OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Paula Gough, District Engineer

Tracker

MEASURES OF DEPARTMENTAL PERFORMANCE

Missourians expect to get to their destinations on time, without delay regardless of their choice of travel mode. We coordinate and collaborate with our transportation partners throughout the state to keep people and goods moving freely and efficiently. We also maintain and operate the transportation system in a manner to minimize the impact to our customers and partners.

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Jon Nelson
Traffic Safety Engineer

PURPOSE OF THE MEASURE:
This measure tracks the mobility of significant state routes in St. Louis, Kansas City, Springfield and Columbia.

MEASUREMENT AND DATA COLLECTION:
Travel time data is collected continuously via wireless technology. To assess mobility, MoDOT compares travel times during rush hour to free-flow conditions where vehicles can travel at the posted speed limit. This measure also assesses reliability, an indicator of how variable those travel times are on a daily basis. The charts in this measure show the average travel time and the 95th percentile travel time, which is the time motorists should plan in order to reach their destinations on time 95 percent of the time. The maps display the mobility of specific sections of roadways during rush hour.

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Travel times and reliability on major routes – 5a

Overall from October to December 2015, travel times in St. Louis and Kansas City continued to exhibit an increasing trend. Average travel times for the entire year increased in each region during both the morning and evening peaks when compared to 2014 averages. For fourth quarter 2015, the average 10-mile travel time in St. Louis was 10.95 minutes during the morning and 12.63 minutes during the evening. For Kansas City, the average travel time was 10.80 minutes during the morning and 11.51 minutes during the evening. Kansas City did see a slight decrease in average travel times from third quarter to fourth quarter. Overall, average speeds ranged between 48 and 55 mph.

The planning times account for unexpected delays and indicate how long customers needed to plan in order to arrive on time 95 percent of the time. In St. Louis, the average 10-mile planning times were 14.74 minutes during the morning and 19.10 minutes during the evening. Customers in the St. Louis evening rush needed to plan almost twice as much time as they would need in free-flow conditions. In Kansas City, the average planning times were 13.59 minutes during the morning and 15.17 minutes during the evening. The planning times in St. Louis and Kansas City represent average rush-hour speeds between 31 and 44 mph.

Individual freeway segments within the regions experienced longer travel times than the regional averages as depicted in the maps. The maps also depict rush-hour conditions on arterial routes compared to normal traffic flow during non-peak traffic conditions.

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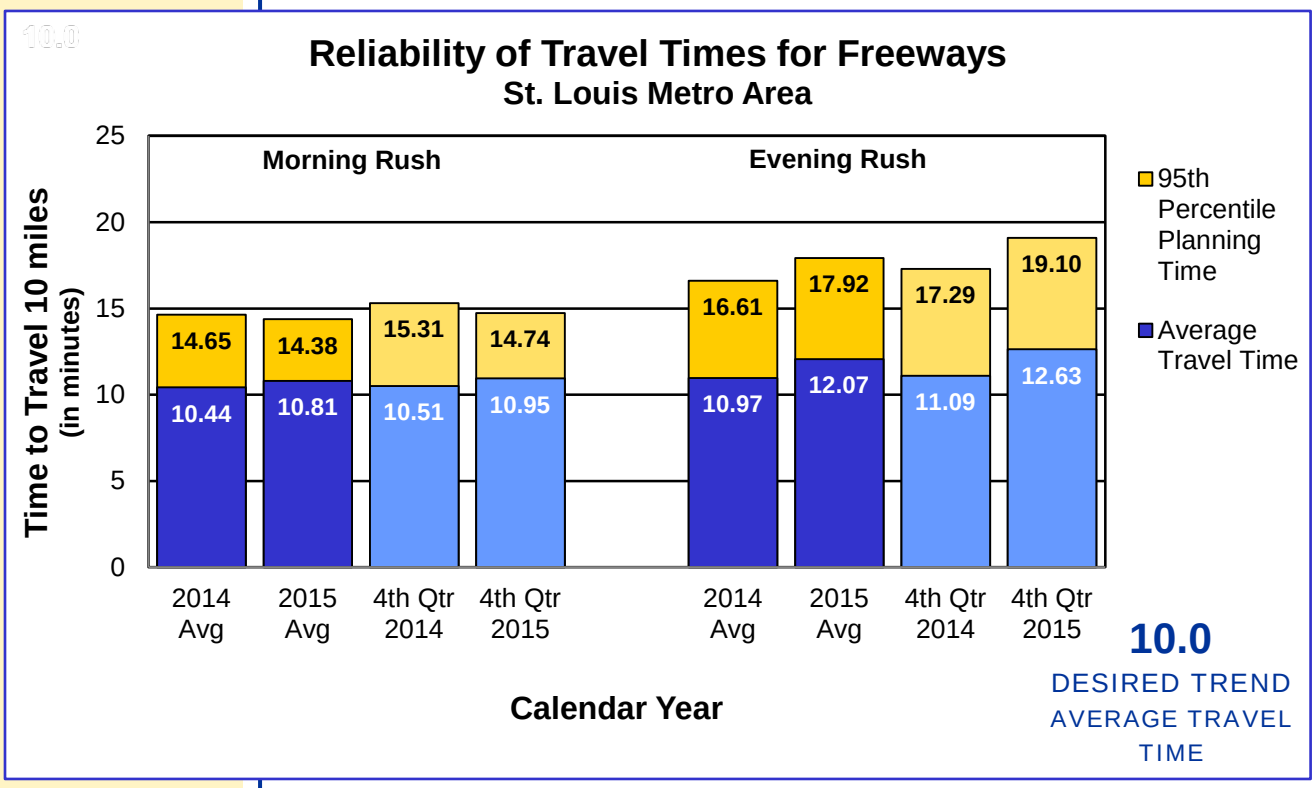
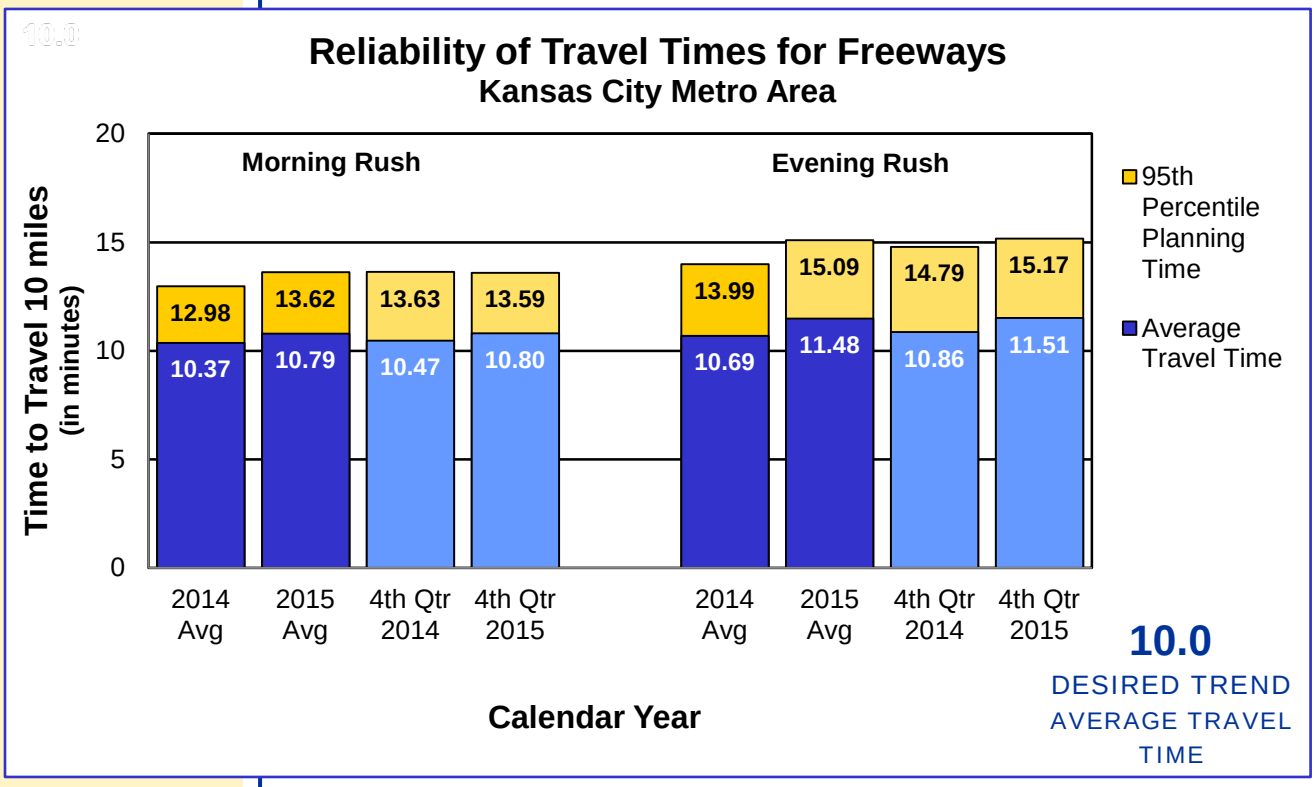
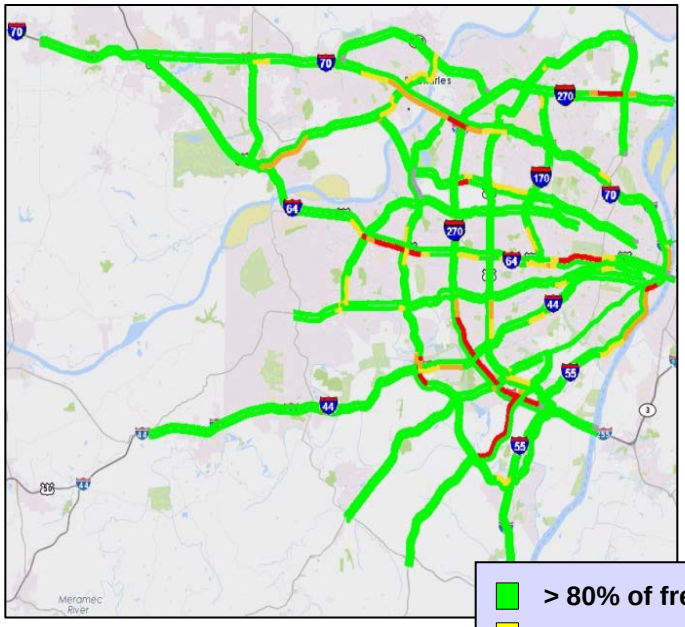
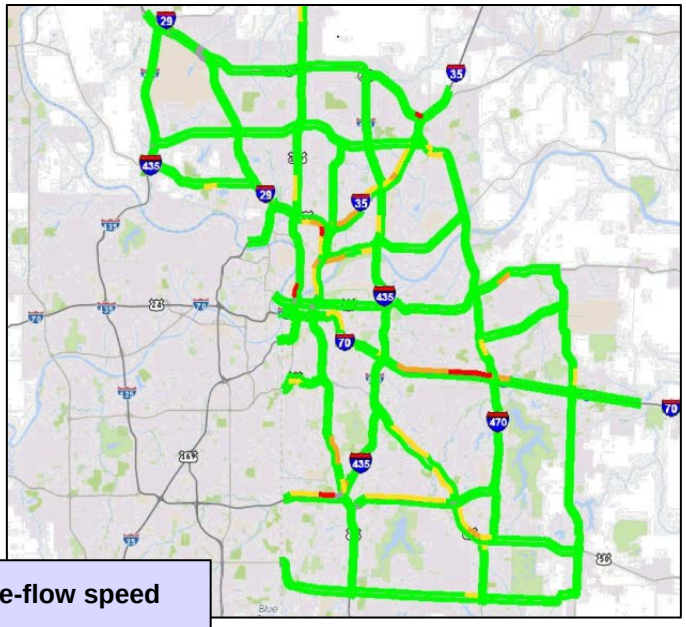




