



FINAL PEL REPORT I-94 AND M-40 INTERCHANGE


Paw Paw, Michigan
MARCH 3, 2021

I-94 and M-40 Interchange Planning and Environmental Linkages Report

2021

This Planning and Environmental Linkages (PEL) Report for the I-94 and M-40 interchange was completed in accordance with the Federal Highway Administration’s (FHWA) PEL process. This study was a collaborative effort between the Village of Paw Paw, the Michigan Department of Transportation, FHWA, other organizations, stakeholders, and the public.

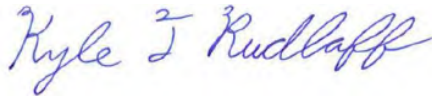
As an acknowledgement of our partnership during this process, we are in concurrence with the I-94 and M-40 interchange final PEL report.

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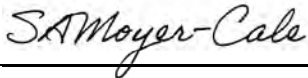
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3/8/21

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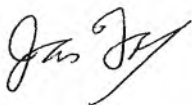
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Planning and Environmental Linkages (PEL) Process

This report is formatted to follow and address the Federal Highway Administration’s (FHWA) PEL Questionnaire which is located in **Appendix A**. The PEL Questionnaire was used as the guide to format the PEL report which summarizes the process followed for the I-94/M-40 project. The PEL process was followed to ensure planning and environmental factors were considered to carry forward into the National Environmental Policy Act (NEPA) analysis. The PEL process promotes a partnership with key stakeholders within the study area leading to an improved and balanced planning and decision-making process.

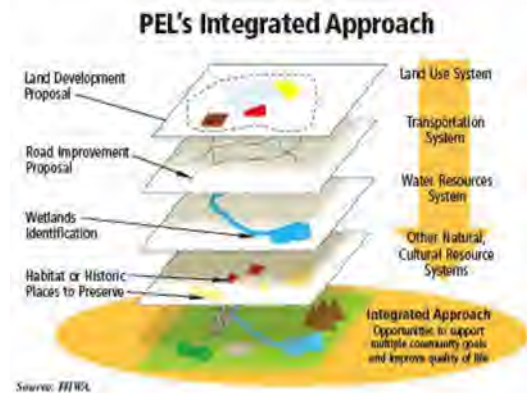
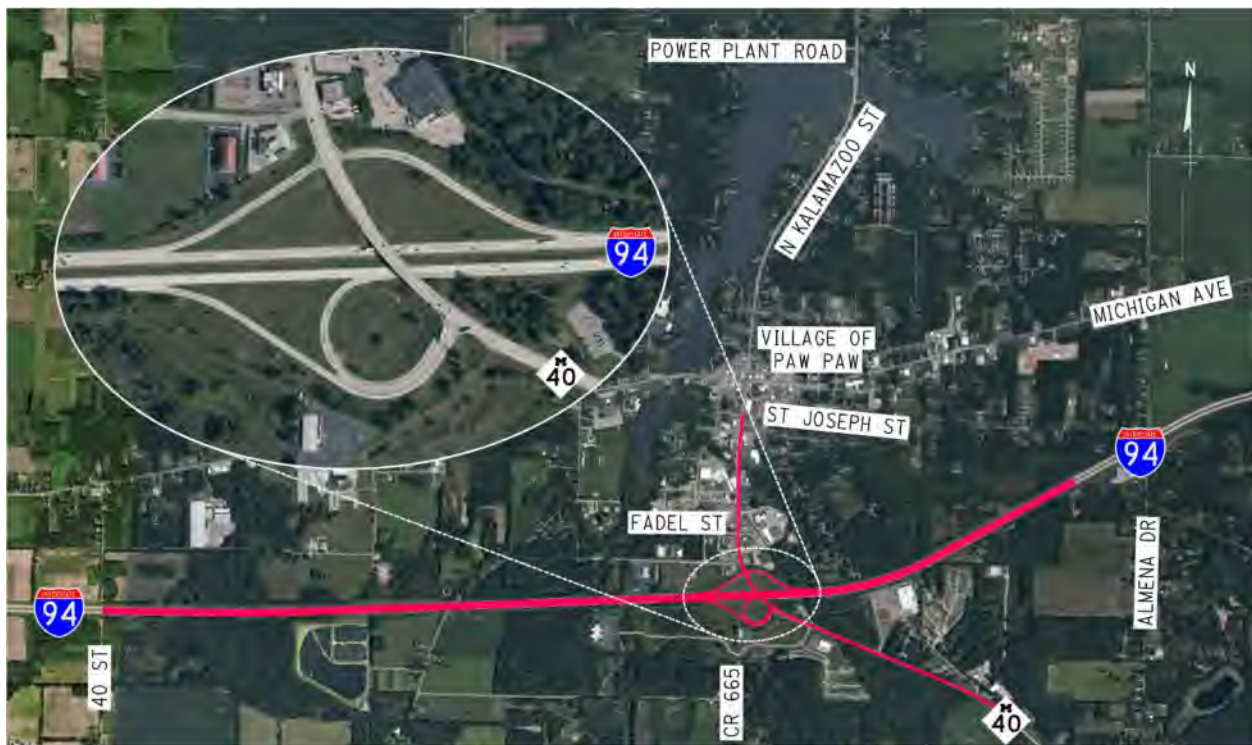


Figure 1: Project Study Area



Section 1

Background and Existing Conditions

The primary purpose of this project is to replace the aging M-40 bridge over the I-94 freeway which has reached its useful service life and improve the interchange ramps and associated intersections. In addition, the project will provide an improved I-94/M-40 interchange along with roadway rehabilitation or reconstruction for eastbound I-94 and M-40 north and south of the interchange. The length of the project is about 3.6 miles of eastbound I-94 and about 1.7 miles of M-40. The limits of the project are: M-40 beginning approximately near the drive entrance to the Paw Paw Seventh-Day Adventist Church (1.1 miles south of I-94) and continuing north to East St. Joseph Street, and eastbound I-94 beginning at 40th Street and continuing to 1.2 miles east of M-40. All project limits are within the Village of Paw Paw, Paw Paw Township, and Antwerp Township, located in Van Buren County (see Figure 1).

Existing Bridge and Roadway

As previously mentioned, the M-40 bridge over I-94 is the main reason for the project. The bridge was built in 1960, rehabilitated in 1980, and has reached the end of its service life. The bridge is a four span, 316 feet long, 51.5 feet wide (four lanes of traffic), 40-degree skew, concrete structure. The bridge is in poor to fair condition with spalled concrete and delaminated beams, abutments, and piers. As a result, bridge replacement and interchange reconstruction are recommended for this structure and location.

The I-94 freeway within the project limits includes 2-lanes in each direction (east and west), with a grass median between the eastbound and westbound travel lanes. The lanes are 12-foot wide each with a 5-foot inside (median) shoulder and 9-foot outside shoulder.

M-40, also known as S. Kalamazoo Street, is primarily four lanes with a center turn lane throughout the project limits. Sidewalks are present along most of M-40 north of I-94 and are four to five feet wide in most locations. However, sidewalk gaps exist along the east side of M-40 between the Knouse Foods and McDonalds driveways and in front of the Speedway adjacent to the Paw Paw River. Additionally, there is currently no safe pedestrian route across I-94 via M-40 because of the narrow cross section of the existing bridge.

