



Chapter 3: Alternatives

The US 31 Improvement Project has been a dynamic process since its inception. During the course of the study, new alternatives and modifications to alternatives were continually investigated. Section 3.1, Preliminary Alternatives Analysis and Screening, will discuss the process by which the preliminary alternatives were developed and screened for four Preliminary Freeway Alternatives. Section 3.2, Modifications to the Alternatives Recommended for Further Analysis, will discuss modifications that were made to the four Preliminary Freeway Alternatives aimed at minimizing socio-economic and environmental impacts. Section 3.3, Descriptions of the Alternatives Selected for Detailed Study, will describe the alternatives selected for detailed study. Section 3.4, Identification of the Alternatives Studied in Detail, will identify the alternatives studied in detail, and Section 3.5, Local Road Improvements, will identify needs for improvements to local or state roadways that may be accelerated by the improvements to US 31.

3.1 Preliminary Alternatives Analysis and Screening

The development of the alternatives for the US 31 Improvement Project began with a broad examination of potential solutions to the transportation needs in the US 31 Corridor. The current transportation system, existing and projected traffic conditions, and the mobility needs for the State of Indiana and the South Bend Metropolitan Area were examined in determining the purpose and need for the project. The major concerns were increasing traffic congestion, deteriorating safety conditions, and poor statewide mobility.

The Indiana Department of Transportation (INDOT) 2000-2025 Long Range Transportation Plan and the Michiana Area Council of Governments (MACOG) - the South Bend Area Metropolitan Planning Organization (MPO) - Transportation Plan were both reviewed to ensure consistency of the proposed improvements to US 31. The alternatives considered include:

- No-Build Alternative
- Travel Demand Management (TDM) Alternatives
- Transportation System Management (TSM) Alternatives
- Intelligent Transportation System (ITS) Applications
- Mass Transit Alternative; and
- Highway Build Alternatives
 - Non-Freeway Alternatives
 - Freeway Alternatives

This section describes each of the alternatives considered, the screening method utilized for each of the alternatives and the rationale for selecting the alternatives to be further evaluated in the DEIS.



3.1.1 Methodology for Screening Alternatives

Each of the alternatives developed for the US 31 Improvement Project, from Plymouth to South Bend, was evaluated to determine if it would be carried forward for evaluation in the Draft Environmental Impact Statement (DEIS). A two-phase process was used to screen each alternative. Phase 1 screened alternatives with respect to purpose and need, while Phase 2 screened alternatives with respect to potential social and environmental impacts. Only those alternatives that met the purpose and need of the project in the Phase 1 analysis were advanced to Phase 2 of the screening process. The screening process is further described below.

Phase 1: Purpose and Need Measures

The first phase of the screening process analyzed the alternatives with respect to the Purpose and Need Statement for this project. To meet the purpose and need for this project, an alternative would have to meet the first two purposes and needs. An alternative would not be eliminated based on the third purpose and need statement. Specific objectives and performance measures were developed for each of the three identified purposes and needs and are discussed in length in Section 2.4, Project Purpose and Need Statement.

To satisfy the first purpose and need for this project, an alternative would have to reduce congestion on existing US 31 by providing the capacity to meet the forecasted travel demand for 2030 at an acceptable level-of-service (LOS). The LOS rating scale of traffic operating conditions utilizes six levels, A-F, and is further explained in Section 2.1, Traffic Congestion. This equates to an acceptable LOS for rural and suburban areas of C (B is preferable) and in urban intermediate/built-up areas of no less than D (C is preferable). A secondary measure of comparison related to congestion for an alternative would be the reduction in the amount of congested vehicle-miles of travel (VMT) and congested vehicle-hours of travel (VHT) in the South Bend Metropolitan Area.

To satisfy the second purpose and need for this project, an alternative would have to improve safety on existing US 31 between US 30 and US 20. This equates to a reduction in the risk of fatal, injury, and property damage only (PDO) accidents to crash rate levels at or below statewide averages for this type of facility; that being associated with travel on existing US 31 between US 30 and US 20. Crash rates are equal to personal injury accidents plus property damage only (PDO) accidents per 100 million annual vehicle-miles of travel. The statewide average crash rate for rural principal arterials is 186.57 accidents per 100 million annual vehicle-miles of travel. A reduction in crash rates (improved safety) is expected by upgrading a roadway facility's level of access control. For example, by improving US 31 from a rural principal arterial with partial and/or no access control, as currently exists from US 30 to West 4A Road, to a freeway, vehicle conflicts and the potential for accidents to occur at intersections would be eliminated by controlling access to interchanges instead of at-grade intersections. In areas along the US 31 Corridor in which the new facility is a new-terrain freeway and existing US 31 will remain as a local access roadway, vehicle conflicts and the potential for accidents to occur along existing US 31 and corresponding accident rates would also be reduced. This reduction would be due in large part to the diversion of traffic onto the new freeway facility and a reduction of residual traffic along existing US 31. This reduction of traffic volumes along existing US 31 would reduce the risk of accidents to crash rate levels at or below average for a rural principal arterial. A secondary measure of comparison related to improved safety for an alternative would be the reduction in fatal, injury, and PDO accidents to crash rate levels at or below statewide averages for this type of facility in the South Bend Metropolitan Area.

For the third purpose and need for this project, alternatives were evaluated to determine consistency with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors as well as consistency with the MACOG Transportation Plan. Alternatives were not required to meet the third criterion in order to satisfy the alternatives meeting purpose and need.



If an alternative clearly did not satisfy the project’s purpose and need, it was not advanced to Phase 2 of the screening process. Alternatives that did meet the project’s purpose and need were advanced to Phase 2 of the screening process.

Phase 2: Social and Environmental Measures

The second phase of the screening process analyzed the socio-economic and environmental impacts of the alternatives that were advanced from the purpose and need evaluation in Phase 1 of the screening process. Environmental information used in this phase of the screening process was collected from existing sources and preliminary windshield and field surveys. A 300-foot wide “working alignment” (using the approximate centerline of each 2000-foot wide “corridor”) was used to determine potential impacts to social, economic, and environmental resources for each alternative. Depending on the expected type of interchange, a 500- or 1000-foot radius circle was incorporated into the working alignment at the potential interchange location. This circle represents an approximation of an interchange footprint to be included in the area studied for potential impacts.

The majority of the environmental screening was done using Geographic Information System (GIS) data. Preliminary windshield and field surveys were also used to collect information.

Along with preliminary cost estimates, the following environmental resources and/or issues are considered in the screening analysis.

- Preliminary Cost Estimates
- Estimated New Right-of-Way
- Forest Impacts
- Wetland Impacts
- Floodplain Impacts
- Stream Impact
- Potential Section 4 (f) Properties
- Managed Lands
- Unique Geological/Ecological Area (Maxinkukee Moraine)
- Farmland Impacts
- Notable Wildlife Habitat
- Residential Relocations
- Business Relocations
- Cemeteries



- Environmental Justice Issues
- Well-Head Protection Area Impacts
- Potential Historic Property Impacts
- Potential Archaeological Impacts
- Potential Residential Noise Impacts
- Hazardous Material Impacts

3.1.2 No-Build Alternative

The No-Build Alternative includes “capacity expansion” projects in the South Bend Metropolitan Area (St. Joseph, Marshall, and Elkhart counties) as reported in the MACOG Transportation Improvement Program (2003-2005 TIP) and the balance of Indiana as reported in the Indiana Statewide Transportation Improvement Program (IN-STIP). Capacity expansion projects include major roadway investments such as a major widening that add through traffic lanes, the extension of existing roadways or construction of new roadways, new interchanges and major roadway realignments, or reconstructions that add through traffic carrying capacity.

When capacity expansion projects that are programmed for construction or that have been completed since the year 2000 are added to the existing roadway network, the resulting roadway network constitutes the No-Build Alternative (or Existing-Plus-Committed Network). It is assumed that these programmed improvements are committed, and will be completed independent of any decision regarding the improvement of US 31 from Plymouth to South Bend.

The committed capacity expansion projects in St. Joseph and Marshall counties include the following.

- Bittersweet Road widening to four lanes from Vistula Drive to McKinley Highway
- SR 331 (Capital Avenue) widening from four to six lanes from Douglas Road to SR 23
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Douglas Road to Day Road (recently completed)
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Day Road to Jefferson Boulevard
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Jefferson Boulevard to Harrison Road (12th Street)
- SR 331 (Capital Avenue) new construction as a six-lane divided arterial from Harrison Road (12th Street) to US 20
- SR 331 (Capital Avenue) widening from four to six lanes from Jackson Road to US 20
- Cleveland Road widening to four lanes from Brick Road to Bendix Drive



- Douglas Road widening to four lanes from SR 23 to west of Grape Road and from Main Street to Fir Road
- Gumwood Road widening to four lanes from Cleveland Road to Brick Road
- Harrison Road (12th Street) widening to four lanes from Merrifield Road to Fir Road
- Ironwood Road widening to four lanes from Ridgedale Road to Randolph Street (completed)
- Jefferson Boulevard widening to four lanes from Fir Road to Capital Avenue
- McKinley Highway widening to five lanes from Elder Road to Birch Road
- Miami Highway widening to four lanes from Kern Road to Jackson Road
- Portage Avenue widening to four lanes from Lathrop Drive to Toll Road
- SR 17 (N. Michigan Street in Plymouth) widening to five lanes from Klinger Street to US 30
- SR 23 (Edwardsburg Highway) widening to four lanes from Cleveland Road to Brick Road
- SR 23 widening to four lanes from Campeau Street to Edison Road

Along the US 31 Corridor, INDOT has programmed traffic-operational improvements for intersections at Kern Road, Roosevelt Road, Madison Road, New Road, and SR 4. The new traffic signal at New Road is the most significant of these “capacity preservation” projects. As these projects do not involve major capital investments that alter the through lane traffic carrying capacity of US 31, these projects will proceed regardless of the decision to improve the US 31 Corridor. On the other hand, a pavement-resurfacing project that would have added a continuous median left-turn lane along US 31 from Madison Road to Kern Road has been suspended until the completion of this NEPA document.

Since the No-Build Alternative fails to add through traffic carrying-capacity, it fails to address a majority of the segments and existing signalized intersections that have an unacceptable LOS in the year 2000. Traffic operating conditions are expected to continue to deteriorate in the future such that US 31 and its signalized intersections experience unacceptable operating conditions in the year 2030 from Michigan Road (north of Plymouth) to US 20. By adding a traffic signal at New Road, the No-Build Alternative addresses the unacceptable delays, among other concerns, for vehicles on this crossroad trying to enter US 31. However, traffic signals will eventually be needed at four additional major crossroads to address unacceptable delays to vehicles trying to enter US 31. While these new traffic signals reduce delays for traffic on crossroads entering US 31, they adversely affect the traffic-carrying capacity of US 31, accelerating the increase in congestion, resulting in longer travel times and slower operating speeds along US 31.

While the No-Build Alternative includes traffic-operational improvements at some intersections, it fails to address fundamental physical characteristics of existing US 31 that contribute to the above average accident rates when compared to similar facilities. These fundamental physical characteristic problems include the lack of a continuous median/left-turn lane from south of Lakeville to US 20. This area has no provisions to accommodate left-turns into and from public roads and driveways (with the exception of signalized intersections). Neither does it accommodate frequent private driveways where traffic entering US 31 encounters increasing greater delays, or increasing conflicts with growing through traffic (that is a result of the growing number of driveways and on-street parking) in LaPaz and Lakeville.



Finally, the No-Build Alternative reveals travel times and operating speeds along the US 31 “Corridor” deteriorating over time such that the essential mobility function suffers.

Phase 1: Purpose and Need

Traffic Congestion: The No-Build Alternative would not reduce congestion on US 31. Currently many segments of US 31 operate at an unacceptable LOS during a peak hour. Three of the four signalized intersections also operate at an unacceptable LOS. By 2030, most of the segments and all four existing signalized intersections are projected to operate with unacceptable LOS.

Traffic Safety: The No-Build Alternative would not improve safety on US 31. Present and projected future crash rates on US 31 exceed the statewide averages for rural principal arterials from US 6 through La Paz, through Lakeville, and from Lakeville to US 20.

Consistency with Transportation Plans: The No-Build Alternative is not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan.

Conclusion

The No-Build Alternative would not address the purpose and need for this project. However, this alternative will be carried forward for evaluation in the DEIS and serve as a baseline when comparing the effectiveness and potential impacts of other alternatives.

3.1.3 Travel Demand Management (TDM) Alternatives

The goal of Travel Demand Management (TDM) strategies is to relieve peak hour traffic congestion. TDM strategies involve actions intended to spread the peak-hours of travel, encourage carpooling (from single-occupancy vehicle), encourage a shift to alternative modes of travel, and encourage travel on other roadways.

Actions to encourage motorists to shift trips to non-peak hour periods include flexible work hours, flexible workdays, and road pricing (also called congestion pricing). As no major employers exist along the US 31 Corridor, flexible work hours and flexible workdays are not viable TDM strategies for the corridor. Road pricing involves charging a user fee or toll for the use of the facility, based on time of day, in order to reduce the level of congestion throughout the day. However, the implementation of road pricing is impractical since a toll collection system is not feasible on a facility such as existing US 31 without full access control. This was verified in the 1999 Indianapolis to South Bend Toll Road Feasibility Study completed by INDOT.

Actions to encourage the shift to alternative modes of travel include trip-reduction ordinances, employer-based trip reduction programs, vanpooling/carpooling, improved transit services and improved bicycle and pedestrian facilities. A trip-reduction ordinance is a legal mechanism that requires the developer of non-residential land uses to reduce the typical trips generated by the proposed development through actions designed to increase vehicle occupancy and to facilitate alternative modes. Employer-based trip reduction programs include:

- Parking management strategies to restrict the number of on-site parking spaces available to employees or charging employees for the use of on-site parking spaces
- Financial incentives to use alternative modes through the subsidy of vanpooling or carpooling or transit fare subsidies



- Flexible work schedules (flexible hours, four-day workweek) and flexible work locations (telecommuting or dispersal to the work site from remote assembly sites)

Employers-based trip reduction programs and trip reduction ordinances do not appear to be viable TDM strategies since there are no major employment centers in the corridor, most development is residential or supportive retail/service uses, and there is no existing or viable transit service. These strategies would be insufficient to address the increase in trip-making in the corridor over the next 30 years, even if such strategies were viable (Institute of Transportation Engineers, Proceedings of ITE's 1987 National Conference).

While walking and bicycling provide non-motorized opportunities to reduce automobile trip-making, these modes are only effective for short trips – generally one mile for walking and six miles for bicycling in good weather conditions. Except in LaPaz and Lakeville, there are no walkways in the US 31 Corridor, and no bicycle facilities presently serve the corridor. Several abandoned railway beds exist in the US 31 Study Area. However, many abandoned railways have reverted to adjoining property owners and no known local or regional plans are underway to convert rails to trails along the US 31 Corridor. As most trips in the corridor are longer than six miles and the corridor is low-density in character, walking and bicycling are ineffective in reducing trips along the US 31 Corridor.

Phase 1: Purpose and Need

Traffic Congestion: TDM alternatives would not noticeably reduce traffic congestion on US 31. Due to the low-density rural character of the corridor, the TDM alternatives considered for this project are expected to only minimally reduce traffic volumes on US 31.

Traffic Safety: TDM alternatives would not improve safety on US 31 to crash rates at or below the Indiana average for other rural principal arterials. Without a reduction in daily traffic volume or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: TDM alternatives are not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors and with the MACOG Transportation Plan that call for improvements to US 31.

Conclusion

The TDM alternatives would not address the purpose and need of this project as “stand alone” alternatives because they would not significantly reduce congestion, improve safety, or be consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan. Therefore, they were not advanced to Phase 2 of the screening process.

3.1.4 Transportation System Management (TSM) Alternatives

Transportation system management (TSM) strategies involve low-cost capital investments to reduce congestion, improve traffic flow, and measures to optimize performance of the existing transportation infrastructure. These strategies include but are not limited to intersection improvements, signal coordination and timing, lane control (reversible lanes), and high-occupancy vehicle lanes.

Present signalized intersections in the US 31 “Corridor” have separate left-turn bays. INDOT has already programmed the improvement of most traffic signals in the corridor including the installation of a traffic signal at New Road. However, three of the four existing signalized intersections operate at an unacceptable level-of-service



today, and the fourth signalized intersection will operate at an unacceptable level-of-service before the year 2030. Even with further improvements to the lane configurations and signal timings at these four intersections, the temporary improvements in traffic flow will soon disappear as traffic increases more than 50% over the next 30 years in the corridor.

Except for the spacing between the Johnson Road and Kern Road traffic signals, the spacing to adjacent traffic signals is more than a mile apart. Thus, traffic signal interconnection, real-time traffic flow monitoring at the traffic signals and traffic signal coordination are not viable options, and provide only a temporary improvement to traffic flow over the next 30 years.

Due to the length of the corridor, existing travel patterns, the low-density rural character of the corridor and existing geometrics of US 31 (a four-lane undivided facility), reversible lanes are not an appropriate option for this rural roadway.

With only four lanes along existing US 31 and a low existing vehicle occupancy rate (about 1.1 persons per vehicle), the designation of one or two lanes in each direction for high-occupancy vehicles (HOV) (even limited to peak-hours) would result in nearly 90% of the vehicles being concentrated in the unrestricted lane during the peak-hours. Traffic would likely divert to the two-lane parallel facilities in the US 31 Study Area that lack sufficient capacity. Thus, the application of HOV lanes to existing US 31 is not an appropriate application.

Phase 1: Purpose and Need

Traffic Congestion: TSM alternatives would not noticeably reduce recurring traffic congestion on US 31. Due to the low-density rural character of the corridor, TSM strategies provide only temporary relief to increasing traffic congestion in the corridor, or are inappropriate solutions (traffic signal interconnection and reversible or HOV lanes).

Traffic Safety: TSM alternatives would not improve safety on US 31 to crash rates at or below the Indiana average for other rural principal arterials. Without a reduction in daily traffic volume or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: TSM alternatives are not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors and with the MACOG Transportation Plan that call for improvements to US 31.

Conclusion

The TSM alternatives would not address the purpose and need of this project as “stand alone” alternatives because they would not significantly reduce congestion, improve safety, or be consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan. Therefore, they were not advanced to Phase 2 of the screening process.

3.1.5 Intelligent Transportation System (ITS) Applications

Intelligent Transportation System (ITS) options include a variety of technology-based programs to actively manage the roadway system. The most common systems provide travel information on roadway conditions to daily commuters. This enables commuters to adjust travel routes to changing travel conditions. Incident management programs are also part of the ITS toolbox to reduce the effect of accidents and vehicle breakdowns on traffic flow.



In light of the rural character, length of the corridor, and lack of adequate alternative north-south routes, ITS options cannot be effectively applied in the US 31 “Corridor” to solve to congestion problems.

Phase 1: Purpose and Need

Traffic Congestion: Expansion of ITS applications will not improve levels of service significantly.

Traffic Safety: ITS alternatives would not improve safety on US 31 to crash rates at or below the Indiana average for other rural principal arterials. Without a reduction in daily traffic volume or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: ITS alternatives are not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors and with the MACOG Transportation Plan that call for improvements to US 31.

Conclusion

The ITS applications would not address the purpose and need of this project as “stand alone” alternatives because they would not significantly reduce congestion, improve safety, or be consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan. Therefore, they were not advanced to Phase 2 of the screening process.

3.1.6 Mass Transit Alternative

The Chicago, South Bend and South Shore Railroad provides commuter rail service from the Michiana Regional Airport, in northwest South Bend, to downtown Chicago, but averages only 100 passengers per day. Local bus transportation for South Bend and Mishawaka is provided by TRANSPO, the South Bend Public Transportation Corporation. TRANSPO provides a system of fifteen fixed routes radiating from downtown South Bend. Although TRANSPO does not provide bus service in the US 31 “Corridor,” it does have two routes that enter the US 31 Study Area. With 30-minute headways (time period between bus arrivals), Route 8 serves the Scottsdale Mall on the north side of US 20, near Miami Highway, and Route 6 serves the residential area on the east side of Miami Highway, immediately south of US 20. In Plymouth, Rock City Riders provides Section 18 transit services; however, such transit service is available to the elderly, handicapped and economically disadvantaged and not the general public.

Bus ridership is characterized by a transit-dependent population. According to the 2000 Census, public transportation (including taxicab) was the means of transportation to work for only 1.2% of the work trips in St. Joseph County and only 0.4% of the work trips in Marshall County. Between 1990 and 2000, the percent of work trips by public transportation dropped by 29%.

In the US 31 “Corridor,” significant transit service is not a viable option for the following reasons.

- Trip-ends are dispersed rather than concentrated, resulting in insufficient ridership to cover transit-operating costs (trip ends were modeled as part of the traffic analysis for this project).
- A geographic area south of US 20 to Kern Road, between Miami Highway and Ironwood Road, is within the City of South Bend. Existing US 31 falls in St. Joseph and Marshall counties and the small, incorpo-



rated areas of Lakeville and LaPaz. Thus, these jurisdictions (not the City of South Bend) must provide the transit operating subsidies to extend any transit service along existing US 31.

- In the year 2030, population densities along existing US 31 are expected to be less than 2,000 persons per square mile, except on the east side of US 31 to Miami Highway and from Roosevelt Road to US 20. Thus, less than 5% of the corridor will have sufficient population densities in the year 2030 to meet the minimum threshold considered necessary for the provision of transit service (Metro Dade County, Florida, Transit Reconfiguration Study; Miami Dade County Transit Authority, 1986).
- According to the Urban Transport Fact Book, mass transit carries only about 2% of the commuters in urban areas.

Phase 1: Purpose and Need

Traffic Congestion: The mass transit alternative would not noticeably reduce traffic congestion on US 31. It is not reasonable to assume that enough travelers would divert to transit service to result in improvements to levels of service on US 31.

Traffic Safety: The mass transit alternative would not improve safety on US 31 to crash rates at or below the Indiana average for other rural principal arterials. Without a reduction in daily traffic volume or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: This alternative is not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors and with the MACOG Transportation Plan that call for improvements to US 31.

Conclusion

The Mass Transit Alternative would not address the purpose and need of this project as a “stand alone” alternative because it would not significantly reduce congestion or improve safety, or be consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan. Therefore, it was not advanced to Phase 2 of the screening process.

3.1.7 Highway Build Alternatives

Highway Build alternatives were examined in two major geometric design categories:

- Non-Freeway Alternatives with partial or no access control, and
- Freeways Alternatives with full access control.

3.1.7.1 Non-Freeway Alternatives

The Non-Freeway Alternatives consist of geometric design options for the upgrading of existing US 31 and options involving upgrading portions of US 31 on a combination of the existing alignment and new alignments. For rural segments of the US 31 Improvement on existing alignment, the roadway would be reconstructed creating a four- or six-lane divided facility, providing a median width of at least 16 feet, where a median does not exist today, to accommodate left-turns. The reconstructed rural segment would typically have 11-foot shoulders (10 feet paved).



For segments of the US 31 improvement through small urban towns (such as LaPaz and Lakeville), the south edge of South Bend (generally from Kern Road to US 20) and built-up areas with right-of-way limitations (such as from Madison Road to Kern Road), an urban typical section might be used in recognition of right-of-way constraints, using a four-lane divided facility with a 14-foot median and 2-foot curbs-and-gutters.