A.M. Mobility

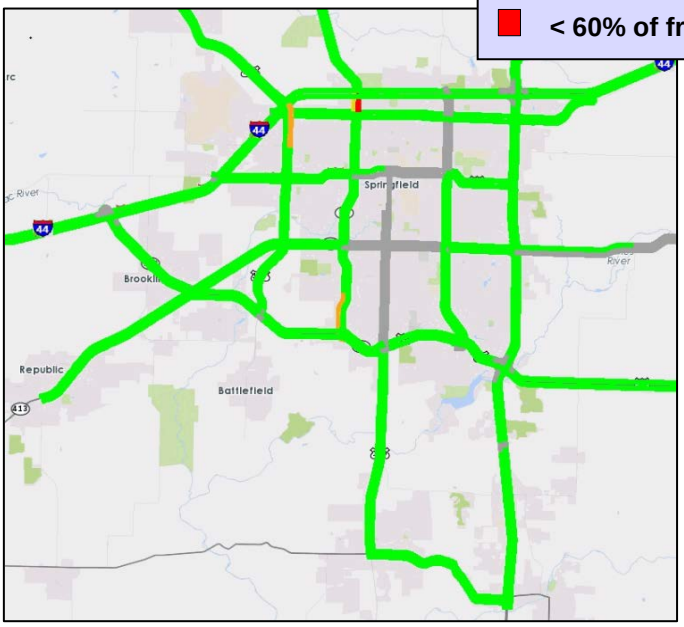


St. Louis Area

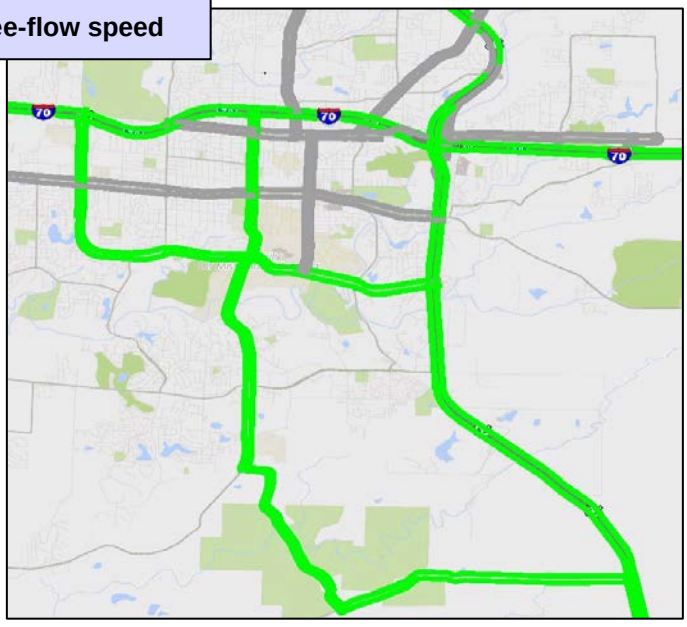


Kansas City Area

- > 80% of free-flow speed
- 70-80% of free-flow speed
- 60-70% of free-flow speed
- < 60% of free-flow speed

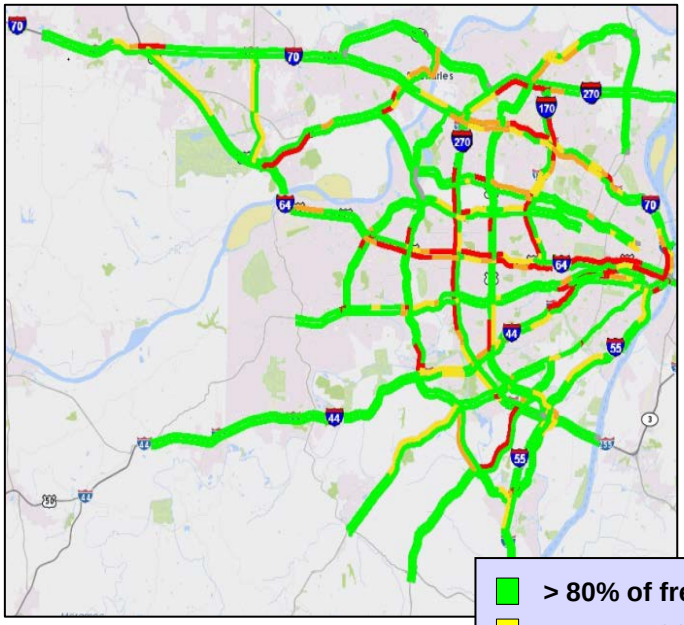


Springfield Area

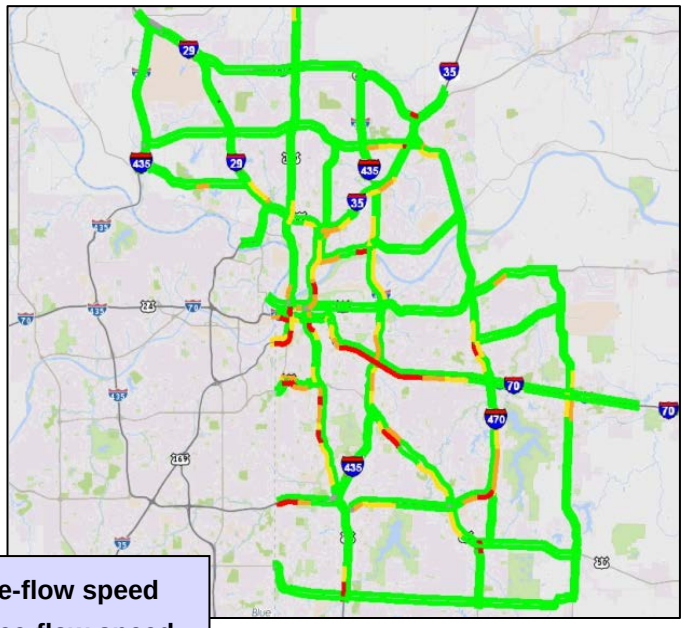


Columbia Area

P.M. Mobility

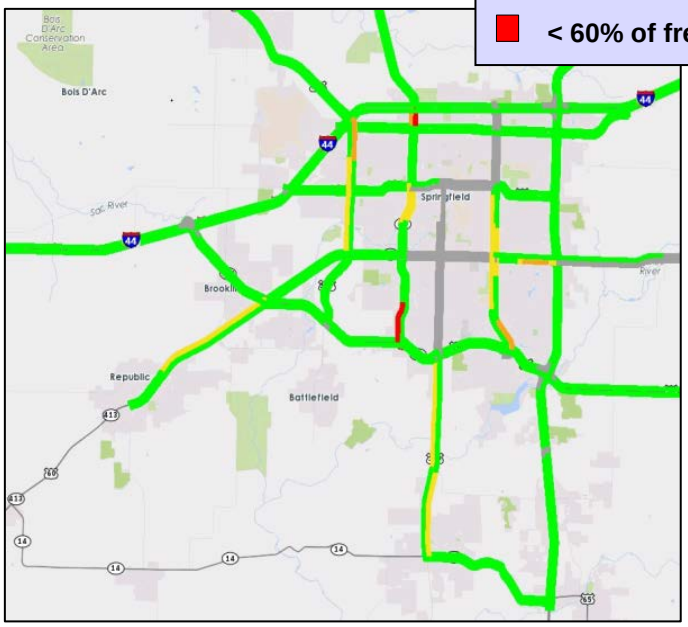


St. Louis Area

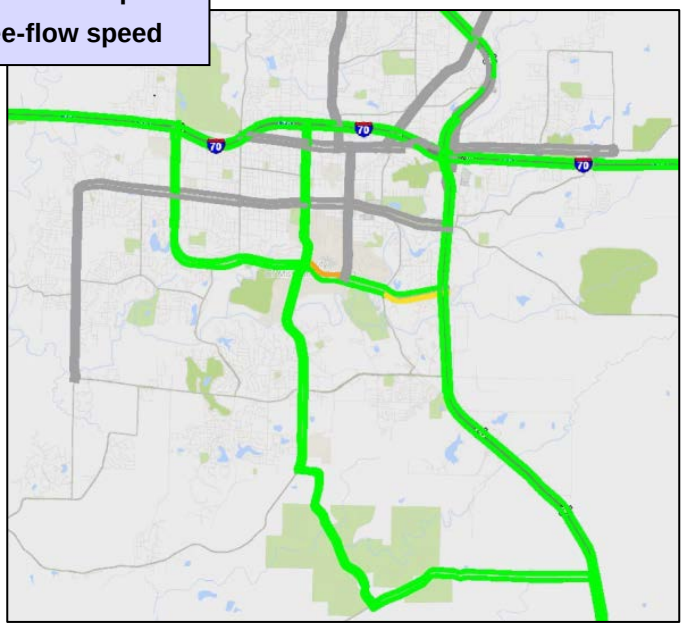


Kansas City Area

- > 80% of free-flow speed
- 70-80% of free-flow speed
- 60-70% of free-flow speed
- < 60% of free-flow speed



Springfield Area



Columbia Area

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Cost and impact of traffic congestion – 5b

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Jeanne Olubogun
District Traffic Engineer

PURPOSE OF THE MEASURE:
This measure tracks the annual cost and impact of traffic congestion to motorists for motorist delay, travel time, excess fuel consumed per auto commuter and congestion cost per auto commuter.

MEASUREMENT AND DATA COLLECTION:
A reporting tool available in the Regional Integrated Transportation Information System looks at user delay costs. This data, in combination with industry standard costs for passenger cars and trucks, reflects the overall costs of congestion. RITIS also includes historic data so trend lines can be tracked and evaluated. The unit cost per passenger car is $16.79 per hour and is obtained from the Texas A&M Transportation Institute. The unit cost per truck is $65.29 obtained from the American Transportation Research Institute, which specializes in tracking freight mobility and provides the best source of data related to freight costs. For previous reporting, the department used data provided by the TTI, which annually produces the Urban Mobility Report.

