

---

## 2.0 ALTERNATIVES CONSIDERED

---

This section describes both the alternatives development process and the alternatives considered. Three key transportation planning decisions were required as a part of the alternatives development for US-131 improvements. These included:

- Evaluation of the mode of transportation including consideration of alternative modes of transportation such as transit or multi-modal facilities. This resulted in the identification of road improvements as the preferred modal choice.
- Evaluation of the location of improvements, which resulted in alternatives being developed both on and off the existing US-131 alignment within the study area.
- Selection of the type and cross-section of alternatives to be studied for improving US-131. This resulted in the following types of roadway alternatives being studied:
  - A limited-access freeway at different locations within the study corridor, and
  - Improvements to the existing facility, with a 2-lane by-pass of Constantine

This section discusses the process and analysis involved in making the above decisions, the development of the initial Illustrative Alternatives, and their refinement into the Practical Alternatives analyzed in this Draft Environmental Impact Statement (DEIS).

If a Build Alternative is recommended, full build-out may not occur as a single event. The phasing of segments or components of the project over time could result in varied cross-sections along US-131 within the study area. The Michigan Department of Transportation's (MDOT) intent for all Build Alternatives is to control or limit access along any proposed relocated portion of US-131 during all phases of development. Project phases would be prioritized by need and staged based upon available funding.

The foldout map located in **Appendix E** at the back of this document should be opened for reference while reviewing this section. This map illustrates the Practical Alternatives and cross-roads referred to in the text.

The general chronology and principal steps in the development of alternatives for this DEIS included:

- 1) The completion of a Corridor Location Study from the Indiana State Line to north of the Village of Schoolcraft
- 2) The identification of a preferred mile wide study corridor and a determination by MDOT to utilize M-60 south of the City of Three Rivers as a logical northern terminus
- 3) A decision by MDOT, concurred with by the Indiana Department of Transportation (INDOT), to extend the corridor south of the State Line to the I-80/90 Indiana Toll Road as a logical southern terminus
- 4) A determination by MDOT to widen the study corridor at the south end to assess potential utilization of a portion of existing Blue School Road
- 5) The development of Illustrative Alternatives from I-80/90 north to M-60
- 6) The refinement of alternatives into seven initial practical roadway Build Alternatives

- 7) Support by local communities and a decision by MDOT to extend the northern terminus five miles north of M-60 to connect with the existing access-controlled US-131 boulevard north of the City of Three Rivers
- 8) Assessment of multi-modal options as an alternative to, or in conjunction with, road improvements
- 9) The development of Illustrative Alternatives north of M-60 to the new northern terminus
- 10) A decision by MDOT, in consultation with INDOT, to revert back to a southern terminus at the Indiana State Line, due to the ability of existing US-131 in Indiana to accommodate No-Build traffic forecasts, and due to the minimal additional right-of-way (ROW) required if the State of Indiana should need to do future widening
- 11) Further development and combination of alternatives south and north of M-60 into four Practical Alternatives extending the length of the entire study corridor
- 12) A detailed traffic analysis for all segments of the original Practical Alternatives
- 13) Ongoing public involvement efforts and continued refinement of alternatives
- 14) A decision by MDOT, in consultation with INDOT, to again make I-80/90 the southern terminus of the study corridor, and to propose a five-lane section from the Indiana State Line south to I-80/90. This was done to address forecasted traffic flow resulting from induced traffic growth associated with the improved connectivity and/or travel speeds for the Build Alternatives
- 15) The definition, refinement, and evaluation of the PA-5 and PA-5 Modified (PA-5 MOD) non-freeway alternatives
- 16) Additional Stakeholder meetings, plus an additional Open House Public Information meeting seeking input on the PA-5 and PA-5 Modified alternatives
- 17) The development of this DEIS and further refinement of alternatives

The rest of this section discusses the alternative development as follows:

- **Section 2.1, Preliminary Corridor Study** discusses the earlier Preliminary Corridor Location Study, conducted by MDOT.
- **Section 2.2, Illustrative Alternatives** summarizes the Illustrative Alternatives, including Illustrative Build Alternatives considered during the course of the study.
- **Section 2.3, Design Criteria** illustrates the design criteria used in the development of the Practical Alternatives
- **Section 2.4, Practical Alternatives** describes the Practical Alternatives carried forward for further evaluation and refinement.
- **Section 2.5, Construction Phasing** describes potential options for phased implementation.

## 2.1 Preliminary Corridor Study

MDOT conducted a US-131 Corridor Location Study extending from the Michigan/Indiana State Line to approximately 12.5 miles north of the City of Three Rivers between 1995 and 1997. The purpose of the study was to identify a preferred corridor within which alternatives would be examined for an improved US-131 facility. This study was a precursor to the development of alternative road alignments as a part of this DEIS.

This 27-mile long Corridor Location Study used public opinion surveys, consultation with the St. Joseph County US-131 Master Plan Committee and other local governments, recorded social, economic, and environmental data, and professional analysis, to assess the need and best potential location for improvements.

Six one-mile wide corridors and a wider on-existing US-131 alignment were examined during this initial study (see **Figure 2.1**). The study results showed that the widening of existing US-131 would create unacceptable social and economic impacts in the Village of Constantine's downtown historic district. The study also determined that while maximizing the use of the existing US-131 ROW has the potential for causing the least overall impact to agricultural, wetland, and surface water resources, it also has the greatest potential for displacing homes and businesses. This is especially true from the City of Three Rivers northward. Over 350 people attended the study's final public meeting conducted in November 1997, at which the consensus was support for Corridor A, utilizing existing US-131 and/or a potential new alignment located west of US-131. This was the selected corridor within which alternatives were developed for this study.

There was no consensus or unified support for extension of the corridor north of M-60. As a result, it was determined that M-60 would be the northern terminus for this DEIS in order to evaluate alternatives for improvements within Corridor A. M-60 is a State trunkline and was viewed as a logical terminus for any US-131 improvements. A subsequent agreement to move the termini to a point one mile north of Cowling Road was made to move traffic from new alignments from the west directly onto US-131. The southern terminus for the DEIS was extended to the Indiana Toll Road (Interstate 80/90) as a logical southern terminus. During the initial development of Illustrative Alternatives for this DEIS, the study corridor was further modified by widening the southern portion of the study area approximately three fourths of a mile to the west to include evaluation of an alignment on or adjacent to Blue School Road; this would allow a potential crossing of the White Pigeon River at the location of the existing Blue School Road bridge. **Section 2.2, Illustrative Alternatives** describes the Illustrative Alternatives and how they were developed.

**Place Holder for Figure 2.1**

## 2.2 Illustrative Alternatives

All US-131 Illustrative Alternatives were evaluated to determine how effectively they would meet the purpose of and need for the project, and the project goals as defined in **Section 1.0, Purpose of and Need for a Proposed Action**. The alternatives that were developed can be divided into four categories:

- The No-Build Alternative, where only maintenance and previously committed geometric improvements are proposed for the existing US-131 facility
- The Transportation System Management (TSM) Alternative, which utilizes minor geometric or traffic control improvements to reduce traffic congestion and improve vehicular flow at key locations
- Public Transit and Multi-Modal Alternatives, which were assessed with regard to their potential for reducing congestion on the existing facility by providing alternate transportation modes for passenger vehicles and shipment of goods
- Build Alternatives, which provide increased capacity by adding lanes adjacent to and/or separate from the existing facility

The Illustrative Alternatives that were determined to meet the study's goals and purpose of and need for a proposed action were selected for further consideration and were advanced to the Practical Alternatives stage for refinement and further analysis. The No-Build Alternative was also carried forward as a viable alternative. It also provides a baseline for comparison to the Build Alternatives.

### 2.2.1 Alternatives Considered but Rejected

Transportation System Management, public transit, and multi-modal alternatives were dropped from further consideration as stand-alone alternatives from the Practical Alternatives stage, as they did not meet the purpose of and need for a project. These alternatives, together with those that were considered for advancement to the Practical Alternative stage, are discussed below.

#### 2.2.1.1 Transportation System Management Alternatives

Transportation System Management (TSM) Alternatives are usually low-cost improvements to the existing roadway network designed to maximize the efficiency of the existing transportation system with little or no new construction. TSM Alternatives evaluated included intersection and lane improvements, pavement restriping, demand management, and access control. While some of the TSM Alternatives discussed below could be effectively implemented on various portions of US-131, the TSM Alternative alone does not completely address the existing and projected need for US-131 improvements. TSM Alternatives, while better than the No-Build Alternative, would not fully meet the purpose of and need for the project as they would not fully address existing inefficient traffic movements (poor progression of traffic through the study corridor), address local concerns associated with the above-average volume of commercial traffic, or reduce truck traffic through the historic district in Constantine. For these reasons, TSM improvements were not retained as an individual Practical Alternative, but may be part of any Practical Alternative.

*Intersection and Lane Improvements:* Intersection and lane improvements include such options as stop signs, traffic signals, turn lanes, traffic islands, channelization, and minor geometric improvements. Intersection improvements that provide additional through lanes and/or right and

left turn-lanes can improve the capacity and function of intersections. Improved signal operations include upgrading outdated traffic equipment, removal of unwarranted traffic signals, addition of warranted signals, signal timing optimization, and installation of Intelligent Transportation System (ITS) improvements. ITS improvements include traffic responsive signals, vehicle detection equipment, closed loop systems, and interconnected and computerized traffic signal systems. These strategies can improve intersection operations on a corridor-wide basis. Some of these types of improvements have already been implemented at various intersections along US-131. For example, in 2001 US-131 was widened to five lanes north and south of US-12, with a turning lane at the intersection. In 2002, a traffic signal was installed at the US-131 and Wilbur Road intersection. However, additional substantive modifications cannot be accommodated within the existing right-of-way, and do not address the project needs of improved system operations and improved commercial traffic operations.

