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Roadway Transportation Deficiencies and Recommended Projects

Chapter 12

Roadway Transportation Deficiencies and Recommended Projects

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The JACTS area-wide Travel Demand Forecast Model (TDFM), discussed in Chapter 11, was utilized to identify potential solutions (needed improvements) to the recognized deficiencies. These solutions assist state and local governmental decision-makers in the development and prioritization of transportation improvement projects, programs, and studies for inclusion in the JACTS 2040 Long Range Transportation Plan.

Capacity deficiencies are identified for both the "base" year and for the future "no-build" scenarios. The base year of 2010 is based on the road system as it was then. The 2040 capacity deficiencies are based on a "no-build" scenario which assumes that there will be no improvements to the roadway network beyond the currently committed projects. A capacity deficiency occurs on the roadway network when existing or forecasted volumes exceed the acceptable capacity of the roadway.

Some factors that affect the level of service are speed, freedom to maneuver, traffic interruptions, amount of commercial traffic, and safety. The level of service measures range from A to F, where A is free flow, D and E are stable flow with some restrictions in speed and maneuverability, and F is a breakdown in the flow of traffic creating stop-and-go conditions. For the purpose of the Jackson 2040 Long Range Transportation Plan, the acceptable capacity of each link in the roadway network is defined as the capacity at level-of-service D.

Table 12-1
Volume to Capacity Severity Range

VOLUME TO CAPACITY RATIO	OPERATING CONDITIONS SEVERITY	LEVEL OF SERVICE
0 TO 0.84	Traffic at free to stable flow	A - C
0.85 to 0.99	High density of traffic, but stable flow	D
1.00 to 1.24	Traffic at near or capacity level	E
1.25 and greater	Forced or breakdown of traffic flow	F

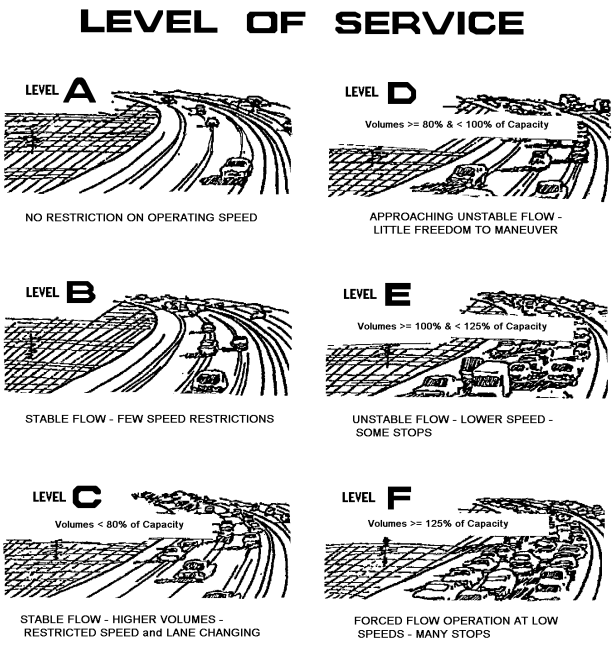

Figure 12-1

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The TransCAD computer model provided projected traffic volumes on area network roadways based on projected socio-economic data provided by the Region 2 Planning Commission. These projected volumes were then compared to the capacity of the same roadways. The result of this comparison was a volume to capacity ratio: the higher the volume/capacity ratio, the worse the congestion.

2010 Capacity Deficiencies

Capacity deficiencies in the 2010 base year of the Jackson 2040 Long Range Transportation Plan occur on roadway or corridor segments or at intersections where existing traffic volumes exceed acceptable capacity. Roadways in the model study area which exceed acceptable capacity limits for 2010 include:

- I-94 – from Cooper Street to Clear Lake Road, including the interchanges of Ann Arbor, Sargent Roads, Mt. Hope and Race Roads
- I-94 Ramps – at Airport Road and Elm Roads
- US-127 Ramps – Ann Arbor Road and Michigan Avenue
- Wildwood Avenue – Daniel Road to West Avenue
- Francis Street – at Cooper Street
- Fourth Street – Horton Street to Hickory Street
- Brooklyn Road (M-50) – South Street to Moon Lake Road
- Brooklyn Road (M-50) – Napoleon Road to Stony Lake Road
- Airport Road – I-94 to County Farm Road
- Airport Road – I-94 WB Ramps to Boardman/O'Neill Roads
- Clinton Road – at US-127/I-94 Interchange
- Clinton Road – West Street to Boardman/Andrew Streets
- Clinton Road – Monroe Street to Lansing Avenue
- Cooper Street – North Street to Francis Street
- Cooper Street – Porter Street to Monroe Street
- Cooper Street/Michigan Cut Off – at Cooper Street/Michigan Avenue
- Main Street, Brooklyn – North of Mill to North of Wamplers Lake Road
- Morrell Street – Greenwood Avenue to Blackstone Street
- South Street – at US-127 Interchange
- South Street – US-127 to Flansburg Road
- Spring Arbor Road – Moscow Road to end of expressway

The study area's 2010 roadway capacity deficiencies are illustrated in Figures 12-1a and 12-1b and listed in Table 12-2.

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The forecasted roadway capacity deficiencies, based on the TransCAD model for 2040, assuming no additional roadway improvements are completed, are illustrated in Figures 12-2a and 12-2b and listed in Table 12-3. The list of 2040 capacity deficiencies indicate a slight increase in the number of roadways that will be operating in excess of their capacity if no additional improvements are made to the 2010 base network transportation system. As the congestion on these roadways approaches or exceeds acceptable capacity, traffic will move to alternate, less congested routes in the area.

2040 Capacity Deficiencies

The roadways listed as capacity deficient in 2010 remain deficient in the year 2040 No-Build scenario. Additional roadways that are forecasted to carry volumes that equal or exceed the roadway's design capacity in the 2040 No-Build Scenario include:

- I-94 EB and WB – Cooper Street to Washtenaw County Line
- Lansing Road – Steward Street to Blackstone Street
- Blackstone Street – Lansing Street to Louis Glick Highway
- Greenwood Street – Wilkins Street to Morrell Street
- I-94 EB – Off Ramp at US-127 North
- Wilkins Street – Greenwood Street to Jackson Street
- Francis Street – Washington Street to Franklin Street
- Brown Street – Franklin Street to Spring Arbor Road
- Franklin Street – Jackson Street to Mechanic Street

