

# Chapter 9

## Roadway Congestion, Deficiencies, & Recommended Projects

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The Travel Demand Forecast Model (TDFM or “model”), as described in Chapter 8 was used to identify roadway capacity constraints and deficiencies within the Jackson MPO. The results were provided for three scenarios:

1. Base year 2014 (“current” year)
2. Base year 2014 with committed projects - as listed in 2017 – 2020 TIP
3. Horizon year 2045 with committed projects - as listed in 2017 – 2020 TIP  
(Also referred to as a “No Future Build” or “No Build” scenario)

Traditionally, there are additional “build option” scenarios to address capacity limitations on the road network. The Region 2 Planning Commission opted to not use these scenarios for the Jackson 2045 Long Range Transportation Plan.

The results of the TDFM use a scale based on the current or anticipated volume of the road over a 24-hour period, and the allotted capacity of the road. The results provided are called “Volume to Capacity ratios (VOC).” Once calculated, the VOCs are assigned to a “Level of Service (LOS)” categorical system using a letter grade. A description and visual representation of the LOS grades are shown in Figure 9-1.

**Figure 9-1 Level of Service Grades for Vehicular Traffic on Roads**

Volume to Capacity Ratio (VOC)	Level of Service (LOS)	Congestion Description	Example
0.00 to 0.60	A and B	Traffic at free & stable flow; high speeds; few interactions	
0.60 - 0.70	C	Moderately high traffic volumes and interactions; stable flow	
0.70 - 0.80	D	High density of traffic & less maneuverability; speed declines; stable flow	
0.80 and above	E and F	Traffic near or at capacity; slowdowns occur; alternate routes used; unstable flow	

Factors that may affect the LOS include the following:

- Free-flow speed
- Freedom to maneuver
- Traffic interruptions (traffic signals, stop signs, merging, etc.)
- Commercial traffic volume
- Safety

The information was developed using a computer travel demand modeling and forecasting software, based on socio-economic data, for each scenario. For the 2045 Long-Range Transportation Plan, the acceptable capacity of each link in the model road network is defined as the capacity at LOS D.

In addition to identifying the roadway capacity constraints, the Jackson MPO and members of the public were provided opportunities to review the model results and address the issues through testing, evaluation, and final selection of projects to include in the plan. Other projects that have the potential to modify the existing road capacity were solicited for input and testing. This allows the Jackson MPO to identify potential impacts associated with capacity changes on the existing road system. Due to the limited amount of congested corridors over a daily period in the area, no capacity projects were tested or selected outside of those already listed in the most current Transportation Improvement Plan (TIP).

MDOT and R2PC staff provided additional roads with moderate VOC (0.60 to 0.70) to the various committees and for public comment, since there were limited roads within the Jackson MPO area that exhibited high capacity restrictions on a daily level. By showing roads with moderate VOC levels, the public was able to identify potential traffic congestion problem areas that may need attention in future construction programs. The locations may also illustrate operational type issues on a road segment, especially during peak travel periods, such as short on/off ramps, intersection queuing, etc.

### **Base Year 2014 Results**

The Base Year 2014 scenario analysis looked at existing conditions of the area-wide transportation system as it was in 2014. The 2014 year was chosen because of the demographic and employment data source availability, along with maintaining consistency with available local agency land use or master plans. Recent road projects and socio-economic data changes are not included in this scenario.

Capacity constraints for the plan were analyzed for roads that exhibited traffic volumes approaching or exceeding the acceptable road capacities. The ten highest congested roads, based on VOC for the Base Year 2014 are listed below:

1. SB M-106 (Cooper St) between W Monroe St & E North St
2. NB M-106 (Cooper St) between E North St & W Monroe St
3. WB I-94 between M-106 (Cooper St) & North Leg US-127 interchanges
4. SB US-127 BR / EB M-50 Off Ramp to E McDevitt Ave / Brooklyn Rd
5. EB & WB E High St between S Elm Ave & Losey Ave
6. EB & WB M-50 (Brooklyn Rd) between Plymouth Rd & M-50 (Brooklyn Rd) – Austin Rd intersection
7. EB I-94 between north & south legs of US-127
8. WB I-94 between South Leg US-127 & M-106 (Cooper St) interchanges
9. EB & WB M-50 (Brooklyn Rd) between M-124 (Wamplers Lake Rd) & M-50 – Brooklyn Rd split
10. NB & SB US-127 BR / EB & WB M-50 (N West Ave) under I-94

A table of the ten highest VOC road corridors, along with maps, for the Base Year 2014 results can be found in Figures 9-1 and 9-2 and Table 9-1 later in the chapter.

### **Base Year 2014 with Committed Projects Results**

As with the Base Year 2014 scenario, the Base Year 2014 with Committed Projects results analyzed the traffic volumes in relation to the road capacity on the road with completion of the 2017 – 2020 TIP projects. Typically, this scenario will include an analysis of roads and corridors with Capacity Improvement projects that aim to increase capacity on roads within the area. In many cases, roads that are expected to see a reduction in the number of thru-lanes, and thus a lower total roadway capacity, are included in this scenario. The main purpose of this is to ensure that traffic is not negatively affected by the reduction in capacity or that the reduction will create a deficient corridor (VOC > 1.00). Only roads that are designated as a part of the federal-aid network are eligible for inclusion in the 2045 plan project lists.

The ten highest congested roads, based on VOC for the Base Year 2045 with Committed Projects scenario are listed below:

1. SB M-106 (Cooper St) between W Monroe Ave & E North St
2. NB US-127 BR / WB M-50 (Louis Glick Hwy) between N Mechanic St & N Blackstone St
3. NB M-106 (Cooper St) between E North St & W Monroe Ave

4. WB Washington Ave (*turn back to city*) between S Mechanic St & S Blackstone St
5. SB US-127 BR / EB M-50 (Louis Glick Hwy) between N Blackstone St & N Mechanic St
6. WB I-94 between M-106 (Cooper St) & North Leg US-127 interchanges
7. SB US-127 / EB M-50 Off Ramp to E McDevitt Ave / Brooklyn Rd
8. EB Washington Ave (*turn back to city*) between S Blackstone St & S Mechanic St
9. E High St between S Elm Ave & Losey Ave
10. EB & WB M-50 (Brooklyn Rd) between Plymouth Rd & M-50 (Brooklyn Rd) – Austin Rd intersection

A detailed table of the ten highest VOC road corridors, along with maps, for the Base Year 2014 with Committed Projects results can be found in Figures 9-3 and 9-4 and Table 9-3 later in the chapter.

