Chapter 9

Roadway Congestion, Congested Links, & Recommended Projects

The Travel Demand Forecast Model (TDFM or "model"), as described in Chapter 8, was used to identify roadway capacity constraints and congestion within the Jackson MPO. These results were provided for two different year scenarios:

- 1) Base year 2018
- 2) Horizon year 2050 with committed projects, as listed in the FY 2023-2026 TIP, and 2050 Socio-Economic and employment data forecast.

The TDFM produces current or future anticipated roadway volumes over a 24-hour period. Those volumes are compared to the capacity of the roadway through a "Volume over Capacity (VOC)" ratio. Once calculated, the VOCs are assigned to a "Level of Service (LOS)" categorical system, using a letter grade (A-F). A description and visual representation of the LOS grades used for the Jackson MPA are provided in Figure 9-1 below:

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

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

The Jackson MPO, and the JACTS technical and policy committees were provided opportunities to review the model results. Since there were limited roadways within the Jackson MPO area that exhibited high VOC levels on a daily level, the results presented to the MPO and the various committees for comment included any roadways with

moderate VOC (0.60 to 0.70) or higher. By showing roadways with moderate VOC levels, members of the various R2PC committees were able to identify potential traffic congestion problem areas that may need attention in future construction programs.

These locations may also illustrate operational-type issues on a roadway segment, especially during peak travel periods. However, other locations not detected by the model results as higher VOCs areas may also present congestion issues once factors not captured by the travel demand model as traffic interruptions (traffic signals, stop signs, merging, etc.), freedom to maneuver, and safety may affect the LOS.

Due to the limited number 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) and already considered in the horizon year scenario.

Base Year 2018 Results

The Base Year 2018 scenario analysis looked at the existing conditions of the area-wide transportation system as it was in 2018. The 2018 year was chosen because of the availability of demographic and employment data and traffic counts for the development and calibration of the model in accordance with the timeline for the 2050 Long Range Transportation Plan. Roadway projects and socio-economic data changes happening after 2018 are not included in this scenario.

The base year model results do not show any roadways with daily traffic volumes that result in a Level of Service E or F (VOC>0.80). Therefore, this document presents the few daily traffic volumes that result in Level of Service C (0.60<VOC<0.70) and Level of Service D (0.70<VOC<0.80) for the area. These thresholds result in the ten roadways listed below:

- 1) SB M-106 (Cooper St) between Porter St & Leroy St
- 2) NW & SE M-50 (Brooklyn Rd) between Napoleon Rd & Austin Rd
- 3) SB West Ave between the I-94 West entrance ramp & Commonwealth Ave
- 4) EB & WB Ganson St between Lansing Ave & Cooper St
- 5) NB & SB US-127 between Floyd Ave & Hart Rd
- 6) NB & SB Francis St between Franklin St & Washington Ave
- 7) NB & SB West Ave between Wildwood Ave & North St
- 8) EB & WB Michigan Ave between Laurence Ave & Main St
- 9) NB M-106 (Cooper St) between Leroy St & Porter St
- 10) NW & SE Lansing Ave between Steward Ave & Ganson St

A detailed table of the highest VOC roadway corridors, including AM Peak and PM peak VOCs for the Base Year 2018 can be found in Table 9-1. Figures 9-2 to 9-7 show the daily, AM, and PM peak maps base year scenario for Jackson County and the City of Jackson.

Table 9-1: Base Year 2018 Scenario Capacity Limitations

Jackson Area Comprehensive Transportation Study (JACTS) Base Year 2018 Scenario Congestion

Rank	Road Name	Direction	From	То	Jurisdiction	Maintaining Road Agency	Length (Miles)	Average AM Peak VOC	Average PM Peak VOC	Average Daily VOC
1	M-106 (Cooper St)	SB	Porter St.	Leroy St	City of Jackson	MDOT	0.81	0.84	0.82	0.77
2	M-50 (Brooklyn Rd)	NW-SE	Napoleon Rd	Austin Rd	Napoleon Twp	MDOT	0.88	0.82	0.79	0.71
3	M-50/BUS US- 127 (West Ave)	SB	I-94 West Entrance Ramp	Commonwealth Ave	Blackman Twp/City of Jackson	MDOT	0.30	0.86	0.79	0.70
4	Ganson St	E-W	Lansing Ave	Cooper St	City of Jackson	City of Jackson	0.58	0.72	0.70	0.66
5	US-127	N-S	Floyd Ave	Hart Rd	Summit Twp	MDOT	0.80	0.76	0.79	0.64
6	Francis St	N-S	Franklin St	Washington Ave	City of Jackson	City of Jackson	0.13	0.69	0.67	0.64
7	West Ave	N-S	Wildwood Ave	North St	City of Jackson	MDOT	0.60	0.72	0.70	0.63
8	Michigan Ave	E-W	Laurence Ave	Main St	Blackman Twp	MDOT	0.41	0.71	0.68	0.61
9	M-106 (Cooper St)	NB	Leroy St	Porter St	City of Jackson	MDOT	0.81	0.70	0.69	0.61
10	Lansing Ave	NW-SE	Steward Ave	Ganson St	City of Jackson	City of Jackson	0.32	0.66	0.65	0.60

