TREND ANALYSIS SUMMARY

ECONOMY

Economy & Employment, Freight Rail, Aging Infrastructure, Public-Private Partnerships, Dynamic Pricing

The last twenty years have seen significant changes occur in Minnesota's economy. Analyzing the trends that will affect Minnesota's economy over the next twenty years is a challenging but important step towards understanding how our transportation system will need to move people and goods throughout the state. Sustaining a transportation system that contributes to a healthy economy in Minnesota is an essential part of realizing the Minnesota GO Vision, and should be a key consideration in all of MnDOT's planning activities.

Economy & Employment

National and local news sources have been fixated on unemployment rates and other economic indicators over the last few years, and for good reason. The years of recovery that followed the Great Recession of 2008 were turbulent. Minnesota is now in a period of economic expansion, and has been for the last few years. Understanding where continued job growth is projected to occur and what sectors are likely to grow or decline can help MnDOT and its partners maintain a transportation system that keeps Minnesota economically competitive both nationally and globally.

MINNESOTA'S SHIFTING ECONOMY

Trends in Minnesota's economy are highly reflective of demographic, environmental, and technological trends in the state. Changes in these areas impact the types of businesses that are needed to provide the goods and services that are in demand; this has led to significant change in how many people are employed in various economic sectors in Minnesota. Generally speaking, Minnesota's economy is slowly shifting from agriculture and manufacturing, two highly visible industries, toward service industries such as education and health services and professional and business services.[1] Figure 1 shows the gross domestic product of Minnesota's top economic sectors.[2]

EMPLOYMENT & THE WORKFORCE

For many, the recovery from the Great Recession of 2008 was a long and slow process. Minnesota, in comparison to other states, has recovered more quickly than other states or the United States as a whole, and has enjoyed a period of economic expansion during the last few years. Unemployment in Minnesota is now below levels recorded before the recession in 2007, though more people are involuntarily employed part time now than before the recession.[3] Figure 2 shows the percentage of Minnesota's workforce that is unemployed and involuntarily working part time.

The sectors of the economy projected to have the largest job growth gains are construction and health care and social assistance (25.0 and 22.9 percent respectively).[4]

Figure 1: Changes in Minnesota's GDP by sector, 1997-2014

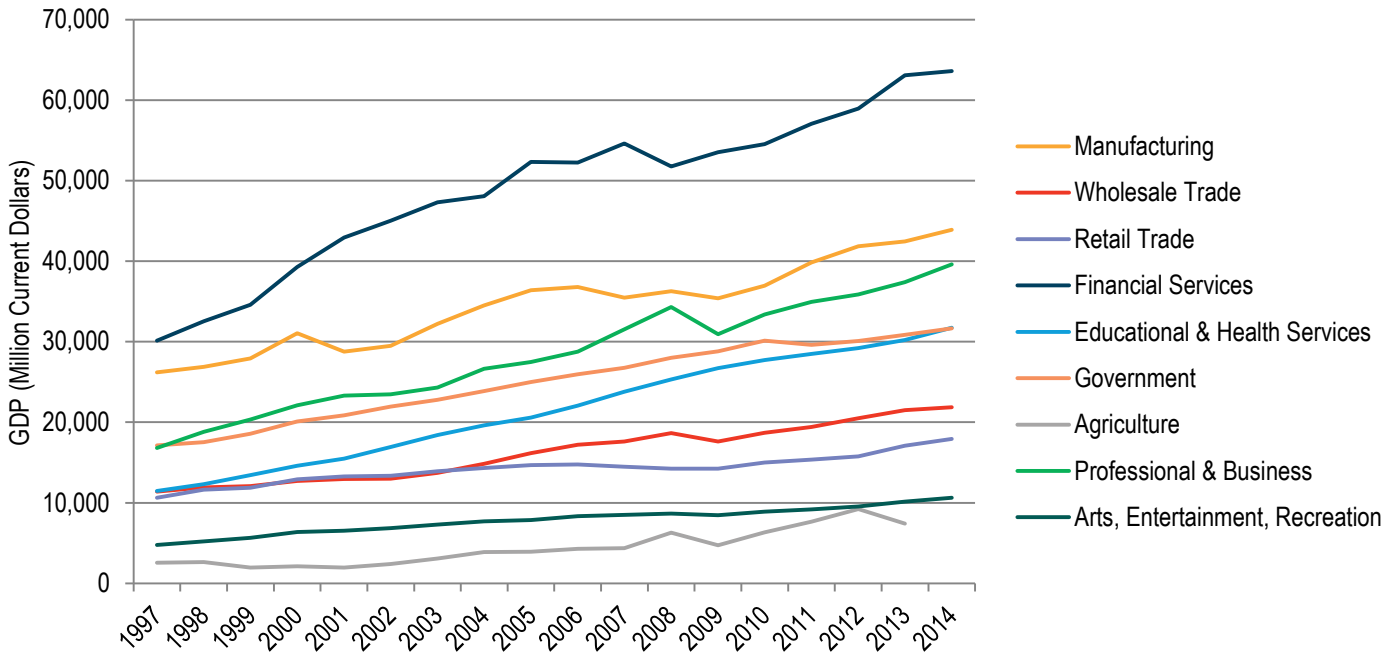
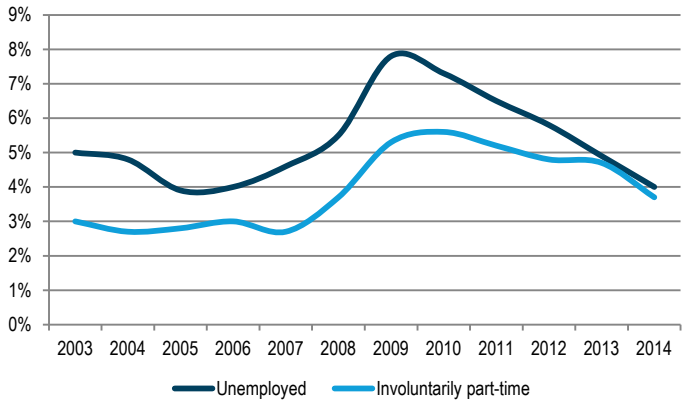


