

CHAPTER 8

FREIGHT INVESTMENT DIRECTION

Overview

The movement of freight plays a critical role in supporting the region’s economic competitiveness and quality of life, that allows the region to stand out as an important business and transportation hub. With a safe, efficient, reliable, and robust freight transportation system, the region’s residents have access to the goods and materials they need to live and work. Without an effectively operational freight transportation system, businesses would not be able to distribute their goods to customers or receive shipments needed to manufacture products.

The growth of the Twin Cities region over the past 150 years has been tied to its function as a major shipping center. While the region does not carry a major share of through-moving freight on the national scale when compared to major shipping ports like Los Angeles, or rail hubs like Chicago, the Twin Cities region is the primary freight hub for Minnesota and the upper Midwest. The metro region is the major distribution center for goods produced and consumed in Minnesota, Wisconsin, North and South Dakota and eastern Montana.

As a freight hub, the Twin Cities region is at the center of many of the mobility and access issues affecting the freight transportation system in Minnesota. Because of this broad reach, the Metropolitan Council does not plan for freight within the region alone, but works closely with the Minnesota Department of Transportation (MnDOT) and other partners to ensure that the regional freight system continues to support a thriving and sustainable economy for the region and the entire state.

The Twin Cities region is fortunate to be served by five modes of freight transportation, each with its own role in moving goods into, out of, through and within the region. These modes include:

- **Trucks** carry freight on roadways, including long-haul trucks traveling through the region, to riverports and rail yards, direct truck service to distribution facilities and freight-generating industries such as manufacturers and processing plants, as well as deliveries to businesses and consumer households.
- **Railroads** move a variety of commodities, especially heavy bulk goods and containerized freight. The region’s rail lines provide important local and regional connections that serve national markets and international trade through east and west coast ports.
- **Barges** provide water transportation over the inland river system and offer lower cost higher-volume shipping options than other modes, which is a particular advantage for transporting bulk freight over long distances. A number of key industries rely on the affordability provided by barge freight transportation.
- **Air** freight services allow regional companies to ship low-weight, high-value and time-sensitive goods to cities in the U.S. and around the world.

- **Pipelines** provide a less obvious, yet important mode for relatively safe and efficient transport of large quantities of fuel products. The metropolitan area has an extensive pipeline network to convey crude oil, refined oil and natural gas for consumption by the transportation, residential heating and manufacturing economic sectors.

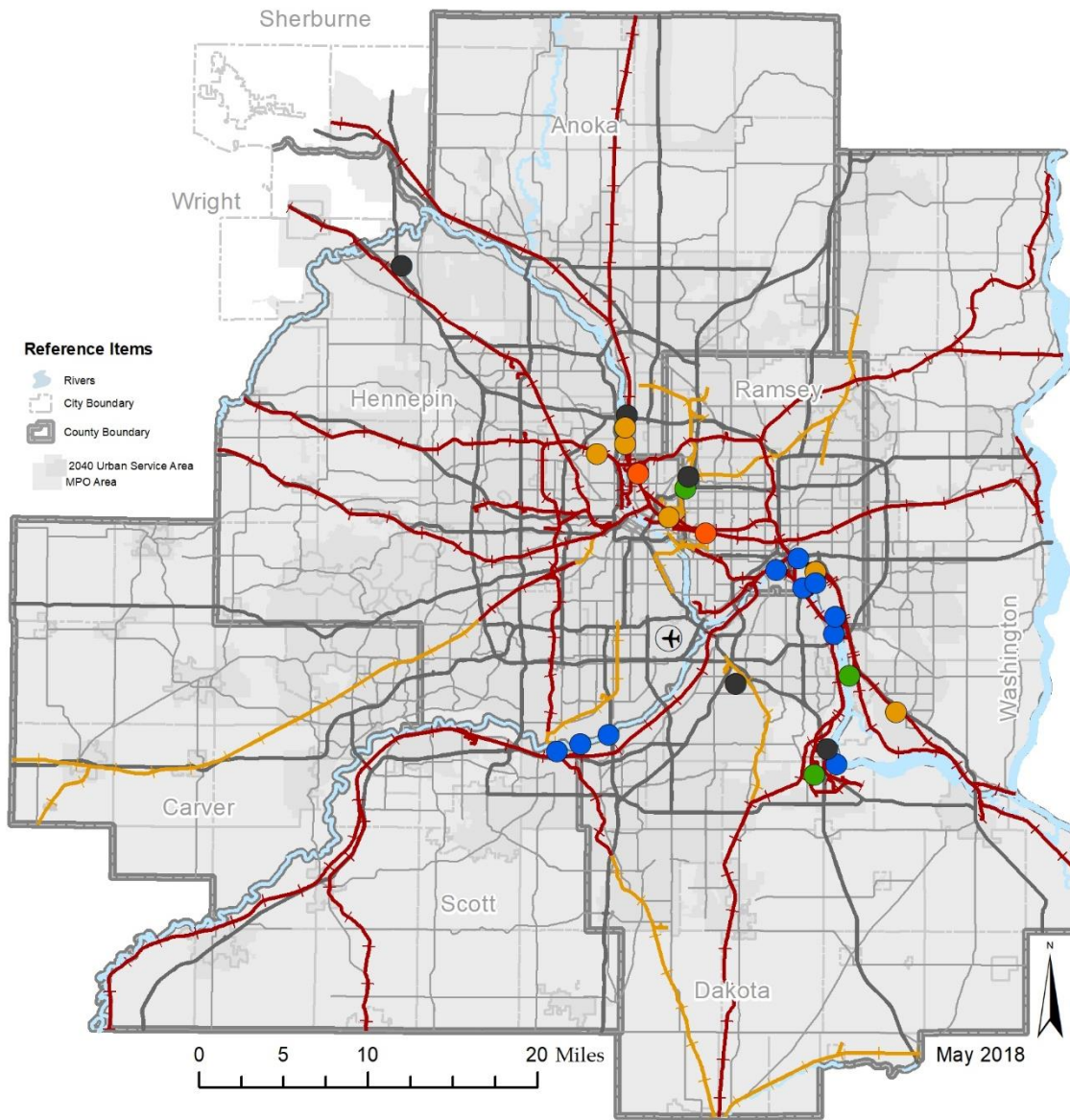
Other chapters of this long-range plan explain future public investments in infrastructure to support two of the five freight modes: highways and aviation. In addition, the 2016 Transportation System Performance Evaluation contains a more detailed discussion about freight movement in the region, as does “The Story of Freight in the Twin Cities.”

Although the region’s highways and airports are publicly owned, many freight-related improvements are the responsibility of private owners and operators of transportation modes and freight terminal facilities. Freight railroads are privately owned and each individual railroad makes its own plans for future infrastructure investments. The federal Army Corps of Engineers maintains and operates the Mississippi River Waterway system, including the Minnesota and St. Croix Rivers, and is responsible for maintaining and updating locks and dams, and for maintaining waterways through extensive channel dredging operations. The pipeline system is owned by private companies and is managed and regulated by the US Departments of Transportation and Energy through the Pipeline and Hazardous Materials Safety Administration and the Federal Energy Regulatory Commission, respectively.