JACTS Base Year 2018, Daily Congestion Analysis Jackson County Territorial Rd Plum Orchard Rd Waterloo Munith Rd Springport Township **Rives Township** Waterloo Township Waterloo Rd Henry Rd Maple Grove Rd Van Horn Rd Devereaux Rd Cedar Knoll Dr Blackman Township Parma Township Boardm 0 3dd 0 66 iia St Wildw 0 20 Tymouth St County Farm Rd Leoni Township Michigan Ave **Grass Lake Township** City of Jackson McCain Rd Page Ave Denton Rd South St King Rd Napoleon Rd Curtis Rd Behling Rd **Spring Arbor Township** Napoleon Tovos Sharon Valley Rd Wickwire Rd **Features** Crouch Rd Hatch Rd Urban Area - Census 2020 Reed Rd Jurisdiction Fowler Rd Norvell Township Jefferson Rd 2018 Fed-Aid Roads Pulaski Township | Hanover Township | Liberty Township Trunkline Columbia Township Daily VOC between 0.60 and 0.70 Daily VOC between 0.70 and 0.80 White Rd Daily VOC between 0.80 and 1.00 Farwell Lake Rd 7.5

Rd

Figure 9-2: Base Year Daily Congestion - Jackson County

Miles

JACTS Base Year 2018, Daily Congestion Analysis City of Jackson E I 94/Cooper RAME O Andrew Ave 0.66 City of Jackson McCain Rd **Features** Urban Area - Census 2020 Jurisdiction City of Jackson 2018 Fed-Aid Roads Trunkline ■ Daily VOC between 0.60 and 0.70 Daily VOC between 0.70 and 0.80 Daily VOC between 0.80 and 1.00 Miles

Figure 9-3: Base Year Daily Congestion - City of Jackson

JACTS Base Year 2018, AM Congestion Analysis Jackson County Territorial Rd Plum Orchard Rd Waterloo Munith Rd Wood Rd να P8 Iliqueγun Meridian Rd **Rives Township Springport Township** Maple Lane Rd Waterloo Township Waterloo Rd Henry Rd Maple Grove Ro Van Horn Rd Devereaux Rd Rd Cedar Knoll Dr Blackman Township Parma Township Bohne Rd County Farm Rd Leoni Township Grass Lake Township City of Jackson McCain Rd Rd Page Ave ing Rd Curtis Rd Behling Rd Spring Arbor Township Cox Rd Norvell Rd Napoleon Tovo sh Hanover St Mathews Rd Sharon Valley Rd Wickwire Rd 6 Sears Rd Homer Rd Austin Rd **Features** Crouch Rd Hatch Rd Reed Rd St Urban Area - Census 2020 Wetherby Rd Fowler Rd **Norvell Township** Jurisdiction Jefferson Rd 2018 Fed-Aid Roads Horning Rd Hanover Township Liberty Township Pulaski Township Trunkline Columbia Township AM VOC between 0.60 and 0.70 State St Liberty Rd Hanover Rd AM VOC between 0.70 and 0.80 White Rd AM VOC between 0.80 and 1.00 Farwell Lake Rd Miles Rd

Figure 9-4: Base Year AM Peak Congestion - Jackson County

JACTS Base Year 2018, AM Congestion Analysis City of Jackson 0.72 Ganson St **Features** Urban Area - Census 2020 Jurisdiction City of Jackson 2018 Fed-Aid Roads Trunkline AM VOC between 0.60 and 0.70 AM VOC between 0.70 and 0.80 AM VOC between 0.80 and 1.00 Miles

