OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Travel times and reliability on major routes – 5a

RESULT DRIVER:
Becky Allmeroth
State Maintenance Engineer

MEASUREMENT DRIVER:
Alex Wassman
Traffic Management and Operations 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.

The target for this measure is updated quarterly. This target is established by projecting a 10 percent improvement over the same quarter of the previous year. The minimum value for the target time is 10 minutes. This corresponds to the time it takes to travel 10 miles at the posted speed limit of 60 miles per hour.

From October to December 2017, average travel times in St. Louis and Kansas City were stable or improved slightly compared to the same period last year. In the first quarter of 2017, the average 10-mile travel time in St. Louis was 10 min., 46 sec. during the morning and 12 min., 4 sec. during the evening. For Kansas City, the average travel time was 10 min., 39 sec. during the morning and 11 min., 23 sec. during the evening. The average travel times for the St. Louis morning and Kansas City evening rushes were higher than the previous year, while the average times decreased for the St. Louis evening and Kansas City morning rushes. All average travel times are lower than the 2016 average. Overall, average speeds ranged between 48 and 56 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 min., 4 sec. during the morning and 17 min., 4 sec during the evening. This means customers in the St. Louis evening rush needed to plan about seven minutes more for a 10-mile trip than they would need in free-flow conditions. In Kansas City, the average planning times were 13 min., 31 sec. during the morning and 15 min., 28 sec. during the evening. Customers in the Kansas City evening rush needed to plan about five and a half minutes more for a 10-mile trip than they would need in free-flow conditions. The planning times in St. Louis and Kansas City represent average rush-hour speeds between 33 and 44 mph. The planning times for all rushes were higher than the previous year with the exception of the St. Louis evening rush. All planning times for the quarter were lower than the 2016 average.

The average travel times in both regions are higher than the target for the second quarter of 2017. The morning travel times are 39-46 seconds greater than the target, while the evening travel times are 58 seconds to 1 minute 16 seconds greater than the target.

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 selected arterial routes compared to normal traffic flow during non-peak traffic conditions.

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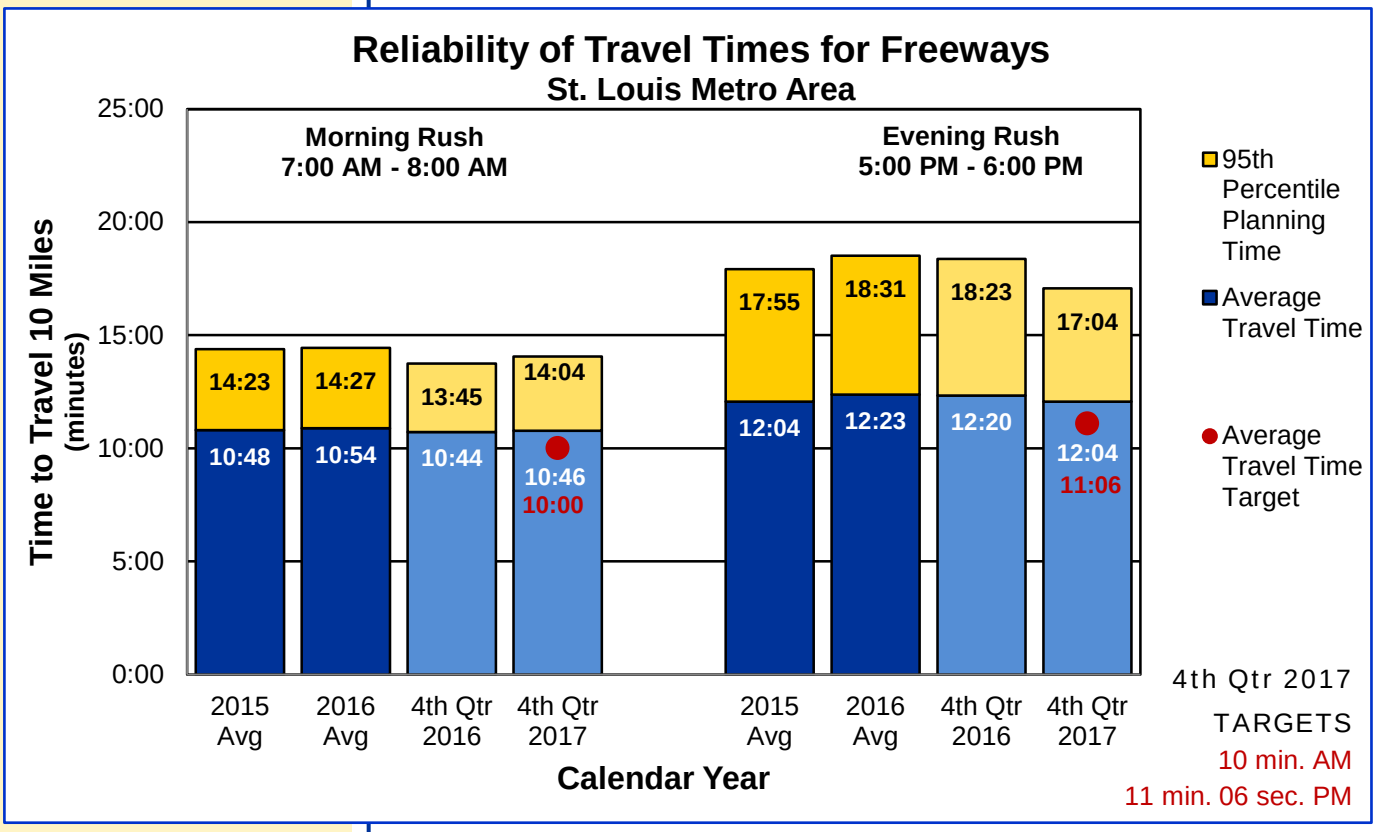
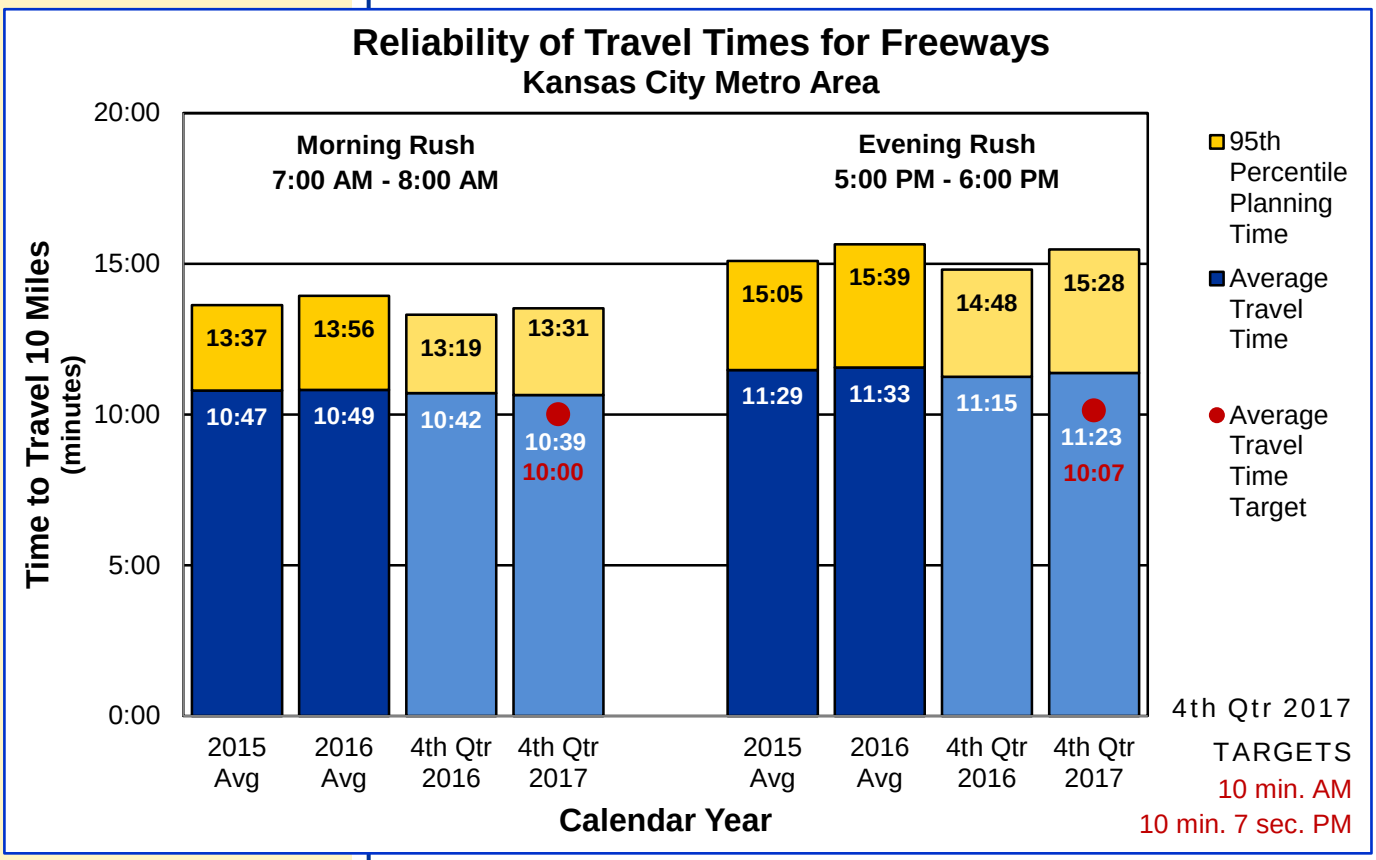
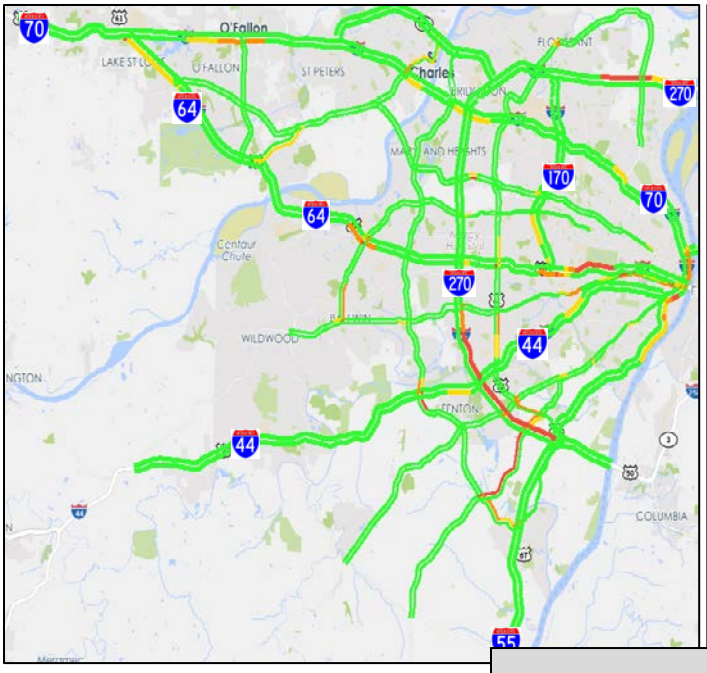
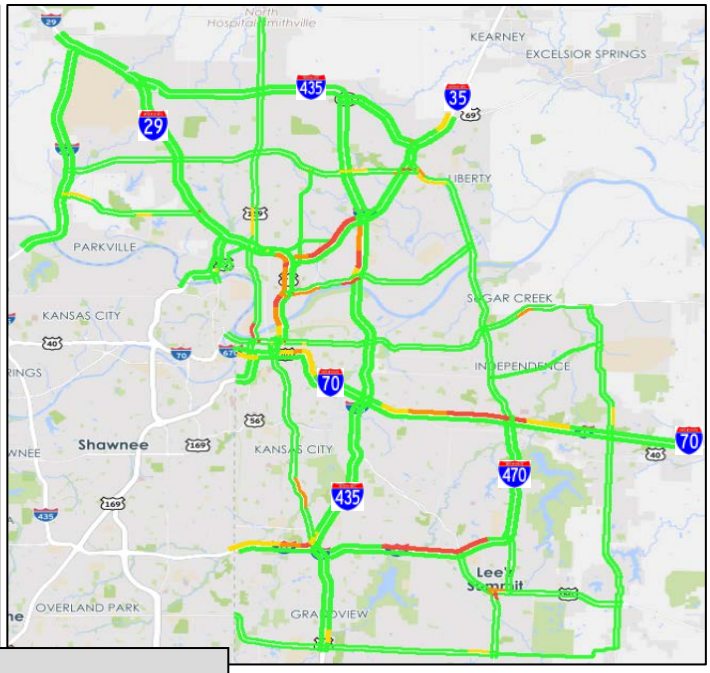




