

# Why a Regional Freight Study? : The Case of the Upper Midwest

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## **ABSTRACT**

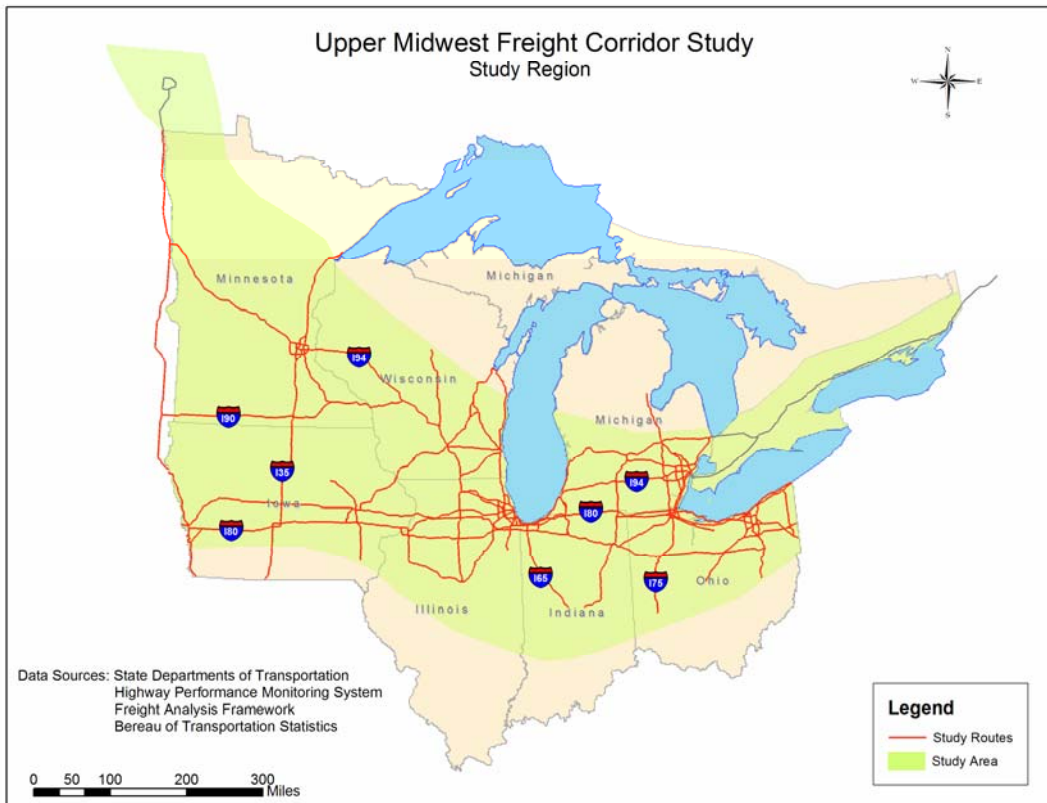
An efficient, reliable and safe freight transportation system is the key to the continued economic health of a region. Bottlenecks in specific cities impact other states, local regulations impact route choices, and the availability of specific modes and the quality of service influence mode choice. However, most freight studies are conducted at the national, state or local level rather than focusing on a region. The Upper Midwest, loosely defined as a corridor including Interstates 80, 90 and 94, serves as a critical corridor for domestic and international freight moving in all directions. This paper describes the Upper Midwest Regional Freight study. The study focuses on outcomes that go beyond state boundaries or require states or other stakeholders to work collaboratively.

## **INTRODUCTION**

The movement of freight into, from or through a region pays no attention to state boundaries (FHWA 2002). Shippers seek efficient routes, industries expect the timely delivery of raw materials, and consumers demand a ready supply of inexpensive goods, all with little or no disruption of passenger flows on both highways and rail lines. The freight movements respond to the generation of and demand for goods.

In the past decade, freight has received considerable attention at the national level (TRB 2002, TRB 2003, FHWA 2004), and several states, including Minnesota (Cambridge Systematics Inc, 2000) and Ohio (Grenzback, and Beagan 2002), have conducted studies. At a regional level, the most often-cited examples for regional studies are the corridor studies.

