Regional Freight Framework

Vision, Goals, Network and Performance Measures

St. Cloud Area Planning Organization

Prepared by:

SRF

Date: February 2018

SRF No. 10275

Table of Contents

List of Figures

List of Tables

H:\Projects\10000\10275\TP\Deliverables\APO Freight Final Report.docx

Executive Summary

The planning process begins a vision for a desired future. From this illustrative statement, goals are developed to guide investment and decision-making. Similarly, performance measures provide accountability towards achieving those goals. After all, "you can't manage what you can't measure." The project team used key takeaways from past work and APO staff input to develop a vision, goals and performance measures for the future regional freight system (Table 1).

Table 1: Regional Freight Vision, Goals and Performance Measures

REGIONAL FREIGHT VISION	Support economic competitiveness and job creation by providing a reliable, efficient and safe regional freight system	
	GOALS	**PERFORMANCE MEASURES**
TRAFFIC	Improve congestion and reliability on the regional freight system	Level of Service (LOS) or Vehicle/Capacity Ratio
		Truck Travel Time Reliability Index
SAFETY	Reduce commercial vehicle crashes region wide	Commercial vehicle crashes and/or severity
CONNECTIVITY	Maintain the LOS and State of Good Repair on the Tier III (local) freight network and intermodal connectors	LOS on local corridors and intermodal connectors
		Pavement and bridge ratings on local corridors and intermodal connectors
WORKFORCE	Connect workers to freight clusters	Transit shed of routes connecting to freight clusters
STATE OF GOOD REPAIR	Capitalize on existing infrastructure	Transportation Improvement Plan (TIP) investment in existing vs. new roads
		Pavement and bridge ratings
		Weight restricted bridges
ENVIRONMENTAL	Minimize negative impacts on the region's vulnerable populations	Transit shed of routes connecting Environmental Justice populations to freight clusters
		Truck volumes within a set buffer of freight network

A key step in the freight planning process is the identification roadway infrastructure that enables the movement of goods from local freight generators to other destinations within the region, the state, and the rest of the country. Multiple designated freight networks already exist at the national and statewide level, but a critical component of planning for freight movement is ensuring the link between those networks and freight trip origins and destinations. This review includes an assessment of freight activity in the St. Cloud APO planning area, a summary of the existing freight networks, and a proposed network of local roads to be designated as key links in the regional freight network.

Freight Vision, Goals and Performance Measures

The planning process begins with a vision for a desired future. From this vision, goals and performance measures are developed to achieve that vision.

To define the freight vision and goals for the St. Cloud region, the project team evaluated the current St. Cloud APO Long Range Transportation Plan (LRTP), Region 7W Comprehensive Economic Development Strategy (CEDS), the Minnesota Statewide Freight System Plan (SFSP), and federal freight planning requirements. The results of this desk scan were used to identify the commonalities in Figure 1.

Figure 1. Relative Key Commonalities from Desk Scan

Regional Freight Vision and Goals

A vision communicates the future in clear and definitive language. The purpose of a vision is to align an organization's internal and external expectations, plans, and actions. Typically, visions describe the "what" and "why" for an organization or initiative. Using key takeaways from the desk scan and APO staff input, a regional freight vision was defined for the St. Cloud APO. While this vision supports federal and MnDOT's freight goals, it is tailored to meet the specific needs of the region.

Support economic competitiveness and job creation by providing a reliable efficient and safe regional freight system.
APO Regional Freight Vision

The project team developed six freight planning goals to support the overall vision. Each goal supports the existing APO LRTP goals and the future direction of the on-going LRTP update.

Table 2: Recommended St. Cloud APO Freight Planning Goals

	Freight Goals
Traffic	Improve congestion and reliability on the regional freight system
Safety	Reduce commercial vehicle crashes region wide
Connectivity	Maintain the LOS and State of Good Repair on the Tier III (local) freight network and intermodal connectors
Workforce	Connect workers to freight clusters
State of Good Repair	Capitalize on existing infrastructure
Environmental	Minimize negative impacts on the region's vulnerable populations

Alignment of Goals

Table 3 exhibits how the recommended freight planning goals align with state and federal freight planning goals and regional transportation and economic development goals.

