

A METROPOLITAN PLANNING ORGANIZATION

STIP Prioritization Meeting
OTO Offices
2208 W. Chesterfield Blvd, Suite 101
August 21, 2019
1:30 PM

Agenda

- 1. Review attached prioritization glossary
- 2. Review project scores
- 3. Group discussion of any needed adjustments to scoring
- 4. Prioritize Projects
- 5. Recommendation to Technical Committee
- 6. Future Meeting: September 4th at 1:30

		High		At Grade						Percent			
		Volume		RR	Current	Future VC		Multi-	Freight	Freight	Travel	Bridge	Priority
Roadway	Project Description	Corridor	Safety	Removal	VC Ratio	Ratio	EJ	Modal	Corridor	Traffic	Time	Condition	
I-244	Interstate Loop	6	28	0	14	. 5	4	1	2	3	14	4	81
13	Capacity, Safety and Operational Improvements Sunshine to Chestnut Expwy		28	0	14	5	4	1	1	0	14	0	73
13	Capacity, Safety and Operational Improvements Chestnut Expwy to 44	4	28	0	7	5	4	1	1	0	14	0	64
US 60	Capacity and Safety Improvements- M to Main St	4	24	0	14	. 5	0	1	1	0	14	0	63
US 60	Convert to Freeway from US 65 to FR 223	4	24	0	14	. 5	0	1	2	3	10	0	63
Glenstone	Safety and Operational Improvements 44 to Kearney	4	36	0	7	5	0	1	0	0	10	0	63
60/MM	Intersection/ RR Crossing Improvements	4	16	5	14	5	0	1	1	0	14	0	60
I-44	Capacity Improvements from Kansas to West Bypass	6	24	0	14	5	0	1	2	3	0	4	59
I-44/160	Ramp improvements	6	16	0	14	5	0	1	2	3	10	0	57
13	Safety and Operational Improvements Battlefield to JRF	4	28	0	0	5	4	1	1	0	14	0	57
160/ FR146	Intersection Improvements	4	32	0	0	5	4	1	0	0	10	0	56
I-44	Capacity Improvements from 65 to Glenstone	6	24	0	14	5	0	1	2	3	0	0	55
I-44	Capacity Improvements from Glenstone to Kansas	6	20	0	14	5	2	1	2	3	0	0	53
65	Interchange Improvements at Kearney	6	16		7	5	0	1	2	2	14		
14	Capacity/Safety/Operational Improvements 6th to 14th	2	28			5	0	1	0	0	10		
14	Capacity/Safety/Operational 14th Street to W	2	28	0	7	5	0	1	0	0	10	0	
14	Route W/Salers Ln control upgrade	2	28				0	1	0	0	10		
13	Capacity/Safety/Operational Improvements from Battlefield to Sunshine		20			5	4	1	1	0	10		
LP 44	Chestnut Expwy from Kansas to National		28				4	1		0	10		
BU 65	Chestnut Expwy from Glenstone to Patterson		24				4	1	0	0	14		
BU 65	Chestnut Expwy from Patterson to US 65		24				4	1		0	14		
160	Six-Lane from Plainview to AA		28				0	1	0	0	14		
60	Intersection Improvements at Main Street		16				0	1		0	10		
1-44	Operational Improvements from 125 to 65	6	28				0	1		3	10		
US 160	West Bypass & College control upgrade	4	28			5	2	1	0	0	10		50
US 60	Safety and Operational Improvements- JRF to M	4	24				0	1	1	0	14		
60	JRF- Capacity and Operational Improvements National to Campbell	6	28		7		0	1	1	0	0		48
65	Capacity and Operational Improvements 14 to F	6	32				0	1	1	0	4	-	48
160	Safety and Operational CC to 14	4	28				0	1		0	10		
160	Safety and Operational Improvements from CC to 14 Chestnut to I-44	4	28				0	1	0	0	10		
160		4	24				4	1		0	10		
60/65	Interchange Improvements Six-Lane from AA to CC	6	16			5	0	1		0	10		47
160	JRF- Operational Improvements Campbell to Kansas	- 4	28				0	1		0	14		
60	<u> </u>	2	24				0	1		0	14		
CC	Widening US 65 to Fremont Operational and Safety Improvements Tiffany to Cheyenne	2	28				0	1		0	10		
14 RT B	I-44 WB Ramp	0	28 28				0	1 1		3	10		
160	Safety and Operational Improvements 44 to Division	2	28				4	1		0	10		
LP 44	Chestnut Expwy from National to Glenstone	1	28				2	1		0	10		
I-44	Capacity and Operational Improvements from Chestnut to 360		16			5	0	1		3	4		
CC	Operational and Safety Improvements Main to Cheyenne						0	1		0	10		
160	Intersection Improvements at FR 123	2					0	1		0	10		
FF	Operational and Safety Improvements	2					2	1		0	10		
11	Operational and Safety Improvements	2	24	U	U	, 3	2	1	U	U	10	U	44

