

Appendix E: Goals and Performance Measures

This technical memorandum outlines the goals of MoDOT State Freight Transportation Plan and the performance metrics that will be used to develop the plan and support its implementation.

Introduction

The Missouri State Freight Plan goals and performance measures will establish the strategic foundation upon which the Plan can be built and implemented.

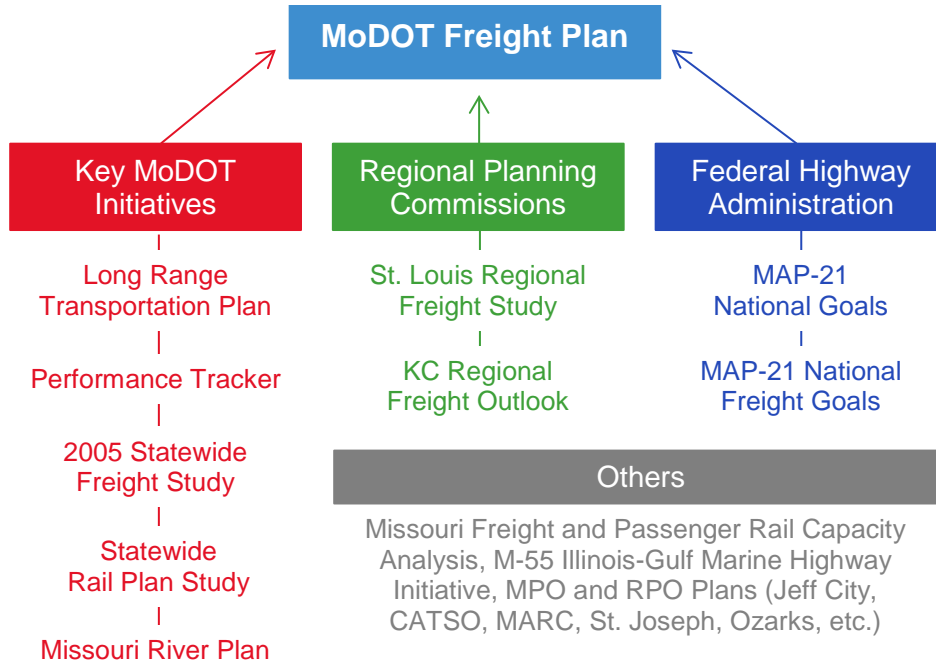
- A broad range of considerations was taken into account when establishing the goals and measures. These considerations are detailed in this appendix, and include a variety of MoDOT efforts as well as initiatives led by its partners such as FHWA and the regional planning partners in Kansas City (MARC) and St. Louis (East West Gateway).
- The goal areas for the plan, which are detailed in in this appendix, align with those established during MoDOT's extensive public engagement effort On the Move and the subsequent 2013 Long Transportation Range Plan. They are:
 - Maintenance
 - Safety
 - Economy
 - Connectivity
- For each of these goal areas, a strategically selected set of performance measures will be used to craft and implement the Freight Plan. These measures, which are introduced in in this appendix, are built on MoDOT's strong record of performance management, best illustrated by *Tracker* - the Department's well known quarterly performance measurement publication.
- Also in this appendix is an outline of how the goals and performance measures might be integrated with the remaining components of the Freight Plan and the next steps necessary to do so.

Considerations

Freight infrastructure investment decisions in Missouri are influenced by a broad range of considerations, including MoDOT's strategic direction and system plans and the needs and activities of MoDOT's partners in the delivery of freight infrastructure. As such, it is important that the State Freight Plan not stand alone but instead align and be informed by the national, state, and local plans and policies that already exist or are in development. **Figure E-11** illustrates these considerations and is followed by a brief summary of each initiative.