Table 3: Alignment of APO Freight Goals

	St. Cloud APO Freight Planning Goal Areas					
	Traffic	Safety	Connectivity	Workforce	State of Good Repair	Environmental
St. Cloud Long Range Transportation Plan*						
Promote safety for all users		X		X		
Increase accessibility and mobility; mitigate congestion	X		X	X		X
Enhance the integration and connectivity between all modes	X		X			X
Efficient management, collaboration, investment, accountability	X	X	X	X	X	X
Good state of repair using low-cost/high-benefit solutions	X				X	
Integrate multimodal options for active living and public health	X			X		X
Promote energy conservation, quality of life, consistent planning	X	X	X	X	X	X
Improve economic competitiveness, productivity, and efficiency	X	X	X	X	X	
Region 7W Comprehensive Economic Development Strategy*						
Uphold a high labor participation rate and low unemployment rate				X		
Increase training for skilled, living-wage occupations				X		
Foster job creation and business growth				X		
Increase cross-sector initiatives to support innovation	X	X	X	X	X	X
Protect and preserve the environment and enhance quality of life				X		X
Affordable high-speed internet to remain competitive in economy			X	X		X
Transportation system that supports the economy	X	X	X	X	X	X
MnDOT Statewide Freight System Plan*						
Support Minnesota's economy	X	X	X	X	X	X
Improve Minnesota's mobility	X		X	X		
Preserve Minnesota's infrastructure	X			X	X	
Safeguard Minnesotans		X				
Protect Minnesota's environment and communities				X		X
National Multimodal Freight Policy Goals*						
Improve economic competitiveness	X		X	X		
Improve safety, security, efficiency, and resiliency	X	X	X	X		X
Improve state of good repair				X	X	
Use innovation/technology to improve safety, efficiency, reliability	X	X	X			X
Improve efficiency and productivity	X		X	X		
Support multi-State corridor planning and address connectivity			X			X
Reduce environmental impacts of freight movement				X		X
*Goals edited extensively for brevity and conciseness						

Freight Performance Measures

Performance measures are an effective tool that can be used to focus attention and decision-making on the regional freight planning goals. The APO can use a simple and streamlined performance management program that can improve communication with the public, the private sector, and elected officials. The measures will make the APO more responsive to freight sector needs. Internally, performance measures should serve three distinct purposes:

- **Planning**: Measure the effectiveness of planning elements and alternatives.
- **Implementation**: Enact agency goals within the programming and project selection processes.
- **Accountability**: Track and report progress towards achieving goals.

Creating valuable performance measures can be complex. They are only valuable if they can be re-produced and sustained over time to make trends and effects of APO actions apparent. They need to be tested, refined, and regularly reviewed for relevancy. Like the freight system itself, performance measures cannot be static. While the measures will meet federal requirements, they must be tailored for the APO to derive maximum usefulness. Criteria for developing performance measures include:

- **Data availability**: The required data and analysis tools should be readily available or easy to obtain. The data should be reliable, accurate, and timely.
- **Strategic alignment**: The measures should align well with the identified goals.
- **Understandable and explainable**: The measures should be easy to communicate to external partners.
- **Causality**: The measures should focus on the items under the APO's control.
- **Decision-making value**: The measures should provide predictive, diagnostic and reporting value to decision makers.

Performance measures are a tool to achieve the plan, not a grade. They must be applied to something within APO's control – otherwise the performance measure has no value and only presents risk of the APO being held accountable for results they cannot influence. To help accomplish each goal, Table 4 lists potential performance measures created with the intention of incorporation into the LRTP update.

This special set of performance measures should be applied to the Tiers 1, 2, and 3 designated freight networks (see analysis beginning on page 12) to the extent that the required data is available. In those cases where data is not currently available, the APO should endeavor to collect or calculate the required data to help ensure that freight-movement goals are measured on all tiers of the freight network.

Table 4: Freight Goals and Performance Measures

GOALS	PERFORMANCE MEASURES	Relative Costs		Timeframe
		Dollars	Labor	
Improve congestion and reliability on the regional freight system	Level of Service (LOS) or Vehicle/Capacity Ratio	$$$	$$$$	Long
	Truck Travel Time Reliability Index	$$	$$$	Medium
Reduce commercial vehicle crashes region wide	Commercial vehicle crashes and/or severity	$	$	Short
Maintain the LOS and State of Good Repair on the Tier III (local) freight network and intermodal connectors	LOS on local corridors and intermodal connectors	$$	$$$	Medium
	Pavement and bridge ratings on local corridors and intermodal connectors	$	$	Short
Connect workers to freight clusters	Transit shed of routes connecting to freight clusters	$	$	Short
Capitalize on existing infrastructure	Transportation Improvement Plan (TIP) investment in existing vs. new roads	$	$$	Short
	Pavement and bridge ratings	$	$$$	Medium
	Weight restricted bridges	$	$$	Medium
Minimize negative impacts on the region's vulnerable populations	Transit shed of routes connecting Environmental Justice populations to freight clusters	$	$	Short
	Truck volumes within a set buffer of freight network	$	$$	Medium