A.M. Mobility

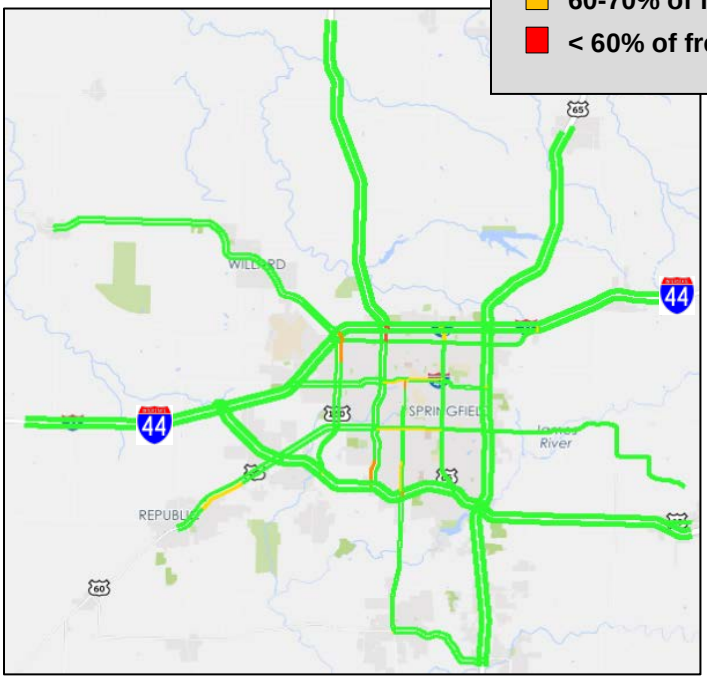


St. Louis Area

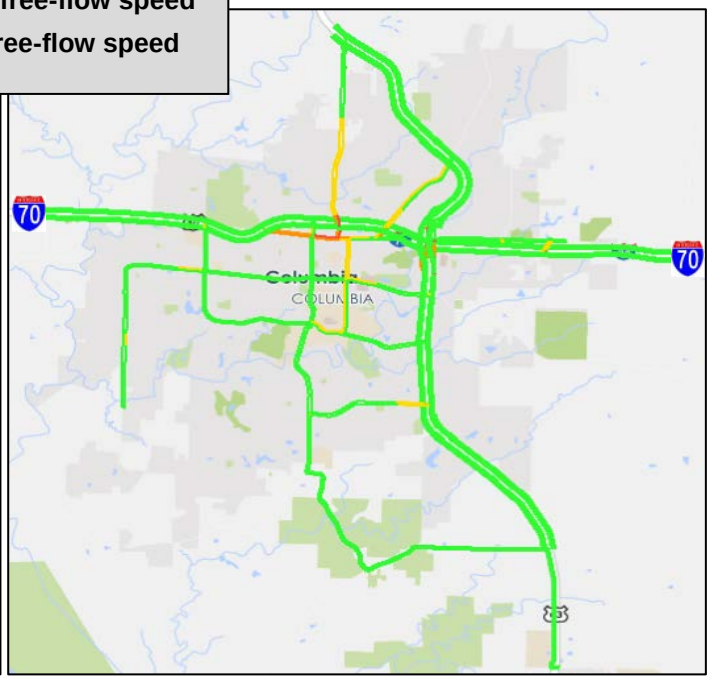


Kansas City Area

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

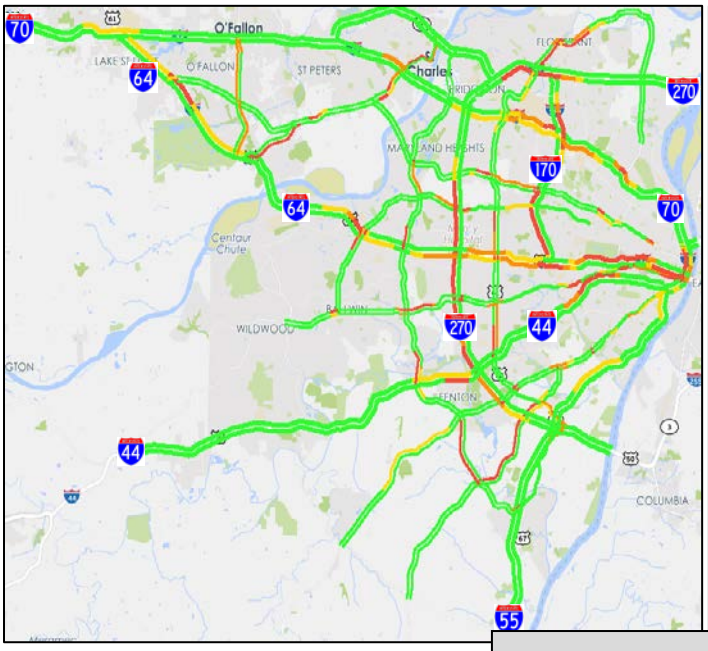


Springfield Area

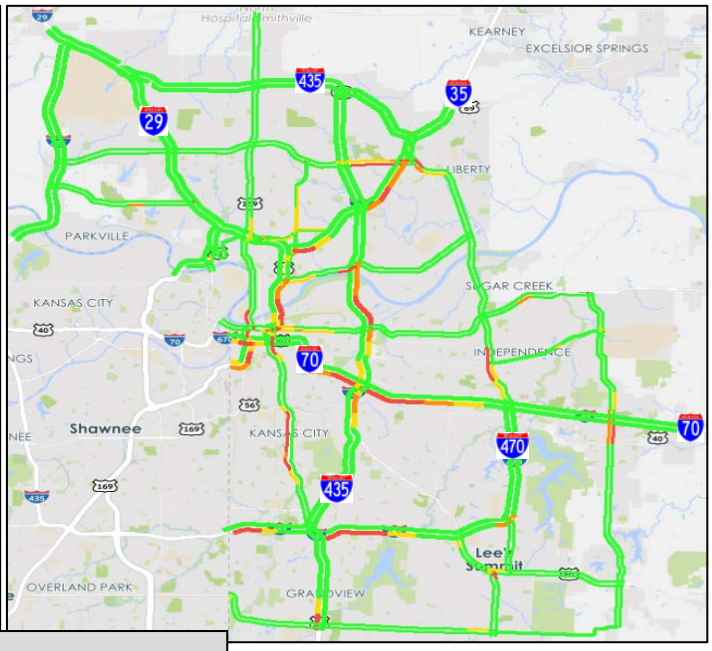


Columbia Area

P.M. Mobility

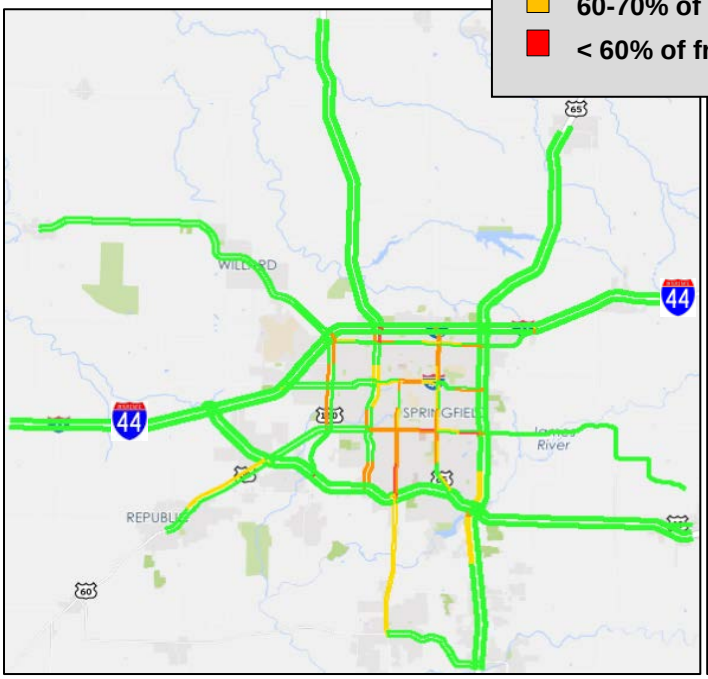


St. Louis Area

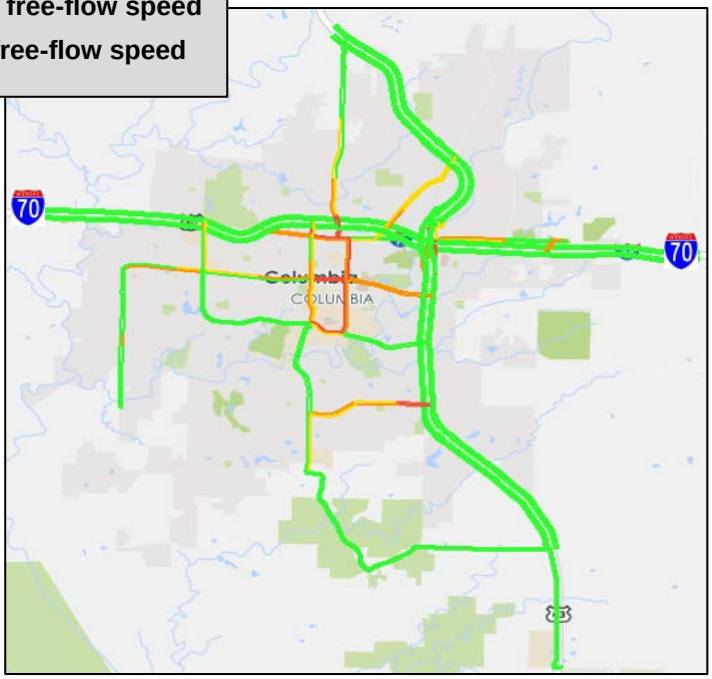


Kansas City Area

- > 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:
Becky Allmeroth
State Maintenance 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 $17.67 per hour and is obtained from the Texas A&M Transportation Institute. The unit cost per truck is $68.09 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. The target for this measure is updated annually in July and is established by projecting a 10 percent improvement over a three-year average.