		High		At Grade						Percent			
		Volume		RR	Current	Future VC		Multi-	Freight	Freight	Travel	Bridge	Priority
Roadway	Project Description	Corridor	Safety	Removal	VC Ratio	Ratio	EJ	Modal	Corridor	Traffic	Time	Condition	Score
I-44	Operational Improvements from West Bypass to Chestnut	4	24	0	0	0	0	1	2	2	10	0	43
14	Operational and Safety Improvements Cheyenne to 32nd	2	24	0	0) 5	0	1	0	0	10	0	42
14	Nicholas to OTO Western Limits	0	36	0	0) 5	0	1	0	0	0	0	42
14	OTC Campus Entrance control upgrade	2	24	0	0	5	0	1	0	0	10	0	42
60	Intersection Improvements at FR 103	4	16	0	0	0	0	1	1	0	14	0	36
14	Intersection Improvements at W	2	16	0	7	5	0	1	0	0	10	0	41
ZZ	Roundabout at FR 182	0	40	0	0	0	0	1	0	0	0	0	41
60	Interchange with Kansas Expressway	6	16	0	0	0	2	1	1	0	14	0	40
CC	Extension from Main to 160	0	28	0	0	0	0	1	0	0	10	0	39
174	Operational Improvements Main to 60	0	28	0	0	0	0	1	0	0	10	0	39
J	Widening US 65 to NN	2	24	0	7	5	0	1	0	0	0	0	39
I-44/ 125	Interchange signalization	6	16	0	0	0	0	1	2	3	10	0	38
I-44/125	Ramp Extension	6	16	0	0	5	0	1	2	3	10	0	43
60	JRF- Operational Improvements Kansas to West Bypass	4	24	0	0	0	2	1	1	0	4	0	36
MM	Operational and Safety Improvements 1-44 to 360	0	24	0	0) 5	0	1	0	1	4	0	35
CC/22nd	Intersection Improvements	2	16	0	0	5	0	1	0	0	10	0	34
NN	Operational and Safety Improvements J to Pheasant	0	28	0	0	0	0	1	0	0	0	0	29
125	Safety Improvements 125 to OTO North Boundary	0	28	0	0	0	0	1	0	1	4	0	34
FF	Operational Improvments through Battlefield	2	24	0	0) 5	2	1	0	0	0	0	34
14	Majestic Oak Dr right turn lane	2	16	0	0) 5	0	1	0	0	10	0	34
60	Capacity, Operational and Safety Improvements west of Republic	2	12	0	7	5	0	1	1	0	4	0	32
65	Operational Improvements CC to 14	6	20	0	0	0	0	1	1	0	4	0	32
65	Longview Interchange	6	20	0	0	0	0	1	1	0	4	0	32
160	Safety and Operations 14 to OTO Southern Boundary	2	24	0	0) 5	0	1	0	0	0	0	32
MM	Intersection Improvements at Sawyer	0	20	0	0	0	0	1	0	0	4	0	25
14	Hwy 14 & Church control upgrade	2	4	0	14	5	0	1	0	0	4	0	30
RT H	RT AA/FR 80 control upgrade	0	24	0	0) 5	0	1	0	0	0	0	30
125/00	Intersection Improvements	0	16	0	0	0	0	1	2	0	10	0	29
14	Hwy 14 & 15th Street control upgrade	2	4	0	7	5	0	1	0	0	10	0	29
CC	Intersection Improvements at Main Street in Nixa	0	12	0	0) 5	0	1	0	0	10	0	28
US 160	West Bypass & Grand control upgrade	4	4	0	0	5	4	1	0	0	10	0	28
65/ FR 94	Intersection Improvements	2	16	0	0	5	0	1	1	2	0	0	27
14	Intersection Improvements at 3rd and Oak	2	8	0	7	5	0	1	0	0	4	0	27
174	Intersection Improvements at Main Street	0	16	0	0	0	0	1	0	0	10	0	27
M	Operational Improvements ZZ to FF	0	24	0	0	0	2	1	0	0	0	0	27
65/AA	Intersection Improvements	2	20	0	0	0	0	1	1	2	0	0	26
NN	Operational and Safety Improvements	0	20	0	0) 5	0	1	0	0	0	0	26
00	Intersection Improvements at Washington	0	16	0	0	0	0	1	0	0	4	0	21
Р	Operational Improvements from Main to Miller	0	20	0	0) 5	0	1	0	0	0	0	26
14	Intersectionat Combs Rd left turn lane	2	8	0	0) 5	0	1	0	0	10	0	26
FF/ Weaver	Intersection Improvements	2	16	0	0	5	0	1	0	0	0	0	24
14	Operational and Safety Imprrovements W to JJ	2	16	0	0	0	0	1	0	0	4	0	23
125/ FR 84	Intersection Improvements	0	16	0	0	0	0	1	0	1	4	0	22
			_	_	_		_	_		_	_		

		High Volume		At Grade RR	Current	Future VC		Multi-	Freight	Percent Freight	Travel	Bridge	Priority
Roadway	Project Description	Corridor	Safety	Removal	VC Ratio	Ratio	EJ	Modal	Corridor	Traffic	Time	Condition	Score
ZZ	Intersection Improvements at Hines	0	16	0	0	5	0	1	0	0	0	0	22
ZZ	Intersection Improvements at FR 174	0	16	0	0	5	0	1	0	0	0	0	22
14	Intersection at Fremont Rd right turn lane	2	4	0	0	5	0	1	0	0	10	0	22
125/YY	Intersection Improvements	0	16	0	0	0	0	1	0	0	4	0	21
125/ FR 132	Intersection Improvements	0	16	0	0	0	0	1	0	0	4	0	21
LP 44	Chestnut Expwy & Orchard Crest control upgrade	2	12	0	0	0	0	1	0	1	4	0	20
174	Intersection Improvements at Boston	0	8	0	0	0	0	1	0	0	10	0	19
NN	Intersection at Melton right turn lane	0	16	0	0	0	0	1	0	0	0	0	17
US 65	US Hwy 65 & FR 68 right turn lane	2	12	0	0	0	0	1	1	1	0	0	17
RT H	FR 94 left turn lane	0	16	0	0	0	0	1	0	0	0	0	17
Р	Intersection Improvements at Miller	0	8	0	0	5	0	1	0	0	0	0	14
NN	Intersection at Sunset	0	4	0	0	5	0	1	0	0	0	0	10

FY 2021-2025 STIP Project Prioritization Glossary

1. High Volume Corridors. Corridors that have high volumes will be awarded additional points.

Corridors are scored based upon AADT. This data is obtained annually from MoDOT. The most recent data is used.

Over 40,000 = 6 Points 20,000 to 40,000 = 4 Points 10,000 to 20,000 = 2 Points 0 to 10,000 = 0 Points

2. Safety

Safety Scores for Project Segments and Intersections (40 points possible)

The MoDOT Actual Accident Rate, 3-Year Fatality Average, and 3-Year Injury Average for State System (SS) Roadway Segments in the SW District were included in an additive combination to produce the priority safety scores for proposed projects. Accident data for the 3-year period from 2015 to 2017 were provided by the MoDOT Central Office in the SS Segment file. The actual accident rate for segments were calculated by MoDOT using a standard formula from the FHWA's Roadway Departure Safety: A Manual for Local Rural Road Owners as follows:

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<u>Crashes*100,000,000</u>
3 [yrs]* 365[days]* [AADT] * [Length]
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Fatality and injury rate calculations for segments use the same formula but only consider fatal crashes or injury crashes in the numerator. Actual Accident, Fatality, and Injury rates are calculated by MoDOT for State System Intersections according to the following formula:

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<u>Crashes*1,000,000</u>
3 [yrs]* 365[days]* [ENTERING VOLUME]
```

An average for all actual accident rates by roadway type was calculated for state system segments within the MoDOT SW District area. Averages were calculated for intersections with the same number of approach legs. Individual rates for segments and intersections were then divided by the average for either roadway type or number of approach legs District-wide. This produced a value above or below one. Values above one indicated how many times greater the individual segment or intersection rate was above its type average. Conversely, values below one indicated that the segment or intersection rate was less than the average for its type in the SW District. Ultimately, this created a symmetrical value among all types suitable for reclassification. The fatality and injury averages by roadway or approach leg values were classed in to four quartiles based on percentile rank accordingly for these metrics:

Actual Rate by Type		3-Year Fatality Avg.		3-Year Injury Avg.
= > 1.5 = 4	+	75th - 100th = 4	+	75th - 100th = 4
> 1.5 and $=> 1 = 3$	+	50th - 75th = 3	+	50th - 75th = 3
> 1 and $=> 0.5 = 2$	+	25th - 50th = 2	+	25th - 50th = 2
> .5 -0 = 1	+	0th - 25th = 1	+	0th - 25th = 1

The reclassed rank values for Actual Accident, Fatality, and Injury rate were then added together creating a range of safety scores from 3 to 12. The safety scores are then rescaled from 1-10 corresponding to the original scale of 3-12. A multiplier of 4 was applied to the rescaled value of 1-10 to award safety points as depicted below:

Safety Score	Rescaled Safety	Safety Score	Safet	y Points
 Value $ ightarrow$	Score \rightarrow	Multiplier \rightarrow	Aw	arded
3	1		x 4	4
4	2		X4	8
5	3		X4	12
6	4		X4	16
7	5		X4	20
8	6		X4	24
9	7		X4	28
10	8		X4	32
11	9		X4	36
12	10		X4	40

3. Improvement or Removal of At-Grade Railroad Crossing

Yes = 5

No = 0

If a project improves or removes an at-grade railroad crossing, it received five points.

4. Congestion Management Current

Current volume-to-capacity greater than or equal to 0.86 = 7 Points Current Volume-to-Capacity Greater than or equal to 1 = 14 points

A volume-to-capacity ratio for roadways in the OTO region was calculated using 2017 Average Annual Daily Traffic totals and percentage of commercial traffic obtained from the MoDOT Central Office. A passenger car equivalent volume was calculated by multiplying the roadway AADT by the percent of commercial traffic. This value was subtracted from the AADT value, multiplied by 3 and then added back to the AADT value. The passenger car equivalent value was compared to roadway capacities stored in the travel demand model to determine the current V/C scoring. Capacity for roadway segments along Hwy 14, Route MM, US Hwy 60 east of