The Upper Midwest, loosely defined as a corridor including Interstates 80, 90 and 94 through Illinois, Indiana, Iowa, Manitoba, Michigan, Minnesota, Ohio, Ontario and Wisconsin, serves as a critical corridor for domestic and international freight moving in all directions, as shown in Figure 1. Table 1 summarizes the rail and highway freight infrastructure in the region, along with revenue and safety statistics, giving a brief glimpse of the region.



**Figure 1 Upper Midwest Freight Study Corridor**

The corridor also includes several major urban areas (with population over 0.5 million), including Chicago, Gary, Detroit, Minneapolis/St Paul, Cleveland and Milwaukee. These urban areas represent over 30% of the total population of all the states crossed by the corridor. They are also highly congested, as illustrated by the average annual delays per traveler for 2003 shown in Table 2. Therefore, freight to, from, and through the Upper Midwest corridor has a significant impact on urban areas; in turn, the congestion in these urban areas impacts the movement of freight through the region.

Not only does the Upper Midwest Corridor handle the major east-west movements of freight, it is also becoming important in the north-south movements of freight in the region and continent, transcending national as well as state boundaries. The relationship of the states in the region to the two Canadian provinces to the north, Manitoba and Ontario, is important for both parties. About seventy-five percent of

**Table 1 Tons and Value of Freight Moving To, From, and Within the Seven States of the Corridor Region (Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin)**

Statistics	IL	IN	IA	MI	MN	OH	WI
State population: 2003	12,653,544	6,195,643	2,944,062	10,079,985	5,059,375	11,435,798	5,472,299
Urban Area(s) in corridor (over 0.5 m) Population	Chicago 7.7 m	Gary/Chicago 0.5 m	- -	Detroit 3.9 m	Minneapolis 2.4 m	Cleveland 1.8 m	Milwaukee 1.3m
Public roads: 2002 (miles)	138,338	94,287	113,450	122,029	132,121	124,885	112,950
Highway bridges: 2002	25,610	18,087	4,086	10,799	12,846	27,903	13,563
Class I Freight Railroads: 2001	8	5	3	4	3	3	3
Class I Freight Railroad: 2001 (miles)	7,762	3,816	2,643	2,228	6,646	4,526	1,832
Highway VMT: 2002 (millions)	105,401	72,523	30,847	100,144	54,562	107,861	58,746
State gasoline fuel tax rates: 2001 (cents per gallon)	19.00	15.00	20.00	19.00	20.00	20.00	27.30
Vehicles weighed: 2001	2,436,249	1,285,948	750,319	557,548	465,183	6,330,496	383,300
Citations: 2001	19,279	7,416	10,225	2,692	3,159	23,931	4,138
Overweight vehicle permits issued: FY 2001	131,776	93,724	44,959	131,841	18,500	121,784	18,685
Fine for a 4,000 lb overweight vehicle	\$365 (\$347 in Cook Co.)	\$1 - \$1,000	\$130	\$360	\$510	\$140	\$170
Fatal Crashes involving large trucks: 2001	180	133	76	123	60	161	95

Source: BTS Summary State Transportation Profile, December 2003

State Comparison of Enforcement [http://www.ops.fhwa.dot.gov/freight/size\\_weight.htm](http://www.ops.fhwa.dot.gov/freight/size_weight.htm)

FHWA [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/tables/table8.htm](http://www.ops.fhwa.dot.gov/freight/freight_analysis/tables/table8.htm)

FHWA [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/state\\_info/98fines.htm](http://www.ops.fhwa.dot.gov/freight/freight_analysis/state_info/98fines.htm)

The CRASH Foundation <http://www.trucksafety.org/default.asp?contentID=556>

U.S. Census Bureau <http://eire.census.gov/popest/data/counties/CO-EST2003-01.php>

Ontario's merchandise trade (by weight) with the United States in 2001 either went to or came from the seven states of the region. Freight movements in this corridor are currently increasing, and this trend is projected to continue (Adams et al, 2005, p. E.S. 13). While both the private and public sectors agree that this important issue must be addressed quickly, neither sector is totally prepared to deal with the anticipated impacts of this projected increase. Current practices will not be sufficient to meet the increased demands on the infrastructure and/or the increased costs associated with freight transport.