Figure 9-5: Base Year AM Peak Congestion - City of Jackson

JACTS Base Year 2018, PM Congestion Analysis Jackson County Tompkins Township Rives Township Henrietta Township Waterloo Township laple Lane Rd Coon Hill Rd Maple Grove Rd Van Horn Rd Sandstone Township Parma Township Blackman Township W 1 94/S M 60 RAMP 6 Grass Lake Township Morrell St Cit of Jackson Spring Arbor Township **Summit Township** Concord Township Napoleon Township Sears Rd **Features** Urban Area - Census 2020 Jurisdiction 2018 Fed-Aid Roads Norvell Township Trunkline Liberty Township Pulaski Township Hanover Township PM VOC between 0.60 and 0.70 Columbia Township PM VOC between 0.70 and 0.80 PM VOC between 0.80 and 1.00

Farwell Lake Ro

Figure 9-6: Base Year PM Peak Congestion - Jackson County

Miles

JACTS Base Year 2018, PM Congestion Analysis City of Jackson 0.70 City of Jackson **Features** Urban Area - Census 2020 Jurisdiction City of Jackson 2018 Fed-Aid Roads Trunkline - PM VOC between 0.60 and 0.70 PM VOC between 0.70 and 0.80 PM VOC between 0.80 and 1.00 Miles

Figure 9-7: Base Year PM Peak Congestion - City of Jackson

Horizon Year 2050 with Committed Projects Results

The Horizon Year 2050 includes all the capacity-related committed projects listed in the FY 2020-2023 TIP and FY 2023-2026 TIP as well as the projects listed on the FY 2017-2020 TIP that were not concluded before 2018 along with the projected changes in socioeconomic data through 2050 approved by the JACTS Technical and Policy Committees. Traffic volume results were also compared to the expected capacities for the road system in 2050. The 2050 model shows SB Cooper St. between Porter St. and Leroy St. as the only corridor with daily traffic volumes that result in a Level of Service E or F (VOC>0.80). However, to be consistent with the thresholds adopted for the base year, this document also presents the daily traffic volumes that result in Level of Service C (0.60<VOC<0.70) and Level of Service D (0.70<VOC<0.80) for the area. These thresholds for the horizon year 2050 result in the fourteen roadways listed below.

- 1) SB M-106 (Cooper St) between Porter St & Leroy St
- 2) SB West Ave between I-94 West entrance ramp & Commonwealth Ave
- 3) NW & SE M-50 (Brooklyn Rd) between Napoleon Rd & Austin Rd
- 4) NB & SB West Ave between Wildwood Ave & North St
- 5) EB & WB Ganson St between Lansing Ave & Cooper St
- 6) EB & WB Michigan Ave between Laurence Ave & Main St
- 7) NB & SB Francis St between Franklin St & Washington Ave
- 8) NB & SB US-127 between Floyd Ave & Hart Rd
- 9) NB M-106 (Cooper St) between Leroy St & Porter St
- 10) NW & SE Lansing Ave between Steward Ave & Ganson St
- 11) WB I-94 between Airport Rd and Parma Rd
- 12) EB I-94 between Parma Rd and Airport Rd
- 13) EB I-94 between US-127 South and Race Rd

Comparing the results of corridors with VOC>0.60 in the base and horizon model scenarios it is noticeable that many of the same corridors appear in both lists. However, EB/WB I-94 between Parma Rd and Airport Rd and EB I-94 between US-127 South and Race Rd that did not have a moderate VOC in the base year are expected to have VOC>0.60 in the horizon year of 2050 with the projected conditions.

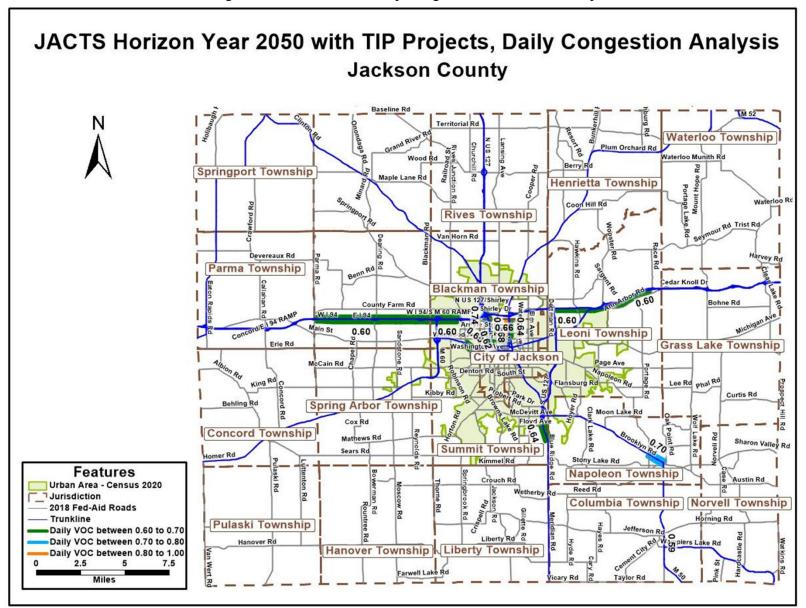
A detailed table of the highest VOC roadway corridors, including the AM and PM Peak periods VOCs, along with maps, for the Horizon Year 2050 with Committed Projects results can be found in Table 9-2 and Figures 9-8 to 9-13.

