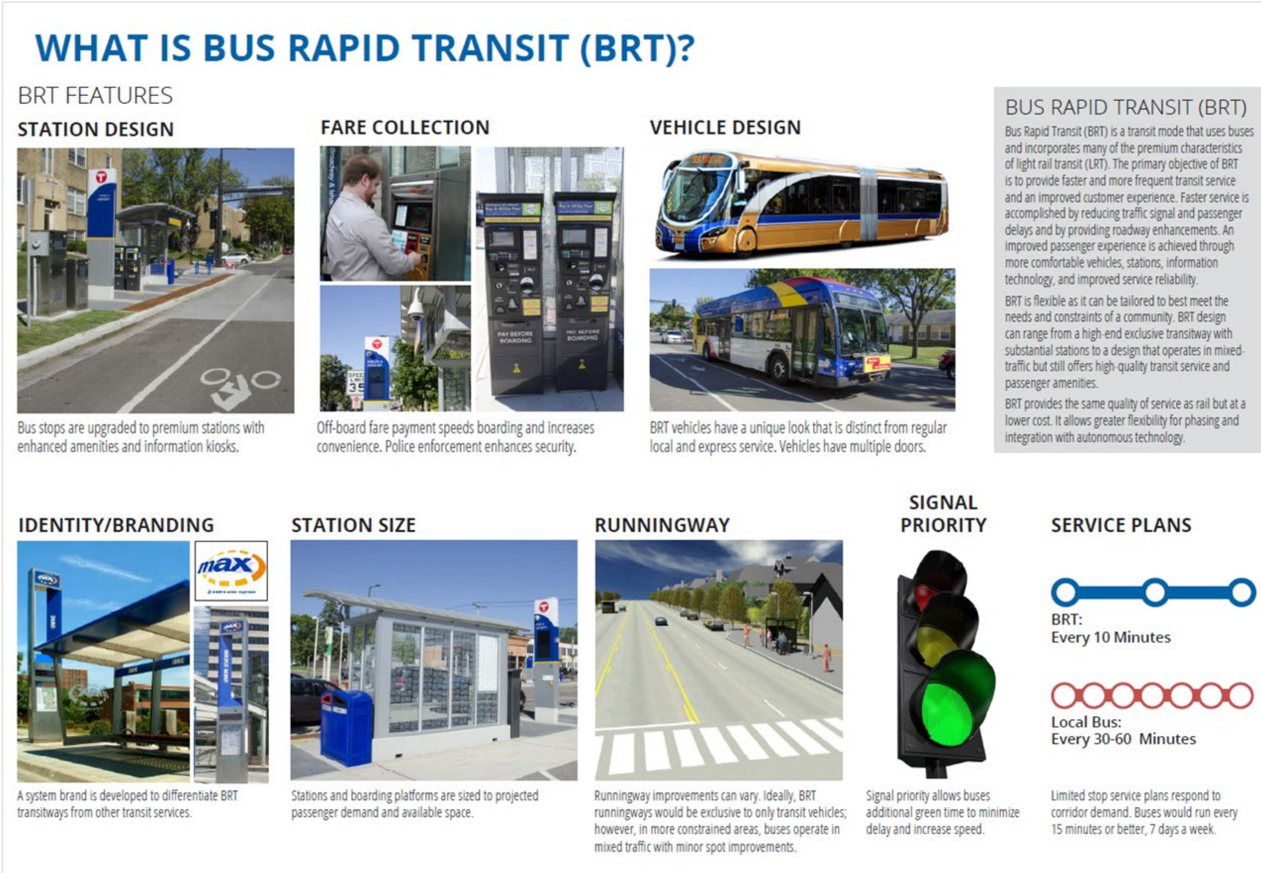
- Ideally at least some of the route operating in a lane dedicated for transit use during peak periods
- Defined stations that are accessible for persons with disabilities, offer shelter from the weather, and provide information on schedules and routes
- Intersection signal priority through congested intersections and or queue jump lanes in areas without a dedicated guideway
- At least a 14-hour span of service on weekdays and in a 10-hour span of service on weekends with a minimum of 10-minute headways in the peak and 15-minute headways in the off peak period on weekdays and 30-minute headways on weekends

Figure 11-6


US 52
37TH ST NW
W CIRCLE DR
CIVIC CENTER DR
2ND ST SW
12TH ST SW
BROADWAY AVENUE
Downtown
Rochester City Limits
Corridor Character
Auto-Oriented
Urban Transition
Urban Core
Primary Corridor
Secondary Corridor
Shopping Center
Retail / Svc / Hospitality
Office
NORTH
Charter
41ST ST NW
37TH ST NW
IBM
Mayo Clinic
VALLEYHIGH DR
HWY 14
Crenlo
CIVIC CENTER DR
2ND ST SW
St. Marys
Olmsted Co Medical Facilities
RCTC
12TH ST SW
Jobs per sq. mile (est.)
0
1 - 500
501 - 1,000
1,001 - 3,000
3,001 - 10,000
10,001 - 68,604
Major Employer
Retail Center

- A separate and consistent brand to easily identify stations and vehicles[1]

Figure 11-7



Bus Rapid Transit buses have features that differ from regular line-haul fixed route buses, as illustrated in Figure 11-7. BRT rubber wheeled vehicles look and feel much

1 From: U.S. Department of Transportation , Federal Transit Administration , June 2016.

like a railcar. They can operate either on streets without major modifications, or in a separate busway, or switch from one to another over the course of a route. Like a rail system, BRT service usually has permanent stations and amenities. BRT vehicles have a low floor design, making them easy to board, and have several doors for faster boarding/deboarding. Features generally associated with a BRT system include signal priority at intersections, queue jump lanes, and off-board fare collection. Vehicles are often fueled with low emission hybrid electric or compressed natural gas, and electric BRT vehicles are becoming more common.

Other BRT features include:

- Wide seats with extra legroom for a comfortable ride
- Standing room for riders who prefer to stand for shorter trips
- Seating for 48 passengers and overall capacity up to 80 riders
- Electronic automatic stop announcements
- Wheelchair boarding at the second door, and sometimes bicycle boarding at the third door directly onto onboard bike racks

BRT service usually includes more station-like boarding/deboarding facilities (Figure 11-8), which can be built to accommodate several buses simultaneously. Stations are less frequent than on local/neighborhood bus routes and spaced farther apart in order to consolidate passenger/bus interaction and keep overall schedules more competitive with the auto. Land use intensity along BRT corridors needs to be considerably higher than typical urban corridors service by local bus service.

Figure 11-8

Implementing the PTN Network

One of the strategic benefits of implementing the proposed Bus Rapid Transit service along the Rochester PTN is that it allows for incremental investment and deployment of a network of enhanced transit service as transit supportive land use intensity evolves along designated corridors.

Figure 11-9 describes a typical path of incremental investment that can lead from traditional local bus service to Bus Rapid Transit service over time as land use along a corridor intensifies and evolves. Initially more frequent service can be introduced incorporating some BRT features, with later evolution to full BRT when land uses along the transit corridors provide enough trip origins and destinations along the routes to justify the added expenses.

Figure 11-9

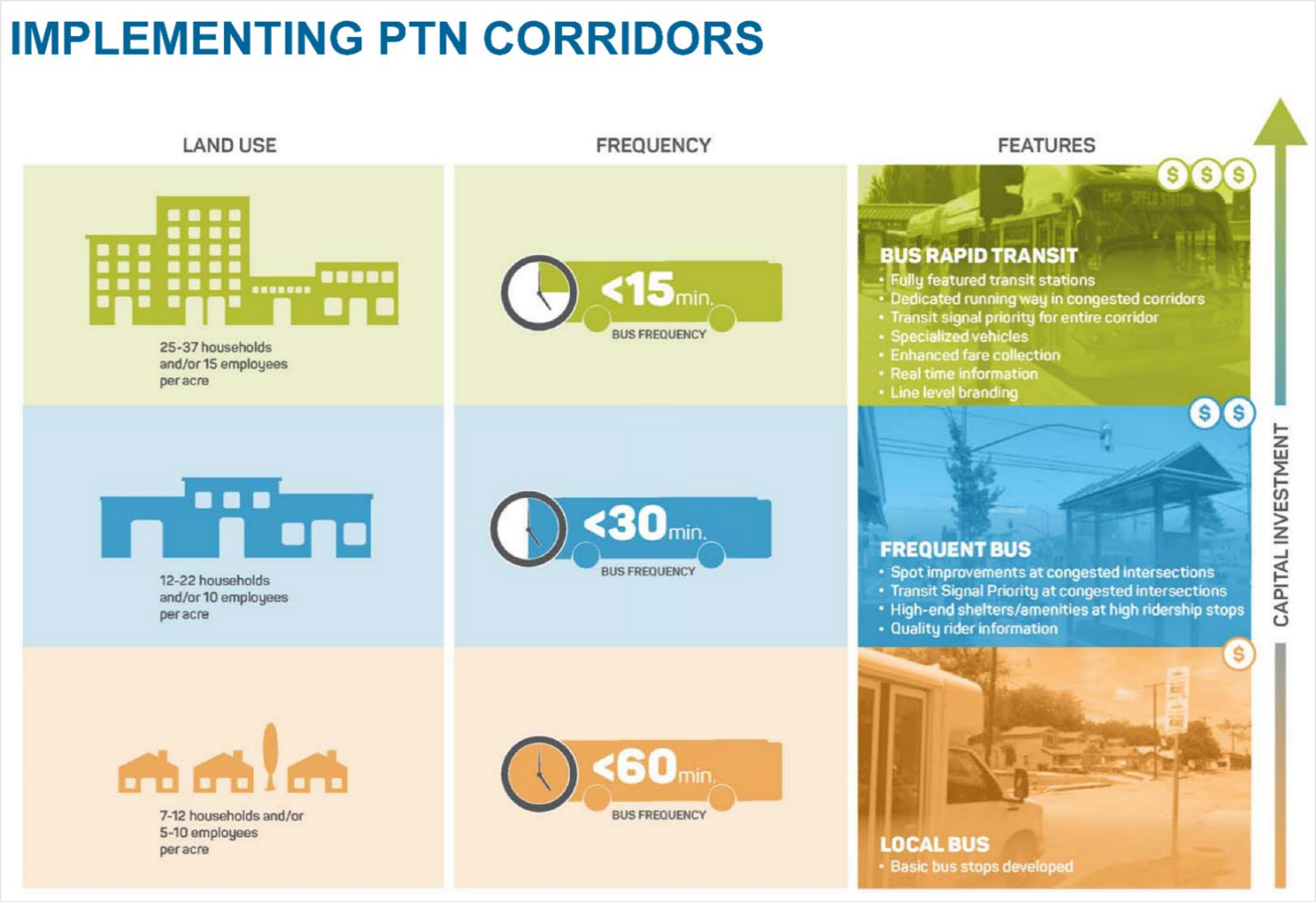
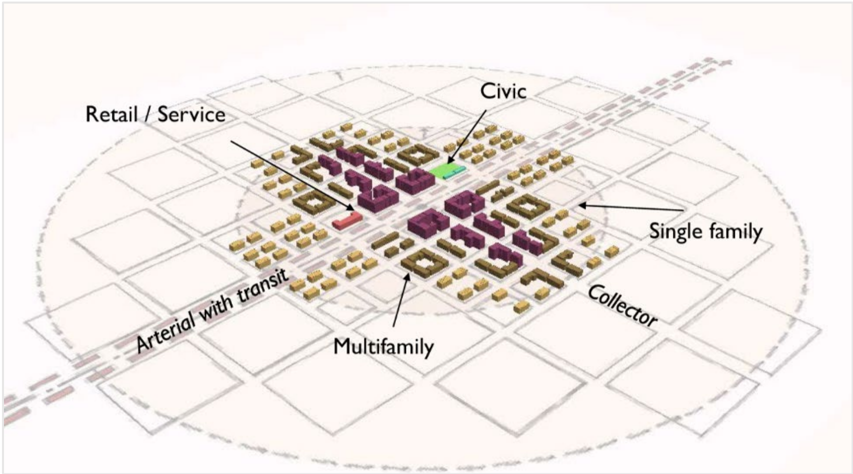


Figure 11-10 provides an example of the types of land uses that can typically be found in a Transit Oriented Development. Along the PTN this would be identified as a node including a BRT station location.

Figure 11-10



The Primary Transit Network can only advance as the land use intensifies along the corridors. Therefore, it's unlikely that the entire network will be built out by the end of this 2045 planning horizon. Figure 11-11 provides an estimate of when the various buildouts on the corridors will occur by timelines. The green boxes show those corridors that are expected to be operating as a full bus rapid transit system by the time horizons given. The red lines show the expected alignment of the first PTN routes, and the black lines show the expected alignment of the subsequent PTN routes.

In 2018, the Rochester-Olmsted Planning Department, in cooperation with ROCOG staff planners and a consultant, began the development of a corridor zoning plan for the first phases of the PTN network. The City of Rochester's Community Development Department completed this undertaking in 2019.This process resulted in adoption of Transit Oriented Development (TOD) regulations for areas of the Broadway Ave corridor and the 2nd St SW/4th St SE corridors outside of Rochester's Central Business District, as illustrated in Figure 11-12. The TOD regulations include both zoning criteria for TOD nodal areas, consistent with the designation of TOD nodes found in P2S 2040, and TOD corridor regulations for those area between nodes. This process also established an R-2x zone in areas within walking distance of Rochester's central core, easily accessible to and supportive of the PTN Network. The TOD and R-2x zones will encourage development with the density necessary to support BRT service. At some point, the next PTN corridor or corridors should be selected for the same type of zoning treatments. This is the primary tool that will ensure that the land use will densify in order to support bus rapid transit service on the Primary Transit Network in Rochester.

Figure 11-11: Anticipated Phasing of Primary Transit Network through 2045

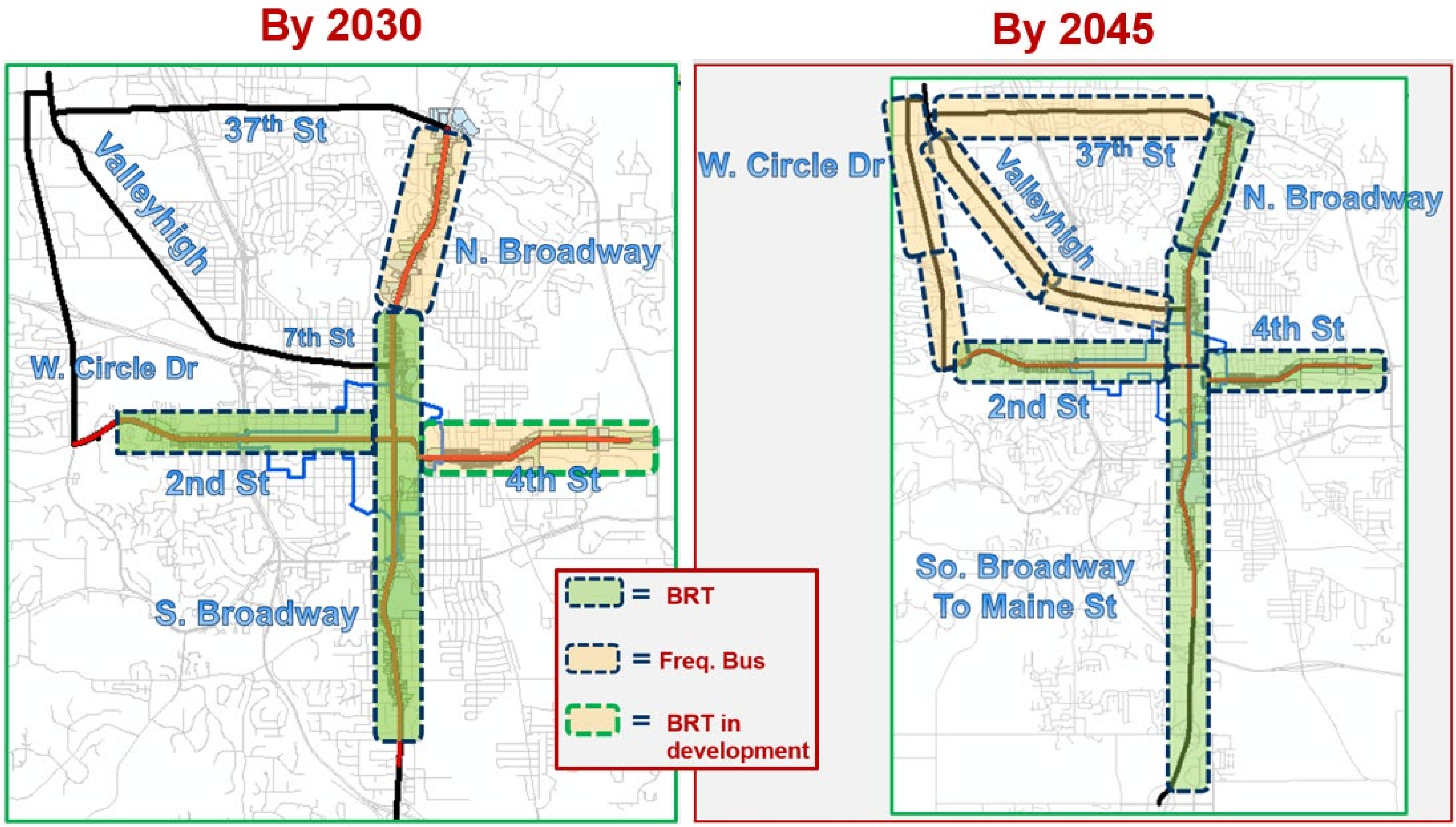
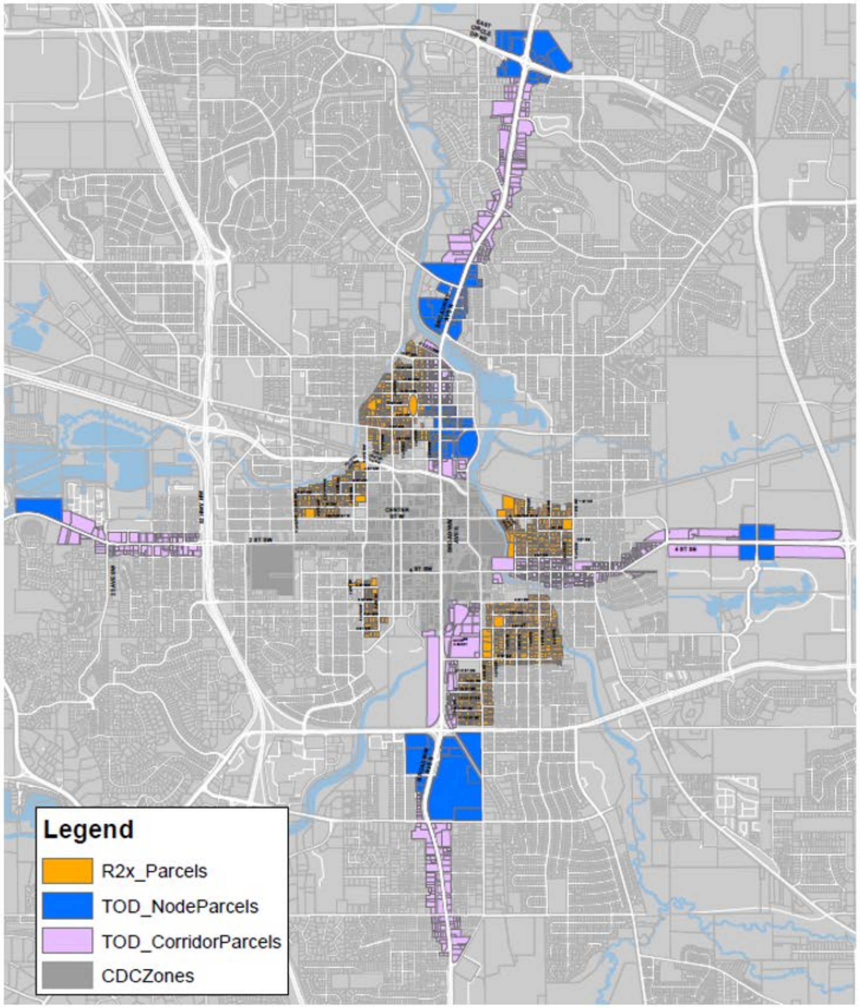


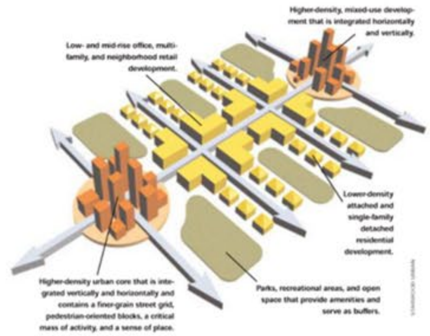
Figure 11-12: Area Zones to Support the Primary Transit Network



Transit Oriented Development Overview

Goal 6 of the Comprehensive Plan; Develop Node and Corridor based Transit-Oriented Development opportunities

- Focused on encouraging mixed housing, employment, recreation and retail opportunities, to support safe and convenient multi-modal transportation options entering downtown
- Residential neighborhood protection standards provide a height and intensity "step down" entering residential neighborhoods
- Based on the nodes and corridors in the Comprehensive Plan- Primary Transit Network
- Focus on staff level review and approval to reduce regulatory barriers
- Within the TOD zone, there are different height and intensities for nodes vs corridors
- Building setback 10 foot maximum
- Building design standards promote street orientation and pedestrian activity



Max. Floor Area Ratio	TOD Node	TOD Corridor
Residential	4.0 FAR	3.0 FAR
Mixed Use	5.0 FAR	4.0 FAR
Nonresidential	3.0 FAR	2.0 FAR
Max Height		
Standard	70ft	60ft
Bonus available fronting on Broadway, 2nd street, 4th street	20% gross floor area residential= 12 additional feet	
	30% gross floor area residential= 16 additional feet	
	40% gross floor area residential= 22 additional feet	

LIST OF PROPOSED PERMITTED USES

- Multi-Family residential
- Semi-Transient Accommodations
- Medical Stay Dwelling
- Congregate Housing
- Transient Accommodation
- Offices
- Research and Testing
- Business Service
- Personal Service
- Educational Services
- Membership Organizations
- Day Care Facility
- Medical Facilities
- Offender Transitional Housing
- Nursing & Personal Care
- Veterinary Service
- Fast Food Restaurant
- Standard Restaurant
- Retail Trade
- Communications
- Emergency Services
- Parking Facility Associated with a City-designated park and ride

Rochester Park and Ride Service

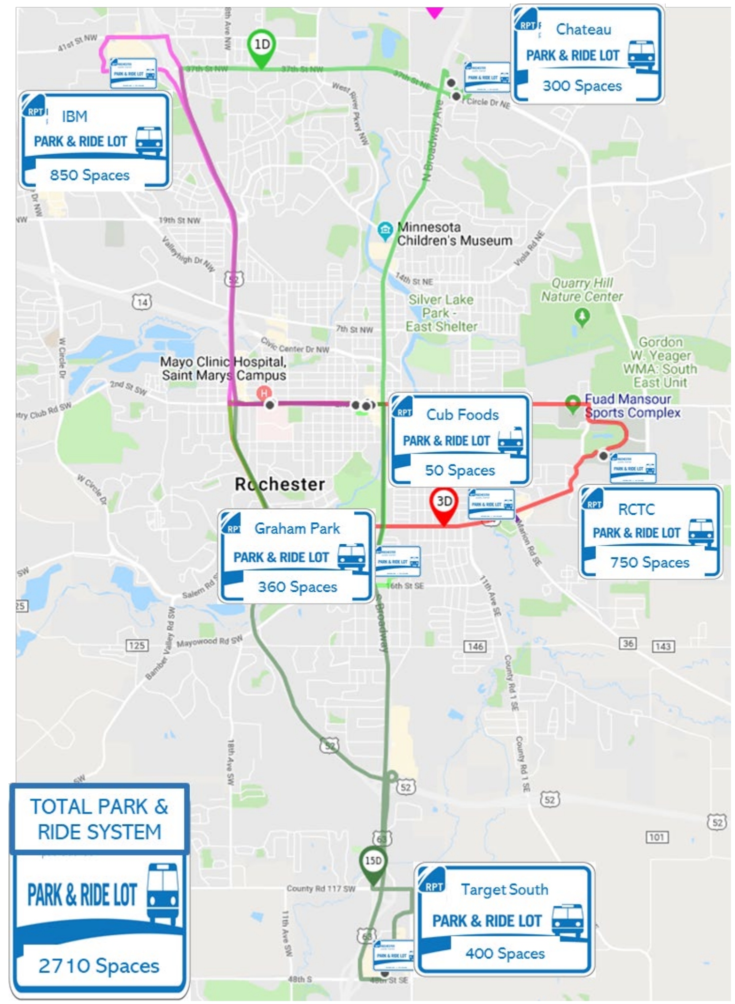
The Rochester public transit system has a long history of providing park and ride express service to downtown and St Marys. The majority of riders work at Mayo. In addition, Rochester City Lines, a private company, also has a long history providing remote park and ride service from surrounding communities in southern Minnesota, also to downtown Rochester and St Marys.

The Rochester Park and Ride network provides remote parking at various locations outside of the Central Business District (CBD) during peak travel times for commuters five days of week. The park and ride locations, and the number of parking spaces available at each, are shown in Figure 11-13. These park and ride facilities are not owned by the City of Rochester; they are used by Rochester Public Transit through agreements/leases with the property owners.

Rochester Public Transit currently provides peak hour express route service from 6 locations. This service is in addition to regular fixed route service. Express peak hour service is now, and will continue to be, an attractive transit option as the urban geography continues to extend into the 5-8 miles range from the Downtown area.

The principal feature of express service is that boardings/deboardings occur only at the park and ride sites, thereby greatly reducing the ride time on the bus

Figure 11-13



and helps the service compete with auto travel time. Note that Mayo also provide their own park and ride service from sites close in to downtown. Most to all of

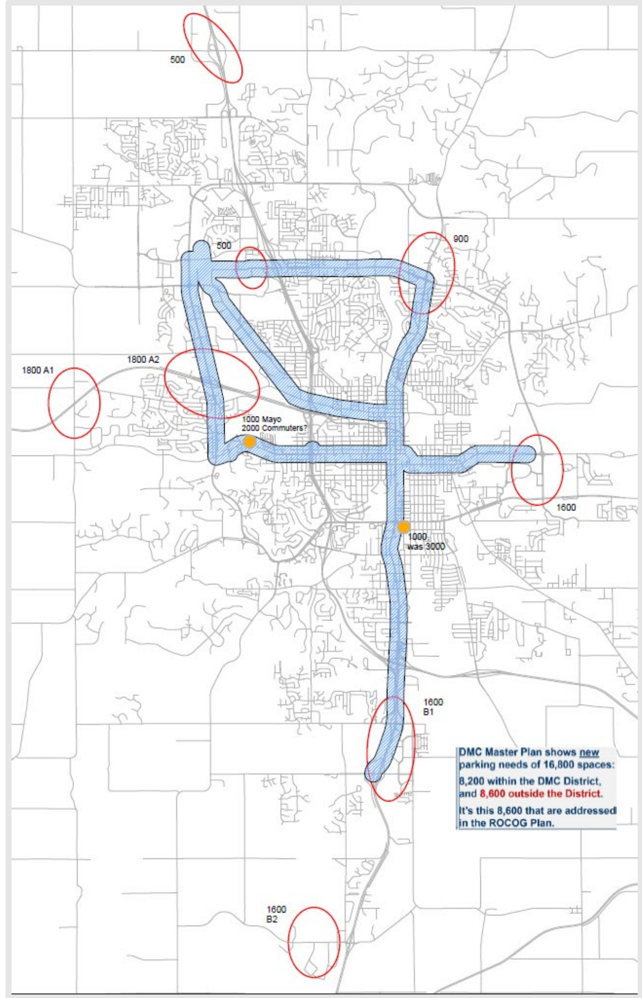
LRTP 2045

this ridership is expected to convert over to use the Downtown Rapid Transit System.

The Destination Medical Center (DMC) Master Plan projects a need for 16,800 new parking spaces to serve future downtown development. About half of these spaces are envisioned to be developed within downtown to serve customers, patients, visitors, event patrons and new downtown residents, along with some minor expansion of employee parking. The remaining new employee parking, estimated at 8,600 spaces, would be built outside of the DMC District. City of Rochester staff and ROCOG planners have jointly developed a component of this 2045 Plan to lay out strategies to move from the current leased park and ride sites to the creation of a network of permanent park and rides sites served by express bus service. These potential sites are shown in relation to the city of Rochester and the PTN in Figure 11-14. Note that on US-14 west of Rochester and on US-63 south of Rochester, two potential locations are indicated; only one site will eventually be selected at each location.

Express route park and ride service tends to serve two principal rider types. The first group are those who live in Rochester but either do not have local bus service at their home, or who do but choose not to ride it. Instead, they drive, walk, or bike to the park and ride site to make the bus trip into downtown to work.

Figure 11-14



The second rider type are those who live outside of Rochester and make an auto commute to the park and ride site and then ride the bus the remaining part of the trip. Both types of park and ride riders are motivated by either the lack of convenient or available parking downtown or by avoidance of paying the relatively high cost of downtown parking.

Figure 11-15 shows an example of a Park & Ride site with surface parking. Bike parking is included inside the building.

Figure 11-16 shows an example of a Park & Ride ramp, in this case with adjoining buildings containing supporting services. (This is a site of the SouthWest Transit system in the Twin Cities metropolitan area). When considering the PTN node/station system and the future Park & Ride system, there is the potential for combining sites in some geographic areas of Rochester.

Regional Commuter Transit

With the Mayo Clinic, employing over 32,000 workers in Rochester/Olmsted County, there is a long history of the local workforce being supplemented by regional workers. Commuters from as far north as the Twin Cities, areas west to Interstate 35, as well as southwestern Wisconsin and northeastern Iowa travel to work in Rochester.

Among the options for these long distance commuters is a regional commuter bus service operating by Rochester City Lines (RCL), a private bus company based in Rochester serving about 40 regional communities with peak period weekday bus service to Rochester, as shown

Figure 11-15

Figure 11-16

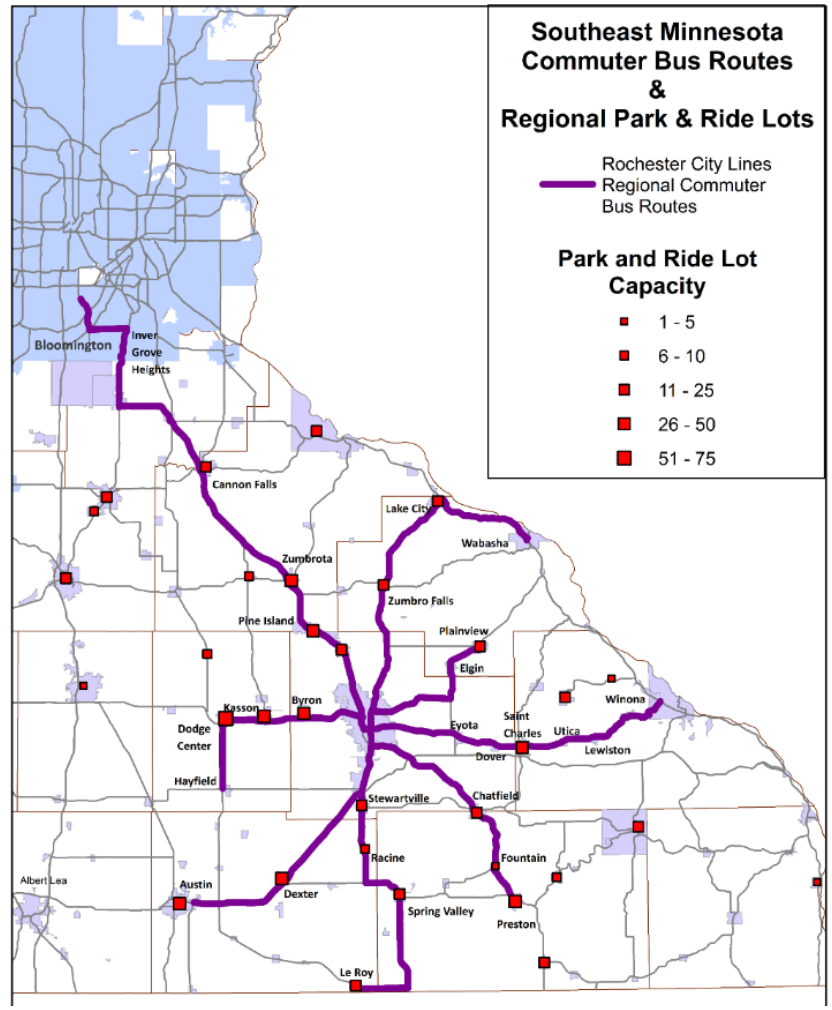
on the map in Figure 11-17. The service is oriented toward the Rochester downtown with secondary service to the St. Marys Hospital campus. All small cities in Olmsted County are served, with the majority of service provided to cities beyond Olmsted County. Due to Mayo Clinic subsidy of employee rides, service is successful without public subsidy.

Intercity bus routes of this type play a key role in helping the City of Rochester achieve its mode-shift goal of reducing auto trips downtown to less than 50% of all trips. By persuading commuters from cities outside Rochester to leave their cars at home and travel longer distances to downtown Rochester on a coach bus, these services reduce congestion and pollution in downtown Rochester, and contribute to a more efficient use of energy, particularly that derived from fossil fuels.

Many of these communities on their own or in partnership with MnDOT have established park and ride lots to serve regional commuters. Some lots serve both those using the RCL service as well as people who meet there to carpool to Rochester or other locations, (shown also in Figure 11-17).

Figure 11-18 helps to illustrate why efforts like regional commuter service is vital for Rochester economic health. This graphic is taken from the Rochester Transit Framework study work conducted in 2015. This study

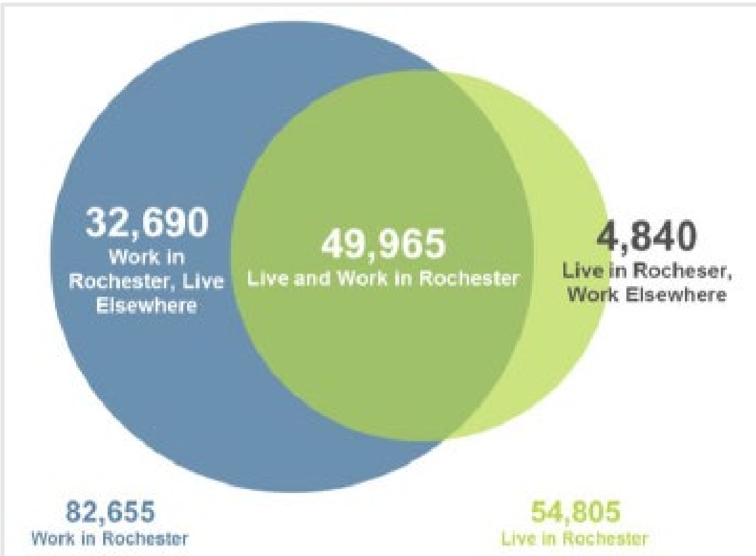
Figure 11-17



included a concentration on long term transit solutions for regional commuters who will continue to fill jobs in

Rochester, particularly jobs in the Rochester downtown area, without the need to park a car downtown.

Figure 11-18

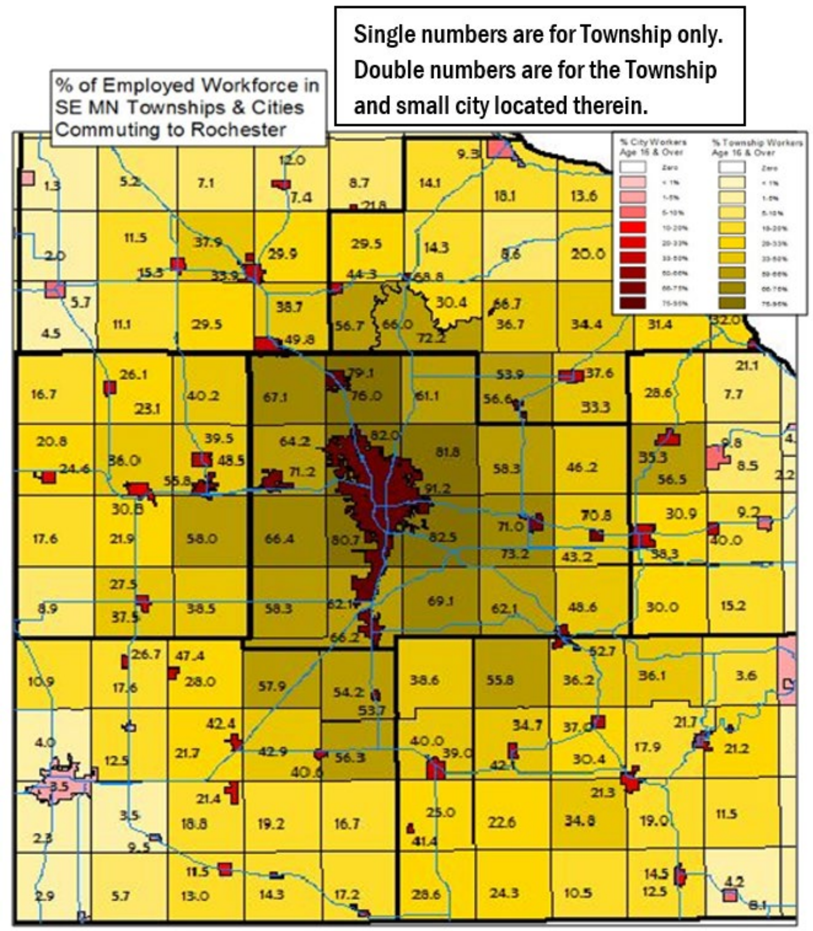


Commuter trip demand to downtown Rochester is expected to continue growing.

- Mayo is expected to continue to subsidize the trip cost
- The DMC initiative will produce a variety of new jobs in the downtown district; many of those will be taken by out of town commuters
- Future new employee parking will be limited in the downtown per DMC planning initiatives

Figure 11-19 helps to illustrate the commuting patterns into Rochester based on Census data. Commuters parking downtown significantly affect downtown congestion and intersection turning movements during the work peak hours. This is being addressed mainly in the DMC planning work in coordination with city planning staff.

Figure 11-19



LRTP 2045

Figure 11-20 provides the most recent commuter ridership estimates and future ridership projections for regional commuter transit ridership. This information is taken from consultant work done as part of P2S 2040 and DMC planning. The major commute-sheds are from the northwest and the west, and these are the areas where transit and park and ride services will most need to intercept commuters before they drive a car and park it downtown.

Figure 11-20

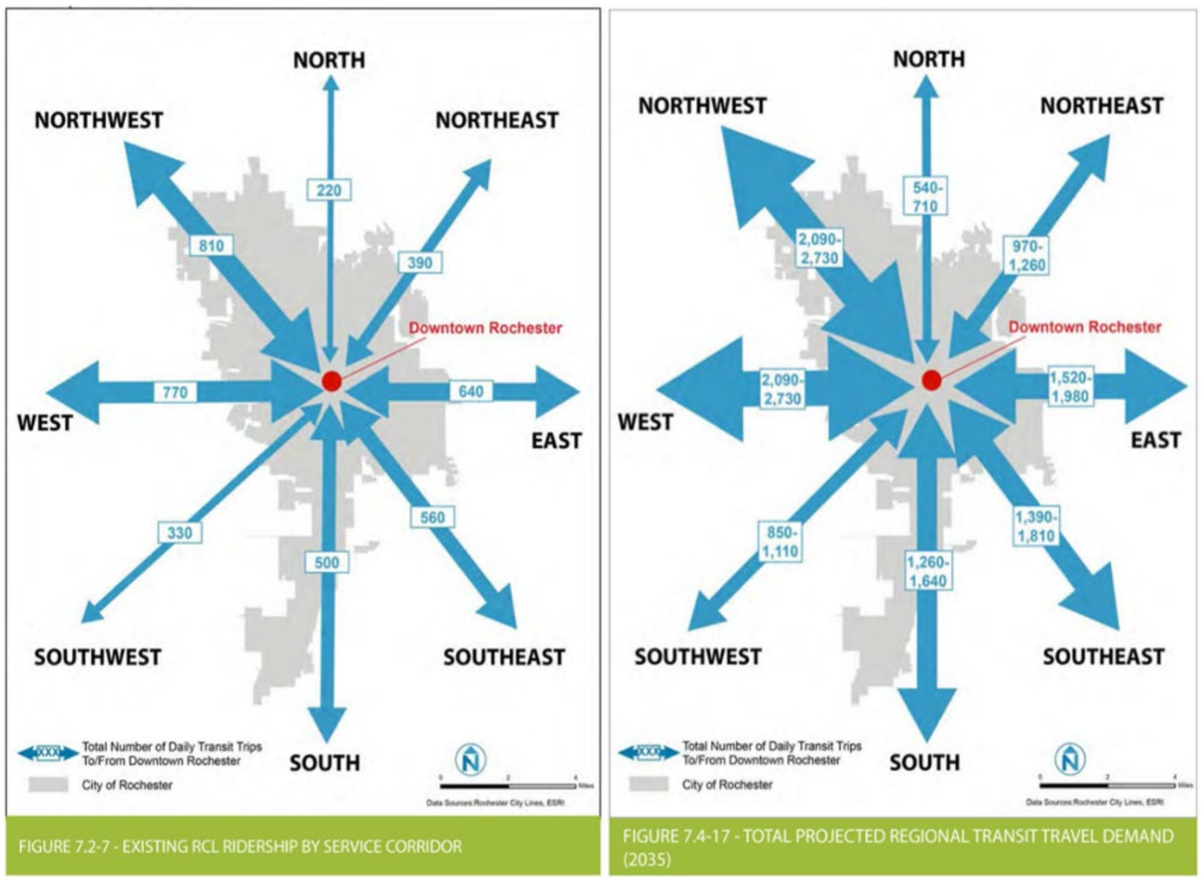


FIGURE 7.2-7 - EXISTING RCL RIDERSHIP BY SERVICE CORRIDOR

FIGURE 7.4-17 - TOTAL PROJECTED REGIONAL TRANSIT TRAVEL DEMAND (2035)

Park and Ride Sites in Small Cities in Olmsted County

Figure 11-21 shows the location of current park and ride lots in Olmsted county outside of Rochester and the envisioned future demand for spaces at these locations. These park and ride lots are located along existing regional commuter bus routes and can also serve individuals interested in carpooling into Rochester. As the park and ride and transit systems grow, these lots can provide another option for commuters who wish to reduce their drive time by parking close to home and making more productive use of their commute time by spending it on a bus (where they can read, write, etc.), rather than driving their car for a longer time and parking in the park and ride facilities in the City.

ROCOG recently explored trying to find a means of supporting maintenance and either expansion of such lots, or constructing new lots using government funding. No means of doing so have been found so far with one reason being that the main bus carrier serving the sites is a private company.

Local Rochester Bus Transit

The local service bus transit mode is planned to be the main transit option for land use in the non-core part of Rochester in the future. This is true for both local fixed route service and the ZIPS paratransit service. This understanding is consistent within several current and future transportation plans:

- Rochester Downtown Mobility Study (2010)
- Previous ROCOG Long Range Plans
- DMC Master Plan (2015)
- 2017 RPT Transit Development Plan
- Rochester Comp Plan Update (2018)

See Chapter 3 for background information on current Rochester transit services. Figure 11-22 provides an overview of the expansion areas that Local Fixed Route service will need to grow into.

Local Fixed Route Service

The current Rochester Public Transit (RPT) fixed route system is managed and funded, both for operations and capital, by the City of Rochester. The two figures below show the general system in two ways: Figure 11-22 shows the general route network along with various levels of future land use growth.

Figure 11-23 is taken from consulting work during the same plan update and shows generalized routes along with a Transit Dependency Index. The purpose of the graphic is to show that regular fixed route service is expected to grow along with land use over the coming decades. Service will develop in future parts of Rochester where residential land use is dense enough and commercial/job sites are strong enough to warrant

Figure 11-21

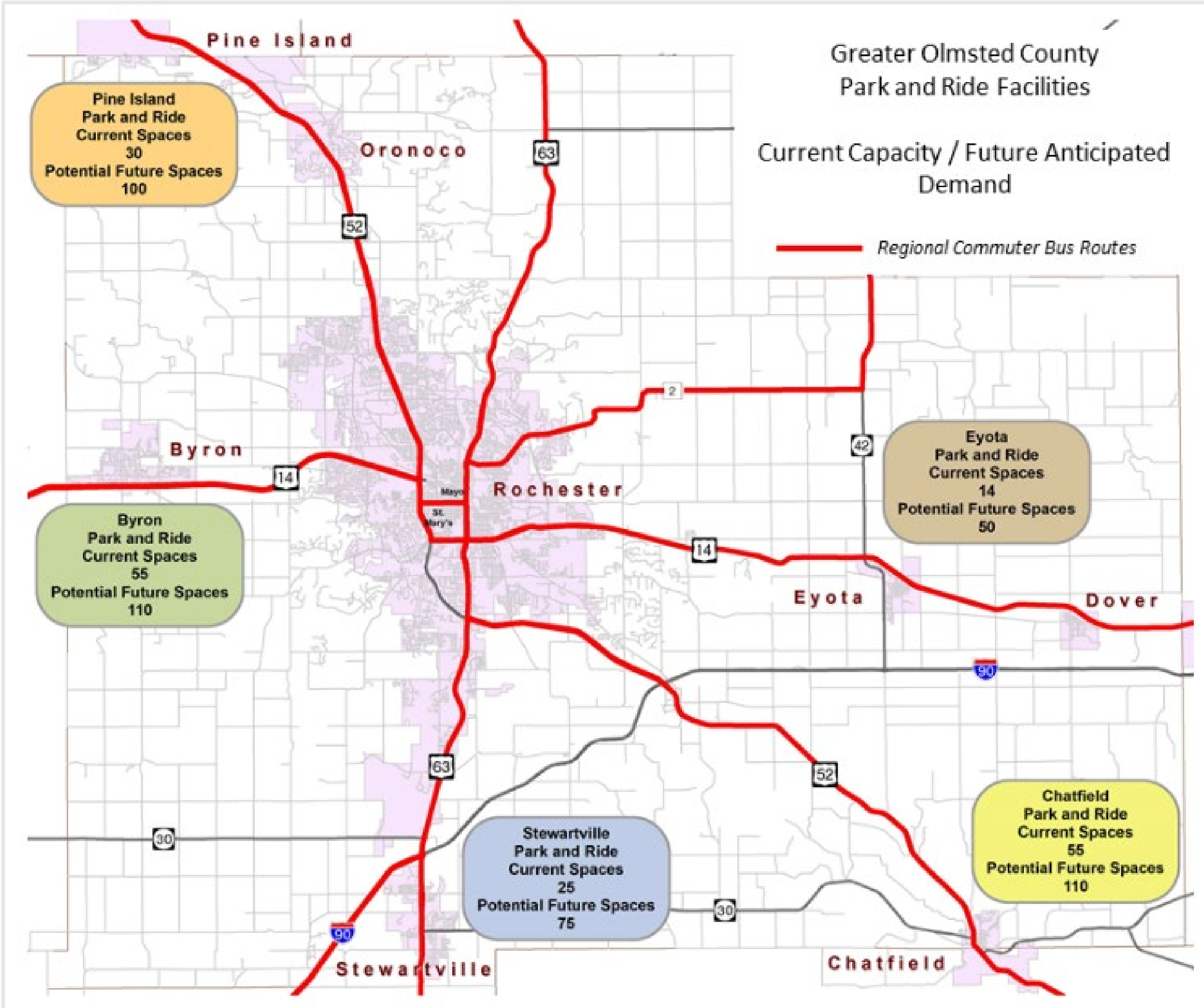

Greater Olmsted County
Park and Ride Facilities
Current Capacity / Future Anticipated Demand
Regional Commuter Bus Routes
Pine Island
Oronoco
Byron
Rochester
Eyota
Dover
Stewartville
Chatfield
Pine Island Park and Ride Current Spaces 30 Potential Future Spaces 100
Byron Park and Ride Current Spaces 55 Potential Future Spaces 110
Eyota Park and Ride Current Spaces 14 Potential Future Spaces 50
Stewartville Park and Ride Current Spaces 25 Potential Future Spaces 75
Chatfield Park and Ride Current Spaces 55 Potential Future Spaces 110
52
63
14
42
2
90
30

Figure 11-22

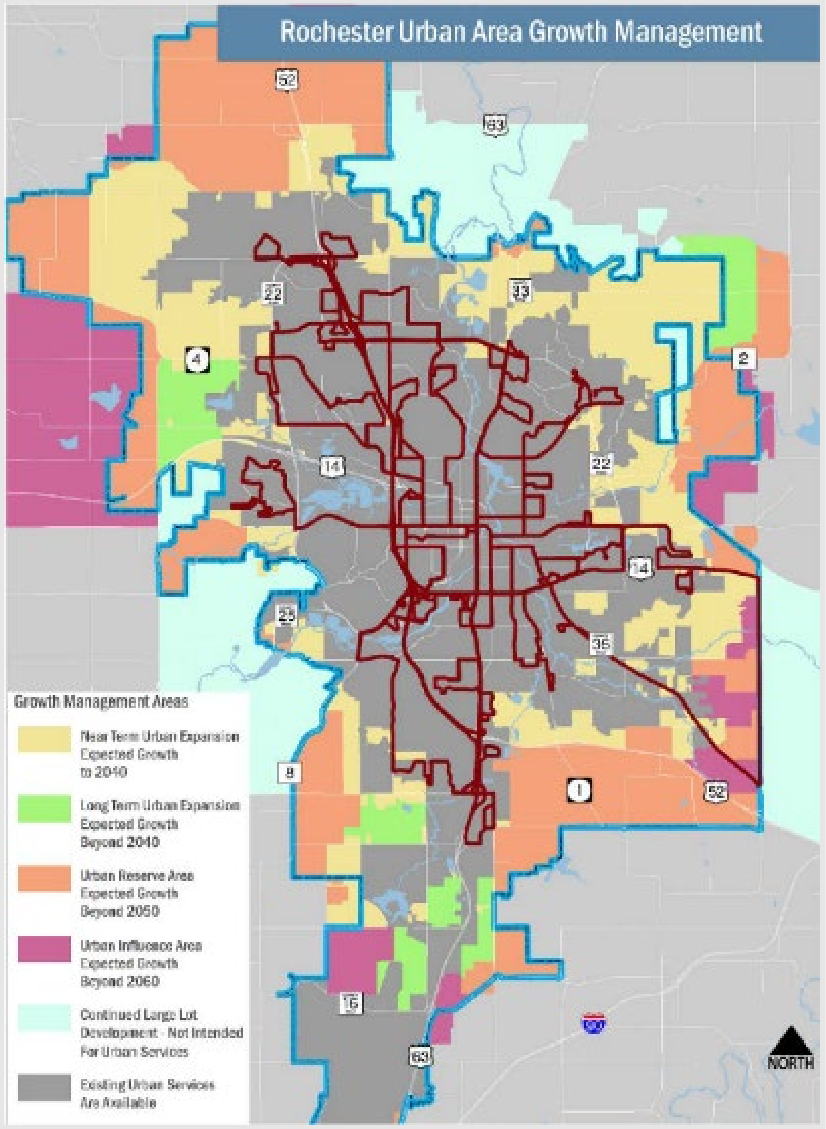


Figure 11-23

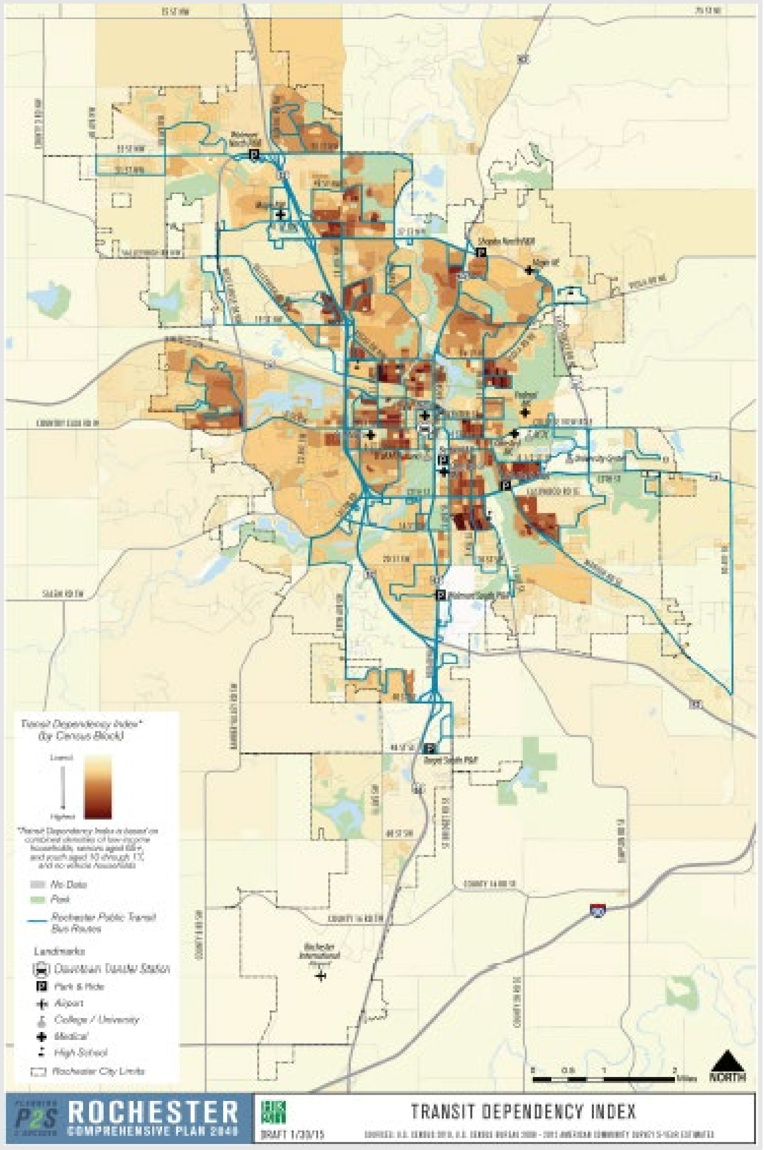


Figure 11-24

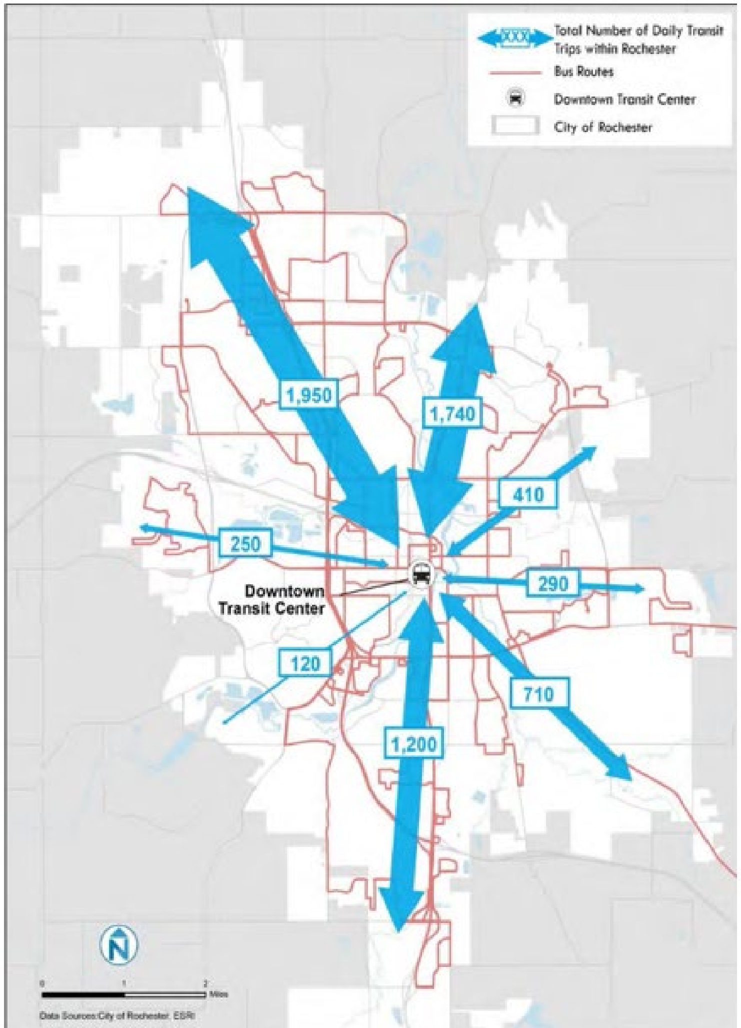


FIGURE 7.2-6 - EXISTING RPT RIDERSHIP BY SERVICE CORRIDOR

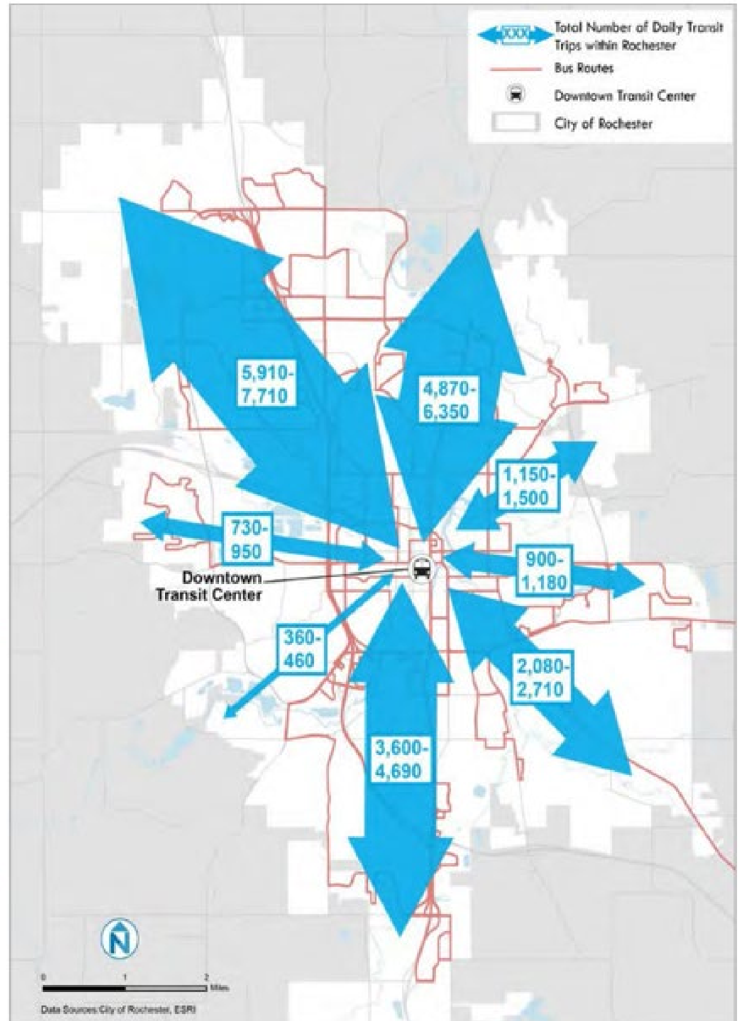


FIGURE 7.4-14 - TOTAL LOCAL TRANSIT TRAVEL DEMAND (2035)

service. The transit dependent are one of the key ridership markets for fixed route service. Additionally, transit dependent or single-auto households may have workers at Mayo. Current and future fixed route service will continue to promote work-centered trip-making since Mayo is the largest trip generator in the city.

P2S 2040 includes a major element called the Transit Framework from which both the Primary Transit Network and future expectations for future fixed route local service emerge. This report contains guidance and recommendations to help to implement transit improvements for increased use of transit from Rochester neighborhoods into the downtown work, higher education, and retail/commercial center. Work done for P2S 2040 by Nelson/Nygaard Consulting produced Figure 11-24. The figure indicates that transit demand will grow at the highest rates in the north and northwest.

RPT Paratransit Service

Rochester, Olmsted County, and ROCOG have long supported paratransit services within the ROCOG study area. The expectation is that the future will call for increased paratransit services due to the aging of the Baby Boomers, and as current life spans continue to grow in general.

The Zumbro Independent Passenger Service (ZIPS) is the local Americans with Disabilities Act (ADA) complementary paratransit service for the Rochester Public Transit service area. The service is managed by the staff of Rochester Public Transit. It offers an alternative mobility option for those who are unable to use the fixed-route system. The operation is contracted at a per vehicle hourly rate with a private transit operator. The contracted operator provides drivers, vehicle maintenance and storage, dispatching, and customer service.

Figure 11-25

The current ZIPS service area is actually somewhat larger than the fixed route area. Because of this, the current ZIPS service boundaries may not necessarily need to be adjusted due to shifts in future urban/suburban residential growth patterns over the next 20-30 years. A focus of P2S 2040 is based on a land use scenario to contain urban growth with less sprawl over time that happens to stay within the current ZIPS service area. The current service covers the four townships of Cascade, Marion, Haverhill, and Rochester townships.

Note that all RPT fixed route buses now have low-floor entry and ramps, and all future ones will also. This helps to reduce some of the demand for the more expensive ZIPS services.

Costs

The expansion of transit service in Rochester planned for the next several decades will require substantial capital investment and additional operating costs. The establishment of two BRT systems (Downtown Rapid Transit and the PTN) and the expansion of the park and ride system are new investments that require not only expansion of the vehicle fleet but new stations, systems operation technology, guideway development and, in the case of park and ride, construction of approximately 7500 parking spaces. These costs are discussed at length in Chapter 15, where the examination looks at transit in five categories:

- ZIPS dial-a-ride paratransit service (existing)
- Fixed-route neighborhood service (existing)
- Park and ride direct service (expansion)
- Downtown Rapid Transit BRT (new)
- Primary Transit Network BRT (new)

The aggregate operating costs for ZIPS dial-a-ride paratransit service are estimated to total $38.5 million across the period of 2021 to 2045. Due to the transition to split bus/taxi service, the number of buses needed for fleet expansion is projected to be only 2-3 vehicles over the planning horizon, while approximately 8 replacement vehicles will be needed during that time period. Total cost of vehicle purchases is estimated at $3.6 million.

Over the 2021-2045 period, operating costs for fixed route neighborhood service (not including park and ride service; see below) is estimated to total $241.6 million. Expected costs for vehicle replacement over the plan horizon are $75.5 million, including purchase of 86 replacement places (approximately 7 vehicles every 2 years working out to a 15-year replacement cycle) and fleet expansion of 17 vehicles.

The City of Rochester plans to transition its park and ride system from one where parking capacity is leased from private landowners to one where the City will own and operate permanent parking structures. In addition, to support the vision of reducing single occupant vehicle travel into downtown Rochester, a major expansion of service is planned. To understand the costs of this expansion, examination of the park and ride direct service as a distinct part of the transit system was completed. The total capital costs from 2021 to 2045 are estimated at $95 million, which includes seven permanent parking facilities, some built as ramps, totaling over 7,000 parking spaces. The annual operating costs for the full build-out of this system are estimated at $4.2 million, which could total over $100 million over the course of this planning period. The long-term operating cost total is difficult to estimate, since the park and ride locations are being chosen with attention given to co-locating with areas served by the PTN. This service would draw some park and ride patrons, reducing the amount of dedicated transit capacity needed for the park and ride direct service. However, the PTN is currently only an illustrative project, and its schedule of phased implementation is uncertain, thus blurring the long-term estimates for the park and ride service vehicle acquisition and operating costs.

Over the 2021-2045 period, operating costs in aggregate for the Downtown Rapid Transit service are estimated to total $93.2 million. This includes both phases of the project, with Phase I coming online in 2025 and Phase II anticipated to come online in a 2029-2030 timeframe. The total development costs of both phases of the project are estimated at $203 million. This includes the price of initial purchase and eventual replacement of 12 60-foot electric BRT vehicles; design and construction of 8 BRT stations in Phase I and 2-3 additional stations in Phase II; development of the guideway using the concept of a Business-Access Transit Lane; and acquisition of needed systems operations technology.

As noted above, the PTN is included in the plan as an illustrative project, since further detailed study must occur before funding for it is sought and secured. However, some necessary items for the service can be identified now. The three corridors identified for PTN service within the 2021-2045 timeframe of the plan will total nearly 20 miles in length, and travel time will be between 20 and 35 minutes per route. This leads to an estimate of 20 vehicles necessary to be dedicated to the PTN during peak hours. The total development costs for the PTN are estimated at $32.9 million. The annual operating costs at full build-out are estimated at $13.6 million. Those annual costs would be lower in the earlier years of the service, since not all corridors are expected to be built at the same time. The uncertain phasing in of PTN service makes a total cost during this plan horizon difficult to predict.

Transit Asset Management

Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law in 2012, and it included several provisions that collectively transformed the federal surface transportation program to one that emphasized the achievement of performance-based outcomes for a set of federally-established performance measures. The Fixing America’s Surface Transportation (FAST) Act was signed into law in 2015, and it expanded upon the MAP-21 performance-based outcomes to emphasize that states and MPOs must also set targets and monitor progress for each of the federal performance measures. Transit asset management and transit safety are two of the areas for which performance targets need to be established and monitored. There are funding implications associated with the progress being made towards each target to incentivize that planning efforts be tied to performance targets and goals.

ROCOG adopts performance targets annually, within 180 days from the state's adoption of targets. Historically, ROCOG has adopted the state's performance targets for safety, bridge and pavement condition, and system reliability. Public transit agencies often opt to set their own performance targets, rather than agree to those set by MnDOT. MnDOT and public transit agencies established a set of performance targets in 2017 for use in measuring transit agency assets. Rochester Public Transit (RPT) indicated in July 2017 that they will develop targets that will support and expand on those developed by MnDOT. As of the publication of this Plan, ROCOG has agreed to the targets established by MnDOT, and once the RPT targets are formally adopted will look to supplement the MnDOT targets with the locally developed RPT targets in future planning work. The preliminary RPT targets are currently available in a report entitled *Public Transit Capital Asset Management Plan for Rochester Public Transit*, dated October 2017. That report will be the repository of the RPT-MPO-supported targets until it may be updated.

RPT's interim TAM targets include:

- **Facilities:** No more than 10% of its facilities have met or exceeded their useful life benchmark, which are 40 years for most transit related facilities such as Maintenance Depot/Facilities, and 20 years for passenger or parking facilities such as stations or park and ride facilities
- **Rolling Stock:** No more 10% of vehicles have met or exceeded a Useful Life Benchmark (ULB) of 14 years for a full-size transit bus or 10 years for a cutaway bus)
- **Equipment** ($50,000 or more in value): No more than 10% of any equipment in a condition that has met or exceeded their ULB.

RPT's current performance related to Transit Asset Management is reported in Chapter 9 where targets and outcomes for all federal performance measures are summarized.