The capacity projects that were used in the model and were listed in the 2017 – 2020 TIP, along with other large projects from the TIP are included in the Table 9-1.



**Table 9-1 Proposed Capacity Improvement Projects**

Proposed Capacity Improvement Projects								
Project ID	Fiscal Year	Project Name	Project Limits	Responsible Road Agency	Capacity Change Type	Project Description	Total Cost	Length (Miles)
1	2017	M-60 (Spring Arbor Rd)	Chapel Rd to Emerson Rd	MIDOT	Capacity Improvement	Resurface and widen to include Center Left-Turn Lane	\$11,205,000.00	1.60
2	2018	I-94	Over I-416 RR and Grand River	MIDOT	Capacity Improvement	Replace and realign bridge structure	\$30,639,000.00	0.40
3	2018	I-94	M-60 to Sargent Rd	MIDOT	Capacity Improvement	Complete roadway reconstruction from Lansing Avenue to Elm Road	\$71,868,000.00	8.90
4	2018	I-94	M-106 (Cooper St) over I-94	MIDOT	Capacity Improvement	Replace bridge structure and associated road work	\$19,765,000.00	0.20
5	2021	I-94	At Elm Ave	MIDOT	Capacity Improvement	Reconstruct interchange	\$20,149,000.00	1.50
<b>TOTAL:</b>							<b>\$153,626,000.00</b>	<b>12.60</b>

## Horizon Year 2045 with Committed Projects Results

The Horizon Year 2045 with Committed Projects scenario includes projects listed in the 2017 – 2020 TIP, along with the projected changes in socio-economic data through 2045. Traffic volume results were also compared to the expected capacities for the road system in 2045. The ten highest congested roads, based on VOC, that are expected in Horizon Year 2045 are listed below:

1. SB M-106 (Cooper St) between W Monroe St & E North St
2. SB M-106 (Cooper Rd) between M-106 (Bunkerhill Rd) – Cooper Rd split & Parnall Rd
3. NB M-106 (Cooper St) between E North St & W Monroe St
4. WB I-94 between south & north legs of US-127
5. SB US-127 BR / EB M-50 (Louis Glick Hwy) between N Blackstone St and N Mechanic St
6. WB M-50 (Brooklyn Rd) between Plymouth Rd & M-50 (Brooklyn Rd) – Austin Rd intersection
7. WB Washington Ave (*turn back to city*) between S Mechanic St & S Blackstone St
8. WB M-50 (Brooklyn Rd) between M-50 – Brooklyn Rd split & M-124 (Wamplers Lake Rd)
9. NB US-127 BR / WB M-50 (Louis Glick Hwy) between N Mechanic St & N Blackstone St
10. EB M-50 (Brooklyn Rd) between M-124 (Wamplers Lake Rd) & M-50 – Brooklyn Rd split

A detailed table of the ten highest VOC road corridors, along with maps, for the Horizon Year 2045 with Committed Projects results can be found in Figures 9-5 and 9-6 and Table 9-4 later in the chapter.

## Recommended Capacity Improvement Projects

After the completion of the travel demand modeling process and identification of congested or deficient corridors, it is necessary to determine what action should be taken to address the current and anticipated future traffic on the road network. With the knowledge of available federal, state, and local revenues for the 27 year span of the plan, the various JACTS Committees considered local community concerns and issues, which determine the improvements that should be programmed in the coming years. The specific projects identified include I-94 trunkline projects on State highways under the jurisdiction of MDOT.

The plan provides a vision of Jackson County's transportation system through the year 2045. The transportation improvement projects included in the first years (2017-2020) of the plan are considered firm commitments by the implementing jurisdictions. This means that funding has been assigned to the specific improvement which will be completed unless unforeseen circumstances prevent completion. The remaining years of the plan (2021 – 2045) are a vision of how the transportation system may develop based on the existing land use and zoning plans of local communities and the current forecast of available transportation revenues. The transportation improvements in the "out" years (2021-2045) of the Plan represent current priorities for the future. The transportation plan is updated every five years and the priorities listed for the later years may change as conditions warrant.

There are a limited number of congested corridors and no corridors that are currently, or are expected to be, deficient within the Jackson MPO. **R2PC's focus is to maintain the current transportation system. This means that although capacity projects are valid and important for the future of the MPO transportation system, they are viewed to be a lower priority than projects aimed at preserving the existing system.** Preservation projects generally include reconstruction and resurfacing of the road within the existing right-of-way. In most cases, the lane configuration of the road remains the same. These types of projects are not required to be identified within this plan.

Examples of capacity improvement projects may be the addition of traffic lanes, turn lanes, merge-weave lanes, or the construction of a new road. Also, only those roads located on the federal-aid road network are eligible for inclusion in the plan's project list. The total estimated investment for the State trunkline Capacity Improvement projects totals \$153.6 million.

### **I-94 Modernization**

Many of the projects currently programmed in the 2017 - 2020 TIP consider several transportation issues outside the focus of the TDFM, in particular the modernization of the Interstate 94 corridor.

MDOT completed the Final Environmental Impact Statement and Final Section 4(f) Evaluation for the I-94 Freeway Modernization Study in November 2006. The Record of Decision (ROD) was approved by the Federal Highway Administration in March 2007. The Re-Evaluation was approved by the Federal Highway Administration in September, 2013, and again in December 2017. The project study area is a nine-mile segment of I-94 extending from the M-60 interchange to just east of the Sargent Road interchange.

The project area encompassed approximately nine miles of existing highway, eight interchanges, local frontage roads adjacent to I-94, and 18 distinct bridge structures at 14 locations. The purpose of the project is to (1) improve the deteriorating condition of existing bridges and road segments consistent with an overall corridor improvement plan, (2) improve travel efficiency and road capacity in the I-94 corridor by replacing existing road segments, interchanges, and bridges with modern facilities designed to accommodate projected year 2045 traffic volumes, and (3) to improve motorist safety.

