

3.0 FREIGHT FLOW OVERVIEW

This analysis primarily uses IHS Global Insight's 2007 TRANSEARCH[®] database and the Surface Transportation Board's 2007 Rail Waybill Sample. These datasets provide county-level data for freight moves originating and terminating within Minnesota, and BEA-level information for those moves originating or terminating beyond state borders. This information provides a quantitative description of the movement of goods between regional origins and destinations by mode. The TRANSEARCH[®] database also provides traffic projections for the years 2020 and 2030. These forecasts predict goods movements between regions, and are not general economic projections. They take into account industry, regional and national economic trends to estimate commodity-level trade flows. This information can help identify transportation improvements, freight planning objectives and other strategies that will benefit the economic competitiveness of the region.

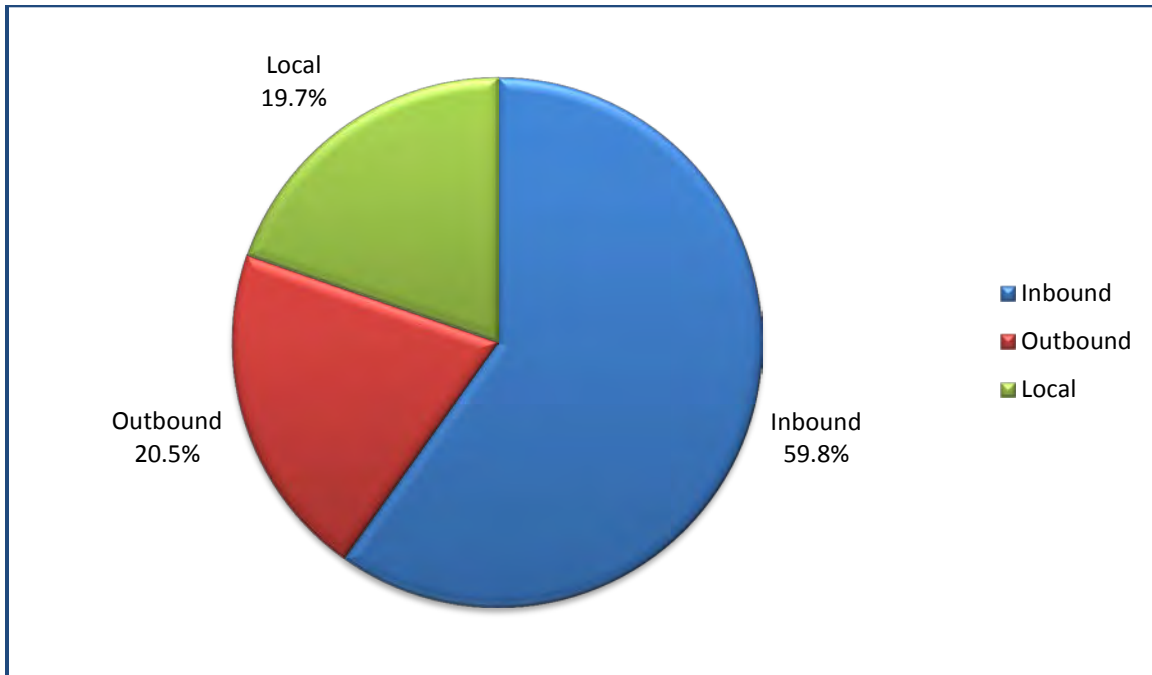
3.1 Directional Flows

According to data analysis, Central Minnesota moved 31 million tons of freight valued at \$16 billion in 2007. **Exhibits 11 and 12** indicate that 60 percent of the freight tonnage and 28 percent of freight value results from freight terminating in the region from origins outside the region. Twenty-one percent of the tonnage and 71 percent of the value originates in the region with destinations outside of the region. Twenty percent of the tonnage and one percent of the value were local freight movements that both originate and terminate in the region.

By 2030, the weight of freight moving into, out of and within Central Minnesota is projected to grow by 41 percent to over 43 million tons. A significant portion of this increase is expected to come from originating freight shipments, although terminating and local freight shipments are also expected to experience increased weights. The value of freight moving into, out of and within the region is projected to grow by 92 percent to approximately \$31 billion by 2030, resulting mainly from originating shipments.

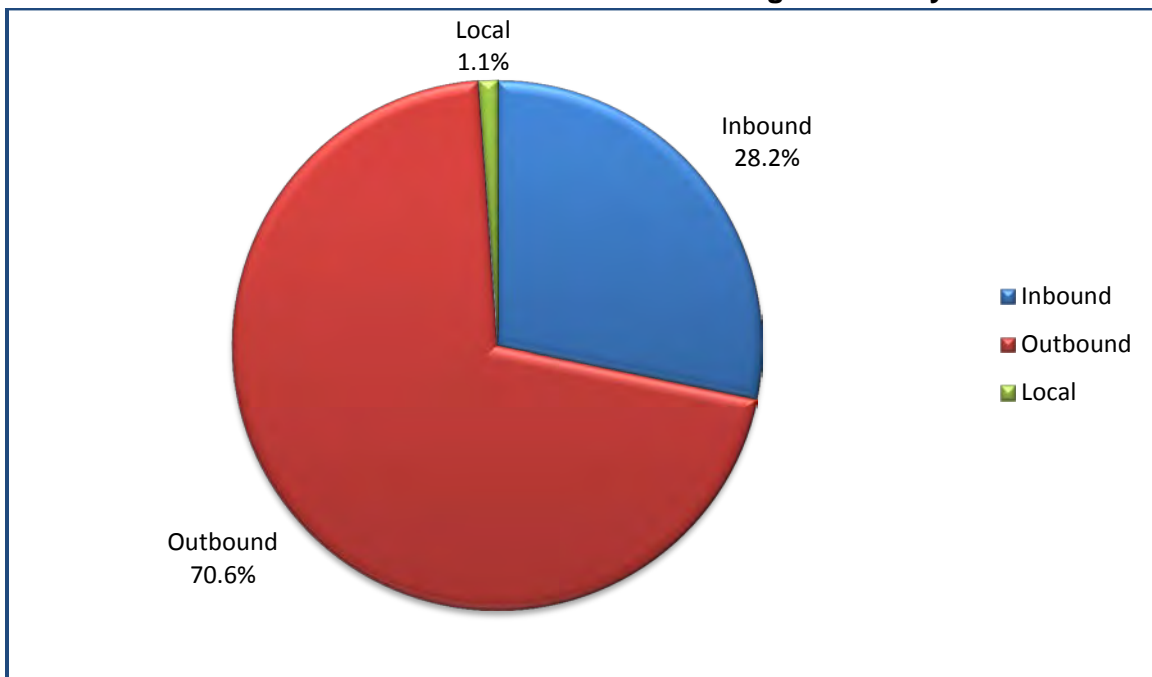
The significant percentage difference between outbound tonnage and outbound value (regional exports) suggest that commodity exports from the region are generally higher value, low weight goods such as Electrical Equipment, Instruments and Transportation Equipment. In contrast, inbound commodities tend to be of lower value, higher weight commodities such as Coal and Non-metallicMinerals.

Exhibit 11: Central Minnesota Directional Flows by Tonnage



Source: TRANSEARCH[®]

Exhibit 12: Central Minnesota Directional Freight Flows by Value



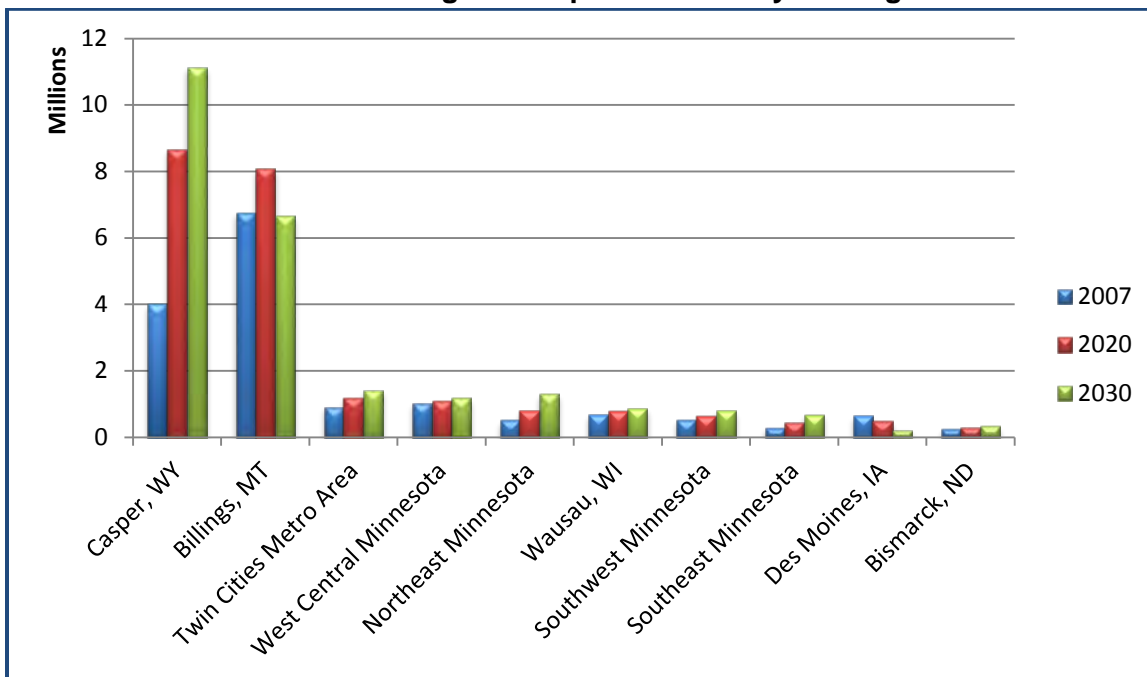
Source: Transearch[®]

Freight shipments moving to Central Minnesota have many different origins. **Exhibit 13** lists the top 10 origins of freight moving to the region by tonnage. Most freight tonnage terminating in Central Minnesota originates in the Powder River Basin regions of Casper, Wyoming and Billings, Montana. These are primarily rail coal shipments destined for the power plant in Becker, Minnesota. Additional origins of freight moving to the district include the Twin Cities

Metro Area, other Minnesota locations, and other locations in the Upper Midwest such as Wausau, Wisconsin, Des Moines, Iowa and Bismarck, North Dakota. **Exhibit 14** lists the top 10 origins of freight moving to the region by value. Again, the Twin Cities is the largest origin, with the Los Angeles, New York, and Seattle areas and the Upper Midwest also representing significant import value.

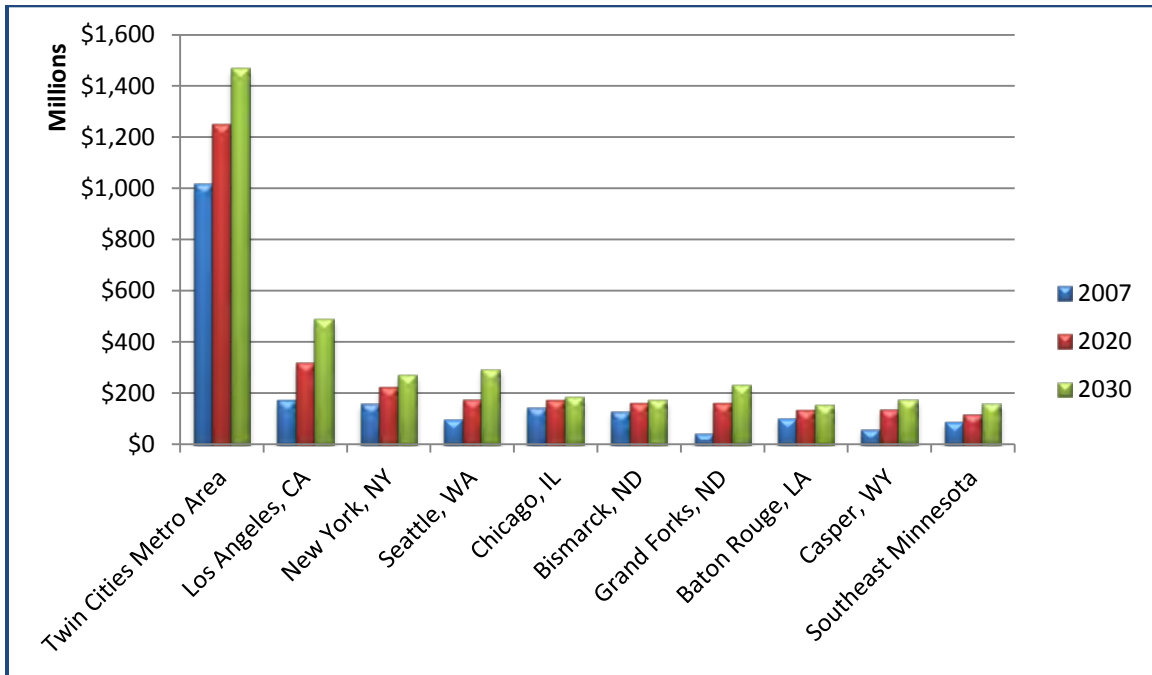
Exhibit 15 lists the top 10 destinations of freight tonnage originating in Central Minnesota. The Twin Cities Metro Area receives the most amount of freight tonnage from Central Minnesota, with other areas in Minnesota and the Midwest also receiving notable tonnage. **Exhibit 16** lists the top 10 freight destinations by value. The Twin Cities Metro Area is the largest destination by value, with Los Angeles, New York, Washington, DC and Philadelphia also receiving notable freight value from Central Minnesota.