Existing Land Use Characteristics

The M-40 corridor north of I-94 is mostly commercial land uses and the main route from the freeway to downtown Paw Paw which is located approximately $\frac{3}{4}$ of a mile north of the interchange. A key corridor feature is the area wineries, St. Julian Winery and Warner Vineyards, both located on the west side of M-40 about a half mile from the freeway exit. Other corridor businesses include gas stations, numerous restaurants (mostly fast food), car dealerships, auto part stores, and Knouse Foods Co-op which is located on east side of the road behind McDonalds.



Looking north towards Paw Paw from the I-94/M-40 interchange

M-40 south of the interchange takes a turn to the southeast towards Lawton, Michigan. In the southeast quadrant is an MDOT Park-n-Ride lot and a Walmart Supercenter. Across the road in the southwest quadrant is a Tractor Supply Co. store along with the Bronson Lakeview Family Care medical center.



Looking south at the CR 665 intersection with M-40 south of the interchange

Section 2 Methodology

The M-40 bridge over I-94 was identified by MDOT as needing replacement. As part of this replacement, MDOT decided to utilize the PEL process to engage the public and local stakeholders to see if other improvements should be made to the interchange. With the interchange work, MDOT also wanted to ensure that both eastbound I-94 and M-40 were improved so MDOT would not need to come back with a follow up project. In order to assess the best fix type within the allotted MDOT funding, a scoping report was developed for both eastbound I-94 and M-40 within the project limits previously described. Westbound I-94 is not included in the project limits as it is in good condition and was just reconstructed in 2006.

As part of this study, multiple technical reports were completed to support the engineering and traffic analysis, and include the following:

- Roadway Scoping Report
- Bridge Scoping Reports for:
 - M-40 over I-94
 - I-94 EB/WB over South Branch of Paw Paw River
 - M-40 over the East Branch of the Paw Paw River
- Culvert Scoping Reports for:
 - I-94 over the 3 Mile Lake Drain
 - M-40 over the Martin Drain
 - M-40 over the Maple Lake Inlet
- Traffic Memos
 - VISSIM Modeling Methodology and Assumptions Memo
 - Data Verification and Screening Assessment Memo
 - Calibration and Validation Memo
 - Base Conditions Memo
 - Alternative Analysis and Operations Memo
- Safety Analysis

The scope of work for this PEL included documentation of the PEL process which was updated throughout the study and included:

- Summarized the environmental analysis and potential impacts completed thus far for use during environmental clearance
- Engaged and solicited input from stakeholders and members of the public, including the Village of Paw Paw
- Developed and refined a purpose and need statement
- Developed a Preferred Alternative for use during final design
- Documented how the Preferred Alternative solves existing traffic congestion and safety issues

Although the PEL process is considered pre-NEPA (National Environmental Policy Act), the goal is to move into NEPA clearance once the PEL process is completed. As such, NEPA-like terminology was used in the project documentation to accommodate future NEPA classification and clearance. For instance, the PEL includes a purpose and need statement which went through multiple reviews and edits, including a public review period.

The decision makers throughout the study process consisted of the Administrative Team (Admin Team) and the Local Advisory Committee (LAC). Key coordination points between decision makers included the collection of relevant data, crash analysis, traffic operation analysis, development of the purpose and need, and alternatives development. Important

alternative decisions were made by the Admin Team utilizing this information. These decisions were communicated to the LAC at subsequent meetings to obtain comments and concurrence prior to the Community Conversations.

Section 3

Agency Coordination

Administrative Team Meetings

The I-94/M-40 PEL Admin Team had representatives from the Michigan Department of Transportation (MDOT), Village of Paw Paw, Federal Highway Administration (FHWA), and consultant WSP. A full list of Admin Team members can be found in **Appendix B**.

The first meeting of the Admin Team occurred in early January 2020. In mid-March, the Admin Team meetings switched from in-person to virtual due to the COVID-19 pandemic and functioned primarily as prep and post coordination meetings focused on the LAC meetings and alternatives development. An additional meeting was held with MDOT Roadside Development to provide the Village of Paw Paw with details related to potential aesthetic/gateway options and cost sharing requirements.

Table 1: Admin Team Meetings

Meeting Name	Meeting Date
Admin Team Meeting kickoff	January 7, 2020
LAC 1 Prep Meeting	March 3, 2020
LAC 1 Follow-up Meeting	March 9, 2020
LAC 2 Prep Meeting 1	April 2, 2020
LAC 2 Prep Meeting 2	May 19, 2020
LAC 2 Prep Meeting 3	June 16, 2020
LAC 2 Follow-up Meeting	June 30, 2020
Community Conversation #1 Prep Meeting 1	July 7, 2020
Community Conversation #1 Prep Meeting 2	July 13, 2020
Community Conversation #1 Prep Meeting 3	July 28, 2020
Community Conversation #1 Prep Meeting 4	July 29, 2020
Roadside Development Aesthetics Meeting	August 4, 2020
Community Conversation #1 Follow-up Meeting	August 5, 2020
LAC 3 Prep Meeting 1	September 1, 2020
LAC 3 Prep Meeting 2	September 22, 2020
LAC 3 Follow-up Meeting and Public Notification Prep	October 26, 2020
Public Notification and Video Released	December 10, 2020

Resource Agencies

Due to the lack of environmental resources located within the project limits and the goal of keeping the project within existing right of way (ROW) to the extent practicable, there was not a need to coordinate with resource agencies.

Section 4

Public Coordination

The I-94/M-40 PEL Admin Team coordinated with stakeholders and the public to obtain input on potential existing issues and receive feedback on proposed alternatives. Three LAC meetings were held, the first in person and the last two virtually, and one virtual Community Conversation was held followed by a publicly released video explaining how the project team arrived at the Recommended Alternative.

Local Advisory Committee (LAC) Meetings

The I-94/M-40 Admin Team worked with representatives of the LAC in order to obtain advisory input regarding direction and decisions made throughout the project. The LAC was an integral element of this study as progression of the project was dependent upon engaging members and gathering important feedback. A list of LAC member organizations is shown below in Table 4: Brainstorming Session Recommendations Local Advisory Committee Agencies/Organizations. A list is also included in **Appendix C** and includes the names of the representatives from each organization who were invited and attended the meetings. LAC members were also kept up to date through emails and postings to the project webpage. Meeting presentations, attendance lists, and other information are included in **Appendix D**.

Table 2: Local Advisory Committee Agencies/Organizations

Van Buren County Administrator	Paw Paw DDA
Van Buren County Board of Commissioners	Paw Paw Fire Department
Van Buren County Road Commission	Paw Paw Police Department
Van Buren Public Transit	Paw Paw Township
Van Buren County Sheriff's Department	Paw Paw Chamber of Commerce
Market Van Buren	Paw Paw District Library
Kalamazoo Area Transportation Study (KATS)	Michigan Senate
Bike Friendly Kalamazoo	Michigan House of Representatives
Bronson Lakeview Hospital	St. Julian Winery
Walmart	Warner Vineyards

LAC Meeting 1 - March 5, 2020

The goal of the first LAC meeting was to introduce the project, provide an overview of the study process and ask for their feedback. The MDOT project team discussed the existing conditions and data that had been collected to date and asked for input regarding other potential issues the team should be aware of. The committee members were also asked to provide input to their initial thoughts regarding the purpose and need for the project beyond just the replacement of the bridge over I-94. The committee members were then

broken into small groups and worked together to provided ideas, observations, and issues onto aerial maps which were then presented to the broader group. At the end of the meeting the MDOT project team provided an overview of the intended communication plan as the project moves forward.