Transit Safety Performance

At the time of plan publication, RPT has not formally adopted final transit safety performance targets. Preliminary targets have been established and published as part of the latest RPT Agency Safety Plan, dated August 2020. Figure 11-26 illustrates the targets RPT is proposing for use:

Figure 11-26

Safety Performance Targets							
Targets below are based on review of the previous 5 years of RPT's safety performance data.							
Mode of Transit Service	**Fatalities (total)**	**Fatalities (per 100 thousand VRM)**	**Injuries (total)**	**Injuries (per 100 thousand VRM)**	**Safety Events (total)**	**Safety Events (per 100 thousand VRM)**	**System Reliability (VRM/ failures)**
Fixed Route Bus	0	0	1	.0568	1	0.568	73,291
ADA/ Paratransit	0	0	0	0	0	0	36,900

12 • Active Transportation

Overview/Summary

Planning for active transportation modes focuses on facilities that serve primarily bicyclists and pedestrians along with users of other non-motorized or low speed two-wheeled modes such as skateboards, scooters, and wheelchairs. Facilities for active transportation serve an important access and mobility role in the transportation system as both an end-to-end travel mode, where active transportation can serve both utilitarian and recreational needs, or as a component of a multi-modal trip in combination with a primary vehicular or transit trip. Serving bicycle and pedestrian travel is in large measure a question of accommodation; while a certain amount of non-motorized travel occurs on trails and paths developed in corridors separate from roadways, most non-motorized travel occurs on facilities either parallel to or sharing a roadway with motorized vehicles.

In developing the recommendations in this chapter, input from the community was gathered during a series of open house and community outreach events as well as through use of on-line tools such as an interactive website that provided opportunity for comment. Input of technical staff from the transportation departments of Olmsted County, the City of Rochester, and District 6 of the Minnesota Department of Transportation was also solicited. Information from a Community Transportation Survey conducted during development of Rochester's 2018 *Planning to Succeed: Rochester Comprehensive Plan 2040* (P2S 2040) was also reviewed. Other studies, including a 2016 study on the access and mobility needs of environmental justice populations, were also reviewed.

This Plan addresses both the Rochester urban area as well as the Greater Olmsted County area, focusing on corridors and facilities that are important in providing multi-modal connectivity to and from important destinations within walking or biking distance, such as schools, transit, parks, and workplaces. For the Rochester Urban Area, the Plan builds on the foundation provided by the 2012 Rochester Area Bicycle Master Plan, the input of the Rochester Pedestrian-Bicycle Committee, and regional committees working on active transportation development in the Olmsted County area. Relevant plans, such as the MnDOT District 6 Bicycle Plan 2019, and the work of state trail committees were also reviewed.

The pedestrian element of this chapter focuses on the Rochester urban area and looks at accommodations, accessibility, and safety for pedestrians along the major street network and transit corridors. The Plan considers recommendations included in the Rochester Downtown Master Plan and the Destination Medical Center (DMC) Development Plan that have been developed since adoption of the last ROCOG Long Range Plan, addressing the expected impact of

- An estimated 30,000 new workers and 5,000 new residents downtown in the next 25 years
- An expected increase of more than 2 million visitors annually to downtown Rochester over that time, primarily related to services provided at the Mayo Medical Center or associated with the Mayo Civic Center
- The city's convention and events venues hosting over 300,000 attendees per year

Figure 12-1 highlights the main elements found in this chapter. Among the highlights are future network plans for the urban and rural planning areas, policy directions, and identification of prospective projects anticipated in the short, medium, and long-term for urban and regional bicycles and other low speed modes.

The system plan for pedestrian facilities includes an element related to improvements needed to support transit system development at station areas located along the future Downtown Rapid Transit line and the larger proposed Rochester Primary Transit network. It addresses improvement needs along the major street network where existing system gaps occur. Pedestrian safety is also discussed, including the multiple ways in which implementation of facility projects can occur, as well as recommended support strategies for active modes.

Figure 12-1: Components of the Active Transportation Plan

Existing Active Transportation Facilities

Figure 12-2 illustrates the existing active transportation infrastructure in the Rochester urban area, including an extensive 130+ mile network of trails and paths, a fairly complete sidewalk network, and 37 miles of on-street bicycle facilities. This graphic also illustrates missing sidewalk facilities throughout the urban area, most of which are on local roadways in areas originally developed before being annexed into the city. Other gaps in the sidewalk network are generally found along the major street network, where state or county roads established decades ago were built without walk facilities.

Turning to regional travel, pedestrian and bicycle travel are largely limited to roadway or roadway shoulders and a limited number of state trails. Pedestrian travel, given the distances involved, is very limited, but bicycle travel, particularly for recreational purposes, is common and found largely on paved roads with paved shoulders. Figure 12-3 provides a map of the ROCOG area illustrating existing state trails and state and county roads with shoulder surface and shoulder widths noted on the map. Generally speaking, paved shoulders of 5 feet or greater in fair or better condition will support bicycling, though somewhat dependent on traffic levels.

Community Perspective on Active Transportation Travel

Community perspectives and input on active transportation needs and issues were gathered from various sources. A number of community events were held, and people were given opportunities to submit their

Figure 12-2: Existing Urban Area Facilities

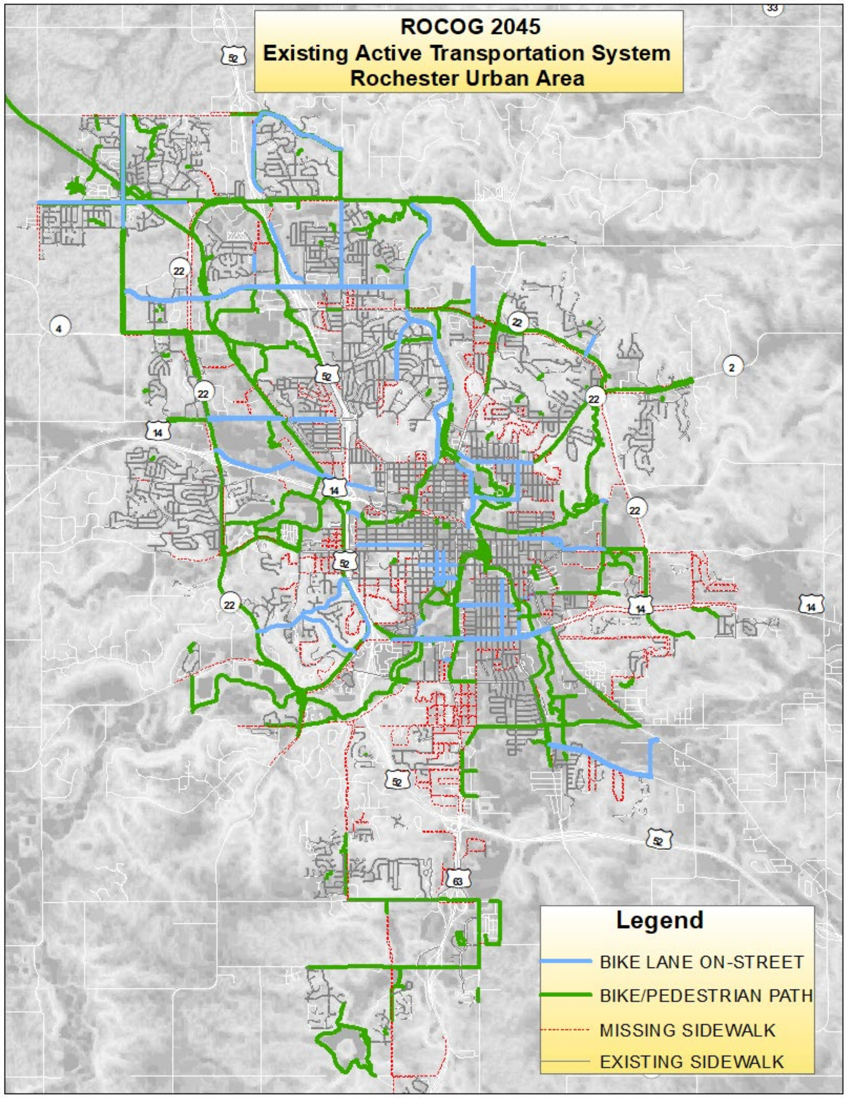
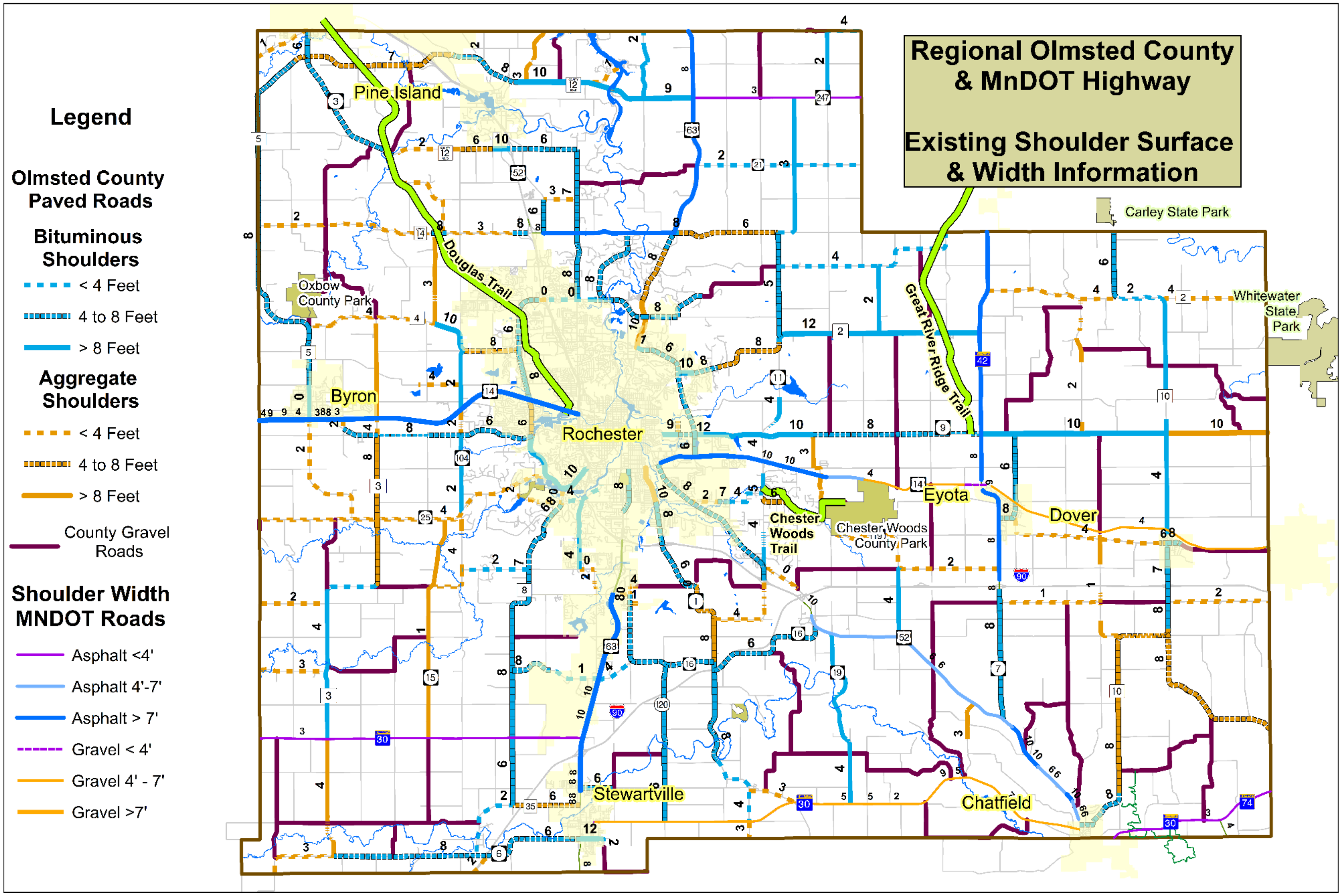


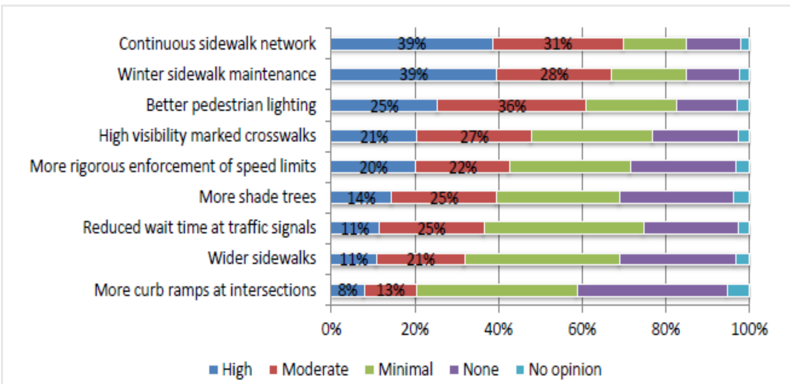
Figure 12-3: Regional State Trails and Highway Shoulder Network



LRTP 2045

comments as part of Rochester's P2S 2040 planning process. During development of P2S 2040, a community transportation survey was conducted to gather perspectives on various transportation issues and priorities, including pedestrian and bicycling modes of transportation. Figures 13-4 and 13-5 report the results of survey questions asking about community preferences regarding improvements that should be made to the pedestrian and bicycle network in the Rochester urban area.

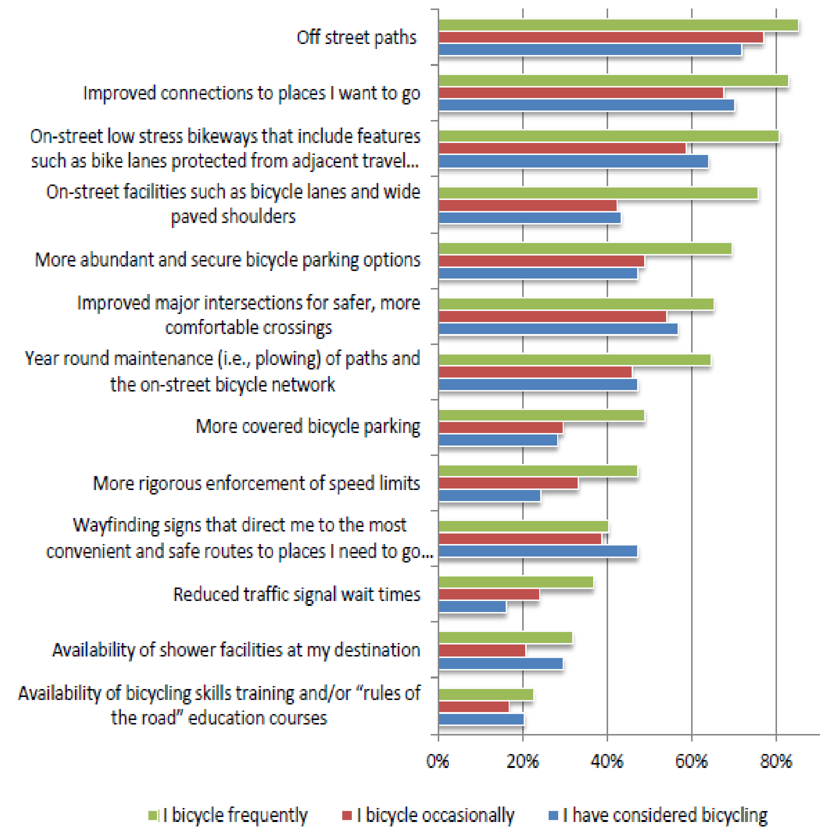
Figure 12-4: Community Facility Enhancement Preferences – Pedestrian Network



Source: Community Transportation Survey, P2S 2040

In terms of pedestrian infrastructure, the highest ranked projects or programs that respondents desired to see were continued investment in sidewalk facilities to provide a continuous network and better winter maintenance, followed by better lighting and crosswalk upgrades. For cyclists, the highest ranked projects or

Figure 12-5: Community Facility Enhancement Preferences – Bicycle Network



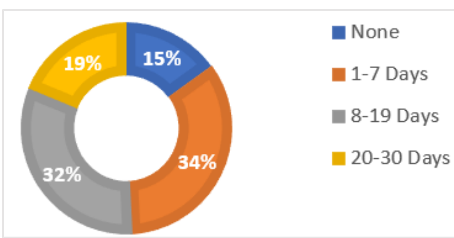
Source: Community Transportation Survey, P2S 2040

programs were network improvements, including more off-street paths and low stress bikeways to provide connections to places people want to go. The bicycle survey showed some differences in opinion by user types; while all users were similarly interested in off-road or protected facilities, persons who bike frequently are more supportive of investing in on-street bike lanes and paved shoulders as acceptable facilities than the occasional bicyclist.

As part of the City of Rochester's application for re-designation as a Bicycle Friendly Community, the League of American Bicyclists conducted a survey as part of the application review to gather data on the community's perspective on bicycle facilities.

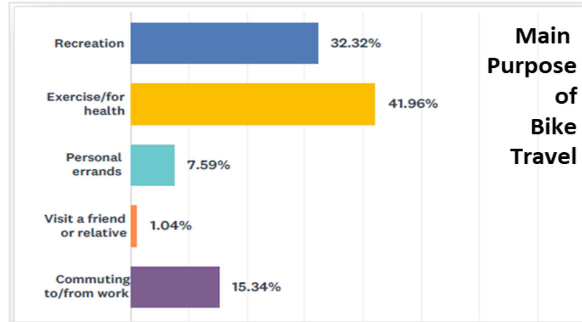
Figures 12-6 and 12-7 provide some basic data on the respondents, while Figure 12-8 reports on the main improvement needs respondents identified. Figure 12-6 reports on levels of biking, while Figure 12-7 reports on typical trip purposes. Figure 12-8 summarizes the comments as far as what type of projects and programs investments were needed.

Figure 12-6: How Often People Ride a Bike Monthly



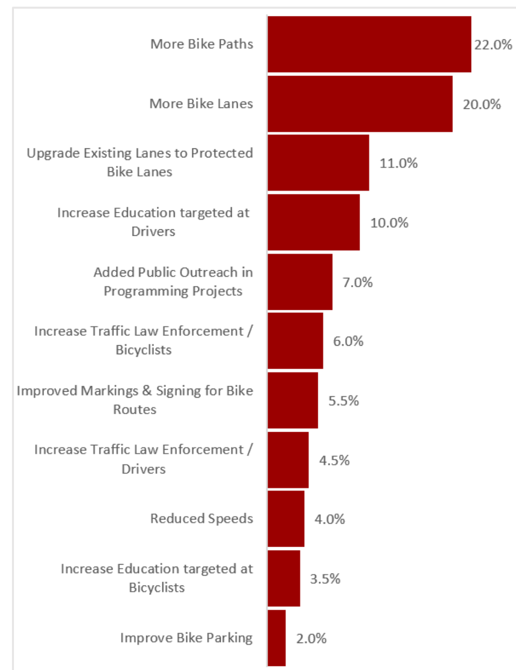
Source: League of American Bicyclists Survey 2018

Figure 12-7: Main Purpose of Bicycle Trips



Source: League of American Bicyclists Survey 2018

Figure 12-8: Main Improvements Bicyclists Would Like



Rochester Bicycle Friendly Community Designation 2018

In 2018, Rochester received a four-year re-designation as a Bronze Level Bicycle-Friendly Community by the League of American Bicyclists. Communities that apply for designation are judged against ten building blocks of a Bicycle Friendly Community as shown in Rochester's Score Card (Figure 12-9).

The five category scores shown were used by the League to gauge the current network, bike education and encouragement efforts, enforcement, and planning. There were four main League recommendations for Rochester coming out of the review:

- Prioritize efforts to improve high speed roadways
- Expand or improve bicycle education opportunities at schools
- Devote an increased level of funding to bicycle facilities
- Place more emphasis on enforcement and encouragement

Walk Friendly Community 2018-2023

Walk Friendly Community (WFC) is a national recognition program sponsored by the U.S Federal Highway Administration and managed by the Pedestrian and Bicycle Information Center (PBIC). Rochester applied for WFC re-designation and was again designated as a Bronze Level Walk-Friendly Community for 2018-2023. One of the benefits of the WFC program, beyond the recognition a community receives, is the review and critique from nationally recognized professionals on how to improve pedestrian travel in Rochester, not only in terms of infrastructure but also in areas such as education, encouragement, and enforcement. The City of Rochester is actively improving pedestrian facilities and deploying the latest pedestrian safety and convenience infrastructure and facilities at major intersections, mid-block crossings, and selected locations in the downtown area. The key WFC recommendations from the 2018 review are:

- Place more emphasis on improved crossing treatments and other amenities that will enhance the pedestrian environment
- Consider educational and encouragement activities to promote active transportation
- Devote more effort to Safe Routes to School planning and programming
- Continue to apply the Complete Streets Policy on all projects

Figure 12-9: League of American Bicyclists' Review Scorecard for Rochester

BICYCLE FRIENDLY COMMUNITY
Fall 2018
BRONZE
THE LEAGUE OF AMERICAN BICYCLISTS

ROCHESTER, MN

TOTAL POPULATION
114,000

TOTAL AREA *(sq. miles)*
54.75

POPULATION DENSITY
2082

OF LOCAL BICYCLE FRIENDLY BUSINESSES 3

OF LOCAL BICYCLE FRIENDLY UNIVERSITIES 0

10 BUILDING BLOCKS OF A BICYCLE FRIENDLY COMMUNITY

	Average Silver	*Rochester*
High Speed Roads with Bike Facilities	35%	4%
Total Bicycle Network Mileage to Total Road Network Mileage	48%	23%
Bicycle Education in Schools	GOOD	NEEDS IMPROVEMENT
Share of Transportation Budget Spent on Bicycling	11%	3%
Bike Month and Bike to Work Events	GOOD	ACCEPTABLE
Active Bicycle Advocacy Group	YES	YES
Active Bicycle Advisory Committee	MEETS EVERY TWO MONTHS	MEETS EVERY TWO MONTHS
Bicycle-Friendly Laws & Ordinances	GOOD	VERY GOOD
Bike Plan is Current and is Being Implemented	YES	YES
Bike Program Staff to Population	1 PER 78K	1 PER 134K

CATEGORY SCORES

ENGINEERING *Bicycle network and connectivity*	3.7 /10
EDUCATION *Motorist awareness and bicycling skills*	4.7 /10
ENCOURAGEMENT *Mainstreaming bicycling culture*	3.8 /10
ENFORCEMENT *Promoting safety and protecting bicyclists' rights*	3.5 /10
EVALUATION & PLANNING *Setting targets and having a plan*	4.8 /10

KEY OUTCOMES

	Average Silver	*Rochester*
RIDERSHIP *Percentage of Commuters who bike*	2.7%	1.13%
SAFETY MEASURES **CRASHES** *Crashes per 10k bicycle commuters*	537	293
SAFETY MEASURES **FATALITIES** *Fatalities per 10k bicycle commuters*	6.3	3.05

Summary of Key Issues and Needs

Figure 12-10 reflects the key active transportation issues reflected from input gathered during development of this plan as well development of recent plans including the 2016-2017 Destination Medical Center Integrated Transit Studies, the Rochester Area Bicycle Master Plan, and P2S 2040. These needs and issues have been identified as important factors to address to improve the attractiveness of active transportation modes.

- **Surface Conditions**
  Unsuitable surfaces such as pavement with frequent cracking, gravel shoulders, or accumulation of debris near edges of roadways discourage non-motorized travel.
- **High Volume Roads**
  High volume roads discourage walkers and bicyclists if sidewalks or paths are absent or are inadequate for users due to minimal setbacks from traffic or inadequate space for travel. Crossing difficulties also create hazards if adequate crossing time is not available and medians or refuge areas are not available.
- **Access and Continuity**
  Access to desired destinations can be limited by topographic and geographic barriers, or auto-oriented land use where space for pedestrians or cyclists is limited. Continuity issues also arise where there are gaps or lack of connections along primary routes between origins and destinations, such as residential neighborhood areas and nearby schools.

Figure 12-10: Key Planning Issues

Surface Conditions	High Volume Roads	Safe Crossing Width for Pedestrians
Access and Continuity	On-Street Parking Utilization	Bridges and Overpasses
Intersection Safety	Using Sidewalks for Cycling	Roadways Without Shoulders
Connectivity to and Mobiity in Downtown Rochester	Major Corridor Gaps	Regional Bicycle Travel Routes

- **On-Street Parking Utilization**
  Most local and collector streets are constructed to accommodate parking on both sides of the street, but in many areas on-street parking is limited as off-street parking is plentiful. This can encourage higher speed vehicular travel, creating conflict and safety concern for both the bicyclists and pedestrians.

Conversely, in higher density areas where street parking is fully utilized, there may not be enough space to provide suitable space for bicyclists.

- **Intersection Safety**
  Intersections can pose problems for cyclists and pedestrians, where left-turning cyclists encountering conflicts with through traffic and right-turning cars can conflict with both cyclists and pedestrians.
- **Bridges and Overpasses**
  Older bridges and overpasses often are deficient with lack of adequate space for non-motorized users.
- **Bicycle Use on Downtown Sidewalks**
  Particularly in areas of high pedestrian concentrations such as in downtown Rochester, it is undesirable for bicyclists to use sidewalks. Busy sidewalks are not appropriate for cycling speeds, there is generally insufficient width for shared bicycle and pedestrian travel, conflicts with motor vehicles at driveways become more complex as motorists are generally are not expecting a cyclist to cross their path on the sidewalk, and traffic rules, such as obligations to yield, are unclear when cyclists ride on sidewalks.
- **Roadways with No Shoulders**
  In older suburban areas, many roads have been built with either no shoulders or shoulders of limited width, forcing bicyclists or pedestrians to utilize a portion of the vehicular travel lane when traveling on such corridors and creating a safety hazard for the non-motorized traveler.
- **Regional Bicycle Travel Routes**
  A major network that has been noted is the need to provide a minimum level of connectivity between communities and from communities to major regional destinations such as county and state parks. Where off-road trails can be developed to accomplish this goal, it is the preferred solution. In addition to off-road trail connections, county roads with wide paved shoulders are used to provide a minimum level of regional accessibility to small cities in the ROCOG area.
- **Major Corridor Gaps**
  The presence of gaps in the path and trail network along or parallel to major highways effectively creates barriers for cross-town travel, as resident perceptions of travel routes are influenced greatly by the major street network.
- Downtown Rochester Access and Mobility
  Studies have identified various barriers that inhibit bicycle connectivity into and through downtown, effectively keeping people from reaching their destinations (Figure 12-11).

Figure 12-11: Downtown Portal Improvements Needed

Highways, thoroughfares and rivers or streams are barriers that impede safe, comfortable bicycle connectivity into downtown from adjacent neighborhoods.

Portals along these barriers present opportunities to provide pedestrian and bicycle connectivity into downtown, but most are not currently safe or comfortable for those users.

While safe, comfortable portals give bicyclists and pedestrians access across barriers, high quality bicycle and pedestrian corridors are necessary to provide access to downtown destinations and beyond.

Source: DMC Integrated Transit Study 2018

Policy Framework

Safe and convenient pedestrian and bicycle travel is vital to the region's quality of life, economy, and public health. Pedestrian and bicycle facilities serve many diverse users in the community and for some are a primary means of everyday travel.

Given the range of users and diverse travel purposes which walking and bicycling serve, it is important to have a broad, inclusive vision for active transportation development and a set of basic principles which will guide decisions on infrastructure investment and support programs.

Active Transportation Principles

- Fix it First—preserve and maintain the existing bicycle and pedestrian system
- Potential pedestrian/bicycle improvements should be considered from the perspective of developing a system, not just on based on whether an individual facility is currently used
- Always place safe design at the forefront of bicycle and pedestrian infrastructure development
- Provide connections for all neighborhoods to the active transportation network and ensure pedestrian connections to nearby community facilities exist

- Support economic development with active transportation infrastructure by developing facilities that support biking and walking tourism
- Make the active transportation network accessible and comfortable for all ages and abilities

Active Transportation Vision

- Providing a safe, accessible, and connected bicycle and pedestrian system throughout the urban area of Rochester
- Developing an accessible and well-connected regional network of bicycle facilities connecting cities in the ROCOG area to each other, to regional trails, and to regional attractions in Southeast Minnesota such as state parks
- Meeting critical access and mobility needs of transportation disadvantaged populations in Rochester and Olmsted County

Table 12-1 refines the overall goals for the Plan described in Chapter 1 to more specifically identify a set of objectives which support the overall goals for active transportation in the Plan and illustrate how the goals and objectives align and address the planning factors spelled out in federal legislation.

Urban Area Multi-User System Plan

Developing an adequate active transportation system requires coordination between planning, design, and financing efforts; land use and open space planning; and the land development approval process. Many elements of the non-motorized network are developed as part of private development projects, including sidewalks and multi-use paths along arterial or collector street frontages. Public entities typically take the lead in off-road trail development, the upgrading or installation of bridges serving active transportation travel, as well as on network infill projects along major roads where development and the street system have largely been built out without adequate active transportation infrastructure put in place. These "infill" projects are often managed by local road authorities, although off-road trails may develop as part of recreation or open space projects. Rochester provides a prime case study in the potential of joint development, where an extensive flood control project developed in the 1980s and early 1990s was paired with extensive park development that incorporated trails along most of the flood control system, resulting in a core network of trails that serves as the backbone of the Rochester trail system.

Figure 12-12 illustrates the Urban Area Active Transportation Network of major regional and major city

Table 12-1: Objectives for Active Transportation and Alignment with Plan Goals & Planning Factors

ROCOG Active Transportation Objectives	Overall Goals for 2045 ROCOG Plan	Planning Factors
• Develop active transportation infrastructure that interconnects cities, major parks and trails, and major destinations within cities • Develop enhanced infrastructure in major transit corridors and transit-oriented districts that provides safe and convenient pedestrian and bicycle access to transit and adjacent land use	▸ Improve connections between major destinations and activity centers ▸ Support first and last mile multi-modal connections to transit service	Connectivity/ Integration of Transportation System
• Provide safe and well-designed corridor & crossing infrastructure for cyclists and pedestrians along major streets • Improve perceived safety by providing security enhancements such as pedestrian scale lighting & secure bike parking	▸ Improve safety through mitigation of high risk / high conflict locations	Safe & Secure Transportation System
• Prioritize the closure of gaps in bicycle and pedestrian networks and provide an adequate number of crossings across major barriers such as freeways and rivers • Ensure residential areas have suitable connectivity to the Active Transportation network	▸ Provide adequate travel options and capacity to serve existing & future land uses ▸ Provide convenient access to goods & services, jobs and recreation for all residents regardless of social-economic status, age or physical abilities	Access/Mobility of People and Freight
Support economic development with active transportation infrastructure by: • Improving connections to and through Downtown Rochester • Expanding network connections into new growth areas • Development of facilities that support biking and walking tourism	▸ Provide travel options to serve future growth areas ▸ Support Implementation of DMC Development Plan	Economic Vitality
• Adequately fund the preservation of the active transportation system	▸ Maintain State of Good Repair through systematic maintenance	Preservation of System
• Identify and implement actions to support and promote alternative modes of travel	▸ Educate & motivate individuals through programs & services that make it easier to commute by active modes	System Management and Operations

corridors existing or planned for the Rochester Urban Area.

- **Regional Corridors** (solid or dotted red lines/see map legend) are intended to provide routes that can serve trips that may cross the city as well as provide access to major destinations within Rochester, connecting major employers, major educational facilities, and community or regional parks and recreation sites throughout the city.
- **Major City Corridors** (shown in solid or dotted blue lines/see map legend) are intended to serve travel between quadrants or sectors of the city not served by a regional corridor, which can provide route continuity across multiple neighborhoods or non-residential districts, or serve as the connection between local neighborhoods and regional trails or routes.

Figure 12-12 also identifies various types of study corridors or study areas where the potential for implementing active transportation infrastructure needs further evaluation to determine possible alternatives, whether development of such infrastructure is feasible, and whether investment will serve an important travel need. The designation of corridors in the Active Transportation Network was informed by the existing Rochester Bicycle Master Plan, adopted in 2012 and being updated in 2020, P2S 2040, the 2016 Rochester Parks & Recreation System Plan, and various downtown area planning efforts over the last 10-12 years.

The plan also identifies a limited number of locations where critical corridor needs have been identified and would benefit from further study. Some of these locations were identified in response to safety concerns; others were identified due to existing barriers to network connectivity that if overcome would benefit users of the system.

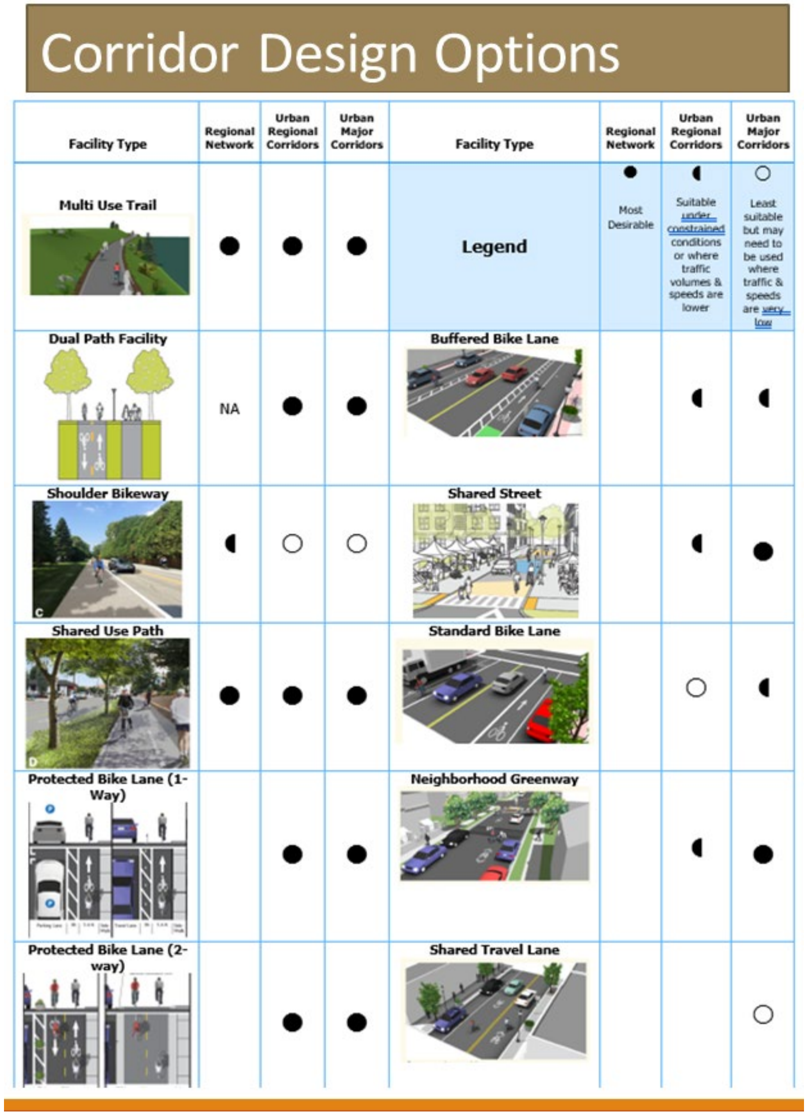
The use of regional and major city classifications is intended to provide a framework for understanding a given corridor's function and importance in the overall active transportation network. Network classification helps to identify critical routes that will facilitate the creation of an overall connected, desirably low-stress, network. Regional corridors should be viewed as having the highest importance in the area, and active transportation accommodations should be prioritized in discussions related to limited space and designed to a higher standard. The primary network of regional and major city corridors should be intuitively understandable and comfortable for most if not all users seeking to travel to key destinations in the community due to directness of travel and limited route interruption.

Assignment of corridors as a regional or major city corridor does not imply a specific type of design. From a design perspective, the Active Transportation System

Plan represents a strategic plan and definition of design will be made during the project development process when an active transportation corridor has been prioritized for development and funding has been programmed to begin project development.

However, general guidance on the type of facilities that are appropriate for regional corridors (corridors outside the planned urban area) as well as urban regional and major city corridors is provided in Figure 12-13. A "Corridor Design Toolbox" is provided to lend direction to decisions regarding the level of separation from vehicular traffic that is deemed appropriate for regional and major city active transportation facilities. The type of user to be accommodated and the environment in which a corridor is developed will help to determine the ultimate design. Where high speed or high volume traffic exists, a higher level of separation and protection for pedestrians and cyclists will likely be warranted; but where traffic impacts are minimal or where the users to be accommodated are more skilled, a corridor may be a candidate for a less stringent design standard and still meet the intent of the plan. In Figure 12-13 a range of facility types deemed suitable for consideration in a given type of corridor are identified, with final determination of the appropriate design type arrived at during the project development process.

Figure 12-12: Design Toolbox for Active Transportation Corridors



Corridor Design Options

Facility Type	Regional Network	Urban Regional Corridors	Urban Major Corridors	Facility Type	Regional Network	Urban Regional Corridors	Urban Major Corridors
Multi Use Trail	●	●	●	Legend	● Most Desirable	◖ Suitable under constrained conditions or where traffic volumes & speeds are lower	○ Least suitable but may need to be used where traffic & speeds are very low
Dual Path Facility	NA	●	●	Buffered Bike Lane		◖	◖
Shoulder Bikeway	◖	○	○	Shared Street		◖	●
Shared Use Path	●	●	●	Standard Bike Lane		○	◖
Protected Bike Lane (1-Way)		●	●	Neighborhood Greenway		◖	●
Protected Bike Lane (2-way)		●	●	Shared Travel Lane			○

Regional Area Active Transportation System Plan

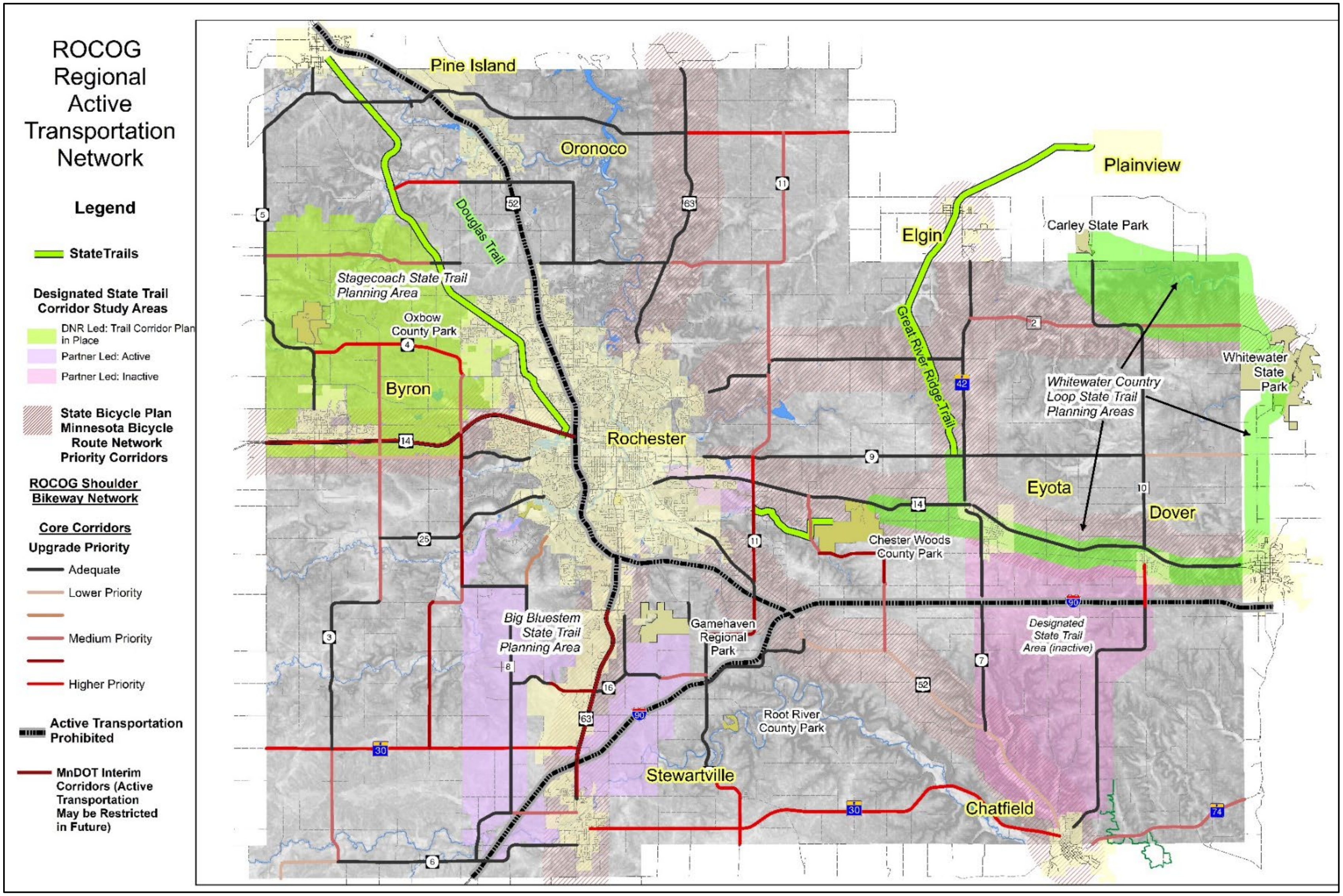
The Regional Active Transportation Network Plan focuses primarily on corridors that will most likely attract cyclists, in-line skating enthusiasts, or others for which greater travel distances are not a deterrent. Pedestrians may find these facilities attractive when located in proximity to suburban residential areas, or when accessed from a regional park or recreation facility where travel distances between origin and destination are not so great.

When thinking about the regional active transportation network, there are multiple tiers of facilities that provide service to different user groups.

- State Trails, such as the Douglas Trail, connect population centers and major regional park facilities. The system plan identifies both existing State Trails and "State Trail Planning Areas" where interest in developing future state trail connections has been recognized through state legislative action.
- The Minnesota State Bicycle Network Plan, developed by MnDOT in 2018, identifies a series of travel desire lines that will provide service within regions of the state and provide state level guidance to national network development within the state. MnDOT District Bicycle Plans refine the state plan by identifying highway corridors where the goal is to enhance the roadways with safe and well-maintained paved shoulders for non-motorized travel, connecting towns and cities and/or regional attractions throughout the state. In some instances, off-road trails or paths may be incorporated into this network where feasible.
- The ROCOG Shoulder Bikeway Network reflects approximately 150 miles of roadway where the goal is to provide paved shoulders of adequate width to provide a minimum level of non-motorized access to/from all areas with the ROCOG Planning region. This network of roads and highways will likely be most attractive to experienced bicyclists who are comfortable riding along with vehicle traffic.

Figure 12-14 highlights the Active Transportation Network Plan for the regional ROCOG area, reflecting the components of State Trails, the MnDOT State Plan, and the Regional Highway Shoulder Network. These facilities serve as an investment in health and recreation and a potential boost to local economic development where communities and businesses choose to enhance connections to the system. Along with Rochester, many of the smaller communities in the ROCOG Area are also working on local trail connections to these facilities.

Figure 12-13: Regional Active Transportation System Plan

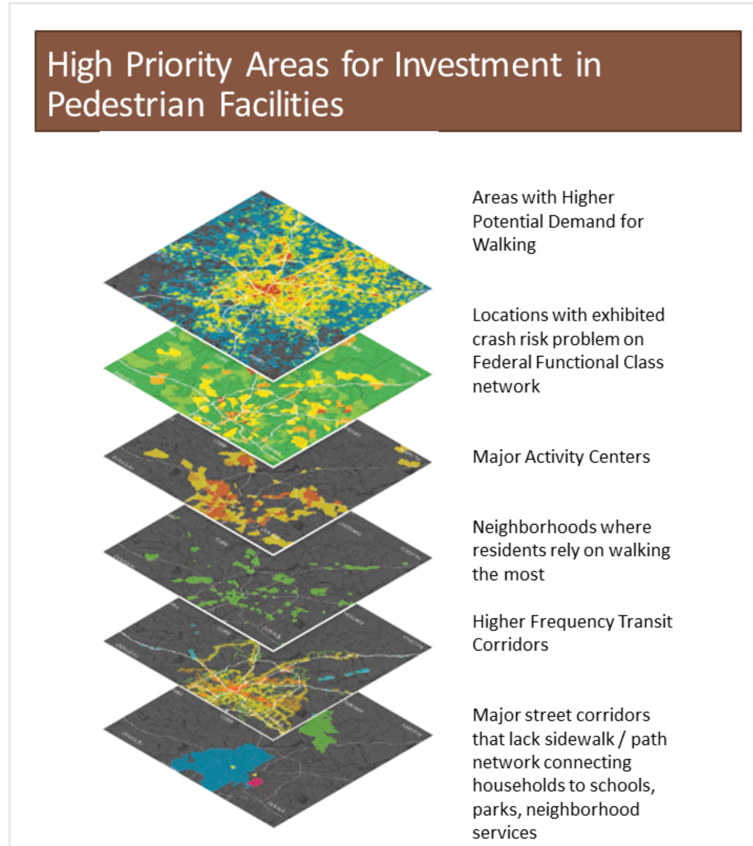


Rochester Urban Area: Pedestrian Improvement Areas

Encouraging pedestrian travel is a socially, economically, and environmentally responsible and healthy approach to improving the performance of our transportation system. In addition to community efforts to develop sidewalk and pedestrian enhancements on local street networks, providing safe and comfortable facilities along major streets, transit corridors, and in major activity centers is important for access and mobility.

The ROCOG Plan focuses on two major elements in its identification of pedestrian improvement areas. The first is providing pedestrian connections to transit in order to maximize the value of public investment in transit and support its success, particularly the new Downtown Rapid Transit system and proposed Primary Transit Network described in Chapter 11. Both of these systems represent a substantial investment in transit infrastructure, and for those services to attract users, pedestrian infrastructure is critical. The other core area of concern for ROCOG is pedestrian infrastructure along the major street network; here issues relating to connectivity and continuity of the network are of primary importance, along with safety. While limited funding is available through the Transportation Alternatives program, it is important for ROCOG to plan for pedestrian improvements that will serve to advance multi-modal travel along roadways and transit corridors where other funding opportunities exist.

Figure 12-14: Types of Federal Pedestrian Investment



Transit Network Pedestrian Improvements

Figure 12-16 illustrates the planned network of transit corridors to be known as the Primary Transit Network

(PTN) that will be served with higher frequency, higher capacity Bus Rapid Transit over time as planned transit-supportive land use patterns emerge to support the Central Business District/Destination Medical Center economic development vision. These corridors are envisioned to provide a wider range of housing choices and business location options in corridors served by frequent transit. Access to the PTN will be provided at stations generally located 1/3 to ½ mile apart. For residents, workers, and visitors, good pedestrian connections to stations will be a necessity.

An analysis was completed looking at the types of pedestrian infrastructure that would benefit the vision of transit supportive land use in general and service to transit stations in particular. Three types of improvement packages are anticipated:

1. The most basic improvement need will be to eliminate gaps in the existing sidewalk or walking path network along the PTN corridors. These areas are highlighted in black in Figure 12-17.
2. The immediate walkshed around proposed stations areas will benefit from and enhanced level of pedestrian amenity, including lighting, landscaping and crossing safety improvements. Potential station areas were identified on Figure 12-17 to understand approximately how many stations there would be; actual locations would be determined as part of PTN development.
3. Along the PTN network, the City of Rochester has identified certain areas as Transit Oriented Development nodes, which will benefit from the highest level of pedestrian amenity including station-oriented improvements as well as wider walkways and accommodation of activity such as sidewalk cafes.

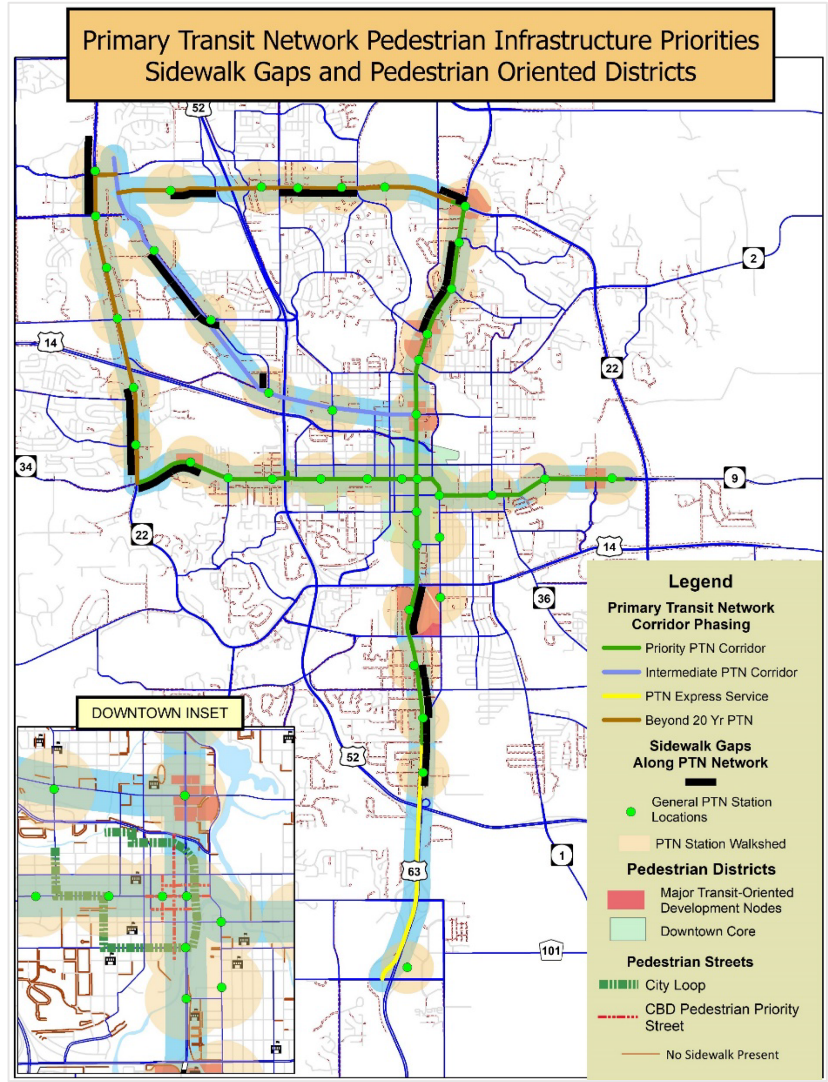
Figure 12-16 provides examples of the types of improvements that can be expected in the immediate vicinity of stations as well as along PTN corridors traversing through a Transit-Oriented Development node.

It is expected that much of the pedestrian infrastructure associated with the PTN will be developed as part of the development of this Bus Rapid Transit service, with costs incorporated into that project and potentially funded by federal transit funds that are available for BRT development.

Many of the missing sidewalk segments shown in Figure 12-17 are a legacy of commercial, industrial, and residential development that occurred at a time when development regulations did not require sidewalk installation as part of the basic package of site improvement requirements. Others are due to past policy for major roadway corridors that did not include construction of pedestrian facilities when private properties did not front directly on the highway.

Figure 12-15: Examples of Pedestrian Improvements Along Major Transit Corridors

Figure 12-16: Primary Transit Network Pedestrian Investment Priorities



Walkway Improvements Along Major Streets and Supporting Transit Investment

Walkway needs along the major street network are primarily a legacy of historic development policies. As a result, there are a number of areas in the Rochester urban area where gaps exist in terms of sidewalks or multi-use paths along arterial or collector streets. Figure 12-18 illustrates major street corridors without some type of pedestrian accommodation in the Rochester urban area. The City of Rochester adopted a policy in 1990 that all new development is required to install sidewalk facilities at the time of development, which has helped to minimize creation of additional areas where sidewalk is not available for users.

Multiple avenues exist for providing pedestrian sidewalks or multi-use paths in the locations identified. One of the main opportunities in areas that have been built out is when streets need reconstruction or major rehabilitation, which allows for adjustments in cross section design that will allow for accommodation of pedestrian facilities. Other opportunities include private development of properties that front on major streets lacking sidewalks or paths, where facilities can be incorporated into the site development process. In certain cases, the development of public facilities such as schools or parks can also facilitate pedestrian facility development.

Figure 12-17: Pedestrian Improvement Priorities Along the ROCOG Major Street Network

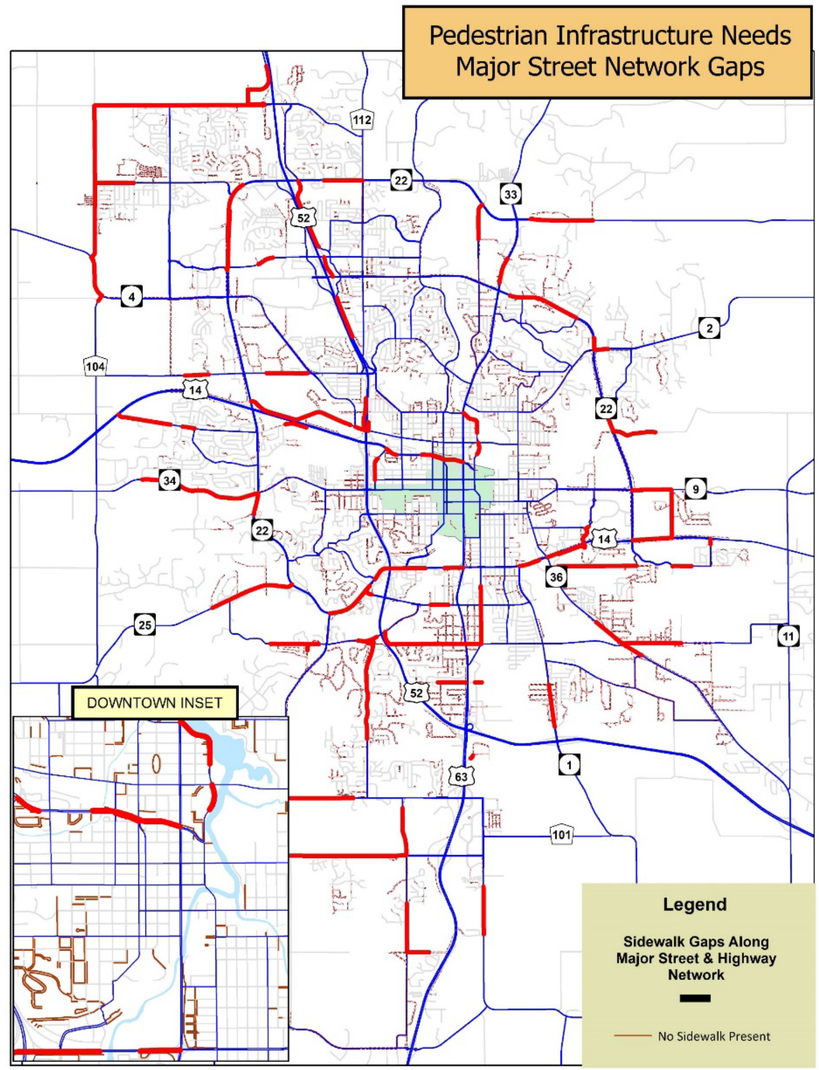


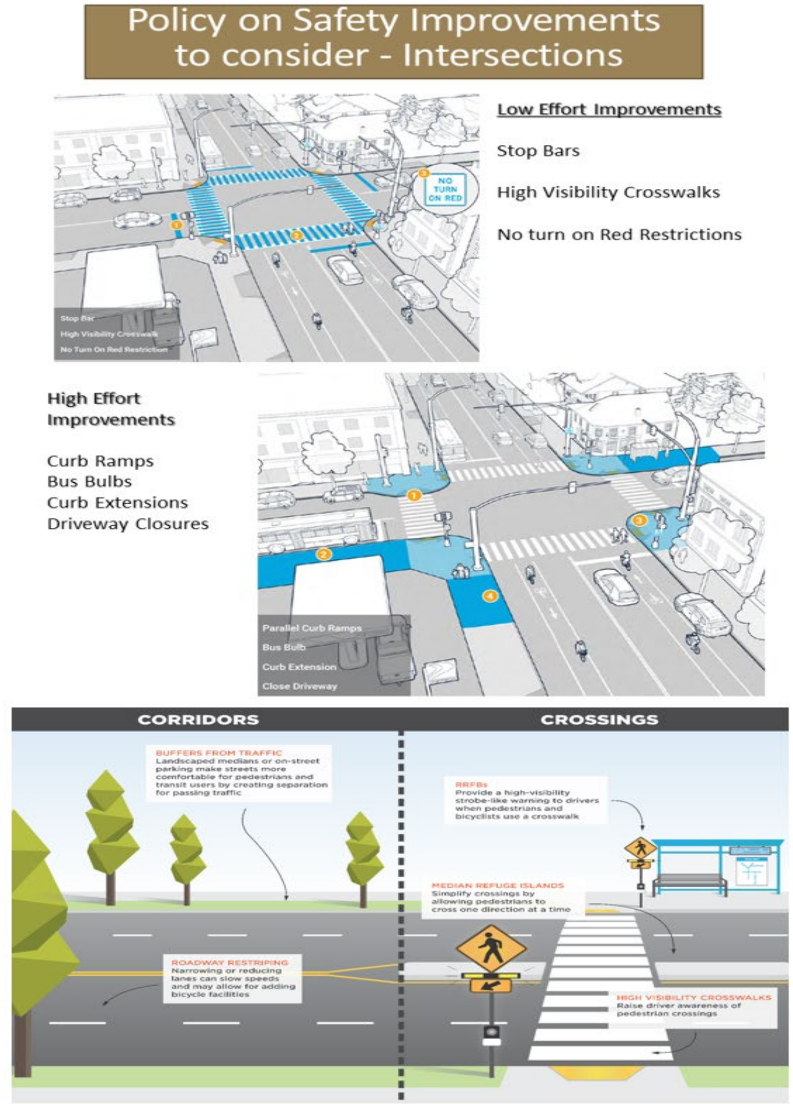
Figure 12-18 is intended to serve as a starting point to identify areas where the City of Rochester will need to work with landowners or state and county road authorities to confirm whether a viable funding plan to install sidewalks can be identified, and whether a sidewalk facility is in fact constructible at a reasonable cost in the locations identified.

Along arterial and collector streets, safety is an important concern and pedestrian or path projects provide an opportunity to address safety considerations as an integral part of project development. Figure 12-19 illustrates some principles and approaches to enhancing safety that should be considered when projects along arterial and collector roads are designed.

MnDOT Statewide and District Bicycle Plans/DNR State Trails

The MnDOT Statewide Bicycle System Plan (SBSP) was adopted in 2016 sets out an ambitious vision and goals to improve safety, convenience and comfort for local, regional, and statewide bicycle trips in Minnesota. The State Bicycle Plan network plan identifies broad travel corridors that envision connections linking destinations throughout the state by bicycle. The statewide plan does not define the actual facilities that will form these connections, that work is accomplished through district level bicycle plans. As shown in Figure 12-20, the statewide plan does prioritize corridor development, with

Figure 12-18: Examples of Pedestrian Intersection and Mid-Block Improvements



State Priority Corridors (shown in blue) as the highest priority improvement. Not all corridors will exclusively use State Highways; development of actual facilities depends on finding comfortable and direct connections and working to make those happen with local and regional partners.

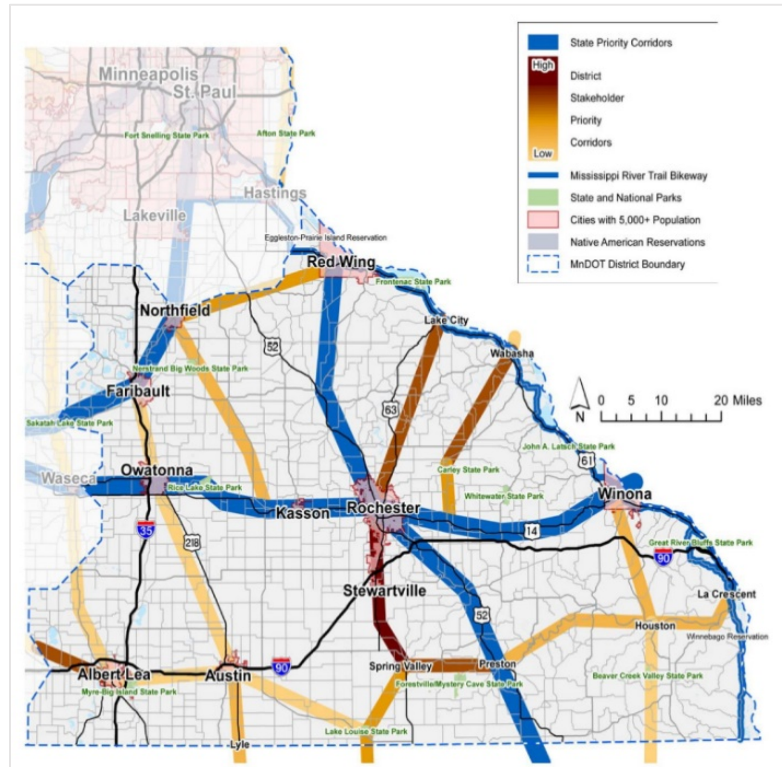
Rochester serves as a fulcrum for connecting many routes in Southeast Minnesota as seen in Figure 12-21. It is expected that given the limited access available to the TH 52/63/14 corridors, there will be a need to utilize regional corridors defined in the urban network plan to facilitate completion of this vision.

District 6 Bicycle Plan

The District 6 Bicycle Plan builds off the Statewide Bicycle Plan by identifying specific Bicycle Investment Routes within the search corridors specified in the Statewide Plan. Bicycle Investment Routes are planning tools that will guide future investments in bicycle facilities across the District. They are not intended to be used as navigational tools, except when designated and mapped as State Bikeways and/or U.S. Bicycle Routes.

MnDOT staff coordinated with local partners to develop these routes to better understand where it is most appropriate to make investments in bicycle infrastructure throughout District 6. A prioritization exercise was completed to see where Bicycle Investment Routes may

Figure 12-19: SE Minnesota Regional Priority Corridors



overlap with projects in MnDOT's Capital Highway Investment Plan. Overlap with CHIP projects provides an opportunity to incorporate bicycle route improvements into highway improvement projects at a lower cost that completing work as a free-standing project. In Olmsted County, two such potential projects were identified:

- Highway 30 east of Stewartville

- Highway 30 through Stewartville

Other corridors that ranked highly based on other prioritization factors included

- CSAH 1 from TH 52 to Simpson
- CR 143/CSAH 36 from Chester Woods Park to Rochester
- CSAH 2 from CSAH 11 to CSAH 22
- CSAH 33 from TH 63 south to 37th St NE
- CSAH 34 from CSAH 22 to CR 104

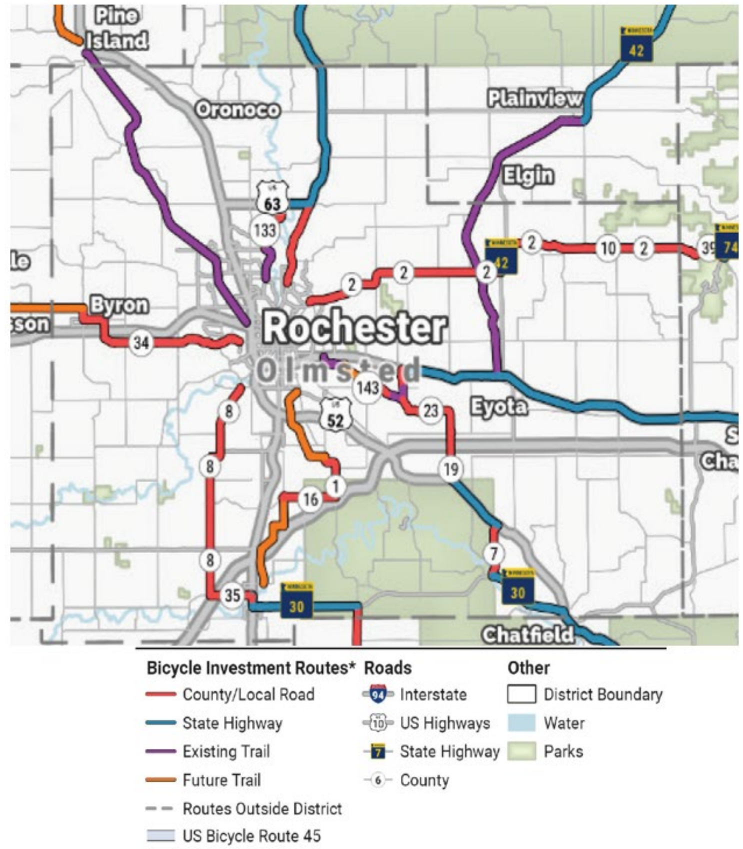
Most of these local corridors found on county roads provide the equivalent of "last mile connections" from the projects identified in the State CHIP. The City of Rochester trail system effectively provides connectivity between the MnDOT regional network and the Rochester Urban Area Active Transportation Network.

ROCOG in developing its Regional Active Transportation Network (Figure 12-14) has accommodated these investment routes to the greatest degree possible as part of the ROCOG Shoulder Bikeway Network.

Southeast Minnesota State Trail System

Southeast Minnesota is home to some of the most popular state trails in Minnesota. In Olmsted County, the Douglas Trail linking Rochester and Pine Island and the Great River Ridge Trail between Eyota and Plainview are part of a growing network of trails being developed to

Figure 12-20: MnDOT District 6 Bicycle Investment Routes



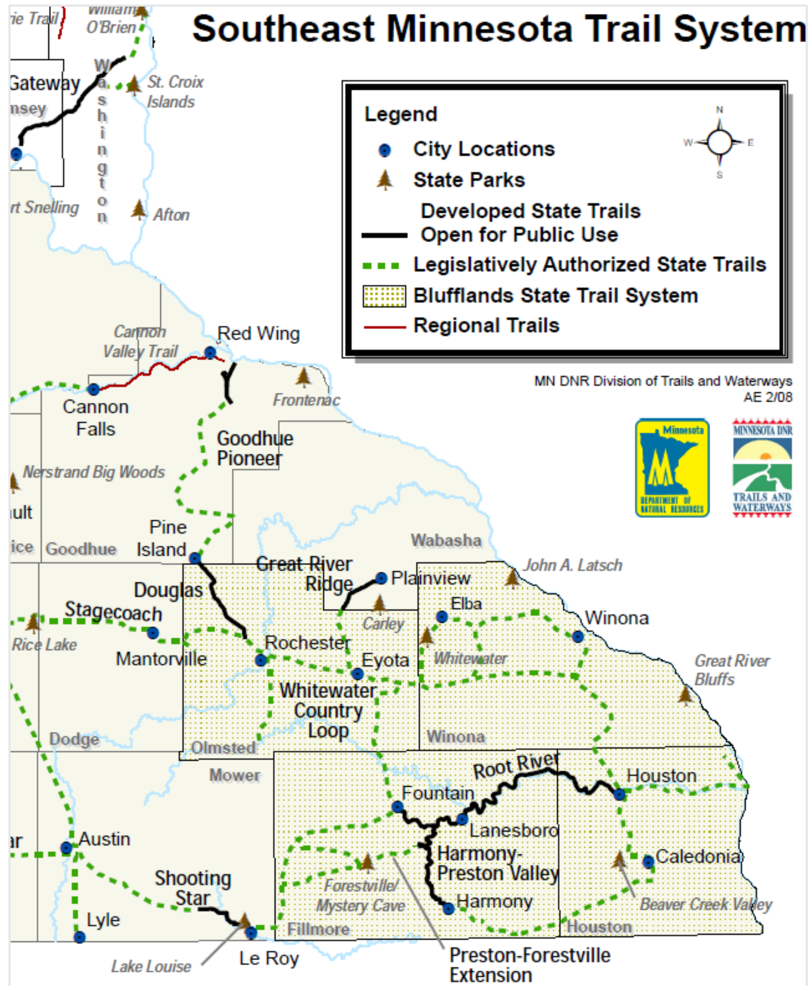
foster recreation opportunities and economic development in the southeast part of the state. Work is scheduled to finish the last segment of the Chester Woods Trail between Eyota and Chester Woods Park, and Rochester has programmed the completion of the last segment of the Chester Woods system west of the park that will connect with the City of Rochester Trail Network, opening up bicycle access to Chester Woods Park for residents of Rochester.

