OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Becky Allmeroth, Chief Safety and Operations Officer

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:
Becky Allmeroth
Chief Safety and Operations 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.

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Travel times and reliability on major routes – 5a

During the fourth quarter of 2018, average travel times in St. Louis and Kansas City were mostly longer compared to the same period last year. The average 10-mile travel time in St. Louis was 11 minutes, 4 seconds during the morning and 12 minutes, 46 seconds during the evening. For Kansas City, the average travel time was 11 minutes, 21 seconds during the morning and 11 minutes, 12 seconds during the evening. The average travel times for all rush periods were higher than the same quarter last year with the exception of the evening rush in Kansas City. Overall, average speeds ranged between 50 mph and 56 mph.

The planning times account for unexpected delays and indicate how long customers need to plan in order to arrive on time 95 percent of the time. In St. Louis, the average 10-mile planning times were 15 minutes, 30 seconds during the morning and 20 minutes, 3 seconds during the evening. This means customers in the St. Louis evening rush needed to plan 10 minutes, 3 seconds more for a 10-mile trip than they would need in free-flow conditions. In Kansas City, the average planning times were 15 minutes, 57 seconds during the morning and 15 minutes, 25 seconds during the evening. Customers in the Kansas City evening rush needed to plan 5 minutes, 25 seconds 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 30 and 44 mph. The planning times for all rush periods were higher than the previous year, with the exception of the evening rush in Kansas City.

The average travel times in both regions are higher than the target for the fourth quarter of 2018. The morning average travel times are both slightly more than a minute greater than the target. The evening average travel times are 57 seconds to 1 minute, 54 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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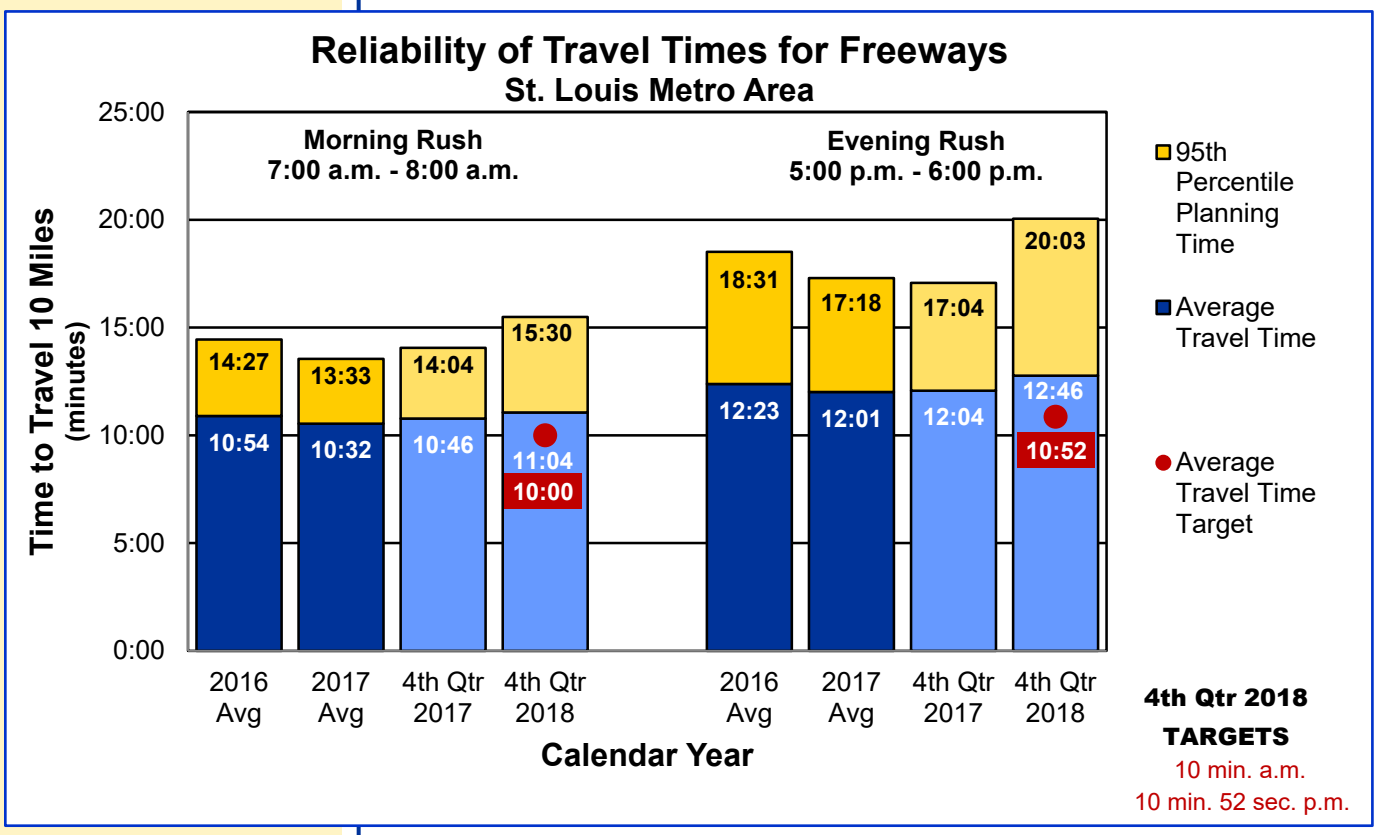