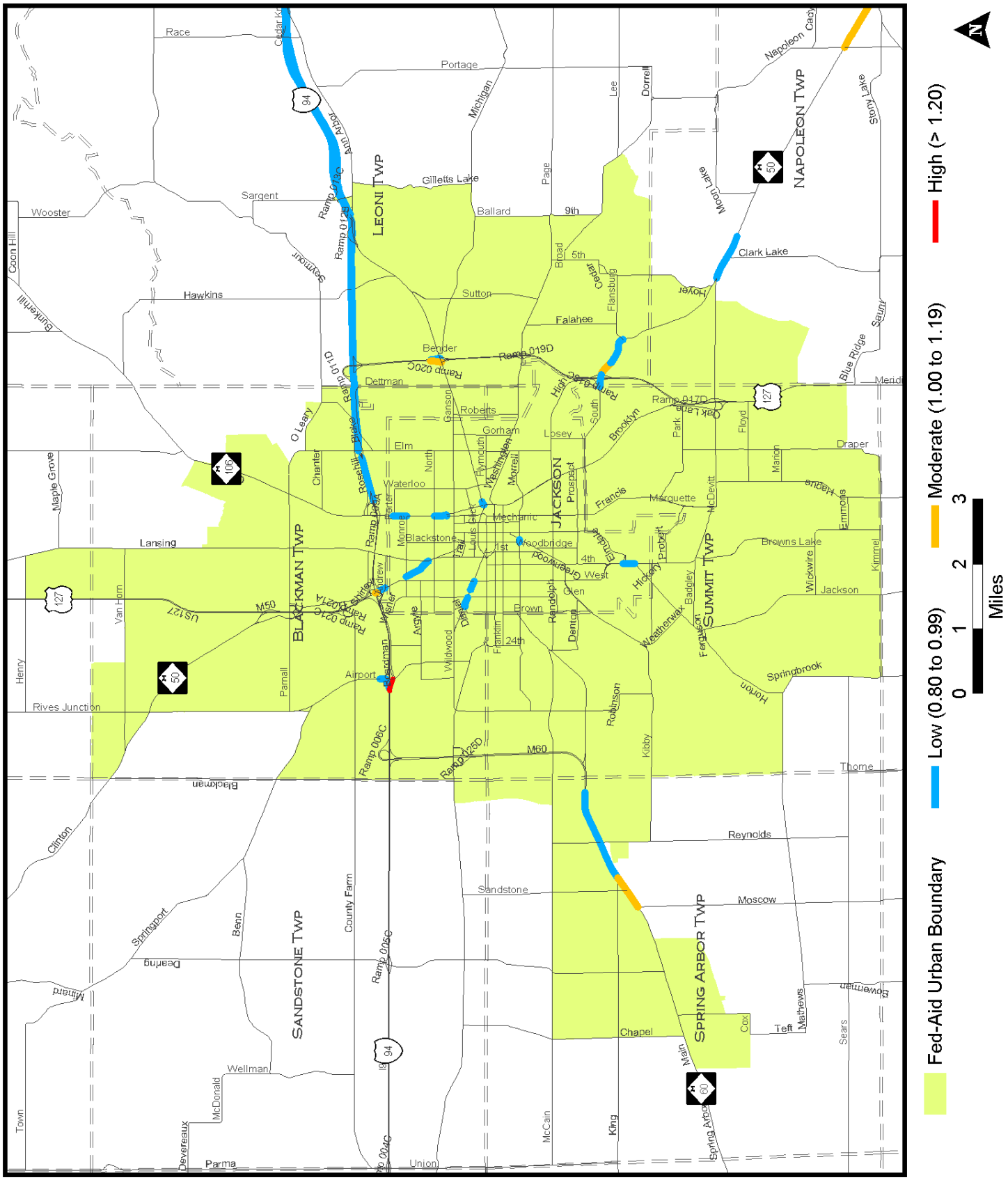

Figure 12-1a
Base Year Scenario: Jackson Urbanized Area

2010 Capacity Deficiencies

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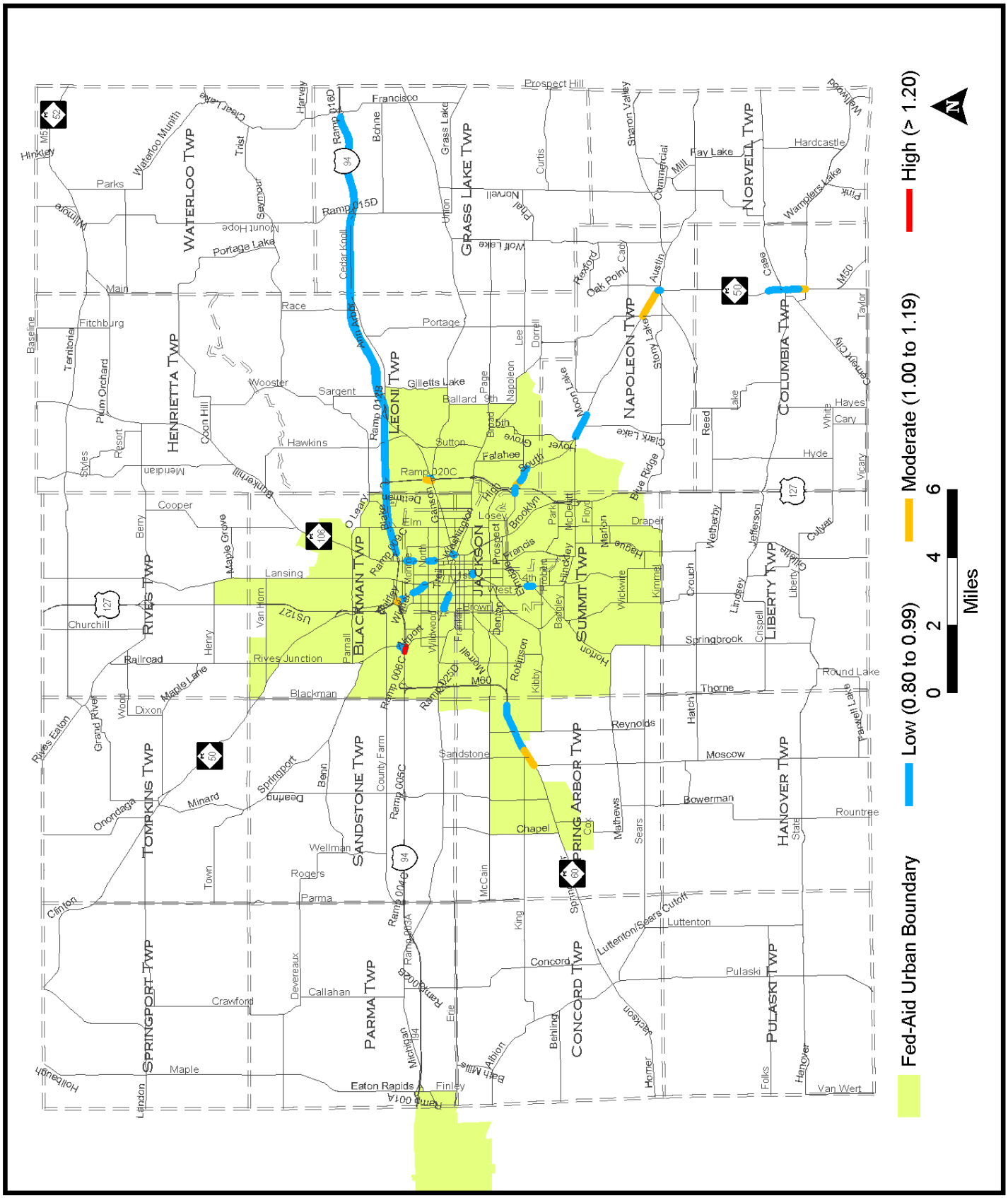

Figure 12-1b
Base Year Scenario: Jackson County

2010 Capacity Deficiencies

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Table 12-2
2010 Deficient Corridors