For rural segments of the US 31 improvement on new alignment, the facility would have the character of an expressway – a rural arterial with partial access control (i.e., access provided with at-grade intersections or grade separation interchanges at selected public roads), as opposed to a freeway having full access control (i.e., access provided at interchanges only). While active railroads would be grade-separated, the expressway would have at-grade intersections with select public roadways and intersections with major crossroads would be signalized. The typical cross-section for the rural expressway would be two or three 12-foot lanes in each direction with 11-foot outside shoulders (10 feet paved), 4-foot paved inside shoulders and a 40-foot median. The typical total right-of-way width would be 150 feet.

If partial access control were pursued for improvements to US 31 on existing alignment, local service (frontage) roadways may be required, but could not be provided through LaPaz or Lakeville without acquiring structures on one or both sides. If interchanges were proposed at major crossroads, additional right-of-way would be required for the interchanges as well as local service (frontage) roads to serve abutting parcels not acquired.

US 31 Upgrade Options using Existing Alignment

Options to upgrade US 31 on the existing alignment involve adding a median, allowing development of left-turn lanes or a center lane for continuous left-turns. From US 30 to the Michigan Road interchange (north of Plymouth), existing US 31 is a four-lane divided facility with a 50-foot median and 10-foot paved shoulders, and has partial access control. From the Michigan Road interchange to just south of US 6 (south edge of LaPaz), existing US 31 lacks partial access control, but has a 16-foot to 24-foot median with few private driveways. Thus, existing US 31 from US 30 to just south of US 6 is a four-lane divided facility, and would not require improvement. Expansion to six-lanes could be accomplished within the median.

From south of US 6 to Center Street, on the north side of LaPaz, existing US 31 is a four-lane undivided facility with a 4-foot flush median, approximately 58 feet of pavement, curb-and-gutter, and sidewalks. Existing US 31 through LaPaz would be reconstructed to provide a four-lane divided facility with an approximate 14-foot median (or continuous left-turn median lane through town) and curb-and-gutter with sidewalks. The reconstruction could be accomplished within the existing right-of-way; however, existing curbs would have to be moved outward, occasional on-street parking must also be eliminated through LaPaz and access control could not be improved along this section. Achievement of partial access control through LaPaz using local service (frontage) roads to remaining properties and frequent intersecting local streets could only be achieved by the acquisition of structures on both sides of existing US 31.

From the north side of LaPaz to Quinn Road, existing US 31 is a four-lane divided facility with a variable median width ranging from 15 feet to 50 feet. This segment would not require improvement.

From Quinn Road, through Lakeville, to the US 20 interchange, existing US 31 is a four-lane undivided facility with a pavement width of 58 to 66 feet with curb-and-gutter and sidewalks. The lone exception is from Patterson Street to Rush Street on the north side of Lakeville, where the pavement lessens to 51-feet. Existing US 31 through Lakeville would be reconstructed to provide a four-lane divided facility with an approximate 14-foot median (or continuous left-turn center lane through town) and curb-and-gutter with sidewalks. The reconstruction can be accomplished within the existing total right-of-way of 90 feet south of Patterson Street, but existing on-street parking would have to be prohibited on both sides through town. North of Patterson Street to the north edge of town,

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



the existing total right-of-way is only 60 feet. Additional right-of-way would be required through the north end of town; however, relocations are not anticipated. Achievement of partial access control using local service (frontage) roads to remaining properties and frequent intersecting local streets through Lakeville could only be achieved by the acquisition of structures on both sides of existing US 31.

From the north edge of Lakeville to the US 20 interchange, US 31 is a four-lane undivided facility with 9-foot to 12-foot unpaved, stone shoulders. Opposite directions of traffic flow are occasionally separated by a 4-foot flush median strip. This narrow median width is inadequate to accommodate left-turn lanes. As the total right-of-way width is 98 feet, this segment may be reconstructed with a minimum 14-foot median with 10-foot to 12-foot paved shoulders with or without curb-and-gutter, as appropriate, without acquiring additional right-of-way. Achievement of partial access control on this segment using frontage roads for the frequent driveways and intersecting local streets cannot be achieved without the acquisition of additional right-of-way.

US 31 Upgrade Using Existing Alignments with New Alignments around Towns

Options to improve US 31 on existing and new alignments would involve using the existing alignment of US 31 except through the towns of LaPaz and Lakeville, where bypasses would be constructed on new alignments. These options would be based on a desirable total right-of-way width of approximately 150 feet, for a four-lane divided facility with a 40-foot median and 10-foot paved shoulders. This 40-foot median width could be increased to a 60- or 80-foot median, if deemed necessary. To the extent practical, partial access control would be achieved.

From US 30 to south of US 6, the existing total right-of-way width is a minimum of 180 feet, and partial access control with a 50-foot median exists from US 30 to the Michigan Road interchange. North of Michigan Road interchange to south of US 6, access rights would be acquired to prevent new drives from being created. Joint driveways and occasional short frontage roads (local service roads (LSR)) would be built to reduce existing access points to US 31. North of the Michigan Road interchange, the existing median reduces in width to 16 to 24 feet, but the 40-foot median may be compromised to avoid roadway reconstruction.

From south of the US 6 intersection to the north side of LaPaz, where the median currently exists on US 31, a bypass of LaPaz would be built on new alignment for a four-lane divided roadway with partial access control, with a 40-foot median on a total of 150 feet of new right-of-way. This 40-foot median width could be increased to a 60- or 80-foot median, if deemed necessary.

From the north side of LaPaz to Quinn Road, on the south side of Lakeville, the existing four-lane divided alignment of US 31 would be used with a variable median width of 15 to 50 feet. The total right-of-way varies from 162 to 180 feet along this segment. Access rights would be acquired to prevent new private driveways from being created. Joint driveways and occasional short frontage roads would be built to reduce existing access points to US 31.

From Quinn Road to SR 4, on the north side of Lakeville, where unpaved, stone shoulders exist; a bypass of Lakeville would be built on new alignment. Its location would be west of Lakeville, in the vicinity of an abandoned railroad corridor. The typical cross section for this segment would be a four-lane divided roadway with partial access control with a 40-foot median on a total of 150 feet of new right-of-way. This 40-foot median width could be increased to a 60- or 80-foot median, if deemed necessary.

From SR 4 to US 20, this segment may be reconstructed with a minimum 14-foot median with 10-foot to 12-foot paved shoulders with or without curb-and-gutter, as appropriate, within the existing total of 100 feet of right-of-way. Achievement of partial access control on this segment, using local service (frontage) roads for the frequent driveways and intersecting local streets, could only be achieved by the acquisition of additional right-of-way.



Non-Freeway Alternatives Assessment

Reducing Congestion Assessment. Achieving the first project purpose and need of reducing congestion hinges on achieving an acceptable level-of-service (LOS C in rural areas and LOS D in urban areas) for forecasted traffic for the year 2030. Table 3.1.1 shows the forecasted traffic volumes for the year 2030 and posted speed limit (operating speed). Table 3.1.2 shows the maximum daily traffic flows for different operating speeds and for four-lane and six-lane divided rural arterial highways, similar to that of the Non-Freeway Alternatives.

Using Tables 3.1.1 and 3.1.2, a comparison of the forecasted traffic volumes for the year 2030 (shown in Table 3.1.1) and the maximum daily traffic volumes for an acceptable level-of-service (shown in Table 3.1.2 as being C) reveals that existing US 31 upgrade options (adding a median or continuous left-turn center lane to undivided portions of US 31) cannot be achieved for a four-lane divided facility. In fact, a six-lane divided facility can only achieve an acceptable LOS for the segment of existing US 31 between Lakeville and LaPaz and from the Michigan Road interchange to US 30. This would require reconstruction of the existing US 31, where medians currently exist, to provide a six-lane facility; however, the majority of the corridor would not achieve an acceptable LOS.

The Non-Freeway Alternatives that use

existing alignment of US 31 for the balance of the corridor yet provide a bypass around LaPaz and Lakeville show better performance. This is due to the fact right-of-way constraints and low posted speeds through the two towns would not be issues. However, a four-lane divided facility still cannot achieve an acceptable level-of-service, even with bypasses of LaPaz and Lakeville. If a six-lane divided facility were considered, an acceptable level of service

Table 3.1.1: Base and Future Daily Traffic Volumes on Existing US 31

| Segments | 2000 Base Year | | 2030 Future Year | |
|----------------------------|----------------|--------|------------------|--------|
| | Volume | Speed | Volume | Speed |
| US 20 – Roosevelt Rd. | 31,526 | 45 mph | 46,000 | 50 mph |
| Roosevelt Rd. – Miller Rd. | 26,419 | 55 mph | 37,500 | 50 mph |
| Miller Rd. – SR 4 | 24,240 | 55 mph | 34,400 | 50 mph |
| SR 4 – Lake Trail | 27,217 | 35 mph | 40,300 | 35 mph |
| Lake Trail – Tyler Rd. | 21,400 | 55 mph | 29,300 | 55 mph |
| Tyler Rd. – US 6 | 19,845 | 35 mph | 28,200 | 35 mph |
| US 6 – Michigan Rd. | 24,232 | 55 mph | 35,200 | 55 mph |
| Michigan Rd. – US 30 | 16,989 | 55 mph | 23,500 | 55 mph |

Note: Segments with unacceptable LOS are shaded.
 Speeds shown represent posted speed limit (operating speed).

Table 3.1.2: Maximum Daily Traffic Volumes for Divided Multi-Lane Rural Arterials

| Level of Service | 4-Lane Divided | | | | 6-Lane Divided | | | |
|------------------|----------------|---------|---------|---------|----------------|---------|---------|---------|
| | 35 mph | 45 mph | 50 mph | 55 mph | 35 mph | 45 mph | 50 mph | 55 mph |
| A | 5,800 | 7,800 | 8,800 | 9,800 | 8,700 | 11,700 | 13,200 | 14,700 |
| B | 10,000 | 13,200 | 14,800 | 16,400 | 15,000 | 19,800 | 22,200 | 24,600 |
| C | 14,400 | 18,600 | 20,600 | 22,700 | 21,600 | 27,900 | 30,900 | 34,100 |
| D | 17,400 | 22,200 | 24,600 | 27,000 | 26,100 | 33,300 | 36,900 | 40,500 |
| E | 21,400 | 26,600 | 29,200 | 31,800 | 32,100 | 39,900 | 43,800 | 47,700 |
| F | >21,400 | >26,600 | >29,200 | >31,800 | >32,100 | >39,900 | >43,800 | >47,000 |

Source: Highway Capacity Manual
 Notes: Speeds shown represent posted speed limit (operating speed). The unacceptable LOS is shaded.

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



is achieved from US 30 to the south side of Lakeville; however, the majority of the corridor from the south side of Lakeville to US 20 would still not achieve an acceptable LOS, even with the bypass of Lakeville.

Thus, with partial access control and bypasses of LaPaz and Lakeville, the Non-Freeway Alternatives cannot achieve an acceptable level-of-service, even for a six-lane divided facility, and fail to meet the first purpose and need of reducing congestion in the US 31 Corridor.

Improving Safety Assessment. Achieving the second project purpose and need of improving safety hinges on whether the roadway improvements can reduce accidents in the long-term.

The existing US 31 upgrade options (adding a continuous median or left-turn center lane to undivided portions of US 31) address one of the physical characteristics of existing US 31 that contributes to the above average accident rate by providing a median or left-turn lanes where none exist through LaPaz and from the south side of Lakeville to US 20. The existing US 31 upgrade options all require the removal of on-street parking in LaPaz and Lakeville, further reducing motor vehicle conflicts. However, the existing US 31 upgrade options do not eliminate the numerous private driveways that also contribute to motor vehicle conflicts and pedestrian conflicts in LaPaz and Lakeville.

The Non-Freeway Alternatives that provide bypasses around LaPaz and Lakeville are more effective in improving safety because they eliminate the frequent driveways and pedestrian movements in the two towns. Nevertheless, the lack of partial access control from north of Lakeville to US 20 does not address the numerous private driveways that contribute to motor vehicle conflicts.

Thus, the Non-Freeway options only partially achieve the project purpose and need of improving safety and upgrading existing US 31. The bypasses around LaPaz and Lakeville results in improved safety over upgrade options passing through the towns. However, the difficulty of achieving partial access control from Lakeville to US 20, without significant residential and business relocations, hampers the ability to improve safety along the highest volume portion of the corridor.

Consistency with Transportation Plans Assessment. Achieving the third project purpose and need involves evaluating consistency with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors and the MACOG Transportation Plan.

Without partial access control throughout the corridor, the Non-Freeway Alternatives are inconsistent with the road characteristics suggested by its high-order road classification in the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or the MACOG Transportation Plan.

Phase 1: Purpose and Need

Traffic Congestion: As discussed in the Reducing Congestion Assessment above, this alternative does not achieve an acceptable LOS and fails to reduce congestion in the US 31 Corridor.

Traffic Safety: As discussed in the Improving Safety Assessment above, this alternative only partially achieves the purpose of improving safety on the US 31 Corridor.

Consistency with Transportation Plans: As discussed in the Consistency with Transportation Plans Assessment above, without partial access control, this alternative is not compatible with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or the MACOG Transportation Plan.



Conclusion

The Non-Freeway Alternatives do not address the purpose and need of this project; therefore, they were not advanced to Phase 2 of the screening process.

It should be noted that a Non-Freeway Alternative that includes interchanges at some major intersections, but achieves only partial access control along the balance of the corridor, performs no better than the Non-Freeway Alternative that bypasses LaPaz and Lakeville and achieve partial access control. Thus, preliminary Freeway Alternative F (described later) best reflects an upgrade of existing US 31 with the addition of interchanges to achieve full access control.

3.1.7.2 Freeway Alternatives

Referring to Figure 3.1.1, the eleven preliminary freeway alternatives are labeled “A” through “K”, generally from west to east. Alternatives A - I were derived from the US 31 Major Investment Study for St. Joseph-Marshall Counties (1997). All of the 11 preliminary freeway alternatives have the common southern terminus of the US 31/US 30 interchange. They all follow existing US 31 to West 4A Road before diverging. It should be noted that the portion of existing US 31 from US 30 to West 4A Road has a 50-foot median on a total of 400 feet of right-of-way. This section could relatively easily be upgraded to a freeway facility with the addition of grade separations and/or county road closures. The northern termini of the preliminary freeway alternatives vary along US 20 from northwest of the SR 23 interchange to the eastern SR 331 (Elm Road/Capital Avenue) interchange.

As a result of the Public Information meeting of April 10, 2003, the Resource Agency Review meeting of May 15, 2003, and subsequent correspondence, several new freeway alternatives were suggested. These alternatives included such ideas as utilizing high-voltage, overhead powerline and abandoned railroad corridors; connecting to the existing Ironwood Road/US 20 interchange; utilizing Lilac Road, starting at West 6A Road; and utilizing the Mangus Road corridor located on the west side of Lakeville. After investigation of these suggestions, two new alternatives were added, Alternatives J and K, to the nine preliminary freeway alternatives presented in April and May of 2003.

Referring to Figure 3.1.1, the first new freeway alternative, Alternative J, is similar to Alternative F, but uses the Mangus Road corridor around the west side of Lakeville. The second new freeway alternative, Alternative K, is similar to Alternative H, but connects to US 20 at the existing Ironwood Road interchange.

In addition to the two new freeway alternatives, some of the previous preliminary freeway alternatives were modified with shifts to more closely parallel powerline corridors. Again, referring to Figure 3.1.1, Alternative H was shifted to the north approximately 2000 feet to more closely parallel a high-voltage, overhead powerline corridor. The other freeway alternatives were also evaluated for their proximity to high-voltage, overhead powerline corridors. A section of Alternative C already parallels a high-voltage, overhead powerline corridor. The shifting of Alternative A approximately one mile to the west to parallel a high-voltage, overhead powerline corridor would route that freeway alternative through Potato Creek State Park, so no modifications were made.

An additional freeway alternative suggested would depart from existing US 31 farther south and east of West 4A Road, the departure point of all of the 11 preliminary freeway alternatives. This suggested alternative would depart from existing US 31 near West 6A Road and utilize the Lilac Road corridor, continue north and northeast around Pleasant Lake and Riddle Lake and tie into Alternate G, near Tyler Road. By departing from existing US 31 approximately two miles south of all other freeway alternatives, this suggested alternative would require approximately two miles of additional new terrain roadway more than any of the other freeway alternatives. It

US 31 Plymouth to South Bend

Draft Environmental Impact Statement

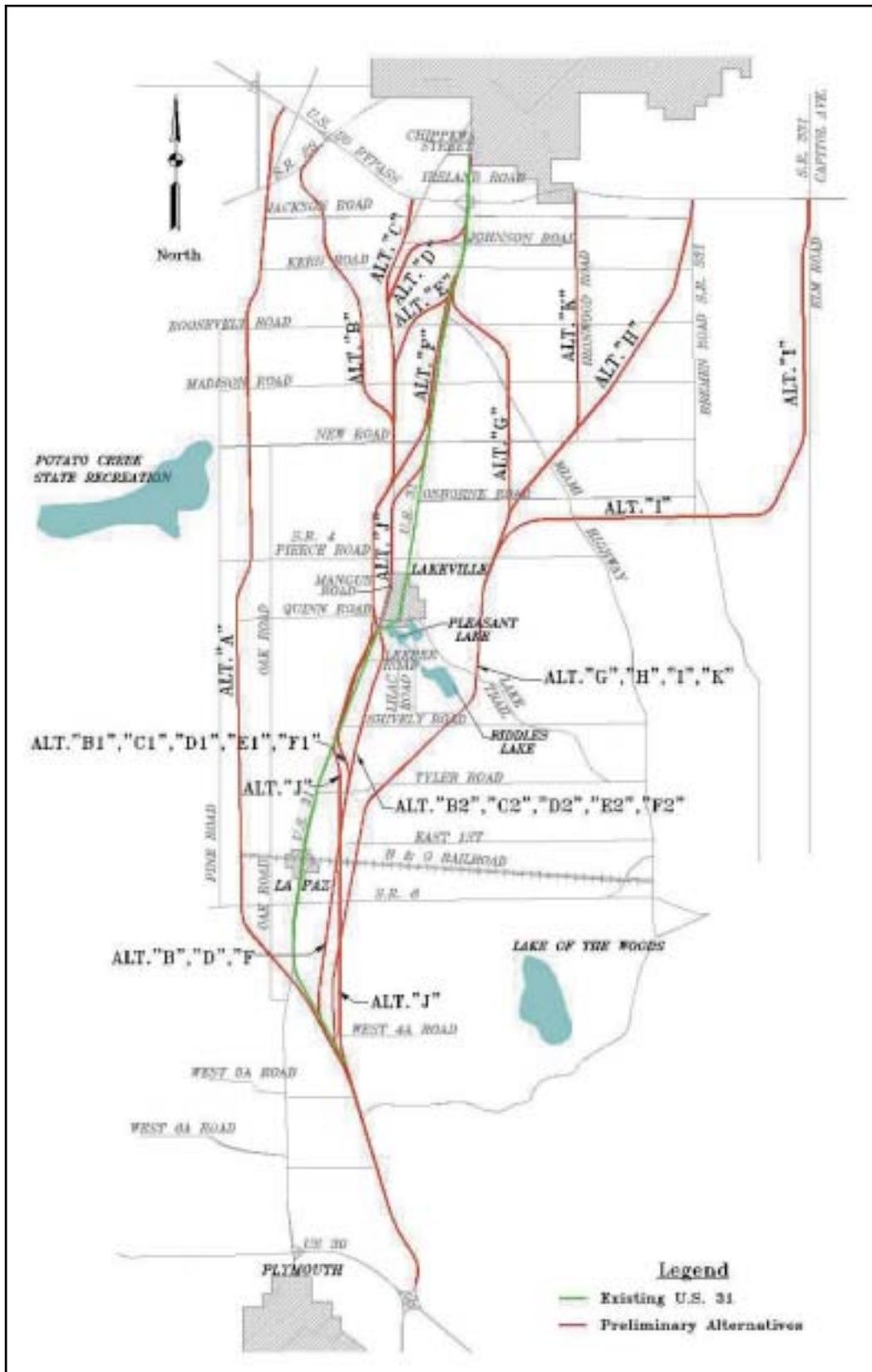


Figure 3.1.1: Preliminary Freeway Alternatives (A - K)



would not make use of the abandoned railroad corridor to the northwest that is utilized by many of the other freeway alternatives. As a result, construction costs associated with the new terrain roadway, as well as the associated socio-economic and environmental impacts to sensitive resources, would be substantially higher than those alternatives utilizing more of the existing US 31 corridor and then following the abandoned railroad corridor. On this basis, it was decided not to examine further the possibility of this suggested new freeway alternative.

As shown in Figure 3.1.2, the typical rural freeway cross section is a four-lane freeway with a 60-foot median, 4-foot inside shoulders, 11-foot outside shoulders (10 feet paved) on a total of 350-450 feet of right-of-way, with a design speed of 70 mph. Full access control would be achieved throughout by the construction of interchanges at major crossroads and grade-separations of other significant crossroads and railroads. According to the FHWA Interstate interchange spacing standards and criteria contained in the INDOT Design Manual, interchange spacing in rural areas should average one interchange every five miles.

For the freeway alternatives that connect to major existing facilities south of US 20, a typical urban freeway cross-section is proposed. For instance, an urban section would be used once an alternative connects to the existing US 31 alignment, or another major road, such as SR 23 or Bremen Highway. The length and termini of the urban section will differ for each alternative. As shown in Figure 3.1.3, the urban section is a six-lane freeway with a 38 to 55-foot median and 14-foot outside shoulders. It is elevated on fill with side retaining walls and concrete barrier in both on the median and outside shoulders. It could have one-way, two-lane local service road (frontage road) or collector/distributor (C/D) roadways could be provided within the typical total right-of-way width of 260 to 300 feet, with a design speed of 60 or 70 mph. According to the FHWA interstate interchange spacing standards and criteria contained in the INDOT Design Manual, interchange spacing in urban areas should average one interchange every two miles, not closer than one mile.