The original priorities were determined at the time of the I-94 Modernization Study (2007) in cooperation with an ad hoc committee consisting of local representatives and MDOT experts evaluating the phasing strategy of the elements based on: 1) Safety; 2) Operations; 3) Condition; 4) Under-clearance; and 5) Funding Availability.

With a projected cost of \$409 million (in 2005-year dollars), sufficient funding is not available for construction of the entire nine-mile corridor. Instead, MDOT will phase project implementation over the next 5 to 40 years based on conditions, traffic volume needs, congestion, funding availability, and safety needs along the corridor. The Preferred Alternative for reconstructing the I-94 corridor has been divided into three separate phases as follows:

**Phase 1:** Sargent Road interchange reconstruction, including the closure of the I-94 BL interchange, and the replacement of the Hawkins Road and Dettman Road bridge overpasses. The bridge replacements are complete and the Sargent Road interchange was completed in 2013.

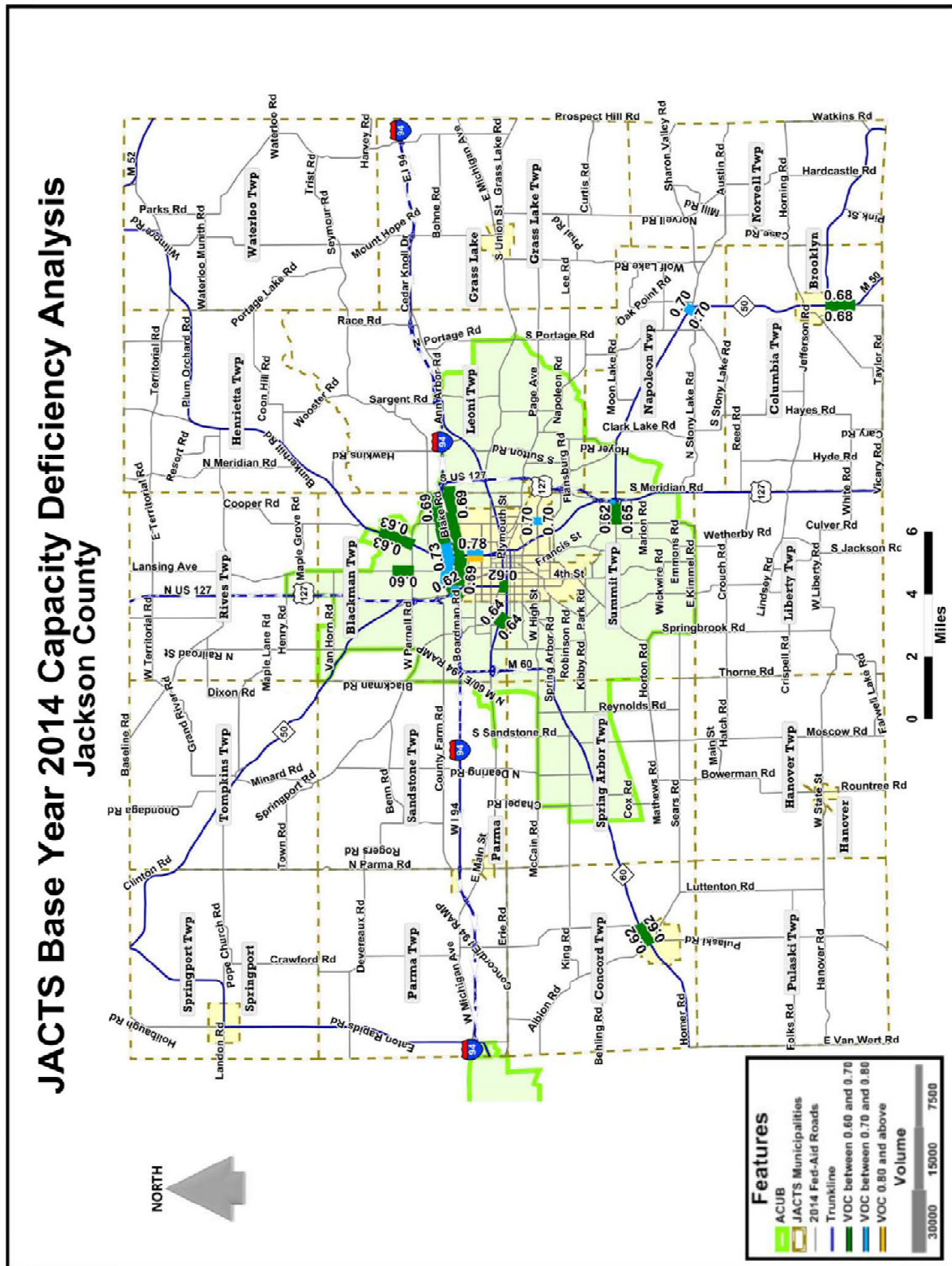
**Phase 2:** Cooper Street interchange reconstruction and other road improvements as necessary will also be performed. The replacement and widening of the I-94 bridge over the Grand River to accommodate potential future widening of I-94. I-94 will be reconstructed from west of Cooper Street to east of Cooper Street. The remainder of I-94 between M-60 and Sargent road will receive a major rehabilitation. Replacement of the M-60 interchange, Lansing Avenue bridge overpass, and the replacement of the Elm Road interchange are also included in this phase. The estimated time frame for the start and completion of this phase is 0 - 10 years. Funding for this phase has been identified. These improvements are visualized in Figures 9-7 – 9-10 at the end of the chapter.

**Phase 3:** US-127/M-50-West Avenue interchange reconstruction; reconstruct the northern portion of the Sargent Road interchange; US-127 South interchange reconstruction; Airport Road interchange reconstruction; widen I-94 between the two legs of US-127; widen I-94 from US-127 South to Sargent Road; widen I-94 from US-

127/M-50/West Avenue to M-60. The estimated start and completion time-period for this phase is 25 to 40 years out. No funding for this phase has been identified.

These unfunded improvements are technically not a part of the JACTS 2045 Long Range Transportation Plan, but instead are included to highlight some of the unmet needs that could be addressed with increased revenues. As future funding is identified and becomes available for implementing the findings included in the I-94 Modernization Study, the JACTS committees will continue to assist MDOT in programming the projects to address the capacity and safety improvements outlined in the study.