Exhibit 13: Regional Import Markets by Tonnage



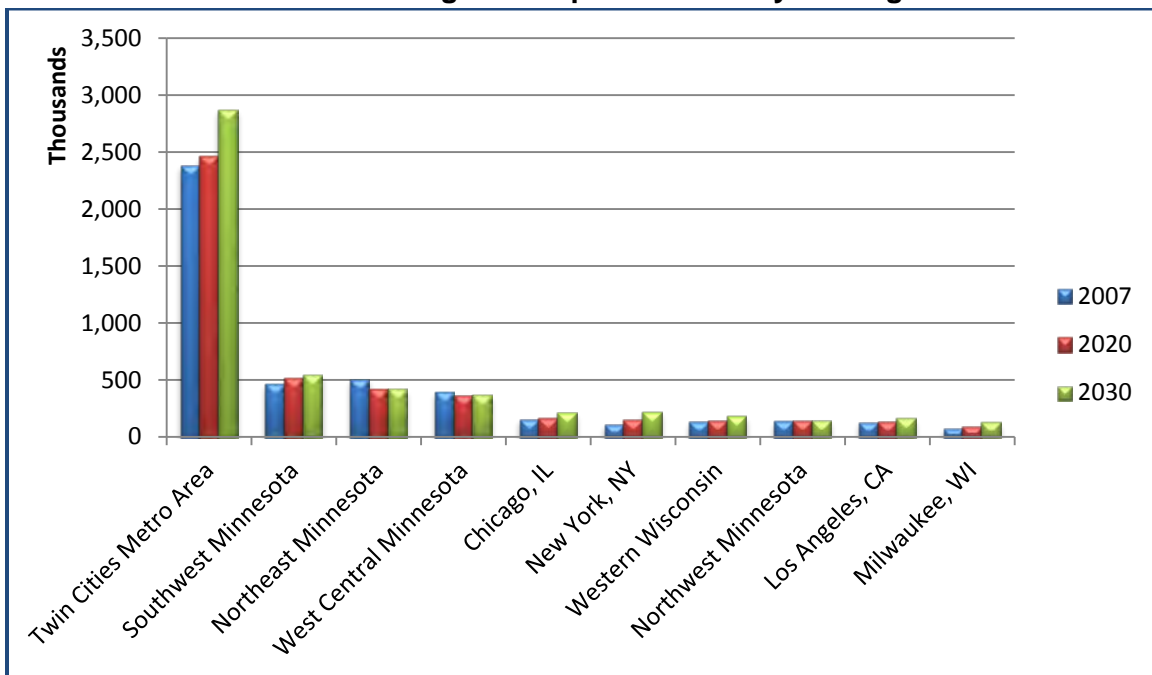
Source: TRANSEARCH®

Exhibit 14: Regional Import Markets by Value

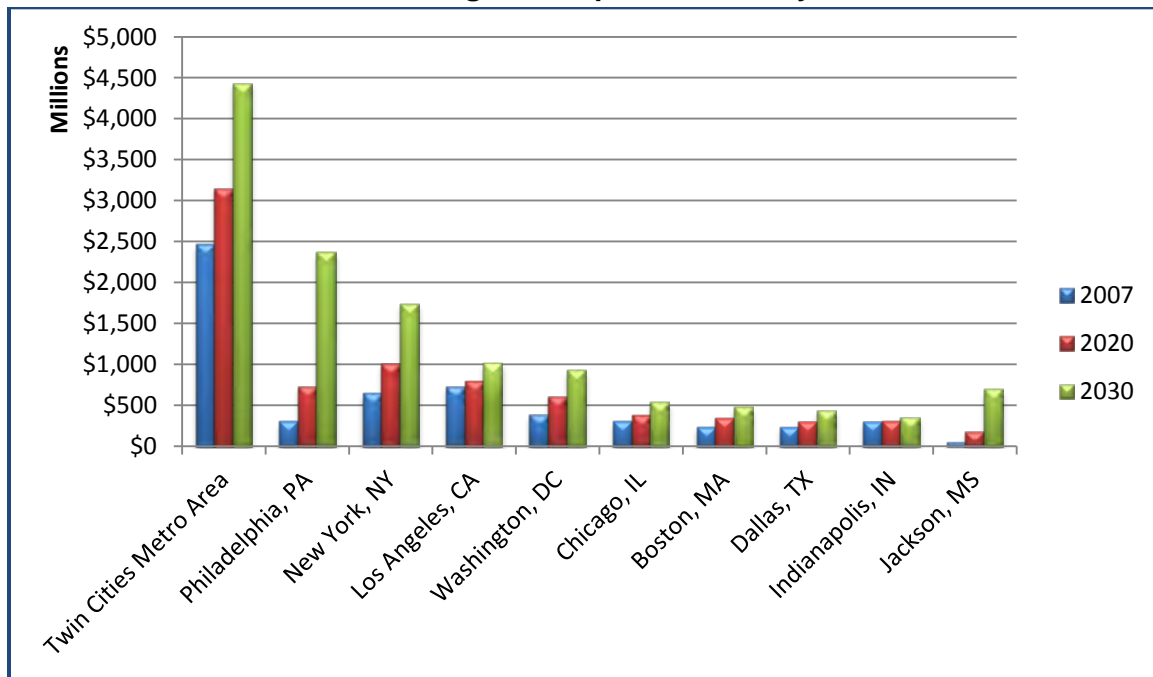


Source: TRANSEARCH®

Exhibit 15: Regional Export Markets by Tonnage



Source: TRANSEARCH®

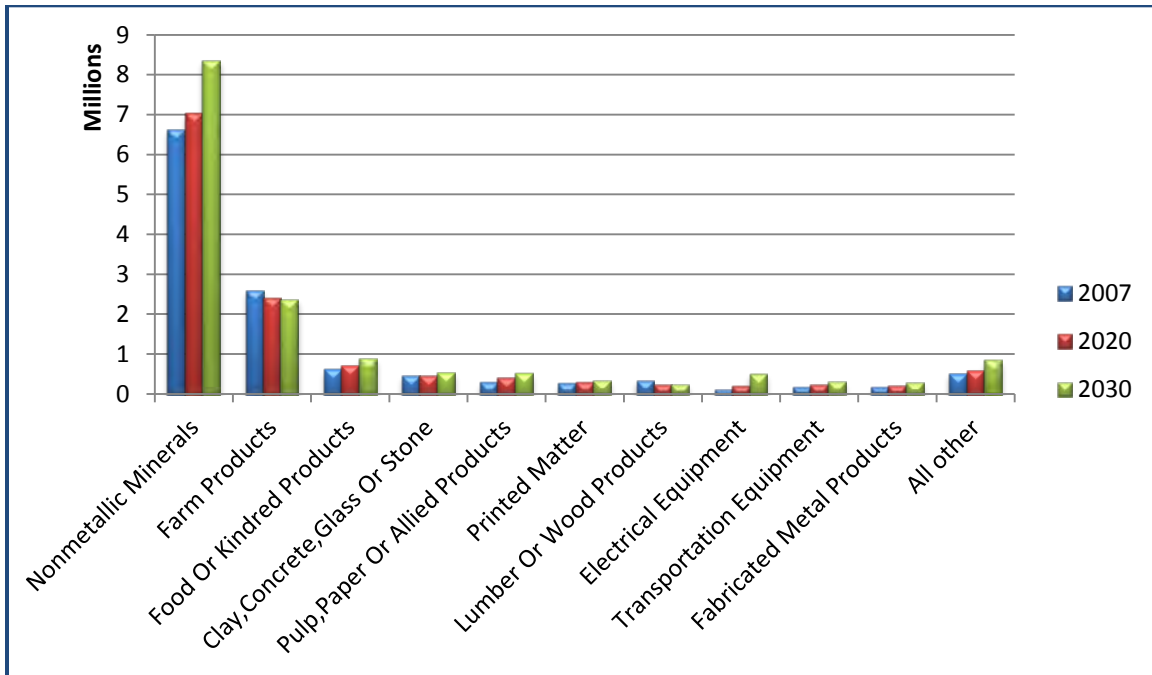
Exhibit 16: Regional Export Markets by ValueSource: TRANSEARCH[®]

3.2 Key Originating Commodities

The largest commodities originating in Central Minnesota by tonnage are *Nonmetallic Minerals* and *Farm Products*, which together make up 75 percent of outbound tonnage. Included in the *Nonmetallic Minerals* group are products such as sand and gravel (including crushed granite), broken stone, riprap and dimension quarry stone. Most of this tonnage moves by truck, but a portion includes rock ballast quarried near Waite Park that moves by rail to locations throughout the U.S. The *Farm Products* group consists primarily of grain, field crops, nuts and seeds. Global Insight projections suggest moderate growth in *Nonmetallic Minerals* tonnage through 2030, while tonnage will remain fairly stable for most other commodities. Another notable commodity producing heavy outbound freight tonnage in the region is the *Food or Kindred Products* group, consisting primarily of soft drinks. **Exhibit 17** lists the top 10 commodities originating in Central Minnesota.

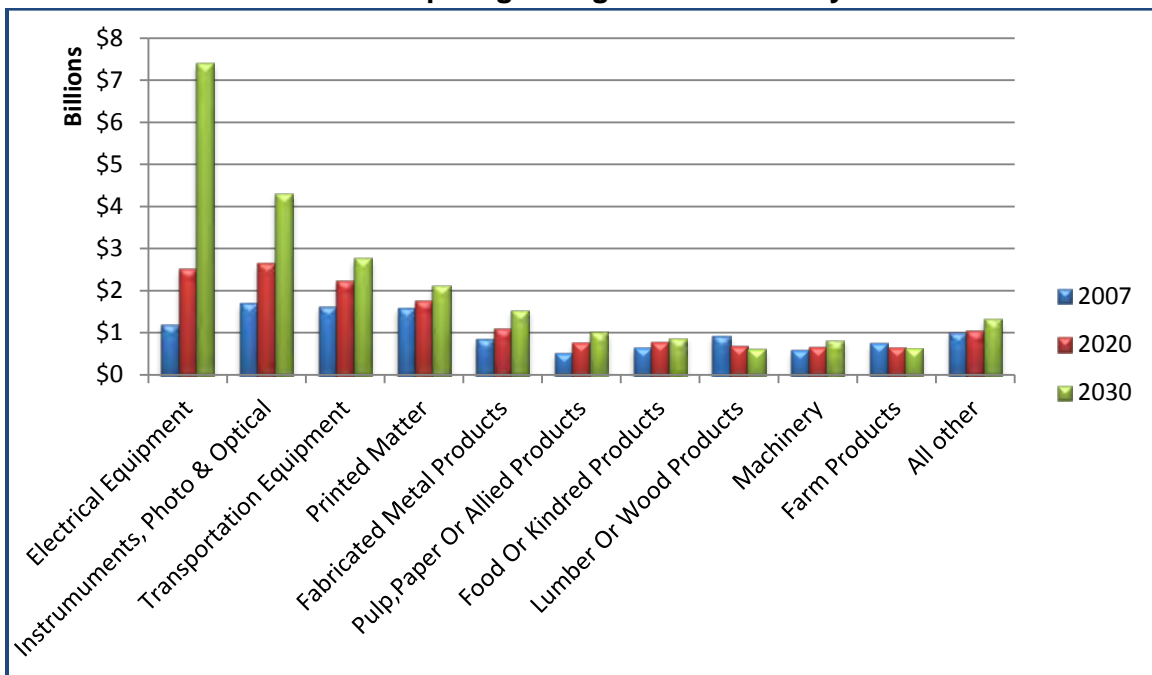
The largest commodities originating in Central Minnesota by value are *Electrical Equipment*, *Instruments*, *Photo and Optical Equipment*, *Transportation Equipment* and *Printed Matter*. The data indicates that *Electrical Equipment* value is expected to grow substantially by 2030. Products included in this group are telephones, refrigerators, appliances, and lighting. *Instruments*, *Photo and Optical Equipment* is also expected to experience moderate growth, and these products include surgical, medical and orthopedic equipment. **Exhibit 18** lists the top 10 commodities originating in Central Minnesota by value.

