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.

MAP-21

Travel times and reliability on major routes-5a

RESULT DRIVER:
Paula Gough,
District Engineer

MEASUREMENT DRIVER:
Jon Nelson,
Traffic Management and Operations Engineer

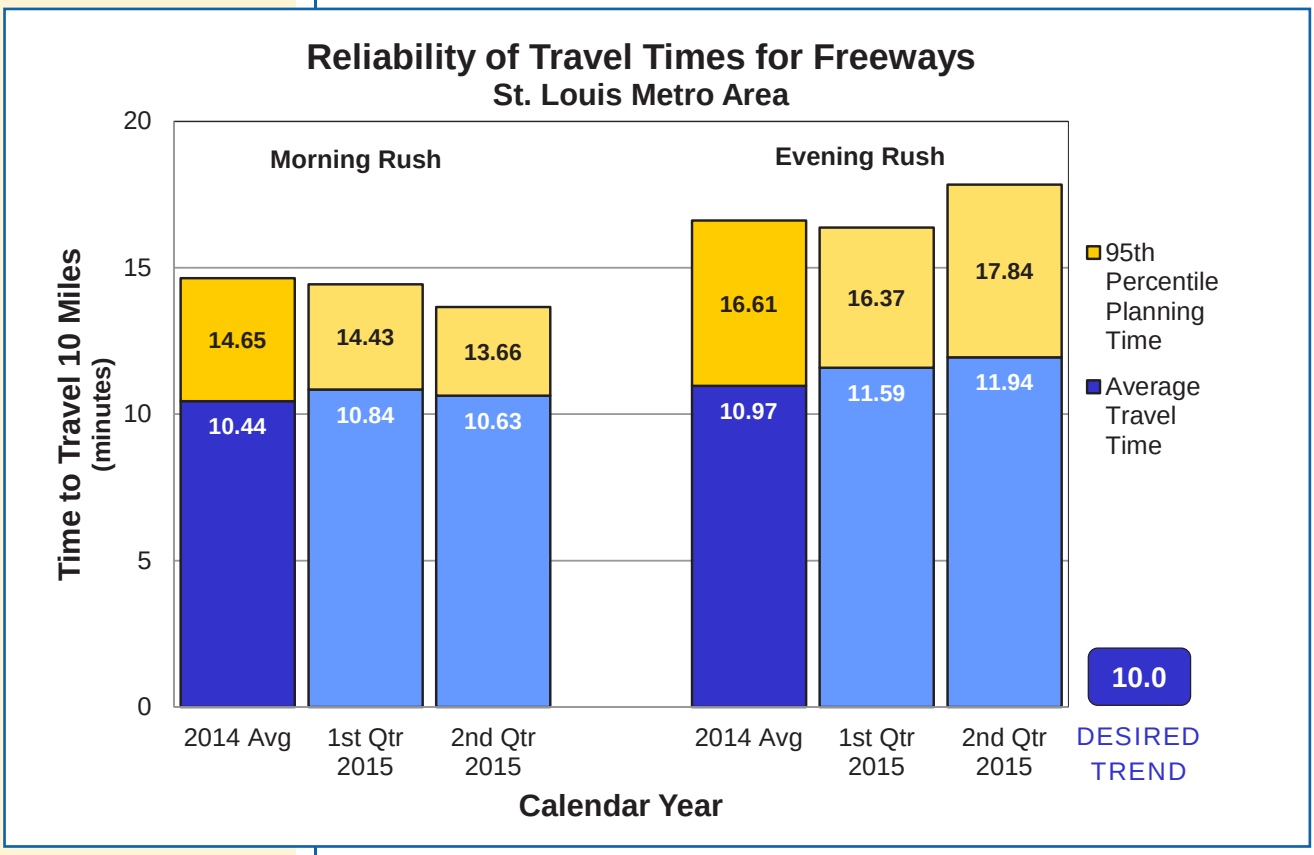
PURPOSE OF THE MEASURE:
This measure tracks the mobility of significant state routes in St. Louis, Kansas City, Springfield and Columbia.

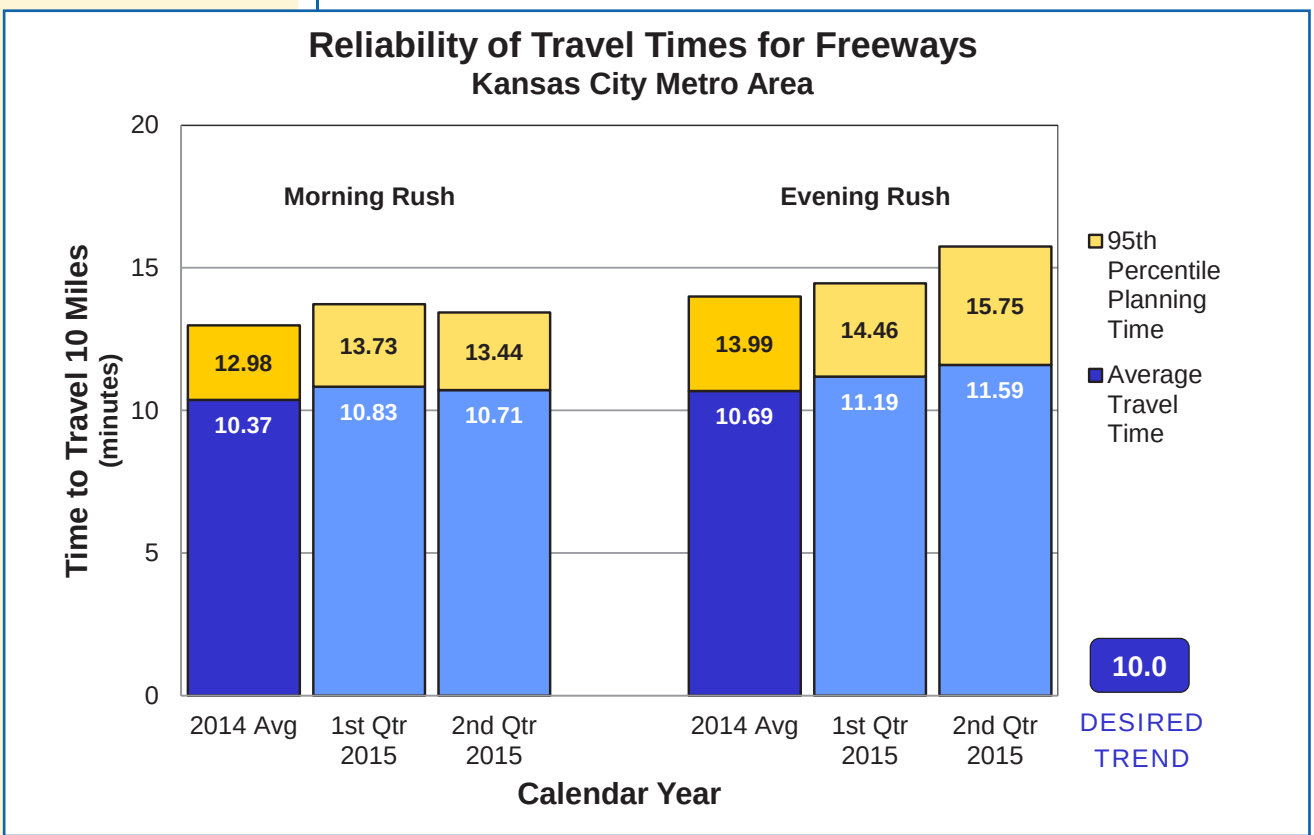
MEASUREMENT AND DATA COLLECTION:
Travel time data is collected continuously via wireless technology. To assess mobility, MoDOT compares travel times during rush hour to free-flow conditions where vehicles can travel at the posted speed limit. This measure also assesses reliability, an indicator of how 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.

Overall, from April to June 2015, travel times decreased during the morning rush and increased during the evening rush. The average 10-mile travel time in St. Louis was 10.63 minutes during the morning and 11.94 minutes during the evening. For Kansas City, the average travel time was 10.71 minutes during the morning and 11.59 minutes during the evening. These travel times represent average rush hour speeds between 50 and 55 mph.

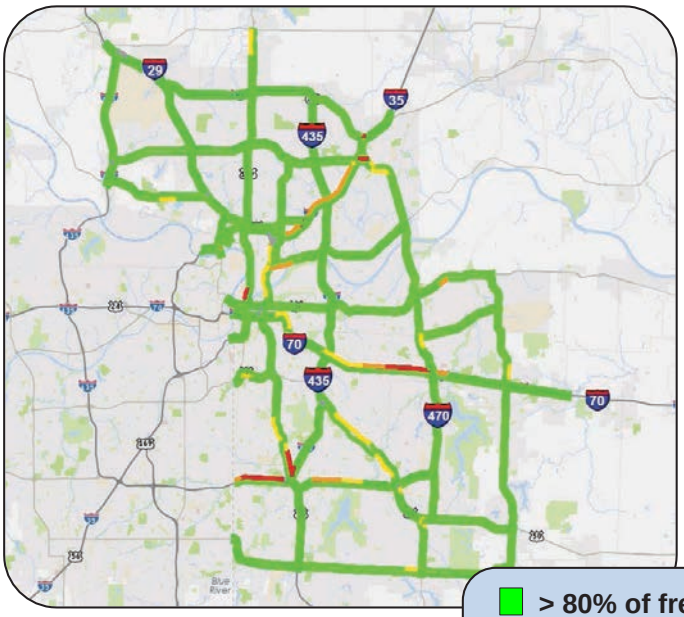
The planning times account for unexpected delays and indicate how long customers needed to plan in order to arrive on time 95 percent of the time. In St. Louis, the average 10-mile planning times were 13.66 minutes during the morning and 17.84 minutes during the evening. In Kansas City, the average planning times were 13.44 minutes during the morning and 15.75 minutes during the evening. These planning times represent average rush hour speeds between 34 and 45 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.