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Figure E-1: Considerations into the MoDOT State Freight Plan Goals



Key MoDOT Initiatives

MoDOT Long Range Transportation Plan

The 2014 Long Range Transportation Plan (LRTP), titled *A Vision for Missouri's Transportation Future*, included the extensive *On the Move* public and stakeholder outreach effort. This outreach effort, coupled with a technical needs analysis, laid the groundwork for the establishment of four goals for meeting Missourians' expectations for their transportation system, including:

- Take Care of the Transportation System and Service We Enjoy Today
- Keep All Travelers Safe, No Matter the Mode of Transportation
- Invest in Projects that Spur Economic Growth and Create Jobs
- Give Missourians Better Transportation Choices

Tracker

MoDOT's *Tracker* is a quarterly publication of departmental performance measures that documents MoDOT's progress. It includes more than 50 performance measures directly linked to the department's mission, values and priorities. The measures gauge performance in seven "Tangible Results" areas, including:

- Keep Customers and Ourselves Safe
- Keep Roads and Bridges in Good Condition
- Provide Outstanding Customer Service
- Deliver Transportation Solutions of Great Value
- Operate a Reliable Transportation System
- Use Resources Wisely
- Advance Economic Development

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Many of the performance measures contained in the Tracker are directly related to the movement of freight and provide a foundation for establishing measures for the Freight Plan.

Statewide Freight Study

MoDOT undertook the Missouri Statewide Freight Study in 2005 as a precursor to an update of a previous LRTP. The Study's primary objective was to study the movement of freight through all modes of Missouri's transportation system in an effort to improve efficiency and safety throughout the system. The Study included five goals:

- Improve Freight System Reliability
- Develop Freight Data and Measure Performance
- Strengthen Intermodal Connectors
- Use Technology to Enhance Freight Operations
- Involve Freight Stakeholders in the Process

Missouri Statewide Rail Plan

The Missouri State Rail Plan, completed in May 2012, provides the strategic framework for passenger and freight rail service in Missouri for the next 20 years. It establishes Missouri's rail vision "to provide safe, environmentally-friendly transportation options supporting efficient movement of freight and passengers, while strengthening communities and advancing global competitiveness through intermodal connectivity."

The Plan evaluates the existing conditions and current and future capacity needs of Missouri's railroad system, and sets for the following goals:

- Promote the Efficient Movement of Passengers
- Promote the Efficient Movement of Freight
- Encourage Intermodal Connectivity
- Enhance State and Local Economic Development
- Promote Environmental and Socially Responsible Rail Transportation Development
- Promote Safe and Secure Railroad Operations

Missouri River Plan

The 2011 Missouri River Freight Corridor Assessment and Development Plan outlines the steps needed to redevelop the Missouri River as a freight corridor with reliable service that support a sustainable market and logistics system. The plan sets forth the following "concepts of operations":

- Steps should be taken to realize the potential of returning the traditional market commodities to the River
- Infrastructure and terminal upgrades are needed to handle a potential shift from land transportation mode to the River
- Emerging markets provide an opportunity for growth but will be more challenging to develop
- Advocacy plays an important role in promoting sustainable freight infrastructure
- Guidance for maintaining freight movement when water levels are above or below optimal conditions is critical

Regional and Local Initiatives

St. Louis Regional Freight Study

The St. Louis Regional Freight Study examines the regional freight needs and identifies strategies to anticipate and take advantage of economic opportunities. The study's recommendations include:

- Implement a Regional Freight Transportation District
- Pursue a "Sector Champion" strategy for freight and logistics (similar to that of the plant and life sciences industries)
- Align economic development with supply chains
- Increase freight speeds and railroad network access

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- Complete a rail network study for the Region, with the active participation of the Class 1 and Short Line Railroads.
- Develop a more robust regional freight Geographic Information System (GIS) supported by performance metrics
- Re-engage with the private sector and pursue public-private strategies to move toward a smaller number of high capacity port terminals
- Emphasize strategies to assemble/reuse older waterfront sites
- Improve monitoring of truck traffic levels on key arterials and near intermodal yards
- Initiate studies to widen the I-270 New Chain of Rocks Bridge to 3-lanes and focus improvements on Hall Street and Route 3 where viable business locations conflict with old infrastructure

Kansas City Regional Freight Outlook

The Mid-America Regional Council (MARC) and Kansas City SmartPort initiated the Kansas City Regional Freight Outlook (RFO) in collaboration with the Kansas and Missouri DOTs in 2009. The RFO was intended to sustain and expand the region's presence in the transportation and logistics industries. The RFO identified the following objectives and critical actions:

- Improve goods movement system performance
- Support transportation and logistics business attraction and retention
- Contribute to ensuring the region's quality environment
- Focus on transportation-related project to identify and highlight freight-related benefits
- Expand the use of existing technologies and tools to monitor freight-specific data
- Recognize the Corridors of Freight Significance - corridors characterized by their service for freight at a National, Regional, or Local level - and conduct regional assessments
- Focus on attraction of transportation and logistics industries
- Improve marketing efforts by emphasizing the competitive advantage of the region