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. 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.

The 2016 target was $492 million. The actual calculation from the RITIS data is $575 million. This report looks at the 2013 to 2016 cost of congestion in the urban areas of Kansas City and St. Louis, as well as rural I-44 and I-70 across the state.

Congestion costs in Kansas City and St. Louis have steadily increased during this period, and the volume trends have also been upward. Interestingly, the costs on rural I-44 and I-70 have decreased, and the volume trends have remained somewhat unchanged.

Volume growth is often seen when gas prices remain low. Compared to prices of three to four years ago, Missouri gas prices are relatively low.

Traffic congestion is widely viewed as a growing problem in many urban areas because the overall volume of vehicular traffic in many areas (based on VMT) continues to grow faster than the overall capacity of the transportation system. Capacity is not merely defined by roadway expansion, but also by things such as carpool efforts, transit usage increases, flexible work hours, incident clearance practices, work zone management and many other factors.

As a state and region, a comprehensive look at all available means to reduce the cost of congestion is necessary.

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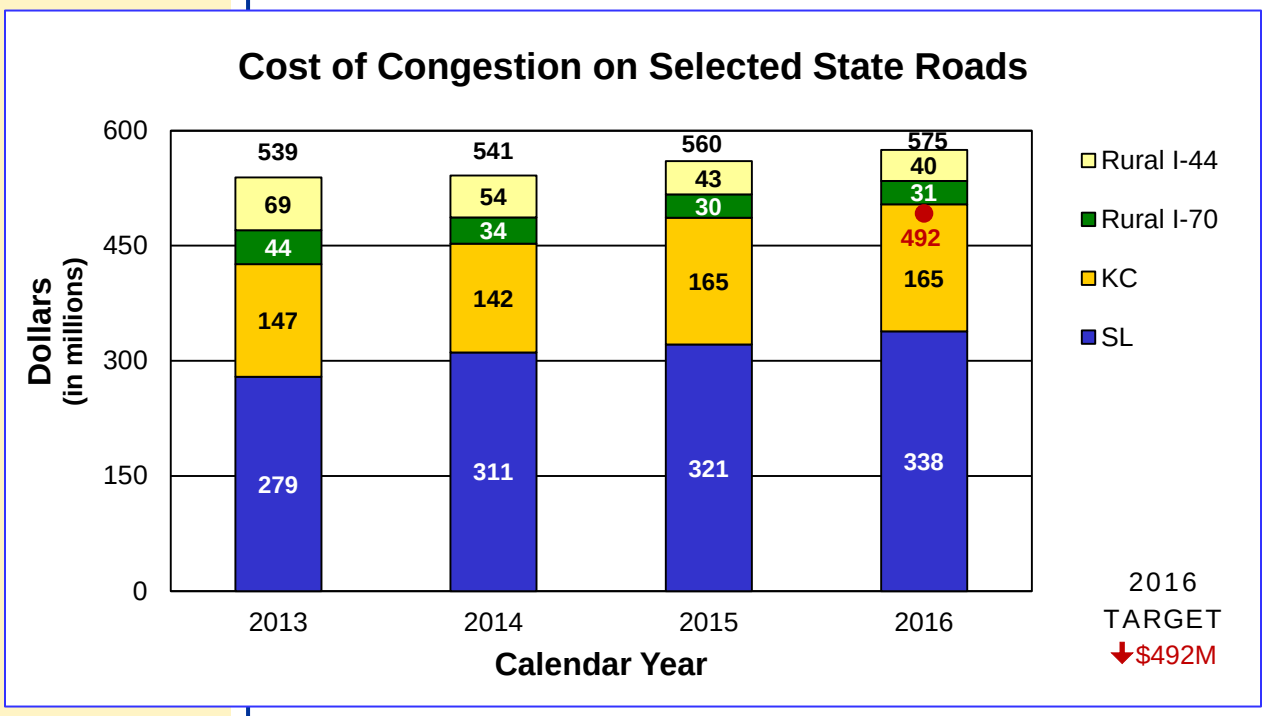

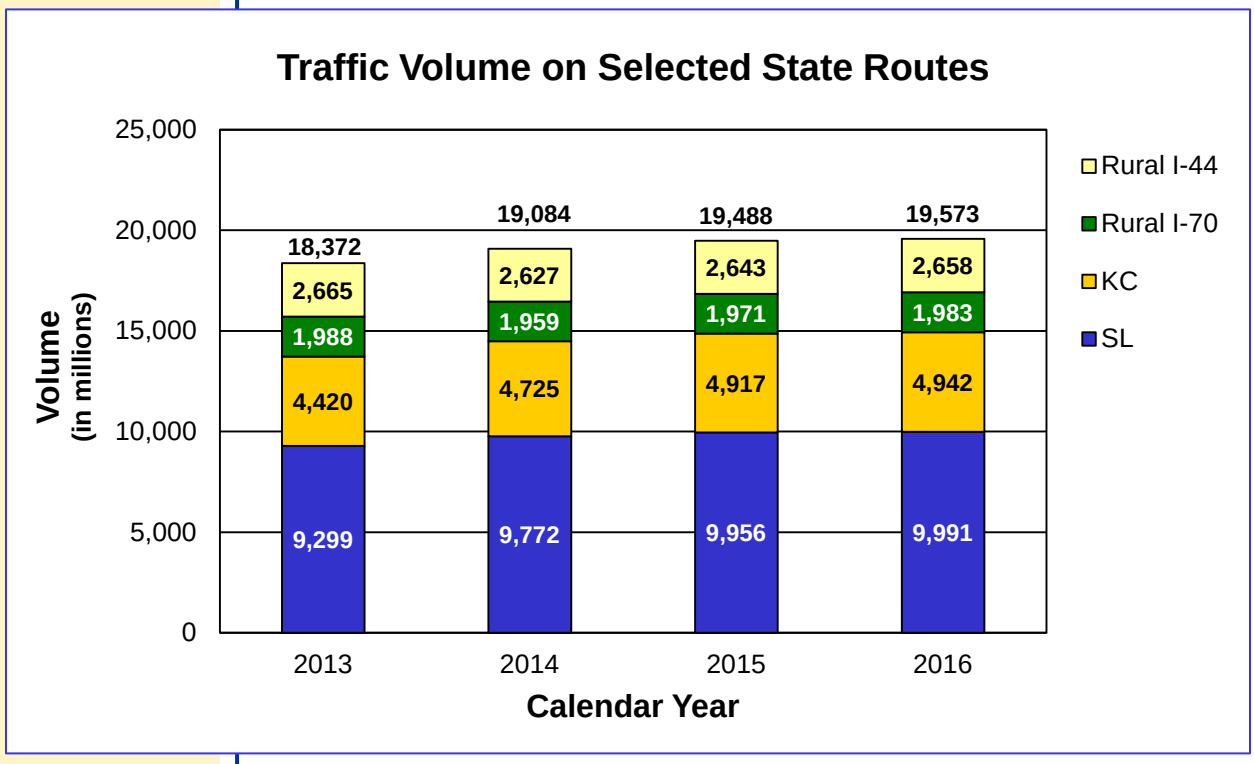

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Average time to clear traffic incident – 5c

RESULT DRIVER:
Becky Allmeroth
State Maintenance 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.