Existing Metropolitan Freight System

A safe, efficient, high-capacity freight transportation system is essential to the economic well-being of the region and the state. Producers and consumers of freight rely on an effective and efficient transportation system to prosper. Although regional transportation planning primarily focuses on facilities for personal travel within the region, the region’s freight system is inseparable from goods movement nationally and internationally. Like passengers, freight moves by multiple modes. Private entities own and operate many of these modes and freight terminal facilities. Public freight-related improvements are limited to those components of the transportation system operated and maintained by the public sector, such as highways and connecting roadways, navigable rivers, riverport terminals and airports. The overall metropolitan freight system is shown in Figure 8-1.

Figure 8-1: Metropolitan Freight System



- | Freight Terminal Type | |
|-----------------------|-------------------------------|
| | Airport Terminal |
| | Pipeline Terminal |
| | Rail Terminal - Container |
| | Rail Terminal - Non Container |
| | River Terminal |
| | Major Truck Terminal |
| | Class I Railroads |
| | Class III Railroads |
| | Principal Arterials |
| | A-minor Arterials |

The existing metropolitan freight system includes the following five modes of freight transportation.

Trucks on Highways

Within this region, freight continues to move primarily by truck and highways continue to be a critical element of the freight transportation system and the region's economic sustainability. Primary arterials (including interstate freeways) minor arterials (mostly consisting of county highways) and city streets support the movement of goods through and within the metropolitan region. Principal arterials also provide important connections to the other major economic centers of the state such as Duluth, Rochester, and St. Cloud. Interstate 94 provides an important freight link, connecting the Twin Cities to other metro areas in the Upper Midwest. The heaviest Minnesota-connected truck activity is along the I-94/I-90 corridor between Chicago and the Twin Cities. Other high-volume truck corridors include I-94 west to Fargo, North Dakota and I-35 between Duluth, Des Moines, Iowa and other locations to the south. The region's minor arterials are also important in providing "first and last mile" connections to freight-dependent businesses and industries.

Highway operations and maintenance are critical, especially snow removal to assure timely, all-weather, freight delivery. Rebuilding and replacing both bridges and pavement is very important for freight movement. Bridges having weight restrictions due to "poor" conditions can greatly affect trucks by adding a significant amount of time and fuel costs detouring to alternate crossings. The Minnesota Manufacturer's Perspective Studies identified deficiencies in pavement quality as a concern. Poor pavement can cause significant damage to cargo (such as precision instruments and high tech machinery) in addition to causing significant damage to trucks.

Barges on Waterways

Portions of the Mississippi and Minnesota rivers in the region are navigable by barge via channels and locks maintained by the U.S. Army Corps of Engineers. Barges carry bulk commodities such as grain, minerals, fertilizer, and aggregate to domestic and international markets. There are two major river ports in the Twin Cities metro region, the Port of Saint Paul on the Mississippi River and the Ports of Savage on the Minnesota River. In addition, there are multiple private barge terminals in Burnsville and between Saint Paul and Hastings on the Mississippi River. The St Anthony Falls Lock and Dam and the Minneapolis Upper Harbor were closed in 2015. Freight is hauled by barge more than 1,800 miles downriver from the Twin Cities to the Port of New Orleans where it is loaded onto ocean-going ships for export to global markets. Also, sand for fracture mining of natural gas and oil is being shipped by barge down the Mississippi and up the Ohio River to river terminals closer to Pennsylvania oil and gas fields. In 2015 the region had roughly 30 active freight terminals that collectively handled more than 9.2 million tons of barge-hauled freight.

Railroads

Early in the 20th century, rail system tracks were constructed to connect between a few large cities and mostly located outside of urban areas. With steady overall population and employment growth through the first half of the 20th century and then escalating in the 1960s and 70s, came the development and growth of suburban and rural communities along the rail corridors. Railroads then grew their systems to serve the growing communities along their lines. The railroad industry has continuously grown since

the 1980s, and rail lines continue to be an increasingly important component of the region's freight system, especially for bulk commodities and containers.

Today, four Class I railroads operate more than 500 miles of track in the metro region: the Burlington Northern Santa Fe, Canadian National, Canadian Pacific and Union Pacific railways. Class I railroads connect the region to major national markets and also carry a large amount of cross-country freight that moves through the region.

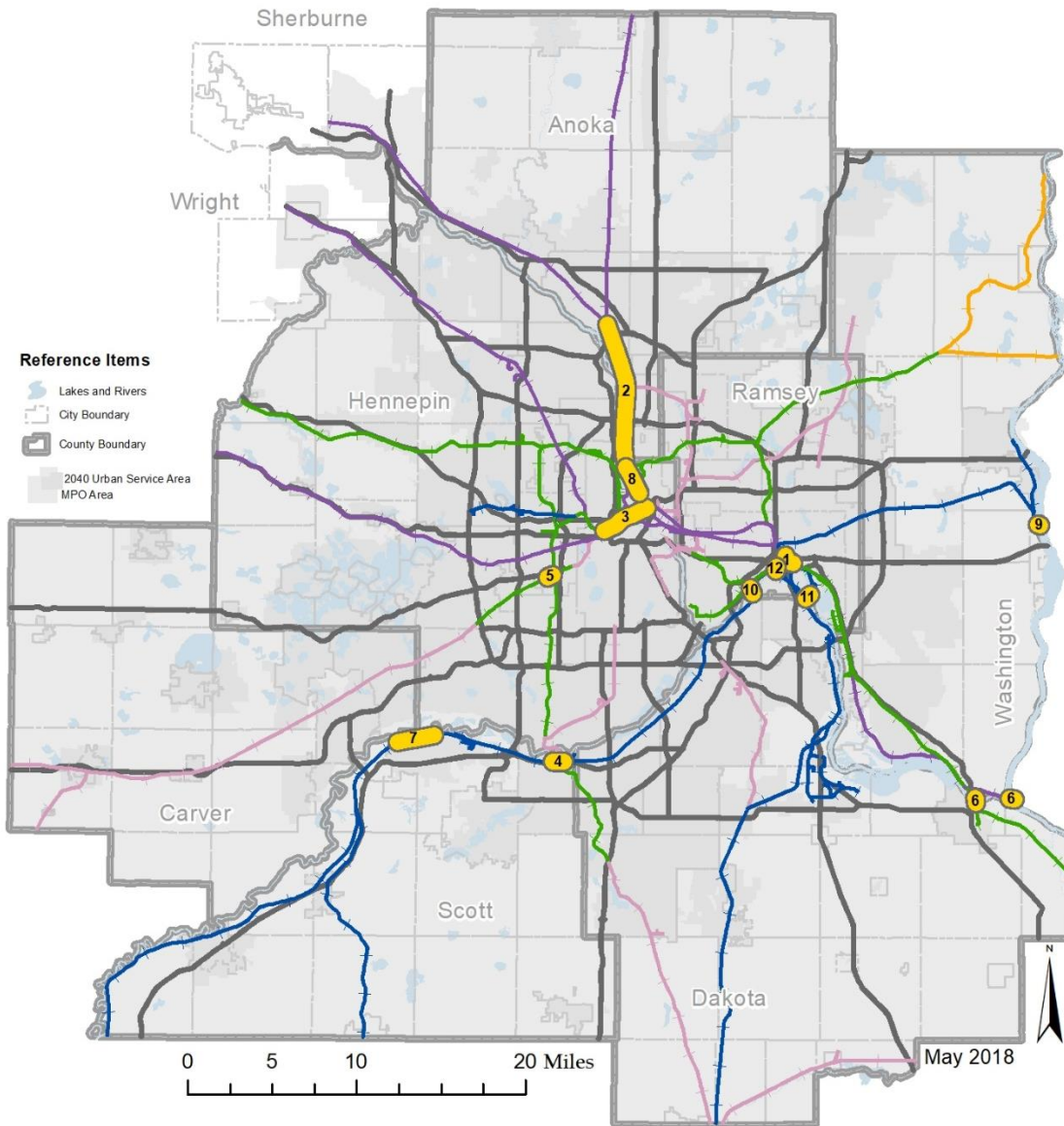
Four Class III (short line) railroads (Minnesota Prairie Line, Progressive Rail, Twin Cities & Western, and Minnesota Commercial Railroad) operate about 160 miles of track within the region. Class III lines carry out local freight transfers, generally within 100 miles of the core cities.