Figure 9-2 JACTS Base Year 2014 Capacity Deficiency Analysis - Jackson County Map







**Table 9-2 Base Year 2014 Scenario Capacity Limitations**

Jackson Area Comprehensive Transportation Study (JACTS) Base Year 2014 Scenario Capacity Limitations										
Rank	Road Name	Direction	From	To	Jurisdiction	Maintaining Road Agency	Length (Miles)	Thru Lanes	Total Thru Lanes	Average VOC
1	M-106 (Cooper St)	SB	W Monroe St	E North St	City of Jackson	MDOT	0.43	1	2	0.89
2	M-106 (Cooper St)	NB	E North St	W Monroe St	City of Jackson	MDOT	0.43	1	2	0.78
3	I-94	WB	M-106 (Cooper St) Interchange (Exit #139)	North Leg US-127 Interchange (Exit #138)	Blackman Township	MDOT	1.29	2	4	0.73
4	SB US-127 / EB M-50 Off Ramp	SB / EB	SB US-127 / EB M-50 (Exit #34)	E McDewitt Ave / Brooklyn Rd (Exit #34)	Summit Township	MDOT	0.25	1	1	0.72
5	E High St	E-W	S Elm Ave	Losey Ave	City of Jackson	Jackson Engineering Division	0.19	N/A	2	0.70
6	M-50 (Brooklyn Rd)	E-W	Plymouth Rd	M-50 (Brooklyn Rd) & Austin Rd Intersection	Napoleon Township	MDOT	0.21	N/A	2	0.70
7	I-94	EB	North Leg US-127 Interchange (Exit #138)	South Leg US-127 Interchange (Exit #142)	Blackman Township	MDOT	3.11	2	4	0.69
8	I-94	WB	South Leg US-127 Interchange (Exit #142)	M-106 (Cooper St) Interchange (Exit #139)	Blackman Township	MDOT	1.62	2	4	0.69
9	M-50 (Brooklyn Rd)	E-W	M-124 (Wamplers Lake Rd)	M-50 - Brooklyn Rd split	Brooklyn Village / Columbia Twp	MDOT	0.88	N/A	2	0.68
10	US-127 BR / M-50 (N West Ave)	N-S / E-W	Under I-94	Under I-94	Blackman Township	MDOT	0.27	N/A	4	0.67

*NB: Northbound*  
*SB: Southbound*  
*N-S: NB & SB*  
*EB: Eastbound*  
*WB: Westbound*  
*E-W: EB & WB*



Figure 9-4 JACTS Base Year 2014 with TIP Projects, Capacity Deficiency Analysis - Jackson County Map