Federal Initiatives

MAP-21 National Goals

The most recent federal surface transportation act, Moving Ahead for Progress in the 21st Century (MAP-21) establishes a performance and outcome-based program and requires states to demonstrate and achieve progress towards seven national goals. The goals are:

- Safety - To achieve significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System
- System Reliability - To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- Reduce Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through elimination delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

MAP-21 National Freight Goals

Map-21 requires US DOT to develop a National Freight Policy that will include the following goals for the national freight system:

- Economic Competitiveness - Invest in infrastructure improvements and implement operational improvements that strengthen the contribution of the national freight network to the economic competitiveness of the U.S., reduce congestion, and increase productivity
- Safety, Security and Resiliency - Improve the safety, security, and resilience of freight transportation
- State of Good Repair - Improve the state of good repair of the national freight network

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- **Advanced Technology** - Use advanced technology to improve the safety and efficiency of the national freight network
- **Performance and Accountability** - Incorporate concepts of performance, innovation, competition, and accountability into the operation and maintenance of the national freight network
- **Economic Efficiency** - Improve the economic efficiency of the national freight network
- **Environmental** - Reduce the environmental impacts of freight movement on the national freight network

Other Initiatives

In addition to those described above, several other ancillary plans and initiatives were used to inform the development of the Freight Plan's goals and performance measures. Details about each can be found in Appendix A, including:


- M-55 Illinois-Gulf Marine Highway Initiative
- Missouri Freight and Passenger Rail Capacity Analysis
- Columbia Area Transportation Study Organization (CATSO) Long Range Transportation Plan
- 2035 Capital Area Metropolitan Planning Organization (CAMPO) Metropolitan Transportation Plan (MTP)
- MARC Long Range Transportation Plan - Transportation Outlook 2040
- Greater St. Joseph Area MPO 2040 MTP
- Ozarks MPO 2035 LRTP

Summary of Inputs

This research has provided a clear and strong foundation from which the Freight Plan goals and performance measures were established. Although these efforts stem from a diverse group of organizations with different intentions and motivations, the majority of the findings can be classified into a handful of what have become industry-standard categories. Figure E-2 illustrates how each of the plans' goals aligns within the categories.

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Figure E-2: Goals for Key Freight Plan Inputs



The Missouri Freight Plan – Cross Comparison of Goals and Issues

Goal Category	Key MoDOT Initiatives					Federal Highway Administration		Regional Planning Organizations	
	Long Range Plan (2014)	Tracker Tangible Results (updated quarterly)	Statewide Freight Study (2005)	Missouri River Freight Plan (2011)	Statewide Rail Plan (2011)	MAP-21 National Goals (2013)	MAP-21 Freight Goals (2013)	St. Louis Freight Study (2013)	Kansas City Freight Outlook (2009)
Maintenance & Preservation	Maintenance	Keep roads and bridges in good condition		Minor maintenance is needed		Infrastructure Condition	Improve state of good repair on the freight system		Maintain the region's freight network
Safety	Safety	Keep customers & ourselves safe			Promote safe and rail operations	Safety	Improve safety on the freight system		
Economy	Economic Development	Advance economic development	Improve freight system reliability	Redevelop and expand traditional freight markets	Enhance economic development	Freight Movement & Economic Vitality	Improve freight contribution to competitiveness	Stay ahead of demands to truck-heavy intersections	Target high growth commodities & leverage new opportunities
Mobility	Connections and Choices	Operate a reliable & convenient system	Strengthen intermodal connectors	Promote market expansion and identify port needs	Encourage modal connectivity & efficient freight movement	Congestion Reduction & System Reliability	Reduce congestion on the freight system	Increase rail capacity	Leverage region's low transportation costs
Environment	Environmental responsibility				Promote environmentally responsible rail development	Environmental Sustainability	Reduce adverse environmental impacts of freight		
Processes & Organization	Performance Management Planning Framework	Use resources wisely Deliver solutions of great value	Develop freight data and measure performance Enhance freight technology (ITS) operations	Identify management approaches to optimize freight river movement		Reduce Project Delivery Delays	Use technology and performance measures in operating the freight system	Explore revenue increases Consider truck focused way-finding system	Institutionalize freight in the planning process
Customers & Partners	On the Move outreach was extensive	Provide outstanding customer service	Involve freight stakeholders in the process	Organized cooperation could improve reliability					Foster public/private partnerships