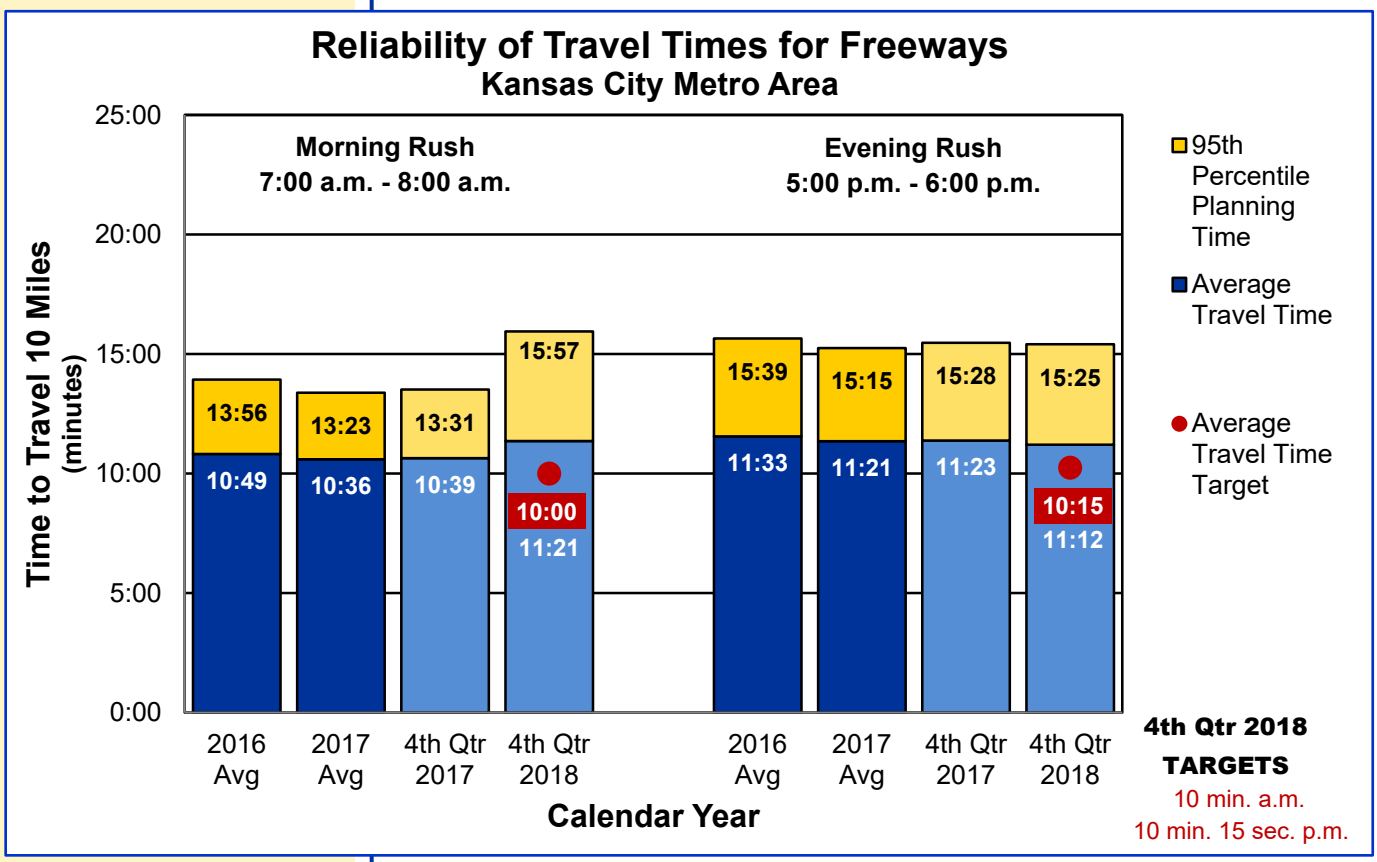

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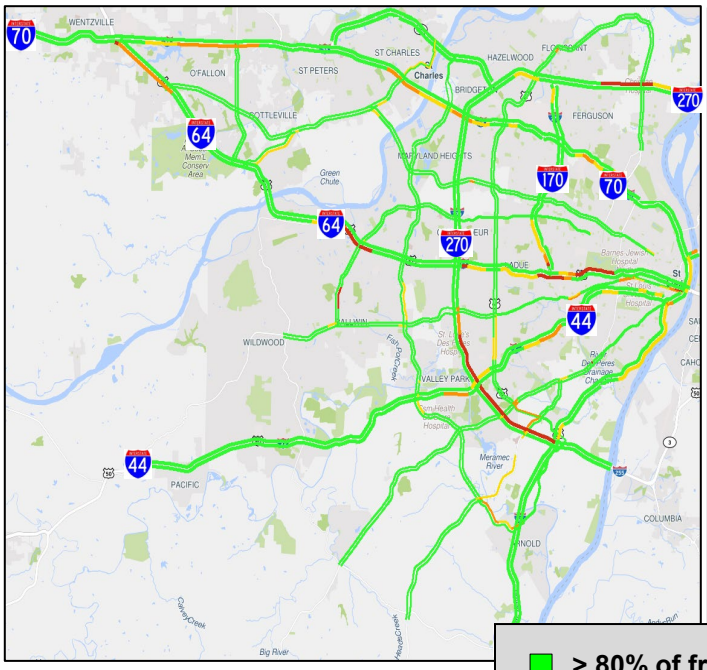
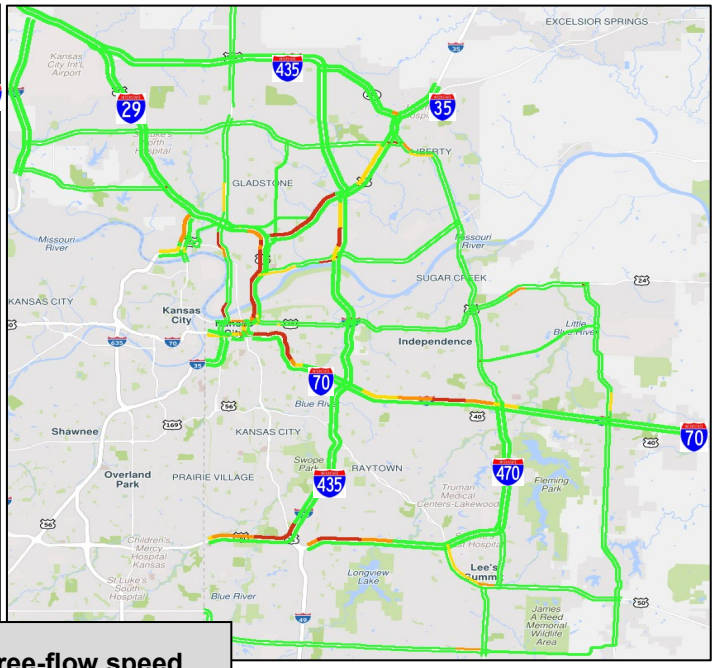
a.m. Mobility

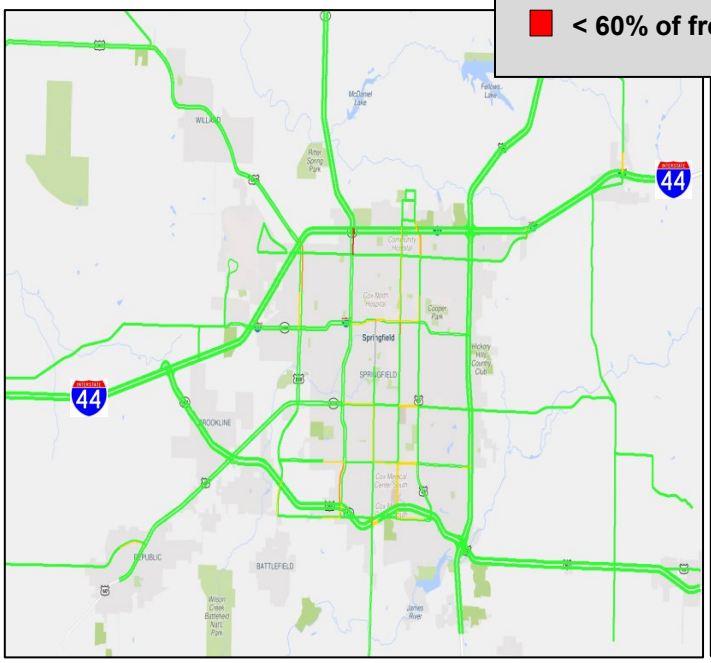


St. Louis Area

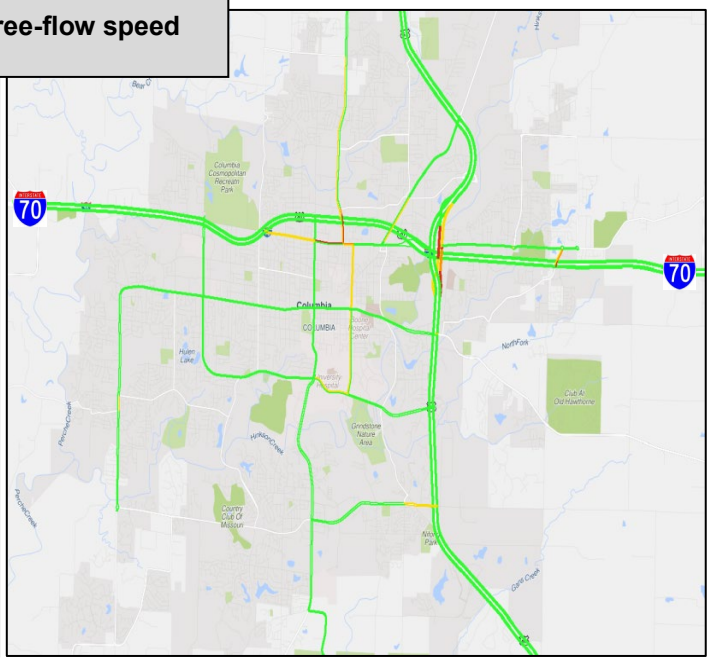


Kansas City Area

- > 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

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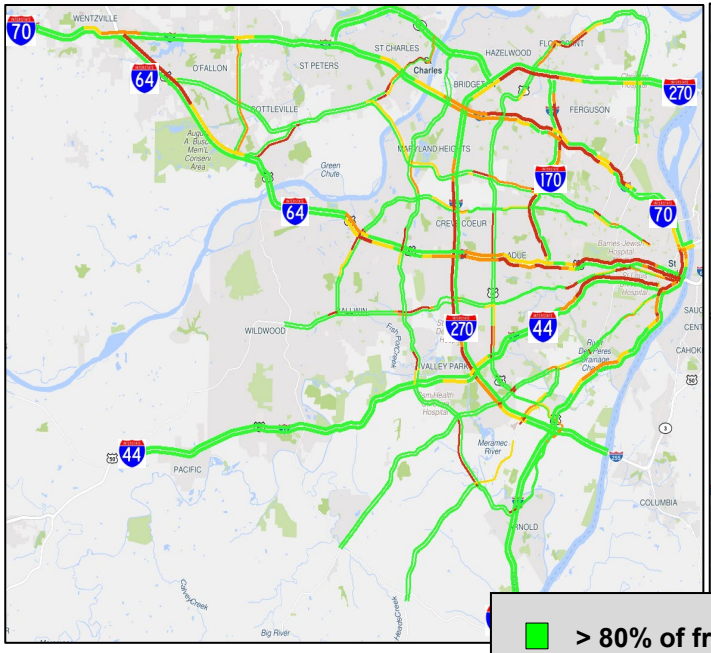
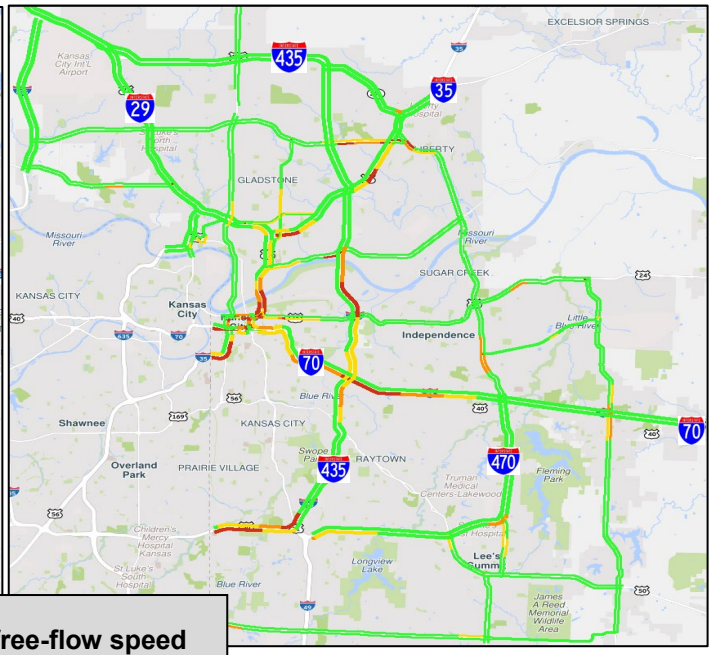
p.m. Mobility

