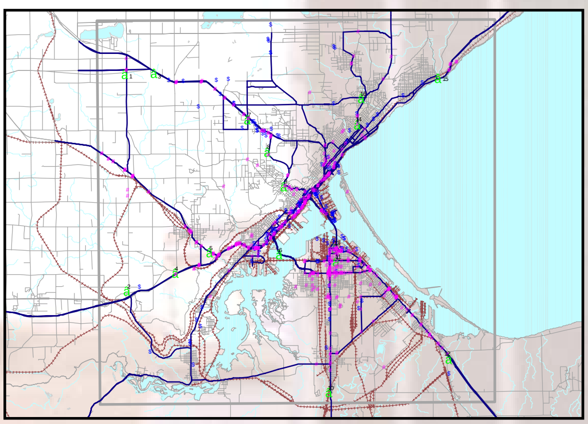
Duluth-Superior Area

TRUCK ROUTE

Study



Duluth-Superior
Metropolitan Interstate
Committee

Approved
April 18, 2001

MIC

Duluth-Superior Truck Route Study

Approved April 18, 2001

Prepared by the
Duluth-Superior

Metropolitan Interstate Committee

Duluth Superior urban area communities cooperating in planning and development through a joint venture of the Arrowhead Regional Development Commission and the Northwest Regional Planning Commission

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Copies of the study are available from the
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Duluth-Superior
Metropolitan Interstate Committee

"Guiding the Future of Transportation and Planning for the Twin Ports Area"

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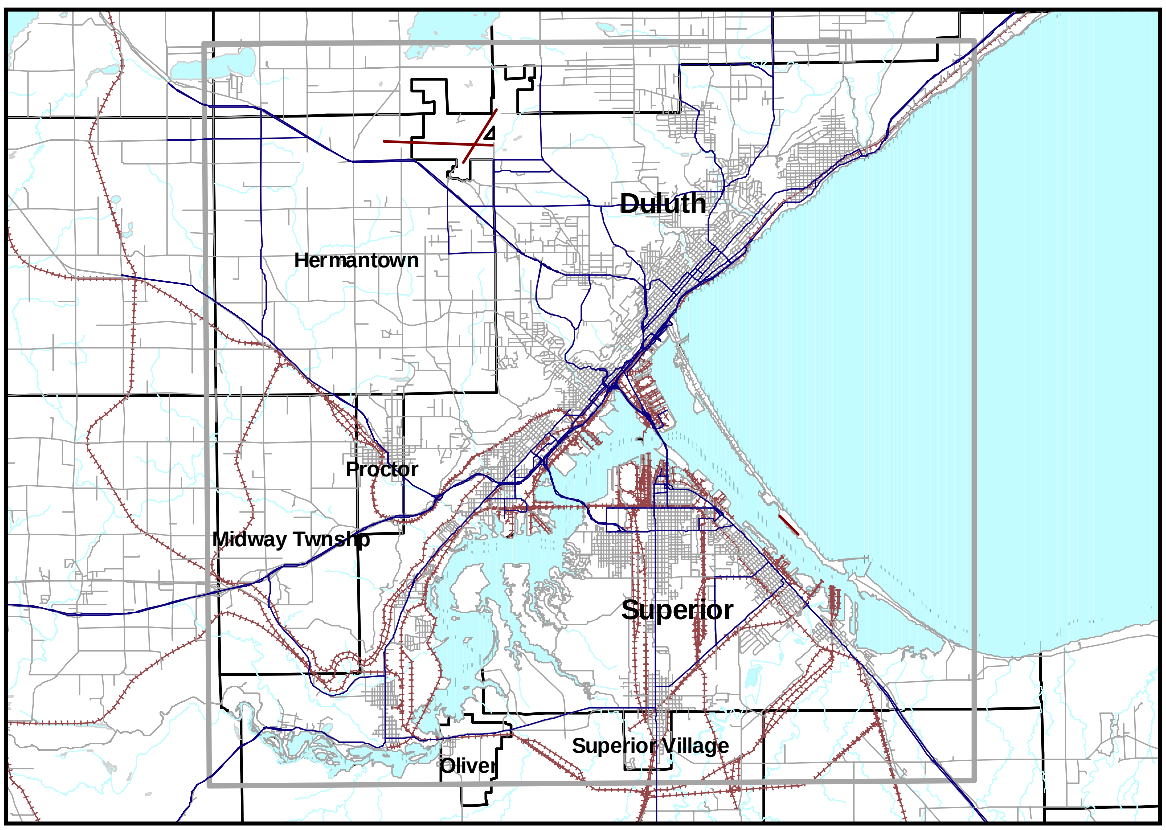
The information on the above maps is a compilation of data from various federal, state, county, regional, and municipal sources. Geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials. Users should consult available data documentation (metadata) to determine limitations and the precision to which the data depicts distance, direction, location or other geographic characteristics. These maps and/or data are not legal survey documents to be used for describing land for the purpose of ownership or title.

Introduction

Trucks are an essential part of everyday life in the Duluth-Superior area. Trucks are an important means of sustaining the community by delivering products to stores for purchase, transporting raw materials and finished products for industries, hauling materials for the construction of roads, schools, businesses and homes, and serving other vital functions. Trucks provide our economy with the most time sensitive, flexible mode of transportation to move large quantities of goods.

The MIC conducted a Truck Route Study in 1990, which examined truck route needs in the Duluth Superior Area. A number of changes in the roadway system have taken place over the last ten years and another examination was needed to see if the truck route system was still serving its purpose. This study is intended to analyze truck routes in Duluth, Superior and the surrounding area. The study area is shown in the map below.



Map 1: Study Area

Truck Route Goals and Objectives

The goal of this study is to identify a truck route network that provides for the safe, effective, and efficient movement of goods and services within and through the Duluth-Superior area. To reach this goal the objectives of this study are:

- Maintain a consistent network of inter-connected roads that allow for the safe and efficient movement of goods
- Match truck size and weight to infrastructure carrying capacity
- Improve network compatibility with adjacent land use
- Direct truck movement to the major arterial system where roadway capacity is the greatest

To reach these objectives, the Duluth-Superior Area Truck Route Study examined the following truck route characteristics and issues:

- Truck traffic
- Vehicle traffic
- Truck accidents
- Location of truck dependent businesses
- Land use adjacent to truck routes
- Roadway functional classification
- Roadway jurisdiction
- Truck route signage
- Truck route ordinances
- Truck dependent business concerns
- Truck driver concerns

The following chapters describe our findings and the final chapter presents recommendations to improve the truck route system in the Duluth-Superior area.

Truck Route Advisory Committee

A study advisory committee was organized to assist in the development of the study. Representation was sought for Duluth, Hermantown, Proctor, Superior, St. Louis County, Douglas County, MnDOT, WisDOT and the trucking industry. From these jurisdictions and agencies, representation from planning, engineering/public works, law enforcement, and the trucking industry was sought. This chapter briefly describes the topics and issues that were discussed at the committee meetings.

The following list is the membership of the advisory committee:

City of Superior
- Paul King, Public Works/Engineering
- Donna Andrews, Law Enforcement
- Glen Sweeney, City Planning
- Cliff Knettel, City Planning

City of Duluth
- Dean Beeman, City Engineering
- Scott Brink, City Engineering
- Ed Moroney, Law Enforcement
- Bill Majewski, City Planning

City of Hermantown
- John Klaers, City Planning

City of Proctor
- John Foschi, City Administration

St. Louis County
- Chris Morris, Public Works/Engineering
- Rick Andersen, Law Enforcement

Minnesota Department of Transportation
- Jim Miles, Traffic Engineer

Wisconsin Department of Transportation
- John Allen, District Planning

Trucking Industry
- Jim Manion, Monson Trucking
- Gary Shaver, Halvor Lines

The input of the advisory committee is vital to the success of the study and the ultimate goal of the study was to see that an efficient truck route system was identified and that all jurisdictions were comfortable with the final recommendations. The committee was presented with background information about the transportation planning function of Metropolitan Planning Organizations (MPOs) in general and the activities of the Duluth-Superior Metropolitan Interstate Committee (MIC) in particular. The MIC policy board had identified a need to coordinate truck movements as part of a single unified system between and through the Duluth-Superior metro area. To this end, staff time was allocated to conduct a Truck Route Study in its work plan for 2000-2001, and this committee was formed to advise the MIC on this issue.

A map of the current area truck routes was distributed and committee members were asked to review it and check the accuracy of the indicated truck routes. There were generally a number of questions as to what constituted a truck route. Some roads assumed to be truck routes were not indicated on the map. Those routes were noted and will be reviewed as potential additions to the truck route system.

The committee was asked to identify issues that should be addressed in the study. The following is a brief description of those issues:

Uniform Signage—Placement: committee members noted that area truck routes are not consistently designated, which complicates or even discourages enforcement efforts. A consistent system of area wide signage was identified as desirable. It was also suggested that key entry points into the area be identified. The question was also raised about whose responsibility it is (city, county, etc.) for the placement of signs.

Uniform Signage—Design and Message: it was also noted that existing signs use inconsistent language (i.e., a mix of negative “no trucks allowed” and positive “truck route” messages) and that they utilize a variety of design elements. Members agreed that uniform signage, with a standardized look and a positive message, would be most effective in guiding truck drivers to the proper routes. The *Manual of Uniform Traffic Control Devices* should be utilized as a guide to what signs should be used.

Uniform Ordinances: committee members also noted that different municipalities have differing ordinances about even basic considerations, such as how a truck is defined and what weight restrictions apply. Members from the different jurisdictions (city, county, and state) were asked to bring sample ordinances that might apply to all localities in the area.

Designation of Truck Routes: it was unclear how routes are designated 10 ton vs. 9 ton and where each is located. Members were asked to consider if new routes are needed or whether the present system is functioning efficiently.

The committee was also asked to identify data collection needs. Suggestions included updated traffic counts in specific locations, truck accident data, locations of State Aid routes, locations of large truck terminals and other truck dependent businesses, and locations of 9- to 10-ton restricted routes. The source of this data includes MnDOT, counties, cities, and prior freight studies.

In subsequent meetings, the committee reviewed collected data to discuss sufficiency and accuracy. Truck counts, accidents, and the location of State-Aid routes was presented to the committee to gain insight into this data. For the most part the committee was comfortable with the data, with the exception of the truck count data in the Winter Street area, where a number of expansions to the trucking companies in that area have taken place. The committee wanted to see a more detailed analysis of the truck accident data with factors such as weather-related conditions and time of day.

Another discussion regarding the effect of signage on truck traffic brought to light the potential need for a designated through truck route. Local truck route signs are confusing to out-of-area or "through" truckers. Committee members from Superior had observed many trucks ending up, unintentionally, on Winter Street by following the signs intended for local truck traffic only. Possible through routes and signage styles and locations were discussed.

Other questions and concerns about the signage issue were discussed. Much confusion existed between the engineering perspective and the law enforcement perspective on the issue of 9-ton vs. 10-ton routes. There was some discussion as to what are the allowable total weights on routes marked as 9-ton. More research into this topic was requested and also to map St. Louis County's County State-Aid Highway 9-ton and 10-ton truck routes.

The committee also took on the task of assisting staff in developing a truck route survey. The content of survey questions and who should get the survey were discussed. It was decided the survey should be brief and separate surveys be developed for truck-related businesses and truck drivers. The business survey should be targeted toward trucking firms and truck dependent businesses. The business survey should be mailed and the driver survey distributed at places such as truck stops and weigh stations. For more information on the survey and survey results see page 25.

The advisory committee met three times between May and August 2000. They provided great insight to the study process by identifying issues that needed to be addressed, identifying data collection needs, developing survey questions, and providing general guidance in the development of the study.

Truck Route System

This chapter describes the roadway system normally used by trucks to move freight in the Duluth-Superior area. The characteristics of the truck route system includes truck counts, state-aid designation, roadway jurisdiction, average daily traffic, roadway functional classification, and the location of large manufacturers and trucking companies. Map 2 illustrates the truck routes in the Duluth-Superior area as of May 2000. This information was obtained from the affected jurisdictions.

Truck Counts

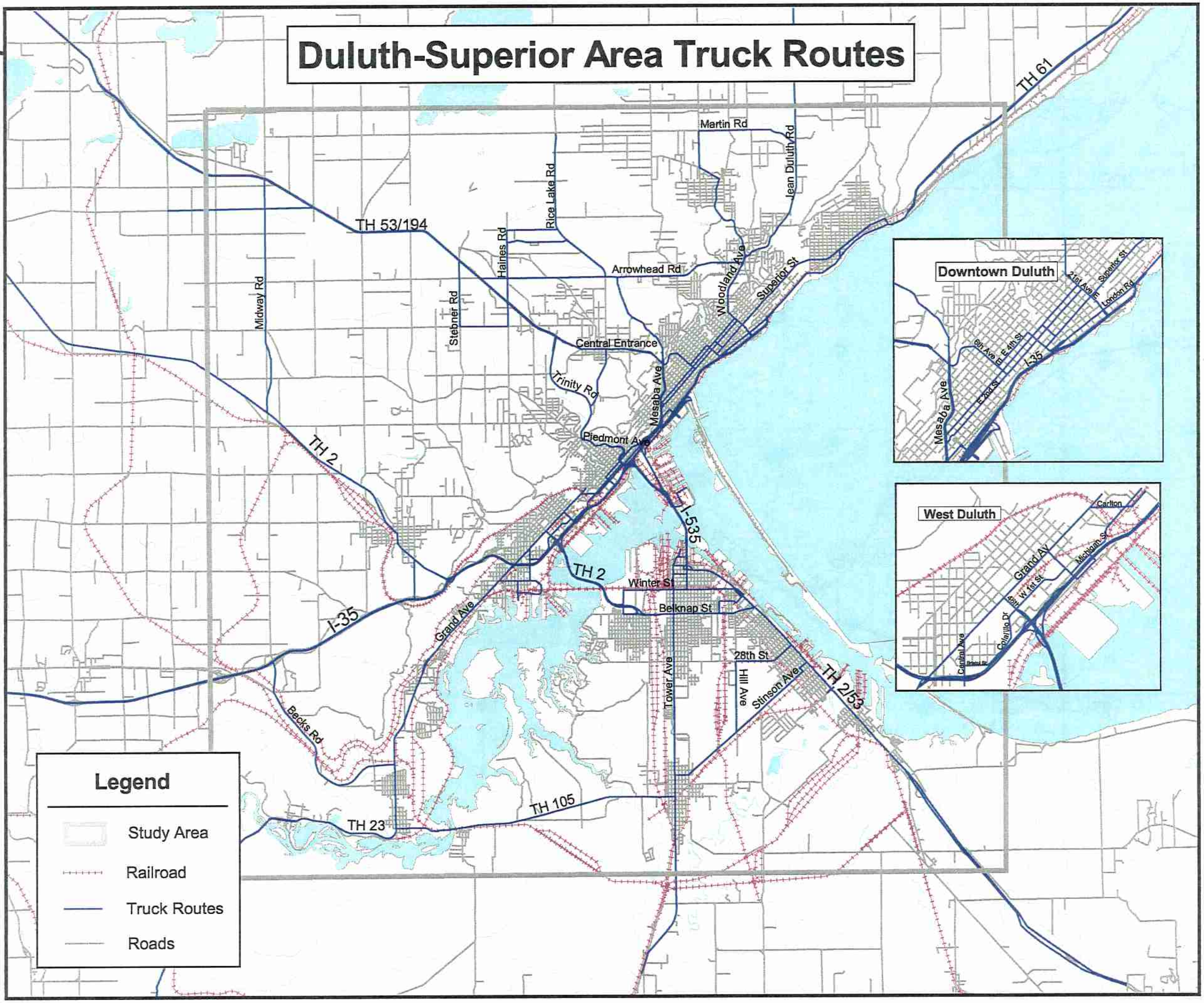
As part of the *Freight Movement Study for the Duluth-Superior Metropolitan Area* conducted by the MIC in 1997, truck counts were conducted at 16 locations throughout the Duluth-Superior area. These counts provided breakdowns by vehicle classification for each of the count locations, allowing staff to evaluate the types as well as the frequency of truck traffic at these locations. Map 3 shows the locations of these 24 hour counts. Also shown on this map are Heavy Commercial Average Daily Traffic (HCADT) obtained from MnDOT and WisDOT. HCADT can be defined as all vehicles except motorcycles, cars, and trucks.