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
I-94 EB Off Ramp	Airport Road Interchange		0.187	1.27	1	1
Brooklyn Rd (M-50)	Napoleon Road	Austin Road	0.877	1.08-1.11	2	2
Spring Arbor Rd	Moscow Road	End of M-60 Expressway	1.977	0.85-1.08	2	2
Clinton Street	US-127/I-94 Interchange	Boardman and Andrew Streets	0.175	0.91-1.07	4	4
US-127 SB Off Ramp	Michigan Avenue Interchange		0.174	1.02	1	1
E. South Street	US-127	Flansburg Road	0.855	0.93-1.01	2	2
S. Main Street, Brooklyn	Wamplers Lake Road	Brooklyn Town Square	0.459	0.87-1.00	2	3
I-94 East Bound	US-127	Clear Lake Road	10.905	0.80-0.99	2	2
Cooper Street	Porter Street	Monroe Street	0.209	0.86-0.96	2	3
I-94 West Bound	US-127	Clear Lake Road	11.087	0.80-0.96	2	2
Clinton Street	Monroe Street	Lansing Road	0.423	0.90-0.94	2	2
US-127 NB On Ramp	Ann Arbor Road Interchange		0.136	0.93	1	1
Cooper/Michigan Cut Off	@ Cooper Street & Michigan Avenue		0.061	0.90	1	1
I-94 WB On Ramp	Airport Road Interchange		0.147	0.90	1	1
Wildwood Avenue	Daniel Street	Wisner Street	0.155	0.87-0.90	2	3
N. Main Street, Brooklyn	North of Mill Street		0.376	0.89	2	3
I-94 West Bound	Cooper Street	US-127	1.340	0.80-0.88	2	2
N. Main Street, Brooklyn	South of Marshall Street		0.064	0.87	2	3
Fourth Street	Horton Road	Hickory Street	0.177	0.81-0.86	2	2

Table 12-2
2010 Deficient Corridors
(Continued)

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
Brooklyn Road (M-50)	Austin Road	Stony Lake Road	0.091	0.86	2	2
Cooper Street	North Street	Francis Street	0.178	0.85	2	**3**
N. Francis Street	@ Cooper Street		0.018	0.84	2	**3**
Brooklyn Road (M-50)	South Street	Clark Lake Road	0.350	0.83	2	2
I-94 East Bound	Cooper Street	US-127	1.619	0.81-0.83	2	2
I-94 WB Off Ramp	Elm Road Interchange		0.177	0.83	1	1
Airport Road	I-94 WB Ramps	Wayland Street	0.086	0.82	4	4
Brooklyn Road (M-50)	Clark Lake Road	Moon Lake Road	0.367	0.81	2	2
Wildwood Street	Wisner Street	West Avenue	0.147	0.80-0.81	2	2
W. Morrell Street	Greenwood Avenue	Blackstone Street	0.043	0.80	2	3
Airport Road	I-94 WB Ramps	Boardman/O'Neill Roads	0.160	0.64-0.78	4	6
I-94 EB Off Ramp	Cooper Street Interchange		0.160	0.63	1	1