Since about 2010 an increasing number of trains traversing the region have been shipping sand from Wisconsin to be used in the fracture mining of oil in North Dakota, and shipping oil from North Dakota to Chicago and eastern U.S. destinations; however, the number of oil trains has dropped off some since new pipelines began transporting oil out of North Dakota in 2016. Oil trains are primarily using BNSF and Canadian Pacific rail lines, while sand utilizes these and other rail lines.

Rail traffic also includes intermodal container-based shipping which has substantially increased the efficiency of goods movement since the 1980s as containers can be moved between modes without the need to repack goods. Also, through partnerships with trucking carriers, railroads have created multimodal delivery networks that further the efficiencies of time-saving intermodal transfers. About 20 independently operated truck-rail transload/warehouse centers also support the intermodal distribution of freight in the metro area.

The region's two primary container intermodal terminals, the Canadian Pacific Shoreham Yard in northeast Minneapolis and the Burlington Northern Santa Fe Midway Hub in Saint Paul, are operating near capacity. The BNSF has acquired land in Washington County which could be used for potential expansion of their Twin Cities intermodal or specialized rail yard operations. Congestion occurs on several segments of the regional rail system as evidenced by the 12 rail bottlenecks in the region identified in MnDOT's *Statewide Freight and Passenger Rail Plan* and shown in lists in Figure 8-2.

Figure 8-2: Metro Rail System Bottlenecks



-  Class I - BNSF
-  Class I - Canadian Pacific
-  Class I - Union Pacific
-  Class I - Canadian National
-  Class III
-  Bottleneck Locations
-  Principal Arterial Road

Metro Rail System Bottleneck Locations (as shown in Figure 8-2):

- | | |
|---|---|
| 1. Hoffman Junction | 7. Shakopee track re-alignment (UP) |
| 2. Coon Creek Junction/3rd Mainline (BNSF) | 8. University Interlocking |
| 3. Minneapolis Junction | 9. Hudson, WI St. Croix River Bridge (UP) |
| 4. Savage MN River bridge (TC&W) | 10. Mendota Heights Mississippi River bridge (UP) |
| 5. St. Louis Park Interchange (CP) | 11. Pigs Eye Mississippi River Bridge (UP) |
| 6. Prescott, WI St. Croix River bridge (BNSF) | 12. Robert Street Mississippi River Bridge (UP) |

Hoffman Junction east of Union Depot is the most congested bottleneck in the metro area. That junction, where the mainline tracks of three major Class I railroads intersect, handles as much as 5% of the nation’s freight rail operations during seasonal peaks (about 10,000 rail cars per day).

Air Freight

High-value, low-weight and time-sensitive goods are shipped via the air freight system, especially when moving over long distances. High-tech and biomedical companies in the region rely heavily on air freight service to make timely shipments of medical supplies to hospitals throughout the nation.

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

Goods shipped via passenger aircraft represent less than 20% of overall air freight tonnage moving through MSP; more than 80% is shipped through the three international air freight carriers.

Pipelines

Pipelines represent a major infrastructure network developed to efficiently transport fuel products to and within the Twin Cities metro area. While not readily apparent as a transportation mode (as all pipelines are buried underground), they significantly reduce the volume of trucks that would otherwise be required to haul fuel on the region’s highways. Although not absent of some risks, pipelines are a relatively safe mode of transport as they are not exposed to the risks inherent in other surface modes with respect to intermodal transfers of flammable substances and the potential for on-the-ground, physical conflicts. Major pipelines in the region lead to the region’s two petroleum refineries located in Saint Paul Park and Rosemount, and to the Magellan pipeline terminal in Roseville.

Freight Challenges and Opportunities

While the overview of this plan discusses general challenges and opportunities for transportation within the region, there are some challenges unique to the freight system.

Freight Capacity and Congestion

Economic and population growth in the metropolitan area continues to increase the amount of freight movement in the region. Deregulation of motor carriers and railroads have also added to the total amount of freight through increased competition and lowered shipping costs. Together, these forces will continue to increase the size of and need for an efficient freight transportation system.

All goods movement relies on a high-capacity freight transportation system. Freight shippers, carriers, and other users have expressed concern that the freight system is not adding capacity to meet growing freight needs in the region. Some freight modes are already hampered by an existing lack of capacity. In particular, truck movement in the region is impacted by recurring highway congestion, in addition to that caused by incidents such as weather and crashes. Trucks also contribute to peak hour congestion on regional highways, just by the nature of their size and slower acceleration capabilities. Freight motor carriers have taken steps to avoid driving in peak-congestion periods when possible, but the growing duration and extent of congested highways and local roads reduces the efficiency and competitiveness of the region's freight system.

Over the last decade, growth in fracture mining of the Bakken oil field in North Dakota and Montana has increased traffic on the east-west rail mainlines through the northern part of the country. In recent years, construction of new pipelines has reduced the need to transport oil by train, alleviating some of the rail congestion experienced between 2010 and 2016. Insufficient capacity of terminal facilities, restrictive or outdated bridges, limited track capacity, and a lack of options for alternative routes and interchanges have also contributed to rail congestion.

Connectivity

Freight connectivity is another issue in the region. Some major freight truck and intermodal terminals within the region have poor connections to major highways. Although the metropolitan highway system is designed for loads of 10-tons per axle, some of the rural areas within the seven-county region have an underdeveloped 10-ton road network. These roads are important for freight connections from farms and other businesses in rural areas in the region.

Exacerbating the connectivity issue is the steady growth of large semi trucks for expanded parcel and local delivery networks. Many minor arterials and collector streets in the urbanized area were designed for smaller delivery trucks, and newer traffic control strategies like roundabouts and curb bump-outs are not always designed with consideration for the turning radius needs of these larger trucks.

Freight Safety

Increased concern over safety affects the freight system. Trucking is a regulated industry with strict operating rules that improve safety for freight movement and motorists, but continued enforcement and

inspection of vehicles, a state responsibility, is critical to ensuring safe roads, bridges, and highways. Trucking companies develop and implement driver training and apply performance measures to monitor safety and compliance with regulations.

