



Executive Summary

REGIONAL FREIGHT PLAN

FOR FARGO-MOORHEAD METROPOLITAN
COUNCIL OF GOVERNMENTS

August 2017

Executive Summary

"Metropolitan economies cannot function unless they trade goods with one another. Land, labor, and capital limit what a metropolitan area can produce on its own, meaning goods trade is essential to deliver economic benefits to metropolitan economies. If economic benefits compel metropolitan areas to trade, then transportation makes those benefits a reality... Goods trade delivers unquestionable returns to metropolitan economies, making it imperative that metropolitan leaders understand how their economic base relates to current and prospective trade partners."¹

- Global Cities Initiative - Brookings Institution and J.P. Morgan Chase

In today's digital economy, demands for freight services are increasingly driven by e-commerce that allow companies and consumers to shop vendors around the globe for goods and services with the click of a mouse. As the Brookings report cited above notes: "*digital communications have also enabled global value chains, allowing value creation through the production, manufacturing and assembly of products to occur in multiple locations, in various firms, and typically spans manufacturing and service industries,*" often in more than one region or nation. To compete in this complex environment requires agile supply chains that can adapt to constantly changing market conditions and consumer demands.

Congress has recognized the importance of freight transportation in recent highway reauthorization programs, and the most recent: Fixing America's Surface Transportation (FAST) Act enacted in 2015 created two new freight funding programs: 1) National Highway Freight Program, and 2) a discretionary freight-focused grant program originally called FASTLANE that the current administration has rebranded as Infrastructure For Rebuilding America (INFRA) Grants.

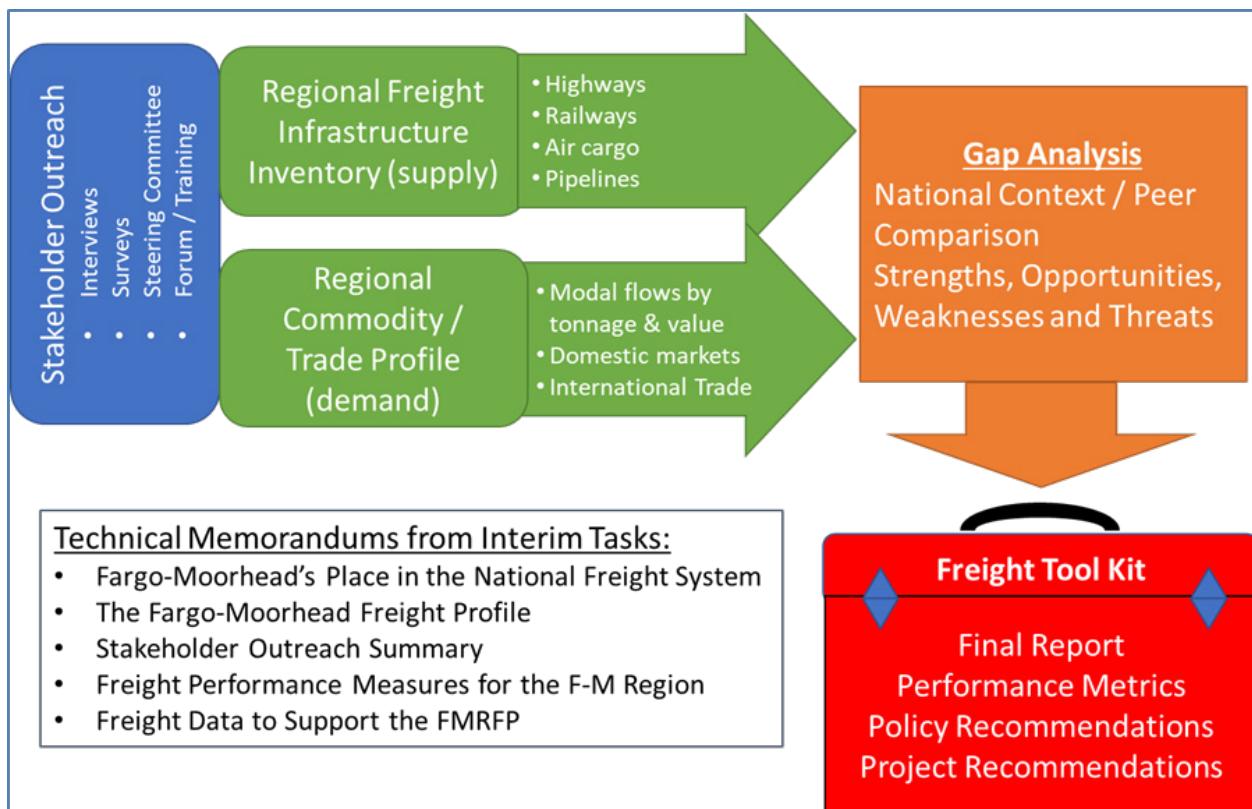
To access formula funds in the National Highway Freight Program, states are required to complete an USDOT approved freight plan. Locally, metropolitan planning organizations (MPOs) like Metropolitan Council of Governments (Metro COG) are encouraged to develop freight plans that complement State freight plans but reflect the needs and objectives of the region. The Fargo-Moorhead Freight Plan examines factors affecting freight movement to, from and within the region to inform Metro COG's other long- and short-range transportation planning efforts. From first and last mile truck movements to long-haul freight entering and exiting the region, understanding regional supply chain elements is important in determining future investment needs to keep local infrastructure efficient and effective in supporting freight movement.

Exhibit ES-1, shown on the next page, shows the high-level approach for completing the Fargo-Moorhead Regional Freight Plan.

¹ Adie Tomer, Joseph Kane, and Robert Puentes. Metro Freight: The Global Goods Trade that Moves Metro Economies. Global Cities Initiative, A Joint Project of Brookings and JP Morgan Chase | October 2013



Exhibit ES-1: High-level Process Flow for Conducting the Fargo-Moorhead Freight Plan



Source: Quetica, LLC

In June 2014, at the request of incoming Federal Highway Administration (FHWA) director Greg Nadeau Fargo hosted a Freight Policy Roundtable. The Fargo Roundtable part of a national listening tour that brought together public agencies from three states and regional businesses, began a dialogue about freight and the economy. In 2014, NDDOT was also working on its first statewide freight plan. These two events prompted Metro COG to begin conversations about the role of freight in local planning efforts.

Metro COG, the metropolitan planning organization for the Fargo-Moorhead Region undertook the Regional Freight Plan to better understand, and inform regional leaders about the transportation service and infrastructure needs of firms in the regional economy. While Metro COG's primary planning interests lie in the public elements of the region, the Fargo-Moorhead Regional Freight Plan (FMRFP) examines freight infrastructure and freight service demands across all modes in the regional transportation network.