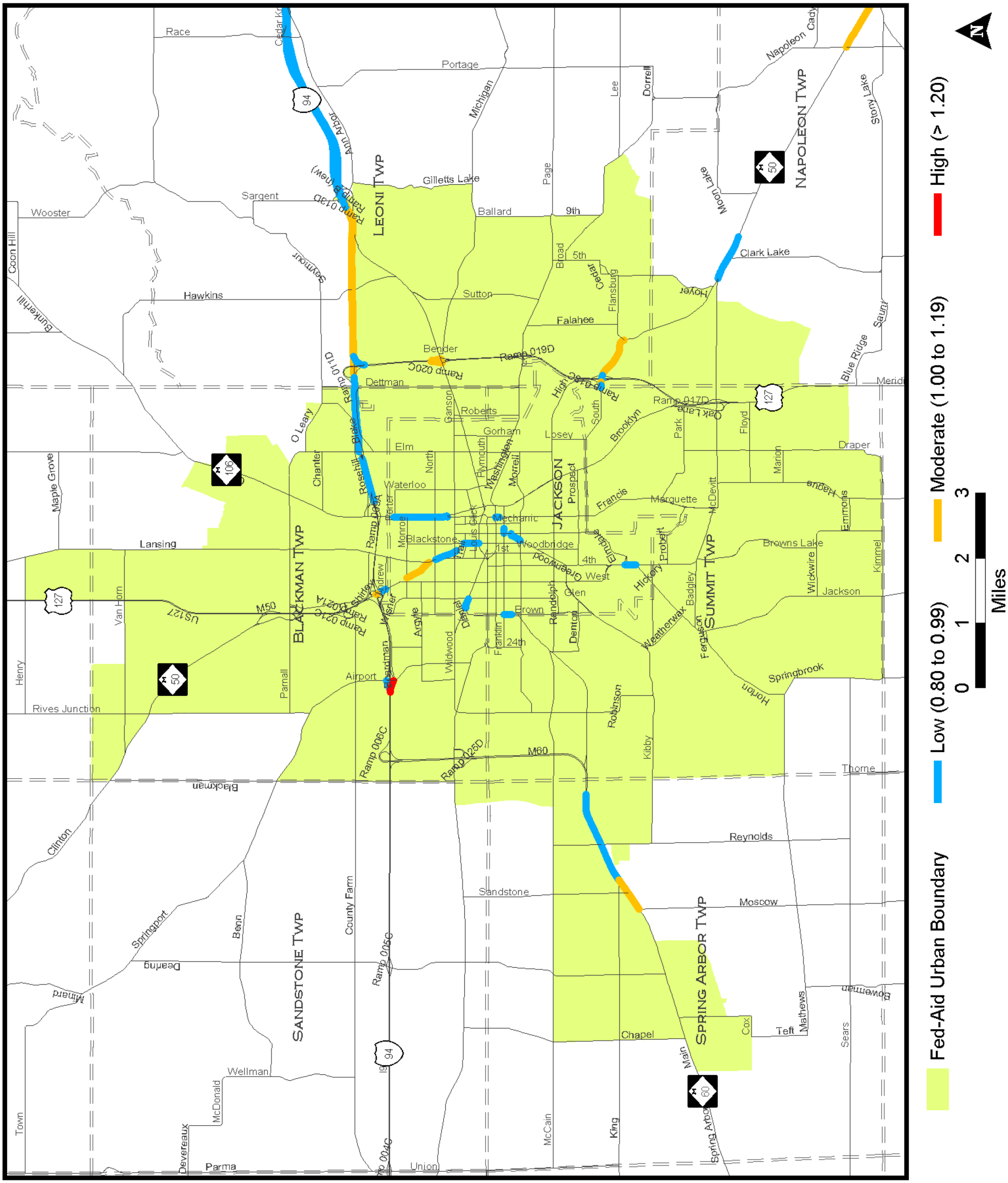

Figure 12-2a
No-Build Scenario: Jackson Urbanized Area

2040 Capacity Deficiencies

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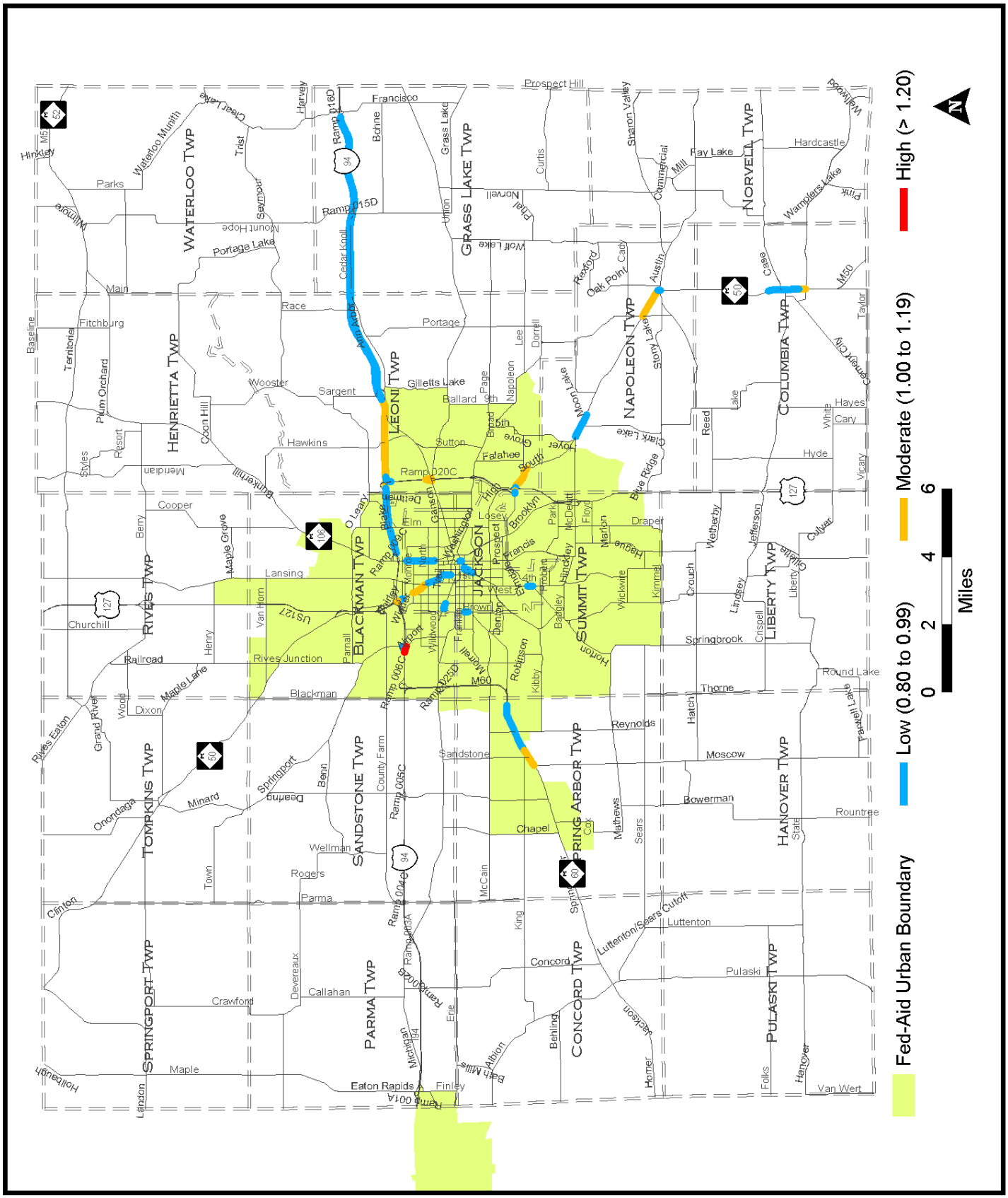

Figure 12-2b
No-Build Scenario: Jackson County

2040 Capacity Deficiencies

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Table 12-3
2040 "No-Build" Scenario Deficient Corridors

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
I-94 EB Off Ramp	Airport Road Interchange		0.187	1.32	1	1
Brooklyn Road (M-50)	Napoleon Road	Austin Road	0.877	1.15-1.18	2	2
US-127 SB Off Ramp	Michigan Avenue Interchange		0.174	1.18	1	1
Clinton Street	US-127/I-94 Interchange	Boardman and Andrew Streets	0.175	0.94-1.11	4	4
Spring Arbor Rd	Moscow Road	End of M-60 Expressway	1.977	0.84-1.09	2	2
E. South Street	US-127	Flansburg Road	0.855	0.97-1.06	2	2
US-127 NB On Ramp	Ann Arbor Road Interchange		0.136	1.06	1	1
Clinton Street	Monroe Street	Lansing Road	0.423	1.01-1.05	2	2
S. Main Street, Brooklyn	Wamplers Lake Road	Brooklyn Town Square	0.459	0.89-1.03	2	3
I-94 East Bound	Cooper Street	Washtenaw County Line	14.215	0.80-1.01	2	2
I-94 West Bound	Cooper Street	Washtenaw County Line	13.441	0.80-1.00	2	2
Cooper Street	Porter Street	Francis Street	0.807	0.81-0.97	2	3
Lansing Street	Steward Street	Blackstone Street	0.350	1.099-1.197	2	2
I-94 WB On Ramp	Airport Road Interchange		0.147	0.92	1	1
Blackstone Street	Lansing Street	Louis Glick Highway	0.233	0.84-0.91	2	2
N. Main Street, Brooklyn	North of Mill Street		0.582	0.81-0.91	2	3
Brooklyn Road (M-50)	Austin Road	Stony Lake Road	0.091	0.90	2	2
Greenwood Street	Wilkins Street	Morrell Street	0.158	0.87-0.88	2	2
US-127 NB Off Ramp	I-94 East Bound		0.227	0.88	1	1

Table 12-3
2040 "No-Build" Scenario Deficient Corridors
(Continued)

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
Brooklyn Road (M-50)	South Street	Clark Lake Road	0.350	0.87	2	2
Wildwood Street	Daniel Street	Wisner Street	0.155	0.83-0.85	2	3
Brooklyn Road (M-50)	Clark Lake Road	Moon Lake Road	1.090	0.80-0.85	2	2
N. Francis Street	@ Cooper Street		0.018	0.84	2	3
Wilkins Street	Greenwood Street	Jackson Street	0.029	0.84	2	2
Fourth Street	Horton Road	Hickory Street	0.166	0.83	2	2
I-94 WB Off Ramp	Elm Road Interchange		0.177	0.83	1	1
Francis Street	Washington Street	Franklin Street	0.056	0.82	2	2
Brown Street	Franklin Street	Spring Arbor Road	0.112	0.82	2	2
Franklin Street	Jackson Street	Mechanic Street	0.154	0.80-0.82	2	2

RECOMMENDED IMPROVE/EXPAND PROJECTS

After completion of the transportation modeling process and the subsequent identification of the congestion deficiencies, it is necessary to decide what, if any, action should be taken to address both current and anticipated deficiencies. With the knowledge of available federal, state, and local revenues for the 28-year span of the LRTP, the JACTS Long Range Plan Steering Committee, taking into account local community concerns and issues, determined what improvements should be programmed in the coming years.