*Demand Management:* Demand Management alternatives include strategies designed to reduce the total number of vehicle trips (traffic demand) made in the project corridor. Demand management strategies include changes in decisions about which transportation mode to use, time of travel, or elimination of the need for the trip entirely. The rural nature of the US-131 corridor and the nature of the traffic, including large percentages of through traffic and commercial trucks, limit the effectiveness of any demand management strategy. Therefore, Demand Management is not deemed a Practical Alternative to address US-131 capacity needs.

*Access Management:* Access Management is used to improve safety and traffic flow by reducing or eliminating cross-traffic conflicts caused by driveway traffic entering or exiting a roadway from adjoining properties. Access Management is most effective as a predevelopment planning and zoning tool for communities to limit driveways and encourage development of frontage roads on commercially developing corridors, and in order to work properly must be implemented by local ordinances. While it is entirely feasible to implement access management measures, they are less effective and more costly to implement after development has occurred. A cooperative Access Management study was completed in 2001 for US-131 from M-60 in the City of Three Rivers northward to south of the Village of Schoolcraft. This study analyzed existing access points and provided recommendations for both interim and long-term control measures that could be taken by local jurisdictions to reduce congestion and improve operations on the existing roadway. These recommendations included adding service drives, minimizing the number of access points per development, and developing access management ordinances that the communities could adopt. Another more refined cooperative US-131 Access Management study is under way in St. Joseph County at this time. Access management measures and zoning regulations from this study are currently being developed. These zoning requirements will not preclude the construction of any of the Build Alternatives. The recommendations from the study can be implemented in the near future as a separate undertaking by the local agencies, especially at the existing four-lane and five-lane sections from Broadway to north of Michigan Avenue in the City of Three Rivers. Components of the recommendations from this study may be incorporated into the Recommended Alternative to be identified in the Final Environmental Impact Statement (FEIS) for this project. MDOT does not, however, have the jurisdictional authority to implement ordinances controlling access where access currently exists, but may request the purchase of access rights for the future.

The freeway Build Alternatives for US-131 would change access from at-grade intersections to a select number of grade-separated interchanges and would provide no driveway access. New service drives/frontage roads along US-131 as proposed in MDOT's existing Access Management study for St. Joseph County would not address the system operations and capacity purposes of this project. A reduction in local access points along US-131 could provide

user benefits, but not to the extent of the freeway alternatives or the intersection and other roadway improvements of the non-freeway Build Alternatives.

Some TSM improvements could be implemented in conjunction with other alternatives to help alleviate existing concerns in the short term. Local access management policies are also highly beneficial in maintaining the long-term efficiency of roadway improvements such as the service drives proposed in conjunction with the US-131 freeway Build Alternatives. Non-freeway Build Alternatives could benefit from retrofitted access management techniques, especially in downtown Three Rivers. However, Access Management by itself is not deemed a Practical Alternative to address US-131 capacity and system operations needs as identified in **Section 1.0, Purpose of and Need for a Proposed Action.**

Summary: The TSM measures described do not fully meet the purpose of and need for a proposed action. Although TSM measures would enhance operations in isolated sections of the study area, these improvements are not significant enough throughout the corridor to improve the levels-of-service of the existing facility and will not address the difficulties associated with the high volume of commercial truck traffic on this route. This alternative also does not address the goal of removing or reducing truck traffic through the historic district within the Village of Constantine. For these reasons, Transportation System Management, as a stand-alone alternative, has not been carried forward as a Practical Alternative for this study.

#### **2.2.1.2 Public Transit**

In some locations, public bus transportation alternatives can be efficient alternatives to highway capacity improvements. The US-131 corridor does not currently have an integrated public transportation system. The St. Joseph County Commission on Aging (COA) and the Arch Workshop Inc. in Sturgis each provide demand-response bus service (Dial-A-Ride) for their clients living in St. Joseph County.

In April 2002, MDOT approved partial funding for a St. Joseph County initiative to provide a county-wide demand-response transit service for its residents. This public transportation service will ultimately have an annual operating budget of approximately \$965,000. The county plans to expand the existing services of COA and the Arch Workshop by adding new facilities to their combined resources and providing services throughout the county.

The nearest intercity bus service to the study area is located at the South Bend Airport multi-modal transportation center, approximately 35 miles southeast of the study area. Once there, passengers can travel by Central Greyhound, Indiana Highways, and ABC Coach Lines service. The South Shore inter-urban electric rail line also connects the South Bend airport with cities in northwestern Indiana and downtown Chicago.

Summary: The three communities within the corridor do not have the population, projected ridership, or workplace density necessary for traditional fixed-route public transit to be a viable alternative to capacity improvements. Bus service cannot address the commercial traffic needs of the corridor. For the above reasons, public transit service improvements have not been carried forward as a Practical Alternative for this study.

#### **2.2.1.3 Multi-modal Alternatives**

Multi-modal strategies are meant to increase the use of high-capacity transportation modes such as transit and inter-modal freight delivery. The concept is to maximize the capacity of

roads by minimizing the number of vehicles needed to move the same amount of people or freight.

Truck and Rail Freight – not carried forward: Projected traffic data indicates that there would be an average of more than 2,600 trucks per day passing through the project area. This is approximately 13% of the average daily traffic forecast for 2025, and is more than double the statewide average commercial percentage for two-lane rural trunkline routes. Truck traffic is greater in the Village of Constantine, due to the lack of access points between US-12 and M-60. Forecasted volumes are projected to reach approximately 2,900 vehicles per day and translate to about 15% of the 19,500 total projected 2025 average daily traffic volume.

There are no existing rail freight yards in the project area that would facilitate efficient transfer of freight between rail and other transportation modes. The Anderson Grain and Gravel facility near the south end of the project area is proposing an expansion of its existing rail loading facility. The American Axle plant in Three Rivers also has rail service and moves freight by both truck and rail. The Norfolk-Southern, a minor freight rail line, provides connections between northwestern Indiana northeast to White Pigeon, where it turns north and parallels US-131 through Three Rivers to Grand Rapids. An average of five trains per day pass through the study area, operating at approximately 30 mph.

The lack of fixed transportation assets (rail yards, distribution facilities, truck storage yards, etc.) in the project area makes it impractical and prohibitively expensive to create the diversions of rail and truck movements necessary for making an inter modal freight transfer facility practical and feasible. Larger metropolitan areas are more favorable locations for these regional type facilities, because there are more local origins and destinations, and a wider array of transportation facilities in existence. If there were future development of such a facility at a destination north or south of the study area, it would likely draw additional truck traffic to this segment of US-131 that is currently routed to larger hub cities like Chicago, Detroit, or Toledo. This would only increase the need for road improvements on US-131.

Air Travel: The closest airport to the study area is the Dr. Haines Municipal Airport, located adjacent to M-60 northeast of the City of Three Rivers. This general utility airport has two paved and lighted runways with service to small jets. The closest commercial airport is the Kalamazoo/Battle Creek International Airport, located three miles southeast of Kalamazoo, approximately 25 miles north of the study area. This airport serves southwestern Michigan with a total of approximately 75 daily arrivals and departures. However, of these flights, approximately 42% are local general aviation flights; 35% are general transient; 16% are air taxi; and 7% of the flights are commercial.

The South Bend Regional Airport, approximately 35 miles southeast of the study area, is a multi-modal transportation center for air, inter-city rail, and interstate bus service. Passengers have the option of traveling via ten airlines with connections through nine hub cities, including Chicago, Cleveland, Cincinnati, Detroit, St. Louis, and Pittsburgh. The airport has approximately 90 daily commercial take-offs and landings.

No wetland mitigation sites in the study area are proposed within one mile of any airport.

Summary: The study area is not at a major cross-road of multiple rail, highway, and/or air cargo transportation routes, and is not a major origin or destination for shipping. The truck traffic on this segment of US-131 is primarily through traffic at a high volume for the existing facility, but not at the magnitude necessary to support investment in a multi-modal freight transfer facility

and the other associated rail and/or air cargo infrastructure improvements that would be required. Therefore, multi-modal improvements have not been carried forward as a Practical Alternative for this study.

### **2.2.2 No-Build Alternative – Carried Forward**

This alternative calls for maintaining the existing US-131 facility with its current lane configuration. With this alternative, routine maintenance will occur on an as-needed basis. Intersection improvements which are already committed will be implemented as funding becomes available.

The system and roadway inefficiencies identified in **Section 1.0, Purpose of and Need for a Proposed Action** are not addressed by this alternative; however, this alternative is required to be carried forward as a basis for comparison to the Build Alternatives, and is a Practical Alternative.

Existing traffic conditions in the study corridor vary. As shown in **Figure 1.2**, existing US-131 generally operates between Level-of-service A and D. Level-of-service (LOS) is rated A to F, and is a qualitative measure of the operational traffic conditions as perceived by a motorist. LOS A is best, and represents free flowing traffic conditions. LOS F is perceived by the average motorist as heavy congestion. Existing traffic counts on US-131 range from 8,600 daily trips near the Indiana/Michigan State Line to approximately 21,100 within the City of Three Rivers (see **Figure 1.2**). Currently, roadway segments within the study area are operating at a LOS A, B or C except for the section through the Village of Constantine, which operates at a LOS D during the p.m. peak hour. It should be noted that during the period analyzed, the northbound direction operates at an acceptable LOS, and both directions of the segment operate at a desirable LOS during the off peak hours of the day. Contributing to the existing undesirable LOS along this section of the US-131 corridor are high commercial truck volumes of approximately 13% of the Average Annual Daily Traffic (AADT) on most segments of US-131 and 15% of the AADT within the village limits of Constantine. The commercial truck percentage of AADT within the Village of Constantine (15%) is 60% greater than the statewide average of 9.5% for a rural two-lane trunkline. However, during the design hour, which is the hourly volume of traffic for which roads are designed, the percent of commercial vehicles ranges from 10% in the Village of Constantine to 9% elsewhere along US-131.