LAC Meeting 2 - June 24, 2020

The second LAC meeting was held virtually and began with a review of what the Admin Team heard at the last LAC meeting regarding local concerns with the interchange and adjoining roads. These issues included: lack of pedestrian accommodations over I-94; lack of pedestrian crossings on M-40 north of the freeway; difficult left turns at the westbound I-94 off ramp; difficult left turns from CR 665 to northbound M-40; desire for aesthetic treatments for the new bridge and interchange, and potential gateway options into the Village of Paw Paw. Gateway options are defined as enhancements that help identify and brand the community character to drivers entering the village. These enhancements can take many forms, but typically include such things as signage, planters, more visible crosswalks, and lighting fixtures. The Team also reviewed the draft purpose and need and presented the three practical alternatives developed since the last LAC meeting. Lastly the Team sought input from the LAC regarding materials to present at the upcoming Community Conversation.

LAC Meeting 3 - October 8, 2020

The third LAC meeting was also virtual and held after the July 30th Community Conversation. It recapped the study to date, finalized the purpose and need, presented the alternative comparison matrix, reviewed the public comments received at the Community Conversation, and presented the Recommended Alternative. The LAC was presented with an opportunity for open discussion of the presented material to obtain feedback as the Admin Team moved into finalizing the recommendations.

Community Conversations

Due to the COVID-19 pandemic, the planned public engagement open houses for the study were switched to an online virtual format. The Community Conversation presentation, meeting invitation, and the public notification for the Recommended Alternative are included in **Appendix E**.

Community Conversation - July 30, 2020

The Team developed a meeting invitation which was distributed using e-mail, press release and the project website which provided the registration directions and connection instructions for the webinar. The webinar was held from 1:00-3:00 pm and had 86 participants including the Admin Team. The meeting provided an overview of the PEL process, introduced the Admin Team and LAC representatives, presented the draft purpose and need, and presented the three practical alternatives. Online polling was used to obtain feedback on materials presented, and participants were able to ask questions using the webinar chat function.

Below is a summary of the comments received from the Community Conversation webinar:

Table 3: Community Conversation Comments

COMMENT TOPICS	NUMBER OF COMMENTS
Desire for pedestrian/non-motorized crossing of I-94 and for crosswalks north and south of the interchange	7
Expressed preference for the roundabout alternative	4
Questions about how the bridge will accommodate I-94 being widened	4
Questions about how successful other roundabouts have been	3
Questions about other alternatives that were considered	3
Questions about the project duration and when it will begin	3
Questions about the process for those who could not attend the meeting but wanted to provide comments	2
Expressed preference for the signals to roundabouts	1
Question about how right of way may impact businesses	1
Question about the lack of traffic lights at the WB terminals for Options 1 and 2	1
Question about the potential relocation of the Park 'N' Ride	1
Prefers meeting to take place outside of working hours	1
Comment to thank the team for a clear presentation that attendees could easily follow along to	1

Public Notification and Video Released - December 10, 2020

As a result of limited comments on the three practical alternatives, positive feedback regarding the recommended alternative, and with support from the Village of Paw Paw and LAC, MDOT decided to issue a public notification regarding the decision on a recommended alternative for the I-94/M-40 interchange. As part of the public notification, a video presentation was developed which explained the process that led to the recommendation of the preferred alternative. The public notification was released on December 10 and provided an 18-day public comment period.

The decision to use the video to convey the recommended alternative to the public was in part due to the unique circumstances related to the COVID-19 pandemic and limited in-person meetings. Typically, MDOT would have held a public meeting/community conversation to present the recommended alternative to the public. Few comments were received from the first community conversation and based on feedback from both the LAC and other public engagement virtual meetings people have indicated an appreciation for information they can view on their own time instead of holding a meeting at a specific time.

Section 5

Purpose and Need

Purpose and Need Development

The purpose and need statement was developed with input provided by the Admin Team, the LAC, and the public and was reviewed and refined several times based on comments received. MDOT provided the I-94/M-40 project objectives to serve as the initial basis for the purpose and need which was shared at the first LAC meeting. The project objectives included:

1. Identify an interchange alternative that efficiently and safely improves mobility and addresses purpose and need
2. Roadway scoping for EB I-94 and M-40 to identify the best fix type with available funding
3. Bridge and Culvert scoping to identify the best fix type with available funding

As mentioned previously the development of the purpose and need was an iterative process with multiple opportunities for review and comment by the Admin Team, LAC, and the public. The process included the following steps:

- LAC Meeting 1 – gather local concerns and priorities to craft the initial draft purpose and need
- Develop draft purpose and need and provide to Admin Team for review and comment
- LAC Meeting 2 – present draft purpose and need and obtain feedback
- Refine draft purpose and need based on LAC 2 comments
- Community Conversation – present draft purpose and need for public review and comment
- LAC Meeting 3 – finalize purpose and need statement

Purpose and Need Statement

Below is the final purpose and need statement based on the reviews and comments received from the process outlined above.

Purpose:

The I-94 at M-40 Planning and Environmental Linkages (PEL) study will look to improve safety and operations for all users of this interchange and transportation system while minimizing impacts to the natural environment and adjoining properties and enhancing positive benefits to the community, businesses, and users of the corridor.

This PEL process addresses M-40 (S. Kalamazoo Street) from the Seventh-day Adventist Church to St Joseph Street including the I-94 interchange ramps, and will:

- Replace the aging M-40 bridge infrastructure over I-94
- Improve interchange and intersection traffic operations
- Provide safe nonmotorized facilities to cross I-94 and M-40
- Enhance the entrance/gateway to the Village of Paw Paw
- Stay within existing limited access right-of-way to the extent practicable
- Optimize constructability for maintenance of traffic
- Minimize future maintenance costs

Need:

- Poor structural condition of the M-40 bridge over I-94
- Limited opportunities and locations for nonmotorized users to cross I-94 and M-40
- Poor sight distance and pavement markings affects traffic mobility, operations, and safety of the interchange and adjoining intersections

Once finalized, the purpose and need statement was used as the basis for the development of the alternatives evaluation matrix which compared the three practical alternatives against how well they met the purpose and need.

Based on the multiple reviews, opportunities for input, and resulting refinement during the development of the purpose and need Statement it should be able to move directly into the NEPA process as the project-level purpose and need.

Section 6

Range of Alternatives

Brainstorming Session

When developing alternatives as part of a PEL study, it is important to evaluate the potential alternatives from a “blank slate” point of view to be certain a full range of potential solutions are investigated. Thus, the range of alternatives covers a wide scope and includes what has already been considered and new alternatives for consideration.

With consideration to the stated objectives of the Michigan Department of Transportation and the Village of Paw Paw, as well as the safety and functionality issues known to exist in this area, the study team proposed and considered several potential solutions. Ten alternatives were put forward and discussed with five of these being carried forward for

further discussion. The others were eliminated from consideration due to a lack of value in relation to their expected cost.