The Missouri Freight Plan | Goals and Measures



Recommended Goals

Based on the considerations above and the strategic input of the Steering Committee, four goal areas for the State Freight Plan have been identified. These goal areas reflect what Missourians told MoDOT during *On the Move* and mirror the four goals of the Long Range Plan. They also align well with both MAP-21's national freight policy provisions and with other recent statewide and regional freight studies. MoDOT Freight Plan Goals are:

- **Maintenance** - Maintain the freight system in good condition by keeping highways and bridges in good condition and supporting the maintenance of railways, waterways, airports, and multimodal connections
- **Safety** - Improve safety on the freight system by decreasing the number and severity of crashes involving commercial vehicles and improving safety at railroad crossings.
- **Economy** - Support economic growth and competitiveness in Missouri through strategic improvements to the freight system
- **Connectivity and mobility** - Improve the connectivity and mobility of the freight system by reducing congestion and increasing reliability on the roadways, by supporting improved efficiency of rails, waterways, and airports, and by improving connections between freight modes.

These goals are mostly related to the performance of the freight system itself. In addition to these system-related goals, there are also strategic considerations that are related to the planning process, collaboration with freight stakeholders, and ultimately the implementation of the Freight Plan. These process and program delivery considerations include:



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- **Environmental** - Reduce and/or mitigate adverse environmental impacts of freight
- **Organizational & Process** - Institute policies and practices that support the freight system, such as exploring funding flexibility and stability and using technology to improve operations on the freight system
- **Customers & Partners** - Improve coordination and collaboration with freight stakeholders

Recommended Performance Measures

Performance measures are used across the transportation industry to assess how transportation systems and agencies are performing. For the Freight Plan, performance measurement can serve the following functions:

- **Plan Development** - Provide a means to quantify baseline system performance and potential Freight Plan recommendations and strategies
- **Plan Implementation** - Support implementation of the Freight Plan, integrating freight performance measures into the budgeting, programming, project selection, and project implementation processes
- **Accountability** - Support accountability for the results of the Freight Plan by tracking and reporting the progress towards the Plan goals (through *Tracker* or some other process).

It is worth noting again that MoDOT has a rich history in performance measurement and management. This is best exemplified by *Tracker*, the department's quarterly performance measure publication. It provides a strong foundation from which to build and many of the recommended measures that follow can be linked directly to *Tracker*.

With *Tracker* as the foundation, and through consultation with the Steering Committee, a limited number of strategic performance measures have been identified within each of the four goals. These measures are summarized in **Figure E-4**.

Figure E-3: Tracker Cover January 2014



Tracker

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Figure E-4: Recommended Performance Measures

Freight Plan Goal	Recommended Measures
<p>Maintenance Maintain the freight system in good condition</p>	<ul style="list-style-type: none"> • Percent of the major highways in good condition* • Percent of structurally deficient deck area on National Highway System bridges*
<p>Safety Improve safety on the freight system</p>	<ul style="list-style-type: none"> • Number of commercial vehicle crashes resulting in fatalities or serious injuries* • Rail crossing crashes or fatalities*
<p>Economy Support economic growth and competitiveness</p>	<ul style="list-style-type: none"> • Goods movement competitiveness* • Job and economic growth by key sector, including: <ul style="list-style-type: none"> ○ Agriculture ○ Manufacturing ○ Transportation/Logistics
<p>Connectivity and Mobility Improve the connectivity and mobility of the freight system</p>	<ul style="list-style-type: none"> • Freight tonnage by mode* • Annual hours of truck delay* • Truck reliability index*