As traffic through the study area increases with no capacity improvements on US-131, the segment of roadway between Dickerson Road north to M-60 on US-131 will deteriorate to LOS E by year 2025. Forecasted year 2025 traffic volumes indicate that AADT traffic volumes will range from 14,400 to 39,700 along US-131 in the study area. As illustrated in **Figure 1.2**, the projected 2025 LOS for each segment based on the existing roadway configuration ranges from LOS A to LOS D except for the section of roadway between Dickinson Road and M-60. This segment would degrade to LOS E during the design hour under the No-Build condition. This segment of US-131 is expected to experience the heaviest congestion due to the existing geometric constraints of the roadway (two-lane facility, rolling terrain, and substandard shoulder widths), and high commercial truck volumes (15% of AADT). Although this segment of US-131 is expected to degrade to LOS E during the design hour by year 2025, it should be noted that the segment will operate at a desirable LOS during the majority of the day. However, while this may be true, the No-Build Alternative does not completely satisfy the purpose of and need for a proposed action. However, it does minimize the social, economic, and environmental impacts compared to any of the Build Alternatives, and it has been retained as a Practical Alternative. The No-Build Alternative has the potential to be selected as the Recommended Alternative if it

is determined that the benefits of the Build Alternatives do not warrant the associated costs and impacts.

### 2.2.3 Illustrative Build Alternatives

The following discussion summarizes the seven alignments developed during the initial phase of the Build Alternatives development for south of M-60 (see **Figure 2.2**). These Illustrative Alternative alignments were developed to address the system deficiencies identified in **Section 1.0, Purpose of and Need for a Proposed Action**, and within the geographic constraints identified during the prior Corridor Location Study. As survey mapping and field data were developed, adjustments were made to these alignments in order to further minimize impacts to existing businesses, residences, farm operations, wetlands, floodplains, and other resources.

Alignment A: Alignment A followed the existing US-131 alignment from the south end of the corridor at the Indiana Toll Road to its north terminus one mile north of Cowling Road. Due to an unacceptable LOS and limitations to widening US-131 in the Village of Constantine, including historic structures, parks, and right-of-way (ROW) limitations, Alignment A was not carried forward as a Practical Alternative.

Alignment B – carried forward as parts of PA-1 and PA-2: Alignment B utilized Alignment A to Brown/Dickinson Road where it curved to the west to bypass Constantine. After crossing the St. Joseph River, Alignment B curved to the east to rejoin Alignment A at Zerbe Road. This alignment was developed as a bypass of the Village of Constantine. Initially, however, this alignment divided parcels near town, did not provide the minimum geometrics required for potential future upgrade to a freeway, and impacted school property in the Village of Constantine.

Alignment B was refined to further minimize impacts to adjacent properties and resources. As discussed in **Section 2.4, Practical Alternatives**, Alignment B was developed as Practical Alternative 2 (PA-2) and blended with Alignment E to form Practical Alternative 1 (PA-1).

Alignment C – carried forward as a part of PA-3: Alignment C followed existing US-131 to Anderson Road where it continued straight north, following Harrison Road to Brown/Dickinson Road. At Brown/Dickinson Road it curved to the west to bypass Constantine, and then east to Zerbe Road, where it headed north following parcel lines approximately one-half mile west of the existing US-131 alignment. At Drummond Road the alignment curved east, and at King Road it headed north, intersecting M-60 approximately one-half mile west of existing US-131.

Alignment C originally merged with Alignment F; however, the alignment was merged with Alignment E north of Zerbe Road to avoid wetland impacts and large cut and fill volumes that would have been required north of Garber Road. The combination of revised Alignments C and E was carried forward as Practical Alternative 3 (PA-3).

Alignment D – carried forward as a part of PA-4: Alignment D followed Alignment C to US-12, where it curved to the west, heading northwest to bypass the Village of Constantine. After crossing the St. Joseph River, it curved to the east to join Alignment C north of Zerbe Road. This alignment was the farthest west of the three initial St. Joseph River crossings in the study area and was developed primarily for evaluation as an alternative crossing location at the St. Joseph River.

This alignment severed several farmsteads from adjoining farmland, and land-locked 10 large parcels on the east side of US-131. This alignment was refined into Practical Alternative (PA-4) to address these issues, while maximizing the use of existing US-131 ROW in the vicinity of Zerbe and Drummond Roads.

Alignment E – carried forward as parts of PA-1, PA-3, and PA-4: Alignment E followed Alignment C to Millers Mill Road. From Millers Mill Road it curved to the east to Zerbe Road where it paralleled existing US-131 approximately one-quarter mile to the west. At King Road it curved to the east for approximately one-half mile and turned north, connecting with M-60 just east of Alignment C.

Alignment E was blended with Alignment B into PA-1, with Alignment C into PA-3, and with Alignment D into PA-4.

Alignment F: Alignment F started at the Indiana Toll Road where it curved to the west to join Blue School Road. It continued north utilizing existing ROW and crossing the White Pigeon River at the location of an existing skewed bridge crossing. It crossed the St. Joseph River at a new location. After crossing Millers Mill Road, it curved east towards M-60 west of US-131, joining Alignment D at Youngs Prairie Road.

This alignment would impact a high number of residential properties, as well as potential wetland and bog habitats near Stag Lake, and sensitive habitat in the White Pigeon River watershed. There were major floodplain and high quality wetland impacts associated with the crossing of the St. Joseph River, and rolling terrain at the north end of the alignment would require extensive earthwork. There was also substantial public opposition to this alignment for the above reasons. Therefore, this alignment was dropped from further consideration.

Alignment G: Alignment G began at the US-131/I-80/90 toll plaza and required modification of the toll plaza, located approximately one-quarter mile west of existing US-131. From this point it followed a northerly alignment and joined Alignment D south of the St. Joseph River.

Alignment G had the same environmental and social impacts as described for Alignment F, as well as requiring reconfiguration of the interchange of US-131 with the Indiana Toll Road. Through coordination with the Indiana Department of Transportation (INDOT), MDOT determined that there was too much adverse distance for a connection between Alignment G and existing US-131. This alignment would have required improvements to the I-80/90 toll plaza, while also requiring improvements for access back to US-131, and INDOT preferred that the existing US-131 alignment be maintained in Indiana. For these reasons, Alignment G was dropped from further consideration.

## **2.2.4 Illustrative Alternative Extensions (M-60 to One Mile North of Cowling Road)**

During the initial analysis phase of the Practical Alternatives (**Section 2.4, Practical Alternatives**), it was determined that a connection to the controlled access segment of US-131, located north of the City of Three Rivers, provided a better north terminus than M-60. The segment of US-131 just south of this new northern terminus was experiencing crash rates above the State average, and it was viewed that an alternative facility type at this location could dramatically improve traffic operations. MDOT made the decision to extend the northern terminus of the project to one mile north of Cowling Road in March 2001. Three alternate extensions of the Illustrative Alternatives were developed as depicted in **Figure 2.2**.

**Place Holder for Figure 2.2**

Alignment H – carried forward as parts of PA-1, PA-3, and PA-4: Alignment H began south of Gleason Road as an extension of Alignment E. From this point it continued in a northerly direction west of existing US-131 and the K-Mart and Meijer department stores. It then curved to the east between Broadway and Millard Roads to connect with existing US-131 just south of Coon Hollow Road. Just north of the Rocky River, Alignment H swung to the west of existing US-131 approximately one quarter mile, and connected with the existing alignment between Wilbur Road and the north project limits.

Alignment H utilized the existing US-131 alignment from south of Coon Hollow Road to north of the Rocky River, thus utilizing the existing Rocky River crossing location. The residential impacts would be less than those for Alignment I, but would not be eliminated. Moving the alignment west of existing US-131 north of the Rocky River allowed for the improvement of intersection geometrics at US-131 and Wilbur Road, which is the northern terminus of the existing US-131 Business Route. Alignment H was carried forward as the northern extension of PA-1, PA-3, and PA-4.

Alignment I: Alignment I began at M-60 as an extension of Alignment C. From this point it continued in a northerly direction and curved to the east past Millard Road. It then paralleled the existing US-131 alignment approximately one-quarter mile to the west, requiring a new crossing of the Rocky River. Alignment I connected with Alignment H at approximately the Fabius/Lockport Township Line (**Figure 2.2**).

Alignment I would directly impact two subdivisions, requiring numerous residential relocations, and would have indirect impacts upon numerous other residential properties. These properties represent the majority of the residential development located west of US-131 and north of M-60. Alignment I required the construction of a longer bridge structure across the Rocky River, and also had greater environmental impacts than Alignment H, including requiring an additional bridge crossing at Kerr Creek. Due to the significant impacts it would have on the existing residences, neighborhoods, and river crossings, Alignment I was dropped from further consideration.

On-Existing US-131 – carried forward as a part of PA-2: An illustrative alignment that followed existing US-131 was also considered north of M-60. This alignment continued as an extension of Alignments A and B. Widening existing US-131 would affect businesses within and north of the City of Three Rivers. American Axle, a major industrial employer for the City of Three Rivers, is located on the east side of US-131 north of Hoffman Road, and is intending to expand its business operation. This expansion could be limited with an on-existing alignment. To assess the potential benefits and impacts of the project goal of maximizing utilization of the existing alignment, the on-existing US-131 alignment was carried forward as the northern extension of Practical Alternative 2 (PA-2).