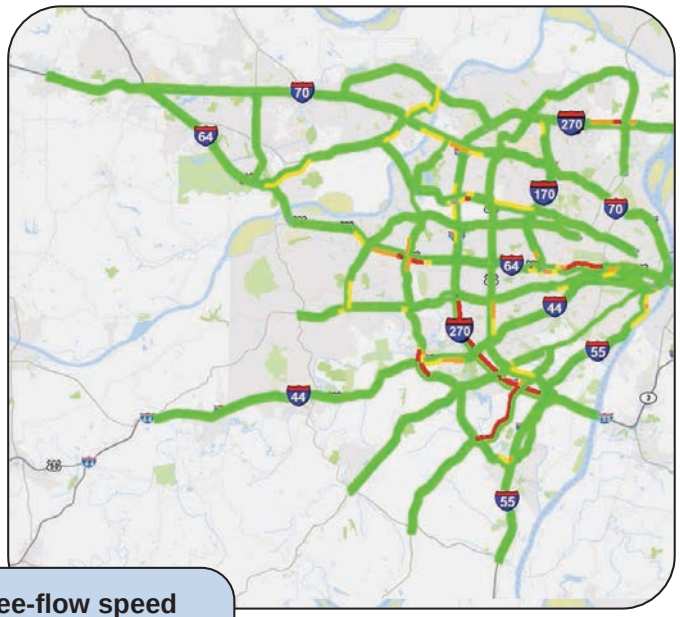

Reliability of Travel Times for Freeways
St. Louis Metro Area
Morning Rush
Evening Rush
Time to Travel 10 Miles (minutes)
20
15
10
5
0
14.65
14.43
13.66
16.61
16.37
17.84
10.44
10.84
10.63
10.97
11.59
11.94
95th Percentile Planning Time
Average Travel Time
10.0
DESIRED TREND
2014 Avg
1st Qtr 2015
2nd Qtr 2015
2014 Avg
1st Qtr 2015
2nd Qtr 2015
Calendar Year


Reliability of Travel Times for Freeways
Kansas City Metro Area
Morning Rush
Evening Rush
Time to Travel 10 Miles (minutes)
20
15
10
5
0
12.98
13.73
13.44
13.99
14.46
15.75
10.37
10.83
10.71
10.69
11.19
11.59
95th Percentile Planning Time
Average Travel Time
10.0
DESIRED TREND
2014 Avg
1st Qtr 2015
2nd Qtr 2015
2014 Avg
1st Qtr 2015
2nd Qtr 2015
Calendar Year