Regional Freight Network

A key step in the freight planning process is the identification roadway infrastructure that enables the movement of goods from local freight generators to other destinations within the region, the state, and the rest of the country. Multiple designated freight networks already exist at the national and statewide level, but a critical component of planning for freight movement is ensuring the link between those networks and freight trip origins and destinations. This review includes an assessment of freight activity in the St. Cloud APO planning area, a summary of the existing freight networks, and a proposed network of local roads to be designated as key links in the regional freight network.

Freight Activity Analysis

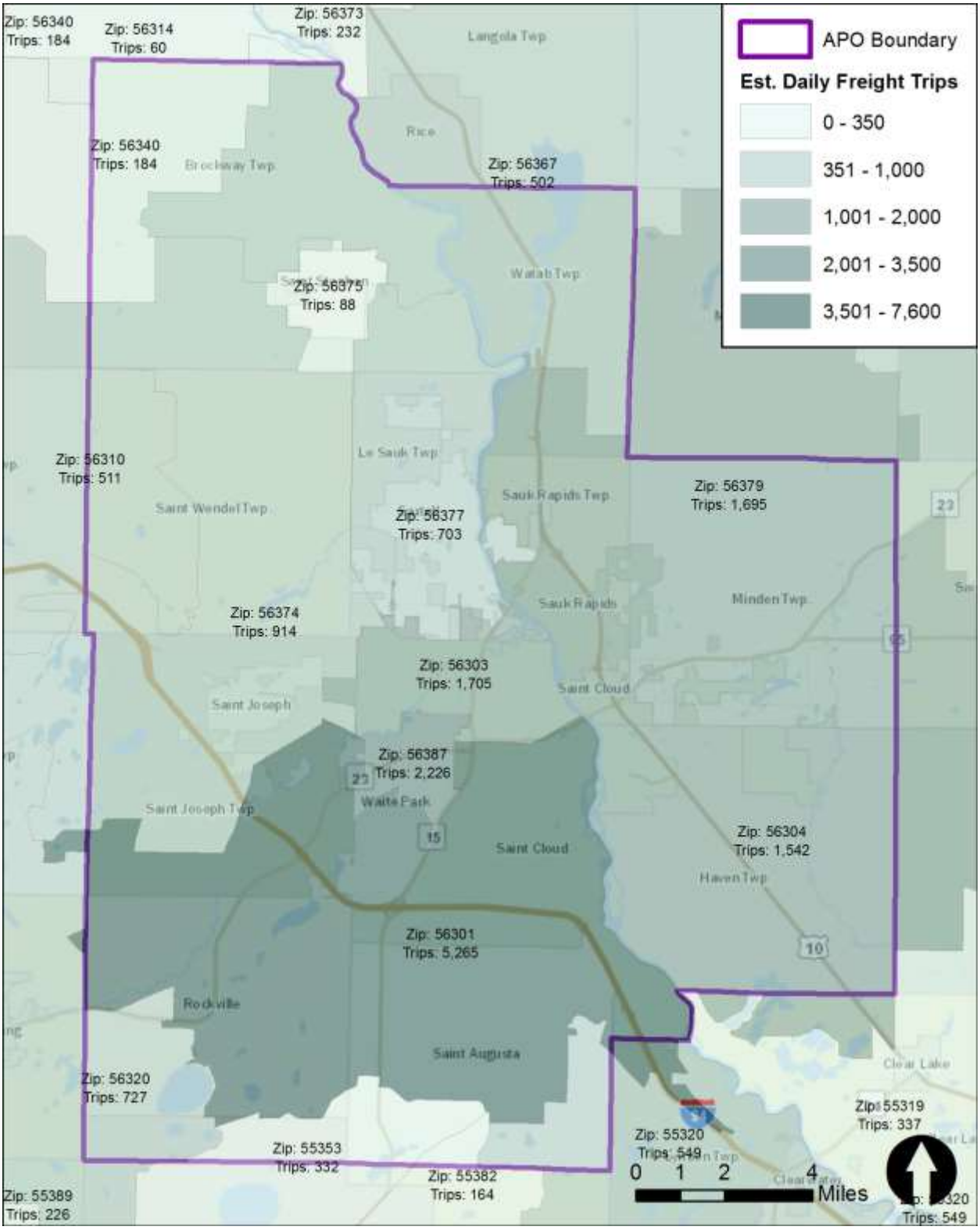
Analysis of freight activity on the local roadway network is often hampered by the limited availability of freight data. This assessment used a combination of three data sources to help illustrate the locations of key freight generators in the area and to approximate the intensity of freight truck trips accessing the various freight networks. A description of the data sources and their associated strengths and weaknesses is provided below.