Table 9-2 Horizon Year 2050 Scenario Capacity Limitations

Jackson Area Comprehensive Transportation Study (JACTS) Horizon Year 2050 Scenario Congestion

Rank	Road Name	Direction	From	То	Jurisdiction	Maintaining Road Agency	Length (Miles)	Average AM Peak VOC	Average PM Peak VOC	Average Daily VOC
1	M-106 (Cooper St)	SB	Porter St	Leroy St	City of Jackson	MDOT	0.81	0.89	0.86	0.82
2	M-50/BUS US- 127 (West Ave)	SB	I-94 West Entrance Ramp	Commonwealth Ave	Blackman Twp/City of Jackson	MDOT	0.30	0.90	0.84	0.74
3	M-50 (Brooklyn Rd)	NW/SE	Napoleon Rd	Austin Rd	Napoleon Twp	MDOT	0.88	0.81	0.80	0.70
4	West Ave	SB/NB	Wildwood Ave	North St	City of Jackson	MDOT	0.60	0.75	0.74	0.68
5	Ganson St	E-W	Lansing Ave	Lansing Ave to Cooper St	City of Jackson	City of Jackson	0.58	0.72	0.70	0.66
6	Michigan Ave	E-W	Laurence Ave	W Main St	Blackman Twp	MDOT	0.41	0.75	0.72	0.65
7	Francis St	N-S	Franklin St	Washington Ave	City of Jackson	City of Jackson	0.13	0.70	0.69	0.65
8	US-127	N-S	Floyd Ave	Hart Rd	Summit Twp	MDOT	0.80	0.76	0.79	0.64
9	M-106 (Cooper St)	NB	Leroy St	Porter St	City of Jackson	MDOT	0.81	0.71	0.73	0.64
10	Lansing Ave	N-S	Ganson St	North St	City of Jackson	City of Jackson	0.32	0.70	0.67	0.62
11	M-50/BUS US- 127 (West Ave)	NB	Commonwealth Ave	I-94 West Entrance Ramp	Blackman Twp/City of Jackson	MDOT	0.30	0.68	0.71	0.60
12	I-94 West	WB	Airport Rd	Parma Rd	Blackman Twp/ Sandstone Twp	MDOT	7.22	0.63	0.70	0.60
13	I-94 East	EB	Parma Rd	Airport Rd	Sandstone Twp/ Blackman Twp	MDOT	7.20	0.64	0.69	0.60
14	I-94 East	EB	US-127 South	Race Rd	Leoni Twp	MDOT	4.92	0.63	0.72	0.60

Figure 9-8: Horizon Year Daily Congestion - Jackson County



JACTS Horizon Year 2050 with TIP Projects, Daily Congestion Analysis City of Jackson 0.66 Michigan Ave Franklin St City of Jackson **Features** Urban Area - Census 2020 Jurisdiction City of Jackson 2018 Fed-Aid Roads Trunkline Daily VOC between 0.60 to 0.70 Daily VOC between 0.70 to 0.80 Daily VOC between 0.80 to 1.00 Miles

Figure 9-9: Horizon Year Daily Congestion - City of Jackson

JACTS Horizon Year 2050 with TIP Projects, AM Congestion Analysis **Jackson County** Baseline Rd Henrietta Township Rives Township Plum Orchard R Wood Rd Waterloo Township Landon Rd **Tompkins Township Springport Township** Henry Rd 12 Maple S Van Horn Rd Bangham Rd Parma Township Leoni Township Cedar Knoll Dr Blackman Township 0.63 County Farm Rd Rapids W 194 RAMP Ann Arbor Rd Bohne Rd 0.64 stone Township Erie Rd Grass Lake Township City of Jackson Page Ave McCain Rd South St Napoleon Rd King Rd Kibby Rd Park Rd P Curtis Rd Behling Rd Spring Arbor Township Rexford Rd **Summit Township** Wickwire Rd Napoleon Towro hip Concord Township | Mathews Rd Sharon Valley R Sears Rd Homer Rd Kimmel Rd 2 **Features** Crouch Rd Urban Area - Census 2020 R Wetherby Rd Rountree Jurisdiction Norvell Township 2018 Fed-Aid Roads Horning Rd Jefferson Rd Trunkline Pulaski Township AM VOC between 0.60 to 0.70 Liberty Rd Hanover Rd AM VOC between 0.70 to 0.80 Columbia Townshi AM VOC between 0.80 to 1.00 Liberty Township Hanover Township Miles