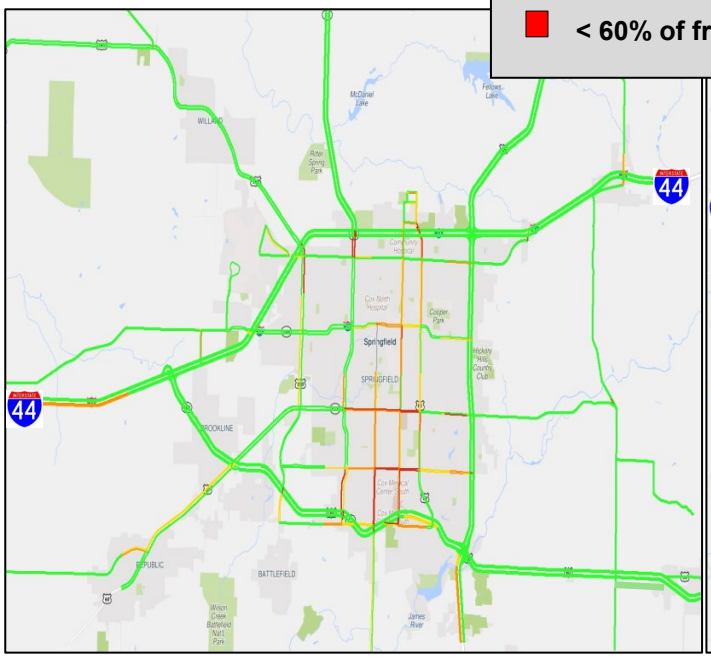


St. Louis Area

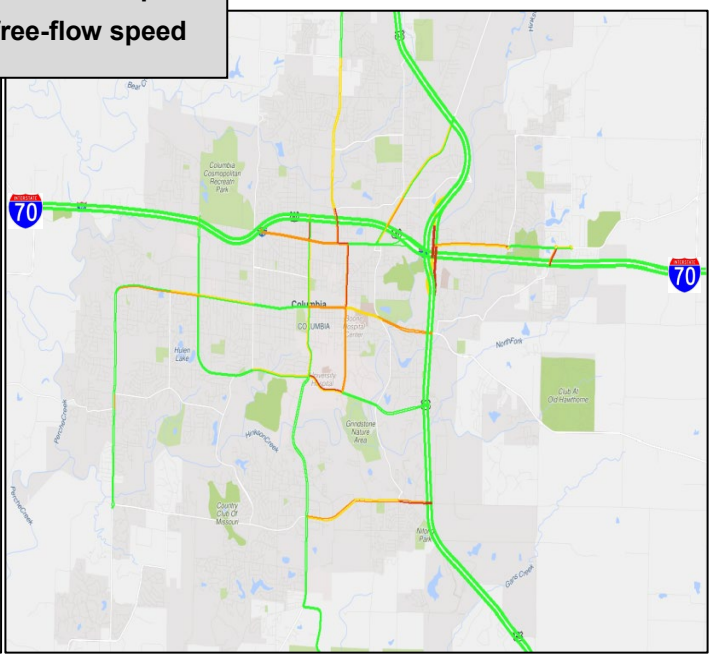


Kansas City Area

- > 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

RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operations Engineer

MEASUREMENT DRIVER:
Brian Umfleet
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 April and is established by projecting a 10 percent improvement over a four-year average.

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Cost and impact of traffic congestion – 5b

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 2017 target was $486 million. The actual calculation from the Regional Integrated Transportation Information System data is $568 million. This report looks at the 2014 to 2017 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 slightly decreased. Interestingly, the costs on rural I-44 and I-70 have decreased, as well as volume trends being down slightly.

Volume growth is often seen when gas prices remain low. The average cost of gasoline in April 2014 was $3.52 per gallon, while in April 2018 it was about $2.45 per gallon. Since mid-2016, while gas prices have fluctuated a bit, the price has been fairly steady.

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 vehicle miles travelled) 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. Like many other state departments of transportation, MoDOT puts forth great effort in incident clearance practices, work zone management and other factors that impact mobility.

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

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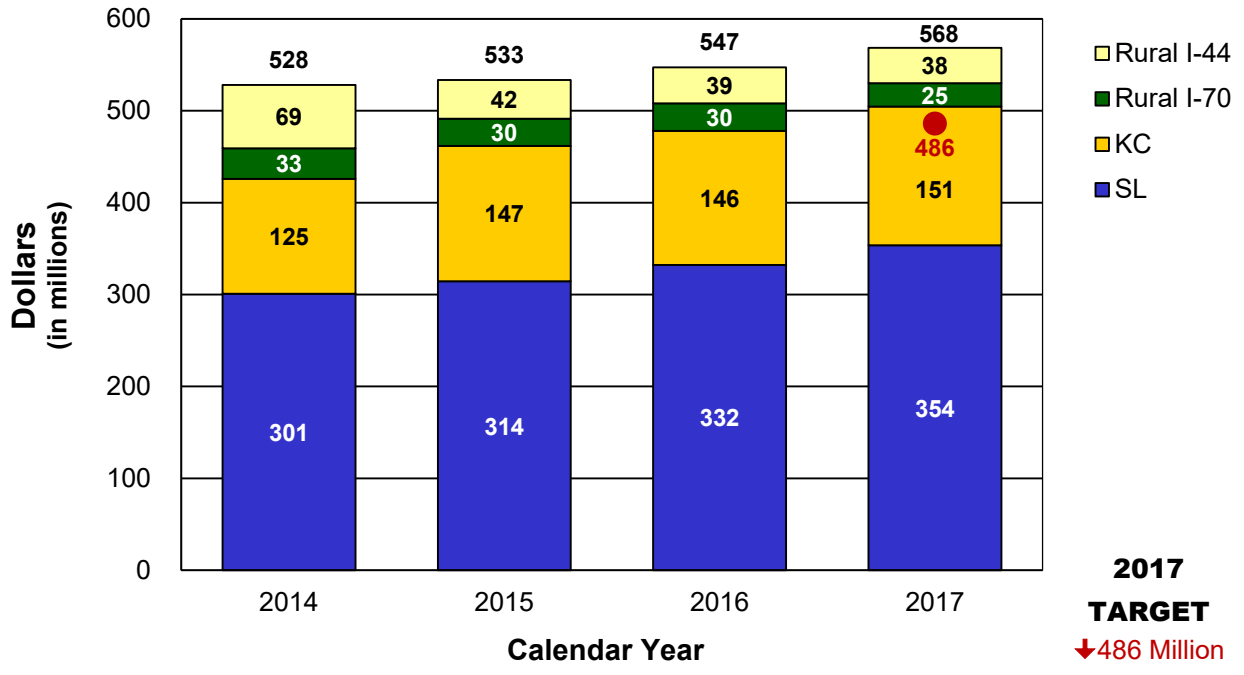
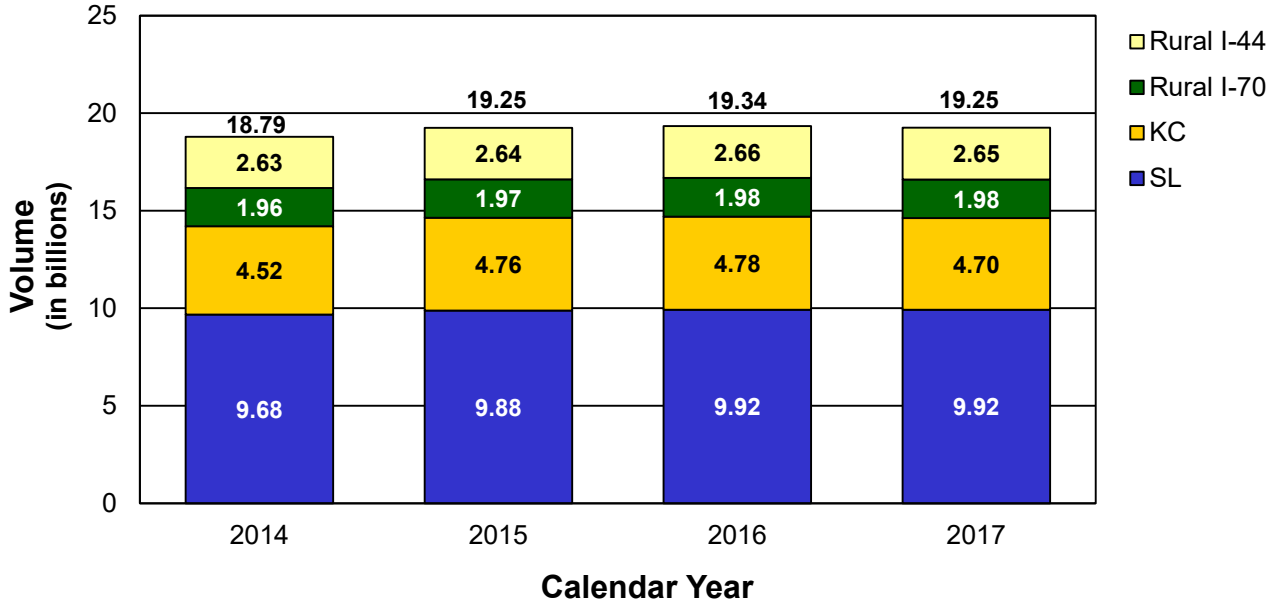
Cost of Congestion on Selected State Roads



Traffic Volume on Selected State Routes



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Average time to clear traffic incident – 5c

RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operations 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 St. Louis and Kansas City 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 2,845 incidents in the fourth quarter of 2018. The average time to clear traffic incidents was 28.2 minutes, an increase of 9 percent from the fourth quarter of 2017.

Kansas City recorded 2,333 incidents in the fourth quarter of 2018. The average time to clear traffic incidents was 25.4 minutes, an increase of 1.6 percent from the fourth quarter of 2017.