The Chester Woods Trail is part of a planned 50-mile loop known as the Whitewater Country Loop Trail that will connect Rochester, Eyota, Dover, St Charles, and Whitewater State Park. Another project in the active planning stage is the Stagecoach Trail, which ultimately will provide a connection from Rice Lake State Park near Owatonna to Rochester.

The Inter-Regional Bikeway Network Map for Southeast Minnesota developed by Department of Natural Resources (DNR) is shown in Figure 12-22. It illustrates regional trail connections between existing or planned urban area bikeways and the future inter-regional bikeways in the ROCOG area. Routes shown on this map correspond with corridors and communities that have been designated in state legislation as part of the Blufflands State Trail System, making facility development ultimately eligible for state trail funding.

Certain corridors that are included in the Blufflands State Trail System have been designated as partner led projects, which means that expectations are for the local community to lead initial planning for these corridors. In the ROCOG area, the connection between Stewartville and Rochester, known as the future Bluestem Trail, and the unnamed corridor connecting Chatfield, Dover and Eyota, have been designated as partner led projects.

Figure 12-21: Southeast Minnesota Trail System



Other projects such as the Stagecoach Trail and parts of the Whitewater Country Trail have been handed to the MnDNR to lead project development.

The ROCOG Regional Active Transportation Plan incorporates all the various state trail projects into its recommendations, appropriately reflecting the status of projects that are well into project development versus those that are in the early planning stages. To summarize, the status of the various projects includes:

- Chester Woods Trail connection east of Rochester has been funded and is under construction and expected to be completed in 2020
- Stagecoach Trail connection is still in the planning stage and expected to be funded in near future
- Bluestem Trail connection is in the initial stages of planning and expected to form a trail group to work together to take it to the next stage of planning
- Chester Woods Trail extensions from Chester Woods park east to Eyota and Dover are awaiting final route determination and funding

Active Transportation Project Implementation

In this section, implementation of the potential universe of active transportation projects suggested by the various network plans presented in the chapter is considered.

Four major facility implementation plans for bicycle and pedestrian facilities are recognized and recommended to guide active transportation development as part of the ROCOG Long Range Transportation Plan. These facility implementation plans include:

- Rochester Urban Area Active Transportation Network Map (Figure 12-12)
- Regional Area Active Transportation System Plan (Figure 12-14)
- Primary Transit Network Pedestrian Investment Priorities (Figure 12-16
- Major Street Network Pedestrian Investment Priorities (Figure 12-18)

To understand the magnitude of financial effort that would be needed to implement the potential projects suggested by these plans, an analysis was completed that identified the scope of potential projects suggested by the plan, estimated what the cost of project implementation would be, and assessed whether there was opportunity through some project mechanism other than a freestanding bicycle or pedestrian project where the work could be incorporated into another project.

Implementation of Urban Area Projects

Federal guidelines require MPOs to include a fiscal constraint analysis to demonstrate that there is a reasonable and credible balance between the expected revenue available for transportation investment and the estimated costs of the facility projects. The findings and conclusions of the fiscal constraint analysis for all modes will be presented in Chapter 15. However, in this chapter, the basics related to project costs and implementation options will be discussed. The urban area analysis will focus on the project concepts suggested on the following three system plans:

- Rochester Urban Area Active Transportation Network Map (Figure 12-12)
- Primary Transit Network Pedestrian Investment Priorities (Figure 12-16
- Major Street Network Pedestrian Investment Priorities (Figure 12-18)

Figure 12-23 illustrates the location of various projects suggested by the network plans. A total of 83 projects are identified. Different project groups are color-coded to indicate the type of project anticipated:

- Multi-Use Pedestrian-Bicycle Facility (green lines)
- Pedestrian-Only Facility (red lines)
- Bicycle-Only Facility (light purple)
- 400 Series Projects(Future Study Areas): The map will only show the project number in the general study area proposed to be investigated
- 300 Series Projects (Crossing Improvements): The map will only highlight the location of high priority crossing improvement needs that were identified in the plans.

Table 12-2 provides high level information about each project, including its endpoints, a short description of the anticipated project concept, and a preliminary estimate of development costs.

Table 12-2 also provides an assessment of how implementation of projects may be facilitated. A total of nine implementation paths or mechanisms were identified that potentially could lead to construction of a project. These nine paths included:

1. Construction of a project as a free-standing active transportation project
2. Construction of active transportation improvements as part of a larger street reconstruction project
3. Construction of improvements as part of a transit capital project such as segments of the PTN network
4. Implementation of active improvements as part of a Complete Streets project. Complete Streets projects involve road preservation short of complete reconstruction (covered under #2) where work such as a pavement mill & overlay provide opportunity to reallocate pavement space

5. Construction of improvements as part of an intersection improvement project
6. Construction of improvements as part of private land development
7. Construction of improvements as part of a Safe Routes to School project
8. Construction of improvements as part of a Rochester sidewalk improvement program project
9. Construction of improvements under the auspices of the Destination Medical Center.

Figure 12-22: Rochester Urban Area Active Transportation Project Concepts

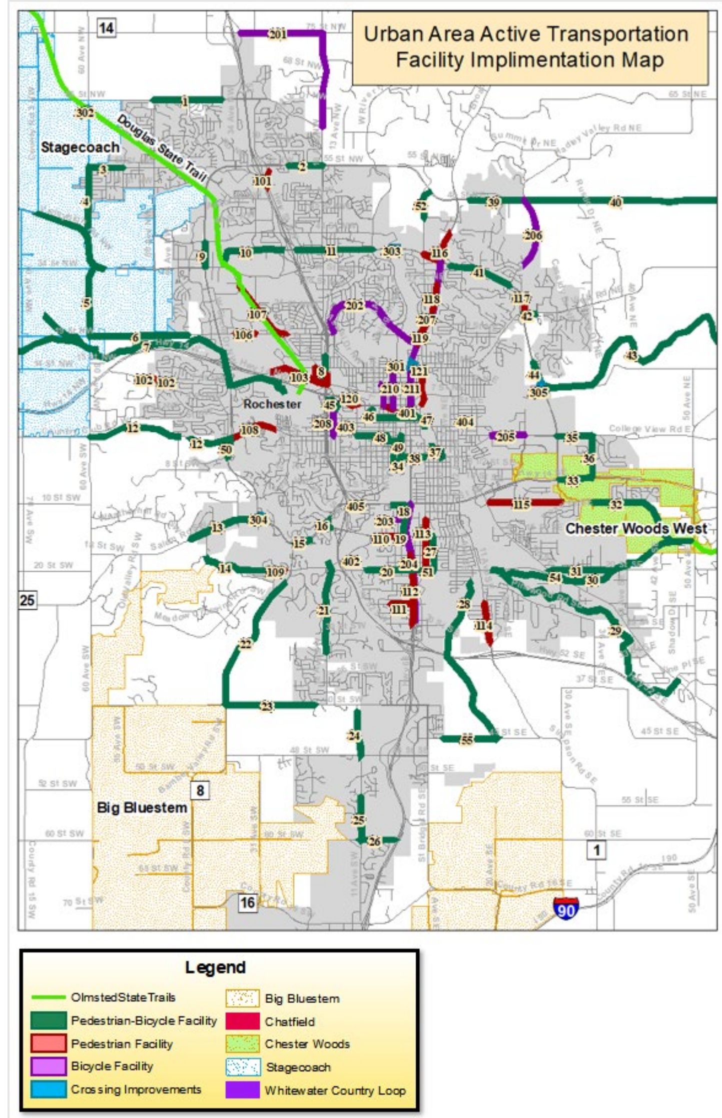


Table 12-2: Urban Area Active Transportation Project Summary

MapID	Location	Endpoint	Endpoint	Description	Cost
Active Transportation Projects					
14	CR 125	Stonegate Dr SW	Zumbro River Trail Trailhead	(Local Network) Construct future multi-use path on north side of corridor; included on project list due to connectivity to Regional Active Transportation corridor (Zumbro River Trail)	$1,080,000
27	CP Railroad Spurline SE	20th St SE	16th St SE	Construct trail along CP Rail Spurline corridor with path along 16th St SW from spurline to 3rd Ave SE	$504,000
32	Chester Woods Trail	Towne Club Parkway	CSAH 11	Construct Chester Woods trail connection from Towne Club Parkway east to CSAH 11	$1,581,800
54	CSAH 36	Melrose St	30th Ave SE	Construct path along south/west side to interconnect system	$500,000
28	Willow Creek Trail	Willow Creek Middle School	CR 101/45th St SE	Construct Trail following along alignment of Willow Creek. This project may be implemented in phases given its cost. Logical breakpoints for phases include: 1) 28th or 30th St SE south to CR 101 / 45th St 2) 28th or 30th St SE north to Willow Creek Middle School 3) End of CP Rail Corridor at 20th St south to trail @ approx 25th St	$3,518,250
107	Valleyhigh Dr NW	19th St NW	Douglas Trail Bridge	Construct pedestrian facility along northeast side of Valleyhigh Dr to improve access to trail & transit network as well as neighborhood destinations	$368,500
9	CSAH 22 West	CSAH 4	41st St NW	Construct multi-use path on east side of corridor	$480,000
11	37th St NW	West River Rd	TH 52 East Frontage Rd	Construct multi-use facility for pedestrians and low speed two wheeled vehicles on north side	$1,440,000
33	TH 14 East	CSAH 22 East	36th Ave SE	Construct multi-use path or trail improvement along north side of TH 14 East to connect City Trail Network to park facilities & neighborhood via signalized intersection at TH 14 / CSAH 22 East	$387,500
37	Riverside School Trail Connector	4th St SE	6th St SE via 7th Ave	Construct trail along south side of Bear Creek from 4th ST SE bridge over Bear Creek to 7th Av SE	$193,750

MapID	Location	Endpoint	Endpoint	Description	Cost
41	CSAH 22 East	6th Ave NE	Stonehedge Dr	Construct multi-use path along south side of East Circle Dr	$780,000
44	CSAH 22 East	Century Hills Dr (south end)	Silver Creek Rd	Construct path or trail connection along east side of CSAH 22 to provide access to Silver Creek Trail including safety crossing enhancements	$273,000
PC	CP Spurline Development	12th St S	16th St S	Public Comment suggested development of path along corridor after it is decommissioned from 16th St into downtown. Staff recommendation is to consider development of trail from 12th St to 16th St SE	$417,000
R	Chester Woods Trail East	Chester Woods Park	St Charles	Construct State Trail facility connecting Chester Woods Park to Eyota	$2,780,000
R	Great River Ridge Trail	CSAH 9	Chester Woods Trail	Connect Great River Ridge Trail south of CSAH 9 with future Chester Woods Trail	$2,112,200
18	Broadway Ave S TH 14 W	12th St to Broadway Av to.	14th St SW Crossroads Dr	Construct multi use path across north and east side of Crossroads Shopping Center	$700,000
29	Badger Run	20th St SE Bridge over Bear Creek	CSAH 36 near Ranch Ct SE	Construct future trail along Badger Run	$4,980,000
30	Bear Creek Trail	20th St SE Bridge over Bear Creek	Chester Woods Trail at CSAH 11	Construct future trail along Bear Creek from confluence with Badger Run to future Chester Woods Trail	$3,300,000
43	Silver Creek Trail Extension	Quarry Hill Park	Haverhill Twp Reservoir	Construct future trail along Silver Creek corridor from Quarry Hill Park to Haverhill Township Reservoir	$4,800,000
45	Cascade Creek Trail	End of Trail near Tennis Club	Trail end under NB off ramp TH 52	Construct connection between Cascade Creek Trail in Kutzky Park & existing trail along NB off-ramp of TH 52 at Civic Center Dr	$531,000

MapID	Location	Endpoint	Endpoint	Description	Cost
401	North Broadway	6th St N	2nd St North	(EVALUATION NEEDED) Connect North Broadway Protected Bike Lanes to City Loop	
R	Chester Woods Trail East	Chester Woods Park	St Charles	Construct State Trail facility connecting Eyota to Dover and St Charles	$5,386,250
R	Stagecoach Trail / Olmsted County	West County Line	City Trail Network	Routing undetermined at this time but options for connection to Rochester / Olmsted County trails would include: 1) connect to proposed city trail at Reservoir KR-7/KR-3 along CR 151 west of 60th Ave NW 2) connect directly to Douglas Trail near Douglas or west of Oronoco	$6,255,000
7	Cascade Creek	Cascade Lake Recreation Area	Kalmar Twp Reservoir	Construct trail from West Circle Drive to Reservoir KR-3 or KR-7; provide on-road or off-road connection to Cascade Lake Recreation area east of CSAH 22; develop crossing of CSAH 22	$6,120,000
Street Reconstruction Projects					
1	65th St NW	34th Ave NW	50th Ave NW	Construct Multi-Use Path on south side of corridor	$1,200,000
4	CR 104 (CSAH 44) CSAH 4	34th St NW to ~55th Av NW to	55th St NW CSAH 3	Construct multi-use path on east side of 60th Ave from CSAH 4 to 55th St (1 mi); on west side of 60th Ave along existing Pebble Creek development from 51st St to 55th ST (0.3 mi); grade for future paths along remainder of project	$3,132,500
20	20th St SW	Broadway Ave	CR 125 / Mayowood Rd	Construct multi-use facilities for pedestrians and two wheeled vehicles along 20th ST SW	$1,146,000
211	Broadway Ave N	6th St N	14th St NW	Develop protected bicycle lanes on North Broadway	$648,000
301	Broadway Ave N	Zumbro River Bridge		Add pedestrian and bicycle crossing improvements to North Broadway Bridge	$1,187,500

MapID	Location	Endpoint	Endpoint	Description	Cost
303	37th St NE	Zumbro River Bridge		Construct pedestrian and bicycle bridge crossing improvements at 37th St bridge over Zumbro River	$725,000
39	48th St NE	CSAH 33	Hadley Valley Rd	Construct multi use path or trail from end of current path to Hadley Creek Rd NE	$960,000
55	CR 101 45th St SE	East Boulder Ridge Dr	Gamehaven Park entrance	Construct multi-use path along 45th ST SE / CR 101 to connect Gamehaven Regional Park and areas west to future Willow Creek trail	$960,000
118	Broadway Av N	24th St NE	27th St NE	Construct pedestrian infill facilities along west side of North Broadway	$201,000
119	Broadway Av N	Elton Hills Dr	23rd St NE	Construct pedestrian infill facilities along west side of North Broadway from Elton Hills Dr to 23rd St NE	$351,000
5	CR 104 (Future CSAH 44)	19th St NW	34th St NW	Construct multi-use path on east side of corridor	$1,260,000
6	19th St NW	Ashland Dr NW	60th Ave NW	Construct multi-use path on north side of corridor; sidewalk on south side with development	$2,553,750
10	37th St NW Extension	TH 52 Interchange	Douglas Trail	Construct multi-use path or trail across north side of former IBM Campus	$1,200,000
21	18th Ave SW	32nd St SW	CR 125 / Mayowood Rd	Construct multi-use path on one side with connection north of Mayowood Rd to Zumbro River Trail	$2,430,000
38	City Loop SE / 6th St SE	Broadway Ave	3rd Ave SE	Construct multi-use dual track trail from Broadway to east side of Zumbro River and pedestrian and bicycle accommodations as part of future extension of 6th St SE	$500,000
40	48th St NE	Hadley Valley Rd	CSAH 11	Construct future multi use path on one side of 48th St from Hadley Creek Rd to CSAH 11	$3,600,000
52	East River Rd	44th St NE	CSAH 22 N	Construct trail or path along one side of East River Road	$540,000

MapID	Location	Endpoint	Endpoint	Description	Cost
101	East Frontage Rd TH 52	55th St N	Pennington Court	Develop pedestrian facility along East Frontage Rd	$83,750
120	Civic Center Dr	4th Av NW to 11th Ave to	6th Ave NW 16th Ave NW	Construct pedestrian infill facilities along south side of Civic Center Dr between 4th and 6th Ave NW and between 111th Ave and 16th Ave NW	$117,250
R	TH 14 E	CP Railroad Overpass	near Chester Woods Park	Correct shoulder width deficiency on TH 14 under railroad overpass	$562,500
115	Eastwood Rd SE	CSAH 36	Felty Dr	(Local Network) Construct multi-use path or trail along Eastwood Rd SE to connect area with sidewalk, path and trail networks along Marion Rd and Towne Club Pkwy to serve existing /future residential development	$1,284,000
204	Broadway Ave S	12th St South	28th St S	Develop bicycle accommodations along South Broadway consistent with 2015 Broadway Corridor Study	$2,100,000
207	Broadway Ave N	14th St NE	37th St NE	Develop bicycle accommodations along North Broadway consistent with 2015 Broadway Corridor Study	$1,800,000
302	Douglas Trail	60th Ave NW		Construct bridge overpass for Douglas Trail over 60th Ave NW	$1,375,000
405	CSAH 22 / TH 14-52 Interchange	Memorial Parkway	Fox Valley Dr	(EVALUATION NEEDED) Develop option for pedestrian/bicycle travel across TH 14/52 along or paralleling Salem Rd/12th St SW corridor	
201	TH 63 North & 18th Ave NW	TH 52 N to Overland Dr to	18th Ave NW TH 63 N	Construct bicycle focused improvements along TH 63 from TH 52 to 18th Ave and along 18th Ave from TH 63 to Overland Dr	$3,180,000

MapID	Location	Endpoint	Endpoint	Description	Cost
PC	16th St SW	Zumbro River Bridge	CSAH 8	Public comment was to improve 16th St SW for two-wheel travel through Apache Mall area and west to CSAH 22. Staff recommendation is for initial step to improve Zumbro River Bridge through reconstruction or cantilever of path facility off bridge to improve access to Apache Mall to/from east (including Zumbro River trail on east side of river)	$725,000
Transit Corridor Projects					
19	Broadway Ave S	14th St SW	16th ST SW	Construct multi-use path along west side of South Broadway	$232,500
108	2nd St SW	CSAH 22W	West Transit Village *(proposed)*	Construct pedestrian facility along north side of 2nd St SW to provide interconnected pedestrian network	$224,450
112	Broadway Ave S	18th St SW	28th St SW	Construct pedestrian infill improvements along west side of South Broadway	$780,000
Complete Streets / Complete Corridor Projects					
12	CSAH 34	CSAH 22 West	CR 104	Construct future multi-use path on south side of corridor	$2,640,000
15	CSAH 22/25 West	CSAH 8	Carriage Dr SW	Construct multi use path along south side of CSAH 22/25 to provide residential area connection to River Trail network	$232,500
16	16th St SW CSAH 22/25	CSAH 22 /25 to 16th St to	Greenview Dr E Greenview Dr W	Construct path or trail along south/west side of 16t St and south/east side of CSAH 22/25 to provide access to safe crossing at signalized intersection. North side connection to Frontage Road.	$240,000
35	CSAH 9	36th Ave SE	CSAH 22 E	Construct multi-use path or trail improvement along one side of CSAH 9	$387,500
203	14th St SW	Broadway Ave S	Zumbro River Trail	Develop bicycle travel accommodation along 14th St SW to connect Graham Park / South Broadway Trails to Zumbro River Trail	$21,000
210	4th Ave NW	Civic Center Dr	14th St NW	Enhance on street bicycle travel along 4th Ave NW from Civic Center Dr to 14th St NW	$24,000

MapID	Location	Endpoint	Endpoint	Description	Cost
8	TH 52 West Frontage Rd	7th St NW	TH 52 Pedestrian Bridge	Construct multi-use path on west side of corridor	$310,000
25	11th Ave SW	Southern Ridge Dr	60th St SW	Extend multi-use path along east side of 11th Ave SW from Southern Ridge Dr SW to 60th St SW	$780,000
51	20th St SE	Broadway Ave	3rd Ave SE	Develop facilities for pedestrians and two wheeled vehicles along 20th St SE	$156,000
104	Valleyhigh Dr	14th St NW	800' south of 14th St SW	Construct pedestrian facility along Valleyhigh Dr NW to complete sidewalk network along this bus route	$33,500
105	East Frontage Rd TH 52	7th St NW	14th St NW	Construct pedestrian facility along East Frontage Rd to eliminate gap in sidewalk network and access to transit route	$117,000
106	19th St NW	32nd Ave NW	Scott Rd NW	Construct pedestrian facility along north side of 19th St to provide fully connected sidewalk network	$83,750
110	16th St SW	2nd Ave SW	6th Ave SW	Construct pedestrian improvements along south side of 16th St to close gap in sidewalk network along transit network and improve trail system access	$83,750
113	3rd Ave SE	14th St SE	20th St SE	Construct pedestrian improvements along east side of 3rd Ave SE to improve eliminate gap in sidewalk network and improve access to Graham Park area	$251,250
117	CSAH 22 East	Viola Rd	Century HS Bike/Ped Bridge	Construct path along east side of East Circle Dr to connect Viola Rd sidewalk to Ped/Bike Bridge and path along north side of East Circle Dr	$116,250
31	20th St SE	CSAH 36	Bear Creek - 20th St crossing	Construct on or off-road path/lane to provide neighborhood access to City Trail Network and Marion Rd path	$459,000
121	West Silver Lake Dr	Broadway Ave N	8th St NE	Construct pedestrian improvements along west side of West Silver Lake Dr	$201,000
122	West Silver Lake Dr	7th St NE	1500' south of 7th St	Construct pedestrian improvements along west side of West Silver Lake Dr to eliminate gap in sidewalk network and serve future development	$60,300

MapID	Location	Endpoint	Endpoint	Description	Cost
Private Development Activity					
2	55th St NW	25th Ave NW	18th Ave NW	Construct multi-use path on south side of corridor	$600,000
3	55th St NW	55th Ave NW	60th Ave NW	Construct multi-use path on north side of corridor	$600,000
4	CR 104 (CSAH 44) CSAH 4	34th St NW to ~55th Av NW to	51st St NW CSAH 3	Complete paving of multi-use path north side of CSAH 4 from 50th Ave to CSAH 3 and along west side of CR 104/60th Ave south of 51st St NW	$2,867,500
23	40th St SW	Odyssey Dr	CSAH 8	Construct multi-use path or trail along north side	$1,402,750
24	11th Ave SW	48th St SW	500 ft south of 40th St	Construct multi-use path on west side (limited development potential on east side)	$780,000
42	CSAH 2	CSAH 22 East	Century Hills Dr	Construct multi-use path along south side of Viola Rd	$156,000
50	CSAH 22 West	Berkman Dr	2nd St SW	Construct multi-use trail along west side of CSAH 22	$457,500
116	37th St NW CSAH 33	East River Rd to 37th St NE to	CSAH 33 41st ST NE	Construct pedestrian improvements along north side of 37th ST and west side CSAH 33 to serve future TOD node / improve transit access	$840,000
Safe Routes Program					
202	Elton Hills Dr	Broadway Ave	East Frontage Rd	Enhance bicycle travel along Elton Hills Dr	$900,000
22	CSAH 8	CR 125 / Mayowood Rd	40th St SW	Construct multi-use path or trail along east side	$1,650,750
114	CSAH 1 / 11th Ave SE	25th St SE	31 St SE	Construct pedestrian improvements along CSAH 1 / 11th Ave to provide safe access to Willow Creek MS and transit	$936,000
304	Intersection Safety	CSAH 22 West	CSAH 25 West	Implement Safety features to facilitate connection of Salem Rd trail with West Circle Dr trail	$25,000

MapID	Location	Endpoint	Endpoint	Description	Cost
13	CSAH 25	CSAH 22 West	Westhill Dr SW	Construct pedestrian-oriented facility on north side	$930,000
404	Eastside N/S Bike Connector	Slatterly Park to 14th St NE		(EVALUATION NEEDED) Develop on-street designated bike corridor serving north/south travel on east side of central Rochester	
Sidewalk Program					
36	36th Ave SE	CSAH 9	TH 14	Construct multi-use path or trail improvement along west side of 36th Ave	$465,000
109	28th Ave SW / CR 125	Maywd Cm St to 28th Ave SW to	CR 125 Bamber School	(Local Network) (Included as possible Safe Routes to School project) Construct pedestrian facilities along 28th Ave SW and Mayowood Rd SW to improve access to Bamber Valley School and trail/path network for residents south of Mayowood Rd	$171,600
PC	Country Club Manor	Various Streets		(Local Network / Local Cost) Implement Country Club Manor Protected Bikeway network along 36th Ave / Manor Woods Dr / 7th St NW)	$109,500
26	60th St SW	11th Ave SW	South Pointe Dr	Construct multi use path or trail along one side of 60th St SW	$600,000
111	25th St SW	Broadway Av S	Oakridge Dr SW	(Local Network) (Included due to possible funding as part of transit access project) Construct pedestrian facilities along 25th St SW to provide improved connections to transit service, nearby business area and City path network	$273,000
206	Stonehedge Dr NE	CSAH 22 East	48th St NE	(Local Network / Local Cost) Enhance bicycle accommodations on existing and future Stonehedge Dr NE to provide bike connectivity between East Circle Dr to 48th St NE	$50,000
209	6th Ave NW	Civic Center Dr	Cascade Creek Trail	Enhance on-street bicycle travel along 6th Ave NW to connect downtown with Cascade Creek Trail	$15,500
103	7th St NW Sidewalk Infill	TH 52 East Frontage Rd	TH 14 North Frontage Rd	Construct pedestrian improvements along 7th St NW to improve connectivity, provide access to Douglas Trail and improve connections to future transit services	$284,750
102	7th St NW Sidewalk Infill	Manor Park Dr	Coventry Ln	Construct missing segments of sidewalk along 7th St NW between Manor Park Dr and Coventry Lane	$83,750

MapID	Location	Endpoint	Endpoint	Description	Cost
DMC Projects					
49	2nd Ave SW	2nd St SW	6th St SW	Construct Discovery Walk facility	$16,800,000
34	City Loop South / 6th St SE	4th Ave SW	Broadway Av	Develop south section of City Loop along 6th St SW from 2nd Av to Broadway & along the north boundary of Soldiers Field Park between 2nd Av and 4th Ave SW	$2,905,000
48	City Loop SW /2nd & 3rd St SW	11th Ave SW	2nd Ave / Discovery Walk	Develop dual track City Loop generally along 2nd St and 3rd St	$4,375,000
46	City Loop North / 2nd St North	1st Ave NE	8th or 9th Av NW	Develop dual track north leg of City Loop facility along 2nd St NE/NW	$5,792,500
47	City Loop NE / along Zumbro R	Center St	1st Ave NE	Develop northeast leg of dual track Downtown City Loop along Zumbro River corridor and Civic Center Dr	$672,000
403	City Loop West	2nd St to Kutzky Park	N-S Avenues	(EVALUATION NEEDED) City Loop connection between 2nd St SW and Cascade Creek Trail	$437,500

Implementation of Regional Active Transportation Projects

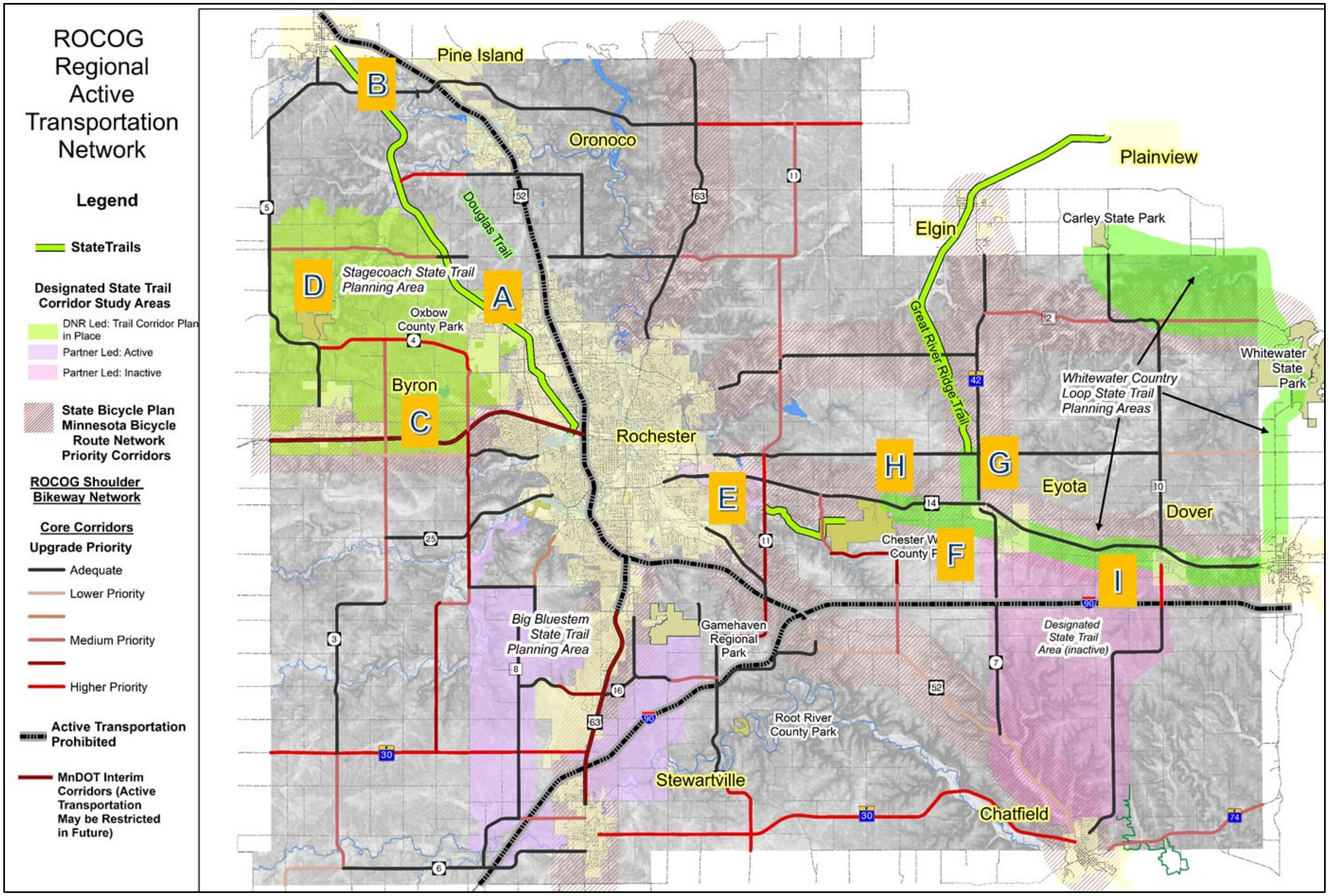
The major work associated with the Regional Active Transportation Network Plan primarily focuses on a series of state trail projects and work related to state highway crossings to facilitate active transportation. Figure 12-24 highlights the locations of these projects. Table 12-3 describes each project and provides, where available, a very preliminary estimate of costs associated with each project.

The other major aspect of the Regional Plan is the designated ROCOG Shoulder Bikeway Network, reflecting approximately 150 miles of roadway where the goal is to provide paved shoulders of adequate width to provide a minimum level of non-motorized access to/from all areas within the ROCOG Planning region. This network of roads and highways will likely be most attractive to experienced bicyclists who are comfortable riding alongside of vehicle traffic.

Table 12-3: Major Regional Projects

	Major Regional Trail Projects in Olmsted County	Cost
A	Construct grade separation on Douglas Trail at 60th Ave NW and 65th ST NW	$ 1 million per structure
B	Completion of Paved Off-Road Trail with construction of new CSAH 5 from CSAH 3 to 31st Ave NW	Cost built into Zumbro River Crossing cost
C	Grade separation at various locations on TH 14 between Rochester and Byron will facilitate shoulder bikeways	Cost built into eventual interchange(s)
D	DNR-led project to determine connection of future Stagecoach Trail to Rochester area trail network	Planning Estimate of $6.2 million
E	Phase 2 of Chester Woods Trail / Connect trail at CSAH 11 to Rochester River Trails network	2020 project with est cost of $1.6 million
F	Phase 3 of Chester Woods Trail from Chester Woods Park to Eyota	Est cost of $2.7 million
G	Connect south end Greater River Ridge Trail to Chester Woods Trail near Eyota	Est Cost of $2.1 million
H	Upgrade geometrics of Railroad Overpass on TH 14 near Chester Woods Park Entrance to provide adequate shoulders	Est cost of $565,000
I	Phase 4 of Chester Woods / Whitewater Country Trail from Eyota to Dover	Est cost of $5.4 million

Figure 12-23: Regional Improvement Projects



Key Principles for Implementing the Plan

As a planning agency with a limited role in the programming of funding for active transportation outside of federal funding and a limited direct role in seeing projects or programs through from project development to completion or deployment, ROCOG must work with and rely on its local partners to advance the recommendations in the Plan. ROCOG's work on planning and early phases of project development will be guided by a set of principles outlined in this section. Success in implementation will require involvement from not only the public sector (State agencies, Olmsted County, local municipalities), but also facility users, neighborhoods groups, business interests, and the development community, all of which have varying roles and responsibilities in regards to achieving the goals of the plan.

Implementation requires that key directions advanced by the plan be incorporated into the routines and practices of jurisdictions and agencies and for those actions to be supported by local citizens and their elected officials. Successful implementation of a plan will rely on:

- Jurisdictions and agencies considering plan policies and strategies in capital programming and development review procedures
- Roadway agencies and site developers incorporating accommodation of non-motorized users in their project design process
- Jurisdictions and agencies continuing efforts to fund non-motorized facility development and work with private or non-profit partners as opportunities arise to implement various actions or strategies

As a general rule, infrastructure systems such as trail and path networks should be planned prior to development. Attempting to assemble route networks in piece-meal fashion after development has occurred will generally result in a disconnected and poorly planned trail or path system.

The following implementation principles will guide ROCOG's work going forward and is grouped into series of major categories including system development, safety, planning, education/encouragement.

System Development Principles

The bicycle and/or pedestrian transportation system should allow users of varying ability to safely travel between various origins and destinations on an interconnected network of facilities. In considering system development, factors to account for include:

- Providing access to desired destinations
- Route continuity

- Route attractiveness
- Minimization of conflict with vehicular traffic
- Ease of implementation
- Cost

The types of land uses that should be connected include neighborhoods, schools, parks, youth centers, employment and commercial centers, transit hubs, existing public trails, and natural areas. To accomplish this, key strategies to pursue include:

- Require the provision of bikeways and walkways consistent with the ROCOG Long Range Transportation Plan in the following cases:
  - In all new highway construction projects
  - When reconstructing or improving existing bridges and roads
  - In public open space development projects
- Local units of government should adopt policies that require the inclusion of adequate bicycle and pedestrian access in all development and standards or guidelines for the dedication or acquisition of easements and rights-of-way for bikeways and walkways in conjunction with development approval.
- Municipal parkland dedication requirements should be considered not only for neighborhood park development but the creation of linear park facilities which would facilitate path or sidewalk development that would enhance overall system connectivity.
- Transportation agencies, utility agencies and jurisdictions should coordinate the development of trail or path links along utility corridors, railway corridors, and stormwater management corridors.
- Development of non-motorized crossings should be considered in urban areas over waterways or freeways where existing crossings are spaced more than a mile apart

System Development in Rural and Suburban Areas

In rural or suburban areas, non-motorized networks will be focused primarily on creating connections between communities, to regional trail systems, and to major destinations such as regional parks. Pedestrian network development is not a high priority, though specific issues such as safety of school bus stops should be addressed on an as-needed basis. A primary improvement strategy for bicycle and pedestrian traffic in rural and suburban areas will be the development of paved shoulders on roadways. Priority should be given to investing in paved shoulders on main corridors connecting cities with other towns and other major destinations such as regional parks. Long term, paved shoulder areas should be considered on all roads whenever traffic volumes are expected to exceed 1000 vehicles per day, particularly where posted speeds are above 30-35 MPH.

Public Transit

Transit trips typically begin and end with a walk or bike ride. Pedestrian and bicycle facilities in transit corridors make transit systems more effective. Therefore, high priority should be given to providing sidewalks and bikeways on transit routes and on local streets feeding these routes from neighborhoods.

Facility Design

Consistency in design helps to foster understanding between different users and improve safety as all users can better anticipate the actions of other users in a shared roadway environment.

Access management is an important element of facility design and addresses the coordination of roadway design in a manner that reflects the safety and traffic management needs of roadway users while recognizing the need for reasonable access to facilitate land development. Consideration should be given to the placement and design of driveways and side street intersections along major roads as properties development to minimize the number and width of driveways and roads connecting to major roadways in order to reduce points of conflict and making vehicle traffic more predictable.

Intersection crossings are the most challenging aspect of travel pedestrians and bicyclists often face and are where most crashes occur. Some pedestrians, especially people with mobility impairments and the elderly, need additional crossing time. Particularly in areas of high pedestrian activity, methods to improve pedestrian safety should be considered including:

- Shortening crossing distances with tools such as pedestrian refuge islands, curb extensions or by reducing curb return radii
- Alerting or warning motorists of the potential presence of pedestrians through use of measures such as signage, crosswalk markings, signals, and lights
- Removing sight obstructions, such as parked cars, trees, and signs in the immediate vicinity of an intersection crossing to improve visibility of pedestrians and vehicles
- Implementing longer crossing times in areas expected to serve slower pedestrians, such as near retirement homes, while balancing with traffic flow operation such that the increased crossing time does not come at the expense of excessively long wait times causing pedestrians to grow impatient and cross during gaps in traffic

Pedestrian Oriented Design

Pedestrian-friendly communities that are well-planned encourage walking and promote higher levels of pedestrian travel. Dedicated pedestrian facilities improve pedestrian safety and increase opportunity for the widest range of potential users. Addressing pedestrian needs should be a routine consideration in every planning study and project development process. The character and setting of an area, nearby land use intensities, the mix of nearby land uses and the presence of pedestrian generating activities (such as transit service) will influence the level of pedestrian use and should inform planning for pedestrian facilities.

Facility Maintenance

In order to provide safe facilities and year-round usability reasonable maintenance standards and practices should be adopted and implemented. Jurisdictions should establish a timely and regular maintenance and repair program for all bicycle and pedestrian facilities, which may include enforcement of the responsibility for path and sidewalk maintenance by adjacent property owners. The level of maintenance can be determined on a corridor-by-corridor basis or can be established on a system-wide basis but should be documented in terms of a maintenance policy. Ongoing maintenance costs should be routinely considered when preparing budgets and capital improvement programs, and reflect growth in the system as it occurs.

Safety

Efforts should be made to assess and evaluate safety needs and reduce conflict between non-motorized and vehicular traffic created by features such as narrow bridges, wide streets, and high volume, high speed traffic corridors. Successful safety efforts include giving attention to road design, traffic operations, safety messaging targeted to all users (motorists, pedestrians, bicyclists) and enforcement.

Safety Planning

Monitor data on crashes involving bicyclists or pedestrians on a routine basis to determine where needs may exist a) for better signing, lighting or traffic control, b) for education initiatives targeted to users of the area, and c) for new facilities to reduce the risks to bicyclists and pedestrians.

Safety Education

Education efforts should focus on building awareness through measures such as safety campaigns in the media, curriculum content within schools and driver education classes, and making information available through venues such as websites or public access television.

Safe Routes Programs

Programs such as Safe Routes to Schools, Safe Routes to Transit, and Safe Routes for Seniors focus on improving the pedestrian or cyclist experience by combining measures drawn from the "5 E's" toolbox of engineering, education, enforcement, encouragement and evaluation. In many instances, improvements will improve conditions for all targeted user groups (students, transit patrons, seniors). Transportation and public health agencies should coordinate with school district facility planners to support a Safe Routes to School (SR2S) program and identify improvements that can enhance bicycle and pedestrian access to schools.

Planning/Plan Coordination

In order for communities and agencies to be successful in developing a safe and effective network of active transportation facilities, it is important that the needs and issues of bicyclists and pedestrians are considered not only at the project level but in community planning efforts. This is particularly important since partnerships will be needed to achieve the goals of this plan in an era of limited resources and to ensure that available resources are used most efficiently. Along with early planning, measuring and communicating progress is important to help build ongoing support for future improvements. To this end:

- ROCOG should ensure that bicycle and pedestrian needs are considered in any subarea land use or transportation study or highway corridor study
- ROCOG should work with local jurisdictions to identify needs and opportunities to preserve corridor right-of-way for bicyclists, pedestrians, and other complementary transportation purposes
- ROCOG staff should monitor petitions to vacate existing right-of-way to consider the appropriateness of maintaining the corridor as public right-of-way for plan purposes
- ROCOG should continue to support the work of the following planning committees:
  - Rochester Pedestrian-Bicycle Committee (BPAC)
  - Southeast Minnesota Association of Regional Trails (SMART)
  - Local trail development groups that typically spearhead the development of regional trail corridors; the organizational template for such efforts is the Dover/Eyota/Chester Woods Trail Committee, who developed a process driven by grassroots community support and participation

Non-Infrastructure Support Measures

While facility design is an important factor in enhancing the bicycle and pedestrian travel experience, effective education and encouragement programs or strategies are important tools to heighten awareness and help mitigate traffic congestion, promote healthier lifestyles and create a more livable community. User familiarity with pedestrian and bicycle facilities as well as familiarity with the rules and responsibilities of the road will lead to a safer and more enjoyable travel experience.

Funding

ROCOG will continue to provide support for federal, state, and non-profit grant applications to develop active transportation projects or programs upon request. ROCOG is in a position to provide planning history, data, and technical expertise in preparation of grant applications.

13 • Travel Demand Management

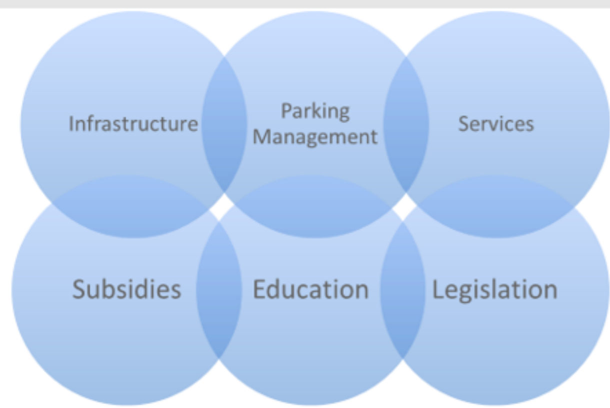
Overview/Summary

As urban areas grow, it's critical to manage the demand for vehicular travel as the cost of expanded road and parking capacity becomes increasingly challenging to accommodate. In Rochester, a particular concern is the ability to provide adequate access to the central core of the city as the Destination Medical Center (DMC) economic development initiative promises to drive significant job growth and visitor activity. Projected downtown job growth of 50% is anticipated over the next 20-25 years, and visitor traffic to the Mayo Medical Center and the Mayo Civic Center, Rochester's Convention and Event Center, is also anticipated to increase the daytime population of downtown.

Work done as part of the planning for DMC suggests that without strategies to manage commuter traffic associated with the downtown workforce, a number of the major roadway portals into downtown Rochester will see significant growth in peak period congestion. This will impact not only economic activity, but also the street-level environment for pedestrians and others. This study also suggested that an additional 16,500 parking spaces will be needed to accommodate workers, visitors, residents, and customers if no change was made in terms of travel mode choice.

What is Travel Demand Management

"A collection of strategies designed to reduce automobile trips and associated parking demand and roadway congestion by redistributing travel to alternative modes, times, and routes"



In response to these findings, planning for the expected changes in travel demand suggests that the City of Rochester and its major downtown partners, including the Mayo Medical Center, the University of Minnesota, Olmsted County, and other business interests, need to work together to develop a robust travel demand management effort to limit peak period vehicular travel growth. A key piece to any comprehensive travel demand management program is organizing and building support for a Transportation Management Association (TMA).

The concept of a TMA for downtown Rochester was being studied in 2012 but was paused when the Mayo Clinic brought forward the DMC concept. Recommendations brought forward with both the 2014 DMC Development Plan and the 2018 follow-up DMC Integrated Transit studies, included strong encouragement for establishing a downtown Rochester TMA.

Figure 13-1 provides a high-level framework for the basic program elements and responsibilities envisioned for managing travel demand through a TMA. The City of Rochester and DMC Economic Development Authority (EDA) would be responsible for parking policies and infrastructure development; the TMA would establish and manage TDM programs, while the TMA would work with the City and EDA on items such as TDM policies for new development and pilot projects.

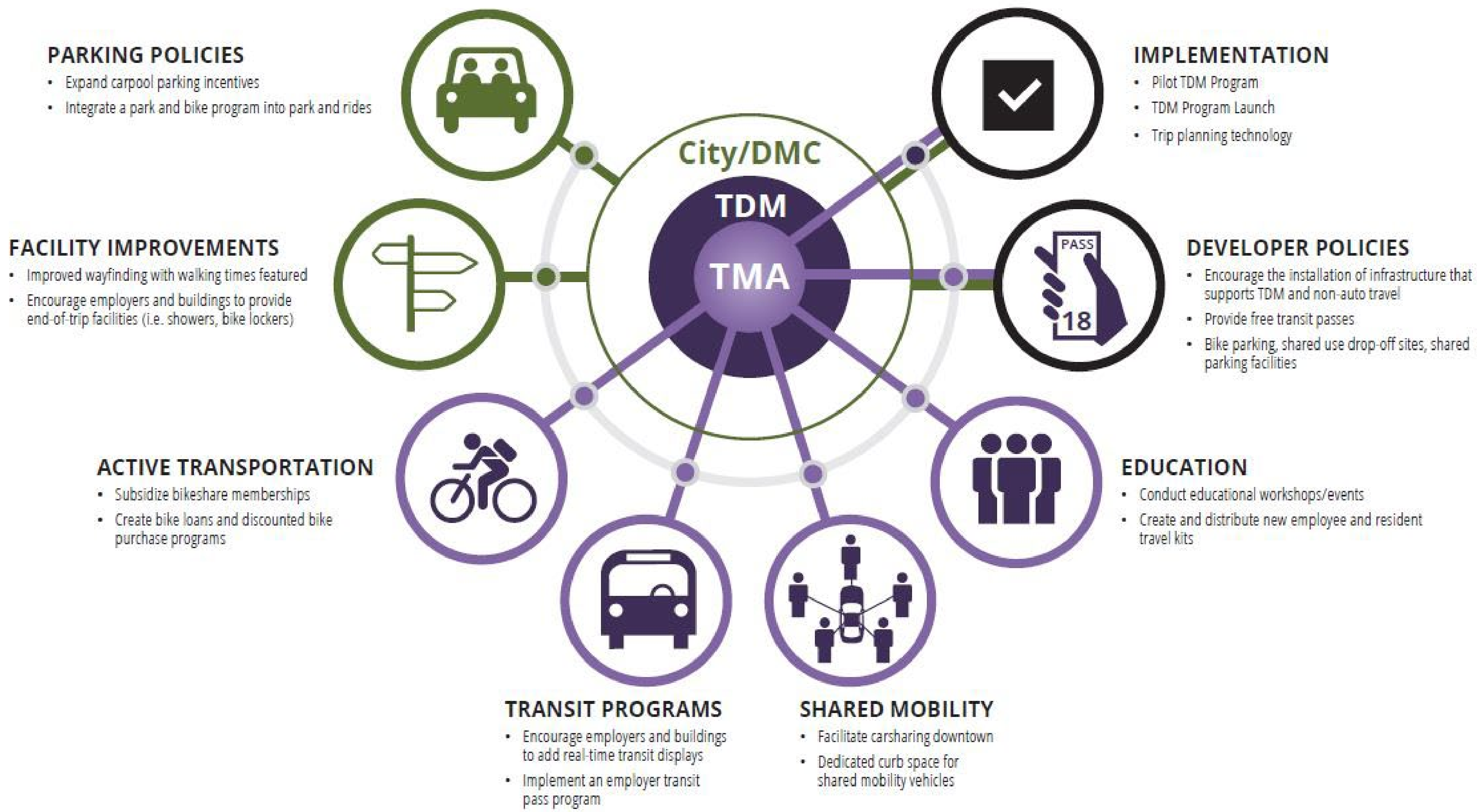
What is a Transportation Management Association?

"A TMA is an organization that provides transportation services in a particular area, such as a commercial district, corridor or downtown area. They are generally public-private partnerships that consist primarily of area employers and receive local government support"

Work began on organizing a TMA in 2018 with kickoff for the program in the second half of 2019. Titled **Arrive Rochester**, the program has taken over some of the transit marketing responsibilities from Rochester Public Transit, including managing transit pass programs as well as other programs such as Guaranteed Ride Home. The organization is managed temporarily under a consultant contract with the goal of getting a governance and organization structure in place in 2020.

While the TMA is getting up and running, the Mayo Medical Center continues to operate its long-standing employee transportation program. Mayo has been recognized as one of the Best Workplaces for Commuters in America. Mayo provides generous support for public and private transit, on-site amenities for people who bike to work, and preferential parking for carpoolers.

Figure 13-1: Rochester Downtown TMA Framework



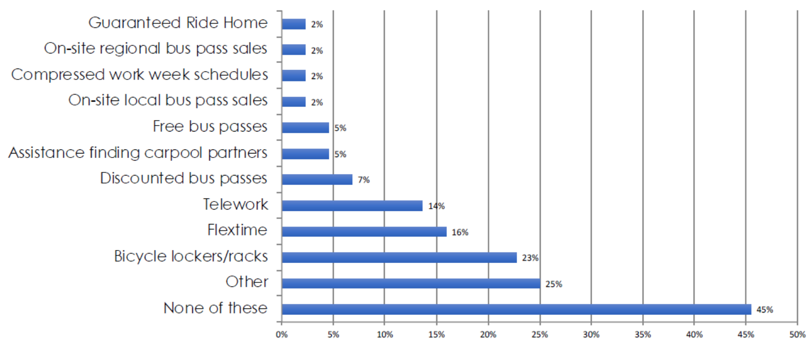
Source: Destination Medical Center Integrated Transit Studies, Parking and TMS Final Report, 2018

TDM Interest

As part of the work associated with organizing for a TDM program, a series of outreach events and survey efforts targeting downtown employers and workers were conducted. The results of this work identified existing services employers currently offer and the level of interest in having an area wide organization in place to relieve the burden on individual employers to establish these services. The survey work also identified what TDM services were of most interest to workers.

Figure 13-2 summarizes survey findings related to what services are currently offered by employers in the downtown Rochester are. Almost 50% of all employers offer no TMD type programs or services; about 25% offer on-site bike racks, with only 5-7% offering some type of free or discounted bus pass program.

Figure 13-2: Current Commuter Services offered by Employers

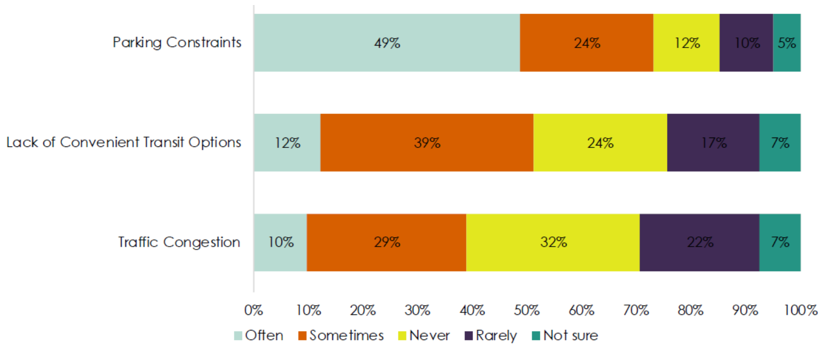


Source: Rochester TMA Start-up Program

Employers were asked about the frequency with which they were faced with recruitment or retention challenges related to employees getting to work. Parking constraints was the most oftened mentioned problem, as shown in Figure 13-3, followed by lack of transit options and congestion concerns.

Employers were also asked what types of services or programs they would be interested in being available through a TMA one established. Assistance in setting up a transit discount pass program saw the most interest, followed by, at only a slightly lower level of interest, a free guaranteed ride home program and some type of trip planning/transit tracking program with incentives.

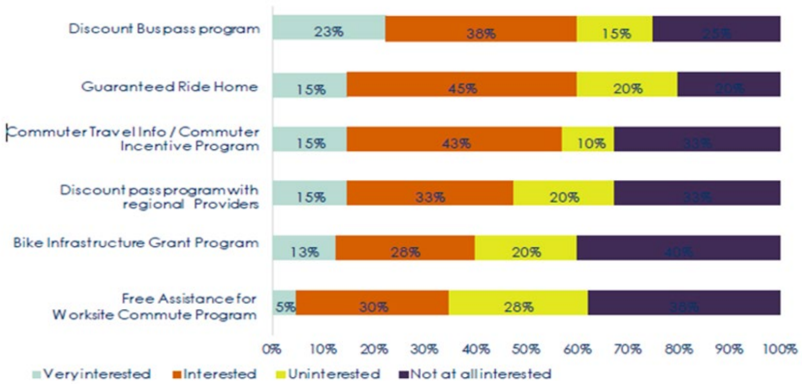
Figure 13-3: Employer Recruitment/Retention Issues



Source: Rochester TMA Start-Up Program

Figure 13-4 highlights the overall response from employers.

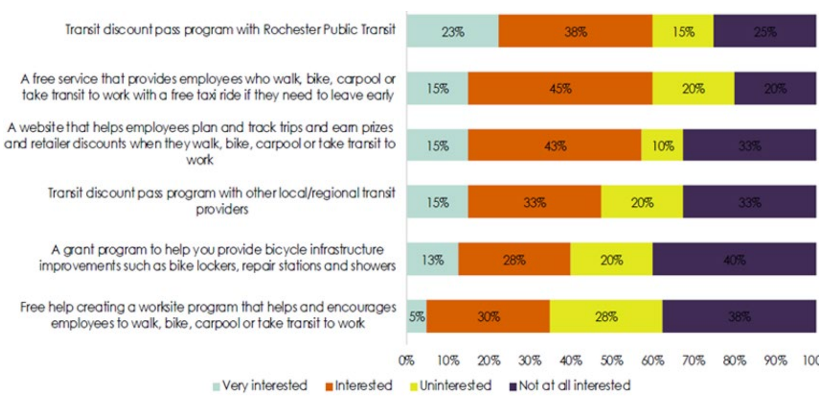
Figure 13-4: TDM Services of Interest to Employers



Source: Rochester TMA Start-Up Program

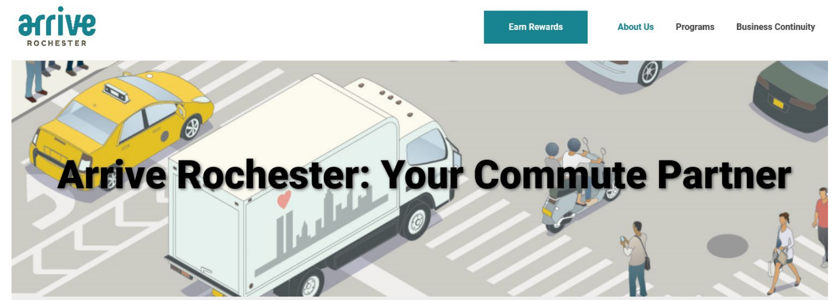
Employee responses to the same question about services of interest generally mirrored those of their employers. As shown in Figure 13-5, access to discounted transit passes, guaranteed ride home, and a trip planning app were of most interest.

Figure 13-5: TDM Services of Interest to Employees



Source: Rochester TMA Start-Up Program

The Arrival of Arrive Rochester



Arrive Rochester launched in October of 2018 with a series of events intended to draw interest to the organization. Success of the organization will depend on developing and nurturing a partnership between public and private sector employers that provide programs and services that commuters find attractive and will make the choice to utilize. Kickoff of the program was built upon more than a year's work by the Arrive Rochester Advisory Committee, a voluntary group of representatives from the City, DMC, local businesses, and other transportation stakeholders.

Arrive Rochester will provide commute options programs to downtown Rochester employers and property, with businesses having access to a range of programs and benefits including:

- Discounted transit passes for employees
- Guaranteed-ride-home program
- Online ride-matching tool for carpoolers

- Employee engagement campaigns and events
- Commuter surveys and commute target goal setting
- Commute impact reporting
- Incentives and raffles for employees choosing greener commute options

Employers are able to join Arrive Rochester at no cost for the first year of operation and access the programs and services noted above. In addition, Arrive Rochester will work with employers and the City to investigate and pilot new policies and programs to support greener commuting.

Activity in Rochester reflects a significant progress since Arrive Rochester's inception. The organization is currently administered by the City, with oversight and guidance from the Arrive Rochester Committee. The following pages highlight the offerings that have been provided in the first 18 months of operations, including:

- Figure 13-6: Base TMA Program Offerings
- Figure 13-7: Arrive Rochester Trip Planning App
- Figure 13-8: Promotions
- Figure 13-9: Incentive Program

All information in these figures is found on the Arrive Rochester website (https://www.arriverochester.com/)

Figure 13-6: Base Program Offerings

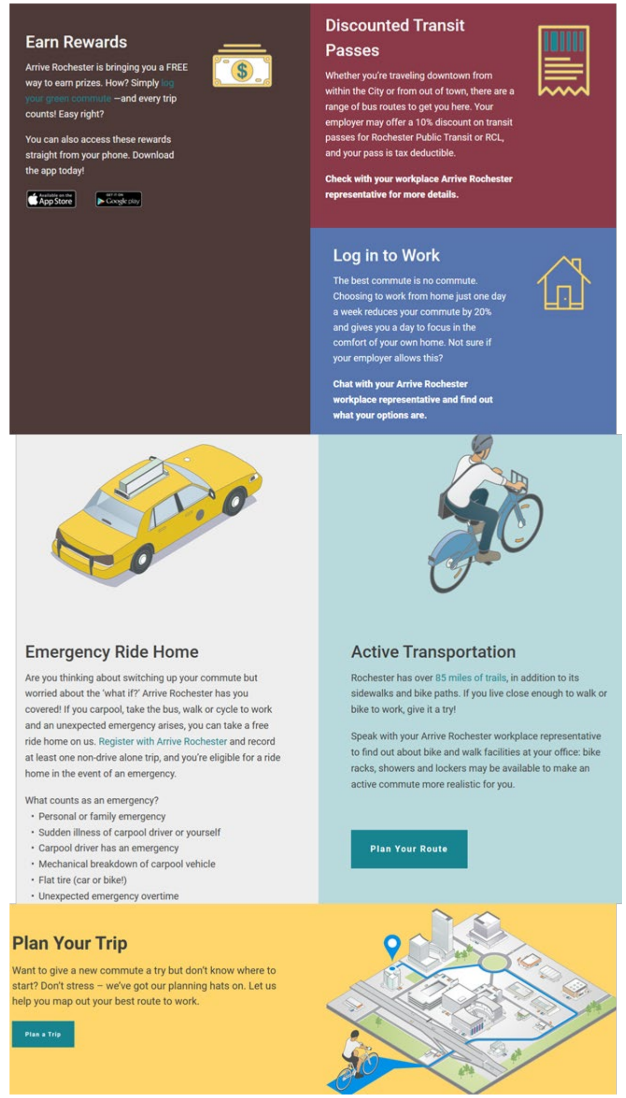


Figure 13-7: Arrive Rochester Trip Planning App

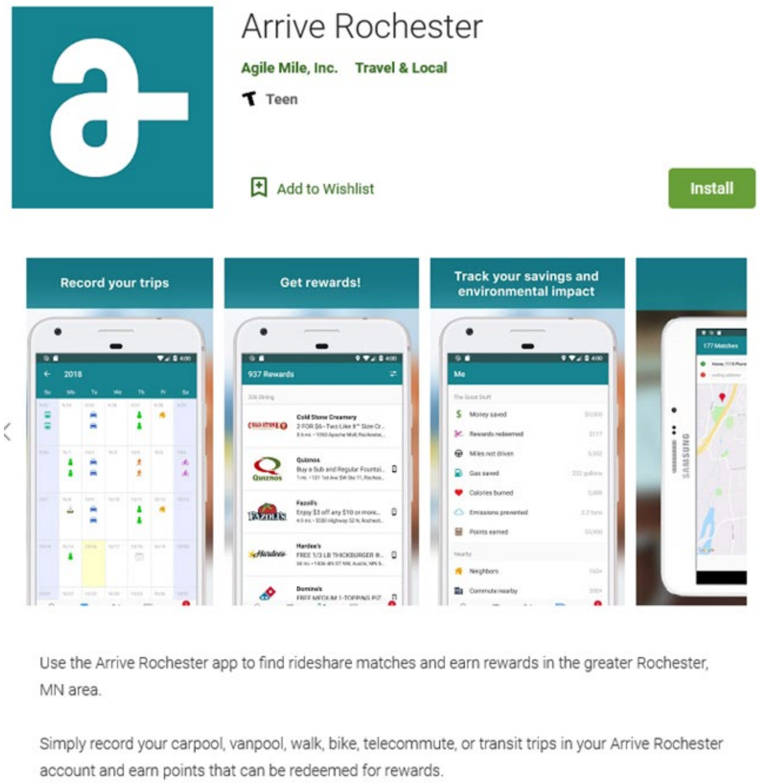


Figure 13-8: Promotions

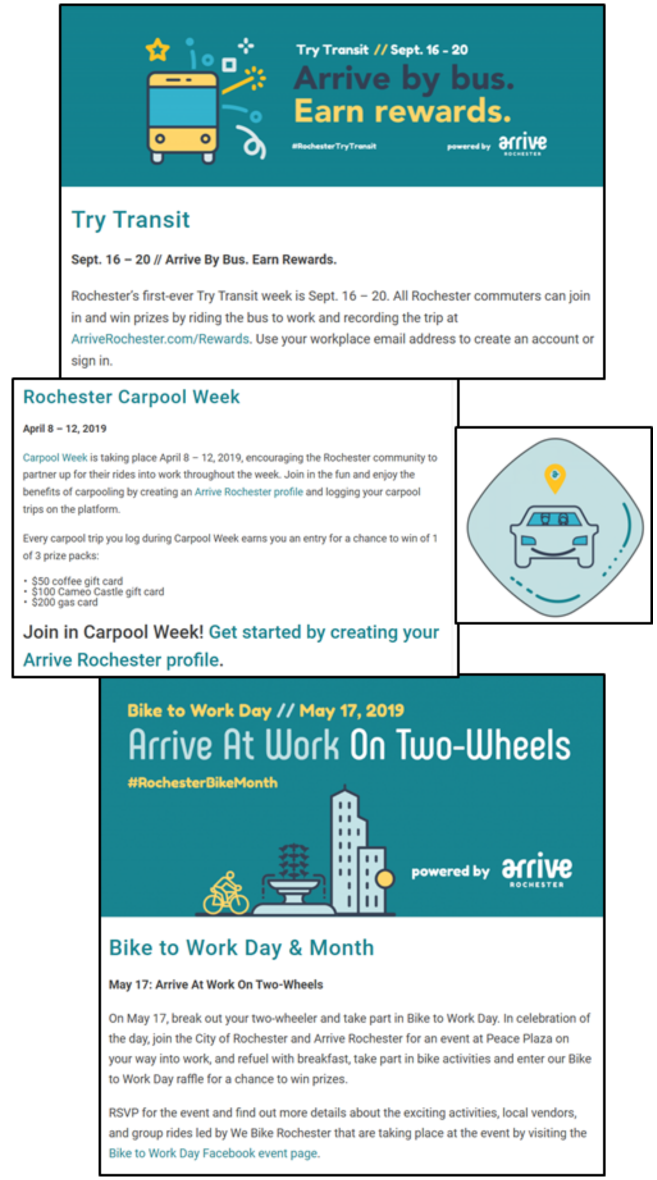
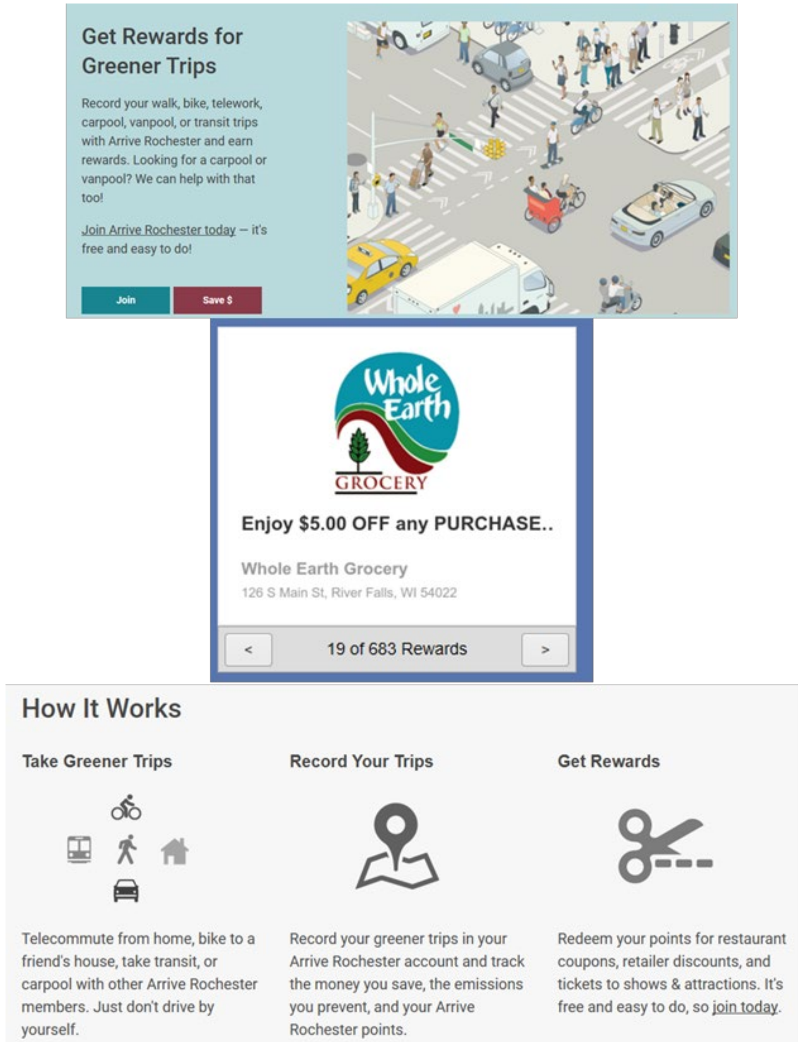


Figure 13-9: Incentive Program



Key Recommendations for TDM

As part of the work conducted under the auspices of the 2018 DMC Integrated Transit Studies, an implementation plan was prepared that included recommendations for how to advance TDM activities and the success of the Arrive Rochester TMA. Table 13-1 indicates the recommendations included in that plan. It is anticipated that once a permanent governance structure is put in place, and a full time TMA Director and support staff are hired to execute the business plan, these recommendations will be revisited and modified or expanded as deemed appropriate, probably somewhere in the 2021-2022 time frame. ROCOG would expect by the time of its next plan update that this list will have been revised and updated.