## **2.2.5 Refinement of Illustrative Alternatives**

Refinement of the Illustrative Build Alternatives south of M-60 included the elimination and/or combination of certain alignments as a result of public comment, impacts, preliminary engineering analysis, and lack of compatibility with the purpose of and need for the project. As a result, six initial Practical Build Alternatives south of M-60 were developed. These initial Practical Build Alternatives, a No Build, and the three northern Illustrative Extensions (**Section 2.2.4, Illustrative Alternative Extensions**) were presented at the March 15, 2001 public meeting. As detailed studies and public involvement continued, new issues arose which rendered some of these alignments not prudent or feasible. At this point the Initial Practical

Alternatives south of M-60 underwent further refinement and were combined with the Illustrative Extensions developed for north of M-60. This resulted in four freeway Practical Build Alternatives being carried forward for detailed analysis in this DEIS. These alternatives, plus the non-freeway Build Alternatives, are described in **Section 2.4, Practical Alternatives**.

## 2.3 Design Criteria

Design Standards were developed for the Practical Alternatives discussed in **Section 2.4, Practical Alternatives**. The criteria adhere to Michigan Department of Transportation (MDOT) and American Association of State Highway and Transportation Officials (AASHTO) guidelines and are depicted in **Table 2.1**.

Each Practical Build Alternative meets or exceeds the desirable design criteria for two-lane controlled access rural, five-lane undivided, or four-lane rural or four-lane urban freeway facility types as applicable. Typical cross-sections for these roadway types are depicted in **Figures 2.4 and 2.5** along with cross-sections for the existing roadway.

Table 2.1 Build Alternative Design Criteria

Design Element	Two-Lane Section	Five-Lane Section	Four-Lane Freeway (Rural)	Four-Lane Freeway (Urban)
Design Speed (mph)	55	55	75	75
Design Level-of-Service	D	D	D	D
Roadway Classification	Arterial	Arterial	Rural Freeway	Urban Freeway
<b>Horizontal Alignment</b>				
Minimum Radius	1,140'	1,140'	3,940' Desirable 2,300' Minimum	3,940' Desirable 2,300' Minimum
Minimum Length of Curve	N/A	N/A	2,300' Desirable 1,180' Minimum	2,300' Desirable 1,180' Minimum
Maximum Superelevation	7.00%	7.00%	7.00%	7.00%
<b>Vertical Alignment</b>				
Maximum Grade	5.00%	5.00%	3.00%	3.00%
Minimum Grade	0.5% Desirable 0.3% Minimum	0.5% Desirable 0.3% Minimum	0.5% Desirable 0.3% Minimum	0.5% Desirable 0.3% Minimum
<b>Cross-section Element</b>				
Lane Width	12'	12'	12'	12'
Median Shoulder Width	N/A	N/A	10' Paved	12' Paved
Right Shoulder Width	8' to 10' Paved or Curb-and-gutter	10' Paved or Curb-and-gutter	10' 6' Paved	12' Paved
Pavement Cross-slope	2.00%	2.00%	2.00%	2.00%
<b>Structures</b>				
Design Loading	HS-25	HS-25	HS-25	HS-25
Minimum Underclearance (highway)	16' – 3"	16' – 3"	16' – 3"	16' – 3"
Minimum Underclearance (railroad)	23'	23'	23'	23'

## 2.4 Practical Alternatives

In developing the Practical Alternatives, components of the Illustrative Alternatives were refined and combined into four continuous freeway alignments extending from the Indiana Toll Road to the northern terminus of the project, one mile north of Cowling Road. This analysis resulted in freeway Practical Alternatives that represent the best attributes of all earlier alignments. PA-5 and PA-5 MOD were added to the study as part of the NEPA process to include evaluation of all viable facility types for meeting the project goals and the Purpose of and Need for a Proposed Action. A Recommended Alternative will be presented within the Final Environmental Impact Statement (FEIS) for the project, which may be a composite of two or more of the six Practical Build Alternatives, or the No-Build Alternative. Transportation System Management (TSM) improvements, including access management measures, could also be implemented in conjunction with, or may be implemented prior to, the selection or construction of any Build Alternative.

The following descriptions for each Practical Alternative progress from the southern to the northern termini of the study area. The Practical Alternatives are depicted in **Appendix E**. This map can be folded out for reference during review of this section. **Table 2.2** summarizes the engineering components and costs of the Practical Alternatives.

**Table 2.2 Practical Alternatives Comparative Matrix**

	No-Build	PA-1	PA-2	PA-3	PA-4	PA-5	PA-5 MOD
Length, in miles(Toll Road to North Terminus)	17.2	17.6	17.7	17.2	18.3	17.4	17.6
Length of New Service Drives, in miles	0	14.4	23.1	14.2	11.2	N/A	N/A
At-Grade Intersections	0	6	3	3	3	8	8
Grade Separations	0	12	15	15	15	0	0
Interchanges Constructed	0	3	4	4	4	0	0
Local Roads Terminated with a Cul-de-Sac	0	5	6	7	6	5	2
Approximate length of new/reconstructed river crossings, in feet:							
<b>White Pigeon River</b>	N/A	135	210	160	160	N/A	N/A
<b>St. Joseph River</b>	N/A	405	405	405	310	405	405
<b>Rocky River</b>	N/A	110	110	110	110	N/A	N/A
Total New ROW Acres Required for Construction	0	845*	925*	878*	914*	134*	59*
Cost (Millions of 2004 Dollars)***	0	\$269.00	\$460.97	\$288.56	\$303.26	\$30.25	\$24.75
<p>*Does not include indirect farmland impacts through the relocation of farm buildings, as discussed in Section 4.2, Farmland Impacts. There is no relocation of farm buildings for PA-5 and PA-5 MOD.  **Except for the bypass of Constantine, PA-5 and P-5 MOD have the same number of at-grade intersections as existing US-131.  ***Cost includes early preliminary engineering, preliminary engineering, construction engineering, pavement, earthwork, structures, and right-of-way.</p>							

*Practical Alternative Typical Sections:* Each of the four freeway Practical Alternatives were analyzed assuming a five-lane controlled access roadway from I-80/I-90 to Anderson Road. The proposed five-lane cross-section connecting US-131 in Michigan to Indiana State Road 13 at I-80/I-90 is not intended to preclude future development of a freeway cross-section at this location, as a part of the State of Indiana's long range plan vision of State Road 13 as a statewide mobility corridor. PA-2, 3, and 4 transition to a rural limited access freeway facility (grass median and open drainage) north of Anderson Road, and continue with that typical section to Coon Hollow Road. PA-1 remains a five-lane controlled access roadway up to Brown/Dickinson Road before transitioning to a limited access freeway facility. From Coon Hollow to Hoffman Road, in the City of Three Rivers, each freeway alternative is an urban freeway (concrete median barrier with enclosed drainage) to minimize right-of-way (ROW) impacts. PA-2 continues as an urban freeway to the northern project terminus due to the existing narrow median. North of Hoffman Road, all other freeway alternatives transition back to a rural limited access freeway to the northern project terminus.

PA-5 and PA-5 Modified (PA-5 MOD) are two-lane alternatives that utilize the existing US-131 alignment and cross-section from the Indiana Toll Road north to Brown/Dickinson Road. Both alternatives utilize the existing crossing of the White Pigeon River. The Norfolk & Southern Railroad crossing north of Indian Prairie Road would remain at grade. North of Brown/Dickinson Road, PA-5 and PA-5 MOD leave the existing US-131 alignment, and bypass Constantine to the west as two-lane controlled access roads, which follow and are within the footprint of PA-1 and 2 (and PA-3 starting at Riverside Drive to the northwest). Both alternatives require a new crossing of the St. Joseph River east of Blue School Road. North of Millers Mill Road, PA-5 curves northeast connecting with existing US-131 at Garber Road. At North River Road, PA-5 MOD curves northeast merging with existing US-131 at the existing signalized intersection with Youngs Prairie Road. This would become a four-legged signalized intersection. From the point where PA-5 merges with US-131 at Garber Road, PA-5 and PA-5 MOD are the same, and both utilize the existing US-131 alignment to the project's north terminus. North of the Village of Constantine there are some long steep grades in both directions located between Garber and Gleason Roads. As illustrated in **Figure 2.3 (sheets 1 and 2)**, a 12ft. wide northbound truck climbing lane of approximately 6,100 feet in length including transitions would be proposed, extending from north of Garber Road to just south of King Road. A southbound truck climbing lane would extend southward approximately 5,200 feet from the eastern terminus of Gleason Road. These lanes would allow passenger vehicles to pass trucks that move slowly when climbing these grades. Just south of M-60, the existing US-131 four-lane divided cross-section would be converted to a five-lane section. This cross-section would extend through the M-60 intersection and north to Hoffman Road in the City of Three Rivers. A new "Tee" intersection is proposed at the location of the existing US-131/M-60 intersection. North of Hoffman Road, PA-5 and PA-5 MOD transition back to the existing four-lane divided cross-section, and continue on the existing US-131 alignment to the north project limits. Where PA-5 and PA-5 Modified utilize the existing US-131 Alignment minor improvements will be implemented to bring the existing alignment up to current MDOT standards (i.e. 8 foot shoulders, 12 foot lanes).

The typical sections for the existing two-lane and four-lane US-131 roadway and for all proposed typical sections are shown in **Figures 2.4 and 2.5**.

As depicted in **Figure 2.5**, of all the considered cross-sections, a limited access, rural four-lane freeway requires the widest ROW at approximately 350 feet. Although traffic analysis showed US-131 levels-of-service (LOS) (**Section 2.3, Design Criteria**) for proposed five-lane or freeway sections to be at or better than the desired minimum (LOS D), a rural freeway cross-section is proposed for most of the length of four of the Practical Alternatives.