The initial development of potential alternatives improvements occurred at the Study Team brainstorming session held on January 16, 2020. Recommendations from the brainstorming session are listed in Table 4, with the ones shaded being carried forward.

Table 4: Brainstorming Session Recommendations

Alternative	Reason for Consideration	Determination
<p>Over-Under Cloverleaf (as proposed by a member of the public)</p>	<ul style="list-style-type: none"> - Efficient traffic flow - Requires no traffic signals 	<p>Eliminated: The proposed design provides traffic capacity beyond what is required. The scale of the interchange as well as the grading elements required for the three levels would result in a substantial cost. As well, the design does not adequately accommodate pedestrian traffic. The design also introduces new weave movements along M-40 resulting in safety concerns. Number and length of bridges would be very expensive and cause future maintenance concerns</p>
<p>Dual Roundabouts (maintaining existing ramp configuration)</p>	<ul style="list-style-type: none"> - Roundabouts allow for improvement to horizontal alignment - Reduces the size and complexity of the bridge - Improves safety by slowing traffic entering Paw Paw - Opportunities for aesthetic/branding features - Potential to tie existing CR 665 into the southern roundabout to eliminate sharp reverse curves - Improves safety and operations of lane add and lane drop along NB and SB M-40 south of I-94 	<p>Carried Forward: This option would accomplish most of the major objectives in a cost-effective way. The downsides include multiple pedestrian crossings and a large amount of fill required to match roundabouts to the vertical alignment of the bridge.</p>
<p>Single Point Urban Interchange (SPUI)</p>	<ul style="list-style-type: none"> - SPUI intersections can be efficient and can handle large traffic volumes. - A SPUI would eliminate the existing loop ramp and the left turn issues exiting WB I-94 ramp terminal. 	<p>Eliminated: A SPUI intersection would be more costly due to the larger bridge structure that is typically required. In addition, the curved horizontal alignment would require a complex bridge design which would further increase cost.</p>

Alternative	Reason for Consideration	Determination
Tight Diamond	<ul style="list-style-type: none"> - Removes substandard M-40 to EB I-94 loop ramp - Provides good pedestrian access - Straightforward interchange configuration 	Carried Forward: This option would be similar to the existing configuration with improved terminals for the EB I-94 ramps. May require additional Right of Way south of I-94.
Diverging Diamond Intersection (DDI)	<ul style="list-style-type: none"> - a DDI can optimize traffic flow and minimize space requirements for some situations 	Eliminated: The horizontal geometric constraints of this location make it impractical for a conventional DDI interchange to be constructed. A modified configuration to fit the existing curve would diminish the primary benefits that a DDI can provide.
Replacement in Kind with lane and signal improvements	<ul style="list-style-type: none"> - Maintains consistency and minimizes the area disrupted - Traffic flow issues could be resolved with lane reconfiguration and a new traffic signal at the WB I-94 ramp terminals - The cost may be lower than the other options 	Carried Forward: This option is likely to be a less expensive option. Most of the traffic flow issues could be addressed by adding signals and/or changing lane configurations. The loop ramp would remain, and the new bridge would have to be constructed with a curve similar to existing. Constructing the new bridge on alignment would be more disruptive to traffic during construction.
Roundabout (South Terminal only)	<ul style="list-style-type: none"> - South roundabout allows for improvements to horizontal alignment - Improves safety by slowing traffic down coming into Paw Paw - Improves safety and operations of lane add and lane drop along NB and SB M-40 south of I-94 	Carried Forward: This option would accomplish many of the primary benefits of introducing dual roundabouts while only requiring a single roundabout.

Alternative	Reason for Consideration	Determination
Dual Roundabout & Full Diamond	<ul style="list-style-type: none"> - Roundabouts allow for improvement to horizontal alignment - Reduces the size and complexity of the bridge - Improves safety by slowing traffic entering Paw Paw - Opportunities for aesthetic/branding features - Diamond configuration allows for a smaller diameter roundabout and simpler signing - Potential to tie existing CR 665 into the southern roundabout to eliminate sharp reverse curves - Improves safety and operations of lane add and lane drop along NB and SB M-40 south of I-94 	Carried Forward: This option would have the same benefits as the dual roundabout option with the added benefit of exchanging the existing loop ramp for a diamond interchange. The downsides include multiple pedestrian crossings and a large amount of fill required to match roundabouts to the vertical alignment of the bridge. It may also require additional Right of Way to be acquired south of I-94 and relocation of the park and ride facility.
Loop in NW Quad with Signal	<ul style="list-style-type: none"> - Provides ideal pedestrian flow by eliminating the need for pedestrians to cross ramps 	Eliminated: A loop ramp does not fit in the existing Right of Way north of I-94 and would require the purchase of several businesses.
Roundabout (North Terminal only)	<ul style="list-style-type: none"> - Resolves left turn issue from existing WB I-94 ramp onto M-40 	Eliminated: A roundabout only on the north side creates geometric challenges trying to tie in with the horizontal alignment to the south.

Practical Alternatives

The results of the brainstorming session resulted in five practical alternatives which were shared and discussed with the Admin Team and include the following:

Figure 2: Brainstorming Practical Alternatives

Alternative #1 – Replace in Kind



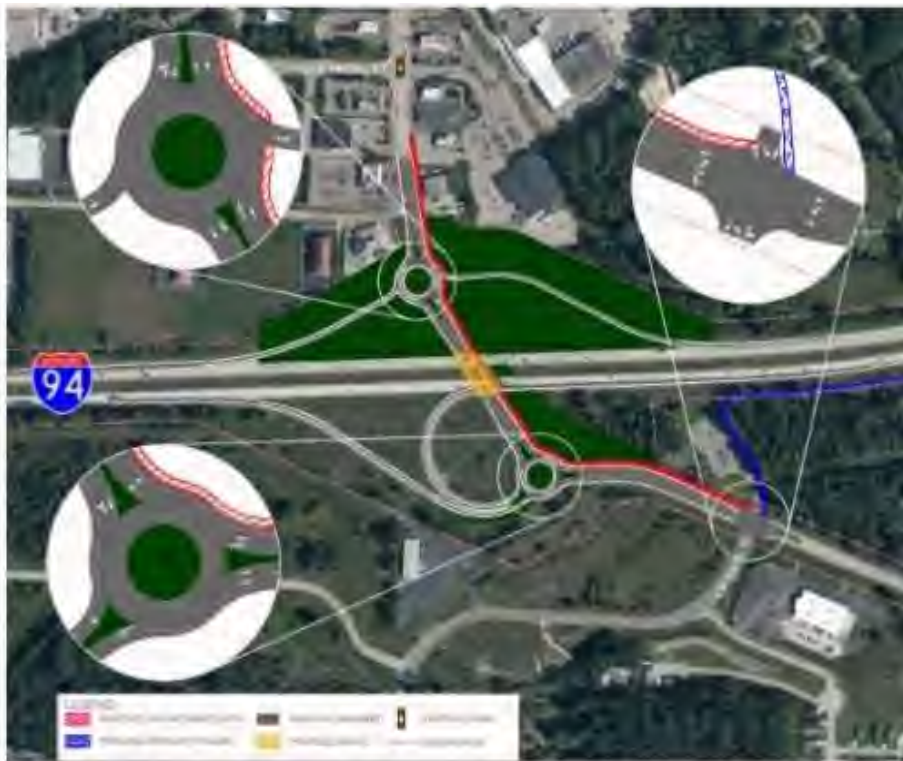
Alternative #2 – Diamond



Alternative #3 – Dual Roundabouts (No Loop)