The vehicle classification system used for these counts is described in Table1. For the purposes of this study all vehicles listed in classes 5-13 were considered trucks.

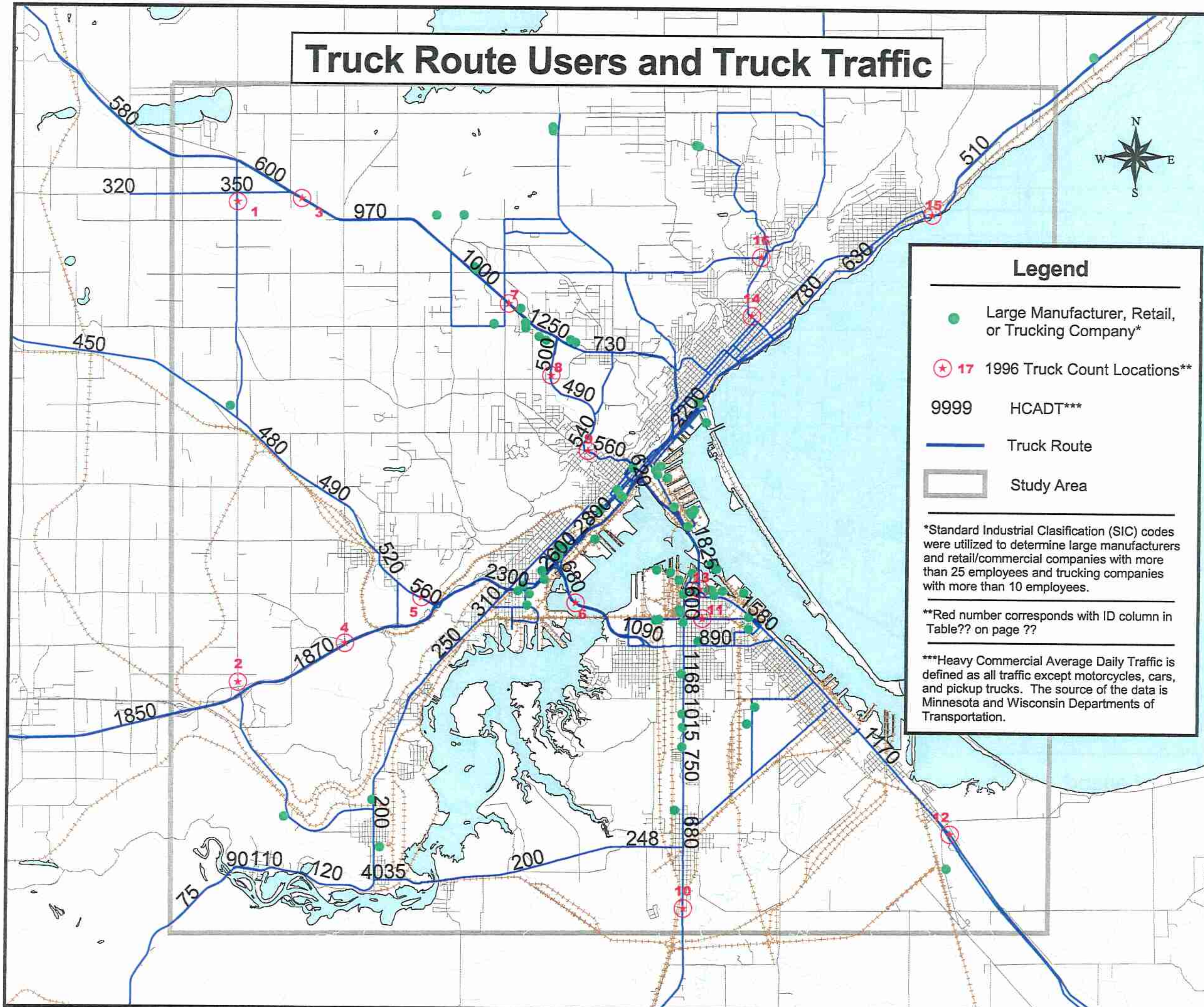
Table 1: Vehicle Classification

Class Number	Class Name	Abbreviation
	Light Vehicles	
1	Motorcycles	MC
2	Cars	CARS
3	Pickup and Panel Trucks	SU2-4
	Heavy Vehicles	
4	Buses	BUSES
	Single Unit Trucks	
5	2 Axle-6 Tire	SU2-6
6	3 Axle	SU3
7	4 Axle or More	SU4+
	Single Trailer Trucks	
8	4 Axle or Less	ST4-
9	5 Axle	ST5
10	6 Axle or More	ST6+
	Multi-Trailer Trucks	
11	5 Axle or Less	MU5-
12	6 Axle	MU6
13	7 Axle or more	MU7+

Map 2


Duluth-Superior Area Truck Routes
Legend
Study Area
Railroad
Truck Routes
Roads
TH 61
Martin Rd
Jean Duluth Rd
Rice Lake Rd
Haines Rd
TH 53/194
Arrowhead Rd
Woodland Ave
Superior St
Midway Rd
Stebner Rd
Central Entrance
Trinity Rd
Mesaba Ave
Piedmont Ave
TH 2
I-535
Winter St
Belknap St
I-35
Grand Ave
28th St
Hill Ave
Stinson Ave
Tower Ave
TH 2/53
Becks Rd
TH 105
TH 23
Downtown Duluth
21st Ave E
Superior St
London Rd
6th Ave E
E 4th St
E 2nd St
I-35
Mesaba Ave
West Duluth
Carlton
Michigan St
Grand Av
W 1st St
Central Ave
Cola/illo Dr

Map 3


Truck Route Users and Truck Traffic
Legend
Large Manufacturer, Retail, or Trucking Company*
17 1996 Truck Count Locations**
9999 HCADT***
Truck Route
Study Area
*Standard Industrial Clasification (SIC) codes were utilized to determine large manufacturers and retail/commercial companies with more than 25 employees and trucking companies with more than 10 employees.
**Red number corresponds with ID column in Table?? on page ??
***Heavy Commercial Average Daily Traffic is defined as all traffic except motorcycles, cars, and pickup trucks. The source of the data is Minnesota and Wisconsin Departments of Transportation.
N
W
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580
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320
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970
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2800
2600
2300
680
310
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1870
1850
1825
600
1580
1090
890
1168
1015
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680
248
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120
90
110
75
200
1170
510
630
780
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16

Table 2: 24 Hour Truck Counts - June 1996

ID	Location	Total Traffic	Classes 5-13	% Trucks
1	Midway Rd S of TH 194	5896	1301	22.07%
2	Midway Rd N of I-35	5379	516	9.59%
3	TH 53 E of TH 194	17590	1808	10.28%
4	I-35 at Ugstad Rd	21780	1636	7.51%
5	TH 2 W of I-35	9921	1438	14.49%
6	TH 2 (Bong Bridge)	15903	1177	7.40%
7	TH 53 E of Haines Rd	19810	953	4.81%
8	TH 53 N of Anderson Rd	10815	719	6.65%
9	TH 53 S of Skyline Pkwy	14745	1000	6.78%
10	TH 35 (Tower Ave) at 69th Ave	6089	434	7.13%
11	Winter St E of Hammond Ave	1438	257	17.87%
12	US 2/53 W of Parkland	13817	1750	12.67%
13	I-535 Bridge N of 5th St	29660	2869	9.67%
14	21st Ave E E of Woodland Ave	13023	1528	11.73%
15	TH 61 at Lester River	13235	995	7.52%
16	Arrowhead Rd W of Woodland Ave	13754	1000	7.27%

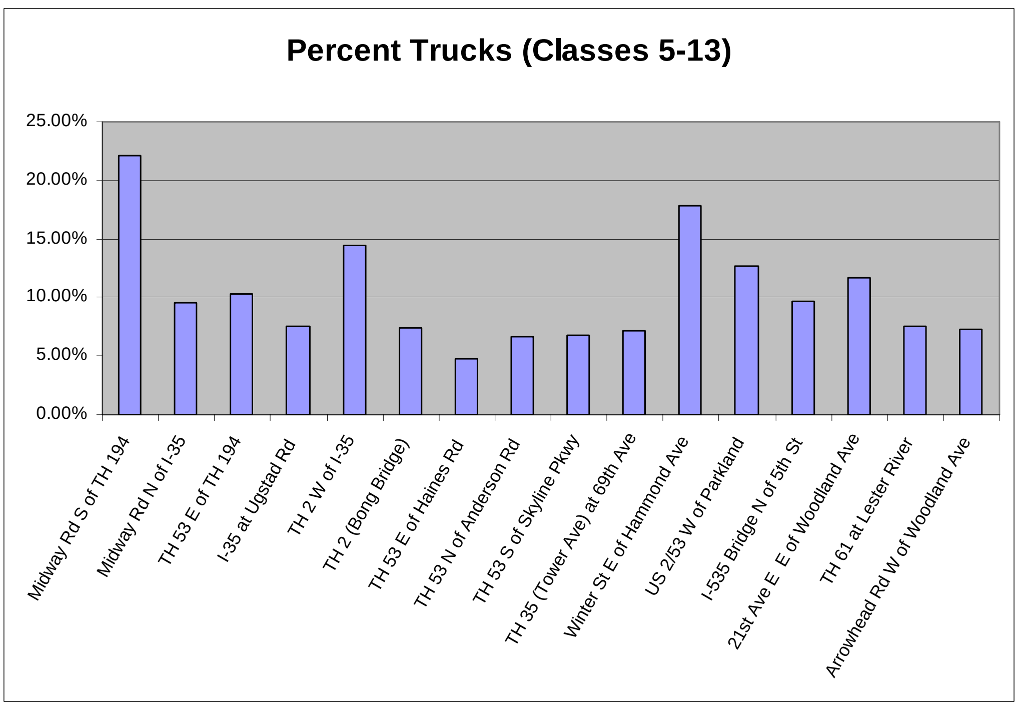


Figure 1

State-Aid Designation
Roadway jurisdictions in Minnesota can have a certain percentage of their roads designated as State-Aid Roadways. As such, these roads are eligible to receive state funds for maintenance and reconstruction activities. Certain rules apply to State-Aid routes. Most significantly, jurisdictions cannot exclude trucks from using these roads unless a physical deficiency exists necessitating a vehicle limit weight. State-Aid routes normally fall into two categories: County State-Aid Highways (CSAH) and Municipal State-Aid System (MSAS). Map 4 shows the Minnesota State-Aid roads in the Duluth area.

The MSAS is for cities with a federal census count over 5,000 in population. The extent of the MSAS for a city shall not exceed 20 percent of the total miles of city streets and county roads within the city, plus the mileage of all trunk highways reverted or turned back to the city, plus the mileage of county highways reverted or turned back to the city. It is projected to carry a relatively heavier traffic volume or is functionally classified as collector or arterial as identified on the urban municipality's functional classification plan. It connects the points of major traffic interest, parks, parkways, or recreational areas within an urban municipality and provides an integrated street system affording, within practical limits, a state-aid street network consistent with projected traffic demands.

The CSAH system is designed to carry heavier traffic volumes and connect towns, communities, shipping points, and markets within a county or in adjacent counties. It provides access to rural churches, schools, community meeting halls, industrial areas, state institutions, and recreational areas. It offers an integrated and coordinated highway system affording, within practical limits, a state-aid highway network consistent with projected traffic demands. The CSAH system normally follows roads functionally classified as collector or arterial as identified in the county's functional classification plan.

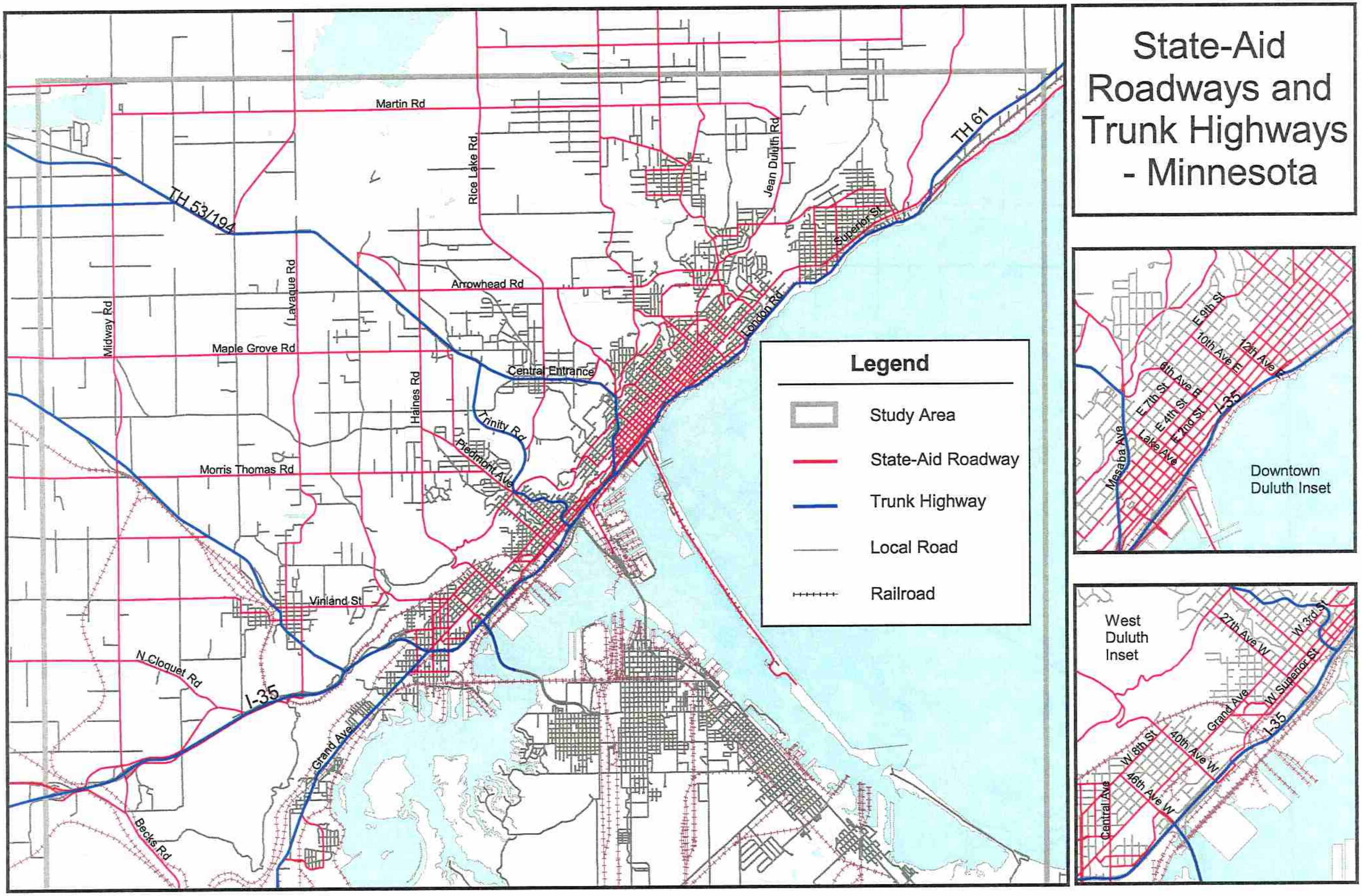
Cities over 5,000 in population may enter into a cooperative agreement with the county in which the city shares costs and maintenance responsibilities of state-aid roadways.