This target is established by projecting a 10 percent improvement over a five-year average.

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, debris and stalled vehicles) improves system performance.

St. Louis recorded 2,577 incidents in the fourth quarter of 2017. The average time to clear traffic incidents was 25.9 minutes, a decrease of 2.8 percent from the fourth quarter of 2016.

Kansas City recorded 1,932 incidents in the fourth quarter of 2017. The average time to clear traffic incidents was 25 minutes, a decrease of 2 percent from the fourth quarter of 2016.

The fourth quarter for Kansas City and St. Louis revealed an array of incidents that ranged from single vehicle crashes, hazardous material spills and reconstructions due to fatalities. Kansas City and St. Louis had an increase in the number of incidents when compared to 2016, but used communication, coordination and data to reduce the average time to clear. Continuous traffic incident management training has helped with quick clearance of incidents. Innovation has helped create safer environments for those working the incident and the traveling public. The most recent innovation is a device that lowers to quickly clear debris from the road allowing the driver to stay in the vehicle (pictured below).

Compared to 2016, both St. Louis and Kansas City had a reduction in the average time to clear in 2017. These reductions have helped them move toward their individual targets.

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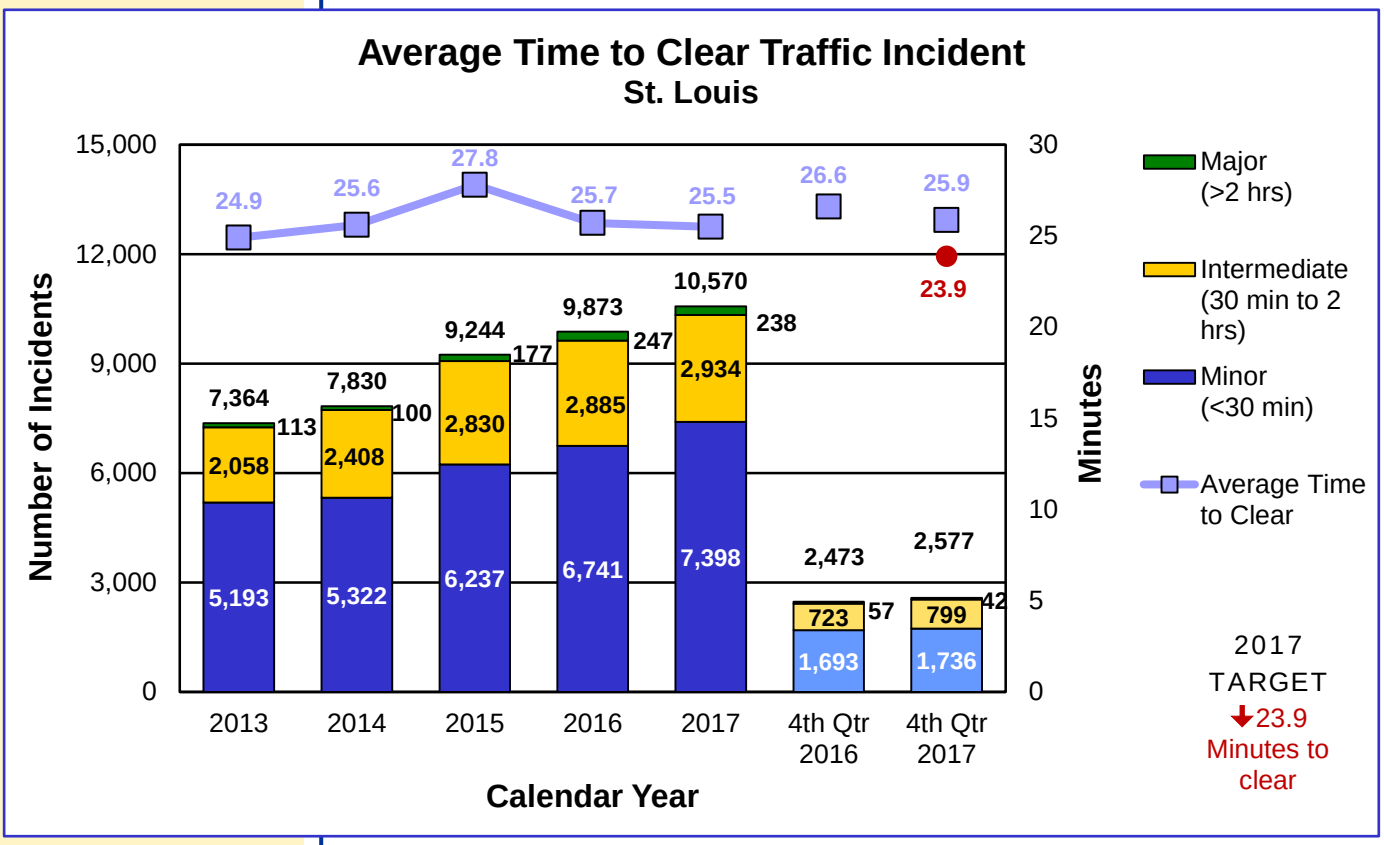