Alternative #4 – Dual Roundabouts (With Loop)



Alternative #5 – South Roundabout Only



After reviewing the practical alternatives, the Admin Team felt that two of the alternatives, although practical, did not meet the evaluation criteria as well as the other three and decided to remove them from further consideration. They included:

- Alternative 4– Dual Roundabouts keeping the same ramp configuration: This concept was removed since it would result in more sideswipe accidents between the northbound M-40 to eastbound I-94 and southbound M-40 movement within the roundabout.
- Alternative 5 – South Roundabout only: This concept was removed because it didn't provide a cost/safety/operational benefit over the Dual Roundabout Alternative.

These alternatives and the associated evaluation matrix were shared with the LAC members at LAC Meeting 3.

Figure 3: Practical Alternative 1 - Replace in Kind



Figure 4: Practical Alternative 2 - Diamond

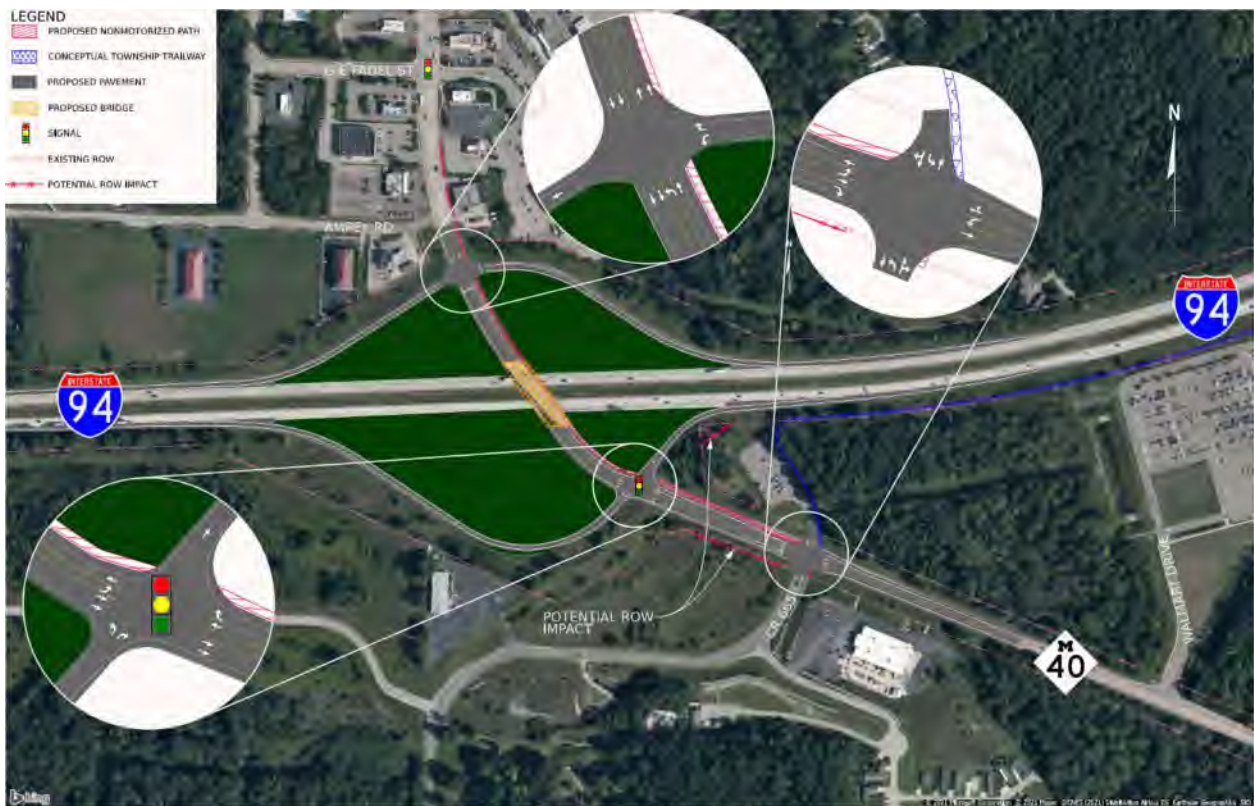
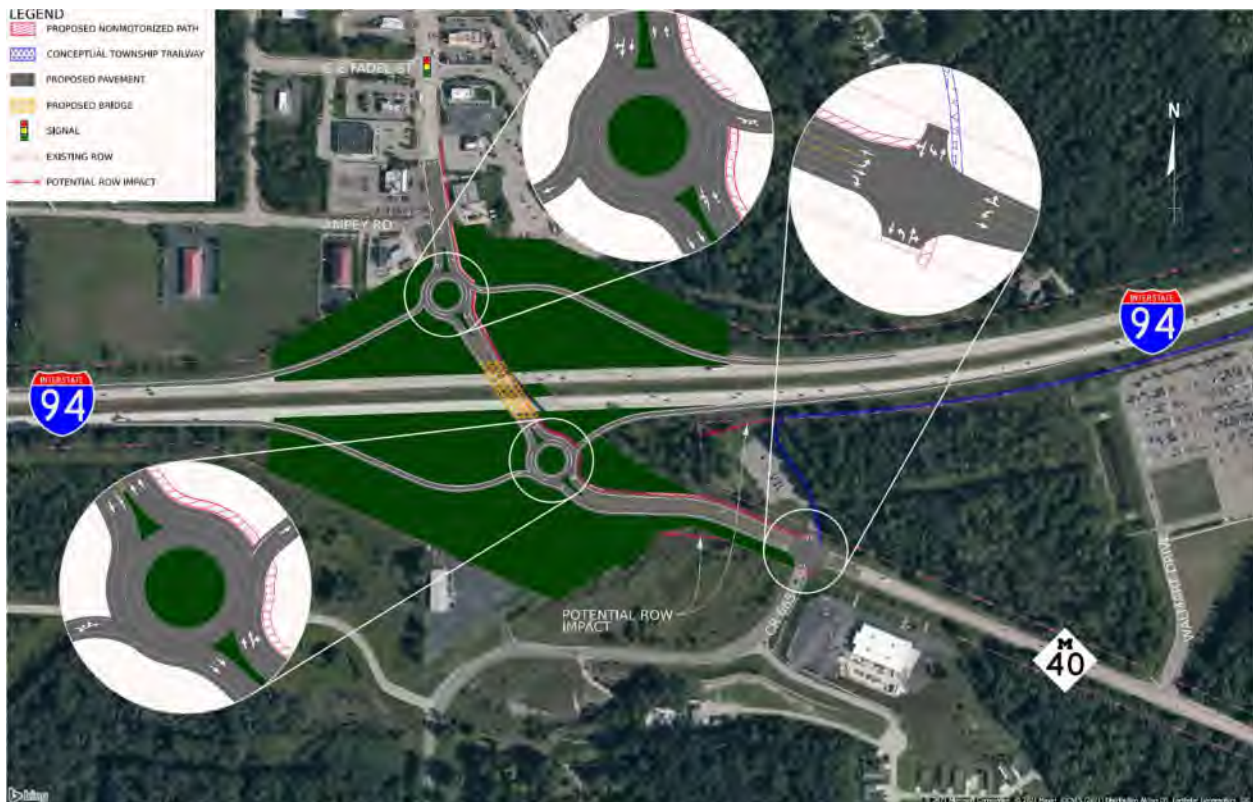


Figure 5: Practical Alternative 3 - Dual Roundabouts



The values in the matrix are a mix of quantified values where possible and qualified assessments depending on the issue being evaluated. Below is a guide to assist in understanding the values in the Comparison of Alternatives Matrix.