Roadway Jurisdiction
Jurisdiction determines which agency has responsibility for the maintenance of a particular road. These maintenance responsibilities normally fall on the state (MnDOT or WisDOT), counties (St. Louis or Douglas) cities, or townships, but these rules vary from state to state. In Wisconsin, roads within a city are the responsibility of that city. Counties normally do not have jurisdiction over roads within a city of 20,000 population. The state pays local road aids to the city for connecting highways and local roads within the city limits and the city maintains the roadways.

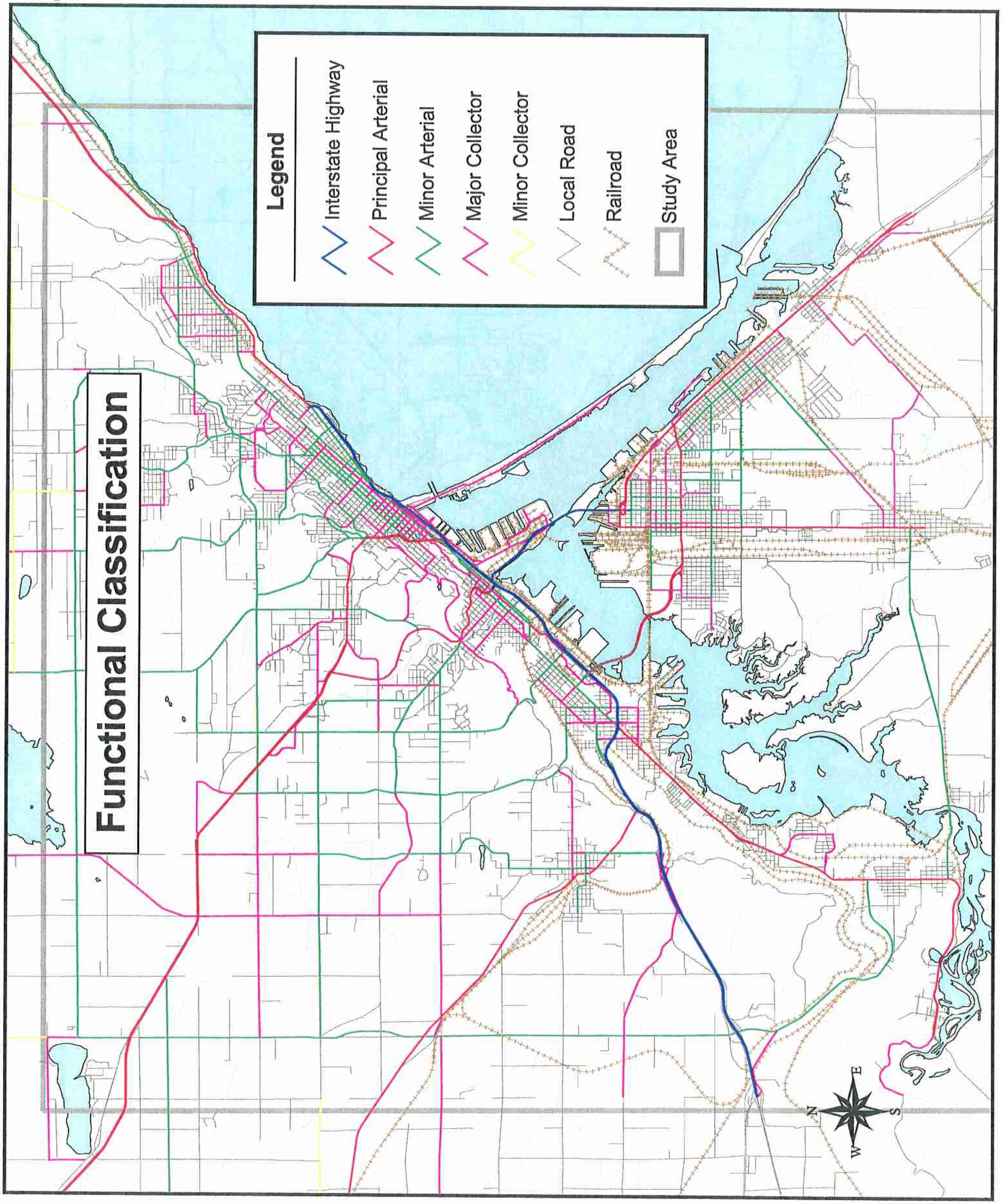
In Minnesota, the state (MnDOT) is responsible for all state and federal highways no matter where they are located. Counties are responsible for their CSAH system and other

Map 4

State-Aid Roadways and Trunk Highways - Minnesota



Map 5



Functional Classification
Legend
Interstate Highway
Principal Arterial
Minor Arterial
Major Collector
Minor Collector
Local Road
Railroad
Study Area
N
E
S
W

county roads. Cities are responsible for roads within their jurisdiction and as stated above, counties and cities over 5,000 in population can enter into agreements to share road responsibility. According to these agreements, counties are sometimes the responsible roadway jurisdiction for certain roads within city boundaries. Within the City of Duluth, St. Louis County has jurisdiction for the maintenance of over 40 miles of CSAH roadways.

Roadway Functional Classification
Functional classification is the process in which streets and highways are grouped in "classes", or systems, according to the way people use them. It is important to remember that roads do not work independent of each other. The purpose of any road network is to move people and goods from one point to another point. These classifications include interstate highways, other freeways and expressways, principal arterials, minor arterials, major collectors, and minor collectors. All other roads are considered local streets. In the state of Minnesota and Wisconsin, functional classification of roadways is typically carried out at the state level in cooperation with regional and local officials through the regional development commissions (RDCs) and metropolitan planning organizations (MPOs). These classifications aid state, county, and city jurisdictions in setting priorities for the various roadways. These priorities can be set for such things as reconstruction, maintenance, and even snow plowing.

Two major criteria, mobility and access, determine a road's classification. Roadways with high mobility move a large amount of traffic but to do so they have little access. Vehicles are traveling at higher speeds with few turning movements to achieve higher levels of mobility. The highest classifications are Interstate Highways and Freeways, which accommodate high levels of traffic but have very little access. Their function is to carry large amounts of traffic to connecting roadways, which in turn offer access to trip destinations. High-access roadways accommodate much lower levels of mobility. In contrast, the lowest classification is Local Roads, which provide a high level of access with limited mobility. Local Roads carry less traffic, provide access to residential areas, and connect to higher classified roads.

The functional classification process is a practical technique for determining the travel corridors that should best serve through and local traffic in an urban area. Truck routes and functionally classified roadways are interrelated. Design factors to accommodate truck traffic, such as weight carrying capacity, lane widths, and turning radii, are typically greater on higher classified routes. Comparing truck routes to functionally classified routes of major collector and higher shows these are primarily the same roadways. Map 5 shows the functionally classified roadways in the Duluth-Superior area.

Location of Truck Dependent Businesses
The location of businesses that depend on trucking to deliver their economic inputs and their products to market was derived from Census information provided to MPOs. This

information gave us the location of all businesses in the Duluth-Superior area and was sorted by Standard Industrial Classification codes (SIC). SIC codes group businesses by type and allowed the sorting of data to identify those businesses that are dependent on trucking. Classifications that were excluded were in the Real Estate, Insurance, Finance, and Public Administration categories. The other categories were examined and businesses with over 10 employees mapped (see Map 3). The major weakness in this set of data is that locations are given by address, which may list all employees for a certain company at its corporate headquarters or main office. One example is the University of Minnesota, which shows all its employees as being located in the Twin Cities, including the employees working at the Duluth campus. Outside of a few short-comings, the data provides a general picture of truck traffic movement in the Duluth-Superior area.

Conclusion

The purpose of this chapter is to examine where trucks are operating in the Duluth-Superior area. The truck count information shows the amount of truck traffic on certain routes. The Heavy Commercial Average Daily Traffic (HCADT) demonstrates how many trucks are using a particular route in a given day. The 24-hour counts present the amount of trucks as a percentage of overall traffic, which gives us a better idea of the intensity of truck traffic. The State-Aid designation, roadway jurisdiction, and functional classification discussion describe how roads are managed for truck traffic. State-Aid routes and higher functionally classified roads are designed and maintained for large amounts of traffic including trucks. The location of truck dependent businesses gives an idea of origin and destination for local truck traffic.

Truck Accident Analysis

Accident information relating specifically to trucks was obtained from the Departments of Transportation in both Minnesota and Wisconsin. The geographic scope of the data covers the cities of Duluth, Proctor, and Hermantown on the Minnesota side and Superior on the Wisconsin side. These city boundaries encompass almost the entire study area. All accidents examined in this analysis were truck-related and were for the time period 1995-1999.

Truck-related accidents were analyzed to examine if any pattern existed that may be contributing to these accidents. A simple observation of the plotted accident data was conducted to see if accidents were taking place at any one area or in any particular corridor. Other factors such as weather and road conditions were analyzed to determine if they were contributing factors to truck-related accidents. This chapter presents the results of the analysis of the truck accident data.

In the time period 1995-1999, there were 407 accidents involving trucks in Duluth, Superior, Hermantown and Proctor. Of this total, 176 accidents were on the Wisconsin side and 231 accidents on the Minnesota side. See Map 7 for accident locations.

A corridor analysis was conducted to examine accidents along the major corridors such as interstate highways and trunk highways, which make up the core of the truck route system in Duluth-Superior and carry the majority of truck traffic in and through the area. This analysis focused on the following corridors (see Map 6):

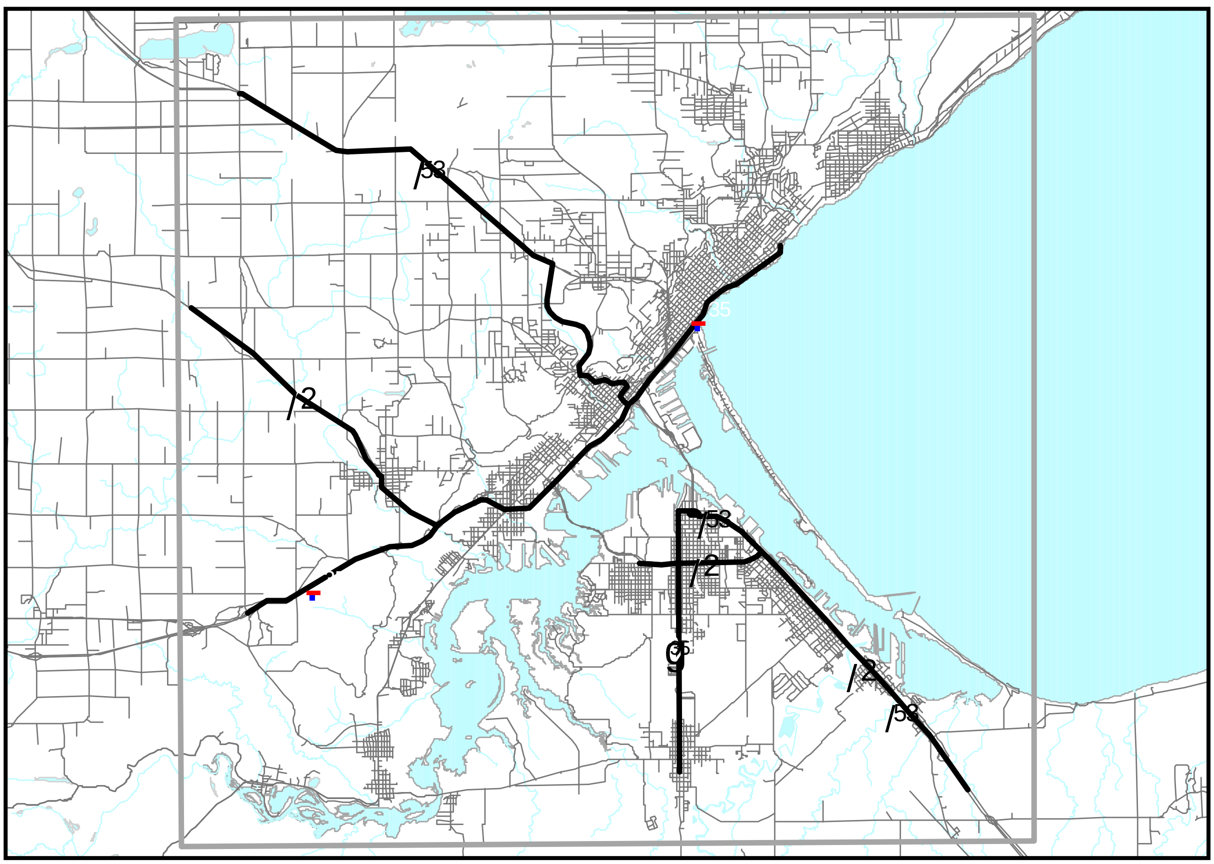
- **Interstate 35** from Midway Road to 26th Avenue East
- **U.S. Trunk Highway 2** from I-35 to Hermantown Road
- **U.S. Trunk Highway 53** from I-35 to Midway Road
- **U.S. Trunk Highway 53** from the Blatnik Bridge to Trunk Highway 2
- **U.S. Trunk Highway 2** from the Bong Bridge to Trunk Highway 53
- **U.S. Trunk Highway 2/53** from Belknap Street to south city limits
- **Wisconsin Trunk Highway 35** from the Blatnik Bridge to south city limits

These corridors encompass 46.5 miles and were chosen for analysis because 63% of all truck-related accidents in the Duluth-Superior area occurred there.