The fourth quarter for Kansas City and St. Louis revealed an array of incidents that included overturned tractor trailers, pedestrians, multi-vehicles and MoDOT fleet. St. Louis and Kansas City saw an increase in the number of incidents when compared to third quarter of 2017. Both continue to use communication, coordination and data to help reduce the average time to clear. An increase in the number of tractor trailer incidents has made it challenging to reduce average clearance times. This has led to statewide discussions and meetings to find best practices to reduce tractor trailer incidents and clearance times involving them.

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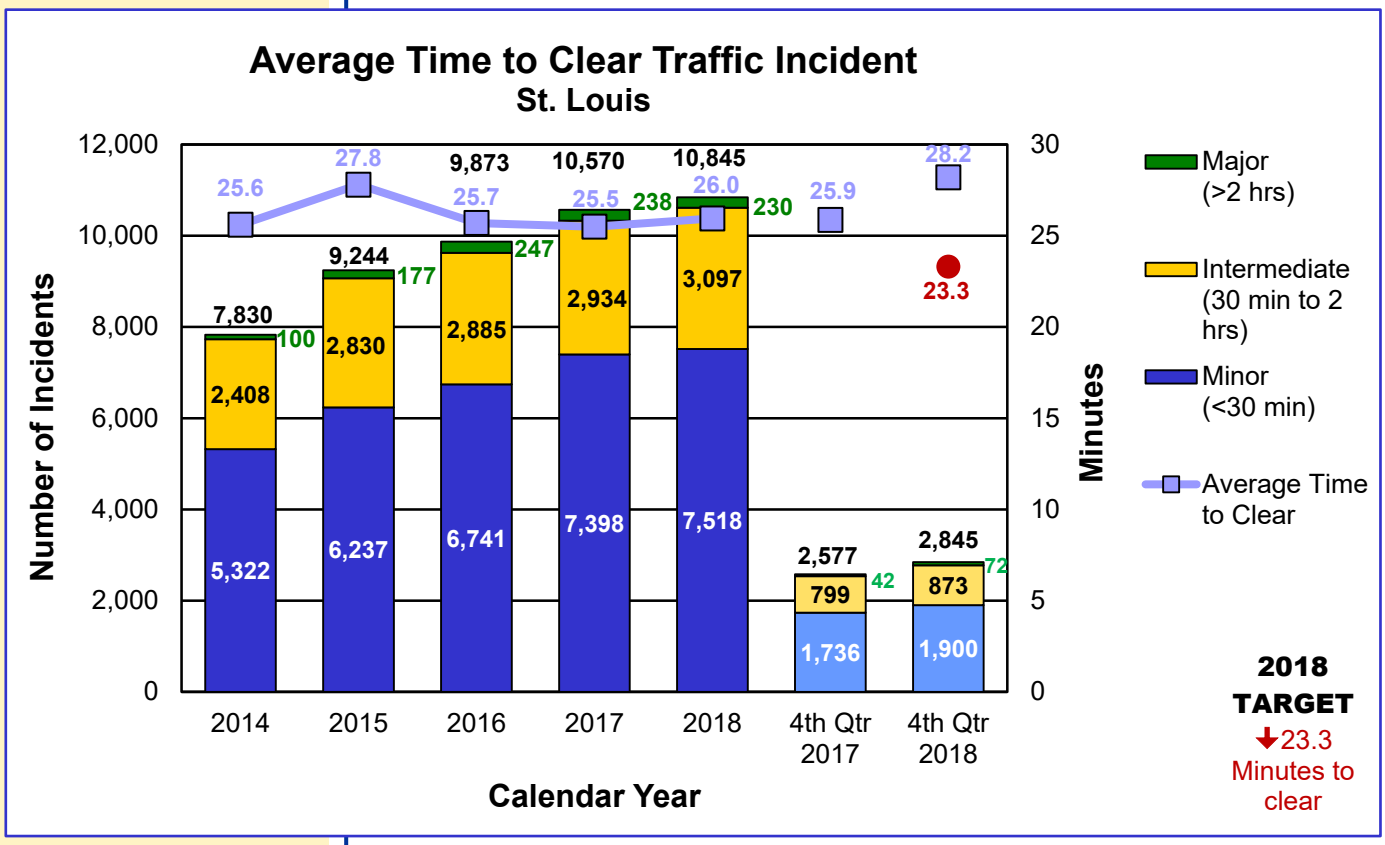

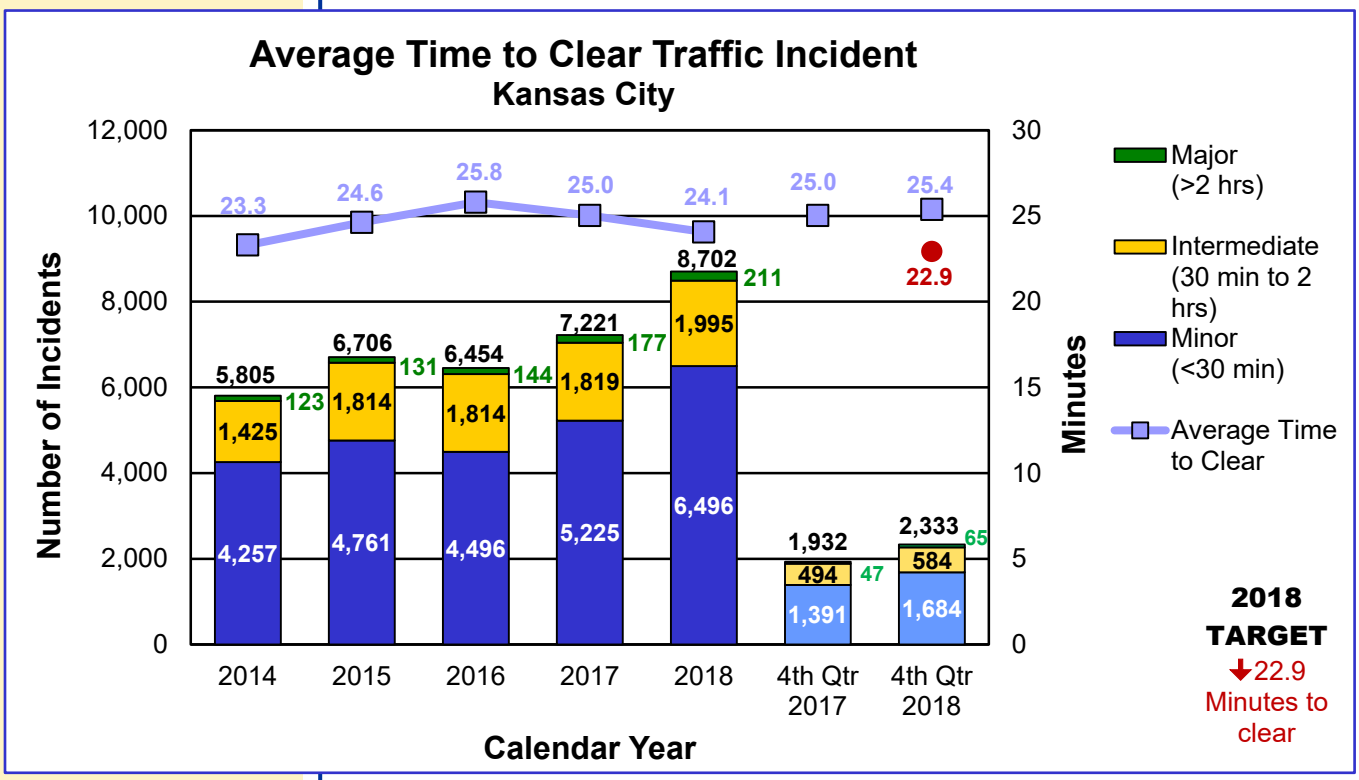

RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operations Engineer

MEASUREMENT DRIVER:
Laurel McKean
Assistant District Engineer

PURPOSE OF THE MEASURE:
This measure tracks the number of and delay caused by unplanned incidents on the divided four-lane section of Interstate 44 and Interstate 70.

MEASUREMENT AND DATA COLLECTION:
Crash data is received from MoDOT's Transportation Management System. The total crashes are for both directions of I-44 and include all crash severity classes.

Incidents were input by the St. Louis and Springfield Transportation Management Operators in Transuite and then collected in Regional Integrated Transportation Information System.

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Unplanned incident impacts on major interstate routes – 5d

Interstates are the arteries that connect the nation and keep people and commerce flowing. When interstates shut down in Missouri, the country is cut in half. Keeping interstates free-flowing is a top priority for MoDOT, but sometimes unplanned incidents affect the department's ability to keep the interstates moving. An unplanned incident can be weather related, emergency road and bridge repair, traffic crash and others. Traffic crashes and delay are two ways MoDOT can track incidents and develop strategies to reduce the impact to the traveling public.

On Sept. 7, 2018, Regional Integrated Transportation Information System, (a third party vendor) began collecting incident data from MoDOT's St. Louis and Springfield Transportation Management Centers. The information from Kansas City is in development. Since there is no data being received from Kansas City, which covers most of I-70, this quarter's information will be focused on I-44.

Of the types of unplanned incidents that can occur, traffic crashes create the majority of the impacts. Utilizing data from MoDOT's Transportation Management System, calendar year 2017 trended downward in total crashes along the divided four-lane portion of I-44 (Oklahoma state line to Gray Summit). Webster, Phelps and Franklin counties had noticeable reductions and Phelps had an increase with all others remaining consistent. Notice to proceed was provided to Jacobs Consulting, LLC on Jan. 7, 2019 to start analyzing I-44 and I-70 to provide an expected crash rate that can be used to locate areas of potential improvement.