The FMRFP is intended to help guide freight investments in the region that support the safety, social equity, economic productivity, sustainability and livable community goals established under Metro COG Long Range Transportation Plan (LRTP). The freight plan also presents performance metrics to assist Metro COG in monitoring programs, project prioritization/selection, and support federal guidance for competitive funding programs.

Fargo-Moorhead's Freight Profile

The Fargo-Moorhead region enjoys a multimodal freight network. During interviews with businesses in the region, stakeholders spoke highly of existing infrastructure and access to services, but also noted the lack of local access to rail container services and inland barge transport. Some stakeholders believe that better access to intermodal container service in the region would boost regional economic opportunities. A common means of gauging performance in the private sector is to compare a firm against industry performance benchmarks. Using the same approach in the public sector, it is expected that not all communities will have the same level of access to all elements of the multimodal transportation network. As part of the study, economic performance and modal networks of the Fargo-Moorhead Region were compared or “benchmarked” to the six cities in the Midwest that are shown in the map of **Exhibit ES-2**.

Overall, the comparative analysis between peer metropolitan statistical areas (MSA's) found the Fargo-Moorhead economy was well diversified, with low unemployment and strong employment growth. In terms of the six peer MSAs, Fargo-Moorhead was squarely in the middle on several benchmarking metrics, including the share of international trade as a portion of the regional economy. While most metropolitan areas saw little export growth during the Great Recession, some peer MSAs performed considerably better than Fargo-Moorhead. From 2003–2008, Fargo-Moorhead's exports by value grew 13.7 percent; but, from 2008–2014 exports grew only 1.4 percent. The slower growth of exports in recent years is a concern that should be monitored. In terms of freight services, the network comparison found no peer MSAs with dedicated intermodal rail services. However, the development of a new intermodal yard has been initiated in the Cedar Rapids, IA MSA.²

Exhibit-ES2: Comparative Metropolitan Statistical Areas

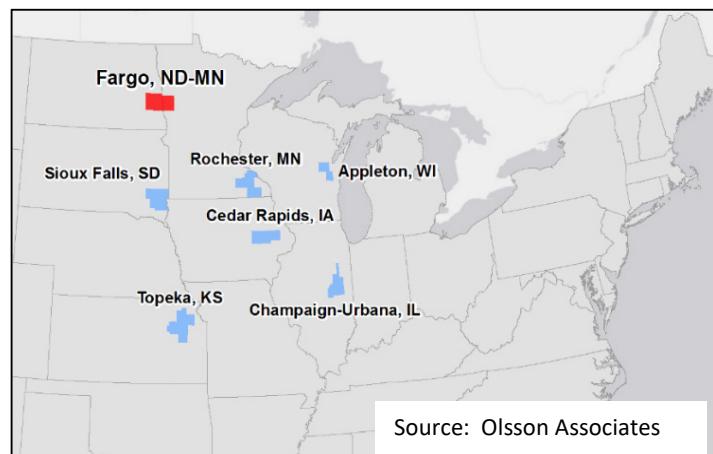
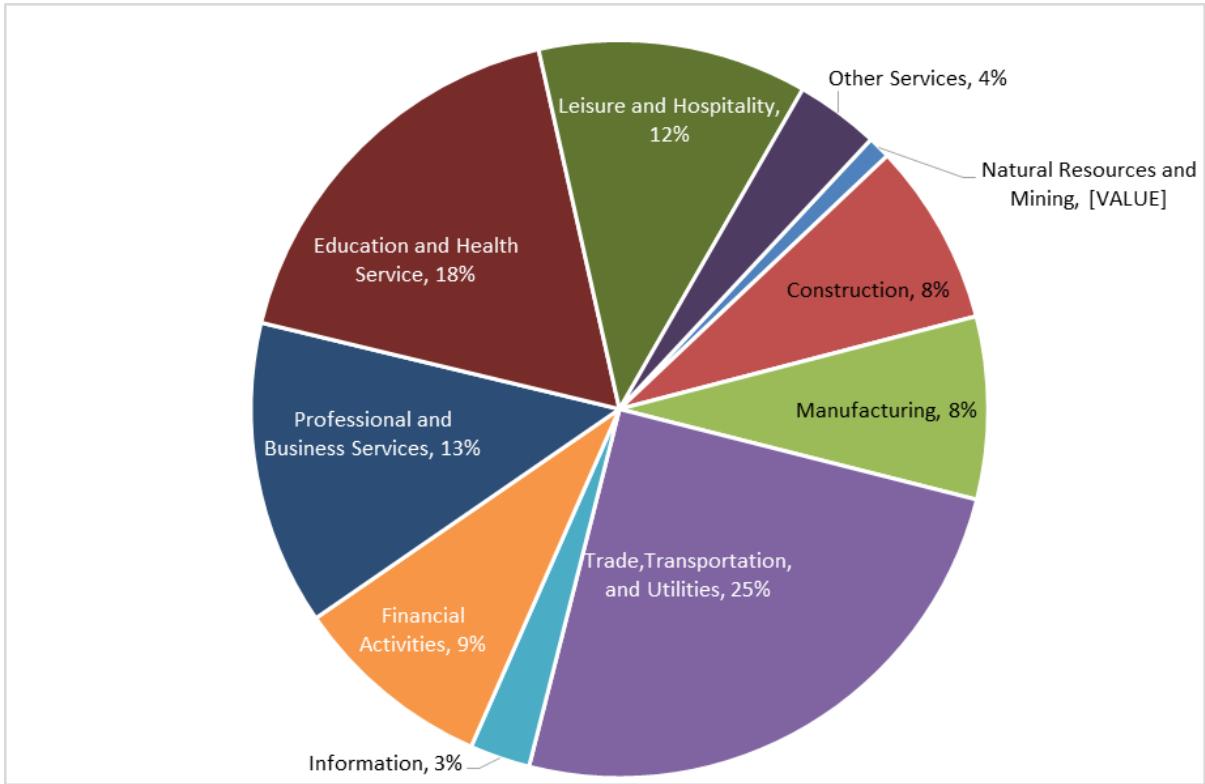


Exhibit ES-3 displays the key industries in the Fargo-Moorhead Region in terms of employment. *Trade, Transportation and Utilities* is the largest employment sector in the region, representing one-quarter of all employment in the MSA. *Natural Resources and Mining* is the smallest industry sector, representing just one percent of the regional economy, however it is likely that mining in other parts of the state contributes to other sectors including professional services.