Table 3: 1995-1999 Truck Accidents by Corridor

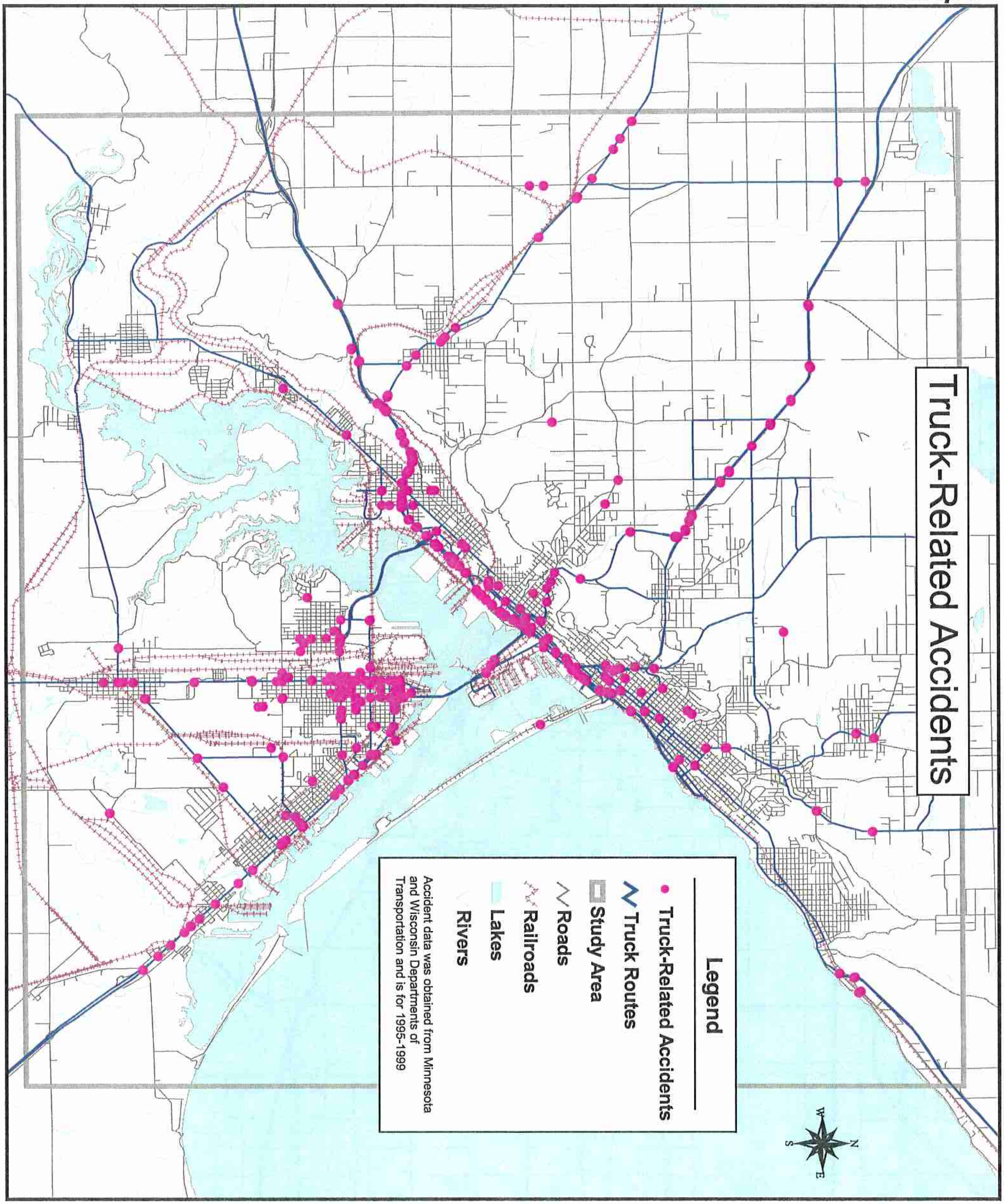
CORRIDOR	TRUCK-RELATED ACCIDENTS 1995-1999	LENGTH (MILES)	AVERAGE DAILY TRAFFIC RANGE 1999
Hwy 53 - Blatnik Bridge to Hwy 2 - Superior	27*	2	9,600 – 18,000
Hwy 2 - Bong Bridge to Hwy 53 - Superior	30*	2.4	6,700 – 17,600
Hwy 2/53 - Belknap St to city limits - Superior	32*	5.4	14,300 – 21,100
Hwy 35 - Blatnik Bridge to city limits - Superior	38	5.4	5,600 – 18,000
I-35 - Midway Rd to 26th Ave E - Duluth	93	13.3	22,900 – 55,000
Hwy 2 - I-35 to Hermantown Rd - Duluth	21	6.8	3,100 – 9,900
Hwy 53 - I-35 to Midway Rd - Duluth	25	11.2	8,000 – 24,400

**The same 4 accidents from the intersection of Belknap & E. 2nd St are included in these totals.*



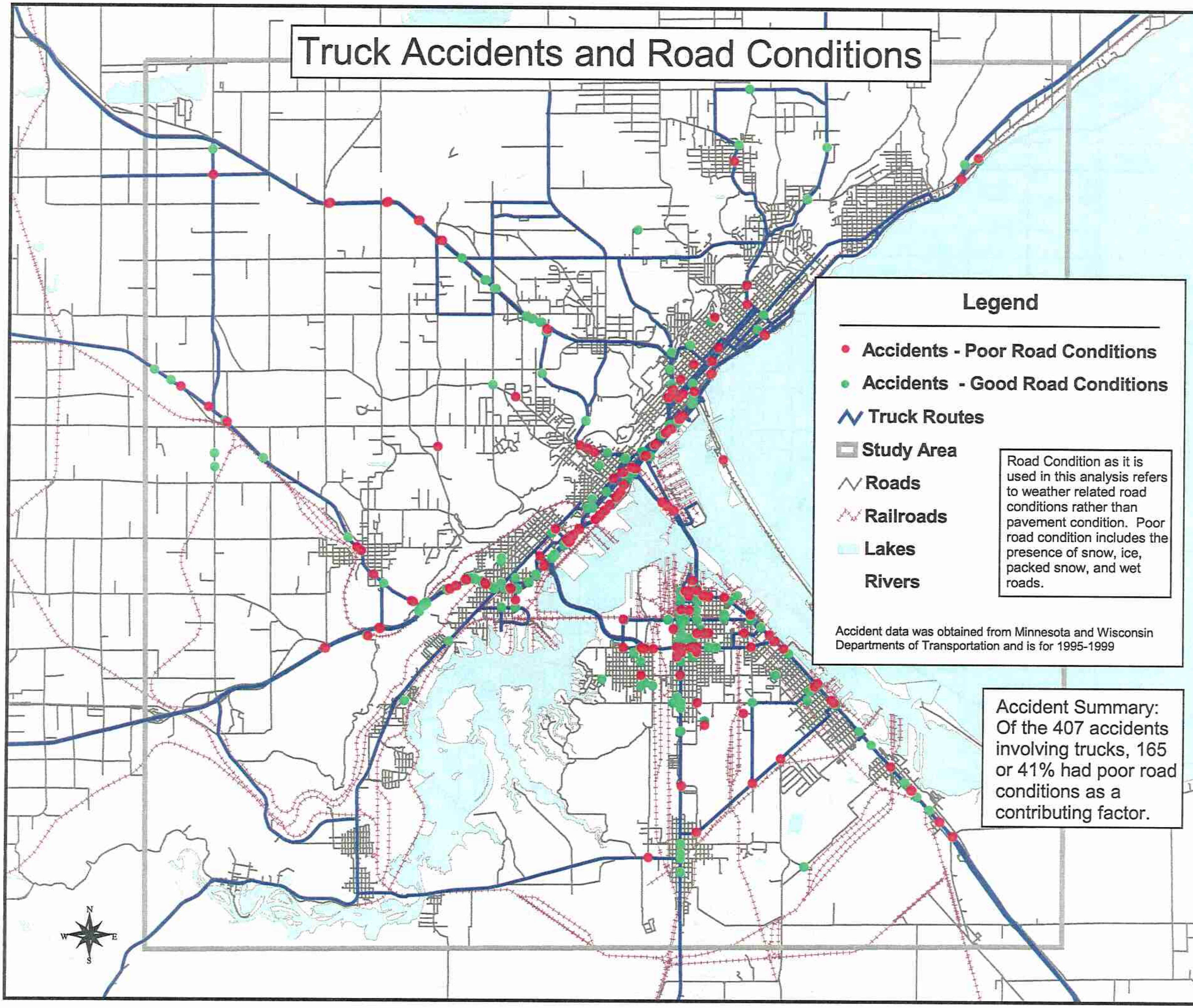
Map 6: Corridors Examined for Truck Accidents

Map 7



Truck-Related Accidents
Legend
Truck-Related Accidents
Truck Routes
Study Area
Roads
Railroads
Lakes
Rivers
Accident data was obtained from Minnesota and Wisconsin Departments of Transportation and is for 1995-1999
N
S
E
W

Map 8


Truck Accidents and Road Conditions
Legend
Accidents - Poor Road Conditions
Accidents - Good Road Conditions
Truck Routes
Study Area
Roads
Railroads
Lakes
Rivers
Road Condition as it is used in this analysis refers to weather related road conditions rather than pavement condition. Poor road condition includes the presence of snow, ice, packed snow, and wet roads.
Accident data was obtained from Minnesota and Wisconsin Departments of Transportation and is for 1995-1999
Accident Summary: Of the 407 accidents involving trucks, 165 or 41% had poor road conditions as a contributing factor.
N
S
E
W

U.S. Trunk Highway 53 - from the Blatnik Bridge to Trunk Highway 2
This two-mile corridor had 27 truck-related accidents from 1995-1999. Weather and road conditions were a factor in 48% of these accidents. Fifteen of these accidents occurred within three blocks of the Blatnik Bridge. The average daily traffic ranges from 28,000 on the Blatnik Bridge to 18,000 east of Grand Avenue to 15,800 near the intersection of Belknap Street. Vehicle classification counts from 1996 reveal that almost 10% of the total traffic coming off the Blatnik Bridge are trucks. The combination of road condition, heavy traffic and the multiple vehicle movements contributes to the high number of truck-related accidents in the Blatnik Bridge area. The tight turning radius at the base of the bridge in the transition area from I-535 to Trunk Highway 53 may also contribute to accidents in this area.

U.S. Trunk Highway 2 - from the Bong Bridge to Trunk Highway 53
Trunk Highway 2 in this 2.4 mile corridor is called Belknap Street and passes through the heart of downtown Superior. The intersection of Belknap Street and Tower Avenue is one of the busiest intersections in Superior. According to 1999 traffic counts the average daily traffic on Belknap Street in this area is 16,000 with Tower Avenue carrying 12,000 cars a day through the intersection. Nine of the 30 truck-related accidents in this corridor occurred at the intersections of Belknap Street with Banks Avenue and Tower Avenue. Weather-related road conditions were a factor in four of the nine truck-related accidents at these two adjacent intersections. The manner of collision in almost all of these accidents was rear end collisions or sideswipes travelling in the same direction. These types of accidents are consistent with vehicle movements in heavy traffic. Land uses in this central business district conflict with heavy truck traffic.

Trunk Highway 2/53 - from Belknap St to Superior City Limits
This corridor begins at the convergence of U.S. Highways 2 & 53 at the intersection of Belknap Street and East 2nd Street and extends to the southeast city limits. The corridor had 32 truck-related accidents from 1995 to 1999. These accidents occurred in clusters along the corridor with 53% of the accidents taking place at the Trunk Highway 2/53 intersections with Belknap Street, 18th Avenue East, and 23rd Avenue East.

Belknap Street and East 2nd Street had four accidents, all occurring between 1 p.m. and 5 p.m. Seven accidents, with no apparent weather or time related factors, occurred at the intersection with 18th Avenue East or Mall Drive as it is sometimes referred to. This road is the primary access to the Mariner Mall and the Hill Avenue Industrial Park and has an average daily traffic count of 7,000 vehicles. This traffic combined with the approximately 20,000 vehicles a day along TH 2 makes for a congested intersection during peak hour. During morning peak traffic, the left turn lane on north and west bound TH 2/53 is often filled to capacity.

The intersection of 23rd Avenue East and East 2nd Street (Trunk Highway 2/53) had six truck-related accidents over the five-year period. The majority of the truck traffic accessing the Trunk Highway from this intersection originates from Murphy Oil refinery.

These tanker trucks have difficulty accessing Trunk Highway 2/53 during peak traffic periods (see Survey results). Turning movement counts were conducted on this intersection to get a better idea of the amounts of vehicle and trucks moving through the intersection (see Turning Movement Analysis – Trunk Highway 2/53 and 23rd Avenue East)

Trunk Highway 35 - from the Blatnik Bridge to Superior City Limits
This corridor stretches from the Blatnik Bridge following North 3rd Street to Tower Avenue and south along Tower Avenue to the south city limits. The corridor had 38 truck-related accidents over the five-year period with 68% taking place between 11 a.m. and 3 p.m. Turning movements were a factor in 47% of the accidents and 63% occurred where no traffic controls were present. The Tower Avenue portion of the corridor is the main street of the central business district and has many access points. The large number of access points, combined with the heavy traffic (up to 18,000 vehicle per day), contributes to a high level of exposure for turning vehicles accessing this busy stretch of road.

In a four block stretch of Tower Avenue in the core of the central business district, 34% of the accidents occurred, with most taking place during weekday business hours. The intersection with the most accidents was Belknap Street and Tower Avenue. This is the point where Trunk Highway 2 and Trunk Highway 35 intersect. Average daily traffic is approximately 12,000 on Tower Avenue and 16,000 on Belknap Street.

Interstate 35 – from Midway Road to 26th Avenue East
This corridor has the heaviest traffic in the area and also had the most truck-related truck accidents. Interstate 35 from Midway Road to 26th Avenue East had 93 truck-related accidents from 1995-1999. The accidents were spread throughout the entire corridor, however, two areas had higher numbers of truck-related accidents. The section of I-35 from Trunk Highway 2 to the Bong Bridge and the section from the DM&IR Ore Docks to the interchange with I-535 and Trunk Highway 53 were areas with higher numbers of accidents.

In the segment of I-35 from where Trunk Highway 2 enters near Proctor to 46th Avenue West where TH 2 follows the Bong Bridge, there were 38 truck-related accidents in this 2.5 mile corridor. Roughly 68% of these accidents fell between 10 a.m. and 6 p.m. Weather and road conditions only played a role in a handful of the accidents. The actions by vehicles involved in most of the accidents include slowing or stopping in traffic, changing lanes, and avoiding other vehicles. These types of vehicle actions can usually be contributed to heavy traffic. The average daily traffic in this area ranges from 31,400 to 42,500 vehicles. This is one of the highest concentrations of traffic in the Duluth-Superior area, and is probably a contributing factor to the large number of truck-related accidents.