Figure 2: Percent of Minnesotans un-or-under employed



New Logistics

A growing global economy has resulted in increased demand for goods around the world. Nearly one third of global transportation energy is dedicated to the movement of freight within and between countries by trucks, ships, and rail. These shipments have impacts on the environment, infrastructure quality, and economies.

Here in the Midwest, trucks carry the bulk of goods to businesses and customers and have seen their share of total shipments increase steadily since 2010. By 2040 the total weight of goods shipped by trucks is projected to increase by 45 percent. In response to this potential for increased demand, shipping companies are shifting their operations to a regional hub system through which goods are shipped from hub to hub as consolidated containers of goods, rather than as individual parcels belonging to one company. As warehouses become regional centers deliveries occur at shorter intervals delivery costs increase.[5] This is especially true in the case of same-day shipping services offered by Amazon and Walmart in select US markets.

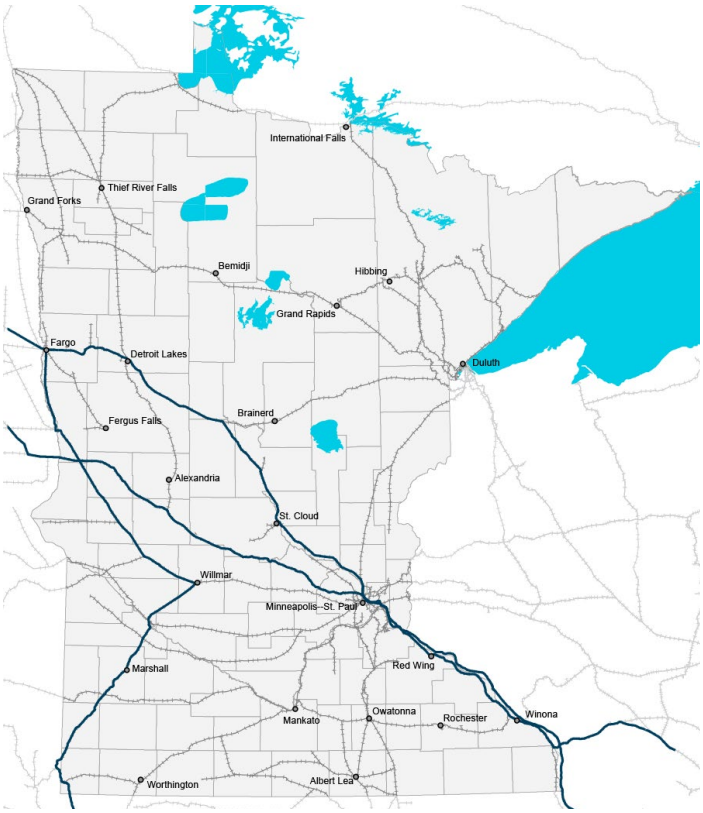
Additionally, freight rail has seen a resurgence since the end of the Great Recession. The advantages of shipping goods on the freight rail system include avoidance of strict motor carrier regulations, an industry-wide truck driver shortage, and superior fuel economy when compared to other land-based shipping methods.[6]