Recurring congestion occurs at regular times, although the traffic jams are not necessarily consistent day-to-day. Nonrecurring congestion is an unexpected traffic crash or natural disaster that affects traffic flow. When either occurs, the time required for a given trip becomes unpredictable. This unreliability is costly for commuters and truck drivers moving goods, which results in higher prices to consumers.

While the desired trend for both costs is downward, challenges exist in Missouri's metropolitan regions to continue toward this desired outcome. A comprehensive look at congestion is needed, looking beyond typical solutions of adding capacity. As the department adapts to limited revenue streams, the capacity for adding projects will be scarce. Using smarter technology to help guide motorists is a must. Still, the desired outcome is lower congestion costs and an indication that traffic is moving more efficiently.

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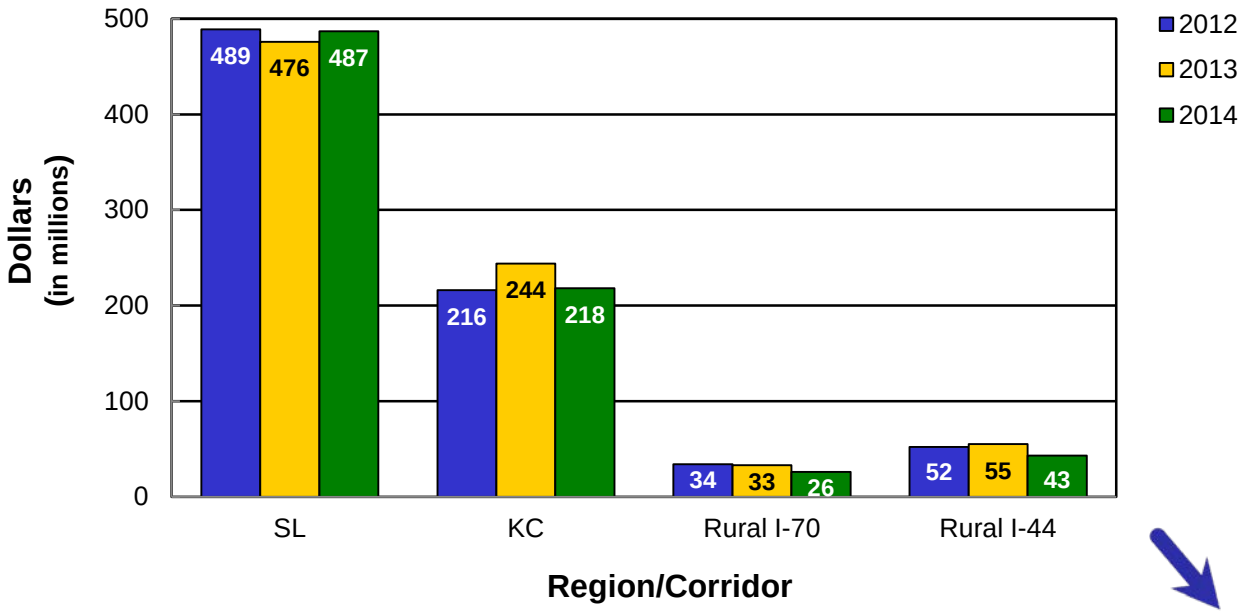
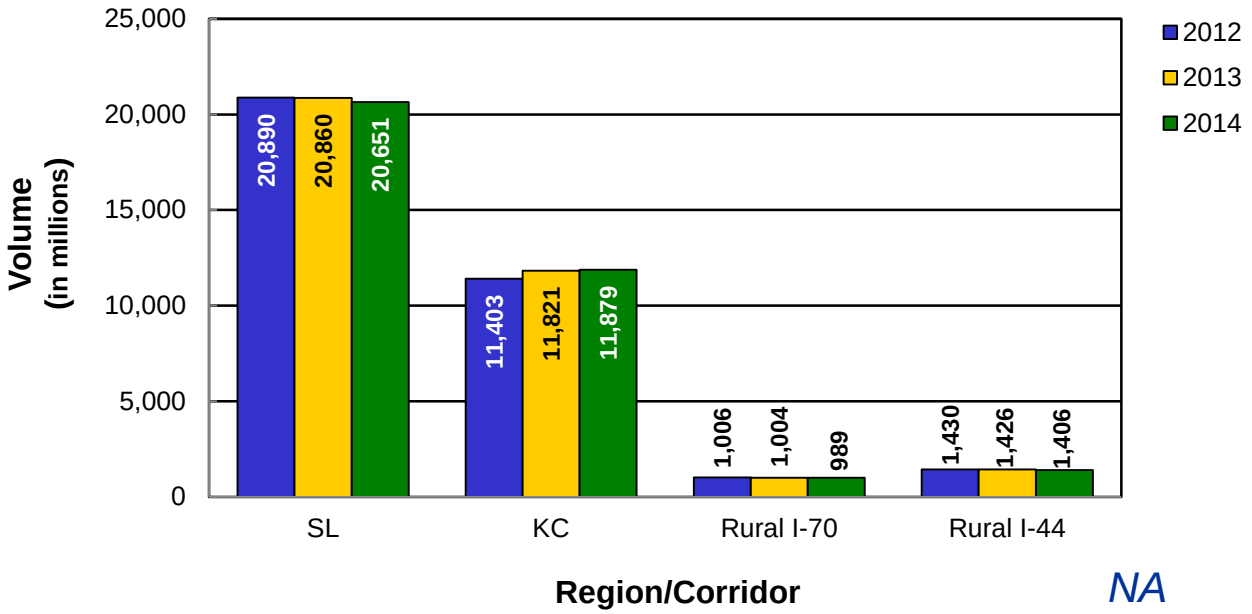
Cost of Congestion on State Roads



DESIRED TREND

Traffic Volume on State Roads



NA

DESIRED TREND

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Average time to clear traffic incident – 5c

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Randy Johnson
Traffic Center Manager

PURPOSE OF THE MEASURE:
This measure is used to determine the trends in incident clearance on the state highway system.

MEASUREMENT AND DATA COLLECTION:
Advanced transportation management systems are used by the Kansas City and St. Louis traffic management centers to record incident start time and the time when all lanes are declared cleared. Traffic incidents can be divided into three general classes of duration set forth by the Manual on Uniform Traffic Control Devices that include minor, intermediate and major. Each class has unique traffic control characteristics and needs.

A traffic incident is an unplanned event that blocks travel lanes and temporarily reduces the number of vehicles that can travel on the road. The speed of incident clearance is essential to the highway system returning back to normal conditions. Responding to and quickly addressing the incident (crashes, flat tires and stalled vehicles) improves system performance.

St. Louis recorded 1,002 incidents in October, 1,039 in November and 889 in December. The average time to clear traffic incidents was 29.4 minutes, an increase of 5 percent compared to the fourth quarter of 2014.

Kansas City recorded 521 incidents in October, 611 in November and 600 in December. The average time to clear traffic incidents was 26.3 minutes, an increase of 16 percent from the fourth quarter of 2014.

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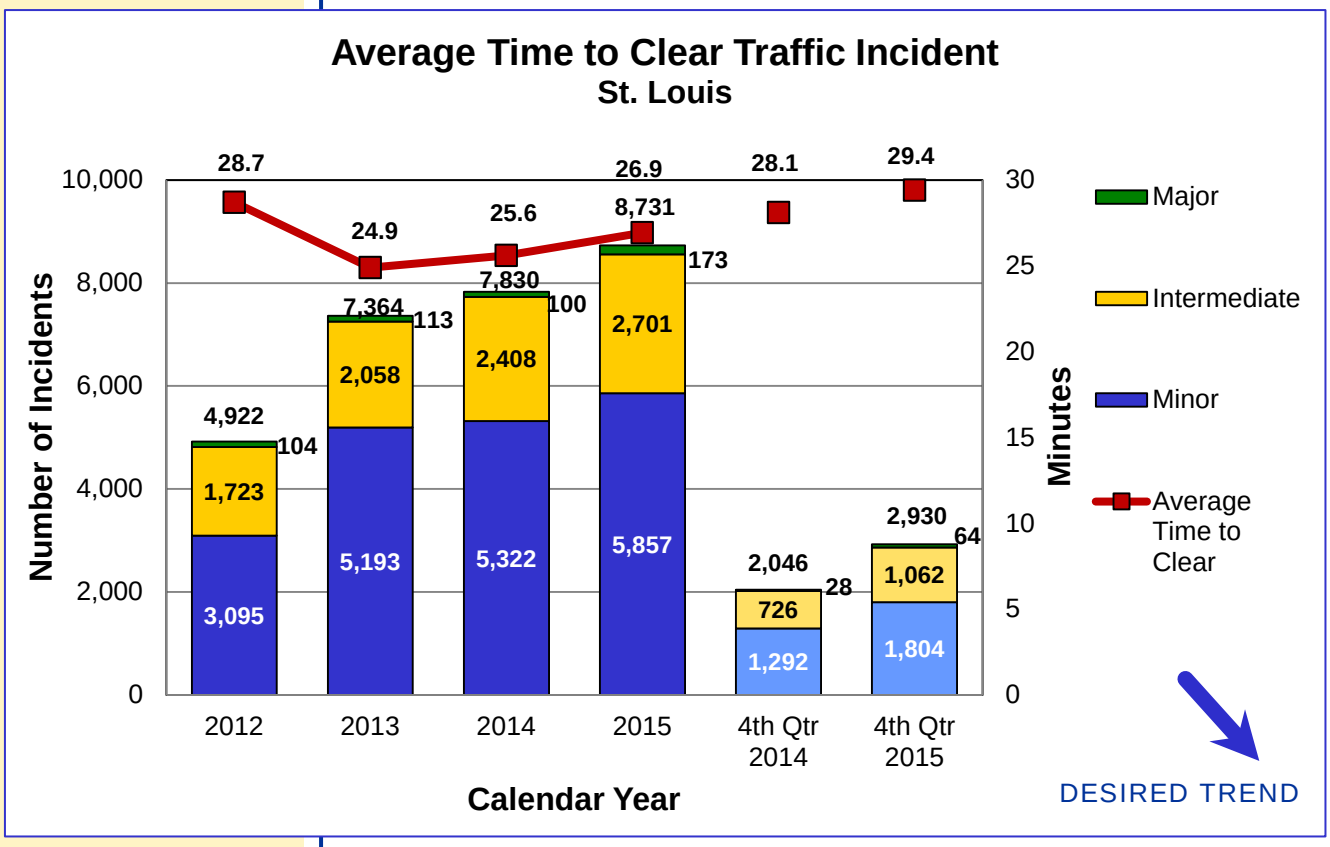