The area from the DM&IR Ore Docks near 35th Avenue West to the interchange of I-35, Trunk Highway 53, and I-535 also has a high concentration of truck-related accidents. This roughly one-mile stretch of I-35 had 22 truck-related accidents from 1995-1999. Almost 60% of these accidents were between 11 a.m. and 5 p.m. Poor road conditions (snow, ice, and wet pavement) were a contributing factor in 14 of the 22 accidents. The freeway in this area is elevated in areas and can be susceptible to icing conditions. The vehicle actions in these 22 accidents were again typical for accidents in areas with high traffic. The average daily traffic in this corridor is between 40,500 and 44,000

U.S. Trunk Hwy 2 – from I-35 to Hermantown Road

Trunk Highway 2 from I-35 to Hermantown Road was also examined. This segment of roadway has a high percent of trucks as total traffic. According to 1996 vehicle class counts on TH 2 near I-35, almost 15% of the total traffic in this area is trucks. In this particular area, that means roughly 1500 trucks a day among the 9,900 vehicles. The average daily traffic along the corridor ranges from 9,900 near I-35 to 3,100 near Hermantown Road. In this 6.5 mile corridor, 43% of the truck-related accidents were weather and road condition related. Trunk Highway 2 is a route used by large numbers of grain trucks originating in western Minnesota and eastern North Dakota destined for the waterfront grain elevators in Duluth and Superior.

U.S. Trunk Highway 53 – from I-35 to Midway Road

This corridor has many diverse segments, ranging from a three lane roadway through the steeply-sloped residential area on lower Piedmont Avenue, to a congested divided highway through the Miller Hill Commercial area. The average daily traffic along this corridor varies from 15,700 (near I-35) to 8,000 (along Trinity Road) to 24,400 (near the Miller Hill Mall where it joins Trunk Highway 194) to 10,500 (at the intersection of Midway Road). Vehicle class counts were performed at four location along this stretch of road (see vehicle class count locations on Map 3) and are summarized in Table 2. Trucks make up over 10% of the total traffic east of the convergence of Trunk Highways 194 and 53 near Lindahl Road. This area has a 55 mph speed limit, fairly free flowing traffic, and few truck-related accidents. Closer to the Miller Hill commercial area near Haines Road, trucks comprise less than 5% of the total traffic and truck related accidents increase in this area. Seven of the 25 or 28% of the truck-related accidents on the TH 53 corridor were near the mall area. South of the mall along the Trinity Road portion of TH 53 traffic decreases and trucks make up about 6% of total traffic. Again, the lower traffic levels correspond with fewer truck-related accidents. Between Six Corners intersection and I-35 along lower Piedmont Avenue, TH 53 has higher levels of traffic and truck-related accidents. Six of the 25 truck-related accidents occur on the lower Piedmont segment with 67% of those weather and road condition affected. Poor road conditions along this steeply-sloped section of road causes hazardous conditions for trucks. This section of roadway is scheduled for redesign and reconstruction in 2003.

Weather-Related Road Conditions

Because we live in a northern climate where snowfall is probable from November through April, weather related road conditions are a definite factor in vehicle accidents including truck-related accidents. The truck accident data that was obtained and analyzed included information about weather-related road conditions. Snow, packed snow, slush and ice are some of the elements that drivers must negotiate through in the late fall to early spring inclement weather. Even in warmer months, rain and wet road surfaces increase the chance of accidents through lower visibility and greater stopping distances. This analysis plotted all accidents where weather-related road conditions were a factor. Of the 407 truck-related accidents in the Duluth-Superior area from 1995-1999, weather related road conditions were a factor in 41% of these accidents (see Map 8 on page 20). A contributing factor to poor weather-related road conditions is the topography of the Duluth-Superior area. Slippery road conditions combined with steep slopes lengthen stopping distances for trucks. These factors combined with higher levels of traffic contribute to truck-related accidents.

Conclusion

Outside of the corridors examined, there was not a concentration of truck-related accidents in any one area. Because the major highway corridors in this area carry the bulk of the truck traffic, it is not surprising that the majority of the truck-related accidents occurred in these corridors and were clustered near areas of heavier traffic. Alleviating the number of truck-related accidents may entail addressing congestion in these corridors.

In an attempt to improve safety, the Minnesota Department of Transportation has begun using Intelligent Transportation Systems (ITS) methods along I-35 in Duluth. Variable messaging boards, pavement icing sensors, and cameras in the downtown tunnels will help reduce the number of accidents due to weather-related road conditions.

Survey Analysis

Introduction

As a component of the project, the truck route study advisory committee chose to utilize a survey as a form of data collection. The goal was to survey local trucking firms and companies with high amounts of truck traffic in order to gain insight on problem areas and deficiencies that exist within the Duluth-Superior truck route system. The survey results would be used in conjunction with existing and historic truck route information to find the most efficient, safest, and least disruptive truck routes through the metropolitan area.

Methodology

In order to obtain opinions from differing perspectives, one survey was formulated targeting businesses that see a high volume of truck traffic and another for the truck drivers themselves. The business survey was kept to a one-page sheet containing nine questions. The business survey was mailed with a short cover letter explaining study objectives in addition to postage paid return envelopes. The mailing list for the business surveys was determined using standardized industrial codes (SIC) to isolate trucking and trucking-related businesses with more than 10 employees in the Duluth-Superior area. This included retail and wholesale businesses. The final mailing list was made up of 157 Duluth-Superior area businesses. Of the 157 business surveys that were sent out, a total of 41 (or 26%) were returned completed.

A total of 200 surveys targeting truckers were dropped off at Duluth-Superior area truck stops, weight stations, trucking firms, as well as Duluth and Superior grain elevators. This survey was also kept to a one-page sheet and consisted of 6 questions. The surveys that were distributed were accompanied by postage paid return envelopes. Unlike the business survey, the trucker survey saw a very poor return rate. Of the 200 distributed, a total of 7 completed surveys were returned. Although this was a return rate of only 4%, valuable opinions and insights were gathered from the ones that were completed.

Results

Business Surveys

As mentioned earlier, 41 completed surveys were returned. The main purpose of this survey was to gather suggestions and opinions regarding the current truck route system in the Duluth-Superior area. When performing analysis, most of the attention was focused on the responses to the three open-ended questions on the survey form. The survey respondents brought to attention a good number of problem areas within the current system. One area that was mentioned on a number of surveys was the issue of inadequate truck route signage in the Duluth-Superior area. This included the lack of truck route signs, poor clarity of existing signage, and no consistency within the signage types being used. Other concerns expressed by the respondents were the Miller Hill mall area and the “six-corners” intersection on Piedmont Avenue. The Miller Hill area was said by several respondents to be extremely congested in addition to having too many traffic lights that disrupt traffic flow. A few issues regarding Superior truck routes came up in the responses multiple times. The first was the difficulty trucks have crossing Tower Ave. and Hammond Ave. while traveling on Winter St. The second was the problems trucks face when entering onto the busy Highway 2/53 off 23rd Ave E. from the south leaving Murphy Oil Inc. USA. In addition to the issues stated above, several other noteworthy variables related to Duluth-Superior truck routes included indirect routing, poor road conditions, railroad crossing tie-ups, and tight intersections.

The respondents of the business survey were also asked what recommendations they had for improving the truck route system in the Duluth-Superior area. Some of the ideas included added frontage roads, proper truck route signage, the clearing of shrubs and brush that block views at intersections, and improved directional signs to other major highways. Another suggestion was to make sure that truck routes are available to all areas of the community. Finally, the point was made to look at what other successful communities have done regarding truck routes and adopt ideas from them.

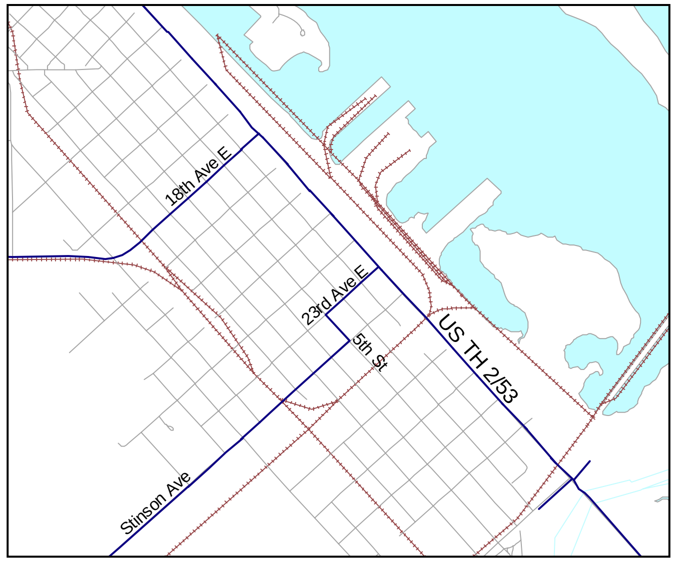
Driver Results

In addition to mailing surveys to area businesses, the truck route study advisory committee thought it would be beneficial to target truck drivers as well. Unfortunately, the return rate for the driver surveys wasn't as high as hoped. From the surveys that were returned, however, valuable information was obtained regarding the Duluth-Superior truck routes. Once again, when analyzing the survey, most attention was focused upon the responses given to the open ended questions. The first open-ended question dealt with problems truck drivers deal with when driving the local routes. The most frequent response was related to the difficulty trucks have turning onto Highway 2/53 off northbound 23rd Ave E. leaving Murphy Oil Inc. According to one respondent, drivers often have to play "chicken" with traffic on the Highway in order to enter east and westbound traffic. Also, trucks often have to use the center turn lane on Highway 2/53 as a merging lane, which poses a safety issue for all motorists. Other problems included poor road conditions, stopping at railroad crossings that are rarely used, and having to stop at lights on Piedmont Avenue while loaded going up the hill.

Truck drivers were also asked to provide any recommendations they have for improving the existing truck route system. Suggestions included putting a traffic signal at the intersection of Highway 2/53 and 23rd Ave. E in Superior or extending the existing truck route to a location where there are existing lights, upgrading railroad crossings, constructing truck stopping lanes, and continuation of traffic monitoring in order to present an updated truck route plan.

Turning Movement Analysis for Highway 2/53 and 23rd Ave. E.

As a large port city and industrial center, the roadway network through the City of Superior services a substantial number of commercial trucks. In addition, several large trucking firms have their operations based out of Superior. Some of the larger firms include Jeff Foster Trucking, Halvor Lines Inc., Dave Evans Transports, and Dean's Trucking Inc. The large number of trucks passing through Superior or making it their final destination present safety issues to both commercial truckers and motorists alike. One such area in Superior is the intersection of Highway 2/53 and 23rd Avenue East (Map 9). Tanker trucks use 23rd Ave E. in order to connect with the local truck route that runs to Murphy Oil USA Inc. on Stinson Avenue. Loaded trucks leaving the refinery must then make the turn onto the busy Highway 2/53.



Map 9: Hwy 2/53 & 23rd Ave. E.

According to 1996 information from Douglas County, the segment of Highway 2/53 passing 23rd Ave E. sees and average annual daily traffic (AADT) count of 21,110. By using a survey targeting truckers and Superior businesses, as well as face to face communication, it was determined that the intersection of Highway 2/53 and 23rd Ave E. poses safety questions and should be studied further.

Methodology

Turning movement counts were conducted at the intersection of Trunk Highway 2/53 and 23rd Ave E. This intersection was studied on three different occasions. This was done in order to get a sample of traffic flow from three distinct time periods within a day. The turning movements were recorded using the DB-400 Intersection Traffic Counter from Jamar Technologies Inc., for two hours each of the three days. The two-hour counts were broken into eight 15-minute intervals in order to calculate peak traffic periods. A count was performed at the intersection from 7:00 to 9:00 a.m., 11:00 a.m. to 1:00 p.m., and 3:00 to 5:00 p.m.

Results

Late-Afternoon Count

The first two-hour count was taken on Thursday, July 20th between 3:15 and 5:15 p.m. During this two-hour time period, a total of 4,182 vehicles passed through the intersection (Figure 2). Of that total, 248 were trucks. This accounted for 6% of total traffic during this time. More significant was the fact that 26% of the northbound traffic on 23rd Ave. E. making the left-hand turn onto Hwy 2/53 were trucks (Figure 3). It was a common occurrence at this intersection to see tanker trucks line up 2-3 deep waiting to make the turn onto the highway. Although there wasn't a high volume of trucks northbound on 23rd Ave E, they did make up a large percentage of total traffic coming from the south. This study time had a peak 15-minute interval between 4:30 and 4:45 p.m. where 593 vehicles passed through the intersection. The peak hour was from 4:00 to 5:00 p.m. when a total of 2,162 entered the intersection. A great deal of traffic during this time was observed to be recreational traffic consisting of vehicles with campers and boat trailers. This observation is supported by the numbers from the count. A total of 2,366 vehicles went straight through the intersection heading out of town on eastbound Hwy2/53. In contrast, only 1,467 went straight through westbound entering the Duluth-Superior area.

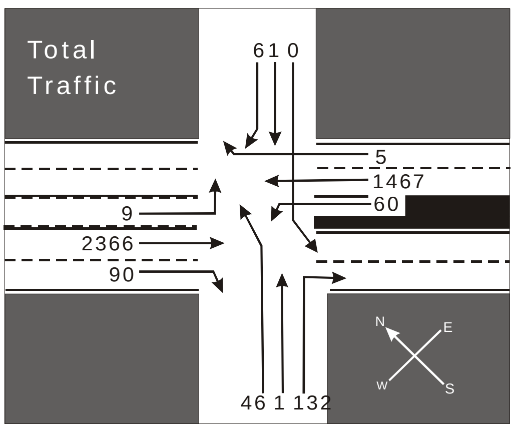


Figure 2: Total Traffic - 3:15 - 5:15 p.m. count

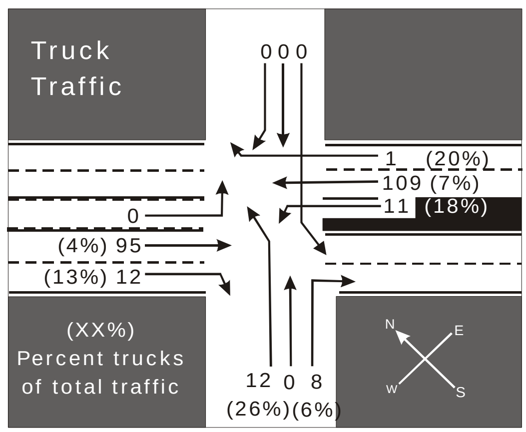


Figure 3: Truck Traffic - 3:15 - 5:15 p.m. count

Mid-Afternoon Count

The second count occurred on Thursday, July 27th, from 11:00 a.m. to 1:00 p.m. During this two-hour count, the total vehicles entering into the intersection was 3,145 (Figure 4). Of that total trucks accounted for 9%, or 273 total, within this time period. As with the late-afternoon count, the percentage that trucks made up of total traffic making the left-hand turn onto Hwy 2/53 off northbound 23rd Ave E. was high at 29% (Figure 5). Also notable was the fact that trucks made up 29% of the total traffic making the right-hand turn onto southbound 23rd Ave E. Once again, trucks were observed having difficulty making the turn onto Hwy2/53 due to heavy traffic resulting in congestion for all traffic at the intersection. The peak 15-minute interval for this count occurred between 11:45 a.m. and noon when 416 vehicles entered the intersection. The peak hour between 11:45 a.m. and 12:45 p.m. saw 1,914 vehicle pass through the intersection.