2 <http://www.news.iowadot.gov/newsandinfo/2016/07/branstad-reynolds-announce-iowa-awarded-more-than-25-million-for-intermodal-transportation-facility-.html>



Source: Bureau of Labor Statistics, 2015

Location quotient (LQ) analysis examines industry concentrations of a regional economy when compared to a state or national economy. An LQ analysis for the Fargo-Moorhead economy found seven occupations that were five times more concentrated within the region as compared to the national economy. The concentration of jobs for Farm Equipment Mechanics and Service Technicians in the Fargo-Moorhead Region is more than nine times the national average. Some of these occupations support freight modes as well, for example diesel mechanics in the farm equipment industry can transition easily to truck or rail equipment. While the region also hosts several truck driver training programs, enrollment in these programs has declined recently.

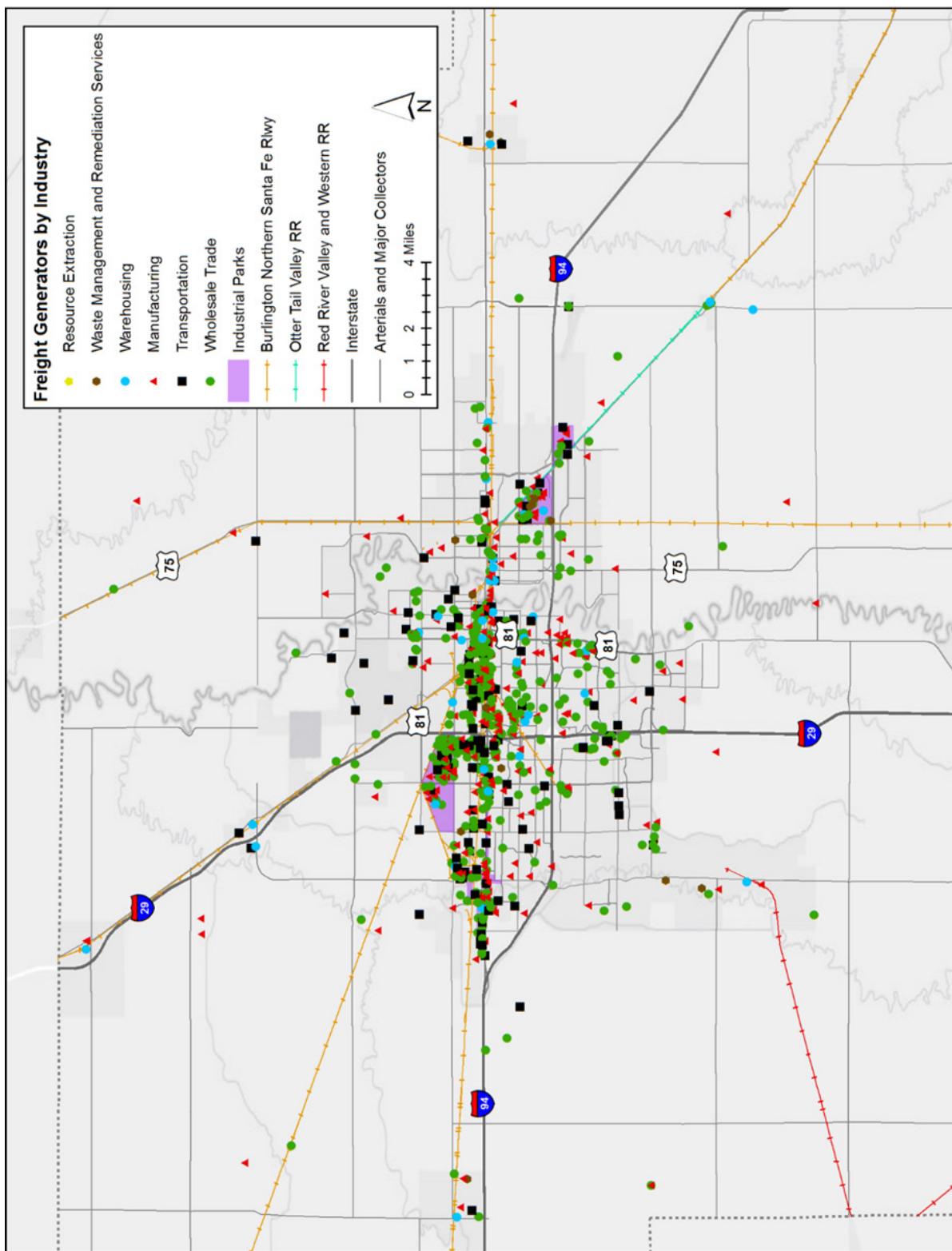
Diesel Lab at M-State Community and Technical



FREIGHT GENERATORS IN THE FARGO – MOORHEAD REGION

Freight generators are sites that generate or receive large volumes of freight, including manufacturing centers, distribution centers and/or large retail centers. **Exhibit ES-4** shows the location of major freight activity generators in the Metro COG Region.

Exhibit ES-4: Freight Generators in the Fargo-Moorhead Region



Source: Metro COG

FREIGHT FLOWS IN THE FARGO-MOORHEAD REGION

The freight facilities shown in the previous map receive and ship freight from other locations, most likely exchanging goods with locations inside and outside of the region. The study analysis also examined the nature of Fargo-Moorhead's freight flows in terms of modal volume and trade with other U.S. regions. **Exhibit ES-5** shows the high-level modal makeup of Fargo-Moorhead's commodity flows in 2014. When examined by weight, the highway/truck mode dominates regional freight flows with an 88% mode share, this compares to an 84% truck share nationally. At the national level, rail accounts for approximately 10% of freight flows by weight, and in the Fargo-Moorhead Region, rail accounts for an 11% mode share by tonnage. The share for multiple modes by weight is just one percent in the region, by tonnage, but 14% by value.