**Table 2. Congestion in Urban Areas in the Corridor**

Urban Area	Average Annual Delay per Traveler (2003) (hours)	Rank of 85 Urban Areas
Chicago/ Gary	58	8
Detroit	57	9
Minneapolis/ St Paul	43	22
Cleveland	10	73

Source: (TTI, 2005)

Shifts in public agency policy relative to infrastructure management and expansion, budgeting decisions, and staff resource allocations have impacted, and will continue to impact, the safe and efficient movement of goods within the region. At the same time, private sector interests insist on an approach that is equitable for all modes and allows industry to remain competitive in the region. Without proper collaboration and communication between the two sectors, as well as between the states and planning agencies of the region, the impacts of projected freight growth could be intolerable to the public.

A regional perspective, such has been taken in other parts of the nation and around the world, is an effective way to consider and address the short- and long-term issues surrounding anticipated increases in this freight movement. The study described in this paper is the first step in establishing a regional approach to improving freight transportation in the Upper Midwest and Great Lakes region. It serves as the foundation for future cooperative efforts by documenting and analyzing the current condition of the freight transportation system in the region.

This paper addresses the need for regional freight studies. The paper begins by providing a context for the Upper Midwest Regional Freight study in terms of other regional studies. The paper then describes the methodology used for the Upper Midwest Regional Freight study. Current patterns of freight movement and related issues facing the Upper Midwest Corridor are then identified. Drawing on these patterns of freight movement and the issues, policy implications and recommendations are then addressed, with a focus on outcomes that transcend state boundaries and require states or other stakeholders to work collaboratively.

## **BACKGROUND: OTHER CORRIDOR STUDIES**

Many other regions of the country, such as the I-35/I-29/I-94 (NASCO 2005) and I-95 corridors (Baniak 2002), have worked together on transportation planning and enhancements. Much can be learned from their efforts at regional cooperation. Areas for consideration include funding, organizational structure, decision-making processes, identification of catalysts, and private sector involvement.

Various objectives have induced states, local agencies and private firms to collaborate. In some regions, for example, organizations sought to better utilize their limited resources to efficiently address issues that crossed jurisdictional boundaries. As part of North America's SuperCorridor Coalition Inc. (NASCO), the states along I-35 and I-29 coordinated deployment of intelligent transportation systems (ITS) for commercial vehicle operations. Other regions emphasized the need for regional thinking and freight planning to increase economic vitality. The southeastern portion of the U.S. realized the importance of Latin American markets to its economy.

The I-95 Corridor Coalition, encompassing the entire east coast of the U.S., set high standards for cooperation across boundaries and modes. This coalition has successfully attracted federal dollars to support regional transportation projects. With a small staff and a relatively small budget, the I-95 group has attempted to coordinate electronic toll payments, develop traveler information systems, and involve private freight carriers in their efforts. Concepts and programs developed by this coalition, such as ideas for funding, organizing, and decision-making, are transferable to the Upper Midwest region .

Of particular relevance for the Upper Midwest Freight Corridor study is the Chicago Region Environmental and Transportation Efficiency (CREATE) Project (CREATE 2005). While not a corridor project, CREATE is an unprecedented collaboration among all the major US and Canadian railroads, the city of Chicago, and the Illinois Department of Transportation to address the bottleneck known as “the Chicago problem.” Released in 2003, the plan identified major rail improvements including 25 rail-highway grade separations. It demonstrates the tight connections among road and rail transportation, particularly intermodal, and the challenges of operating in a heavily congested urban area (Blaszak 2003). These studies emphasize the need to

- Share resources to improve efficiency. Agencies should jointly define problems, pool resources to solve them, and share the results of these efforts. This could be applied to training, data collection, and working with the federal government.
- Increase communication among the personnel who work with freight issues. The freight industry is complex, changes rapidly and could benefit from advances in technology. The states will benefit by sharing ideas and learning about different perspectives in freight.
- Improve coordination with other freight-related groups in the study corridor to take advantage of the work already done by other groups, such as the Gary-Chicago-Milwaukee ITS Priority Corridor and CREATE, and not duplicate these efforts.

## **STUDY METHODOLOGY**

The primary objective of the study was to facilitate the first and important steps in establishing a regional approach for improving freight transportation in the Upper Midwest through a multi-state, multi-jurisdictional partnership of public and private sector stakeholder interests. This partnership considered and addressed short- and long-term issues surrounding anticipated increases in freight movement within the region and the likely impacts on the region’s infrastructure and economic health.