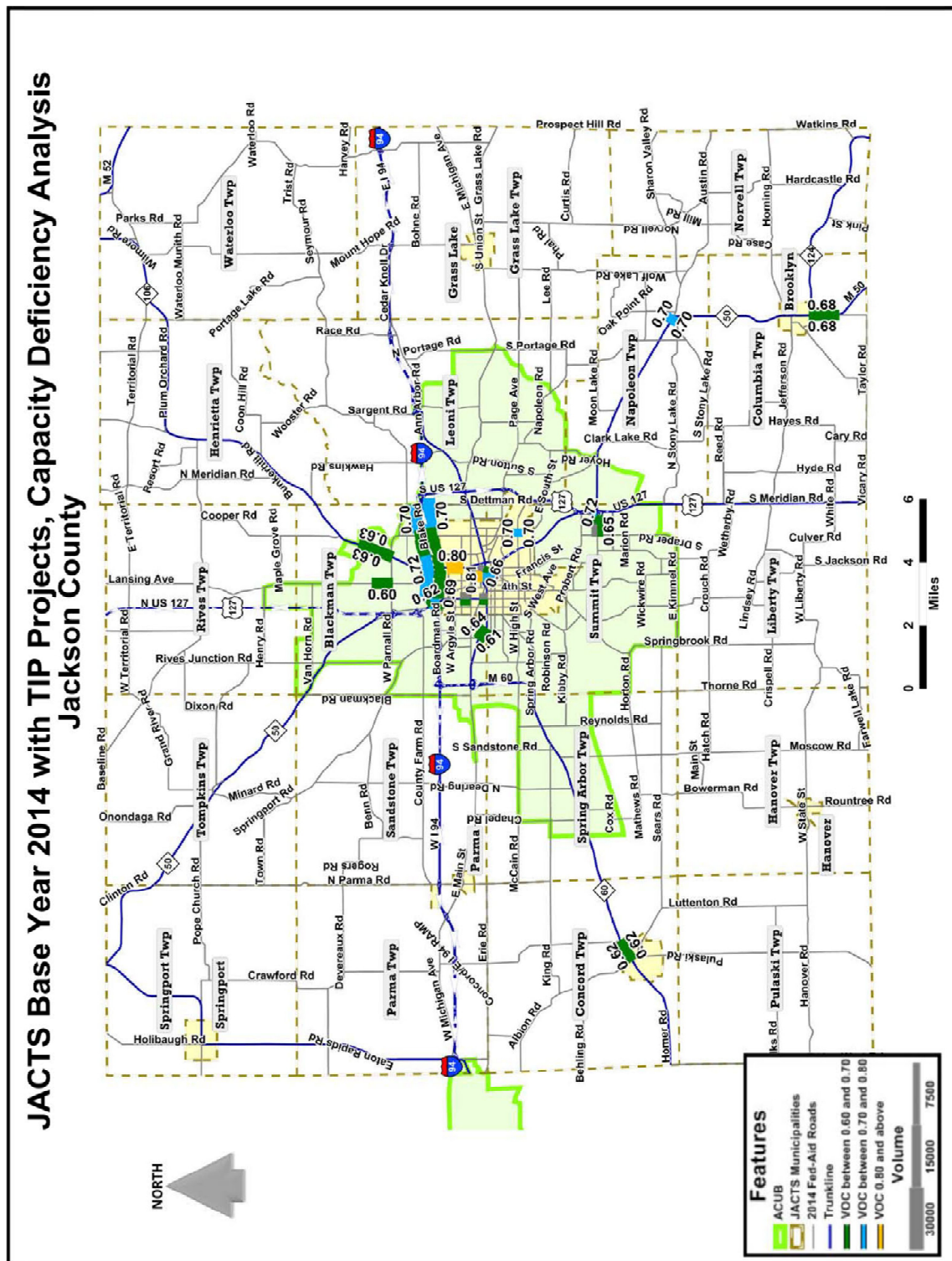
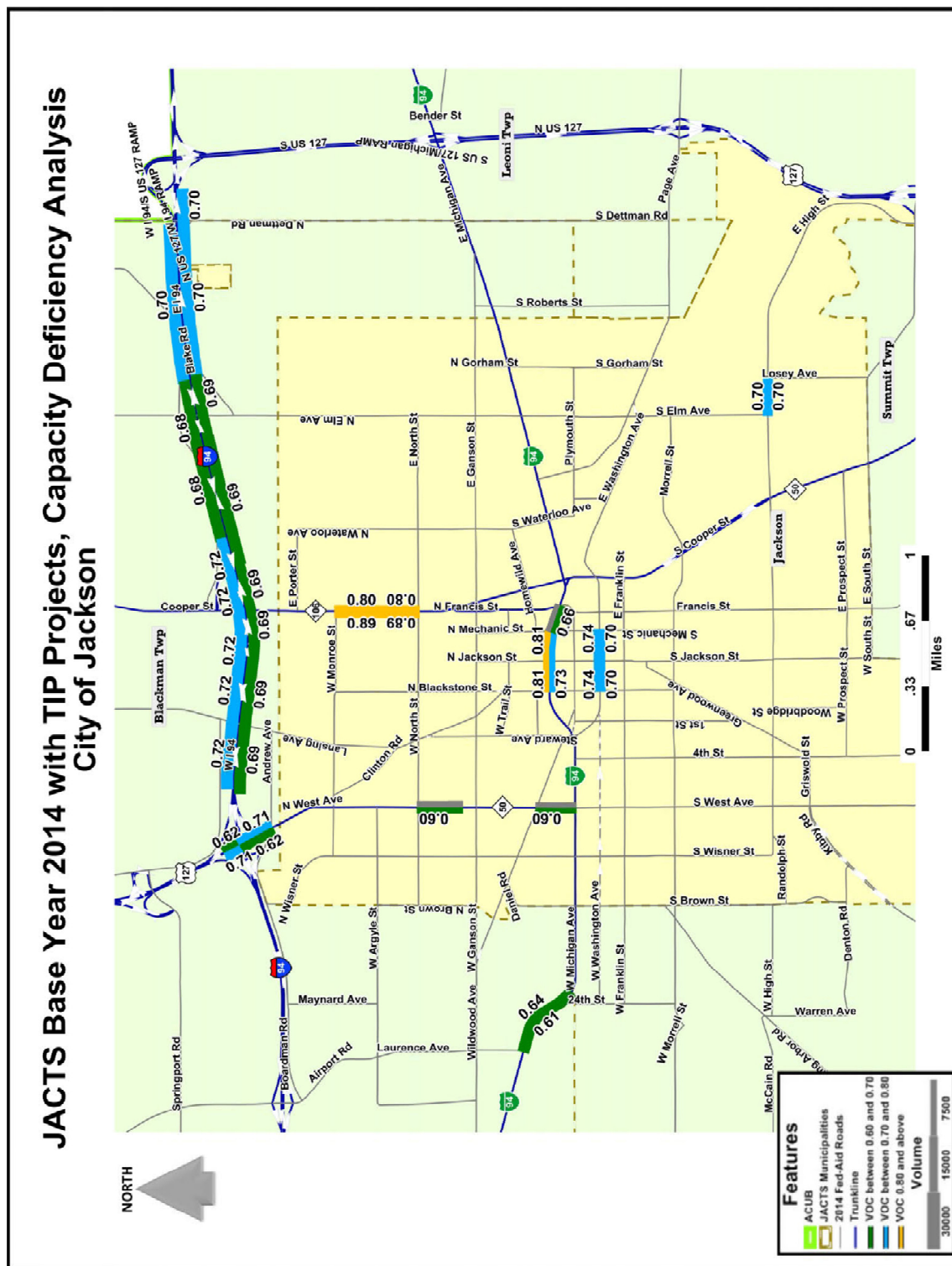


Figure 9-5 JACTS Base Year 2014 with TIP Projects, Capacity Deficiency Analysis - City of Jackson Map