Zip Code-Level Freight Activity Estimates

A new approach for estimating freight activity at both the zip code and establishment levels was recently published in *NCFRP Research Report 37: Using Commodity Flow Survey Microdata and Other Establishment Data to Estimate the Generation of Freight, Freight Trips, and Service Trips*. The research team reviewed several highly-detailed data sources to develop a freight trip estimation model based on the North American Industry Classification System (NAICS) code and the number of employees at each establishment. The resulting trip generation formulas can be applied to establishments if the NAICS code and employment counts are known. The research team also developed an online tool which applies the trip generation formulas to zip-code level Census Business Pattern data. The results of this tool when applied to the St. Cloud APO are shown in Figure 2. This figure shows a high concentration of freight activity in the southern portion of the APO in zip code 56301, adjacent to the I-94 corridor.

While the zip-code level estimates are accurate, they are also at too large of a scale to be useful in that form. To make this data more useful to the study, an InfoUSA data set was used to allocate the zip code estimates to the Transportation Analysis Zone (TAZ) level.

Figure 2. Estimated Zip Code Freight Activity



InfoUSA Freight Business Data

The InfoUSA freight business dataset is a product used primarily for targeted business marketing efforts. The information is updated routinely and includes information such as business location, NAICS code, estimated number of employees, estimated sales volume, and many other related data points. A set of this data was collected by the Minnesota Department of Transportation (MnDOT) in 2014 for use in the update to the statewide freight plan and has been repurposed for this analysis. One key limitation of this data is that to lower costs, MnDOT collected it only for businesses with employee counts of 20 or more. Because of this, the data should be considered a sample rather than a complete dataset.

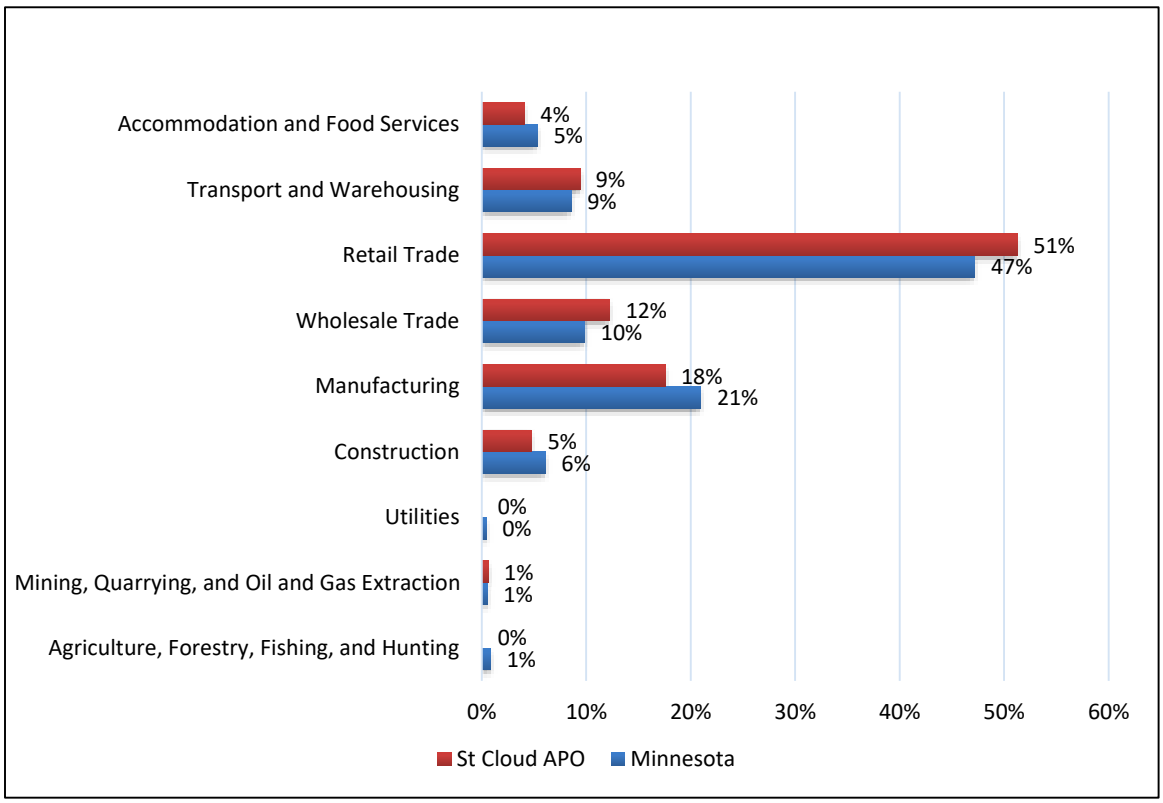
Despite excluding smaller freight businesses, the InfoUSA data still helps to highlight the distribution of key freight generators in the APO planning area and to provide a snapshot of the main industry categories active in the St. Cloud APO planning area. A list of the freight-related NAICS codes are summarized along with a classification of freight generation type. Industries classified as "receivers" include businesses such as grocery stores, restaurants, and clothing stores. Industries classified at "generators" include businesses such as manufacturing facilities and natural resource production. Industries classified as "transportation and warehousing" are involved primarily with the movement and storage of freight goods.