The specific projects identified included local road projects proposed by the City of Jackson and the Jackson County Department of Transportation (JCDOT); trunkline projects on state highways under the jurisdiction of the Michigan Department of Transportation (MDOT); and public transit projects which will be developed and implemented by the Jackson Area Transportation Authority (JATA). The proposed costs of the projects were initially estimated in present year dollars, then adjusted to account for an inflation rate of 3 percent annually for both road construction and transit capital and operation expenditures.

The 2040 LRTP provides an overall vision of Jackson County's transportation system through the year 2040. Those transportation improvements included in the first years (2014-2017) 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 2040 Plan are a "vision" of how the transportation system may develop based on the existing land use and zoning plans of the City of Jackson, villages, and townships of Jackson County, and the current forecast of available transportation revenues. The transportation improvements in the "out" years (2018-2040) 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.

Recommendations

As in the previous long range transportation plans completed for the JACTS study area, the top priority of the JACTS planning process is the overall preservation and maintenance of the current transportation system. This means that although the capacity projects identified are valid and important, they are generally deemed to be of a lower priority than the projects aimed at preserving the existing system. Preservation projects generally include the reconstruction and resurfacing of a roadway within its existing right-of-way. These types of projects however are not required to be specifically identified within this Plan.

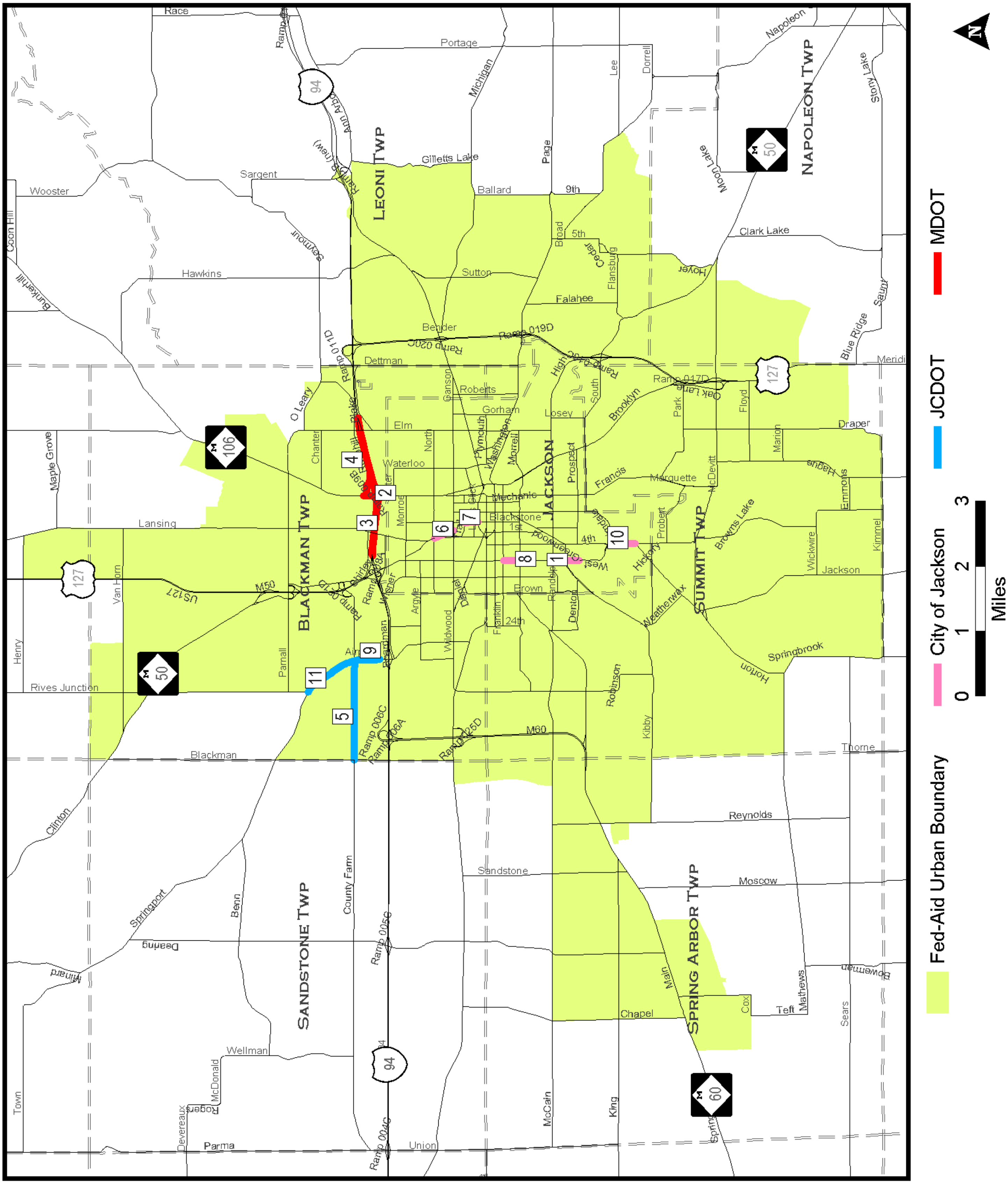

Figure 12-3a
Proposed Improve & Expand Projects

Jackson Urbanized Area

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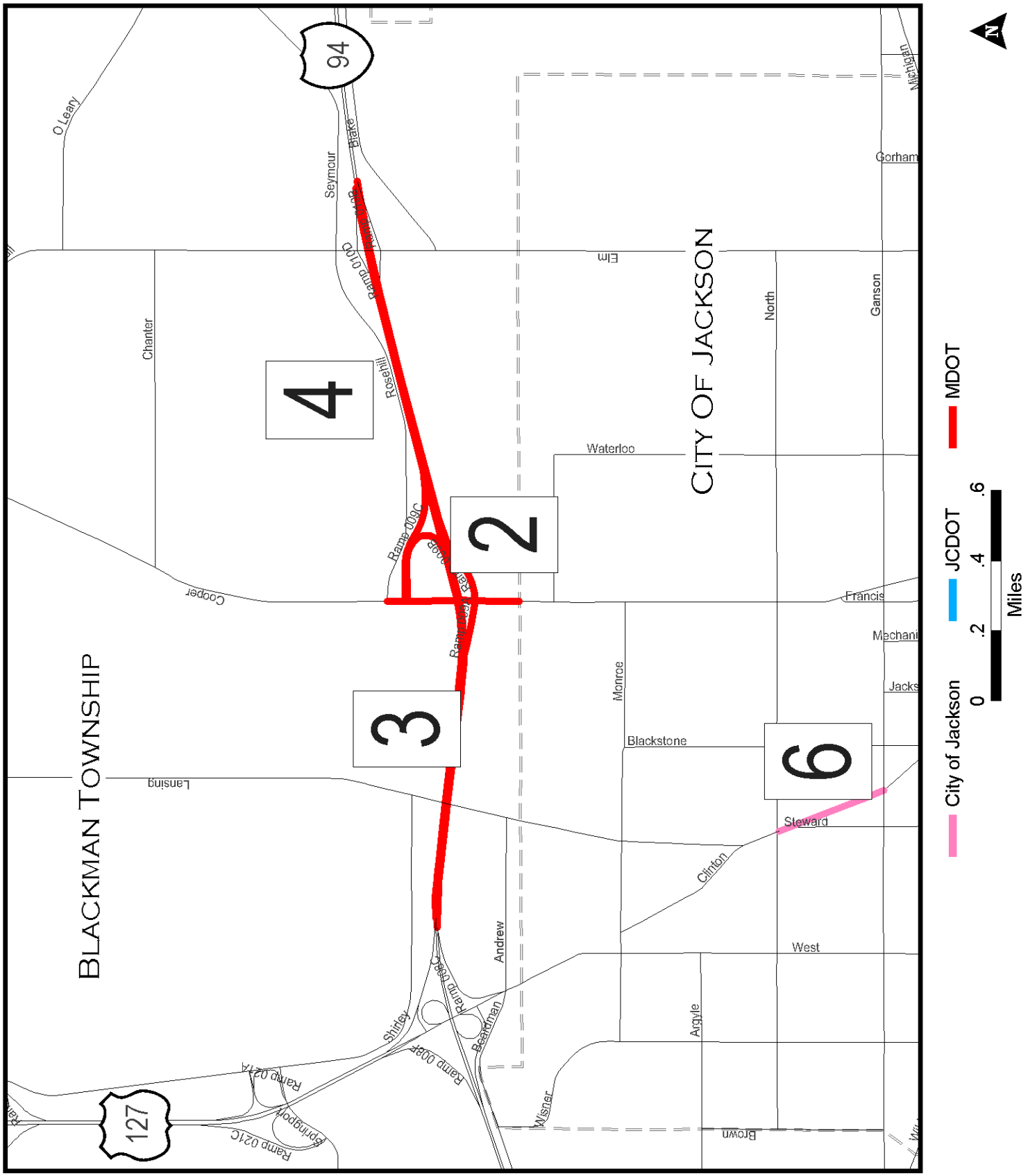

Figure 12-3b
Proposed Improve & Expand Projects

Interstate 94 Projects

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Table 12-4
Proposed Improve & Expand Projects

KEY	PROJECT	LIMITS	LENGTH (Miles)	DESCRIPTION	TOTAL COST	RESPONSIBLE AGENCY	YEAR
1	West Avenue	Bloomfield Street to High Street	0.27	Add SB Right Turn Lane at Kibby Road	$630,400	City of Jackson	2015
2	Interstate 94 (I-94)	Cooper Street Interchange	0.16	Bridge Replacement & Associated Road Work	$14,077,201	MDOT	2016
3	Interstate 94 (I-94)	Over ConRail and Grand River	0.40	Realign and Replace Structure	$20,177,000	MDOT	2016
4	Interstate 94 (I-94)	Lansing Road to Elm Road	1.52	Reconstruction and Realignment	$20,000,000	MDOT	2016
5	County Farm Road	Airport Road to Blackman Road	1.50	Widen to 3 Lanes	$1,518,000	JCDOT	2020
6	Lansing Avenue	Ganson Street to Steward Avenue	0.30	Widen to 3 Lanes for 2-Way Conversion	$817,000	City of Jackson	2020
7	Blackstone Street	Louis Glick High-way to Trail Street	0.21	Widen to 3 Lanes for 2-Way Conversion	$1,275,000	City of Jackson	2020