Exhibit 17: Top Originating Commodities by Tonnage



Source: TRANSEARCH®

Exhibit 18: Top Originating Commodities by Value



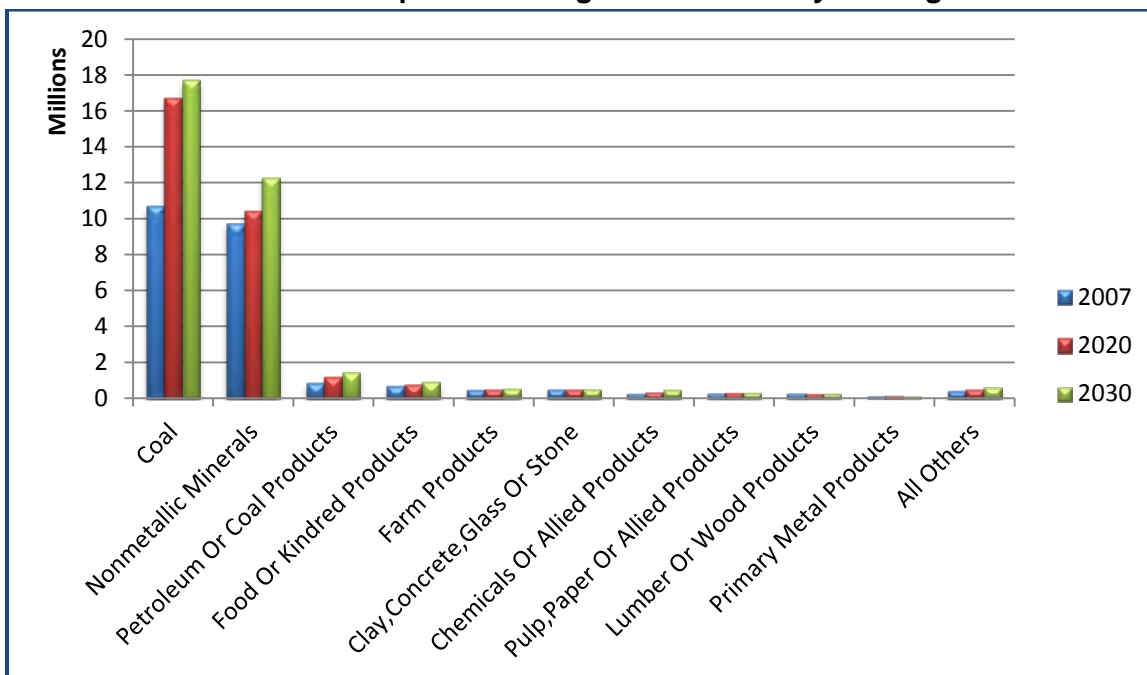
Source: TRANSEARCH®

3.4 Key Terminating Commodities

The largest commodity terminating in Central Minnesota by tonnage is *Coal*. These are mostly rail movements from the Power River Basin in Wyoming and Montana destined for the coal-fired power plant in Becker, MN. The *Nonmetallic Minerals* commodity group also generates significant tonnage. Products included in this commodity group included rip rap, sand and gravel. Much of this *Nonmetallic Minerals* terminating tonnage results from local truck movements that both originates and terminates within Central Minnesota. **Exhibit 19** lists the top 10 terminating commodities by tonnage.

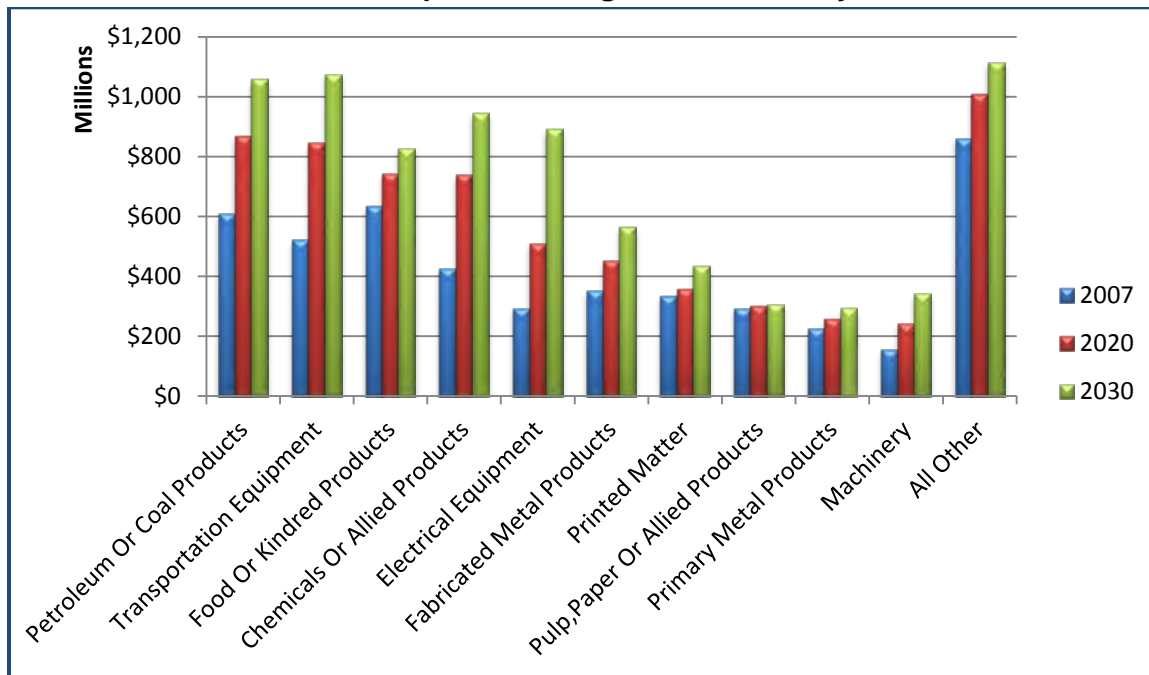
The largest commodities terminating in Central Minnesota by value are *Petroleum or Coal Products*, *Transportation Equipment*, and *Food or Kindred Products*. The *Petroleum or Coal Products* commodity group consists primarily of petroleum refining products. The *Transportation Equipment* group consists of parts for buses, boats and trailers. The *Food or Kindred Products* group consists mainly of soybean oil and cheese. **Exhibit 20** lists the top 10 commodities terminating in Central Minnesota by value.

Exhibit 19: Top Terminating Commodities by Tonnage



Source: TRANSEARCH®

Exhibit 20: Top Terminating Commodities by Value

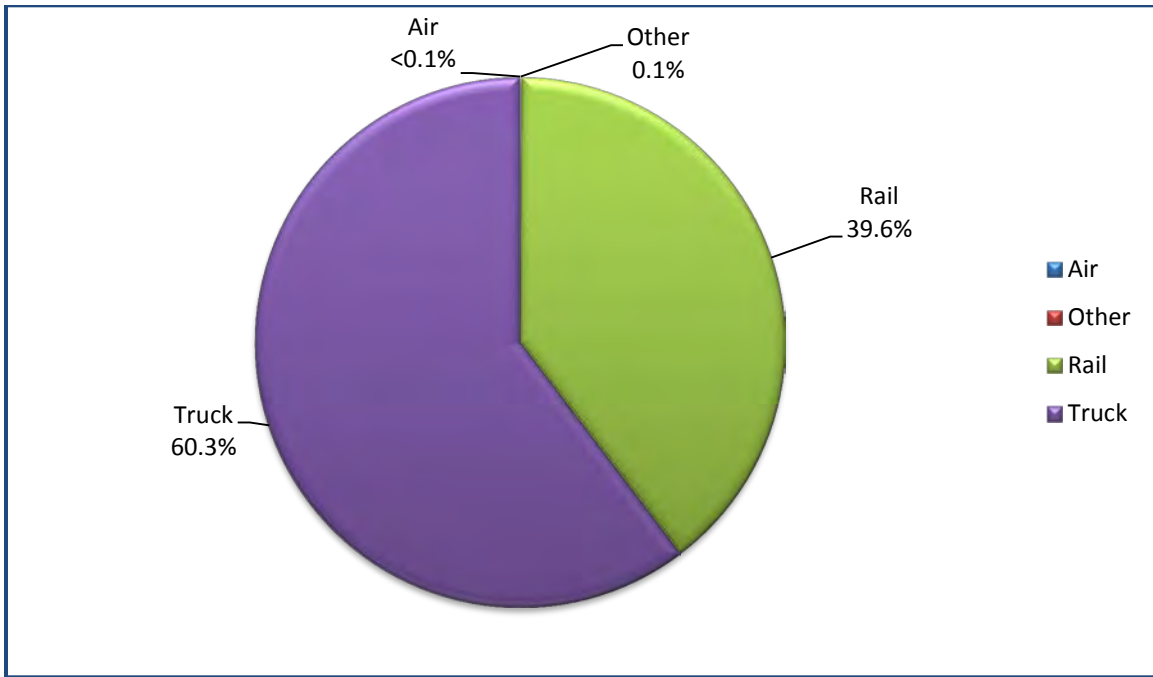


Source: TRANSEARCH®

3.4 Modal Split

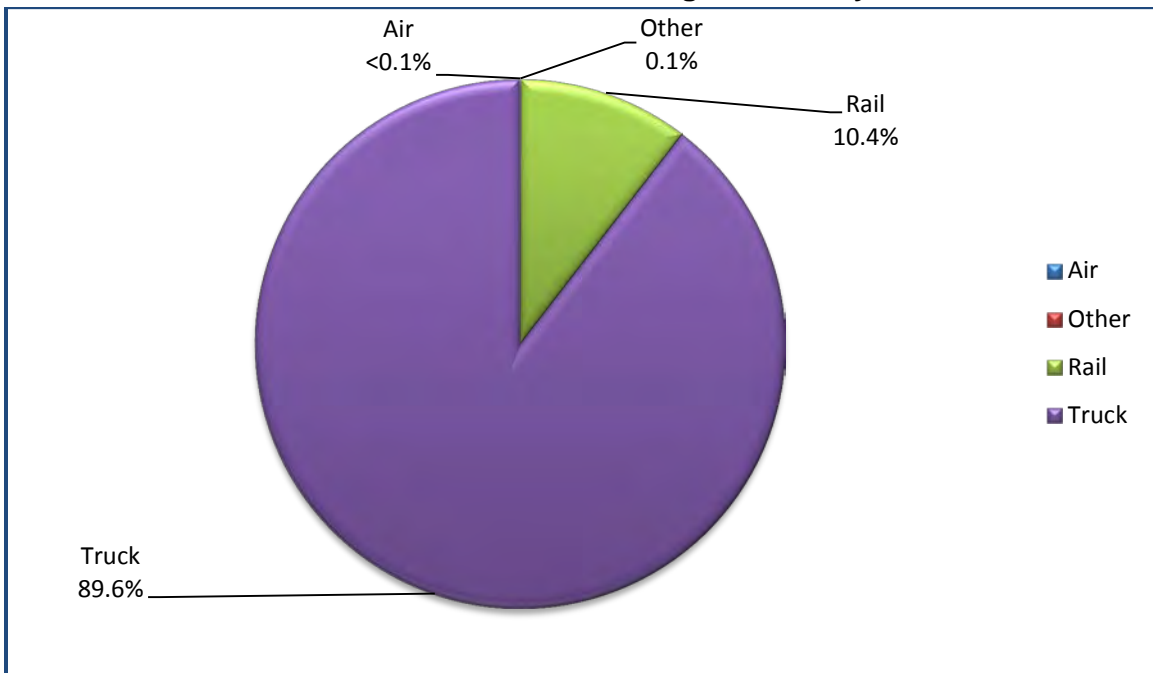
Trucking has the largest share of total originating and terminating tonnage in Central Minnesota. Trucks handled 60 percent of freight tonnage and 90 percent of freight value in the region in 2007. Rail also handled a significant amount of freight, with air and other modes handling much smaller tonnage and value. Waterways carried no freight in Central Minnesota because there are no waterway terminals in the region. **Exhibit 21** shows the 2007 modal split of inbound, outbound and local freight tonnage in Central Minnesota, and **Exhibit 22** shows this modal split by value.

Exhibit 21: Central Minnesota Freight Modes by Tonnage



Source: TRANSEARCH®

Exhibit 22: Central Minnesota Freight Modes by Value



Source: TRANSEARCH®

Trucking has a larger share of total freight tonnage in Central Minnesota than it does statewide. Rail's tonnage share in the region is comparable to that of Minnesota as a whole. **Exhibit 23** compares the 2007 modal split of freight tonnage and value in the region to that of the

Minnesota. There are several freight rail lines and highways in Central Minnesota that have significant volumes of through freight which this analysis does not capture. Data limitations prevent this analysis from including through freight movements at the regional level. This limitation results in underreporting of modal freight tonnage and value.