Improvements made to US-131 as a result of this study may be implemented in stages as funding becomes available. Discussion of potential phasing of improvements can be found in **Section 2.5, Construction Phasing.**

The difference between a rural and an urban freeway is the width and type of median. A rural freeway requires a wider ROW, but there are no median barriers and the cost of median drainage is minimal. An urban freeway section permits a narrower ROW than a rural section, but it requires a median barrier and an enclosed drainage system which is more costly to construct and maintain. A depressed urban freeway, as proposed in the City of Three Rivers for PA-2, has the advantage of not requiring the grade to be raised for local roads to pass over the freeway, but the additional costs of retaining walls and drainage are substantial and the long term maintenance costs are much greater.

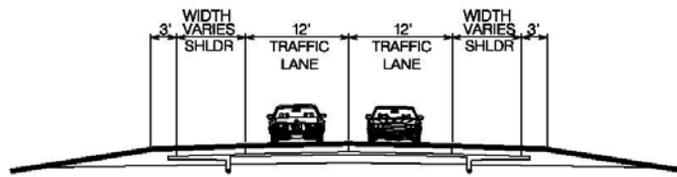
PA-5 and PA-5 MOD have the same ROW width, 66 feet, as existing US-131. Around Constantine, both alternatives have 66 feet of ROW but would be controlled access roadways with vehicular access generally limited to major cross-road intersections.

North of M-60, PA-5 and PA-5 MOD follow the existing US-131 alignment, converting the existing narrow median four-lane section to a five-lane cross-section and maintaining at-grade intersections. These alternatives could also benefit from potential access management improvements from Broadway to north of Michigan Avenue. Typical ROW width is 120 feet.

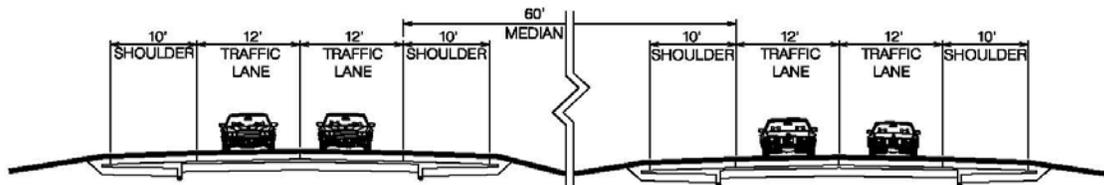
*River Crossing Structures:* In the study area the span of any proposed structures crossing any of the rivers would exceed the span length of the existing US-131 structure on those rivers. A hydraulic analysis will be performed during the design phase to ensure that the new structures will be designed so that no increase in backwater elevation will occur. Wildlife corridors have been included in the structure costs to mitigate any wildlife issues that potentially may arise.

Place Holder for Figure 2.3 sheet 1 of 2

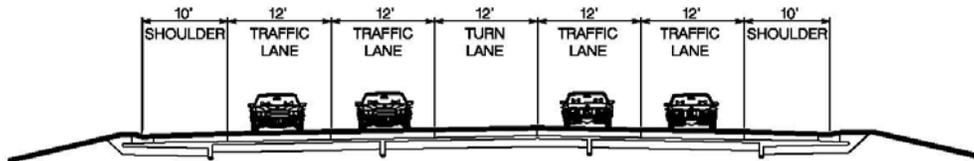
Place Holder for Figure 2.3 sheet 2 of 2



Existing US-131 Typical Two-Lane Roadway  
(South of M-60)

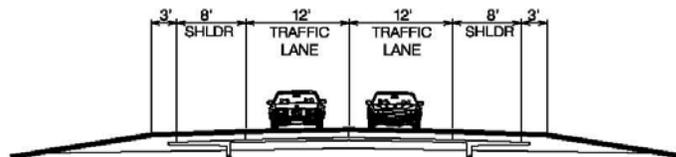


Existing US-131 Typical Four-Lane Divided Roadway  
(North of M-60)



Proposed Typical Five-Lane Roadway  
(PA-1\*, PA-2\*\*, PA-3\*\*, PA-4\*\*, PA-5\*\*\*, PA-5 Mod\*\*\*)

- \*Applicable South of Village of Constantine for PA-1
  - \*\*Applicable South of Village of White Pigeon for PA-2, PA-3, PA-4
  - \*\*\*Applicable from M-60 to Rocky River for PA-5 & PA-5 Mod
- Average right-of-way width approximately 120' (varies)

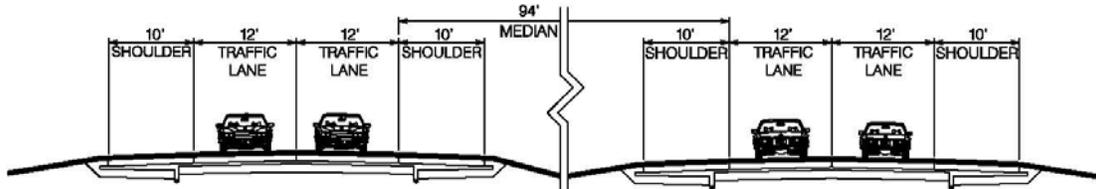


Proposed Typical Two-Lane Roadway  
(PA-1\*, PA-2\*, PA-3\*, PA-4\*, PA-5, PA-5 Mod)

\*Potential construction as a two way roadway within a freeway right-of-way as a first phase of freeway implementation for PA-1 through PA-4

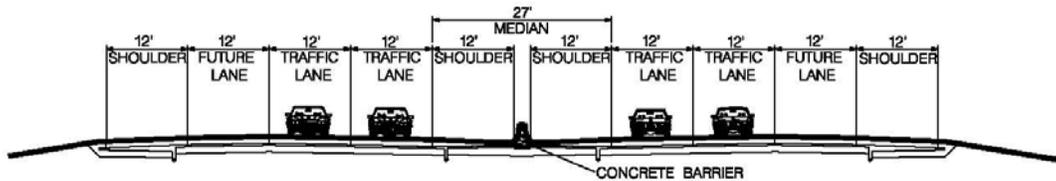
Figures Not to Scale

Figure 2.4 Existing Roadway Typical Cross-Sections



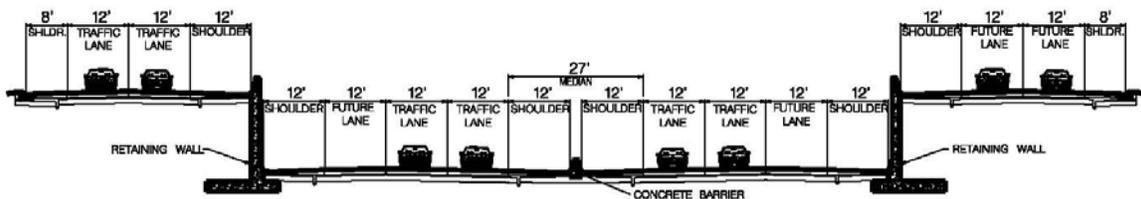
Proposed Typical Four-Lane Rural Freeway and  
Four-Lane Divided Highway (for potential phased implementation)

Potential Second Stage construction of a four-lane divided highway  
within a freeway right-of-way (approximately 350' ROW, width varies)  
allowing for future construction of interchanges and  
grade separations as limited access freeway



Proposed Typical Four-Lane Urban Freeway  
Michigan Avenue to Rocky River in Three Rivers  
(PA-1, PA-2, PA-3)

Average right-of-way width approximately 200' (varies) with enclosed drainage



Proposed Typical Four-Lane Depressed Urban Freeway with Parallel Service Drives  
Michigan Avenue to Hoffman Road in Three Rivers  
(PA-2)

Average right-of-way width approximately 200' (varies) with enclosed drainage

Figures Not to Scale

Figure 2.5 Proposed Roadway Typical Cross-Sections

*US-131 Business Route Location:* The current US-131 Business Route (US-131 BR) within the City of Three Rivers is approximately 2.5 miles long. It begins at the intersection of US-131 and Michigan Avenue, runs east to Main Street, follows Main Street north, and reconnects with US-131 at Wilbur Road (see **Figure 2.6**). If service drives are developed to provide local access to businesses as proposed for the freeway Build Alternatives, MDOT would turn over ownership of the existing Business Route to the City of Three Rivers and St. Joseph County within their respective jurisdictions. The service drives would be designated as the new Business Route in Three Rivers, and the city/county would take over responsibility for maintenance of the old Business Route. This would allow the city to consider adding angled parking on Main Street in downtown Three Rivers, as the city has previously proposed. MDOT policy precludes the development of angled parking on State designated and operated business routes.

The City of Three Rivers has also discussed with MDOT keeping the US-131 BR designation on its current Main Street route, terminating at relocated Lovers Lane/Cowling Road. If this alternative were selected, MDOT would construct only those portions of the service drives required to assure access to all properties along the Recommended Build Alternative. This would eliminate the need for a service drive north of Hoffman Road. A new bridge crossing of the Rocky River would therefore not be constructed, as this bridge structure is intended only to provide a continuous Business Route connection to US-131 at the north and south termini of the new Business Route. If the US-131 BR remains at its current location, this connection will not be required to maintain access to adjoining properties.

**Place Holder for Figure 2.6 Location of US-131 Business Route in Three Rivers**

#### **2.4.1 Practical Alternative 1 (PA-1) (freeway)**

Practical Alternative 1 (PA-1) begins at the existing four-lane section of US-131 at the entrance ramp to the Indiana Toll Road, where it widens to a five-lane roadway, and follows existing US-131 north to Brown/Dickinson Road. North of Brown/Dickinson Road, the roadway transitions from the five-lane section to a four-lane limited-access freeway, and leaves the existing US-131 alignment, curving to the northwest in order to bypass the Village of Constantine. North of Millers Mill Road, PA-1 curves to the east connecting with existing US-131 and continues north along the existing US-131 alignment to Drummond Road. PA-1 continues north at Drummond Road and connects with M-60 approximately one-half mile west of the existing intersection of US-131 and M-60. At Broadway Road, PA-1 turns northeast and meets the existing US-131 alignment near Coon Hollow Road where it transitions from a rural to an urban freeway facility. After crossing the Rocky River, PA-1 transitions back to a rural freeway and curves north, then west near Cowling Road, joining existing US-131 at the northern project terminus.