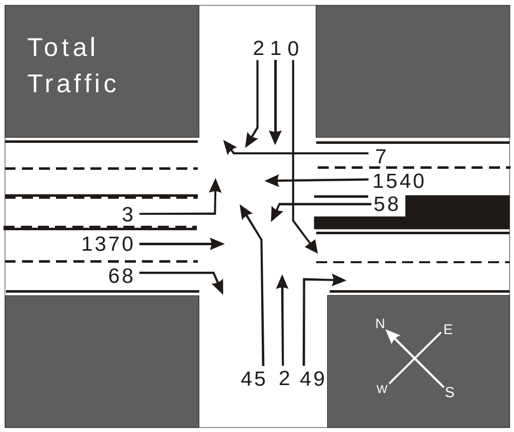


Figure 4: Total traffic - 11:00 a.m. - 1:00 p.m. count

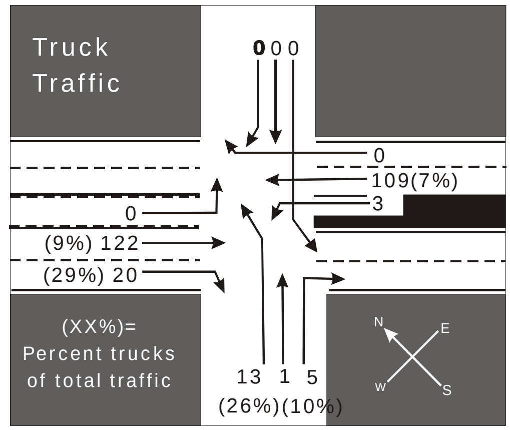


Figure 5: Truck traffic - 11:00 a.m. - 1:00 p.m. count

Morning Count

The third and final count took place between 7:00 and 9:00 a.m. on Tuesday, July 25th. This time was chosen in order to observe interaction between trucks and cars during the morning rush period. During this time period a total of 2,734 vehicles passed through the intersection (figure 6). Of this total, 291 were trucks. This accounted for 11% of total traffic during this time. In looking at the numbers, it was clear that the early time this count took place had great impact on the numbers. A total of 1,755 vehicles entered into the intersection on westbound Hwy 2/53, reflecting the morning commute of Duluth-Superior workers to town. In comparison, only 755 vehicles were moving eastbound on Hwy 2/53 at this time. This count saw trucks as a large percentage of traffic for many of the turning movements. A surprising 57% of total traffic making the right turn onto eastbound Hwy 2/53 were trucks, while trucks made up 39% of traffic making the left turn (figure 7). In addition, 45% of total traffic making the right turn off Hwy 2/53 onto southbound 23rd were trucks. Also significant is that 14% of through traffic moving eastbound on the highway were trucks. The peak 15-minute interval during this time took place between 7:30 and 7:45 a.m. when 460 vehicles passed through the intersection. The peak hour saw 1,525 vehicles enter the intersection from 7:15 to 8:15 a.m.

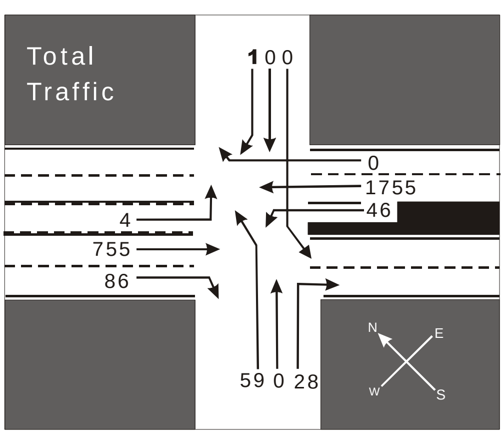


Figure 6: Total traffic - 7:00 - 9:00 a.m. count

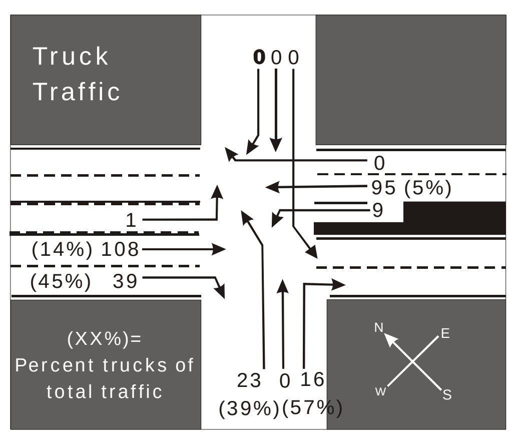


Figure 7: Truck traffic - 7:00 - 9:00 a.m. count

Conclusion

Given the large number of trucks exiting off 23rd Ave E. and the high volume of traffic on Highway 2/53, this intersection might eventually be considered for some form of traffic control device. One obvious solution is the possible installation of traffic signals at the intersection of 23rd Ave E. and Hwy 2/53. Another alternative might be to re-route the truck route so it enters onto the highway at 18th Ave E. where that intersection is currently signalized. From the observations made during this study and the results tabulated from surveys, it is clear that safety issues do exist at the intersection of Highway 2/53 and 23rd Avenue East and the site should be examined further to determine ways to alleviate safety problems.

Truck Route Signage

A number of truck route survey respondents and the study advisory committee members suggested that improvements could be made to the truck route signage in our area. Some of the signage issues include locations of the signs, message on the signs, and consistency of truck route signage between different jurisdictions. Location issues for truck route signage include putting enough signs along a truck route to keep those unfamiliar with the area on the truck routes. Other signage locations issues include providing proper signage for through truck traffic to use the best route through the urbanized area and truck weight limit signs to protect roadways from damage of heavy trucks. Sign message issues include having a message that is clear and concise. The truck route user should see signs that are familiar and easily interpreted. Consistency of signage between jurisdictions is important because truck route users are not always aware when they enter another jurisdiction and corresponding rule changes.

Sign message and consistency are two related issues that are dictated by the *Manual on Uniform Traffic Control Devices* (MUTCD). This manual is produced by the U.S. Department of Transportation – Federal Highway Administration and contains the types and messages that are permissible on roadway signs. The MUTCD "sets forth the basic principles that govern the design and usage of traffic control devices." Traffic control devices are used to assist vehicle operators in navigating public roadways. Having standards and uniformity provides consistency to the messages communicated to drivers through road signs. Responsibility for design, placement, operation and maintenance of traffic control devices rests with the governmental agency having jurisdiction over a particular roadway. The following section is a brief summary of some of the truck route signage that is contained in the MUTCD. The numbers after the colon in the Figure captions are the sign numbers contained in the MUTCD.

The TRUCK auxiliary sign (Figure 8) may be used to designate an alternate route that branches from a regular numbered route, when it is desirable to encourage or require commercial vehicles to use the alternate route. When used, the TRUCK auxiliary sign shall be mounted directly above a route sign. The sign size is usually 12"x 24" but may be larger if the Highway Marker (Figure 8) it is mounted on is larger. It should not exceed the width of the Highway Marker.

Figure 8: M4-4(Top), M1-4(Bottom)

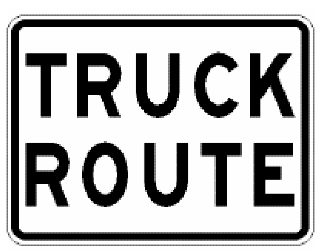


Figure 9: R14-1

Figure 10: R14-1(Top), M6-6(Bottom)

The TRUCK ROUTE sign (Figure 9) should be used to mark a route which has been designated to allow truck traffic. Normally, this sign is used when a truck route follows a non-numbered route. Arrows (Figure 10) can also be used with this sign to indicate changes in the route. In the Duluth area, this sign has been used for county roads and city streets. The normal sign size is 24" x 18".

Figure 11: R5-2

Most states allow local roadway jurisdiction authorities to exclude trucks or commercial vehicles by placing a sign with a No Trucks symbol (Figure 11) where such vehicles are prohibited by ordinance. Suitable legends such as the NO TRUCKS legend may also be added.

Weight limits may be imposed on roadways for a variety of reasons such as seasonal freeze/thaw conditions, obsolete bridge structures and pavements, and other roadway impairments. Vehicle weights may be limited for the entire vehicle or a per axle limit. Weight limit signs shall be located immediately in advance of the section of roadway or structure to which it applies. To reduce backtracking, a weight limit sign with an advisory message may be placed at approach road intersections or other points where affected vehicles can detour or turn around. Standard size is 24"X 30" but a larger size may be desirable on major roadways.

Currently the MUTCD allows four options for signing of weight limits on truck routes and bridge structures. The sign in Figure 12 is a limit on the total weight of the vehicle. The sign in Figure 13 limits the weight of the vehicle by axle. Total vehicle weight would be limited by maximum allowable weight set by the state and the number of axles on the truck. The sign in Figure 14 takes it one step further by limiting weight by axle and the total weight of the truck and load. The sign in Figure 15 uses symbols to show the number of axles and total truck and load weight.

Figure 12: R12-1

Figure 13: R12-2

Figure 14: R12-4

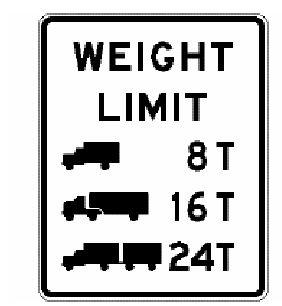


Figure 15: R12-5

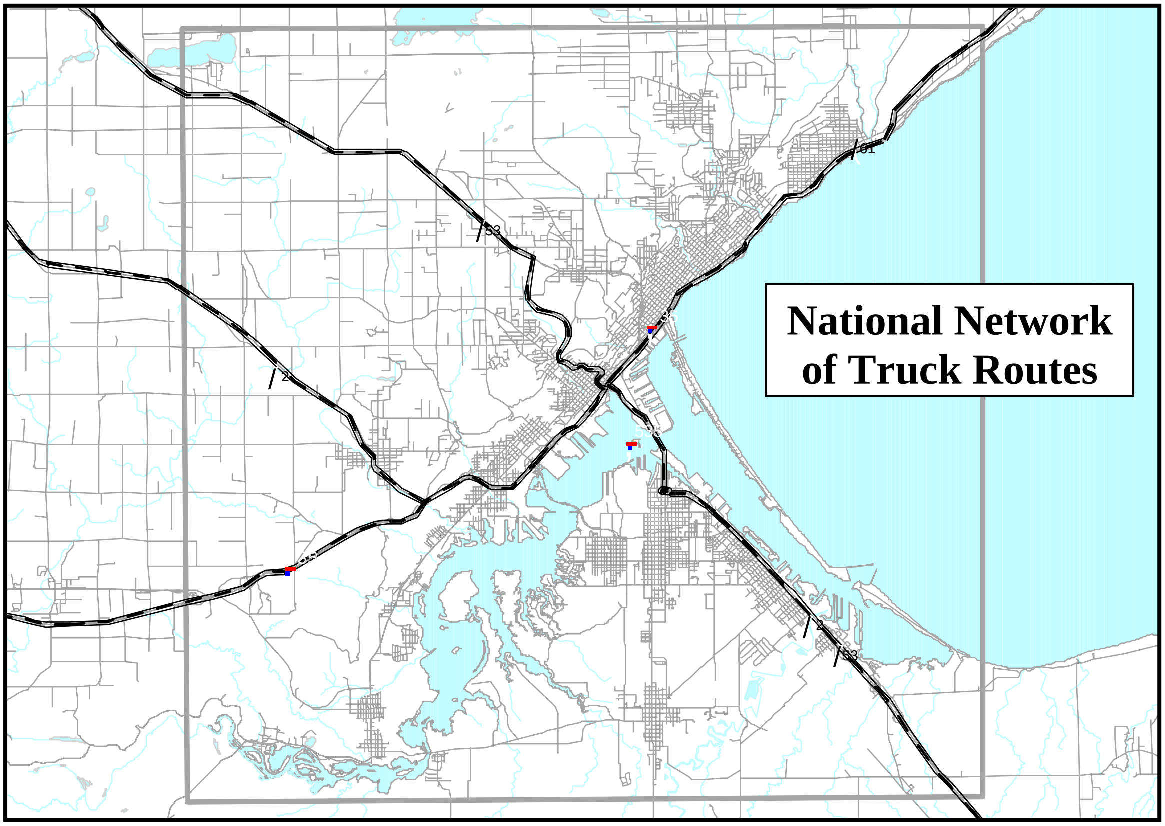
Figure 16

The sign in Figure 16 is a variation of the sign in Figure 13 above and limits the axle weight of the truck. This sign is used by St. Louis County and limits trucks to 10 tons per axle. A truck with five or more axles with the proper spacing could carry the maximum allowable load in Minnesota, which is 80,000 lbs or 40 tons.

Optional signing of the National Network Routes (Figure 17) is also available. The sign symbols are a rear view of a semi trailer with a green circle around it. These federally designated routes on the National Network consist of the Interstate System (with some exceptions), and additional federal-aid primary highways. In the Duluth-Superior area, the National Network of Truck Routes consists of the following roads (see Map 10):

- I-35
- I-535
- U.S. Trunk Highway 53
- U.S. Trunk Highway 61 – Duluth to Two Harbors
- U.S. Trunk Highway 2 – North Dakota to I-35
- U.S. Trunk Highway 2 - U. S. Trunk Highway 53 to Michigan

Figure 17: R14-4



Map 10

The criteria for designation of National Network truck routes considers the following roadway characteristics: type of traffic, the amount of traffic, sight distance, severity and length of grades, pavement width, horizontal curvature, shoulder width, bridge clearances and load limits, traffic volumes and vehicle mix, intersection geometry, connectivity of areas of economic activity, and safety issues.

The National Network of Truck Routes are routes that connect principal cities and highly developed portions of the state. The routes contain high traffic volumes and are used extensively by large vehicles for interstate commerce. All routes are available to large vehicles that meet the provisions of the Surface Transportation Assistance Act (STAA). However, nothing in these regulations shall be made to prevent any state from applying size and weight limitations to other highways, unless these limits would deny access to the National Network.

A state may sign the route or provide maps or list the highways to identify the National Network. Exceptional local conditions will be signed and all signs will conform to the Manual on Uniform Traffic Control Devices. Exceptional local conditions shall include, but are not limited to, operational restrictions designed to maximize the efficiency of the total traffic flow (such as time of day prohibitions or lane use controls); geometric and structural restrictions (such as vertical clearances); posted weight limits on bridges; or restrictions caused by construction detours from urban Interstate routes to bypass of circumferential routes for commercial motor vehicles not destined for the urban area to be bypassed.

The Hazardous Cargo Route sign (Figure 18) may be used to mark routes which have been designated by proper authority for vehicles transporting a hazardous cargo and where an exclusion for such vehicles has been imposed on alternate routes. The symbols on this sign are capital letters HC with a green circle around it.