- Good, Better, Best ratings relate to how well the alternative meets the objectives within the Purpose & Need statement
- *Traffic Operations – Average amount of delay (in seconds) a motorist is anticipated to experience traveling through the interchange during the highest volume peak hour in 2039
- **Safety – Average number of crashes per year (2019) expected within the interchange (includes mainline I-94)
- ***Safety – Average number of crashes per year (2019) expected at the ramp terminals only

Table 5: Comparison of Alternatives Matrix

	Alternative 1 Replace in Kind	Alternative 2 Diamond	Alternative 3 Dual Roundabouts
Cost	\$20.98M	\$21.34M	\$21.25M
Right of Way Impacts	0 acre	0.21 acre	0.25 acre
*Traffic Operations	26.3 seconds	30.8 seconds	5.9 seconds
Non-motorized Mobility	Provided	Provided	Provided
**Safety (Interchange) (Fatal/Injury)	30.2 crashes (5.95)	29.3 crashes (5.48)	25.0 crashes (4.46)
***Safety (Ramp Terminals) (Fatal/Injury)	5.85 crashes (1.18)	7.35 crashes (1.41)	2.83 crashes 0.36
Aesthetic/Gateway Opportunities	Good (bridge and infield area)	Good (bridge and infield area)	Best (bridge, infield and roundabouts)
Environmental Impacts	Minimal	Minimal	Minimal
Constructability	Good (part-width bridge, all ramps on alignment)	Better (part-width bridge, 1 ramp off alignment)	Best (bridge off alignment, 1 ramp off alignment)
Maintenance	Good (27,296 square feet bridge, 1 signal, no street lighting)	Better (23,458 square feet bridge, 1 signal, no street lighting)	Best (22,178 square feet bridge, 0 signals, street lighting at roundabout)

Recommended Alternative

During LAC Meeting 3, the Admin Team indicated Alternative 3, the Dual Roundabouts alternative, appeared to be the best solution for this interchange based upon a variety of factors including stakeholder and public sentiment. The Comparison of Alternatives Matrix supported this conclusion and based upon the reasons listed below and the comments received during LAC Meeting 3, the Admin Team made the decision for Alternative 3 to be the Recommended Alternative for the I-94/M-40 interchange.

Reasons why Alternative 3 was selected as the Recommended Alternative:

- Reduces speeds entering Paw Paw from the south
- Eliminates sight distance concerns for the westbound exit ramp
- Improves the existing I-94 eastbound entrance loop ramp to a straight configuration
- Easier to maintain traffic during bridge construction
- Provides better gateway opportunities

Roundabout Safety

FHWA has identified roundabouts as a proven safety countermeasure because of their ability to substantially reduce the types of crashes that result in injury or loss of life. Roundabouts are designed to improve safety for all users, including pedestrians and bicyclists. They also provide significant operational benefits compared to conventional intersections. On average, roundabouts reduce severe crashes – those resulting in injury or loss of life – by 78-82%.

There are a couple reasons for the reduced severe crashes:

- 1) Lower speeds - Traffic speed at any road or intersection is vitally important to the safety of everyone, and especially non-motorized users. Lower speed is associated with better yielding rates, reduced vehicle stopping distance, and lower risk of collision injury or fatality. Also, the speed of traffic through a roundabout is more consistent with comfortable bicycle riding speed.
- 2) Less conflicts – Dual roundabouts have fewer pedestrian-vehicle conflict points than a comparable stop or signal controlled intersection. Conflicts between bicycles and vehicles are reduced as well.

Section 7

Planning Assumptions and Analytical Methods

Range of Alternatives

The approach for evaluating a full range of alternatives and interchange configurations is to evaluate potential alternatives from a “blank slate” point of view to be certain a full range of potential solutions were examined as viable alternatives for the interchange. Thus, the range of alternatives covers a wide variety of potential options with the understanding the actual location of the interchange would not be moved, only altered depending on the specific alternative being evaluated. See Section 6, Range of Alternatives, for a full discussion on the alternatives considered.

Alternative Evaluation Criteria

The project purpose and need statement, feedback received from the Admin Team and the LAC, and comments received from the public meetings, were all used to develop a comparison of alternatives matrix/table (see

Table 5: Comparison of Alternatives Matrix) The purpose of the table was to provide a method/exhibit to easily compare the alternatives being considered using key criteria developed to that point in the study. The criteria centers around the key elements of the purpose and need statement such as traffic operations, safety, and non-motorized mobility. Each criterion was then evaluated against the potential practical alternatives. Where possible, quantitative data was used in the evaluation criteria, such as traffic operations and safety. Other criteria used a qualitative rating of Good, Better, Best rating as it related to how well the alternative meets the purpose and need. Estimated costs were included in the comparison matrix to illustrate the difference between the alternatives. Although cost is ultimately a consideration for transportation projects, in this case it was not a significant differentiator.

Environmental Analysis

MDOT's Environmental Section completed an environmental scoping review (see **Appendix F**) for the project that preliminarily assessed potential impacts to environmental resources. At this stage of project development (PEL) the intent is to identify constraints that could influence the alternative evaluation and selection process. The primary environmental resources of potential concern are water quality, streams, wetlands, and contaminated sites. It is anticipated minimal ROW impacts will occur as a result of the Recommended Alternative and thus minimal environmental impacts are anticipated.

Traffic Analysis

The three Practical Alternatives were all analyzed using traffic analysis software (**Appendix G**) with traffic volumes grown from present conditions to anticipated 2039 (20-year) traffic volumes. The traffic growth factor used to establish the 2039 future conditions was provided by MDOT's Planning Department. For this analysis, a 0.5% annual compounding growth rate was applied to all existing condition traffic volumes over the 20-year analysis period. This growth factor was applied to the base condition models (AM and PM peak hour) to grow the traffic volumes to estimated 2039 volumes which became the No-Build model (Alternative 1) as this model contained the existing geometry, lane markings, and traffic control with the future traffic volumes. The No-Build (Alternative 1) model was then modified geometrically, operationally, or both as required to replicate the alternatives.

Safety Analysis

Anticipated Crash Analysis Methodology

The Highway Safety Manual (HSM) was used to analyze the various interchange alternatives. Based on the HSM and ISATe analysis, Alternative 3 is expected to result in fewer crashes overall. Although, Alternative 3 is expected to result in slightly higher crashes on the crossroad segments compared to Alternatives 1 and 2, fewer crashes are expected to occur at the intersections, ramps, and mainline.