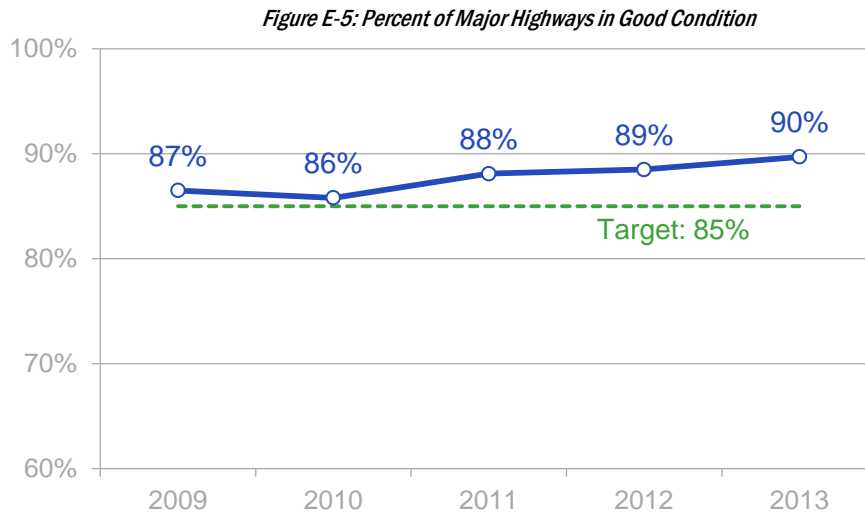
* These or similar measures have been established in MoDOT's Tracker

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Maintenance Measures

Percent of the major highways in good condition

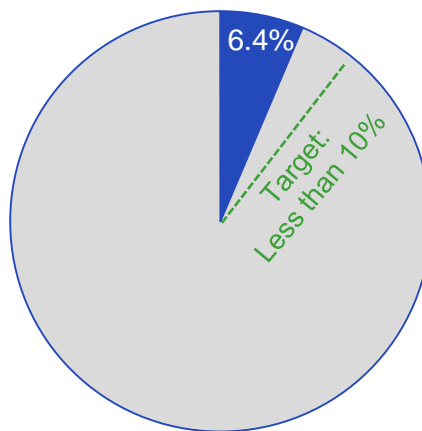
This measure tracks the conditions of Missouri's major highways system, which contains the 5,533 miles of the State's busiest highways including Interstates and most U.S. routes. It also includes busy routes in urban areas, particularly where vehicles travel between business districts and residential areas. **Figure E-5** shows the percent of Missouri's major highways that are in good condition. MoDOT has established a target of better than 85% for this measure.



Percent of structurally deficient deck area on NHS bridges

This measure tracks the percent of structurally deficient deck area for bridges that are part of the National Highway System (NHS). **Figure E-6** shows the percent of structurally deficient deck area on the National Highway System. MAP-21 requires that states track this measure with a target of fewer than 10 percent.

Figure E-6: Percent of Structurally Deficient Deck Area on the National Highway System