For railroads, safety is also a primary consideration. While the rail freight industry enjoys lower accident and fatality rates than the truck industry, rail accidents are high-profile events with serious liability concerns for the railroad and safety concerns for the public and railroad employees. Highly volatile Bakken crude oil moving in unit trains through the region has increased the possible risks in the last 8 to 10 years.

To improve rail safety, the Federal Railroad Administration has developed a National Rail Safety Action Plan. The plan identifies a number of possible actions for the nation's freight and passenger railroads to improve safety, including the implementation of grade-crossing improvements, application of in-vehicle safety devices, and strengthening railcars used in transporting hazardous materials. New technologies and careful routing will allow railroads to identify potential risk factors and make routing decisions that maximize rail safety.

Finally, adequate right-of-way adjacent to rail tracks is an important safety feature to provide a clear space in the event of a derailment or material spill. Encroachment on rail property by adjacent properties or other interests increases the risk of accident and injury.

Freight Security

Security is a major concern in freight transportation. Security includes the protection of goods and commodities as well as safeguards against potential threats of terrorism. Nationwide, initiatives to improve freight security have included electronic tracking of shipments, sealed freight containers, vehicle-tracking technologies, and inspection of vehicles at security-sensitive facilities and destinations.

Rail trespassing is a safety concern as well as a security concern. Rail bridges and corridors can be attractive (though illegal) shortcuts for pedestrians and cyclists, with sometimes fatal results. Nationally, over 500 people die each year in railroad trespassing-related incidents. In Minnesota, more people die from pedestrian/rail accidents than from vehicular/rail accidents. Unlike the policies in 48 other states, state and local law enforcement statutes in Minnesota do not support railroad policing of their own property to address this problem. Rail is also the mode of choice for many hazardous materials, including dangerous chemicals and nuclear material, and rail trespassers pose a security threat to these shipments.

Automated Trucks

The development of automated truck technology is moving very quickly as the size of the trucking industry makes it a lucrative target. Although there is much uncertainty as to when technical and regulatory hurdles will be overcome for any self-driving vehicles, widespread usage of self-driving trucks may occur even sooner than for automobiles. Logistics companies will quickly turn over their fleets to self-driving trucks if and when it becomes profitable to do so, whereas widespread use of

autonomous cars will depend on decisions of individual drivers who will factor in emotional, cultural, and personal financial considerations.

Self-driving trucks would have some advantages for the freight industry, as they could help reduce current and growing shortages of truck drivers and also their ability to remain in service for longer periods, rather than having to stop for federally-mandated, driver rest breaks. This may allow for freight to be delivered more efficiently, as well as make better use of the capital invested in trucks. Even before fully autonomous vehicles are available, the trucking industry is already making use of advanced technologies to improve safety; these applications include collision avoidance, speed governors, automatic vehicle location and automatic braking . Automated lane steering may be added within a few years. Another possible advantage of automated trucks is increasing the utilization of highways through auto-vehicle platooning that could improve operational capacity of some urban highway corridors.

It is likely that the first use of self-driving trucks will be on long haul trips through rural areas, especially on interstate freeways and other highways with lower traffic volumes and more controlled environments than city streets (for example, expressways with limited access points and few conflicts with non-motorized modes).

As experimental driverless truck platoons are being deployed and wider implementation of semi- and fully autonomous trucks is within reach, there are concerns from organized labor within the trucking industry regarding likely impacts to employment. Today there is a growing shortage of truck operators for long haul shipping, and a rapid deployment of the technology would create the short-term benefit of reducing, or even eliminating the shortage. There may always be a need for manned trucks to haul goods in dense urban areas where interactions and conflicts with other modes and users are great, and the current technology used in demonstration projects requires an operator in the lead truck of a multi-unit “road train.” In the longer term, however, many drivers could be displaced by automated technology. A potentially significant challenge in the adoption of automated trucks may be how to implement the technology at an acceptable pace that remains in balance with the current and projected supply of truck operators.

E-Commerce and Urban Freight Logistics

E-commerce, or the option of making consumer purchases through the internet, has been available since the mid-1990s, but has increased in recent years in overall volume and number of individuals participating. The global e-commerce market is projected to grow as much as 20% per year through 2025. This ongoing trend is affecting the efficiency of freight movements in urban areas due to the public’s high and continually growing demand for overnight or expedited home deliveries that minimize opportunities to receive, consolidate, and distribute parcels in fully-loaded trucks and delivery vehicles. This has often times resulted in increased traffic congestion in densely developed areas, and safety issues to other users like pedestrians and bicyclists, due to reduced sight lines for operators of large trucks navigating on streets designed for smaller vehicles. However, despite these impacts, the private market has begun to adapt with some innovative developments, including:

- Corporations purchasing fleets of small courier vans to provide “last mile” parcel deliveries from regional warehouses;
- Shipping to lockbox locations or parcel acceptance centers at neutral retail sites designated for customer pick-ups;
- Utilizing other transportation modes to deliver parcels locally, such as personal automobiles, cargo bicycles, and parcel porters.

Local governments can also adopt various operations, logistics, or technology strategies to improve urban freight mobility and reduce impacts to residents and businesses. These can include curbside management policies to designate and enforce freight loading zones, institutional policies such as encouraging or requiring deliveries during off-peak hours, newer applications of intelligent transportation systems, and policies to encourage or incentivize the use of green technologies. More detailed information is available in the “Primer for Improved Urban Freight Mobility and Delivery Operations, Logistics, and Technology Strategies,” USDOT, Federal Highway Administration, 2018.

Freight Terminals and Adjacent Land Use

The metro region has a variety of freight terminals located on rivers, in industrial centers with access to the freeway system, in proximity to railroad main lines, and at Minneapolis Saint Paul International Airport. Trucking terminals can be located in a wide variety of locations, as long as they have roadway connections, and are often specifically located in industrial areas to be near potential shippers and away from housing and other incompatible land uses. However, terminals for rail and barge freight modes are limited to locations which are adjacent to a navigable river or a rail line spur.

Over the last few decades there has been increasing competition for land adjacent to the Mississippi River system. Many industrial uses have been redeveloped into residential, non-industrial commercial, or park land as demand for industry adjacent to the river has declined over time. The Mississippi River Critical Area identifies an Urban Diversified district for the purpose of maintaining a diversity of uses, including barge transportation. However, some cities report that there has been pressure from regulators to constrain these historic and important industrial uses. The Metropolitan Council will continue to work with local units of government, the Minnesota Department of Natural Resources and park agencies to balance these various uses so that Mississippi and Minnesota river terminals may continue to handle the bulk commodities most cost-effectively transported by barge.

To address congestion, environmental impacts, and the region’s economic competitiveness, railroads remain a viable alternative for many of our freight transportation needs. One train can take over 400 trucks off the highway system, at one-fifth of the fuel use and one-third of the cost. However, the growth of intermodal rail/truck movement over the past three decades has also increased conflicts between rail intermodal container terminals and nearby residential neighborhoods. Cities and counties will need to continue working with MnDOT and the Metropolitan Council to ensure that adequate road access exists to accommodate trucks between these intermodal rail terminals and the region’s major highways and freeways. The Metropolitan Council will continue to work with cities by supporting best practices in

planning and development that minimize conflicts between these essential freight terminals and residential and commercial land uses.