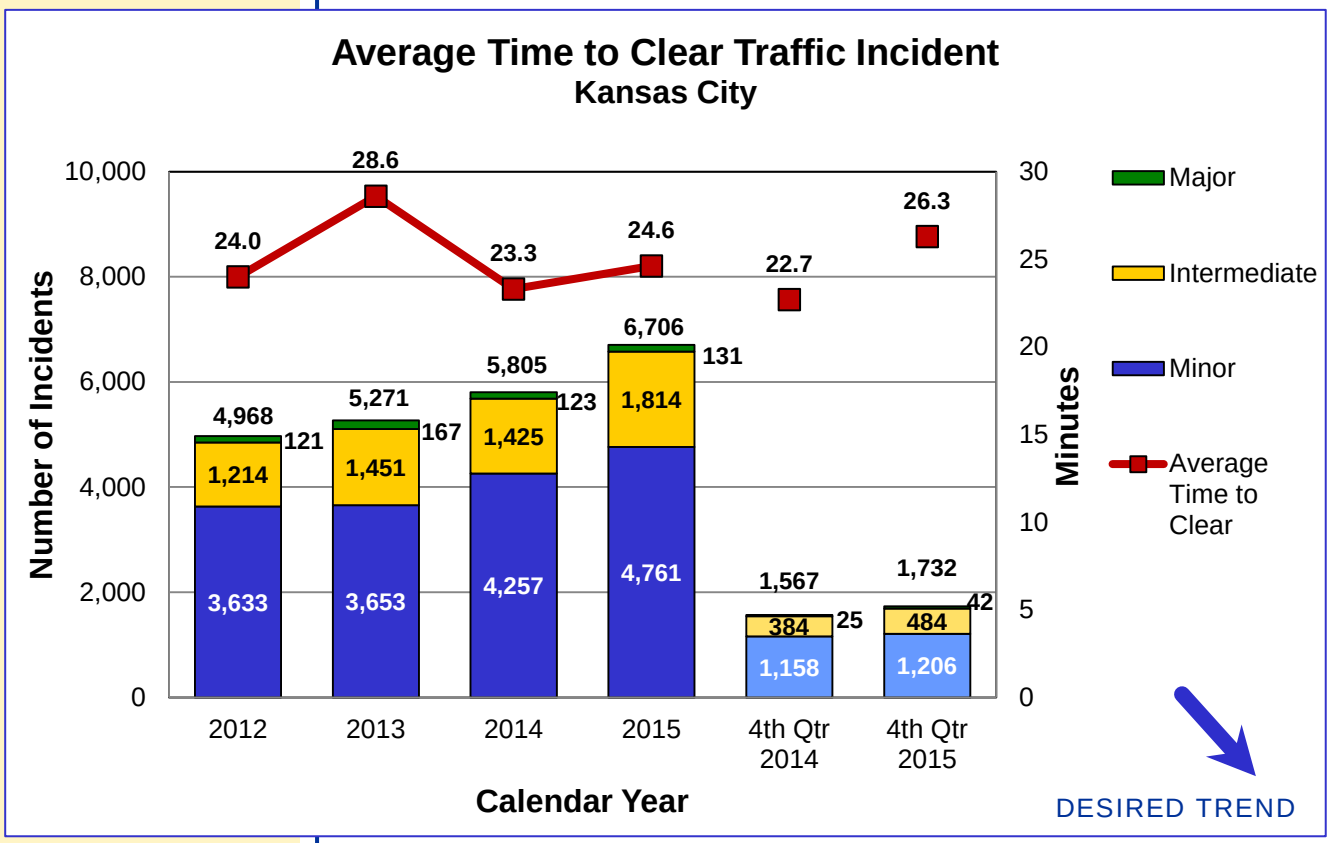

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Rick Bennett
Traffic Liaison Engineer

PURPOSE OF THE MEASURE:
This measure tracks the traffic incident impacts on Interstate 70 and Interstate 44 due to highway incidents.

MEASUREMENT AND DATA COLLECTION:
Interstate route closures having an actual or expected duration of 30 minutes or more are entered into MoDOT's Transportation Management System for display on the Traveler Information Map. By using the incident locations identified from the Traveler Information Map data along with the Regional Integrated Transportation Information System, real-time durations and delays for these incidents can be identified. The impact duration is the total amount of time that there was a noticeable impact on traffic speeds as a result of the incident regardless of how long the actual incident closure lasted. The maximum delay is the longest delay that an individual traveler would have experienced as a result of the incident. What is important about these measurements is that they represent the impacts that are "felt" by our customers resulting from incident closures.

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Traffic incident impacts on major interstate routes – 5d

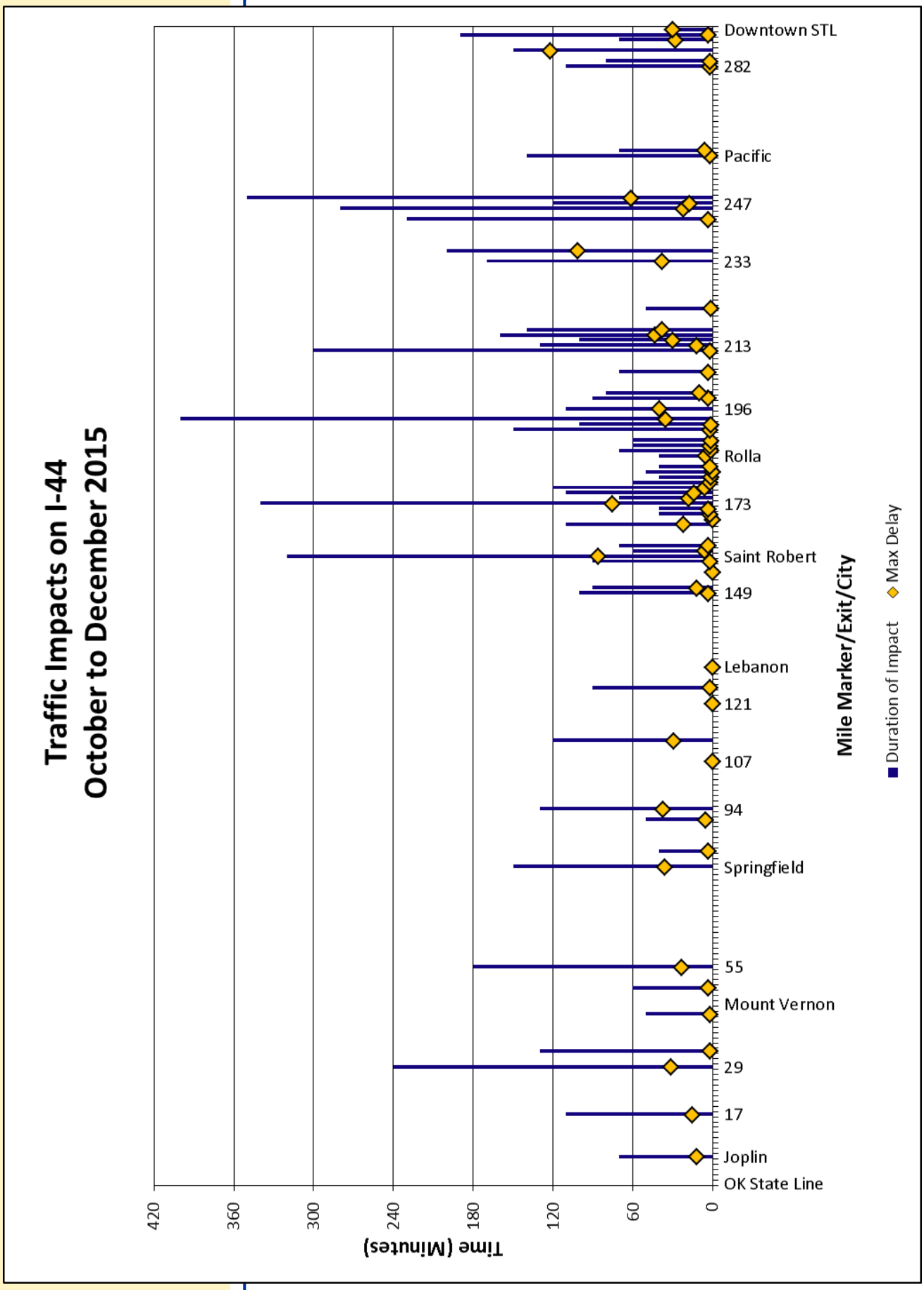
Interstates are the arteries that connect our nation and keep people and commerce flowing. When they shut down in Missouri, the country is cut in half. Keeping interstates free-flowing is a top priority for MoDOT, but sometimes vehicle crashes affect the department's ability to keep the interstates moving.

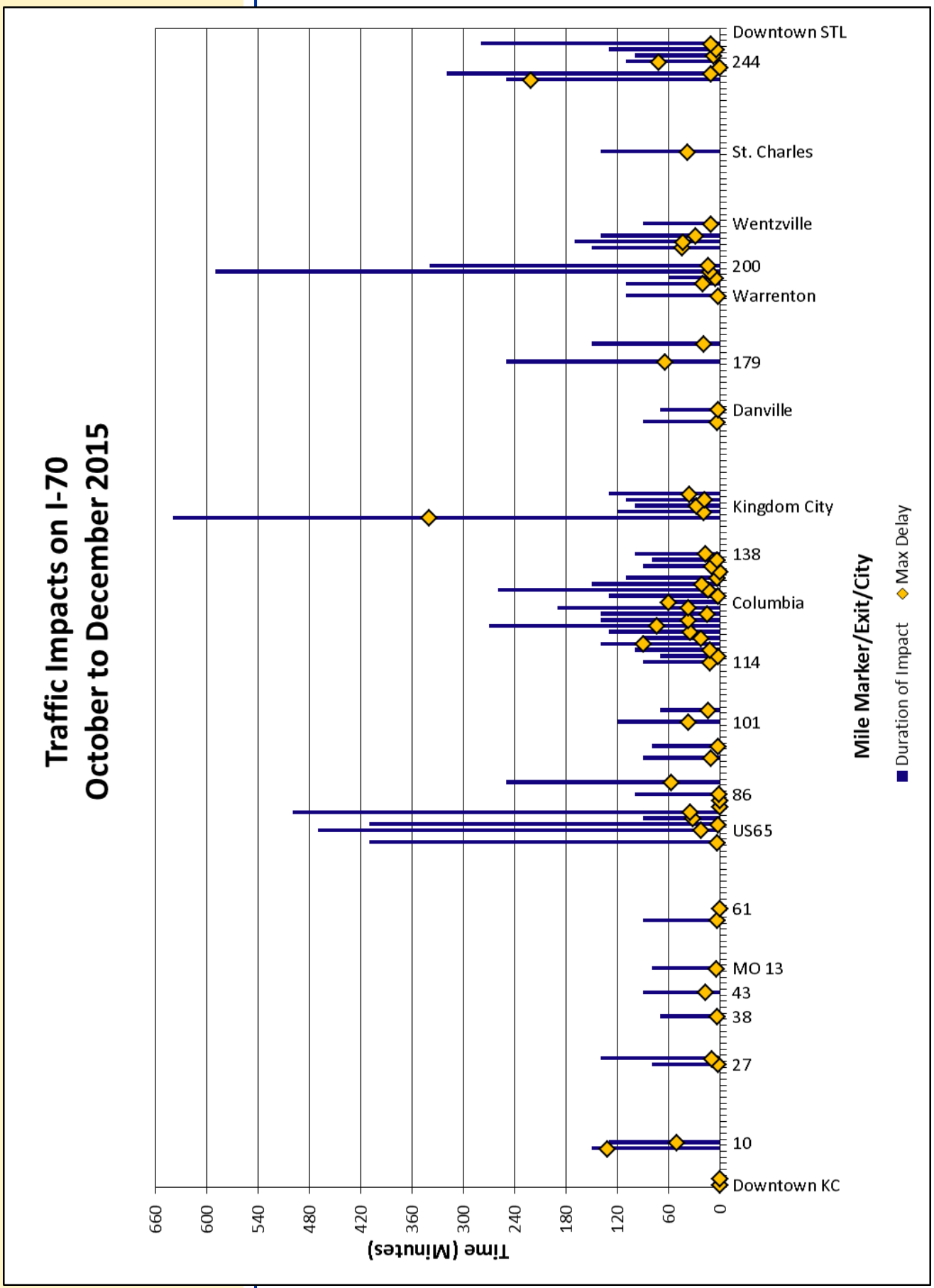
The I-70 and I-44 charts give a comparison of the duration of the incidents and the actual delay experienced by the travelers as provided by the RITIS tool. An incident with a long duration may not create a long delay. This can occur when at least one lane remains open or if there is a good detour route around the incident. The time of day and traffic volumes on the corridor also can be a factor. The final map provides a picture of where the incidents are occurring over a full year to see the areas with higher concentrations of incidents.