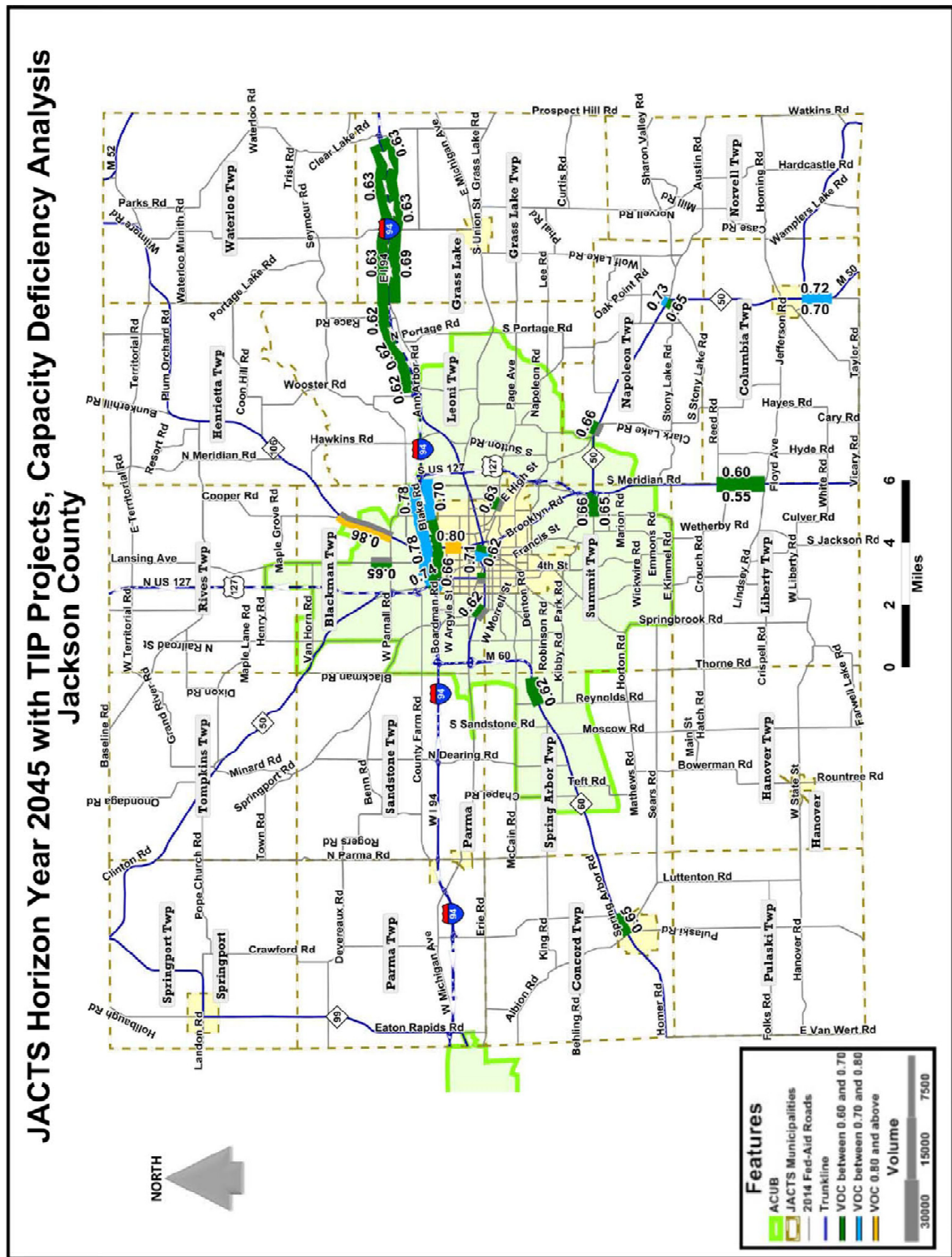
**Table 9-3 Base Year 2014, Existing and Committed Scenario Capacity Limitations**

Jackson Area Comprehensive Transportation Study (JACTS) Base Year 2014, Existing and Committed Scenario Capacity Limitations										
Rank	Road Name	Direction	From	To	Jurisdiction	Maintaining Road Agency	Length (Miles)	Thru Lanes	Total Thru Lanes	Average VOC
1	M-106 (Cooper St)	SB	W Monroe Ave	E North St	City of Jackson	MDOT	0.43	1	2	0.89
2	US-127 BR / M-50 (Louis Glick Hwy)	NB / WB	N Mechanic St	N Blackstone St	City of Jackson	MDOT	0.31	1	2	0.81
3	M-106 (Cooper St)	NB	E North St	W Monroe Ave	City of Jackson	MDOT	0.43	1	2	0.80
4	Washington Ave (turn back to city)	WB	S Mechanic St	S Blackstone St	City of Jackson	Jackson Engineering Division	0.31	1	2	0.74
5	US-127 BR / M-50 (Louis Glick Hwy)	SB / EB	N Blackstone St	N Mechanic St	City of Jackson	MDOT	0.31	1	2	0.73
6	I-94	WB	M-106 (Cooper St) Interchange (Exit #139)	North Leg US-127 Interchange (Exit #138)	Blackman Township	MDOT	1.29	2	4	0.72
7	SB US-127 / EB M-50 Off Ramp	SB / EB	SB US-127 / EB M-50 (Exit #34)	E McDewitt Ave / Brooklyn Rd (Exit #34)	Summit Township	MDOT	0.25	1	1	0.72
8	Washington Ave (turn back to city)	EB	S Blackstone St	S Mechanic St	City of Jackson	Jackson Engineering Division	0.31	1	2	0.70
9	E High St	E-W	S Elm Ave	Losey Ave	City of Jackson	Jackson Engineering Division	0.19	N/A	2	0.70
10	M-50 (Brooklyn Rd)	E-W	Plymouth Rd	M-50 (Brooklyn Rd) & Austin Rd Intersection	Napoleon Township	MDOT	0.21	N/A	2	0.70