River and Rail-Accessible Industrial Land

In 2017, the Metropolitan Council conducted an inventory of industrial and manufacturing zoned land throughout the region. As part of that effort, an assessment of rail-accessible and river-accessible industrial land was undertaken. The results of that assessment are shown in Table 8-1. These data will be tracked over time to identify regional trends in the availability of industrial land overall and of rail and river-accessible land for rail and barge-dependent facilities. As a continuation of that effort and to make the database available to public users, a Work Program item has been added in Chapter 14 to develop an on-line, interactive mapping tool to be known as the Industrial Land Atlas. This new tool will help economic development specialists and private sector planners to conveniently assess industrial land options and prioritize sites for future industrial development. In addition, the database and mapping tool may enable local agencies to better understand the region’s supply of industrial land and to identify where such parcels may need to be preserved.

Table 8-1. 2016 Metro Industrial Acres by Access Type

Land Status	Acres Vacant	Acres in Use	Total Industrial
River Accessible Acres	17.7%	82.3%	3.5%
	375	1,739	2,113
Rail Accessible Acres	20.0%	80.0%	16.1%
	1,945	7,782	9,726
Other Industrial Acres	28.2%	71.8%	80.4%
	13,702	34,810	48,513
Total Industrial Acres	26.5%	73.5%	100%
	16,022	44,331	60,352

As Table 8-1 indicates, in 2016 there were more than 60,300 acres of industrial land across the seven-county region. Land accessible to the Mississippi River Waterway system makes up only about 3.5 % of all industrial land, and less than 400 acres of river-accessible land are undeveloped. There are more than 2,100 acres of river-accessible land with existing facilities taken into account. By comparison, there is a much greater amount of land that is or could be made rail accessible to a Class III railroad or an already existing Class I spur track (Class I railroads typically have not provided new and direct industrial access from rail mainlines) with more than 9,700 rail-accessible acres across the region. Of that total, nearly 2,000 acres (or 20%) are not in use and available for development. Considering all

industrial land, more than 16,000 acres, or roughly 26%, are potentially available for new development, based on Metropolitan Council parcel and land use data.

Freight Investment Direction

Truck Freight Investment Direction

Fixing America's Surface Transportation Act (FAST Act)

The FAST Act was signed into law by President Obama in late 2015 and was the first transportation bill to provide dedicated freight funding. It includes a \$4.5 billion competitive grant program for nationally significant freight and highway projects, plus \$6.3 billion in formula-based funds for fiscal years 2016-2020. Minnesota's share of these formula funds will be roughly \$20 million per year over the five-year period.

Minnesota's share of this new federal formula funding for freight has been allocated for construction of roadway projects through state fiscal year 2022. Additional information about FAST Act funding for freight projects can be found in the State Freight Investment Plan.

The FAST Act established a new National Highway Freight Network (NHFN) with programmed funds exclusive to improving this network. This NHFN incorporated all interstates not previously included on the Primary Freight Network created under the Moving Ahead for Progress in the 21st Century Act (MAP-21), plus intermodal connectors included on the National Highway System.

Critical Urban and Rural Freight Corridors

In addition to the interim National Highway Freight Network established by the Federal Highway Administration in the new FAST Act, MnDOT and the Metropolitan Council are responsible for identifying additional roadways to this network through the designation of critical urban and critical rural freight corridors. The law established mileage limits for each state when designating these corridors and Minnesota is limited to 75 urban miles and 150 rural miles, statewide. Due to these constraints, a freight investment advisory committee led by MnDOT, in partnership with Metropolitan Council, determined that proceeding with a solicitation of statewide projects for federal freight funds should be done ahead of designating specific corridors. This made it possible for actual demand for highway freight funds to be gauged, and corridors to be designated, in line with areas of greatest need. These corridors, which can be modified in response to changing needs, are identified in MnDOT's recently updated Statewide Freight System Plan as the Minnesota Highway Freight Program. The resulting freight projects selected for funding, and highway connections to the National Highway Freight Network that were also designated through this process as critical urban, and critical rural freight corridors, are shown in Figure 8-3 and Table 8-2 for the metro region. Specific freight project locations and dollar amounts funded through the Federal Highway Freight Program, can be found in Table 5-11 of Chapter 5, "Highway Investment Direction and Plan."