US Hwy 65 and through Republic were revised using 24-hour capacities determined via a roadway capacity analysis conducted for the OTO by CJW Consultants. The travel demand model no-build scenario for 2040 includes projects committed through 2018. The projected volume to capacity ratio for the 2040 no-build scenario is used for the future V/C scoring. The ratio of 0.86 is considered Level of Service E (or at capacity).

Volume-to-capacity ratios were calculated for opposing directions. A project was awarded points based on the highest directional value intersecting the project road segment or intersection. Projects with segments less than 0.86, current or future, received 0 points.

5. Congestion Management Future

Future (2040 or most recent model run) volume-to-capacity greater than or equal to 0.86 = 5 Points. See above description

6. Environmental Justice

Environmental Justice Tracts

In order to adequately consider historically disadvantaged groups. Each of these categories has been mapped by Census Tract percentages from the 2012 – 2016 American Community Survey 5-Year Estimates. If the value for one of these categories is greater than the average Tract percentage for the MPO area, it is considered high percentage tract. If a proposed project intersects or is adjacent to one or both of these identified tracts is will be given points as follows:

Intersecting or adjacent to tract consider to have a high percentage of minorities = 2 points Intersecting or adjacent to tract consider to have a high percentage of low income = 2 points

7. Multi-Modal (maximum of 3 points)

Intermodal Benefit (Bike/Ped/Transit and Truck/Rail)

No intermodal potential = 1 points

Facilitates transfer or intermodal potential between 1 to 2 modes = 1 point x number of modes In this category, one point is awarded for each mode connected. A single-mode project receives one point in this category. One point is awarded for each additional mode connected.

8. Freight Corridor Statewide Freight Plan

Project is on a corridor that is identified as a Tier I or Tier II facility in the State Freight Plan

Tier 1 = 2 Points

Tier 2 = 1 Point

9. Percentage Freight Traffic

Greater than 20% = 3

Between 15% and 20% = 2

Between 10 and 15% = 1

10. Travel Time

The OTO employs Acyclica wifi sensors and INRIX/HERE travel time data which utilizes mobile signals contained in the Regional Integrated Transportation Information System (RITIS) to develop travel time analytics at locations along roadways in the OTO area. Travel time data are collected for all weekdays during April. The collection period for the AM peak is from $7:15 \, \text{AM} - 8:15 \, \text{AM}$ for all roadways. The collection period for the PM peak varies from $5:00 \, \text{PM} - 6:00 \, \text{PM}$ for Freeways and Springfield arterials to $5:30 \, \text{PM} - 6:30 \, \text{PM}$ for arterials outside of Springfield. Travel times are converted to miles per hour