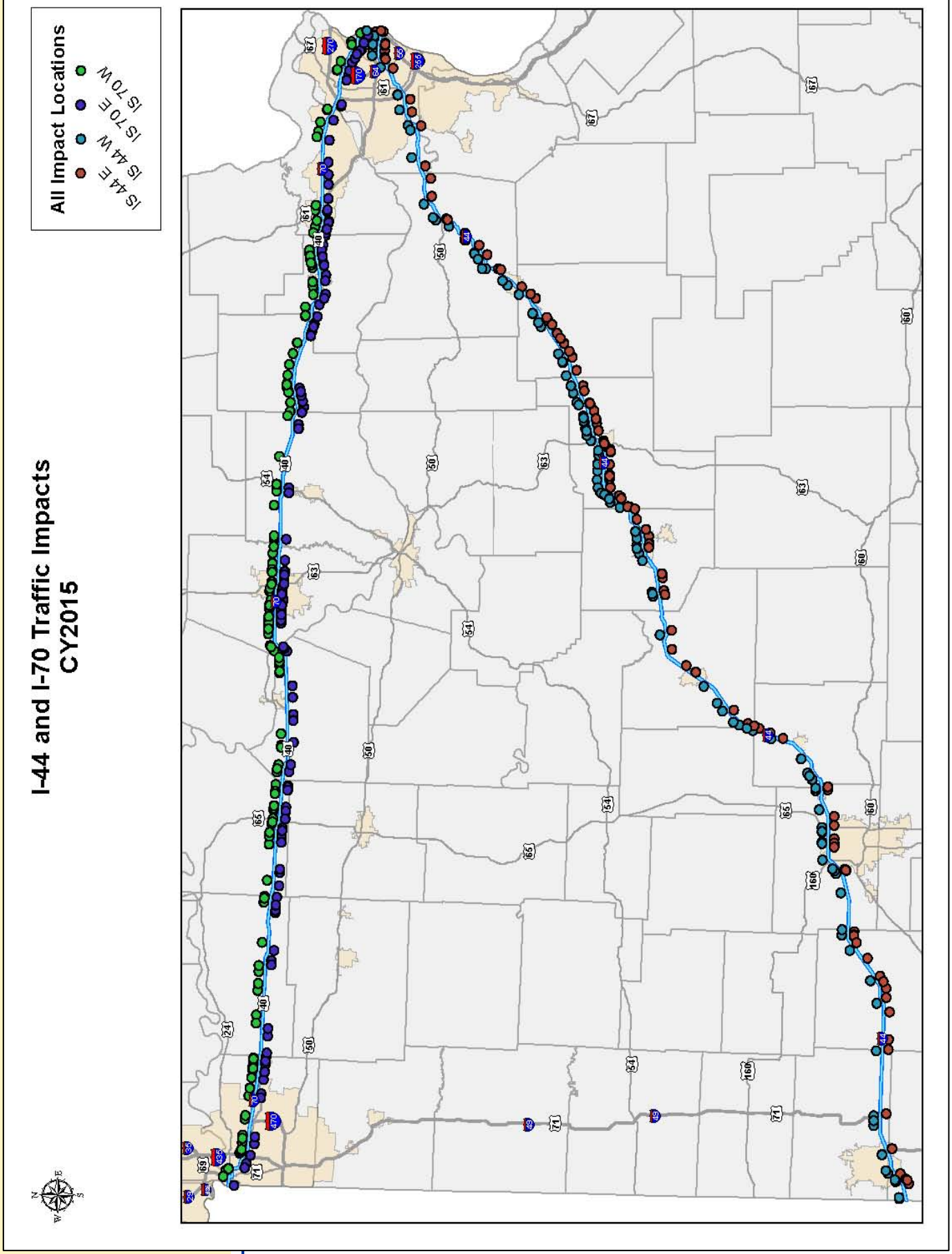
MoDOT continues to work with emergency responder partners to minimize the delay caused by closures on the interstate system. This Tracker measure provides more information so staff can focus on the incidents with higher "real" impact to travelers. This information is used to develop and implement strategies and best practices to reduce the impacts to travelers.

Top 10 Incidents by Delay
October - December 2015

Route	County	Dir	Mile Marker	Date	Impact Duration (hrs:min)	Max Delay (hrs:min)
I-70	CALLAWAY	E	148	10/27/2015	10:40	5:40
I-70	ST. LOUIS	E	241	12/25/2015	4:10	3:41
I-70	JACKSON	E	8	11/23/2015	2:30	2:12
I-44	ST. LOUIS CITY	W	286	12/30/2015	2:30	2:02
I-44	FRANKLIN	W	235	10/23/2015	3:20	1:41
I-70	BOONE	W	121	10/26/2015	2:20	1:30
I-44	PULASKI	W	160	10/31/2015	5:20	1:26
I-44	PHELPS	E	173	12/13/2015	5:40	1:15
I-70	BOONE	E	123	12/3/2015	4:30	1:14
I-70	ST. LOUIS CITY	W	245	11/7/2015	1:50	1:12


Traffic Impacts on I-44
October to December 2015
Downtown STL
282
Pacific
247
233
213
196
Rolla
173
Saint Robert
149
Lebanon
121
107
94
Springfield
55
Mount Vernon
29
17
Joplin
OK State Line
Mile Marker/Exit/City
Duration of Impact
Max Delay
Time (Minutes)
420
360
300
240
180
120
60
0


Traffic Impacts on I-70
October to December 2015
Downtown STL
244
St. Charles
Wentzville
200
Warrenton
179
Danville
Kingdom City
138
Columbia
114
101
86
US65
61
MO 13
43
38
27
10
Downtown KC
Mile Marker/Exit/City
Duration of Impact
Max Delay
660
600
540
480
420
360
300
240
180
120
60
0
Time (Minutes)


All Impact Locations
I44E
I44W
I70E
I70W
I-44 and I-70 Traffic Impacts
CY2015

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Jerica Holtsclaw
Design Liaison Engineer

PURPOSE OF THE MEASURE:
Work zones are designed to allow the public to travel through safely and with minimal disruptions. This measure indicates how well significant work zones perform.

MEASUREMENT AND DATA COLLECTION:
Work zone impacts are collected by conducting visual observations or using automated data collection. Recent updates to traffic data collection methods allow for more work zones to be evaluated. An impact is defined as the additional time a work zone adds to normal travel. They are categorized into three levels: a minor impact that lasts less than 10 minutes; a moderate impact that lasts 10 to 14 minutes; and a major impact that lasts 15 minutes or more.

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Work zone impacts to the traveling public – 5e

Motorists want to get through work zones with as little inconvenience as possible. MoDOT tries to minimize the travel impacts by shifting work to nighttime hours or during times when there are fewer impacts to the traveling public. To get a wider range of data and a better understanding of the impact work zones have on motorists, the department has increased the number of work zones it monitors each quarter.

MoDOT monitored 81 significant work zones this quarter, with 12 major impacts and 16 moderate impacts. This brings the 2015 totals to 116 major and 156 moderate impacts, with a total of 400 work zones analyzed. The significant projects this quarter that accounted for the most impacts were the Design Build Project on I-70 in Central District and the Welcome Center on I-35 in the Northwest District. These work zones accounted for eight major and 13 moderate impacts, nearly 61percent of all the impacts this quarter. The Kansas City District had two major impacts on I-35 southbound interchange improvements project, both were due to stalled vehicles in the area of the work zone.

Overall for the calendar, year the most delays were realized on two projects in the Kansas City District (Blackwater and Sni A Bar Bridge projects on I-70). These two projects alone accounted for approximately 70 percent of all the impacts for the entire year displayed in the charts.

Based on work zone surveys received through this year, 41 percent of motorists are satisfied with timeliness when traveling in a work zone.