For each freeway alternative, existing US 31 and its major intersections were analyzed in accordance with the Highway Capacity Manual (HCM) to determine their present and future LOS. Future Average Daily Traffic (ADT) volumes used to conduct this analysis were generated using output from the regional travel model. Between Plymouth and South Bend, existing US 31 was analyzed in eight segments as well as at four signalized intersections and at six notable two-way stop-controlled intersections (stop control for the crossroad approaches) as listed below:

US 31 Segments:

- US 30 to Michigan Road
- Michigan Road to US 6
- US 6 to Tyler Road
- Tyler Road to Lake Trail
- Lake Trail to SR 4
- SR 4 to Miller Road
- Miller Road to Roosevelt Road
- Roosevelt Road to US 20

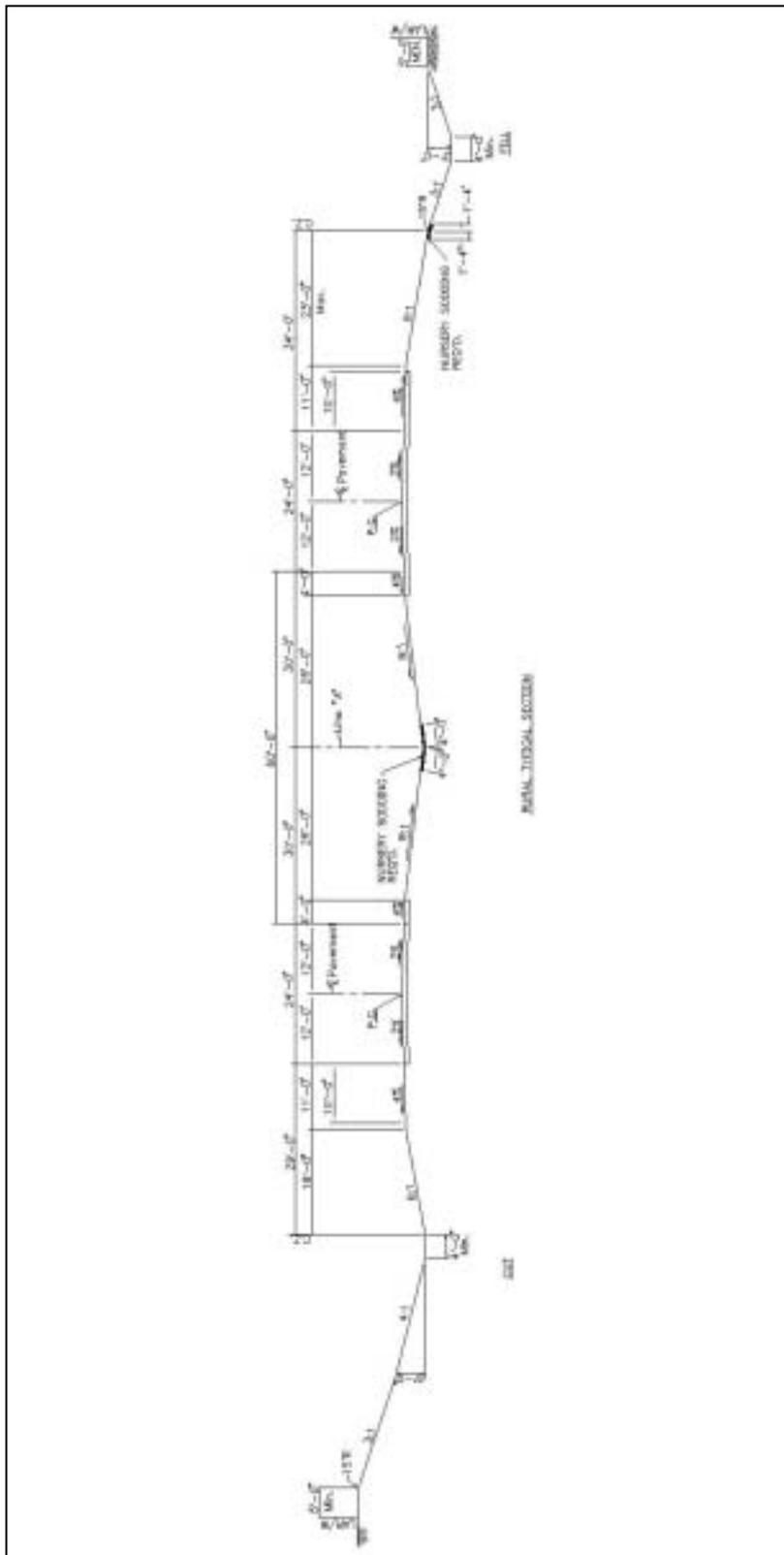


Figure 3.1.2: Rural Typical Section

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



US 31 Signalized Intersections:

- US 31 and US 6
- US 31 and SR 4
- US 31 and Kern Road
- US 31 and Johnson Road

US 31 Major Unsignalized Intersections (Two-way Stop-Controlled):

- US 31 and Plymouth-Goshen Trail
- US 31 and W 5A Road
- US 31 and Tyler Road
- US 31 and New Road
- US 31 and Madison Road
- US 31 and Roosevelt Road

Table 3.1.3 shows resulting residual traffic volumes on the existing US 31 when any of the freeway alternatives are constructed. The goal of the freeway alternatives is to divert traffic from existing US 31 on to the new alternative. Table 3.1.3 shows the extent to which each freeway alternative achieves an acceptable level-of-service in the year 2030 for the existing US 31 Corridor from US 30 to US 20. Because the freeway alternatives are four-lane freeways in the rural area with some six-lane segments near US 20, traffic experiences acceptable operating conditions of LOS C or better when using the freeway alternative in rural segments, and LOS D or better for urban segments. Accordingly, the achievement of an acceptable level-of-service focuses on the residual traffic remaining on the existing US 31 alignment.

Substantiating the assessment of the relief of congestion on existing US 31 is the amount of residual vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT), referring to Table 3.1.4. VMT measures the directness of route to the straight line from the origin to the destination of the trip, and VHT measures congested travel time.

A secondary measure for assessing the effectiveness of the freeway alternatives in relieving congestion is the reduction with VMT and VHT in the South Bend Metropolitan Area (Elkhart, Marshall and St. Joseph counties) with an unacceptable LOS (i.e., LOS E or F in urban areas and LOS D, E, or F in rural areas). This performance measure addresses how well a single improvement addresses congestion problems throughout the Metro Area (not just congestion along US 31). VMT measures the directness of route to the straight line from the origin to the destination of the trip, and VHT measures congested travel time. As people are often more open to travel greater distances to save travel time, VHT is a more important consideration than VMT. Table 3.1.5 shows that the rankings for the alternatives.



Table 3.1.3: Freeway Alternative Future Traffic and Level-Of-Service on Existing US 31
(Daily Traffic Volumes (LOS) in Year 2030 – Unacceptable LOS* shaded)

| Freeway Alternatives | Segments | | | | | | | |
|----------------------|------------------------|-----------------------|--------------------|--------------------------|--------------------|------------------|----------------------------|-------------------------|
| | Rural | Rural | Rural | Rural | Rural | Rural | Rural | Urban |
| | US 30 to Michigan Road | Michigan Road to US 6 | US 6 to Tyler Road | Tyler Road to Lake Trail | Lake Trail to SR 4 | SR 4 to New Road | New Road to Roosevelt Road | Roosevelt Road to US 20 |
| No-Build | 21,504(C) | 28,707(E) | 25,687(F) | 25,911(D) | 28,279(F) | 29,714(F) | 32,485(F) | 43,512(F) |
| A | | 16,065(B) | 12,454(D) | 12,622(B) | 14,922(E) | 16,031(C) | 18,810(C) | 33,766(F) |
| B | 2,628(A) | 5,608(A) | 3,108(A) | 3,454(A) | 5,914(B) | 6,259(A) | 24,108(E) | 35,889(F) |
| C | 2,532(A) | 5,542(A) | 3,002(A) | 3,285(A) | 4,793(A) | 3,775(A) | 7,568(A) | 21,932(D) |
| D | 2,625(A) | 5,622(A) | 2,998(A) | 3,253(A) | 4,529(A) | 1,985(A) | 5,609(A) | 10,612(B) |
| E | 2,546(A) | 5,467(A) | 2,827(A) | 3,103(A) | 4,699(A) | 2,291(A) | 5,659(A) | 7,002(B) |
| F | 2,545(A) | 5,389(A) | 2,826(A) | 3,095(A) | 4,489(A) | 5,209(A) | 1,690(A) | |
| G | 2,979(A) | 6,181(A) | 3,516(A) | 3,761(A) | 3,971(A) | 4,975(A) | 8,029(A) | 8,992(A) |
| H | 9,861(A) | 16,451(C) | 14,408(D) | 14,690(B) | 16,433(E) | 17,568(C) | 20,363(D) | 34,356(F) |
| I | 11,225(B) | 18,953(C) | 17,137(E) | 17,436(C) | 19,515(F) | 21,093(D) | 23,783(E) | 35,583(F) |
| J | 541(A) | 3,507(A) | 2,354(A) | 2,634(A) | 4,971(B) | 2,619(A) | | |
| K | 3,246(A) | 6,511(A) | 4,278(A) | 4,488(A) | 5,542(B) | 6,309(A) | 9,228(B) | 25,406(F) |

*An LOS C is the minimum acceptable for rural segments. An LOS D is the minimum acceptable for urban segments.

For the No-Build Alternative and for each freeway alternative, present and projected future crash rates on five segments of US 31 were compared to the average statewide crash rates for rural principal arterials (the functional classification for US 31) as listed below:

US 31 Segments:

- US 30 to LaPaz
- Through LaPaz
- LaPaz to Lakeville
- Through Lakeville
- Lakeville to US 20

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



Table 3.1.4: US 31 Residual Vehicle-Miles of Travel and Vehicle-Hours of Travel by Freeway Alternative (in Year 2030 – poorest performers shaded)

| Freeway Alternatives | VMT | | | VHT | | |
|----------------------|---------|------------------------|------|-------|------------------------|------|
| | Miles | % Change from No-Build | Rank | Hours | % Change from No-Build | Rank |
| No-Build | 488,498 | | | 8,721 | | |
| A | 211,754 | -57% | 9 | 3,694 | -58% | 9 |
| B | 146,804 | -70% | 8 | 2,634 | -70% | 8 |
| C | 74,744 | -85% | 6 | 1,306 | -85% | 6 |
| D | 57,826 | -88% | 4 | 1,008 | -88% | 4 |
| E | 47,398 | -90% | 3 | 804 | -91% | 3 |
| F | 41,993 | -91% | 2 | 703 | -92% | 2 |
| G | 63,189 | -87% | 5 | 1,064 | -88% | 5 |
| H | 251,749 | -48% | 10 | 4,380 | -50% | 10 |
| I | 293,336 | -40% | 11 | 5,133 | -41% | 11 |
| J | 26,241 | -95% | 1 | 450 | -95% | 1 |
| K | 95,095 | -81% | 7 | 1,655 | -81% | 7 |

Table 3.1.5: South Bend Metro Area Congested Vehicle-Miles of Travel and Vehicle-Hours of Travel by Freeway Alternative (in Year 2030 -poorest performers shaded)

| Freeway Alternatives | VMT over LOS C | | | VHT over LOS C | | |
|----------------------|----------------|------------------------|------|----------------|------------------------|------|
| | Miles | % Change from No-Build | Rank | Hours | % Change from No-Build | Rank |
| No-Build | 2,509,904 | | | 68,867 | | |
| A | 2,355,943 | -6.13% | 6 | 67,520 | -1.96% | 11 |
| B | 2,393,659 | -4.63% | 10 | 66,245 | -3.81% | 9 |
| C | 2,409,697 | -3.99% | 11 | 67,052 | -2.64% | 10 |
| D | 2,363,255 | -5.84% | 8 | 65,745 | -4.53% | 6 |
| E | 2,360,917 | -5.94% | 7 | 65,662 | -4.65% | 5 |
| F | 2,366,349 | -5.72% | 9 | 65,762 | -4.51% | 7 |
| G | 2,346,618 | -6.51% | 5 | 65,322 | -5.15% | 3 |
| H | 2,337,643 | -6.86% | 3 | 65,315 | -5.16% | 2 |
| I | 2,292,760 | -8.65% | 1 | 66,235 | -3.82% | 8 |
| J | 2,359,906 | -5.98% | 4 | 65,614 | -4.72% | 4 |
| K | 2,341,562 | -6.71% | 2 | 65,003 | -5.57% | 1 |



Table 3.1.6 shows the extent to which each freeway alternative reduces total accidents along existing US 31 and in the Metro Area (Elkhart, Marshall and St. Joseph counties). Again, the freeway alternatives that divert the most traffic from existing US 31 result in the best performance. The reduction of accidents in the Metro Area is a secondary consideration that examines the extent to which this improvement project alone reduces the level of accidents throughout the Metro Area (not only US 31).

| Table 3.1.6: Existing US 31 and South Bend Metro Area Reduction in Total Accidents by Freeway Alternative (In Year 2030, poorest performance shaded) | | | | | | |
|---|--------------------------------|------------------------|------|----------------------------|------------------------|------|
| Freeway Alternatives | Existing US 31 Total Accidents | | | Metro Area Total Accidents | | |
| | Crashes | % Change from No-Build | Rank | Crashes | % Change from No-Build | Rank |
| No-Build | 375 | | | 11,242 | | |
| A | 178 | -53% | 9 | 10,966 | -2.19% | 6 |
| B | 151 | -60% | 8 | 11,043 | -1.77% | 7 |
| C | 67 | -82% | 6 | 11,074 | -1.49% | 10.5 |
| D | 49 | -87% | 5 | 11,074 | -1.49% | 10.5 |
| E | 36 | -90% | 3 | 10,963 | -2.48% | 4 |
| F | 25 | -93% | 2 | 10,959 | -2.52% | 3 |
| G | 48 | -87% | 4 | 10,965 | -2.46% | 5 |
| H | 204 | -46% | 10 | 11,063 | -1.59% | 8 |
| I | 238 | -37% | 11 | 10,067 | -1.56% | 9 |
| J | 16 | -96% | 1 | 10,941 | -2.68% | 1 |
| K | 83 | -78% | 7 | 10,951 | -2.59% | 2 |

Table 3.1.7 shows the total crash rate for each freeway alternative for residual traffic on existing US 31 segments. The total crash rate for each freeway alternative is compared to the Indiana average total crash rates for other rural principal arterials. The freeway alternatives that divert the most traffic from existing US 31 result in the lower total crash rate.

Table 3.1.8 summarizes the Phase 1 evaluation for each of the preliminary alternatives related to the Purpose and Need Statement for the project. It also identifies the preliminary alternatives that were advanced to Phase 2 of the screening process. Table 3.1.9 summarizes the socio-economic and environmental impacts for each of the preliminary alternatives that were advanced to the Phase 2 of the screening process for the project. It also identifies the preliminary alternatives that were recommended for further study in the Draft Environmental Impact Statement (DEIS).

It is important to note that the US 31 Improvement Project has been a dynamic process. The information contained in Table 3.1.9 is from the best-known existing secondary source data and conceptual design parameters available at the time that the preliminary screening was conducted. Additional information was identified during a detailed

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



Table 3.1.7: Total Crash Rate by Alternative for Existing US 31 Segments (in year 2030)
(Total crash rate exceeding statewide rural principal arterial of 186.57 shaded)

| Freeway Alternatives | US 30 to LaPaz | Through LaPaz | LaPaz to Lakeville | Through Lakeville | Lakeville to US 20 |
|----------------------|----------------|---------------|--------------------|-------------------|--------------------|
| No-Build | 94.17 | 250.82 | 45.04 | 456.04 | 239.93 |
| A | 52.70 | 121.61 | 21.94 | 240.64 | 186.23 |
| B | 18.40 | 30.35 | 6.00 | 95.37 | 197.94 |
| C | 18.18 | 29.31 | 5.71 | 77.29 | 120.96 |
| D | 18.44 | 29.27 | 5.65 | 73.04 | 58.53 |
| E | 17.93 | 27.60 | 5.39 | 75.78 | 38.62 |
| F | 17.68 | 27.59 | 5.37 | 72.39 | 38.62 |
| G | 20.27 | 34.33 | 6.54 | 64.04 | |
| H | 53.97 | 140.69 | 25.54 | 265.01 | 189.48 |
| I | 62.17 | 167.33 | 30.30 | 314.71 | 196.25 |
| J | 11.50 | 22.98 | 4.58 | 80.16 | |
| K | 21.36 | 41.77 | 7.80 | 89.37 | 140.12 |

Note: Assumes crash rate changes in proportion to residual daily traffic on existing US 31.

field review later in the progress of the study, and the numbers contained in the detailed analysis of the alternatives studied further in the DEIS and described in Section 3.3, Description of the Alternatives Selected for Detailed Study, may be slightly different than those contained in Table 3.1.9.

Freeway Alternatives B – F each consists of two options and are listed in the tables as B1, B2, C1, etc. (see Figure 3.1.15). The options are located south of Lakeville and each is approximately 3.4 miles in length. Option 1 follows existing US 31 from Shively Road to Quinn Road, for approximately 1.7 miles, before leaving the existing US 31 alignment just south of Lakeville. Option 2 follows the abandoned railroad corridor east of US 31, then crosses to the west of the existing US 31 alignment south of Lakeville. Option 1 would retain the existing southbound US 31 lanes as a two-way local service road, incorporate the northbound lanes into the freeway, and add a two-way frontage road from Shively Road to Leeper Road on the east side of the new freeway. Differences in purpose and need measures between the two options are negligible and are not included in the purpose and need discussion.

General descriptions and the screening evaluation for each of the freeway alternatives, as well as the advantages and disadvantages of Options 1 and 2 follow.



Table 3.1.8: Phase 1: Purpose and Need Evaluation

| PHASE 1 – PURPOSE AND NEED EVALUATION | | | | |
|---------------------------------------|---|------------------------------|---|-------------------------------|
| Alternative | Reduces Congestion On Existing US 31 (Acceptable LOS for all segments) ¹ | Improves Safety ² | Consistent with INDOT & MACOG Transportation Plans ³ | Advanced to Phase 2 Screening |
| No-Build | NO | NO | NO | NO |
| TDM | NO | NO | NO | NO |
| TSM | NO | NO | NO | NO |
| ITS | NO | NO | NO | NO |
| Mass Transit | NO | NO | NO | NO |
| Non-Freeway Alternatives | NO | YES | NO | NO |
| Freeway Alternatives | | | | |
| Alternative A | NO | NO | YES | NO |
| Alternative B | NO | NO | YES | NO |
| Alternative C | YES | YES | YES | YES |
| Alternative D | YES | YES | YES | YES |
| Alternative E | YES | YES | YES | YES |
| Alternative F | YES | YES | YES | YES |
| Alternative G | YES | YES | YES | YES |
| Alternative H | NO | NO | YES | NO |
| Alternative I | NO | NO | YES | NO |
| Alternative J | YES | YES | YES | YES |
| Alternative K | NO | YES | YES | NO |

NOTES: Alternatives recommended for advancement to Phase 2 screening shaded.

¹ An LOS C is the minimum acceptable for rural segments. An LOS D is the minimum acceptable for urban segments.

² Crash rates at or below Indiana average for rural principal arterials.

³ Alternatives were not eliminated solely on their ability to meet this criterion.



Table 3.1.9: Potential Socio-Economic and Environmental Impact Evaluation For Alternatives Advanced to Phase 2 of Screening Process

| Socio-Economic and/or Environmental Measure | Alternative Location | | | | | | | | | |
|--|----------------------|------|------|------|-----|------|---------|-----|-----|---------|
| | Western | | | | | | Central | | | Eastern |
| | C1 | C2 | D1 | D2 | E1 | E2 | F1 | F2 | J | G |
| Preliminary Average Cost Estimate (million \$) | 253 | 245 | 263 | 255 | 278 | 266 | 325 | 313 | 346 | 283 |
| New Right-of-Way (acres) | 1050 | 1071 | 1130 | 1152 | 985 | 1008 | 917 | 961 | 857 | 1043 |
| Forest (acres) | 162 | 196 | 146 | 178 | 114 | 148 | 75 | 111 | 55 | 117 |
| Wetlands (acres) | 77 | 85 | 74 | 81 | 74 | 82 | 48 | 57 | 28 | 43 |
| Floodplains (acres) | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 35 |
| Streams Impacted | 11 | 12 | 12 | 13 | 11 | 12 | 8 | 9 | 8 | 12 |
| Potential 4(f) Property Impacts | 2 | 0 | 2 | 1 | 5 | 3 | 5 | 3 | 5 | 4 |
| Managed Land Impacts | 5 | 7 | 6 | 8 | 6 | 8 | 5 | 7 | 4 | 5 |
| Unique Geological/ Ecological Area | M | M | M | M | M | M | L | L | L | L |
| Farmland (acres) | 824 | 810 | 809 | 797 | 755 | 742 | 727 | 731 | 702 | 833 |
| Notable Wildlife Habitat (IDNR) | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 1 |
| Residential Relocations | 78 | 48 | 155 | 125 | 146 | 116 | 202 | 172 | 235 | 113 |
| Farm Relocations | 8 | 4 | 8 | 4 | 8 | 4 | 10 | 6 | 10 | 8 |
| Business Relocations | 11 | 8 | 46 | 43 | 84 | 81 | 94 | 91 | 86 | 80 |
| Environmental Justice Issues | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| Well-Head Protection Area Impacts | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 0 |
| Archaeology Impacts (Previously Surveyed) | 4 | 2 | 4 | 2 | 4 | 2 | 4 | 2 | 3 | 2 |
| Historic Property Impacts (on NR or PE)* | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 |
| Cemeteries Impacted | 0 | 0 | 0 | 0 | 2 | 2 | 4 | 4 | 4 | 2 |
| Potential Residential Noise Impacts | 69 | 54 | 115 | 101 | 82 | 66 | 105 | 88 | 146 | 66 |
| Hazardous Material Site Impacts | 0 | 0 | 6 | 6 | 10 | 10 | 11 | 11 | 13 | 10 |
| Carried Forward for Detailed Study in DEIS*** | No | Yes | No | No | No | Yes | No | Yes | No | Yes |

NOTES:

Alternatives recommended for further study shaded.

* Historic Property Impacts include those properties listed on or potentially eligible for the National Register, that fall within the 2000-foot corridor for each alternative. These numbers are representative of potential Section 106 impacts.

** Alternatives' recommendations are discussed in detail in Section 3.1.7.

*** The No-Build Alternative – does not meet purpose and need of the project; however, it will be carried forward for detailed study in the DEIS to serve as a baseline to compare with other alternatives.



Alternative A

Alternative A (see Figure 3.1.4) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs west of La Paz, roughly parallels Oak Road, and ends at US 20 northwest of the existing SR 23 interchange. Alternative A is the most western alternative. It uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), Kern Road, and US 20. Alternative A is 21.3 miles in length, with average preliminary costs estimated at \$224 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Traffic Congestion: This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, three of the eight segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include four-lane divided bypasses of LaPaz and of Lakeville; widening of existing US 31 to seven lanes from Roosevelt Road to US 20; and widening of existing US 31 to five lanes from US 20 northward to Sample Road.

Traffic Safety: This alternative fails to address the purpose of improving safety on the existing US 31. Future crash rates on existing US 31 exceed the statewide average through Lakeville. Residual traffic on US 31 requires further major roadway investment along existing US 31 to improve physical conditions adversely affecting safety. One such improvement includes the widening of existing US 31 to five lanes from SR 4 to Roosevelt Road.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Conclusion

Alternative A fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.