Exhibit ES-5: Mode Share for All Freight Flows in the Fargo-Moorhead Region - 2014

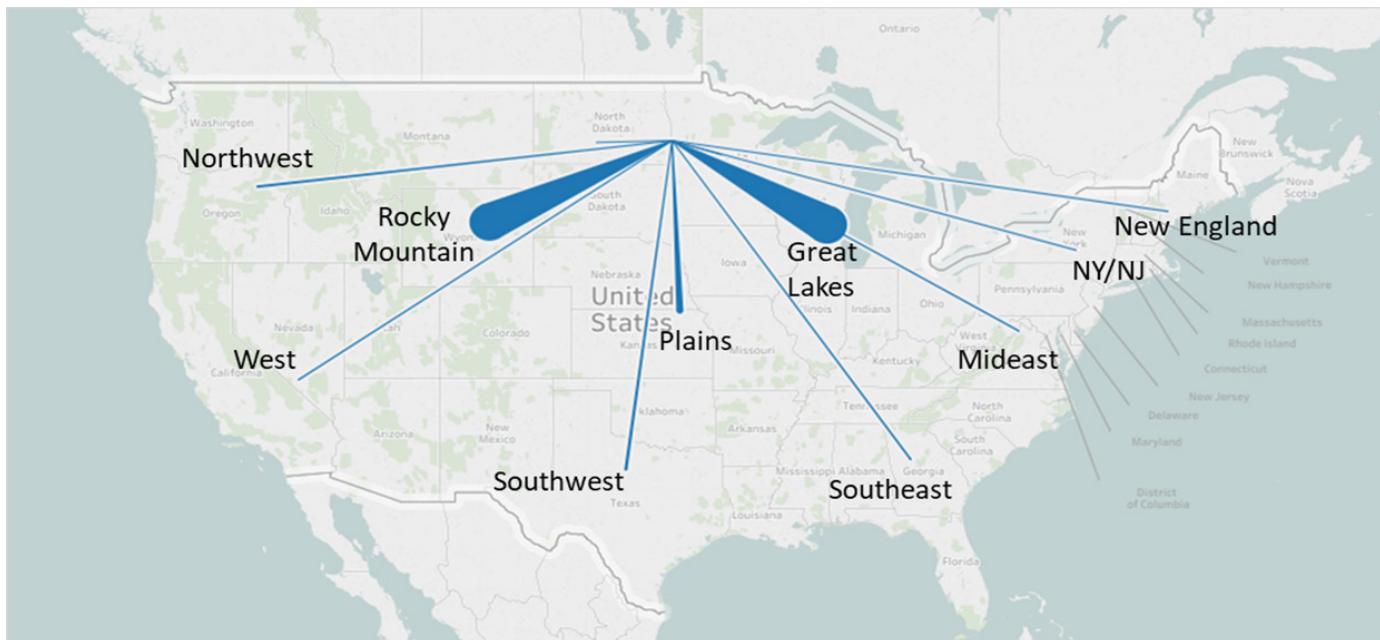


Source: FHWA Freight Analysis Framework Version 4 (FAF-4) and Quetica.

DIRECTIONAL FREIGHT FLOWS FOR THE FARGO-MOORHEAD REGION

Providers of transportation services across all modes prefer to serve areas that exhibit a balance between inbound and outbound freight. *Lane balance*, especially in high volume lanes, raises equipment utilization for carriers and reduces the frequency of empty backhauls. The commodity flow analysis examined the volume and value of goods moving between the Fargo-Moorhead Region and ten, multi-state U.S. regions that were broadly aggregated into sub-regions of the eastern U.S. and western U.S. It should be noted that the Fargo-Moorhead Region was split between two of these sub-regions: Cass County, ND is part of the Rocky Mountain Region in the West, and Clay County MN is part of the Great Lakes Region in the East. The maps in **Exhibits ES-6** and **ES-7** show commodity flows by tonnage values, with additional details in a tabular format of inbound and outbound flows by mode.

Exhibit ES-6: Trade between Fargo-Moorhead and Multistate US Regions by tonnage – 2014



Total Tonnage by Region (MM)

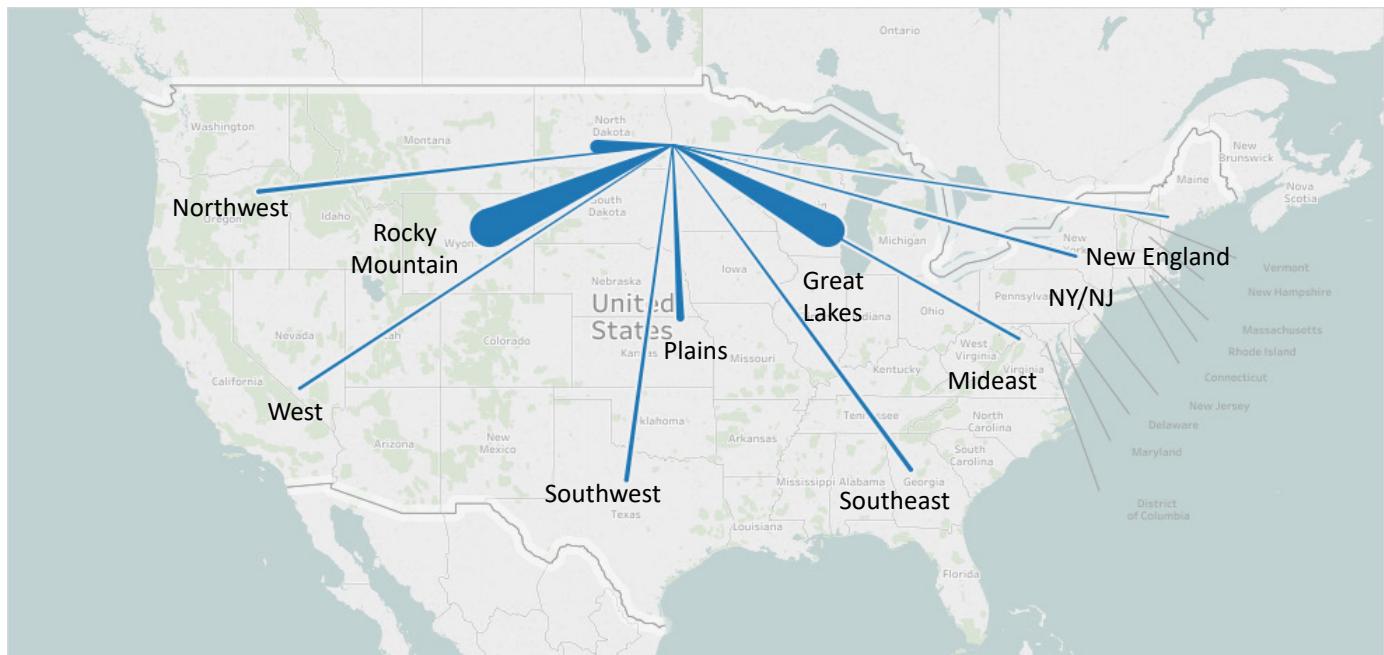
Region	Outbound	Inbound	Within	Grand Total
Rocky Mtn	7.38	12.35	1.19	20.92
Great Lakes	10.52	10.07	0.64	21.23
Plains	1.14	1.91		3.06
Southwest	0.47	0.43		0.90
Southeast	0.19	0.16		0.35
West	0.15	0.07		0.22
Northwest	0.63	0.08		0.71
New York	0.05	0.05		0.10
Mideast	0.22	0.03		0.25
New England	0.09	0.01		0.10
Grand Total	20.84	25.16	1.83	47.83