The study focused on preparing an inventory of the existing system including performance metrics, capacity, administrative issues, and usage. Through a series of workshops, interactions with the stakeholders, and a review and synthesis of the literature and available data, the research team addressed the following tasks:

1. Compile and synthesize existing plans and efforts.
2. Create a setting for coalition building through regular communication and data sharing.
3. Identify and document the conditions and needs across all modes of freight transportation for the identified corridors in the region.
4. Understand the market activities that generate goods for shipping that impact this region.
5. Identify the regulatory inconsistencies and associated bottlenecks across the region.
6. Look at possibilities for streamlining administrative practices, taking a regional perspective, through regional cooperation, ITS/CVO technology, and standardization of key infrastructure.

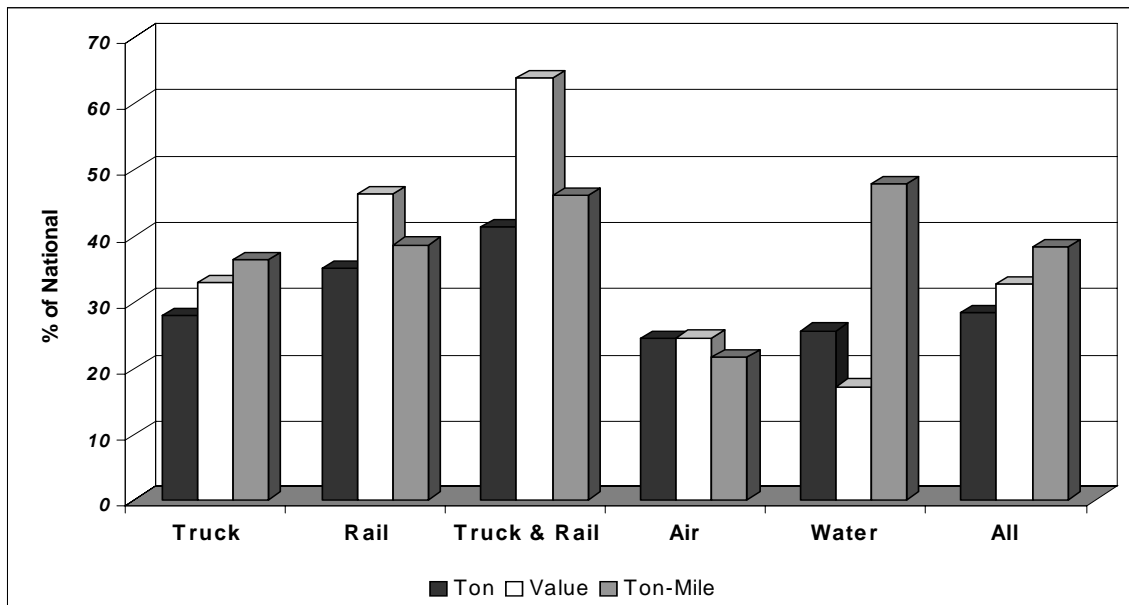
Although beyond the scope of this paper, the study also developed a data site to provide access to freight-related data for the region (Adams et al. 2005).

## **HOW FREIGHT MOVES**

The study area accounts for roughly one-third of the total freight activities that occur in the U.S. and roughly 19% of the U.S. employment, so it is fair to claim that regional economic activities are "freight intensive." In fact, the study area has about 27% of the manufacturing jobs in the U.S. Furthermore, the region is at the heart of the transportation network that connects the economic engines on the East, West, and Gulf coasts of the U.S. as well as the adjoining Canadian provinces.

Figure 2 shows freight shipments that have at least one trip-end within the Upper Midwest Corridor study area. The figure indicates the region's share of the total U.S. freight shipments by ton, value, and ton-mile for the various modes. These data show the importance of the region to the country across all modes of transportation. Water plays a significant role when the parameter, ton-miles, is considered.