and subtracted from the posted speed limit. Points are awarded for travel delay along roadway segments during either AM or PM peak periods according to the following scales:

Arterials

20.0 mph or more Below the Speed Limit = 14 10.0 to 19.9 mph Below the Speed Limit = 10 5.0 to 9.9 mph Below the Speed Limit = 4 Above the Speed Limit to 4.9 mph Below = 0

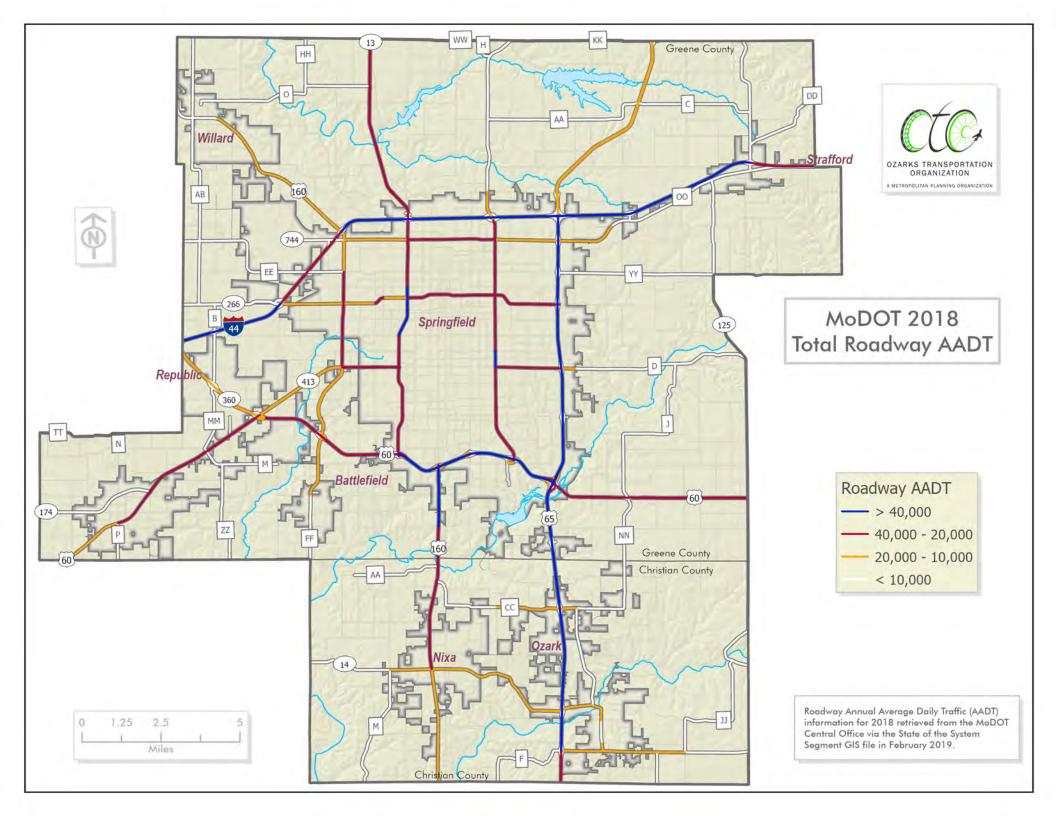
Freeways

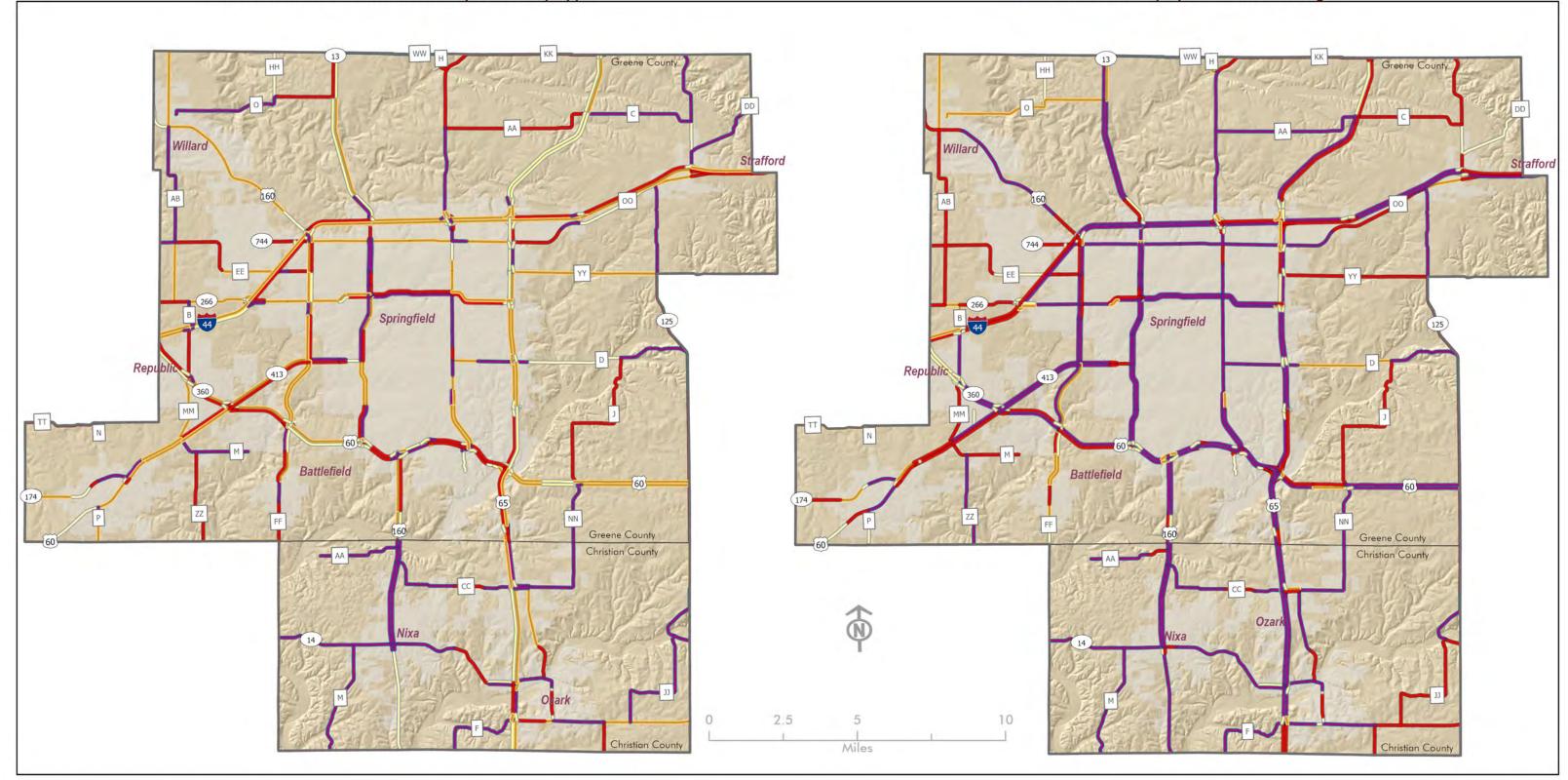
10 mph or more Below the Speed Limit = 14 9.9 to 5 mph Below the Speed Limit = 10 4.9 to 0.1 mph Below the Speed Limit = 4 Equal to or Above the Speed Limit = 0

11. Bridge Condition (4 points possible)

Project corridor includes a structurally deficient bridge determined to be poor or very poor by MoDOT.

Yes = 4 Points No = 0 Points





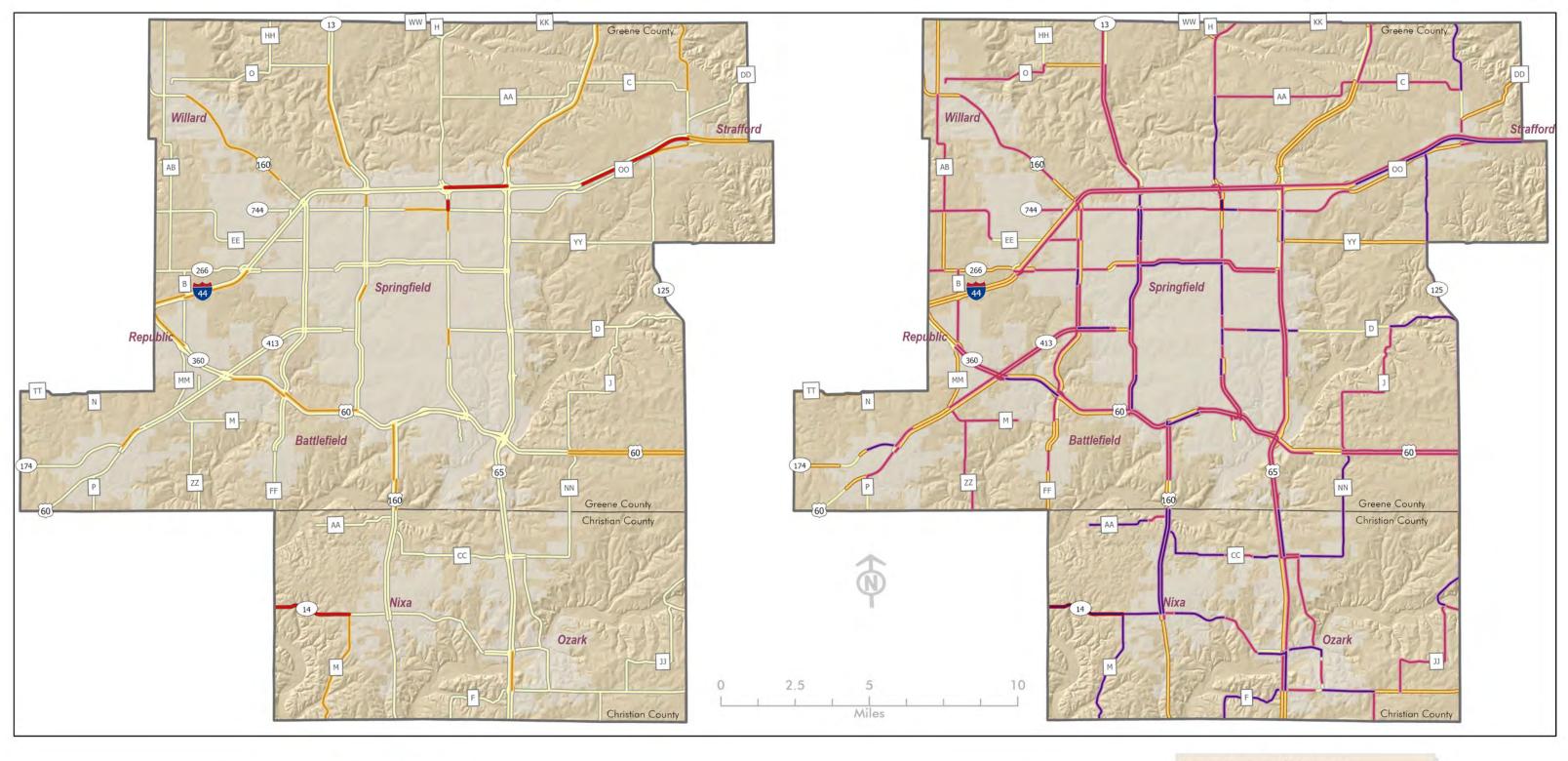
Actual Accident Rate by Roadway Type

- 1.49 1.01 times the SW District Average (3 points)
- 1 0.51 times the SW District Average (2 points)
- = 0.5 0 times the SW District Average (1 point)



3-Year Injury Accident Average

- 20.667 1.667 (4 points)
- 1.333 0.667 (3 points)
- 0.333 (2 points)
- ___ 0 (1 point)





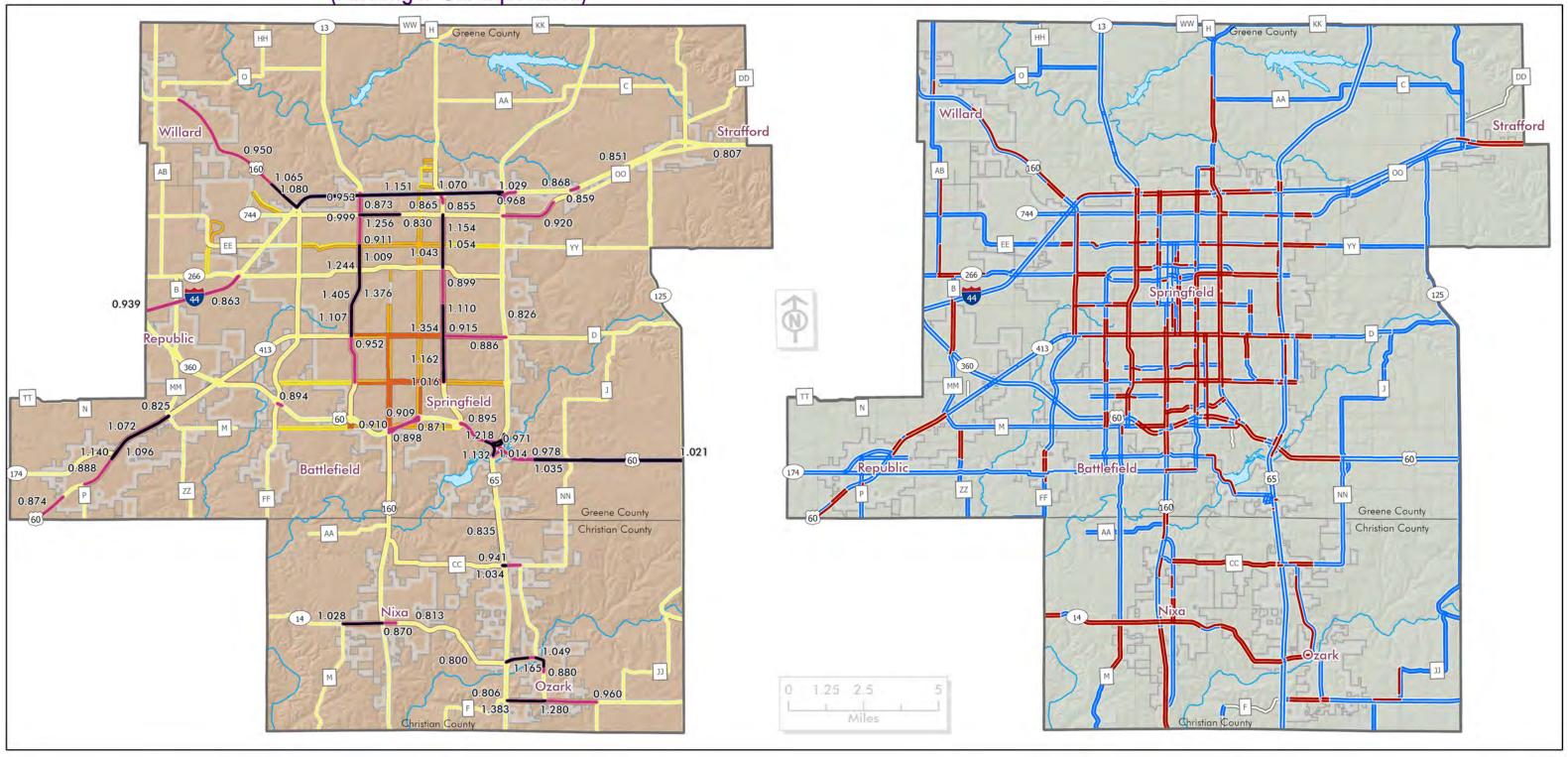


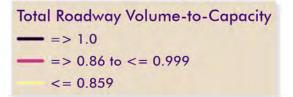
Cumulative Safety Score

- 11 -12 (36 40 prioritization points)
- 9 10 (28 32 prioritization points)