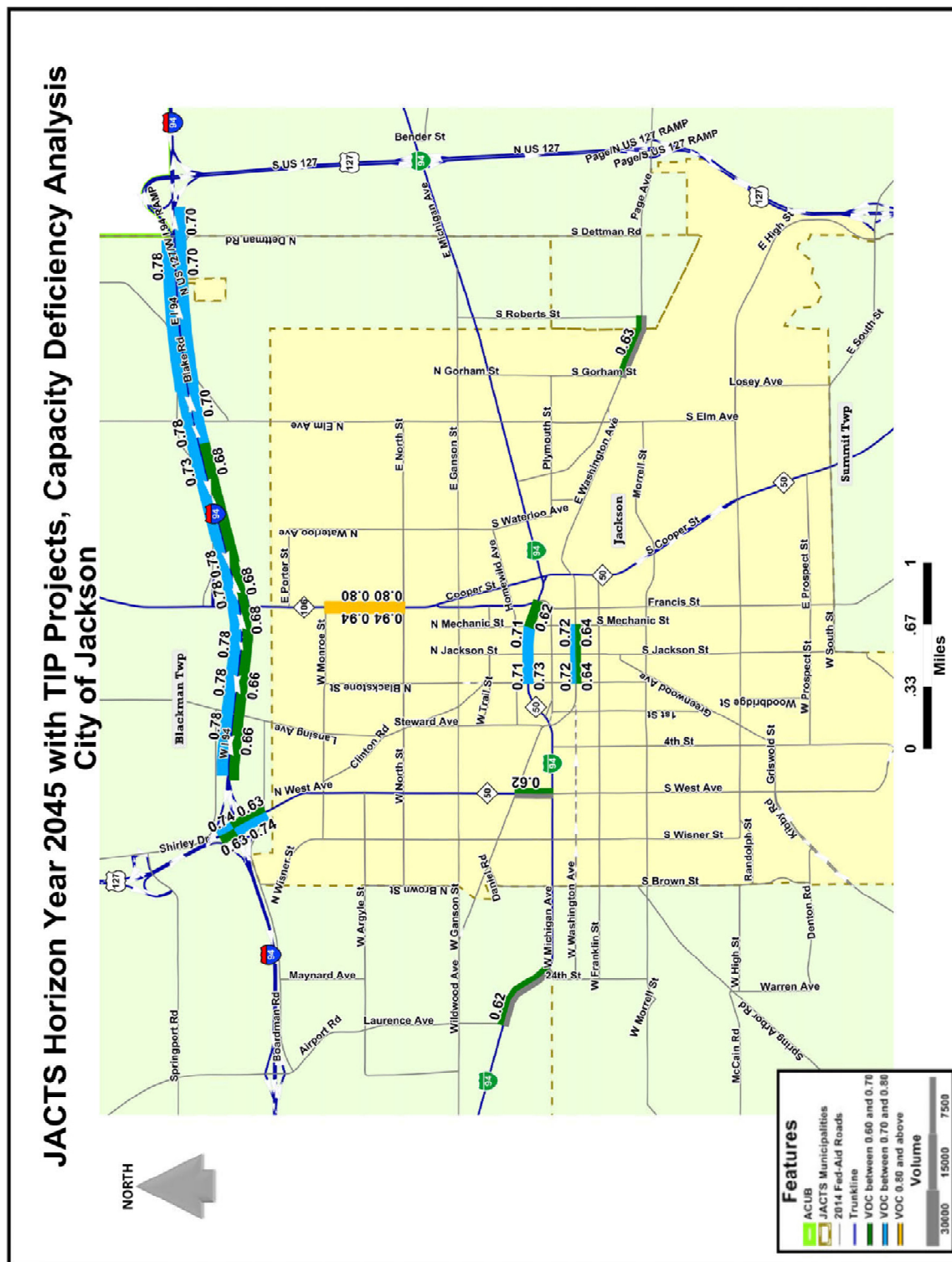
NB: Northbound  
 SB: Southbound  
 N-S: NB & SB  
 EB: Eastbound  
 WB: Westbound  
 E-W: EB & WB



Figure 9-6 JACTS Horizon Year 2045 with TIP Projects, Capacity Deficiency Analysis - Jackson County Map