8	West Avenue	Glenwood Street to Franklin Street	0.45	Widen to 3 Lanes	$1,287,000	City of Jackson	2020
9	Airport Road	Wayland Drive to Springport Road	0.40	Add 5th Lane	$500,000	JCDOT	2024
10	Fourth Street	Horton Road to West Avenue	0.36	Widen to 3 Lanes with Roundabout at Hickory Street	$1,623,000	City of Jackson	2025
11	Springport Road	County Farm Road to Rives Junction Road	0.90	Widen to 3 Lanes	$1,481,000	JCDOT	2026
	GRAND TOTAL				**$63,385,601**		

MDOT – Michigan Department of Transportation
JCDOT – Jackson County Department of Transportation

The projects listed in Table12-4 and illustrated in Figures 12-3a through 12-3d, specifically identify the proposed Improve and Expand (I &E) projects that would increase the capacity on a roadway. Examples of improve and expand projects may be the addition of traffic lanes, turn lanes, or the construction of a new roadway. Also, only those roadways located on the federal-aid roadway network (Figures 5-2a and 5-2b) are eligible for inclusion in the 2040 LRTP project list. The total estimated cost for the state trunkline I & E projects totals $54.3 million, with the local agency capacity projects totaling approximately $9.1 million.

Through a comparison of the 28-year list of projects proposed for capacity improvements and the capacity deficiencies previously identified, it is evident that not all of the 2010 and 2040 capacity deficiencies have been addressed by the plan. Improvements have not been proposed for a number of the deficiencies primarily due to funding availability or environmental, social, or political issues rendering the project unfeasible during the 2040 Long Range Transportation Plan's time frame.

Only those I & E projects for which funding is projected to be available, based on anticipated federal, state and local revenues, are included in 2040 LRTP list of projects. Other unfunded projects and areas of concern discussed during the planning process by both MDOT and local agencies can be included in the Plan as “illustrative” projects but not programmed for implementation.

Previously in this chapter (Table 12-2), the transportation modeling process identified the existing (2010) volume/capacity corridor deficiencies based on the existing road network. The second system analysis included future (2040) trips on the existing network if no improvements to the system were made. This is referred to as the “No Build” alternative, and usually includes just those projects which are committed to be built in the near future.

The final scenario included in the system modeling analysis is a review of the future trips on the future road system. The 2040 “Build” network model includes the suggested road widening and capacity improvements proposed to alleviate congested subareas or corridors. It is important to remember that the volume to capacity ratio reflects a 24-hour volume and a 24-hour capacity. It does not reflect deficiencies that only occur briefly at certain time periods, because of road geometrics, or roadway conditions. Adding the 2040 ‘Build’ projects to the travel-demand forecast model resulted in minimal impacts on the forecasted volumes on the future network (Figure 12-4a and 12-4b and Table 12-5).