AM Mobility

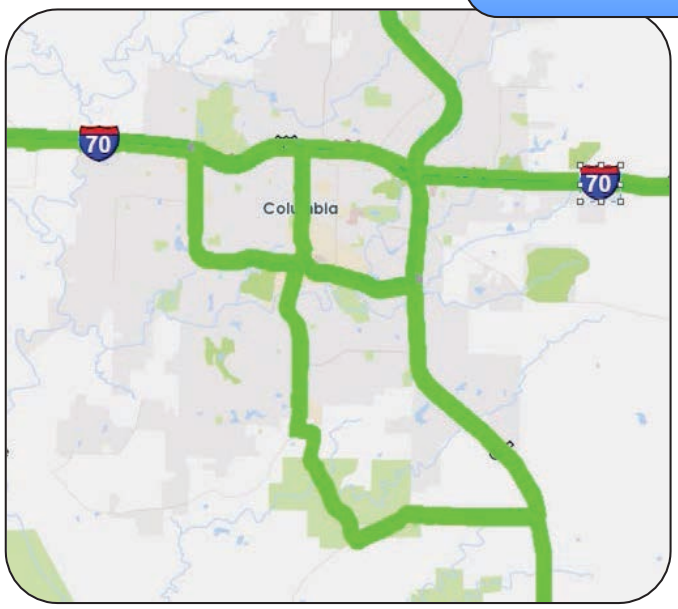


Kansas City Area

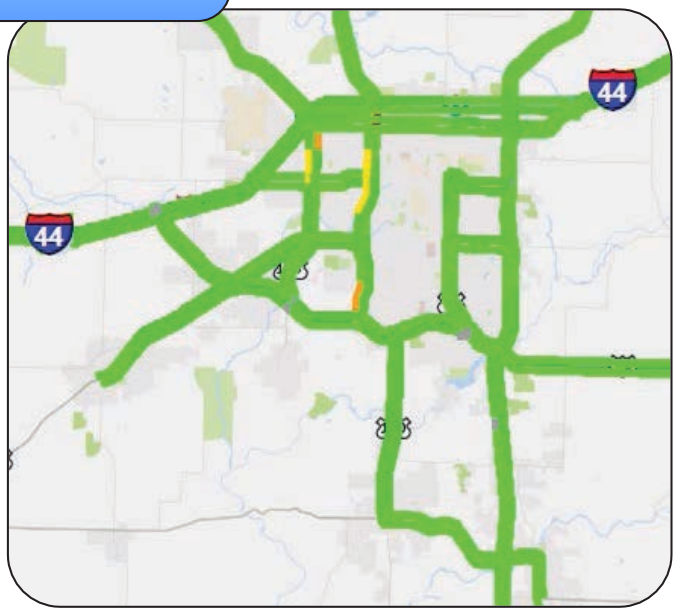


Saint Louis Area

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

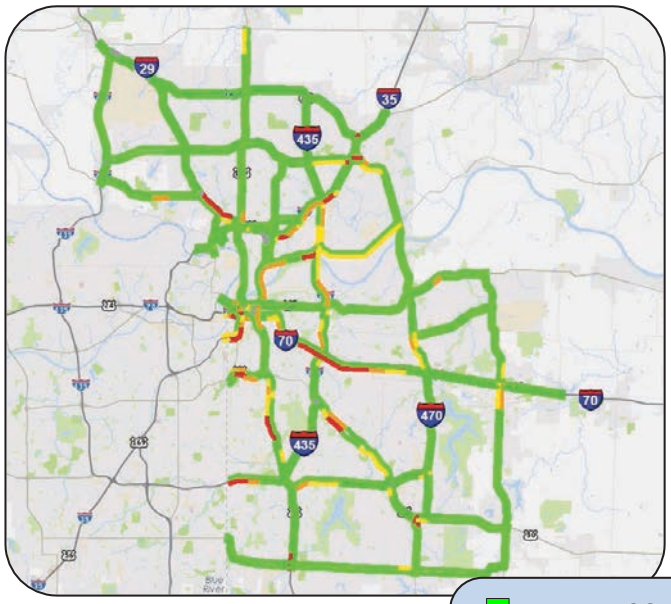


Columbia Area

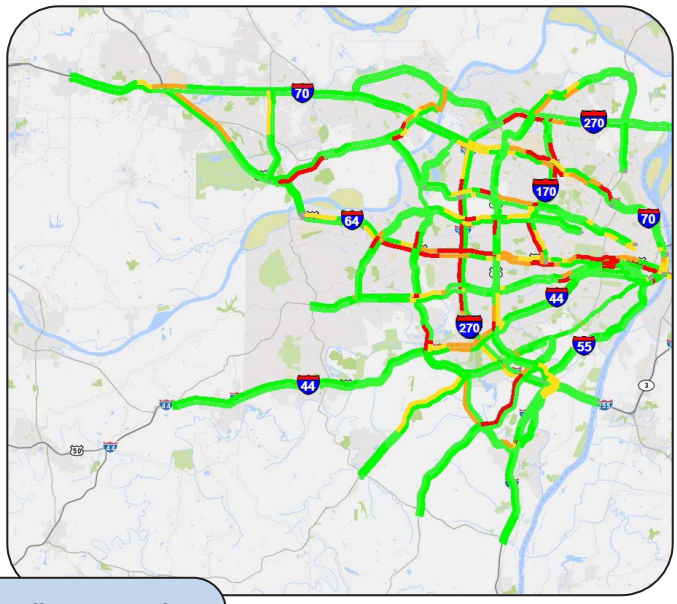


Springfield Area

PM Mobility

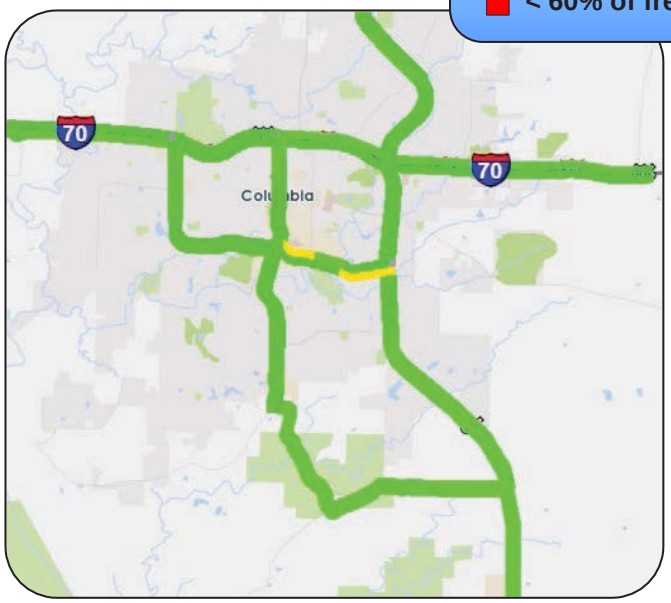


Kansas City Area

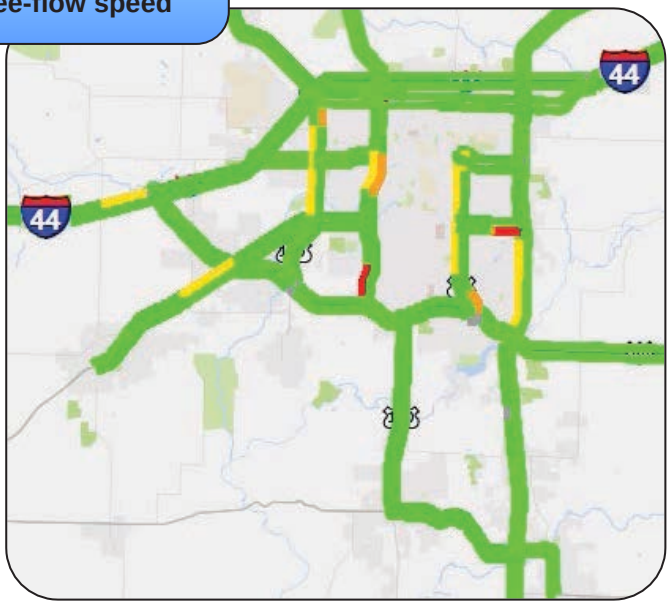


Saint Louis Area

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



Columbia Area



Springfield Area

RESULT DRIVER:
Paula Gough,
District Engineer

MEASUREMENT DRIVER:
Jeanne Olubogun,
District Traffic Engineer

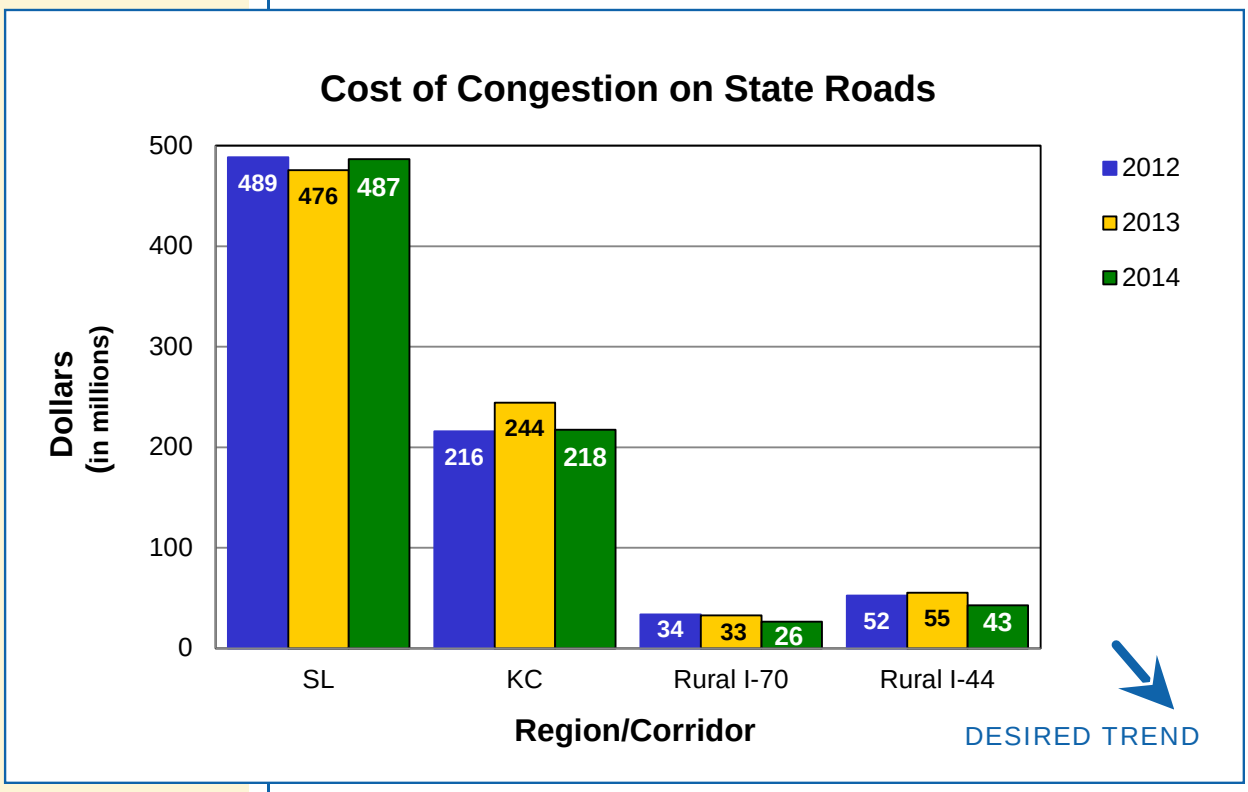
PURPOSE OF THE MEASURE:
This measure tracks the annual cost and impact of traffic congestion to motorists in the areas of motorist delay, travel time, excess fuel consumed per auto commuter and congestion cost per auto commuter.

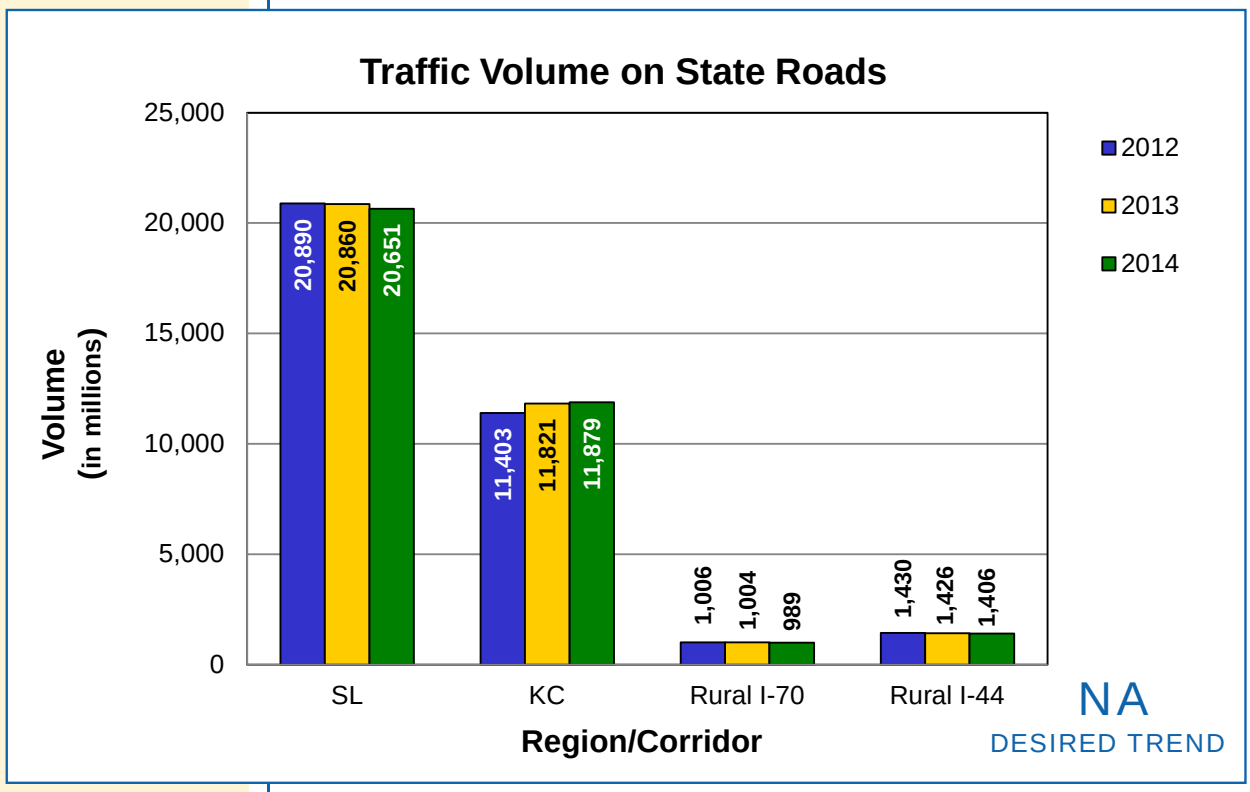
MEASUREMENT AND DATA COLLECTION:
A reporting tool available in the Regional Integrated Transportation Information System looks at user delay costs. This data, in combination with industry standard costs for passenger cars and trucks, reflects the overall costs of congestion. RITIS also includes historic 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.

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. As the department adapts to shrinking 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.


Cost of Congestion on State Roads
Dollars (in millions)
500
400
300
200
100
0
489
476
487
216
244
218
34
33
26
52
55
43
SL
KC
Rural I-70
Rural I-44
Region/Corridor
2012
2013
2014
DESIRED TREND


Traffic Volume on State Roads
Volume (in millions)
25,000
20,000
15,000
10,000
5,000
0
20,890
20,860
20,651
11,403
11,821
11,879
1,006
1,004
989
1,430
1,426
1,406
SL
KC
Rural I-70
Rural I-44
Region/Corridor
2012
2013
2014
NA
DESIRED TREND

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.

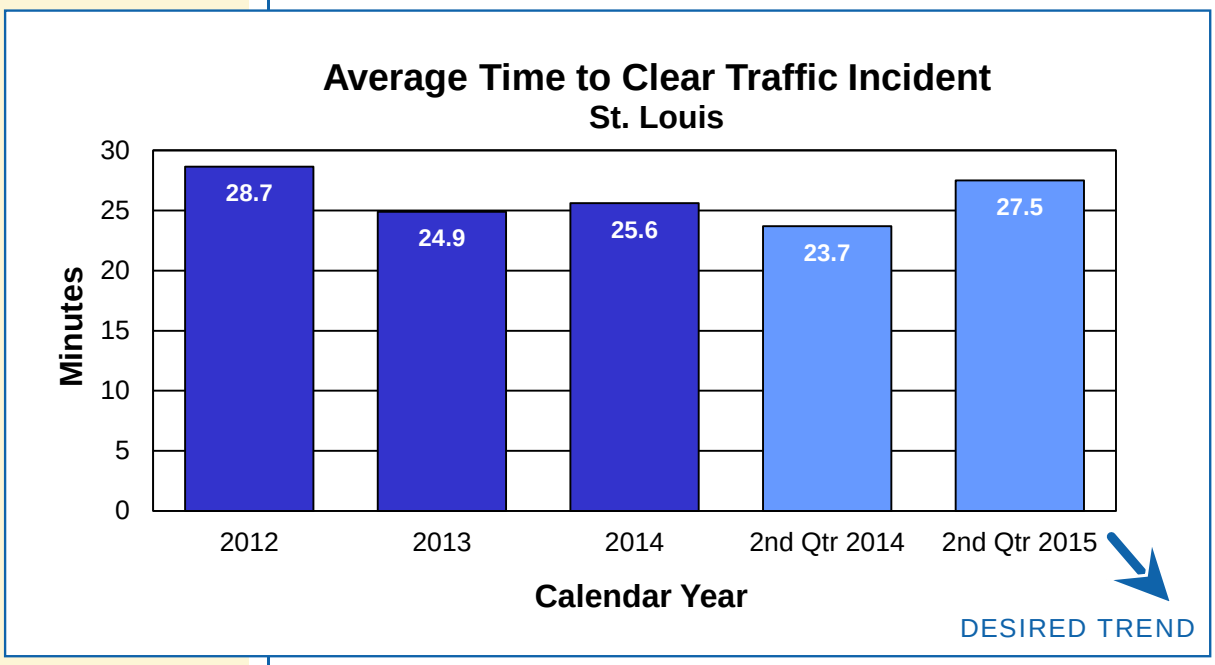
OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