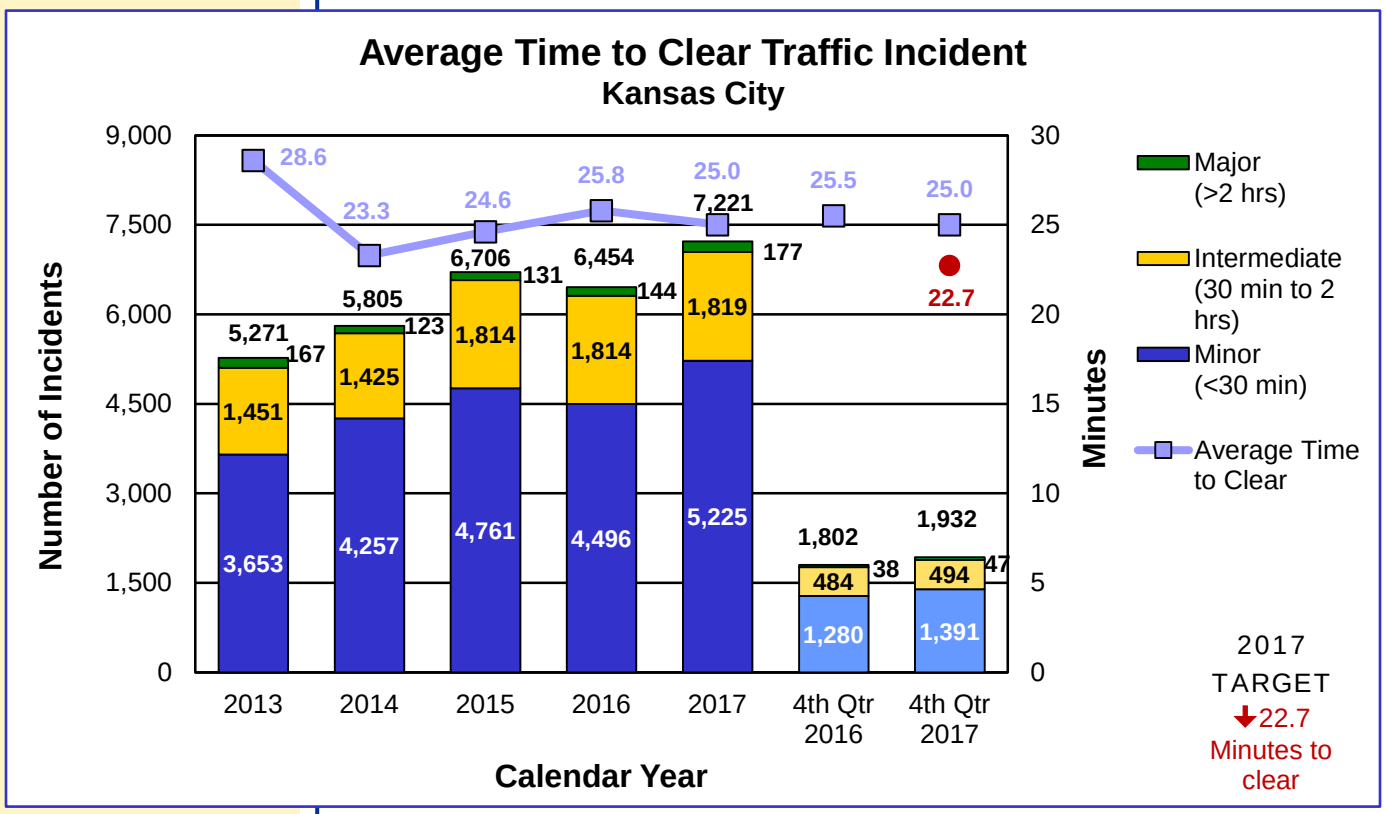

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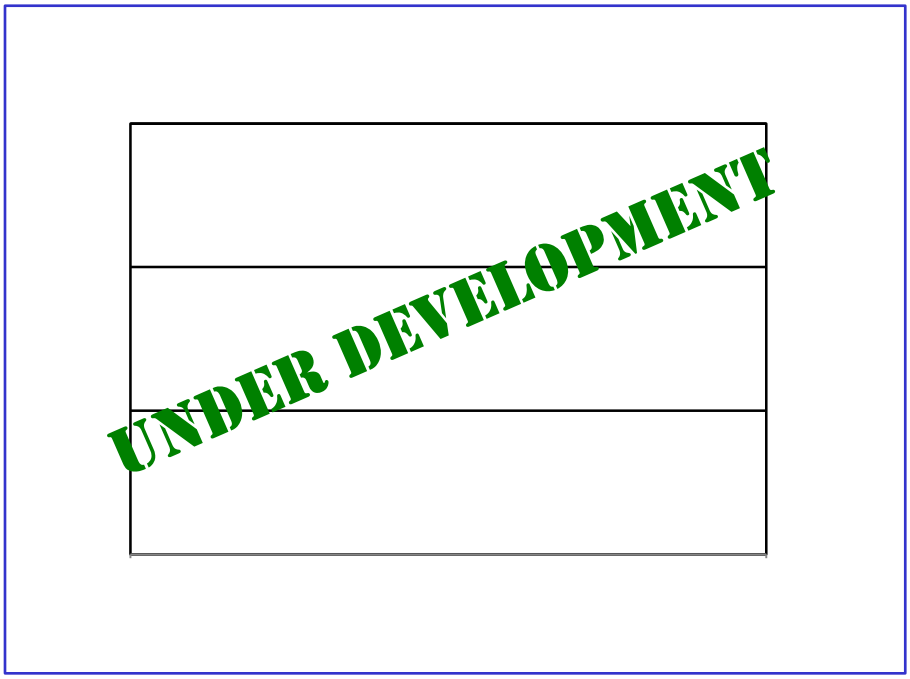
Traffic incident impacts on major interstate routes – 5d

RESULT DRIVER:
Becky Allmeroth
State Maintenance Engineer

MEASUREMENT DRIVER:
Laurel McKean
Assistant District 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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Work zone delays to the traveling public – 5e

RESULT DRIVER:
Becky Allmeroth
State Maintenance Engineer

MEASUREMENT DRIVER:
Jon Nelson
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 identified using automated data collection or by visual observations. An impact is defined as the additional time a work zone adds to normal travel. Impacts resulting in a delay of at least 10 minutes are included in this report.

The targeted number of impacts greater than 10 minutes represents a 10 percent improvement from the previous two years of data based on the number of lane closures during a given quarter. The target for this measure is updated quarterly.

Motorists want to get through work zones with as little inconvenience as possible. MoDOT tries to minimize travel impacts by shifting work to nighttime hours or during times when there are fewer impacts to the traveling public. Other strategies include using technology in work zones, providing valuable information to customers and innovative uses of traffic control devices to promote efficient traffic flow. To measure the effectiveness of these strategies, each quarter MoDOT monitors the performance of work zones with the greatest potential to impact traffic. The goal is to minimize the number of times a work zone creates a traffic delay of 10 minutes or more.

From October to December, MoDOT monitored 225 significant work zones with 92 instances in which traffic was delayed for at least 10 minutes. Based on the number of lane closures this quarter, the targeted number of instances in which such a delay was exceeded was 60 times or less. Twenty-two of the delays (24 percent) occurred on I-70 in Jackson County for concrete barrier wall maintenance. Nineteen delays (21 percent) occurred on the Poplar Street Bridge project in St. Louis as work on the bridge deck continued. Twelve delays (13 percent) occurred on I-64 EB in St. Louis County for paving operations during nighttime hours. Fourteen other delays (15 percent) occurred on three separate bridges in Jackson County. The remaining 25 delays were experienced across 16 different work zones.

For 2017, there were 434 total delays of at least 10 minutes, which is 146 more than the target of 288 delays or less and 155 more than in 2016. Bridge work accounted for the majority of work zone delays, followed by pavement improvements and maintenance operations. MoDOT will continue using available tools and resources to minimize the number of impacts. Where impacts are anticipated, MoDOT will continue to monitor and communicate conditions to customers.

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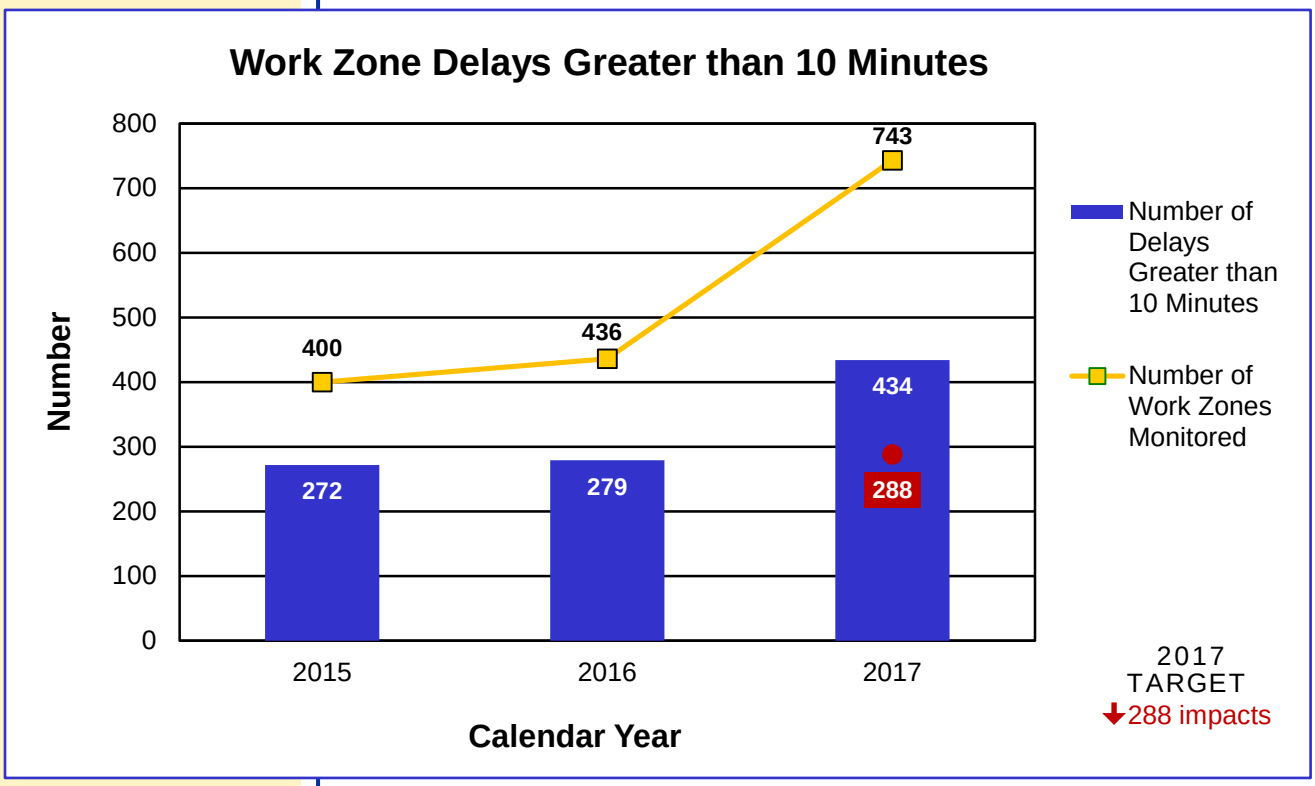