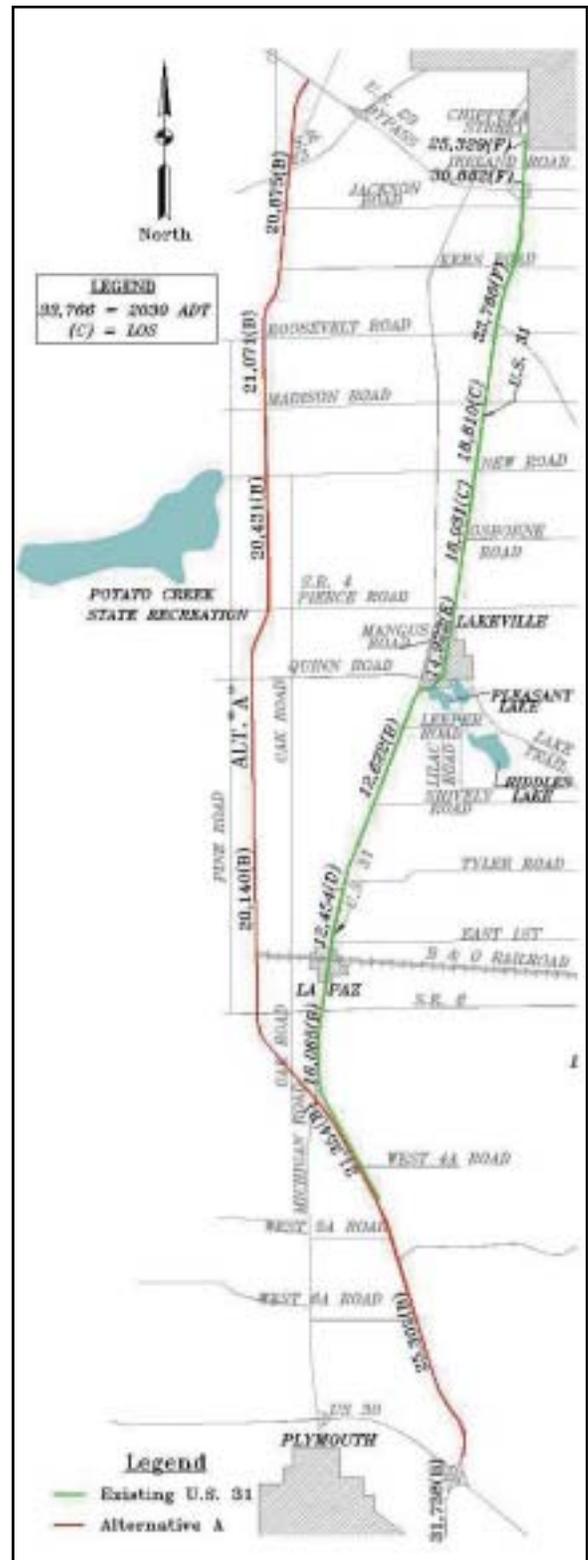


Figure 3.1.4: Alternative A

US 31 Plymouth to South Bend

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Alternative B

Alternative B (see Figure 3.1.5) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville, and ends at the existing US 20/SR 23 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), Kern Road, SR 23 (partial interchange) and US 20. Alternative B is 21.2 miles in length, with preliminary costs estimated at \$225 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Traffic Congestion: This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, two of the eight segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include widening existing US 31 to seven lanes from New Road to US 20 and widening existing SR 23 to five lanes from just north of US 20 to Sample Road.

Traffic Safety: This alternative fails to address the purpose of improving safety on the existing US 31. Future crash rates on existing US 31 exceed the statewide average from Lakeville to US 20. Residual traffic on US 31 requires further major roadway investment along existing US 31 to improve physical conditions adversely affecting safety. One such improvement includes widening existing US 31 to five lanes from SR 4 to New Road.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Conclusion

Alternative B fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.

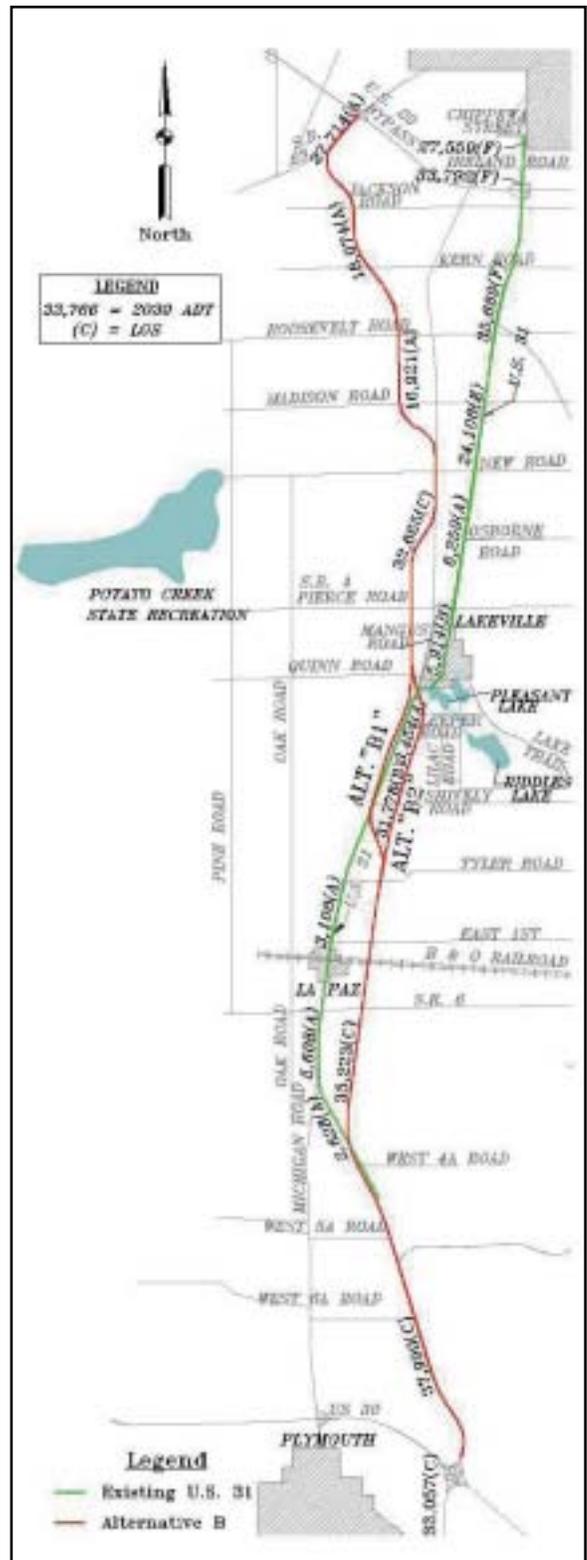


Figure 3.1.5: Alternative B



Alternative C

Alternative C (see Figure 3.1.6) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, and ends at US 20 west of the existing US 31 interchange. This four-lane rural freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), Kern Road and US 20. Alternative C parallels a high transmission powerline for approximately 0.5 mile near Madison Road. Alternative C is the shortest alternative at 19.5 miles in length, with preliminary costs estimated at \$245 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion of existing US 31. Projected LOS for the year 2030 range from A – C along rural segments and LOS D for the urban segment of existing US 31. These projected LOS values meet INDOT standards.

Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 82% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative C meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

Option 1: Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs (see Table 3.1.9), Option 1 is not recommended to be advanced for further study. The Screening of Options 1 & 2 for Alternatives B-F follows the analysis of Alternative K.

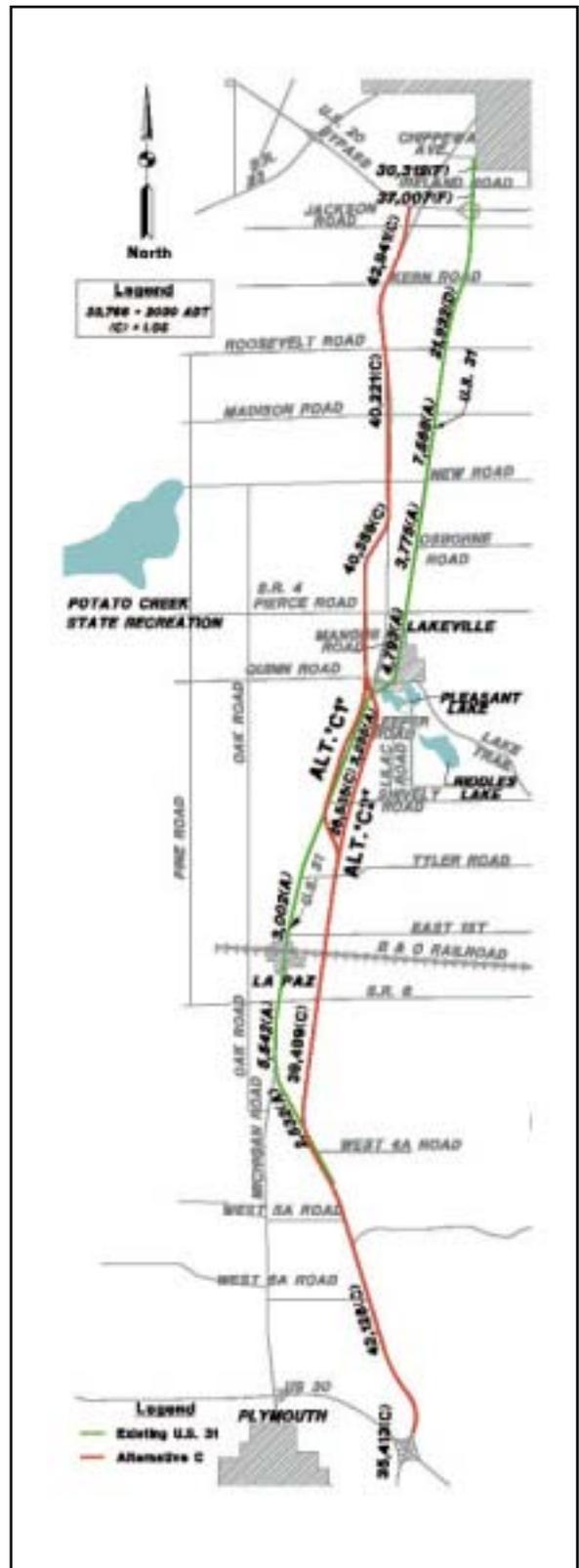


Figure 3.1.6: Alternative C



Option 2: The potential socio-economic and environmental impacts identified for Alternative C are listed in Table 3.1.9. This alternative would require an estimated 1,071 acres of new right-of-way, of which, 196 acres are forested, 85 acres are wetlands, 11 acres are floodplains, and 810 acres are farmland. Approximately 12 streams would be crossed by the alternative. This alternative crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique geological and ecological area. Alternative C is expected to directly impact two Notable Wildlife Habitat Areas as identified by the Indiana Department of Natural Resources (IDNR). According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative C would result in approximately 48 residential, eight businesses, and four farm relocations. There are several large, industrial businesses potentially impacted near the proposed interchange with US 20. This alternative would also potentially impact seven managed lands, which include three classified forests and four classified wildlife areas.

This alternative could potentially impact one property on the National Register, and one property potentially eligible for the National Register. Both properties are located near the proposed Alternative C/US 20 interchange. The property listed on the National Register is the Evergreen Hill Farm. This property includes 38 acres, with an Italianate-style house, c. 1873, barn, cemetery, and smokehouse. The Cover House is potentially eligible for the National Register. It is a Prairie-style residence built c. 1920. Both properties are possible Section 106 impacts.

It will also impact two previously surveyed archaeological sites, neither of which was recommended for further study.

This alternative crosses four well-head protection areas.

Conclusion

Alternative C is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.9 further discusses those alternatives to be carried forward for further analysis in the DEIS.



Alternative D

Alternative D (see Figure 3.1.7) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of LaPaz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), Kern Road, US 31 (partial interchange), and US 20. Alternative D is 20.9 miles in length, with preliminary costs estimated at \$255 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion of existing US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 87% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative D meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

Option 1: Given the higher residential, farm, business relocation, impacts to historic sites and higher

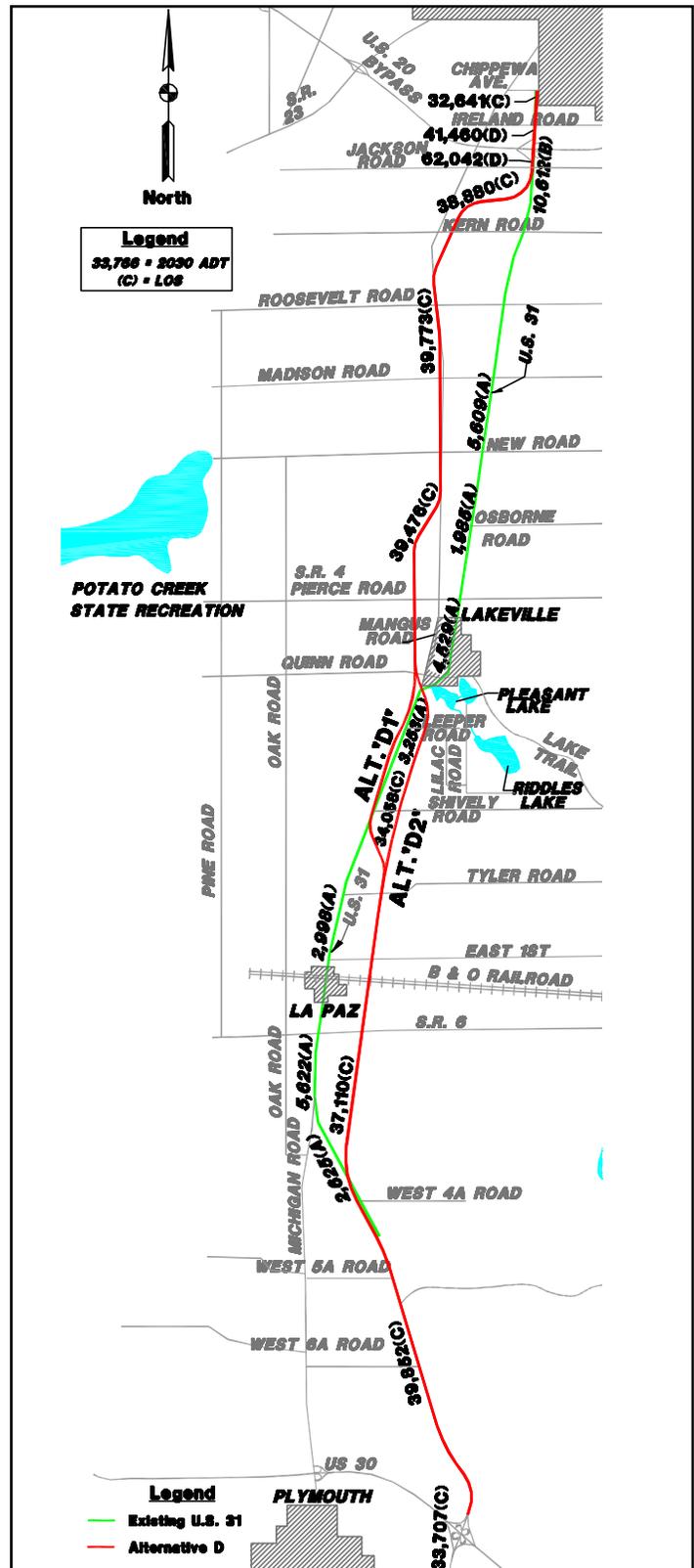


Figure 3.1.7: Alternative D



overall costs (see Table 3.1.9), Option 1 is not recommended to be advanced for further study. The Screening of Options 1 & 2 for Alternatives B-F follows the analysis of Alternative K.

Option 2: The potential socio-economic and environmental impacts identified for Alternative D are listed in Table 3.1.9. This alternative would require an estimated 1,152 acres of new right-of-way, of which, 178 acres are forested, 81 acres are wetlands, 11 acres are floodplains, and 797 acres are farmland. Approximately 13 streams would be crossed by the alternative. This alternative crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique geological and ecological area. Alternative D is expected to directly impact two Notable Wildlife Habitat Areas as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative D would result in approximately 125 residential, 43 business, and four farm relocations. This alternative crosses directly through the Whispering Hills subdivision near its connection with US 31, resulting in a high number of residential relocations and neighborhood impacts.

Alternative D connects to existing US 31 approximately 1/3 of a mile south of the existing US 20 interchange. The close proximity of this connection to the existing interchange creates insufficient distance to accommodate the proper weaving movements for the traffic flow.

Alternative D would impact six potential hazardous material sites including: two Underground Storage Tanks (USTs), one Leaking Underground Storage Tanks (LUSTs), and three Resource Conservation and Recovery Act (RCRA) sites.

This alternative would also potentially impact eight managed lands, which include three classified forests, four classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

The O'Brien Park is the only potential Section 4(f) property impacted by this alternative. It will also impact two previously surveyed archaeological sites, neither of which was recommended for further study.

This alternative crosses four well-head protection areas.

Conclusion

Alternative D is being eliminated from further consideration based on the insufficient land for the needed geometrics in the vicinity of the US 20/US 31 interchange and a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.8 contains those alternatives eliminated from further consideration.



Alternative E

Alternative E (see Figure 3.1.8) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of LaPaz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, returns to US 31 south of Kern Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), US 31 (partial interchange), Kern Road, and US 20. Alternative E is 20.6 miles in length, with preliminary costs estimated at \$266 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion on existing US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 90% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative E meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

Option 1: Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs (see Table 3.1.9), Option 1 is not recommended to be advanced for further study. The Screening of Options 1 & 2 for Alternatives B-F follows the analysis of Alternative K.



Figure 3.1.8: Alternative E

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



Option 2: The potential socio-economic and environmental impacts identified for Alternative E are listed in Table 3.1.9. This alternative would require an estimated 1,008 acres of new right-of-way, of which, 148 acres are forested, 82 acres are wetlands, 11 acres are floodplains, and 742 acres are farmland. Approximately 12 streams would be crossed by the alternative. This alternative crosses the edge of the Maxinkukee Moraine in the northwestern portion of the study area, a unique geological and ecological area. Alternative E is expected to directly impact two Notable Wildlife Habitat Areas as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative E would result in approximately 116 residential, 81 business, and four farm relocations. Many of the residence and business relocations are located along the existing US 31. This alternative would also impact the Center Township Fire Department.

Alternative E would impact ten potential hazardous material sites including: six USTs, one LUST, and three RCRA sites.

This alternative would also potentially impact eight managed lands, which include three classified forests, four classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farneman House, an Italianate-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register) and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 3.2.19). Due to the close proximity of these two properties, it will be difficult to construct a freeway facility in this area without significant impact to one or both properties. It may be possible to minimize right-of-way requirements between the properties or to shift Alternative E to connect with existing US 31 slightly north of these sites. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

It will also impact two previously surveyed archaeological sites, one of which was recommended for intensive survey.

This alternative crosses three well-head protection areas.

Conclusion

Alternative E is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.9 further discusses those alternatives to be carried forward for further analysis in the DEIS.



Alternative F

Alternative F (see Figure 3.1.9) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It crosses over US 31 south of Lakeville, runs west of Lakeville near an abandoned railroad, returns to US 31 near New Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), Kern Road, and US 20. Alternative F is 20.4 miles in length, with preliminary costs estimated at \$313 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion of existing US 31. Alternative F has a projected LOS of A along existing US 31, and meets INDOT standards.

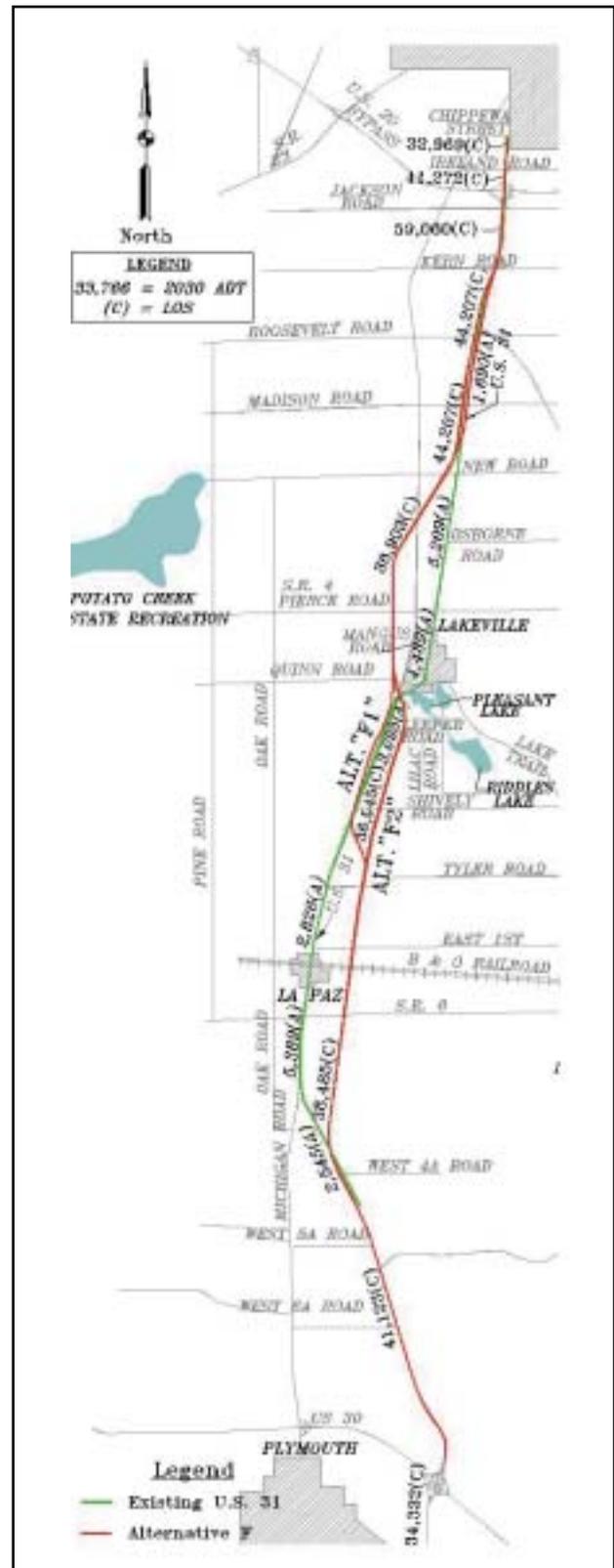
Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 93% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative F meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

Option 1: Given the higher residential, farm, business relocation, impacts to historic sites and higher overall costs (see Table 3.1.9), Option 1 is not recommended to be advanced for further study. The Screening of Options 1 & 2 for Alternatives B-F follows the analysis of Alternative K.



3.1.9: Alternative F



Option 2: The potential socio-economic and environmental impacts identified for Alternative F are listed in Table 3.1.9. This alternative would require an estimated 961 acres of new right-of-way, of which, 111 acres are forested, 57 acres are wetlands, 11 acres are floodplains, and 731 acres are farmland. Approximately nine streams would be crossed by the alternative. Alternative F is expected to directly impact one Notable Wildlife Habitat Area as identified by the IDNR. According to the Indiana Natural Heritage Data Center, managed by the IDNR Division of Nature Preserves, in 1999 a Blanding's turtle (*Emydoidea blandingii*) was reported within the corridor for this alternative. This report could be representative of a population of this state endangered species in the area.

Alternative F would result in approximately 172 residential, 91 business, and six farm relocations. Many of the residence and business relocations are located along the existing US 31. This alternative would also impact the Center Township Fire Department.

Alternative F would impact 11 potential hazardous material sites including: seven USTs, one LUST, and three RCRA sites.

This alternative would also potentially impact seven managed lands, which include two classified forests, four classified wildlife areas, and the O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farneman House, an Italianate-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 3.2.19). It may be possible to minimize right-of-way requirements between the properties or to shift Alternative F to connect with existing US 31 slightly north of these sites. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

Three cemeteries, in addition to the Southlawn Cemetery, could also potentially be impacted by this alternative. It will also impact two previously surveyed archaeological sites, none of which were recommended for intensive survey.

This alternative crosses two well-head protection areas.

Conclusion

Alternative F is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.9 further discusses those alternatives to be carried forward for further analysis in the DEIS.