Table 5: Freight Intensive NAICS Sectors and Freight Generation Classification

Freight Intensive NAICS Sector	Freight Generation Classification
11: Agriculture, Forestry, Fishing, and Hunting	Generator
21: Mining, Quarrying, and Oil and Gas Extraction	Generator
22: Utilities	Receiver
23: Construction	Receiver
31-33: Manufacturing	Generator
42: Wholesale Trade	Generator
44-45: Retail Trade	Receiver
48-49: Transportation and Warehousing	Transportation and Warehousing
72: Accommodation and Food Services	Receiver

The distribution of the freight estimated freight activity by NAICS code in the St. Cloud APO area is shown in Figure 3. Relative to freight activity in the state of Minnesota, the APO has slightly higher levels of retail and wholesale trade, but slightly less activity in the manufacturing and construction industries.

Figure 3. Estimated Freight Trip Activity by NAICS Category

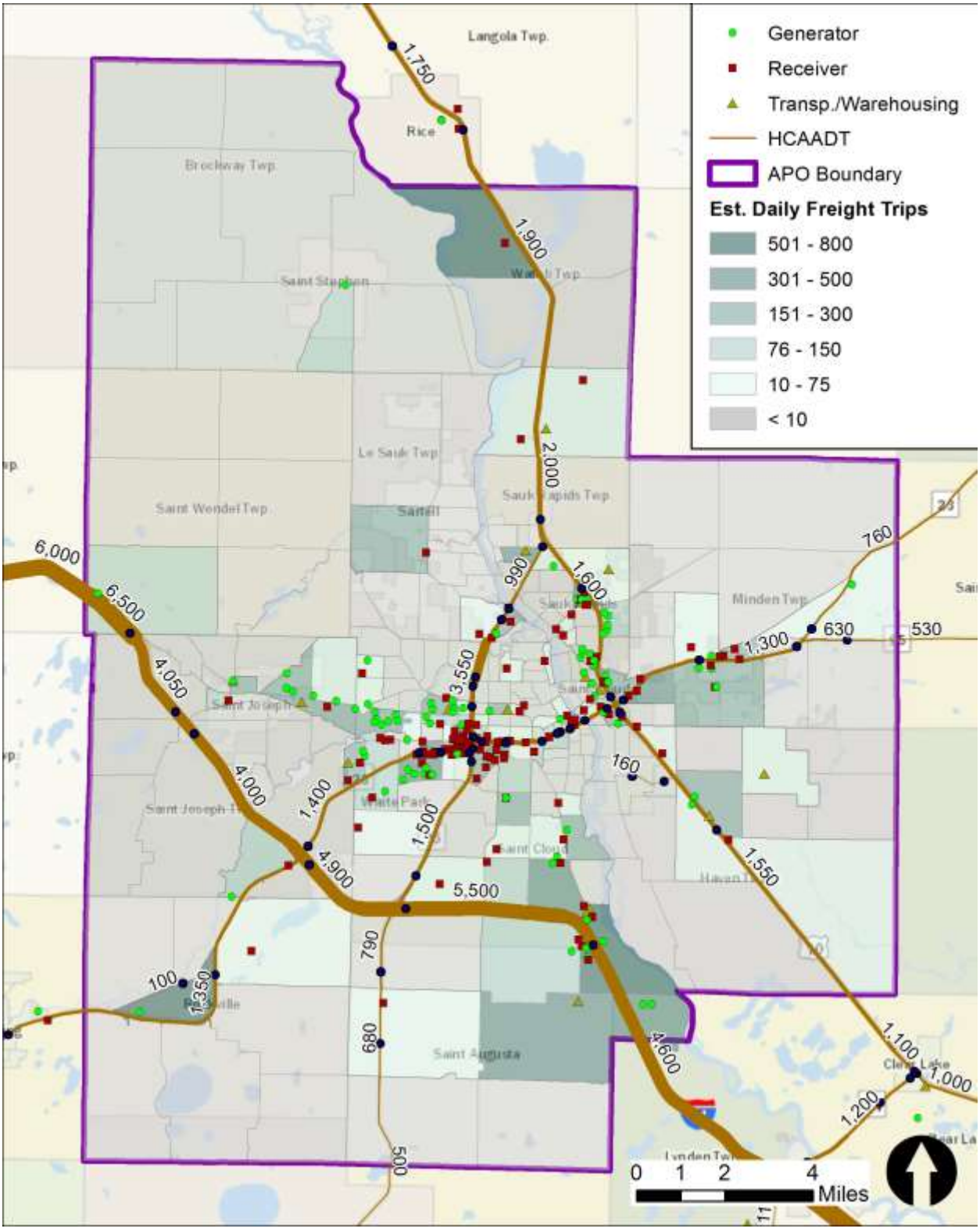


The location of the freight-related businesses and the estimated freight activity by TAZ is shown in Figure 4. The TAZ-level freight activity was estimated by allocating the zip-code-level freight activity to each TAZ based on the proportion of establishment-level freight activity in each TAZ. For example, if the InfoUSA establishment data showed that an estimated 50 percent of the freight trips in each zip code were in a single TAZ, then that TAZ would be allocated 50 percent of the zip-code-level freight activity estimates generated from the NCFRP report estimation tool. This figure shows a high concentration of freight businesses located in Waite Park and St. Cloud with a more dispersed distribution throughout the rest of the APO area. Other notable concentrations of freight businesses are southern St. Cloud adjacent to I-94 and the northwestern corner of Rockville.

Truck Volumes

The Heavy Commercial Annualized Average Daily Traffic Counts (HCAADT) in the St. Cloud APO area are also shown in Figure 4. These counts are routinely collected by MnDOT, but are only available on major highways. One key link that is missing from the HCAADT data is the county road between St. Joseph and St. Cloud. There is a heavy concentration of freight businesses along this corridor which is likely generating substantial heavy commercial truck trips. At the intersection of County Road 75 with I-94, the HCAADT counts on I-94 increase from 4,050 to 6,500. The 2,450-vehicle difference between these counts is a good approximation of the expected heavy commercial truck counts on County Road 75.