Freight Rail in Minnesota

Freight rail makes up an important component of Minnesota's freight shipping network. The volume of goods being shipped on Minnesota's rails has reflected ebbs and flows in the state's economy – as the recent economic recession deepened, fewer goods were shipped on Minnesota's rails. Today, thanks to a widespread economic recovery in Minnesota, freight rail shipments have increased to pre-recession levels and are projected to continue growing into the future.[7] Cereal grains and metallic ores make up the majority of tons shipped on Minnesota's rails, and are projected to continue to be the most frequently shipped product on the state's rail system.[8]

Heightened scrutiny has been placed on Minnesota's railroads as the oil boom in North Dakota's Bakken region has led to increased shipments of crude oil on railroads throughout the country. While preparedness and an understanding of the risks associated with this activity are important, it must be said that oil shipments make up a very small portion of the total tonnage shipped on Minnesota's rails and are not

Figure 3: Rail routes carrying crude oil from North Dakota



the most hazardous material shipped by railroads. The map in Figure 3 shows rail routes used for shipping Bakken crude oil in Minnesota.[9] There are a total of 683 at grade crossings along routes that carry crude oil from North Dakota's Bakken oil fields.

Aging Infrastructure

Although the majority of Minnesota businesses say that the existing transportation system meets their needs, though there is cause for concern. Minnesota is part of a sweeping national narrative on the topic of aging public infrastructure in need of investment that is often cited when discussions of public investment in infrastructure come up; the United States is a country of aging infrastructure. Many of the public systems that were constructed to serve communities throughout the country were built between 40 and 70 years ago, when expansion of urban areas into the surrounding countryside necessitated a rapid buildout of highway, sewer, water delivery, and utility systems.

Minnesota is facing a wave of pavements across all roadway systems that are aging and in need of maintenance investments or reconstruction. As pavements near the age of 60-70 years maintenance activities increase in both frequency and cost. MnDOT typically reconstructs roadways in this age range. Figure 4 shows the age of pavements on Minnesota's state highway system.

The state's share of Minnesota's overall roadway network is small –

Figure 4: Age of pavements on the state highway system

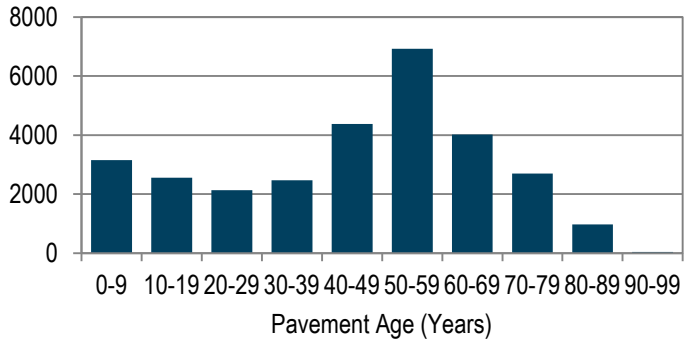
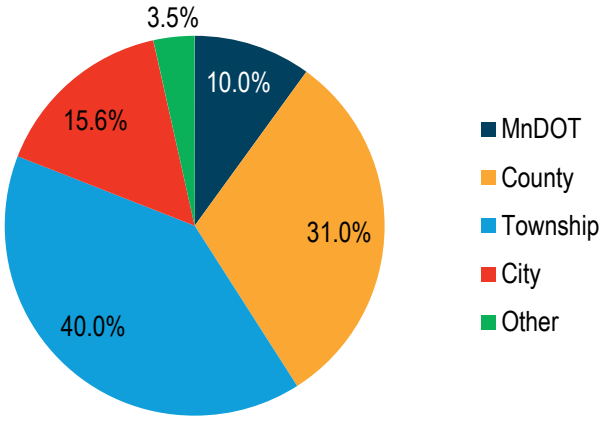


Figure 5: Ownership of Minnesota's roads by government level



the chart in Figure 5 shows the proportional breakdown of roadway ownership. Data for local jurisdictions is limited though the broader picture is largely the same.