Alternative G

Alternative G (see Figure 3.1.10) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of LaPaz, and parallels US 31 to the east near an abandoned railroad. It runs east of Lakeville, returns to US 31 south of Kern Road, and ends at the existing US 20/US 31 interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), US 31 (partial interchange), Kern Road, and US 20. Alternative G is 21.2 miles in length, with preliminary costs estimated at \$283 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion on existing US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 87% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative G meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

The potential socio-economic and environmental impacts identified for Alternative G are listed in Table 3.1.9. This alternative would require an estimated 1,043 acres of new right-of-way, of which, 117 acres are forested, 43 acres are wetlands, 35 acres are floodplains, and 833 acres are farmland. Approximately 12 streams would be crossed by the alternative. Alternative G is expected to directly impact one Notable Wildlife Habitat Area as identified by the IDNR.



Figure 3.1.10: Alternative G

US 31 Plymouth to South Bend

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Alternative G would result in approximately 113 residential, 80 business, and eight farm relocations. This alternative would also impact the Center Township Fire Department. Alternative G would impact ten potential hazardous material sites including: six USTs, one LUST, and three RCRA sites.

This alternative would also potentially impact five managed lands, which include three classified forests, one classified wildlife area, and O'Brien Park. O'Brien Park is located along US 31, just north of Ireland Road.

Potential Section 4(f) sites include O'Brien Park, the Ullery/Farneman House, an Italianate-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 3.2.19). Due to the close proximity of these two properties, it will be difficult to construct an interstate type facility in this area without significant impact to one or both properties. It may be possible to minimize right-of-way requirements between the properties or to shift Alternative G to connect with existing US 31 slightly north of these sites.

Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact. A second potential Section 106 impact from Alternative G is the Francis Donaghue Farmstead near Turkey Trail. This property includes an Italianate-style house, c. 1861, bank barn, privy, chicken house, windmill, and well house.

It will also impact two previously surveyed archaeological sites, none of which were recommended for intensive survey. One cemetery, in addition to the Southlawn Cemetery, could potentially be impacted by this alternative.

Conclusion

Alternative G is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.9 further discusses those alternatives to be carried forward for further analysis in the DEIS.



Alternative H

Alternative H (see Figure 3.1.11) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 east of an abandoned railroad. It runs east of Lakeville, and ends at the existing western US 20/SR 331 (Bremen Highway) interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), SR 331 (south of Kern Road), and US 20. Alternative H parallels a high transmission powerline corridor from near Osborne Road to Kern Road (approximately 4.6 miles). Alternative H is 20.9 miles in length, with preliminary costs estimated at \$239 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Traffic Congestion: This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, four of the eight segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include four-lane divided bypasses of LaPaz and of Lakeville; widening of existing US 31 to seven lanes from New Road to US 20; widening of Bremen Highway (Union Street) to seven lanes from US 20 to Dragoon Trail; and widening of Bremen Highway (Union Street) to five lanes from Dragoon Trail to SR 933 (Lincolnway).

Traffic Safety: This alternative fails to address the purpose of improving safety on the existing US 31. Future crash rates on existing US 31 exceed the statewide average from Lakeville to US 20. Residual traffic on US 31 requires further major roadway investment along existing US 31 to improve physical conditions adversely affecting safety. One such improvement includes the widening of existing US 31 to five lanes from SR 4 to New Road.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

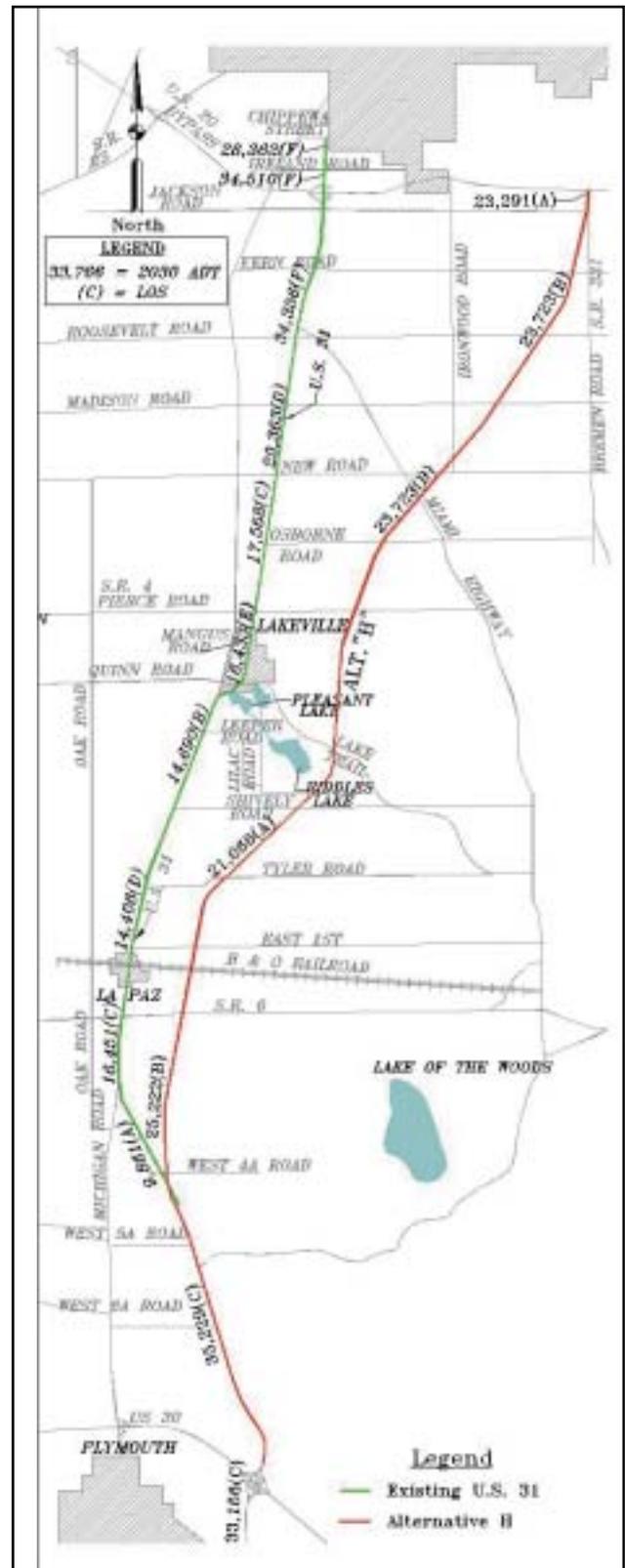


Figure 3.1.11: Alternative H



Conclusion

Alternative H fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



Alternative I

Alternative I (see Figure 3.1.12) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of La Paz, and parallels US 31 to the east near an abandoned railroad. It runs east of Lakeville, and ends at the existing eastern US 20/SR 331 (Elm Road/Capital Avenue) interchange. This freeway alternative uses the existing US 30 interchange, and includes interchanges at West 5A Road, US 6, SR 4 (Pierce Road), SR 331 (south of Osborne Road), Elm Road/Kern Road and US 20. Alternative I is the longest alternative at 24.3 miles in length, with preliminary costs estimated at \$272 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Traffic Congestion: This alternative fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, five of the eight segments of existing US 31 have an unacceptable LOS. The residual traffic on US 31 requires further major roadway investment in the existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include four-lane divided bypasses of LaPaz and of Lakeville; and widening of existing US 31 to seven lanes from SR 4 to US 20.

Traffic Safety: This alternative fails to address the purpose of improving safety on the existing US 31. Future crash rates on existing US 31 exceed the statewide average through Lakeville and from Lakeville to US 20. Residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety. These improvements include the LaPaz and Lakeville bypasses as well as the widening of US 31 to seven lanes from SR 4 to US 20.

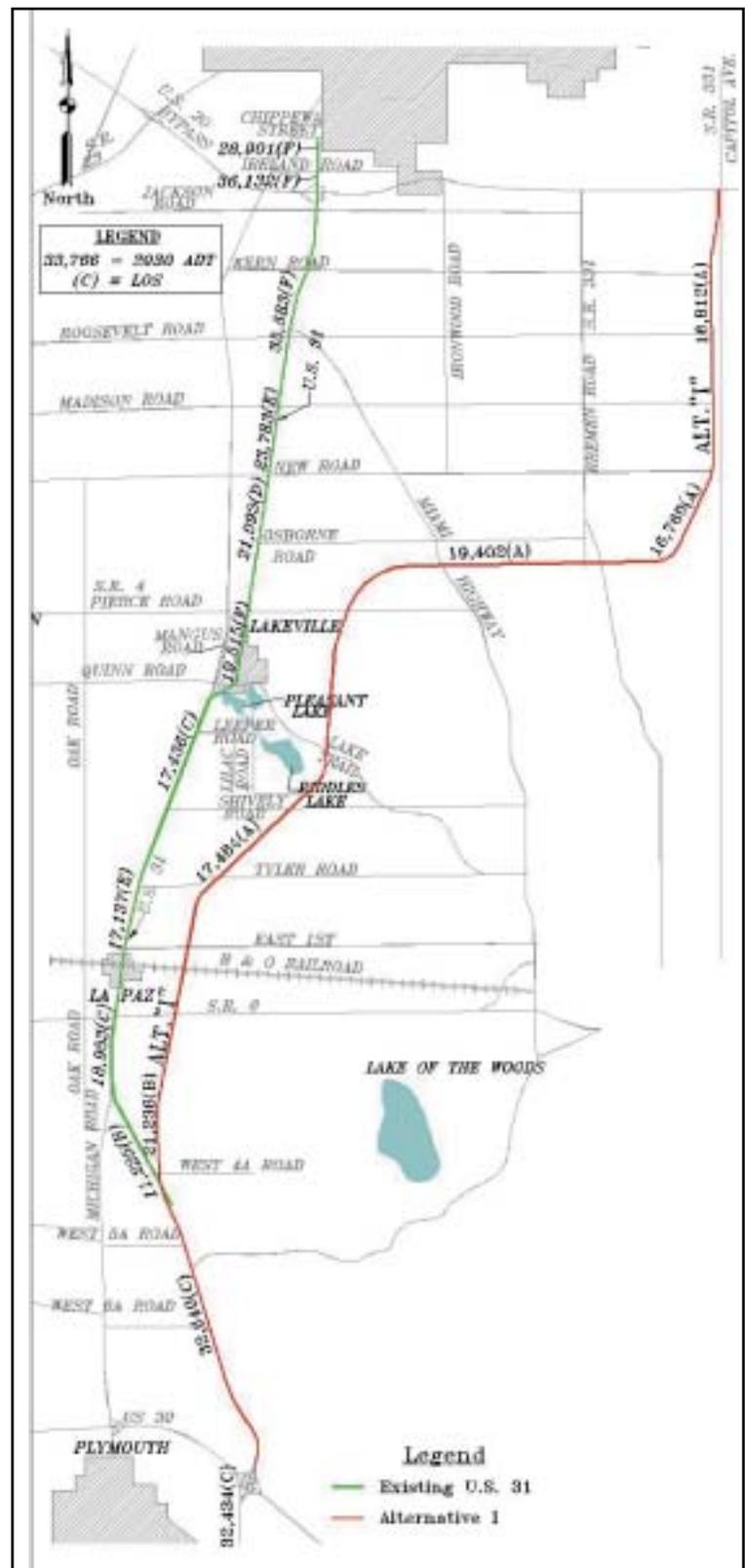


Figure 3.1.12: Alternative I

US 31 Plymouth to South Bend

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Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Conclusion

Alternative I fails to address the first two purposes and needs for the project (i.e., reduced congestion and improved safety). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process.



Alternative J

Alternative J (see Figure 3.1.13) begins at the existing US 31/US 30 interchange, departs US 31 near West 4A Road, runs east of LaPaz, and parallels US 31 to the east near an abandoned railroad. It follows the alignment of US 31 from Shively Road (south of Lakeville) to Quinn Road, departs the US 31 alignment west of Lakeville near an abandoned railroad, returns to US 31 south of New Road, and ends at the existing US 20/US 31 interchange. Alternative J is 20.2 miles in length, with preliminary costs estimated at \$346 million. This preliminary estimate includes costs for construction, right-of-way and preliminary engineering (design).

Phase 1: Purpose and Need

Reduce Congestion: This alternative would reduce congestion on existing US 31. Projected LOS for the year 2030 range from A – B along existing US 31, and meet INDOT standards.

Improve Traffic Safety: This alternative would improve safety on existing US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 96% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternative J meets all three purposes and needs identified for this project. This alternative was advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

The potential socio-economic and environmental impacts identified for Alternative J are listed in Table 3.1-9. This alternative would require an estimated 857 acres of new right-of-way, of which, 55 acres are forested, 28 acres are wetlands, 11 acres are floodplains, and 702 acres are farmland. Approximately eight streams would be crossed by the alternative.

Alternative J would result in approximately 235 residential, 86 businesses, and ten farm relocations. In addition, this alternative would impact a 48-unit apartment complex. Many of the residence and



Figure 3.1.13: Alternative J

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



business relocations are located along the existing US 31. This alternative would also impact the Center Township Fire Department, and could potentially impact the La Paz wastewater treatment plant.

Alternative J would impact 13 potential hazardous material sites including: eight USTs, two LUSTs, and three RCRA sites.

This alternative would also potentially impact four managed lands, which include one classified forests, one classified wildlife areas, O'Brien Park, and Newton Park. O'Brien Park is located along US 31, just north of Ireland Road, and Newton Park is located along US 31 near Pierce Road.

Potential Section 4(f) sites include O'Brien Park, Newton Park, the Ullery/Farneman House, an Italianate-style house, c. 1860 (a Local Historic Landmark with a high potential to be eligible for the National Register), and the Southlawn Cemetery (a Local Historic Landmark). The Ullery/Farneman House and Southlawn Cemetery are located very close together along existing US 31 (Figure 3.2.19). Due to the close proximity of these two properties, it will be difficult to construct a freeway type facility in this area without significant impact to one or both properties. Because of its high potential to be eligible for the National Register, the Ullery/Farneman House would also most likely be a Section 106 impact.

Alternative J is adjacent to both the Newton Park in Lakeville and the LaVille Jr.-Sr. High School. Shifting Alternative J to the west to avoid the park and school would make it essentially the same as Alternatives B, C, D, E and F of which Alternatives C, E, and F have been carried forward for further analysis.

It will also impact two previously surveyed archaeological sites, none of which were recommended for intensive survey.

This alternative crosses two well-head protection areas.

Conclusion

Alternative J is being eliminated from further consideration based on residential relocations being two to six times higher than any other freeway alternative, potential impacts to the Newton Park and LaVille Jr.-Sr. High School and a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process. Section 3.1.8 contains those alternatives eliminated from further consideration.



Screening of Options 1 & 2 for Alternatives B – F

Freeway Alternatives B – F each consists of two Options, as shown in Figure 3.1.15, and are listed in the tables as B1, B2, C1, etc. The Options are each 3.4 miles in length and differ in terms of their associated environmental impacts. Option 1 diverts to use the existing US 31 for 1.7 miles, before leaving the existing US 31 alignment just south of Lakeville. Option 2 follows the abandoned railroad corridor east of US 31, and then crosses to the west of the existing alignment south of Lakeville (Figure 3.1.15).

Phase 1: Purpose and Need

The screening process for Options 1 and 2 differed from that of the individual freeway alternatives in that the differences in purpose and need measures are expected to be negligible. Thus, if a freeway alternative met all three purposes and needs identified for the project, both options were directly advanced to Phase 2 of the screening process, the socio-economic and environmental screening, and were viewed in terms of advantages and disadvantages. If a freeway alternative did not meet all three purposes and needs identified for the project, the alternative, including both Options 1 and 2, was not advanced to Phase 2 of the screening process and was eliminated from further consideration. Table 3.1-8 identifies the alternatives that were advanced to Phase 2 of the screening process, including Alternatives C-F. Alternative B did not meet all three purposes and needs identified for the project, therefore was not advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

As shown in Table 3.1.8, Freeway Alternatives C-F were advanced to Phase 2 of the screening process and potential impacts to both Options 1 and 2 were identified (C1, C2, D1, etc.). Table 3.1.9 summarizes these potential socio-economic and environmental impacts associated with each of the alternatives that were advanced to Phase 2 of the screening process. Table 3.1.9 also identifies the alternatives recommended for further study.

Option 1 (Alternatives C – F)

This Option utilizes the existing US 31 alignment for approximately 1.7 miles south of Lakeville.

Advantages:

- This Option uses **more** of the existing US 31 right-of-way.
- It impacts approximately 34 acres **less** of forest than Option 2.
- It impacts approximately 8 acres **less** of wetlands than Option 2.

Disadvantages:

- It impacts two historic sites potentially eligible for the National Register of Historic Places.
- It would require 30 **more** residential relocations than Option 2.
- It would require four **more** farm relocations than Option 2.
- It would require three **more** business relocations than Option 2.

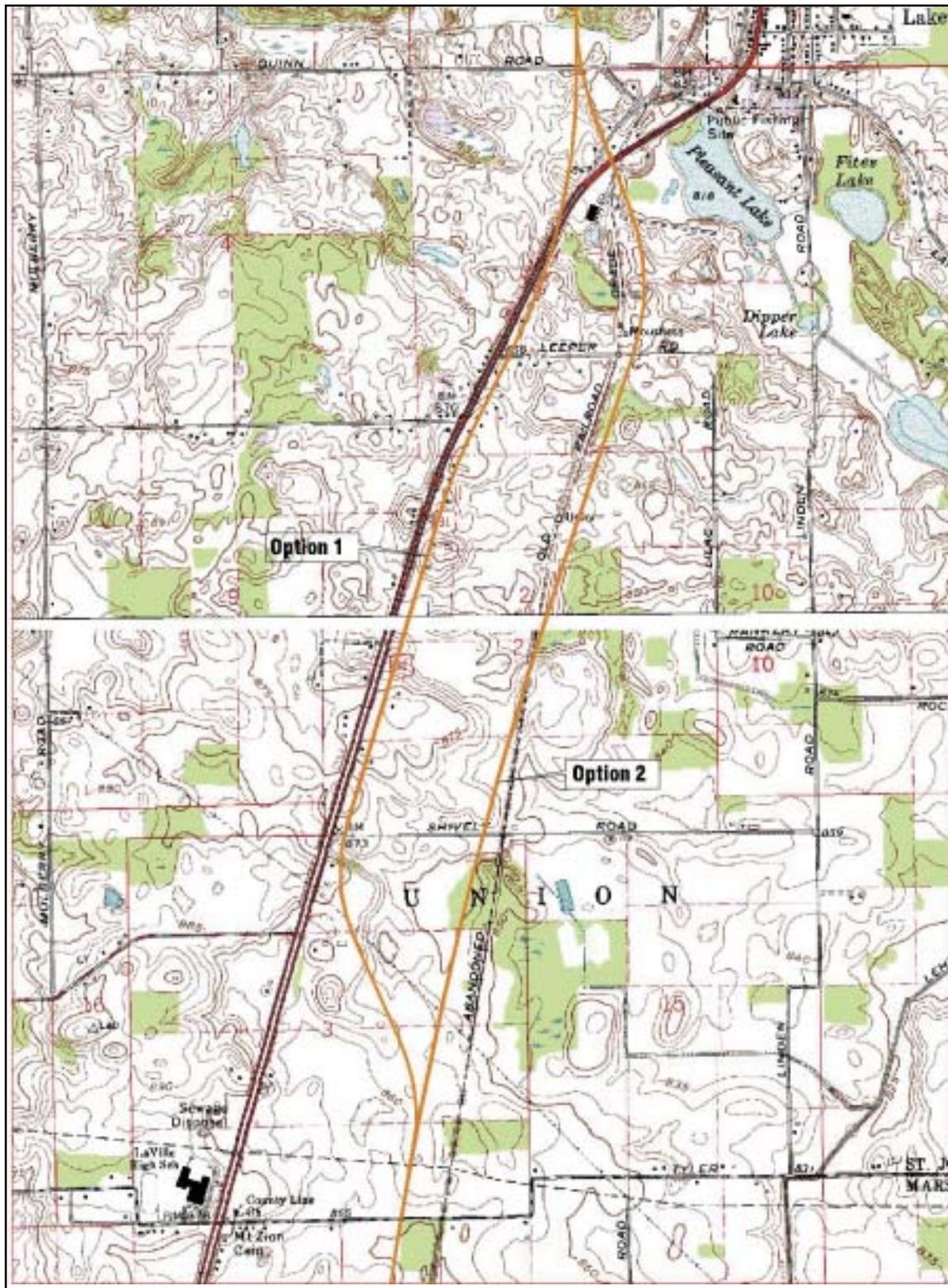


Figure 3.1.15: Options 1 & 2 for Alternatives B - F



- This Option would have higher overall costs due to **more** relocations and construction of frontage roads.
- It would require **greater** maintenance of traffic during construction.
- There is a **higher** potential for utility relocations associated with this Option.

Option 2 (Alternatives C – F)

Advantages:

- No sites on or potentially eligible for the National Register would be impacted by this Option.
- It follows an abandoned railroad corridor.
- It would require 30 **less** residential relocations than Option 1.
- It would require four **less** farm relocations than Option 1.
- It would require three **less** business relocations than Option 1.
- It would have **lower** overall costs due to fewer relocations and no need for frontage roads.
- It would require **less** maintenance of traffic during construction than Option 1.
- There is a **lower** potential for utility relocations associated with this Option.

Disadvantages:

- It uses **less** of the existing US 31 right-of-way.
- It impacts approximately 34 acres **more** of forest than Option 1.
- It impacts approximately 8 acres **more** of wetlands than Option 1.

Conclusion

Given the higher residential, farm, and business relocations, impacts to potential historic sites, and higher overall cost, Option 1 is not recommended to be advanced for further study. As further discussed above in the screening of each of the freeway alternative, for Alternatives C – F, Option 2 was used to screen each alternative.

3.1.8 Preliminary Alternatives Eliminated From Further Consideration

Based on the findings of this study, the following preliminary alternatives are being eliminated from further study for the following reasons:

- *Travel Demand Management (TDM) Alternatives* - Do not meet the purpose and need of the project.
- *Transportation System Management (TSM) Alternatives* - Do not meet the purpose and need of the project.



- *Intelligent Transportation System (ITS) Applications* - Do not meet the purpose and need of the project.
- *Mass Transit Alternative* - Does not meet the purpose and need of the project.
- *Non-Freeway Alternatives (Highway Build Alternative)* - Do not meet the purpose and need of the project.
- *Option 1 for Freeway Alternatives C-F* - Given the higher residential, farm, and business relocations, impacts to potential historic sites, and higher overall cost, Option 1 is not recommended to be advanced for further study.
- *Freeway Alternatives A, B, H, I and K (Highway Build Alternatives)* - Do not meet the purpose and need of the project.
- *Freeway Alternative D (Highway Build Alternative)* - Did meet the purpose and need of the project; however, Alternative D crosses through the large Whispering Hills subdivision, resulting in a high number of residential relocations and neighborhood impacts. It also connects to existing US 31 approximately 1/3 of a mile south of the existing US 20 interchange. The close proximity of this connection to the existing interchange creates insufficient distance to accommodate the proper weaving movements for the traffic flow. Due to the insufficient geometrics, the high number of residential relocations and neighborhood impacts, this alternative was eliminated from further consideration.
- *Freeway Alternative J (Highway Build Alternative)* - Did meet the purpose and need of the project. This freeway alternative was one of the best performers in regards to the purpose and need measures. Generally, the more an alternative utilized portions of existing US 31, the better it performed and Alternative J utilized more of the existing US 31 alignment than any other alternatives. Alternative J also generally had the lowest impacts to the natural environment, as less new right-of-way would be required. However, this alternative also had the highest residential relocations among the alternatives and the highest cost. Alternative J would require 235 residence, two to six times more residential relocations than any of the other freeway alternatives, as well as 86 business relocations. In addition, it would significantly impact two closely situated Local Historical Landmarks along existing US 31, the Ullery/Farneman House, an Italianate-style house (c. 1860), and the Southlawn Cemetery (including the small caretaker's building). Alternative J is adjacent to both the Newton Park in Lakeville and the LaVille Jr.-Sr. High School. Shifting Alternative J to the west to avoid the park and school would make it essentially the same as Alternatives B, C, D, E and F, of which Alternatives C, E, and F have been carried forward for further analysis. Alternative J, although a high performer in regard to purpose and need, was eliminated due to the high relocations, significant impacts to Local Historic Landmarks, impacts to Newton Park and the LaVille Jr.-Sr. High School and high cost.