The heat map included in this measure indicates where incidents were logged along I-44 from Oct. 1, 2018 through Nov. 19, 2018. Every incident is shown regardless of duration. Incidents can be anything from a stalled car on the shoulder to a crash blocking lanes. The next step in the development of the measure is to display the delay to the traveling public due to incidents.

The longest major impact incident was 12 hours and 30 minutes in Lawrence County. The incident involved two tractor trailers, occurred at 6:30 p.m., was cleared the following morning and required off-loading of glass bottles by hand. Throughout the duration of the incident there was a maximum delay of 4 minutes and 39 seconds to the traveling public. Of the 26 major impact incidents, 17 are known to have involved at least one tractor trailer.

I-44 Incidents from Oct. 1 – Nov. 19, 2018

Incident Impact Category	Number	Average Duration (minutes)
Minor (<= 30 Minutes)	166	10
Intermediate (>30 and <=120 minutes)	103	61
Major (>120 minutes)	26	261

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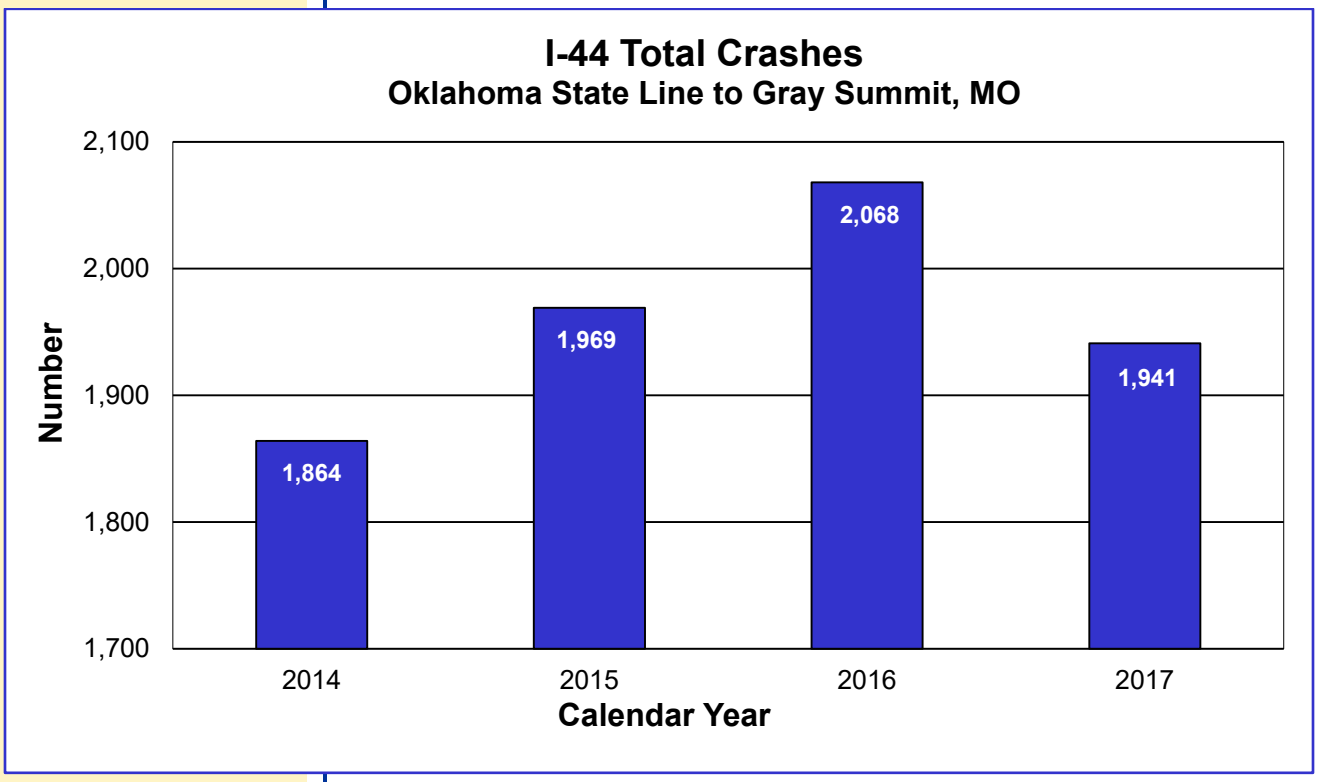