Exhibit 23: Regional Mode Comparison (2007)

	Tonnage		Value	
	Central MN	Minnesota	Central MN	Minnesota
Truck	60.3%	49.3%	89.6%	79.6%
Rail	39.6%	38.2%	10.4%	19.3%
Water	0.0%	5.9%	0.0%	0.5%
Air	<0.1%	<0.1%	<0.1%	0.5%
Other	0.1%	6.6%	0.1%	<0.1%

Source: TRANSEARCH[®]

Each mode offers a unique set of costs and benefits that appeal to different commodities. Goods carried by truck tend to have higher value-to-weight ratios than rail and water. Therefore, trucking carries a higher percent of value of freight shipped in the region than it does tonnage. Air cargo transports the highest value to weight ratio of all modes. These low weight, high value goods are extremely time sensitive and benefit from the added cost to utilize one of the fastest and most expensive modes of transport. Rail tends to transport heavier goods that are less time-sensitive than those shipped by air and truck, though these goods may also be high in value. Waterways carry the least time-sensitive goods, and are typically bulk goods. Other modes such as pipelines tend to ship specific commodities of varying value-to-weight ratios. **Exhibit 24** lists the top originating and terminating commodities by mode in Central Minnesota.

Exhibit 24: Top Originating and Terminating Commodity Tonnage by Mode (2007)

Mode	Originating Commodity	Terminating Commodity
Truck	Nonmetallic Minerals	Nonmetallic Minerals
	Farm Products	Petroleum Or Coal Products
	Food Or Kindred Products	Food Or Kindred Products
	Clay, Concrete, Glass Or Stone	Farm Products
	Lumber Or Wood Products	Clay, Concrete, Glass Or Stone
Rail	Pulp, Paper Or Allied Products	Coal
	Waste Or Scrap Materials	Clay, Concrete, Glass Or Stone
	Lumber Or Wood Products	Pulp, Paper Or Allied Products
	Transportation Equipment	Chemicals Or Allied Products
	Food Or Kindred Products	Lumber Or Wood Products
Air	Misc Mixed Shipments	Misc Mixed Shipments
		Machinery
		Farm Products
		Mail Or Contract Traffic

Source: TRANSEARCH®

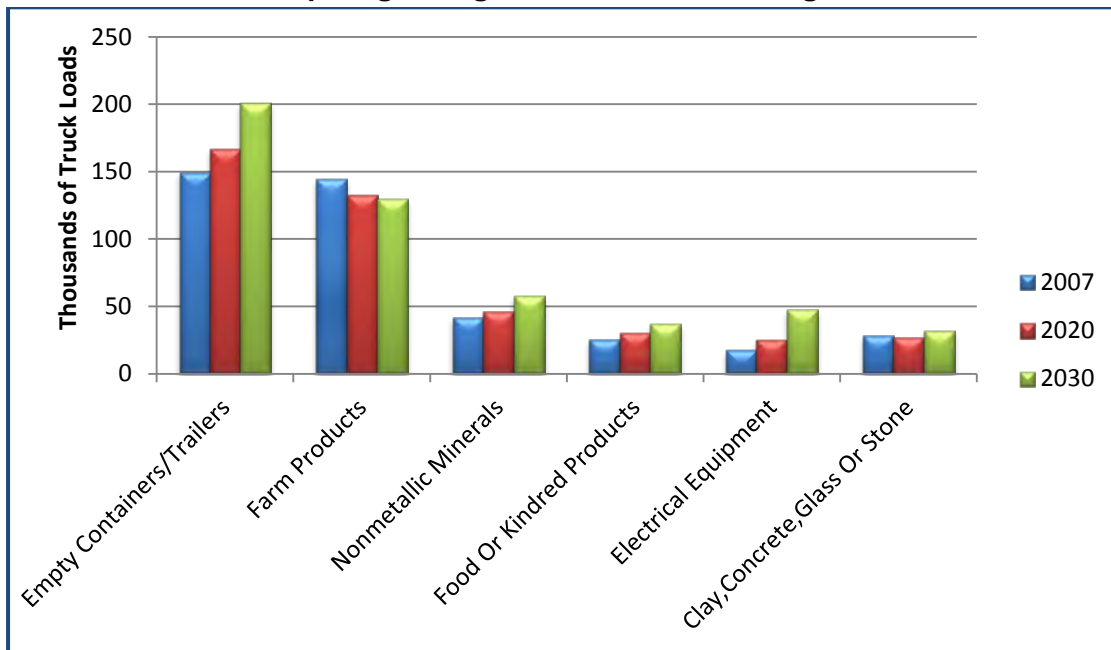
3.5 Trucking

In 2007, trucks moved over 18 million tons of freight moved to, from, and within the Twin Cities Metro Area. The percent of all freight tonnage in the region that moves by truck is significantly higher than the percentage of statewide freight tonnage that moves by truck. The value of freight moving by truck as a percentage of all freight modes is also above the average for the state. **Exhibit 25** lists *Nonmetallic Minerals*, *Farm Products*, *Food or Kindred Products*, *Clay, Concrete, Glass or Stone* and *Lumber or Wood Products* as major commodities by tonnage.

Tonnage and value are good measures of overall product flow in the region. Truck loads are a measure of the number of trucks moving on roadways, and are more directly related to roadway capacity and the amount of space that trucks utilize.

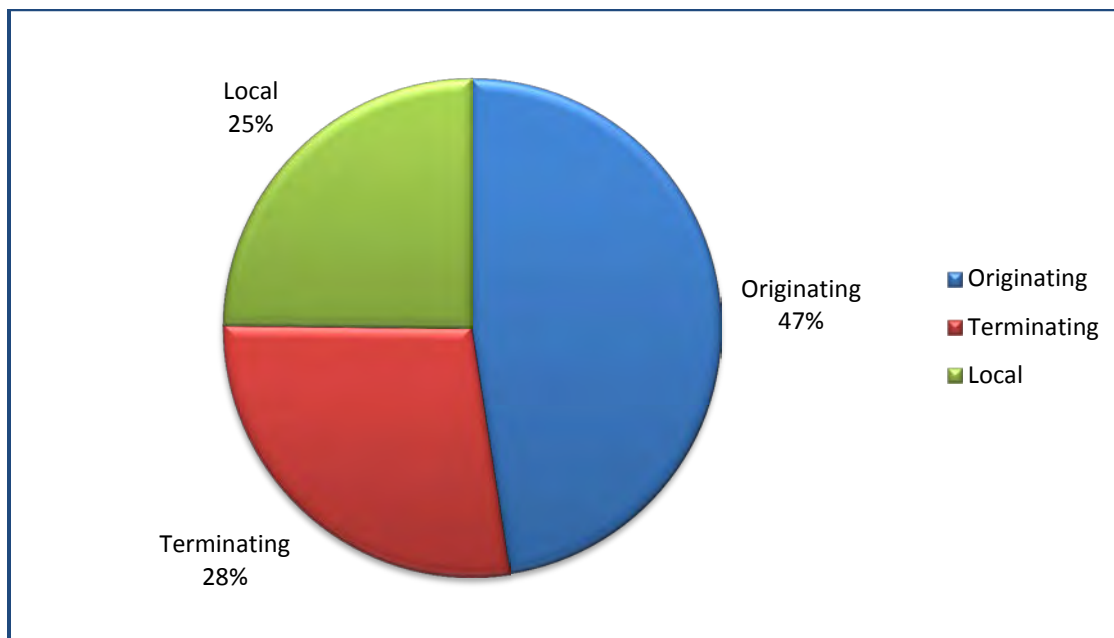
Exhibit 26 indicates the originating, terminating, and local distribution of truck freight movements in Central Minnesota by truck loads. Most truck loads moving to, from, and within the region are originating truck movements. There is also a significant portion of terminating and local truck load movements in the region.

Exhibit 25: Top Originating Truck Load Generating Commodities



Source: TRANSEARCH®

Exhibit 26: Distribution of Truck Loads



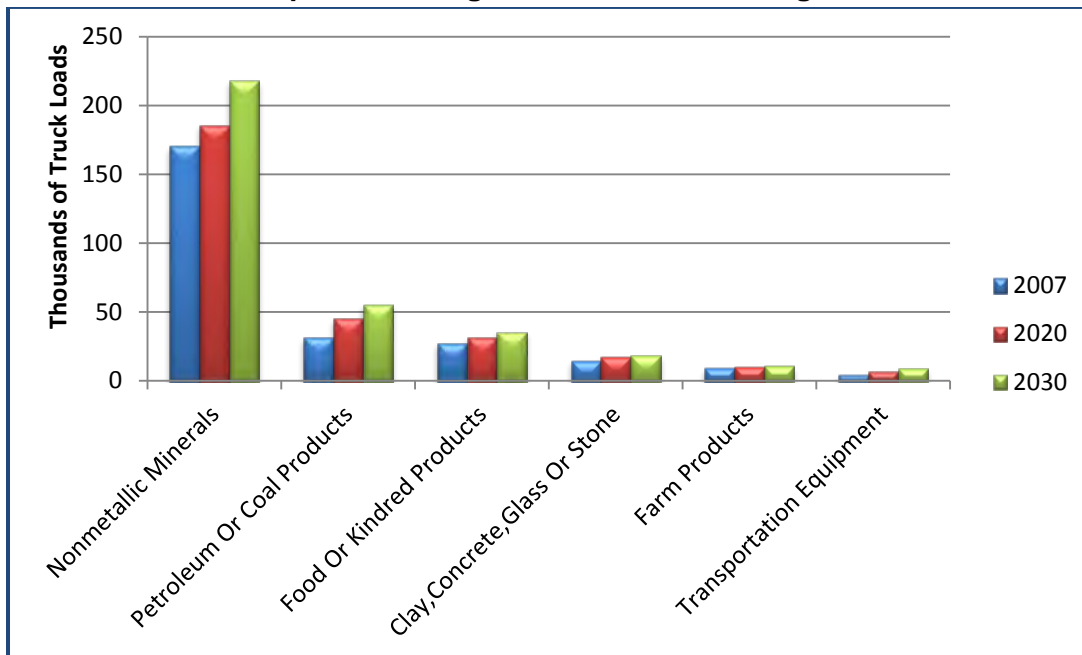
Source: TRANSEARCH®

In 2007, over 1 million trucks moved to, from, and within Central Minnesota. This Exhibit does not include through truck movements that pass through the region. **Exhibit 27** breaks down originating truck movements by empty moves and the top commodities by truck loads. Empty truck moves represent a significant portion of originating truck loads, and represent more loads than any other commodity group. *Farm Products*, *Nonmetallic Minerals* and *Food or Kindred Products* are major originating commodities. Many of these truck loads are destined for locations within Minnesota and the Upper Midwest, and New York is also a major destination.

Thirty-one percent of local, originating, and terminating truck loads in Central Minnesota are empty moves.

Exhibit 28 identifies the top commodities by truck loads that terminate in the region. *Nonmetallic Minerals, Petroleum or Coal Products, and Food or Kindred Products* are major commodities terminating in the region. Most of these truck loads originate at locations within Minnesota and the Upper Midwest and Chicago, though Los Angeles and New Orleans also send a significant number of truck loads to the region.

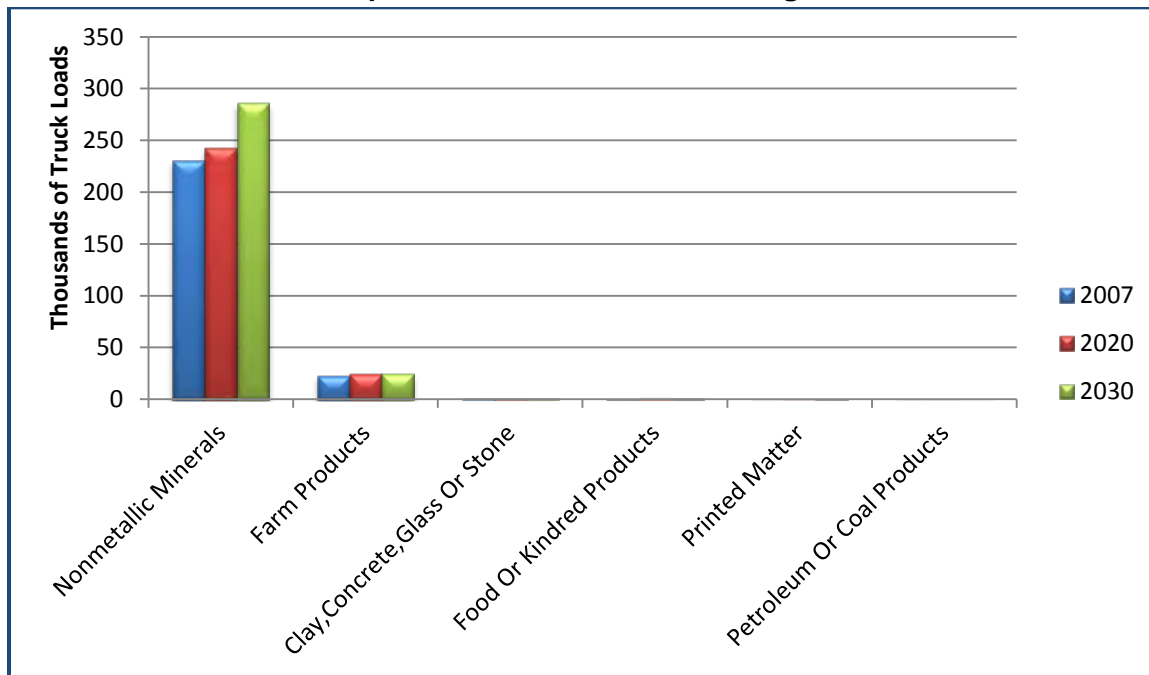
Exhibit 27: Top Terminating Truck Load Generating Commodities



Source: TRANSEARCH®

Exhibit 28 identifies the top local truck commodities by truck loads. *Nonmetallic Minerals, Farm products, Clay, Concrete, Glass or Stone, Food or Kindred Products, Printed Matter and Petroleum or Coal Products* are major commodities moving locally within the region.