Figure 3.1.16 shows the freeway alternatives that have been eliminated from further consideration.

3.1.9 Preliminary Alternatives Carried Forward for Further Analysis

The following alternatives are recommended for more detailed engineering and environmental evaluations. The preliminary freeway alternatives recommended to be carried forward are shown in Figure 3.1.17. Socio-economic and environmental impacts associated with each of these Preliminary Alternatives, particularly related to wetland impacts, residential and business relocations, and historic property impacts, are contained in Table 3.2.1.

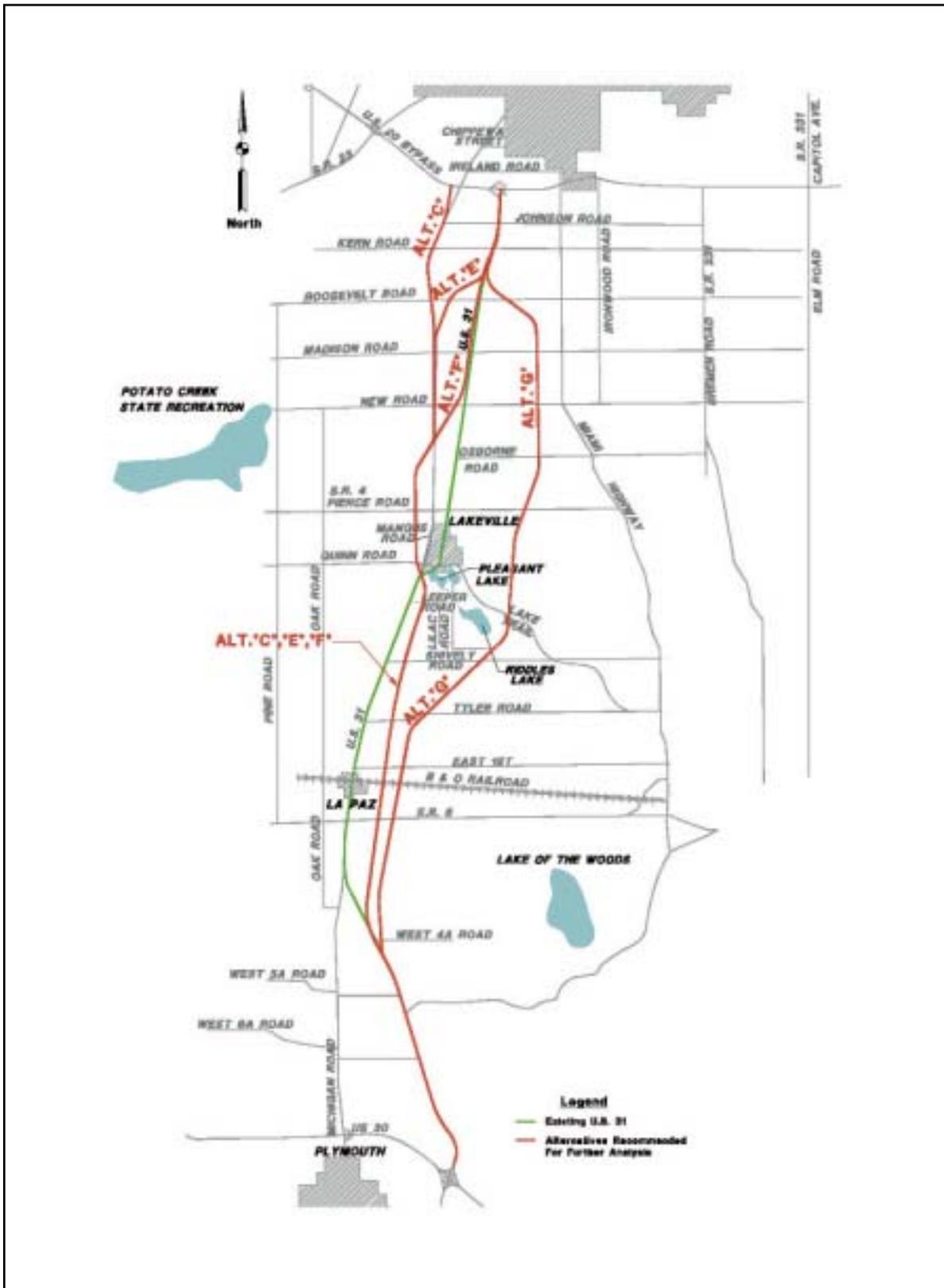


Figure 3.1.17: US 31 Plymouth to South Bend Preliminary Freeway Alternatives Recommended for Further Analysis in the DEIS (Alternatives C, E, F, and G)



No-Build Alternative

The No-Build (No Action or Do Nothing) Alternative is represented by the existing roadway network plus programmed major roadway improvements in the South Bend Metropolitan Area. This alternative would not meet the purpose and need for the project, but will be carried forward for further analysis to serve as a baseline for comparing the Build Alternatives. Carrying the No-Build Alternative is also a requirement of the National Environmental Policy Act (NEPA).

Alternative C

This preliminary freeway alternative meets the purpose and need for the project. It has a relatively low number of residence (48) and business (8) relocations. Alternative C avoids the two closely spaced Local Historic Landmarks (Ullery/Farneman House, c. 1860 and Southlawn Cemetery) on the existing US 31, both of which are potential Section 4(f) issues. This alternative has relatively high potential forest (196 acres) and wetland (85 acres). It crosses the edge of the Maxinkukee Moraine, a unique geological and ecological area, and could potentially affect a population of the state endangered Blandings turtle (*Emydoidea blandingii*).

Alternative E

This preliminary freeway alternative meets the purpose and need for the project. Alternative E uses a significant portion of US 31. It has a relatively moderate number of residence (116) relocations and a high number of business (81) relocations. It may be possible to minimize right-of-way requirements between the two closely spaced Local Historic Landmark (Ullery/Farneman House, c. 1860 and Southlawn Cemetery) properties or to shift Alternative E to connect with existing US 31, slightly north of the two properties. This alternative has relatively high potential forest (148 acres) and wetland (82 acres) impacts. It crosses the edge of the Maxinkukee Moraine, a unique geological and ecological area, and could potentially affect a population of the state endangered Blandings turtle (*Emydoidea blandingii*).

Alternative F

This preliminary freeway alternative meets the purpose and need for the project. It has a relatively low number of residence (48) and business (8) relocations. Alternative F uses a significant portion of US 31. It may be possible to minimize right-of-way requirements between the two closely spaced Local Historic Landmark (Ullery/Farneman House, c. 1860 and Southlawn Cemetery) properties or to shift Alternative F to connect with existing US 31, slightly north of the two properties. This alternative has relatively low potential forest (111 acres) and wetland (57 acres) impacts. This alternative could potentially affect a population of the state endangered Blandings turtle (*Emydoidea blandingii*).

Alternative G

This preliminary freeway alternative meets the purpose and need for the project. It has a relatively moderate number of residence relocations (113) and a high number of business (80) relocations. Alternative G uses a significant portion of US 31. It may be possible to minimize right-of-way requirements between the two closely spaced Local Historic Landmark (Ullery/Farneman House, c. 1860 and Southlawn Cemetery) properties or to shift Alternative G to connect with existing US 31, slightly north of the two properties. This alternative has relatively low potential forest (117 acres) and wetland (43 acres) impacts. This alternative is to the east of the existing US 31, and avoids the unique geological and ecological areas associated with the Maxinkukee Moraine.



3.2 Modifications of Alternatives Recommended for Further Analysis

Following the publication of the Preliminary Alternative Analysis and Screening Report on August 19, 2003, and detailed in Section 3.1, Preliminary Alternatives Analysis and Screening, there were several meetings held to discuss the screening results. These meetings included:

- Community Advisory Committee (CAC) – September 4, 2003,
- Section 106 Consulting Parties – September 4, 2003
- Public Information Meeting in Lakeville – September 4, 2003
- St. Joseph County Chamber of Commerce Legislative Affairs - September 9, 2003
- Resource Agency – September 30, 2003
- Emergency Service Provider and School System – September 30, 2003
- Elkhart Chamber of Commerce – October 17, 2003
- Town of LaPaz – November 13, 2003
- Marshall County and Plymouth – December 2, 2003

In addition to information and comments received at the meetings, numerous written comments and comments from the project's website were received. The study team continued to collect and analyze data related to social and environmental impacts for each of the four preliminary freeway alternatives. A team of environmental scientists spent several weeks in the field, walking each of the alternatives and collecting field data. A team of engineers developed proposed lane configurations, interchange locations and configurations, overpass locations, more accurate proposed right-of-way limits and revised construction cost estimates for each of the alternatives.

As the field data and public and resource agency comments were analyzed and preliminary engineering further developed, a more accurate measure of social and environmental impacts of each of the alternatives was determined. A review of these social and environmental impacts raised concerns within the study team, which included resource agencies and consulting parties involved with the project. Concerns focused around both socio-economic and environmental impacts, particularly related to wetland impacts, residential and business relocations, and historic property impacts (see Table 3.2.10).

It is important to again note that the US 31 Improvement Project has been a dynamic process. The information previously presented in Table 3.1.9 was from the best-known existing secondary source data and conceptual design parameters available at the time that the preliminary screening of alternatives was conducted. Additional information was identified during a detailed field review later in the progress of the study, and the numbers contained in Table 3.2.10 may be slightly different than those contained in Table 3.1.9.

Along with the socio-economic and environmental concerns, there were also engineering concerns, particularly related to two historically significant sites that impact three of the four recommended preliminary freeway alternatives. These sites are located along existing US 31, in an area just south of the US 31 and Kern Road intersection. The first



historically significant site is known as the Ullery/Farneman House. This site is an Italianate-style house, c. 1860, a Local Historic Landmark that is Potentially Eligible (PE) for the National Register of Historic Places (NR) and a likely Section 4(f) issue. The Ullery/Farneman House is located on the west side of US 31. The second historically significant site is situated directly east of and across US 31 from the Ullery/Farneman House. This site is the Southlawn Cemetery and also a potential Section 4(f) issue (see Figure 3.2.18).

| Table 3.2.10: Socio-economic and Environmental Impacts to the Freeway Alternatives | | | | |
|--|-------------|--------|--------|--------|
| Socio-Economic / Environmental Measure | ALTERNATIVE | | | |
| | C | E | F | G |
| Wetlands | 68 Ac. | 65 Ac. | 47 Ac. | 36 Ac. |
| Relocations | | | | |
| Residential | 48 | 101 | 156 | 100 |
| Business | 7 | 49 | 60 | 52 |
| Historic Properties (on NR or PE) (Within Area of Potential Effect (APE)) | 4 | 4 | 4 | 8 |
| Historic Properties (on NR or PE) (Section 4(f)) | 0 | 1 | 1 | 1 |

The significance of the Ullery/Farneman House in local history is exemplified by the following facts and folklore.

- The Ullery family settled on Palmer’s Prairie in 1838 and built the home around 1855.
- The original farm was approximately 1,000 acres, a large holding for the era.
- It is located on Michigan Road, a landmark for travelers in the 1800’s.
- The house is symbolic of the larger trend of Gentlemen Farmers building homes in the style popularized by Andrew Jackson Downing’s Pattern Books.
- According to local folklore, it was reportedly a gathering point for South Bend’s Civil War Soldiers before marching to Indianapolis to be mustered in.
- Farneman was prominent in the first St. Joseph Agricultural Society, along with Schuyler Colfax, former Vice-President of the United States.

The engineering concerns related to these two potential Section 4(f) properties arose due to the close proximity of these two historically significant properties. It would be difficult to construct a freeway facility in this area without significant impacts to one or both properties. Alternatives E, F, and G all pass between these historic sites, along existing US 31, and would have major impacts to both properties (see Figure 3.2.18).

The roadway typical section in the vicinity of these properties would be an urban section (see Figure 3.1.3). The urban typical section would place the edge of the proposed roadway right-of-way between 30 and 50 feet from the front of the Ullery/Farneman House. It would require the relocation of the Southlawn Cemetery Gate House and the roadway would likely be within 10 to 20 feet of gravesites. Along with these physical impacts related to the required roadway right-of-way, there would also be visual and noise impacts to both the Ullery/Farneman House and the Southlawn Cemetery related to the close proximity of the roadway to both sites.



Figure 3.2.18: Potential Impacts to Ullery/Farneman House and Southlawn Cemetery



The US 31 Improvement Project has been a dynamic process since its inception. The study team has made a commitment to respond to comments received from the public, elected officials, involved resource agencies, and consulting parties. This has been exhibited during the course of the study as new alternatives and modifications to alternatives were continually investigated, as described in Section 3.1, Preliminary Alternatives Analysis and Screening. This commitment by the study team to respond to comments continued after the publication of the Preliminary Alternatives Analysis and Screening Report on August 19, 2003. Subsequent meetings, comments, and more detailed analysis of socio-economic and environmental impacts led the study team to again investigate the possibility of modifying alternatives in an attempt to minimize impacts.

The major concerns raised by the study team, public, elected officials, resource agencies, and consulting parties that are involved with the projects development, focused around both socio-economic and environmental impacts. These major concerns were particularly related to wetland impacts, residential and business relocations, and historic property impacts (see Table 3.2.10). To address these concerns, modifications in the four remaining preliminary freeway alternatives, Alternatives C, E, F, and G, were investigated. The goal of these modifications was to minimize impacts to the environment, residents, businesses, and historic properties.

The following sections provide a general description of the modified alternatives. Additionally, the socio-economic and environmental impacts of each of the modified alternatives have been compared with the impacts of the original alternatives. Lastly, a recommendation regarding utilization of the original alternative or modified alternative is provided.

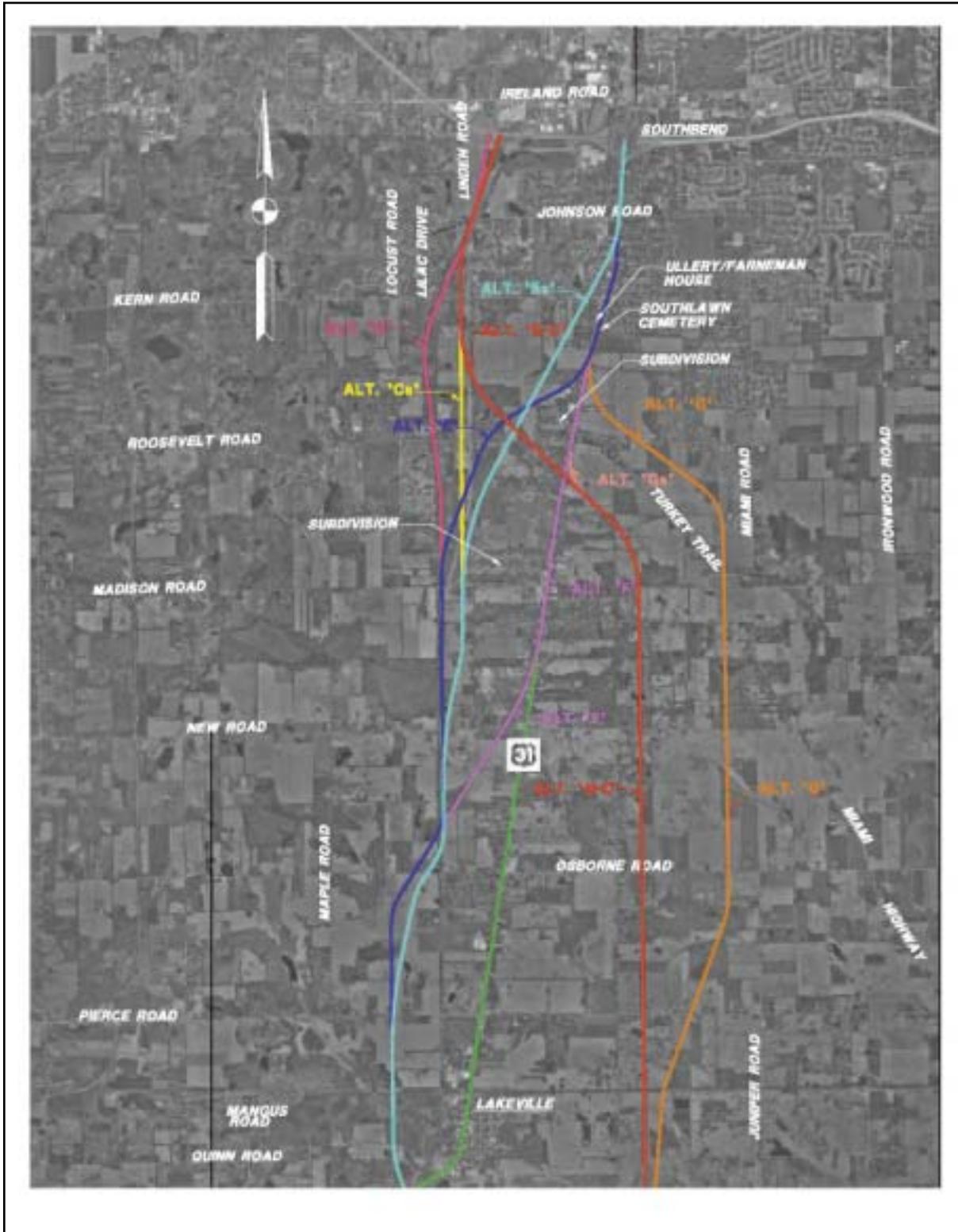
3.2.1 Alternative F Modifications

One of the main issues driving the alternative modifications is related to three of the four remaining freeway alternatives, Alternatives E, F, and G. This is a historic properties issue related to the two historically significant sites located along existing US 31, in the area just south of the US 31 and Kern Road intersection. Alternatives E, F, and G all pass between these historic sites, along existing US 31, and would have major impacts to both properties. The historically significant sites are the Ullery/Farneman House and the Southlawn Cemetery, discussed in detail above (see Figure 3.2.18).

Modifications to Alternatives E, F, and G were investigated just south of the Ullery/Farneman House and the Southlawn Cemetery area (See Figure 3.2.19). These modifications came about in an attempt to minimize impacts to the Ullery/Farneman House and Southlawn Cemetery and to eliminate the likely Section 4(f) issues related to both structures. The modifications to Alternative G in this area will be discussed later in this document. The modifications to Alternative E, to be called Alternative Es, relocated Alternative E to the west side of (behind) the Ullery/Farneman House and is further discussed later in this document. The modifications to Alternative F, to be called modified Alternative F, in this area also involved a shift to the west in order to go to the west side of (behind) the Ullery/Farneman House. As shown, modifications to Alternative F that involve relocating Alternative F to the west would significantly impact two residential subdivisions, one just north of Madison Road and west of US 31, the other at Roosevelt Road and west of US 31. Additional modifications to Alternative F that involve the relocation of Alternative F further to the west to avoid these two subdivisions would essentially place the modified Alternative F on top of Alternative E and/or Alternative Es. For this reason, there is no modified Alternative F shown.

Conclusion

Modifications to Alternative F that would relocate it to the west of the Ullery/Farneman House, in an attempt to minimize impacts and eliminate the Section 4(f) issue, would essentially make the modified Alternative F the



3.2.19: Alternative F Modifications

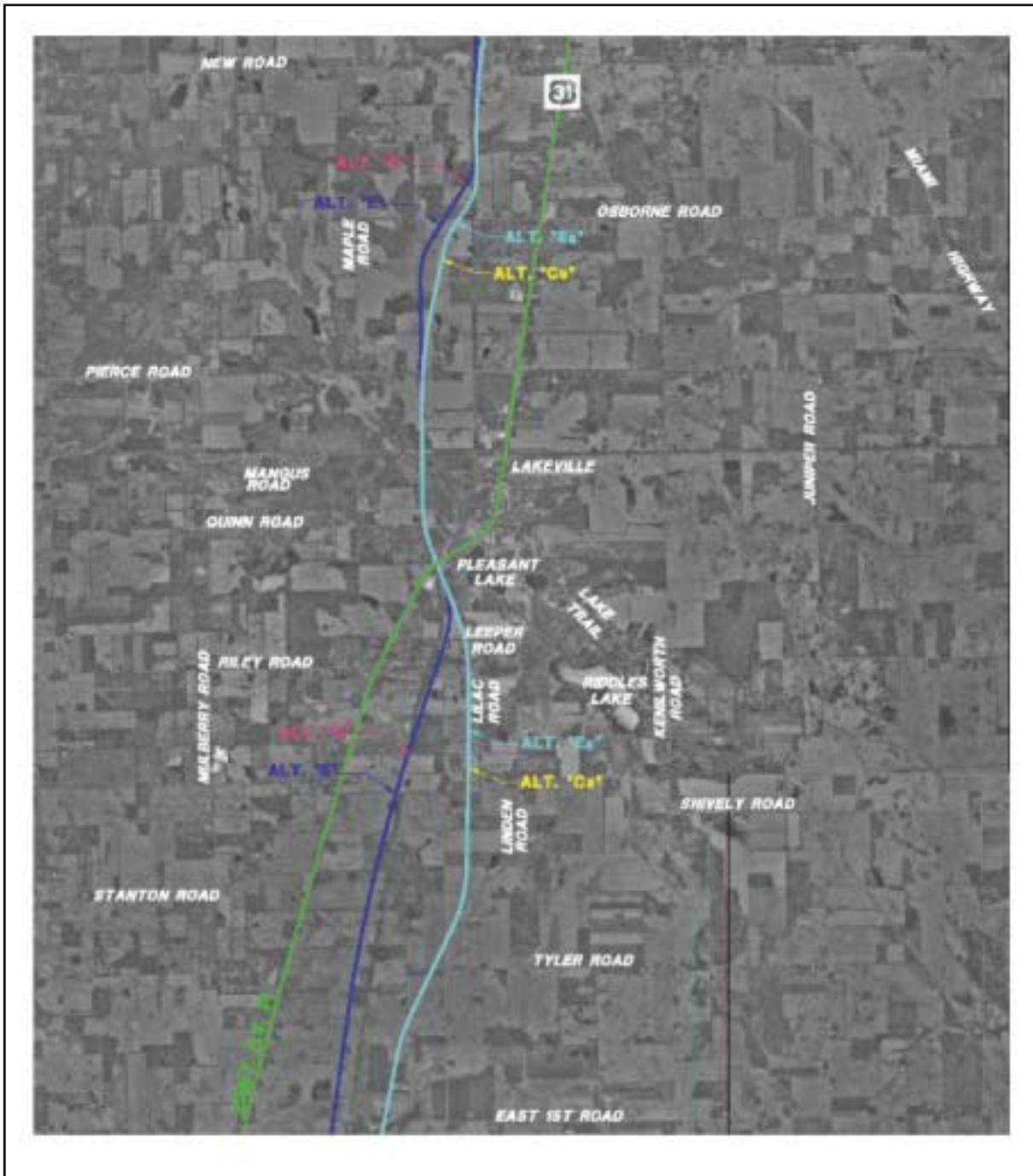


Figure 3.2.20: Alternatives C and E Modifications



same as Alternative E and/or Alternative Es. For this reason, the modified Alternative F is being eliminated from further consideration. Section 3.3, Description of the Alternatives Selected for Detailed Study, contains those alternatives selected for detailed study in the DEIS.