Table 13-1: Travel Demand Management Implementation Plan/ITS Integrated Transit Studies 2018

1.0 BEGIN TO IMPLEMENT THE TRAVEL DEMAND MANAGEMENT PLAN	
2018 - 2019 Priorities	Implementation Status*
1.1 Launch Arrive Rochester ride-matching/trip planning/ trip tracking app and website and develop campaigns and promotions to promote the tool	Launched Ongoing promotion
1.2 Establish a District-wide guaranteed ride home program	In Progress
1.3 Establish and market a Corporate Transit Discount Pass Program with Rochester City Lines for regional commuters and market a Corporate Transit Pass Program with Rochester Public Transit for local commuters	Ongoing
1.4 Increase awareness of TMA through marketing and outreach plan	Ongoing
1.5 Explore feasibility of carpool/vanpool options/incentives with providers and District Employers that could be offered through the TMA	Not Started
1.6 Research infrastructure needs and opportunities for emerging mobility and shared travel options	Initiated / City of Rochester in lead
1.7 Increase awareness of Travel Options through development of travel options marketing materials, workshops, events and employer/employee webinars	Initiated & Ongoing

1.8 Incorporate TDM communications into overall city communications	Ongoing
1.9 Study the need for a "retail outlet" for TDM services	Not Started
1.10 Develop TDM Evaluation Plan	Not Started
1.11 Develop and implement a recruitment/sales strategy to attract TMA employer members and provide in-depth programming and support for TMA members	Ongoing
2020 - 2024	
Nurture advocates / champions for the TMA that can help build support for key service or organizational goals the TMA needs to be successful in its mission, recognizing it's critical importance in supporting mode shift	
Integrate TMA Program Measurement and Evaluation efforts with larger DMC District data collection and monitoring program; communicate and leverage data to inform efforts to ensure successful movement toward mode shift targets	
Grow participation in TMA among downtown employers and businesses	
Wayfinding Improvements • Prepare a comprehensive wayfinding plan for the district that encompasses bicycles, pedestrians, parking, vehicular and transit needs • Integrate walking and bicycling times and dynamic parking/transit information with wayfinding	
Education and Encouragement • Use virtual reality to educate about biking and taking transit to work • Create and distribute new employee travel kits • Continue to conduct educational workshops/events regarding travel options and programs	
Developers and Building Managers • Encourage developers to install infrastructure that supports TDM and non-auto travel • Encourage employers and building owners to provide end-of-trip facilities for alternative modes such as bike parking, shower and locker facilities, etc. • Encourage employers and building owners to add real-time transit displays	

• Encourage developers/building managers to provide free transit passes		
Bicycling • Create bike loans and discounted bike purchase programs for low income households • Conduct bike education classes		
Mobility Pass Program – Investigate development of a Mobility Pass Program that offers payment for various modes of travel (transit, ride-hailing, carshare, bikeshare, scooters, parking, etc.) through a single smartphone platform/app		
2025 - 2034		
Create and distribute new resident travel kits		
2.0 ADVANCE *ARRIVE ROCHESTER* GOVERNANCE		
2018 - 2019 Priorities	**Implementation Lead***	**Implementation Status***
2.1 Secure contract for service to operate agency through 2019 (UrbanTrans)		Complete
2.2 Engage the Advisory Committee regularly		Ongoing
2.3 Solidify TMA host agency, formalize, and prepare for late 2019 transition from consultant management to permanent TMA Program Manager		In Progress
2.4 Establish a transportation coordinator network with District employers to work with TMA		Ongoing
2.5 Recruit, hire and train TMA Director and staff		In Progress
2.6 Finalize short and long-term funding strategy		In Progress

2.7 Develop a business plan for ~~2020 – 2021~~ 2021-2022 NOTE: An annual business plan will detail additional tasks to be executed in any given year		Annual
2020 - 2024		
Refine governance structure and funding model if necessary		
2025 – 2034		
A well-established, successful Transportation Management Association (TMA) is operating in Rochester and the DMC District and coordinates with others on data collection, reporting, and continued service.		

Mayo Medical Center Transportation Program

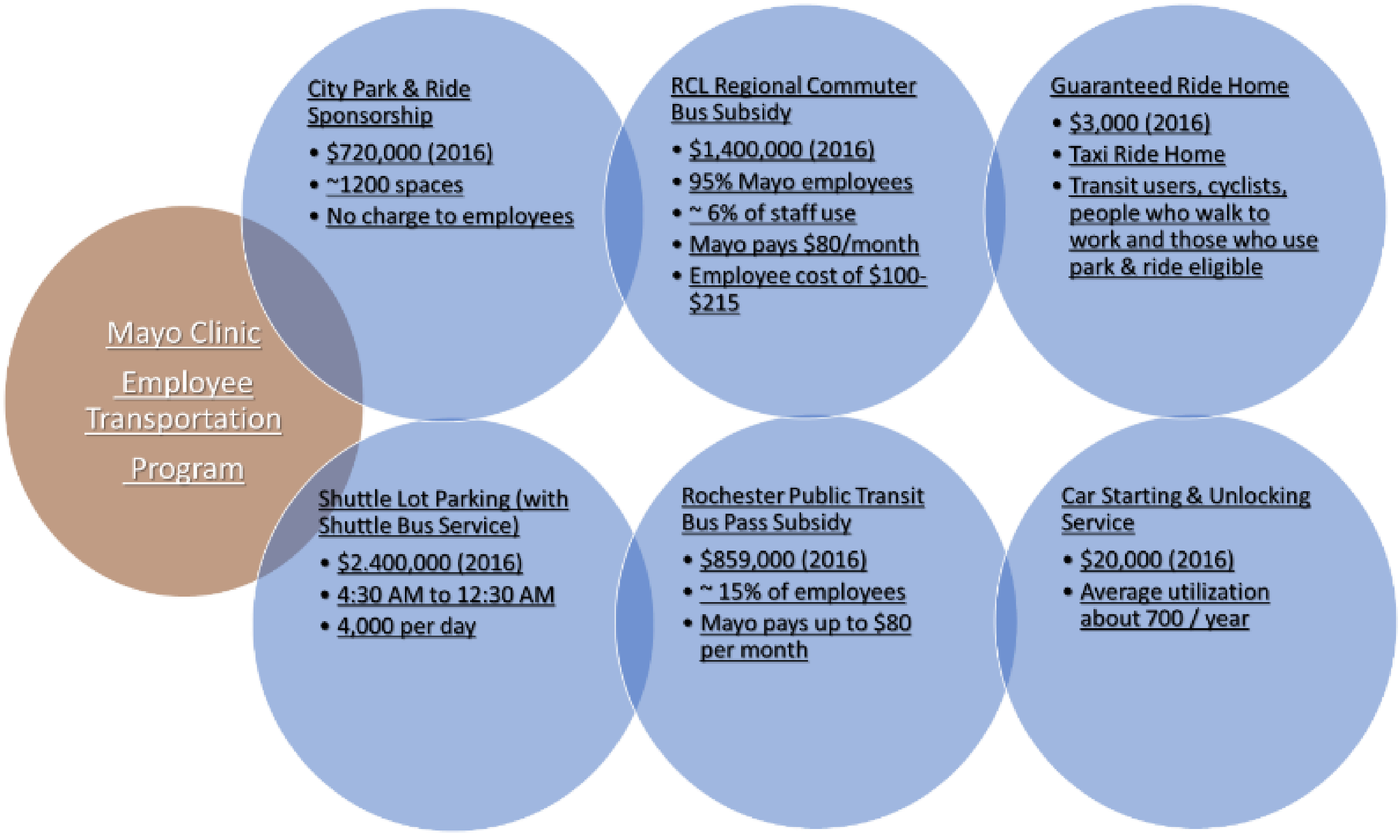
The Mayo Medical Center provides a range of alternative commute mode options for employees as an alternative to single occupant vehicle commuting. Figure 13-10 illustrates the prime elements of the program available to Mayo Employees. In addition to these transit and parking related service, Mayo also provides 80 on-site bicycle racks with a capacity for parking 780 bikes; riding season utilization is 85%. Mayo also provides prime parking for carpool users; as of 2106 there were 280 active carpools and 840 registered employees.

As the Arrive Rochester TMA gets established, some of these services that Mayo provides internally are expected to be taken over by the TMA, with some level of financial support provided by Mayo.

Parking Management and TDM

In addition to direct programs and services offered through TDM styled programs, the management of parking offers another avenue to influence vehicular travel demand, make the most efficient use of parking resources, and minimize the need to develop additional off-street parking facilities. Differential parking pricing, targeted parking for certain users or pricing favoring short-term parkers such as customers over long term parkers such as workers at the most desirable downtown locations are examples of strategies that could be considered. Parking management is critical in the central area of Rochester, where the travel demands of high daytime population levels must be balanced with other community goals targeted at maintaining a vibrant core area.

Figure 13-10: Mayo Employee Alternative Commute Services



Source: Mayo Clinic Transportation Services Department

The Rochester Downtown Master Plan and DMC Development Plan recommended various strategies for managing downtown parking demand, including changes in parking pricing and availability. To better manage the development of new supply, Rochester adopted a Destination Medical Center District Parking Overlay Zone to better address the policies and principles for off-street parking set out in the DMC Development Plan. Key features of these Overlay Zone amendments included:

- Establishment of DMC District requirements for joint use and mixed occupancy parking by through creation of shared use parking requirements
- Development of incentives for unbundled parking in the district
- Reductions in off-street parking requirements for many use types
- Introduction of parking design principles to improve compatibility of off-street parking development with the pedestrian-oriented nature of street corridors that is being encouraged in the DMC District
- Encouragement of the adaptive reuse of historic structures and location of small retail business in the district by exempting such uses from providing off-street parking
- Requiring larger developments to develop and implement an on-site Travel Demand Management Plan

Over time other parking system management strategies are expected to be investigated. One area of interest that has been identified is demand-responsive pricing for on-street parking.

Figure 13-11 illustrates the area where the DMC Downtown Parking Overlay regulations are applied.

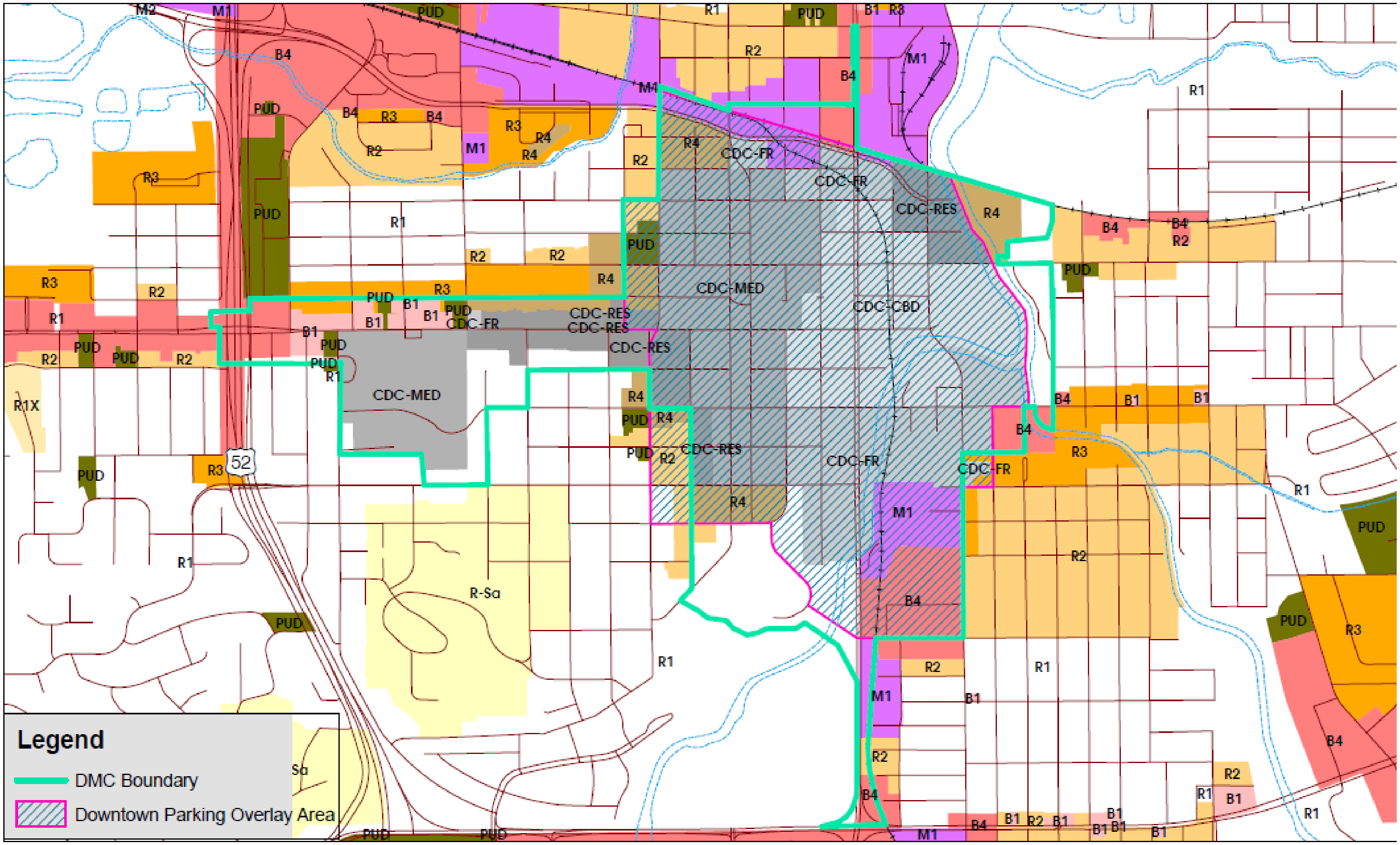
Other parking management strategies employed by the City of Rochester and Mayo Clinic in the downtown area are described in Table 13-2. The City and the Mayo utilize these strategies to achieve a balance between parking supply and demand.

Emerging Travel Options

Emerging Travel Options in the Rochester area includes a combination of micro-mobility options (a category including shared bikes and electric scooters), shared mobility options (a category including car sharing at this time) and automated vehicles. Typically, micro-mobility refers to transportation used for short distance trips less than two mile that offers riders an alternative to single occupancy vehicles in downtown or congested areas. Micro-mobility and shared mobility modes can serve as a last mile option for users of public transit.

Figure 13-11: DMC Parking Overlay District

Downtown Zoning & Development Boundary Comparison



Source: Rochester-Olmsted Planning Department, 2016

Table 13-2: Parking Management and TDM Strategies

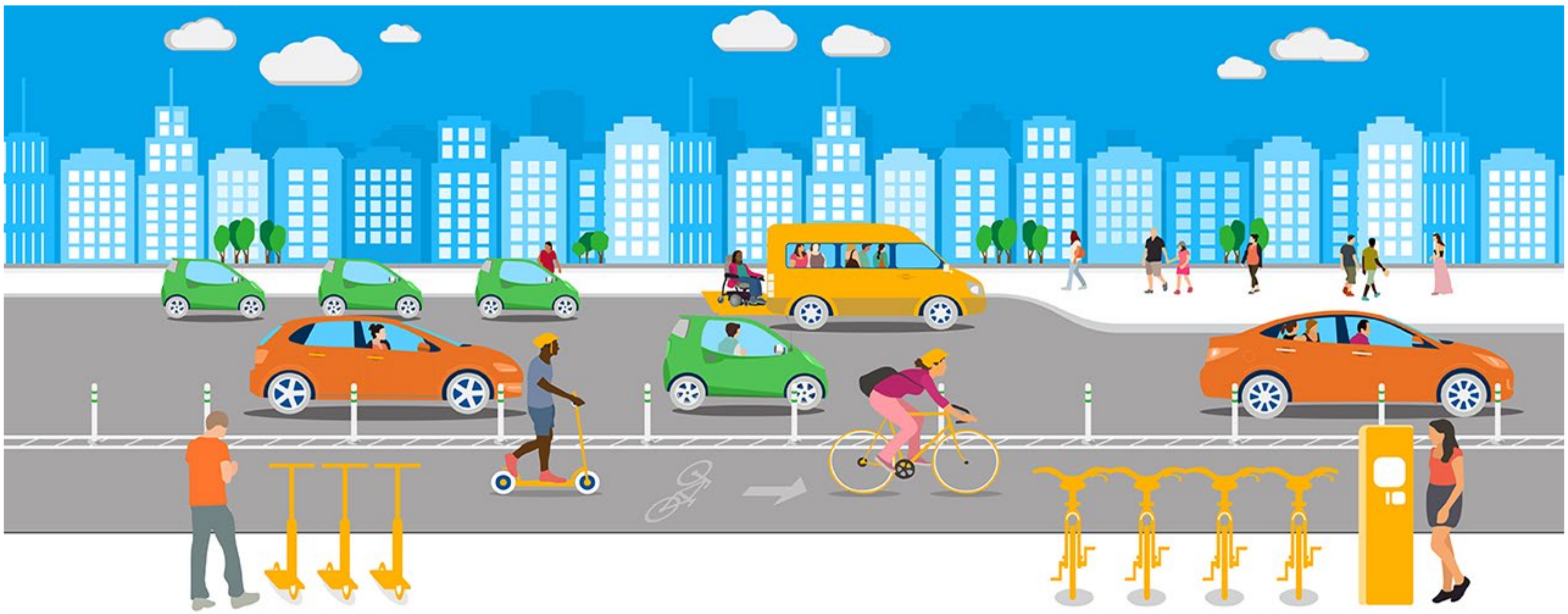
Parking	Inventory Conditions	Pricing or Supply Philosophy
On Street Parking	There are currently approximately 1260 on-street metered parking spaces in downtown Rochester. Rates range from \$0.50 for 30-minute meters, to \$0.25/hour for 10-hour meters. The 90-minute, 2-hour and 3-hour meters charge between \$0.70 and \$1.00 per hour. Utilization rates are high, averaging 82%.	City of Rochester uses a differential parking rate structure to encourage preservation of core area on – street and ramp parking for customers, clients and other short-term needs of businesses and attractions in the CBD. Lower daily and monthly rates are available in lots located on the fringe of the CBD that are marketed to employees when unused capacity is available.
Off Street Parking	Off Street parking is provided in a combination of parking ramps and surface lots. There are approximately 12,800 off street parking spaces managed by the Mayo Clinic, representing approximately 82% of the downtown off street inventory. These spaces are roughly evenly divided between spaces in ramps and spaces in surface parking lots. Utilization rates average about 95% in Mayo facilities Approximately 17% of the inventory is managed by the City, including approximately 2600 spaces in 5 ramps with utilization rates ranging from 84% to 91%.	Mayo parking management principles include providing adequate parking to meet patient / visitor demand in close proximity to clinic and hospital facilities and also to provide convenient, close-in parking for staff doctors and residents. Approximately 1400 spaces are provided downtown for this purpose For the remainder of the employees, Mayo strives to meet a ratio of approximately having three spaces available for every five employees, and to encourage alternatives to driving to reduce parking demand.

Micro-Mobility Projects and Pilots in Rochester

The City of Rochester has been conducting pilot projects for a number of micro-mobility modes over the last two years. These have included a bike share pilot completed with Nice Ride Bike of Minnesota, and an electric scooter pilot with Lime Scooters.

The Nice Ride pilot was discontinued going into the 2019 riding season and the bikes were donated to the City of Rochester. With the abrupt end of the bike share pilot, the City established a temporary program in 2019 at Silver Lake Park, a major attraction in downtown Rochester.

For 2020, the City has established a bike share program for the riding season that provides community members and visitors the ability to check out bikes for free. Bikes are available at the Rochester Public Library, the Peace Plaza in the downtown business district, and at Rochester City Hall, with a total of 20 bikes available for use. The City also donated 100 of the bikes to community organizations.



Lime Scooter conducted a pilot project in 2019 in Rochester and has expressed interest in continuing to provide its service in the city. Based on the success of the pilot, Rochester determined it would pursue vendor deployment of scooter service through a Request for Proposals in time to launch in the Spring 2020. Lime Scooter was the sole respondent and was chosen to provide service again in 2020. However, due to the COVID-19 health pandemic, a decision was made to delay deployment. In late summer of 2020, a partial deployment of scooters was undertaken with the intent to return to a full deployment in future years.

Shared Mobility Projects

The City of Rochester entered 2020 anticipating the establishment of a limited downtown car share program to serve residents, workers, and visitors who do not own a vehicle but periodically desire access to a vehicle for specific trips. With a vendor selected, the program was just getting started when the COVID health pandemic impacted demand and use of the system, leading to the program being scaled back to three vehicles. The original project was to include five cars. Based on conditions outside of the vendor's and the City's control, the program was discontinued in early 2020. Further discussions may ensue once limitations imposed by health conditions allow a return to something close to normal.

At the time this ROCOG Plan was prepared and adopted, insufficient information existed to determine the future of shared mobility in the Rochester market. Inconclusive initial pilot studies will likely need to be followed up by additional pilot study work before a final determination can be made as to the scale of micro-mobility that is appropriate for Rochester.

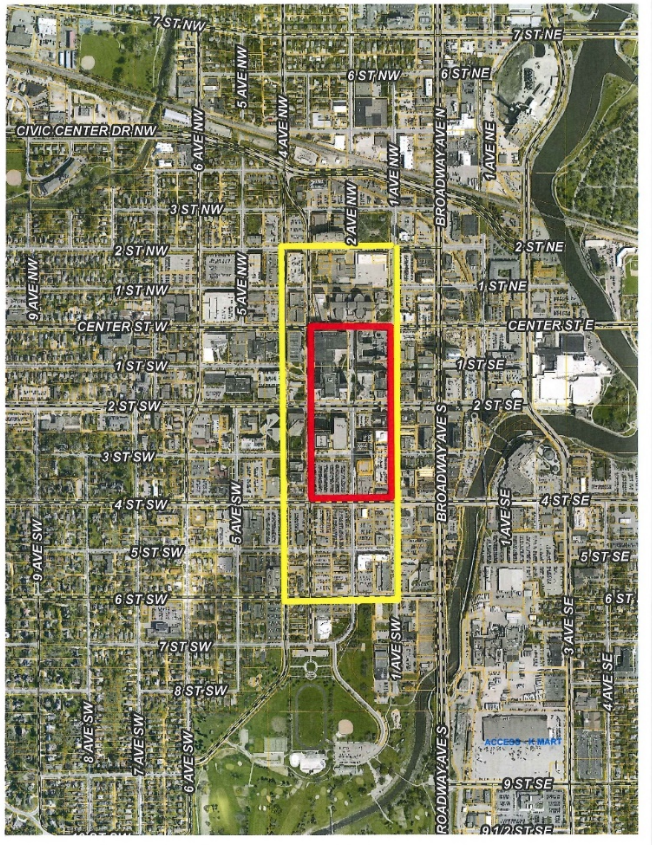
Automated Vehicle Demonstrations

Rochester has been engaged in early planning with various partners, including the Minnesota Department of Transportation, in two automated vehicle demonstration projects.

The first demonstration is a project that was brought to the City by the team of First Transit and Easy Mile. First Transit would manage operation of the system and Easy Mile would provide the vehicles and control systems. This service would be an automated shuttle running on a limited length loop in downtown Rochester.

Again, due to the Covid-19 public health pandemic, implementation of the service was delayed, although logistics are in place for storage and charging of vehicles. A route was established utilizing Broadway Ave, 6th Street SW, 3rd Ave West, and West Center Street, which reflects a combination of the two routes originally considered as shown in Figure 13-12.

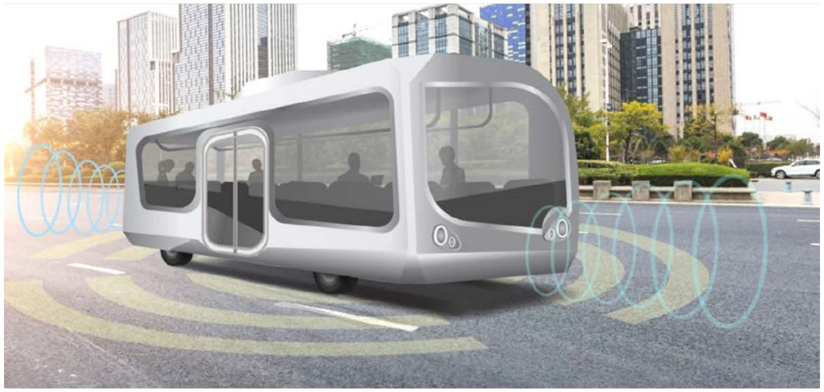
Figure 13-12



Automated Bus Consortium

The second transit pilot project the City of Rochester is involved in is part of the Automated Bus Consortium, a project organized by AECOM, Inc. to test full size automated transit in a range of cities and across a range of service environments.

Rochester was selected as one of twelve cities for this national pilot program. The concept would be to test full sized automated buses on a Park and Ride Express route from the former IBM campus to downtown Rochester. This would involve operation in both a freeway and downtown surface arterial environment.



Ongoing discussions are underway to facilitate preparation of bidding documents. There is a need for local match funding on the order of $100,000 that needs to be raised as well before the City would move into the next phase of the pilot project program. Characteristics of the proposed route are listed in Table 13-3.

At this point it is too early to speculate as to long term deployment prospects for such a service, but continued investigation will help shape future considerations.

Table 13-3: Automated Express Service Route Characteristics

Route Characteristic	Value/Description
Route Number/Name	18D: IBM Park & Ride to St. Mary's to Downtown
Description	Route 18D in Rochester, MN connects the IBM Campus/Office Park with Downtown Rochester 4.5 miles away. The route utilizes both local roads and the Hwy 52 general purpose lanes in mixed flow condition.
Length (roundtrip)	5 miles
Type of Service	Freeway (Mixed Flow)
Headway (peak)	5-30 minutes
% in Exclusive Lane	0%
Daily Ridership (weekday)	1,600
Operating Speed	30-60 mph
Number of Buses Assigned to Route	7
Number of Left Turns	2
EV Readiness (Low, Med, High)	Medium-High

14 • Transportation Systems Management & Operations

Introduction

Transportation Systems Management and Operations (TSMO) encompasses a range of practices and technologies used to maximize the safety, reliability, and efficiency of existing transportation systems. Used alone or in conjunction with travel demand management (TDM) strategies, these methods can reduce congestion and improve travel time reliability. The need for TSMO should be considered at any location that experiences either recurring or non-recurring congestion or both. Typical causes of congestion can include:

- Poor highway geometrics
- Inefficient traffic coordination or use of system capacity
- Inefficient merging of vehicles entering a busy highway
- Traffic incidents such as high crash locations
- Drivers with poor skills

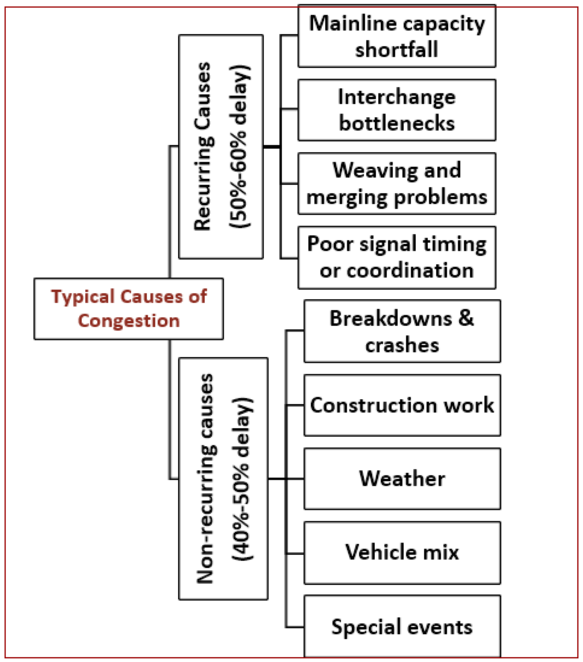
WHAT IS TSMO?

TSMO means integrated strategies to optimize the performance of existing infrastructure through the implementation of cross-jurisdictional multimodal and intermodal systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of transportation systems.

23 U.S Code $101(a)(30)

Figure 14-1 summarizes the typical causes of congestion or traffic delay and what share is typically due to recurring causes and non-recurring causes. In some cases, TSMO improvements can serve as an alternative to adding capacity by increasing the mobility and reliability of the existing system enough to meet current and projected traffic needs and do so more quickly. Other times TSMO may improve conditions enough to delay the need for a road expansion project, enabling an agency to stretch their limited funding to more areas.

Figure 14-1: Typical Causes of Congestion



Source: FHWA Office of Operations

The main objective of TSMO strategies is to improve safety and mobility outcomes by actively managing the transportation network. This includes:

- Optimizing the performance of existing facilities, thereby maximizing the performance of the system;
- Using targeted solutions to address causes of congestion; and
- Complementing capacity projects with services.

Common TSMO tools can include lower cost construction improvements such as addition of auxiliary lanes, coordination of traffic signals, variable message signs advising motorists of delays or detours, telephone or internet-based resources with information on real-time traffic and roadway conditions, or the use of managed lanes. These strategies are often supported and enabled by Intelligent Transportation System (ITS) technologies that provide the sensor, communication, data management, and artificial intelligence technology that drives these systems.

MnDOT has been the primary agency leading the implementation of many TSMO and ITS tools and strategies across the Rochester area. This work began in the mid-2000's as part of the construction management plan for reconstruction of TH 52, with investments in a regional Traffic Operations Center, variable message boards, traffic surveillance cameras, and communication equipment. The City of Rochester plays an important role in one of the primary TSMO strategies deployed in the Rochester—traffic signal coordination—partnering with MnDOT and Olmsted County to equip and manage signal coordination on high volume arterials throughout the community.

Key elements of the ongoing TSMO work of the local road authorities include

- Periodic signal retiming and coordination projects

- Ongoing installation of advanced communications infrastructure to permit a higher level of control over traffic systems
- Signal pre-emption capabilities for both emergency service responders and transit vehicles
- Monitoring technologies including advanced vehicle detection sensors and closed-circuit television to monitor traffic flow on major highways
- Deployment of automatic vehicle location technology to provide for real time bus location information
- Enhancements such as mobile data terminals for law enforcement officers

Other key efforts to improve system performance include the adoption and application of access management and level of service policies to guide planning and project design efforts.

MnDOT adopted a Statewide Strategic TSMO plan in 2018 to complement its Statewide ITS Architecture Plan and provide both guidance to TSMO efforts and investment in technology to advance these efforts. The ITS plans have been updated periodically to remain in conformance with the National ITS Architecture and Standards. ROCOG recognizes the Minnesota Statewide Regional ITS Architecture as the regional architecture that will govern ITS improvements within the metropolitan transportation planning area.

Understanding the Factors That Contribute to Poor Operations

Figure 14-1 summarizes the typical causes of congestion, based on research conducted by FHWA. The basic problem is turbulence; even a little disrupts the smooth, linear flow of traffic when congestion is heavy. This dramatically reduces travel speeds and encourages driver behavior that increases the chance of crashes, further reducing speeds and travel time reliability. TSMO address poor operations by targeting the following main sources of turbulence.

- **Poor highway geometrics:** This can mean turns that are too tight, bottlenecks due to lane drops, or lanes that are too narrow. Fixes are primarily engineering ones, not in terms of lanes added but roadway reconfiguration to reduce or eliminate the source of turbulence.
- **Inefficient coordination or use of system capacity:** Poor signal timing is the best example of this. If traffic flow involves excessive stop and go movement, capacity drops. Optimizing signal timing can improve flow.
- **Inefficient merging of vehicles entering or exiting a busy highway:** Typically seen at on-ramps, the main strategy involves smoothing the entry of vehicles through improvement in highway geometry by adjusting merge or lane design. This

also happens on arterials, where the problem can occur at uncontrolled intersection or driveways as a result of the speed differentials that occur when vehicles turn on or off the road under higher volume conditions. Greater attention to access management can aid in addressing this issue.

- **No or limited information about congestion and alternatives:** If drivers can be alerted to traffic problems before they're part of them, they can take steps to avoid them. Solutions such as sensors and video cameras installed along highways permit traffic managers to monitor highways in real time. Various types of information services can tap into this information to inform drivers about highway conditions.
- **Too many cars on the highway at the same time:** An efficiently designed system used by well-informed drivers can still get overly congested at peak periods. Measures aimed at spreading demand over time such as flexible or staggered work start times, shifting to more space-efficient travel modes such as transit, though services such as commuter bus, park & ride lots, and financial benefits such as subsidized bus passes can help ease congestion. These policies are especially valuable during the morning commute when commuters are more time-constrained and on days with bad weather, major traffic incidents, or special events.
- **Traffic incidents:** Research has found that crashes and disabled vehicles can contribute to as much as 60 percent of time lost to congestion. Timely response to incidents, which typically requires response by multiple agencies, can minimize the impact and provide significant benefits on highly congested corridors.
- **Poor Drivers:** Certain driving behaviors such as speeding, weaving in and out of traffic, and tailgating disturb smooth traffic flow. TSMO measures such as more sophisticated or automated law enforcement, more information such speed monitoring signs, or targeted public campaigns such as saturation events targeting speeding, can help remind drivers to improve their driving habits.

Examples of TSMO Tools and Their Benefits

Figure 14-2 provides examples of TSMO strategies applicable in both urban and rural environments. Many TSMO strategies make economic sense but require a different way of thinking about benefit; think of them as analogous to the strategies private business owners use to "drive costs out of the system". But communicating and realizing the benefits may require some education to get decision makers to think in terms of full costs rather than the just the direct costs of implementation.

The reason for this is that trips vary in their value. Improving efficiency is about more than simply freeing up more capacity for more drivers to make more trips. For example, when a fender bender occurs on a congested road, the time disruption to many other travelers is expensive from an economic perspective given the lost time experienced by those impacted, yet these indirect costs are often not given consideration when deciding to deploy TSMO strategies. Table 14-2 reports on typical TSMO strategies and the assesses the economic and other benefits that can accrue from wider use of these strategies.

Existing/Future Congestion & Crash Concerns

Figures 14-3 through 14-6 identify potential areas where traffic and safety conditions may present opportunities for considering the use of TSMO strategies to address travel time reliability, safety or accessibility concerns. These graphics are based on recent work conducted for Rochester's 2018 comprehensive plan update (P2S 2040), the 2018 DMC Integrated Transit Studies, and the ROCOG Plan. In some locations, congestion and safety issues may co-exist, while in other locations only safety issues or congestion are present. This information provides an initial level of screening for identifying current sites or corridors for further study and key areas to monitor for emergence of future problems. It can provide the basis for creating a systematic, multi-year plan of potential improvement needs and strategies.

Congestion Assessment

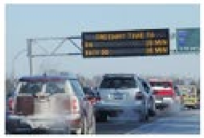
Figures 14-3 and 14-4 were developed as part of P2S 2040 and identify existing areas of congestion (Figure 14-3) and projected future areas of congestion (Figure 14-4). Corridors flagged for congestion are identified based on traffic volumes and road geometry and provide only a high-level screening of areas where future study may be warranted. Table 14-1 provides additional data regarding future conditions for the corridors identified on Figure 14-4, where future volumes exceed the typical capacity of an unmanaged arterial road, but with effective TSMO measures could continue to operate with the current number of lanes under projected 2045 traffic volumes.

Portal Capacity

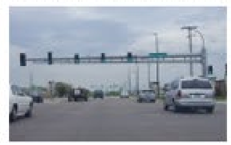
The DMC Integrated Transit Studies identified existing access capacity issues at all west side entry portals into downtown projected access capacity issues at the majority of downtown portals by 2040, as illustrated in Figures 14-5 and 14-6. These portals should be monitored as downtown activity intensifies to ensure timely implementation of measures such as transit system improvements to help moderate or reduce peak period traffic demand.

Figure 14-2: Typical TSMO Strategies and Their Benefit

Example TSMO strategies and benefits

TSMO Strategy	How It Works[1]	Observed Benefits
Traveler Information 	Provides current and anticipated travel and weather conditions, route, and mode options (and other information) via dynamic message signs, 511, web, social media, and text. Supports travelers' optimal choice of trip route, timing, and mode	**National[2]** 511 customer satisfaction of 68–92% Route-specific travel times: 5–13% increase in on-time performance (i.e., reliability)
Traffic Incident Management 	Applies incident detection, verification, response, clearance, crash investigation, medical response, and traffic control Organizes the management and clearance of disruptions and responses to emergencies and ensure incident site safety and restoration of traffic flow	**National[2]** Reduced duration of traffic incidents 30-50% resulting in • Reduced congestion • Improved reliability • Improved safety including reduction in secondary crashes
Safety Service Patrol 	Locates, assists, and removes disabled vehicles, crashes, and debris from freeways; assists State Patrol with crash site traffic control and first aid Reduces congestion, improves safety, and provides a customer-oriented approach to freeway operations	**National[2]** B/C ratio = 5:1 to 25:1 **MnDOT** MnDOT Freeway Incident Response Safety Team or FIRST: B/C ratio = 15:1
Road Weather Management Systems 	Generates advance and current information regarding disruptive weather conditions by combining roadway environmental sensing, weather information, treatment and clearance strategies and weather information dissemination Improves agency capacity to minimize traveler delay and improve agency efficiency of weather-related roadway maintenance	**National[2]** Wet pavement detection and advisory system reduced crashes by 39% B/C ratio = 2:1 to 10:1

Example TSMO strategies and benefits (Continued)

TSMO Strategy	How It Works[1]	Observed Benefits
Work Zone Management Systems 	Provides dynamic, traffic-responsive traffic control (lane use, speeds, warnings) in construction work zones Improves safety to drivers and construction workers and improves traffic flow	**National[2]** B/C ratio = 2:1 to 42:1
Traffic Signal Optimization 	Provides traffic-responsive or traffic adaptive signal operations at intersections for corridor and network optimization and event responsiveness Minimizes delay throughout corridor and network	**National[2]** Reduced traffic delay 15–40% Reduced travel time up to 25% B/C ratios sometimes exceeding 50:1
Adaptive Ramp Metering 	Controls traffic flow (rate and spacing) entering freeway based on actual traffic conditions Minimizes main line traffic disruptions and safety hazards and improves travel time	**National[2]** • Increased freeway throughput 13–26% • Decreased crashes 15–43% **MnDOT** • Increased throughput 14% • Decreased crashes 25% B/C ratio = 15:1

1. AASHTO TSMO Guidance
2. FHWA

Source: MnDOT Transportation Systems Management and Operations Strategic Plan, 2019

Figure 14-3: Corridors Currently Experiencing Periodic Congested Travel

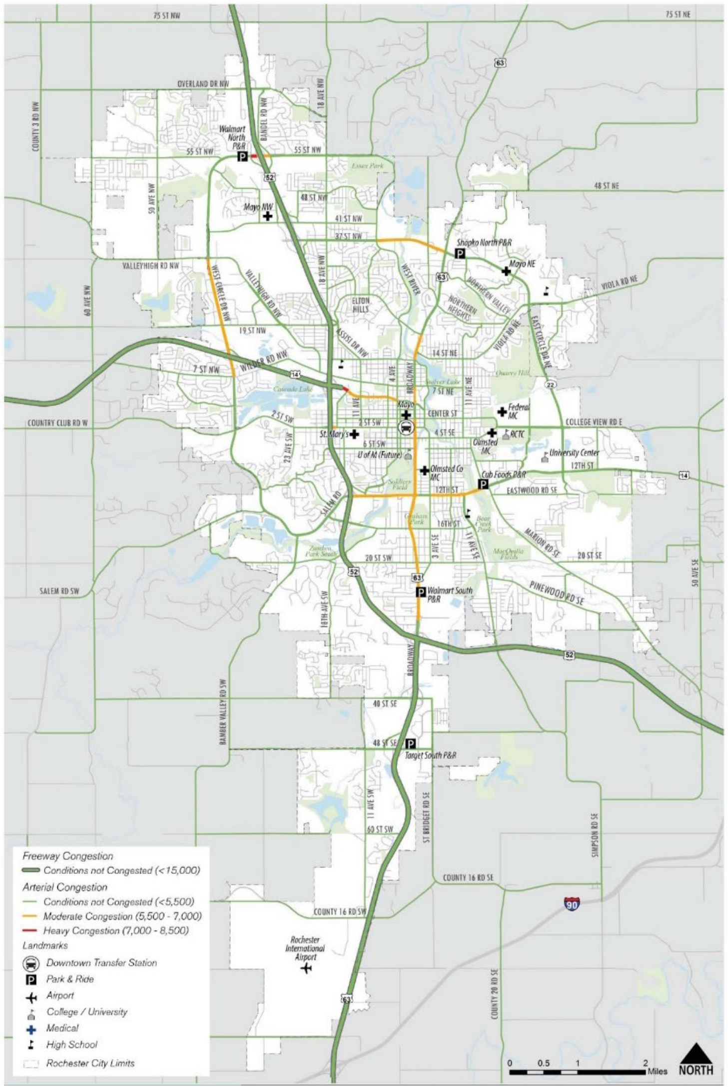


Figure 14-4: Corridors Projected to Experience Congested Travel, 2040 Conditions

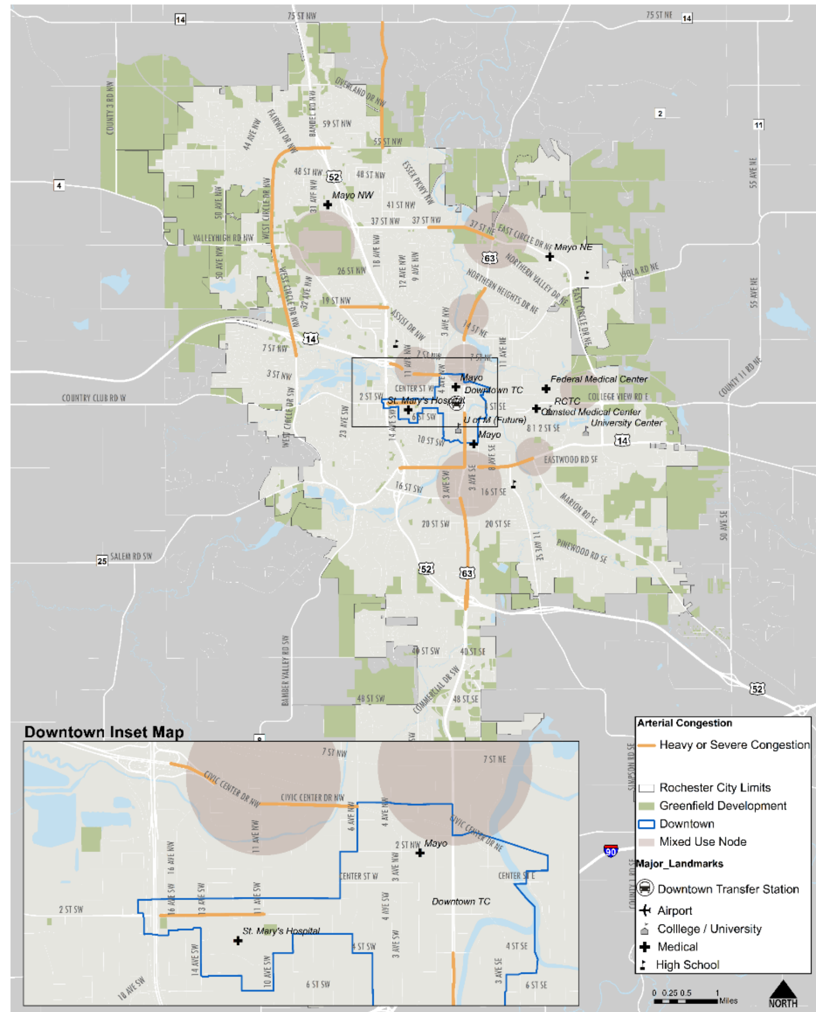


Table 14-1: Characteristics of Congested Corridors in Figures 14-3 and 14-4

Corridor	Traffic Growth Existing & 2045 Traffic Volumes	Transit Infrastructure	High Crash Locations	Signal Coordination Infrastructure
South Broadway HWY 52 to 16th St	26,500 (2016) to 35,000 (South end) 24,300 (2018) to 32,000 (North end) Flagged for Congestion	Primary Transit Network (add BRT infrastructure)	16th St 20th St 25th St	Existing
South Broadway 6th St to 12th St	26,000(2016) to 32,000 Flagged for Congestion	Downtown Rapid Transit Primary Transit Network	6th St 12th St	Existing
12th ST SE Broadway to Marion Rd	23,100 (2018) to 35,000 Flagged for Congestion	No	3rd Ave SE 15th Ave	Existing
12th ST SE Broadway to 52	26,500 (2018) to 30,500 Flagged for Congestion	No	Memorial Parkway 3rd Ave SW	Existing
North Broadway 14th St to Northern Heights	22,000(2018) to 32,000 (South end) 17,500 (2016) to 29,000 (North end) Flagged for Congestion	Primary Transit Network (add BRT infrastructure)	Elton Hills Dr 37th ST NE	Existing
Civic Center Dr Broadway to TH 52	26,000(2018) to 35,000 (East end) 32,500 (2016) to 38,000 (West end) Flagged for Congestion	**Traffic Diversion due to Downtown Rapid Transit	Broadway 6th Ave NW 11th Ave NW	Existing
37th St NW/NE Broadway to West River Road	24,000(2018) to 37,000 Flagged for Congestion	Primary Transit Network (beyond 2040)	Broadway West River Rd	Existing
West Circle Dr TH 52 to 2nd St SW	27,000(2018) to 35,000 (South end) 18,000 (2016) to 32,000 (North end) Flagged for Congestion	Transit Village and West Side Park & Ride impact	19th St 26th St CSAH 4	Existing

Figure 14-5: Existing Downtown Portal Capacity

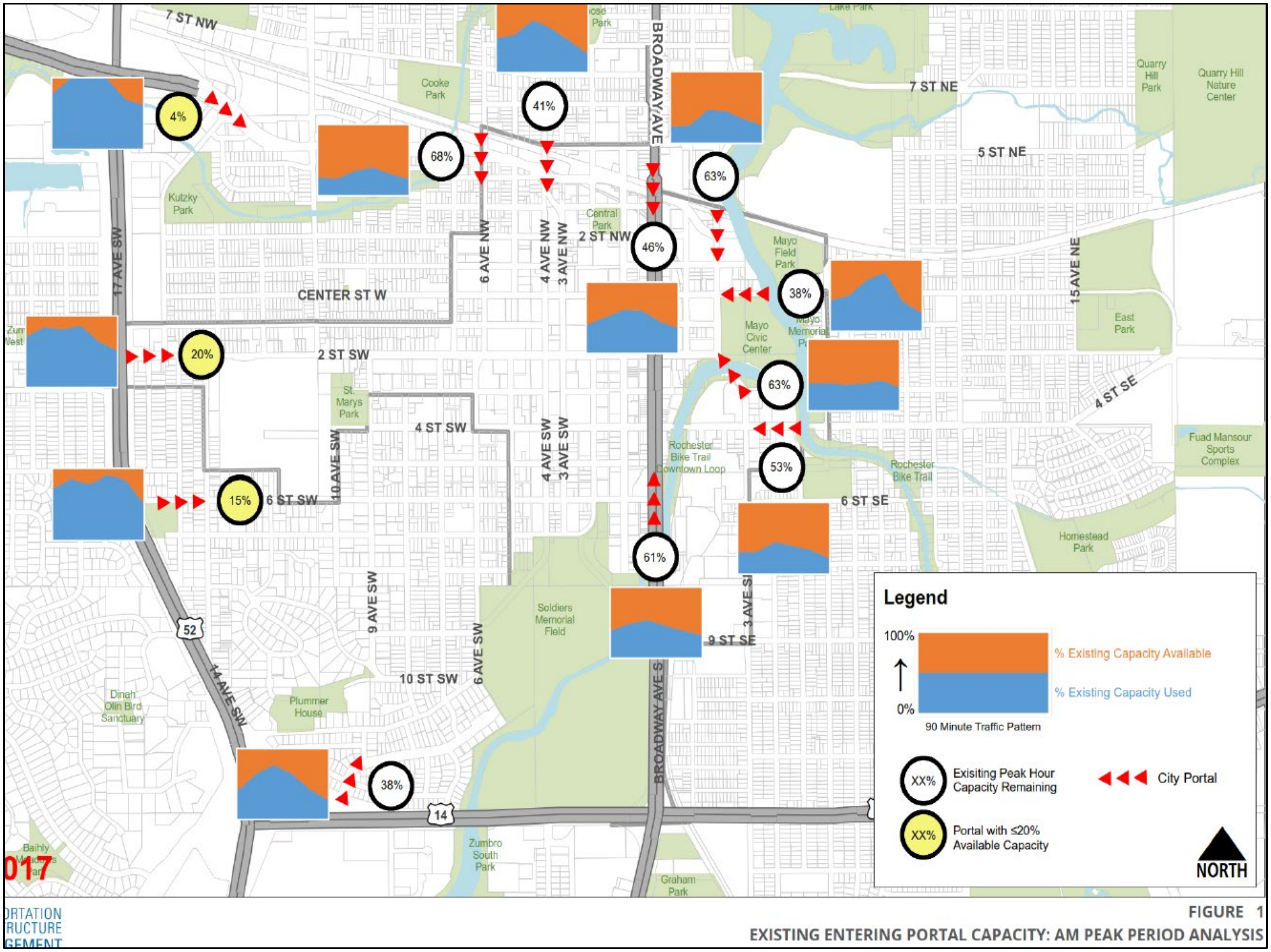
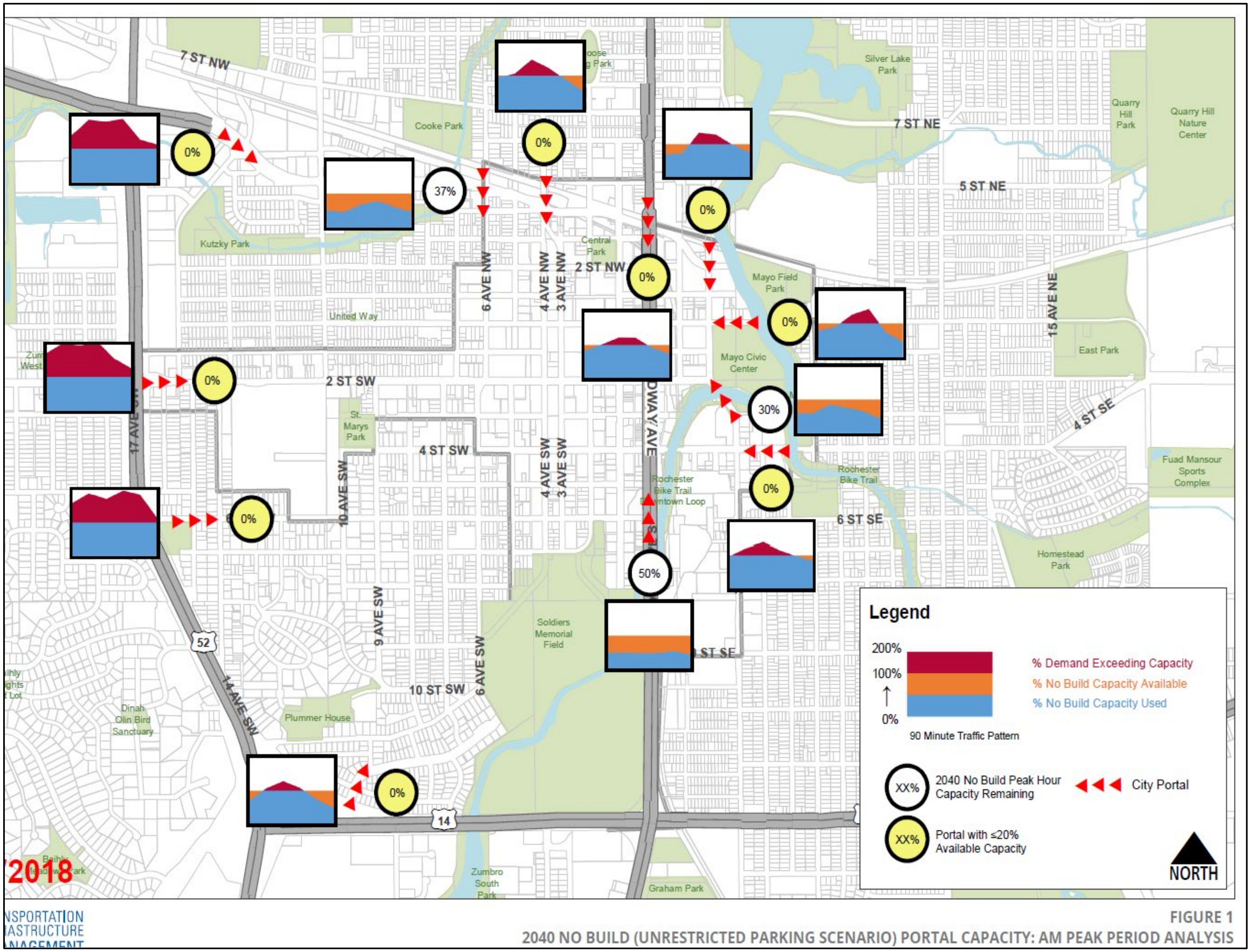


Figure 14-6: Projected 2040 Downtown Portal Capacity



Crash Locations

Figure 14-7 illustrates crash frequency at intersections across the urban area. At selected interchanges and along certain high traffic corridors (coinciding with some of the corridors identified on the congestion map), clusters of high frequency crash locations can be observed in the data. Further study of the crash data is recommended to develop a better understanding of the type and causes of crashes and whether TSMO strategies may be effective in reducing crash numbers.

Alignment of TSMO Objectives with Goals of the Plan

Moving people and freight while providing benefits to the economy, quality of life, and environment can be enhanced by emphasis on reliable and safe travel that provides desired multi-modal access to its users. The Plan's goals provide broad guidance on the outcomes the community is striving toward; the objectives identify general courses of action meant to guide the selection of strategies and actions within the realm of TSMO that will help to achieve these goals.

Table 14-2 refines the overall goals for the plan described in Chapter 1 to more specifically identify a set of objectives which support the overall goals for TSMO in the Long-Range Plan and illustrate how the goals and objectives align and address the Planning Factors spelled out in federal legislation.

Figure 14-7: 2016-2018 Annual Average Crashes and High Crash Clusters

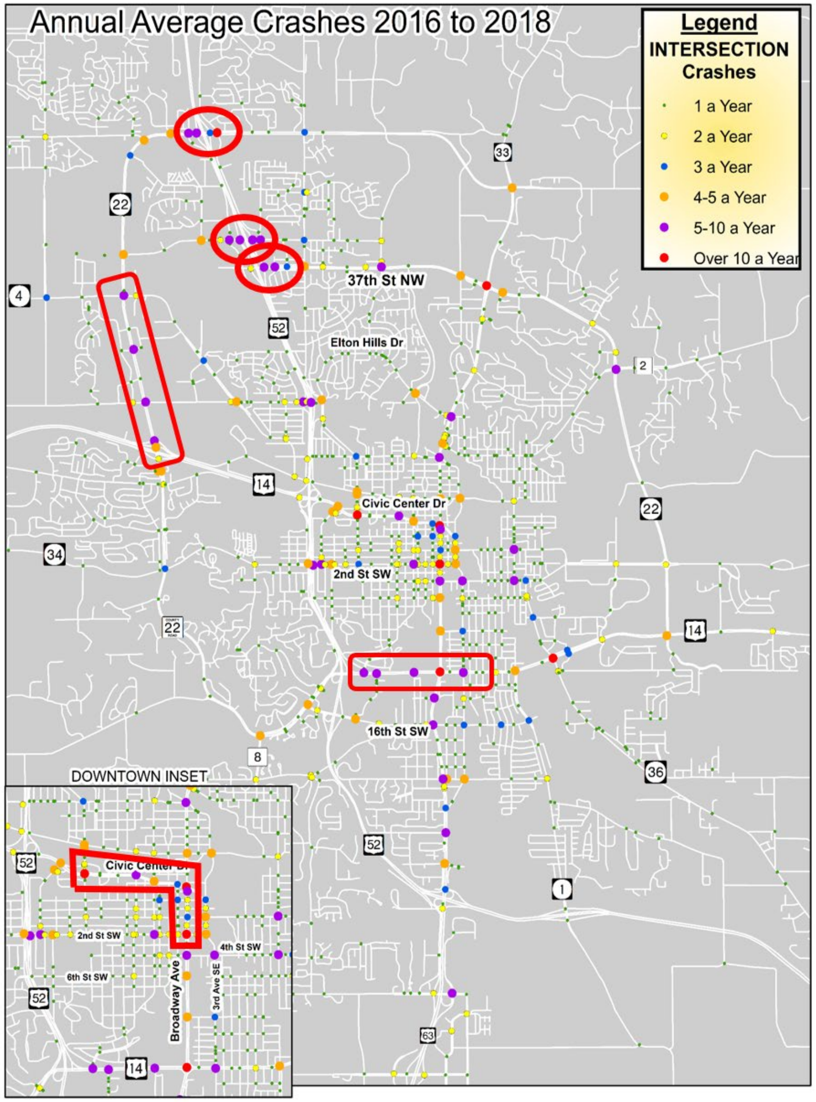


Table 14-2: TSMO Objectives and Alignment with Plan Goals

TSMO Planning Objectives	ROCOG Long Range Transportation Planning Goals
Preserve ITS/traffic signal equipment and infrastructure inventory through monitoring of service life and timely maintenance. **Improve** the reliability and predictability of travel by monitoring the use of the transportation system and through collection of pertinent data.	**Preserve** existing transportation infrastructure through systematic maintenance to sustain a state of good repair.
Maximize use of existing roadway capacity by actively managing traffic and identifying congestion hotspots for operational improvements. **Improve** and implement strategies and technologies that mitigate congestion and improve travel flow and reliability. **Provide** and enhance/optimize traffic signal coordination and corridor performance. **Foster** the application of advanced technologies to the transportation system.	**Mitigate** current and future congestion by considering operational improvements or multi-modal options as well as capacity expansion.
Reduce crash rates and improve safety at signalized intersections for pedestrians, bicycles and vehicles. **Improve** the resiliency of the transportation system to react to and recover from major incidents or events, weather, or disruption.	**Improve** safety through mitigation of high risk/high conflict locations/behaviors.
Provide integrated freeway and major arterial corridor management strategies and support systems. **Reduce** delay and travel on selected corridors for vehicles, transit and bicycle / pedestrian travel with low cost operational improvements.	**Provide** adequate capacity and travel options to serve future 2045 Urban Expansion areas.

TSMO Planning Objectives	ROCOG Long Range Transportation Planning Goals
Improve safety and reliability of bicycle and pedestrian travel by implementing intersection crossing and complete street features.	**Improve** bicycle and pedestrian connections with and through Downtown Rochester.
Improve transit system reliability to keep existing riders and attract new riders.	**Support** implementation of transit system enhancements to increase transit mode share.
Improve service for special visitor or traveler needs through the use of ITS applications and specialized traveler information systems. **Reduce** unexpected delays in day to day travel for downtown commuters.	**Support** implementation of DMC Development Plans.
Provide and/or enhance multi-modal information dissemination and trip planning tools that allow system users to make informed travel choices across all modes.	**Educate**, motivate and reward people through programs and services that make it easier for commuters to travel by bus, carpool, walking or biking.
Support investments that reduce congestion and improve travel time reliability to provide reliable movement of goods and services and improved travel for commuting, shopping or recreation.	**Ensure** commercial passenger and freight traffic is convenient, safe and reliable.

The identified objectives will help to influence and guide decisions in the areas of planning, programming, and project development, as well as inform day to day system operations and maintenance activities.

Given the expense and difficulty of adding capacity on existing arterial corridors, and the demand for future capacity as illustrated in Figures 14-4 and 14-5, it is clear that strategic investment in operational improvements will continue to be important in the future. Looking forward, the important role of additional ITS investments and emerging and future technologies such as connected vehicle technology hold promise and need to be considered as deployable technology emerges.

Existing TSMO Plans and Activities

From 2016-2018 MnDOT undertook an initiative to formalize its work on TSMO matters by completing a multi-step planning process focused on developing a TSMO Strategic Plan, Business Plan, and Implementation Plan. The goal of this effort was to establish an internal agency framework in terms of staffing and resources that would focus on establishing goals and objectives for MnDOT relevant to the realm of TSMO.

Figure 14-8 summarizes the main thrust of each planning product that was produced by this effort. The Strategic Plan identified three primary goals:

- Improve safety, reliability and efficiency
- Increase safety
- Carefully and responsibly manage transportation operations assets

Sixteen objectives aligned with these goals were identified, as illustrated in Figure 14-8. A number of the strategies identified in the plan are relevant to the ROCOG Planning Area.

ROCOG supports the goals and objectives of the MnDOT Strategic Plan (Figure 14-9) and is coordinating with MnDOT to explore joint efforts on a number of the specific strategies that MnDOT in the Implementation Plan, highlighted in Figure 14-10.

Figure 14-8: MnDOT TSMO Program Guidance

Figure 14-9: MnDOT TSMO Objectives

Figure 14-10: Key MnDOT TSMO Strategies

Implementation Plan

Strategies

1. Update Signal Timing and Coordination
2. Increase MnDOT Usage of 3rd Party Data and Sharing (e.g. Google, WAZE, INRIX, HERE)
3. Develop Regional TIM Programs
4. Implement Low-Cost / High-Benefit Capital Improvements
5. Coordinate Work Zones Across Districts and Routes
6. Expand Snow Fence Use through Research and Increased Use
7. Expand the Coverage of Freeway and Expressway Traffic Management Systems
8. Develop TIM Strategies for Work Zones
9. Utilize Intelligent Work Zone Systems Where Appropriate
10. Expand the Use of Ramp Metering
11. Expand Use of Technology at Weigh Stations for Enforcement

Of interest to ROCOG are the following strategies:

- Continued work with District 6 on signal timing and coordination as it relates to the intersection of state and local corridors, particularly in the vicinity of west side interchanges along TH 52 and TH 14 which see the highest traffic volumes in the urban area.
- Obtain access to third-party travel data for system monitoring and to enhance the travel condition data available to the general public.
- Implementation of low cost, high benefit improvements, particularly in regards to addressing safety concerns at interchanges as well as high speed expressways such as TH 14 west of Rochester, and response to heightened levels of intersection conflict in the future, particularly along TH 63 east of TH 52 on the north side of Rochester as traffic volumes grow.
- Coordination of work zones and use of intelligent work zone systems on future work in urban areas. A particular corridor where this will be of importance is the future work anticipated on TH 14 in the Byron area, involving construction of multiple grade separated structures and access closures across the corridor.
- Ramp metering, while not used in the Rochester area currently, may take on added importance in the future at locations such as TH 14/52 and the CSAH 22/TH 14 West interchanges as expected growth in downtown Rochester and in northwest Rochester occurs over the next 10-15 years.

Rochester TSMO Activities

The City of Rochester has implemented a number of TSMO strategies across the Rochester area and has collaborated with MnDOT on other initiatives such as development of communications networks to support MnDOT and Rochester Traffic Management Centers (TMC). Among the most widely implemented and important actions for improving the operation of the highway system in the Rochester area include:

- Arterial corridor signal optimization involving the timing and coordination of signals within a corridor or area to minimize the stop-and-go traffic flow

- Regulation of access to reduce opportunities for conflict and disruption of traffic flow on major streets from entering and exiting vehicles
- Low-cost safety and pavement reallocation to address issues through actions such as re-striping travel lane widths, adjusting intersection approach geometry, and channelization of turn movements
- Transit operation enhancements, such as signal pre-emption and real-time transit tracking information using AVL (Automated Vehicle Location) technology, have been deployed to enhance schedule adherence and provide real time information to riders
- Traveler information services including highway advisory radio; variable message signs and online road reports
- Signal preemption to permit emergency vehicles to utilize communications technology to override intersection controls and facilitate response to incidents
- Data management systems to improve management and response to incidents such as reported accidents, unsafe street conditions, and missing or damaged signage, sidewalks, streetlights, and traffic signals

Secondary TSMO Strategies Employed

Table 14-3 summarizes additional strategies and actions used by Rochester, Olmsted County, and MnDOT District 6 to enhance operation of the street network. Most references in this table related to signal systems refers to the City of Rochester as the City manages and maintains most signals in the urban area under joint agreements with Olmsted County and MnDOT.

Table 14-3: Local TSMO – Related Strategies

Strategy or Program	Description of Strategy
	Collaboration
Interagency Coordination	To facilitate the efficient operation of the roadway system MNDOT, the City of Rochester and Olmsted County meet on a periodic basis to discuss operational issues of common concern. Among key coordination efforts are existing agreements between the state, county and city regarding responsibility for signal system operations, and issues such as coordination of speed limits across jurisdictions.
Community Input	Rochester and MnDOT accept comments regarding traffic operational issues via their websites as well as routinely taking input on issues via phone calls and letters. Issues are addressed as they are submitted, with no formal system in place to monitor or track trends in terms of the geographic location or types of requests. One of the most frequent requests the City of Rochester receives in terms of traffic issues is for speed control on neighborhood collector streets;

Strategy or Program	Description of Strategy
	The city currently programs $50,000 annually to provide for the implementation of traffic calming measures through jointly funded projects with neighborhood property owners. Rochester Web Page for submitting traffic concerns: https://www.rochestermn.gov/departments/police/file-a-non-emergency-report/voice-your-traffic-concern MNDOT Web Page for submitting traffic concerns: http://www.dot.state.mn.us/information/submit.html MnDOT also conducts periodic surveys of area businesses to gather input about freight issues. City staff meet with the Downtown Business Association as to help stay informed and respond to business concerns.
	Data Collection and Monitoring
Data Collection	Crash data is reported through the Department of Public Safety Accident Reporting system, which reflects incidents requiring the filing of accident reports under state law. Access to the information in this system is provided through the Minnesota Crash Mapping Analysis Tool (MnCMAT2), an online database accessible through a GIS interface to allow easy on-line access to crash data AADT (Annual Average Daily Traffic) count data is collected on a regular basis under the State Aid Assistance program, and the City of Rochester archives count data gathered as part of targeted studies in a local database. The city also has the infrastructure in place to collect traffic volume data at signalized intersections through video cameras, though utilization at the current time is limited to gathering data needed for specific projects.
Traffic Monitoring & Performance Measurement	Rochester, Olmsted County, MnDOT and law enforcement meet to review traffic crash data from all incidents involving fatalities and serious injury monthly and meet annually to review locations with 5 or more crashes per year in order to monitor trends at these locations and assess the potential for safety projects to mitigate problems at these locations. With adoption of the Statewide Strategic Highway Safety Plan a framework for monitoring crash experience has been established. Regular annual reporting of shared with regional and local entities is provided and coordination through a district level Towards Zero Death collaboration is provided. With the advent of Performance Planning requirements in federal legislation beginning with the 2005 SAFETEA-LU legislation, annual monitoring of a set of performance is conducted by MnDOT in the areas of Safety, Pavement Condition, Bridge Condition, Transit Assets, Transit Safety, and Travel Reliability for the ROCOG area.

Strategy or Program	Description of Strategy
	Transit
Transit Monitoring and Performance	Management of the transit system relies heavily on monitoring to assess the cost effectiveness of various routes and for targeting of service improvements. Four key measures that are assessed routinely on both a system level and route level include 1) farebox recovery; 2) load factor; 3) running speed, 4) on-time performance/schedule adherence and 5) passengers per vehicle hour.
	Non-Motorized
Pedestrian Accommodations	The City of Rochester has incorporated pedestrian activation of signals at intersections in the downtown area and at other locations in the city where significant pedestrian crossing activity occurs on a regular basis and continues to expand the number of locations that have pedestrian activation installed. To improve pedestrian understanding at particular high-volume locations, countdown signals have been installed, primarily in areas around the Mayo Medical Campus and at crossings of Broadway Avenue in downtown Rochester.
School Travel	The City works closely with MnDOT, Olmsted County, and the Rochester School District to assess school route travel options and identify the need for crosswalks, crossing guards, and other safety devices on primary walking routes to schools.
	Traveler Information Services
Traveler Information	Key elements that has been deployed in terms of traveler information systems in the Rochester area are a series of variable message signs along TH 52, TH 14 and TH 63 to alert motorists to difficult travel conditions or incidents that may be impacting traffic operations. MnDOT also provides for distribution of regional traffic and road condition information via its website, including access to information from 32 traffic cameras sited at various locations in the ROCOG area, as part of its statewide 511 system.
	Incident and Event Management
Work Zone and Temporary Operational Changes	The City of Rochester, Olmsted County and MnDOT work with contractors on all projects to implement work zone traffic operation plans in order to facilitate the safe flow of vehicular and non-motorized travelers during construction. All permit applications for construction within the right of way are reviewed to determine their impact on traffic, and if necessary, measures such as limiting the hours of construction, instituting temporary signal retiming, adjusting transit routes and implementing detour routes are considered as mitigation measures. For major projects information about temporary changes and work zone areas is disseminated through the local newspaper, websites, and PSA's sent to all TV and radio stations serving the area.