Figure 18: R14-2

The Hazardous Route Prohibition sign (Figure 19) may be used where by the proper authority transporting of hazardous cargo has been prohibited. The sign should be placed on a street or roadway at a point where vehicles transporting hazardous cargoes have the opportunity to take an alternate route. The symbols on this sign are capital letters HC with a red circle around it and a slash through it.

Figure 19: R14-3

Truck route signs need to communicate to the truck driver where they should be operating their vehicle. Through truck traffic should be routed to the safest, most efficient route through the urban area. Local truck traffic should know which roads they can use and what the weight restrictions are on each. Truck drivers need to be able to interpret the message on the sign easily and have time to make route decisions comfortably. Signage with a consistent design, clear message, and proper placement will accomplish this goal.

The signage described in this chapter is not an exhaustive list of signs that pertain to trucks but illustrates signs most commonly used to manage truck traffic. The signs shown in this chapter are the foundation of signs used to move truck traffic efficiently around and through the truck route system of the Duluth-Superior area.

Over-Size Truck Route

Over-Size Load Truck Route

A recommended route through the Duluth-Superior area (see Map 11) exists that offers a path of least resistance for over-size loads. Permits from responsible roadway jurisdiction authorities are required to move any over-size load. In Superior, the route follows U.S. Trunk Highway 2 from the southeast city limits to the Bong Bridge. In Duluth the route becomes more indirect following 46th Avenue West from the Bong Bridge to Grand Avenue. The route follows Grand Avenue to Carlton Street and then to Superior Street. It follows Superior Street to Piedmont Avenue and then follows the high-clearance route described below.

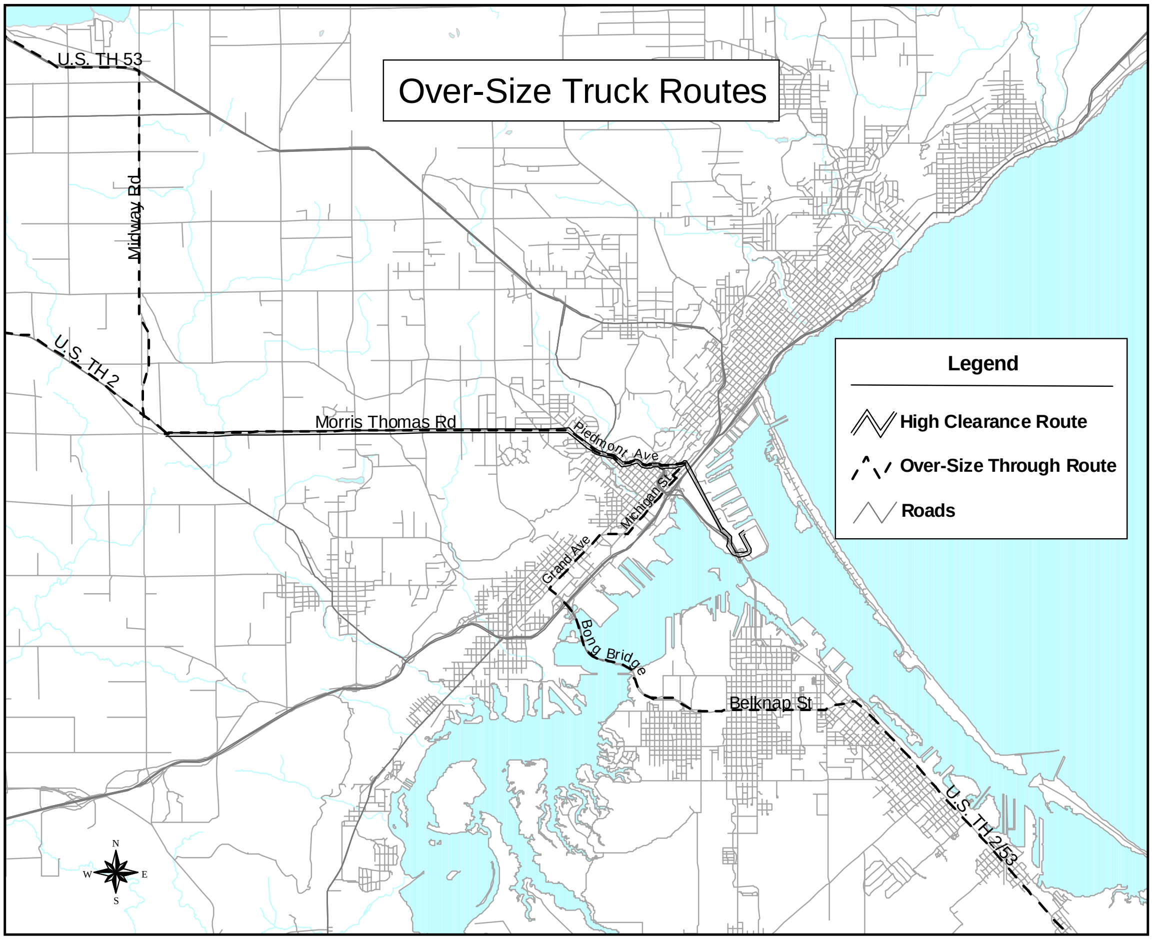
High-Clearance Route

Periodically, the port terminal on Rices Point receives loads of large equipment bound for destinations in Northern Minnesota and places as far away as northern Alberta, Canada. Many of these loads move by truck out of the port and up the hill in Duluth. At this point, many obstacles exist for loads that are 20 feet high or taller. Bridges, overhead signs, utility lines, and traffic lights impede or prohibit the movement of high clearance loads on I-35 and other area roads.

The 1990 Truck Route Study identified the need for a route in which high-clearance loads (as high as 22.5 feet) could move through the Duluth area. The route begins at the port terminal on Rices Point (see Map11) and runs along Port Terminal Drive to Garfield Avenue. The route follows Garfield Avenue to Superior Street where it crosses onto Piedmont Avenue. It continues up Piedmont Avenue until 3rd Street where a gate is located that was installed to maintain connection with the Trunk Highway 53 section of Piedmont Avenue. After the gate, which is only used to allow passage of over-size loads, the route follows Piedmont Avenue to Six Corners intersection. The route follows Piedmont Avenue through Six Corners intersection up the hill to Morris Thomas Road. From this point, the route follows Morris Thomas Road west until it meets Trunk Highway 2. From here, the high-clearance loads can access most highways in northern Minnesota either moving west or north to Canada.

The major obstacle in utilizing this route is the presence of overhead power, telephone and cable television lines. The presence of these overhead lines requires the local power, telephone and cable companies to dispatch crews to lift or take down the lines each time a high-clearance load moves through this area. These efforts are expensive and inconvenient for all parties involved, including local residents who may have power interruptions caused by the disconnection of the power lines.

Utility Lines - Morris Thomas Road



Map 11

Benefits of establishing a route with high clearance are many. The economic impact of the port on the region is well documented. This route would add to the reputation of the port as a trans-shipper of large loads. Two 90-ton gantry cranes are present at the port terminal, which provide the Duluth-Superior port with a competitive advantage in moving heavy loads. Other ports on western Lake Superior have to bring in portable cranes to be able to unload large loads. The location of our port as the farthest inland port also provides an advantage over other ports as water transportation is cheaper and more efficient than land transportation. Large cargoes have less distance to travel overland if they are shipped here. Every additional ship that calls on the port produces economic benefits that have a positive impact on the regional economy.

Resources already invested in the route include the construction of a 300-ton capacity bridge on Garfield Avenue over I-35, a gate between the Trunk Highway 53 and city sections of Piedmont Avenue, and swing-away stoplights at the Six Corners intersection. The 300-ton bridge was built to prevent I-35 from becoming a barrier to moving over-size loads out of the port. The gate between the new and old Piedmont Avenue alignments was installed to provide a connection for loads that could not access Trunk

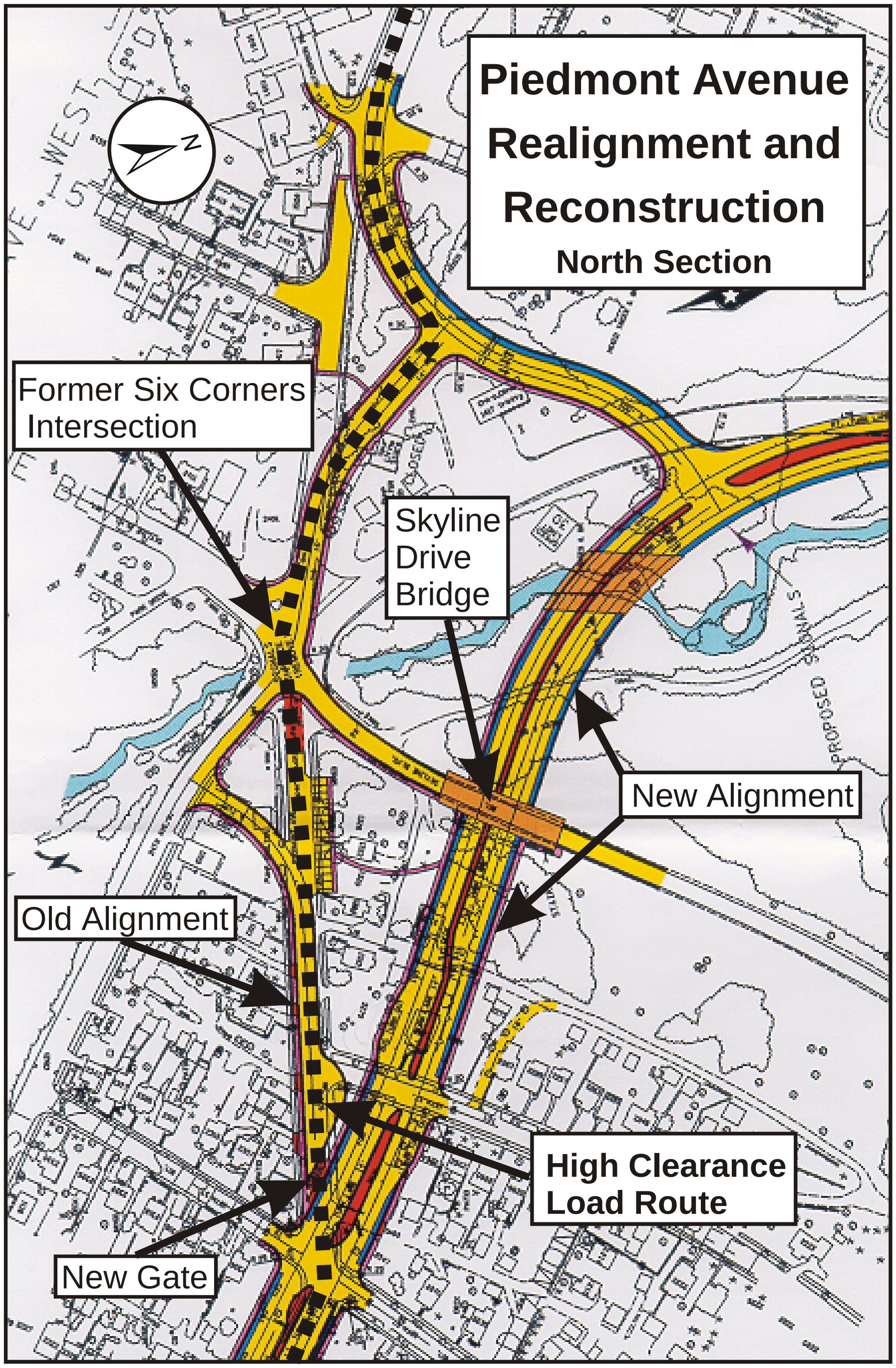
Highway 53 from the freeway interchanges to the south. The swing-away lights at Six Corners intersection are designed to move to the side to allow high-clearance loads to pass through the intersection.

Garfield Ave Bridge over I-35

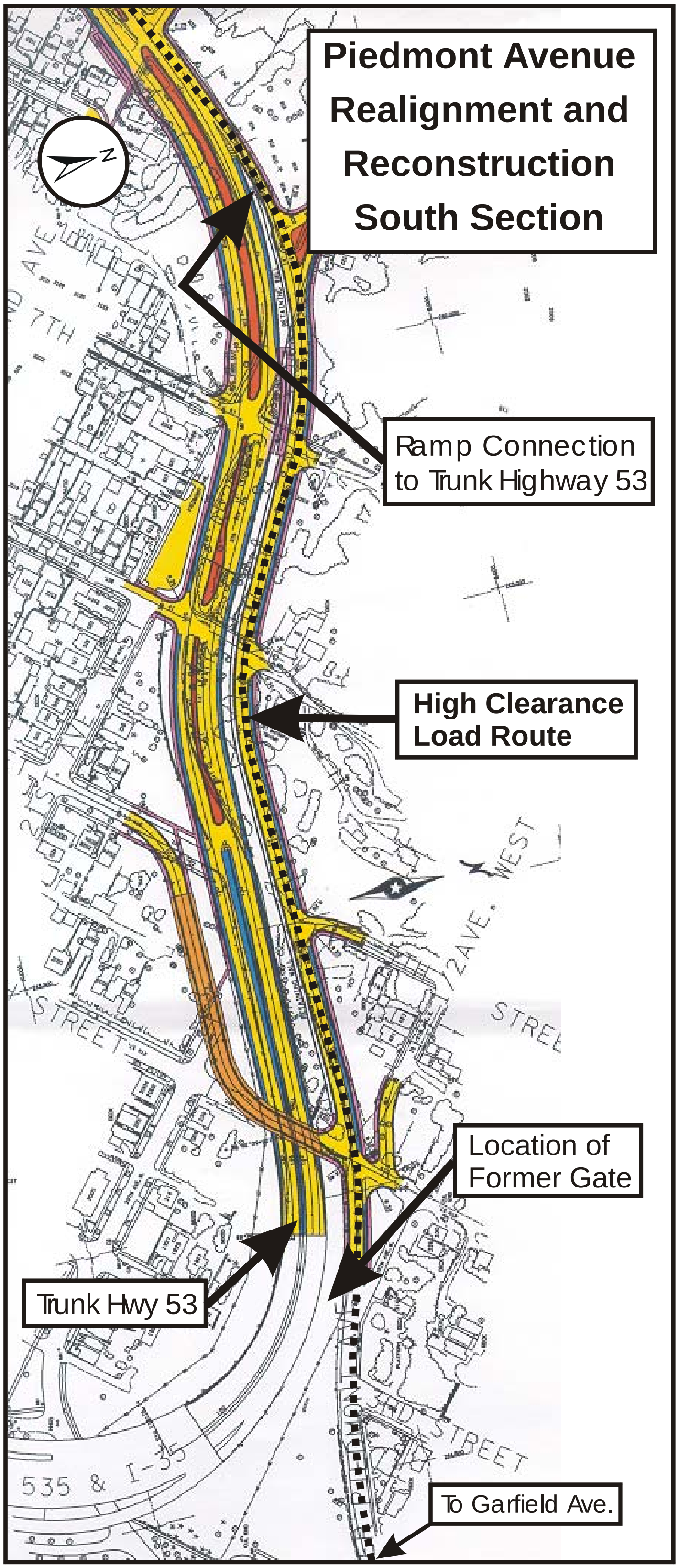
As part of the development of the Duluth-Superior Landside Port Access Study completed in January 2000, a meeting of local stakeholders was held to discuss possible solutions to this problem. The meeting included representatives from the port terminal operator, a trucking company specializing in over-size loads, Duluth Seaway Port Authority, Minnesota Power, QWest, Minnesota Department of Transportation, St. Louis County, Duluth, and Hermantown. The history of this issue was discussed and possible alternatives were considered. It was decided that the best solution would be to establish the identified route as the permanent and official high-clearance load route. This route provides the most direct route from the port up the hill and out of the city of Duluth.