Minnesota's airports, railroads, ports, and waterways are all also feeling the effects of aging infrastructure. Allocated funding for airport maintenance meets only roughly one-third of the total maintenance need for air infrastructure.[10] Railroads, while owned by private companies, also contribute to Minnesota's large amount of aging infrastructure. Public agencies are responsible for maintaining rail crossing warning devices where roadways cross railroads – it is estimated that 270 of 1,400 rail crossing devices in service have exceeded their useful life and need to be replaced.[11] Needs on Minnesota's navigable waterways are also great – dredging costs continue to rise on rivers and in ports, with a total need of $110 million on the Saint Paul District's portion of the Mississippi River system (Minneapolis to Guttenberg, IA).

Public-Private Partnerships

The vast need for investment in America's public infrastructure has led to increased calls for the pursuit of public-private partnerships (P3s) as a way to provide needed capital. Proponents of P3s tout advantages like the opportunity for increased flexibility, potential cost savings,

and the ability to accelerate projects. Despite the stated benefits, P3s have largely been limited to design-build and design-bid-build contracting in Minnesota. MnDOT also uses design-build and design-bid-build contracts to maximize financial efficiency and minimize traffic disruptions.[12]

Broadly speaking, P3s are not a solution to all infrastructure problems, though they do offer opportunities to increase the efficiency of project delivery or build additional flexibility into designs.

MnDOT uses other innovative contracting methods and programs extensively. The Transportation & Economic Development program run jointly by MnDOT and the Minnesota Department of Employment and Economic Development provides funding for communities where transportation investments can leverage economic development. Occasionally, MnDOT works with private partners who approach the agency with unsolicited proposals for collaboration on infrastructure projects (ex. Bren Road interchange reconstruction at US 169). Innovative contracting strategies like indefinite delivery / indefinite quantity agreements and contract manager / general contractor agreements offer greater flexibility in how MnDOT can leverage efficiencies through work with private-sector consultants.

Dynamic Road Pricing

Another set of options often raised to address transportation funding shortfalls include road pricing strategies. Road pricing, or tolling, charges users of the highway system directly base on their use of the infrastructure. Some tollways use static or fixed pricing to charge users a set fee every time they pass certain checkpoints. Other tollways rely on dynamic or flexible pricing to vary toll fees depending on the time of day or congestion levels. Priced lanes that use variable tolling are often referred to as HOT (high-occupancy toll) lanes, as they charge tolls to users driving alone, while allowing high-occupancy vehicle users to use the lanes without paying. MnPASS is an example of HOT lanes. Although mileage-based user fees have been studied in Minnesota, there has been little desire for road pricing beyond the MnPASS system.

Dynamic pricing strategies are not new. Many parking facilities use dynamic pricing to adjust rates based on nearby events, time of day, and other factors. Uber and Lyft (ridesharing companies) use dynamic pricing to increase fees during periods of high demand. Other ticketed travel providers like airlines, passenger trains, and intercity buses use dynamic pricing to adjust ticket fees based on the demand for trips on a given day.

CONCLUSION

Minnesota's economy is growing again, and this growth will place new and additional demands on the state's transportation system. Ensuring that a variety of modes are available to move goods to, from, and within Minnesota is a vital part of continuing the current economic expansion. Greater employment in service-based industries will change where people work and the times that they need to be at work, placing changing demands on the transportation system, especially in Minnesota's cities and towns. Changes in the manufacturing sector may necessitate easier access to air cargo facilities to ship smaller, high-value goods. The advent of same-day shipping from online retailers has the potential to change the way that people think about delivery and courier services, and the way that those services use the transportation system.

Amidst this rapid change in how goods move throughout the state, our transportation infrastructure is showing its age and is in need of significant maintenance. Many of the pavements on Minnesota's state highway system are between 40 and 70 years old, the period when repairs must be conducted most frequently and are most costly. Funding for these activities remains a challenge under the status-quo, and while innovative partnership opportunities offer an option to improve efficiency and flexibility, they do not offer a clear path toward a method for addressing the vast infrastructure needs in Minnesota.

CITATIONS

1. MN Department of Employment & Economic Development
2. MN Department of Employment & Economic Development Census of Employment & Wages
3. Current Employment Statistics, Bureau of Labor Statistics
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7. American Association of Railroads, 2015
8. Freight Analysis Framework, 2010
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10. MnDOT State Aviation System Plan, 2012
11. MnDOT State Rail Plan, 2015
12. MnDOT Design-Build

For more information about the the Statewide Multimodal Transportation Plan update please visit our website: www.minnesotago.org