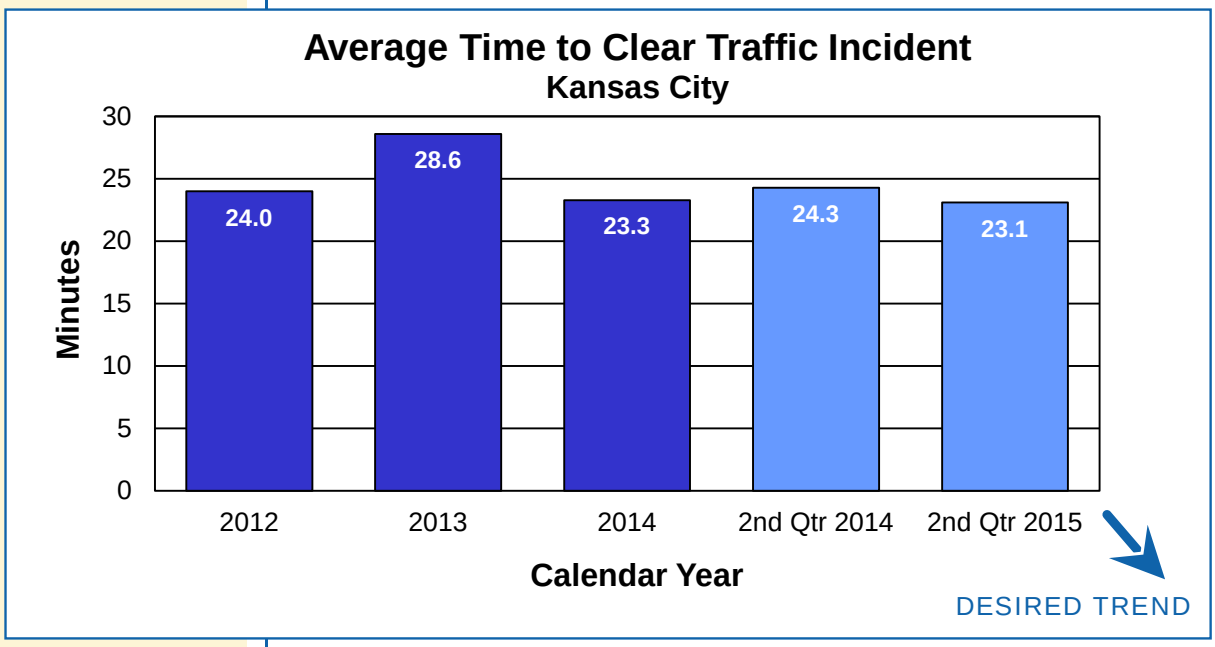
Average time to clear traffic incident-5c

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 648 incidents in April, 767 in May and 755 in June. The average time to clear traffic incidents was 27.5 minutes, an increase of 16 percent compared to the second quarter of 2014.

Kansas City recorded 539 incidents in April, 582 in May and 639 in June. The average time to clear traffic incidents was 23.1 minutes, a decrease of 5 percent from the second quarter of 2014.


Average Time to Clear Traffic Incident
St. Louis
Minutes
30
25
20
15
10
5
0
28.7
24.9
25.6
23.7
27.5
2012
2013
2014
2nd Qtr 2014
2nd Qtr 2015
Calendar Year
DESIRED TREND


Average Time to Clear Traffic Incident
Kansas City
Minutes
30
25
20
15
10
5
0
24.0
28.6
23.3
24.3
23.1
2012
2013
2014
2nd Qtr 2014
2nd Qtr 2015
Calendar Year
DESIRED TREND

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.

Traffic incident impacts on major interstate routes-5d

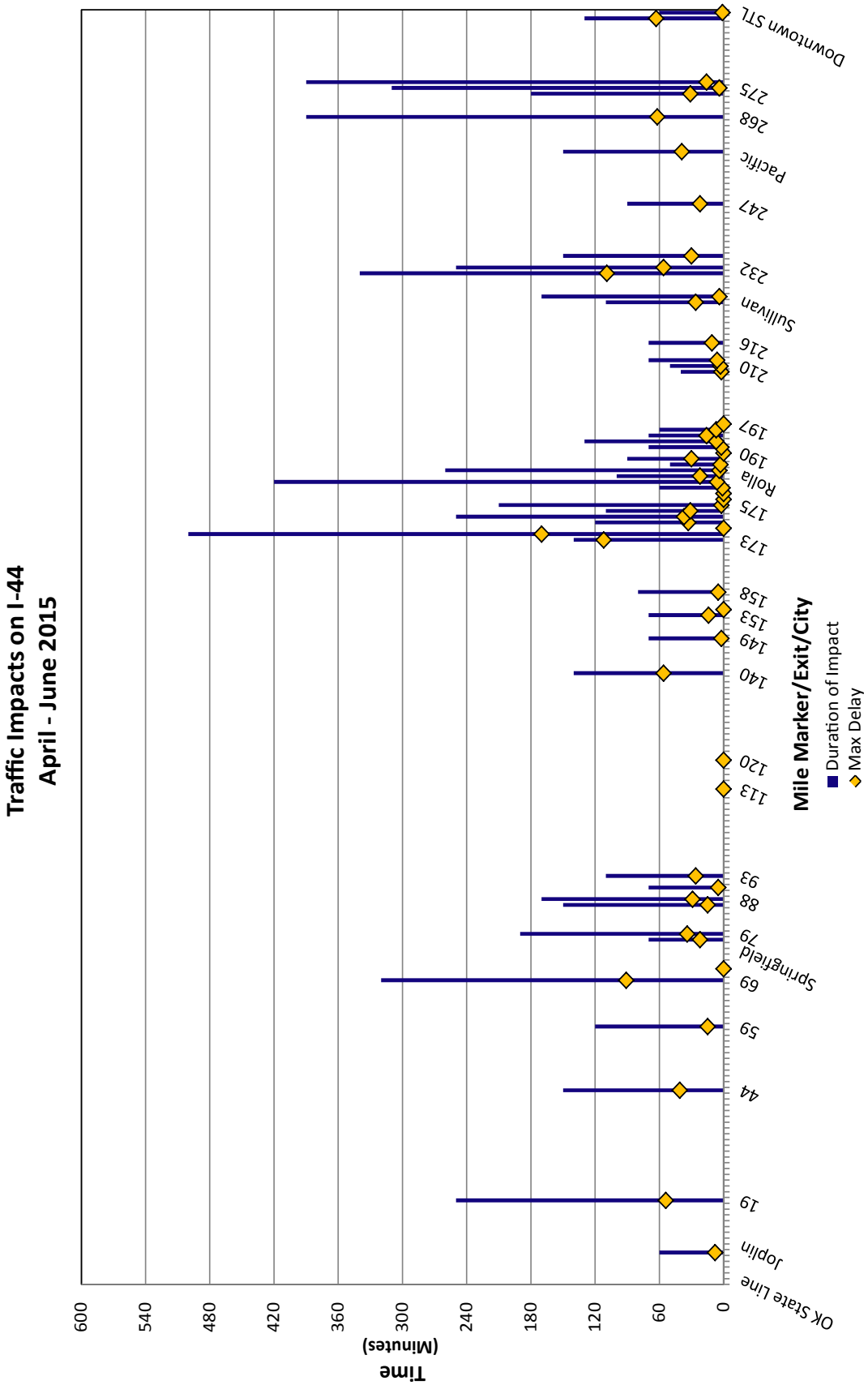
Interstates are the arteries that connect our nation and keep people and commerce flowing. When they shut down in Missouri, the country is cut in half. Keeping interstates free-flowing is a top priority for MoDOT, but sometimes vehicle crashes affect the department's ability to keep the interstates moving.

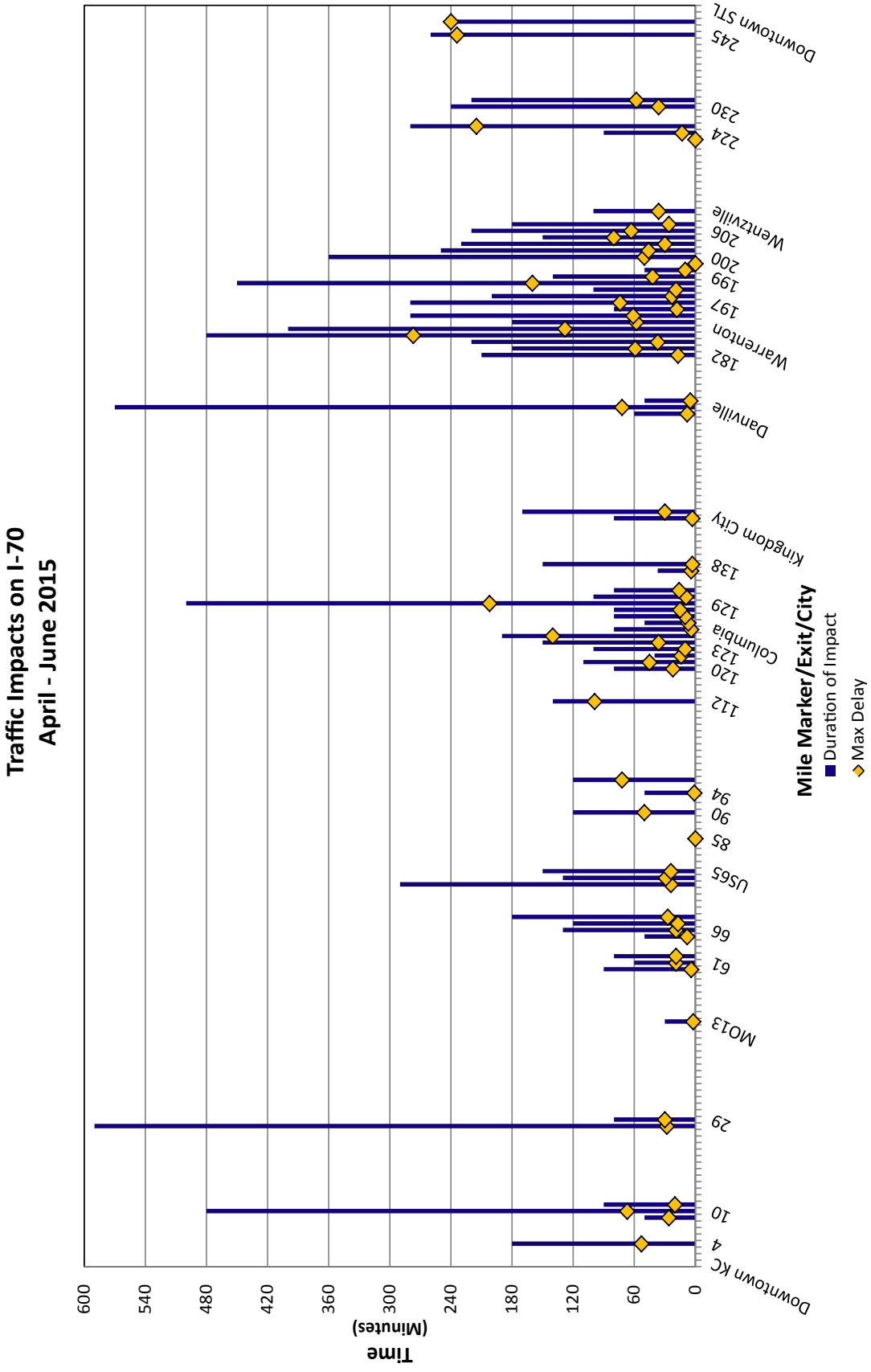
The I-70 and I-44 charts below give a comparison of the duration of the incidents and the actual delay experienced by the travelers as provided by the RITIS tool. An incident with a long duration may not create a long delay. This can occur when at least one lane remains open or if there is a good detour route around the incident. The time of day and traffic volumes on the corridor can also 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.