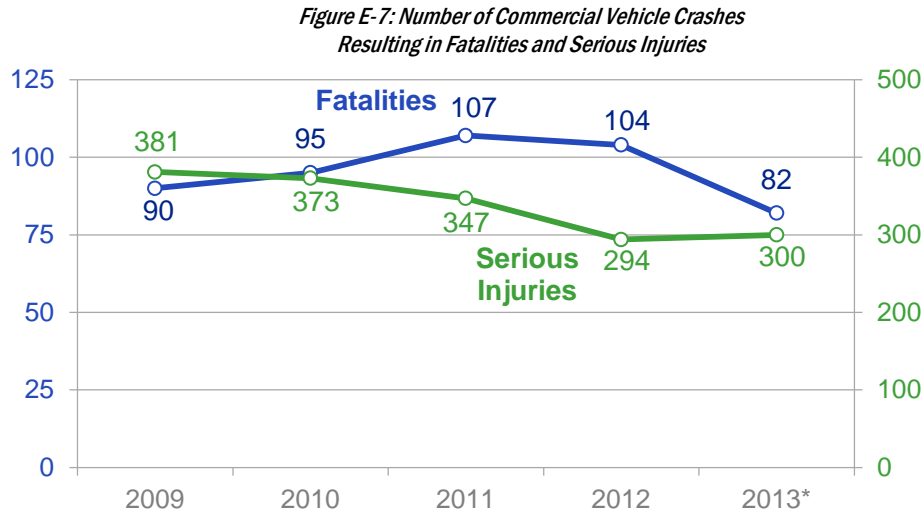


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Safety Measures

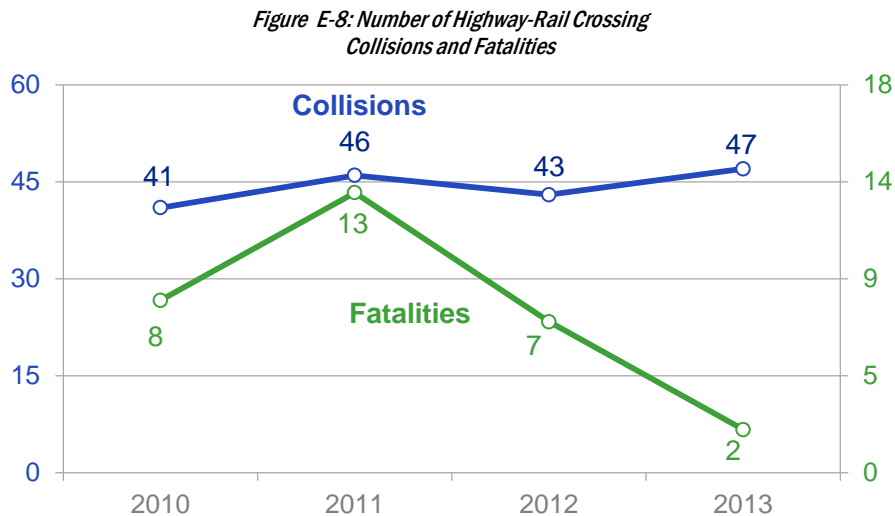
Number of commercial vehicle crashes resulting in fatalities and serious injuries

This measure, as shown in Figure E-7, tracks the number of Commercial Motor Vehicles involved in fatal and serious injury crashes each year. MoDOT uses the information to target educational, enforcement and safety improvement feature efforts.



Rail crossing crashes and fatalities

This measure, as shown in Figure E-8, tracks annual trends in fatalities and collisions resulting from train-vehicle/pedestrian crashes at public railroad crossings in Missouri. This data drives the development and focus of a portion of the Missouri Highway Safety Plan.



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Economy Measures

Goods movement competitiveness

This measure, developed specifically as a part of the Freight Plan and shown in Figures E-9, E-10, and E-11 tracks annual trends in the cost of transporting three key commodities in Missouri as compared to other Midwest states. The commodities are soybeans, crop protection, and motor vehicles. There is much more to economic competitiveness than just the costs associated with the three commodities and their specific destination and mode of travel - as such a more comprehensive look at each of can be found in Appendix B.

Figure E-9: Cost of Shipping One Ton of Soybeans from Key States to New Orleans (largely by barge), 2014



Figure E-10: Cost of Shipping One Ton of crop protection from Key States to Mexico (largely by rail), 2014

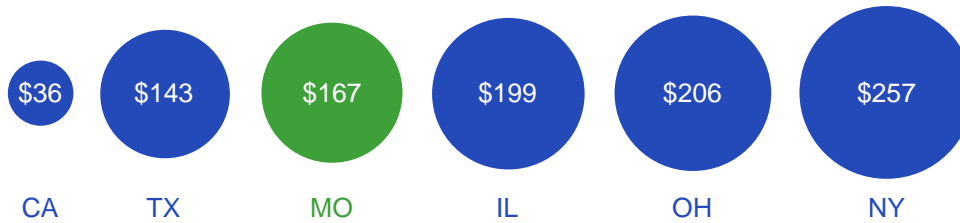


Figure E-11: Cost of Shipping One Motor Vehicle from Key States to Toronto (by truck) and Los Angeles (by rail), 2014



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Job and economic growth by key sector in Missouri

This measure was also developed specifically as a part of the Freight Plan and was done so in partnership with the Missouri Department of Economic Development. For three key transportation-reliant sectors - agriculture, manufacturing, and transportation/logistics - this measure tracks job and economic growth (GDP) growth and is shown in Figures E-12, E-13 and E-14.