Strategy or Program	Description of Strategy
	Parking Management
	At this time fixed or dynamic message signing has been introduced on a limited basis to direct motorists to available parking in downtown Rochester. Limited use is made of parking restrictions by time of day or day of week to facilitate traffic operations.

Key TSMO Tools

There are a number of key TSMO tools that play an important role in management of traffic flow on the major street network across the ROCOG Area. Together with ongoing use of a number of advanced planning strategies, these tools are important to the provision of reliable and efficient travel service. This section summarizes these key infrastructure elements and planning strategies.

Primary TSMO Infrastructure

Traffic signal systems are critical for managing traffic flow affecting general vehicular traffic, transit service, freight delivery and emergency response. Key components of these systems include the communication and signal equipment, signal interconnectivity, and periodic retiming of signals.

Communications

MnDOT, Rochester, Olmsted County, and private partners have invested in communications infrastructure to support TSMO initiatives, including the signal management system. A network of fiber optic cable has been constructed that connects most of the signal infrastructure in the urban area. The scope of the current system is illustrated in Figure 14-11.

Of the 170 signals in the Rochester area network, 131 are currently connected to the City Traffic Management Operations Center, permitting centralized monitoring, timing plan implementation and emergency override. Four signals, such as two at the TH 52/TH 63 South interchange, are set up for local operation given the unique traffic control at that locations, and 35 others currently are not connected to the TMC for various reasons, such as lack of access to fiber optic cable.

Signal Coordination

Figure 14-12 illustrates the arterial corridors in Rochester on which signal coordination has been established. Signal coordination can improve arterial function and discourage speeding on arterials while allowing motorists to make better time.

Figure 14-11: Rochester Area Fiber Optic Cable

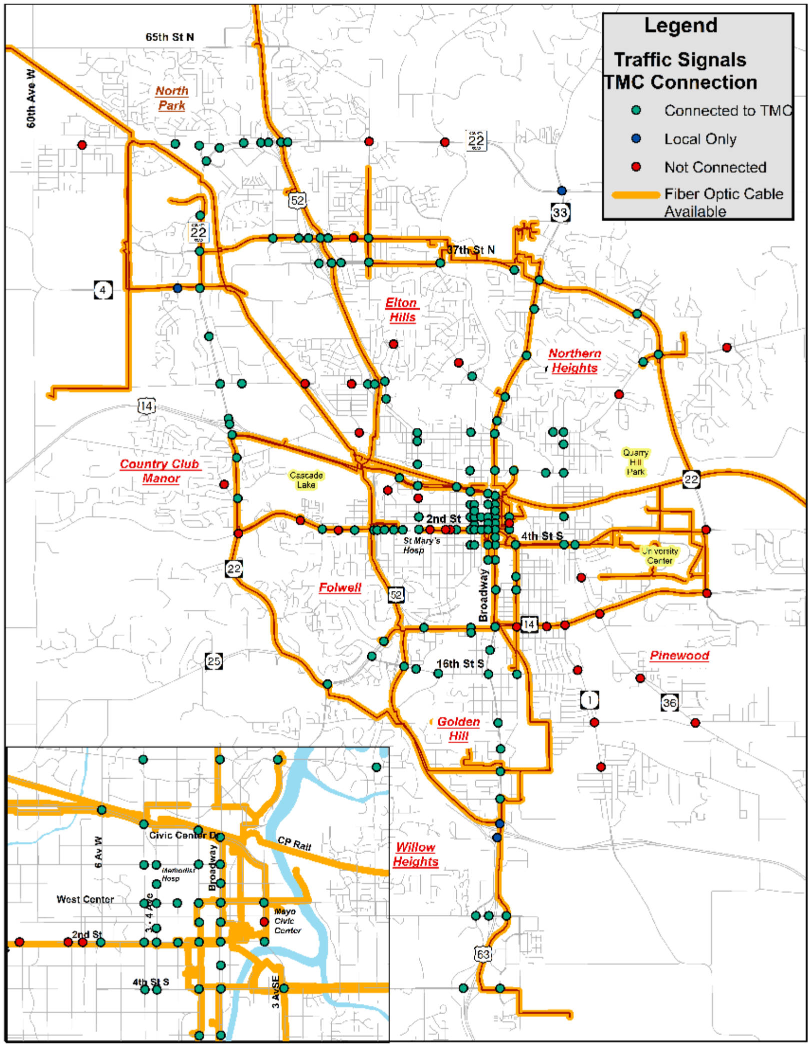
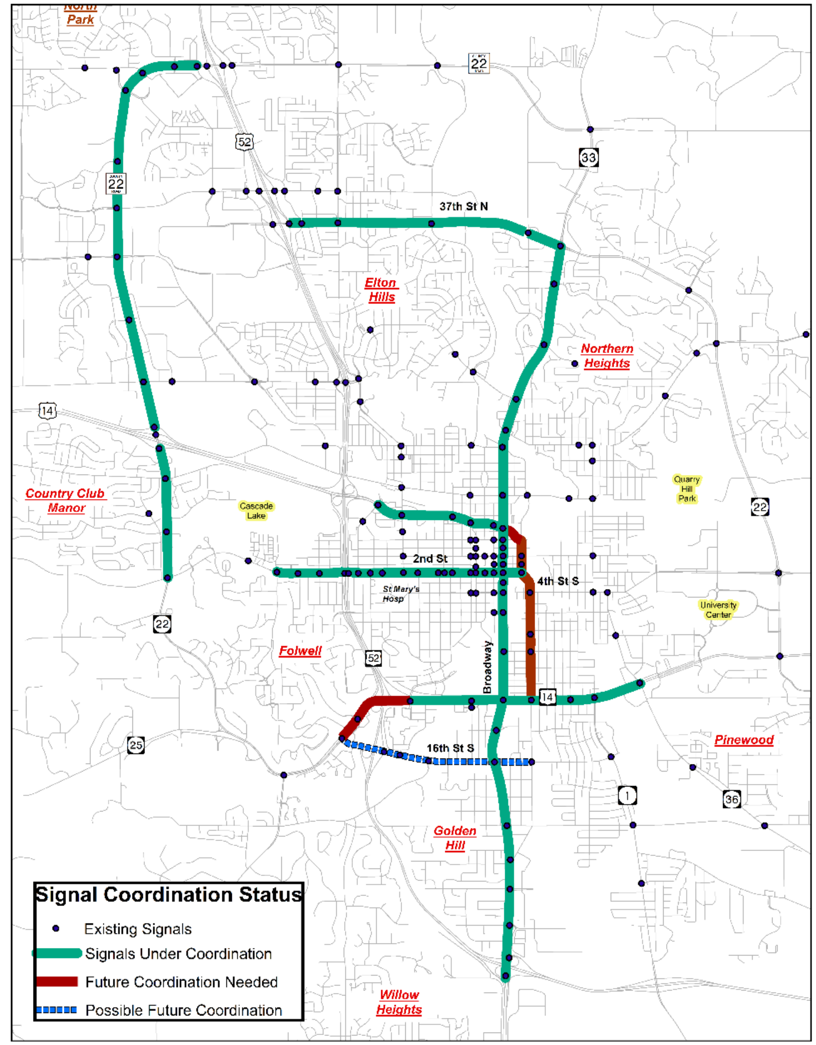


Figure 14-12: Signal Coordination in Rochester



In addition to existing corridors currently operating under coordination, a high-level analysis was completed of other high volumes corridors in the city to identify other corridors that may benefit from future coordination projects. Civic Center Dr /3rd Ave SE on the east side of downtown Rochester as well as extending coordination on 12th St SW to 16th St SW were identified as two future corridor candidates. The analysis also identified 16th St South as a future candidate, although the analysis results were less conclusive as to the benefit of coordination on that corridor under projected 2040 traffic volumes.

Signal Timing

Through cooperative service agreements with MnDOT and Olmsted County, the City of Rochester also manages traffic signals on state and county roadways within the city limits to provide for enhanced coordination of the system. Rochester and Olmsted County budget dollars annually to review and optimize signal timing. The goal of Rochester is to review and retime signals in on an eight-year schedule. Priority is given to the major arterial corridors but differences in priorities between the road authorities (city/county/state) sometimes results in the inability to have the necessary funding in place where joint ownership is involved.

Signal Maintenance

To ensure the operational integrity of the traffic signal network, the Rochester has a signal maintenance program established for

- The replacement of signal hardware installations over 25 years in age, with a goal to replace one system a year
- Installation and upgrading of battery backup power systems for signal installations, with the goal to install four per year
- Replacement of signal LEDs on a ten-year lifecycle
- Signal controller replacement, with the goal to replace one installation a year

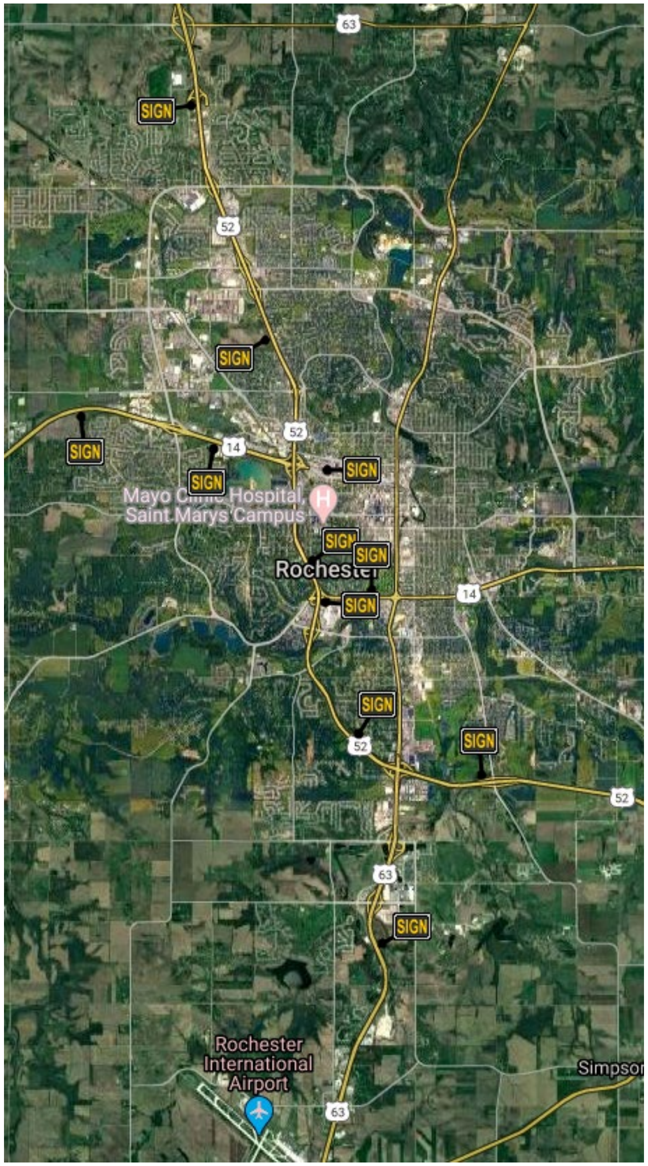
Olmsted County contracts with the City to maintain signal installations in the Rochester area on the County road network at a cost of approximately $160,000 per year, while MnDOT funds an annual set-aside in their District Transportation Improvement Program for signal installation replacement at $450,000 per year within District 6 (an eleven county area).

Supporting TSMO Infrastructure

While traffic signals systems are probably considered to be the main type of TSMO infrastructure, many additional systems or services are in existence which need require communications infrastructure, monitoring and management as well. In the Rochester area, among the important additional systems/services that have been deployed include the following:

- **Transit Signal Priority (TSP)** is an innovation which allows buses to activate signals for extended green time as they approach a signal if they are behind schedule, allowing transit vehicles to provide higher quality service. It should be noted that autos in the same traffic stream with the bus will benefit as well. Because the green phase is typically extended only two or three times per hour, the impact on side streets is minimal. Most of the current fleet is equipped with the necessary hardware and software and signal hardware has been deployed on major corridors and is in the process of being deployed on other on the remainder of bus route corridors.
- **Emergency Vehicle Pre-emption** permits emergency responders to hold existing green or implement all-way red control at signalized intersections to permit emergency vehicles to pass through intersections unhindered. All signals and vehicles have been equipped with this infrastructure.
- **Variable Message Signs** are electronic traffic signs used to give motorists about events or incidents that are impacting travel in the corridor as well as, in limited cases, other information in the public interest. The VMS signs are located as shown in Figure 14-13 and were first installed in 2002 as part of the package of road construction traffic management installed for

Figure 14-13: Variable Message Signs Locations



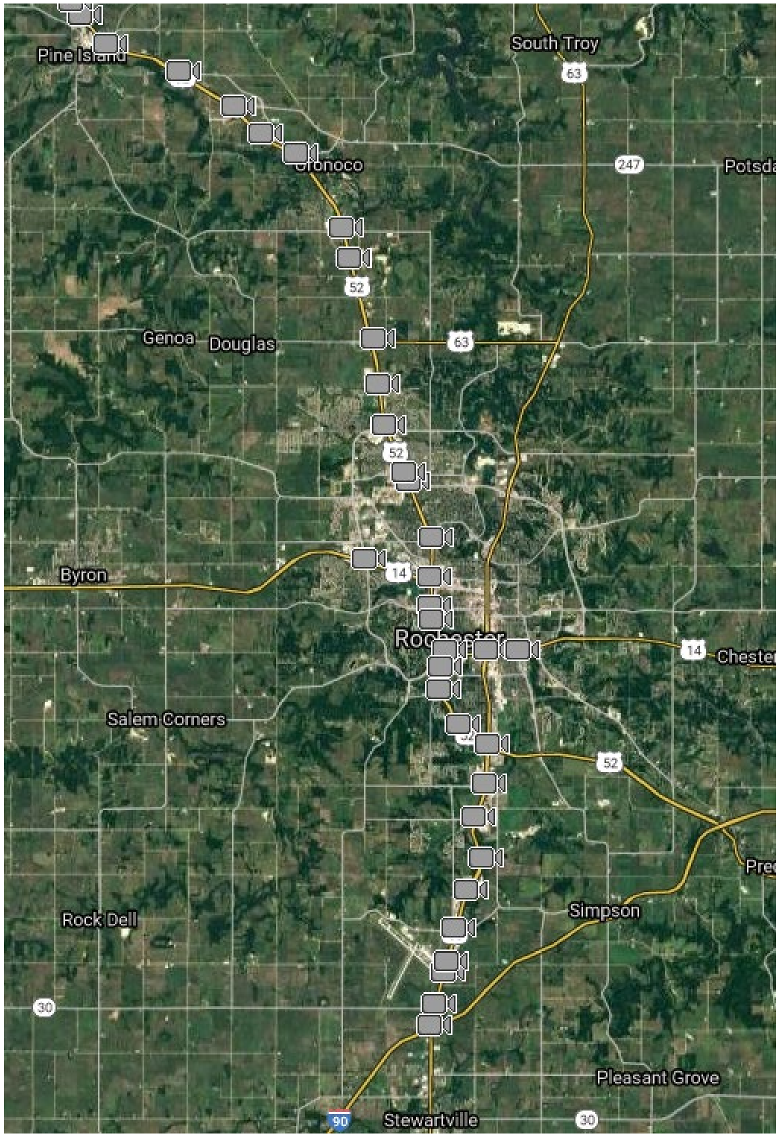
the TH 52 reconstruction project.

- **Traffic Cameras**, as shown in Figure 14-14, are located primarily along TH 52 and provide traffic managers a real time view of conditions on the roadway as well as providing information on current traffic conditions to the public through various media including MnDOT's 511 travel information site.

Primary TSMO Planning Policies

Primary TSMO management policies include access management and traffic control guidelines and regulations adopted as part of plans or through local ordinances. Application of the policies and standards typically occur at the early stages of project development, as part of highway corridor or subarea studies, or during review of private development proposals. Among the actions that can be advanced include establishing parameters to guide decisions such right-of-way preservation needs, establishment of access principles to be applied to lands abutting a corridor, early decisions regarding features such as median openings, and signal locations that will affect future corridor operation. These strategies have been adapted for use by ROCOG in a number of past corridor planning studies to help preserve the future function of major arterial corridors that are critical to the overall operation of the highway network in the Rochester area.

Figure 14-14: Traffic Camera Locations



Access Management Policy

The frequency and location of access connections, along with traffic signal spacing, are key elements for efficiently managing traffic flow and minimizing traffic conflict along highway corridors. They are most beneficial in the management of major urban and regional highways. The justification for control of access is based on several factors, including safety, capacity, economics, and aesthetics. The economic potential of development corridors can be enhanced by a coordinated program of access management.

The functional life of roads can also be extended through higher utilization of the roadway's design capacity, thus permitting funds that might have been spent on road widening to be spent on road maintenance and operations. Studies have found that appropriate control of left and right turns, the impact of unregulated driveways, and the speed of access and egress can improve capacity by 25% over uncontrolled conditions.

Research indicates that access management is just as valuable to pedestrians and bicyclists as to motorists. Every sidewalk or path that crosses a driveway represents multiple potential pedestrian/vehicle conflict points. Reducing the number of driveways per block reduces the number of conflict points proportionally, which makes it easier for both pedestrians and drivers since they have fewer conflicts to concentrate on while passing through a corridor.

The rationale for managing access in rural areas differs from that in urban areas. Roadways in rural areas almost always serve low-density land uses and usually have volumes below capacity thresholds, thus disruptions to through traffic are less significant. However, managing rural access increases safety (by ensuring adequate sight distance, reducing the number of conflict areas, and reducing the severity of crashes when vehicles run off the road) and minimizes ongoing operational and maintenance costs related to snow removal, resurfacing, and drainage repairs.

Establishing rules in advance of development also aids developers by reducing the cost and delay that may occur as a result of needing to negotiate and redesign access. Adopted guidelines assure consistent and equitable treatment of all property owners and business interests.

Right-of-way requirements and access design should always take into consideration the ultimate facility size. The amount of traffic a roadway can handle is dependent upon such factors as the presence of parking, number of driveways and intersections, speed and alignment of the roadway, and anticipated intersection controls. Table 14-4 provides guidance on the approximate volumes that can be accommodated by various non-freeway road types, and how TSMO ("Enhanced Management") can expand the capacity of a roadway.

Table 14-4: Approximate Volumes for Planning Future Roadway Improvements

Road Type	Standard Management	Enhanced Management*
Two-Lane Road	Up to 12,000 VPD	Up to 15,000 VPD
Three-Lane Road	Up to 18,000 VPD	Up to 22,500 VPD
Four-Lane Road	Up to 24,000 VPD	Up to 30,000 VPD
Five-Lane Road	Up to 35,000 VPD	Up to 43,500VPD

VPD – Vehicles per Day

* Enhanced Management Conditions with adequate road design, access control and other capacity enhancing measures

Current Access Management Programs

The main road authorities in the ROCOG Planning Area all have some level of access management policies or ordinances in place to guide the installation of access connections or local streets to major roads.

- Olmsted County adopted an Access Management Ordinance in 2006 that lays out specific permitting and process requirements as well as identifies standards for access. https://www.co.olmsted.mn.us/yourgovernment/ordinancescodes/Documents/Chapter%201300%20Access%20Managment%20Ordinance.pdf
- MnDOT adopted an Access Management Manual in 2008 that establishes guidance on access to state highway facilities which are linked to roadway classification. The Manual also provides guidance on the development and permit review process. Access permitting is handled at the District 6 level
- Rochester has adopted access guidelines as part of its comprehensive Land Development Manual which includes the City's zoning and subdivision regulations. Access design is integrated throughout the City's development review process, so access gets addressed at the earliest stages of a development proposal. Once a development has been approved the final step is application for and issuance of a formal access permit.

Policy Guidance on Access Connections

Table 14-5 provides a set of general policy guidelines that establish benchmarks for the connection of driveways or new public roads (whether as part of a public project or private development) to the major street network in the ROCOG Planning Area. An important principle of connection management is to avoid, if possible, the connection of roadways or driveways that have significantly different functions and operating characteristics. For example, regulations should discourage the connection of private driveways to high mobility arterials or expressways.

These ROCOG guidelines are intended as a planning tool to inform decisions by local or state partners as to recommended policy on access connections, and will be most relevant 1) in the early stages of development

Table 14-5: Recommended Access Connection Policy

Roadway Classification	Major Highways (InT/InR/SA/MA)	Secondary Roads (ScA / PC)	Local Roads (Urban/Developing)	Local Roads (Rural / UIA)	Land Use Overlay Zone	Private Access - High (HV) & Medium Volume (MV)[1]	Private Access - Low Volume (LV) & Minimum Use (MU)[1]
Limited Access Roadways / Median Controlled							
Freeway	Connections Permitted Interchange Preferred; See Table 15-for spacing guidance	Direct Connection Not permitted; Overpass Preferred See Table 15-5 for spacing guidance	Connection Not Permitted	Connection Not Permitted	All	Connection Not Permitted	Connection Not Permitted
Planned Freeway	Connection Permitted; Full Median Opening; See Table 15-5 for recommended spacing; Interim Signals @ future interchange location	Interim Connection permitted; Full Median Opening with reversion to Directional median if safety/congestion problems develop; See Table 15-5 for recommended spacing	No new connections permitted; Existing connections permitted to remain on Interim basis with planning for closure	Reversion of Full Median Opening to Directional median or RI/RO if safety or congestion problems develop	All	Connection not permitted except on interim basis where no feasible alternative access exists	Interim access approval must include planning for closure to occur at time alternate access becomes available or when freeway is built
Expressway	Connection permitted via Full Median opening; Spacing of median openings consistent with Divided Roadway Median Opening Guidelines (Table 15-5) Signal spacing consistent with Table 15-6; Signalization only when warranted	Connection permitted via Full or Directional Median Opening; Spacing of median openings consistent with Table 15-5 Signalization permitted if consistent with guidelines of Table 15-6, otherwise reversion to Directional median if safety/congestion problems develop	Permitted if consistent with Local Street Spacing (Table 15-5) subject to finding that higher order road is not needed; Unsignalized with reversion to Directional Median unless location meets signal spacing guidelines (Table 15-6)	Permitted if consistent with Local Street Spacing (Table 15-5) subject to finding that higher order road is not needed; Signalization must be warranted	All	Generally not permitted; HV may be permitted in lieu of local road connection if consistent with Local Street Spacing (Table 15-5) on one leg of intersection subject to finding public street not needed; Unsignalized with reversion to Directional Median unless location meets signal spacing guidelines	Connections not permitted except on interim basis where no feasible alternative access exists; approval of interim access on planned expressway must include agreement for removal of access when local street system is completed or alternate access becomes available
Limited Access Roadways / Median Controlled (Continued)							
Other Regional Major Arterial	Same as Expressway (See Above)	Connection permitted via Full or Directional Median opening consistent with guidelines of Table 15-5; Signalization permitted if consistent with guidelines in Table 15-6 for signal spacing, otherwise reversion to Directional median if safety/congestion problems develop	Connection permitted subject to Divided Road Median Opening guidelines of Table 15-5 & subject to finding that major road not needed at location, Signalization permitted if consistent with Signal Spacing guidelines (Table 15-6); Reversion to Directional Median if signal not permitted	Not Applicable	All	Connection permitted subject to Divided Road Median Opening guidelines of Table 15-5 and subject to finding that public road not needed at location; Signalization permitted only if consistent with Signal Spacing Guidelines (Table 15-6); otherwise reversion to Directional Median or RIRO; Encourage joint access with adjacent properties	Connection not permitted if alternative access available; If no feasible alternative exists consider joint/shared access; Directional median if consistent with Median Opening spacing guidelines of 15-5, otherwise RI/RO
Other Urban Major Arterial							
Limited Access Roadways / Undivided							
Expressway	Connection permitted- Spacing of connections should be consistent with System Development Guidelines of in Chapter 11 Signalization should be consistent with signal spacing guidelines (Table 15-6)	Connection permitted Spacing of connections should be consistent with System Development Guidelines of Chapter 11 Signalization should be consistent with signal spacing guidelines (Table 15-6)	Connection permitted if consistent with Local Road Spacing Guidelines Table 15-5 Signalization of Local Street connections discouraged unless for School or Fire Station		Rural/UIA	Require access to lower level road if available; Otherwise, one access per parcel subject to road authority spacing for corner clearance/Driveway separation Traffic Signal if warranted and consistent with spacing guidelines (15-6)	Require access to lower level road if available, Otherwise one access per parcel subject to Corner clearance and driveway spacing requirements of local road authority
					All Urban		
Super Two					Rural/UIA		
					All Urban		
Main Street					CBD	Connection permitted subject to Driveway Separation & Corner	New connection not permitted; Require access to lower class street or alley

Roadway Classification	Major Highways (InT/InR/SA/MA)	Secondary Roads (ScA / PC)	Local Roads (Urban/Developing)	Local Roads (Rural / UIA)	Land Use Overlay Zone	Private Access - High (HV) & Medium Volume (MV)(1)	Private Access - Low Volume (LV) & Minimum Use (MU)(1)
						Clearance requirements of local road authority.	
Other Regional Major Arterial					Urban Zones	Connection permitted subject to Driveway Separation & Corner Clearance requirements of local road authority. Signalization if warranted consistent with spacing guidelines (Table 13-5)	Require access to lower level road if available; Otherwise one access per parcel subject to Corner clearance and driveway spacing requirements of local road authority
Other Urban Major Arterial					Urban Zones		
Other Urban Roadways							
Regional Secondary Arterials	Connection permitted Signalization controlled by spacing guidelines for major highway	Connection permitted Subject to consistency with System Development Guidelines of Chapter 11 Signalization only if warranted	Connection permitted Subject to Local Road / Driveway Separation / Corner Clearance requirements of local road authority Traffic Signals discouraged	Connection permitted Subject to Local Road / Driveway Separation / Corner Clearance requirements of local road authority Traffic Signals discouraged	All Urban	Connection permitted Subject to Local Road / Driveway Separation / Corner Clearance requirements of local road authority)	Require access to lower level road if available; Otherwise one access per parcel subject to corner clearance guidelines of local road authority
Urban Secondary Arterials					All Urban		
Regional Primary Collectors					All Urban		One access per parcel subject to minimum driveway spacing / corner clearance requirements of local road authority
Urban Primary Collectors					All Urban		
Other Rural Area Roadways							
Regional Major Arterials	Connection permitted Signalization only when warranted and only on a Major Arterial	Connection permitted Subject to consistency with System Development Guidelines of Chapter 11 Signalization Discouraged	Not Applicable	Connection permitted Subject to Local Road / Driveway Separation / Corner Clearance requirements of local road authority	Rural/UIA	Connection permitted Subject to Local Road / Driveway Separation / Corner Clearance requirements of local road authority)	One access per parcel subject to minimum driveway spacing / corner clearance requirements of local road authority On Reg. Major Arterial if frontage < spacing req. consider joint/shared access. On all roadways require access from lower level road if available
Regional Secondary Arterials					Rural/UIA		
Regional Primary Collectors					Rural/UIA		

FOOTNOTES
(1) Volume Ranges for Private Access Connections: High (HV) > 1500 ADT; Medium (MV) 500-1500 ADT; Low (LV) 50-500 ADT; Minimum Use <50ADT
(2) If Driveway Separation requirements cannot be met use of joint or shared access to obtain spacing should first be investigated to determine feasibility

review, 2) in early stages of project development projects, and 3) as the policy basis for a more specific access management regulation. Additional considerations related to permitting processes, variance procedures, review procedures and inspection/enforcement are needed at the jurisdictional level for a full-fledged access management program. It is important to note that while these guidelines are comprehensive, final spacing of medians and driveways will need to be resolved on an individual basis using accepted engineering and planning principles.

The basis on which the guidelines have been established is by roadway classification and median character.

References to other guidelines in the plan inform the connection policies, such as recommended the spacing of median openings, local streets connections or traffic signal spacing. The guidelines do not address the specifics of access design such as grades, sight distance, driveway or roadway widths or vehicle storage needs.

Core Access Management Strategies

In applying the access management policy guidance found herein, ROCOG will work with its partner road agencies to apply the policies through the following five core strategies:

- **Strategy 1:** Preserve the integrity of the major street system with an effective program for managing the frequency of access connections along major street corridors. Plan new higher volume connections to existing arterials at locations where the spacing of traffic signals will preserve two-way traffic progression.
- **Strategy 2:** Coordinate access and development during the zoning and platting process. Coordinate zoning and subdivision reviews with staff responsible for access permitting as early as possible in the development permitting process to minimize later issues when access permits applications are filed.
- **Strategy 3:** Include connection and spacing recommendations as part of all corridor management or congestion mitigation plans. Median treatments, road connection priorities and use of signalization should always be a consideration in these plans.
- **Strategy 4:** Use connection and spacing guidelines in rural areas to balance land use objectives with the primary function of major roads as important regional travel corridors.
- **Strategy 5:** Acquire access control rights consistent with the connection and spacing guidelines of this plan or local access management ordinance requirements when purchasing right of way for future major street construction.

Traffic Operations Planning

A second layer of advanced planning guidance relates to decisions that will have impact on future traffic operations planning related to the placement of traffic signals and control of the median. This guidance will influence efforts to establish signal coordination along a corridor as well as factoring into safety based on management of median openings.

Decisions regarding future signal locations and the nature of median openings should be considered at all levels of planning, including during network plan development and as part of corridor/subarea studies.

Traffic signal spacing should be related to the desired operating speed for the corridor. Signal spacing criteria should take precedence over unsignalized spacing standards in situations where future signalization is likely.

In general, traffic signals should not be installed on high-speed corridors in rural locations. Isolated signals in rural locations are inconsistent with the function and expected performance of the highway. Rural traffic signals are unexpected by the motorist who is unfamiliar with the location, requiring longer than normal time for drivers to react.

Median Opening and Signal Spacing Guidelines

ROCOG and its partners will use the guidelines in Tables 14-6 and 14-7 as minimum benchmarks for the location and design of major street system connections during network planning as well as corridor or subarea studies. It is important to note that while these guidelines are comprehensive, final spacing of medians and signal installation will need to be resolved on an individual project basis using accepted engineering and planning principles.

Table 14-6 includes spacing guidelines for interchange, median openings, and public street connections to major streets. These spacing guidelines identify minimum separation standards for different types of connections, which will improve safety and traffic flow by reducing the number of conflict points through separation of areas where drivers are entering, existing, weaving, or crossing opposing traffic streams. Spacing standards also should provide adequate sight distance and reaction time for motorists in general.

Table 14-6 includes guidelines for traffic signal spacing on different classes of roadways. Spacing between traffic signals is a strategy employed to preserve Level of Service (LOS) of the roadway segment. Optimum signal spacing will provide for greater signal progression and higher arterial speeds. Long and uniform spacing can more efficiently accommodate varying traffic conditions during peak and off peak and are essential to an effective traffic management program. See Chapter 10 for a description of roadway classification and land use context as used on the Functional Designation Map of this plan.

Table 14-6 includes three subsections establishing guidelines for the spacing of different types of connections to the major roadway network. Table 14-6(A)provides guidelines for interchange and overpass spacing along freeways and planned freeways. Table 14-6(B) provides guidelines for the spacing of full and restricted median openings along the various types of divided highways. Table 14-6(C) provides guidelines for the minimum spacing of local public streets along major roadways.

Table 14-7 describes recommended signal spacing for different classifications of roadways and land use environments. Roadway classifications are listed down the left column and land use context zone classifications across the top of the table. See Chapter 10 for a

Table 14-6: Interchange, Median Opening, Local Public Street Spacing

Table 15-5(A) Interchange and Overpass Spacing

	Land Use Overlay Zone				
Road Classification	Rural	Rochester Developing	Rochester Urban / Core	Small City Developing	Small City Urban/Core
Freeway Interchange	4-6 mi	1-2 mi	1 mi	2-3 mi	1-2 mi
Freeway Overpass	2-3 mi	1 mi	1 mi	1-2 mi	1 mi

Table 15-5(B) Divided Roadway Median Spacing

	Full Median Opening			Directional Median Opening			Right-In / Right-Out	
	Land Use Overlay Zone			*Land Use Overlay Zone*			*Land Use Overlay Zone*	
Roadway Classification	Rural	Developing / Urban	Urban Core CBD	Rural	Developing / Urban	Urban Core CBD	Developing / Urban	Urban Core CBD
Planned Freeway	1 mi	1/2 mi	NA	1/2 mi	1/4 mi	NA	1/8 mi	NA
Expressway	1/2 mi	1/2 mi	1/4 mi	1/4 mi	1/4 mi	1/8 mi	1/8 mi	Local Ordinanance
Other Regional Arterial	NA	1/3 mi	1/8 mi	NA	1/8 mi	330 ft	Local Ordinance	Local Ordinance
Other Urban Arterial	NA	1/4 mi	1/8 mi	NA	1/8 mi	330 ft		

Table 15-5(C) Local Public Street Spacing (1)(2)

Road Classification	All Urban Local Street Spacing (ft)	Rural Local Street Spacing (ft)
Interstate / Interregion	***See MNDOT Access Management Policy for spacing requirements***	
Strategic Arterial	1320	2640
Regional Major Arterial	880	2640
Urban Major Arterial	660	NA
Secondary Arterial	480	1320
Primary Collector	330	1320
Local Collector	x	x

NOTES

(1) Adequate Stopping Sight Distance and Intersection Sight Distance should be provided at all connections points

(2) Local Streets and Low to High Volume driveways should be aligned with connection points on the opposite side of the roadway or offset a minimum distance as defined in the following table

Posted Speed	*30 MPH*	*35 MPH*	*40 MPH*	*45 MPH*	*> 45 MPH*
Desirable Offset: Local Street or High Volume Driveway Access	*300 ft*	*425 ft*	*525 ft*	*630 ft*	*750 ft*
Desirable Offset: Low Volume or Moderate Volume Driveway Access	*150 ft*	*200 ft*	*250 ft*	*300 ft*	*400 ft*

Table 14-7: Spacing Guidelines for Signalized Intersections

NOTE: In practice, signals must also meet warrants for signalization

Roadway Classification	Land Use Overlay Zone: *Rural*	*Urban Edge Areas*	*Urban / Urban Core Areas*	*CBD Areas*
Limited Access Roadways / Median Controlled [(1)].				
Freeway	Not applicable			
Planned Freeway	Interim only; only if warranted / 2 mi	Interim only / 1 mi	Not applicable	
Expressway	Only if warranted and all other options exhausted / 1 mi	1 mile	1/2 mi - Urban Area 1/4 mi - Urban Core	1/8 mile
Other Regional Major Arterial	Not	1/2 mi	1/4 mile	Not Applicable
Other Urban Major Arterial	Applicable		1/4 mi	1/8 mile
Limited Access Roadways / Undivided [(1)].				
Expressway	Only if warranted and all other options exhausted / 2 mi	1 mile	1/2 mile	1/8 mile
		1 mile	Not Applicable	
Other Regional Major Arterial	1 mile	1/2 mile	1/4 mile	1/8 mile
Other Urban Major Arterial	1 mile	1/2 mile	1/4 mile	1/8 mile
Other Urban Roadways				
Regional Secondary Arterials				
Urban Secondary Arterials		Signals Spacing at Intersections with major roads controlled by		
Regional Primary Collectors		Major Road Signal Spacing; other locations only where warranted		
Urban Primary Collectors				
Other Rural Area Roadways				
Regional Major Arterials		Signals only considered when other options ineffective and signal must be warranted		
Regional Secondary Arterials		Use of traffic signals highly discouraged on regional secondary arterials		
Regional Primary Collectors		or primary collectors in rural areas ; evaluate other options first		

NOTES

(1) A signalized intersection location may deviate from the ideal location without detailed analysis if within a distance from the preferred location as specified in the table below. Where a proposed distanace is offset by a greater distance, an analysis should be conducted demonstrating that minimum bandwith expectations can be met.

Road Classification	Permissible offset from Desired location	Minimum Bandwidth Criteria: Peak Period	Off-Peak Period
Interregional	100 ft	50%	50%
Strategic Arterial	150 ft	45%	40%
Major Arterial	200 ft	40%	35%

description of roadway classification and land use context as used on the Functional Designation Map of this Plan.

Spacing should be measured from center of intersection to center of intersection, though distances may vary by up to 200 feet without having a significant effect on the ability to establish traffic flow progression (the key goal of this guideline).

TSMO in Land Development and Project Development

Level of Service Guidelines

Level of Service (LOS) is a measure of the quality of service provided by a roadway facility. Quality of service refers to a user's perception of how well a transportation service or facility operates. LOS measurement is tied to a rating scale ranging from A (very high level of satisfaction with freely moving traffic) to F (very poor quality with near gridlock conditions).

ROCOG will use and encourage its partners to use the guidelines for Level of Service described in Table 14-8 to define the minimum operating conditions that should be maintained for the predominant peak or off-peak direction of traffic flow in planning, project development, and the review of private development proposals. Use of the term "Maintain" means operating conditions are preserved at or above the existing level of service through immediate or future improvements in areas where existing service levels are already below the standards in the table.

Table 14-8: Level of Service Guidelines for ROCOG Area

Subarea Land Use Zone	Land Use Area	Functional Designation (1)	Peak Period LOS	Mid-Day LOS	Existing Substandard LOS
CBD	Rochester	InT/InR/SA	Mid-D	C/D	Maintain
		MA/ScA	Mid-D	C/D	
		PC/LC	D/E	Mid-D	
Urban Core	Rochester	All roadways	Mid - D	C/D	Maintain
	Small City				
Urban	Small City	All roadways	C/D	B/C	
	Rochester	All roadways	C/D	Mid-C	
Urban Edge	Small City	All roadways	Mid-C	B/C	
	Rochester	All roadways	C/D	Mid-C	
Urban Influence	Rochester	All roadways/2020	B/C	Mid-B	
Area		All roadways/2035	Mid-C	B/C	
Rural	All	All roadways	B/C	Mid-B	

(1) Functional Designation Abbreviations are as follows:
All roadways - guideline refers to all classes of roadways
InT/InR/SA - guideline refers to Interstate, Interregional, Strategic Arterials
MA/ScA - guideline refers to Major Arterials, Secondary Arterials
PC - guidelines refers to Primary Collectors

While numerous methods have been developed to assess Level of Service, ROCOG recommends use of the methods based on the Highway Capacity Manual as the primary methodology for assessing LOS.

ITS Planning

Intelligent Transportation System technology plays an important role in enabling many TSMO strategies that rely on various communications and information systems in order to monitor conditions, collect and disseminate transportation system information, and provide the ability to adjust systems in response to changing travel conditions. In Minnesota, MnDOT has taken the lead in creating a collaborative vision of the use of ITS as well as leading the deployment of various services that rely on ITS Technologies. A MnDOT Statewide ITS Plan (SITSP) was adopted in 2015 to identify short and mid-term ITS needs, based on the goals and objectives found in Minnesota GO, the State's 50-Year Transportation Vision, and the Statewide Multimodal Transportation Plan.

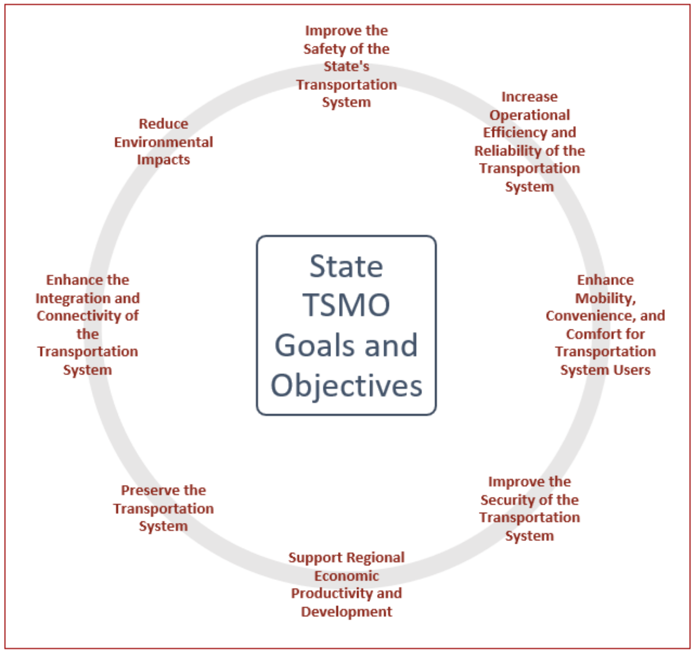
In collaboration with stakeholders, six ITS goals were established:

- **Safety:** Utilize Minnesota's Intelligent Transportation System to reduce fatalities and serious injuries through the use of technology to enhance the overall safety of the transportation system.
- **Mobility:** Minimize overall travel delay by providing and operating systems that maximize highway capacity, reduce delays and communicate information about road conditions to travelers.
- **Fiscal Responsibility and Sustainability:** Establish responsible and sustainable funding for Intelligent Transportation Systems in Minnesota and encourage private investment/research opportunities for continuous improvement.
- **Operations and Maintenance:** Provide an Intelligent Transportation System that is reliable and effective for users and improves operational efficiency of systems and MnDOT.
- **Asset Management:** Improve the management of Minnesota's ITS assets by focusing on risk and life-cycle costs to prioritize maintenance, investment, and system management.
- **Consistency:** Establish an Intelligent Transportation System that provides consistency statewide with technology, processes and procedures, interoperability, operations and maintenance.

Adoption of the SITSP provided the foundation for the next step in Statewide ITS system development with completion of the 2018 Minnesota Statewide Regional ITS Architecture report. This multi-volume report, an update of a prior version developed in 2014, was completed to

- Foster integration of the deployment of regional ITS systems
- Facilitate stakeholder coordination in ITS planning, deployment and operations
- Reflect the current state of ITS planning and deployment

- Provide a high-level planning for enhancing the state transportation systems using current and future ITS technologies
- Conform with the National ITS Architecture



The 15 volumes of the ITS Architecture Report include 12 volumes devoted to specific service packages that can be used as a jumping off point to develop specific service deployments. For MnDOT's partners, an Implementation Volume was prepared that summarizes ITS initiatives and projects concepts that can be used as a handbook not only by MnDOT, but also by its local and regional partners. This document is a resource to identify particular ITS initiatives and project concepts for consideration as part of local capital improvement programs as well as the basis for discussing partnership opportunities with MnDOT and federal or state funding opportunities through the STIP process. The last section of this chapter discusses initiatives and project concepts of particular interest to the ROCOG Planning Area.

Rochester's ITS Introduction

Before looking ahead, it is instructive to look back to the 2004-2006 TH 52 project which involved reconstruction of 10 miles of TH 52 through the Rochester area. As part of the project planning, time was spent on developing an ITS Plan to provide short term support for the construction project in terms of work zone traffic management, traveler information services, and traffic monitoring during construction, transitioning to form the basis for a freeway management system once the work was completed. Along with the focus on the TH 52 corridor, other high priority elements were identified with some likely to be impacted by detour traffic being implemented in advance of the construction, such as installation of traffic signal interconnection, control, monitoring, and timing for arterial street routes. Others, such as rail crossing safety and transit services, became future elements of a Rochester area ITS Strategy.

This ITS implementation was completed as part of a "Quick Start" process under the MnDOT NOVA project, a program begun in the late 1990's focused on kickstarting the deployment of ITS initiatives in urban and rural areas of Greater Minnesota. Table 14-9 lists the ITS components that were identified for deployment in that plan and which were ultimately deployed. Others, such as rail crossing safety, were not deployed as the need for certain projects never materialized as expected.

Looking Ahead: Future TSMO Activities

A solid foundation of TSMO infrastructure and services has been established through the efforts of MnDOT and local agencies over the last two decades in the Rochester area, beginning with planning for installations associated with the ROC 52 reconstruction project in the late 1990s and continuing to this day. It will be important going forward to maintain and enhance the services and infrastructure currently in place while staying abreast of new technologies and innovation that could further enhance the efficiency of the transportation system.

This section is broken into two parts, one discussing actions and activities needed to preserve, maintain, and enhance proven TSMO tools, and one discussing developing and emerging tools that may be of benefit in the future.

Proven Tools: Preserving, Maintaining, and Enhancing Existing TSMO Infrastructure

Maintaining the progress that has been achieved through deployment of various TSMO services/improvements requires first and foremost ensuring that existing services and tools continue to function and provide quality service to travelers in the ROCOG Planning Area. ROCOG supports the following actions of its partners to maintain the effectiveness of deployed TSMO strategies. These actions are grouped into the following five categories:

- Maintenance
- Infrastructure expansion
- Operations
- Planning
- Communications/information

Key Maintenance Activities

1. Continue to conduct routine maintenance and replace as needed key permanent hardware such as signal system hardware, closed circuit traffic cameras, dynamic message boards as well as mobile equipment such as work zone management systems to insure continued service in the future.
2. Maintain signage and pavement markings to assist motorists navigating the transportation network.
3. Maintain and replace as needed equipment associated with the Traffic Management Centers of MnDOT and

Table 14-9: Rochester Area Early 2000's ITS Deployment Plan

Proposed Rochester Area ITS Component	Deployed?	Program Status or Current Deployment Priority
FREEWAY MANAGEMENT		
Transportation Operations Center established at State Patrol Communication Center ($0.4k)	Yes	TOC still in operation
Vehicle detection sensors installed on TH 52,14 and 63 to collect volume/speed data for identifying congestion ($0.4 k)	Yes	Sensors still in operation
Closed circuit television cameras installed at key locations to monitor freeway traffic condition/4 in initial phase and 4 additional in second phase ($0.48k)	Yes	CCTV still in operation
Freeway variable message signs at 8 locations on TH 52 and TH 14 ($1.6m)	Yes	VMS still in operation
Portable traffic management system acquired for use in highway work zones; 1st deployment on 14/52 construction project	Yes	Status unknown
TRAVELER INFORMATION		
Automated telephone system to provide real-time, route specific, on-demand information via telephone managed from Traffic Operations Communications Center (TOCC)	Yes	Integrated in early 511 program
Pavement condition reporting system/maintenance vehicles equipped with mobile data terminal to transmit information by maintenance personnel into Mobile Data Terminal (MDT)	No	MnDOT maintains statewide fleet to collect pavement data
Variable message signs operated by MnDOT on state highways used to alert motorists to construction diversion and travel conditions operated from Rochester Traffic Operations Center	Yes	VMS still in operation

Proposed Rochester Area ITS Component	Deployed?	Program Status or Current Deployment Priority
Real time travel condition information accessible through the Internet/ managed by the Traffic Operations Communications Center	No	Under consideration by MnDOT
Cable television broadcast of traffic channel providing 24-hour information on congestion, travel speeds, accidents, construction and special events	No	Targeted to assist in TH 52 reconstruction but not completed
Establish highway advisory radio channel	No	Low Priority
PUBLIC TRANSIT SERVICES		
Computer aided scheduling and dispatch software system to provide dial-a-ride type service to general public during off-hours	No	Not used in TH 52 project but may receive added impetus through transit / human service agency coordination efforts
Installation of information kiosks at key locations throughout Rochester to provide information on transit services (8 sites)	No	Limited Kiosks ultimately deployed under FTA programs at main bus transfer centers
RAILROAD INTERSECTION SAFETY		
Rail/traffic signal coordination, system established to recognize trains and implement special signal timing plans to minimize disruption to traffic flow (7 crossings/13 signals)	No	Not a priority given uncertain status of DM&E Powder River Basin Project
Variable message signs on secondary arterial roads under local control to alert motorists to approaching trains, construction diversion, and congested travel conditions	No	Not programmed but Rochester has under consideration

Proposed Rochester Area ITS Component	Deployed?	Program Status or Current Deployment Priority
Automatic tracking of trains using sensors with information transmitted to law enforcement/fire/ambulance dispatchers and RTOC to implement signal coordination	No	Not a priority given uncertain status of Powder River Basin Coal Train Project
TRAFFIC SIGNAL CONTROL		
Emergency vehicle pre-emption	Yes	Fully deployed on all vehicles and traffic signals
Traffic signal interconnection, control, monitoring & timing for arterial street network in Rochester	Yes	Rochester in partnership with MnDOT and Olmsted County have implemented across urban area on select corridors (Fig 14-12)
PUBLIC SAFETY SERVICES		
Automatic vehicle location—equipping State Patrol vehicles with AVL	Yes	Program continues (new vehicles)
Mobile Data Terminal (MDT) system for State Patrol Rochester office	Yes	Program continues (new vehicles)

4. the City of Rochester which serve as the control centers for the overall TSMO system.

Infrastructure Expansion

1. Continue to expand fiber optic cable network and supporting wireless networks in order to open up opportunities to provide services such as signal coordination, dynamic messaging, and traffic control on new corridors and in new areas of the region.
2. Provide additional equipment and staffing that may be needed at the Traffic Management Centers as highway networks grow and evolve.
3. Continue to deploy transit signal priority and emergency vehicle pre-emption on new vehicles and at new controlled intersections to provide reliable transit service and timely emergency response in corridors that are seeing or expected to see future traffic growth.

4. Expand the locations where infrastructure such as pedestrian countdown signals and pedestrian activated signals are installed to improve pedestrian safety and security.
5. Pursue funding for Safe Routes to School installations such as crosswalk enhancements and speed control measures to improve the safety and quality of the walk or bike to school experience.
6. Continue to evaluate the benefit of infrastructure-based safety warning systems in rural and suburban locations such as Rural Intersection Conflict Warning System (RICWS), Reduced Conflict Intersections (RCI), Curve Warning Systems (CWS) and other active measures to alert motorists to potentially dangerous traffic conditions.
7. Identify and program improvements to minimize the risk of extended traffic disruption from events such as flooding by identifying potential locations where roadways or bridges are subject to floodwater damage and identifying improvements needed to mitigate the risk.

Operations

1. Budget adequate funding to allow periodic updating of intersection signal timing and corridor level signal coordination plans to maintain efficiencies in traffic flow as conditions change over time. A desirable target would be to provide funding for periodic updates at no more than five-year intervals.
2. Maintain readiness to deal with periodic non-recurring travel delay resulting from everyday incidents such as crashes, special events, and pavement failure.
3. Maintain readiness and preparedness to respond to infrequent incidents that can cause extended travel disruption such as flooding, severe weather, and hazardous materials spills. Coordination between road authorities and emergency operations managers are key to this.

Planning

1. Continue to apply access management and traffic operation guidelines during the project development process and review of private development proposals to establish desirable access management design and placement/control of locations where future median openings or signalization will be provided.
2. In all project development that involves renewal of pavement surfaces such as mill and overlay projects or reconstruction, plan for Complete Street improvements as well as reallocation of pavement use through measures such as restriping or road diets. Intersection improvements at major locations should always weigh the tradeoffs between signals and roundabouts or, in select cases, other innovative intersection treatments.

Information/Communication

1. Working through mechanisms such as the Arrive Rochester Transportation Management Organization, expand travel demand management services and programs to attract more travelers to modes such as transit or carpooling through various service and financial incentive programs.
2. Continue to expand the use of parking management tools such as real time parking availability to reduce the amount of unnecessary circling by motorists attempting to find available parking.
3. Continue to enhance and expand the uses of Traveler Information Systems such as Minnesota 511 and the new Rochester and Olmsted County Construction Impact online information tools.

Developing and Emerging Tools: New Avenues to Enhance Travel Experience

Technology is rapidly evolving, and breakthroughs find their way into new tools that can be adapted to various uses, including within the realm of traffic and travel management. Over the next 10 to 20 years, increasingly ubiquitous data, mobile applications, and technology enabled services are expected to change how transportation is managed in the future. MnDOT has been at the forefront in the state thinking about these potential changes and the application of various tools through its 2017 TSMO Strategic Plan and 2018 Statewide Regional ITS Architecture Reports.

In reviewing these reports and other similar materials from research centers and other states and localities, ROCOG has identified a number of emerging technologies or refinements of existing tools and technologies that likely will command some attention in future years as elements of the local TSMO/ITS infrastructure framework. The following paragraphs describe some of the most promising applications with relevance to Rochester; use of some of the services reviewed here have been suggested for further consideration in various DMC-related studies in the last five years as opportunities to enhance the attractiveness and livability of Rochester's downtown area. The list is not meant to be comprehensive but to provide a sample of key TSMO approaches that could see application in Rochester.

CAV Ready Intersections

"CAV ready intersections" refers to the installation of communication infrastructure that will permit communications between Connected/Autonomous Vehicles (CAVs) and either roadside or cloud-based communication systems to permit the exchange of information between vehicles and systems such as traffic signal system controllers. An example of the information exchanged would be the signal system communicating to the CAV the current signal status such as phase (green/yellow/red) or providing warnings to CAVs of potential traffic signal violations, which intelligence in the CAV would then respond to.

In terms of investment, a major item for public road agencies will be the upgrading or installation of signal systems that are CAV ready, including installation of communications hardware which may be roadside units communicating via wireless means or cloud-based communications. The communication infrastructure is key to permitting the two-way flow of information which can enhance the safety and operations of the intersection.

ROCOG area road agencies should continue to monitor advances in the realm of CAV communications and expect to plan for investment in this type of equipment during the next 20-year horizon of this plan.

Arterial or Expressway Traffic Management Systems & ITS Service Package

Figure 14-4 and Table 14-1 reported on strategic and major arterial corridors in the Rochester urban area that are currently experiencing higher numbers of crashes, are expected to see growth in traffic congestion during the next 20 years, and are targeted for investment in transit infrastructure to support future Bus Rapid Transit service. Analysis of potential future congestion levels and higher absolute number of crashes observed suggest that travel reliability in these corridors may decline over time, impacting mobility as well as the delivery of a high-quality transit service envisioned on the Primary Transit Network. Given these factors, a need may emerge in these corridors for a strategic traffic management plan that includes TSMO strategies as well as transit and other multi-modal enhancements that can preserve the level and quality of service needed to effectively and efficiently provide the mobility warranted on these high level arterial corridors.

The future of traffic management on important arterial corridors such as Broadway and West Circle Drive is likely to include elements of an Intelligent Transportation System (ITS) service package called Active Traffic Management (ATM), also referred to as Active Expressway or Active Arterial Management. ATM service packages typically involve the application of multiple real-time strategies that provide the ability to dynamically manage traffic based on current and expected conditions. Among the individual types of applications that can be combined in ATM package for a corridor include:

- Adaptive ramp metering
- Dynamic speed limits
- Queue warning system
- Dynamic shoulder lanes
- Adaptive traffic signal control

In addition to these active traffic measures, an ATM corridor will typically see enhanced traffic monitoring and communication infrastructure installed as well as potentially upgraded traffic management center hardware and software to operate. However, this approach has been used across the United States for many years as well in some European countries with results showing overall capacity increases of up to 22% over non-managed corridors with increased travel reliability and declines in crashes of up to 30%.

The benefit of deploying ATM infrastructure is that from a cost perspective it provides a significant cost savings over capacity expansion projects, particularly in highly developed corridors such as Broadway or 2nd St SW where right-of-way is at a premium.

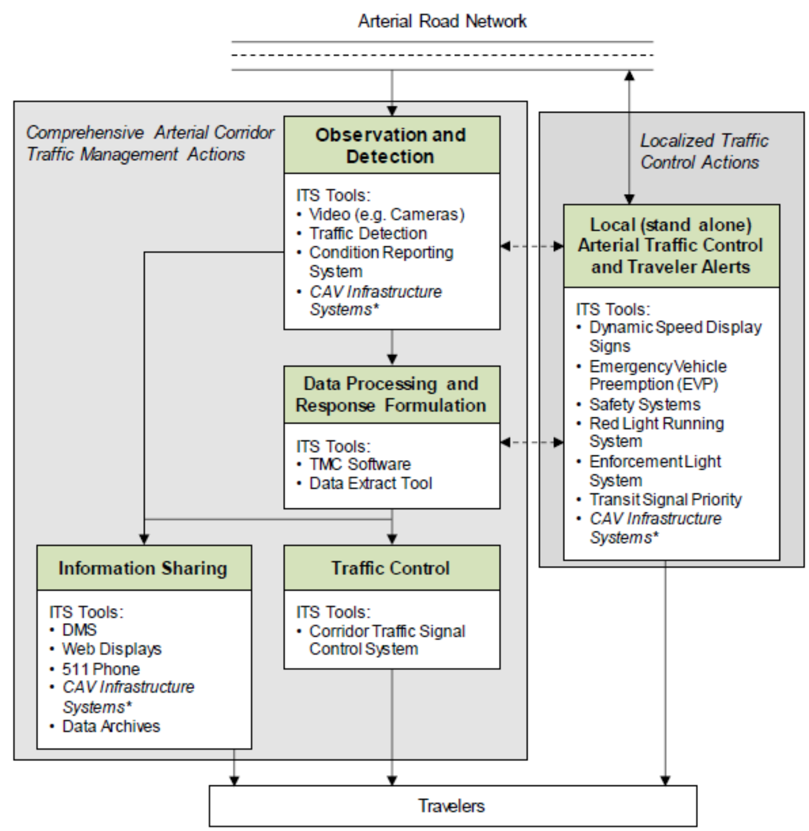
As MnDOT gains experience with ATM in the Twin Cities areas, ROCOG area road agencies and MnDOT District 6 should monitor conditions on these important strategic corridors determine if or when a higher level of traffic management is warranted. Generally, a comprehensive, integrated package of Arterial Corridor Traffic Management Actions as shown in Figure 14-15 exemplifies the type of ATM solution to consider.

Curbside Management

Curbside management is an emerging practice referring to management and allocation of increasingly valuable curb space as its demand multiplies due to

- The emergence of new forms of transportation (including parking for modes such as scooters)
- Increasing package deliveries due to online shopping

Figure 14-15: Illustrative Arterial Traffic Management Corridor Package



- Increased passenger pick-up and drop-off from services such as Uber and Lyft
- Potential need for more curb space to accommodate transit vehicles
- Demand for curb space from services such as food trucks or stationary vendors

- Interest in activating the street frontage with features such as outdoor seating and more landscaping
- Continued demand for on-street parking to serve high turnover customer parking

Furthermore, in Rochester, the implementation of Downtown Rapid Transit will impact streets including 2nd St SW, creating added pressure on valuable curb space. Managing the use of curb space in a vibrant downtown such as Rochester in the future will be more challenging, and among the solutions starting to emerge are online apps that help manage the allocation of curb space and the pricing of that space for different users. It is likely in coming years that additional technology and smart infrastructure applications will begin to emerge to help cities manage this space. It will be important for Rochester to monitor conditions downtown in the near term and start planning for a higher level of management of downtown curb space in the future.

15 • Financial Assessment

Overview/Summary

Shortfalls in funding have been a fact of life for transportation agencies over the years, as receipts from traditional funding sources such as federal and state gas taxes have not kept pace with nationwide increases in construction and maintenance costs and the growth in travel demand. Other sources of funding often used for transportation, such as local property taxes, face many competing demands where the community's transportation needs must be balanced against other social and economic needs. This need is most acute for street and highway infrastructure, but transit and non-motorized modes also are faced with the same challenge.

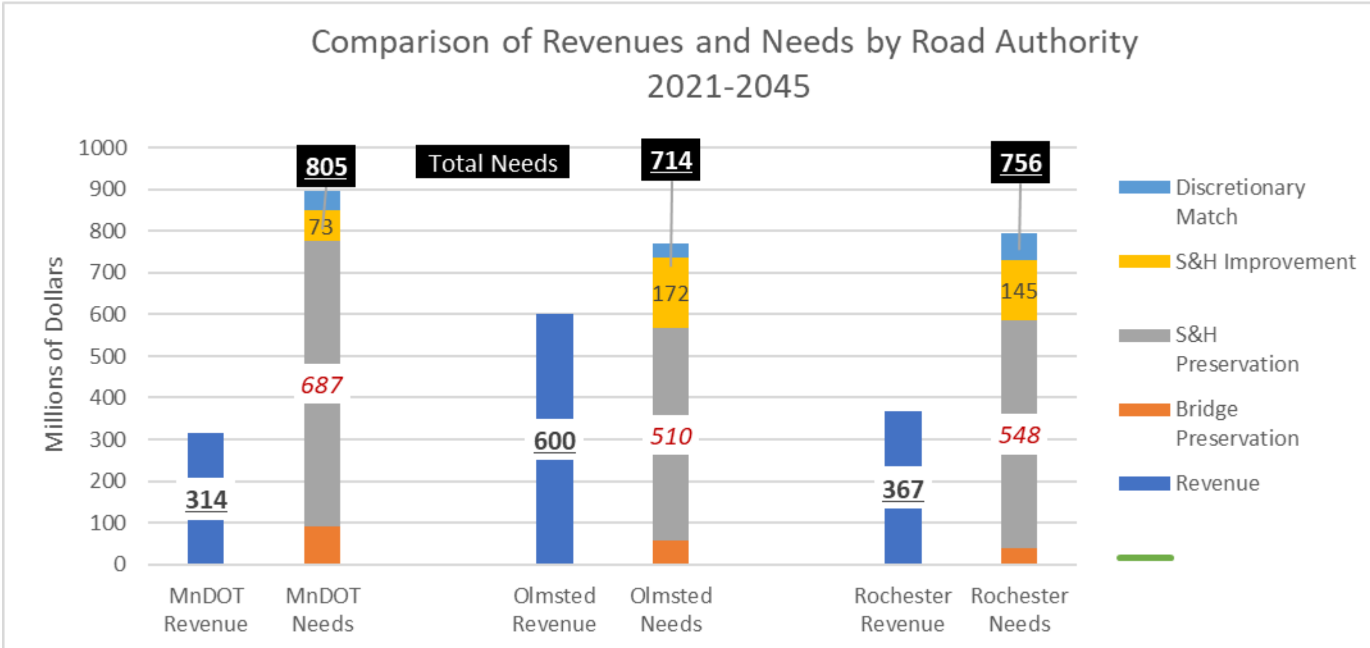
Under federal regulations, the LRTP is to include a financial plan that discusses system-level estimates of revenues anticipated to be available for investment and the cost of potential programs or projects. This information forms the basis of an analysis leading to a "fiscally constrained plan" that demonstrates the amount of investment that can be supported by historically available funding or potential new revenue sources for which there is high certainty of availability in the future.

In addition, the LRTP can discuss additional "illustrative projects" that are a priority for completion if additional funding can be secured.

Chapter 15 looks at the three major modes of highway travel, transit, and active transportation. From a cost perspective, the major system is the street and highway system, with MnDOT, Olmsted County, and the City of Rochester responsible for managing the major streets and highways network.

Figure 15-1 illustrates high-level results of the financial analysis completed for the street and highway network, showing for each agency the difference between estimated needs and revenues. MnDOT is expected to have approximately 40% of the funding that would be needed to fully fund all highway preservation and improvement work identified on state facilities. Olmsted County is estimated to have approximately 84% of the funding needed to fully fund all highway needs identified, and the City of Rochester is estimated to have about 50% of the funding needed to fully fund all highway needs identified. Olmsted County has fully phased in two new funding sources since the last ROCOG plan: a

Figure 15-1: Street and Highway System Comparison of Projected Revenues and Costs



Source: ROCOG

County wheelage tax and a ½ cent sales tax for transportation. A portion of the Olmsted County sales tax will be used to fund transit capital investment associated with the Destination Medical Center in downtown Rochester as part of the larger economic development package the State Legislature approved in 2014.

The County is directed to allocate approximately $48 million for transit purposes to support the DMC initiative. The City of Rochester was adversely affected in 2019 by a decision of the Minnesota Supreme Court which limits the fees that could be levied on development for off-site improvements. While the City of Rochester is working to fully understand the implications of this court ruling, it is exploring new avenues to raise revenue, including the levy of a utility right of way charge. The City is also considering instituting a sidewalk improvement district fee to fund preservation of non-motorized infrastructure.

Of the revenues illustrated in Figure 15-1, ROCOG has direct decision-making authority on the annual programming of only $2.3 million of federal Surface

Transportation Block Grant funds out of approximately $45 million in investment funded by the three road authorities. The local match for this federal funding, approximately $575,000 per year, represents about 1% of annually programmed funding and does not present a barrier to the City or County in terms of raising the necessary local match or diverting meaningful funding away from preservation work.

In light of demonstrated funding shortfalls, Chapter 15 includes a discussion of potential prioritization policies that could be considered when choices need to be made among major street projects, reflecting consideration of system, preservation, access, and mobility factors.

The financial environment for transit service has improved since the last ROCOG Plan update, as a result of meaningful changes the State Legislature made in 2016 to support transit through dedication of additional Motor Vehicle Sales revenue to transit operations throughout the state. The share of State operating funding for fixed route and paratransit service has allowed the City to keep fares relatively unchanged while service has expanded, since local revenue has needed to fill a smaller percentage share (though somewhat larger absolute share) of transit operating costs. Access to traditional FTA transit capital funding has allowed the City to expand its fleet and add transit infrastructure such as transit signal priority and new farebox control systems.

Looking forward, the City is moving into a new realm with proposed plans to provide BRT-type service under two different systems: one (Downtown Rapid Transit) focused on central area of Rochester and the other (the Primary Transit Network) envisioned to provide a network of high frequency, higher capacity BRT service in core travel corridors that serve many major city destinations and downtown. Development of Downtown Rapid Transit has been accepted into the federal Small Starts program as a candidate project as a means to fund the estimated $200 million cost. Operating costs for this system are expected to be funded through a new public/private partnership model Rochester is working on that would rely in part on traditional public sources but add to the mix significant private funding from the Mayo Medical Center and other potential users. The Primary Transit Network BRT service may also need to rely on Small Starts or other discretionary funding for capital and consider innovative funding models for operating costs.

Non-motorized travel (referred to as "active transportation" in this plan) has historically been challenged to fund major capital projects and that will likely remain the same in the future. Funding for capital projects requires creativity and flexibility, which is recognized in the analysis by the many different mechanisms assumed to support development of this infrastructure.