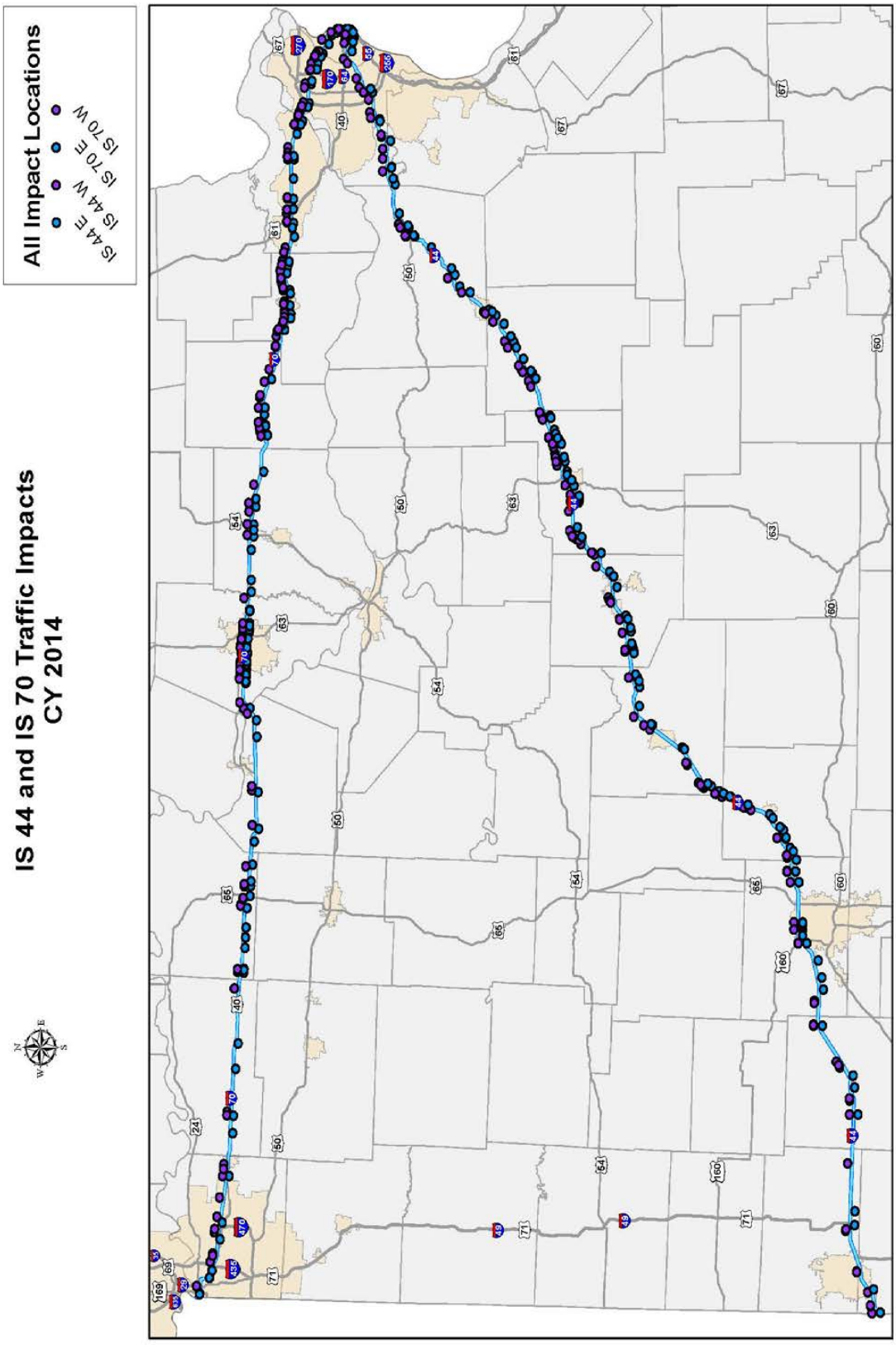
MoDOT continues to work with emergency responder partners to minimize the delay caused by closures on the interstate system. This Tracker measure gives us more information so that staff can focus on the incidents with higher "real" impact to travelers. This information will be used to develop and implement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

Top 10 Incidents by Delay
April–June 2015

Route	County	Dir	Mile Marker	Date	Impact Duration	Max Delay
I-70	WARREN	E	194	4/19/2015	8 hr 0 min	4 hr 37 min
I-70	ST. LOUIS CITY	E	248	6/5/2015	4 hr 0 min	4 hr 0 min
I-70	ST. LOUIS CITY	W	245	5/2/2015	4 hr 20 min	3 hr 54 min
I-70	ST. CHARLES	W	226	5/10/2015	4 hr 40 min	3 hr 35 min
I-70	BOONE	W	129	6/19/2015	8 hr 20 min	3 hr 22 min
I-44	PHELPS	E	173	4/5/2015	8 hr 20 min	2 hr 50 min
I-70	WARREN	W	199	4/19/2015	7 hr 30 min	2 hr 40 min
I-70	BOONE	E	126	4/23/2015	3 hr 10 min	2 hr 20 min
I-70	WARREN	W	194	4/19/2015	6 hr 40 min	2 hr 8 min
I-44	PHELPS	W	173	4/29/2015	2 hr 20 min	1 hr 52 min


Traffic Impacts on I-44
April - June 2015
Time (Minutes)
600
540
480
420
360
300
240
180
120
60
0
Mile Marker/Exit/City
Duration of Impact
Max Delay
Ok State Line
Joplin
19
44
59
69
Springfield
79
88
93
113
120
140
149
153
158
173
175
Rolla
190
197
210
216
Sullivan
232
247
Pacific
268
275
Downtown STL


Traffic Impacts on I-70
April - June 2015
Time (Minutes)
0
60
120
180
240
300
360
420
480
540
600
Mile Marker/Exit/City
Duration of Impact
Max Delay
Downtown KC
4
10
29
MO13
61
66
US65
85
90
94
112
120
123
Columbia
129
138
Kingdom City
Danville
182
Warrenton
197
199
200
206
Wentzville
224
230
245
Downtown STL


IS 44 and IS 70 Traffic Impacts
CY 2014
All Impact Locations
IS 44 E
IS 44 W
IS 70 E
IS 70 W

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.

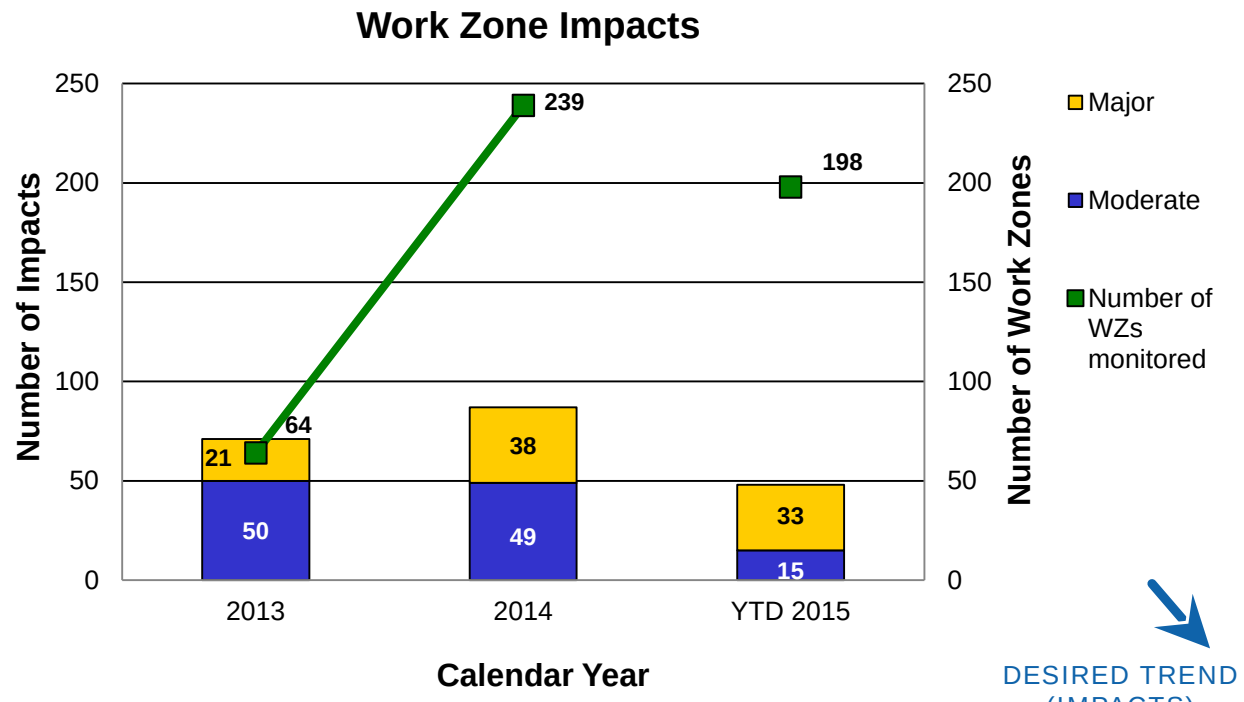
OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