Table 3 shows shipment by ton, value, and ton-mile that are intrastate (IS), interstate within the region (Reg), and interstate outside the region (Ext). By tonnage, the freight activity in the Upper Midwest is dominated by intrastate truck shipments (64%). However, low-value shipments such as gravel and non-metallic minerals account for about 30% of all the intrastate truck freight movements. Also, the trip lengths for those commodities tend to be very short. Consequently, the analyses of other indicators of freight activity, such as value of shipments and ton-miles, are more useful than the tonnage of freight moved. When value is considered, intrastate shipments by truck are still substantial (38%), but regional moves (Reg) and external moves (Ext) are also substantial. This supports the claim that the states in the region are their own best trading partners. When ton-miles are considered, as expected, rail and water shipments carry a larger portion of the total shipments.



**Figure 2. Share of the U.S. Freight Shipments with One or Both Trips End in the Upper Midwest (Source: Woods & Poole, 2003)**

Intrastate shipments typically account for less than 20% of the total truck tonnage transported on any given link. The remainder is attributed to regional, external and pass-through freight traffic. All freight modes cater to fairly specific market niches that are defined by the origin-destination pairs and commodities. For example, a considerable portion of the freight moved by water involves low-value bulk

goods such as coal and grain between the Upper Midwest and Louisiana ports. Intermodal competes against truck and air for certain high-value commodities such as automobile parts, electronics, and other machinery. The flow of freight is driven largely by a limited number of origin-destination and commodity combinations.

**Table 3. Breakdown of Freight Shipments with One or Both Trip-Ends in the Upper Midwest**

Mode	Freight Tons %			Freight Value %			Freight Ton-Mile %		
	IS	Reg	Ext	IS	Reg	Ext	IS	Reg	Ext
Total	70.3	13.5	16.2	39.6	23.4	36.9	15.0	17.0	68.0
Truck	64.3	10.4	9.2	38.4	21.9	30.3	12.2	11.9	29.5
Rail	5.1	2.4	4.4	1.0	1.1	4.0	2.2	3.9	22.1
Truck and Rail	0.0	0.0	0.2	0.0	0.0	1.4	0.0	0.0	2.1
Air	0.0	0.0	0.0	0.1	0.4	0.7	0.0	0.0	0.1
Water	0.9	0.7	2.4	0.1	0.0	0.5	0.6	1.2	14.2

IS = Intrastate; Reg = Regional; Ext = External;

Total does not include all modes, only the five major modes specified in the table.

Typically about one-third of the freight flow can be attributed to the top 15 origin-destination pairs.

Intermodal transport (i.e. truck and rail combination) is used mostly for long-distance shipments of high-value commodities. California is by far the most important destination for the intermodal shipments originating from the Upper Midwest. The type of commodities and also origin-destination pairs served by air transportation are similar to intermodal movements. California appears to be an important trade partner for air freight. Approximately 60 to 70 % of the total value of all the shipments can be attributed to precision machinery such as electronic equipment and instruments, suggesting a narrow market niche for the airfreight industry. Truck is by far the most versatile in terms of the types of commodities transported. All other modes are narrowly focused on only a few commodities that typically account for over 80% of total freight transported.

Although gravel and crushed stone accounted for over 23% of truck freight movements in terms of weight, the economic significance of these products is negligible (0.3% of total value). Meanwhile,

finished goods and machines account for a significant percentage, approximately 25%, of the total value of the shipments moved by trucks.

Five out of the ten largest traffic generators of rail freight in the U.S. are either within or in close proximity to the study area, underscoring the importance of the study corridor for the movement of freight by rail. The Chicago region ranks third and first as origin and destination, respectively. In terms of weight, bulk commodities account for most of the rail shipments. Roughly 70% of the rail shipments that originate or terminate in the study area are coal, metallic ores, or cereal grains.

The Great Lakes and the inland waterway system provide an extensive network for the movement of freight by water. The movement is predominantly north-to-south, taking advantage of the Mississippi River system. Freight movement from Illinois to Louisiana accounts for almost a third of all movements in terms of tonnage and over half by value.