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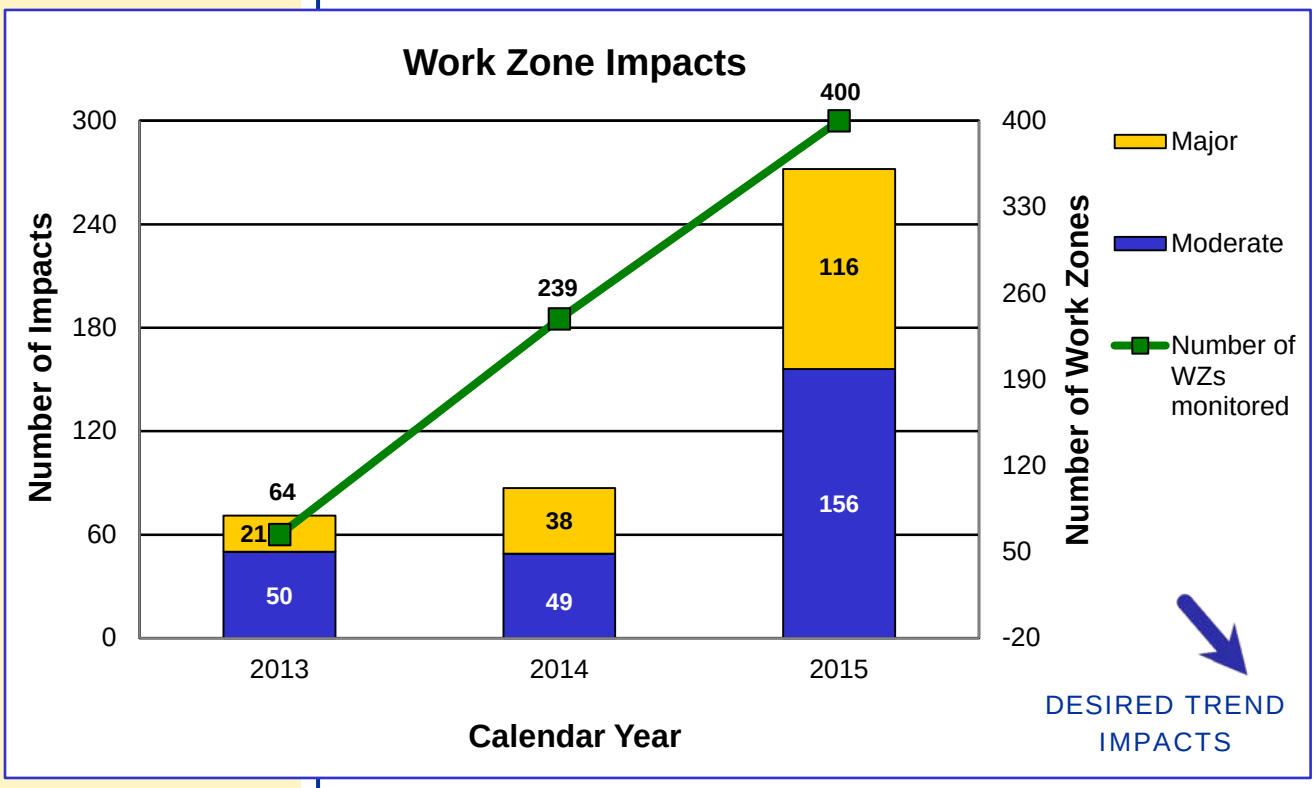

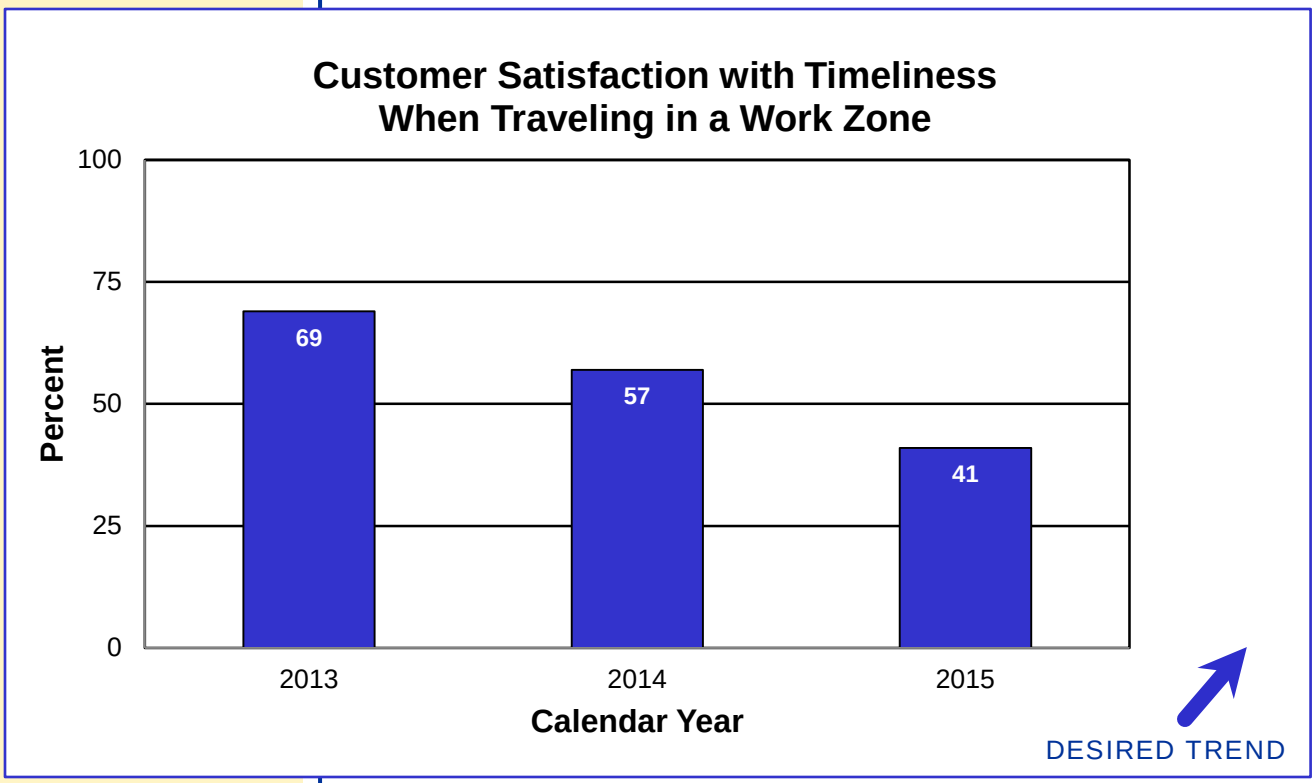

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Mike Henderson
Transportation Planning Specialist

PURPOSE OF THE MEASURE:
This measure tracks concentrations of pollutants in on-road mobile source emissions. In other words, the department is tracking pollution caused by vehicles on the roads.

MEASUREMENT AND DATA COLLECTION:
MoDOT is still determining what pollutants to track and what concentration levels will align with the U.S. Environmental Protection Agency's air quality standards. At this time, the department collects data on oxides of nitrogen, volatile organic compounds, fine particulate matter and carbon monoxide. Because this measure is part of the latest federal surface transportation act's performance requirements, guidance for measurement and data collection will be established in 2015.

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Effectiveness of improving air quality – 5f

MoDOT is committed to improving air quality through modifying its daily operations, incorporating employee actions and education, providing information to the public, leading air quality improvements, managing congestion to reduce emissions, providing alternative choices for commuters and promoting the use of environmentally friendly fuels and vehicles.

Effectiveness of Improving Air Quality

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Tim Chojnacki
Maintenance Liaison Engineer

PURPOSE OF THE MEASURE:
This measure tracks the amount of time needed to perform MoDOT's snow and ice removal efforts.

MEASUREMENT AND DATA COLLECTION:
For major highways and regionally significant routes, the objective is to restore them to a mostly clear condition as soon as possible after the storm has ended. MoDOT calls these "continuous operations" routes. State routes with lower traffic volumes should be opened to two-way traffic and treated with salt or abrasives at critical areas such as intersections, hills and curves. These are called "non-continuous operations" routes. After each winter event, maintenance personnel submit reports indicating how much time it took to meet the objectives for both route classifications.

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Time to meet winter storm event performance objectives – 5g

Knowing the time it takes to clear roads after a winter storm can help the department better analyze the costs associated with that work. MoDOT's response rate to winter events provides good customer service for the traveling public while keeping costs as low as possible. The beginning of the 2015-2016 winter was light with only a few minor events affecting portions of the state. It took an average of three hours to meet MoDOT's objective for continuous operations routes, and an average of 4.5 hours for non-continuous routes. These numbers compare favorably with the type of storms received and our historical performance. Winter operations, on average, cost about $46.8 million dollars per year. As of December 31, 2015, MoDOT has expended $3.7 million dollars responding to events this winter. The money and time spent on clearing the roads of snow and ice means funds are not available to maintain the roadways in the spring, such as surface improvements, sign repair, brush cutting and drainage work.

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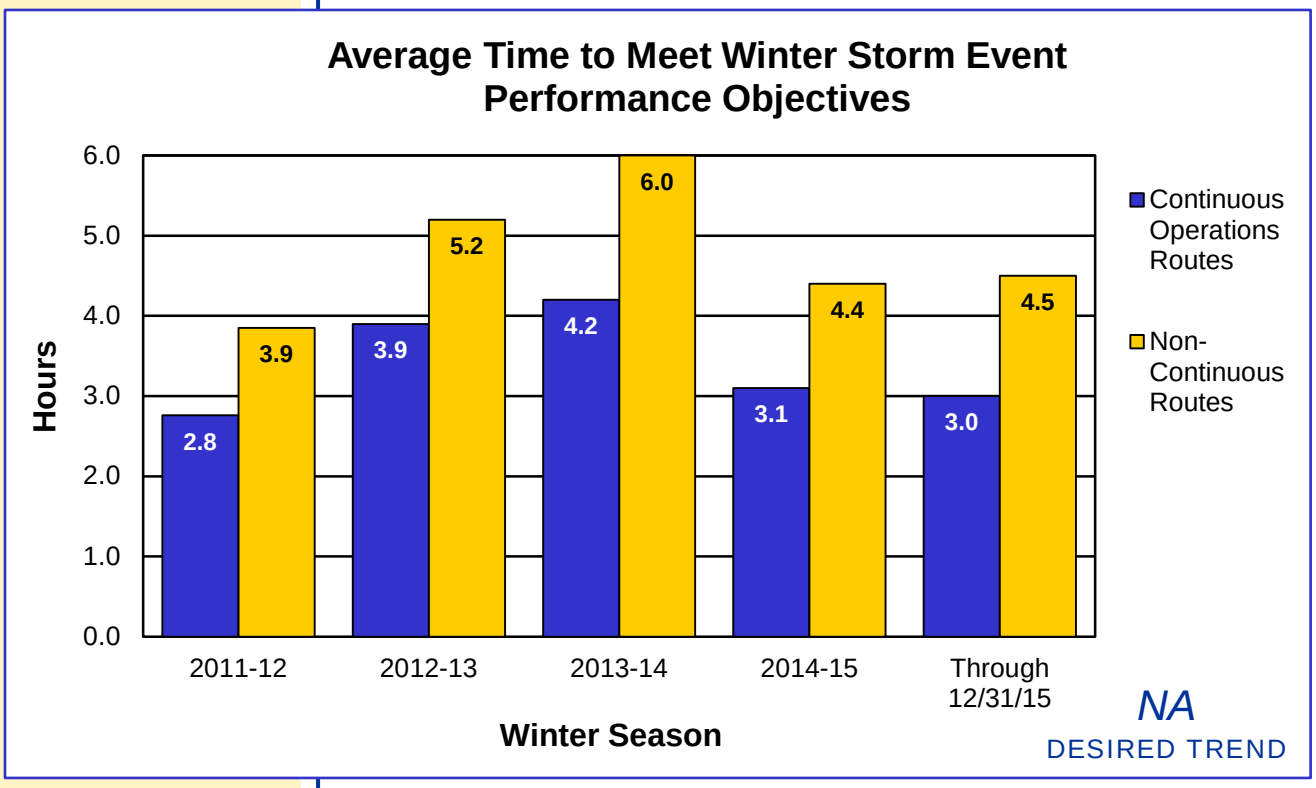