Percent of Tonnage by Direction (%)

Region	Outbound	Inbound	Within
Rocky Mtn	35.3%	59.0%	5.7%
Great Lakes	49.6%	47.4%	3.0%
Plains	37.4%	62.6%	
Southwest	51.8%	48.2%	
Southeast	55.0%	45.0%	
West	68.6%	31.4%	
Northwest	88.6%	11.4%	
New York	48.0%	52.0%	
Mideast	87.9%	12.1%	
New England	88.5%	11.5%	
Grand Total	43.6%	52.6%	3.8%

Source: FHWA FAF-4 and Quetica

Exhibit ES-7: Trade between Fargo-Moorhead and Multistate US Regions by value – 2014



Total Value by Region (\$MM)

Region	Outbound	Inbound	Within	Grand Total
Rocky Mtn	\$4,993	\$5,365	\$1,635	\$11,994
Great Lakes	\$4,256	\$7,460	\$200	\$11,917
Plains	\$829	\$1,602		\$2,430
Southwest	\$415	\$1,511		\$1,926
Southeast	\$404	\$617		\$1,021
West	\$245	\$612		\$857
Northwest	\$413	\$205		\$618
New York	\$247	\$262		\$509
Mideast	\$228	\$149		\$377
New England	\$119	\$105		\$225
Grand Total	\$12,150	\$17,889	\$1,835	\$31,873

Percent of Value by Direction (%)

Region	Outbound	Inbound	Within
Rocky Mtn	41.6%	44.7%	13.6%
Great Lakes	35.7%	62.6%	1.7%
Plains	34.1%	65.9%	
Southwest	21.6%	78.4%	
Southeast	39.6%	60.4%	
West	28.6%	71.4%	
Northwest	66.8%	33.2%	
New York	48.6%	51.4%	
Mideast	60.5%	39.5%	
New England	53.1%	46.9%	
Grand Total	38.1%	56.1%	5.8%

Source: FHWA FAF-4 and Quetica

FUTURE FREIGHT FLOWS FOR THE FARGO-MOORHEAD REGION

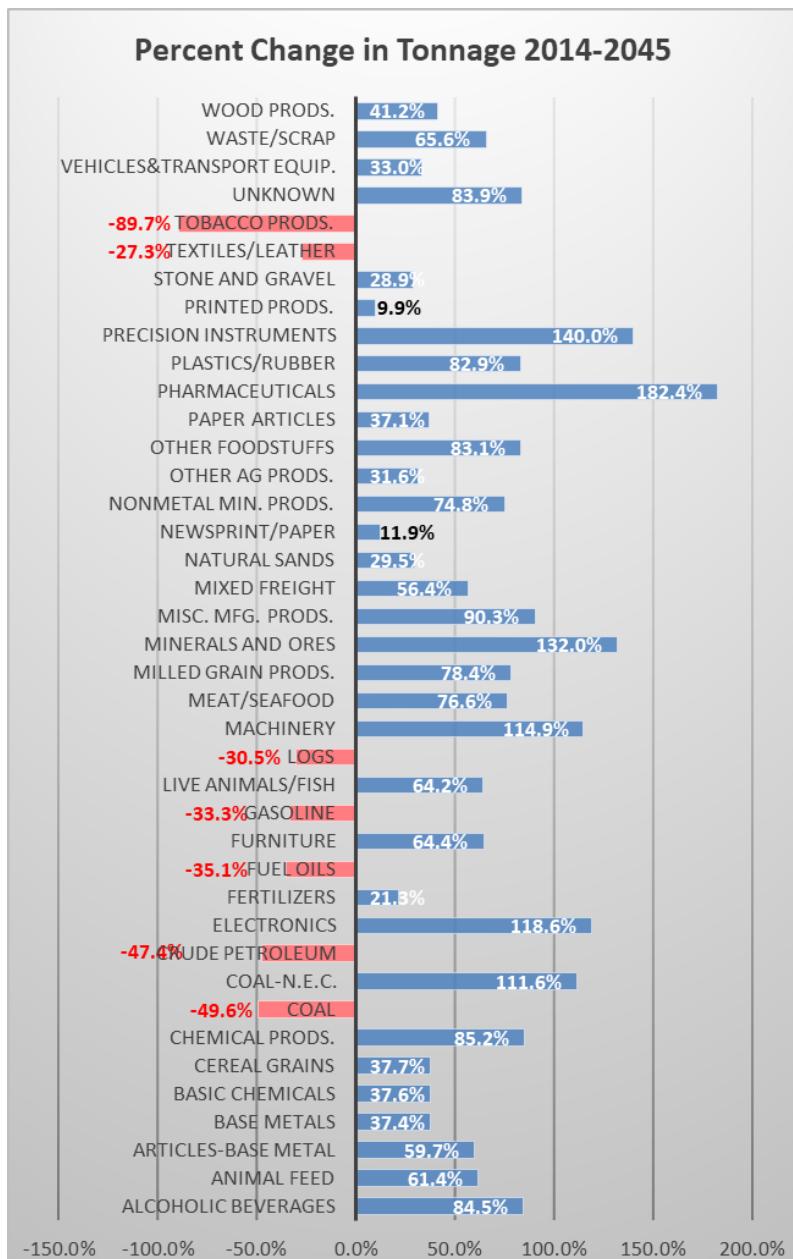
FHWA produces commodity flow forecasts as part of the Freight Analysis Framework (FAF) data series. **Exhibit ES-8** shows the predicted percentage change in commodity flows for the Fargo-Moorhead Region between 2014 and 2045.

Six commodity groups are predicted to see total tonnage increases exceeding 100 percent: *Pharmaceuticals* (182.4%); *Precision Instruments* (140.0%); *Minerals and ores* (132%); *Electronics* (118.6%); *Machinery* (114.9%), and; *Coal* (111.6%). Six commodity groups are forecast to see declines in total tonnage: *Tobacco Products* (89.7%); *Coal* (49.6%); *Crude Petroleum* (47.4%); *Fuel oil* (35.1%); *Gasoline* (33.3%), *Logs* (30.5); and *Textiles/Leather* (27.3%). It should be noted that the forecast data provided is for only four modes: truck, rail, water and multiple modes. It must be noted that FAF does not provide forecasts for pipelines, which may account for the decline in petroleum. It is likely that the forecast reflects declines in regional petroleum movements by rail, but does not show projected increases in petroleum movements by pipeline.