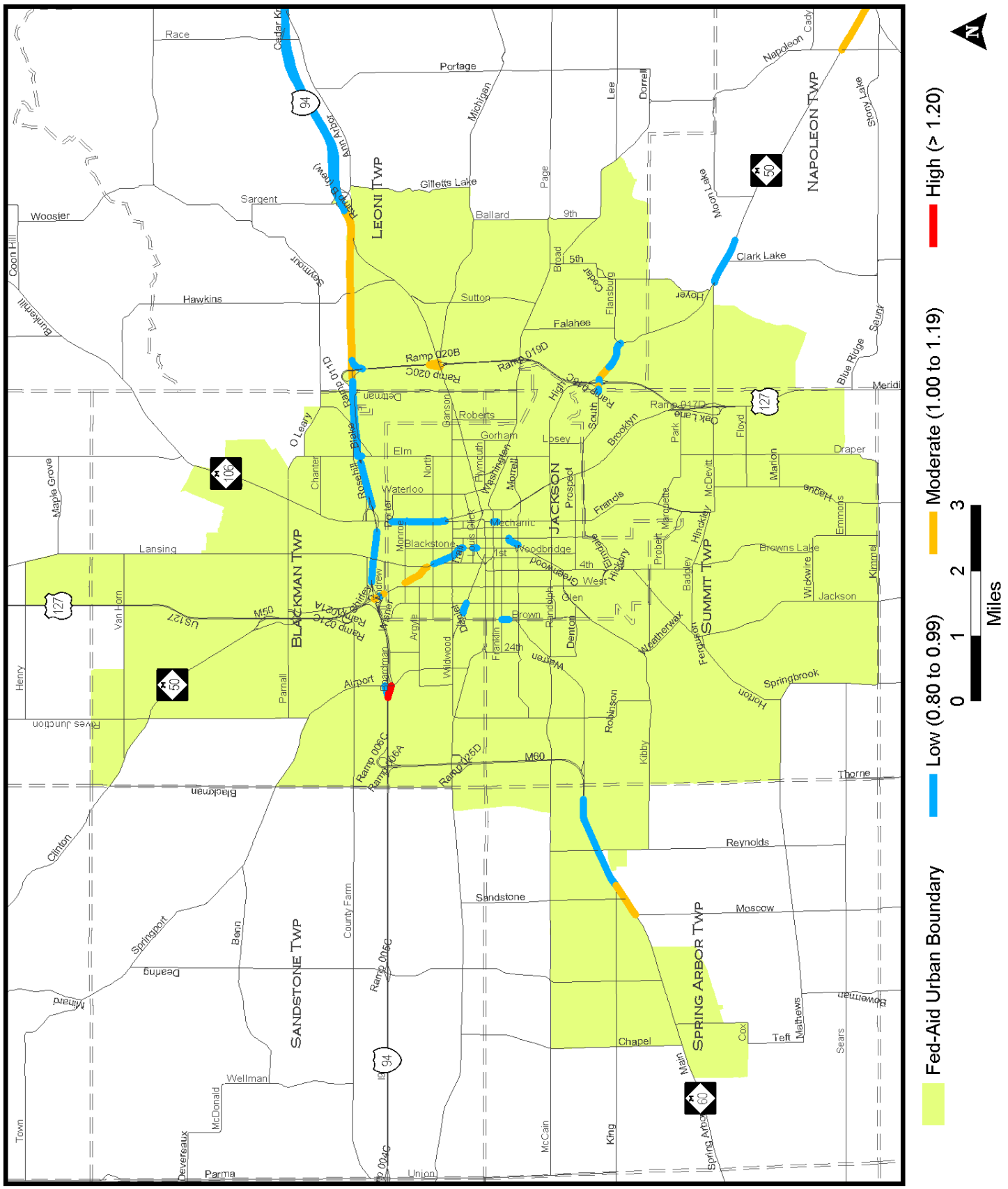

Figure 12-4a
Build Scenario: Jackson Urbanized Area

2040 Capacity Deficiencies

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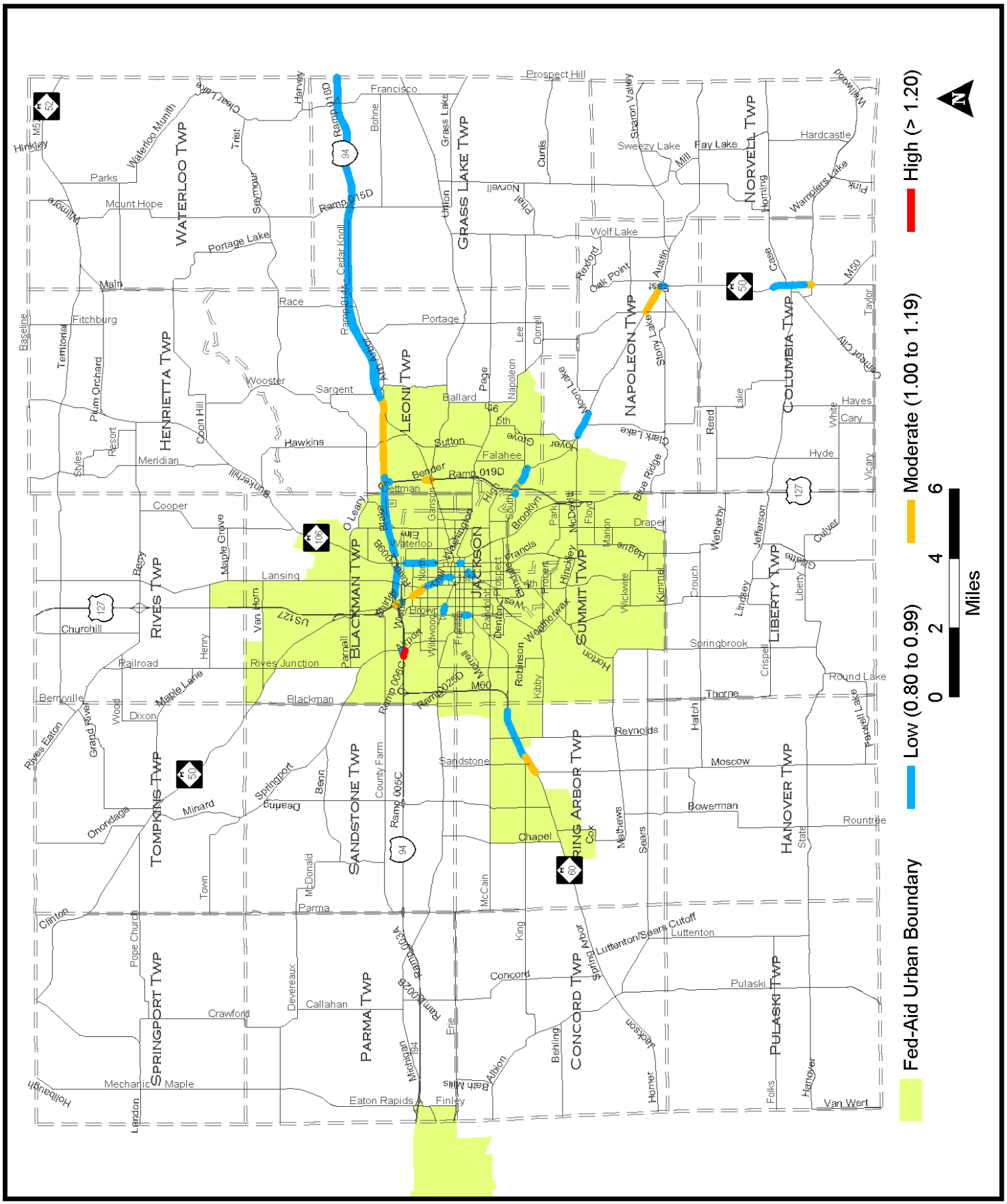

Figure12-4b
Build Scenario:Jackson County

2040 Capacity Deficiencies

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Table 12-5
2040 "Build" Scenario Deficient Corridors