Figure 4. InfoUSA Freight Business Locations and Estimated TAZ Freight Activity



Designated Freight Networks

The designation of an official freight network recognizes the importance of certain roadway links for the movement of freight. This designation can also provide opportunities for focused investment that will benefit the movement of freight in the area. While such freight networks have been designated at the national and state levels, there still exist many gaps in the roadway system between these networks and the final destinations of freight movement. The "last-mile" of freight movement is often the most difficult for freight shippers to navigate. The purpose of this section is to provide an overview of the existing national and statewide freight networks in the St. Cloud APO area and to propose a local road network for inclusion in a potential regional freight network. The locations of these networks as well as the locations of the InfoUSA freight-related businesses is shown in Figure 5.

Tier 1: National Highway Freight Network

The National Highway Freight Network (NHFN) is a network of major highways identified as part of the FAST Act using objective national data. The purpose of the NHFN is to strategically direct Federal resources and policies in a manner that improves the performance of the freight system. In Minnesota, the NHFN consists of 913 miles of highway, 547 of which are part of the interstate highway system. In the St. Cloud APO area, this network consists of I-94 in an east-west direction through the southwestern portion of the APO area. As shown previously in Figure 4, truck volumes on this highway range from 2,900 to 4,200 vehicles per day.

Tier 2: Minnesota Principal Freight Network

The Minnesota Principal Freight Network (PFN) was identified during the development of the Minnesota Statewide Freight Plan update in 2015. As with the federal NHFN, the purpose of the Minnesota PFN was to identify the transportation infrastructure most critical to the movement of freight in Minnesota. Through a thorough review of existing roadway networks, MnDOT selected the Enhanced National Highway System (NHS) to be designated as the highway portion of the PFN. In the St. Cloud APO, the PFN consists of most of the major highways in the area, including US Highway 10, Minnesota Highways 15 and 23, and County Road 75.