Figure 8-3. National Highway Freight Network in Twin Cities Region

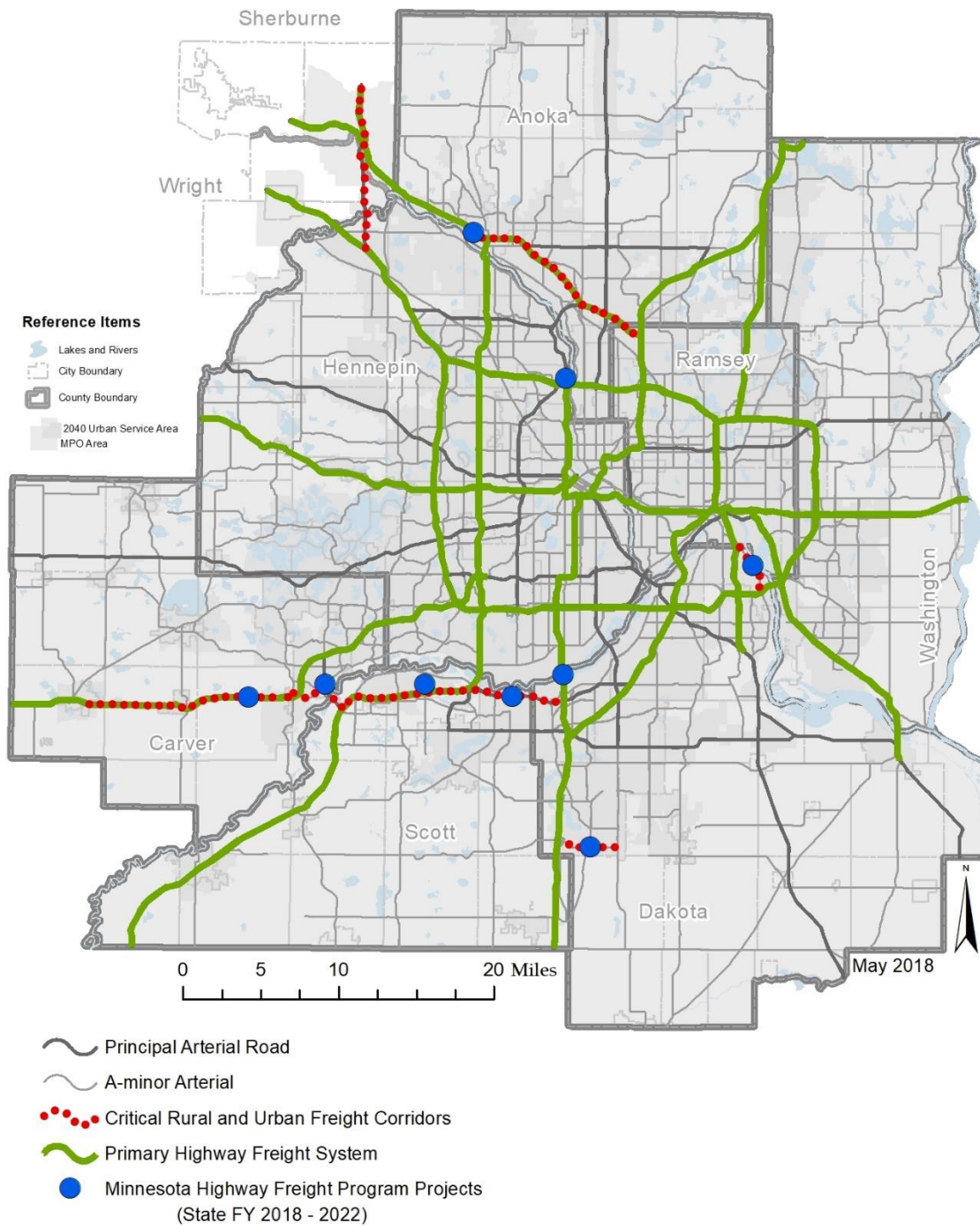


Table 8-2. Critical Urban and Critical Rural Freight Corridors in Twin Cities Region

Critical Urban Freight Corridors

Agency	Highway	From	To	Length (Mi)
Carver County	County Road 61	MN 41	Co. Road 11	2.8
Dakota County	CSAH 70	I-35	Cedar Ave	4.0
MnDOT	MN 156	I-494	Annapolis St E	3.5
MnDOT	MN 13	I-35W	US-169	7.2
MnDOT	US 169	MN 13	MN 41	7.7
MnDOT	MN 41	US Hwy 169	Co. Road 61	2.2
MnDOT	US 10	I-35W near Mounds View Blvd.	0.5 mile west of Thurston Ave	14.2
MnDOT	MN 252	I-694	70th Ave N	0.7
MnDOT	MN 101	I-94 in Rogers	US 10/US 169	6.8
MnDOT	US 169	MN 101/US 10	Sherburne County Rd 33	3.5
Scott County	CSAH 83	4th Ave East	US 169	1.1

Critical Rural Freight Corridors

Agency	Highway	From	To	Length (Mi)
Carver County	County Road 11	County Road 61	US 212	0.2
MnDOT	US 212	County Road 11	Tacoma Ave	4.4
MnDOT	US 212	Tacoma Ave	Carver County Road 34	8.5

Total Mileage Critical Urban and Critical Rural Freight Corridors 66.7 Miles

Regional Truck Highway Corridors Study

The efficient movement of freight is vital to the economic competitiveness of the Twin Cities metropolitan area, and truck highway corridors comprise a key component of the regional freight transportation system. A Regional Truck Highway Corridors study was completed in 2017 with guidance from a Technical Advisory Group consisting of staff from each of the seven counties, MnDOT, Minneapolis, Saint Paul, the City of Savage and Saint Paul Port Authority, as well as several suburban

city and private transportation industry representatives. The purpose of the study was to identify and prioritize the region’s major highway corridors upon which the trucking industry most relies. The study evaluated the metro area’s highway corridors across four primary factors: average annual truck volume, truck percentage of overall traffic, proximity to freight-related economic centers, and proximity to regional freight terminals. The principal and minor arterial highways analyzed were assigned to one of three priority tiers, using a data-driven scoring process. Table 8-3 shows the distribution of lane miles among the tiers and across highway functional class and Figure 8-4 is a map of regional truck freight corridors.

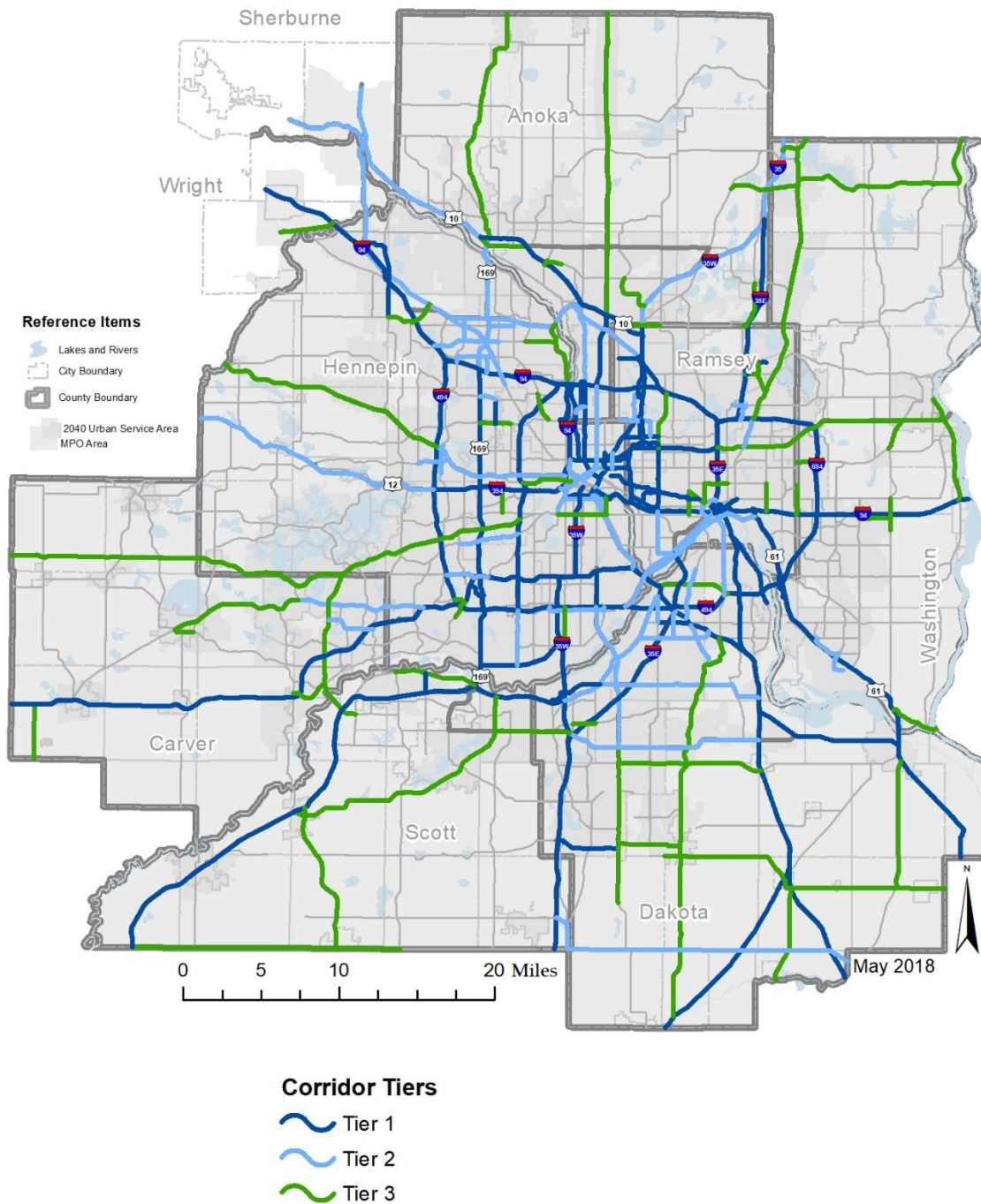
Table 8-3. Centerline Road Miles by Regional Truck Corridor Tier

	Interstate	Principal Arterial	Minor Arterial	Total
Tier One	211	227	108	546
Tier Two	18	111	166	295
Tier Three	0	95	290	385
TOTAL	229	433	564	1226

Nearly all (92%) of the interstate highway miles in the region are designated as Tier 1 truck corridors, which is consistent with their perceived importance to regional trucking overall. For non-interstate highways, there is a fairly equal distribution between principal (43%) and minor (57%) arterials, overall; principal arterials, designated for longer and higher-speed trips through the region, make up about two-thirds of the non-interstate mileage for Tier 1 truck corridors, while minor arterials, more closely associated with the last-mile connections to freight centers, make up two-thirds of the Tier 1/Tier 2 non-interstate truck corridor miles combined.