PA-1 includes three partial cloverleaf interchanges on the proposed US-131 freeway. These are located at realigned Quarterline Road, M-60, and realigned Cowling Road. The intersection of US-131 and US-12 would remain at-grade since PA-1 is not proposed to be a freeway until north of Brown/Dickinson Road. The I-80/90 entrance ramp, and US-131 intersections with Indiana County Road 2, Anderson Road, and Brown/Dickinson Road would also remain at-grade. Stears Road, Riverside Drive, Youngs Prairie Road, Zerbe Road, Drummond Road, Broadway Road, Millard Road, Hoffman Road, and Wilbur Road would not have access to US-131, but would retain access across the roadway with a grade separation/bridge structure. Segments of five roads in the study area would be terminated with a cul-de-sac at US-131. These include North River Drive, Millers Mill Road, Garber Road, Kerr Creek Road, and Coon Hollow Road. Gleason Road would be terminated in a cul-de-sac, but would also retain access by connecting to service drives. Access to Eagley Road is realigned via a new at-grade intersection, while King Road is realigned as part of a service drive. Service drives or access roads would be constructed in locations where existing US-131 or other local roads cannot be maintained for local access along the proposed freeway.

The proposed interchange at Quarterline Road would provide improved access to the Village of Constantine. Eastbound traffic on Quarterline Road would intersect existing US-131 at an existing signalized intersection. The proposed relocation of US-131 with a new interchange at M-60 would allow for the reconfiguration of the existing US-131/M-60 connection into a “tee” intersection. This intersection presently operates as an at-grade interchange, allowing for some directional free-flow movement while requiring complex operations for other traffic. Realigning Cowling Road/Lovers Lane with a new interchange and carrying Wilbur Road over US-131 Road would considerably improve the existing geometrics at these existing intersections by eliminating all at-grade access points.

PA-1 crosses the White Pigeon River at the existing US-131 river crossing, but creates a new crossing of the St. Joseph River west of the Village of Constantine. Two lanes of existing US-131 would be maintained as a service drive on the east side of the facility, from the existing US-131 BR, at Michigan Avenue, to Wilbur Road. The proposed grade of the freeway would be raised to carry it over Hoffman Road, allowing for an intersection of the service drive with Hoffman Road on the east side of the freeway. PA-1 crosses the Rocky River on the current US-131 alignment, but new structures would be required due to the grade change, which is necessary to carry the new roadway over Hoffman Road. A new Rocky River crossing would also be required east of this location to accommodate the service drive if it is designated as the

new US-131 Business Route within the City of Three Rivers. The following are the principal engineering advantages and disadvantages of PA-1 when compared to the other Practical Alternatives.

Advantages of PA-1:

- Utilizes existing bridge crossing at the White Pigeon River
- Least costly freeway Practical Alternative (\$269.0 million)
- Interchange at Quarterline Road provides Constantine access via existing intersection
- Perpendicular crossing of the St. Joseph River
- Improved intersection geometrics
- Reduces truck traffic in downtown Constantine

Disadvantages of PA-1:

- Railroad crossing delay due to the five-lane roadway at-grade crossing of the Norfolk & Southern Railroad south of the Village of White Pigeon
- Six at-grade intersections
- Requires five local roads to be terminated with a cul-de-sac
- Substantially more costly than PA-5 or PA-5 MOD

**2.4.2 Practical Alternative 2 (PA-2) (freeway)**

Practical Alternative 2 (PA-2) follows the same alignment as PA-1 up to Drummond Road, north of the Village of Constantine, except that it transitions from a five-lane roadway to a four-lane limited access freeway north of Anderson Road. PA-2 then continues along the existing US-131 alignment to the north terminus of the project one mile north of Cowling Road. North of King Road, PA-2 transitions from a rural to an urban freeway facility (a longer urban freeway section than proposed for PA-1, PA-3, and PA-4) and is proposed to be depressed approximately 20 feet below existing US-131. This depression allows existing local roads to cross US-131 without being raised, and allows service drives to be located directly in front of businesses currently fronting on US-131. After crossing the Rocky River, PA-2 transitions back to a rural freeway until it connects with existing US-131 one mile north of Cowling Road.

PA-2 includes three partial cloverleaf interchanges located at US-12, realigned Quarterline Road, and M-60; the smaller footprint of a single-point interchange is proposed with realigned Cowling Road/Lovers Lane due to the close proximity of the Norfolk-Southern Railroad. The I-80/90 entrance ramp, Indiana County Road 2, and Anderson Road would remain as at-grade intersections. Indian Prairie Road, Brown/Dickinson Road, Riverside Drive, Youngs Prairie Road, Zerbe Road, Drummond Road, Broadway Road, Millard Road, Hoffman Road, and Wilbur Road would not have access to US-131, but would retain access across the roadway with a grade separation. A grade separation is also proposed to carry US-131 traffic over the Norfolk & Southern Railroad south of the Village of White Pigeon. Three roads in the study area would not be carried over US-131, but would intersect with service drives paralleling US-131. These are King Road, Gleason Road, and Kerr Creek Road. Segments of Stears Road, North River Drive, Millers Mill Road, Garber Road, King Road, and Coon Hollow Road would end in cul-de-sacs. Eagley Road is realigned as part of a service drive. Service drives are proposed where necessary to provide access on the east side of the PA-2 freeway alignment. This would be required within the Village of White Pigeon and much of the City of Three Rivers. At the bypass of the Village of Constantine, existing US-131 and local roads would continue to provide access. If designated as the new US-131 BR in the City of Three Rivers, the new service drive at this location would provide a continuous Business Route connection from existing US-131

south of M-60, north to Wilbur Road. A service drive is also proposed for access on the west side of the freeway extending from Drummond Road north to connect with Kerr Creek Road south of Millard Road.

The US-131/US-12 proposed interchange is located entirely on the south side of the intersection because of the Wahbememe Memorial Park located in the northwest quadrant of this interchange. The proposed interchange at Quarterline Road would intersect existing US-131 at an existing signalized intersection, improving access to the Village of Constantine. The interchange with M-60 would replace the existing at-grade interchange. Realigning Cowling Road/Lovers Lane with a new interchange and carrying Wilbur Road over US-131 north of Three Rivers would improve the existing geometrics at these intersections, by eliminating all at-grade access points.

PA-2 crosses the White Pigeon River at the existing US-131 river crossing, but two additional bridges would be required due to the widening of the US-131 roadway and the addition of a new service drive. PA-2 also creates a new crossing of the St. Joseph River west of the Village of Constantine. The crossing of the Rocky River is the same for all freeway Build Alternatives as described for PA-1.

North of Coon Hollow Road, PA-2 transitions out of its depressed section, and continues to rise to carry it over Hoffman Road and allow for an at-grade intersection of the service drive with Hoffman Road, east of the proposed US-131 freeway. A new service drive would be constructed on the east side of PA-2 north of Hoffman Road if PA-2 is designated as the new US-131 Business Route within the City of Three Rivers. The following are the principal engineering advantages and disadvantages of PA-2 when compared to the other Practical Alternatives.

Advantages of PA-2:

- Utilizes existing White Pigeon River crossing
- Utilizes existing US-131 corridor to the greatest extent of all freeway alternatives
- Interchange at Quarterline Road provides Constantine access via existing intersection
- Perpendicular crossing of the St. Joseph River
- Improved intersection geometrics
- Reduces truck traffic in downtown Constantine

Disadvantages of PA-2:

- Most expensive Practical Alternative (\$460.9 million)
- Most difficult for staged implementation
- Most difficult for maintenance of traffic during construction
- Most costly for long term maintenance
- Requires new bridge for service drive over the White Pigeon River
- Requires most total ROW due to service drive requirements and adjoining property setback requirements (925 acres)
- Requires most service drives (23.1 miles)
- Requires six local roads to be terminated with a cul-de-sac

**2.4.3 Practical Alternative 3 (PA-3) (freeway)**

Practical Alternative 3 (PA-3) begins as a five-lane roadway, as described above for PA-1, at the Indiana Toll Road and follows existing US-131 northeast to Anderson Road. At Anderson

Road PA-3 transitions from a five-lane roadway to a four-lane limited access freeway, heading north to parallel existing US-131 approximately one-half mile to the west. North of Brown/Dickinson Road PA-3 curves west, using the same alignment as PA-1 and 2 over the St. Joseph River. PA-3 continues along the PA-1 alignment to the northern project terminus.

PA-3 includes four partial cloverleaf interchanges on the proposed US-131 freeway alignment. These are located at US-12, realigned Quarterline Road, M-60, and realigned Cowling Road. The I-80/90 entrance ramp, Indiana County Road 2, and Anderson Road would remain as at-grade intersections with US-131. Indian Prairie Road, Brown/Dickinson Road, Riverside Drive, Youngs Prairie Road, Zerbe Road, Drummond Road, Broadway Road, Millard Road, Hoffman Road, and Wilbur Road would not have access to US-131, but would retain access across the roadway with a grade-separated bridge structure. A grade separation is also proposed to carry US-131 traffic over the Norfolk & Southern Railroad south of the Village of White Pigeon. Segments of seven roads in the study area would be terminated with a cul-de-sac. These include Crampton Road, Stears Road, North River Drive, Millers Mill Road, Garber Road, Kerr Creek Road, and Coon Hollow Road. Gleason Road would be terminated in a cul-de-sac but would retain access by connecting to service drives. King Road would be realigned as a part of a service drive. In locations where existing US-131 or other local roads cannot be maintained for local service along the proposed freeway, service drives or access roads would be constructed to assure access to all properties.