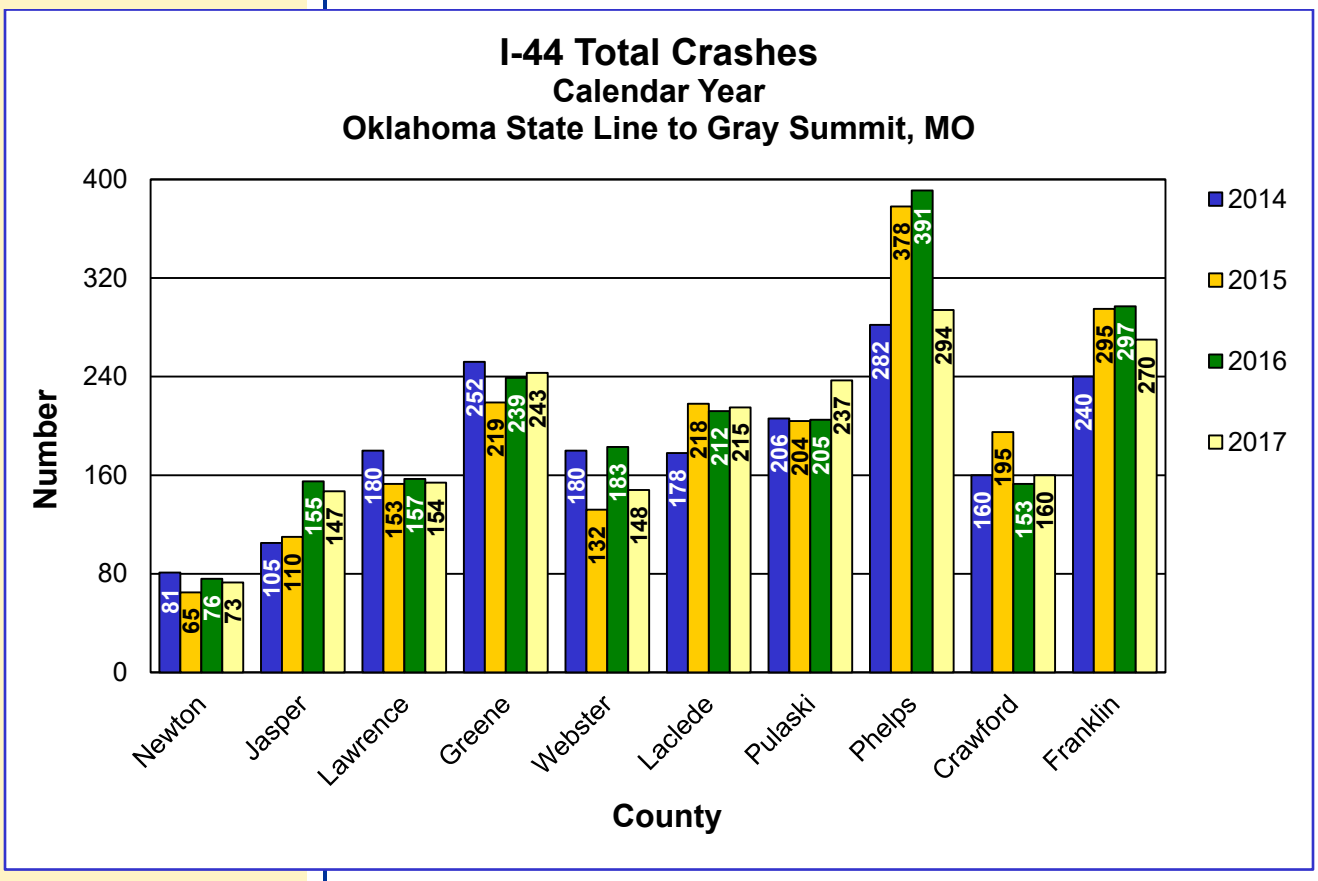

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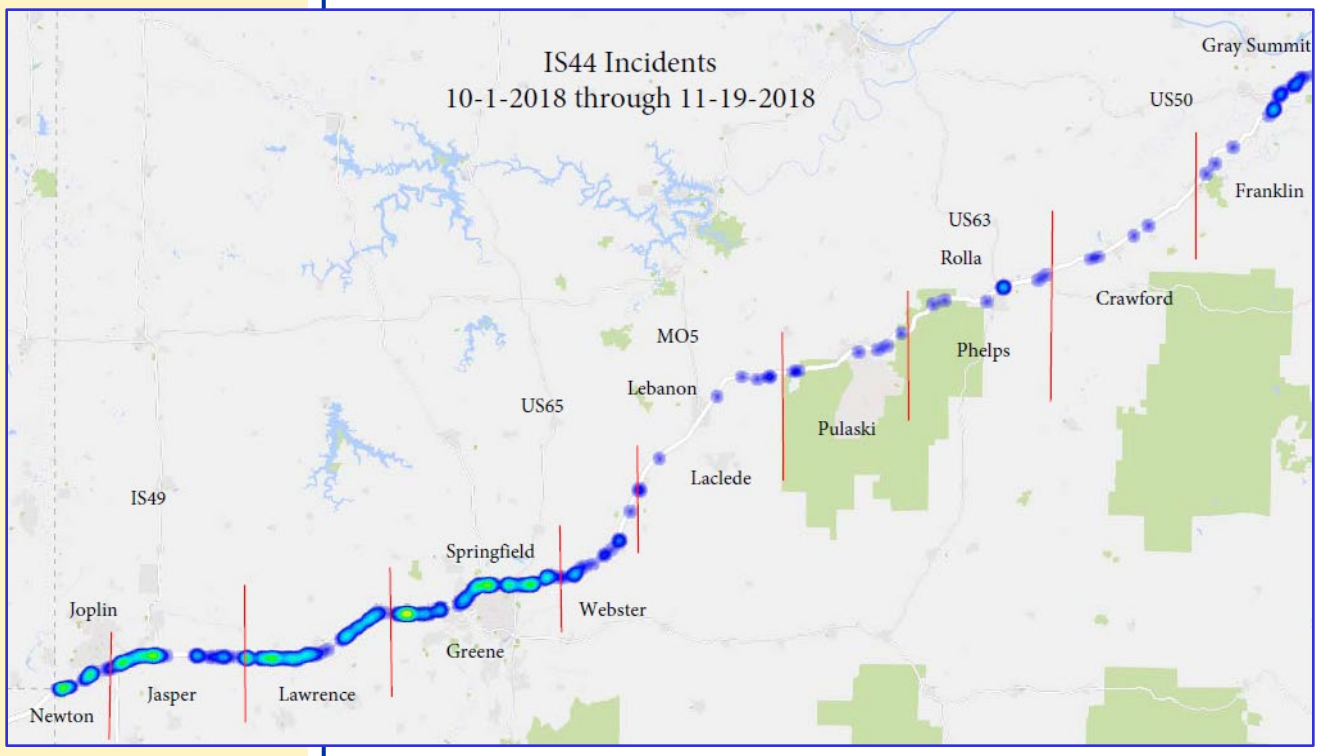

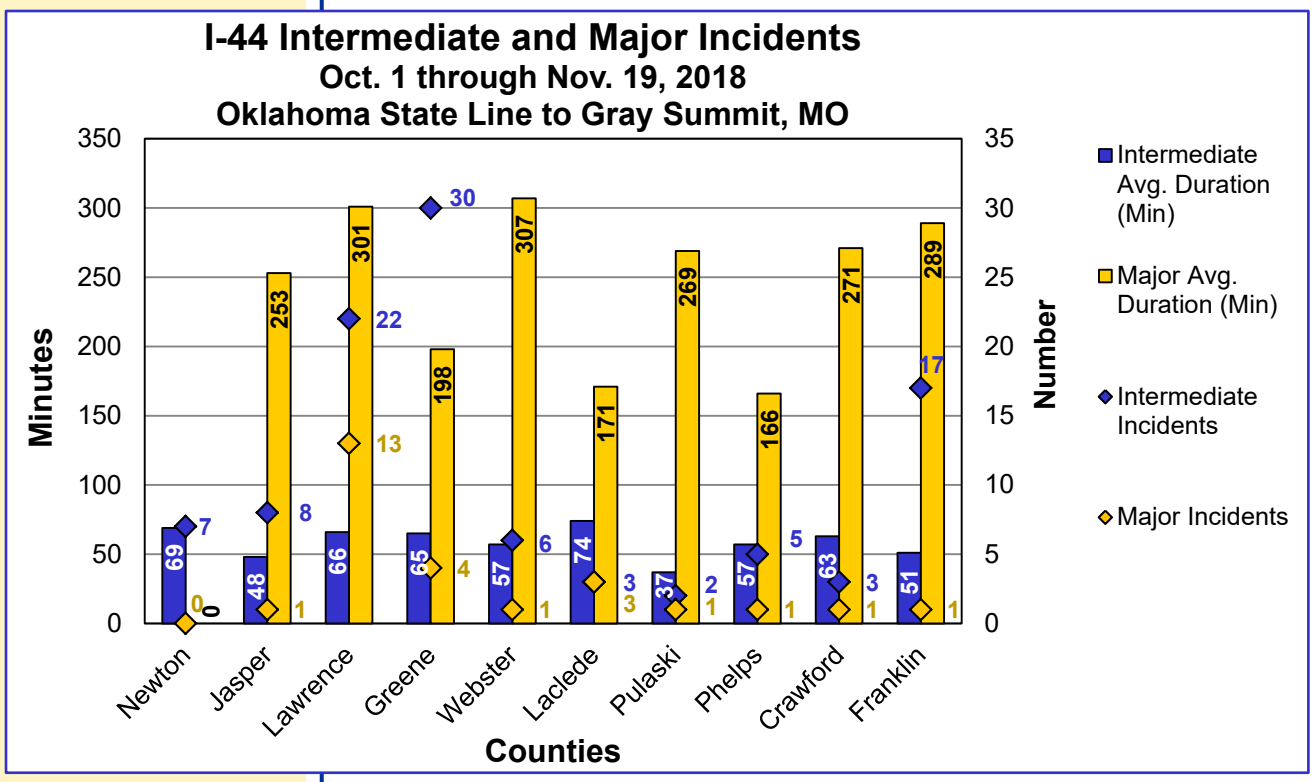

RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operations Engineer

MEASUREMENT DRIVER:
Troy Hughes
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 hours of work zone congestion are based on previous years' data and an acceptable tolerance of 30 total minutes for work zone congestion statewide. The target for this measure is updated quarterly.

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Work zone delays to the traveling public – 5e

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, MoDOT monitors the performance of work zones with the greatest potential to impact traffic each quarter. The goal is to minimize the number of times a work zone creates a traffic delay of 10 minutes or more.

During fourth quarter 2018, MoDOT monitored 317 work zones, which brings the 2018 total to 1,125. There were 117 instances in which traffic was delayed for at least 10 minutes. These instances occurred in 19 work zones and accounted for 5,537 total minutes (92.3 hours) of congestion. The total congestion for the year was 202.7 hours. The biggest contributor to the congestion was bridge projects which accounted for 88 percent of the total congestion.

This quarter, three projects along I-44 between Route 270 and Grand Blvd. in St. Louis County contributed 60 hours of the congestion. In the Kansas City district, the Clay County Route 210/435 project contributed eight hours of congestion and the Lafayette County I-70 project added five hours.

An initial target for the cumulative work zone congestion statewide had been set at 180 hours for the year (45 hours per quarter). This target translates to approximately 30 minutes of work zone congestion per day statewide.

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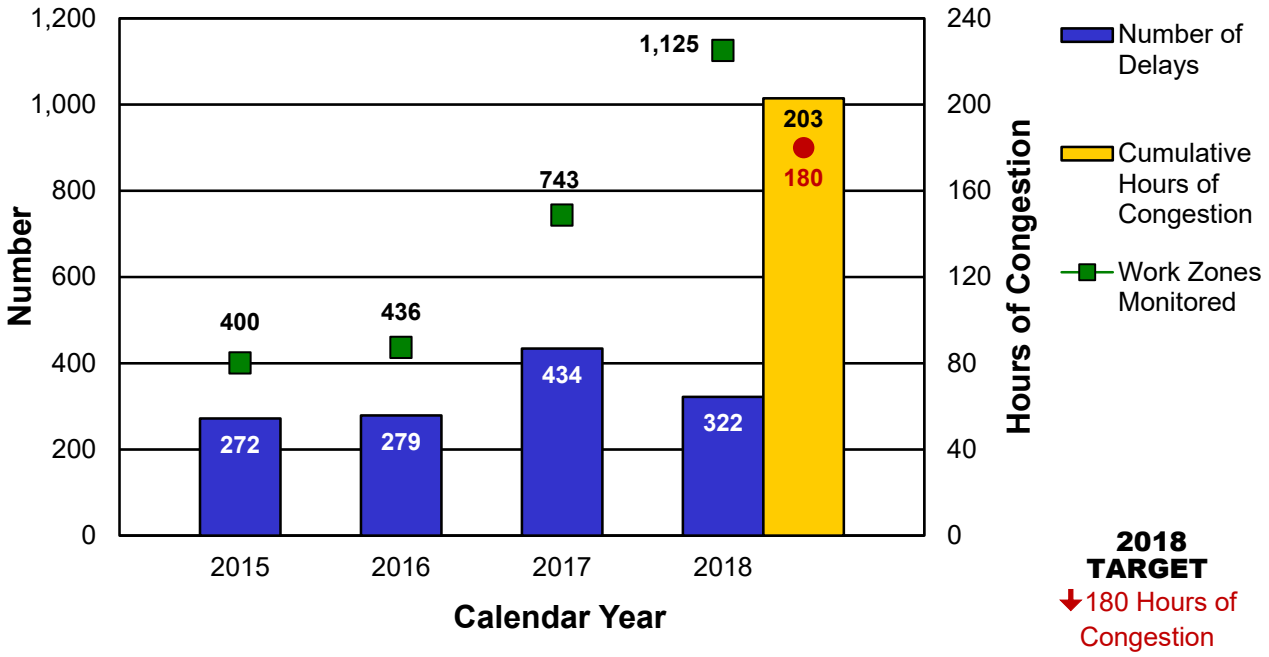
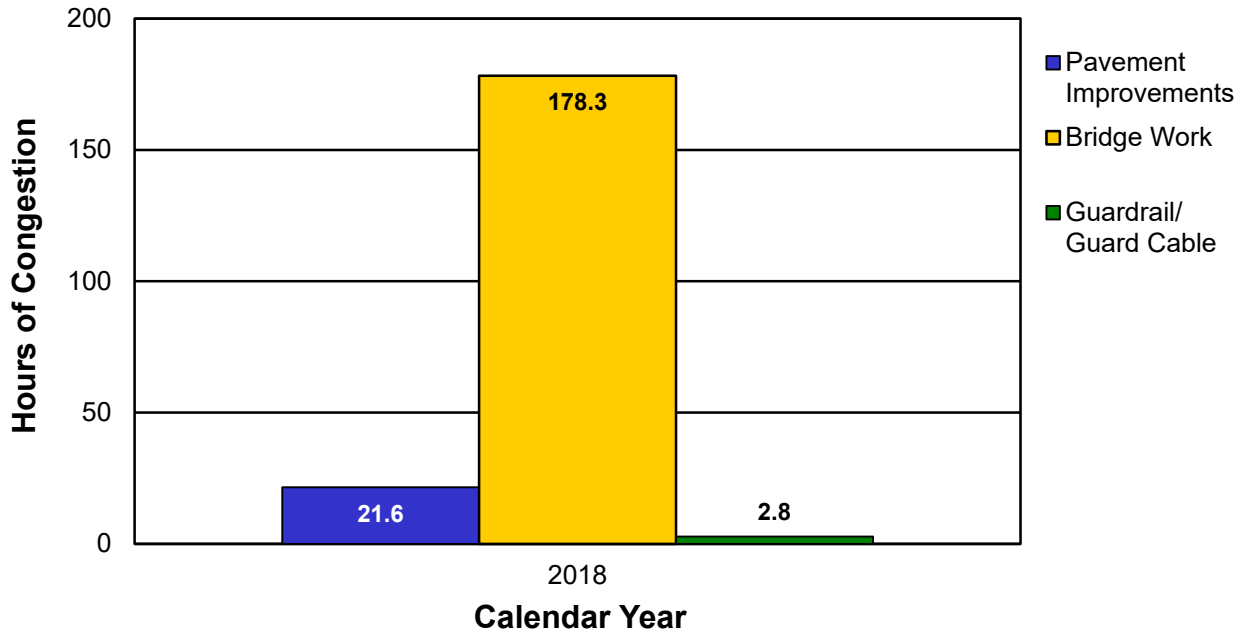
Work Zone Delays Greater than 10 Minutes