A follow-up study action from the Regional Truck Highway Corridors Study will be to develop a framework for collecting and reporting truck classification count data on regional truck freight corridors. This will be done in coordination between the Metropolitan Council, MnDOT and county transportation departments with the purpose of monitoring truck volumes and other metrics on these key highways for freight. This effort is outlined as a future study in the “Work Program” chapter.

Figure 8-4. Regional Truck Freight Corridors



Guidelines for Regional Investment

The Metropolitan Council, through its Transportation Advisory Board’s regional solicitation process, makes specific categories of federal transportation funds available to MnDOT and local governments

for highway improvement programs on a competitive basis. This regional solicitation of federal funds occurs every two years. Final projects selected for this funding are added to the region's Transportation Improvement Program (TIP) for the next unprogrammed, two-year cycle (typically years 5 and 6 in relation to the current 4-year TIP). Many projects funded through different federal highway programs benefit the movement of freight to the extent that they improve overall highway safety, reduce congestion, or increase operational efficiency through transportation system management. Further specifics about these highway programs and the region's project-specific highway investment plan can be found in Chapter 5, "Highway Investment Direction and Plan."

As an output of the Regional Truck Highway Corridors Study, the Regional Truck Freight Corridors, previously shown in Figure 8-3, provide an additional context for evaluating projects submitted for regional solicitation funds and other state and federal freight funding programs. Regional Truck Freight corridors are designated as regional priorities and ~~should be considered as a possible new~~ have been incorporated as an additional scoring criterion through the regional solicitation and other state and state-administered federal freight transportation programs. Proposed projects that address safety, congestion, or system efficiency on segments of a Regional Truck Freight Corridor ~~should be considered for receiving~~ may receive prioritization points in transportation funding programs. During the development of the 2020 Regional Solicitation, several agencies inquired about how changing local conditions that may affect the truck corridors study analysis factors, could be accounted for in future Regional Solicitations. In response, Council staff will develop a process whereby new data relating to the original analysis factors may be applied on a localized, case-by-case basis. An update to the study analysis tool to allow for such local adjustments will be completed in time to be applied in the 2022 Regional Solicitation and available for similar adjustments in subsequent Regional Solicitations.

Other Highway Funding Priorities that Benefit Freight

Chapter 5, "Highway Investment Direction and Plan," of this plan focuses limited financial resources in general funding categories. Investments in all of these areas will benefit truck movements on highways.

Operations and maintenance funding is critical, especially snow removal to ensure safe and timely, all-weather freight delivery. Rebuilding and replacing bridges and pavement is very important for freight movement. Bridges which have weight restrictions caused by their poor condition can greatly affect trucks, which may have to spend a significant amount of time and fuel costs detouring to alternative crossings. Recent freight research Interviews with businesses in western Minnesota through the Minnesota Manufacturer's Perspective Studies identified poor pavement quality as a concern for business operations. Deficient highway pavement can cause significant damage to cargo such as precision instruments and high tech machinery, in addition to damaging trucks.

Regional mobility improvements are also important for trucks. The implementation of traffic management technologies on highways, such as traveler information systems, incidence response programs, traffic signal operations and coordination, queue warning systems, and the dynamic rerouting of trucks along congested corridors, may reduce breakdowns in traffic flow. These in turn will benefit freight by maintaining reliability to meet delivery schedules and improving overall safety for trucks and other vehicles.

Implementing “spot mobility” improvements through MnDOT Congestion Management and Safety Program projects will potentially represent the most cost-effective options to relieve congestion. Some of these improvements, such as on-ramp/off-ramp extensions or collector-distributor lanes between freeway interchanges, can alleviate some of the specific congestion problems trucks can create for other vehicles when accelerating up to the same speed as general traffic.

Implementation of an expanded system of MnPASS lanes, such as those already developed along I-394, I-35W and I-35E, will provide benefits to local and regional freight moved by truck. MnPASS lanes can directly benefit shipments by single-unit commercial vehicles (dual-axle trucks weighing less than 26,000 pounds), vans and autos because those vehicles are allowed to pay to use these lanes otherwise reserved for transit and high-occupancy vehicles. This is especially beneficial to air freight companies such as Federal Express and UPS which transport freight for the biomedical, high-tech and other industries that rely on expedited deliveries of high-value, time-sensitive products.

The development of a MnPASS network may also benefit traditional freight movements by larger trucks because MnPASS lanes can free up capacity and increase traffic flow in adjacent general purpose lanes. By delaying the frequency and reducing the duration of breakdowns in general purpose lanes, the total hours of corridor congestion can be minimized, thereby improving conditions for moving freight.

Future Direction of Freight, Other Modes

Rail Freight

There has been a surge in rail traffic in and through the Twin Cities area in the last decade due to the development of the Bakken oil fields in North Dakota and eastern Montana. The Bakken area initially had very few pipelines but is served by the BNSF and CP Railroads, which enable oil to be shipped through the Twin Cities to Chicago and points east via rail. Westbound shipments to the Bakken area include sand used for hydraulic fracturing of the wells, much of which originates in Wisconsin and southeastern Minnesota and thus must travel through the Twin Cities to North Dakota. New pipeline construction involves a long process of design, permitting, and construction. While completion of some pipeline capacity in the last few years has diminished the number of oil trains, the oilfields are substantial enough to support many years of significant production growth as well as decades of continued production, so some demand for rail transport of oil is expected to continue. The railroads, especially the Burlington Northern Santa Fe, have made, and will continue to make, investments in the system to resolve delays caused by this significant commodity movement. These investments will also be critical to maintaining passenger rail movements to and within the Twin Cities so these delays will not impact Amtrak and Northstar passenger rail performance, as well as maintaining efficient freight rail performance for other goods.

This Bakken crude-by-rail flow has also caused an associated concern for community safety in the region. Bakken crude is a highly volatile material, classified by the U.S. Department of Transportation as a hazardous material requiring specialized testing, handling, and rail equipment regulated by the

Federal Railroad Administration (FRA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA).

This has heightened the need for rail safety measures and inspections, better emergency response training for local fire and police departments, and a renewed emphasis for planning sufficient spatial separation of transportation and industrial corridors from residential and employment concentrations. In 2014 the state legislature funded two additional MnDOT rail inspectors to assure tracks in the state are maintained to safely handle oil trains. MnDOT also completed a study of which oil train rail/highway crossings should be given priority for safety improvements.