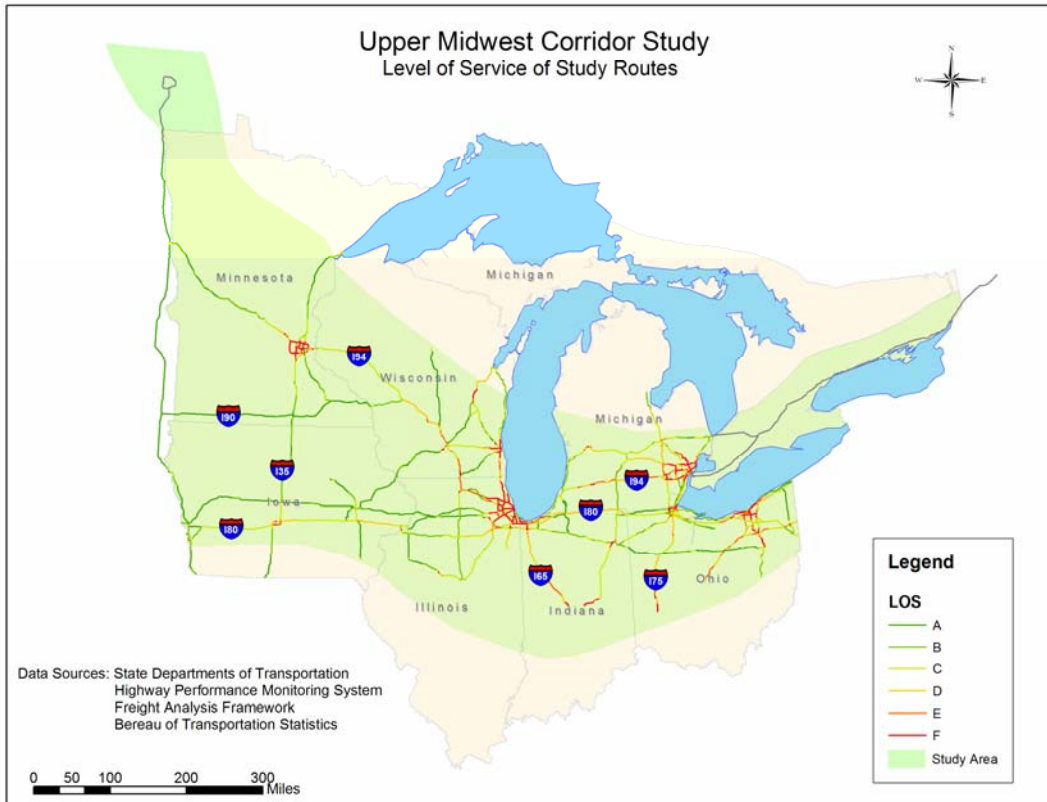
## **ISSUES**

The lack of excess capacity is generally perceived as one of the most critical issues for all modes:

- **Highways.** Indeed, most highway segments in the urban areas are congested and operating at capacity, as shown in Figure 3. As other factors such as interchange geometry, toll plazas, and incidents are included, the overall operating capacity deteriorates beyond what is shown in Figure 3.
- **Rail.** Rail capacity is similar to that of highways. While many railway segments have the ability to handle additional traffic flow, key rail segments are at capacity. Additional constraints on the system are rail yards and terminals. The number of sidings and signals also negatively impacts rail segment capacity.
- **Air.** Although excess runway capacity exists at many of the airports in the region, other factors such as air traffic control systems, weather, and landside capacity may constrain airport capacity.

Furthermore, Chicago, Minneapolis/St Paul and Detroit are ranked as the second, seventh, and eighth busiest airports, respectively, in the United States in terms of passengers per year.

- Waterways. River locks are bottlenecks in the regional waterways navigational system, causing inefficiency in the movement of barges and bulk goods. If these bottlenecks were addressed, excess line-haul capacity would be available in the navigational system.



**Figure 3. Thematic Map Showing Level of Service for the Study Region Highway Network**

The impacts of regulatory inconsistencies for freight transport on highways in the study areas were also considered. Issues related to other modes that are privately controlled (rail), federally regulated (air and water ports), or controlled by limitations specific to the locations (water ports) were not considered.