Introduction

Chapter 15 summarizes estimated revenues and costs associated with preserving and improving the network of transportation infrastructure and services throughout the ROCOG study area for a 25-year period. The following steps were completed in preparing this analysis for each mode of travel:

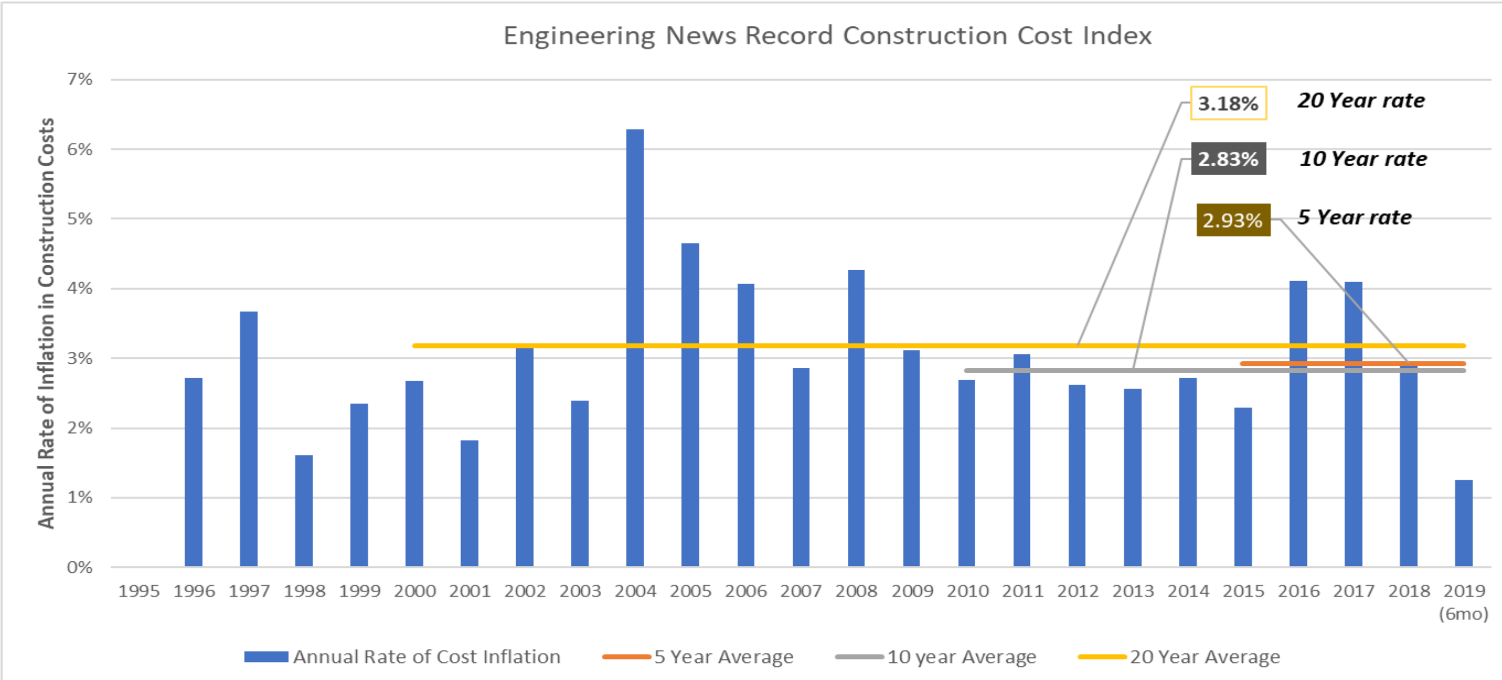
- A list of transportation needs was identified using input gathered from the public and community leaders, along with technical analysis completed by project staff.
- Typical costs for various types of system preservation and improvement activities were applied to identified needs. For preservation needs, a typical design life is assumed from which an aggregate annual average preservation cost could be calculated for the current networks or systems in place.

In terms of revenue, estimates of what would be available over a 25-year period from traditional funding sources were developed for each mode. For federal and state funds, this involved an analysis of information from various sources including past years of the State Transportation Improvement Program (STIP), the Statewide Highway Investment Plan 2018-2037 (SHIP), the MnDOT District 6 10-Year Capital Highway Investment Plan, and district level revenue forecasts generated by MnDOT Central Office. For Olmsted County and the City of Rochester, revenue estimation involved analysis of trends in federal aid, state aid, tax levy, other local sources, and private contribution revenues, which were then projected out for 25 years to match the horizon of the plan.

Current federal guidelines establish that the metropolitan transportation plan must use "Year of Expenditure (YOE) dollars", based on reasonable financial principles and information, to estimate future funding needs. For the purposes of this plan, ROCOG evaluated information from the Engineering News Record and MnDOT, reflecting local data tracked through the Minnesota Construction Cost Index in order to estimate an annual cost inflation rate. Figures 15-2 and Table 15-1 present trend data from these sources. While some fairly significant yearly swings in these indices were observed over time, an assumed 3% annual inflation rate was chosen as a representative annual value to reflect cost inflation.

On the revenue side, reasonable assumptions regarding the escalation of funding can be assumed for purposes of the Plan, but under federal guidelines, these assumptions must be based on a reasonable demonstration that such increases will be available. For the purposes of this analysis, federal and state aids to Olmsted County and Rochester have been estimated based on historical trends, while the tax levy share of local funding assumes that the historic % of tax levy funds devoted to transportation will remain constant but the tax base will

Figure 15-2: Trends in Engineering News Record Construction Cost Index



Source Data: Engineering News Record; Analysis: ROCOG

Table 15-1: Comparison of Historic Engineering News Record and Minnesota Construction Cost Index Percentage Growth Rates

Period	Engineering News Record CCI	Minnesota CCI (All Factor Composite)
5 Year Annual Average Change in Costs	2.93%	2.14%
10 Year Annual Average Change in Costs	2.83%	3.06%
20 Year Annual Average Change in Costs	3.18%	4.63%

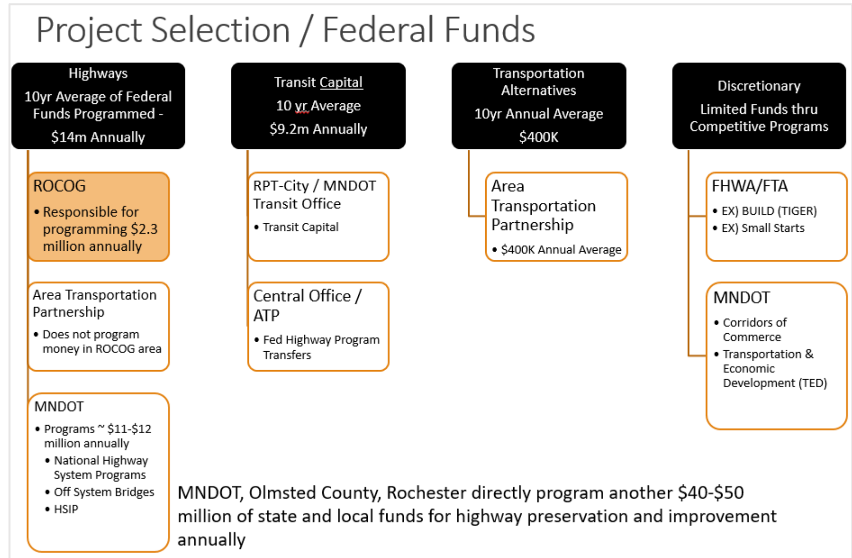
Source Data: Engineering News Record; Analysis: ROCOG grow in line with historic trends, resulting in a moderate growth of local funds available for transportation. A similar approach was applied to sources such as wheelage taxes and sales taxes where the base against which the tax is levied is expected to continue to grow over time.

Figure 15-3 provides a high-level overview of the major federal funding categories that have historically been available for programming in the ROCOG area, along with information on the entity which programs the funds. ROCOG has a limited role in programming of federal dollars, responsible for $2.3 million in Surface Transportation Block Grant dollars. Most non-discretionary federal funds are programmed through MnDOT at the Central Office or District level.

Street and Highway System Financial Assessment

This section of Chapter 15 focuses on the financial assessment of the major street and highway network in the ROCOG Planning Area. Three entities, MnDOT, Olmsted County, and the City of Rochester, are responsible for managing about 99% of the 617 mile non-local Functional Class System in Olmsted County, with the cities of Byron and Stewartville combined having about 5 miles, or slightly less than 1%, of the system under their jurisdiction. Byron and Stewartville streets on the system are all classified as minor collectors, which have a low probability of receiving funding; thus, they are not analyzed in the assessment.

Figure 15-3: Federal Funding Programming Responsibility



Source: ROCOG

Jurisdictional Revenue Assessment

For each road authority, a table is provided that summarizes the primary sources of funding expected to be available for street and highway capital investment.

MnDOT 2021-2045 Revenue Assumption

Table 15-2 summarizes the revenues that MnDOT expects to have available for highway investment in the ROCOG Planning Area for the next 25 years. This estimate relies on MnDOT source documents as noted in the table, with early periods using information found in the STIP and the 2018 District 6 Capital Highway Investment Plan (CHIP). For the out-years of the planning horizon, information from the MnDOT 20-Year State Highway Investment Plan (MnSHIP) is used to estimate available revenues that District 6 will have available for investment through 2045. ROCOG analyzed the program year from the last ten adopted STIPs (beginning with 2010-2014 through 2019-2023 reports) to assess the average percentage of districtwide STIP funding that has been programmed in the ROCOG area. From this analysis it was found on average that the ROCOG area received 12.85% of districtwide funding.

The out-year assumptions assume that federal funding to Minnesota will increase at a rate of 2.2% annually, and that formula funding from state revenue sources distributed through the State Highway Trust Fund will increase at a rate of 1.9% annually, based on technical information available from the MnDOT Central Office.

For the mid-term and long-term period, ROCOG adapted district-level revenue forecasts available from the MnSHIP and applied a share factor reflecting historic District 6 spending in the ROCOG area. The original analysis yielded an estimate of $283 million as the share of District 6 funding available for expenditure in the ROCOG area for the period 2029-2045.

Table 15-2: Estimate of Anticipated MnDOT Funding for Capital Improvements 2021-2045

Time Period	Estimated Revenue	Notes
Programmed in STIP	$22.9	STIP Figures adjusted to reflect only 2021-2023 ears. Since LRTP adoption occurs in 2020, 1st year of STIP is not part of "Plan"
Near Term (CHIP Projects for 2024-2028)	$63.2	This figure comes from the District 6 Ten Year Capital Highway Investment Plan (CHIP) for the five year period of 2024-2028
Mid Term	$116	This funding is based on information in the MNDOT 20 Year Statewide Transportation Plan which cover the period 2029 through 2037
Long Term	$111	This funding estimate is based on projecting revenue trends discussed in the Statewide 20 Year plan out to the Year 2045
TOTAL	$313.66	(Millions of dollars)
	$12.55	Annual Average (millions)

Figures shown are in millions of Dollars

Source: ROCOG Analysis of MnDOT Source Documents

MnDOT District 6 staff felt this estimate was too high and reflected the impact of one-time state bonding and special program dollars that had been directed into the district budget to complete ultra-high cost projects such as new crossings of the Mississippi River near Winona and La Crosse, which inflated District 6 spending levels in recent years.

District staff felt that going forward, funding levels would be more reflective of formula program resources available through the Highway User Trust Fund (HUTF) distribution and federal funds MnDOT receives and distributes to the district. As a result, the final estimate of available revenues totals $227 million for the period 2029-2045, a reduction of $56 million from the original estimate.

Olmsted County 2021-2045 Revenue Projections

Table 15-3 summarizes the revenues that Olmsted County expects to have available for investment in Olmsted County for the next 25 years.

Olmsted County has benefited from the establishment of new county-specific revenue sources in the last five years. Figure 15-4 illustrates the financial revenue impact expected from a County Wheelage tax authorized by the State Legislature in 2014; with continued growth in vehicle ownership population, this funding source is expected to grow from $1.3 to $1.6 annually.

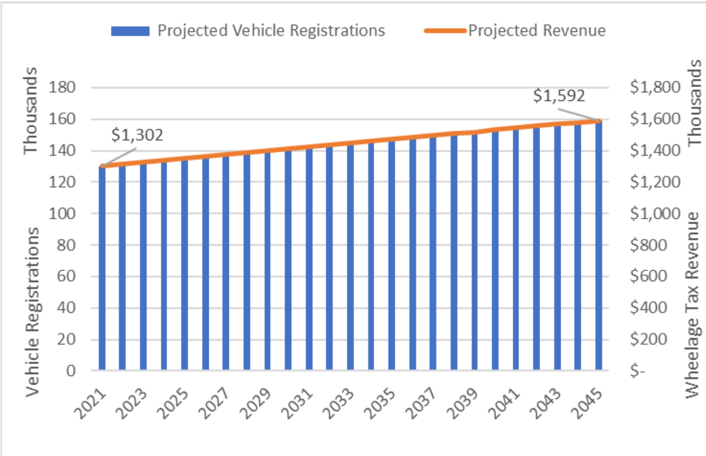
Figure 15-5 illustrates revenue that a ¼-cent sales tax will generate based on sales in Olmsted County. Olmsted County Commissioners approved two separate ¼-cent sale tax levies for transportation: one strictly for county transportation needs and a second to help fund transit investment spurred by the Destination Medical Center economic development initiative. The DMC transit sales tax will provide approximately $3 million per year for transit investment for 15-17 years, with remaining dollars available for other transportation purposes. Once Olmsted County has fulfilled its DMC transit contribution, the full revenue amount accrues to the County for highway use.

Table 15-3: Estimate of Olmsted County Funding for Capital Improvements 2021-2045

Revenue Source	Estimated Revenue	Notes
County State Aid Funding	$167.75	This figure represents 60% share of assumed state aid allotment; remaining 40% is dedicated to maintenance. Estimate reflects projected HUTF growth rate of 1.9% annual per SHIP.
Federal Aid for Highways	$40	Reflects actual 2021-2023 TIP funds programmed for Olmsted Count projects plus ½ of the annual ROCOG allocation, currently $2.3 million, adjusted for assumed growth rate in federal funding of 2.2% per year per SHIP.
State/Federal Bridge Bonding	$34.25	Bridge bonds are awarded through MNDOT Central Office; there is no annual allocation to District 6. Figure assumed is based on last 10 years of bridge bonding revenue realized.
2012 Rochester Sales Tax	$12	Remaining funding Olmsted County has from 2012 Rochester Sales Tax
County ¼ cent Sales Tax for Transportation	$175	Estimated based on application of ¼ cent tax rate to projected sales in Olmsted County through 2045. Assumes revenue will grow at 0.4% annually based on most recent 5-year growth trend in local sales (10-year trend of 2.55% not used due to surge in economic activity coming out of the Great Recession)
County ¼ cent DMC/Transit Sales Tax	$128	Partially will support DMC related Transit; amount shown remains after annual $3.1m contribution to DMC that will continue for 15 years.
County Wheelage Tax	$36.9	$10 per vehicle rate assumes continued growth in number of registered vehicle based on historic trends.
Other Local Funds	$6.25	Estimate of local City/Town contributions to County Road projects based on analysis of CIP revenues for 2015 through 2020
TOTAL	$600	(Millions of dollars)
	$24	Annual Average (millions)

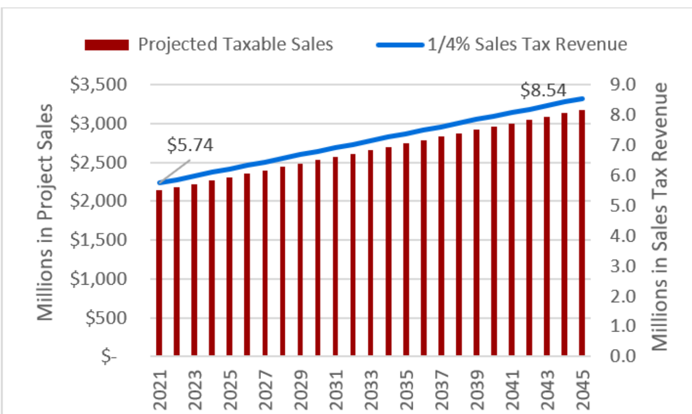
Source: ROCOG

Figure 15-4: County Wheelage Tax Revenue Impact



Source: Registration Data from MN Dept of Public Safety

Figure 15-5: Estimated Revenue from a ¼ cent Sales Tax Levy in Olmsted County



Source: Sales Data from MN Dept of Revenue

Rochester Future Revenue Profile

Table 15-4 summarizes the revenues the City of Rochester expects to have available for investment for the next 25 years.

The City of Rochester revenue profile was significantly impacted by the anticipated impact of a 2017 State Supreme Court ruling in a case involving the City of Woodbury. The Court found that charging transportation fees for off-site traffic impacts expected as the result of new development is not allowable under state statute. Woodbury had been charging fees in the form of Transportation Impact District charges and Substandard Street fees for a number of years to help fund improvement of collector and arterial road improvements necessitated in part by new development, and to help fund the cost of other improvements such as interchange access to major highways.

As a result of this adverse finding, expected private sector development contributions to transportation improvements is expected to drop by approximately $200 million over 25 years when compared to the last ROCOG Plan update. The City is pursuing avenues to replace a portion of these revenues for maintenance and preservation purposes, including a Private Utility Franchise Fee reflecting the value of utility use of the public right-of-way, and a Sidewalk Improvement District program which is authorized under state law. The City has also prioritized the adoption of state legislation that

Table 15-4: Estimate of Anticipated Rochester Funding for Capital Improvements 2021-2045

Revenue Source	Estimated Revenue	Notes
Municipal State Aid	$167.10	Assumes allocation will growth by 1.9% per year per assumption in the SHIP for growth in the HUTF. *Final figure assumes $1.2m of state aid funds are dedicated to maintenance purposes annually*
Federal Aid for Highways	$46.40	Reflects actual 2021-2023 TIP funds plus ½ of annual ROCOG allocation of $2.3 million, growing at 2.2% per year per SHIP Federal Funds growth rate
Tax Levy	$50	Based on discussion with city staff, $2 million annually in tax levy for road purposes was assumed.
Highway Turnback	$19	Reflects remaining funds available from MNDOT turnback of Trunk Highway 63 (Broadway Ave) to the city
DMC Funds (Share of General State Aid of $327m)	$42	Estimate based on analysis of Financial Plan from the 2014 DMC Development Plan. Reflects a share of $327m in General State Aid estimated for use strictly on road improvements
TOTAL/ Public	$324.5	(Millions of dollars)
Private & Utility Fund Contributions	$42	Based on analysis of funding sources included in Year 1 of annual CIP's for 2014-2020.
Overall Total	$367	(Millions of dollars)
	$14.6	Annual Average (millions)
REVENUE ENHANCEMENTS BEING CONSIDERED		
Utility Franchise Fee	$50	See discussion below
Sidewalk Improvement District	n.a.	See discussion below

Source: ROCOG

would authorize municipalities to establish Street Improvement Districts to fund maintenance of existing roadways in designated districts that could be established under such a law. The use of funds from any of these programs, if enacted, would be for the primary purpose of maintaining and preserving existing infrastructure. The availability of new funds for those purposes may help to free up some capital dollars now spent on reconstruction or pavement preservation for future improvement projects.

Jurisdictional Needs Assessment

This section reports the estimated costs of anticipated capital preservation and system improvements needs for the period 2021-2045 for the MnDOT, Olmsted County, and City of Rochester roadway systems. Unit cost values for preparing the estimates were derived from review of local project data for the last 5-7 years, along with reference and research material published by the Minnesota Local Road Research Board, MnDOT, the Wisconsin DOT and the FHWA HPMS program in publications such as the MnDOT 2018 Transportation Asset Management Plan. The analysis focuses on MnDOT, Olmsted County, and Rochester since these jurisdictions historically have been the only recipients of federal highway funding in the ROCOG planning area and are responsible for 99%+ of the major road system.

The infrastructure components evaluated for this assessment included:

- The roadway systems managed respectively by MnDOT, Olmsted County, and Rochester
- The network of bridges managed by MnDOT, Olmsted County, and Rochester
- Improvement needs identified by ROCOG based on review of multiple sources of data including:
    - Corridor and Subarea Studies that have been completed by the respective jurisdictions or other local partners which have been adopted or endorsed by local jurisdictions
    - Jurisdictional capital improvement programs (generally covering 4-5 years) and longer-term Capital Investment Plans which generally cover a 10-20-year period
    - The transportation elements of local jurisdictional comprehensive plans
    - Analysis conducted by ROCOG using current and projected 2045 AADT data as well as safety and operations data
    - Review of economic development needs, such as current truck routes and 9/10-ton routes, master plans for facilities such the Rochester International Airport, and programs such as the Destination Medical Center initiative

The identified improvement projects were reviewed with ROCOG's Transportation Technical Advisory Committee (TTAC) and Policy Board to gain concurrence on use of the list as a basis for assessing investment needs and the adequacy of revenues.

This analysis does not account for day to day operations or reactive maintenance activities, which typically are not considered capital improvements. This work includes activities such as snow and ice removal, street sweeping, pothole repair, and other general unscheduled maintenance activities. At the local level, these types of activities are generally funded using local property tax dollars. Spending needs can vary greatly year to year in response to weather conditions; local governments will tap other funds as needed to address short term risk resulting from major incidents caused by weather or other unforeseen incidents.

Capital Preservation Costs

For purposes of the Plan, a life cycle cost analysis was prepared reflecting the work needed to maintain a road or bridge structure in working condition over an extended period of years, generally stretching 50 to 70 years for roadways, 75 to 90 years for bridge structures, and 90 to 110 years for bridge culverts. Life cycle preservation was assumed to include the following types of activities:

- Minor surface preservation work such as periodic sealcoats on bituminous pavements and joint repair on concrete pavements along with crack filling on all roadways

- Mill & overlay of bituminous pavements every 15-20 years or one minor and one major concrete pavement restoration project over a 50-year life cycle
- Re-rocking of gravel roads once every 3 years (this applies only to Olmsted County)
- For bridges, preventative maintenance is assumed to include one deck replacement and two deck overlays during the 75-90-year life of a bridge
- For bridge culverts, preventative maintenance is assumed to include one pipe relining during the life of a structure
- For all bridges, major work to respond to specific issues such as erosion/scour repair, replacing culvert ends, etc. is typically done on an as-needed basis; based on information in the 2018 MnDOT Transportation Asset Management Plan, this type of work was estimated at an annual cost of 8 cents per square foot of structure

Existing structures eventually require reconstruction, which for purposes of the Plan will occur based on the assumed design life for each type of asset. Unit costs for road reconstruction are based on review of recent information from Rochester, Olmsted County, and MnDOT, and costs will differ depending on the type of pavement, type of traffic load, and location (rural vs urban) of the asset. Bridge replacement is assumed to cost $300 per square foot of structure in 2019 dollars.

Costs for culvert replacement ranges from $2500 to $10,000 per linear foot of barrel length, depending on locations and roadway function.

A Note on Design Life Assumptions

In prior ROCOG long range plans, a standard design life of 50 years was assumed for all road structures. Based on analysis of road system data provided by MnDOT, Olmsted County, and Rochester, and review and discussion of the analysis results with the ROCOG Technical Advisory Committee, the assumptions on design life were adjusted to reflect the reality of preservation investment in an era of constrained resources. In place of a standard 50-year design life, roadways were grouped in one of three categories, reflecting a 50, 60, or 70-year design life. The schedule of preservation activities during the life span of roadways assumed to have a 60 or 70-year design life were then adjusted to incorporate additional preservation such as an additional cycle of crack filling/seal coating and mill and overlay work to maintain pavement surface conditions during the additional years of service. The criteria used for assigning roadways a 50, 60, or 70-year design life are described in Table 15-5.

Roadway Improvement Costs

Roadway improvement cost categories include both high cost and lower costs project types including:

- construction of new roadways

- upgrading of existing roadways to include new lanes
- paving existing aggregate surfaced roadways to provide better functional service
- construction/reconstruction of interchanges or overpasses
- installation of intersection improvements such as signals, roundabouts or turn lanes
- lower cost rural pavement strengthening or shoulder improvement projects

An estimate of right-of-way acquisition costs has been built into project cost estimates to reflect land costs (but not business and relocation costs).

Note on Estimating Year of Expenditure Costs

Applying a 3% cost inflation factor to preservation and improvement projects presents an analysis challenge, particularly with regard to improvement projects, in that it suggests a determination needs to be made as to when a project may realistically occur. Unlike preservation and maintenance, where activity generally occurs year after year on a network-wide basis and the amount of work in any given year is roughly the same as prior years (similar to a zero-based budgeting approach) or increases at a steady rate over time, improvement or expansion of a road or bridge is a one-time expenditure. Assuming a project will occur in the first five years of the planning horizon versus the 25th year, for example, makes a major difference in how many "inflation-adjusted" dollars are needed to complete the project.

Table 15-5: Roadway Design Life Assignment Criteria

Design Life	Criteria
MnDOT Roads	(Design Life based on Functional Classification)
50-year	Interstates, FC of Freeways or Other Expressways, Other Urban Principal Arterials
60-Year	FC of Urban Minor Arterial, Rural Principal Arterial
70-Year	FC of Rural Minor Arterial, all Rural Collectors
Olmsted County	(Design Life based on land use context (urban vs rural) and AADT level
50-Year	All Roads urban or rural > 6000 AADT
60-Year	All Roads urban or rural 1500-6000 AADT; urban roads 500-1500 AADT
70-Year	All Rural roads < 1500 AADT;
Rochester	(Design Life based on land use context factors and Functional Classification)
50-Year	All streets in defined Central Business District; all streets with FC of Principal Arterial or Minor Arterial
60-Year	FC of Collector
70-Year	FC of Local Road

Source: ROCOG

For the purposes of completing the "Year of Expenditure" analysis in this plan, after estimating the program or project cost in base year 2019 dollars, an annual baseline cost was assigned to Year 1 of the cost analysis representing 1/25th of the project cost, with 1/25th of the program or project cost also assigned to each subsequent year through Year 25 of the analysis period, inflated by the 3% inflation factor for the appropriate number years that would have passed since Year 1. For example, if 1/25th of the project cost in Year 1 was $1000, the impact to the overall cost analysis would be $1305 in Year 10 and $2032 by Year 25 for that particular project based on the assumed 3% inflation rate.

The effect of this is to essentially smooth out the aggregate program/project revenue need over the planning period to create an annual average budget need reflecting inflation. This permits a total 25-year inflation-adjusted dollar need to be estimated as well as provides annual budget estimates in inflation-adjusted dollars, reflecting the assumption that the total annual program cost will somewhat level out over the 25-year time horizon of the Plan. This permits the total or annual budget need to be compared to the bottom-line numbers found in Tables 15-2 through 15-4, showing estimated total revenues and annual average revenue for MnDOT, Olmsted County, and Rochester.

Note on Improvement Categories

For the analysis of roadway improvement costs, all projects were grouped into one of eight project categories or three program categories that were referenced in Chapter 10 and are referenced in summary cost tables 15-5 through 15-7 for MnDOT, Olmsted County, and Rochester. Categories group similar projects together based on factors such as cost magnitude, functional importance, and type of project.

The categories for street and highway improvements, (projects described in more detail in Chapter 10) include:

1. **National Highway System Interchange Access** – projects involving major upgrades to existing interchanges or construction of new interchanges on the National Highway System.
2. **Regional Highway Access Management** – projects involve lower cost safety and mobility improvements on the State Highway System (including the NHS), including interim safety projects at certain locations included Category 1 (NHS Interchange Access) where the ultimate interchange project is of unknown timing.
3. **Regional Arterial Safety & Mobility** - projects include safety and mobility upgrades on regional arterials (typically County State Aid Highways) serving suburban areas around Rochester due to changes in traffic levels, access, and multi-modal demand on facilities built to standards of 40-50 years ago, with limited shoulder width, lack of intersection auxiliary lanes, substandard off-road recovery areas and other deficiencies.
4. **Urban Major Arterial Capacity & Mobility** - projects on gateway corridors serving downtown

Rochester that carry the highest volumes of traffic entering downtown and are expected to see greater multi-modal demand due to the important transit connectivity they provide to downtown and the focus on transit oriented development being planned along these corridors.

5. **Support Rochester Growth Management Plan** – projects generally on corridors designated as future arterials and primary collectors that lie within areas identified on the Rochester Growth Management Plan as areas for urban expansion through 2040; these corridors are typically legacy township roads not constructed to urban standards, often with a gravel surface.
6. **Support Economic Development** – projects generally found in business or multi-use districts that will improve service to those districts by filling in the street grid or upgrading road standards.
7. **Corridor Reliability/Traffic Management** – low cost projects designed to provide safety and traffic management benefits on arterials corridors.
8. **Rail Crossing Safety** – illustrative projects representing a placeholder for future rail crossing grade separation on important arterials should future conditions warrant.

Spot Safety/Corridor Enhancement Programs include the following subcategories of improvements in:

1. **Intersection Improvement Program** – projects involving arterial and collector street intersections where upgrades spanning from low cost (improved lighting, signage, striping) to high cost (signals, roundabouts) are anticipated through 2045 based on projected traffic growth and/or land development needs over the next two decades.
2. **10-Ton Network Improvement Program** – projects involving pavement strengthening to support 10-ton heavy commercial vehicle traffic. Routes identified based on criteria including connectivity to 10-ton routes in surrounding counties and the State 10-ton network, business areas with poor access to the 10-ton network, and traffic volume levels. A total of 42 miles are targeted for improvement.
3. **Regional Shoulder Enhancement Program** – projects involving surface or width improvements to existing regional highway shoulders, based on consideration of traffic volumes, shoulder surface, coincidence with 10-ton network and coincidence with the recommended Shoulder Bikeway Network. A total of 51 miles are targeted for improvement.
4. **MnDOT Safety Upgrade Program** – lower cost projects identified in the 2016 MnDOT District 6 Safety Plan aimed at reducing fatalities or serious injury by mitigating design features that contribute to lane departure, right angle, rear end, or failure to yield right of way crashes based on systematic

analysis of design features that demonstrably contribute to crash risk.

Projects in existing developed areas were assumed to have a higher priority than projects in future development areas, and projects reflecting lower cost traffic management measures were given higher priority for the near term than new construction or major capacity improvements.

Summary of Estimated Street and Highway Costs for Long Range Planning Horizon

Tables 15-6 thru 15-8 summarize estimated costs for MnDOT, Olmsted County, and Rochester based on the preservation needs and improvement discussed in Chapter 10. Costs are shown both in current dollars and YOE dollars, along with Year 1/Year 25 estimated revenue needs. Each table includes four blocks of data:

- Block 1 summarizes preservation costs for the street and bridge networks of the road authority.
- Block 2 summarizes estimated improvement costs based on improvement needs identified in Chapter 11.
- Block 3 clarifies the dollar amount of improvement needs associated with illustrative projects where the need for discretionary funding has been identified.
- Block 4 summarizes the net position of the road authority in terms of assessing what shares of needs can be met given the 25-year revenues estimated in Tables 15-2 through 15-4.

Following each table is a discussion of fiscal feasibility/fiscal constraint for each road authority.

Discussion of MnDOT District 6 Preservation and Improvement Costs & Revenues: 2021-2045

Preservation and improvement needs shown in Table 15-6 for the MnDOT system in the ROCOG area are expected to approach $800 million in YOE dollars over the next 25 years. Preservation needs drive these costs, accounting for 86% of the total need estimated. Included in projected system preservation needs is over $200 million in estimated backlog needs, which are roadways that have exceeded the 50/60/70-year design life that was assigned for purposes of the analysis.

Estimated revenue available to District 6 over the next 25 years is $314 million, representing only 39% of projected need. This will significantly limit the amount of investment that MnDOT can support. Based on review of the current 2020-2029 Capital Highway Investment Program (CHIP) and CHIP documents of the last 5 years, the District targets a high proportion of available investment dollars on continued pavement and bridge preservation, as the average CHIP preservation target over the last 3-5 years has been approximately 70%. A 70% level of investment would result in about $220

Table 15-6: MnDOT Cost Summary and Net Revenue/Cost Position 2021-2045

MnDOT District 6 Cost Summary & Revenue Comparison	Total Need (2019 Dollars)	Year 1	Year 25	Total Need (YOE Dollars)	NOTES	
ALL FIGURES IN MILLIONS OF DOLLARS						
Preservation						
Bridge Preservation	$61.5	$2.5	$5.0	$89.6		
Pavement Preservation					Estimate of Backlog	This Block Summarizes Preservation Costs
Bituminous Pavements	$33.8	$1.4	$2.7	$49.3	$2.3	
Concrete Pavements	$375.9	$15.0	$30.6	$548.2	$201.3	
Total Road Preservation	$409.7	$16.4	$33.3	$597.5	$0.0	
Total System Preservation	$471.1	$18.8	$38.3	$687.1	$203.5	
Improvements					Illustrative	
NHS Interchange Access	$42.2	$1.7	$3.4	$61.5	60% Discretionary	
Regional Highway Access Management	$22.7	$0.9	$1.8	$33.1	20% Discretionary	
Regional Arterial Safety/Mobility	$0.0	$0.0	$0.0	$0.0		This Block Summarizes Improvement Costs
Urban Major Arterial Capacity/Mobility	$0.0	$0.0	$0.0	$0.0		
Support Growth Management Plan	$0.0	$0.0	$0.0	$0.0		
Support Economic Development	$0.3	$0.0	$0.0	$0.4	5% Discretionary	
Corridor Reliability / Traffic Management	$1.8	$0.1	$0.1	$2.6		
Spot Safety / Corridor Enhancement	$9.7	$0.4	$0.8	$14.1		
Rail Crossing Safety	$1.9	$0.1	$0.2	$2.8	90% Discretionary	
Total Improvement Costs	$78.5	$3.1	$6.4	$114.4		
INFORMATION ONLY: Improvement needs w/o match for Discretionary Projects	$50.4	$2.0	$4.1	$73.5		Improvement costs w/o Discretionary Projects
INFORMATION ONLY: Jurisdictional Match Identified for Discretionary Funded Projects				$41.0		
Total Cost: Preservation and Improvements	**$549.6**	**$22.0**	**$44.7**	**$801.5**	% of Needs	Summary Data
Estimated MnDOT 25 Yr Revenues				**$313.7**	**39%**	
Net Position				($487.9)	that can be met	

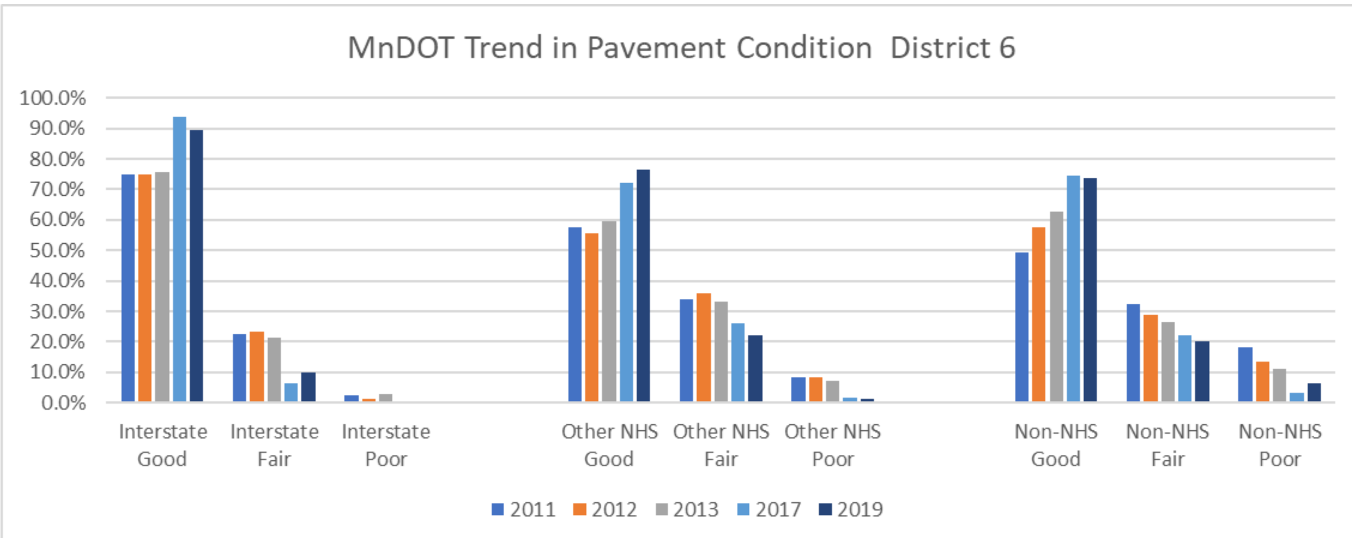
Source: ROCOG

million available for preservation, or about one-third of the identified need. As per the strategies listed in the 2020 Statewide CHIP, Interstate and other NHS pavements will be priorities, and in general the lowest cost preservation strategy that can effectively maintain pavement surface quality will be used. This approach has permitted District 6 to improve pavement quality over time on major road, as illustrated in Figure 15-6. Condition of pavements in the ROCOG area are typical of overall conditions found throughout District 6, as was shown in the discussion of performance outcomes in Chapter 9, Table 9-3.

While bridge investment needs represent only about 15% of the estimated system preservation needs, the charts in Figure 15-7 do identify an aging set of structures that will likely need attention during the time horizon of the plan. Structures rated as Fair or Worse are indicative of needs surfacing within a 10 to 20-year period, which is seen most noticeably with the bridge culvert inventory given the age profile of those structures.

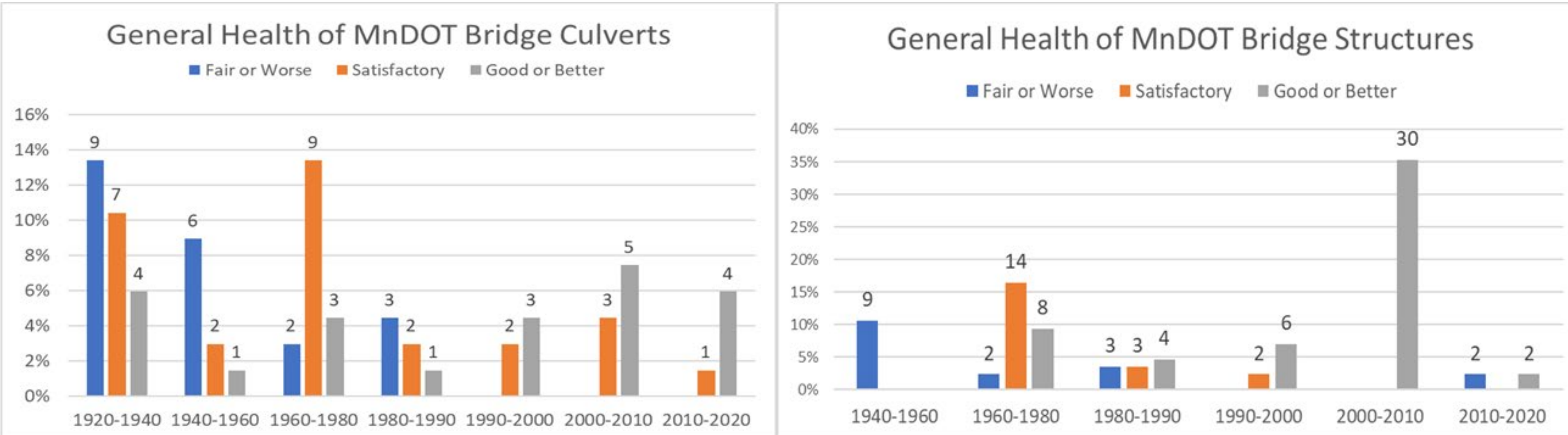
Looking at improvement needs, the largest share of costs included is in the NHS Interchange Access and Regional Highway Access Management categories. These categories are composed primarily of high cost ($20-$40

Figure 15-6: Trend in MnDOT Pavement Conditions since 2011



Source: MnDOT Office of Transportation System Management

Figure 15-7: Bridge Network on MNDOT System



Source: Data from MnDOT Bridge Office; Analysis by ROCOG

million) interchange or overpass projects on the NHS system. Given the revenue positions of all three road authorities, the expectation is that discretionary funding, such as from the Corridors of Commerce program, will be needed to complete these projects. A total of $131 million in supplemental funding is needed for a total of 9 projects. For these projects, a local share of 10-30% is reflected in the third block of the Cost Summary (Table 15-6). MnDOT District 6 is assigned $41 million in local share costs for these 9 projects, but that amount could be reduced if a higher level of grant funding is secured.

The remainder of improvement needs in Table 15-6 reflect costs for:

- Programmed interchanges such as I-90/TH 52
- Access management such as future frontage roads along TH 63 south of Rochester identified in the TH 63/Rochester Airport Corridor Study
- Low cost safety and traffic management projects, such as those identified in the 2016 District 6 Safety Plan; a total of $14 million in need is identified, and projects are likely candidates for funding through targets set in the CHIP for roadside infrastructure or traveler safety

Discussion of Olmsted County Preservation and Improvement Costs & Revenues: 2021-2045

Preservation and improvement needs shown in Table 15-7 on the Olmsted County roadway system are expected to approach $710 million ($YOE) over the next 25 years,

Table 15-7: Olmsted County Cost Summary and Net Revenue/Cost Position 2021-2045

Olmsted County District 6 Cost Summary & Revenue Comparison	Total Need (2019 Dollars)	Year 1	Year 25	Total Need (YOE Dollars)	NOTES
ALL FIGURES IN MILLIONS OF DOLLARS					
Preservation					
Bridge Preservation	$38.4	$1.5	$3.1	$56.0	
Pavement Preservation					Estimate of Backlog
Bituminous Pavements	$172.3	$6.9	$14.0	$251.3	$67.2
Concrete Pavements	$138.8	$5.6	$11.3	$202.4	$10.9
Total Road Preservation	$311.1	$12.4	$25.3	$453.7	$78.1
Total System Preservation	$349.5	$14.0	$28.4	$509.8	$78.1
Improvements					Illustrative
NHS Interchange Access	$26.7	$1.1	$2.2	$38.9	60% Discretionary
Regional Highway Access Management	$15.9	$0.6	$1.3	$23.2	20% Discretionary
Regional Arterial Safety/Mobility	$39.7	$1.6	$3.2	$57.9	
Urban Major Arterial Capacity/Mobility	$0.4	$0.0	$0.0	$0.6	
Support Growth Management Plan	$35.7	$1.4	$2.9	$52.0	
Support Economic Development	$0.0	$0.0	$0.0	$0.0	5% Discretionary
Corridor Reliability / Traffic Management	$0.3	$0.0	$0.0	$0.4	
Spot Safety / Corridor Enhancement	$17.0	$0.7	$1.4	$24.7	
Rail Crossing Safety	$1.5	$0.1	$0.1	$2.2	90% Discretionary
Total Improvement Costs	$137.1	$5.5	$11.1	$200.0	
INFORMATION ONLY: Improvement needs w/o match for Discretionary Funded Projects	$115.1	$4.6	$9.4	$167.9	
INFORMATION ONLY: Jurisdictional Match Identified for Discretionary Funded Projects				$32.1	
Total Cost: Preservation and Improvements	$486.7	$19.5	$39.6	$709.7	% of Needs
Estimated Olmsted Co 25 Yr Revenues				$600.0	**85%**
Net Position				($109.7)	that can be met

This Block Summarizes Preservation Costs

This Block Summarizes Improvement Costs

Improvement costs w/o Discretionary Projects

Summary Data

Source: ROCOG

with system preservation driving the majority of costs at approximately 72% of the total need estimated. Included in the estimated system preservation need is an estimated $78 million in backlog needs, which are roadways that have exceeded their 50/60/70-year design life that was assigned for purposes of the analysis.

The estimated revenue available to Olmsted County over the next 25 years is $600 million, representing about 84% of overall projected need. This level of revenue would permit the County to meet its preservation needs while having sufficient revenue available to meet about 45% of improvement needs over the planning horizon. Olmsted County will participate in some of the projects targeted for discretionary funding identified in Chapter 10, which have a total cost of $145 million and a local share of up to $32 million. As with MnDOT, this amount could be reduced if a higher level of grant funding is secured.

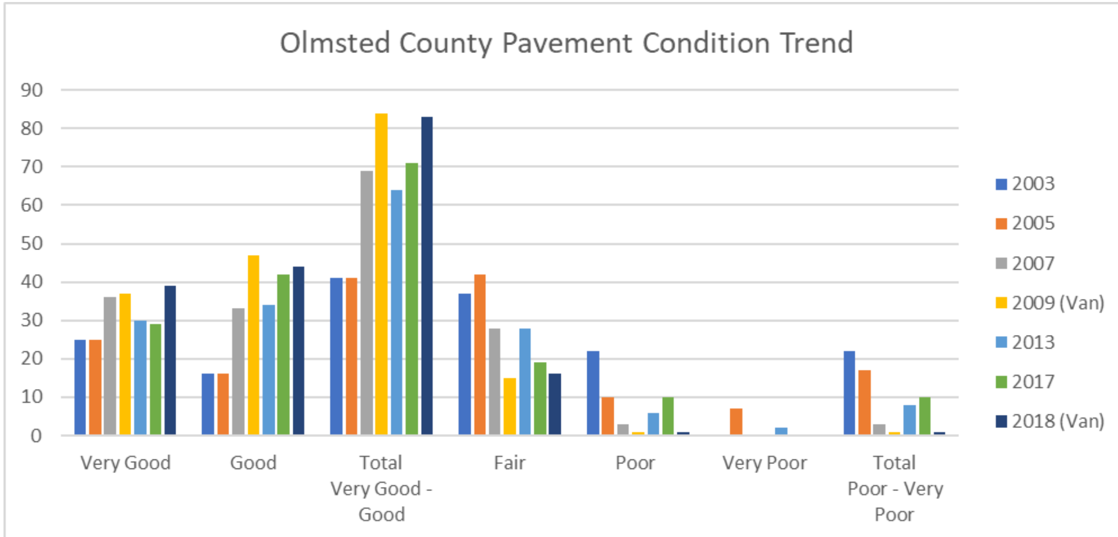
The level of revenue estimated to be available to Olmsted County should permit them to meet most of their preservation needs and maintain pavement quality at a similar level as today. As seen in Figure 15-8, Olmsted County has improved overall network pavement quality in the last 15-20 years, raising the share of miles in good or very good condition to over 70%. Of the roads not at this level, most are very low volume (<1500 AADT) rural roads serving very low-density rural areas.

Figure 15-9 illustrates that the County Bridge Network is likely to need only a moderate level of investment going forward. Most bridge and bridge culvert structures are rated in Good or Better condition and unlikely to need replacement over the next two decades. The chart for bridges in Figure 15-9 suggests there is a subset of bridges dating to the 1960-1980 period which, given their age, may need attention during the second half of the plan horizon. Structure ratings of Satisfactory or Fair, coupled with an age of 40 to 60 years, are indicative of potential bridge rehab needs surfacing in a 10 to 20-year period.

In terms of improvement needs, most of the projects in in the NHS Interchange Access and Regional Highway Access Management categories are tagged as illustrative projects in need of discretionary funding in order to move forward. The $32 million shown in Block 3 of Table 15-7 as jurisdictional match for discretionary projects could be reduced further if a higher level of grant funding is secured.

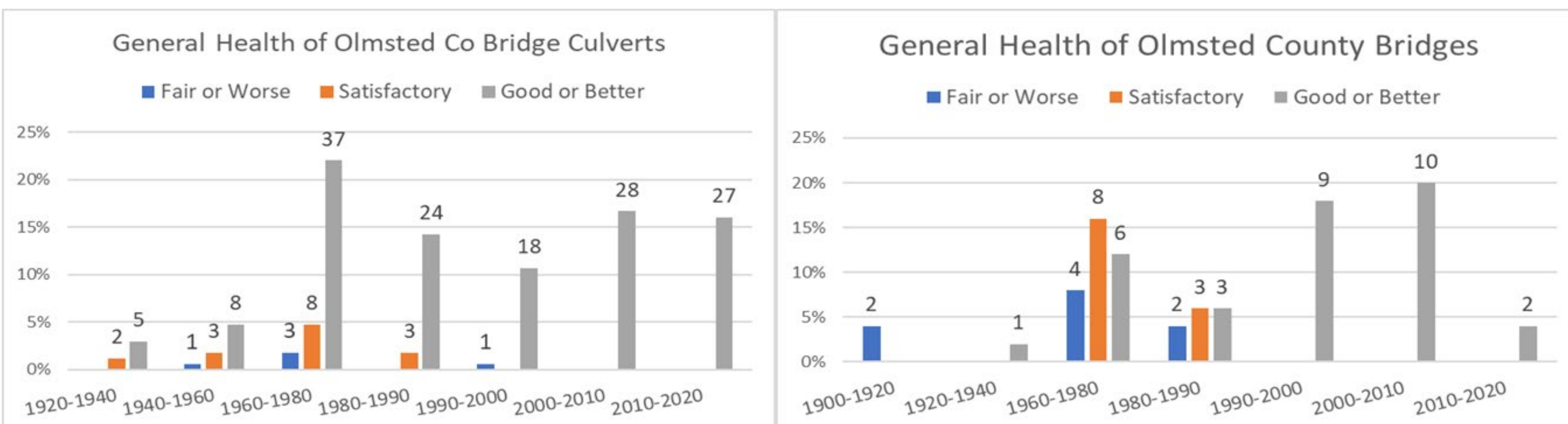
Other major improvement cost categories for Olmsted County include regional arterial safety/mobility, support for growth management plan and spot safety/corridor enhancement needs. History has shown that not all growth management or spot safety needs will likely be realized over the horizon of the plan, though specifying which individual projects will occur is difficult as it

Figure 15-8: Trend in MnDOT Pavement Conditions since 2011



Source: Olmsted County Public Works Department

Figure 15-9: Bridge Network on Olmsted County System



Source: Data from MnDOT Bridge Office, Analysis by ROCOG depends on the scale and location of growth the city of Rochester experiences. Assuming that about 50% of improvement needs for regional arterials, spot safety and growth management are needed, along with a higher realized level of grant funding (reducing local share on discretionary projects) and some delay of preservation work on low volume roads suggests that Olmsted County is in a fiscally constrained position.

Discussion of Rochester Preservation and Improvement Costs & Revenues: 2021-2045

Preservation and improvement needs, as shown in Table 15-8 on the Rochester system, are expected to approach $756 million (YOE dollars) over the next 25 years, with system preservation driving the majority of costs at approximately 72% of the total need estimated. Included in the estimated system preservation need is over $139 million in estimated backlog needs, which are roadways that have exceeded their respective 50/60/70-year design life that was assigned for purposes of the analysis. Note that 71% of the lane miles in the Rochester street system are accounted for by local streets in neighborhoods or business areas, which experience low traffic volumes. These may be amenable, given a shortfall in funding, to extended maintenance and preservation program activities short of reconstruction after their 70-year design life has been exceeded, thus reducing the fiscal cost of street preservation.

The estimated revenue available to Rochester over the next 25 years is $367 million, representing approximately 50% of projected need. In the previous ROCOG Plan, city revenues were approximately $200 million higher due to the expectation of development fees related to off-site traffic operations and management improvement, such as signals and turn lanes, and substandard street fees to contribute to upgrading of local roads to arterial or collector function in areas of new development. A recent Minnesota Supreme Court case determined cities could not collect such fees for off-site improvements at the time of development. Other court cases tightened benefit determination rules applicable to special assessments, which has also limited the amount of revenue cities can collect from property owners abutting projects.

Despite the funding constraints, the City has been able to maintain pavement conditions at reasonable levels given current revenues. Figure 15-10 illustrates the trend in pavement conditions over the last 10 years. The City has been able to maintain 80-90% of streets at a pavement surface quality of Good or Very Good, with approximately 10% at a level of Fair and less than 2% Poor.

Rochester has only 47 bridges under its control, including 24 bridge culverts and 23 bridges. Bridge preservation needs are estimated at less than 7% of overall system preservation needs, so the impact of bridge costs is a relatively minor factor in the fiscal assessment.

Table 15-8: Rochester Cost Summary and Net Revenue/Cost Position 2021-2045

Rochester Cost Summary & Revenue Comparison	Total Need (2019 Dollars)	Year 1	Year 25	Total Need (YOE Dollars)	NOTES
ALL FIGURES IN MILLIONS OF DOLLARS					
Preservation					
Bridge Preservation	$26.0	$1.0	$2.1	$37.9	
Pavement Preservation					Estimate of Backlog
Bituminous Pavements	$291.2	$11.6	$23.7	$424.7	$114.3
Concrete Pavements	$58.9	$2.4	$4.8	$85.8	$25.2
Total Road Preservation	$350.1	$14.0	$28.5	$510.6	$139.5
Total System Preservation	$376.1	$15.0	$30.6	$548.5	$139.5
Improvements					Illustrative
NHS Interchange Access	$7.7	$0.3	$0.6	$11.2	70% Discretionary
Regional Highway Access Management	$2.6	$0.1	$0.2	$3.7	
Regional Arterial Safety/Mobility	$0.4	$0.0	$0.0	$0.5	
Urban Major Arterial Capacity/Mobility	$42.0	$1.7	$3.4	$61.2	30% Discretionary
Support Growth Management Plan	$39.4	$1.6	$3.2	$57.4	
Support Economic Development	$41.5	$1.7	$3.4	$60.4	5% Discretionary
Corridor Reliability / Traffic Management	$0.3	$0.0	$0.0	$0.4	
Spot Safety / Corridor Enhancement	$7.6	$0.3	$0.6	$11.0	
Rail Crossing Safety	$1.2	$0.0	$0.1	$1.8	80% Discretionary
Total Improvement Costs	$142.4	$5.7	$11.6	$207.7	
INFORMATION ONLY: Improvement needs w/o match for Discretionary Funded Projects	$99.5	$4.0	$8.1	$145.1	
INFORMATION ONLY: Jurisdictional Match Identified for Discretionary Funded Projects				$62.6	
Total Cost: Preservation and Improvements	$518.5	$20.7	$42.2	$756.1	% of Needs
Estimated Rochester 25 Yr Revenues				$367.0	49%
Net Position				($389.1)	that can be met

This Block Summarizes Preservation Costs

This Block Summarizes Improvement Costs

Improvement costs w/o Discretionary Projects

Summary Data

Source: ROCOG

To help address the shortfall in funding for road preservation, the City is exploring options for raising additional revenue. A utility charge for the use of right-of-way by private utilities is being considered, which could raise $2-$3 million annually for road preservation. The City is also working with likeminded communities at the State Legislature to advocate for the ability to establish Street Improvement Districts as an alternative mechanism to raise dollars for maintenance.

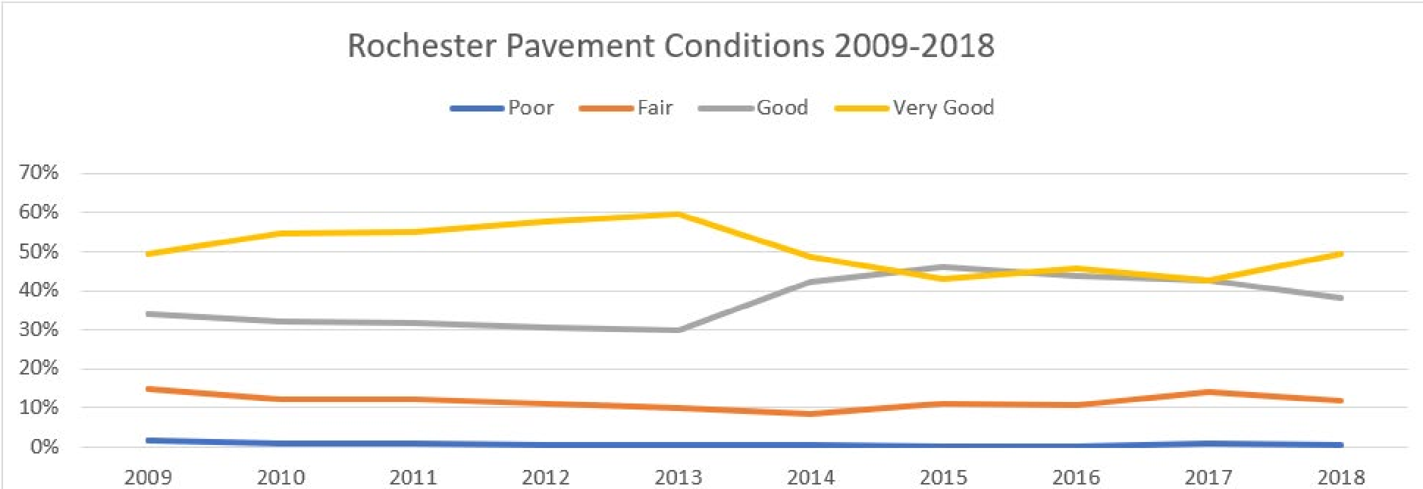
Turning to improvement needs, it is estimated that the City could potentially need up to $207 million for improvements over the horizon of the plan. About 30% of this amount is accounted for by assumptions regarding the local share the City would contribute towards future illustrative projects to be funded with discretionary grant dollars. The majority of the remaining dollar needs identified accrue in the categories of Supporting the Growth Management Plan, Supporting Economic Development, and capacity/mobility enhancement of the Major Urban Strategic Arterials that serve as the main gateways to downtown Rochester.

As with Olmsted County, not all growth management needs are expected to be necessarily during the horizon of the Plan and will be dependent on the scale and direction of urban growth over the next 25 years. Projects supporting economic development are a mix of improvements that would enhance connectiveness of the urban street grid in business areas and would be desirable projects but could be delayed if necessary if funding was not available.

Capacity and mobility enhancement on major urban arterials will be important to provide necessary travel capacity in and out of downtown; per the Destination Medical Center and Downtown Mobility Plans, these improvements are expected to benefit multi-modal travel, particularly transit, and accommodate shifts in traffic due to implementation of transit priority lanes. This work is expected to be supported partially by discretionary grant dollars, and also by dollars from the DMC Economic Development Authority. Grant and DMC dollars are expected to provide about 55% of needed funding, so it will be important for the city to be able to leverage these funds at about a 1:1 ratio with an estimated $41 million if all the major urban strategic arterials are implemented.

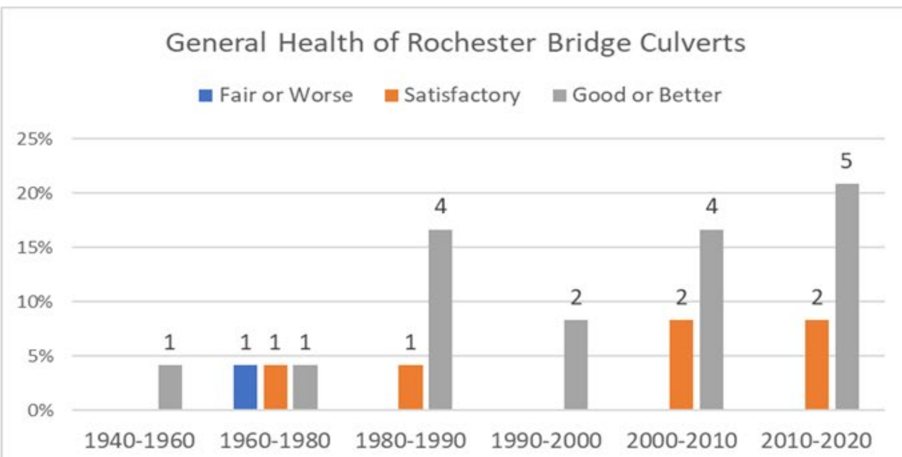
In terms of fiscal constraint, a likely scenario for the City is to devote approximately 75% of current revenues to preservation, which would fund about 50% of estimated preservation needs. 100% of major streets and bridge preservation needs could be funded under this scenario, with approximately 35-40% of local street preservation needs being met. Reconstruction of local streets at the end of their design life would be delayed in lieu of low-cost pavement surface maintenance, similar to what occurs now. Any additional revenue sources expand the preservation effort on local streets or could allow for some shifting of dollars to improvement needs.

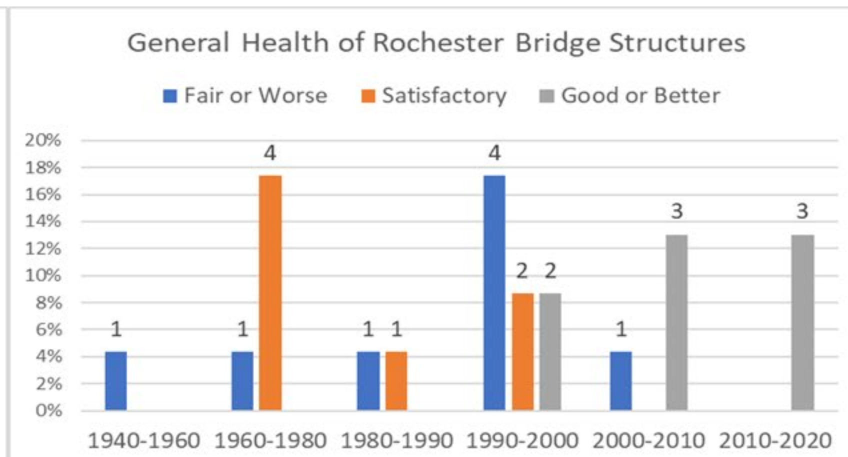
Figure 15-10: Trend in Rochester Pavement Conditions Since 2011



Source: Rochester Public Works Department

Figure 15-11: Bridge Network on Rochester Street System





Source: Data from MnDOT Bridge Office; Analysis by ROCOG

In regard to improvement needs, under the 75% maintenance scenario, approximately 40-45% of improvement needs could be met. Most importantly, the local match on all projects flagged as illustrative and dependent on discretionary could be provided, but that would be at the expense of growth management and economic development needs. In the likely scenario that possibly 50% of discretionary funding is realized, about $60 million in improvements needs could be met, which would represent 40% of improvement needs. Approximately $42 million in dedicated DMC funds and $28 million in private funds are assumed, which would raise the overall level of improvement needs that could be funded to about 60-65%.

Operating Costs for Road Agencies

Operating costs for road agencies include a range of day-to-day activities necessary for keeping the road network functioning for daily travel. It includes activities such as snow and ice control, street sweeping, emergency repairs, and clean-up due to events such as flooding or spring pothole repairs. For the most part, these activities are conducted by in-house staff and are treated as a current expense (as opposed to a capital expense) for financial purposes. The following sections discuss operations for Rochester, Olmsted County, and MnDOT.

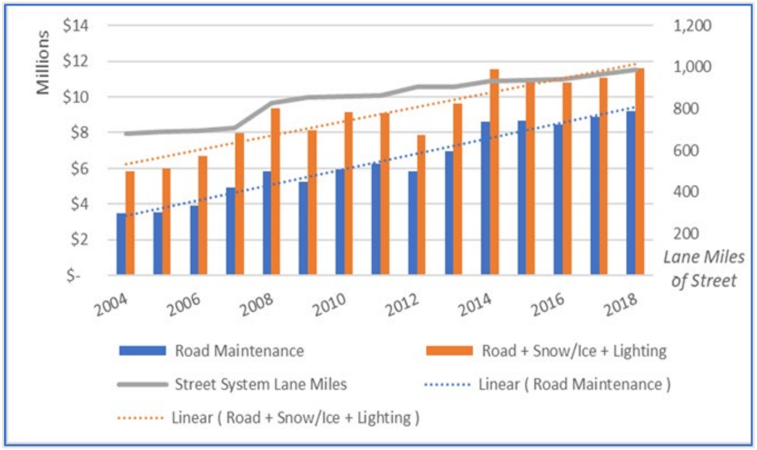
Rochester Street Operations

As shown in Figure 15-12, street operation costs for the City of Rochester have grown over the last 15 years from approximately $5.8 million in 2004 to $11.6 million in 2018, an annual increase of approximately 4%. This cost is composed of three elements, including street and highway maintenance, snow and ice control, and street lighting. Street and highway maintenance accounts for the largest share of expenses, growing from 60% of costs in 2004 to 80% of costs in 2018 as costs for lighting and snow/ice control have grown only nominally over the time period.

The increase in costs for street and highway maintenance are influenced by multiple factors, the most important being the growth in street mileage along with inflationary changes in prices and labor costs. As illustrated in Figure 15-12, during the 2004-2018 period the Rochester road system has grown by 2.9% annually, from 647 lane miles in 2004 to 988 lane miles in 2018.

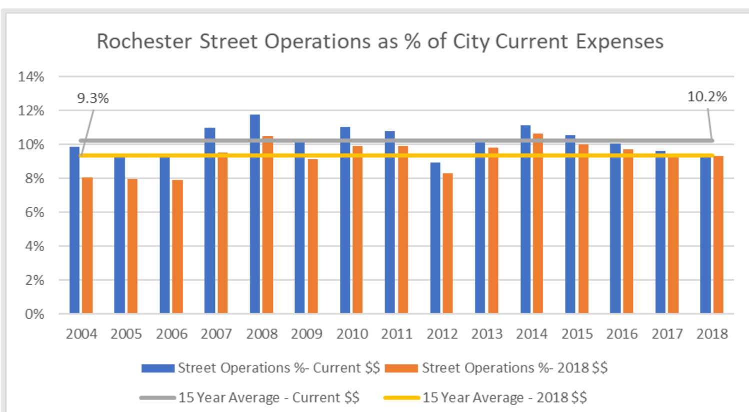
When viewed from the perspective of budgetary impact, street operations have been a fairly steady item in the City's current expense ledger as shown in Figure 15-13. The street operations share of current city operating expenses has varied from a low of 8.9% to a high of 11.7%, averaging 10.2% in current dollars and 9.3% inflation-adjusted dollars over the 2004-2018 period.

Figure 15-12: Cost of Street Operations – Rochester



Source: Data from Minnesota State Auditor Annual City Finances Reports

Figure 15-13: Budgetary Impact of Street Operations



Source: Data from Minnesota State Auditor Annual City Finances Reports

Figure 15-14 illustrates street operations cost per mile in both current dollars and inflation-adjusted dollars. Current dollar costs have risen from $8,527 to $11,768 per lane mile over the 15-year period, an annual increase of 2.2%.

Figure 15-14: Cost Per Mile for Street Operations

Source: ROCOG Analysis

Looking forward, ROCOG estimates that for the period of 2021 to 2045 Rochester will need approximately $438 million in revenue to pay for street operations based on projections of past cost trends. From a 2018 annual cost of $11.6 million, it is projected that annual costs in 2045 would be approximately $22 million. This represents a 2.3% annual increase in costs.

The City devotes a base share of $2 million annually in Municipal State Aid funding to street maintenance, which currently accounts for about 16% of costs. The remainder of funding will come from local city tax revenue, as it has historically. Table 15-9 lists the primary sources of city tax revenue and the realized growth rate in these tax sources over the 2004-2018 period, along with the annual growth rate in taxable market value, which is the base on which property taxes are calculated.

Table 15-9: Rochester Tax Revenue Growth

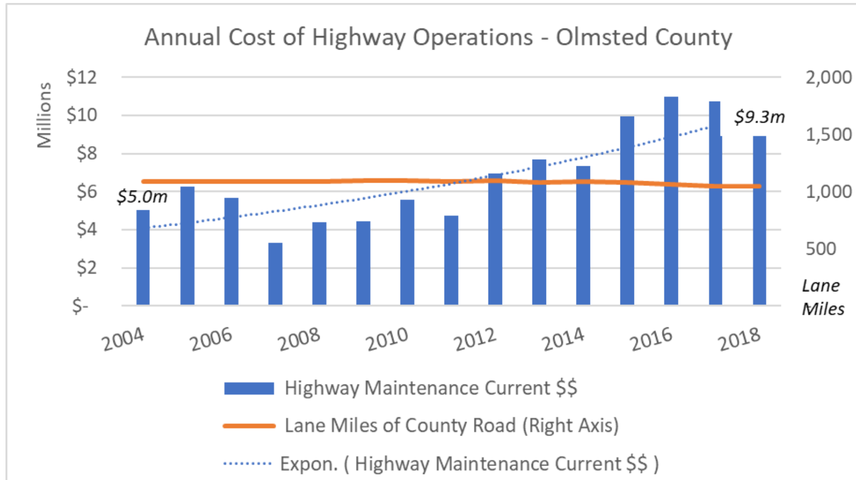
Tax Source	Annual Growth Rate 2004-2018
Property Tax	13.6%
Local Sales Tax	9.4%
Non-Property Tax	19.4%
*Taxable Market Value	6.9%

ROCOG has projected population and household growth of 40% for the period through 2045 for Rochester, slightly lower than growth seen in the last 25 years but still significant, along with continued growth in visitor traffic fueled by increases in Mayo Clinic patient numbers. As a result, ROCOG expects tax revenue and taxable market value for Rochester will continue to grow, and that adequate revenue will be available to fund street operations even accounting for the projected 2.3% annual increase in costs.