3.2.2 Alternatives C and E Modifications

Alternatives C and E follow the same alignment from the US 30 and US 31 interchange to just north of Madison Road (See Figure 3.2.20). Any modification made to either of these alternatives in this area, aimed at minimizing impacts, would be made to both of the alternatives.

Just north of Madison Road, Alternatives C and E diverge and follow separate alignments northward to US 20. Modifications made to one alternative would therefore be independent of modifications made to the other alternative.

This section will discuss modifications made to both Alternatives C and E. These modifications will be identified as Alternative Cs and Alternative Es. Each of the alternatives contains three separate areas in which modifications have been made in an attempt to minimize impacts. The corridors have been divided into three segments to represent the three areas in which the alternatives have been modified.

The southern segment of the modifications to Alternatives C and E extends from West 4A Road to the south edge of Lakeville. In this southern segment, Alternatives C and E follow the same alignment and are evaluated together in Section 3.2.2.1.

The central segment of the modifications to Alternatives C and E extends from SR 4 (Pierce Road) to just north of Osborne Road. In this central segment, Alternatives C and E follow the same alignment and are evaluated together in Section 3.2.2.2.

The northern segment of the modifications to Alternatives C and E extends from Madison Road to US 20. In this northern segment, Alternatives C and E follow different alignments and will be evaluated separately. Alternative C is evaluated in Section 3.2.2.3 and Alternative E is evaluated in Section 3.2.2.4.

3.2.2.1 Alternatives C and E Modifications from West 4A Road to the South Edge of Lakeville

The southern segment of the modifications to Alternatives C and E extends from West 4A Road to the south edge of Lakeville (see Figure 3.2.21). In this southern segment, Alternatives C and E follow the same alignment and are evaluated together.

This alignment modification involved the shift of Alternative C, to be called Alternative Cs, and Alternative E, to be called Alternative Es, to the east. The modified Alternatives Cs and Es were shifted to follow Alternative G from West 4A Road to just south of Tyler Road. At that point, Alternatives Cs and Es continue northward and connect with Alternatives C and E on the south edge of Lakeville. The main goal of these alignment modifications was to minimize impacts to wetlands while striving to prevent any significant increase in the number of residential and business relocations.

Table 3.2.11 summarizes the socio-economic and environmental measures related to wetland impacts, residential and business relocations and historic properties impacts.

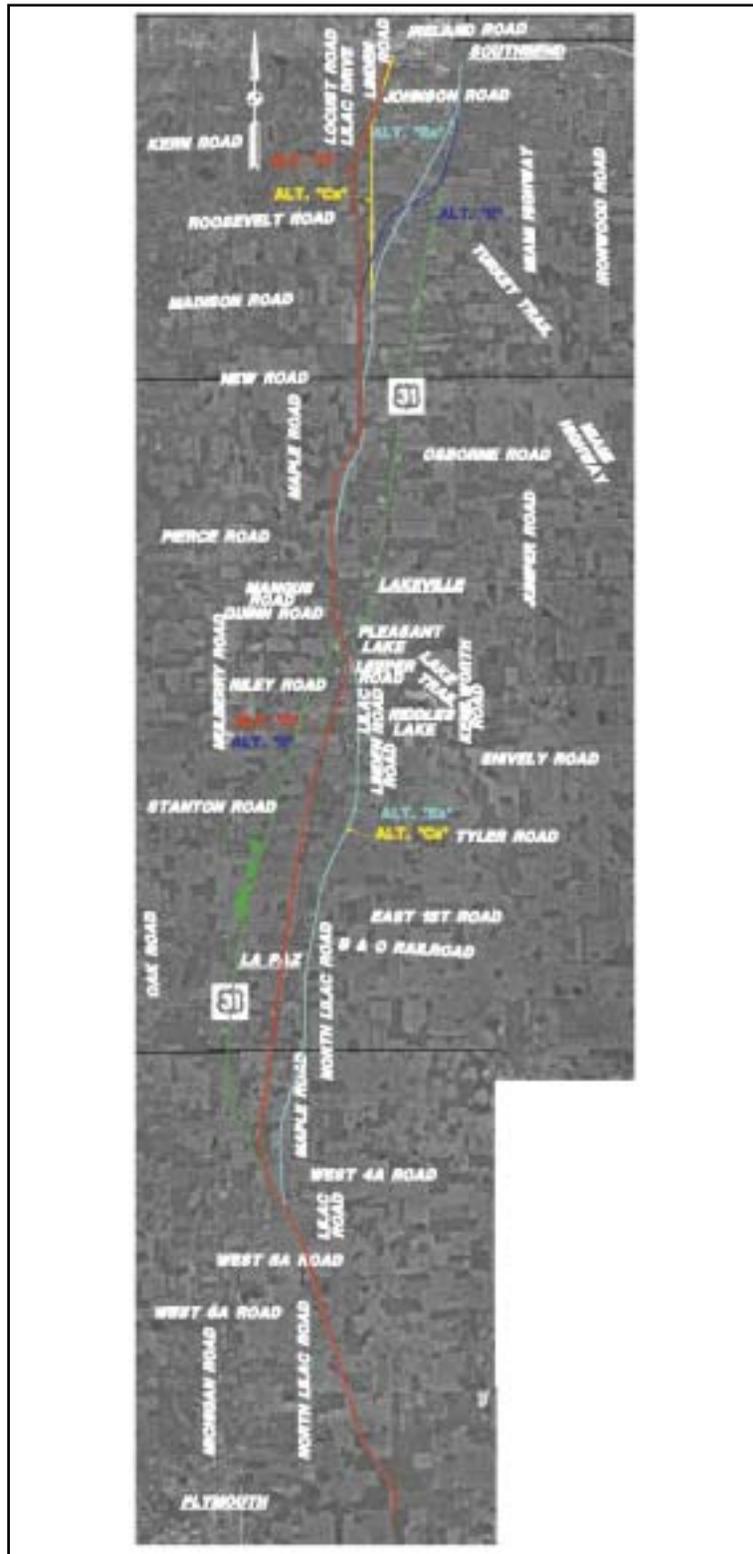


Figure 3.2.21: Alternatives C & E Modifications from West 4A Road to the South Edge of Lakeville



| Table 3.2.11: Comparison of Alternatives C, E, Cs & Es from West 4A Road to south side of Lakeville | | |
|---|-------------|----------|
| Socio-Economic/Environmental Measure | Alternative | |
| | C & E | Cs & Es |
| Wetlands | 26 Acres | 13 Acres |
| Relocations | | |
| Residential | 20 | 21 |
| Business | 1 | 2 |
| Historic Impacts (on NR or PE) (within APE) | 0 | 0 |
| Historic Impacts (on NR or PE) (Section 4(f)) | 0 | 0 |

Conclusion

Modifications to Alternative C and E, called Alternatives Cs and Es, that would relocate them to the east, reduce the wetland impacts by 50% while having modest impact to relocations and no impact to historic properties. For these reasons, in this segment, Alternatives Cs and Es are being carried forward for more detailed studies in the DEIS. Section 3.3 contains those alternatives selected for detailed study in the DEIS.

3.2.2.2 Alternatives C and E Modifications from SR 4 (Pierce Road) to Just North of Osborne Road

The central segment of the modifications to Alternatives C and E extends from SR 4 (Pierce Road) to just north of Osborne Road (see Figure 3.2.22). In this central segment, Alternatives C and E follow the same alignment and are evaluated together.

This alignment modification involved the shift of Alternative C, to be called Alternative Cs, and Alternative E, to be called Alternative Es, to the east. Alternatives Cs and Es continue northward and connect with Alternatives C and E just north of Osborne Road. The main goal of these alignment modifications was to minimize impacts to wetlands while striving to prevent any significant increase in the number of residential and business relocations.

Table 3.2.12 summarizes the socio-economic and environmental measures related to wetland impacts, residential and business relocations and historic properties impacts.

Conclusion

Modifications to Alternative C and E, called Alternatives Cs and Es, that would relocate them to the west, reduce the wetland impacts by one acre and had no impact on residential relocations or to historic properties. The one acre of wetland reduction in this segment is a particularly high quality wetland. For these reasons, in this segment, Alternatives Cs and Es are being carried forward for more detailed studies in the DEIS. Section 3.3 contains those alternatives selected for detailed study in the DEIS.



3.2.2.3 Alternative C Modifications from New Road to US 20

The northern segment of the modifications to Alternatives C and E extends from New Road to US 20 (see Figure 3.2.23). In this northern segment, Alternatives C and E follow different alignments and are evaluated separately.

This alignment modification involved the shift of Alternative C, to be called Alternative Cs, to the east. Alternatives Cs continues northward and terminates at US 20. The main goal of this alignment modification was to minimize impacts to wetlands while striving to prevent any significant increase in the number of residential and business relocations.

Table 3.2.12: Comparison of Alternatives C, E, Cs & Es from SR 4 to just north of Osborne Road

| Socio-Economic/Environmental Measure | Alternative | |
|---|-------------|---------|
| | C & E | Cs & Es |
| Wetlands | 3 Acres | 2 Acres |
| Relocations | | |
| Residential | 3 | 3 |
| Business | 0 | 0 |
| Historic Impacts (on NR or PE) (within APE) | 0 | 0 |
| Historic Impacts (on NR or PE) (Section 4(f)) | 0 | 0 |

Table 3.2.13 summarizes the socio-economic and environmental measures related to wetland impacts, residential and business relocations and historic properties impacts.

Conclusion

Modifications to Alternative C, called Alternatives Cs, relocating it to the east, increased the wetland impacts by seven acres and had no impact on residential relocations or to historic properties. Due to the increases in wetland impacts, in this segment, Alternatives C is being carried forward for more detailed studies in the DEIS. Section 3.3 contains those alternatives selected for detailed study in the DEIS.

3.2.2.4 Alternative E Modifications from New Road to US 20

The northern segment of the modifications to Alternatives C and E extends from New Road to US 20 (see Figure 3.2.24). In this northern segment, Alternatives C and E follow different alignments and are evaluated separately.

Cultural Resource issues are the driving force behind the need to modify this segment of Alternative E. Two historically significant sites are located along existing US 31, in the area just south of the US 31 and Kern Road intersection. The historically significant sites are the Ullery/

Table 3.2.13: Comparison of Alternatives C & Cs from New Road to US 20

| Socio-Economic/Environmental Measure | Alternative | |
|---|-------------|----------|
| | C | Cs |
| Wetlands | 31 Acres | 38 Acres |
| Relocations | | |
| Residential | 17 | 17 |
| Business | 4 | 4 |
| Historic Impacts (on NR or PE) (within APE) | 4 | 4 |
| Historic Impacts (on NR or PE) (Section 4(f)) | 0 | 0 |



Figure 3.2.23: Alternative C Modifications from New Road to US 20

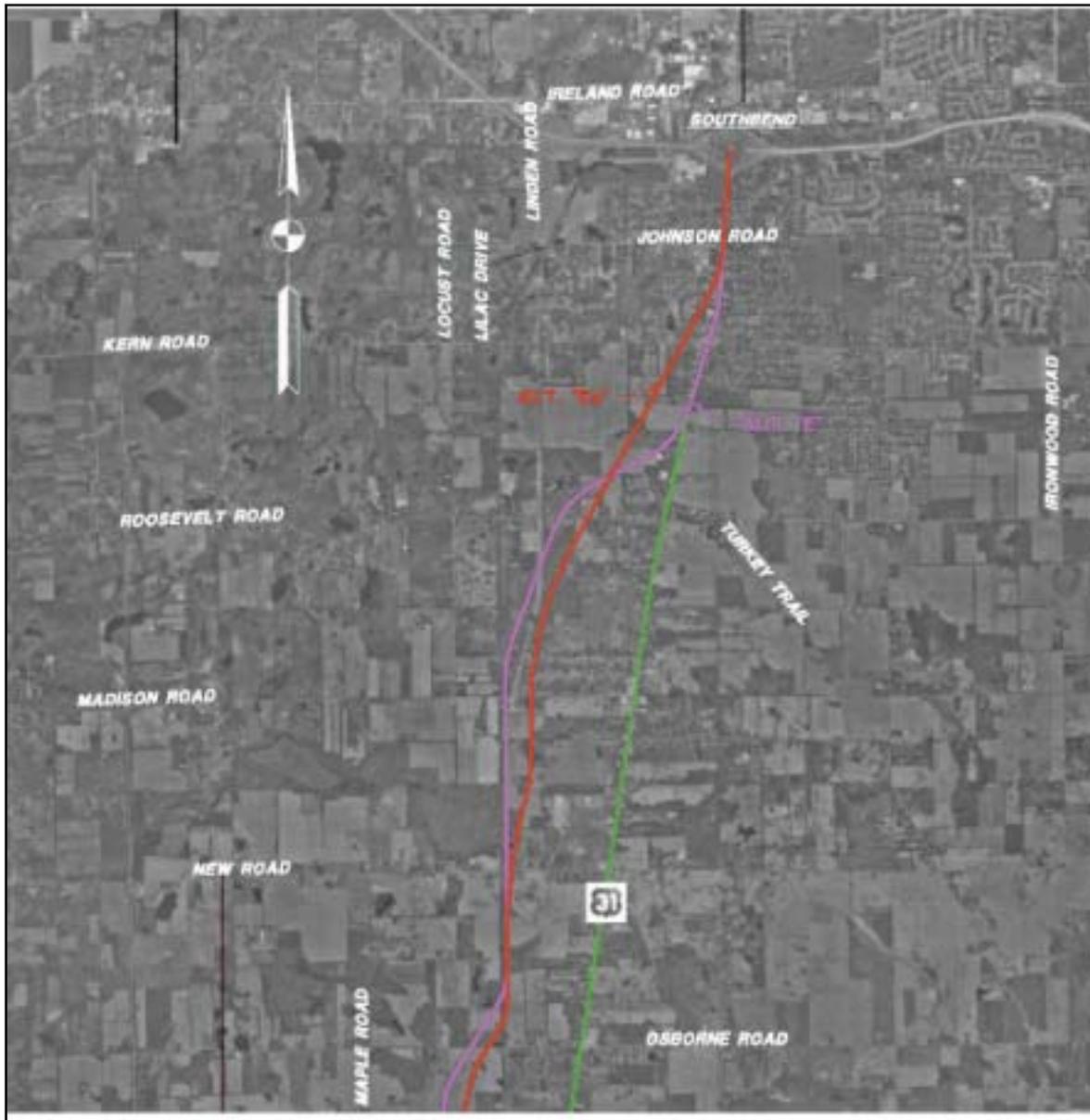


Figure 3.2.24: Alternative E Modifications from New Road to US 20



Farneman House and the Southlawn Cemetery, discussed in detail above (see Figure 3.2.19).

Alternative E passes between these historic sites, along existing US 31, and would have major impacts to both properties. Modifications to Alternatives E were investigated just south of the area of the two historic sites in an attempt to minimize impacts to the historic sites and to eliminate the likely Section 4(f) issues related to both the Ullery/Farneman House and the Southlawn Cemetery. The modifications to Alternative E, to be called Alternative Es, relocated Alternative E to the west side of (behind) the Ullery/Farneman House. Alternative Es continues northward and connects to Alternative E between Kern Road and Johnson Road.

Table 3.2.14 summarizes the socio-economic and environmental measures related to wetland impacts, residential and business relocations and historic properties impacts.

| Table 3.2.14: Comparison of Alternatives E & Es from New Road to US 20 | | |
|--|-------------|----------|
| Socio-Economic/Environmental Measure | Alternative | |
| | E | Es |
| Wetlands | 26 Acres | 14 Acres |
| Relocations | | |
| Residential | 73 | 50 |
| Business | 46 | 26 |
| Historic Impacts (on NR or PE) (within APE) | 4 | 4 |
| Historic Impacts (on NR or PE) (Section 4(f)) | 1 | 0 |

Conclusion

Modifications to Alternative E, called Alternatives Es, relocating it to the east and behind the Ullery/Farneman House reduced the wetland impacts by 12 acres, decreased residential relocations by 23 and business relocations by 20, and eliminated the Section 4(f) issue related to historic properties. Due to these reasons, in this segment, Alternatives Es is being carried forward for more detailed studies in the DEIS. Section 3.3 contains those alternatives selected for detailed study in the DEIS.

3.2.3 Alternatives G Modifications

Alternative G is the only eastern preliminary freeway alternative that has been further studied in the DEIS. This section will discuss modifications made to Alternative G. These modifications will be identified as Alternative Gs and G-C (see Figure 3.2.26).

Two separate modifications to Alternative G were investigated, Alternatives Gs and G-C. Both of the modified alternatives follow Alternative G from the existing US 30 and US 31 interchange to Lake Trail, just east of Riddles Lake. At that point, the alternatives diverge as Alternative G goes northeast while Alternatives Gs and G-C



continue northward on a common alignment, just east of and parallel to Kenilworth Road. Just north of Miller Road and south of Turkey Trail, Alternatives Gs and G-C turn to the northwest and parallel Turkey Trail. As these two alternatives approach existing US 31 they diverge. Alternative Gs turns northward and ties into existing US 31 at Roosevelt Road. It continues northward along existing US 31, connects to Alternative G south of Kern Road and terminates at the existing US 31 and US 20 interchange. Alternative G-C continues northeast, crosses existing US 31 near Roosevelt Road and ties into Alternative C near Kern Road. From that point, Alternative G-C continues northward, following the same alignment as Alternative C, and terminates at US 20.

Several issues drove the modifications to Alternative G. Concerns were expressed at the September 30, 2003, resource agency meeting related to this alternative. It was suggested that Alternative G should remain closer to existing US 31. This westward modification was accomplished by continuing northward at Lake Trail, instead of diverging northeast as Alternative G does.

Concerns were also expressed at the September 4, 2003, Section 106 consulting parties meeting with regard to potential cultural resource impacts associated with Alternative G. The consulting parties had concerns related to historic properties, particularly potential impacts to several properties along the Miami Highway and Turkey Trail. Those concerns were also addressed by the westward modification at Lake Trail. This modification keeps Alternatives Gs and G-C closer to existing US 31 and further away from the Miami Highway. The northwestern turn of Alternatives Gs and G-C, just north of Miller Road, keeps both alternatives south of Turkey Trail.

Cultural Resource issues are the driving force behind the need to modify this segment of Alternative G. Two historically significant sites are located along existing US 31, in the area just south of the US 31 and Kern Road intersection. The historically significant sites are the Ullery/Farneman House and the Southlawn Cemetery, discussed in detail above (see Figure 3.2.18).

Alternative G passes between these historic sites, along existing US 31, and would have major impacts to both properties. Alternative Gs does not address the impacts to these properties as it turns northward and ties into existing US 31 at Roosevelt Road. Alternative Gs continues northward along existing US 31, connects to Alternative G south of Kern Road, and passes between these historic sites.

Alternative G-C was investigated in an attempt to minimize impacts to the historic sites and to eliminate the likely Section 4(f) issues related to both structures. Instead of turning northward and rejoining Alternative G, as Alternative Gs does just south of Roosevelt Road, Alternative G-C continues northwest, crosses existing US 31 just south of Roosevelt Road and south of the area of the two historic sites, and ties into Alternative C near Kern Road. Alternative G-C relocated Alternative G to the south (below) and west side of (behind) the Ullery/Farneman House. This will eliminate the direct impacts to the Ullery/Farneman House and the Southlawn Cemetery.

For both Freeway Alternatives Gs and G-C, existing US 31 and its major intersections were analyzed in accordance with the Highway Capacity Manual (HCM) to determine their present and future LOS. Future Average Daily Traffic (ADT) volumes used to conduct this analysis were generated using output from the regional travel model. Between Plymouth and South Bend, existing US 31 was analyzed in eight segments as well as at four signalized intersections and at six notable two-way stop-controlled intersections (stop control for the crossroad approaches) as listed below.

US 31 Segments:

- US 30 to Michigan Road
- Michigan Road to US 6



Figure 3.2.25: Alternatives G Modifications



- US 6 to Tyler Road
- Tyler Road to Lake Trail
- Lake Trail to SR 4
- SR 4 to Miller Road
- Miller Road to Roosevelt Road
- Roosevelt Road to US 20

US 31 Signalized Intersections:

- US 31 and US 6
- US 31 and SR 4
- US 31 and Kern Road
- US 31 and Johnson Road

US 31 Major Unsignalized Intersections (Two-way Stop-Controlled):

- US 31 and Plymouth-Goshen Trail
- US 31 and W 5A Road
- US 31 and Tyler Road
- US 31 and New Road
- US 31 and Madison Road
- US 31 and Roosevelt Road

Table 3.2.15 shows resulting residual traffic volumes on the existing US 31 when either of the modified freeway alternatives are constructed. The goal of the modified freeway alternatives is to divert traffic from existing US 31 on to the new alternative. Table 3.2.15 shows the extent to which each modified freeway alternative achieves an acceptable level-of-service in the year 2030 for the existing US 31 Corridor from US 30 to US 20. Because the modified freeway alternatives are four-lane freeways in the rural area with some six-lane segments near US 20, traffic experiences acceptable operating conditions of LOS C or better when using the modified freeway alternative in rural segments, and LOS D or better for urban segments. Accordingly, the achievement of an acceptable level-of-service focuses on the residual traffic remaining on the existing US 31 alignment.

Substantiating the assessment of the relief of congestion on existing US 31 is the amount of residual vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT), referring to Table 3.2.16. VMT measures the directness of route to the straight line from the origin to the destination of the trip, and VHT measures congested travel time.

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



Table 3.2.15: Modified Freeway Alternative Future Traffic and Level-Of-Service on Existing US 31 (Daily Traffic Volumes (LOS) in Year 2030 – Unacceptable LOS* shaded)

| Freeway Alternatives | Segments | | | | | | | |
|----------------------|------------------------|-----------------------|--------------------|--------------------------|--------------------|------------------|----------------------------|-------------------------|
| | Rural | Rural | Rural | Rural | Rural | Rural | Rural | Urban |
| | US 30 to Michigan Road | Michigan Road to US 6 | US 6 to Tyler Road | Tyler Road to Lake Trail | Lake Trail to SR 4 | SR 4 to New Road | New Road to Roosevelt Road | Roosevelt Road to US 20 |
| No-Build | 21,504(C) | 28,707(E) | 25,687(F) | 25,911(D) | 28,279(F) | 29,714(F) | 32,485(F) | 43,512(F) |
| Gs | 2,979(A) | 6,181(A) | 3,516(A) | 3,761(A) | 3,971(A) | 4,975(A) | 8,029(A) | 8,992(A) |
| G-C | 3,139(A) | 6,249(A) | 3,748(A) | 3,993(A) | 5,844(B) | 7,221(A) | 10,212(B) | 19,409(D) |

*An LOS C is the minimum acceptable for rural segments. An LOS D is the minimum acceptable for urban segments.