Exhibit 28: Top Local Truck Load Generating Commodities



Source: TRANSEARCH[®]

3.5.1 Truck Traffic Trends

The map in **Exhibit 29** provides information collected by the Minnesota Department of Transportation and indicates the average number of heavy commercial vehicles traveling on highway segments per day in the year 2008. The most significant corridors in Central Minnesota are the Interstate 94 Corridor, the US 10 Corridor, and the US 169 Corridor. Interstate 94 between Clearwater and the Twin Cities carries the most truck traffic in the region, and Interstate 94 from Clearwater to the west and US 10 between St. Cloud and Clear Lake also receive high truck volumes. The US 71, MN 371 and MN 23 Corridors are additional routes with significant amounts of truck traffic.

Exhibit 30 displays annual truck tons for 2007 for the Central Minnesota Region. **Exhibit 31** shows projected truck tonnage growth between 2007 and 2030.

Exhibit 29: Truck Counts (Annual Average Daily Trucks), 2008

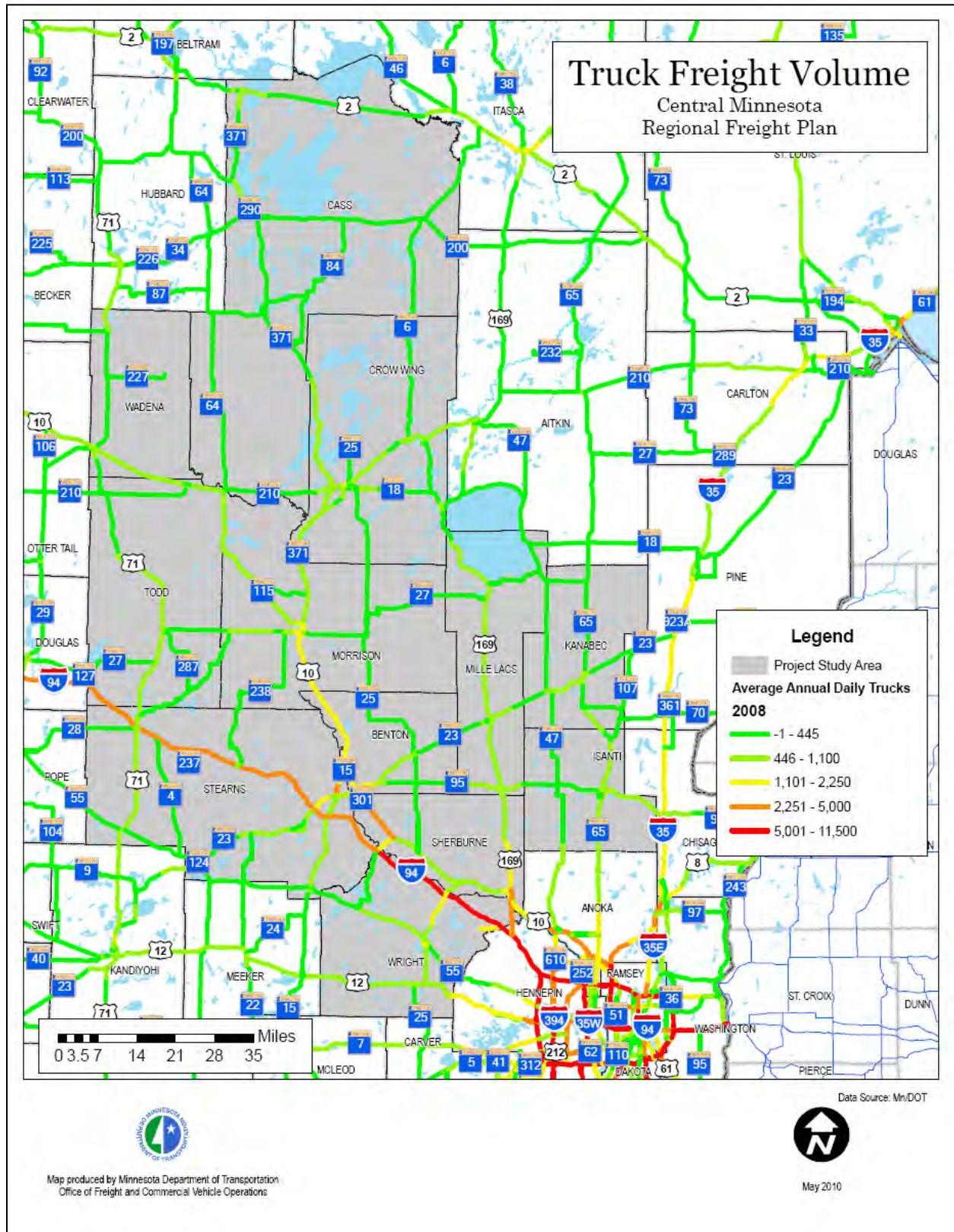


Exhibit 30: Annual Truck Tonnage, 2007

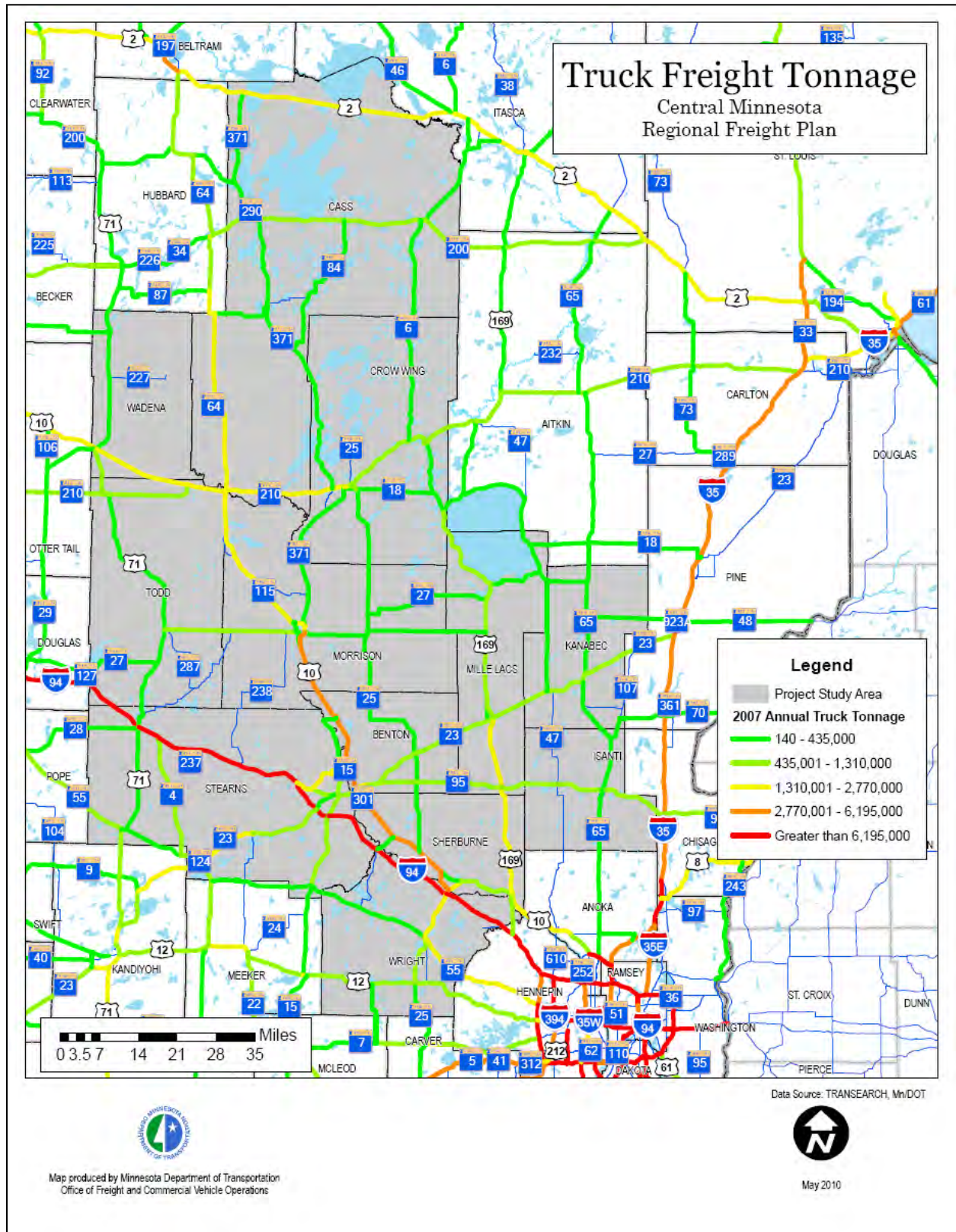
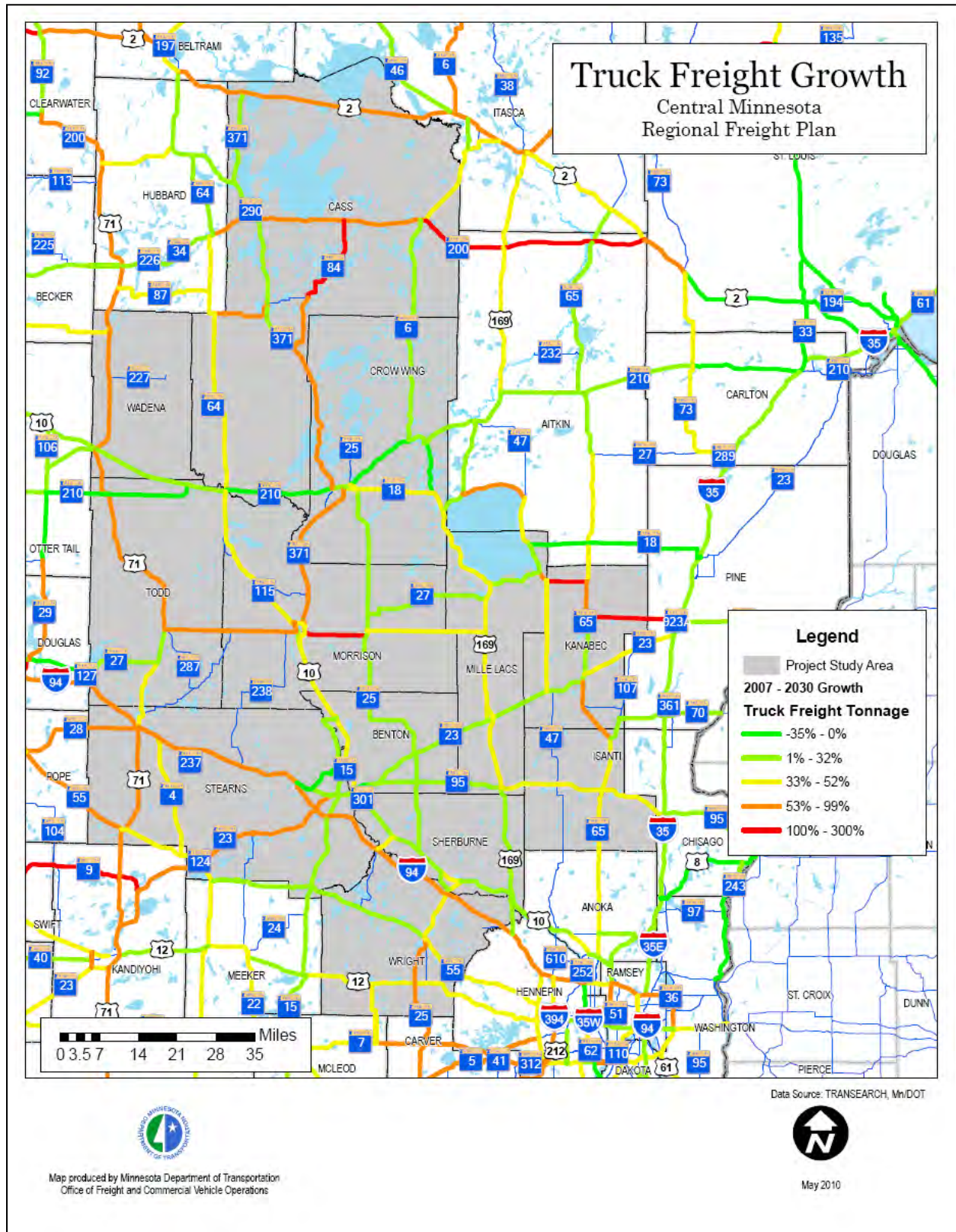


Exhibit 31: Projected Truck Freight Tonnage Growth, 2007-2030



3.6 Rail Freight

The Central Minnesota Region is home to the state's largest coal fired electric generation plant. Excel Energy's Sherburne County (Sherco) generating station, comprised of three power plants, has the capacity to generate 2,400 megawatts of electricity and consumes 30,000 tons or three unit trains of coal each day. Low-sulfur coal from Wyoming and Montana arrives daily at the Sherco Station where it takes just three minutes to unload an entire coal car, and just six hours to unload an entire train.⁴

Exhibit 32 shows the distribution of rail commodities in the Central Minnesota Region, with 97% of all rail shipments by weight, as terminating trips.