Federal regulations govern freight vehicle equipment, maintenance, and operators on federally funded highways. Some regulatory inconsistencies occur on non-designated, state roadways and as a result, impact freight movement when the shipment's origin or destination is located within certain areas of the region. The inconsistencies have no effect on the movement of freight movement through the region

because of the uniformity of federal regulations. U.S. federal regulations are generally more restrictive than Canadian guidelines; thus, trucks that meet size and weight rules to travel in the U.S. comply with Canadian regulations. Regulatory inconsistencies in the region include the following:

- Minnesota and Wisconsin do not allow STAA (Surface Transportation Assistance Act of 1982) doubles (twin 28.5 foot trailers with max gross vehicle weight (GVW) of 40 tons) on non-designated state highways as do other jurisdictions.
- The adjoining Indiana East-West Toll Road (I-80/I-90) and Ohio James W. Shocknessey Turnpike (I-80 all/I-90 some) accommodate longer combination vehicles (doubles and triples), but both the maximum allowable GVW and the cargo size for these vehicles are different for Indiana and Ohio.
- A standard five-axle truck and trailer that complies with U.S. federal weight regulations cannot legally travel on non-designated state routes in Minnesota and on some state roads in Illinois.
- Indiana, Illinois, Ohio, and Michigan enforce a speed differential for trucks that is up to 15 mph lower than for cars.

Regulatory inconsistencies may impact the efficiency of freight movement within the region. Trucks faced with multiple regulations must comply with the most restrictive, leading to more trucks and higher transport costs.

## **POLICY IMPLICATIONS**

The project recognized the value of consistent performance measures. Communication, understanding, and an ability to focus regional efforts are essential for improving the flows of freight in the Upper Midwest. Agreeing on and reporting a common set of metrics can play a significant role in unifying regional efforts by helping to guide action and direct resources. Because metrics influence the direction of the region on freight-related issues, they must be carefully selected to reflect accurately the items (e.g., speed, efficiency, and safety) that are important to the region. The first part of a process to select a

common set of metrics should be a structured planning session that would bring the stakeholders together to agree on the key regional performance parameters for freight. Measures should flow directly from those parameters. Because much of the information currently available through transportation agencies does not deal with the topic of freight or the details needed for measurement, additional work will be required to develop dependable data sources.

Previous efforts at defining freight-related performance measures and the results of surveys generally point to the following broad areas for measurement:

- Safety of the employees of the transportation firms as well as the general traveling public.
- Economic development that might be fostered by freight movement.
- Economic efficiency, as measured by larger economic trends.
- Economic efficiency, as measured by the costs of moving freight.
- Environmental quality.
- Congestion, reliability and time.

## **CONCLUSIONS AND RECOMMENDATIONS**

If the transportation network in the Upper Midwest is to keep pace with the demands of businesses that move freight, achieve economic growth and development that lead to jobs, and meet the leisure and recreational needs that enhance quality of life, it must be developed and managed as a regional asset. The process for implementing these efforts requires the development of mechanisms for interstate cooperation at the policy, planning, implementation, and operating levels. It is a process that requires the commitment, support, and involvement of the CAO/Director in the state DOTs. Commitment implies authority to move ahead; support implies resources to do the work; and involvement implies an active role in driving the concept throughout the DOT and participation in regional policy making. The following are important outcomes that should result from the process:

- Continued communication among freight transportation stakeholders in the region.
- Processes for reviewing and investing in promising ideas and technologies that boost the safety, reliability and efficiency of the transportation network.
- Efforts to seek federal support for projects that are important to the region and the nation.
- Resource sharing in design, planning, and implementation expertise as well as the planning and execution of transportation research.
- Establishment of regional cooperation.

Before these innovations can be implemented, challenges must be overcome to assure efficient, timely, and accurate information exchange within the region. The first of these issues deals with regional interest, dialog and participation among the players.

To accomplish these outcomes, regional transportation leaders must create a vision for the future of transportation in the Upper Midwest and define a structure and process that leads us to that vision through broad-based participation and intense interaction, free and open idea exchange, and frank evaluation and feedback. The study implies that the vision should involve transportation as the means to the ends of better economic development and enhanced quality of life. Key factors include the development, application and use of transportation- and information-systems-related technology . Creating a vision involves cooperative efforts in planning, implementation, and operations, supported by sharing resources, information, and ideas. A process for turning this vision into reality requires a multi-state, multi-jurisdictional partnership of public and private sector stakeholders that can transform the vision to specific goals, action plans, and projects.