STAKEHOLDER VIEWS OF REGIONAL FREIGHT SERVICES

From its establishment in 1871, as the location where the Great Northern Railroad would cross the Red River linking the Midwest to the Pacific Northwest, Fargo's regional economy has been intimately tied to transportation infrastructure. Today, the regional economy is supported by several important modal networks: BNSF now operates on the Great Northern Corridor; Fargo is at the crossroads of Interstate Highways 29 and 94; the region is also served by extensive national, state and local road networks; several pipelines support energy needs of the region; and Hector International

Exhibit ES-8: F-M Commodity Flow Forecast (Change in Tonnage)



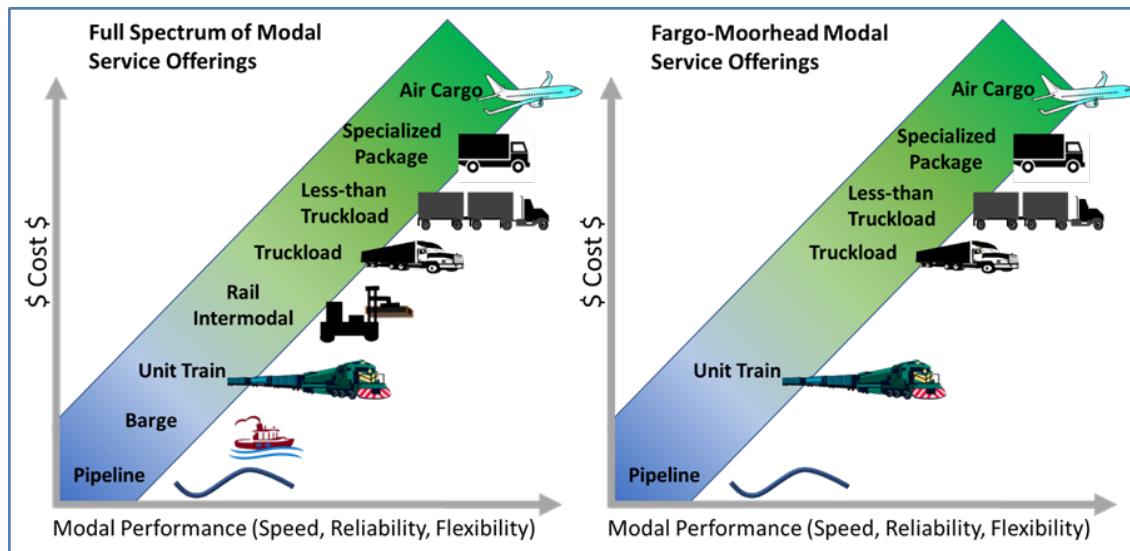
Source: FHWA, FAF-4 / Quetica



Airport provides daily flight schedules for passengers and packages. The multimodal nature of the region's freight services supports a diverse, growing regional economy; however, many stakeholders express the view that the lack of some key service offerings are a significant barrier to even more economic diversification.

Each freight mode provides a mix of cost, speed, accessibility and flexibility that shapes service attributes. Service needs play a major role in determining the mode(s) used by specific industries for the commodities they consume and produce. High cost air cargo services are typically used for products with a high value to weight ratio (e.g. computer chips), or those extremely time sensitive (e.g. fresh flowers). Low cost service options like pipeline and barge are used for products with low value to weight ratios (e.g. crude oil, water), and low time sensitivity (e.g. road salt). While air cargo and pipeline transport represent opposite extremes in the cost/service spectrum of freight services, many options exist in between. The left side of **Exhibit ES-9** shows some of the most common modal freight service options, aligned along a spectrum based on cost and service flexibility. The right hand side of the exhibit shows the common service offering in the Fargo-Moorhead Region. The nearest barge access is on the Mississippi River in Saint Paul, Minnesota, over 200 miles away. A repetitive issue raised by stakeholders concerned poor access to intermodal rail services. The nearest intermodal rail terminals are in Minneapolis (230 miles) and Winnipeg (220 miles).

Exhibit ES-9: Freight Transportation Service/Cost Modal Spectrum

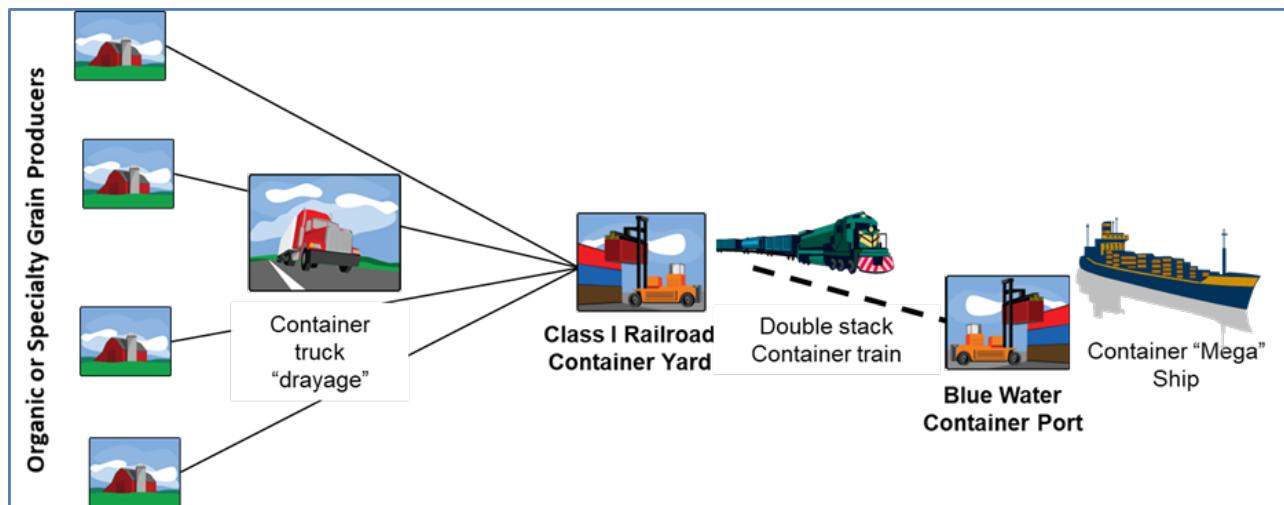


Source: Quetica, LLC

Access to competitively priced services best suited to meet the industrial mix of the local/regional economy is important to economic efficiency. While the Fargo-Moorhead economy has become more diversified, it remains heavily influenced by agriculture. There is growing demand in export markets for organic and/or "identify preserved" (IP) crops. An IP crop typically has special characteristics (e.g. grown from non-GMO seeds, or grown without chemical fertilizers) and the IP supply chain provides the buyer with a great deal of transparency about how the crop is handled and transported. A typical IP grain supply chain requires meticulous care be taken to prevent cross-contamination or mixing with other grains during harvest and transport. To ensure this integrity during transport, most IP grains are shipped in 20-foot or 40-foot international containers.