The HSM introduces a science-based technical approach to incorporating safety into traditional roadway planning and safety analyses. The first edition of the HSM (2010) provides information and tools to facilitate roadway planning, design, operations, and maintenance decisions based on precise consideration of their safety consequences. The primary focus of the HSM is the introduction and development of analytical tools for predicting the impact of transportation projects and program decisions on road safety.

For this analysis, a combination of tools was used to assess the alternatives. Since the Enhanced Interchange Safety Analysis Tool (ISATe) does not currently analyze roundabout ramp terminal configurations, HSM was utilized to analyze the ramp terminals and crossroad segments as it allows the predicted number of crashes to be proportionally increased or decreased based on conditions in Michigan.

Road Safety Audit

A Road Safety Audit (RSA) was not conducted for this project due to COVID-19's effect on travel patterns and driver behavior as it was determined to not provide sufficient value to the overall study if completed during these unique conditions. However, MDOT plans to complete the RSA prior to the completion of final design if travel patterns return to pre-pandemic conditions.

Section 8

Environmental Resources Reviewed

MDOT's Environmental Section was engaged in this project and assisted in the identification of potential environmental impacts and completed an Environmental Scoping Review for the study area. Summarized below are the results of the Environmental Scoping Review which included the review of 23 areas/resources for potential impacts. Only the areas/resources that have potential concerns are listed below. All others were determined to have no anticipated concerns or no involvement. The entire Environmental Scoping Review memo can be found in **Appendix F**.

- National Pollutant Discharge Elimination System (NPDES): *Potential concerns*
 - It is anticipated the project will result in more than 5 acres of earth disturbance activities. PA 451, Part 31 requires that a Storm Water Certified Operator conduct inspections of soil erosion and sedimentation control measures on a weekly basis or within 24 hours of a storm event.
 - A Notice of Coverage form will need to be submitted to the Michigan

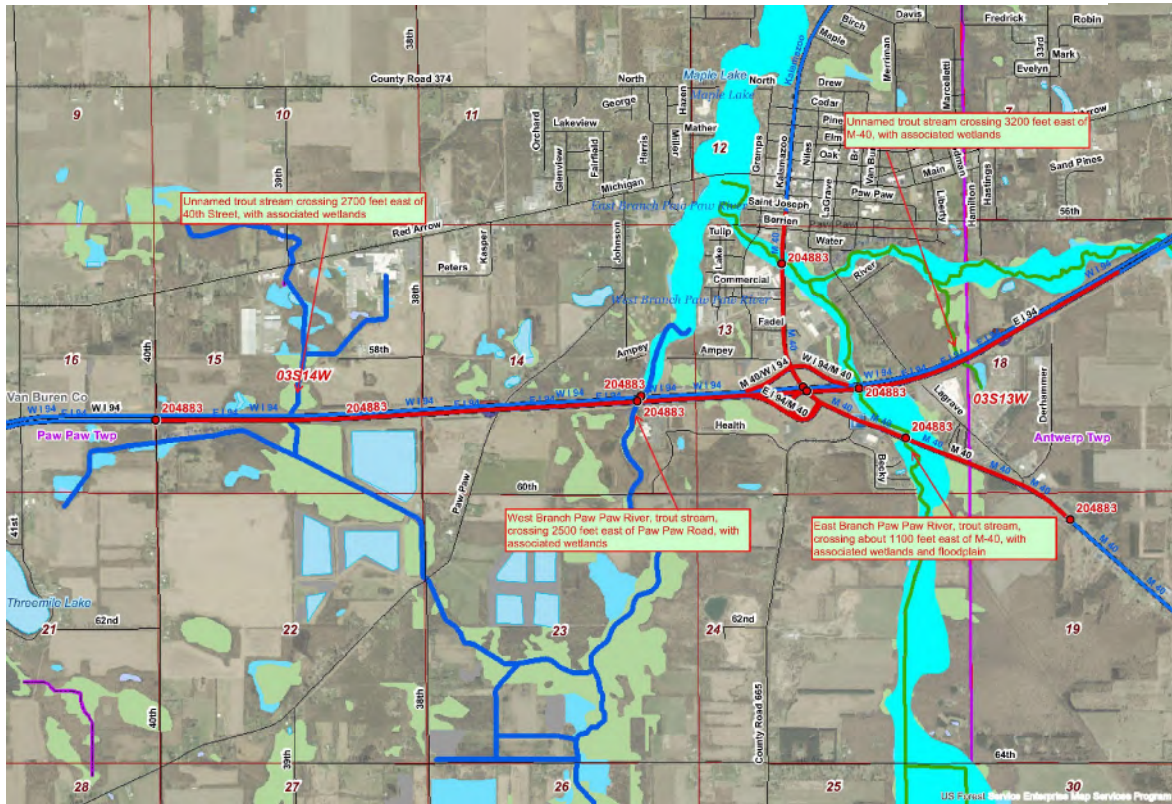
Department of Environment, Great Lakes, and Energy (EGLE).

- Wetlands: *Potential concerns*
 - There are wetlands adjacent to the project limits and those wetlands along I-94 EB at several locations may be impacted due to the grade raise of six inches and the subsequent grading to blend the slope. There are also wetlands adjacent to some of the culverts that may be repaired. The extent of culvert work is yet to be determined. If work takes place in any wetland then an EGLE Part 303 permit will need to be applied for by the MDOT Region Resource Specialist.

- Streams: *Potential concerns*
 - There are five locations in which potential stream impacts could occur:
 - I-94 over the South Branch of the Paw Paw River
 - M-40 over the East Branch of the Paw Paw River
 - I-94 over Three Mile Lake Drain
 - M-40 over Martin Drain
 - I-94 over tributary to Three Mile Drain

 - If proposed work and repairs impact these streams, then an EGLE Part 301 permit will need to be applied for by the MDOT Region Permit Coordinator.

Figure 6: Streams and Floodplains



- Floodplains: *Potential concerns*
 - There are floodplain areas associated with several of the stream/drain crossings located within the project area. If cut or fill is required in any of the floodplain areas, then an EGLE Part 31 permit will need to be applied for by the MDOT Region Permit Coordinator.
- Endangered Species: *Flora – Potential impacts yet to be determined*
 - The project corridor contains seven listed plant species at three different locations within a two-mile radius. As a result, a habitat suitability assessment is required in the spring to determine potential areas where listed plant species could be growing.
 - Once the project plans have solidified a field survey information can be used to assess potential impacts to these species and their habitats.
- Endangered Species: *Fauna – Potential concerns*
 - A record for federally endangered Mitchell's Satyr Butterfly occurs approximately 1.2 miles southeast of the project. Consultation for this

species will be required with the Fish and Wildlife Service to determine the viability of this population and the potential for effects from this project. Multiple records for state special concern box turtle also occur somewhat close to the project, the nearest being 0.2 miles away in contiguous habitat within the ROW. During construction, fencing may be necessary to protect the box turtle from construction impacts.