The study team, with the support of the steering committee and the advisory committee, is making the following recommendations:

1. Continue efforts to build a regional coalition to improve freight transportation. The essence of this partnership is to

- Define regional goals, objectives, and metrics
  - Examine commodity flows into and out of the region
  - Discuss and resolve public policy issues
  - Develop and execute transportation plans
  - Identify issues on the ground
2. Form a policy committee for the Upper Midwest states that would include the CAO or a designated representative from each of the seven state DOTs. The initial tasks for this group are to
- Develop a vision statement for the region that considers economic development, the quality of life, the role of technology, regional planning and cooperation.
  - Create a process that can transform the vision into specific goals, action plans and projects.

The study underscored the need for a regional approach recognizing that individual states, specific urban areas, and the various transportation modes have unique issues but that a holistic approach is more effective and efficient. Based on the study, several observations on the importance of a regional view can be made:

- Freight is important to the economy of the region.
- Trade flows within the region outweigh trade with other states or foreign partners.
- Congestion in urban areas is significant.
- The region benefits from cooperation in understanding performance and implementing traffic management.
- As far as the movement of freight is concerned, the Upper Midwest, as defined in this study, seems to be the appropriate geographical boundary.

Phase II of the study has now been initiated. All seven states in the Upper Midwest Corridor are participating in the study and are considering the recommendations.

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## **REFERENCES**

Adams, T., T. Gordon, E. Wittwer, J. Gupta, P. Lindquist, M. Vonderembse, K. Kawamura, and S. McNeil, Upper Midwest Freight Corridor Study, Final Report, Midwest Regional University Transportation Center, Madison, Wisconsin, March, 2005.

<http://www.uppermidwestfreight.org/files/finalreport.pdf> Date Accessed 12/10/05.

Baniak, J. A Decade of Partnership, Evolution and Growth: The I-95 Corridor Coalition, 9th World Congress on Intelligent Transport Systems, Chicago, Illinois, Sponsored by ITS America, Washington DC, 2002.

Blaszak, M.W., "Chicago: City of Interchange," *Trains*, Volume 63, Issues 8, pp 40-57, July 2003.

Bureau of Transportation Statistics, Summary State Transportation Profile, December 2003.

[http://www.bts.gov/publications/state\\_transportation\\_profiles/summary/index.html](http://www.bts.gov/publications/state_transportation_profiles/summary/index.html) Date Accessed 12/10/2005.

Cambridge Systematics Inc, Statewide Multimodal Freight Flows Study, Minnesota Department of Transportation, April, 2000.

CREATE: Chicago Region Environmental and Transportation Efficiency Project, Final Feasibility Plan, August, 2005. [http://www.createprogram.org/PDF/final\\_feasibility\\_plan.pdf](http://www.createprogram.org/PDF/final_feasibility_plan.pdf). Date Accessed 12/10/2005.

Federal Highway Administration. FREIGHT ANALYSIS FRAMEWORK: Derivation of the FAF Database and Forecast <http://www.ops.fhwa.dot.gov/freight/documents/WebMeth/index.htm>, Date Accessed 6/5/04

Federal Highway Administration. Office of Operations. Southern California Regional Freight Study. 2002. [http://ops.fhwa.dot.gov/freight/freight\\_analysis/reg\\_ind\\_studies/so\\_cal\\_study.htm](http://ops.fhwa.dot.gov/freight/freight_analysis/reg_ind_studies/so_cal_study.htm) Date Accessed 12/10/2005

Grenzback, Lance and Daniel Beagan, "Freight Impacts on Ohio's Roadway System," Final Report, Ohio Department of Transportation, Prepared by Cambridge Systematics, June 2002

North America's SuperCorridor Coalition, Inc. (NASCO) About NASCO. <http://www.nasco-itc.com/pages/about/about.htm> Date Accessed 12/9/05

Texas Transportation Institute, 2005 Urban Mobility Report. <http://mobility.tamu.edu/ums/report/> Date Accessed 12/10/2005.

Transportation Research Board, *Regulating Weights, Lengths, and Widths of Commercial Motor Vehicles*, TRB Special Report 267, Transportation Research Board, Washington, DC, 2002.

Transportation Research Board, *Freight Capacity for the 21<sup>st</sup> Century*, TRB Special Report 271, Transportation Research Board, Washington, DC, 2003.

Woods & Poole Economics. County Forecasts. Woods & Poole Economics, Inc., Washington D.C. 2003