A new interchange at US-131 and US-12 would improve the flow of traffic between these two State trunklines while maintaining access to local businesses during construction more easily than PA-1 and PA-2. The proposed interchange at Quarterline Road would intersect existing US-131 at an existing signalized intersection, effectively improving access to the Village of Constantine. The proposed relocation of US-131 with a new interchange at M-60 would allow for the reconfiguration of the existing US-131/M-60 connection into a “tee” intersection. This intersection presently operates as an at-grade interchange, allowing for some directional free-flow movement while requiring complex operations for other traffic. Realigning Cowling Road with a new interchange and carrying Wilbur Road over US-131 Road would improve the existing geometrics at these existing intersections, by eliminating all at-grade access points.

PA-3 provides a new crossing of the White Pigeon River and a new crossing of the St. Joseph River west of the Village of Constantine. The crossing of the Rocky River would be the same for all freeway Practical Alternatives as described for PA-1.

Two lanes of existing US-131 would be maintained as a service drive on the east side of the proposed facility, extending from the existing US-131 BR, at Michigan Avenue, to Wilbur Road. The proposed grade of the freeway would be raised to carry it over Hoffman Road, allowing for an intersection of the service drive with Hoffman on the east side of the proposed US-131 freeway alignment. The following are the principal engineering advantages and disadvantages of PA-3 when compared to the other Practical Alternatives.

Advantages of PA-3:

- Utilizes existing topography north of Garber Road for screening/separation
- Shortest distance from south to north terminus (17.2 miles) of all Build Alternatives
- Interchange at Quarterline Road provides Constantine access via existing intersection
- Perpendicular crossing of the St. Joseph River
- Improved intersection geometrics
- Reduces truck traffic in downtown Constantine

#### Disadvantages of PA-3:

- Requires seven local roads to be terminated with a cul-de-sac.
- More expensive than PA-1, and significantly more expensive than PA-5 and PA-5 MOD.

#### **2.4.4 Practical Alternative 4 (PA-4) (freeway)**

Practical Alternative 4 (PA-4) follows the same alignment with the same roadway typical sections as PA-3 from the Indiana Toll Road north to Brown/Dickinson Road. At Brown/Dickinson Road PA-4 heads northwest to bypass the Village of Constantine approximately one-half mile west of the Village limits. At North River Road PA-4 curves northeast, then heads north between Zerbe and Garber Roads. North of Drummond Road PA-4 turns northeast and runs parallel to existing US-131 to the west. At Gleason Road, PA-4 heads north to intersect M-60 just east of the PA-1/M-60 proposed interchange location. North of Broadway Road PA-4 joins the PA-1/PA-3 alignment extending to the north project limits.

PA-4 would include four partial cloverleaf interchanges. One or more of these could initially be constructed as rural diamonds. These are located at US-12, Youngs Prairie Road, M-60, and realigned Cowling Road. The I-80/90 entrance ramp, Indiana County Road 2, and Anderson Road would remain as at-grade intersections with US-131. Indian Prairie Road, Brown/Dickinson Road, Riverside Drive, North River Road, Zerbe Road, Drummond Road, Broadway Road, Millard Road, Hoffman Road, and Wilbur Road would not have access to US-131, but would retain access across the roadway with a grade separation. A grade separation is also proposed to carry US-131 traffic over the Norfolk & Southern Railroad south of the Village of White Pigeon. Seven roads in the study area would be terminated with a cul-de-sac. These include Crampton Road, Blue School Road, Garber Road, King Road, Kerr Creek Road, and Coon Hollow Road. Quarterline Road would end in a cul-de-sac, but also connects to a service drive. Millers Mill Road, Shafer Road, and Gleason Road do not cross PA-4 but connect with service drives. In other locations where existing US-131 or other local roads cannot be maintained for local access along the proposed freeway, service drives or access roads would be constructed.

The new interchange proposed at US-131 and US-12 would improve the flow of traffic between these two trunklines and makes maintaining access to local businesses during construction easier than with PA-1 and PA-2. The proposed interchange at Youngs Prairie Road would provide access to the Village of Constantine, but at a greater distance from town than the other alternatives with interchanges at Quarterline Road. Access between the PA-4 interchange and Constantine requires travel through a residential neighborhood on Youngs Prairie Road. This interchange also requires the relocation or closure of a number of local roads. The proposed interchange location at M-60 allows the reconstruction of the existing US-131/M-60 connection as a “tee” intersection. This intersection presently operates as an at-grade interchange, allowing for some directional free-flow movement while requiring more complex operations for other movements. Realigning Cowling Road/Lovers Lane with a new interchange and carrying Wilbur Road over US-131 would improve the existing geometrics at these existing intersections, by eliminating all at-grade access points.

PA-4 provides a new crossing of the White Pigeon River and a new crossing of the St. Joseph River west of Blue School Road. The St. Joseph River crossing location was selected to minimize impacts while providing a perpendicular crossing, however, the 100-year floodplain is relatively wide (1085 feet) at this location. The Rocky River crossing is the same as for all other freeway Build Alternatives.

Two lanes of existing US-131 would be maintained as a service drive on the east side of the proposed freeway from the existing US-131 BR, at Michigan Avenue, to Wilbur Road. The proposed grade of the freeway would be raised to carry it over Hoffman Road, allowing for an intersection of the service drive with Hoffman on the east side of the proposed US-131 freeway alignment. The following are the principal engineering advantages and disadvantages of PA-4 when compared to the other Practical Alternatives.

Advantages of PA-4:

- Least length of service drives (11.2 miles)
- Perpendicular crossing of the St. Joseph River
- Utilizes existing topography to greatest extent
- Improved intersection geometrics
- Reduces truck traffic in downtown Constantine

Disadvantages of PA-4:

- Greatest floodplain crossing length at the St. Joseph River (approximately 1325')
- Requires six local roads to be terminated with a cul-de-sac.
- Requires access to the Village of Constantine through a residential street on Youngs Prairie Road

**2.4.5 Practical Alternative 5 (PA-5) (two lane non-freeway)**

Practical Alternative 5 (PA-5) begins as a two-lane facility from the Indiana Toll Road and follows existing US-131 north to Brown/Dickinson Road. There are at-grade intersections with the ramps to the Indiana Toll Road, Indiana County Road 2, Anderson Road, Indian Prairie Road, US-12, and Brown/Dickinson Road. Anderson Road would be realigned to achieve a more optimal intersecting angle, as would Eagley Road. The PA-5 alignment utilizes the existing US-131 crossing of the White Pigeon River. An at-grade crossing of the Norfolk & Southern Railroad north of Indian Prairie Road is also proposed. North of Brown/Dickinson Road, PA-5 consists of a two-lane controlled access roadway section, and leaves the existing US-131 alignment, curving to the northwest in order to bypass the Village of Constantine. Existing US-131 would be realigned south of Stears Road to create a tee intersection with the new US-131 bypass. North of Stears Road, PA-5 follows the northbound roadway alignment of PA-1 and PA-2 while maintaining an at grade intersection at Riverside Drive. This alternative requires a new two-lane bridge crossing of the St. Joseph River east of Blue School Road, at the same location as PA-1, PA-2, and PA-3. In this area, the only at-grade intersection that is proposed is at Quarterline Road, providing access to the Village of Constantine. Quarterline Road would be realigned to tee into the existing US-131 and Young's Prairie intersection. Between Quarterline and Millers Mill Roads, Shaffer Road would be reconstructed as a paved road. Youngs Prairie Road and Millers Mill Road would be cul-de-saced at the PA-5 alignment. North of Millers Mill Road, PA-5 curves northeast merging with the existing US-131 alignment at Garber Road. At this location, existing US-131 would be realigned to provide a more optimal intersecting angle with the new US-131/PA-5 alignment. From this point north, PA-5 continues as a two-lane section and utilizes the existing US-131 alignment to north of Gleason Road. However, a single 12-foot wide truck climbing lane would be added in each direction north of Garber Road. The northbound lane would extend approximately 6,700 feet north from Garber Road and the southbound lane would extend approximately 5,200 feet south from the eastern terminus of Gleason Road. Just south of M-60 the roadway would transition from a two-lane to a five-lane section through M-60. A new "tee" intersection is proposed at the location of the existing US-131/M-60 intersection.

North of M-60, PA-5 follows the existing US-131 alignment from Broadway to Hoffman Road, with conversion of the existing narrow median four-lane section to a five-lane section at this location. North of Hoffman Road, PA-5 transitions back to a four-lane divided cross-section, and continues on the existing US-131 alignment to the north project limits while maintaining and improving existing at-grade intersections. Access management measures and zoning regulations on US-131 in St. Joseph County are being evaluated in a separate study, and can be incorporated by local agencies as a separate effort regardless of which alternative is recommended. **Figure 2.3 (sheets 1 and 2)** shows potential driveway consolidation as a part of PA-5 within the City of Three Rivers. Identifying the locations of potential driveway closures and/or consolidations is an engineering design issue which would have minimal or no impact on ROW requirements. For the purposes of the traffic operational analysis, some driveways were assumed to be closed. The potential for, and locations of, actual driveway closures would be identified in MDOT's ongoing Access Management study for St. Joseph county and in consultation with property owners during design.

Where PA-5 and PA-5 Modified utilize the existing US-131 Alignment minor improvements will be implemented to bring the existing alignment up to current MDOT standards (i.e., 8 foot shoulders, 12 foot lanes).

The following cross-roads are not proposed to be carried across PA-5: Stears Road, Youngs Prairie Road, Millers Mill Road, Zerbe Road, and King Road. Access is proposed to be maintained to all other crossroads.