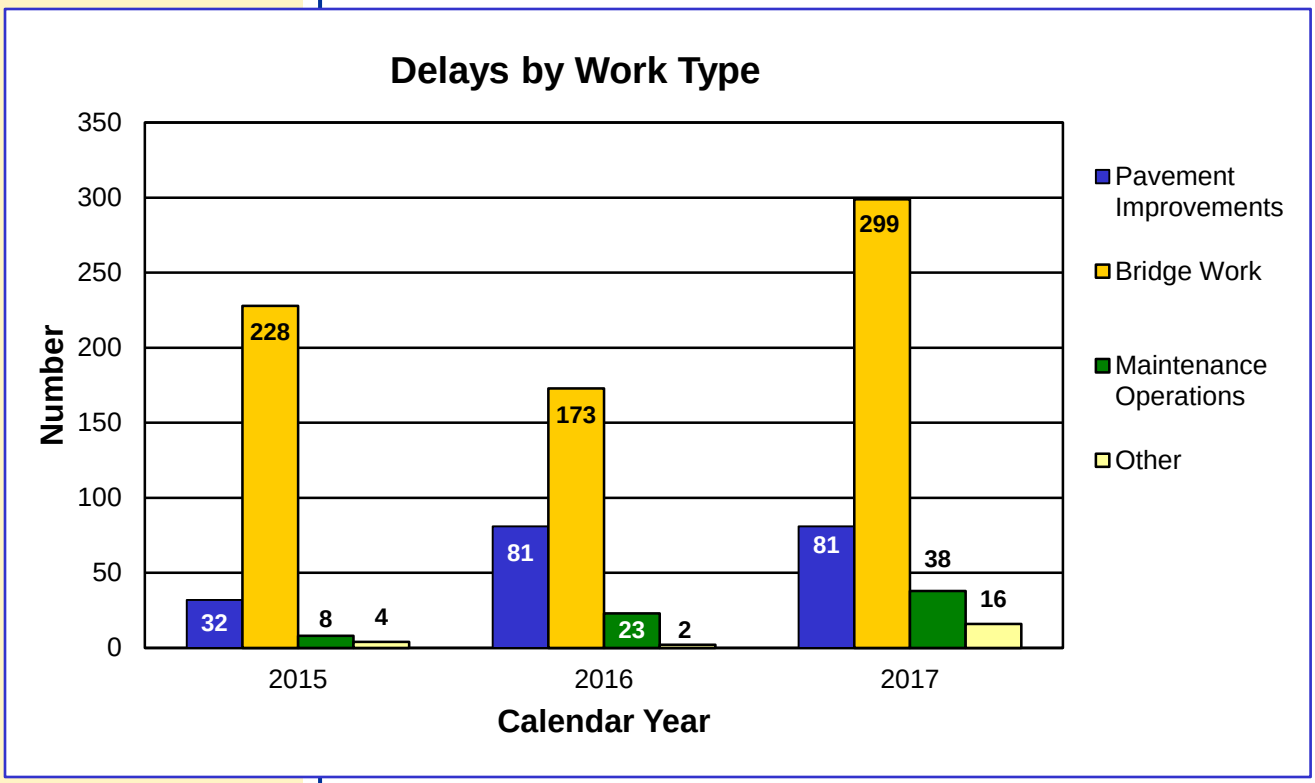

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Time to meet winter storm event performance objectives – 5f

RESULT DRIVER:
Becky Allmeroth
State Maintenance Engineer

MEASUREMENT DRIVER:
Arisa Prapaisilp
Assistant District Maintenance 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.

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.

Through December, the 2017-2018 winter has been relatively light. Only a few winter events have occurred with little to no accumulation. These light winter events have resulted in the average times to meet MoDOT's objectives 3.6 hours for continuous operations routes, and 3.5 hours for non-continuous routes. The time of 3.6 hours for continuous operations routes is typical while the time of 3.6 hours for non-continuous operations routes is lower than previous years. This can be attributed to the light accumulations being addressed more quickly and easily.

Winter operations, on average, cost about $45 million per year. As of December 31, 2017, MoDOT has expended $3.6 million responding to events this winter. With less money spent on clearing the roads of snow and ice because of a light winter, these savings mean more funds are available to maintain the roadways in the spring to complete surface improvements, sign repair, brush cutting and drainage work.