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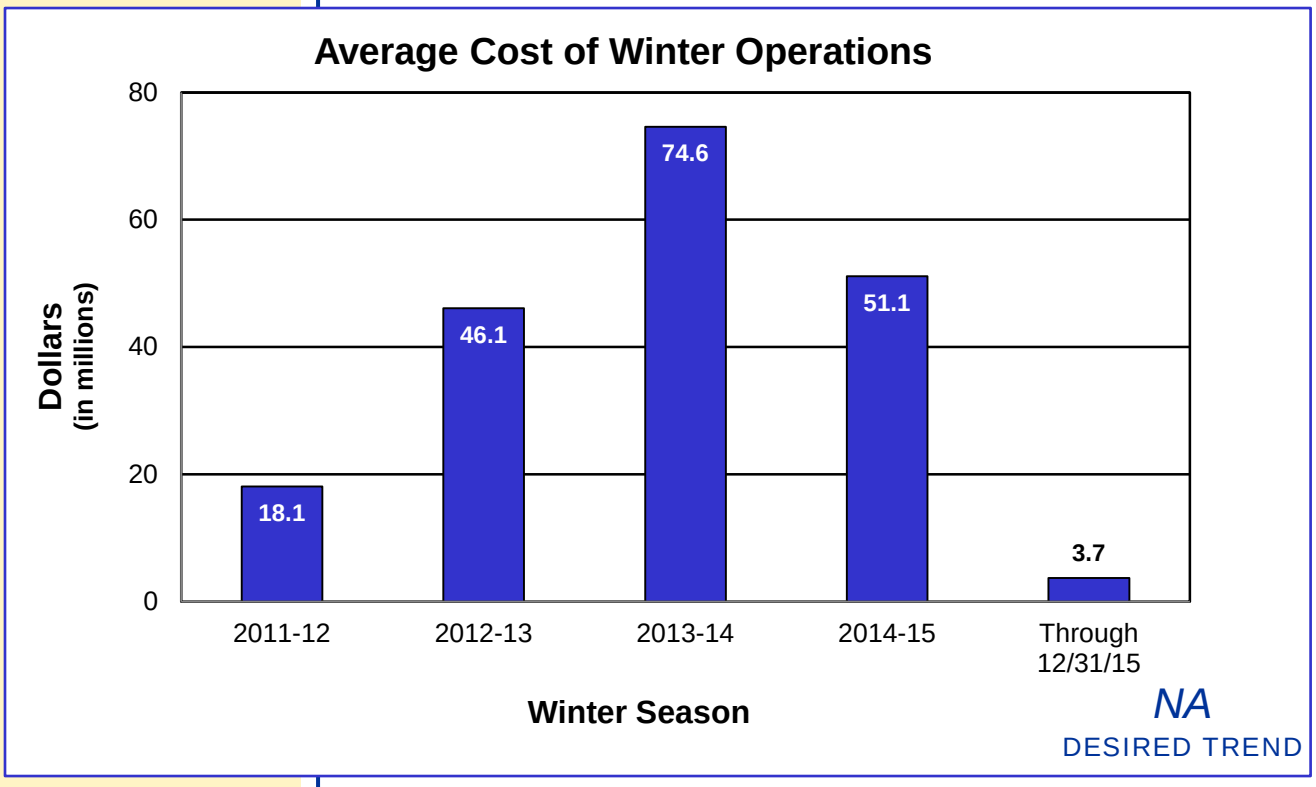
DESIRED TREND



NA

DESIRED TREND

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Bike/pedestrian and ADA transition plan improvements – 5h

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Ron Effland
Non-motorized Transportation Engineer

PURPOSE OF THE MEASURE:
This measure tracks MoDOT's investment in pedestrian facilities and progress toward removing barriers. Accessibility needs occur both within the right of way, such as sidewalks and traffic signals, and within department buildings, parking lots and restrooms. Removal of the barriers listed in MoDOT's 2010 Transition Plan is required as part of the department's compliance with the Americans with Disabilities Act.

MEASUREMENT AND DATA COLLECTION:
Tracking of MoDOT's investment in pedestrian facilities is done by collecting awarded contract amounts for the 20 most common construction elements used on pedestrian projects each year. Transition Plan progress is based upon completed work that has corrected defective items reported in the August 2010 Transition Plan inventory. The dollar amounts are based on unadjusted estimates from 2008 and will not reflect actual expenditures. This avoids impacts from inflation or changing field conditions.

MoDOT continues to be responsive to public requests for improved accessibility and has been proactive in many areas to make systematic improvements when opportunities arise and limited funding allows.

MoDOT has improved more than $16.0 million of deficient ADA facilities in the right of way since 2008. Additional work totaling more than $135.3 million is still necessary to complete the 2010 ADA Transition Plan inventory.

Unfortunately, limited revenue for construction projects at both state and federal levels makes it difficult to even maintain existing facilities. Additional funding sources will need to be developed before significant progress can be made in developing the improved pedestrian facilities that Missourians desire.

MoDOT's annual investment in pedestrian facilities for 2015 totals $6.82 million. In 2014, the annual investment was an all time high of $11.76 million. Since 2008, MoDOT has invested over $54.8 million in pedestrian facilities statewide.

MoDOT has committed to complete ADA improvements, including cross slope corrections, as work is being done on the adjacent roadway section.

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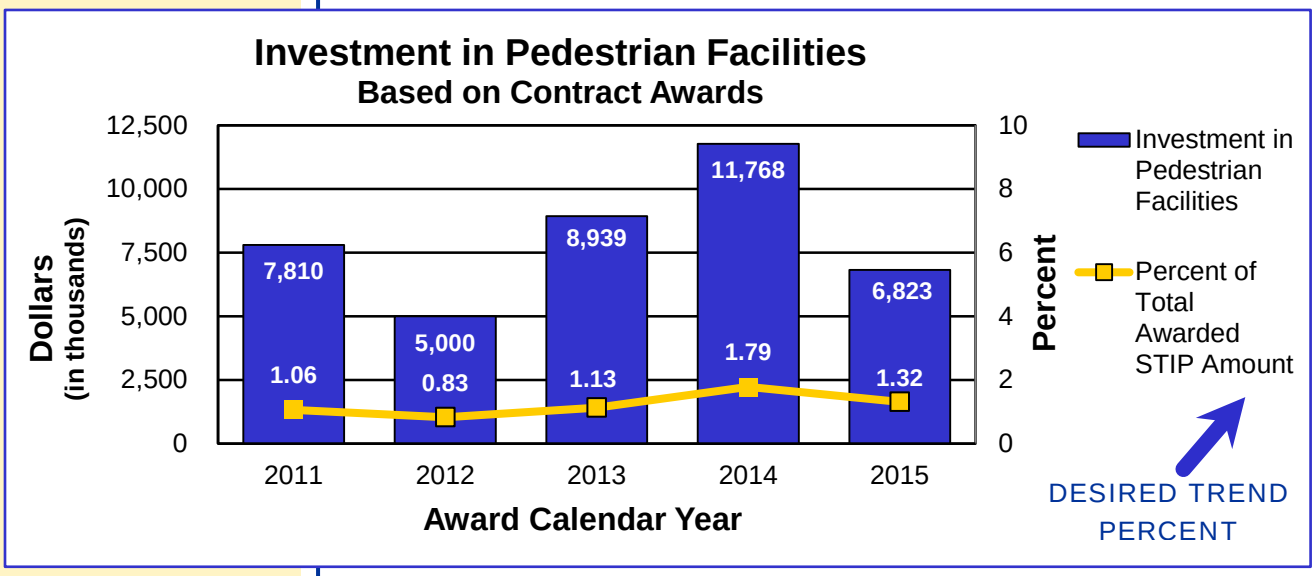