#### Advantages of PA-5:

- Utilizes more of the existing alignment than any freeway alternative except PA-2
- Improves intersection geometrics
- Perpendicular crossing of the St. Joseph River
- Less environmentally intrusive than all freeway alternatives
- Much less new ROW than the freeway alternatives
- Controlled access bypass of Constantine
- Less costly than all freeway Build Alternatives
- Reduces truck traffic in downtown Constantine

#### Disadvantages of PA-5:

- Requires five local roads to be terminated with a cul-de-sac.
- More environmentally intrusive than PA-5 MOD
- More costly than PA-5 MOD
- Lower design speed for through traffic than freeway alternatives
- Requires southbound traffic on Youngs Prairie Road and westbound traffic on Millers Mill Road to use Shaffer and Quarterline Roads to access Constantine.
- More travel time required to reach motorist destinations than any of the Build Alternatives, except PA-5 MOD, because of delays due to traffic flow interruptions
- Lower posted speeds and more traffic interruptions compared to the freeway alternatives

#### **2.4.6 Practical Alternative 5 Modified (PA-5 MOD) (two lane non-freeway)**

Practical Alternative 5 Modified (PA-5 MOD) is exactly the same alternative as PA-5 except at the north end of the Village of Constantine bypass, between North River Road and Garber Road. At North River Road, PA-5 MOD curves northeast, merging with existing US-131 at Youngs Prairie Road. A new four-legged signalized intersection is proposed where US-131

connects with the existing US-131 alignment. From this point north, PA-5 MOD remains as a two-lane section and utilizes the existing US-131 alignment to Garber Road. North of Garber Road to the study limits, PA-5 MOD is the same alternative as PA-5.

The following cross-roads are not proposed to be carried across PA-5 MOD: Stears Road and King Road. Access is proposed to be maintained to all other crossroads.

Advantages of PA-5 MOD:

- Utilizes more of the existing alignment than any Build Alternative
- Improved intersection geometrics
- Perpendicular crossing of the St. Joseph River
- Least environmentally intrusive Build Alternative
- Controlled access bypass of Constantine
- Least costly Practical Build Alternative
- Least amount of local roads to be terminated with a cul-de-sac
- Least amount of ROW required of all Build Alternatives
- Reduces truck traffic in downtown Constantine
- Removes right angle turn for US-131 traffic in Constantine with minimal ROW

Disadvantages of PA-5 MOD:

- Requires three local roads to be terminated with a cul-de-sac
- Requires access to the Village of Constantine from the bypass via a new roadway
- Lower design speed for through traffic than freeway alternatives
- More signalized intersections than any other Practical Alternative
- Most travel time required to reach motorist destinations of any of the Build Alternatives, because of delays due to traffic flow interruptions
- Lowest posted speeds and most traffic interruptions of all the Build Alternatives

#### **2.4.7 Practical Alternatives Addressing the Purpose of and Need for a Proposed Action**

The No-Build Alternative does not meet the Purpose of and Need for the project. Each of the Practical Build Alternatives analyzed in this document meets the purpose of and need for a proposed action as defined in **Section 1.0, Purpose of and Need for a Proposed Action**. Each Build Alternative improves highway system operations, assures sufficient capacity to accommodate future traffic growth, and improves roadway inefficiencies. As previously noted, a detailed traffic analysis was developed as part of this study utilizing MDOT's statewide travel demand model. This analysis provided existing and projected (year 2025) traffic volumes, which were used to analyze the capacity of each alternative. The average annual daily traffic (AADT) and associated LOS for the No-Build Alternative and each Practical Build Alternative is listed in **Table 2.3** for the base year and 2025 design year. A detailed discussion can be found in the separate Traffic Analysis Technical Memorandum available for review at MDOT.

All Practical Build Alternatives improve the system operations, efficiency of vehicular travel, and the movement of goods and services through the US-131 study corridor. When any of the Practical Alternatives are fully implemented, there will be no posted speed limits lower than 55 miles per hour on rural portions of US-131. For all Practical Build Alternatives, through traffic would no longer be required to negotiate the ninety-degree turn in Constantine and the on-street parallel parking on US-131 in downtown Constantine. The freeway alternatives would allow traffic to avoid most of the signalized and non-signalized intersections throughout the corridor, and traffic from the numerous drives accessing US-131 in the City of Three Rivers. For PA-5 and PA-5 MOD, conflicting traffic movements associated with the numerous drives accessing

US-131 in the City of Three Rivers could potentially be alleviated by access management measures. MDOT, in collaboration with the local communities, has a US-131 Access Management study underway in St. Joseph County. MDOT has no control over the zoning and land use components of Access Management, but measures identified within this plan for driveway consolidation, service drives, or other elements can be developed in conjunction with the on-alignment Build Alternatives.

With PA-1, a signalized intersection will still exist at US-12/US-131, and all Practical Alternatives will continue to feature uncontrolled access between the Indiana Toll Road and the Indiana/Michigan state line. North of White Pigeon, PA-1 through PA-4 are limited access freeways. The freeway Practical Alternatives all improve the system operations of the overall US-131 corridor, increasing the percentage of US-131 that is limited access freeway between the Indiana Toll Road and I-94 near Kalamazoo.

Each of the freeway Practical Alternatives meets the additional project purpose of separating conflicting local traffic from through commercial trips. Through traffic would be able to utilize a limited access facility while access for local traffic would be maintained through service drives, grade separations, and interchanges. For PA-5 and PA-5 MOD, conflicting local traffic would be separated from through commercial trips in Constantine, because through truck traffic would use the bypass.

The improvements from each Practical Build Alternative would also meet the project purpose of improving pedestrian and motorist safety along US-131. The bypass of downtown Constantine which is a part of all Practical Build Alternatives would make it easier for pedestrians and local traffic to cross the existing US-131 roadway. For the freeway Practical Alternatives, through traffic moving at high speeds through urbanized parts of the study area would no longer interact with crossing traffic at intersections. Controlled and limited access facilities as proposed for the Practical Build Alternatives have historically lower average crash rates than does the existing US-131 four-lane uncontrolled access roadway through Three Rivers. Many of the conflicting movements that contribute to higher than average crash rates for segments of US-131 in Three Rivers and Constantine (**Section 1.2, Need for a Proposed Action**) would be minimized with the implementation of any Build Alternative. All Practical Build Alternatives also address the majority of the limited passing opportunities on the existing two-lane segment of US-131.

**Table 2.3 Forecast 2025 Traffic and Level-of-Service for the Practical Alternatives**

US-131 Segment (Non- Freeway Alternatives)		Indiana Toll Road to Dickinson Road	Dickinson Road to M-60	M-60 to Hoffman Road	Hoffman Road to North Project Limit
2003 Existing US-131	AADT	8,600-10,400	11,100-12700	20,700	18,700
	LOS	C	D	B	A
2025 No-Build	AADT	14,400-15,800	16,800-19,500	34,100	23,800
	LOS	D	E	B	B
2025 PA-5	AADT	14,500-17,600	14,800-17,400	34,500	24,100
	LOS	D	C-D	B	B
2025 PA-5 MOD	AADT	14,400-17,300	14,400-18,100	34,200	23,900
	LOS	D	C-D	B	B
US-131 Segment (Freeway Alternatives)		Indiana Toll Road to US-12	Dickinson Road to Quarterline Road*	Quarterline Road to M-60	M-60 to North Project Limit
2025 PA-1	AADT	20,620-21,600	21,400	25,600	23,700-24,500
	LOS	B	A	B	A
2025 PA-2	AADT	20,700-21,800	21,600	25,800	28,000-30,600
	LOS	A-B	B	B	B
2025 PA-3	AADT	18,300-21,700	24,600	27,000	24,800-26,200
	LOS	A-B	B	B	A
2025 PA-4	AADT	17,100-20,400	19,100	24,000	23,100-23,600
	LOS	A-B	A	A	A

\*The PA-4 Interchange is at Youngs Prairie Road and not Quarterline Road.

## 2.5 Construction Phasing

Phased implementation of a Build Alternative may be required due to construction costs, right-of-way (ROW) and mitigation requirements, the magnitude of proposed construction, and requirements for maintaining traffic flow during construction. For any Build Alternative, improvements can be made to US-131 in stages as warranted by traffic, and as funding becomes available.

If identified as a Recommended Alternative in the Final Environmental Impact Statement (FEIS), build-out of a limited access freeway or a Constantine bypass would likely be staged. Funding allocations may require phased construction over an extended period of time to address project needs in order of priority as funding becomes available. The proposal for a freeway Build Alternative would be to obtain right-of-way for a limited access freeway. However, for segments of new alignment, a lesser two-lane facility with controlled access and at-grade intersections could be constructed as an interim solution for improved capacity and separation of through and local trips. A freeway bypass of Constantine, or any segment where an alignment off existing US-131 is proposed, may first be constructed as a two-lane access-controlled facility with at-grade intersections. Access control would preclude driveways on the new alignment, and new bridge structures would be built to freeway standards. As traffic warrants and funding allows, the roadway could then be upgraded to a four-lane divided highway, allowing the at-grade road intersections to remain. Through the staged construction of interchanges, bridge crossovers, cul-de-sacs, required local road connections, and service drives, the facility could subsequently be converted to a limited access freeway. Construction would be staged to maintain access to properties during all stages of construction.

Staging for a freeway or non-freeway Build Alternative may also be done by roadway segment or locational priority. If phased construction is required, right-of-way requirements, geometric

inefficiencies, and traffic demands will all be important factors in prioritizing staging by segment or location. Segments experiencing high crash rates, new development, and/or less than desirable level-of-service or roadway inefficiencies could be among those given priority for right-of-way acquisition and construction.

If new or replacement bridge crossings of the White Pigeon, St. Joseph, and/or Rocky Rivers are required, they are proposed to be constructed at the width and standards to accommodate the Recommended Alternative, regardless of the status of phased implementation. There are many variables for potential staging for each of the Practical Build Alternatives. If the Recommended Alternative is determined to be a Build Alternative, potential staging opportunities will be addressed in greater detail within the FEIS.