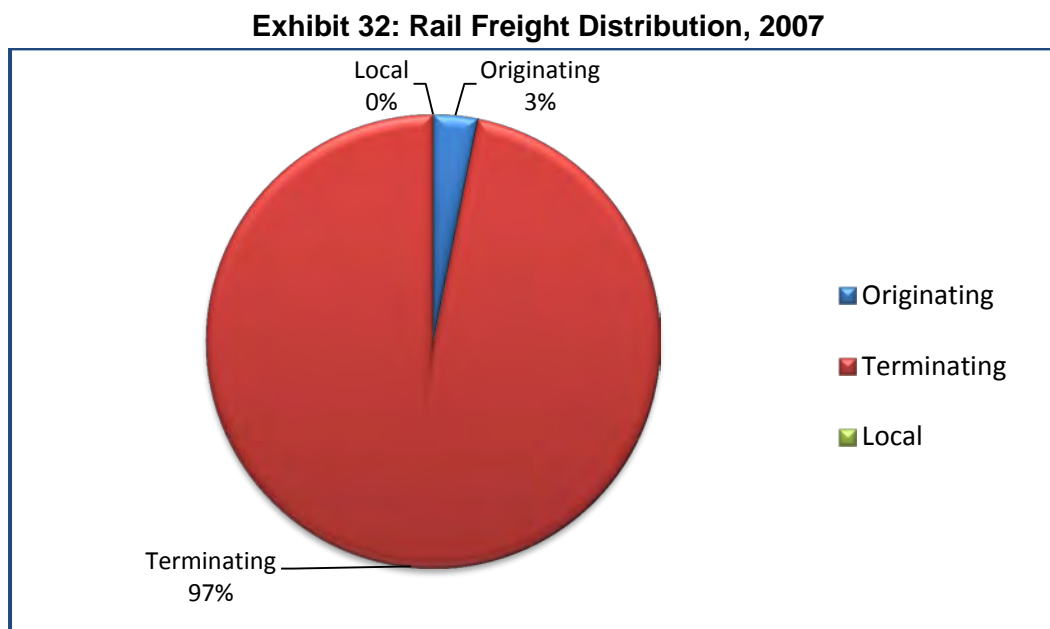


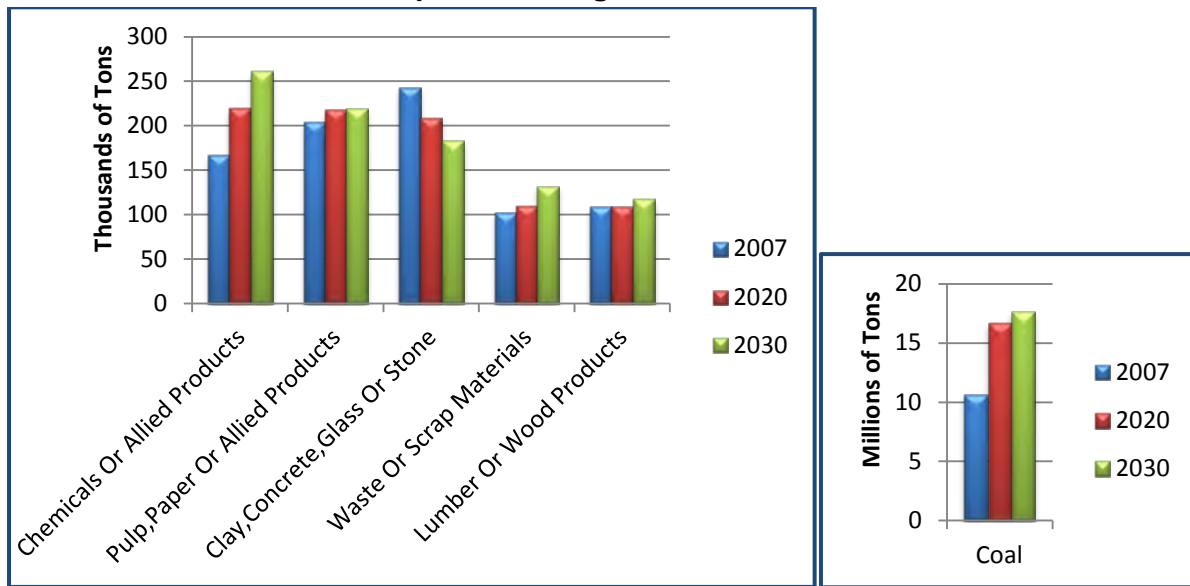
Exhibit 33 displays the rail commodities terminating by carload in the study region. Due to the overwhelming predominance of *Coal*, the graphic is shown in two-parts using different scales. In 2007, *Coal* accounted for more than 10 million tons of product moving in to the region by rail, while the next closest commodity group; *Clay, Concrete, Glass or Stone* accounting for just under 250 thousand tons, followed by *Paper or Allied Products* (approximately 200 thousand tons), and *Chemicals or Allied Products* accounting for just over 150 thousand tons. By 2030 *Chemicals or Allied Products* are projected to surpass all other terminating rail commodities by tonnage, with the exception of *Coal*.

Exhibit 34 displays the top commodities originating by rail in the Central Minnesota Region. *Pulp, Paper or Allied Products* accounted for just under 200 thousand tons in 2007, with volume projected to more than double by 2030. The next closest commodity group is *Waste or Scrap Materials* at approximately 70 thousand tons, with little project growth through 2030.

Exhibits 35 and 36 present maps on subsequent showing current and projected commodity volumes by rail line in the Region.

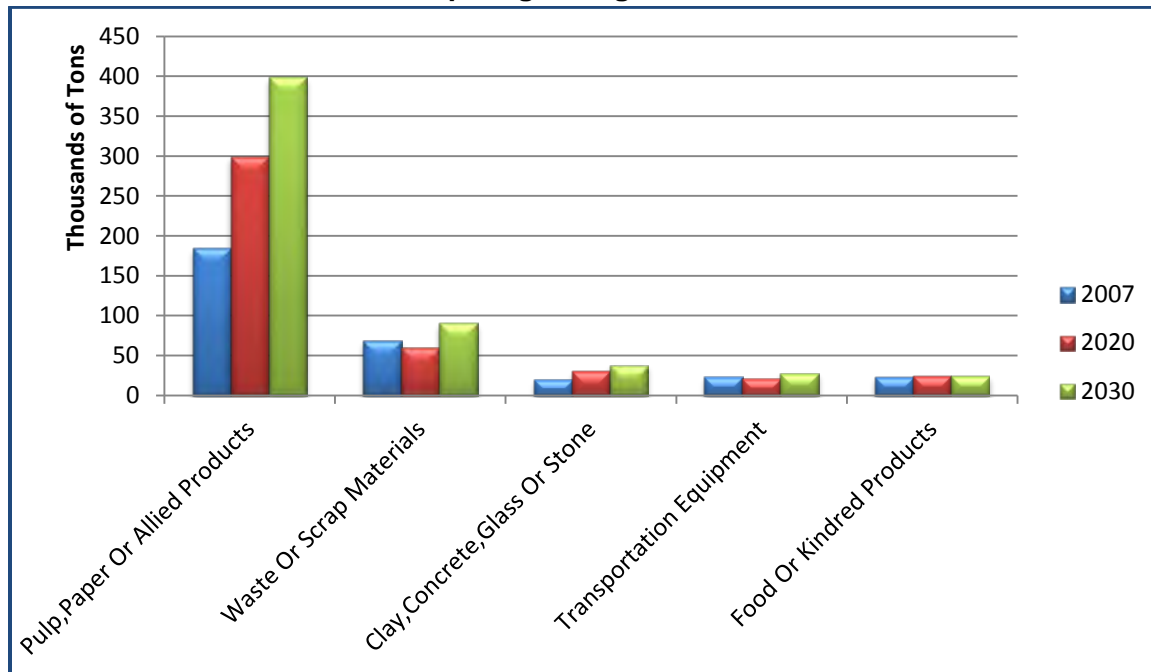
⁴ Information taken from Excel Energy website at: <http://www.xcelenergy.com/>