- The project is within the threat exclusion zone (TEZ) of the federally threatened Eastern Massasauga Rattlesnake (EMR). Wildlife friendly erosion control will be required within the project corridor to help avoid impacts to this species.
- If work is expected below the ordinary highwater mark of the West Branch Paw Paw River, this work will require coordination with MDNR Fisheries to determine if a mussel survey and relocation is warranted.
- This project is also within the range of the federally endangered Indiana bat and threatened northern long-eared bat. Landscape scale habitat is present throughout the study area for both listed bats. For the protection of these two species, it's advised any tree removals are performed during the winter Oct 1 - Mar 31. Additionally, the structures where work is planned will require inspection during the roosting season (May 15 - Aug 15) to ensure they are not being used as day roosts.
- Contamination: *Potential concerns*
 - Over 11 known contaminated sites were identified to be located within or adjacent to the proposed project area including a superfund site. It is recommended a Project Area Contamination Survey (i.e., PACS, Phase I Environmental Site Assessment) be conducted to confirm known and identify potential sites of contamination and locations of known and unknown monitoring wells. A PACS is necessary to purchase fee ROW and may be necessary for grading permit/easement ROW. All contaminated media must be handled and disposed of appropriately in accordance with state and federal regulations.
- Water Quality: *Potential concerns*
 - There are several stream and drains located within the project area in addition to potential wetlands. Specific impacts to these water resources will be determined once design plans have been advanced.
 - Preliminary geometric improvements indicate a reduction in impervious surfaces, which may result in a reduction of runoff rates and volumes. This may be adequate to address the flood protection and channel protection

requirements. Water quality may be addressed using stormwater BMPs including but not limited to vegetated swales, check dams, sedimentation basins, and mechanical swirl chambers.

- Historic: *Potential concerns*
 - There are above-ground historic properties located within the project limits that could be potentially impacted by the proposed project.
 - The former Paw Paw Water Works Pumping Station on the west side of M-40, now part of the Warner winery, is eligible for listing on the National Register of Historic Places. A Michigan Historical Marker is located in front of the building.
 - Just to the north of the northern project limits on M-40, at the northeast quadrant of Saint Joseph Street, is the National Register-listed Van Buren County Courthouse complex.
 - A potential historic property, Prospect Manor Manufactured Home Community located at the south end of the project, would require research and evaluation to determine if it is eligible for listing on the National Register.
 - It is anticipated only limited ROW will be needed for the project. If proposed work extends beyond the edge of the shoulder or beyond the edge of right-of-way in the vicinity of the properties, consultation with the State Historic Preservation Officer (SHPO) may be required.
- Archaeology: *Potential concerns*
 - No previously recorded archaeological sites are recorded within or adjacent to the two road's rights of way and the sensitivity for prehistoric archaeological sites in the vicinity of the project area is low. Sensitivity is also low for historic period archaeological sites, except for work outside the toe of slope where M-40 crosses the East Branch of the Paw Paw River where there is a dam just east of M-40 and, at one time, a mill adjacent to M-40 (Kalamazoo Street).
- Tree Removals: *Potential concerns*
 - If tree removal results as part of the project, Additional Endangered Species review and potential USFWS coordination is required.
 - The MDOT Region Resource Specialist must be contacted to identify tree removal locations.

Section 9

Environmental Resources Not Involved in Study

MDOT's Environmental Section prepared an Environmental Scoping Memo that was discussed in **Section 8** which can be found in **Appendix F**. This memo is comprehensive and all environmental resources that the Study Team is aware of were reviewed in this PEL study.

Section 10

Cumulative Impacts

Indirect and Cumulative impacts were reviewed as part of MDOT's Environmental Scoping Review (January 8, 2021) indicating no anticipated concerns.

The project should not induce significant impacts to planned growth or land use for the area, does not have significant impacts on travel patterns, and does not involve unusual circumstances.

Section 11

Mitigation Strategies

Depending on final design and associated environmental impacts, potential mitigation could be required. Mitigation measures are commitments that will be integrated into the project once the Recommended Alternative moves into the design phase. Below is a preliminary list of potential mitigation that could be required for the project.

Wetlands: Wetland mitigation will be required for all wetland impacts.

Endangered Species - Flora: If any of the endangered species are determined to be present, and avoidance is not possible, a MDNR Threatened and Endangered Species Permit will be required which would typically include mitigation such as fencing and signage to avoid plants, transplanting impacted species, and site/habitat restoration.

Endangered Species - Fauna: If any of the endangered species are determined to be present, and avoidance is not possible, mitigation could be required and may include fencing, wildlife friendly erosion control, and restrictions on tree removal.

Water Quality: Depending on potential impacts from the final roadway and bridge design, stream mitigation measures are possible and will require coordination with the Aquatic Resource Specialist.

Tree Removals: If tree removal is required by the project then the MDOT Region Resource Specialist must be contacted to identify tree removal locations.

Maintenance of Traffic (MOT): Access to adjacent businesses will be maintained during construction.

Section 12

Future NEPA Coordination

Much of this project will remain within existing ROW with limited acquisition. Thus, from a National Environmental Policy Act (NEPA) perspective the biggest issues moving forward from the PEL study are related to the potential endangered species and wetland/stream impacts. MDOT will need to determine whether endangered species are located within the impact limits and determine if there will be impacts to associated streams, floodplains, and potential wetlands.

Contaminated sites also need to be further investigated by completing a Project Area Contamination Survey (PACS) to identify potential sites and locations.

Further coordination is likely needed regarding potential impacts to above ground historic properties. Although it is unlikely ROW will be needed from any of these properties, changes to the curb line or streetscape could necessitate coordination with the MDOT historian and possibly SHPO.

It is anticipated 0.1 acre of ROW acquisition will be required in the southwest interchange quadrant. In addition, 0.14 acre will be required in the southeast quadrant from the MDOT owned Park-N-Ride lot. Based upon the limited ROW acquisition and minimal anticipated environmental impacts, it is projected this project will meet the requirements for a Categorical Exclusion (CE).

Section 13

Potential Issues for Future Consideration

- **Aesthetic and Gateway Opportunities** - The Village of Paw Paw has indicated a desire for the project to include aesthetic and gateway elements. MDOT has discussed this process with the Village and explained how the program works including the cost sharing element for these types of treatments. The details related to aesthetics and gateway opportunities needs to be further discussed and worked out with the Village and broader community.
- **Road Safety Audit (RSA)** - As indicated prior, a RSA was not conducted for this project due to COVID-19's effect on existing travel patterns and driver behavior as it was determined to not provide sufficient value to the overall study if completed during these unique conditions. However, MDOT plans to complete the RSA prior to the completion of final design if travel patterns return to pre-COVID-19 conditions.
- **Crosswalk Locations** – The community indicated a desire for marked crosswalk(s) across M-40 north of the interchange. The need for the crosswalk(s) is due to the winery tourism in Paw Paw and the fact the wineries are located on the west side of the street while some parking and restaurants are located on the east side. The PEL documented the need for the crosswalk(s), but the specific location needs to be finalized. If the RSA is completed, this is an issue that should be addressed then.
- **Project Lighting** – Lighting has yet to be determined for the project and will need to be figured out as part of final design. Currently MDOT is planning on installing roadway lighting at the roundabouts with the Village of Paw Paw taking over the operational costs. This still needs to be discussed with the Village.