Tier 3: Regional Freight Network

Portions of the local roadway network were selected based on their ability to connect areas with high concentrations of freight businesses to the state and national freight networks. As proposed, the Regional Freight Network consists of approximately 50 miles of municipal and county roadways as shown in Figure 5 and in more detail in Figure 6. Of the 247 freight businesses included in the InfoUSA dataset, 220 (89 percent) are located within one quarter mile of either the national, state, or regional freight networks.

Figure 5. National, State, and Proposed Regional Freight Networks

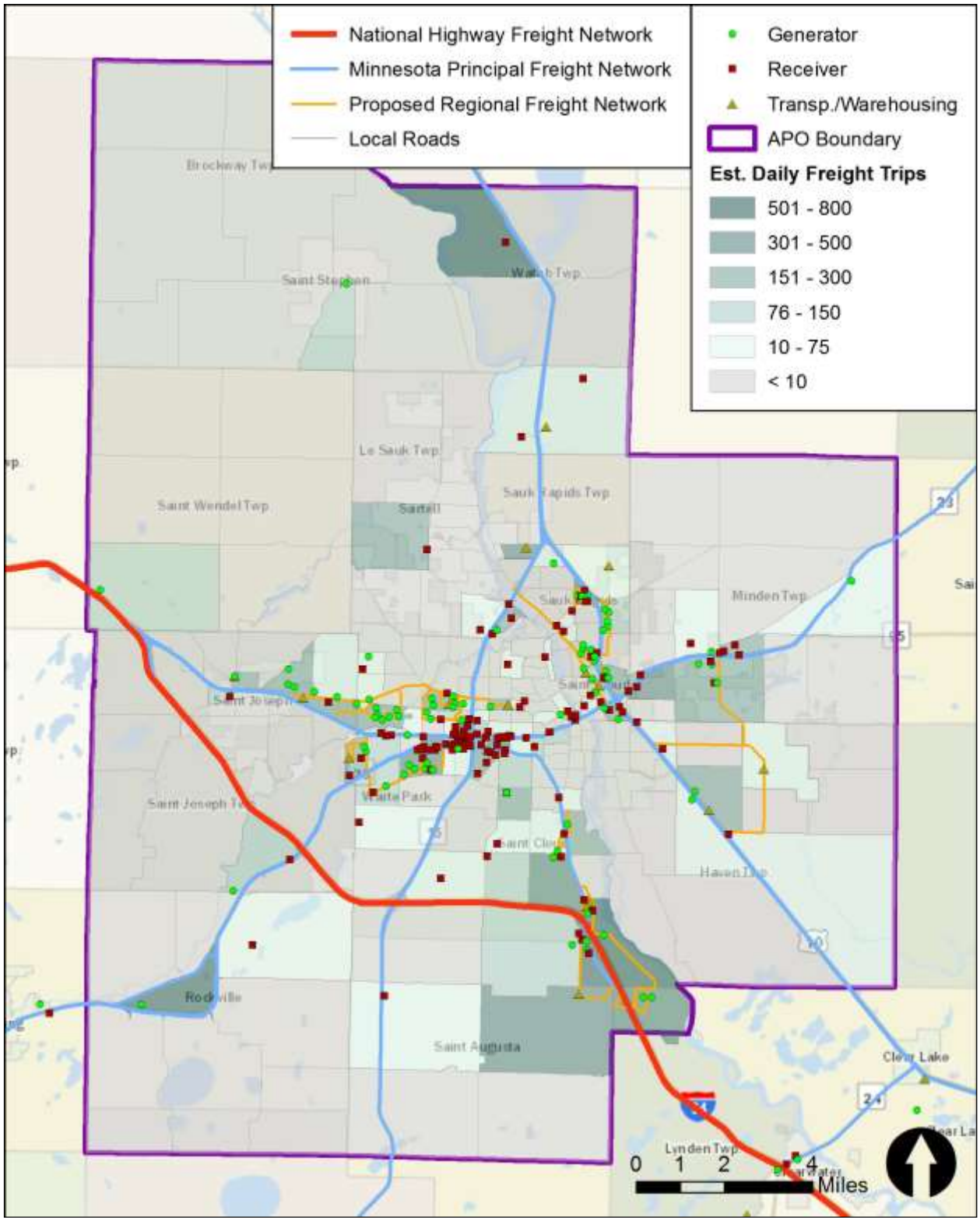
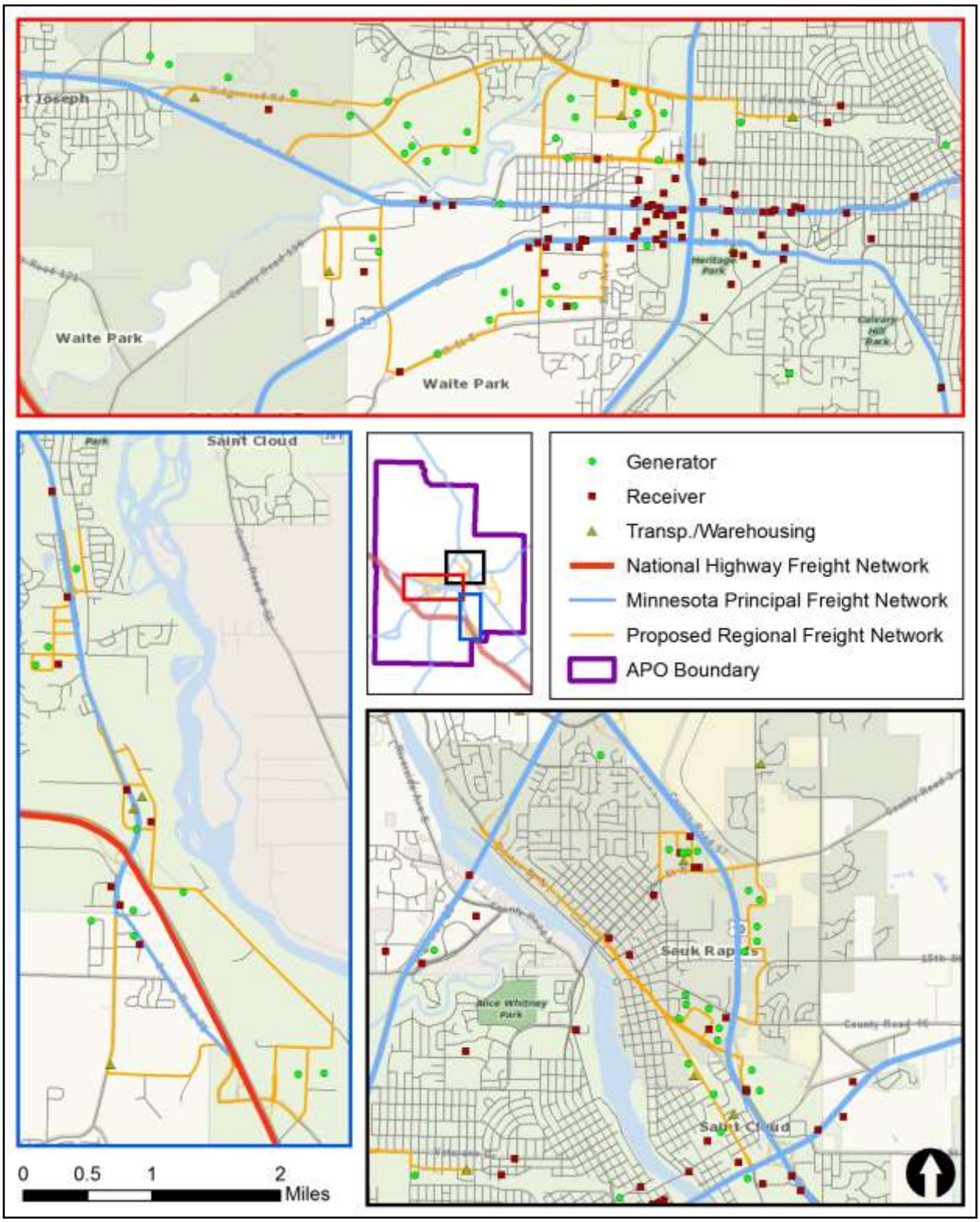


Figure 6. Regional Freight Network Detailed View



Conclusion

This report was developed to inform the APO's long-range planning process. While freight is a critical aspect of the regional transportation system, it is only one aspect. Its recommendations must be applied within the context of the other regional needs and available resources. Features, such as freight goals and performance measures, must be integrated with the larger LRTP goals and measures. This integration will be key to building an effective tool that can be used to focus attention and decision-making on the overall system.

Additionally, the report will serve as a supplement for the APO's day-to-day freight planning activities. Multiple freight networks already exist at the national and statewide level, but a critical component of planning for freight movement is ensuring the link between those networks and freight trip origins and destinations. This study developed a tiered network that identified how local economic activities move from their origin to the rest of the state and nation.