**Figure 9-7 JACTS Horizon Year 2045 with TIP Projects, Capacity Deficiency Analysis - City of Jackson Map**

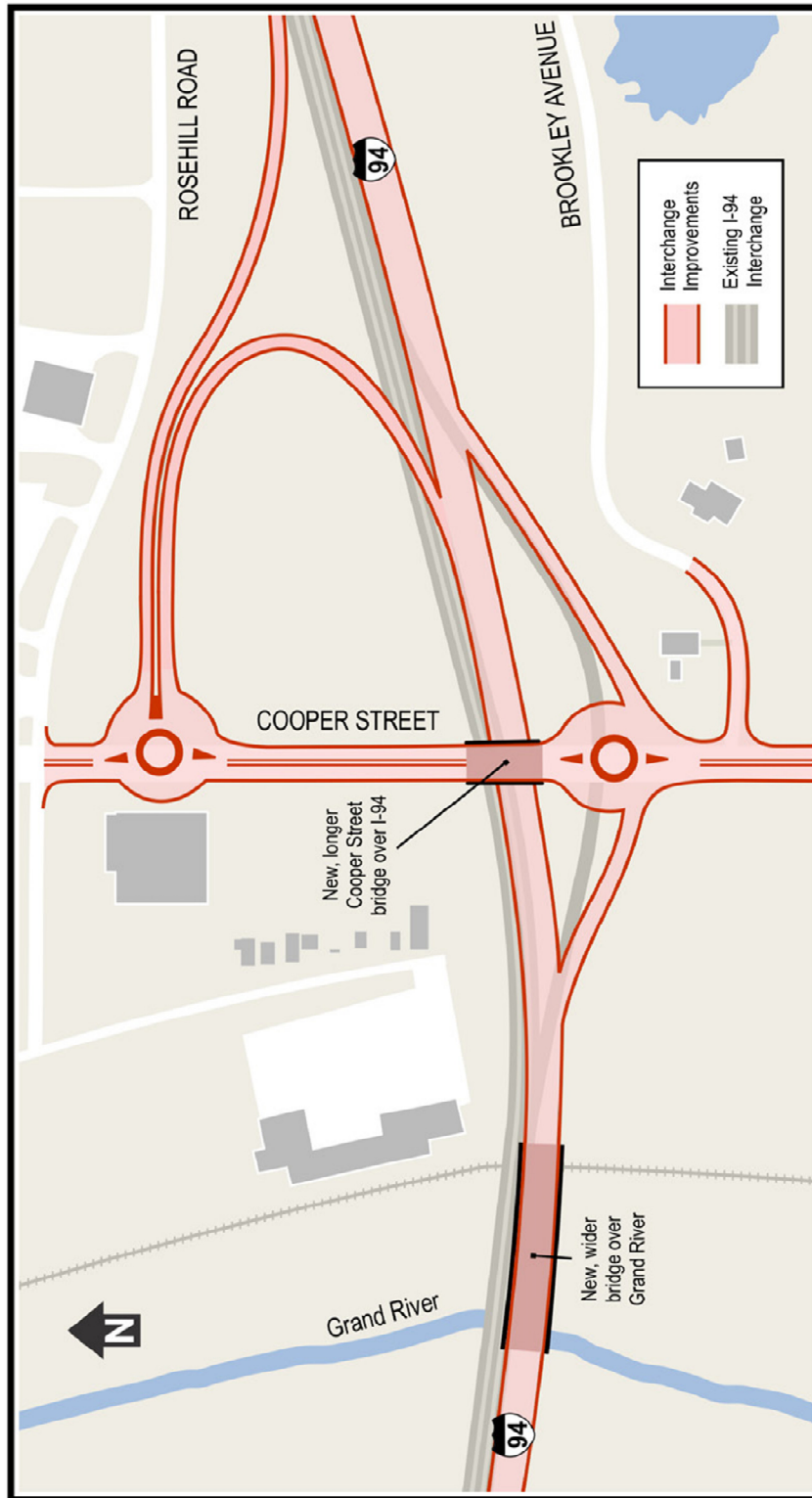


**Table 9-4 Horizon Year 2045, Existing and Committed Projects Scenario Capacity Limitations**

Jackson Area Comprehensive Transportation Study (JACTS) Horizon Year 2045, Existing and Committed Projects Scenario Capacity Limitations										
Rank	Road Name	Direction	From	To	Jurisdiction	Maintaining Road Agency	Length (Miles)	Thru Lanes	Total Thru Lanes	Average VOC
1	M-106 (Cooper St)	SB	W Monroe St	E North St	City of Jackson	MDOT	0.43	1	2	0.94
2	M-106 (Cooper Rd)	SB	M-106 (Bunkerhill Rd) - Cooper Rd split	Parnall Rd	Blackman Township	MDOT	1.77	1	2	0.86
3	M-106 (Cooper St)	NB	E North St	W Monroe St	City of Jackson	MDOT	0.43	1	2	0.80
4	I-94	WB	South Leg US-127 Interchange (Exit #142)	North Leg US-127 Interchange (Exit #138)	Blackman Township	MDOT	2.91	2	4	0.78
5	US-127 BR / M-50 (Louis Glick Hwy)	SB / EB	N Blackstone St	N Mechanic St	City of Jackson	MDOT	0.31	1	2	0.73
6	M-50 (Brooklyn Rd)	WB	Plymouth Rd	M-50 (Brooklyn Rd) & Austin Rd Intersection	Napoleon Township	MDOT	0.21	1	2	0.73
7	Washington Ave (turn back to city)	WB	S Mechanic St	S Blackstone St	City of Jackson	Jackson Engineering Division	0.31	1	2	0.72
8	M-50 (Brooklyn Rd)	WB	M-50 - Brooklyn Rd split	M-124 (Wamplers Lake Rd)	Brooklyn Village / Columbia Twp	MDOT	0.88	1	2	0.72
9	US-127 BR / M-50 (Louis Glick Hwy)	NB / WB	N Mechanic St	N Blackstone St	City of Jackson	MDOT	0.31	1	2	0.71
10	M-50 (Brooklyn Rd)	EB	M-124 (Wamplers Lake Rd)	M-50 - Brooklyn Rd split	Brooklyn Village / Columbia Twp	MDOT	0.88	1	2	0.70

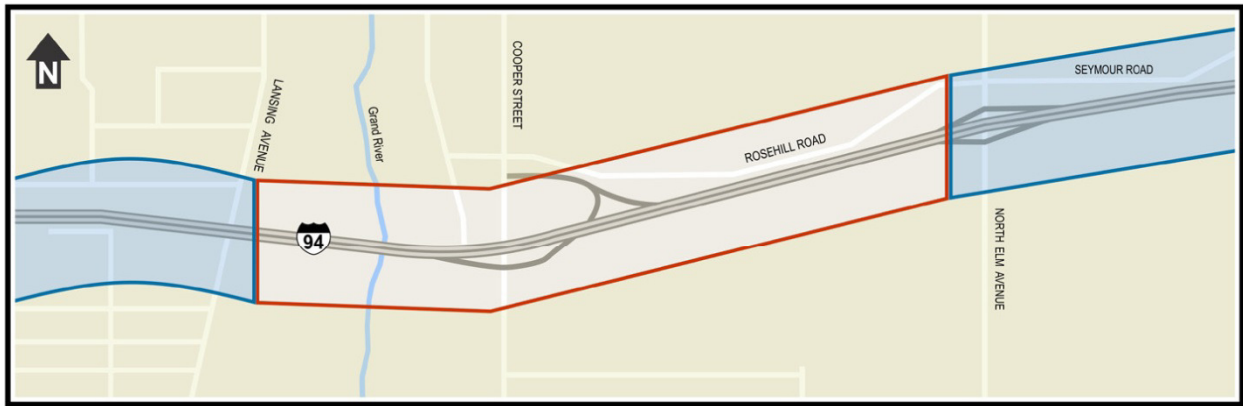
*NB: Northbound*      *EB: Eastbound*  
*SB: Southbound*      *WB: Westbound*  
*N-S: NB & SB*        *E-W: EB & WB*

Figure 9-8 I-94/Cooper Street Interchange Improvements (in red)





**Figure 9-9 Reconstruction on I-94 from Lansing Avenue to Elm Road**



**Figure 9-10 Resurfacing on I-94 from M-60 to Lansing Avenue**

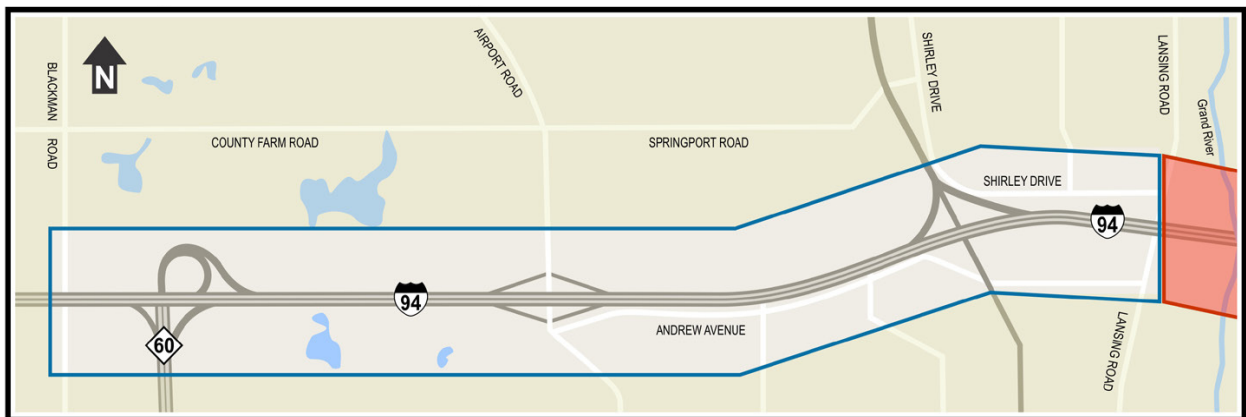




Figure 9-11 Resurfacing on I-94 from Elm Road to Sargent Road