Olmsted County Operations

As shown in Figure 15-15, costs for highway operations for Olmsted County have grown from approximately $5 million in 2004 to $9.3 million in 2018, an annual increase of 5% in current dollar costs. The increase in costs for street and highway maintenance are influenced by multiple factors, the most important being inflationary changes in prices and labor costs. The size of the Olmsted County highway network has remained fairly constant, declining from 521 centerline miles to 500 miles between 2004 and 2018, although it is expected the system will grow back to its prior size as banked

Figure 15-15: Cost of Highway Operations

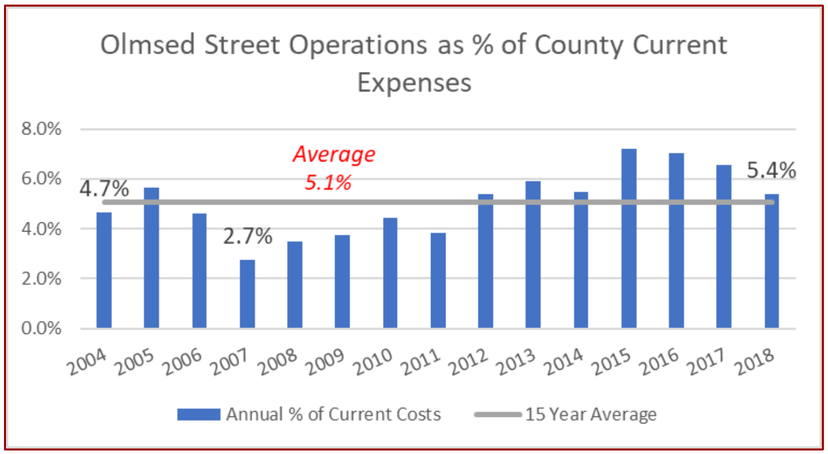


Source: Minnesota State Auditor Annual County Finances Report

County State Aid mileage from highway turnbacks is reassigned.

When viewed from the perspective of budgetary impact, highway operations have been a fairly steady item in the County's current expense ledger as shown in Figure 15-16. Highway operations have on average been 5.1% of the County's current city operating expenses, varying from a low of 2.7% to a high of 7.2%. During the period of the Great Recession, costs ran noticeably below average. But since 2012, the range of annual costs has been in a much narrower band, varying by only 1.8%.

Figure 15-16: County Budget Impact for Road Operations



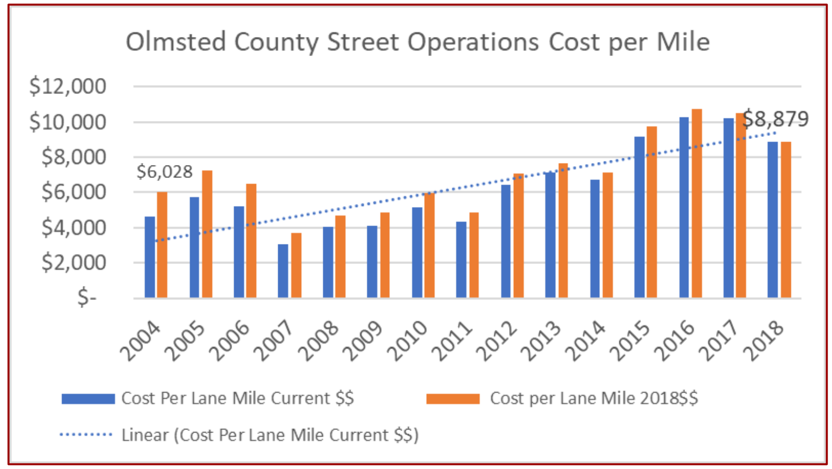
Source: Minnesota State Auditor Annual County Finances Report

Figure 15-17 illustrates street operations cost per mile in both current dollars and inflation-adjusted dollars.

Current dollar costs have risen from $4625 to $8900 per lane mile over the 15-year period, an annual increase of 4.8%, while in inflation adjusted terms costs have risen by 2.8% annually.

Looking forward, ROCOG estimates Olmsted County will need approximately $405 million in revenue to pay for operations based on past trends, with annual cost rising from $9.3 million $21 million in 2045, which represents a 2.7% annual increase in costs.

Figure 15-17: Highway Operations Cost per Mile – Olmsted County



Source: ROCOG Analysis

The County receives an annual maintenance allocation from the County State Aid Highway programs which in 2019 equaled approximately $3.4 million. This will typically fund a portion of operations costs. The remainder of funding comes primarily from locally raised tax revenue.

Table 15-10 lists the primary sources of tax revenue Olmsted County collects and the realized growth rate in these tax sources over the 2004-2018 period, along with the annual growth rate in taxable market value, which is the base on which property taxes are calculated. Note that sales taxes for transportation and wheelage taxes were only collected beginning in 2014, and that sales tax collections were phased in—the 36% is not reflective of long-term growth prospects. ROCOG expects long term sales tax growth would mirror closely the rate reported for Rochester in Table 15-9, which was 9.4% annual growth

Table 15-10: Olmsted Tax Revenue Growth

Tax Source	Annual Growth Rate 2004-2018
Property Tax	8.1%
Transportation Sales Tax *(see narrative for explanation)*	36%
Wheelage Tax	3.5%
*Taxable Market Value	7.5%

*Taxable Market Value is not a tax revenue tool but the base on which property tax is calculated

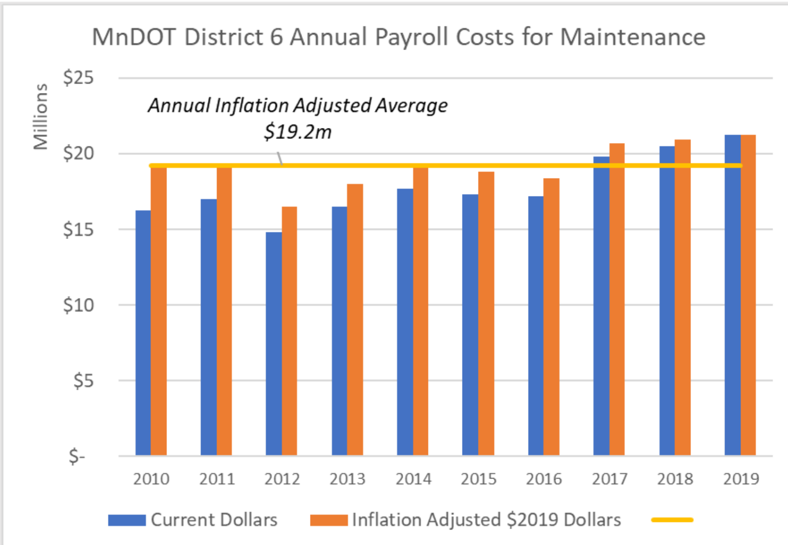
ROCOG has projected population and household growth of approximately 40% for the period through 2045 for Olmsted County, slightly lower than growth seen in the last 25 years but still significant. Transportation sales tax and wheelage tax collections are also expected to continue to grow, as discussed earlier in this chapter. As a result, ROCOG expects tax revenue and taxable market value for Olmsted County will continue to grow, and that adequate revenue will be available to fund street operations even accounting for the projected 2.7% annual increase in costs.

MnDOT Highway Operations

MnDOT District 6 maintains 825 miles of Interstate highway, 3670 lane miles of trunk highway, and 877 bridges in District 6. The district on average has spent $19.2 million on payroll (Figure 15-18) and $12.2 million on non-payroll items in inflation-adjusted dollars for maintenance over the period 2010-2019. Payroll costs have varied in a band from a low of $16 million to $21 million annually; non-payroll costs have varied more significantly from $7.7 million to $16.7 million annually.

Using linear projections based on historic data, ROCOG estimates MnDOT will need $735 million for payroll costs for the 2021-2045 period, reflecting 2.1% annual growth. To project non-payroll costs, given the wide variation in historic costs, ROCOG used the annual inflation-adjusted average cost of $12.2 million from Figure 15-19, adjusted

Figure 15-18: MnDOT Payroll Costs for Operations



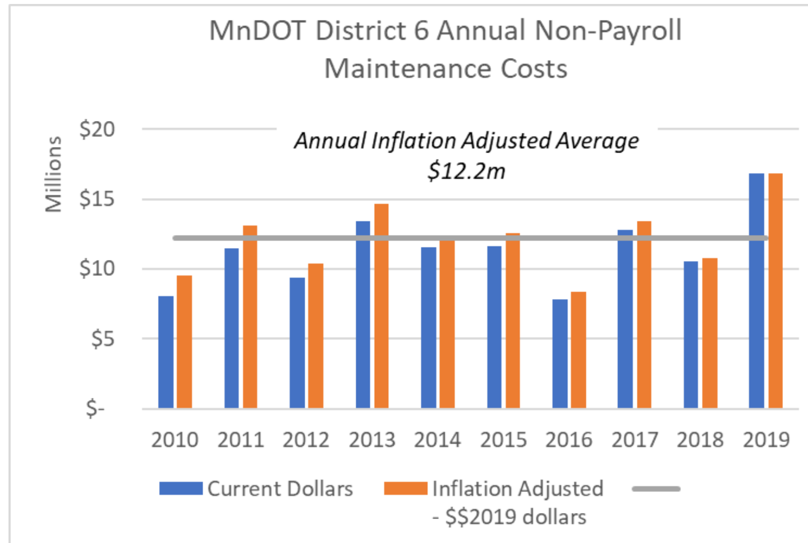
Source: Data from MnDOT Report on Dedicated Fund Expenditures, Various Years

for future inflation of 2.3%, to project District 6 will need $415 million in funding for non-payroll items. The annual growth rates are in line with latest MnSHIP assumptions, which assumes the Highway Trust Fund (HTF) will grow at 2.2% annually. Since the HTF funds 97-98% of maintenance costs, it is the best proxy for future funds.

ROCOG Programming of Federal Funding and Fiscal Constraint

ROCOG estimates that the ROCOG Planning Area receives on average approximately $16 million in federal highway investment annually. As shown in Table 15-9, ROCOG is responsible for programming only $2.3 million of Surface Transportation Block Grant dollars. With an assumed 20% local match, this provides $2.875 million in project funding on an annual basis. Over 25 years, the STBG will provide $57.5 million in funding at today's

Figure 15-19: MnDOT Non-Payroll Costs for Operations



Source: Data from MnDOT Report on Dedicated Fund Expenditures, Various Years

current allocation, and a total of $14.375 million in local share funding will be needed to leverage this federal funding. Assuming the 50/50 split in terms of allocating these federal to Rochester and Olmsted County, each jurisdiction will need to provide approximately $7.2

million over the life of the plan to match the STBG allocation. For Olmsted County, this represents 1.2% of estimated revenues over the plan horizon and for Rochester it represents 2% of available revenues. Rochester and Olmsted County are both able to provide adequate match for the funding ROCOG allocates.

Table 15-11: Flow of Federal Highway Funds into ROCOG Planning Area

Entity	Annual Ave $$	Who Submits / Identifies Projects	Who selects Projects
ROCOG			
Surface Transportation Block Grant Program	$2.3 M	Olmsted Co, Rochester, Byron, Stewartville	ROCOG
District 6 Area Transportation Partnership			
Transportation Alternatives	$400,000	Jurisdictions throughout District 6	ATP-6
MNDOT District 6			
State Trunk Highways on National Highway System (NHS)	$4.6 M (2010-2019 avg)	District 6 identifies projects	Central Office selects projects
State Trunk Highways on Non-NHS System	$7.4 M (2010-2019 avg)	District 6 identifies projects	District 6 selects projects
MNDOT Central Office			
Off-System Bridges	$2.4 M (2010-2019 avg)	District 6 provides input	Central Office selects projects
National Highway Freight Program	*$20 M Statewide	Solicited statewide by Central Office annually	MnDOT Senior Leadership selects projects with input from State Freight Investment Committee
Highway Safety Improvement Program	$8-$12 M Statewide	Solicited Statewide by Central Office annually	Central Office selects projects

Source: ROCOG

In 2018, the ROCOG Policy Board adopted a policy on programming of the $2.3 million allocation that includes creation and periodic updating of a list of projects from which a project(s) will be selected to receive the annual allocation of ROCOG-programmed federal funds. The ROCOG Policy Board will use this list as a starting point for selecting each year during development of the TIP. It is expected that this list will remain in good standing until the next Plan update occurs, at which time it will be updated. Table 15-10 represents the current list of candidate projects.

Table 15-12: Current ROCOG Candidate Project List for STBG Funding

Corridor	Lead Agency	Description	Construction Cost
ROCOG Short Term (2024-2029) Project Selection List for ATP Funding			
CR 101	Olmsted	Reconstruct Gravel Rd to 2 Lane Suburban Arterial from CSAH 20 to CSAH 1	$4,000,000
48 ST NE	Olmsted	Reconstruct Gravel Rd to 2 lane Suburban Arterial from CR 124 to CSAH 11	$4,500,000
65 ST NW	Rochester	Reconstruct 2 lane township road to urban arterial from 37 AV NW to 50 AV NW	$8,500,000
North Broadway	Rochester	Reconstruct from 14th St to Elton Hills Dr	$7,100,000
20 ST SW	Rochester	Reconstruct 2 lane township road to urban collector from South Broadway to CR 125	$8,000,000
50 AV NW	Rochester	Construct new urban arterial from CSAH 4 to 19 ST NW	$7,100,000
19 ST NW	Rochester	Reconstruct 2 lane township road to urban arterial from Ashland Dr to 50 AV NW	$4,000,000
19 ST NW	Rochester	Reconstruct 2 lane township road to urban arterial from 50 AV NW to CSAH 44	$8,000,000
ROCOG Flexible (Short or Long Term) Project Selection List for ATP Funding			
CSAH 44	Olmsted	Build 2 lanes of ultimate 4 lane expressway from 55 ST NW to 55 ST NW	$5,500,000
CSAH 44	Olmsted	Build 2 lanes of ultimate 4 lane expressway from 65 ST NW to 75 ST NW	$2,000,000
CSAH 44	Olmsted	Build 2 lanes of ultimate 4 lane expressway from 19 ST NW to CSAH 4	$2,000,000

Corridor	Lead Agency	Description	Construction Cost
ROCOG Long Term (2030-2045) Project Selection List for ATP Funding			
I-90 & TH 52 Interchange	MnDOT	Phase II of project to upgrade interchange / Ramp Rebuild	$7,930,000
CR 117	Olmsted	Reconstruct 2 lane County Road to suburban arterial standard from 60 AV SW to CSAH 8	$4,400,000
48th ST NE (CR 124)	Olmsted	Extend 4 lane section from CSAH 33 through Hadley Valley Rd intersection	$10,965,000
CSAH 8	Olmsted	Renovate CSAH 8 to adjust curves and extend 4 lanes if needed (dependent on future development) from Bamber Valley School to 40 ST SW	$5,300,000
CR 147	Olmsted	Reconstruct CR 147 as urban arterial from 40 ST SW to CSAH 125	$6,200,000
CSAH 22 / Bandel Rd Intersection	Olmsted / Roch	Relocate East Frontage Rd intersection east approximately 800' to improve interchange operations	$7,800,000
65 ST NW	Rochester	Reconstruct existing two-lane township road to urban arterial from 50 AV NW to 60 AV NW	$6,000,000
East River Road	Rochester	Reconstruct existing two-lane township road to urban industrial collector from 44 ST NE to CSAH 22	$6,700,000
Silver Creek Rd NE	Rochester	Reconstruct existing township gravel road to two lane urban collector from CSAH 22 East to approx. 40 AV NE	$8,800,000
Commercial Dr SW	Rochester	Construct new urban collector frontage road from 40 ST SW to existing north end of Commercial Dr SW	$6,000,000
IBM Campus Area	Rochester	Construct / Upgrade new urban arterial/collector along north side IBM Campus to connect 37th ST NW and Valleyhigh DR NW	$8,400,000
40 ST SW	Rochester	Reconstruct existing two-lane township road to urban arterial from CSAH 8 to 18 AV SW	$3,300,000

List of Illustrative Projects in Long Range Plan

The prior section of this chapter referred to illustrative projects for which the local road authorities (MnDOT, Olmsted County, Rochester) will be seeking discretionary funding. Table 15-11 lists these projects.

Table 15-13: Illustrative Project List

Primary Roadway	Endpoint 1	Endpoint 2	Project Type	Total Cost 2020	Discretionary Grant Target
Regional Highway Access Management				$176,815,000	**$120,882,000**
TH 52	TH 14 West		Improve Interchange	$37,500,000	$26,250,000
I-90	TH 52	Bridge/Ramps	Improve Interchange Phase 2	$14,000,000	$11,200,000
TH 14 W	CSAH 22		Improve Interchange	$44,600,000	$26,760,000
TH 14 W	CR 104		Construct Interchange	$41,215,000	$32,972,000
TH 14 West Corridor	East Core Area Grade Separation		Interchange A in Byron Area	$19,000,000	$11,400,000
TH 14 West Corridor	West Core Area Grade Separation		Interchange B in Byron Area	$20,500,000	$12,300,000
Regional Highway Access Management				$33,000,000	**$10,890,000**
TH 14 West Corridor	CSAH 3 / 10th Ave		Overpass / Interchange Construction	$16,000,000	$5,280,000
TH 14 West Corridor	CSAH 5 / CSAH 15		TH 14 Connectivity Improvements	$17,000,000	$5,610,000
Urban Major Network Development / Improve Safety & Mobility				$84,555,000	**$29,558,750**
North Broadway Av	Civic Center Dr	14th St North	Major Arterial Multi-Modal / Safety Modernization	$18,950,000	$7,580,000
N Broadway Av	14 St NE	Northern Heights Dr	Major Arterial Multi-Modal / Safety Modernization	$10,815,000	$2,163,000
S Broadway Av	14th St S	28 St S	Major Arterial Multi-Modal / Safety Modernization	$17,230,000	$5,599,750
N Broadway Av	Northern Heights	37 St NE	Major Arterial Multi-Modal / Safety Modernization	$16,160,000	$5,656,000
Civic Center Dr	N Broadway Av	16 Av NW	Urban Core Capacity Project	$21,400,000	$8,560,000
2nd St SW	TH 52 W Frntge	Broadway	Transit Mobility Corridor	$107 Milllion	Small Starts Program
DMC South Gateway	2nd St South	14th St South	Transit Mobility Corridor	$96 Million	Small Starts Program
Urban Network Development / Support Economic Development				$2,535,000	**$2,028,000**
CSAH 16 / Future MN 30	TH 63 S	Braatas Dr	Corridor Modernization	$2,535,000	$2,028,000
Rail Crossing Improvements				$46,605,000	**$40,722,000**
TH 14 E	CP Rail		New Rail Overpass	$19,100,000	$17,190,000
CSAH 22 E	CP Rail Crossing		Rail Crossing Safety	$15,280,000	$13,752,000
West Silver Lake Dr	CP Rail Crossing		Rail Crossing Safety	$12,225,000	$9,780,000

Transit Financing Overview

The ROCOG 2045 Long Range Plan reflects a new vision for the future of transit in the Rochester urban area as the range of services expands and transit no longer consists solely of traditional fixed route service and complementary paratransit service. The next 25 years are expected to see notable changes as a Downtown Rapid Transit Line is developed, the City of Rochester transitions from a Park and Ride program where parking capacity is leased from private businesses to one where Rochester establishes permanent park and ride hubs along major regional highways with significantly expanded capacity, and the initial phases of a BRT-based Primary Transit Network emerge.

At the same time, traditional fixed route community service will continue to expand as the city grows from a 2018 population of 117,500 to an expected 2045 population of over 160,000, downtown employment grows by 50% to over 60,000 workers, and the overall level of urban area employment reaches 150,000. Dial-A-Ride service, which has served a relatively stable number of riders for the last decade, will likely see increased demand as the number of persons over age 60 increases from 20% of the population to a projected 31% of the population by 2045.

These expanded and new services will likely expand the range of funding sources that need to be considered to support transit and may necessitate the consideration of different funding models for operating certain services, particularly those serving targeted markets such as commuters.

Federal financing of transit involves various programs which use different allocation models. Section 5307 funding is distributed directly to public transit authorities, while other FTA program dollars are allocated to the state and distributed through a collaborative process involving the MnDOT State Transit Office and the local transit authority. Funding recommendations from these entities are forwarded on to the Area Transportation Partnerships (ATP) and MPOs for inclusion in the TIP/STIP. A limited amount of federal highway dollars can also be flexed and used for transit capital investment; final decisions regarding use of these Surface Transportation Block Grant funds rest with the ATP (with MPO concurrence) as these bodies are responsible for final distribution of the MnDOT share of federal highways funds allocated to District 6. Rochester also enters an era where success in seeking discretionary federal funds through competitive grant programs will be important for capital investment associated with new services such as the Downtown Rapid Transit project, currently accepted into the Small Starts program, and the Primary Transit Network.

This section summarizes the financial implications of the continued provision of existing transit services in the

Rochester area along with development of new services including Downtown Rapid Transit (DRT), an expanded Park and Ride network and the Primary Transit Network (PTN). Table 15-12 summarizes the estimated costs for implementing and operating these services over the 25-year plan horizon, based on an implementation scenario reflecting recent community plans. The total estimated cost through the Year 2045 is $1.17 billion, including approximately $350 million to continue providing basic fixed route transit service and $310 million to develop and operate the proposed Downtown Rapid Transit service starting in 2025.

While $1.2 billion is a significant number, it represents year of expenditure costs reflecting a 2-3% annual inflation rate for goods and services. What this means is that infrastructure or service that costs $1 today will cost $2 ($1.97 to be exact) in the year 2045 at a 3% inflation rate. The assumption regarding rate of inflation is based on the trends observed in local transit metrics such as cost per mile and cost per hour, based on analysis of 10 to 15 years of historic cost data.

Summarizing each of the five major components of the future Rochester transit system finds the following:

- **ZIPS Dial-A-Ride Service:** This service serves elderly and handicapped individuals who have been determined to be eligible to use the service. Continued passenger growth is expected to occur at a slightly higher rate than the last 10 years (2% annually) given the changing demographics of the local population, which will see a significant growth in the number of persons age 65 and above. The Plan assumes the State will continue its commitment to funding basic transit services, which is important given the level of operating funding the State provides for paratransit service.
- **Neighborhood Fixed Route Service:** While Rochester Public Transit manages all types of fixed route service as a single system, for purposes of the Long Range Plan, the analysis was broken into two systems: one referred to as Neighborhood Fixed Route and the second reflecting the City's Park and Ride service. This was done to clearly illustrate the magnitude of change expected in the Park and Ride service, which serves about 2000 users today but is expected to grow to approximately 9000 users by the year 2045. A transition is being made from leased parking to City-owned parking on properties the City would acquire.

Relative to "Neighborhood Fixed Route" service, the plan assumes a slightly higher growth rate in ridership and passenger miles (1.9% annually versus a historic rate of 1.5%), but does so with a slightly lower growth in vehicle miles and vehicle hours of service. This assumption is predicated on the growth management strategy adopted in 2018 as part of the City's updated comprehensive plan (P2S 2040), which

Table 15-14: Summary of Estimated Transit Costs 2021-2045

Transit Service Summary Sheet (all figures in Millions of Dollars)					
	Near Term 2021-2027	Mid Term 2028-2035	Long Term 2036-2045	Total Plan Costs	
OVERALL COSTS	$281.83	$386.09	$505.63	$1,173.55	
Dial A Ride	$10.48	$13.80	$21.49	$45.77	4%
Annual Operating Cost	$8.70	$11.86	$17.90	$38.46	
Vehicle Replacement	$1.53	$1.64	$3.20	$6.37	
Vehicle Fleet Expansion	$0.25	$0.30	$0.39	$0.94	
Neighborhood Fixed Route	$79.85	$114.77	$156.40	$351.02	30%
Annual Operating Cost	$51.50	$74.25	$90.10	$215.85	
Vehicle Replacement	$13.25	$18.92	$30.90	$63.07	
Vehicle Fleet Expansion	$2.60	$3.70	$6.10	$12.40	
Other Capital Investment	$12.50	$17.90	$29.30	$59.70	
Downtown Rapid Transit	$116.30	$130.92	$62.54	$309.76	26%
Phase 1 Project Development	$107.40			$107.40	
Phase 2 Project Development		$96.00		$96.00	
Operating Cost	$8.90	$33.30	$50.95	$93.15	
Vehicle Replacement		$1.62	$11.59	$13.21	
Park & Ride Facility Cost	$20.40	$22.70	$31.10	$74.20	22%
NE Sector	$8.90			$8.90	
E/SE Sector			$13.80	$13.80	
South Sector		$15.10		$15.10	
SW Sector		Done with Rapid Transit		$0.00	
West Sector	$7.60	$7.60		$15.20	
NW Sector	$3.90		$17.30	$21.20	
P&R Operating Cost	$12.00	$27.20	$58.30	$97.50	
Composite All Sectors	$12.00	$27.20	$58.30	$97.50	
P&R Vehicle Cost (EV)	$17.90	$16.40	$48.00	$82.30	
Replacement Vehicles		$5.70	$43.70	$49.40	
Vehicle Fleet Expansion	$17.90	$10.70	$4.30	$32.90	
Primary Transit Network	$24.90	$60.30	$127.80	$213.00	18%
Project Development	$15.30	$5.00	$12.60	$32.90	
Vehicle Fleet Expansion (EV)	$9.60	$7.00	$9.40	$26.00	
Operating Cost (Offset in Fxd Rt)	$0.00	$48.30	$105.80	$154.10	

Source: ROCOG

1) assumes a more centralized pattern of growth directed towards areas already served by public transit, and 2) assumes an expected shift towards higher density styles of housing development which should be more efficient to serve. As with dial-a-ride service, the plan assumes neighborhood fixed route service being part of the "basic" transit service provided to the community and that the State will continue its commitment to funding this service at a similar level as in the past.

- **Downtown Rapid Transit:** The City of Rochester has entered the FTA Small Starts program for the Downtown Rapid Transit project and is currently in Phase I project development. The Downtown Rapid Transit system is expected to provide 5-minute peak period service and 10-minute off peak service along a 3.7-mile corridor serving core employment and activity areas of downtown Rochester along the downtown's primary east/west corridor (2nd St South) and extending south from 2nd St along a corridor yet to be determined that will serve a potentially large area of future redevelopment in the southeast sector of downtown Rochester. Termini for the corridor will be "West" and "East" Transit Villages that are envisioned to be mixed use developments with housing along with significant amounts of commuter parking (2500 to 3000 spaces at the West Village and 1000-1500 spaces at an East Village) and mobility hub features. The project will be developed in two phases, with Phase I serving the 2nd St SW corridor. The design of the system will be based on the principles of Bus Rapid Transit running partially in mixed traffic partially in Business/Access Transit lanes ("BAT" lanes).
- **Commuter Parking Development and Express Park and Ride Bus Service:** The Plan describes a program for developing 7400 new spots for commuter parking over its horizon, located on the periphery of the city, along major regional highways that deliver over 25,000 commuters per day to Rochester from throughout southeastern Minnesota. These sites will be linked to downtown Rochester by a fleet of peak period express buses, a service which the City is interested in providing with the newest electric bus technology.
- **Primary Transit Network (PTN):** The final element of the proposed transit system is the proposed PTN that has been articulated in the City's comprehensive plan. Development of this core service would provide high frequency, high quality Bus Rapid Transit on a limited number of core corridors, including Broadway Ave north/south through the city, 2nd St South & 4th St SE east/west through the city, and a corridor on 7th St NW - Valleyhigh Drive NW connecting downtown with the major northwest concentration of business activity focused on a redeveloping IBM campus and nearby Mayo Clinic satellite facilities. Two

other corridors envisioned as part of the ultimate PTN, including part of the west side expressway corridor known as West Circle Dr, and a portion of 37th St North, are not assumed to occur during the 25-year horizon of the Plan.

The following pages provide added detail to the Transit Summary Cost Table information in Table 15-14, including discussion of the analysis or assumptions that drive the estimates of operating, vehicle, and capital costs. Summary charts following these overviews illustrate expected cash flow needs for operating and capital investment, based on an assumed phasing that reflects recommendations from various recent plans including P2S 2040, the 2018 DMC Integrated Transit Studies, and the 2014 DMC Development Plan.

Dial A Ride Service Summary

Table 15-15 summarizes the analysis estimating future operating and capital costs for the Rochester ZIPS Dial-a-Ride service thru the planning period of 2045. The upper half of this table reports historic results for selected years since 2003 for information and comparison purposes, while the lower half of the table reports projected results at five-year increments through 2045. Total operating costs in Summary Table 15-12 are derived from this work.

Table 15-16 compares historic and projected annual growth rates for the various metrics. Historic rates are based on the 10-year period of 2009-2018, while projected rates are for the planning horizon of 2021-2045. Growth rates are generally slow, though this in part is due to laws of large number where similar levels of historic and future growth will yield lower future growth rates as the underlying base from which the growth is calculated grows. Based on the projected growth of vehicles hours of service (and assumptions that a vehicle will provide 2000 hours of service per year and Class 300/400 vehicles have a service life of 150,000 miles) the plan estimates that the in-service fleet will need to expand by 1 vehicle every 7 years, and that a replacement vehicle will need to be scheduled for every 3-4 years. Vehicle costs are assumed to be $200,000 in 2019, rising to an inflation-adjusted cost of $406,500 by the year 2045, with a 20% local cost share.

The mix of funding that supports ZIPS service has changed significantly over the last 10 years. In 2016, the Minnesota State Legislature adopted a revised funding approach for transit in the state of Minnesota that both raised the level of revenue available to support transit operations and allowed more State dollars to flow into basic paratransit and fixed route service. Figure 15-20 illustrates the impacts of these changes on the funding of operations. The share of state dollars has risen from a low point in 2014 of supporting 70% of operating costs to meeting close to 95% of costs by 2019. This has

Table 15-15: Analysis of Dial-A-Ride Service Parameters for 2021-2045

Year	Rochester Population	Total Operating Cost	Passenger Trips	Passenger Miles	Vehicle Miles	Vehicle Hours	Trips per Capita	Rev Miles Per Capita	Passengers per hour	Passengers per veh mile	Cost per Hour	Cost per Passenger	Cost per Vehicle Mi	Cost per Passenger Mile
2003	93,037	$ 441,035	48,256	298,564	159,735	11,784	0.52	1.72	4.10	0.30	37.43	$ 9.14	$ 2.76	$ 1.48
2005	97,191	$ 542,694	43,089	290,285	180,123	12,266	0.44	1.85	3.51	0.24	$ 44.24	$ 12.59	$ 3.01	$ 1.87
2010	106,769	$ 647,773	40,717	303,923	178,161	12,176	0.38	1.67	3.34	0.23	$ 53.20	$ 15.91	$ 3.64	$ 2.13
2015	111,907	$ 854,442	45,062	318,476	272,293	17,198	0.40	2.43	2.62	0.17	$ 49.7	$ 18.96	$ 3.14	$ 2.68
2018	117,444	$ 1,084,931	46,133	266,758	252,315	15,917	0.39	2.15	2.90	0.18	$ 68.2	$ 23.52	$ 4.30	$ 4.07
2025	128,500	$ 1,271,277	52,006	306,933	288,259	17,546	0.40	2.24	2.96	0.18	$ 72.5	$ 24.45	$ 4.41	$ 4.14
2030	138,000	$ 1,430,691	56,868	335,633	315,213	18,536	0.41	2.28	3.07	0.18	$ 77.2	$ 25.16	$ 4.54	$ 4.26
2035	147,500	$ 1,605,260	61,883	365,228	343,007	19,509	0.42	2.33	3.17	0.18	$ 82.3	$ 25.94	$ 4.68	$ 4.40
2040	154,875	$ 1,772,451	66,144	390,378	366,627	20,190	0.43	2.37	3.28	0.18	$ 87.8	$ 26.80	$ 4.83	$ 4.54
2045	162,250	$ 1,955,988	70,530	416,264	390,938	20,866	0.43	2.41	3.38	0.18	$ 93.7	$ 27.73	$ 5.00	$ 4.70

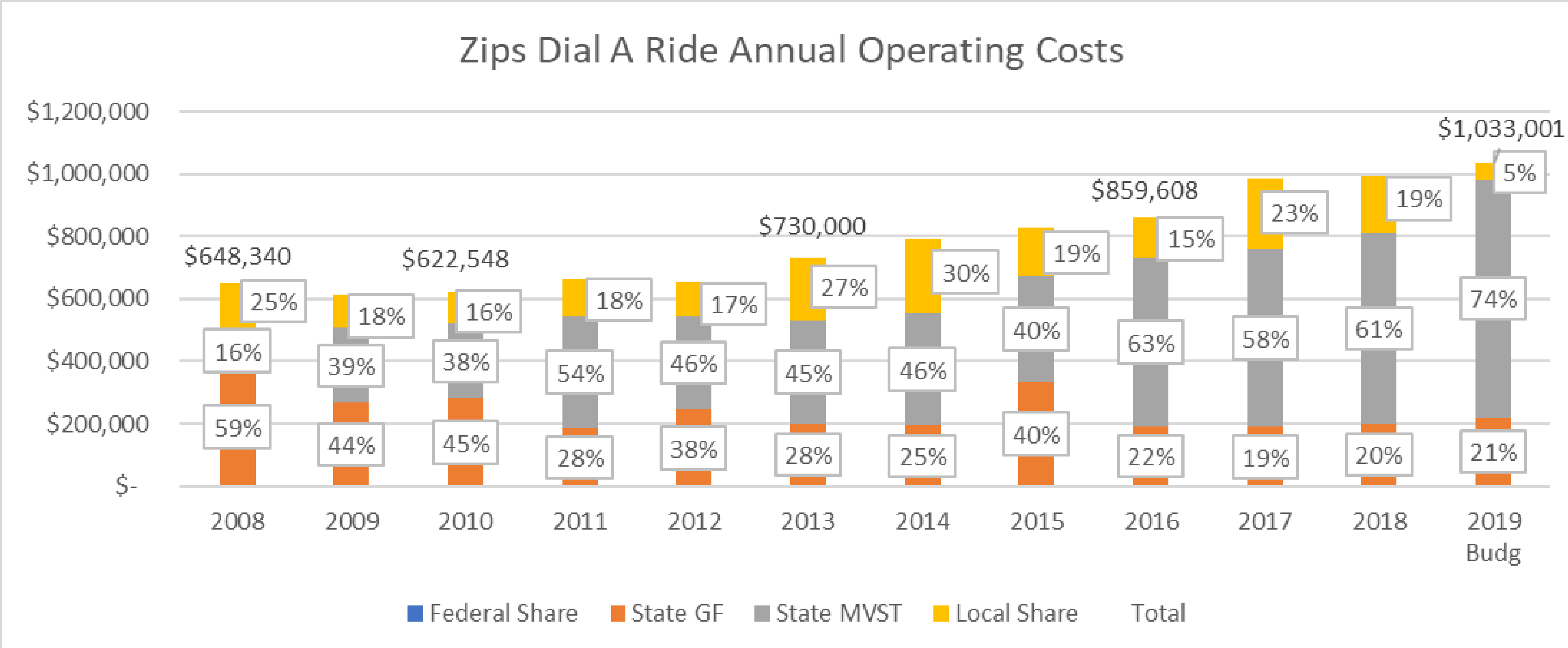
Source: Base data from National Transit Database; projection by ROCOG

Table 15-16: Historic and Projected Annual Growth Rates for Selected Paratransit Parameters

	Total Operating Cost	Passenger Trips	Passenger Miles	Vehicle Miles	Vehicle Hours	Trips per Capita	Passengers per hour	Passengers per veh mile	Cost per Hour
Ann Ave Growth 2009-2018	8.0%	1.7%	-1.1%	4.2%	3.4%	0.3%	-1.3%	-1.8%	3.5%
Ann Ave Growth 2021-2045	2.8%	1.9%	1.9%	1.9%	1.0%	0.4%	0.7%	0.0%	1.5%

Source: ROCOG Analysis

Figure 15-20: Funding of ZIPS Dial-a-Ride Annual Operating Costs

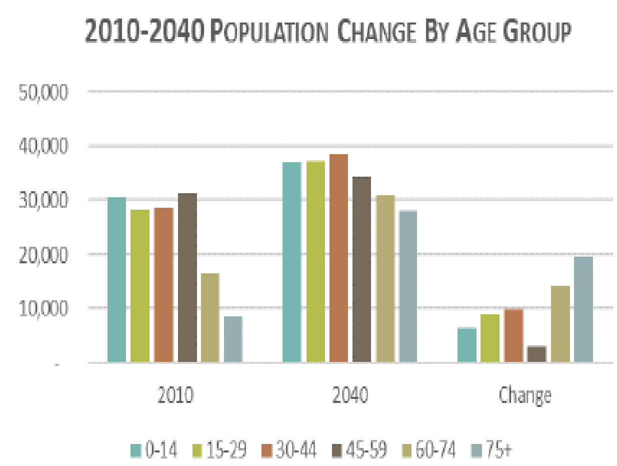


Source: Base data Minnesota State Transit Report

permitted the City of Rochester to hold the absolute local share of funding level even while service improvements including supplemental taxi service during periods of peak demand or for evening service, which is more efficient in terms of metrics such as passengers per hour and passengers per vehicle miles of service.

In summary, ROCOG expects to see demand for paratransit continue to growth, in large part driven by the changing demographics of the community as shown in Figure 15-21. We assume state funding will contribute a similar share of dollars for operating costs going forward but are aware that issues regarding the adequacy of the revenue flowing into the Greater Minnesota Transit Account may require changes in funding to support future growth in service.

Figure 15-21: Projected Population Growth by Age Cohort, Olmsted County



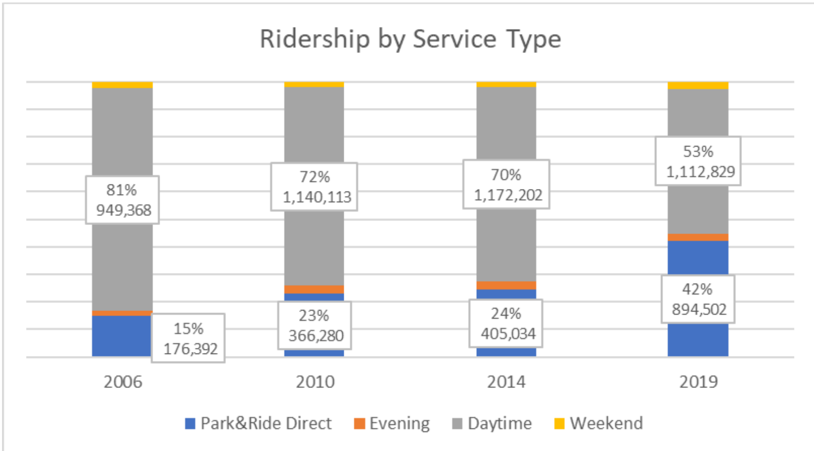
Source: Base data from U.S Census

Fixed Route Neighborhood Service Summary

As was noted in the transit introduction, Rochester Public Transit manages Fixed Route Service as a single system, with both neighborhood level service and express service between park and ride facilities and downtown Rochester accounted for within one accounting framework. For purposes of this Plan, these two service elements are analyzed as separate systems, due to the significant expansion in park and ride service planned to support the Destination Medical Center initiative which may result in 300-400% growth in the number of park and ride users.

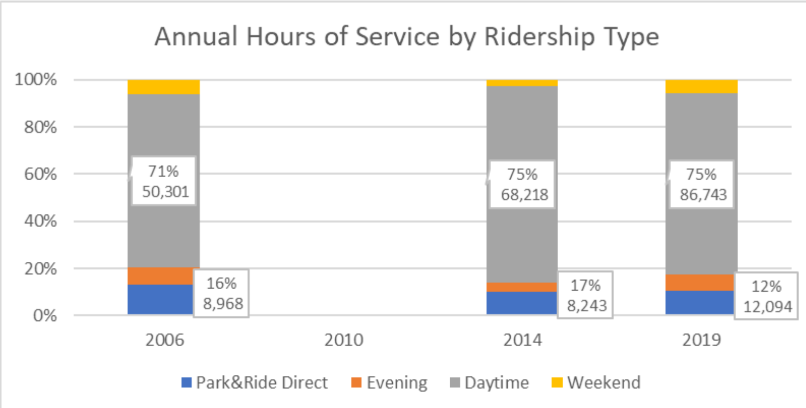
The following charts illustrate how the character of these two elements of Rochester fixed route service have been diverging recently. Figure 15-22 illustrates the significant growth in park and ride ridership, which has changed the mix of users by close to 20% recently. Figure 15-23 illustrates that even with this change in ridership mix, the percentage of service hours devoted to neighborhood service has remained relatively unchanged as both service components have grown from a service hour perspective. Finally, Figure 15-24 illustrates the divergence that has emerged in terms of cost per rider, as express buses operate closer to capacity which effectively has reduced the cost per rider to about one-third the level of neighborhood fixed route users.

Figure 15-22: Ridership by Service Type



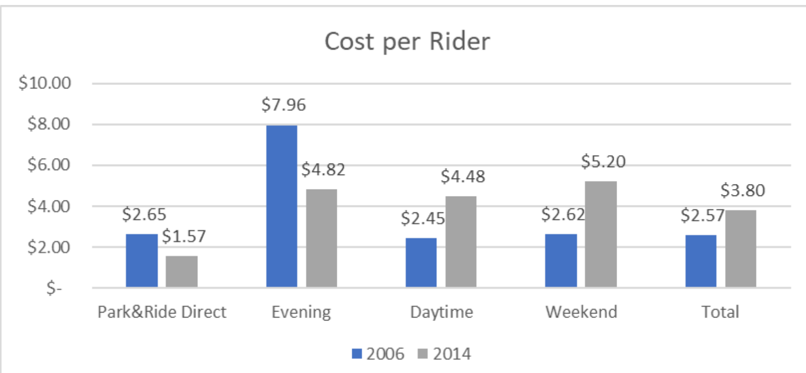
Source: Rochester Transit Development Plans

Figure 15-23: Hours of Service by Service Type



Source: Rochester Transit Development Plans

Figure 15-24: Cost Per Rider by Service Type



Source: Rochester Transit Development Plans

Based on the data in Figures 15-14/15/16, an estimate was made of the historic neighborhood system share of costs, passengers, and vehicle operations for fixed route service, reported in the upper half of Table 15-17. Using these estimates, projections of various metrics were completed for the period of 2021-2045. As a means to understand the implications, note the 2018 Operating costs of $6.4 million represent about 70% of the total fixed route operating costs of $9.2 million reported for 2018.

As with paratransit service, projected growth rates for factors such as operating costs, vehicles miles/hours of service miles per capita are expected to be similar or lower than historic rates. ROCOG policies and strategies adopted by the City of Rochester in its 2018 Growth Management Plan, which encourage a more centralized growth pattern emphasizing infill and redevelopment, and slower expansion in terms of outward expansion due to financial constraints that will limit expansion of municipal sewer infrastructure, will help moderate the need to expand transit service in the urban area compared to past decades.

Table 15-18 analyzes past capital investment in the Rochester transit system to establish a benchmark for comparing future needs. Over the ten-year period of 2011-2020, over $82 million in capital investment was programmed through the annual ATP-STIP process, or an average of approximately of $8.2 million annually. The lower part of the table shows the breakdown in funding, with approximately 28% of project costs funded with local dollars and the remainder with federal dollars.

Table 15-17: Fixed Route Neighborhood Transit Service – Historic and Projected Metrics

Year	Rochester Population	Total Operating Cost	Passenger Trips	Passenger Miles	Vehicle Miles	Vehicle Hours	Trips per Capita	Rev Miles Per Capita	Passengers per hour	Passengers per veh mile	Cost Per Hour
2005	*97,191*	$2,573,697	964,381	3,823,278	609,367	59,794	9.92	6.27	16.13	1.58	$43.04
2009	*104,578*	$3,423,776	1,094,976	4,341,020	695,007	46,850	10.47	6.65	23.37	1.58	$73.08
2010	*106,769*	$3,700,226	1,127,625	4,470,456	695,678	47,535	10.56	6.52	23.72	1.62	$77.84
2015	*111,907*	$4,687,922	1,253,443	4,969,258	769,598	52,554	11.20	6.88	23.85	1.63	$89.20
2018	*117,444*	$6,423,438	1,239,110	4,912,437	1,002,825	72,119	10.55	8.54	17.18	1.24	$89.07
Ann Ave Growth 2009-2018	**1.4%**	**9.7%**	**1.5%**	**1.5%**	**4.9%**	**6.0%**	**0.1%**	**3.2%**	**-2.9%**	**-2.4%**	**2.4%**
2025	128,500	$7,616,338	1,473,965	5,276,794	1,023,455	69,039	11.47	7.96	21.35	1.44	$110.32
2030	138,000	$8,897,626	1,601,673	5,733,989	1,167,413	75,737	11.61	8.46	21.15	1.37	$117.48
2035	147,500	$10,178,915	1,729,381	6,191,184	1,331,189	82,435	11.72	9.03	20.98	1.30	$123.48
2040	154,875	$11,460,204	1,857,089	6,648,379	1,517,452	89,134	11.99	9.80	20.83	1.22	$128.57
2045	162,250	$12,741,492	1,984,797	7,105,575	1,729,223	95,832	12.23	10.66	20.71	1.15	$132.96
Ann Ave Growth 2021-2045	**1.4%**	**3.9%**	**1.9%**	**1.9%**	**3.7%**	**2.1%**	**0.4%**	**1.7%**	**-0.2%**	**-1.0%**	**1.2%**

Table 15-18: Capital Expenditures for Transit 2011-2020

	Bus Garage	Shelters	Downtown Hub	EV Charging	NW Hub	Park & Ride	St. Mary's Hub	Technology	Vehicles	Total
2011	$15,000,000								$1,331,000	$16,331,000
2012	$12,300,000						$200,000		$2,280,000	$14,780,000
2013					$150,000	$150,000			$1,938,000	$2,238,000
2014			$500,000					$1,500,000	$1,648,000	$3,648,000
2015							$300,000		$2,120,000	$2,420,000
2016									$1,978,231	$1,978,231
2017							$120,000			$120,000
2018						$1,000,000	$250,000	$420,000	$5,330,000	$7,000,000
2019	$6,125,000	$40,000	$50,000	$1,000,000	$150,000		$250,000	$150,000	$11,028,000	$18,793,000
2020		$24,000		$1,237,500		$2,000,000	$500,000	$200,000	$11,000,000	$14,961,500
Grand Total	$33,425,000	$64,000	$550,000	$2,237,500	$300,000	$3,150,000	$1,620,000	$2,270,000	$38,653,231	$82,269,731

Capital expenditures during this period were largely directed towards vehicle acquisition and construction of the Rochester Transit Operations Center. Looking forward, while some expansion of the RTOC is expected, vehicle acquisition will remain a major expenditure with Park and Ride development expected to draw more funds as described in the next section.

Similar to paratransit service, the funding mix that supports fixed route operations has changed in the last five years with the infusion of additional State funds to support the service (Table 15-19). As illustrated in Figure 15-25, changes adopted by the State Legislature in 2016 have increased the share of State funding to close to 80% and reduced local share needs from 40% to approximately 10%. While the Plan assumes a similar level of support will be retained going forward, ROCOG as noted in the paratransit discussion, is aware of risks relative to the funding that may be available from the Greater Minnesota Transit Fund and that a shifting mix of funds may be required again in the future, with more reliance on local funding to support this service.

Express Park and Ride Service Summary

The scale of Express Park and Ride service for downtown workers Rochester provides is expected to undergo a significant change over the course of the next 20 years. Figure 15-26 illustrates the current system which has six sites providing approximately 2000 spaces for commuters; the system envisioned will have 6 sites with approximately 7400 spaces, with the City owning and operating the sites instead of the current arrangement where they lease parking spaces from landowners.

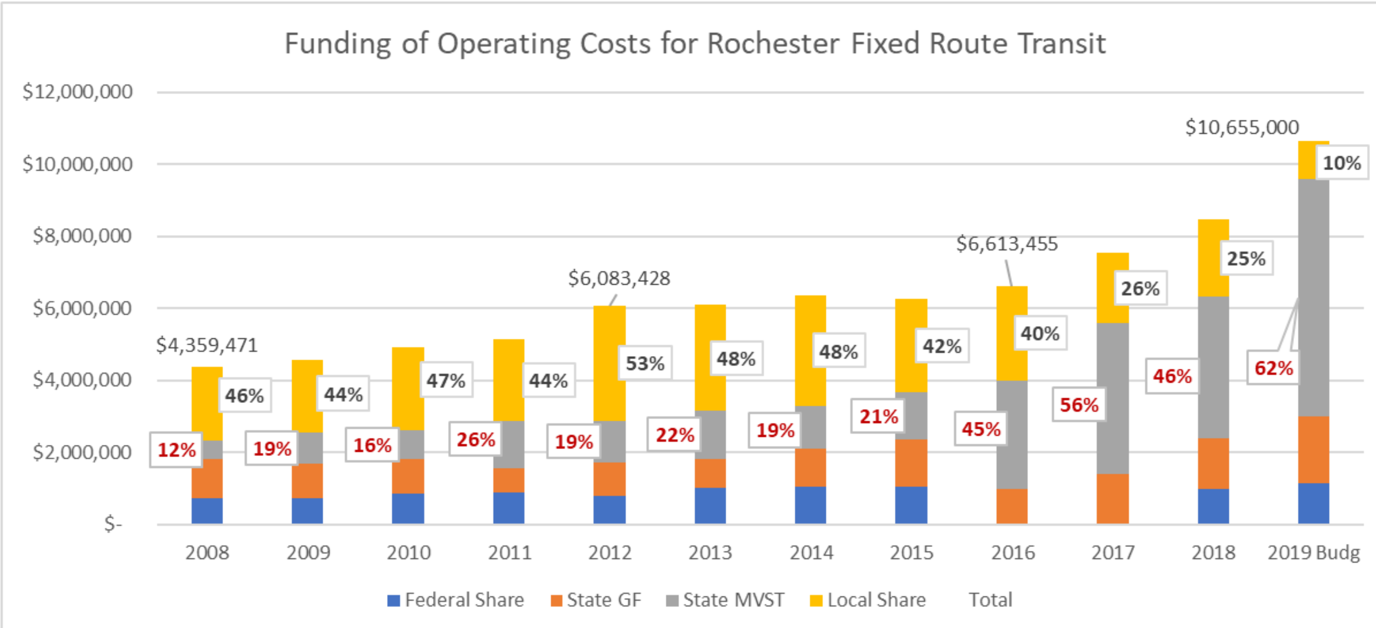
Development of the sites is estimated to cost $95 million. It is expected to be phased in over time, with new capacity being strategically added every 3 or 4 years as demand for commuter parking in different corridors grows.

Table 15-20 summarizes expected development costs for the future park and ride network. Most sites are expected to be developed as surface lots, although possible ramp facilities are envisioned in two areas where land cost are

Table 15-19: Sources of Capital Funds 2011-2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
FTA	$12,586,000	$11,381,600	$1,155,200	$2,188,800	$1,936,000	$1,371,084	$ 96,000	$1,600,000	$ 9,302,400	$ 9,166,152	$50,783,236
FHWA	$ 479,200	$ 442,400	$ 468,000	$ 297,000	$ -	$ 211,500	$ -	$3,360,000	$ -	$ 2,783,848	$ 8,041,948
Local	$ 3,265,800	$ 2,956,000	$ 614,800	$ 662,200	$ 484,000	$ 395,647	$ 24,000	$2,040,000	$ 9,440,600	$ 3,011,500	$22,894,547
Total	$16,331,000	$14,780,000	$2,238,000	$3,148,000	$2,420,000	$1,978,231	$120,000	$7,000,000	$18,743,000	$14,961,500	$81,719,731

Figure 15-25: Sources of Operating Cost Revenues – Fixed Route Transit

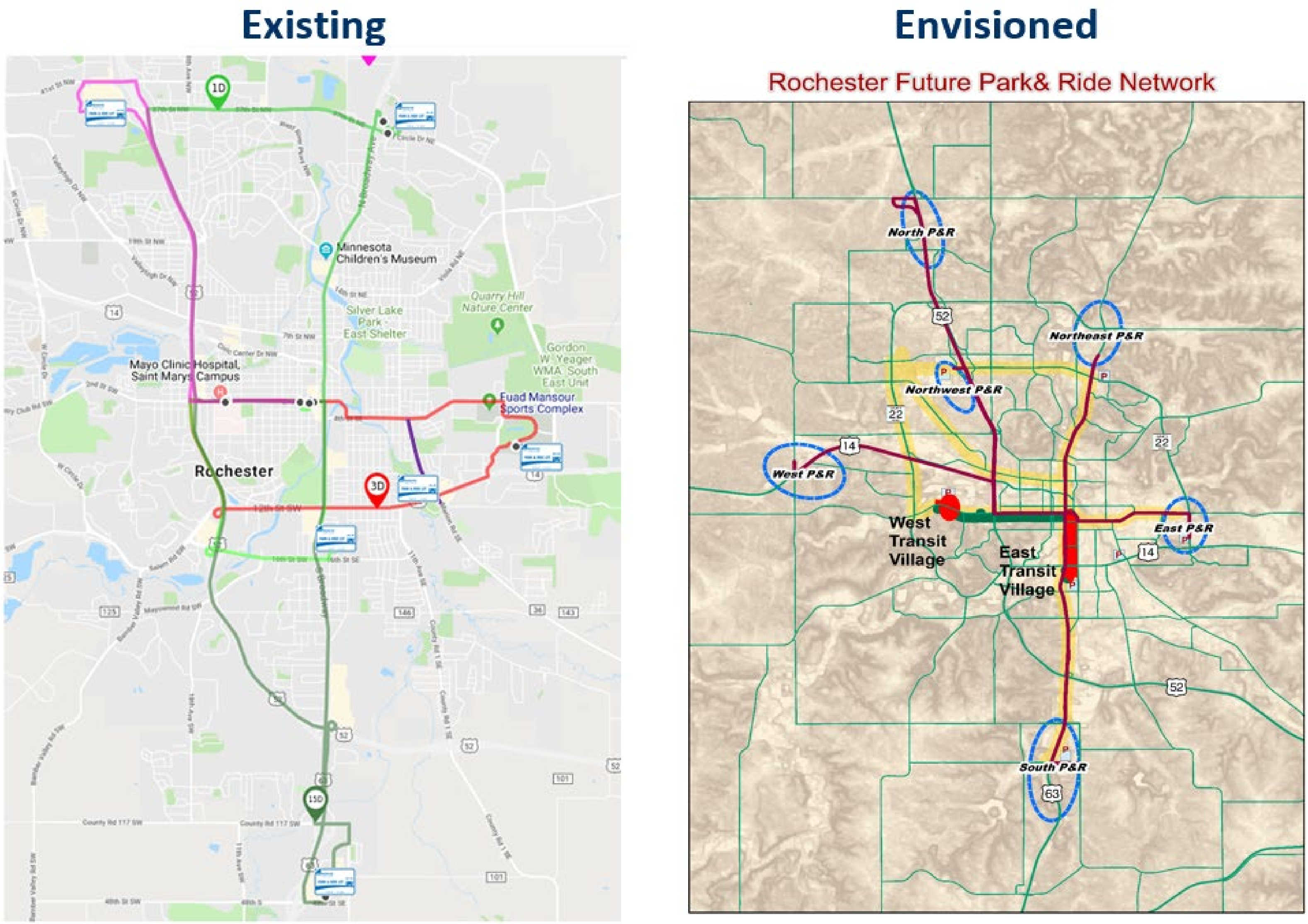


expected to be higher or land availability more limited. Funding for the park and ride facilities is expected to come from a number of sources, including standard FTA capital investment programs, DMC capital investment funds raised through state and county transit sales taxes, and general-purpose DMC sales tax funds contributed by the City. The City of Rochester may also choose to use revenue from its parking utility fund to help fund these facilities.

Table 15-21 summarizes projected operating costs for the Express Bus network that will serve the Park and Ride network and compares those costs with the current system. The second and third columns in the table report costs for current Express Bus service, which is $1.1 million annually, serving about 1700 users at an average annual cost of $655 per user. The proposed system, described in the remaining columns, is estimated to have an annual operating cost of $4.2 million at full capacity of 7,400 users, at an annual average cost of $573 per user.

Park and Ride users at most sites will also have access to service provided by the Primary Transit Network, which will help to limit the number of dedicated vehicles for express service that need to be running. A large share the costs of the current system are covered by the Mayo

Figure 15-26 Existing and Proposed Rochester Park and Ride Network



Source: ROCOG

Table 15-20: Development Costs for Permanent City Park and Ride Sites

Sector	Long Term P&R Area	Spaces	Type	Land Cost	Access & Amenity Cost	Design / Construction	Total Cost
NE	Transit Operations Center (TOC)	900	Lot ~ 7 Acres	$1,200,000	$450,000	$5,625,000	$8,900,000
E/SE	East Side in RCTC area	1600	Lot 12 Acres	$1,200,000	$700,000	$10,000,000	$13,800,000
SE/S	Maine Street Area	1600	Lot 12 Acres	$2,100,000	$450,000	$10,000,000	$15,100,000
SW	South Broadway	500	Ramp 1 Acre	$500,000	$500,000	$18,750,000	$20,800,000
W	TH 14 West Area	1800	Lot 13 Acres	$1,300,000	$650,000	$11,250,000	$15,200,000
NW	IBM Area	500	Ramp 1 Acre	$300,000	$500,000	$15,625,000	$17,300,000
NW	75th St Area	500	Lot 4 Acres	$40,000	$350,000	$3,125,000	$ 3,900,000
Source:	ROCOG					TOTAL	$95,000,000

Medical Center, whose employees account for about 90% of usage. This model will be continued going forward, with non-Mayo users contributing operating funds as well as traditional operating sources such as state funding.

Downtown Rapid Transit Service Summary

The Locally Preferred Alternative for the proposed Downtown Rapid Transit system is illustrated in Figure 15-27, running from a proposed West Transit Village on west 2nd St to a proposed East Transit Village along South Broadway Ave. A limited number of stations to serve the corridor would be developed, and commuter parking would be located at each end of the route as part of a mixed-use transit village development.

Development of the Rapid Transit Route is proposed in two phases. The first phase would focus on the 2nd St SW corridor, running from the proposed West Transit Village location to east end of the Central Business District, as illustrated in Figure 15-21. Total development

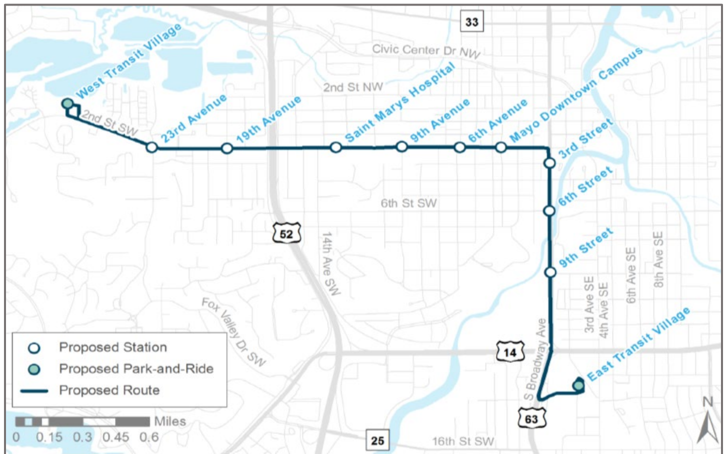
Table 15-21: Park & Ride Express Bus Annual Operating Costs

Sector	Current Site	Annual Operating $$ (2019)	Long Term P&R Site	Spaces	PTN?	Annual Operating Cost (2019)	Interlined With
NE	Shopko 250 Users	$182,250	Transit Operations Center Area	900	Yes	$ 1,211,000	75th St
E/SE	RCTC 140 Users	$75,716	RCTC area	1600	Yes	$ 1,211,000	IBM
	Cub Food 50 Users	$60,350					
SE/S	Maine Street 260 Users	$234,500	Maine Street Area	1600	Yes	$ 1,816,500	TH 14 West
SW	Graham Park 300 Users	$250,425	South Broadway	500	Yes	Served by Rapid Transit	
W	-		TH 14 West Area	1800	No		Maine Street
NW	IBM 745 Users	$310,400	IBM Area	500	Beyond Plan Horizon		RCTC
NW			75th St Area	500	No		NE
TOTALS	1,700 USERS	$1,113,641 COST	$655 COST/USER	7,400 USERS		$4,238,500 COST	$573 COST / USER

cost is estimated at $203 million, with Phase 1 having an estimated cost of $107 million. The breakdown of the major development cost components is shown in Table 15-20.

Development Costs for the two phases of the projects are shown in Table 15-22. Costs include purchase of vehicles in Phase 2, development of BRT Guideway, development of the St Mary's Hospital Transit Center and 2nd St reconstruction, along with construction of an East Transit Village in Phase 2. Service on the Phase 1 alignment is expected to start in 2025, with Phase 2 tentatively scheduled to follow with 3-5 years.

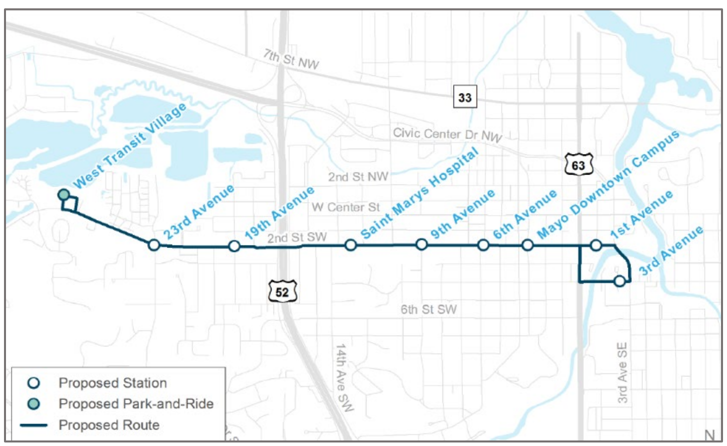
Figure 15-27: Locally Preferred Alternative – Rochester Downtown Rapid Transit



Station locations are shown for illustrative purposes.

Source: City of Rochester

Figure 15-28: Phase 1 of Proposed Downtown Rapid Transit Network



Source: City of Rochester

Table 15-23 illustrates the anticipated funding program for development of Phase I and Phase II of the Downtown Rapid Transit Line. Approximately half of the funding is expected to come through a Small Starts grant, with the bulk of the local share coming from dedicated funding streams associated with the Destination Medical Center economic development program. These DMC revenues are funded by sales tax (Olmsted County) and the return of an increment of additional income and sales taxed collected by the State of Minnesota. These taxes have been collected since 2016 and will continue through 2034 to provide $128 million for transit purposes.

Table 15-24 illustrates projected annual operating costs for the Rapid Transit System for selected years along with total operating costs through the year 2045.

Funding for Rapid Transit operations is expected to come from a variety of revenue mechanisms. Table 15-25 illustrates the sources that have been identified in the preliminary financing plan and the expected amounts each source would yield for selected years through 2045 as well as for the entire 2025-2045 period of operations. Reallocation of service refers to cost savings Rochester expects to realize through redesign and/or elimination of certain neighborhood transit routes with implementation of the Rapid Transit service, with service on those routes provided by the Rapid Transit line.

Table 15-22: Development Costs for Downtown Rapid Transit

Phase 1 Development Costs					
Project Element	Base Year (2019)	Contingency Amount	Professional Services	Total Base Cost	YOE (2024) Cost
Vehicles / Electric Bus / 60' Articulated	$16,800,000	$1,600,000	$100,000	$ 18,500,000	$21,400,000
BRT Guideway Development, Stations. Systems Operations Technology, etc.	$21,400,000	$3,200,000	$10,700,000	$ 35,300,000	$40,900,000
2nd Street Reconstruction and Streetscape	$5,500,000	$800,000	$1,900,000	$ 8,200,000	$9,500,000
Saint Marys Transit Center and Subway connection	$8,700,000	$1,100,000	$3,100,000	$ 12,900,000	$15,000,000
Unallocated Contingency	*Unallocated Contingency reflects the risk of scoping changes to*			$ 17,800,000	$20,600,000
Totals	$98,700,000	$12,100,000	$34,400,000	$ 92,700,000	$107,400,000
Phase 2 Development Costs					
Project Element	Base Year (2019)	Contingency Amount	Professional Services	Total Base Cost	YOE (2029) Cost
BRT Guideway Development, Stations. Systems Operations Technology, etc.	$18,000,000	$2,600,000	$9,000,000	$29,600,000	$36,400,000
East Parking Structure and Transit Hub	$28,300,000	$2,800,000	$10,600,000	$41,700,000	$51,300,000
Unallocated Contingency	*Unallocated Contingency reflects the risk of scoping changes to*			$ 6,750,000	$8,300,000
Totals	$98,700,000	$12,100,000	$34,400,000	$ 78,050,000	$96,000,000

Table 15-23: Revenues for Development of Downtown Rapid Transit

Rapid Transit Capital Revenue Sources	Federal Funding	Local Funding
FTA Small Starts Grant	$99,800,000	
Destination Medical Center / Olmsted County Transit Aid		$27,200,000
Destination Medical Center / State of Minnesota Transit Aid		$41,000,000
Destination Medical Center / State of Minnesota General State Aid for Infrastructure		$32,400,000
Other Funds		$3,000,000
Total Revenue	$99,800,0000	$103,600,000

Table 15-24: Operating Costs for Downtown Rapid Transit

Year	Hourly Operating Cost	Annual Operating Cost
Year 1 - Phase 1 - 2025	$118.33	$2,940,000
Year 5 - Phases 1&2 - 2030	$127.47	$4,353,000
2035	$137.32	$4,690,000
2040	$147.94	$5,052,000
2045	$159.37	$5,443,000
Operating Cost Total through Year 2045		$93,210,000

Table 15-25: Rapid Transit Funding for Operations

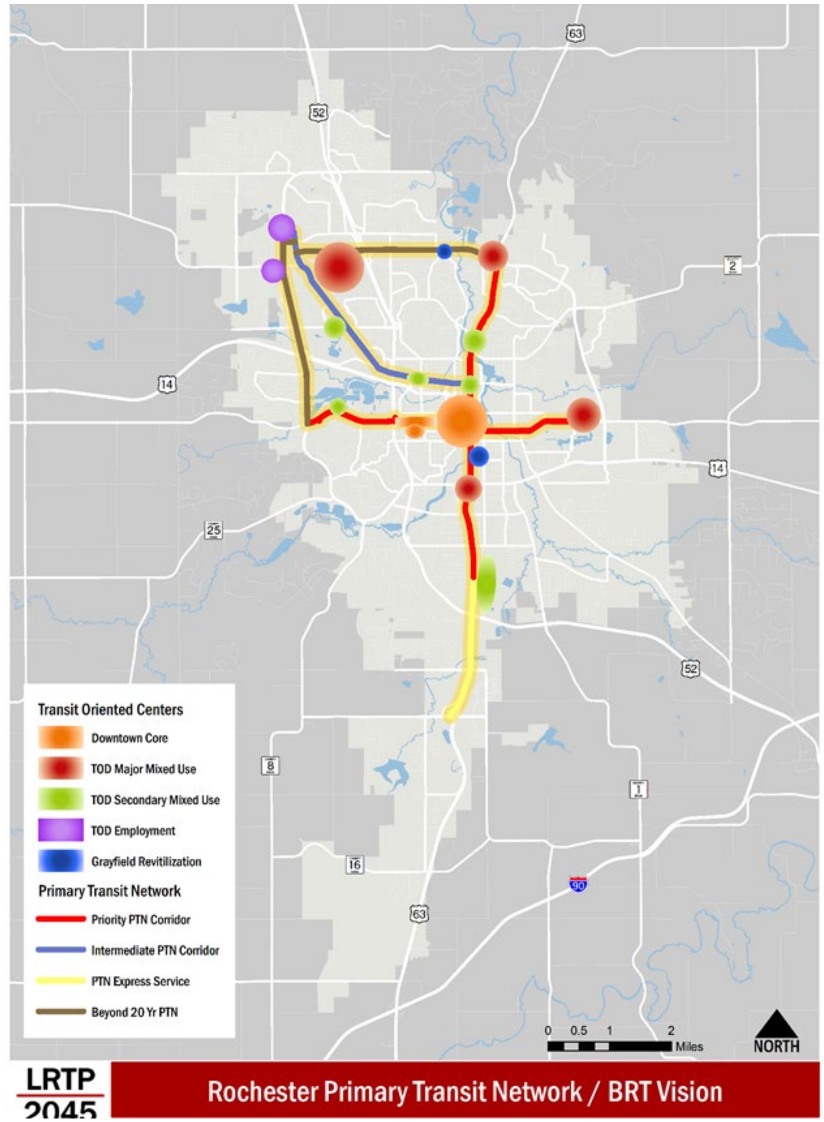
	Operating Cost Revenue Assessment						
Year	Fares / Employer Contribution	Reallocation of Service	State Transit Operating Assistance	Federal	City Local Share	Advertising	Total
% Share	25%	25%	40%	2.5%	2.5%	5%	100%
2025	$735,000	$735,000	$1,176,000	$73,500	$73,500	$147,000	$2,940,000
2030	$1,088,250	$1,088,250	$1,741,200	$108,825	$108,825	$217,650	$4,353,000
2035	$1,172,500	$1,172,500	$1,876,000	$117,250	$117,250	$234,500	$4,690,000
2040	$1,263,000	$1,263,000	$2,020,800	$126,300	$126,300	$252,600	$5,052,000
2045	$1,360,750	$1,360,750	$2,177,200	$136,075	$136,075	$272,150	$5,443,000
TOTAL	$23,302,500	$23,302,500	$37,284,000	$2,330,250	$2,330,250	$4,660,500	$93,210,000

Primary Transit Network Service Summary

The Primary Transit Network (PTN) is a proposed transit network centered on downtown Rochester that will feature high quality, high frequency transit service with modern amenities that connect major centers of activity (downtown, employment centers, higher education, shopping) along a select set of corridors planned for mixed-use, transit oriented development. The corridors will also connect to a number of proposed long-term park and ride lots (see Express Park and Ride Service Summary), supplementing the capacity on that system provided by dedicated Express Buses while also providing off-peak service to the park and ride lots. The PTN corridors are envisioned ultimately to be served by Bus Rapid Transit (BRT). Figure 15-29 highlights the corridors; only those corridors shown as Priority or Intermediate PTN Corridors are anticipated to be developed during the planning horizon of the Plan.