Hours of Congestion by Work Type



RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operation Officer

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.

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Time to meet winter storm event performance objectives – 5f

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. In addition, one of MoDOT's Strategic Initiatives is working toward predictive analytics to optimize winter operations resources.

The 2018-2019 winter season began early with several winter events occuring in November including a named winter storm over the Thanksgiving weekend. Winter storm Bruce had blizzard conditions in the northwest part of the state and caused the closure of Interstate 29. The impact from winter storm Bruce was measured from a vehicle delay perspective. The major routes statewide during this winter storm were measured using cell phone data. The measurement was motorist delay costs which were over $3 million. December was relatively mild and the resulting average time to meet MoDOT's objective for continuous operations routes was 4.8 hours, and 5.1 hours for non-continuous routes. These response times are higher than previous years which is due in large part to the impacts of winter storm Bruce.

On average, winter operations cost about $45 million per year. MoDOT expended $11.1 million through Dec. 31, 2018. This is higher than the last two seasons which were mild, but is on track for an average winter.

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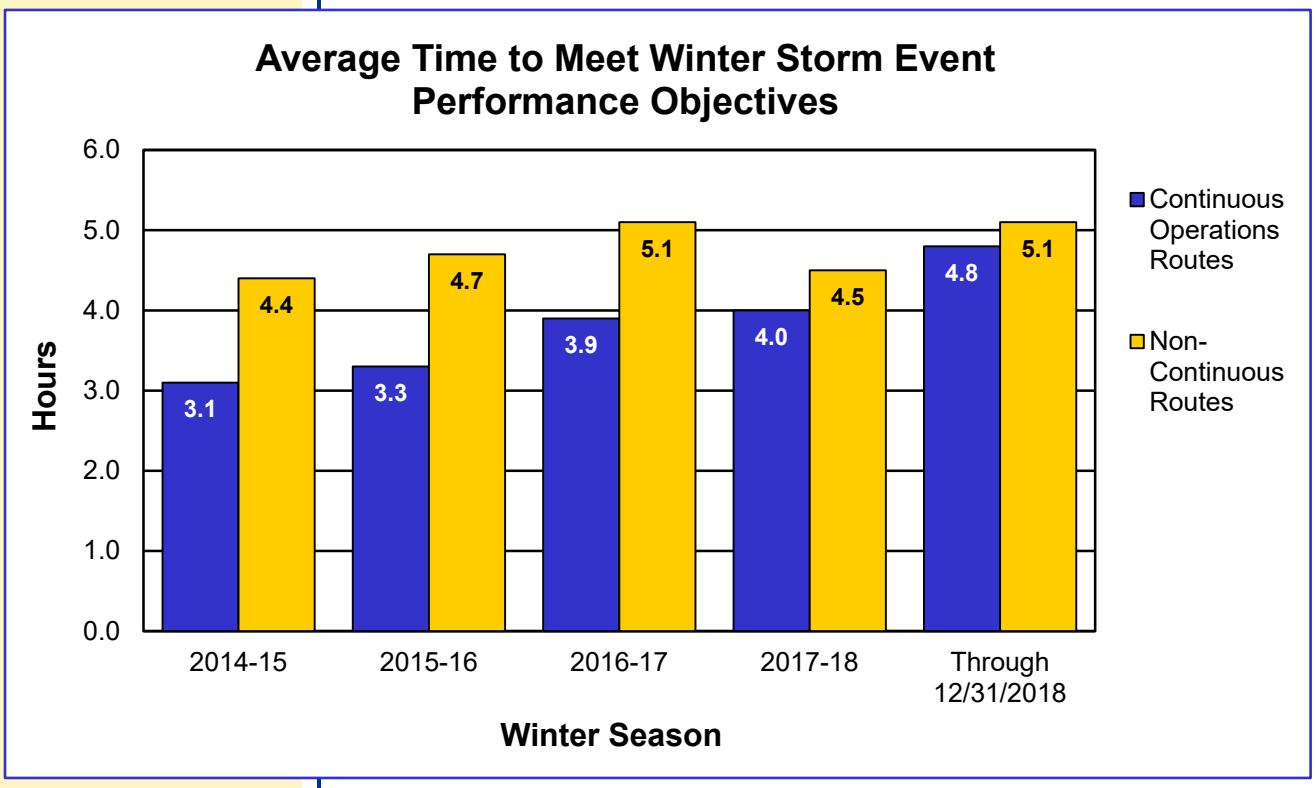

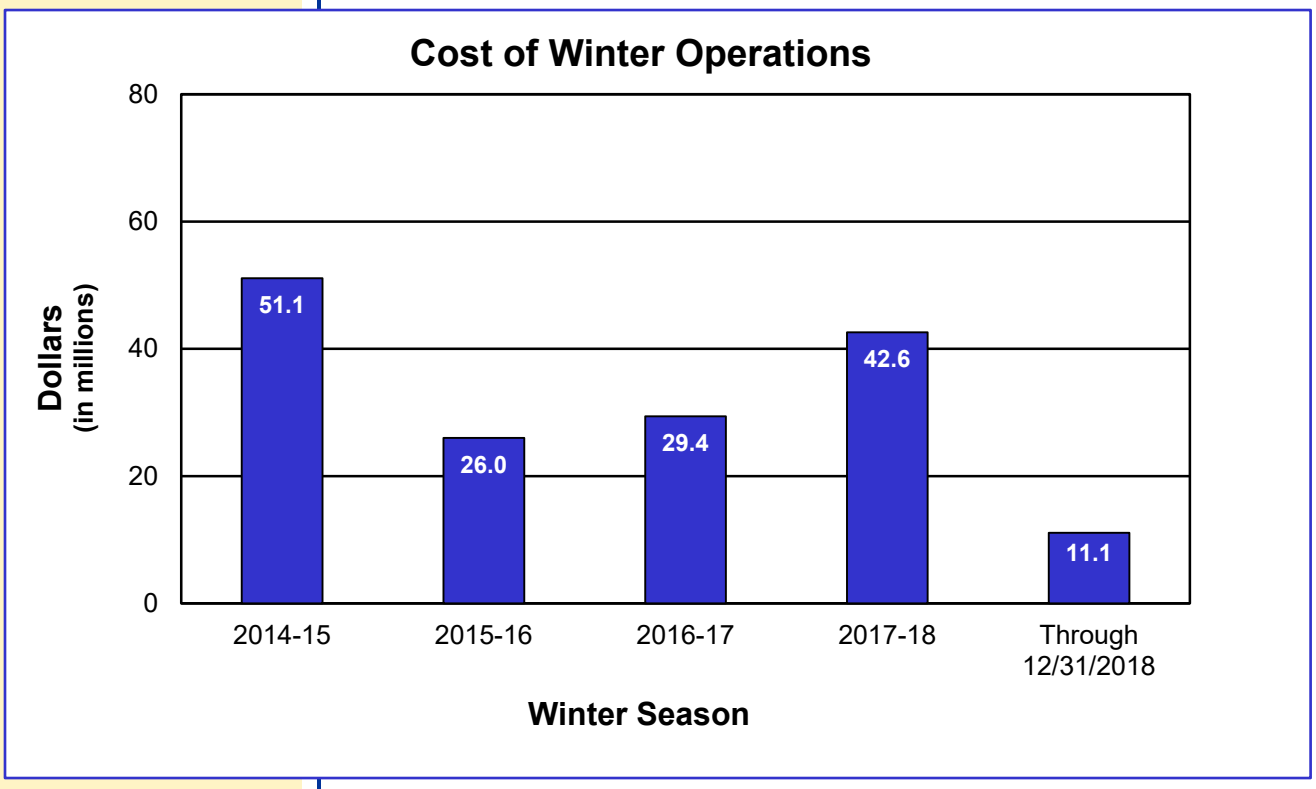

RESULT DRIVER:
Becky Allmeroth
Chief Safety and Operations Engineer

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.