- 7 8 (20 24 prioritization points)
- 5 6 (12 16 prioritization points)
- 3 4 (4 8 prioritization points)

2018 Roadway Volume-to-Capacity Ratio (Passenger Car Equivalent)

Model Year 2040 Volume-to-Capacity Ratio

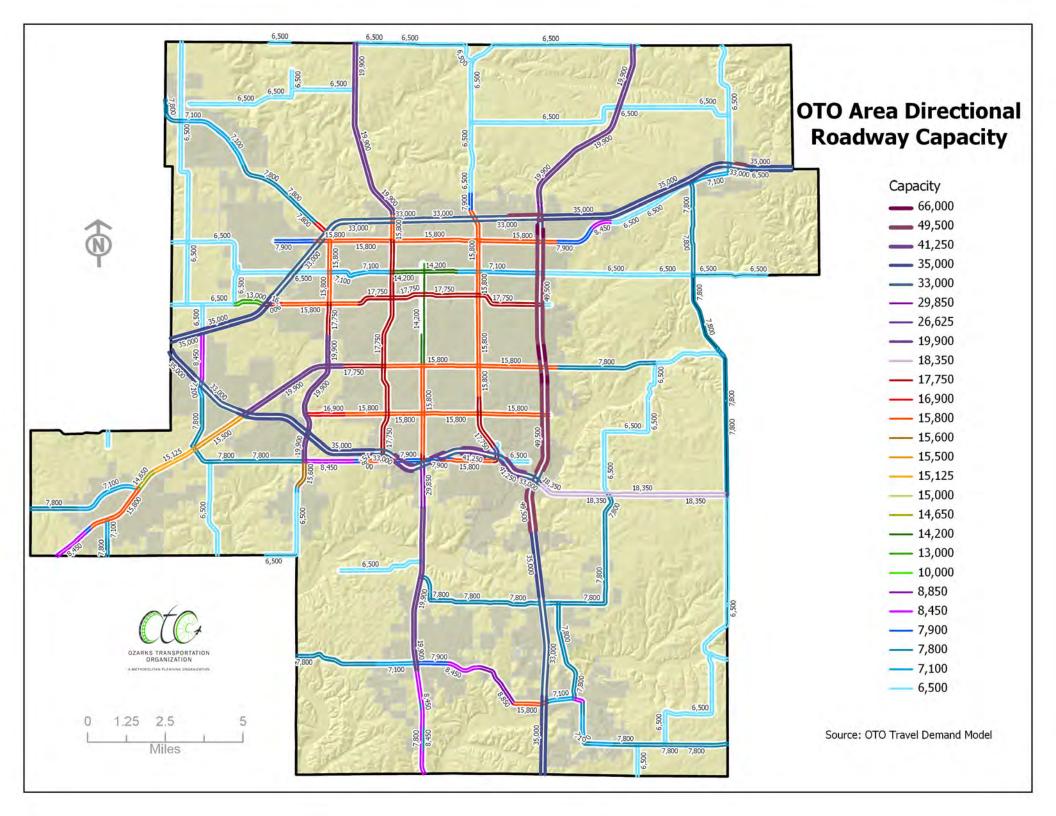


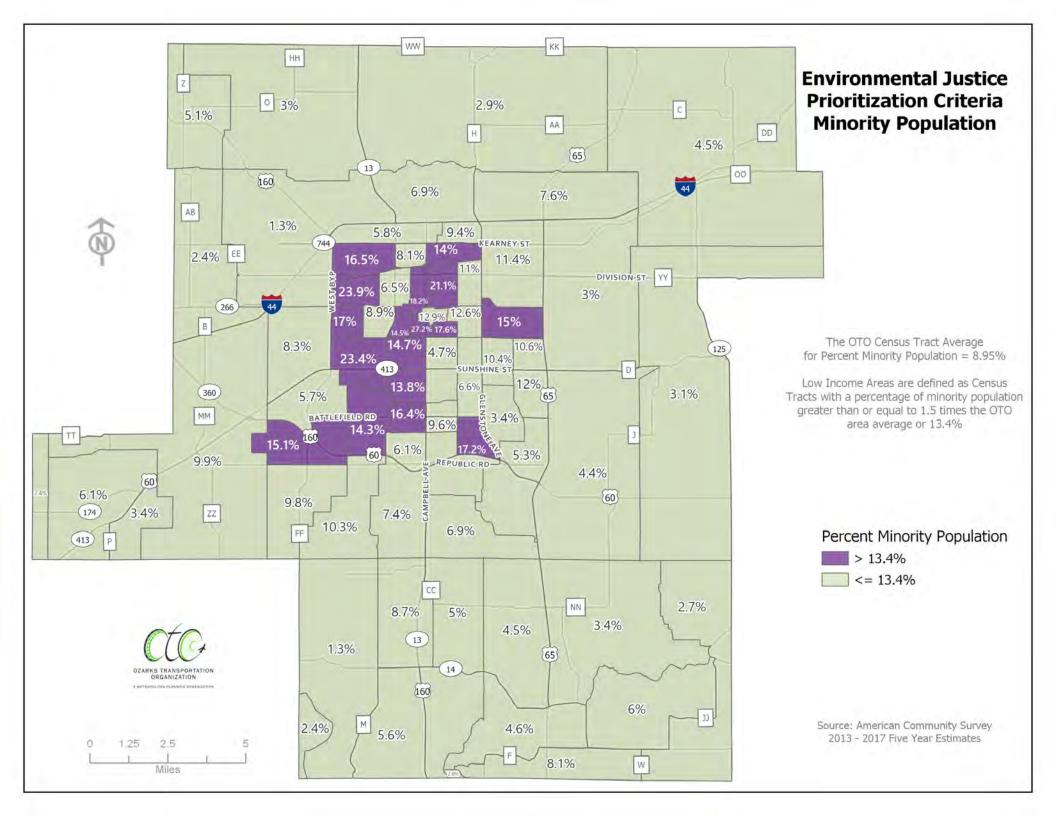


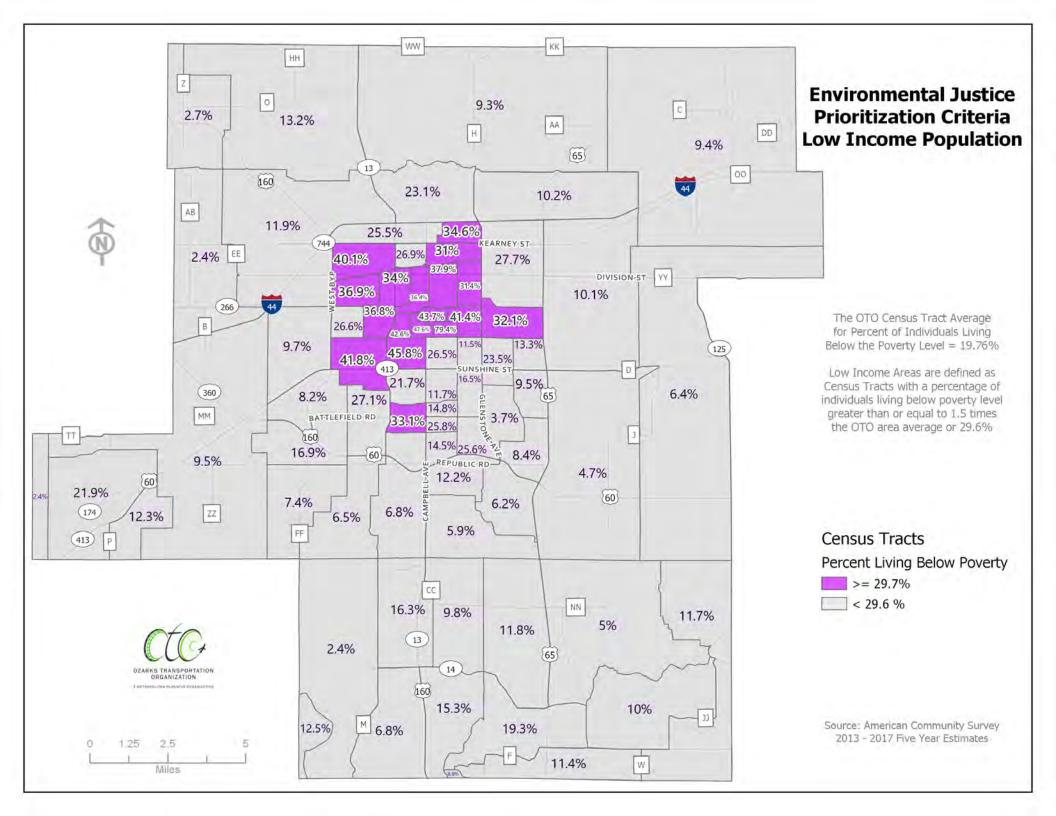
2018 roadway volumes were derived from MoDOT AADT and applying a three-passenger car equivalent to bus and combo-semi truck traffic.



2040 Volume-to-Capacity
— => 0.86
— < 0.86

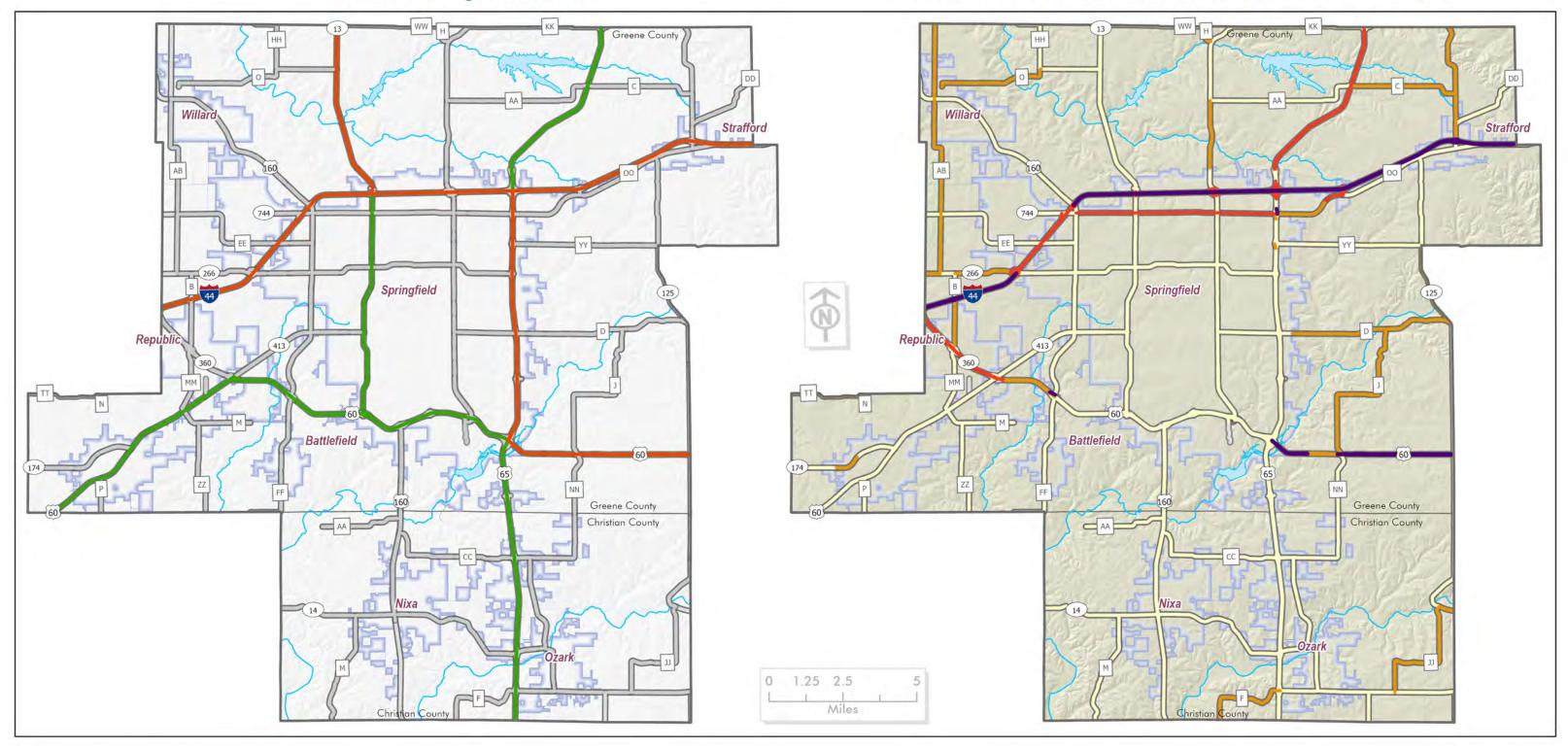






Missouri Freight Network

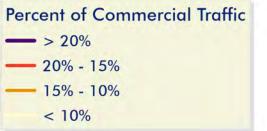
Commercial Traffic as a Percentage of MoDOT 2018 AADT

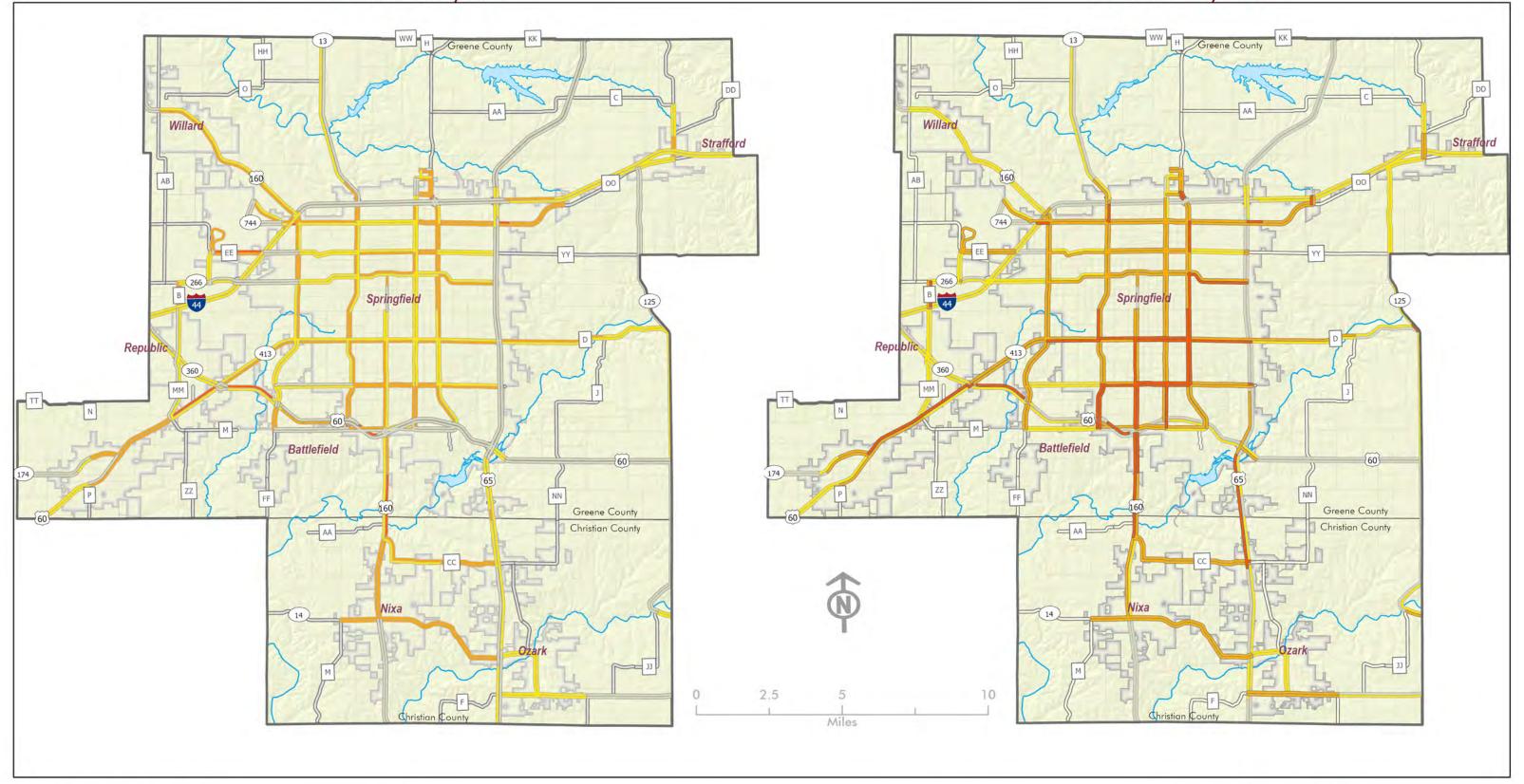




Sources: MoDOT 2017 Freight Plan. Freight Network Recreated from Springfield Area Inset on P. 3-22. Percentage of commercial traffic from MoDOT 2018 State of the System Segment GIS file retrieved from the Central Office in February 2019.

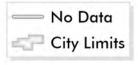






Arterial Travel Speed

- <= 5 mph Below the Posted Speed Limit
- 5.1 to 10 mph Below the Posted Speed Limit
- 10.1 to 20 mph Below the Posted Speed Limit
- -> 20 mph Below the Posted Speed Limit





Freeway Travel Speed

- <= 0 mph Below the Posted Speed Limit
- 0.1 to 4.9 mph Below the Posted Speed Limit
- 9.9 to 5 mph Below the Posted Speed Limit
- -> 10 mph Below the Posted Speed Limit