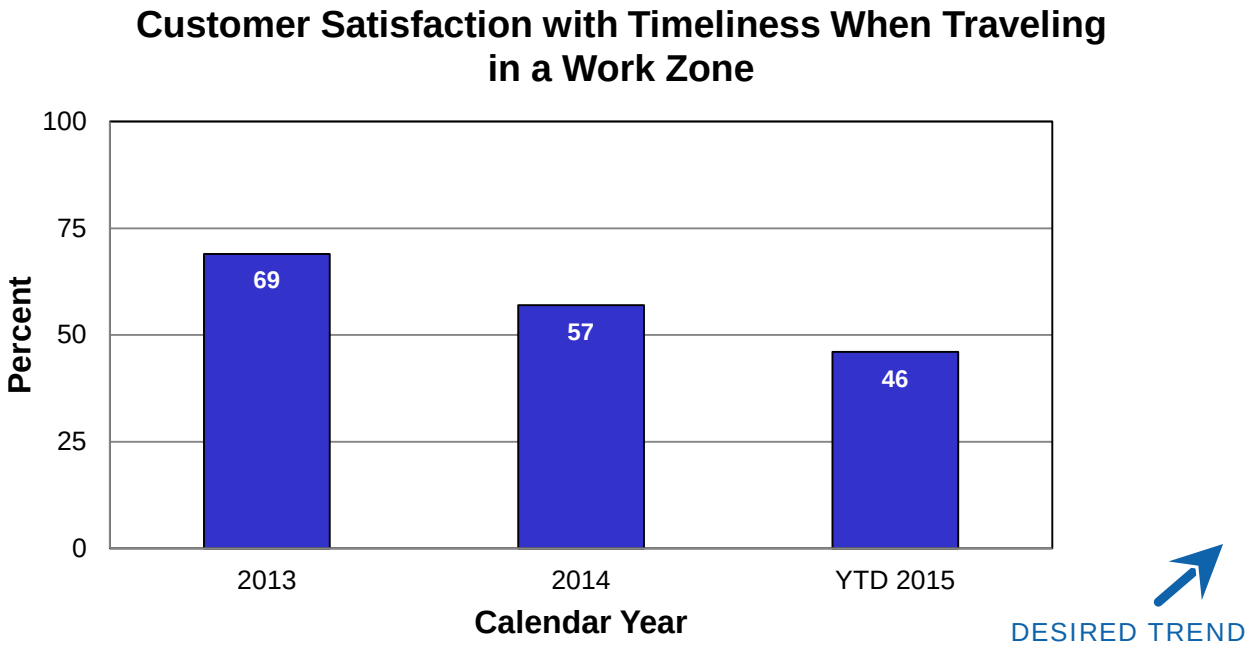
Work zone impacts to the traveling public-5e

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 better understand the impact work zones have on motorists, the department has increased the number of work zones it monitors each quarter.

MoDOT monitored 120 significant work zones this quarter, with 30 major impacts and 12 moderate impacts. This brings the calendar year-to-date totals to 33 major and 15 moderate impacts, with a total of 198 work zones analyzed. The significant project this quarter that accounted for the most impacts was the Blackwater bridge project in the Kansas City District. This work zone accounted for 21 major and two moderate impacts. The St. Louis District had four major impacts and three moderate impacts. One major impact in St. Louis on Interstate 55 southbound bridge work was due to an accident in the advanced warning area of the project. Therefore, the crews pulled off and it was determined this work would be completed at night. One major impact in the Southwest District was during a lane drop at the new Prigmore interchange in Jasper County. The queue was managed and did not back up past the work zone signing.

Based on work zone surveys received this quarter, 46 percent of motorists are satisfied with timeliness when traveling in a work zone.


Work Zone Impacts
Number of Impacts
Number of Work Zones
250
200
150
100
50
0
239
198
64
21
38
50
49
33
15
2013
2014
YTD 2015
Calendar Year
Major
Moderate
Number of WZs monitored
DESIRED TREND (IMPACTS)


Customer Satisfaction with Timeliness When Traveling in a Work Zone
Percent
100
75
50
25
0
69
57
46
2013
2014
YTD 2015
Calendar Year
DESIRED TREND

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:
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.

Time to meet winter storm event performance objectives-5g

RESULT DRIVER:
Paula Gough,
District Engineer

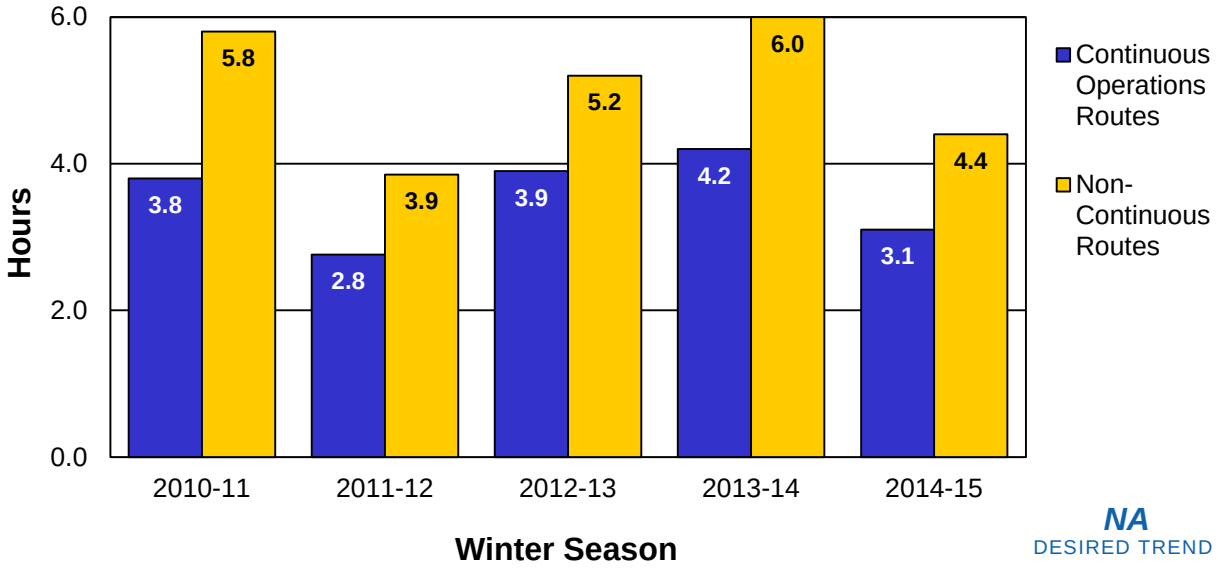
MEASUREMENT DRIVER:
Tim Chojnacki,
Maintenance Liaison Engineer

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.

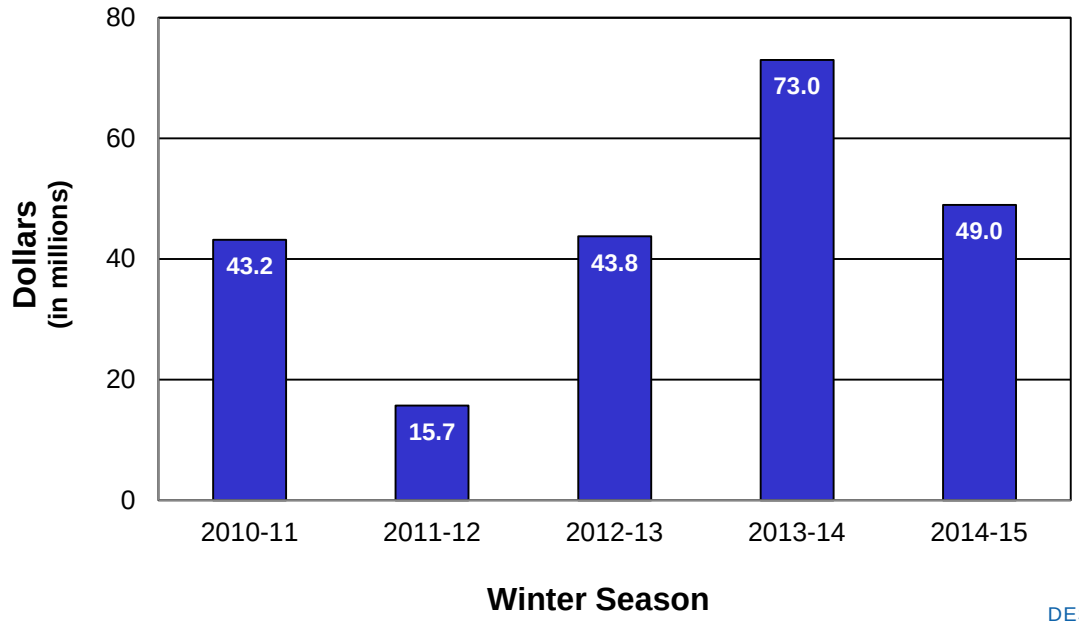
Knowing the time it takes to clear roads after a winter storm can help the department better analyze the costs associated with that work. MoDOT's response rate to winter events provides good customer service for the traveling public while keeping costs as low as possible. While the first half of this winter was light, Missouri experienced many winter storms in January and February of 2015. It took an average of 3.1 hours to meet MoDOT's objective for continuous operations routes, and an average of 4.4 hours for non-continuous routes. These numbers compare favorably with the type of storms received, but MoDOT still spent 574,000 hours fighting these snow and ice events at a cost of $49.0 million through the end of March. Winter operations, on average, cost about $47.6 million dollars per year. 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.

Time to Meet Winter Storm Event Performance Objectives



NA
DESIRED TREND

Average Cost of Winter Operations



NA
DESIRED TREND

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.

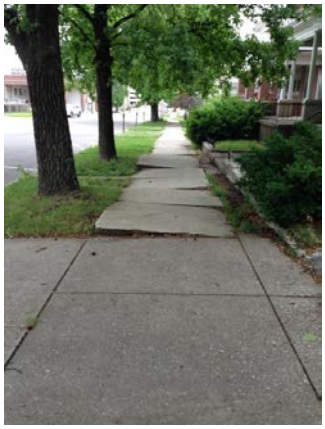
MEASUREMENT AND DATA COLLECTION:
Tracking of MoDOT's investment in pedestrian facilities is done by collecting awarded contract amounts for the 20 most common construction elements used on pedestrian projects each year. Transition Plan progress is based upon completed work that has corrected defective 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.