The supply chain for IP grains is depicted in **Exhibit ES-10**. In recent years, pulse crops (dried beans, chick peas and lentils), also referenced as legumes, are increasingly being grown in the Northern Plains, as an IP export crop to countries like India, Pakistan, and China. In 2015, North Dakota was the nation's top producer of legumes.³

Exhibit ES-10: Emerging IP Grain Supply Chain

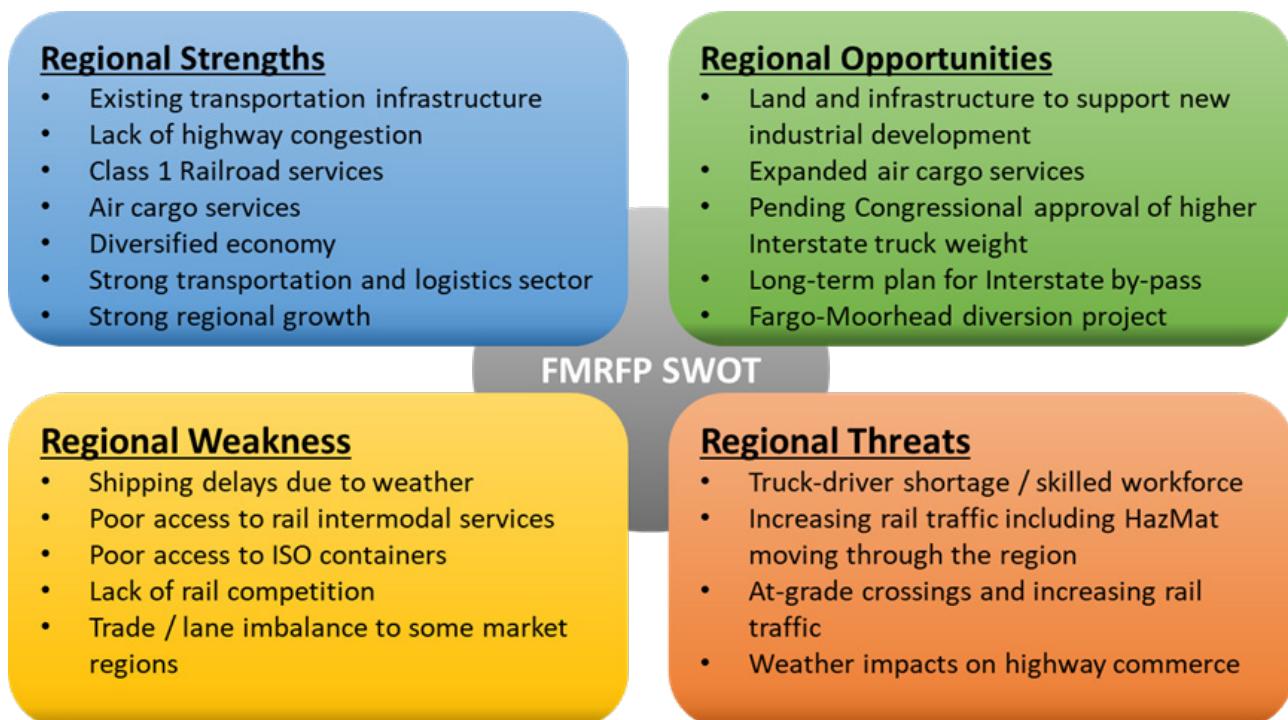


Consistent with its origins as a region built upon key transportation facilities, Fargo-Moorhead's greatest strength lies in its existing transportation infrastructure: uncongested roadways, with access to high-level road and railroad networks. Many of the stakeholders noted the region's lack of congestion as a regional strength, with recurring congestion during peak travel generally limited to short durations of roughly 15 minutes. Shippers and carriers report that interstates and major highways are generally in good condition and support efficient freight movements in both north-south and east-west directions.

Exhibit ES-11, on the next page, provides a broad summary of the Strengths, Weakness, Opportunities and Threats identified through data analysis, stakeholder interviews, truck driver surveys, and a regional freight forum conducted to have a dialogue about early study findings.

³ Alan Bjerga, Bloomberg Businessweek: Peas on the Prairie Destined for New Delhi; Indian Appetites are changing the U.S. crop mix. March 31, 2016. <http://www.bloomberg.com/graphics/2016-pulse-crops/>

Exhibit ES-11: Summary SWOT Matrix based on Freight Stakeholder Input



FARGO-MOORHEAD REGIONAL FREIGHT PLAN RECOMMENDATIONS

"Metropolitan economies cannot function unless they trade goods with one another. Land, labor, and capital limit what a metropolitan area can produce on its own, meaning goods trade is essential to deliver economic benefits to metropolitan economies. If economic benefits compel metropolitan areas to trade, then transportation makes those benefits a reality."