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
I-94 EB Off Ramp	Airport Road Interchange		0.187	1.31	1	1
Brooklyn Road (M-50)	Napoleon Road	Austin Road	0.877	1.13-1.16	2	2
US-127 SB Off Ramp	Michigan Avenue Interchange		0.174	1.13	1	1
Clinton Street	US-127/I-94 Interchange	Boardman and Andrew Streets	0.175	0.94-1.11	4	4
Spring Arbor Rd	Moscow Road	End of M-60 Expressway	1.977	0.84-1.09	2	2
E. South Street	US-127	Flansburg Road	0.855	0.96-1.04	2	2
US-127 NB On Ramp	Ann Arbor Road Interchange		0.136	1.05	1	1
Clinton Street	Monroe Street	Lansing Road	0.423	1.06-1.10	2	2
S. Main Street, Brooklyn	Wamplers Lake Road	Brooklyn Town Square	0.459	0.89-1.03	2	3
I-94 East Bound	West Avenue (US-127 NB)	Washtenaw County Line	15.254	0.64-1.01	2	2
I-94 West Bound	West Avenue (US-127 NB)	Washtenaw County Line	15.241	0.71-1.00	2	2
Cooper Street	Porter Street	Francis Street	0.807	0.81-0.96	2	3
Lansing Street	Steward Street	Blackstone Street	0.350	0.81-0.91	2	3
I-94 WB On Ramp	Airport Road Interchange		0.147	0.92	1	1
Blackstone Street	Lansing Street	Louis Glick Highway	0.233	0.75-0.83	2	3
N. Main Street, Brooklyn	North of Mill Street		0.582	0.80-0.90	2	3
Brooklyn Road (M-50)	Austin Road	Stony Lake Road	0.091	0.89	2	2
Greenwood Street	Wilkins Street	Morrell Street	0.158	0.84-0.85	2	2
US-127 NB Off Ramp	I-94 East Bound		0.227	0.88	1	1

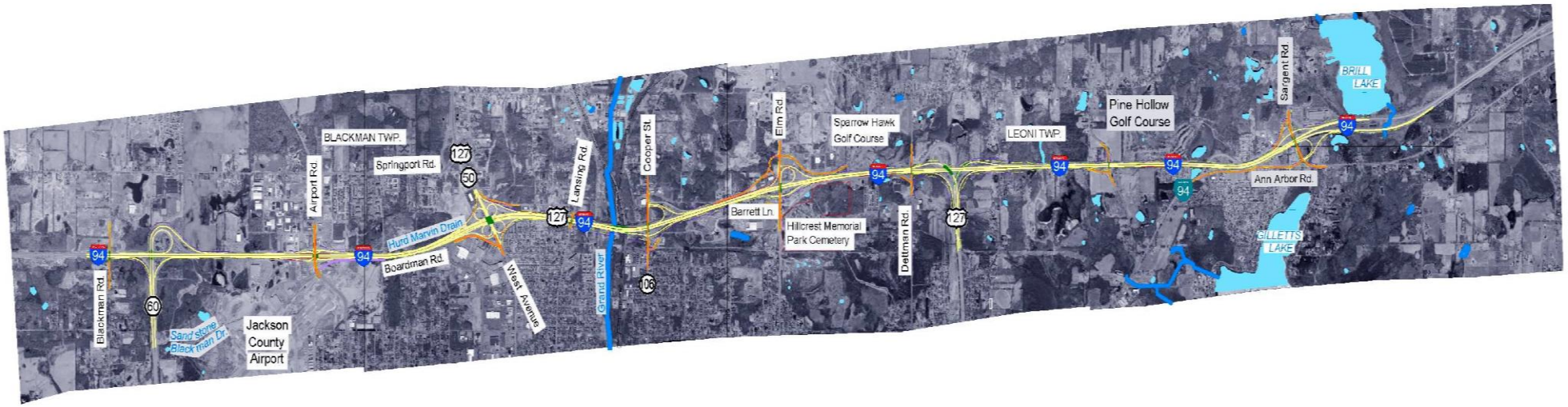
Table 12-5
2040 "Build" Scenario Deficient Corridors
(Continued)

ROUTE NAME	FROM	TO	LENGTH (Miles)	V/C RATIO	THRU LANES	TOTAL LANES
Brooklyn Road (M-50)	South Street	Clark Lake Road	0.350	0.86	2	2
Wildwood Street	Daniel Street	Wisner Street	0.155	0.82-0.84	2	3
Brooklyn Road (M-50)	Clark Lake Road	Moon Lake Road	1.090	0.79-0.84	2	2
N. Francis Street	@ Cooper Street		0.018	0.85	2	3
Wilkins Street	Greenwood Street	Jackson Street	0.029	0.81	2	2
I-94 WB Off Ramp	Elm Road Interchange		0.177	0.86	1	1
Francis Street	Washington Street	Franklin Street	0.056	0.82	2	2
Brown Street	Franklin Street	Spring Arbor Road	0.112	0.82	2	2
Elm Street	@ I-94 Interchange		0.063	0.80	2	2

I-94 MODERNIZATION STUDY

The Michigan Department of Transportation (MDOT) completed the Final Environmental Impact Statement and Final Section 4(f) Evaluation for the I-94 Freeway Modernization Study in November, 2006 and the Record of Decision (ROD) was approved by the Federal Highway Administration in March, 2007 (Appendix B). The project study area included 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 roadway capacity in the I-94 corridor by replacing existing road segments, interchanges, and bridges with modern facilities designed to accommodate projected year 2025 traffic volumes, and (3) to improve motorist safety (Figure 12-5).



Legend

- Interstate Route
- Business Route
- U.S. Route
- State Route

- Open Water
- Proposed I-94 Mainline and Ramp Improvements
- Proposed Local Road Improvements
- Proposed Bridge Structure

MDOT
Michigan Department of Transportation

Figure 1
Preferred Alternative (Overall View)

I-94 Jackson Freeway Modernization Project
M-60 to Sargent Road
Jackson County, Michigan

Chapter 12

Roadway Transportation Deficiencies and Recommended Projects

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The following information is directly from the 2035 Long Range Transportation Plan. At that time, the phasing listed below was agreed to by all parties. Currently, an ad hoc committee consisting of local representatives and MDOT experts is reevaluating the phasing strategy of the elements based on: 1) Safety; 2) Operations; 3) Condition; and 4) Underclearance.

No agreement has been reached regarding the phasing of the corridor improvement projects. This information will be updated once agreement has been reached.

"With a projected cost of $409 million (in year 2005 dollars), sufficient funding is not available for construction of the entire 9-mile corridor. Instead, MDOT will phase project implementation over the next 5 to 40 years based on traffic volume needs, congestion, and funding availability. 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 should be completed in 2013.*

***Phase 2**: US-127/M-50-West Avenue interchange reconstruction; reconstruct the northern portion of the Sargent Road interchange; replacement of the Lansing Avenue bridge overpass; and the replacement and widening of the I-94 bridge over the Grand River. The estimated time frame for the start and completion of this phase is 5 -25 years. No funding for this phase has been identified.*

***Phase 3**: US-127 South interchange reconstruction; Cooper Street interchange reconstruction; widen I-94 between the two legs of US-127; Airport Road interchange reconstruction; widen I-94 from US-127 South to Sargent Road; M-60 interchange reconstruction; 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 2035 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."