Figure E-12: Jobs and Economic Growth in the Agriculture Industry in Missouri

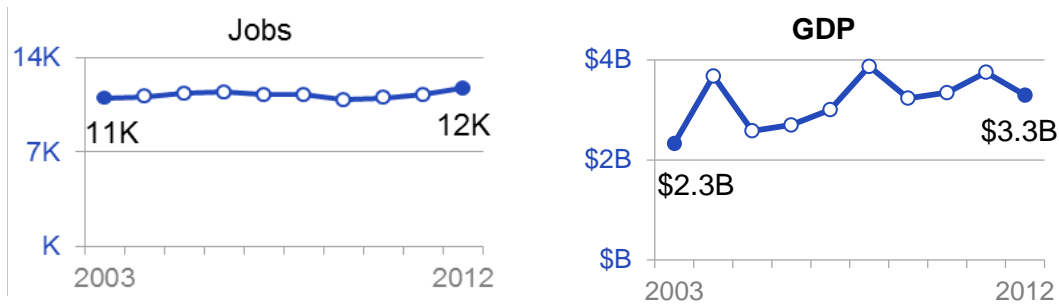


Figure E-13: Jobs and Economic Growth in the Manufacturing Industry in Missouri

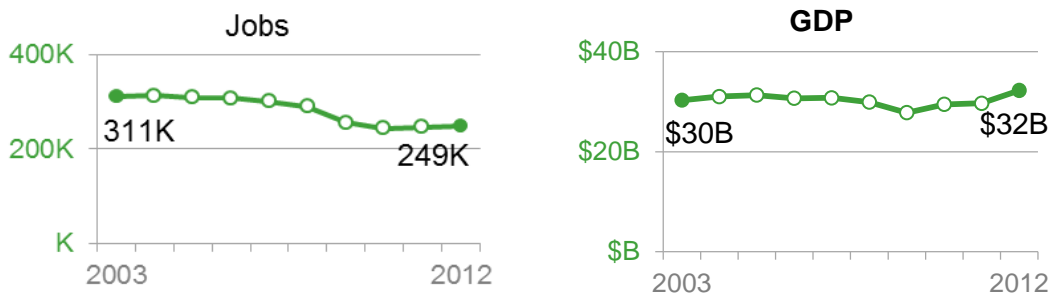
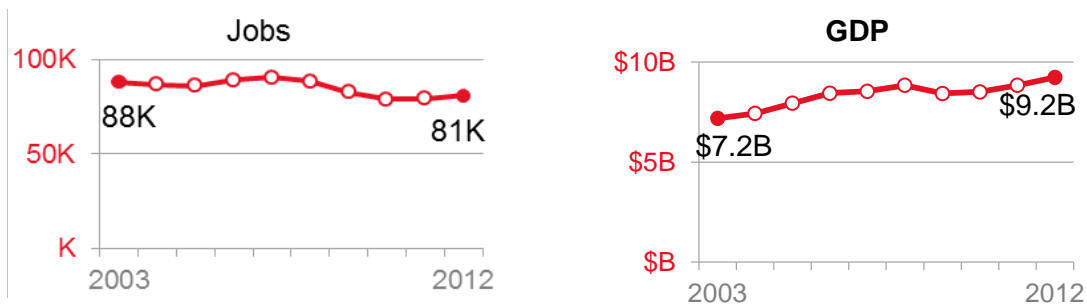


Figure E-14: Jobs and Economic Growth in the Transportation/Logistics Industry in Missouri



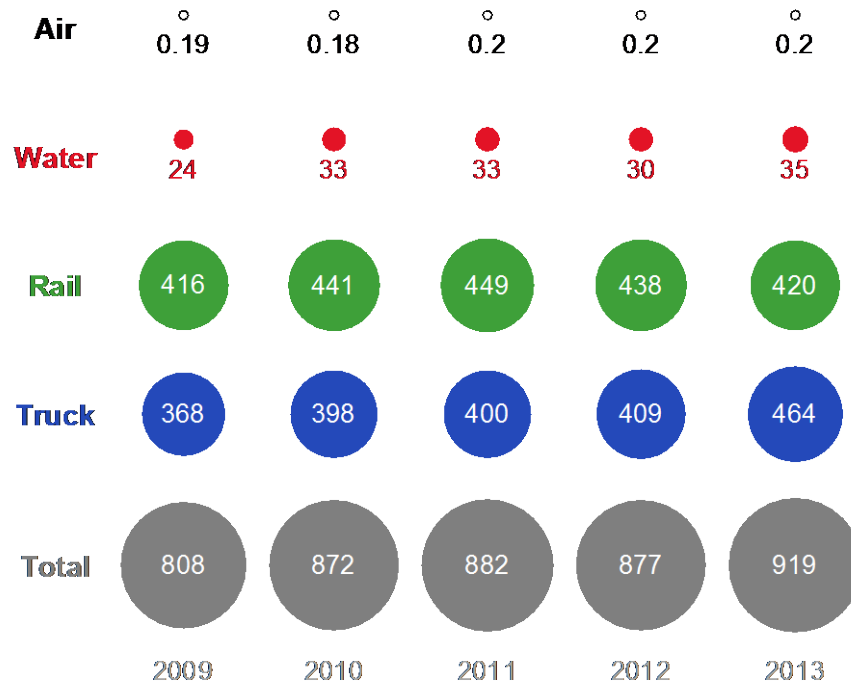
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Connectivity Measures