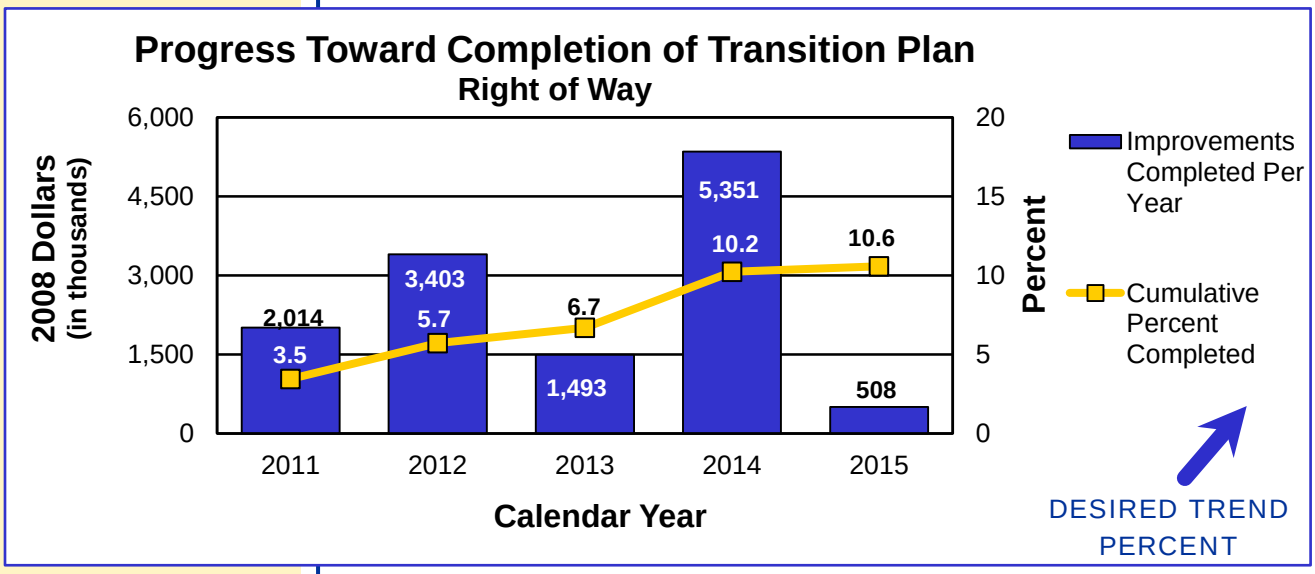

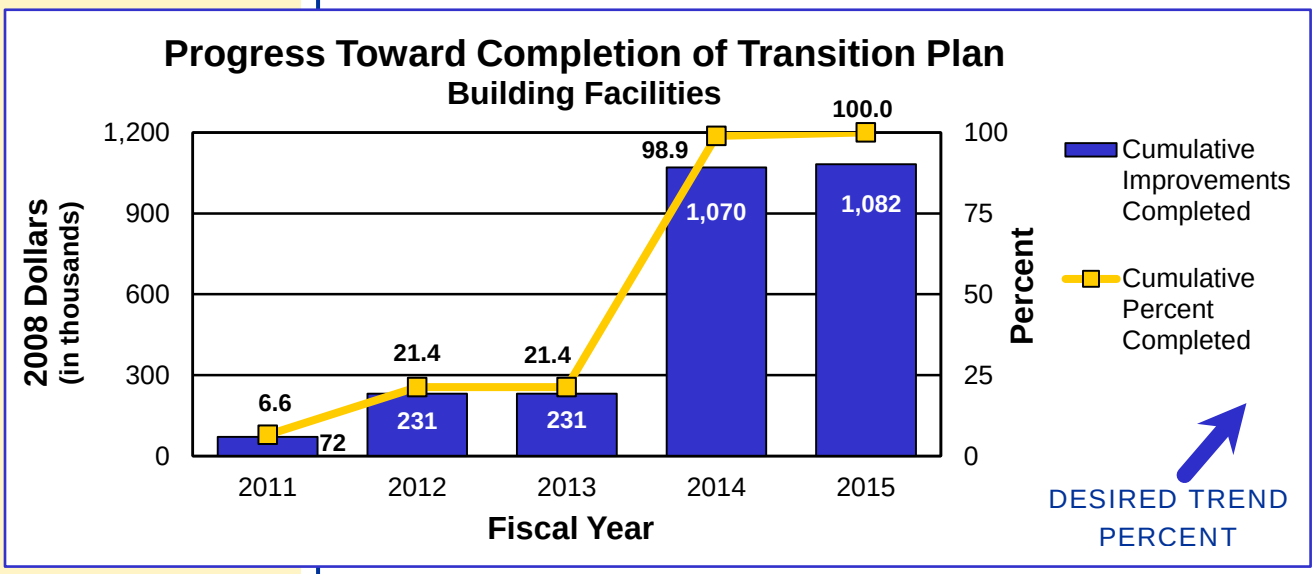

RESULT DRIVER:
Paula Gough
District Engineer

MEASUREMENT DRIVER:
Amy Ludwig
Administrator of Aviation

PURPOSE OF THE MEASURE:
This measure tracks passenger use of modes other than highways in Missouri.

MEASUREMENT AND DATA COLLECTION:
Airline passenger counts are obtained from the Federal Aviation Administration. The state of Washington is the benchmark due to its comparable population. Ferry passenger data is compiled from the New Bourbon and Mississippi County ferryboats, services owned and operated by Missouri public port authorities. Amtrak supplies Missouri River Runner passenger counts. Urban and rural transit services provide transit passenger data, with Wisconsin as the benchmark. Aviation and transit data is updated annually in October while ferryboat and rail data is updated quarterly.

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Use and connectivity of transportation modes – 5i

Planes, trains, ferries and transit are vital means of transport for Missourians. Alternative modes of transportation connect Missourians to work, healthcare and other necessary activities. They also are used to grow Missouri's economy and create jobs. Missouri's current transportation funding for these modes is inadequate and unreliable. The state is unable to meet even the existing needs for these important transportation system components.

The number of ferryboat passengers in the second quarter of FY 2016 totaled 8,260, a decrease from the 8,820 passengers in the second quarter of FY 2015. The Mississippi County ferry was closed for two weeks in October for dredging operations, while the New Bourbon ferry was closed for two weeks in December due to flooding and high water levels on the Mississippi River.

Ridership continues to decline on Missouri River Runner trains, falling nearly two percent in the second quarter of FY 2016. There were 46,043 passengers in the second quarter of FY 2016, compared to 48,818 in the same period of FY 2015. Low gas prices and recurrent bus bridges due to construction on the high-speed rail corridor between St. Louis and Chicago continue to impact ridership.

Transit ridership (passenger boardings) showed a slight decrease from 63.1 million trips in FY 2014 to 62.8 million trips in FY 2015. Urban ridership, which accounts for over 95 percent of the ridership totals for the state, decreased 0.5 percent in FY 2015, while non-urban ridership increased 2 percent in FY 2015. The overall decrease in ridership in FY 2015 can be attributed to low gas prices.

The number of airline passengers has remained fairly steady from 2010 to 2014, with a slight increase in passenger enplanements (boardings) for 2014. Due to increasing state Aviation Trust Fund revenues, in March 2015 MoDOT issued grants to commercial service airports for the air service program. These grants can be used for air service promotion and marketing and to study potential new routes.

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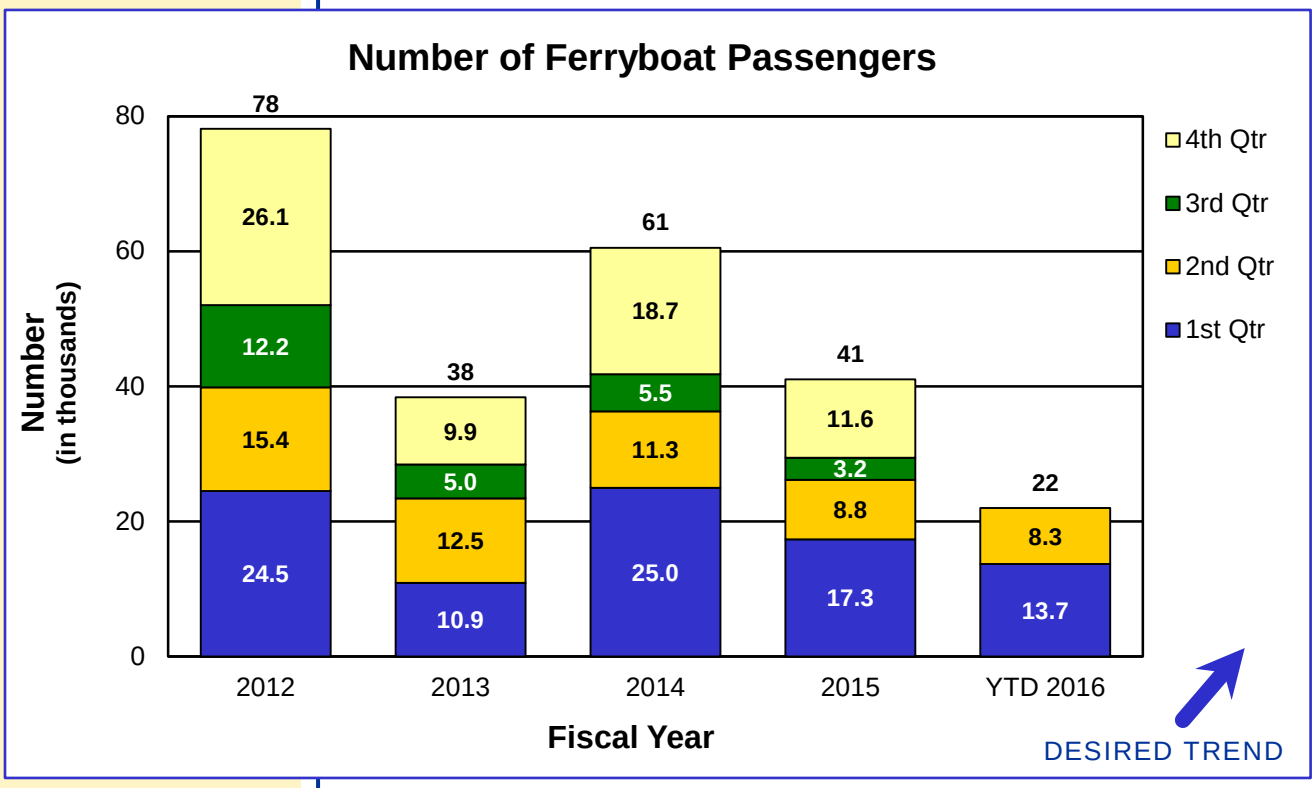

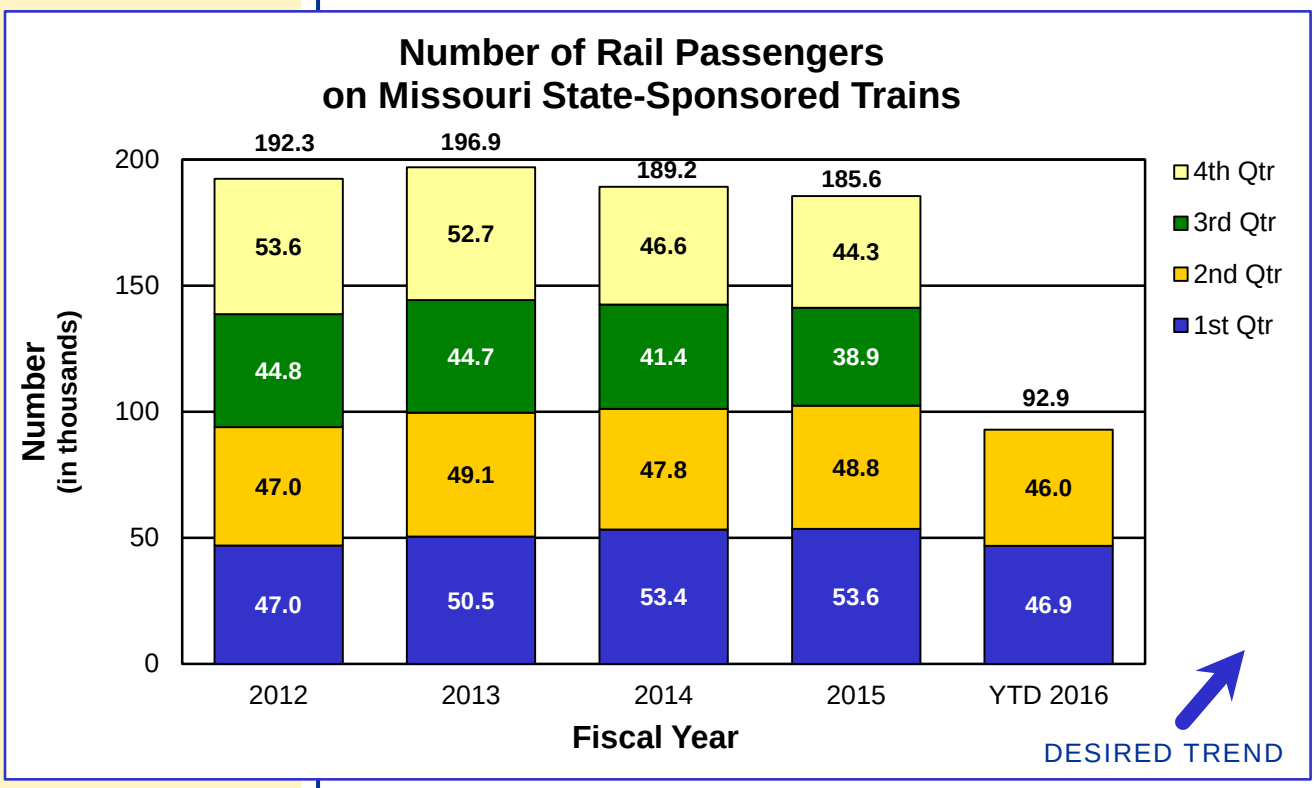

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