At this time, the PTN Network is included in the Long Range Plan as an illustrative project, as additional early project development work needs to be completed to identify future capital and operating revenues for the network. The following tables summarize the magnitude of costs anticipated to support the system. It is anticipated that some station development and pedestrian oriented features to support the future PTN will be incorporated into highway preservation projects as the opportunity arises. For example, a proposed

Figure 15-29: Primary Transit Network System



reconstruction of North Broadway Ave between downtown Rochester and the Zumbro River Bridge, scheduled for 2021, will incorporate features to accommodate a future station at 7th St NW as well as enhanced pedestrian features throughout the corridor.

Table 15-26 illustrates the estimated development costs for each corridor shown in the PTN Network Plan. These costs are estimated at $1.4 million per mile and are intended to reflect costs associated with infrastructure to support the service such as station development, improved station access for pedestrians, cyclists and scooters, handicapped accommodations, and technology-related systems. In Table 15-27, the reduced cost for the 2nd St SW/4th St SE corridor is reflective of having this infrastructure developed as part of the Downtown Rapid Transit project in advance of the future PTN service. Table 15-27 illustrates anticipated operating costs for each route, reported in base year dollars.

Table 15-26: Development Costs for Primary Transit Network

PTN Route	Length (mi)	Stations	Project Costs (millions)	Timing	Escalated Cost (millions)
Broadway Ave Corridor	9		$12.6	Near Term	$15.3
2nd St SW / 4th St SE Corridor	5		$3.5	Mid Term	$5.0
7th St NW / Valleyhigh Corridor	5		$7.0	Long Term	$12.6
Totals	19	miles	$23.1	million	$32.9

Source: ROCOG

Table 15-27: Estimated Annual Operating Costs for PTN Routes

PTN Route	Peak Vehicles	Off Peak Vehicles	Travel Time	Annual Hours	Annual Operating Cost
Broadway Ave Corridor	6	4	35 min	33,700	$3,835,000
2nd St SW / 4th St SE Corridor	4	4	22 min	24,520	$2,790,000
7th St NW / Valleyhigh Corridor	4	4	24 min	24,520	$2,790,000
Totals	20	18		119,520	$ 13,605,000

Source: ROCOG

Summary of Aggregate Transit Funding Needs

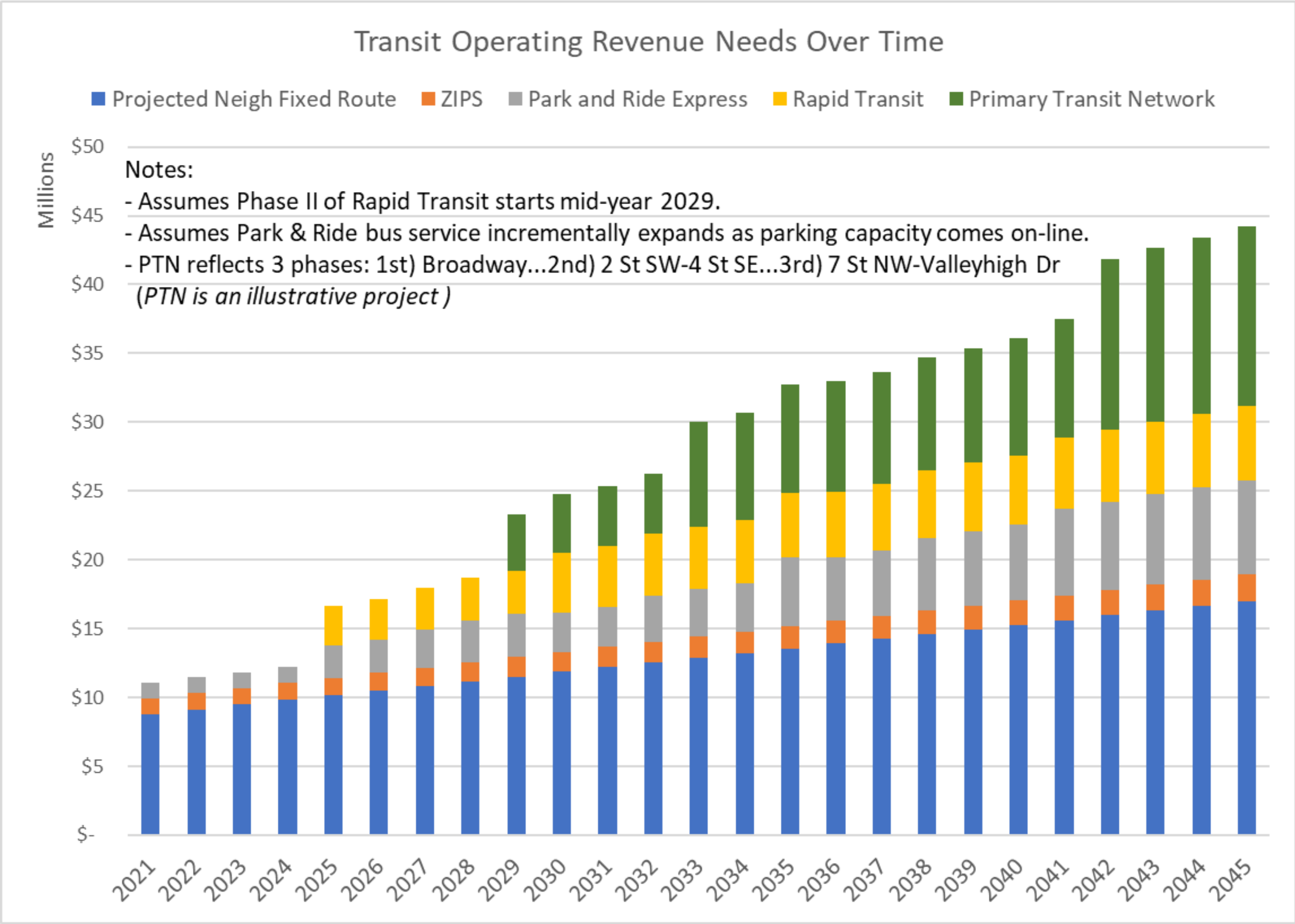
Figures 15-30 through 15-32 highlight the revenue needs over time for capital investment and operating purposes that various elements of the transit and commuter parking system plan will require in order to maintain, expand or initiate the services that have been identified.

Figure 15-30 illustrates transit operating revenue needs over time. From a current level of approximately $12 million a year, projected operating needs would rise to approximately $44 million annually by 2045 in YOE costs. The Plan assumes neighborhood fixed route and paratransit services will continue to receive similar levels of state support through the planning horizon. Downtown Rapid Transit and Park and Ride Express service will have funding plans for operations that rely more heavily on user fees to support these services, with support of programmatic transit operating funds limited to 40% of service costs. The Primary Transit Network at this time is included as an illustrative project to highlight potential future need for additional operating funds. It is possible that the City may pursue a larger system redesign effort in advance of PTN deployment to explore options for reallocating transit revenues more effectively across the range of services proposed.

Figure 15-31 summarizes vehicle acquisition needs across time for the different services. Fixed route neighborhood service will see a steady need for vehicle replacement purchases over time, with limited expansion needs. Rapid Transit sees an early acquisition phase in the 2020s followed by vehicle replacement needs in 2040s. Express Bus Park and Ride service will see a steady need for acquisition as parking capacity is phased in (Figure 15-32) and early vehicle acquisition in the 2020s generate a need for vehicle replacements starting in late 2030s. PTN vehicle needs are illustrative at this time.

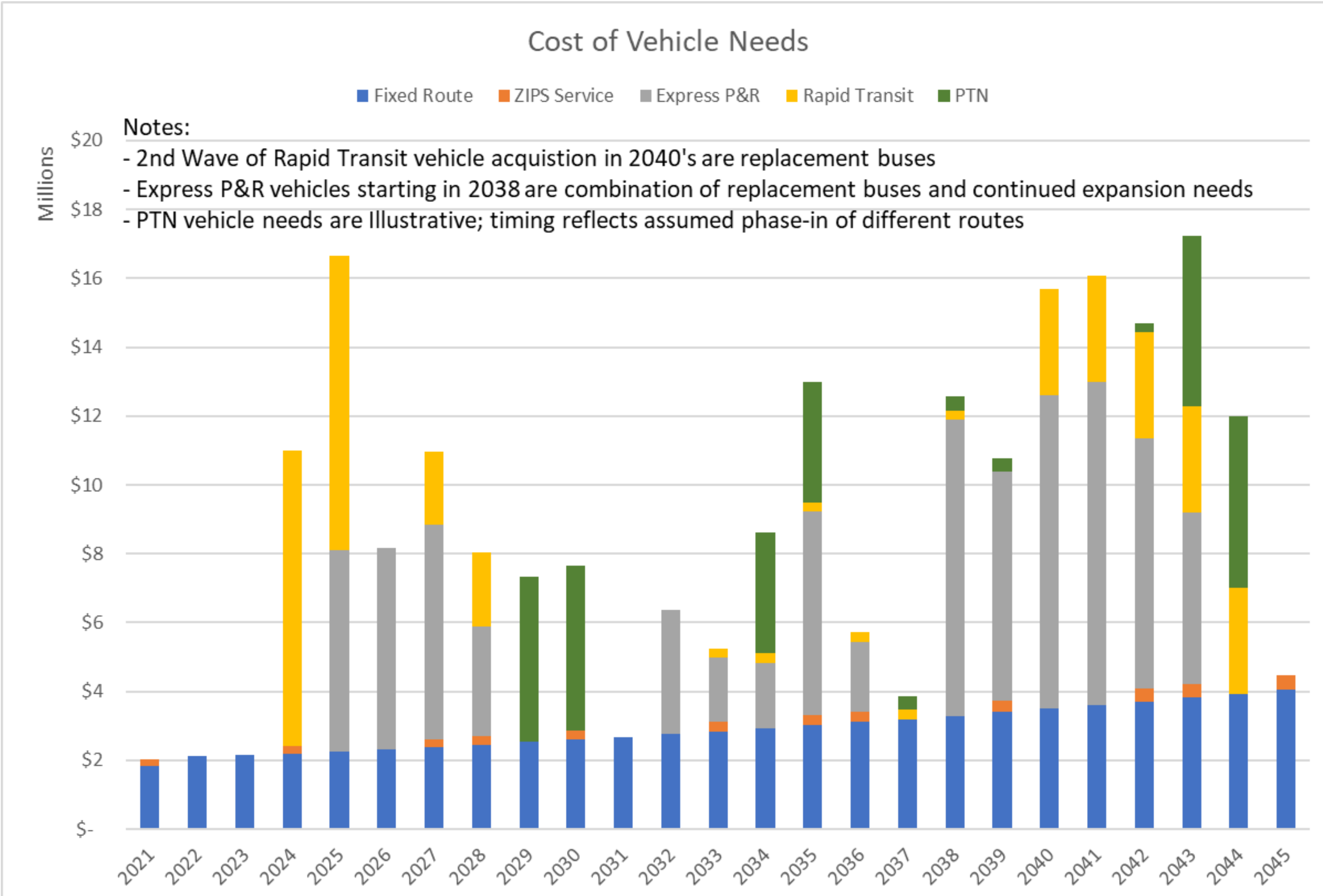
Figure 15-32 summarizes other capital investment needs. The largest share of investment is associated with development of Downtown Rapid Transit in the 2020's, assumed to be funded with Small Starts and dedicated DMC dollars. Development of Park and Ride capacity is phased in over time as new high capacity (1000-2000 space) facilities are brought on-line. Costs with the phase-in of PTN corridors are shown, though these costs are illustrative at this time. A steady volume of fixed route and dial-a-ride enhancements, on the order of $1-$2 million a year, in keeping with historic expenditures, are also assumed. The plan assumes that aside from Rapid Transit, most of these costs will qualify for FTA capital funding.

Figure 15-30: Estimated Transit Operating Needs



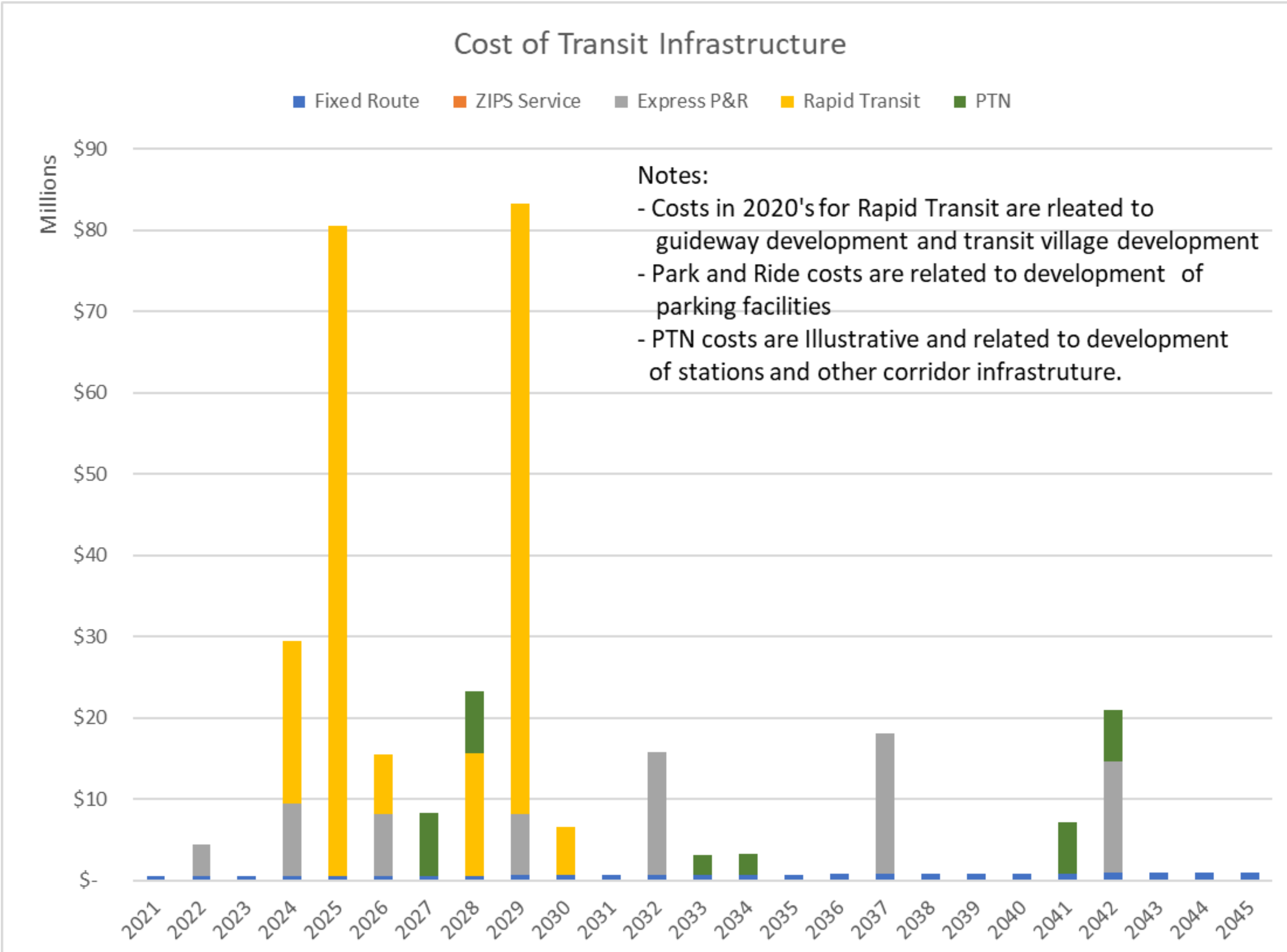
Source: ROCOG

Figure 15-31: Vehicle Acquisition and Replacement Needs



Source: ROCOG

Figure 15-32: Investment Needs for Non-Vehicle Transit Infrastructure



Source: ROCOG

Active Transportation Financial Assessment

Development of active transportation infrastructure in the ROCOG area is supported by a broad mix of federal, state, local, and private funds. Federal funding includes the Transportation Alternatives (TA) program which represents a share of the federal Surface Transportation Block Grant (STBG) program, the core federal highway program. Funds are distributed by the U.S.DOT through a formula to each state, and MnDOT subsequently sets a programming target for each district office.

In the current solicitation for Transportation Alternatives projects, MnDOT District 6 was given a TA target of $1.2 million for distribution across the eleven counties in the district. At the district level the program is managed as a competitive grant program, with candidate projects solicited and awards selected by the District 6 Area Transportation Partnership. To assess what level of TA funding ROCOG could realize over the 25-year horizon of the plan, an analysis of TA (and predecessor programs) dollars awarded to ROCOG area jurisdictions was completed. Based on this analysis, the ROCOG area received on average $470,750 per year (current dollars) in federal TA funding. Awards typically represented 49% of project costs and required a 51% of project costs to be covered by local dollars.

Using this as the basis to estimate future revenues, Table 15-28 reports the estimated 2021-2045 dollars the ROCOG area could expect to realize from the TA program, applying MnDOT's assumption of a 2.2% annual growth in realized federal revenues.

Table 15-28: Expected Federal Funding

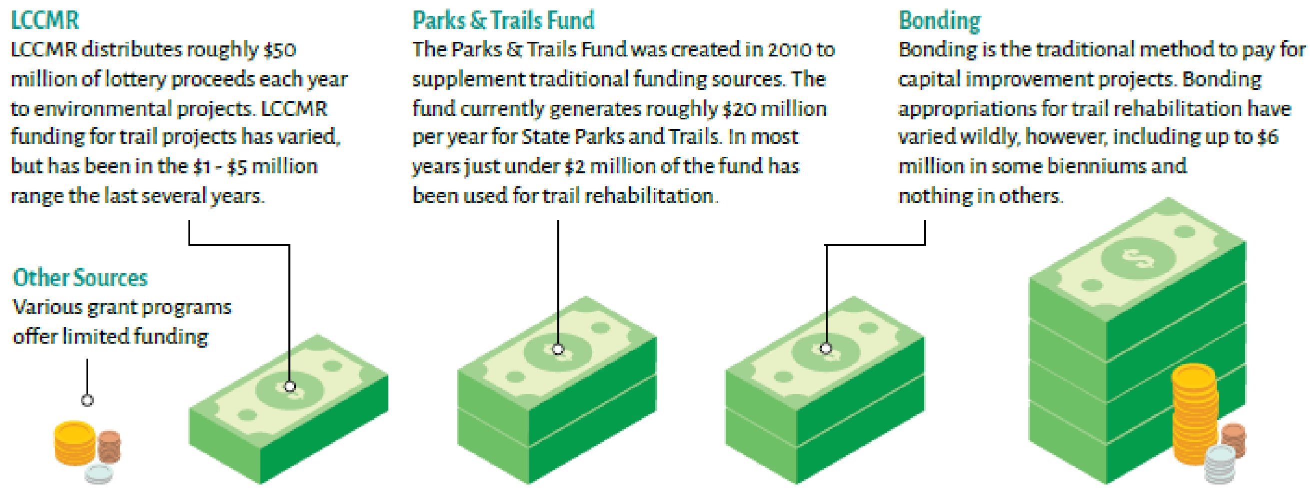
Historic Annual Average TA Funding	Annual Rate of Program Growth	2021-2045 Realized TA Revenue
$470,475	2.2%	$15.46 million

Source: ROCOG

It should be noted that standard federal highway funds and federal transit funds for capital investment can also be used to build or improve active transportation infrastructure when incorporated as a supporting element in a highway or transit infrastructure project. This will be further explored later in this assessment in the section discussing future implementation feasibility.

State funding for active transportation is made available to counties, cities, towns, and organizations through a series of competitive grant programs funded by Minnesota State Lottery proceeds or state bonding dollars. Figure 15-25 summarizes available state funding programs. Note that in addition to local projects supported by these programs, the Minnesota Department of Natural Resources (MnDNR) leads development of state trails, such as the Douglas Trail, for which it uses department funding as well as competing for lottery

Figure 15-33: State Active Transportation Funding Programs



Source: State of the Trails 2018/2019 Report, Parks & Trails Council of Minnesota

and bonding funds.

At the local level, the City of Rochester has been the primary ROCOG recipient of state funds from these programs for projects beyond the state trail network. An analysis of state funding awards for the last 10 years indicates the City has received on average $182,500 annually (in current dollars). Table 15-27 summarizes what this level of funding would translate to over the 2021-2045 period, assuming a 1% annual increase in lottery and bonding dollars.

As with federal highway funds, state highway funds such as County and Municipal State Aid can also be used to fund active transportation infrastructure included as an element of a primary road construction project.

Table 15-29: Expected State Funding

Historic Annual Average TA Funding	Annual Rate of Program Growth	2021-2045 Realized State Funding
$182,500	1%	$5.15 million

Source: ROCOG

Local funding for active transportation in the ROCOG area is primarily provided by Rochester to support system development and, more importantly, to provide the local match needed for federal or state dollars that are secured for project development. ROCOG analysis of local funding focuses on the City of Rochester, since it is the jurisdiction providing the most sustained funding for development and maintenance of facilities serving active transportation users within the ROCOG area.

Table 15-30 provides a look at historic funding for City pedestrian and trail/path projects for the 10-year period of 2011-2020 based on projects programmed in the Budget Year of the City Capital Improvement Program.

Funding is highlighted in 3 project groupings:

- Maintenance
- System Development
- Destination Medical Center (DMC)

Items to note relative to Table 15-30 include:

- Special assessment bonds are included as maintenance funding since they are used primarily for infrastructure replacement
- The DMC group is broken out separately due to projects within the DMC District relying heavily on DMC funding sources eligible only to be used in the DMC District

Under System Development, federal and state funds are highlighted since these represent outside funds for which local matching funds must be provided. Note the 10-year federal total of $4.8 million matches up well with the historic annual average of $470,000 in federal

Table 15-30: Analysis of Rochester Funding

Rochester Funding for Active Transportation	2011-2020 Totals
Maintenance	
Flood Control trail system Preservation	$150,000
Trail overlay program (Non-flood control corridors).	$55,000
Special Assessment Bonds	$3,955,000
System Development	
Federal	$4,868,550
Local Government Aid	$115,000
Municipal State Aid for Streets	$3,905,500
Private Funds	$50,000
Project reserves	$1,359,500
Sales Tax	$1,950,000
Sales Tax 2013	$50,000
State	$1,425,000
Tax Levy	$2,575,500
Destination Medical Center Projects	
Bike Lanes on Center and 4th Ave	$500,000
Dedicated Bike Lanes on 3rd/4th Av and Center St	$1,100,000
Discovery Walk	$3,200,000
Grand Total	$25,259,050

Source: Adapted from data in Rochester Capital Improvements Program

Transportation Alternatives funding reported in Table 15-28.

Using this information as a starting point, 25-year estimates of expected Rochester funding were prepared as shown in Table 15-31. Note in this table DMC funding was re-analyzed using only a four-year timeframe, since programming DMC projects began in earnest only in 2017. The $28.8 million level of projected funds shown for the DMC area matches up well with the programming for active transportation projects shown in the original DMC Development Plan.

Table 15-31: Estimated Rochester Funding for Active Transportation

City of Rochester Projected Active Transportation Funding	25 Year Funding (Based on 10 Year History)	25 Year Funding (Based on 4 Year History)
Maintenance	$10,400,000	
System Development	$25,010,000	
DMC		$28,800,000

Source: ROCOG

Evaluation of Costs Associated with Preservation of Existing System

Active transportation preservation needs focus on three main elements of the active transportation infrastructure:

- Regional state trails
- Rochester urban area trails and paths
- Rochester Urban Area active transportation bridge structures

Regional State Trails

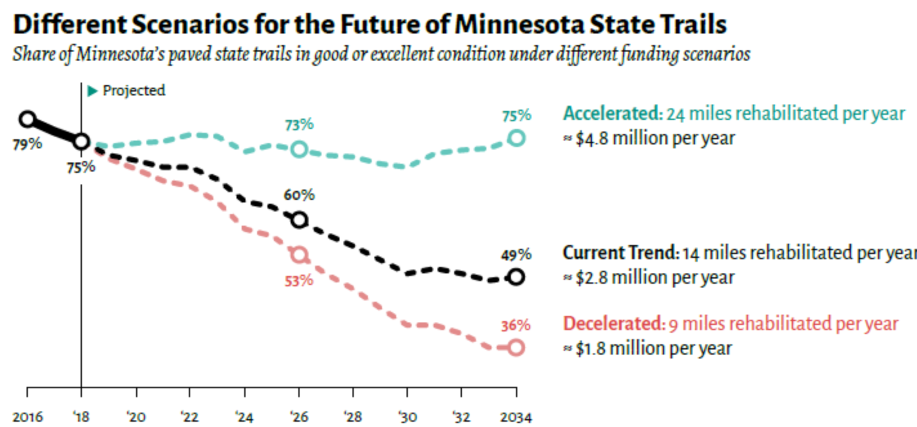
Regional trails are a high visibility/high impact component of the active transportation network in terms of serving recreational and tourism-related travel in the planning area. With MnDNR having the responsibility for the state trail network, maintenance and preservation falls outside of the direct purview of ROCOG consideration. To the extent that a state trail may in the future need significant repair or reconstruction, it may compete for the same federal or state funds as local jurisdictions do.

In 2018, the State Parks and Trails Council completed an analysis of the state trail network and is urging the State Legislature to fund state trail rehabilitation at a level of $4.8 million annually—50% higher than current levels. Figure 15-34 illustrates expected future conditions on Minnesota’s state trails under current funding and the recommended level of funding. Routes generally can remain serviceable for 15-20 years with minimal preservation work, but as routes approach 30 years or more in age (such as the Douglas Trail), more significant work needs to be considered.

Rochester Urban Area Trails and Paths

Similar to roadways, paths and trails need a certain level of periodic preservation work to resist the impact of use, age, and environment. Periodic seal coating for bituminous trails and crack repair on concrete paths, along with bituminous overlays and concrete surface rehab, can extend the life of facilities until a point where reclamation or reconstruction may be required. Table 15-32 summarizes data provided by the City of Rochester that was used to estimate preservation costs for the urban area trail and path system.

Figure 15-34: Future State Trail Condition Under Different Scenarios



Source: State of the Trails 2018/2019 Report, Parks & Trails Council of Minnesota

Table 15-32: Rochester Urban Area Trail and Path Network Statistics

Measure	Total	Bituminous Surface	Concrete Surface
System Miles	110 miles	94.5 m	15.5 mil
Paths and Trail Dimensions	10 feet or greater	8 feet	Less than 8 feet
% of System	60% of system	28% of system	12% of system
Quantity of Path & Trails	Total	Bituminous Surface	Concrete Surface
Square Feet	5,300,000	4,670,000	630,000
When Trail / Path was built	Since Year 2000	1980-2000	Before 1980 or Unknown
Bituminous Facilities	68%	31%	1%
Concrete Facilities	52%	44%	4%

Source: Data from Rochester Public Works Department; Data Analysis by ROCOG

Table 15-33 documents the life cycle assumptions used to estimate the funding needed for preservation of the Rochester trail and path network. Using standard square footage costs provided by the City of Rochester, estimates of total costs for the preservation or reconstruction needs shown in the Table 15-33 are reported in Table 15-34.

Table 15-33: Life Cycle Treatment Assumptions

Trail or Path Surface	Minor Preservation	Major Preservation	Reconstruction
Bituminous	Seal Coat twice during 25-year plan horizon	Overlay once during 25-year plan horizon	Reclaim or reconstruct any trail built before 1990
Concrete	Crack Seal twice during 25 horizon of plan	Microsurface once during 25 horizon of plan	Reconstruct any trail built before 1980

Source: ROCOG

Table 15-34: Estimated Costs of Trail & Path Network Preservation

Surface Type	Minor Preservation	Major Preservation	Reconstruction	Total
Bituminous	$550,000	$4,485,000	$1,705,000	$6,740,000
Concrete	$445,000	$2,000,000	$860,000	$3,305,000

Source: ROCOG

Comparing the total costs shown in the last column of Table 15-34 with estimated revenues that the City of Rochester has available for trail and path maintenance in Table 15-31 indicates that funding for maintenance is currently well aligned with anticipate maintenance needs, with expected 25-year costs of approximately $10 million.

Rochester Urban Area Active Transportation Bridges

There are a number of bridge structures that have been built specifically to serve the non-motorized travel network in the Rochester area, along with many standard roadway bridges that incorporate pedestrian or bicycle accommodations. These include the following facilities:

- 5 major trail or pedestrian bridges spanning major multi-lane divided highways such as TH 52 or TH 14
- 35 low cost pedestrian bridges serving the trail and path system spanning rivers, streams, and local streets
- 69 standard roadway bridges serving the trail and path system which have incorporated wider crossing areas to accommodate paths or trails
- A total of 30 skyway bridges in downtown Rochester, 13 of which cross public streets

In general, the non-motorized bridge network currently is anticipated to need minimum maintenance over the plan horizon. Most facilities have been built in the last 30 years; thus, they are not expected to need major repair within the horizon of the Plan given their expected life span of more than 50 years.

Funding Future Active Transportation Improvements

During development of the Plan, a list of candidate active transportation projects was developed and taken to the public for review and comment. Project concepts were drawn from existing plans and programs along with ideas submitted by the public. Early iterations of the project list were reviewed with the ROCOG Transportation Technical Advisory Committee and the ROCOG Policy Board.

Estimated costs for the final list of project needs were prepared by project staff. The amount of funding needed to implement these projects far exceeds the dedicated active transportation dollars available from federal, state, and local sources. However, local history has shown that projects such as trails or paths often are constructed through other avenues, such as being integrated into larger roadway construction or transit development projects, or as part of private development.

Based on this, the list of future projects was further analyzed to develop an implementation scenario that recognized the different project development paths available to construct active transportation infrastructure. Projects were assigned to logical development paths in an effort to identify that subset of projects most likely to be candidates for the $15.5 million in federal funds that would be available over the course of the planning horizon through the Transportation Alternatives program.

A total of 10 project development/project delivery paths were identified, including:

- Project developed as a free-standing trail/path project
- Project developed as integral part of a street construction/reconstruction project
- Project developed as an integral part of a transit capital project
- Project developed as part of a Complete Streets project (generally involves reallocation of pavement)
- Project developed as part of safety improvement
- Project required as part of private development
- Safe Routes to School funds used to construct project
- City sidewalk program funds used to construct or improve pedestrian facilities
- Project developed as part of a Destination Medical Center infrastructure project
- Project developed as a MnDNR State Trail Project

Following assignment of projects to a likely project delivery path, the projects were further classified as to likely timing of development. For this classification, five categories were used:

- Projects are programmed in first 3 years of a capital improvements program
- Projects are considered a priority for near term development (years 1-10 of Plan)

- Projects are considered a priority for long term development (years 11-25 of Plan);
- Projects a considered illustrative/higher priority;
- Projects are considered illustrative/lower priority.

This timing classification is particularly important relative to fiscal constraint since the list of projects most likely to rely on federal funds needs to be constrained to reflect a level of cost consistent with the anticipated level of federal funds available.

Table 15-33 provides a summary of anticipated costs grouped by anticipated project delivery path and the five timing classes. Implementing all candidate projects is estimated to cost approximately $135 million, as shown at the bottom of Table 15-35. The categories of projects considered prime candidates for federal funding, reflected in the third and fourth columns of Table 15-35, include:

- Group 1: Federal funds as primary funding source for free standing trail/path projects;
- Group 2: Federal funds used to supplement street reconstruction funds on selected projects
- Federal Funds are identified as a secondary funding source in the following project development groups:
  - Transit capital projects
  - Complete Streets projects
  - Safe Routes projects
  - State trail projects

The estimate of federal funds that would be used in these categories is $15.9 million, assuming primary source funding provides 70% of project costs and secondary source funding provides 30% of project costs. With anticipated federal revenues of $15.5 million, there is good correspondence between anticipated project funding levels and available federal revenues.

Preliminary Fiscal Constraint Finding

From a fiscal constraint standpoint, the costs associated with project delivery groups that have been targeted as candidates for federal funding is consistent with the estimated level of federal revenue available as shown in Table 15-28, with Rochester having adequate local dollars available to match federal funding. In addition, the level of maintenance need identified in Table 15-34 (approximately $10 million) is generally consistent with the maintenance funding shown in Table 15-31 that the City of Rochester has available from historic funding sources.

Table 15-35: Summary of Program Costs by Primary Implementation Category

COST SUMMARY BY PRIMARY IMPLEMENTATION GROUP	Total Project Costs	Federal Dollars as Primary Funding (70% of Cost)	Federal Dollars as Secondary Funding (30% of Cost)
Active Transportation Projects	$ 32,254,800	$ 8,766,660	$ -
Programmed / Committed	$ 4,665,800	$ 3,266,060	$ -
25 Yr Horizon / Near Term	$ 3,886,750	$ 2,720,725	$ -
25 Year Horizon / Long Term	$ 3,971,250	$ 2,779,875	$ -
Illustrative - Higher Priority	$ 13,611,000	$ -	$ -
Illustrative - Lower Priority	$ 6,120,000	$ -	$ -
Street Construction Projects	$ 32,447,250	$ 2,733,500	$ 946,500
Programmed / Committed	$ 8,039,000	$ -	$ 217,500
25 Yr Horizon / Near Term	$ 2,472,000	$ -	$ -
25 Year Horizon / Long Term	$ 12,847,250	$ -	$ 729,000
Illustrative - Higher Priority	$ 5,184,000	$ -	$ -
Illustrative - Lower Priority	$ 3,905,000	$ 2,733,500	$ -
Transit Capital Projects	$ 1,236,950	$ -	$ 234,000
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ 456,950	$ -	$ -
25 Year Horizon / Long Term	$ 780,000	$ -	$ 234,000
Illustrative - Higher Priority	$ -	$ -	$ -
Illustrative - Lower Priority	$ -	$ -	$ -
Complete Corridor Projects	$ 5,809,300	$ -	$ 1,026,000
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ 3,157,500	$ -	$ 792,000
25 Year Horizon / Long Term	$ 1,931,500	$ -	$ 234,000
Illustrative - Higher Priority	$ 459,000	$ -	$ -
Illustrative - Lower Priority	$ 261,300	$ -	$ -

COST SUMMARY BY PRIMARY IMPLEMENTATION GROUP	Total Project Costs	Federal Dollars as Primary Funding (70% of Cost)	Federal Dollars as Secondary Funding (30% of Cost)
Private Participation / Facilitation	$ 8,091,250	$ -	$ 420,825
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ 7,251,250	$ -	$ 420,825
25 Year Horizon / Long Term	$ 840,000	$ -	$ -
Illustrative - Higher Priority	$ -	$ -	$ -
Illustrative - Lower Priority	$ -	$ -	$ -
Safe Routes projects	$ 4,441,750	$ -	$ 776,025
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ 900,000	$ -	$ -
25 Year Horizon / Long Term	$ 2,611,750	$ -	$ 776,025
Illustrative - Higher Priority	$ -	$ -	$ -
Illustrative - Lower Priority	$ 930,000	$ -	$ -
Sidewalk Program / Local Street Project	$ 2,053,100	$ -	$ -
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ 746,100	$ -	$ -
25 Year Horizon / Long Term	$ 938,500	$ -	$ -
Illustrative - Higher Priority	$ -	$ -	$ -
Illustrative - Lower Priority	$ 368,500	$ -	$ -
DMC Projects	$ 30,982,000	$ -	$ -
Programmed / Committed	$ 16,800,000	$ -	$ -
25 Yr Horizon / Near Term	$ 7,280,000	$ -	$ -
25 Year Horizon / Long Term	$ 6,902,000	$ -	$ -
Illustrative - Higher Priority	$ -	$ -	$ -
Illustrative - Lower Priority	$ -	$ -	$ -

COST SUMMARY BY PRIMARY IMPLEMENTATION GROUP	Total Project Costs	Federal Dollars as Primary Funding (70% of Cost)	Federal Dollars as Secondary Funding (30% of Cost)
State Trail Projects	$ 17,908,450	$ -	$ 1,046,160
Programmed / Committed	$ -	$ -	$ -
25 Yr Horizon / Near Term	$ -	$ -	$ -
25 Year Horizon / Long Term	$ 4,892,200	$ -	$ 633,660
Illustrative - Higher Priority	$ 13,016,250	$ -	$ 412,500
Illustrative - Lower Priority	$ -	$ -	$ -
Category Totals	**$ 135,224,850**	**$ 11,500,160**	**$ 4,449,510**
Federal Transportation Alternatives Funding Estimate			**$ 15,949,670**

Source: ROCOG

Principles for Managing Investment Under Constrained Revenue Scenario

Given the long history of all levels of government being unable to craft solutions to raise the revenue needed to meet transportation funding needs, consideration needs to be given to how to manage the gap between current revenues and needs. As a true planning agency with programming authority only over a limited share of federal funding (and no authority over programming state or local transportation revenue), ROCOG's role and influence in managing how transportation dollars are investment is limited largely to facilitating strategic discussions among partners regarding priorities and project selection processes. Strategies that could be considered help determine how to allocate resources include:

- Establishing programming priorities to aid in weighing competing needs
- Establishing selection criteria to guide the programming and prioritization process

The following sections discuss features of these two approaches to fine tuning the programming process.

Management Strategy #1: Establishing Program Priorities

In an environment where funding levels cannot address the full range of improvements needed, it becomes necessary for decision makers to weigh competing needs and decide where resources should be directed. In this situation, decision makers typically will want to see emphasis placed on preserving what is already in place and doing as much as possible to ensure the system operates safely and efficiently. Federal planning regulations require that state and metropolitan transportation plans discuss how, given a constrained revenue environment, resources will be targeted. Typical priorities found in a review of selected MPO plans included the following guidance:

- The most common priority is to direct adequate funding to system preservation in order to maintain existing service levels.
- Another common priority calls for investing in low and moderate cost strategies to improve the efficiency or management of the highway system, including projects such as turn lane additions, correction of geometric deficiencies, access modifications, and enhanced traffic signal systems to optimize safety, capacity and operations.
- Travel reliability is gaining adherents as a high priority based on travelers' desire to be able to rely on a certain level of performance, such as travel time, for common trips such as the trip to work or school. Achieving travel reliability often relies on a mix of projects addressing safety or capacity bottlenecks and programs such as the coordinated response of public safety and maintenance teams to efficiently clear incidents or otherwise manage traffic flow to minimize disruptions.
- Many plans place the lowest priority on expansion of the highway system, including construction of new corridors or the addition of new lanes to existing corridors.

The vitality of the urban area in terms of whether it is growing (and at what rate), stable, or in decline, will affect these priorities, particularly when considering system expansion. With Rochester and the small cities in the ROCOG area experiencing growth similar to historic high growth levels, the need for selected capacity additions may be necessary.

To ensure a high level of system reliability and maintain an acceptable level of infrastructure quality, the following key principles can help to guide future capital programming decisions.

- **Network Preservation**
  - **Bridges:** Given the level of inspection data available for bridges, prioritizing structures with existing or emerging structural deficiencies that

pose a potential risk to network operations should be given priority. Structures that are highly important to network function and economic activity should be given the highest priority.

- **Roadways**
    - Utilize pavement management systems to supply the information needed to make cost-effective pavement preservation decisions and ensure necessary level of data collection is funded.
    - Prioritize preventative maintenance in the early years of a roadway's life cycle to ensure extended facility life, while pavement structures near the end of their useful life should be treated with low cost strategies to address safety concerns until dollars can be budgeted for significant restoration or reconstruction.
- **Management & Safety**
    - **Safety**
        - Prioritize safety expenditures on those locations where the greatest risk reduction relative to potential fatal or serious injury can be achieved.
        - Consider bundling of low-cost improvements that will improve high risk intersection or road segments locations which can be funded as a single project or a multi-year program.
    - **Management**
        - Implement access management improvements consistent with guidelines in local ordinances and the Plan.
        - Fund traffic signal management systems involving the coordination/synchronization of traffic signals on corridors where congestion or conflict stretching across multiple intersections is observed.
- **Travel Demand Management**
    - Fund actions or strategies that can transit as an alternative mode of travel, particularly the work trip, through projects that will
        - Increase the number and enhance the attraction of park and ride facilities
        - Expand the availability of transit subsidy programs
        - Price parking to reflect the market-based value of the service
- **Corridor Preservation**
    - Fund efforts to preserve lands expected to be needed for corridor management purposes. Where a corridor is at-risk for loss of critical right of way, consider completing early project work and

officially mapping corridors as a first level of protection for future improvements.

- Establish and fund a set-aside annually in local capital improvement programs to fund early right-of-way acquisition for interchanges and strategic arterials.

- **Network Improvement**
  - Fund priority intersection improvements
    - Fund lower cost improvement projects aimed at correcting geometric deficiencies that result in safety hazards.
    - Fund needed at-grade intersection capacity improvements that can be achieved through the installation of turn lanes or auxiliary lanes, on major or strategic arterials.
    - Given the high cost of interchange projects, give early attention to acquiring needed right of way for future construction or upgrades and develop a strategy to secure funding for projects.
- **Economic Development Needs**
  - Priority corridor improvements include
    - Fund improvements on planned regional freeway or expressway corridors where traffic volumes are expected to result in inadequate level of service within 10 years.
    - Fund improvement of existing gravel or deficient two-lane paved roadways planned as major arterials in urban expansion areas in advance of development when possible to avoid disruption to travel after the corridor area is developed.
    - Address basic deficiencies on major roadways including pavement strengthening and substandard shoulders when conducting preservation work, desirably as part of standing preservation program.
  - In all cases prioritize programming of local matching funds to leverage discretionary funding or programmatic federal funding to ensure that these outside funds do not lapse.
- **Planning**
  - Promote greater integration of transportation and land use planning through elimination of barriers to transit-supportive and pedestrian-friendly development in targeted transit corridors, coordination of transportation investments with land use through targeted corridor or subarea investment areas, and the development of guidelines to permit redevelopment of infill and

greyfield (i.e., underused commercial retail centers) sites.

Chapter 10 discusses the regionally significant and locally significant improvement projects that should have the highest priority for federal and/or state funding consideration should dollars become available for improvement work.

Management Strategy #2: Project Selection Screening Criteria

In a constrained funding environment, projects considered for state or federal funding should meet a minimum set of criteria to justify funding. The following project screens are suggested for use when ROCOG considers candidate projects for funding or when looking to recommend projects to the District 6 Area Transportation Partnership.

- **Readiness:** The project has been through initial project development process steps and no significant environmental flaws or concerns have been identified which would cast doubt on the ability of the project to proceed through final environmental clearances; local sources of matching funds have been identified.
- **System Importance:** The project is functionally classified as being either interstate or interregional roadway or a strategic and major arterial roadway.
- **System Development:** The project will contribute to maintaining or improving overall system continuity and is located on a corridor that serves regional as well as local area traffic needs or provides important service to a major development area.
- **Project Need:** The project addresses either a significant safety deficiency or substandard structural conditions, or addresses an existing capacity deficiency or one anticipated to materialize in a 1 to 10-year time frame.
- **Economic Development:** The project is needed to support the creation of new employment opportunities in industries or business sectors that generate income or sales primarily from the sale of products or services to areas outside of the local region. In economic terms, these businesses are referred to as basic industries.
- **Multi-Modal Travel:** The project will enhance opportunities for travel via modes other than single occupant vehicles by improving conditions for pedestrians and/or bicyclists or improving conditions for transit system users.

An example of a screening system incorporating some of these factors that was used when assessing projects to include in the candidate list of projects for ATP Funding discussed earlier in this chapter is shown in Figure 15-35.

Figure 15-35: Example Prioritization Matrix

Investment Objective	Weight	Relative Score	Factors used to Assess Consistency with Investment Objectives: High		Medium		Low	
Asset Management / state of good repair								
Upgrades structural condition and extends service life	2	0	Project will Improve road structure with existing Poor Condition Rating or bridge structure with	5	Project will improve road structure with Fair condition rating or bridge Structure with	3	Project involves road or bridge structure with existing good condition ratings	1
System Importance / Development / Benefit								
Function of road on ROCOG Functional Designation System	2	0	Project provides mobility, access or safety improvement that benefits	5	Project provides mobility, access or safety improvement that	3	Project provides mobility, access or safety improvement that	1
Safety/Risk Mitigation								
Crash rate Improve vehicular travel safety	2	0	Project provides improved safety at location with observed critical crash ratio over 1.5	5	Project provides improved safety at location with observed critical crash ratio over 1.0	3	Project provides improved safety at location with observed critical crash ratio below 1.0	1
Mobility / Congestion								
Improve Regional Mobility by addressing capacity bottleneck or deficiency	2	0	Addresses existing capacity bottleneck or congestion deficiency	5	Addresses projected capacity bottleneck or congestion deficiency	3	Project area not impacted by existing or future congestion	1
Improve Reliability of Community Area or Development SubArea Access	1	0	Will improve system access by addressing high risk access conflict	0	Will improve system by addressing moderate risk access conflict	0	Project is not in a location where high or moderate access present or projected	0
Support Community Vision								
Consistent with and supports Regional Growth Management Planning	2	0	Project will improve travel in an established urban area	5	Projects will support future travel needs in planned growth area	3	Project primarily serves travel needs in area of low demand	1
Supports Regional Economic Vision	1	0	Projects provides 9 or 10 Access or improves structural condition of a arterial truck route AND benefits commuter access to major	5	Project improves structural conditon of non-arterial 9 or 10 Ton truck route OR benefits commuter travel	3	Project provides minor benefit to truck route network or commuter travel	1
Multi-Modal Travel								
Project provides for expansion or upgrade the Active Transportation Bikeway Network	1	0	Project provides opportunity to improve significant Active Transportation Bikeway network gap	5	Project provides opportunity to improve existing Active Transportation Bikeway infrastructure	3	Project corridor plays minor role in regional Active Transportation Bikeway Network	1
Project provides for expansion or upgrade the Active Transportation Walkway Network	1	0	Project provides opportunity to improve significant Active Transportation Walkway network	5	Project provides opportunity to improve existing Active Transportation Walkway	3	Project corridor plays minor role in regional Active Transportation Walkway Network	1
Will advance the Regional Transit Vision	1	0	Project corridor is part of PTN or access to Park & Ride site	5	Project corridor serves multiple non-PTN transit routes	3	Project corridor plays minor role in regional transit vision	1

16 • Implementation

Overview

Chapter 16 includes a compilation of actions and strategies recommended in the 2045 Plan along with lists of specific planning and project development studies recommended for completion. Implementation of these recommendations is contingent upon a wide range of external factors, including but not limited to funding availability, the timing and significance of emerging needs, evolving socio-economic and development trends, as well as political and institutional considerations.

The first section of the chapter lists action plan items. These items reflect a range of implementation considerations which should receive attention going forward, ranging from on-going system management strategies to the refinement and implementation of policy.

The second section of the chapter identifies specific studies that are recommended for completion. Table 16-1 lists project development studies recommended for future consideration. Project development studies are key for implementing the concept of corridor preservation, which has been a major focus of past efforts to protect corridors through 1) establishment of official right of way maps, 2) guidance on future access management, and 3) identification of preliminary cross section needs to assure adequate land will be available for multi-model travel and environmental needs. Completion of corridor preservation studies also benefits private development interests by allowing future development to be planned in with anticipated transportation infrastructure changes.

Table 16-2 identifies recommended planning/policy studies. These studies are intended to address policy or system issues and are grouped by primary modal or policy concern.

These lists should be revisited periodically to determine if priorities have changed or new issues that need in-depth attention have arisen. The list should be referenced annually during the preparation of budgets, work programs, and capital improvement programs by ROCOG, MnDOT, and local road authorities. Doing so will help identify whether resources exist, or funding needs to be found, for the highest priority projects and whether consultants need to be retained to assist in project work.

Implementation Principles

The following sections summarize key principles that will guide implementation of the 2045 Long Range Plan. The measures identified reflect a range of considerations that should be used to guide planning and project development work during environmental review and preliminary design phases. This process begins once a transportation need has progressed to the point where action is required and funding and other available resources for project development have been identified.

Implementation Recommendations

Roadway Network

- ROCOG and its partners will consult **roadway classification maps** in Chapter 10 and associated multi-modal planning guidance early in the project concept or project development process to inform project scoping and identification of alternatives relative to decisions such as general alignment location, right-of-way needs, access and connection spacing, modal features to provide, and expected level of service.
- ROCOG and its partners will utilize **right of way guidelines** in Chapter 10 in public sector studies such as corridor preservation studies and in responding to public and private development proposals. This will ensure that adequate right of way is identified to address future multi-modal improvement needs along proposed new or reconstructed corridors, with particular attention given to the need for right of way at intersections to accommodate turn lanes, medians, pedestrian refuge areas, bike facilities, and bus stops as well as environmental and quality enhancement needs.
- Cooperative funding efforts involving the City of Rochester, Olmsted County, and MnDOT are needed to facilitate completion of early corridor planning and environmental documentation work involving alternatives analysis, environmental assessment, and tools such as official maps on major corridors where future improvements are anticipated.
- ROCOG and its partners will consult **street connection, signal spacing guidelines, and level of service criteria** to efficiently plan for the management of traffic flow and to minimize traffic conflict along highway corridors. In an era of constrained resources, maximizing the efficiency of existing roadways is critical to meeting capacity demands, and managing the spacing of access and signals is one of the most effective means to accomplish that.
- **Complete Streets** and **Context-Sensitive Design** principles will be considered in all projects to reduce impacts of vehicular traffic to the community and

provide safe accommodations for bicyclists and pedestrians in all corridors.

- Rochester, Olmsted County, and MnDOT will continue to prioritize efforts to fund the preservation of the existing transportation network in order to maximize the efficiency and utilization of existing capital investment.

Transit

- Transit route performance will be regularly monitored. The information gathered will be used to modify or restructure the transit network on an ongoing basis to maximize financial performance.
- The majority of transit routes converge on the Downtown Transit Center. Alternative service concepts that supplement this hub and spoke service design, such express service zones, crosstown routes, and secondary hubs, will be evaluated as the Rochester urban service area continues to expand.
- Regional transit service should be integrated where it makes financial sense and can improve service, such as the possible interfacing of Rolling Hills Regional Transit with Rochester's fixed route transit service.
- The multi-modal recommendations of the Rochester Downtown Master Plan and the Destination Medical Center Development Plan should be implemented as opportunities arise and resources can be secured to address anticipated growth in demand and facilitate the accommodation of various users on downtown Rochester streets.
- The development of additional park and ride facilities for both the urban area and regional commuters will be a major strategy to manage the flow of vehicular travel into Rochester's downtown core. A Park and Ride Strategic Plan should be developed to identify target areas for park and ride development in order to facilitate advance land acquisition for development and protect potential sites.
- Project development for high frequency, high capacity transit concepts, such as Downtown Rochester Rapid Transit and the Primary Transit Network, should be advanced to meet long-term downtown Rochester travel demand needs. Feasibility studies may be needed for the Primary Transit Network to further assess the concept and the potential changes or evolution in land use patterns needed to make such a system successful. Abandonment or sale of rail corridors should be carefully scrutinized for their future value as alternate transportation corridors before abandonment of any such corridor is approved.
- Feasibility studies should be conducted to determine the ability of mobility hubs to attract new users to transit services and serve as secondary transfer points that facilitate the transition of fixed route transit away from a hub and spoke design to a grid network that

can expand convenient transit access to more parts of the urban area.

- Transit facility development should be coordinated with roadway improvements and pedestrian or bicycle projects to provide connectivity to public transportation hubs and nodes via multiple modes of travel. Jurisdictions with land use authority should study whether transit infrastructure such as bus shelters, information kiosks, and off-board ticketing should be considered part of the basic package of adequate public facilities needed to support private development.
- The City of Rochester should continue its partnership with the Mayo Medical Center to manage employee travel demand and reduce single occupant vehicle commuter travel. When feasible, efforts to more closely integrate Mayo's program with Arrive Rochester should be expanded.
- Given the potential intensity of downtown development that could result from the Destination Medical Center initiative, a coordinated parking strategy involving integration of parking resources to meet different time of day needs should be evaluated by Rochester and downtown interests.
- To encourage more individuals to consider alternatives to private vehicle travel, Arrive Rochester should expand transit marketing efforts, distribution of transit information, and the number of outlets where information can be accessed.
- With regards to individuals unable to use regular route transit, coordination efforts should be continued with human service organizations in order to make more efficient use of available public transportation resources.

Bicycle and Pedestrian

- Municipalities should continue to require the construction of sidewalk facilities and accommodation for planned bikeway facilities in all new developments.
- Appropriate bikeway and walkway accommodations should be provided in all new highway construction projects, when improving or reconstructing existing bridges and roads, and as part of any park and open space development where the location would provide an important link in the active transportation network.
- ROCOG and its partners will pursue grant funding and legislative appropriations to facilitate the construction of regional trails and major trail corridors in the urban trail network.
- Transportation agencies, utility agencies and jurisdictions will coordinate opportunities for future joint development of paths or trails along utility corridors, railway corridors, and major stormwater management corridors.

- ROCOG and its partners will continue to monitor pedestrian safety needs and implement pedestrian safety improvements where warranted.
- Jurisdictions will continue to seek additional funding for the maintenance of bikeway and walkway facilities.
- ROCOG and its partners should develop an investment plan to provide paved shoulders of adequate width on suburban and rural roads designated as part of the ROCOG Shoulder Bikeway network. Prioritization of improvements should reflect the bikeway service priority assigned to corridors in the plan and the anticipated timing of road and bridge preservation activities.
- ROCOG will work with trail development committees to expand the regional trail network to facilitate recreation, tourism, and commuter needs.
- ROCOG and the City of Rochester should develop street level bicycle suitability information that could be distributed to the public as a means to encourage and promote bicycle travel.
- ROCOG will work with community partners to promote and encourage non-motorized travel through activities such as Bike to Work week, maintenance of up-to-date path and trail maps, and development of wayfinding information.

Freight & Commercial Passenger Transportation

- Olmsted County and MnDOT should continue to expand the 10-ton route network to improve service and reduce access restrictions for rural businesses.
- Road authorities should continue to monitor crashes involving heavy commercial vehicles to determine potential safety investment needs and seek funding to deploy safety improvements consistent with the Minnesota Statewide Heavy Vehicle Safety Plan.
- Jurisdictions should monitor changes in freight rail traffic and be proactive in planning for rail/highway crossing safety improvements should heavy rail traffic levels increase.
- ROCOG and local road authorities should continue to work with the Rochester International Airport to coordinate needed landside access improvements.

Safety

- ROCOG and its partner jurisdictions will continue to collaborate with local law enforcement, public health agencies and others on travel safety education and outreach activities as part of Southeast Minnesota Towards Zero Death.
- ROCOG's partner road agencies will continue to coordinate with law enforcement agencies on targeted enforcement campaigns and initiatives.

- ROCOG and its partner road authorities will continue to monitor crash data on a routine basis to identify potential improvement needs that can be advanced into local capital improvement programs and state/federal grant funding.
- ROCOG and its partner road agencies will coordinate safety investments and improvements across jurisdictional boundaries.

Security

- ROCOG and its partner agencies will continue to work with the Olmsted County and City of Rochester Emergency Management staff on preparedness and mitigation planning.
- ROCOG and its partners will continue to participate in local emergency response drills and exercises.
- ROCOG and its partner agencies will continue to participate in periodic updates of the Olmsted County and Rochester hazard mitigation plans.
- ROCOG will continue to provide emergency responders with up-to-date electronic base map products to facilitate 9-1-1 and emergency dispatch services.

System Management

- Local and regional road agencies will continue to coordinate the implementation of traffic management programs such as signal timing and coordination as well as deployment of ITS infrastructure in key corridors.
- ROCOG and its partners will monitor the major strategic arterial system to identify emerging congestion and safety issues and recommend actions that can improve the reliability and performance of high-volume corridors and reduce the need for future capacity expansion.
- ROCOG and its partners should continue to coordinate Early Project Development (EPD) assessment of design concepts, access and traffic management priorities, and environmental resource issues. This will facilitate corridor preservation and early right-of-way acquisition as well as provide a pipeline of projects that can be considered in response to new state or federal funding initiatives.

Asset Management

- Agencies will continue to collect and maintain facility condition, traffic volume, and geometric data in order to support system preservation activities.
- Agencies will use quantitative performance measures for assets and monitor how well strategic goals are being met.
- ROCOG and its local partners should work with MnDOT on establishing data compatibility, interoperability, and metadata standards to improve data sharing capabilities.

- Local jurisdictions need to plan for the incremental expansion of maintenance budgets to address the increasing costs of preserving growing and/or aging local road networks.

Demand Management

- The City of Rochester and Arrive Rochester will continue to promote travel demand management (TDM) strategies such as bus pass subsidy and guaranteed ride home programs. Where feasible, the introduction of parking cash-out or subscription services to the largest employers, in an effort to attract more employees to alternatives to single occupant vehicle commuting, should be considered.
- ROCOG and the City of Rochester will continue to partner on the study of how land use and community design programs can promote greater reliance on alternative transportation modes including transit, walking, and biking as well as support deployment of high capacity transit services in the future. Development of pedestrian-oriented and transit-supportive policies, using an activity center or corridor-based approach to the placement of higher density residential and employment centers that feature mixed-use development and compact design styles, should be emphasized. Opportunities for redevelopment that would promote more efficient utilization of existing infrastructure, particularly of greyfield sites and older industrial areas, will be supported.
- The City of Rochester will consider the impacts of parking policies on transit ridership and how to adjust those policies to promote transit use.

Travel Options

- The City of Rochester will continue its efforts to attract new shared mobility options to the urban area through use of pilot projects and small initial deployments of services such as car-sharing, bike-sharing, and e-scooters to expand the range of options available for residents, workers, and visitors in more dense areas of the urban center.
- The City of Rochester will continue to work with partners at the state and federal level and in the private sector to pilot and test automated vehicle technology in order to learn about its feasibility and applicability to Rochester.

Environmental

- Assessment of potential environmental implications of all regionally significant transportation projects should be completed as early as possible in order to gauge the feasibility of improvements for further investment planning and to provide guidance to public and private development interests.

- ROCOG and its partners will continue efforts to coordinate with environmental and resource agencies throughout the development of plans and projects.
- ROCOG will work with local jurisdictions to ensure that land development regulations are consistent with goals of the Plan.

Financial

- ROCOG will continue to monitor transportation funding needs at the system level and support efforts to increase revenues for transportation improvements.
- ROCOG will review area land use plans, economic development initiatives, and environmental policies to determine how well they coordinate with or may impact the Plan.

Public Involvement

- ROCOG and its partners should be proactive in providing opportunities for interested parties to participate in all project planning studies and ensure that the environmental justice implications of major federally and state funded projects and actions are considered, consistent with the guidelines included in ROCOG's Environmental Justice Protocol.

Information

- ROCOG will develop and publish a ROCOG Report Card to provide citizens, leaders, elected officials, and ROCOG members with information about the region's transportation infrastructure (roads, bridges, sidewalks, etc.) with regards to physical condition, traffic changes, and local projects completed and planned. Travel behavior metrics that influence transportation demand, such as mode of journey to work, demographics, and economic information, will be included.

Project Development and Plan Refinement Priorities

Table 16-1 identifies locations where completion of early phases of project development, including confirming the purpose and need for a project, early identification of regulatory concerns and project alternatives, and conducting preliminary environmental screening, can help advance future project delivery by bringing stakeholders into early discussions on emerging transportation needs in the community. The projects identified in this list reflect the interests of ROCOG and its partner agencies in conducting early phases of the traditional state/federal project development process in order to facilitate adoption of measures such as right-of-way protection, traffic operational policies, and implementation responsibilities while not jeopardizing future federal approvals for a project.

Completing such work helps minimize future risk from inappropriate development and/or other infrastructure improvements that could create implementation barriers. This process can also help clarify expectations among policymakers and the public and help minimize the potential for projects to be significantly changed or amended at a later time once funding has been secured.

Table 16-2 identifies plan refinement needs that have been identified in this plan or other complementary studies (such as the P2S 2040 or the Rochester Downtown Master Plan) that may require further detailed study and evaluation. While the Plan has been developed based on the best available information as to the future transportation needs of the region, in some cases there are issues that may require a level of detailed evaluation and discussion that are beyond its scope and need further resolution before practical solutions can be proposed.

These studies are grouped into six categories, reflecting a range of modal and management considerations. This list should be reviewed periodically and efforts undertaken to identify the resources needed to complete these studies.

Table 16-1: Project Development/Corridor Preservation Studies

Gray shading identifies projects in process; tan shading identifies projects related to Destination Medical Center initiative)

Project Development Priorities

	Interstate / Interregional Corridors	Strategic Arterials	Major Arterials	Secondary Arterials & Primary Collectors	Transit / Rail	Non-Motorized
Highest Priority	Complete Alternative Analysis of Design Concepts / Byron Interchange (MnDOT)		Complete Streets Planning on Existing Arterials identified in Yrs 1-2 of City CIP for pavement preservation or reconstruction (Rochester)	CR 125 / CR 147 Multi-modal Improvement Study	Downtown Rapid Transit Small Starts Project (Phase I) (Rochester)	Discovery Walk 2nd St SW to Soldier's Field Park (DMC-EDA / Rochester)
	Final Environmental Review and Official Map / Byron Interchange Study (HCPP)	South Circle Drive Highway Corridor Preservation Project (ROCOG)				Willow Creek Trail 20th St to Gamehaven Park (Rochester)
	Identifiying / Pursuing Discretionary Funding for NHS Interchanges (Olmsted / MnDOT)	Downtown Broadway Enhancement (6 St S to 6th St N) (Rochester)		6th ST SE Bridge Study (DMC Year 10-15 Project) (Rochester)	Downtown Rapid Transit Small Starts Project (Phase II) (Rochester)	North Broadway Bridge Crossing (Rochester)
		Marion Rd - Eastwood Road Intersection Area Study (Olm-Roch)			Broadway Ave Bus Rapid Transit Deployment (Primary Transit Network) (Rochester)	City Loop Project (DMC Year 1-10 Phased Project) (Rochester / DMC-EDA)
Lowest Current Priority		Capacity Mitigation / Enhancement Needs - High Volume Strategic Arterials			4th St SE Bus Rapid Transit Deployment (Primary Transit Network) (Rochester)	Douglas Trail Bridge over CSAH 44 (Lead Agency undermined)

Table 16-2: Planning Studies

Gray shading identifies projects in process; tan shading identifies projects related to Destination Medical Center initiative)

Planning Study Grid

	Funding & Investment	System Management	Sustainability	Transit	Non Motorized	Safety and Security
Highest Priority	Assist Local Partners in preparation of Grant Applications for Project Funding (ROCOG)	Develop framework for ROCOG Report Card & processes for data management (ROCOG)	Establish Long Term Governance Structure for ARRIVE Rochester TMO (City of Rochester)	2021-22 Rochester Transit Development Plan Update (Rochester Public Transit)	Assist DNR in completion of planning for Olmsted Co. portion of Stagecoach Trail	Conduct further evaluation of highway safety screening results in LRTP to identify possible needs
	Assess Performance Measures & Targets for ROCOG (ROCOG)	Review of Rochester Traffic Impact Study Requirements (Rochester / ROCOG)			Rochester Safe Routes to School Implementation (ISD 535 with grant funded staff)	Assist in Education, Safety Awareness & Encouragement Initiatives (Public Health /TZD leads)
	Phase I Highway Jurisdiction Evaluation Focus: State Aid Cities Coordination of CSAH/MSAS (Olmsted/ROCOG)	Investigate use of STREETLIGHT Data or similar products for Planning & Operations needs (ROCOG)	Update Environmental Justice Policy (ROCOG)	Bus Transit System Redesign Analysis / Study (RDMP / DMC / P2S Finding)		
		Assess local ITS Framework) (ROCOG manage process)	Assessment of Transit Oriented Development (TOD) Opportunities & Tools to support High Capacity Urban Transit (Rochester)	Rochester Park & Ride Service /Satellite Mobility Hubs Planning (TDP / DMC Finding)	Stewartville - Rochester Bluestem State Trail Planning (Stewartville lead)	Assist in periodic update of Hazard Mitigation Plans
	Phase II Highway Jurisdiction Evaluation Focus: Other Cities (Olmsted / ROCOG)	Review of Rochester Access Management Requirements for Major Streets	ROCOG Complete Streets Principles	Regional Commuter Bus / Regional Park& Ride Service Planning (RDMP / DMC Finding)	Oronoco Connection to Douglas State Trail (lead to be determined)	
Lowest Priority	Phase III Highway Jurisdiction Evaluation Focus: Rural areas (Olmsted / ROCOG)	Develop framework for monitoring reliability and safety on major high volume urban corridors				