Freight tonnage by mode

This measure, shown in Figure E-15, tracks the amount of freight moved by Missouri's largest transportation modes. These modes experience volume shifts from year to year, often based on the health of the national economy and shifts in consumer preferences. For example, air has seen slight increases due to increases in e-commerce, water usage has increased as disruptions due to drought and flooding have been less frequent, and rail usage has declined slightly because of less coal usage in the country.

Figure E-15: Freight Tonnage by Mode (millions)



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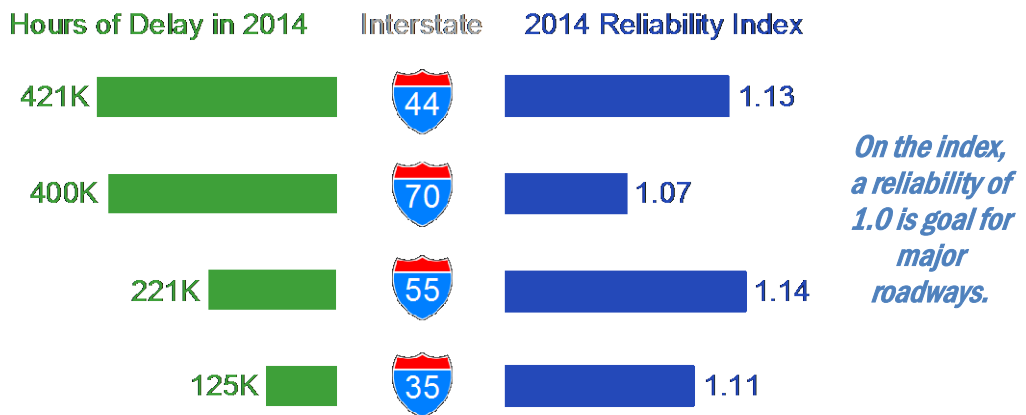
Annual hours of truck delay and truck reliability index

Annual hours of truck delay and truck reliability index are measures proposed for use in MAP-21 to measure national freight performance.

Delay is measured anytime trucks experience speeds 5 mph or more below the posted speed limited. These delays impact the cost of goods and reduce business's ability to complete on a global scale.

The Reliability Index, shown in Figure E-16, is a measure of how consistent truck travel times are on a corridor - the closer the index is to 1.0, the more reliable the corridor. Shippers and freight carriers require predictable travel times to control transportation costs and remain competitive.

Figure E-16: Hours of Truck Delay and Truck Reliability Index



Integration Within the State Freight Plan

The goals and performance measures established within this document provide a foundation from which to build the Freight Plan. The following components of the plan that will be informed by these goals and measures:

- Trends and needs analysis - The data and analysis contained within these performance measures should support and enhance the baseline efforts to quantify the trends, issues and needs within the plan development.
- Scenario analysis - As the scenarios are developed and analyzed, the impact upon these performance measures will be estimated.
- Project prioritization - As projects are evaluated for their freight impacts, the performance measures can provide a baseline from which the prioritization criteria can be developed.
- Policy development - As policies and overall Freight Plan recommendations are developed, these goals and performance measures can inform their development by offering a glimpse into where and how the freight system can and should be maintained and/or improved.
- Communication efforts - Performance measures can often be useful in communicating the impact and importance of the freight system. The economic competitiveness metric could be especially useful in this area.
- Plan implementation - After the plan is completed, these performance measures can be incorporated into MoDOT's Tracker to observe how well the recommendations coming out of MoDOT Freight Plan have been implemented.