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Bike/pedestrian and ADA transition plan improvements – 5g

MoDOT has improved more than $30.3 million of deficient Americans with Disabilities Act facilities in the right of way since 2008. However, additional work totaling more than $120.9 million of the 2010 ADA Transition Plan inventory needs to be completed before August 2027. To meet the commitment of the Missouri Highways and Transportation Commission, MoDOT needs to complete more than $13.9 million in improvements each year from now through 2027.

Since fiscal year 2016, the MHTC has retained half of the Transportation Alternatives Program funding it receives to be used toward MoDOT's ADA Transition Plan activities. The 2018 Statewide Transportation Improvement Program estimates the annual TAP funds retained for MoDOT ADA projects at approximately $8.6 million per year. Additional investments by the districts are required to complete the ADA Transition Plan by August 2027.

For 2018, MoDOT has completed only $3.55 million in ADA improvements. In 2017, MoDOT completed $3.37 million in ADA improvements. These amounts are well below the $13.5 million annual pace needed to complete the required ADA improvements by 2027. Current reporting of Transition Plan Completion at 20.1 percent complete is significantly behind the 49.0 percent 2018 target. Only one of the seven districts reported ADA Transition Plan progress this quarter. The Northeast District did not report any completed ADA improvements in 2018. Northeast was also the only district that failed to report any completed ADA improvements in 2017.

In 2018, MoDOT has invested $10.7 million toward improvements in pedestrian facilities. For 2018, MoDOT utilized 1.35 percent of the total 2018 STIP awards toward pedestrian facilities – a substancial increase over the record low rate of 0.72 percent in 2017. In 2017, MoDOT invested a total of $5.38 million in pedestrian facility improvements.

The annual investment target for this measure has been set at $15 million. A significant increase in ADA Transition Plan progress is necessary for MoDOT to be able to complete the ADA Transition Plan by August 2027.

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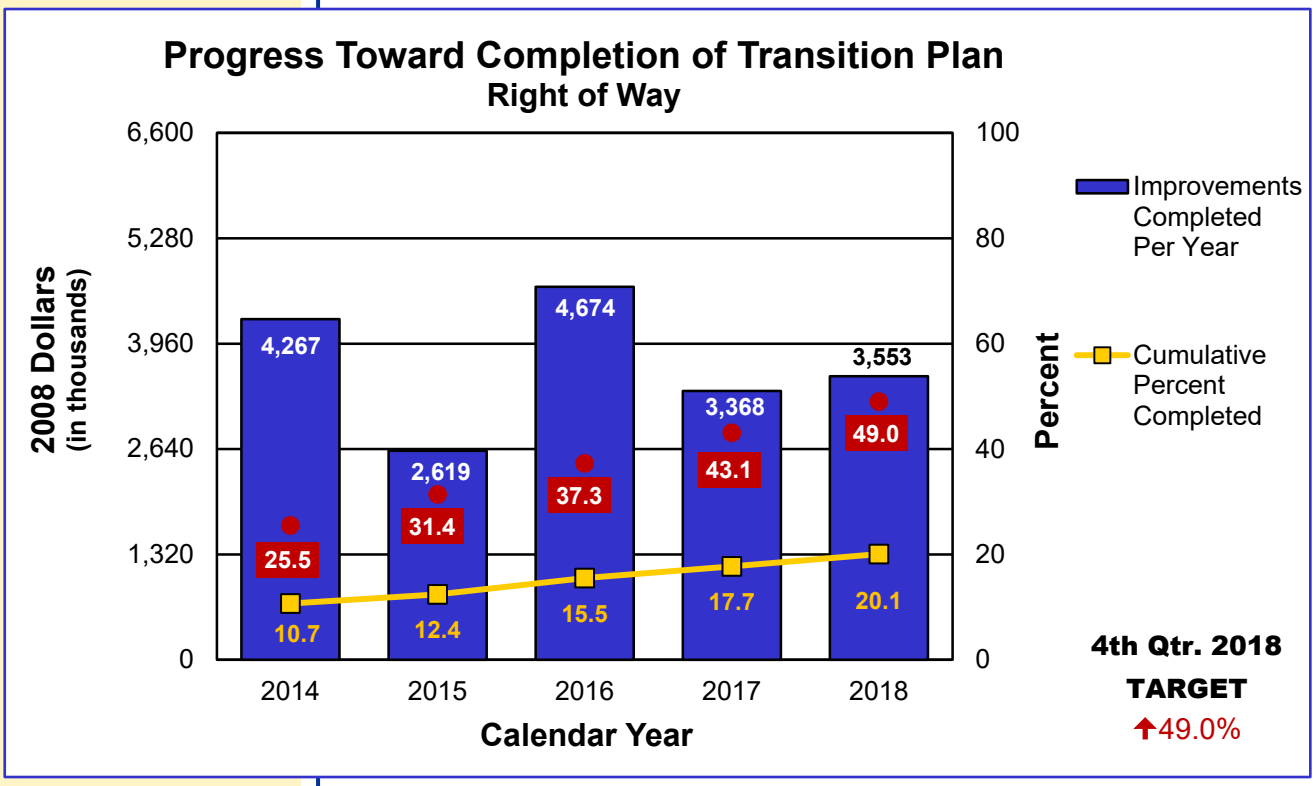

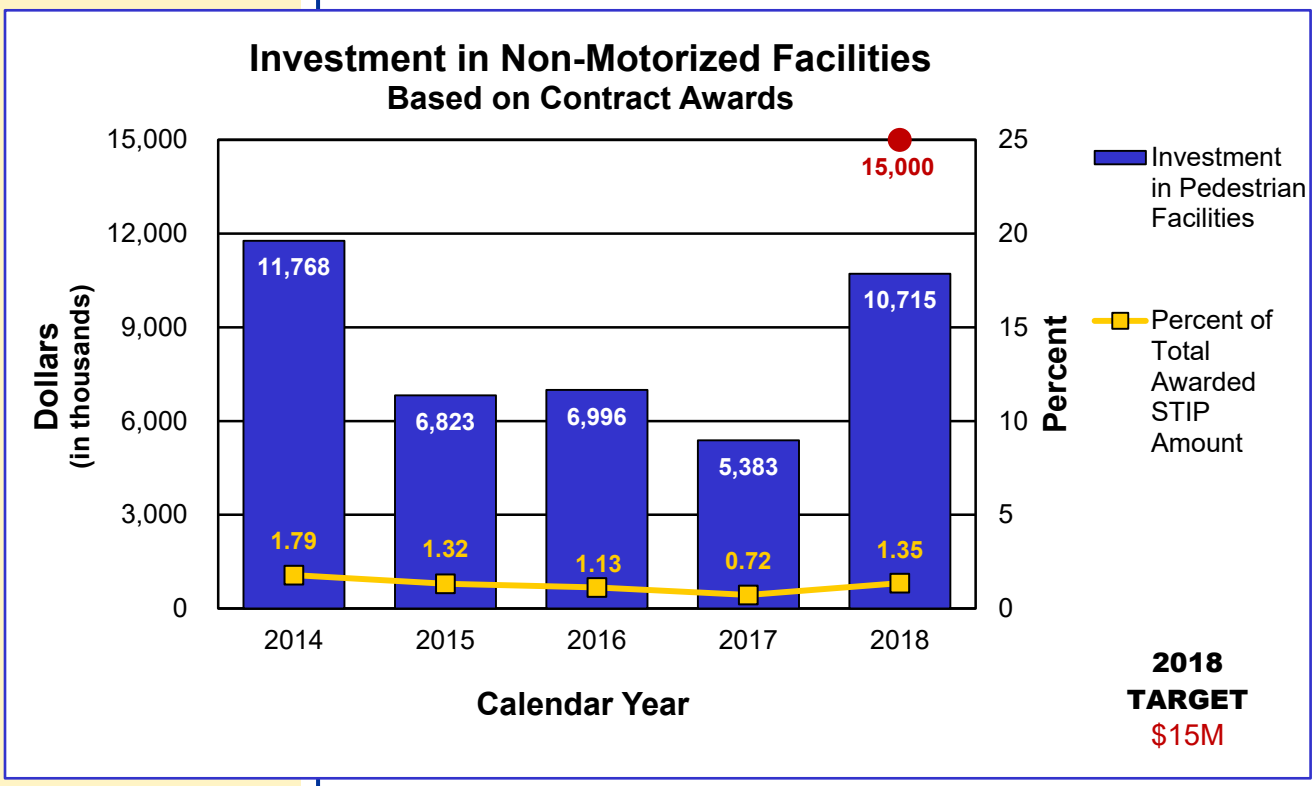

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