Figure 9-10: Horizon Year AM Peak Congestion - Jackson County

JACTS Horizon Year 2050 with TIP Projects, AM Congestion Analysis City of Jackson County Farm Rd 0.63 0.63 0.64 Monroe St 0.89 North St 0.72 Ganson St Plymouth St Franklin St City of Jackson McCain Rd Griswold S **Features** Urban Area - Census 2020 Jurisdiction City of Jackson Flansburg Rd 2018 Fed-Aid Roads Trunkline AM VOC between 0.60 to 0.70 AM VOC between 0.70 to 0.80 Kibby Rd AM VOC between 0.80 to 1.00 Miles

Figure 9-11: Horizon Year AM Peak Congestion - City of Jackson

JACTS Horizon Year 2050 with TIP Projects, PM Congestion Analysis **Jackson County** Springport Township Tompkins Township Rives Township Henrietta Township Waterloo Township Henry Rd Maple Grove Rd Van Horn Rd Devereaux Rd Rd Cedar Knoll Dr Parma Township Sandstone Township Blackman Township R County Farm 0.70 Grass Lake Township City of Jackson McCain Rd Curtis Rd Concord Township | Spring Arbor Township **Summit Township** Napoleon Towio 8 in **Features** Reed Rd Urban Area - Census 2020 Norvell Township 7 Jurisdiction 2018 Fed-Aid Roads Pulaski Township Hanover Township Liberty Township Trunkline Columbia Township Liberty Rd PM VOC between 0.60 to 0.70 Hanover Rd PM VOC between 0.70 to 0.80 PM VOC between 0.80 to 1.00 Miles

Figure 9-12: Horizon Year PM Peak Congestion - Jackson County

JACTS Horizon Year 2050 with TIP Projects, PM Congestion Analysis City of Jackson County Farm Rd Springport Rd 0.72 E 1 94/Co 0.70 0.69 Monroe St North St 0.70 Ganson St Wildwood Ave Michigan Ave 0.72 Plymouth St Franklin St City of Jackson McCain Rd Griswold S Denton Rd **Features** Urban Area - Census 2020 Jurisdiction City of Jackson 2018 Fed-Aid Roads PM VOC between 0.60 to 0.70 PM VOC between 0.70 to 0.80 PM VOC between 0.80 to 1.00 Miles

Figure 9-13: Horizon Year PM Peak Congestion - City of Jackson

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 years span of the plan, the JACTS Technical and Policy Committees considered local community concerns and issues, which determine the improvements that should be programmed in the coming years.

The plan provides a vision of Jackson County's transportation system through the year 2050. The transportation improvement projects included in the first years (2023-2026) 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 (2027–2050) 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 (2027-2050) 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, 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.

I-94 Modernization

Many of the projects currently programmed in the FY 2023-2026 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, December 2017, and again in October 2020. The project study area is a nine-mile segment of I-94 extending from the M-60 interchange to just east of the Sargent Rd 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 2050 traffic volumes
- 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
- 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 - Complete

- Sargent Rd interchange reconstruction, including the closure of the I-94 BL interchange.
- Replacement of the Hawkins Rd and Dettman Rd bridge overpasses.

Phase 2 - Complete

- Cooper St interchange reconstruction and other road improvements as necessary.
- Replacement and widening of the I-94 bridge over the Grand River to accommodate potential future widening of I-94.
- The remainder of I-94 between M-60 and Sargent Rd will receive a major rehabilitation.
- Replacement of the M-60 and Elm Rd interchanges and Lansing Ave and Elm Rd bridge overpasses.

Phase 3

- Reconstruction of US-127/M-50-West Ave interchange to diverging diamond Complete
- Reconstruct the northern portion of the Sargent Rd interchange
- US-127 South and Airport Rd interchanges reconstruction
- Widen I-94 between M-60 and Sargent Rd Mostly complete

These unfunded improvements are technically not a part of the JACTS 2050 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.