The most congested bottleneck in the metro area remains at Hoffman Junction, between Dayton's Bluff and Union Depot in downtown Saint Paul, where three class I railroads operate daily and must cross each other's mainline tracks to deliver freight to several nearby rail yards, while accommodating national freight movements through the Twin Cities. This junction handles up to 120 freight train movements daily (representing about 5% of the nation's freight rail traffic) in addition to two daily Amtrak passenger trains accessing Union Depot. This junction also directly serves the Saint Paul Port Authority terminals. Rail freight tonnage nationwide is forecast to grow about 24% by 2045, and this region could expect to see similar increases in rail freight transport.

In 2013, the Ramsey County Regional Railroad Authority completed the East Metro Rail Capacity Study. That study outlined a 20-year, phased framework for public and private investment in east metro rail corridors to handle the projected growth in freight and passenger rail traffic. In 2018, Ramsey County completed a follow-up study, the East Metro Yards Improvement Project, that focused on the rail lines and yards affected by congestion near Hoffman Junction. The study explored track capacity solutions such as rail-over-rail grade separations and/or additional tracks near rail yard entrances and mainline crossing points in the area.

A continuing trend regarding the region's freight rail system is the increasing competition between freight and passenger demands for rail service within the limited capacity constraints of established freight rail corridors. Future rail planning studies, similar to those done by Ramsey County, will be needed in other rail corridors before potential expansions of passenger rail service are implemented.

As a result of the state's long term vision for enhanced and expanded passenger rail service in corridors shared with freight rail operations, there is a need for long-term partnering between public agencies and the railroads to plan, fund and implement rail system improvements that will achieve public sector goals for passenger rail transportation while maintaining the ability of the private railroads to safely operate existing and future freight rail service.

Considering the potential growth in freight and passenger rail, communities with rail corridors should expect continued and potentially increasing railroad operations. In the event any rail line were to be abandoned, the Metropolitan Council will assist its partners in preserving linear rights-of-way for transportation purposes, if needed. However, about half of the railroad mileage that existed in the metro area in 1990 has since been abandoned and few excess or redundant lines remain in the system, so communities should expect few additional rail line abandonments.

Barges on Waterways

The region's river port terminals are currently concentrated in Saint Paul along both banks of the Mississippi river, and in the cities of Savage and Burnsville on the Minnesota River. Some are private terminals operating on privately owned land, while other terminals operate on public land leased from the Saint Paul Port Authority.

After closure of the Minneapolis Upper Harbor and St. Anthony locks in 2015, Saint Paul and the ports of Savage are the only remaining riverports in the area, making preservation of sufficient riverfront land for barge terminals increasingly important to the region. Saint Paul's port is expected to continue as the single largest barge traffic generator on the Mississippi River north of St. Louis. For the first time in 2013, the port handled more cargo inbound than outbound, reflecting growth and diversification in the commodities being carried by barge. The ports of Savage on the Minnesota River continue to provide an important intermodal operation for exporting agricultural products to other states and international markets, and to transport aggregate to local and regional construction markets.

Maintenance of the entire Mississippi River Waterway system, including dredging of channels and repairing and upgrading of the locks and dams, is dependent on federal funding appropriations to the US Army Corps of Engineers, that are outside of the state's and region's control.

Air Freight

The freight terminal area of Minneapolis-St. Paul International Airport was relocated and rebuilt during the last decade when construction of the new north-south runway displaced the previous freight area. The new area is conveniently accessed off of State Highway 77 at 66th street, and can also be reached via secured access onto the airport property near 34th Avenue and Post Road. The interchange at I-494 and 34th Avenue was rebuilt in 2013. Due to these relatively recent upgrades, there are currently no plans for future major investment in air freight facilities during the next 20 years, although there may be minor improvements for freight resulting from ongoing upgrades to the airfield and passenger facilities.

Pipelines

Maintenance and expansion of pipelines are the responsibility of the private oil and natural gas industries. The US Departments of Transportation and Energy have federal management and regulatory authority over interstate pipelines through the Pipeline and Hazardous Materials Safety Administration and the Federal Energy Regulatory Commission, respectively.

Other Freight Planning Activities

In 2017, MnDOT updated its Minnesota Statewide Freight System Plan (<http://www.dot.state.mn.us/planning/freightplan/pdf/mn-statewide-freight-system-plan.pdf>) that incorporates the National Highway Freight Network (NHFN) designated in the FAST Act with other Interstate highways within the state which are important to freight movement. The plan describes Minnesota's freight transportation system and its role in the state's economy, current and emerging

industry trends, the performance of the freight transportation system, and current and future issues and needs. The plan also provides a policy framework and strategies to guide future investments in Minnesota's freight system through a Freight Action Agenda for MnDOT and its partners. This "agenda" identifies key steps to advance strategies that will improve the efficiency, safety and reliability of the freight system that includes the newly designated Minnesota Freight Network. The statewide plan works in coordination with the Transportation Policy Plan by providing broad guidance, while allowing for informed decision making at the regional level.

Several other plans have influenced the development of this TPP freight chapter and provide more detail on the future of freight in the region. These include:

The *Minnesota State Freight Investment Plan* (MnDOT, November 2017), can be viewed via this link: <https://www.dot.state.mn.us/planning/freightplan/pdf/freightinvestmentplan.pdf>

The plan identifies freight investments within Minnesota resulting from new, freight-specific federal funding provided under the Fixing America's Surface Transportation Act of 2015. It was published as an amendment to the Statewide Freight System Plan adopted in 2015. The investment plan's purpose is to coordinate federal, state and local investments on the freight network for the 2018-2027 ten year plan horizon. The plan lists freight projects funded through the Minnesota Highways Freight Program for state fiscal years 2016 through 2022.

The *2015 State Rail Plan* (MnDOT), can be found here: <http://www.dot.state.mn.us/planning/railplan/index.html>

This rail plan was an update of the 2010 Minnesota Comprehensive Statewide Freight and Passenger Rail Plan) and provided additional guidance for rail initiatives and investments, including a vision for effective utilization of the rail network and its future development. It identified rail issues and bottlenecks in the region.

The *Statewide Multimodal Transportation Plan*, was updated by MnDOT in 2016, and encourages greater accessibility and more efficient movement of goods throughout the Twin Cities metropolitan area and Minnesota. The plan can be viewed here: <http://www.dot.state.mn.us/minnesotago/SMTP.html>

It aimed to improve freight operations and connections for better access to the transportation system and to define priority networks for all modes based on connectivity and accessibility.

In 2013, MnDOT completed the first-ever Minnesota *Statewide Ports and Waterways Plan* <http://www.dot.state.mn.us/ofrw/waterways/pwp.html>

The plan includes an overview and history of Minnesota's waterways, industry shipper profiles, and an inventory of facility conditions for metro region ports and locks, as well as for facilities throughout the state's Mississippi River navigable waterway.

The *Twin Cities Metropolitan Region Freight Initiative* <http://www.dot.state.mn.us/ofrw/freight/metroofreightstudy.html> was completed jointly by MnDOT

and the Metropolitan Council in 2012 and provides more details about freight planning in the region.