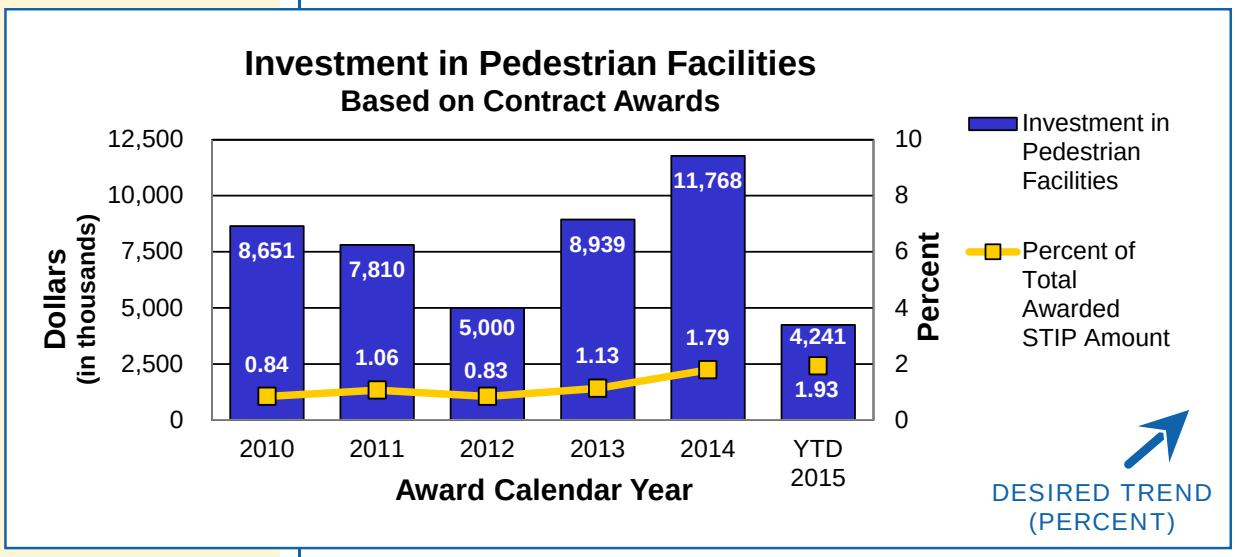
MoDOT has been responsive to public requests for improved accessibility and has been proactive in many areas to make systematic improvements when opportunities arise and limited funding allows. MoDOT has improved more than $15.2 million of deficient ADA facilities in the right of way since 2008. Additional work totaling more than $136.1 million is still necessary to complete the 2010 ADA Transition Plan inventory.

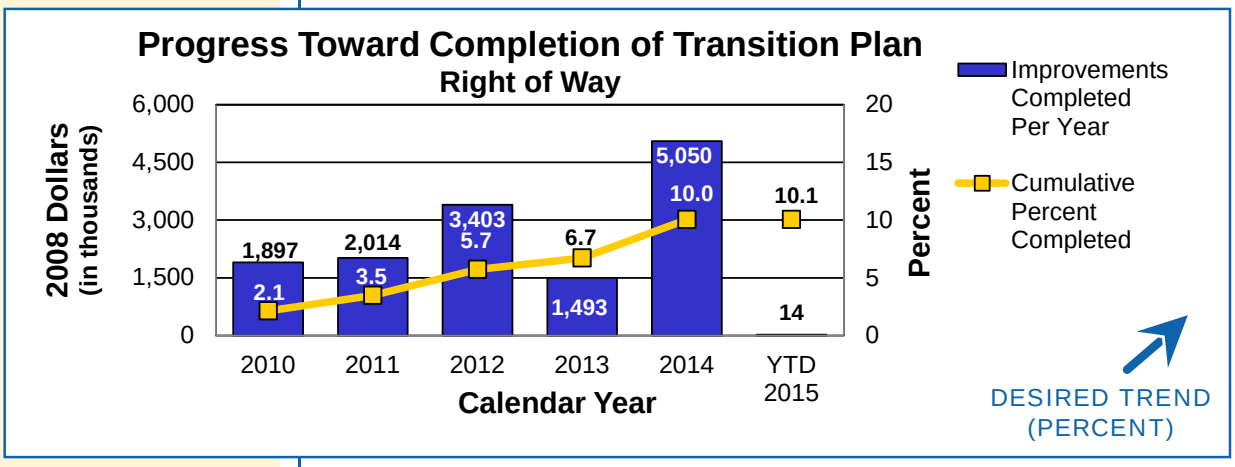
Unfortunately, a dwindling revenue stream for construction projects at both state and federal levels makes it difficult to even maintain existing facilities. Additional funding sources will need to be developed before significant progress can be made in developing the improved pedestrian facilities that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

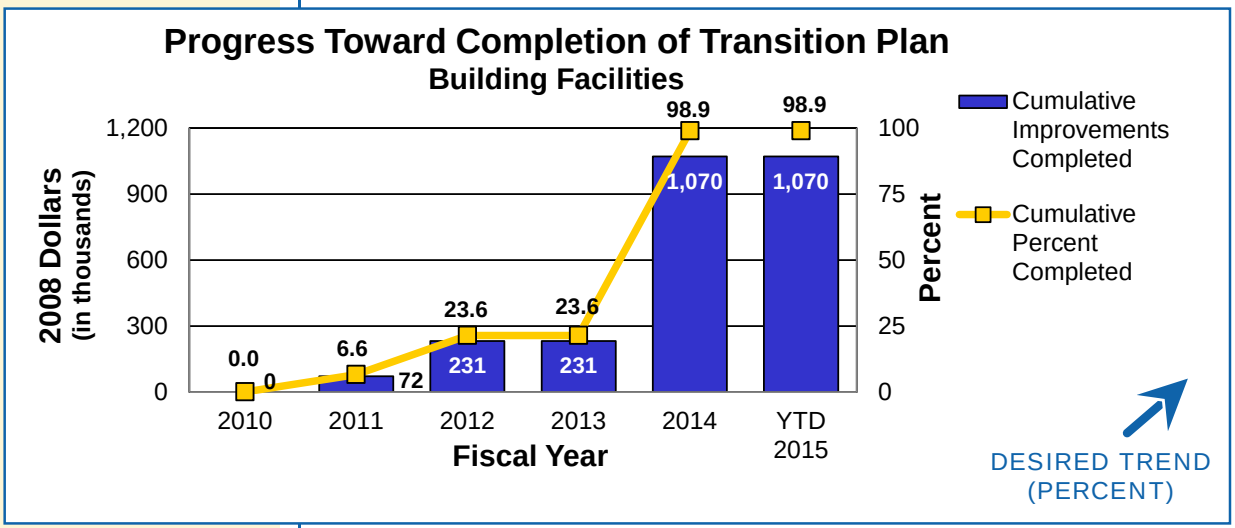
MoDOT's investment in pedestrian facilities through April 2015 totals $4.24 million. In 2014, the annual investment was $11.76 million. MoDOT has committed to complete ADA improvements, including cross slope corrections, as work is being done on the adjacent roadway section. The future of this commitment is being reviewed as MoDOT considers the tough choices necessary to operate the state's highway system on very limited funding.

Americans with Disability Act compliance in MoDOT facilities is nearing completion with six of the seven districts showing 100 percent of ADA improvement projects completed. The Southeast District has just $12,000 of ADA work to complete.




Investment in Pedestrian Facilities
Based on Contract Awards
Dollars (in thousands)
12,500
10,000
7,500
5,000
2,500
0
Percent
10
8
6
4
2
0
8,651
7,810
5,000
8,939
11,768
4,241
0.84
1.06
0.83
1.13
1.79
1.93
2010
2011
2012
2013
2014
YTD 2015
Award Calendar Year
Investment in Pedestrian Facilities
Percent of Total Awarded STIP Amount
DESIRED TREND (PERCENT)


Progress Toward Completion of Transition Plan
Right of Way
2008 Dollars (in thousands)
6,000
4,500
3,000
1,500
0
Percent
20
15
10
5
0
1,897
2,014
3,403
1,493
5,050
14
2.1
3.5
5.7
6.7
10.0
10.1
2010
2011
2012
2013
2014
YTD 2015
Calendar Year
Improvements Completed Per Year
Cumulative Percent Completed
DESIRED TREND (PERCENT)


Progress Toward Completion of Transition Plan
Building Facilities
2008 Dollars (in thousands)
1,200
900
600
300
0
Percent
100
75
50
25
0
0
72
231
231
1,070
1,070
0.0
6.6
23.6
23.6
98.9
98.9
2010
2011
2012
2013
2014
YTD 2015
Fiscal Year
Cumulative Improvements Completed
Cumulative Percent Completed
DESIRED TREND (PERCENT)

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 and from individual airports. 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 January and October, respectively – while ferryboat and rail data is updated quarterly.

OPERATE A RELIABLE AND CONVENIENT TRANSPORTATION SYSTEM

Use and connectivity of modes of transportation-5i

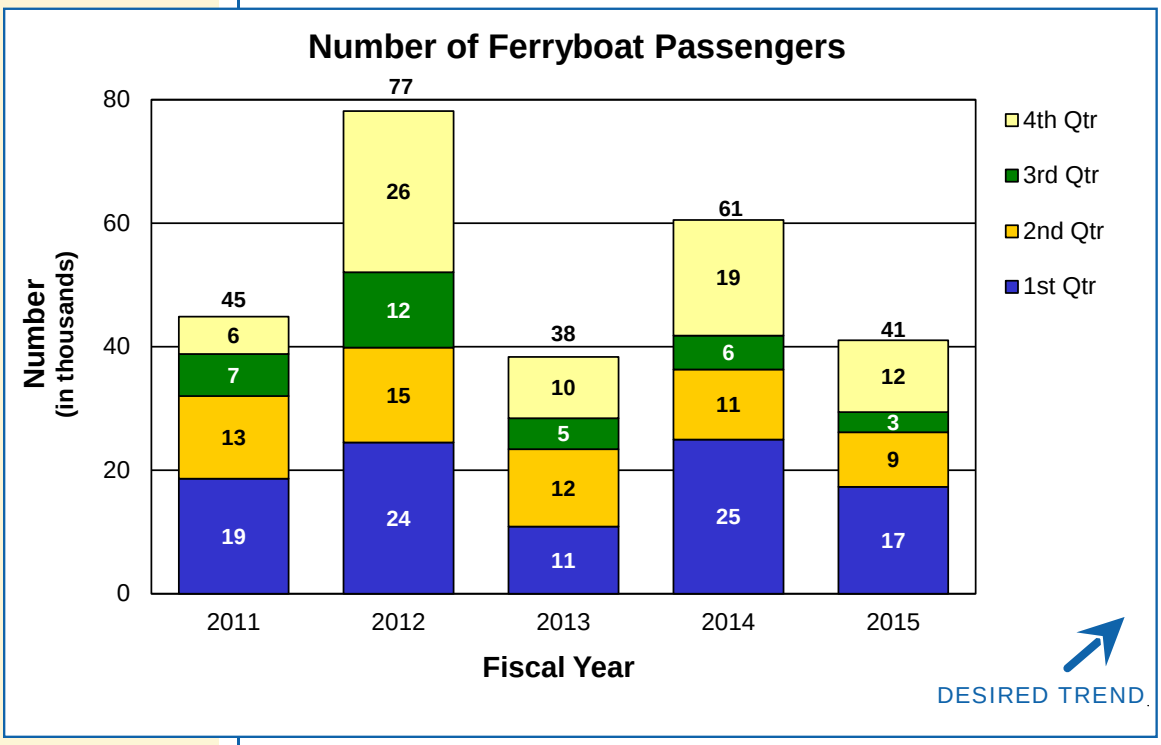
Planes, trains, ferries and transit are vital means of transport for Missourians. Alternative modes of transportation connect Missourians to work, healthcare and other necessary activities. They also are used to grow Missouri's economy and create jobs. Missouri's current transportation funding for these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