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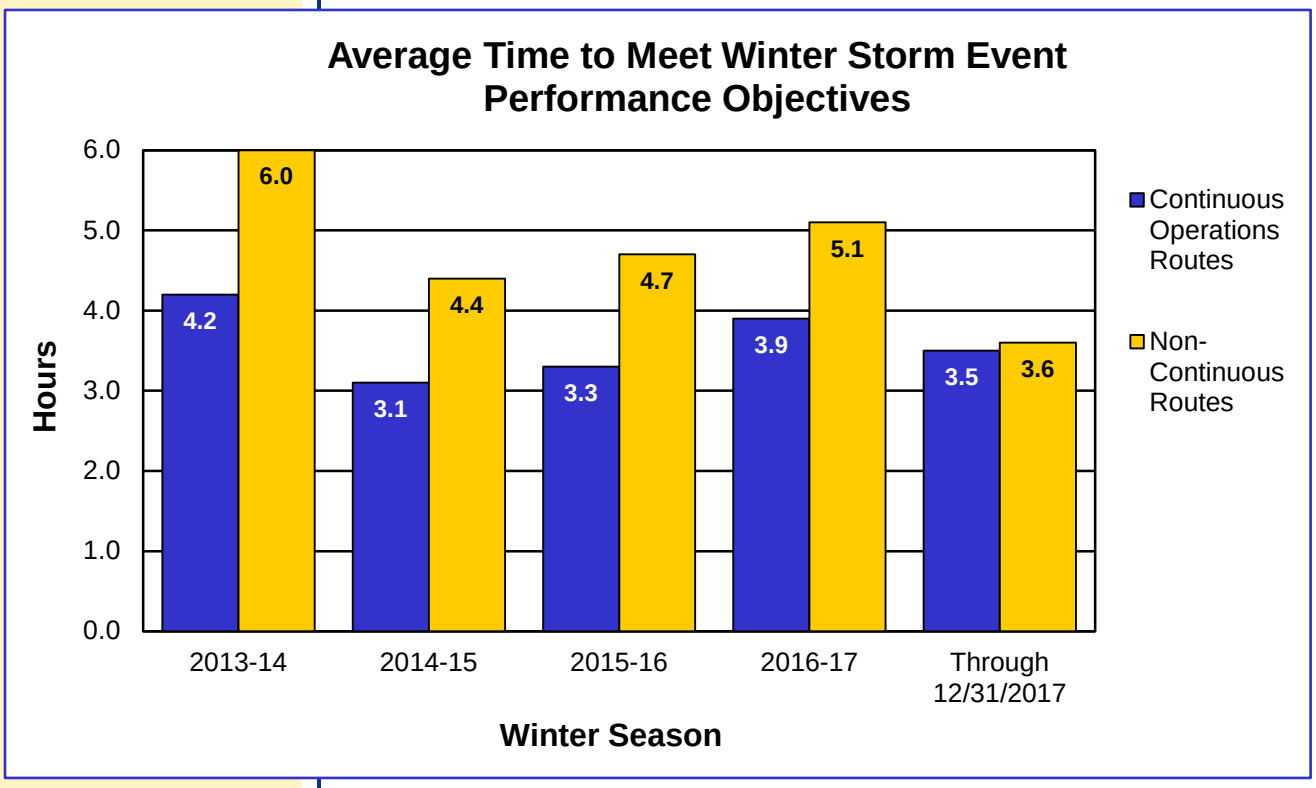

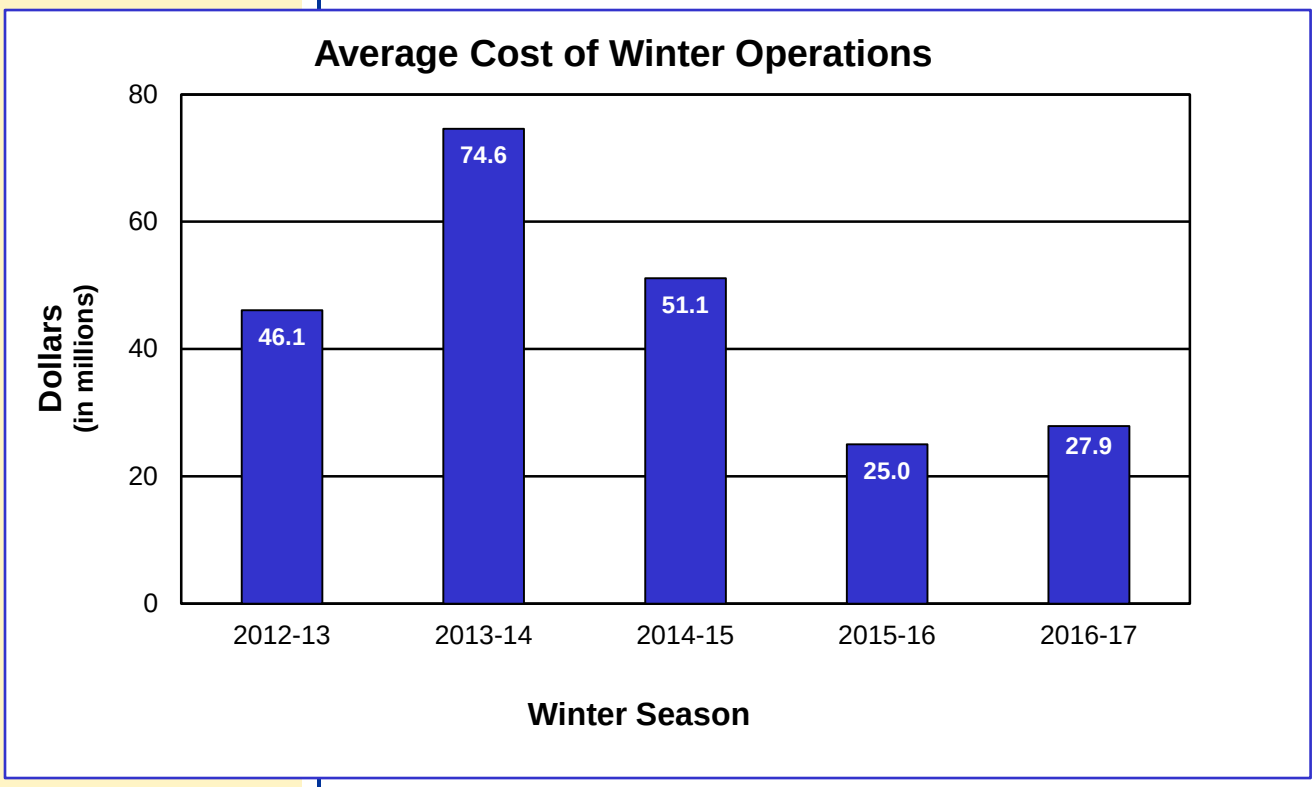

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Bike/pedestrian and ADA transition plan improvements – 5g

RESULT DRIVER:
Becky Allmeroth
State Maintenance 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 within the right of way, such as sidewalks and traffic signals. Removal of the barriers listed in MoDOT's 2010 ADA Transition Plan is required as part of the department's compliance with the Americans with Disabilities Act.

MEASUREMENT AND DATA COLLECTION:
MoDOT's investment in pedestrian facilities is determined from the awarded contract amounts for the 20 most common construction elements used on pedestrian projects each year.
ADA Transition Plan progress is based upon completed work that has corrected defective items reported in the ADA 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.
A progress target line is included to show where MoDOT's progress should be in order to fully complete the ADA Transition Plan by 2027. Annual funding levels necessary to complete the ADA Transition Plan by 2027 determine the target, which is set in April of each year.

MoDOT has improved more than $29.6 million of deficient Americans with Disabilities Act facilities in the right of way since 2008. However, additional work totaling more than $121.7 million is necessary to complete the 2010 ADA Transition Plan inventory by the August 2027 target date. To meet the commitment of the Missouri Highways and Transportation Commission (MHTC), MoDOT needs to be completing more than $13 million of improvements each year until 2027.

In 2017, MoDOT completed only $4.4 million in ADA improvements. This amount is well below the annual pace needed to complete the required ADA improvements as promised. Significant improvement in performance is necessary for MoDOT to be able to complete the ADA Transition Plan by August 2027.

In February 2016, the MHTC included money in the 2017-2021 State Transportation Improvement Plan for funding ADA Transition Plan improvements. This $5 million per year funding is in addition to $8.5 million per year of Transportation Alternatives Program funding dedicated to the ADA work on the state highway system. Missouri now has a dedicated funding source of $13.5 million per year for use toward completion of the ADA Transition Plan work. The spending target for this measure is currently set at $15 million annually because not all work funded in this category is for work specifically listed in the 2010 ADA Transition Plan.

In 2017, MoDOT invested only $5.38 million towards improvements in pedestrian facilities. This is the lowest amount invested in more than seven years. At 0.72 percent, it also is the lowest percentage of the yearly STIP awarded for ADA improvements in the last seven years. The 2017 investment used only 39 percent of the $13.5 million from the dedicated budget for ADA improvements in 2017.

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