Two more follow-up stakeholder meetings were held in April and December of 2000. The most recent meeting was held to discuss project scope and cost, local match funding options, and changes in the project due to two upcoming Piedmont Avenue reconstruction projects. The scope of the project has changed based on the planned reconstruction of two segments of Piedmont Avenue. Upper Piedmont Avenue above Six Corners intersection will be reconstructed during the 2001 construction season. The design for this section has incorporated raised or buried utility lines.

The reconstruction of the lower section of Piedmont Ave is much more complex. This $18 million reconstruction and realignment project is scheduled to take place in 2003 and 2004. This project will develop a new road alignment for Trunk Highway 53 by moving the highway to the east of Six Corners intersection. The latest design also has a bridge over the new highway alignment with Skyline Drive going over the highway. Given that there was not enough room to gain sufficient bridge height for high-clearance loads, other options were examined. The old roadway alignment through the former Six Corners intersection will be maintained for high-clearance loads (see Map 12). This will allow the high-clearance loads to bypass the Skyline Drive bridge and move through the area to upper Piedmont Avenue. Another change this project will bring is a direct connection from the residential area of Piedmont Avenue above Superior Street to the Trunk Highway section of Piedmont Avenue above Third Street. A new on-ramp will replace the gate that formerly separated these two sections of roadway (see Map 13). When completed the two Piedmont Avenue projects will allow clearance for loads up to 25 feet in height.



Map 12: Trunk Highway 53 - Piedmont Avenue Realignment and Reconstruction project scheduled for 2003 and 2004. This section of the project includes the new roadway alignment for the Trunk Highway 53 connection with Trinity Road.



Map 13: Southerly section of the Trunk Highway 53 - Piedmont Avenue Realignment and Reconstruction project. The new connection will provide a direct link from Garfield Avenue to Trunk Highway 53.

Truck Route Policies and Ordinances

A number of truck route policies were examined to determine best practices in determining truck routes and creating policies to enforce the laws pertaining to them. A number of truck route policies and ordinances were examined to determine how other cities and jurisdictions manage truck route issues. Truck route ordinances were examined for three Minnesota cities: St. Paul, Rochester, and Stewartville. Engineering and Public Works Departments were contacted from cities similar in size to the Duluth-Superior area and asked how they manage truck routes and truck route issues.

Rochester, MN
Rochester's Truck Route Ordinance begins with a reference to Minnesota Statutes Chapter 169 – Traffic Regulations. It states that all regulations in Chapters 169.80-169.88 shall govern unless further restrictions are spelled out in their ordinance. Their truck routes are described on a map and include axle weight limits imposed in each route by the governing jurisdiction. The ordinance covers weight limits, shortest route to destination, emergency vehicles, road construction, posting requirements, police authority, owners responsibility, buses, and garbage collection.

St. Paul, MN
St. Paul's truck route ordinance begins with a definition of commercial vehicle and gross weight. Truck Routes were established in 1967 and a record of the routes is maintained in various city offices such as the city engineer, city clerk and police department. Vehicles over 15,000 lbs gross weight are restricted to designated truck routes. The ordinance describes exceptions for deliveries, powers of the director of public works concerning truck routes, government vehicles, and truck route ordinance conflicts with other laws.

Stewartville, MN
Stewartville is a city of approximately 4,500 people near Rochester. Their truck route ordinance defines a truck as "any vehicle operated for the transportation of property and whose total weight is over 10,000 lbs." All truck routes are listed in the ordinance and the Clerk/Administrator maintains the truck route map. The ordinance also covers truck route sign posting, truck owner liability, law enforcement powers, and criminal penalties.

The following city departments were interviewed concerning truck routes in their areas. Questions were asked about truck route policies, signage, weight restrictions, and generally how truck routes function in their area.

St.Cloud, MN - Engineering Department
- No designated truck routes or signage.
- No specific weight limits through city, however;

- If a county road passes through the city, the weight limit is the same as it was on the county road that entered into the city.
- The same holds true for highways and other roadways entering the city.

Green Bay, WI – Traffic Engineering Department
- "If you are going to use a city as a model for truck route, don't use Green Bay".
- Green Bay has old black on white signs near intersections, they don't reflect well.
- Staff has been working for 10 years to improve the truck route situation, but nothing has happened.
- It would cost $30,000 to re-sign the City of Green Bay (not including labor).
- Green Bay uses state weight limits on truck routes. On non-routes, they use a gross limit (loaded weight) of 10,000 lbs.
- If trucks have to leave truck routes, they are to "deviate by the most practical route". This means trucks can leave the route to make deliveries or pickups.
- Staff recommended we contact the City of Ashwaubenon, Wisconsin.

Ashwaubenon, WI – City Engineering Department
- The city signs truck routes with large black lettering on yellow signs.
- It is best to use signs with shape recognition, colors, and symbols.
- At the entrances of the city, there are signs that say "local truck routes marked with signs".
- The city pays attention to detail in design and placement of signage.

Eau Claire, WI – City Engineering Department
- Eau Claire does not have specific truck routes, signage, or a truck route ordinance.
- There are a few selected locations in the city where signs are posted where street layout is confusing.
- Staff feels truck routes aren't a good idea because they are hard to enforce. "You have to see the truck and catch them in the act, then you have to be able to weigh them. The job of the police is not to enforce truck routes".
- Staff also doesn't believe they are a good thing because how large trucks need to leave routes to make pickups and deliveries.
- Staff feels if signage is posted, it should be advisory and helpful, not regulatory.
- Citizens regularly complain if the idea of designating their street as a truck route is introduced.

By examining how other communities handle trucks and truck routes, we can see strengths and weaknesses in how truck routes policies are handled in our area. Positive characteristics of good truck route policies include clearly designating truck routes by providing consistent signing of routes and maintaining consistency with state and national policies.

Duluth-Superior Truck Route Study Recommendations

Truck routes are vital to maintain the economic integrity of the Duluth-Superior area. Efficient movements of goods via trucks are fundamental to the function of our economy. From a community perspective truck routes should be compatible with adjacent land uses where feasible. The following recommendations attempt to strike a balance between the efficient movement of goods and truck routes that are compatible with a variety of urban land uses.

A. Add the following roadway segments to the official truck route system (see Map 15 on page 46):

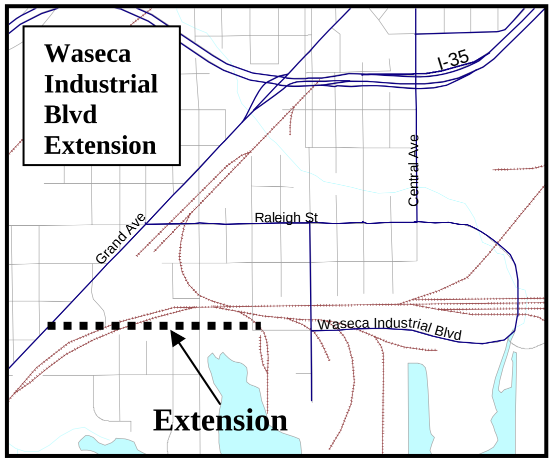
- Midway Road – I-35 to TH 2
- Maple Grove Road – Midway Road to Stebner Road
- Midway Road – TH 53 to Martin Road
- Martin Road – Midway Road to Woodland Avenue
- Rice Lake Road – Martin Road northerly
- Arlington Avenue – Arrowhead Road to Central Entrance

Trucks are presently using the roadways listed in the first six bullets and the addition of these routes probably will not increase truck traffic in these areas. All of the additions to the system on the Minnesota side are on CSAH routes and as such cannot prohibit trucks.

B. Improve truck route connection to Trunk Highway 2/53 at the intersection of 23rd Avenue East in Superior. Examine alternatives such as:

- Route truck traffic over to 18th Avenue East to take advantage of existing stoplights;
- Installing traffic light at the intersection of 23rd Avenue East and Trunk Highway 2/53;
- Moving truck route connection to 22nd Avenue East and installing a traffic signal at that intersection.

C. Connect Waseca Industrial Boulevard to Grand Avenue to provide another truck entrance to the Waseca Industrial area (see Map 14). Examine the need for extension of Waseca Industrial Boulevard to Grand Avenue if future growth increases truck traffic on Raleigh Street. Trucks currently accessing the Waseca Industrial area from the southwest along Grand Avenue use Raleigh Street to enter this area. Alternate routes would force trucks into the West Duluth Business District or other residential streets. Extending Waseca Industrial Boulevard would provide direct access for trucks to Grand Avenue.



Map 14

D. Study the feasibility of an east-west connection from Trunk Highway 53 to Trunk Highway 61. Examine the extension of Martin Road from Jean Duluth Road east to Trunk Highway 61.

E. Monitor areas of increased truck activity in order to incorporate this information into design considerations of reconstruction projects.

F. Focus on good access management practices as a tool to reduce congestion and accidents, preserve road capacity, and reduce travel times for the delivery of goods and services. Departments of Transportation, counties, cities, and townships should work cooperatively to ensure land use decisions consider the impact on transportation facilities.

G. Establish an over-size load route from the port terminal area to Trunk Highway 2 utilizing Garfield Avenue, Piedmont Avenue, and Morris Thomas Road to Trunk Highway 2. Seek to relocate utility wires either underground or establish a minimum height overhead. Work with stakeholders to find a solution to this issue. Incorporate designed changes for Piedmont Avenue reconstruction and realignment projects into this route.

H. Formalize and sign a route for through truck traffic to use the National Network of Truck Route roadways (see Map 10 on page 33). This would move through truck traffic from the Bong Bridge and Belknap Street in Downtown Superior to the Blatnik Bridge and Trunk Highway 53. The new through route would be more compatible with current land use and avoids the Central Business District in Superior. Utilize a consistent signage scheme in both states such as the National Network of Truck Routes signs, which could have a message added to the bottom that says “Through Route”.

I. Identify at-grade rail crossings where truck/train conflicts are problematic. Prioritize crossings by looking at truck traffic, train traffic, crossing warning devices, functional classification of roadway, and other roadway characteristics. Provide this information to the Departments of Transportation for inclusion in their rail planning efforts.

J. Improve signal coordination in Miller Hill area.

K. Utilize more consistent signage on area roads where weight limits are imposed. Consider using signs R 12-1, R 12-2, and R 12-4 (see below)

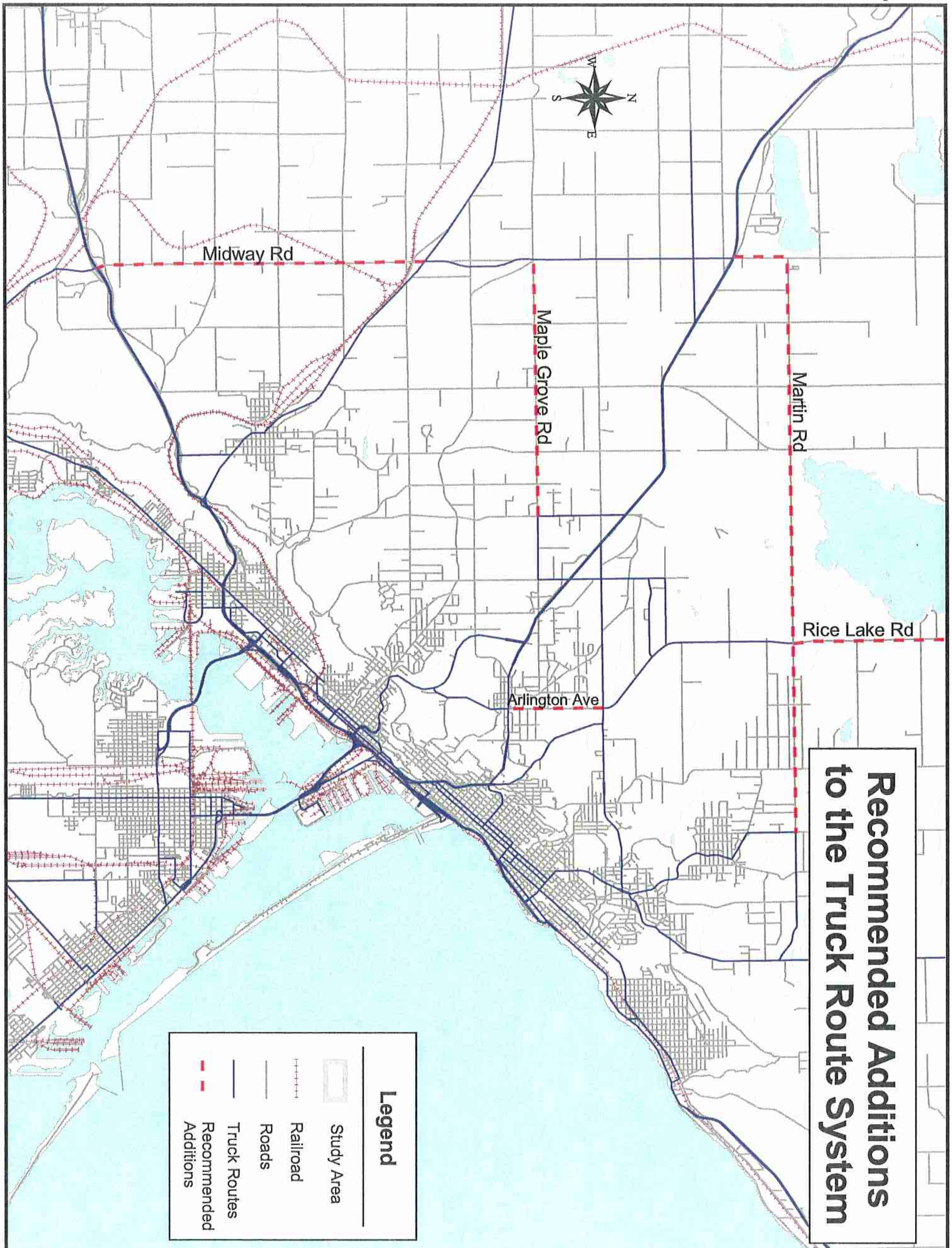
R 12-1

R 12-2

R 12-4

L. Improve turning radii in industrial/commercial areas such as Winter Street and Susquehanna Avenue in Superior and 40th Avenue West and Oneota Street in Duluth.

Insufficient turning radius can cause damage to curbing and sidewalks and create a safety hazard.



Revised April 18, 2001