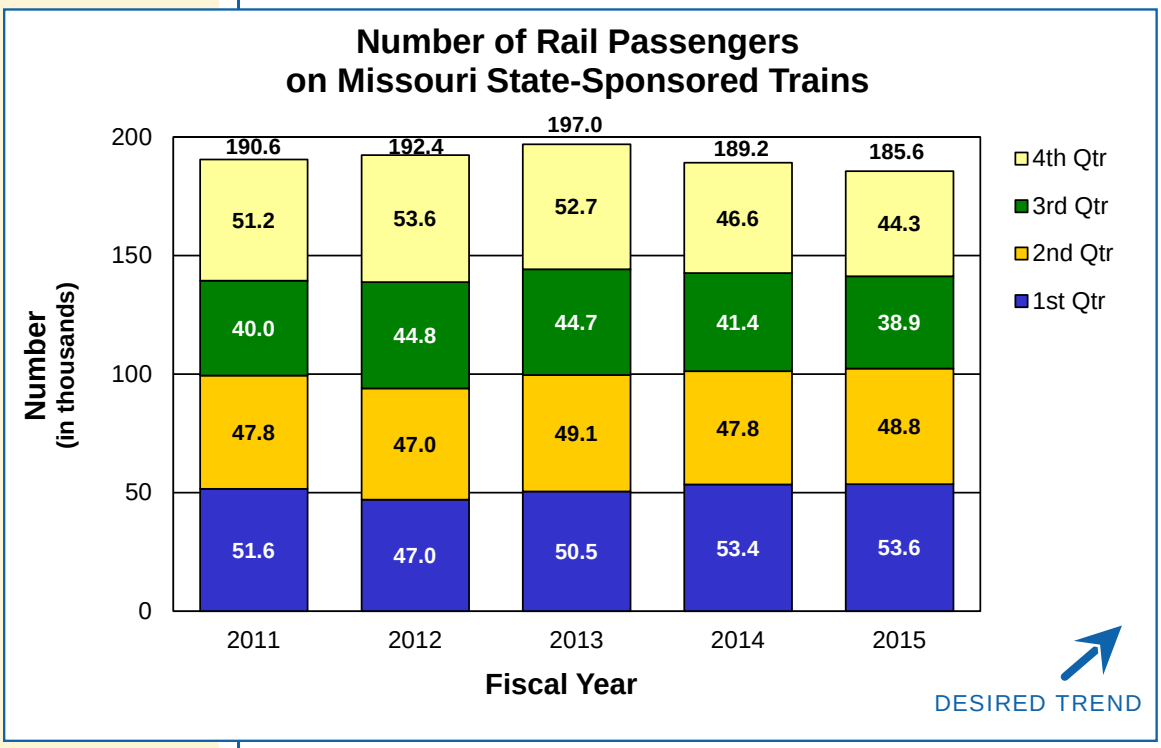
The number of ferry boat passengers decreased from 60,527 passengers in fiscal year 2014 to 40,630 in 2015 due to weather related issues.

Missouri River Runner trains carried 185,591 passengers in FY 2015, a slight decrease in ridership from the previous year. Lower gas prices are likely contributing to this decrease. On-time performance also decreased from 86 percent the previous year to 84 percent due to weather and track work.

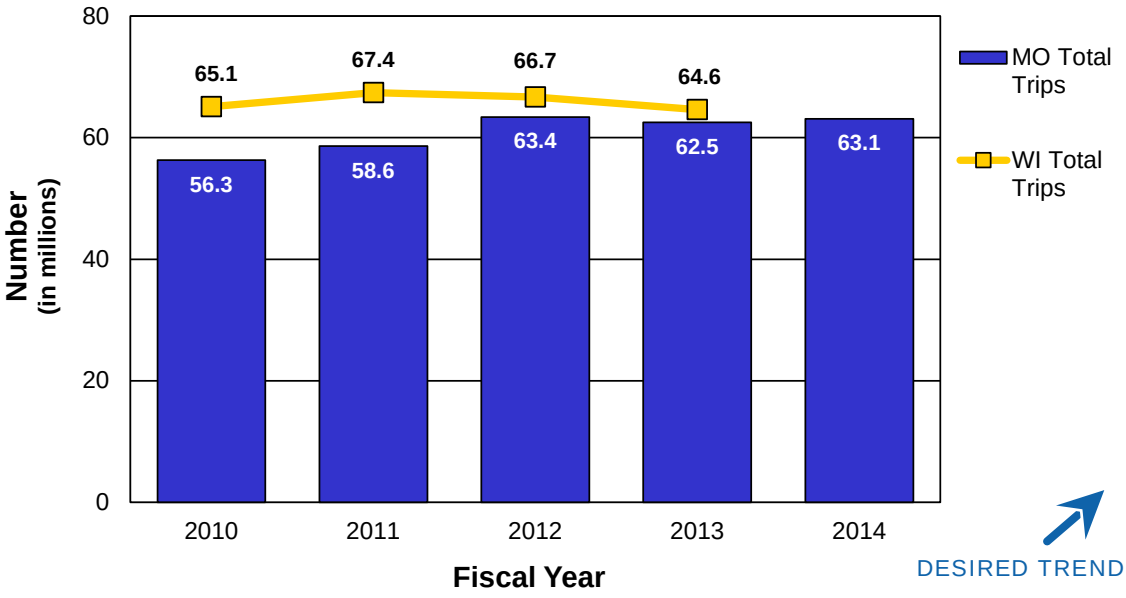
Transit ridership showed a small increase going from 62.5 million trips in FY 2013 to 63.1 million trips in FY 2014. Metro transit ridership saw an increase of 2 percent ridership while non-metro transit ridership saw a decrease of almost 30 percent ridership. Both of these shifts can be largely attributed to Cape Girardeau's ridership now being counted as metro transit ridership instead of rural.

The number of airline passengers has remained fairly steady from 2010 to 2013, but appears to be increasing based on the preliminary estimates of passenger enplanements (boardings) for calendar year 2014. Due to increasing state Aviation Trust Fund revenues, MoDOT solicited grant applications in November 2014 from commercial service airports for the air service program for the first time since 2010. These grants can be used for air service promotion and marketing and to study potential new routes.

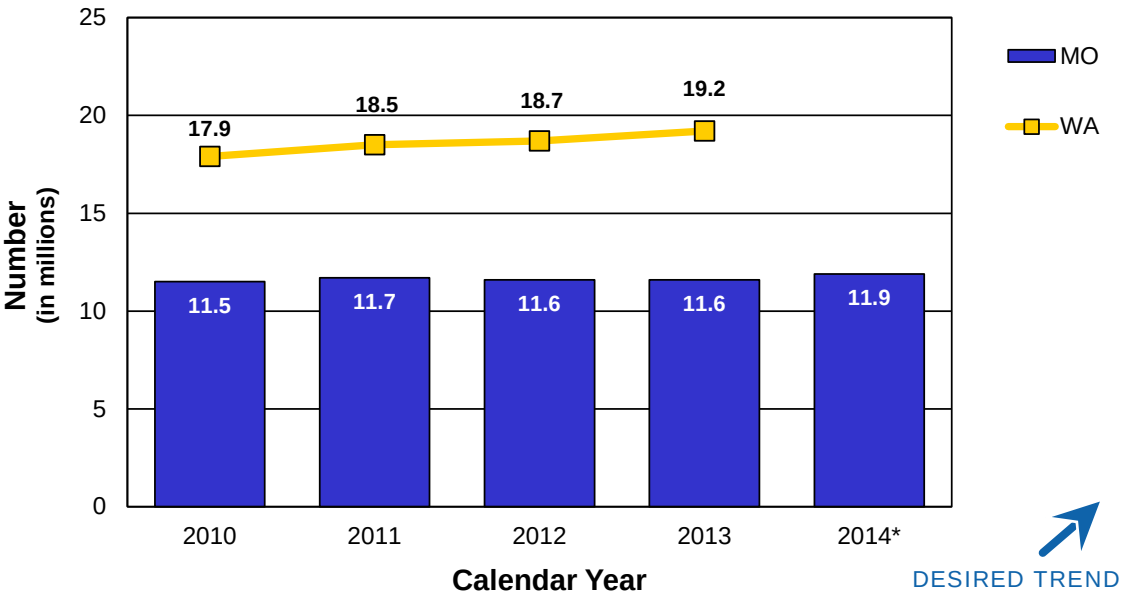

Number of Ferryboat Passengers
Number (in thousands)
80
60
40
20
0
2011
2012
2013
2014
2015
Fiscal Year
45
6
7
13
19
77
26
12
15
24
38
10
5
12
11
61
19
6
11
25
41
12
3
9
17
4th Qtr
3rd Qtr
2nd Qtr
1st Qtr
DESIRED TREND


Number of Rail Passengers
on Missouri State-Sponsored Trains
Number (in thousands)
200
150
100
50
0
2011
2012
2013
2014
2015
Fiscal Year
190.6
51.2
40.0
47.8
51.6
192.4
53.6
44.8
47.0
47.0
197.0
52.7
44.7
49.1
50.5
189.2
46.6
41.4
47.8
53.4
185.6
44.3
38.9
48.8
53.6
4th Qtr
3rd Qtr
2nd Qtr
1st Qtr
DESIRED TREND

Number of Transit Passenger Boardings
(annual one-way unlinked transit passenger trips)



Number of Airline Passengers



***2014 data is based on preliminary individual airport statistics. FAA publishes data in October for the preceding year.**