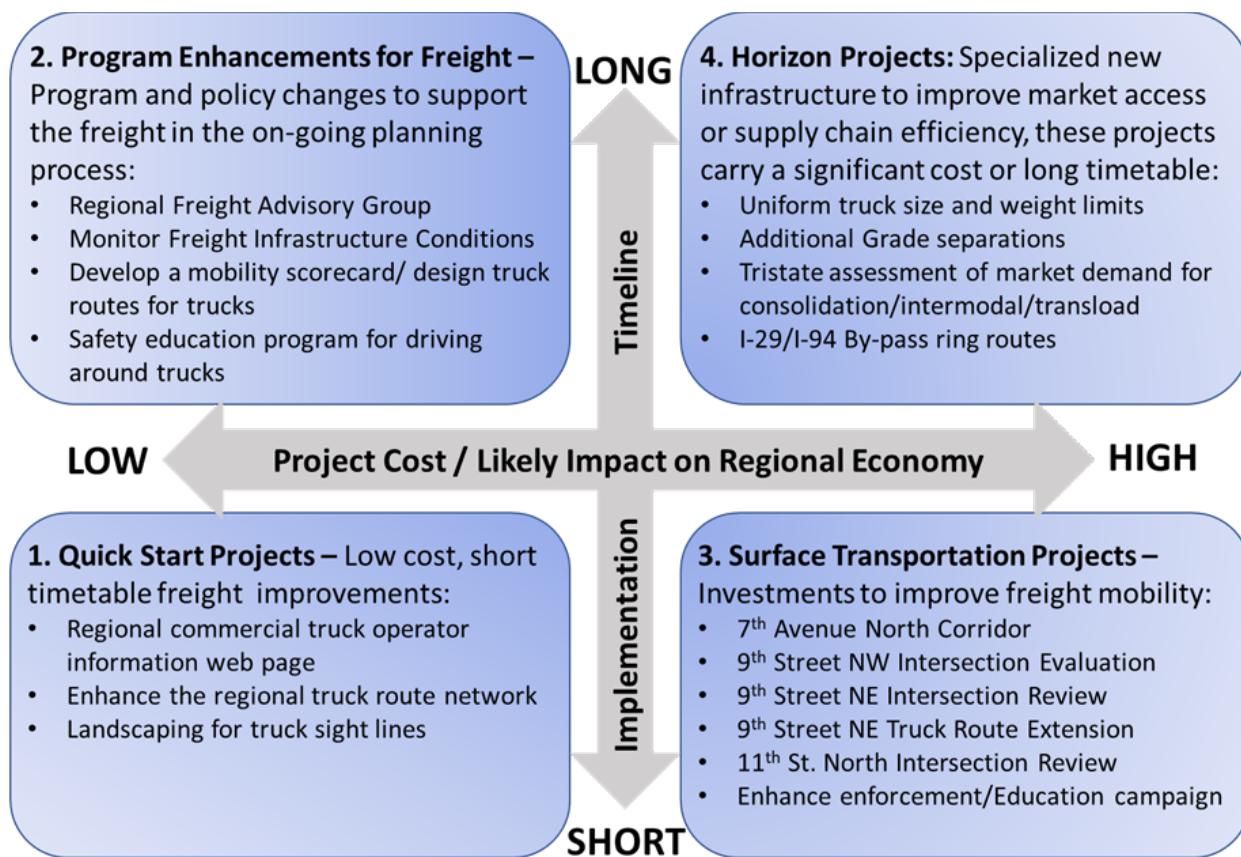
- Global Cities Initiative, Brookings Institute and JPMorgan Chase

The statement above from one in a series of reports issued by the Brookings Institution about the impact of goods movement on metropolitan economies is just one more piece of evidence in an already extensive and growing archive of research and policy studies that demonstrates the critical link between economic prosperity in urbanized areas and strong freight transportation networks. A key goal for Metro COG in undertaking the regional freight plan is to better understand the freight needs of industrial and retail segments of the regional economy, and to provide recommendations (short-term and long-term, policy and projects) that will improve mobility of the regional freight network. From a process standpoint, a key outcome of the study is the development of recommendations that mitigate weaknesses and threats, while taking advantage of regional strengths to capitalize on opportunities. The recommendations framework provided in **Exhibit ES-12** presents a summary of the recommendations put forth as a result of data analysis and stakeholder outreach. This framework recommends projects and policies on two primary dimensions: a) Project or policy implementation cost, and b) Implementation timeframe. A third dimension is presented as synonymous with project cost: Impact on Regional Economy. The implication being that significant project investments should be expected to have significant impacts on regional economic development. Using the primary dimensions of cost and time, four project/policy categories are:



- Quick Start Projects:** The public sector plans with time horizons of 20 years or more. Businesses plan for 1-5 years. Quick start projects are low cost, with short implementation horizons for the purpose of demonstrating to private sector partners that their input was received and acted upon.
- Program Enhancements for Freight:** Actionable strategies and projects that Metro COG can consider are to enhance existing planning activities to incorporate freight considerations to a greater degree in a continuous and on-going manner.
- Surface Transportation Projects:** These short range projects have been identified as being potential projects that will require further analysis prior to implementation. Traffic signal warrants, geometric reviews, and other engineering analysis will be necessary to understand the ultimate build out of the recommended projects.
- Horizon Projects:** This category of projects intends to address freight specific projects and/or policies that, due to their nature, are relatively high cost and/or may require long time horizons (e.g. more than 5 years) to implement due to regulatory hurdles, the state of technology, public acceptance, or private sector buy-in.

Exhibit ES-12: Strategic Framework for Metro COG Freight Recommendations



RECOMMENDATIONS ON A METRO FREIGHT SCORECARD AND NEXT STEPS

Exhibit ES-13 presents a framework for preparing a comprehensive scorecard to monitor Metro 2040 Plan Goals from a freight perspective.

Exhibit ES-13: Recommendations for Metro COG Performance Objectives and Measures

MPO Planning Factors / Metro 2040 Plan Goals	Overall Measurement Objective	Data Metrics	Performance Measure / Scorecard Measure
Safety Provide Safe and Secure Transportation	Reduce the number of truck crashes in the Metro COG region (long term downward trend)	Federal Motor Carrier Safety Administration (FMCSA) safety data MCMIS & FARS*4	Annual truck crashes in Cass and Clay County
			Fatal truck crashes in Cass and Clay County
System Preservation / Maintain Existing System	Maintain bridges and pavement in a State of Good Repair on designated truck routes.	Pavement Condition Rating	Truck route infrastructure condition score
		Bridge Condition Ratings	
		Posted bridges on truck routes	
System Management and Operations / Improve the Efficiency, Performance and Connectivity of a Balanced Transp. System	Reduce bottlenecks / circuity on truck routes	Low bridge clearance on truck routes	Truck route geometric design scorecard
		Inadequate intersections on truck routes	
Economic Vitality / Support Economic Vitality	Export trade to support business and job growth	TBD	Exports as a percent of regional GDP
Accessibility / Maximize Cost Effectiveness	Business access to rail transload / intermodal	GIS/location data on transload and intermodal facilities	Facilities within 50 mi., 100 mi 150 mi., 200 mi. and 250 mi.
Connectivity Across Modes	See Accessibility / Cost Effectiveness	See above	See above
Environment / Protect the environment and conserve resources	Reduce idling and emissions at regional at-grade crossings		

Once the final scorecard and performance measures are established, Metro COG and its stakeholders can also add the scorecard or specific elements to annual reports so the region's stakeholders can monitor progress toward goals. Since performance measurement is an interactive process, it is important not only to measure the region's performance annually but to also pause occasionally to ensure that the scorecard continues to reflect stakeholder concerns in the region, changes to the regional economy and the Fargo-Moorhead freight environment.

4 Motor Carrier Management Information System (MCMIS) and Fatal Accident Records System (FARS)



The consultant team would like to
thank the Metro COG Steering
Committee for their help and support
during the project.

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