Exhibit 33: Top Terminating Rail Carload Commodities



Source: TRANSEARCH®

Exhibit 34: Top Originating Rail Carload Commodities



Source: TRANSEARCH®

Exhibit 35: Rail Freight Tonnage, 2007

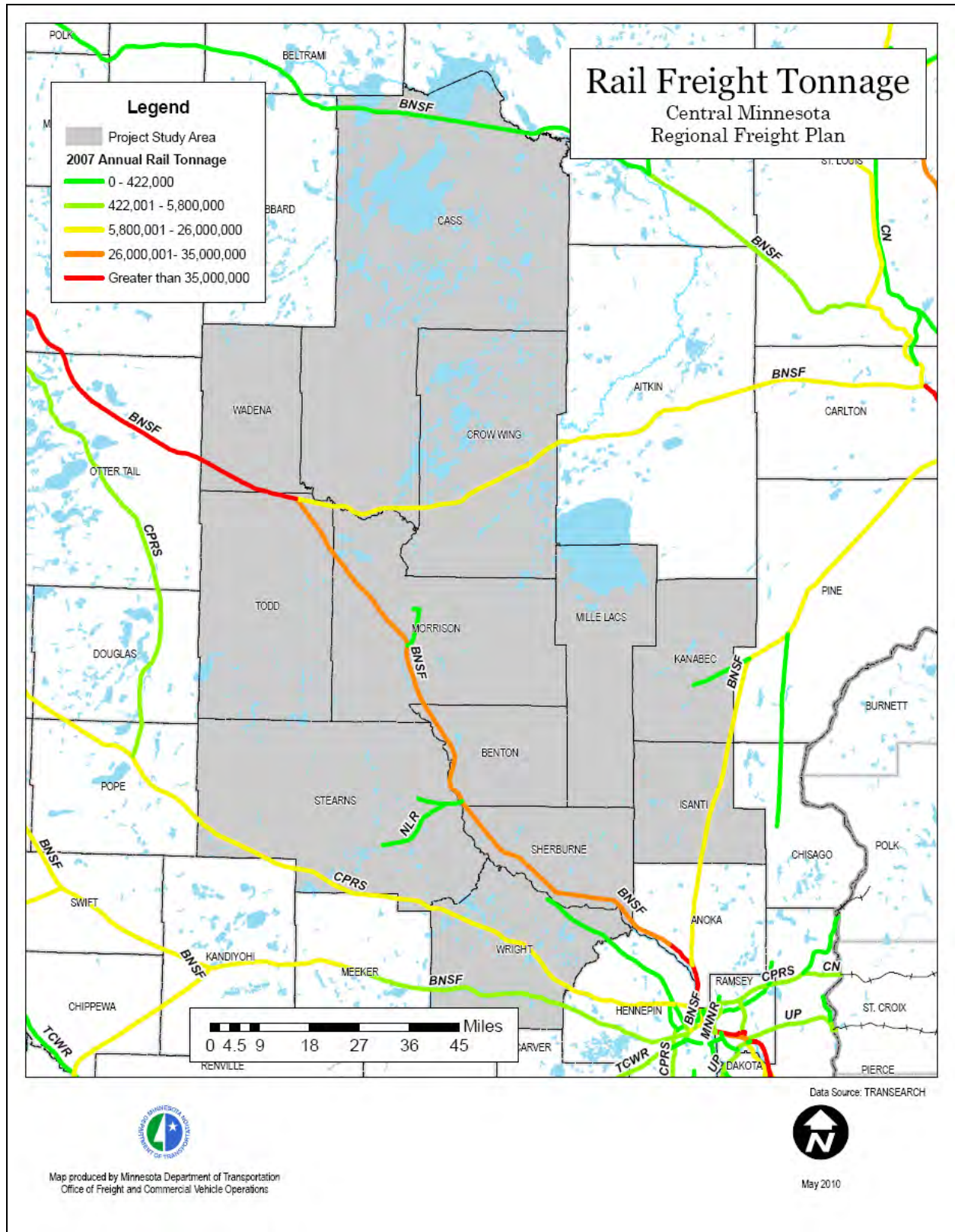
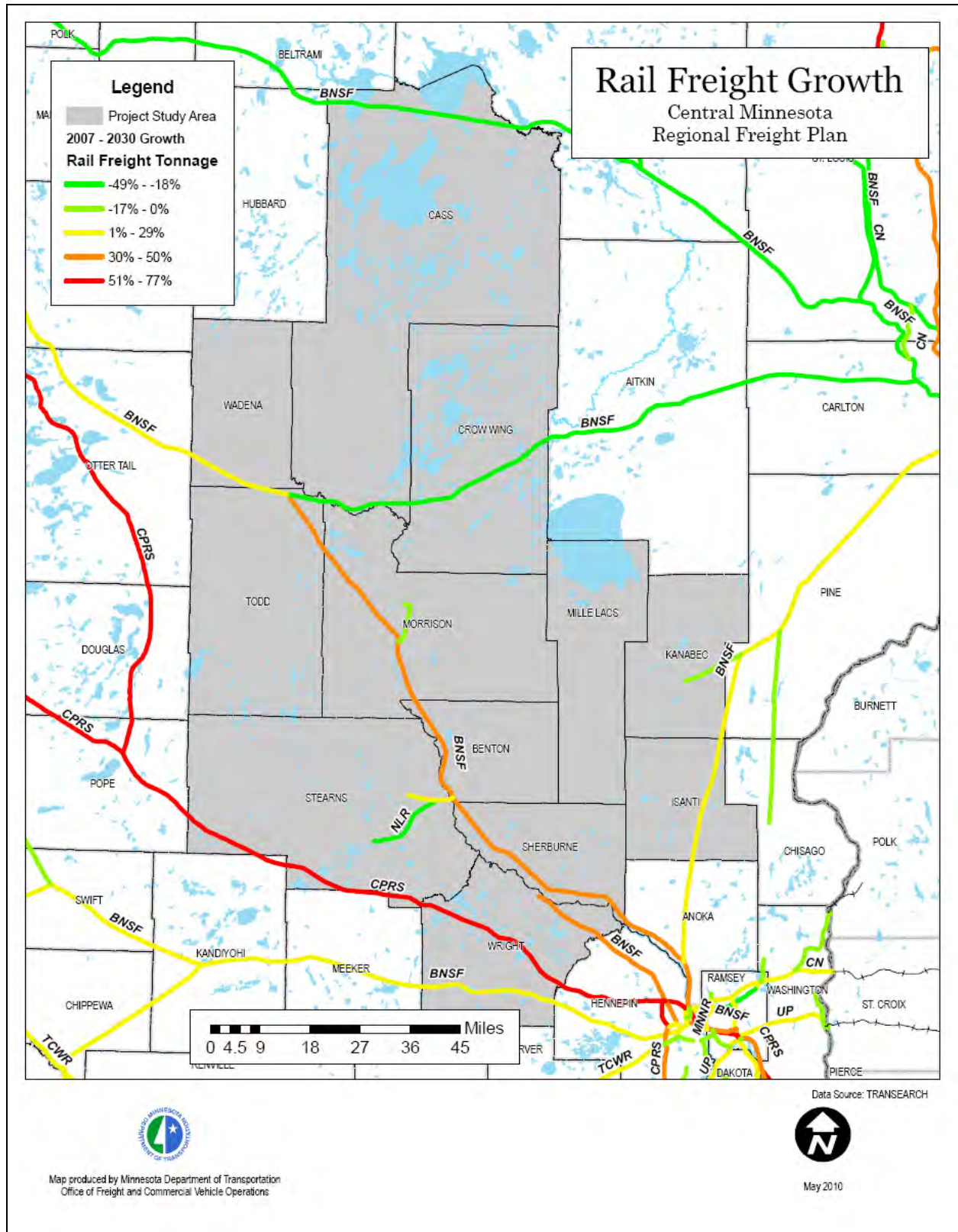


Exhibit 36: Projected Rail Tonnage Growth, 2007-2030

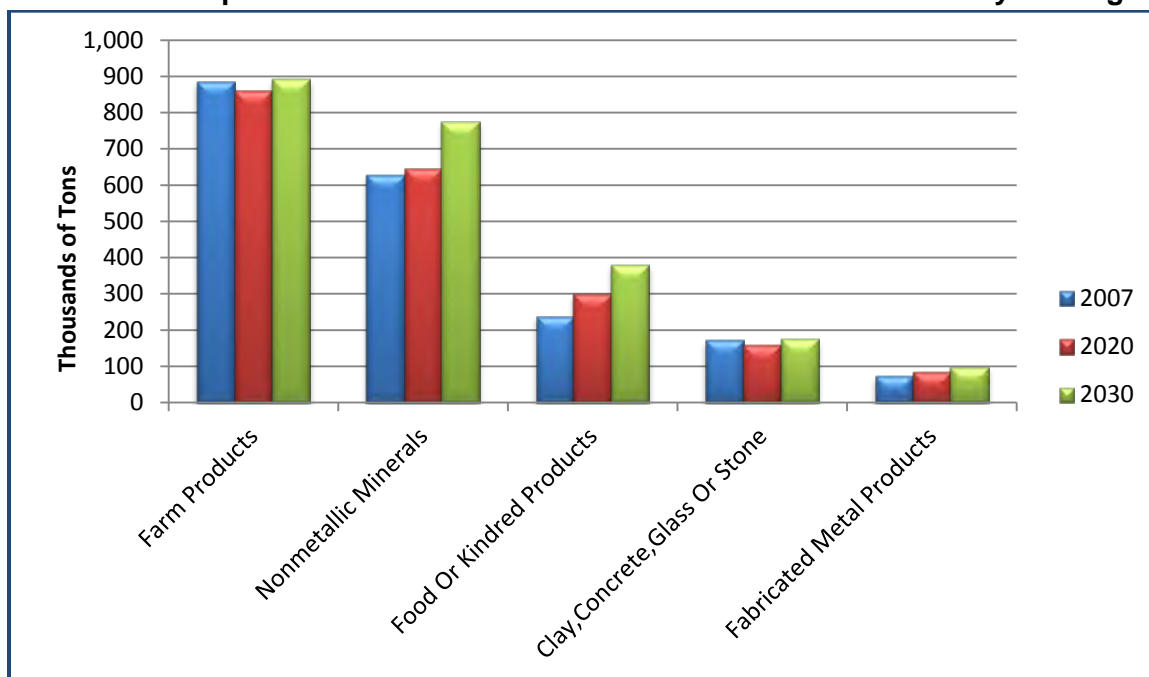


3.7 Trade with Twin Cities Metro Area

Nearly one million tons of freight moves from the Twin Cities in to Central Minnesota, while more than twice that volume moves from Central Minnesota to the Twin Cities. Ninety-three percent of freight by tonnage moving into the Region from the Twin Cities and 98 percent of freight tonnage to the Twin Cities from the Region moves by truck. The remaining tonnage is almost exclusively rail movements.

Exhibit 37 below displays the top commodities moving from the study region to the Twin Cities Metro Area (TCMA) by tonnage. *Farm Products* are the top commodity group totaling just under 900 thousand tons in 2007, however growth in this commodity group is projected to remain flat through 2030. The next largest commodity groups moving from the study area to the Twin Cities are *Non Metallic Minerals* and *Food or Kindred Products* both groups are projected to show moderate growth over the forecast period.

Exhibit 37: Top Commodities from Central Minnesota to Twin Cities by Tonnage



Source: TRANSEARCH®

Exhibit 38 displays the top commodities moving from Central Minnesota to the TCMA by value. *Printed Matter, Fabricated Metal Products* and *Instruments, Photo Equipment and Optical Equipment* are currently the three top commodity groups imported to the region by value from the TCMA. However, by 2030 *Electrical Equipment* is projected to surpass all other commodity groups moving in this direction, with the value of these movements increasing approximately five fold. *Instruments, Photo Equipment and Optical Equipment* is projected to move into second place by value.

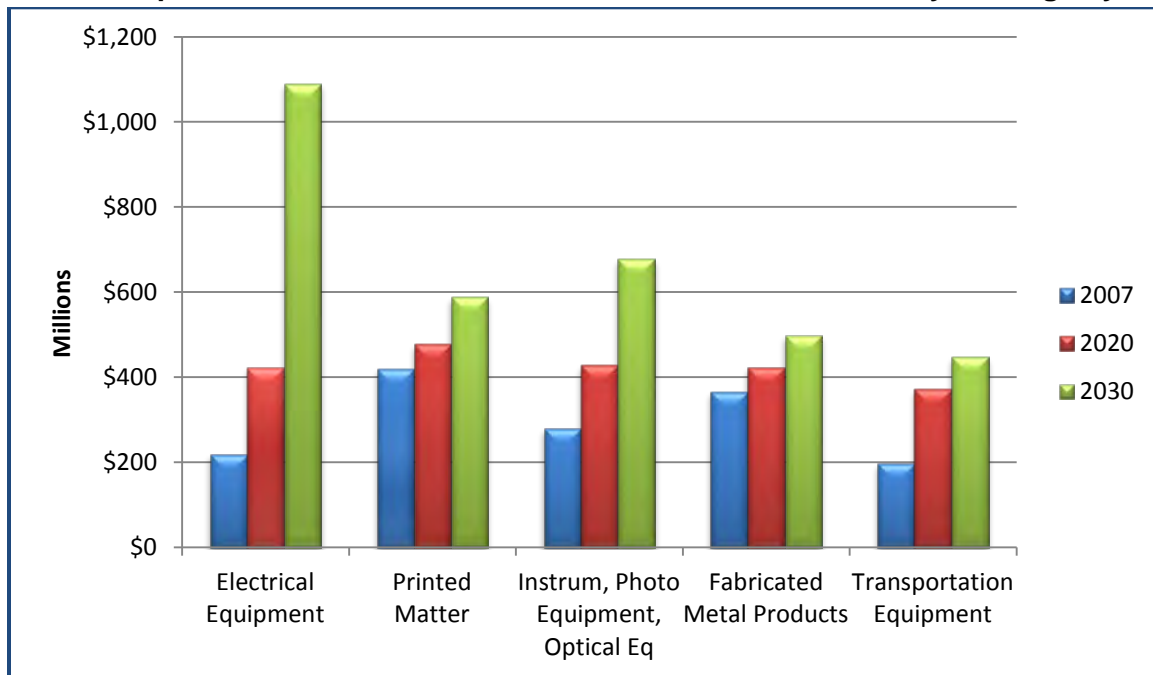
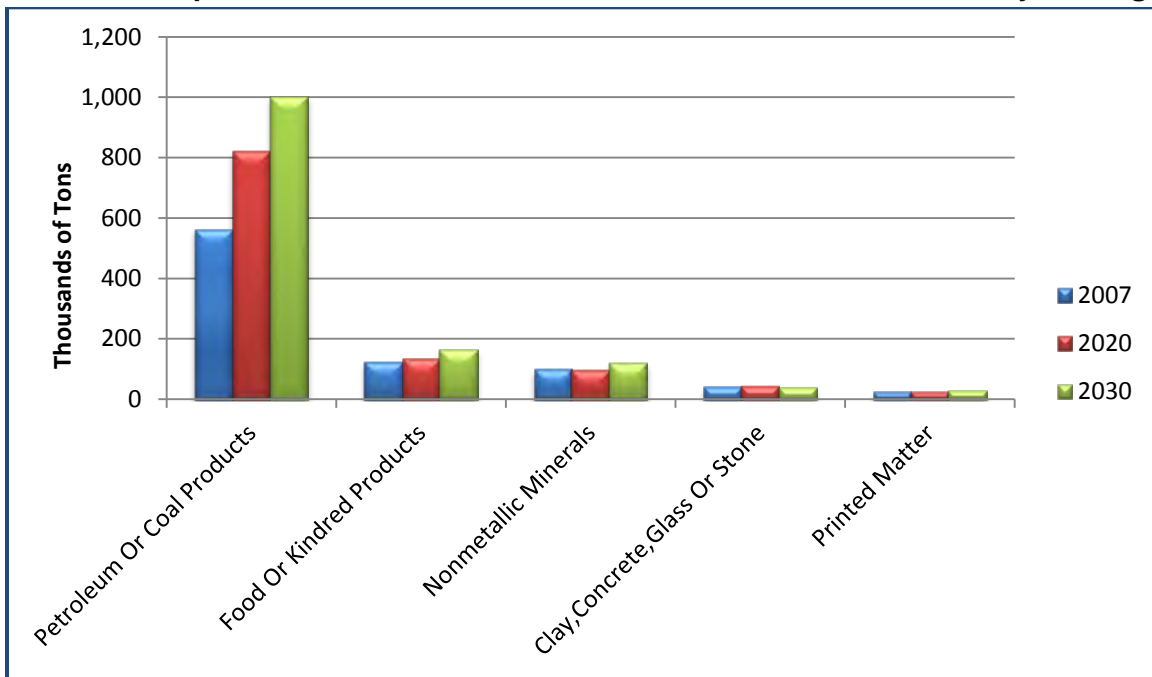
Exhibit 38: Top Commodities from Central Minnesota to Twin Cities by Tonnage by ValueSource: TRANSEARCH[®]

Exhibit 39 displays the top commodities moving into the study region from the TCMA by tonnage. *Petroleum or Coal Products* are the top commodity group totaling just under 600 thousand tons in 2007 with strong growth projected through 2030. The next largest commodity groups moving to the study area from the TCMA are *Food or Kindred Products* and *Nonmetallic Minerals* both groups are projected to show slow or no growth over the forecast period

Exhibit 40 displays the top commodities moving into the study region from the TCMA by value. Again, *Petroleum or Coal Products* are the top commodity group totaling just over \$400 dollars in value for 2007. Unlike *Coal* moving into the Region by rail from beyond Minnesota, it is likely that movements in this commodity group from the TCMA are likely fuels such as gasoline, diesel and heating oil. *Printed Matter* and *Fabricated Metal Products* are the next most valued commodity groups moving from the Region to the TCMA.

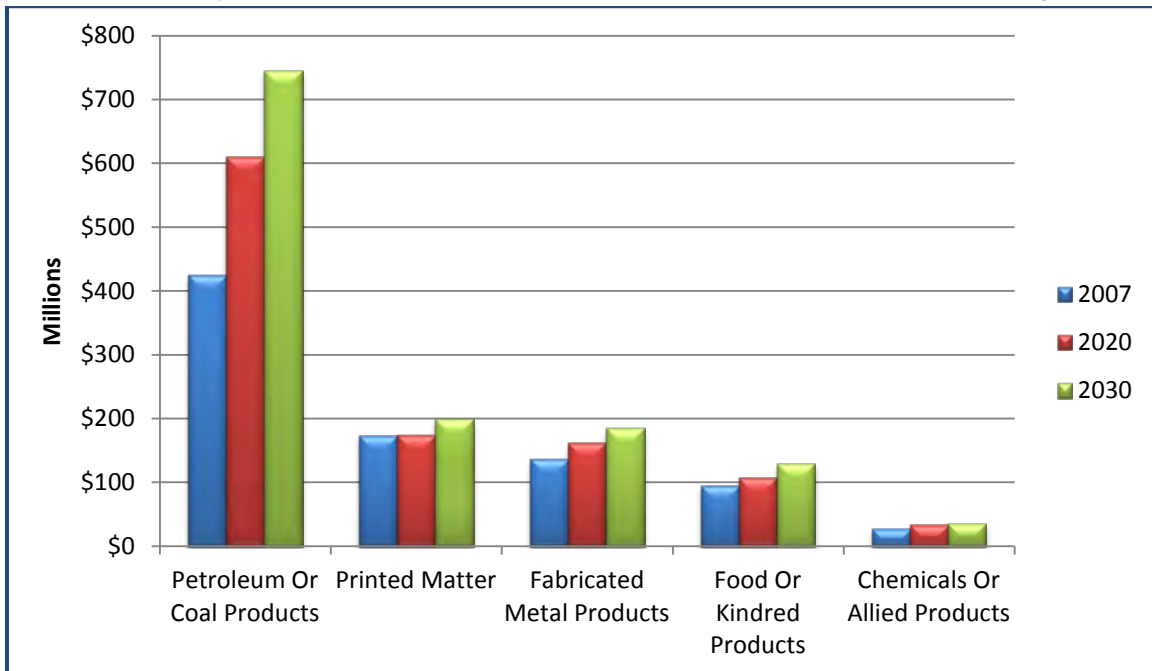
Exhibits 41 and **42** show truckload movement volumes between Central Minnesota and the TCMA. *Farm Products* and *Shipping Containers* are the top outbound truckload movements to the TCMA, while *Petroleum or Coal Products* and *Food and Kindred Products* lead the volume of inbound truckloads from the TCMA. It is presumed that *Shipping Containers* are moving back to TCMA rail yards from regional manufacturing and retail businesses after their contents have been unloaded.

Exhibit 39: Top Commodities from the Twin Cities to Central Minnesota by Tonnage



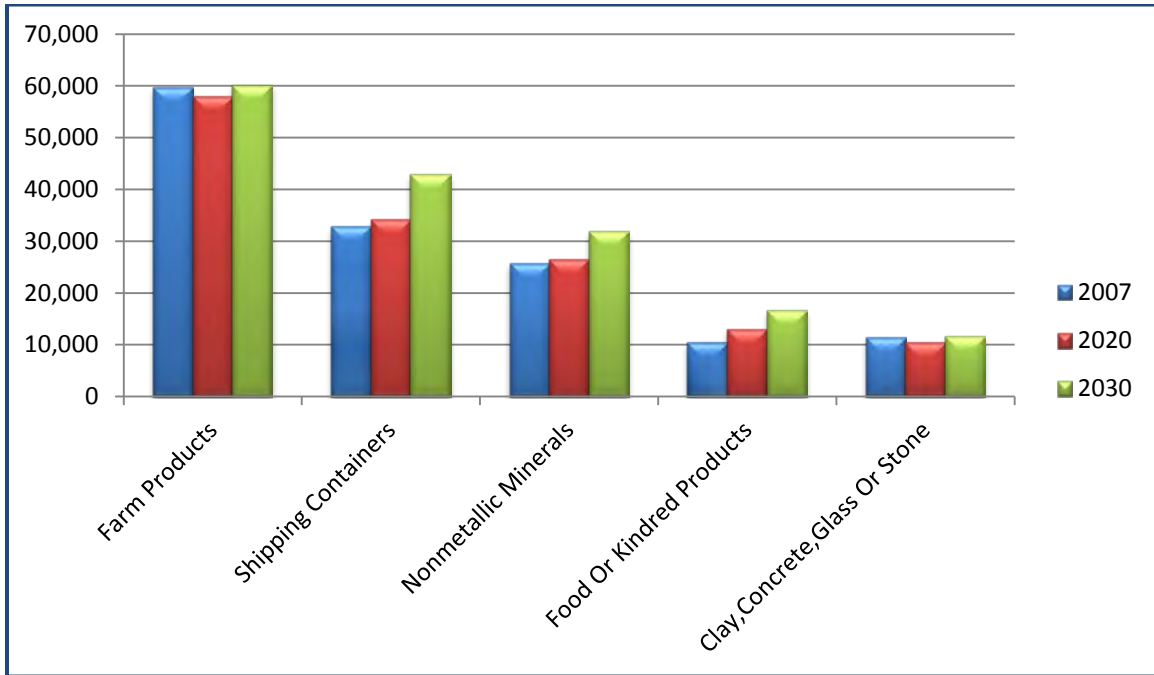
Source: TRANSEARCH[®]

Exhibit 40: Top Commodities from the Twin Cities to Central Minnesota by Value



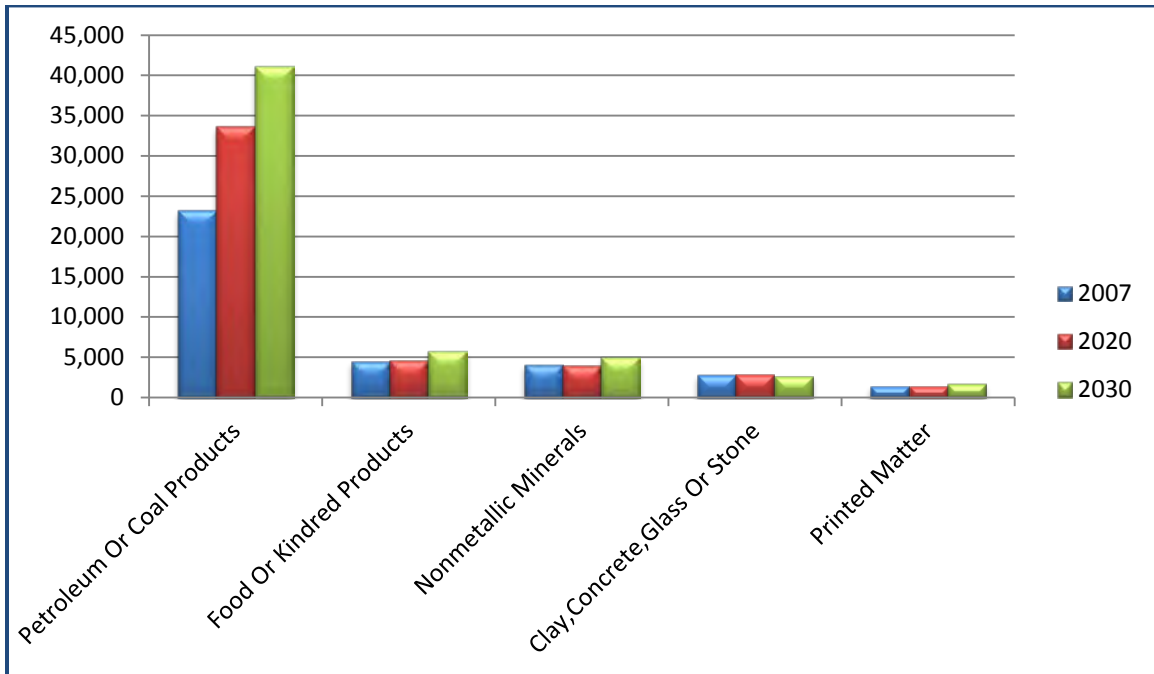
Source: TRANSEARCH[®]

Exhibit 41: Truck Loads from Central Minnesota to the Twin Cities



Source: TRANSEARCH®

Exhibit 42: Truck Loads from the Twin Cities to Central Minnesota



Source: TRANSEARCH®

3.8 Central Minnesota Top Ranking Livestock, Crops, and Sales by Commodity

Top *Livestock* include types of chicken production to include: broiler and other meat-type chickens, layers, and pullets for laying flock replacements. These chickens are primarily grown in Morrison, Benton, Stearns, and Wright Counties. Morrison, Stearns, and Benton Counties, respectively, are rank number 1, 2 and 3 in the production of broiler and other meat-type chickens.

Top agricultural crops in the study include *Forage* (hay), *Corn for Silage* and *Oats for Grains*, these crops are used for livestock feed. These crops are primary grown in Cass, Todd, Morrison and Stearns Counties. Stearns County is ranked 1st out of Minnesota's 87 counties for their quantity of *Forage*, *Corn for Silage* (ranked 4th in the U.S.), and *Oats for Grain* (ranked 3rd in the U.S.).

Top Commodities by Sale Value include *Poultry and Eggs*, *Cattle and Calves* and *Milk* and other dairy products from cows. These commodities are primarily produced in Stearns, Morrison, Todd and Benton Counties. Stearns County is ranked number 1 in the state and 21st in the U.S. in it production of milk and other dairy product from cows.

Exhibit 43: Central Minnesota Livestock, Crops and Sales by Commodity

	Cass	Todd	Morrison	Benton	Stearns	Isanti	Sherburne	Wright
Livestock								
Boiler & other meat-type chickens			1	3	2			6
Turkey		7	6		3			4
Layers			5		3			
Pullets for laying flock replacement			3		4			
Cattle & Calves		10	3		1			
Pheasants		7					1	2
Top Crop								
Rye for Grain						5		
Forage (hay)	8	4	3		1			
Corn for Silage		4	2		1 ^{**}			
Wild Rice	2							
Oats for Grain		4	5		1 [‡]			
Potatoes							2	
Vegetables harvested for sale							5	
Value of Sale by Commodity								
Poultry & Eggs			3		2			
Cattle & Calves					3			
Milk & other dairy products from cows		8	3	9	1 ⁺⁺			

Other Notes: ^{**} 4th in the US; [‡] 3rd in the US; ⁺⁺ 21st in U S