A secondary consideration for assessing the effectiveness of the modified freeway alternatives in relieving congestion is the reduction of VMT and VHT in the South Bend Metropolitan Area (Elkhart, Marshall and St. Joseph counties) with an unacceptable LOS (i.e., LOS E, or F in urban areas and LOS D, E, or F in rural areas). This performance measure addresses how well a single improvement addresses congestion problems throughout the Metro Area (not just congestion along US 31). VMT measures the directness of route to the straight line from the origin to the destination of the trip, and VHT measures congested travel time. As people are often more open to travel greater distances to save travel time, VHT is a more important consideration than VMT. Table 3.2.17 shows that the results for both modified alternatives.

For the No-Build Alternative and for both Freeway Alternatives G-s and G-C, present and projected future crash rates on five segments of US 31 were compared to the average statewide crash rates for rural principal arterials (the functional classification for US 31) as listed below:

US 31 Segments:

- US 30 to LaPaz
- Through LaPaz
- LaPaz to Lakeville

Table 3.2.16: US 31 Residual Vehicle-Miles of Travel and Vehicle-Hours of Travel by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | VMT | | VHT | |
|----------------------|---------|------------------------|-------|------------------------|
| | Miles | % Change from No-Build | Hours | % Change from No-Build |
| No-Build | 488,498 | | 8,721 | |
| Gs | 63,189 | -87% | 1,064 | -88% |
| G-C | 94,624 | -81% | 1,637 | -81% |



- Through Lakeville
- Lakeville to US 20

Table 3.2.18 shows the extent to which both modified freeway alternatives reduces total accidents along existing US 31 and in the Metro area (Elkhart, Marshall and St. Joseph counties). Again, the modified freeway alternatives that divert the most traffic from existing US 31 result in the best performance. The reduction of accidents in the Metro area is a secondary consideration that examines the extent to which this improvement project alone reduces the level of accidents throughout the Metro area (not only US 31).

Table 3.2.17: South Bend Metro Area Congested Vehicle-Miles of Travel and Vehicle-Hours of Travel by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | VMT over LOS C | | VHT over LOS C | |
|----------------------|----------------|------------------------|----------------|------------------------|
| | Miles | % Change from No-Build | Hours | % Change from No-Build |
| No-Build | 2,509,904 | | 68,867 | |
| Gs | 2,346,618 | -6.51% | 65,322 | -5.15% |
| G-C | 2,339,040 | -6.81% | 65,059 | -5.53% |

Table 3.2.18: Existing US 31 and South Bend Metro Area Reduction in Total Accidents by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | Existing US 31 Total Accidents | | Metro Area Total Accidents | |
|----------------------|--------------------------------|------------------------|----------------------------|------------------------|
| | Crashes | % Change from No-Build | Crashes | % Change from No-Build |
| No-Build | 375 | | 11,242 | |
| Gs | 48 | -87% | 10,965 | -2.46% |
| G-C | 83 | -78% | 11,009 | -2.07% |

Table 3.2.19 shows the total crash rate for both modified freeway alternatives for residual traffic on existing US 31 segments. The total crash rate for each modified freeway alternative is compared to the Indiana average total crash rates for other rural principal arterials. The modified freeway alternatives that divert the most traffic from existing US 31 result in the lower total crash rate.

Table 3.2.19: Total Crash Rate by Modified Alternative for Existing US 31 Segments (in year 2030) (total crash rate exceeding statewide rural principal arterial of 186.57 shaded)

| Freeway Alternatives | US 30 to LaPaz | Through LaPaz | LaPaz to Lakeville | Through Lakeville | Lakeville to US 20 |
|----------------------|----------------|---------------|--------------------|-------------------|--------------------|
| No-Build | 94.17 | 250.82 | 45.04 | 456.04 | 239.93 |
| Gs | 20.27 | 34.33 | 6.54 | 64.04 | |
| G-C | 20.50 | 36.60 | 6.94 | 94.24 | 107.05 |

Note: Assumes crash rate changes in proportion to residual daily traffic on existing US 31.



Phase 1: Purpose and Need

Reduce Congestion: Both Alternatives Gs and G-C would reduce congestion on existing US 31. For the year 2030, Alternative Gs has an LOS A for all segments and Alternative G-C ranges from LOS A - B along rural segments and LOS D for the urban segment of existing US 31. These projected LOS values meet INDOT standards.

Improve Traffic Safety: Both Alternatives Gs and G-C would improve safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 87% for Modified Alternative Gs and 78% for Modified Alternative G-C, and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials.

Consistency with Transportation Plans: Both Alternatives Gs and G-C are consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Alternatives Gs and G-C meet all three purposes and needs identified for this project. These alternatives were advanced to Phase 2 of the screening process.

Phase 2: Socio-Economic and Environmental Impacts

Table 3.2.20 summarizes the socio-economic and environmental measures related to wetland impacts, residential and business relocations and historic properties impacts.

Conclusion

The modifications to Alternative G, called Alternatives Gs, that would relocate it to the west, closer to existing US 31 and further away from the Miami Highway and Turkey Trail, reduced the wetland impacts by four acres, increased residential relocations by 33 and business relocations by two, and reduced the historic impacts to those structures located within the area of potential impact (APE) by three. It did not eliminate the Section 4(f) issue related to historic properties. The modifications to Alternative G, called Alternative G-C, relocating it to the west, closer to existing US 31 and further away from the Miami Highway and Turkey Trail, as well as south (below) and west (behind) the Ullery/Farneman House, increased wetland impacts by nine acres, a 26% increase. However, it reduced residential relocations by 31, a 32% reduction, and business relocations by 43, an 83% reduction. Alternative G-C reduced the historic impacts to those structures located within the APE by two and it eliminated the Section 4(f) issue related to historic properties.

Due to reductions in both residential and business relocations and the elimination of the Section 4(f) issue related to historic properties, Alternatives G-C is being carried forward for more detailed studies in the DEIS. Section 3.3 contains those alternatives selected for detailed study in the DEIS.

| Socio-Economic/Environmental Measure | Alternative | | |
|---|-------------|--------|----------|
| | G | Gs | G-C |
| Wetlands | 34 Acres | 30 Ac. | 43 Acres |
| Relocations | | | |
| Residential | 97 | 130 | 66 |
| Business | 52 | 54 | 9 |
| Historic Impacts (on NR or PE) (within APE) | 8 | 5 | 6 |
| Historic Impacts (on NR or PE) (Section 4(f)) | 1 | 1 | 0 |



3.2.4 Alternative G – Ironwood Road Connection

In response to a request made at the resource agency meeting held on September 30, 2003, modifications to Alternative G that would terminate at the existing US 20 and Ironwood Road interchange were investigated (see Figure 3.2.27). The US 20 and Ironwood Road interchange was the north terminus of Alternative K that was eliminated from further consideration in Section 3.1.7 due to its failure to meet the purpose and need of the project.

This modified alternative was the same as Alternatives Gs and G-C from the existing US 30 and US 31 interchange to New Road. At that point, the alternatives diverge. Alternatives Gs and G-C continue northward on a common alignment, just east of and parallel to Kenilworth Road. The Modified Alternative G – Ironwood Road Connection turns northeast and ties into Ironwood Road, near Kern Road. From that point, it continues northward, following Ironwood Road, and terminates at the existing US 20 and Ironwood Road interchange.

For Modified Freeway Alternatives G – Ironwood Road Connection, existing US 31 and its major intersections were analyzed in accordance with the Highway Capacity Manual (HCM) to determine their present and future LOS as discussed above for Modified Alternatives Gs and G-C. Future Average Daily Traffic (ADT) volumes used to conduct this analysis were generated using output from the regional travel model. Between Plymouth and South Bend, US 31 was analyzed in eight segments as well as at four signalized intersections and at six notable two-way stop-controlled intersections (stop control for the crossroad approaches) as above for Modified Alternatives Gs and G-C.

Table 3.2.21 shows resulting residual traffic volumes on the existing US 31 when the modified freeway alternative is constructed. The goal of the modified freeway alternative is to divert traffic from existing US 31 on to the new alternative. Table 3.2.21 shows the extent to which this modified freeway alternative achieves an acceptable level-of-service in the year 2030 for the existing US 31 Corridor from US 30 to US 20. Because the modified freeway alternative is a four-lane freeway in the rural area with some six-lane segments near US 20, traffic experiences acceptable operating conditions of LOS C or better when using the modified freeway alternative in rural segments, and LOS D or better for urban segments. Accordingly, the achievement of an acceptable level-of-service focuses on the residual traffic remaining on the existing US 31 alignment.

Substantiating the assessment of the relief of congestion on existing US 31 is the amount of residual VMT and VHT, referring to Table 3.2.22. VMT measures the directness of route to the straight line from the origin to the destination of the trip, and VHT measures congested travel time.

A secondary consideration for assessing the effectiveness of the modified freeway alternative in relieving congestion is the reduction of VMT and VHT in the South Bend Metropolitan Area (Elkhart, Marshall and St. Joseph counties) with an unacceptable LOS (i.e., LOS E or F in urban areas and LOS D, E or F in rural areas). This performance measure addresses how well a single improvement addresses congestion problems throughout the Metro Area (not just congestion along US 31). As people are often more open to travel greater distances to save travel time, VHT is a more important consideration than VMT. Table 3.2.23 shows that the results for both modified alternatives.

For the No-Build alternative and for Modified Freeway Alternatives G – Ironwood Road Connection, present and projected future crash rates on five segments of US 31 were compared to the average statewide crash rates for rural principal arterials (the functional classification for US 31) as detailed above for Modified Alternatives Gs and G-C.

Table 3.2.24 shows the extent to which this modified freeway alternative reduces total accidents along existing US 31 and in the Metro Area (Elkhart, Marshall and St. Joseph counties). Again, the modified freeway alternatives that divert the most traffic from existing US 31 result in the best performance. The reduction of accidents in the

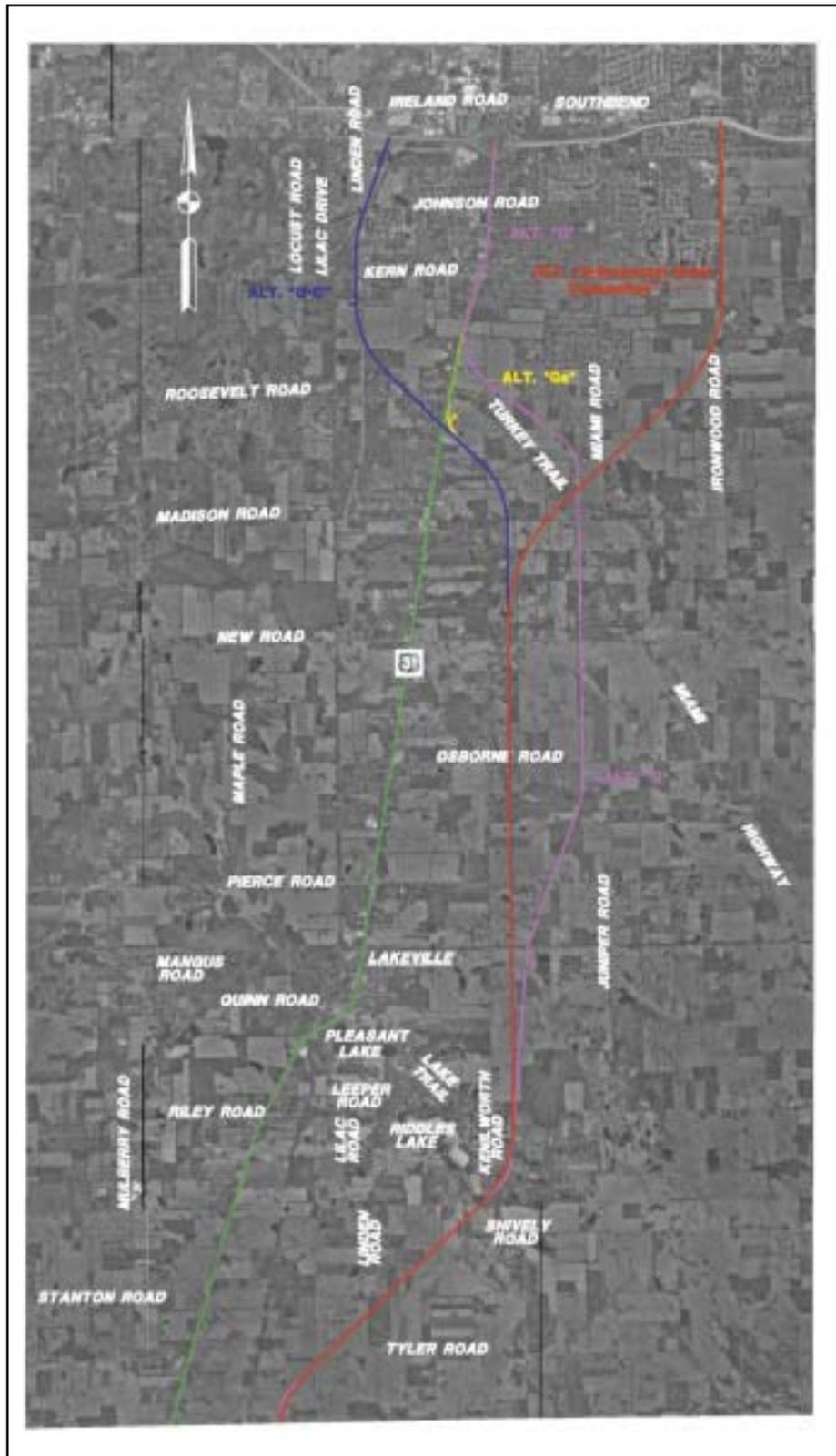


Figure 3.2.26: Alternative G – Ironwood Road Connection



Table 3.2.21: Modified Freeway Alternative Future Traffic and Level-Of-Service on Existing US 31 (Daily Traffic Volumes (LOS) in Year 2030 – Unacceptable LOS* shaded)

| Freeway Alternatives | Segments | | | | | | | |
|--------------------------|------------------------|-----------------------|--------------------|--------------------------|--------------------|------------------|----------------------------|-------------------------|
| | Rural | Rural | Rural | Rural | Rural | Rural | Rural | Urban |
| | US 30 to Michigan Road | Michigan Road to US 6 | US 6 to Tyler Road | Tyler Road to Lake Trail | Lake Trail to SR 4 | SR 4 to New Road | New Road to Roosevelt Road | Roosevelt Road to US 20 |
| No-Build | 21,504(C) | 28,707(E) | 25,687(F) | 25,911(D) | 28,279(F) | 29,714(F) | 32,485(F) | 43,512(F) |
| Ironwood Road Connection | 3,494(A) | 7,344(A) | 5,122(A) | 5,344(A) | 6,556(A) | 7,336(A) | 10,173(B) | 26,120(F) |

*An LOS C is the minimum acceptable for rural segments. An LOS D is the minimum acceptable for urban segments.

Metro Area is a secondary consideration that examines the extent to which this improvement project alone reduces the level of accidents throughout the Metro Area (not only US 31).

Table 3.2.25 shows the total crash rate for this modified freeway alternative for residual traffic on existing US 31 segments. The total crash rate for each modified freeway alternative is compared to the Indiana average total crash rates for other rural principal arterials. The modified freeway alternatives that divert the most traffic from existing US 31 result in the lower total crash rate.

Phase 1: Purpose and Need

Traffic Congestion: The Modified Alternative G – Ironwood Road Connection fails to address the purpose of reducing congestion on the existing US 31. In the year 2030, one of the eight segments of existing US 31 has an unacceptable LOS. The segment from Roosevelt Road to US 20 has an LOS E. The residual traffic on US 31 requires further major roadway investment in the

Table 3.2.22: US 31 Residual Vehicle-Miles of Travel and Vehicle-Hours of Travel by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | VMT | | VHT | |
|--------------------------|---------|------------------------|-------|------------------------|
| | Miles | % Change from No-Build | Hours | % Change from No-Build |
| No-Build | 488,498 | | 8,721 | |
| Ironwood Road Connection | 107,643 | -78% | 1,869 | -79% |

Table 3.2.23: South Bend Metro Area Congested Vehicle-Miles of Travel and Vehicle-Hours of Travel by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | VMT over LOS C | | VHT over LOS C | |
|--------------------------|----------------|------------------------|----------------|------------------------|
| | Miles | % Change from No-Build | Hours | % Change from No-Build |
| No-Build | 2,509,904 | | 68,867 | |
| Ironwood Road Connection | 2,341,884 | -6.69% | 65,133 | -5.42% |



Table 3.2.24: Existing US 31 and South Bend Metro Area Reduction in Total Accidents by Modified Freeway Alternative (in Year 2030)

| Freeway Alternatives | Existing US 31 Total Accidents | | Metro Area Total Accidents | |
|--------------------------|--------------------------------|------------------------|----------------------------|------------------------|
| | Crashes | % Change from No-Build | Crashes | % Change from No-Build |
| No-Build | 375 | | 11,242 | |
| Ironwood Road Connection | 90 | -76% | 10,978 | -2.35% |

Table 3.2.25: Total Crash Rate by Modified Alternative for Existing US 31 Segments (in year 2030) (total crash rate exceeding statewide rural principal arterial of 186.57 shaded)

| Freeway Alternatives | US 30 to LaPaz | Through LaPaz | LaPaz to Lakeville | Through Lakeville | Lakeville to US 20 |
|--------------------------|----------------|---------------|--------------------|-------------------|--------------------|
| No-Build | 94.17 | 250.82 | 45.04 | 456.04 | 239.93 |
| Ironwood Road Connection | 24.09 | 50.01 | 9.29 | 105.73 | 144.06 |

Note: Assumes crash rate changes in proportion to residual daily traffic on existing US 31.

existing US 31 corridor, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include the widening of existing US 31 to a seven-lane section from Roosevelt Road to US 20 and the widening of Ironwood Road to seven lanes from US 20 to SR 933 (Lincolnway).

Traffic Safety: The Modified Alternative G- Ironwood Road Connection improves safety on US 31 by diverting traffic from the existing facility. The estimated reduction in accidents from the No-Build is 76% and all segments along existing US 31 would have crash rates at or below statewide averages for other rural principal arterials. However, the residual traffic on US 31 requires further major roadway investment to improve physical conditions adversely affecting safety. One such improvement is the widening of existing US 31 to five lanes from SR 4 to Roosevelt Road.

Consistency with Transportation Plans: This alternative is consistent with the INDOT 2000-2025 Long Range Transportation Plan and with the MACOG Transportation Plan.

Conclusion

Modified Alternative G – Ironwood Road Connection fails to address the first purpose and need for the project (i.e., reduced congestion). This alternative would not meet the purpose and need for the project and was not advanced to Phase 2 of the screening process. Some of the traffic impacts and potential socio-environmental impacts related to the Ironwood Road Connection include:

- Widening of existing US 31 to seven lanes from Roosevelt Road to US 20 would be necessary in order to obtain a minimum LOS D in this section, in addition to the new freeway facility.



- Widening of existing US 31 to five lanes from SR 4 to Roosevelt Road, to improve safety, in addition to the new freeway facility.
- Widen Ironwood Road to seven lanes from US 20 to SR 933 (Lincolnway) in order to obtain a minimum LOS D in this section, in addition to the new freeway facility.
- Reduces 2030 traffic volumes on Michigan Street north of US 20 by 12.5%; however, diversion of traffic from Michigan Street is not sufficient to improve the LOS above F on Michigan Street north of US 20.
- Requires the widening of Michigan Street to six lanes from US 20 to Chippewa.
- The shift of traffic from Michigan Street to Ironwood Road results in serious impairment to the LOS on Ironwood Road from the US 20 to Lincolnway (SR 933).
 - A 40% increase in daily traffic occurs on the segment of Ironwood Road between US 20 and Ireland Road, resulting in a drop of LOS from D to F.
 - Alternatives C, Cs, E, Es, F, G and G-C do not increase traffic on any street north of US 20 over the No-Build Alternative.
 - The balance of the Ironwood Road corridor north of Ironwood Road is pushed to LOS F.
 - In addition to the need to improve Michigan Street from US 20 to Chippewa to six lanes, this Ironwood Connection would require the improvement of Ironwood Road to seven lanes from US 20 to Lincolnway (SR 933).
 - Potential impacts to a local radio broadcasting station, WSBT.
 - Would impact St. Joseph County Fairgrounds.
 - 150-acre facility on southwest corner of Ironwood Road and Jackson Road.
 - Hosts' yearly 4H Fair and community activities year-round.
 - Would eliminate two main entrances to fairgrounds or require frontage roads for access.
 - Would take Esther Singer 4H Exhibit Hall, the main exhibition hall.
 - Would require relocations and access problems for five neighborhoods.
 - Would require relocation of three churches, two TV stations, Knights of Columbus and the Avalon Grotto Buildings.



3.3 Description of the Alternatives Selected for Detailed Study

The Preliminary Alternative Analysis and Screening Report, dated August 19, 2003, and detailed in Section 3.1, Preliminary Alternatives Analysis and Screening, recommended the following four preliminary alternatives for further study in the DEIS.

- No-Build Alternative
- Alternative C (Freeway Alternative)
- Alternative E (Freeway Alternative)
- Alternative F (Freeway Alternative)
- Alternative G (Freeway Alternative)

Following the publication of the Preliminary Alternatives Analysis and Screening Report, information and comments were received at various meetings and from the project’s website. The study team continued to collect and analyze data related to social and environmental impacts for each of the four preliminary freeway alternatives. Proposed lane configurations, interchange locations and configurations, overpass locations, more accurate proposed right-of-way limits, and revised construction cost estimates for each of the alternatives were developed.

As the field data and public and resource agency comments were analyzed and preliminary engineering further developed, a more accurate measure of social and environmental impacts of each of the alternatives was determined. A review of these socio-economic and environmental impacts raised concerns within the study team, resource agencies, and consulting parties involved with the project. Concerns focused around both socio-economic and environmental impacts, particularly related to wetland impacts, residential and business relocations, and historic property impacts (see Table 3.2.10).

To address these concerns, modifications in the four remaining freeway alternatives, Alternatives C, E, F, and G, were investigated, as detailed in Section 3.2. The goal of these modifications was to minimize impacts to the environment, residents, businesses, and historic properties. The socio-economic and environmental impacts of each of the modified alternatives were compared with the impacts of the original alternatives. Based on this comparison, a recommendation regarding utilization of the original alternative or modified alternative was provided. Table 3.3.26 summarizes the recommendations of the modified alternatives as detailed in Section 3.2, Modifications of the Alternatives Recommended for Further Analysis.

| SEGMENT LOCATION | FREEWAY ALTERNATIVE | | | | | | | |
|--|---------------------|----|---|----|---|---|----|-----|
| | C | Cs | E | Es | F | G | Gs | G-C |
| Southern Segment – From W. 4A Rd. to Lakeville | | X | | X | | | | |
| Central Segment – From SR 4 to North of Osborne Road | | X | | X | | | | |
| Northern Segment – From New Road to US 20 | X | | | X | | | | |
| From West 4A Road to US 20 | | | | | | | | X |



Recommendations contained in the Preliminary Alternative Analysis and Screening Report, dated August 19, 2003, and detailed in Section 3.1, Preliminary Alternatives Analysis and Screening, have been modified, as detailed in Section 3.2, and the following four preliminary alternatives were studied further in the DEIS (see Figure 3.3.27).

- No-Build Alternative
- Alternative Cs (Freeway Alternative)
- Alternative Es (Freeway Alternative)
- Alternative G-C (Freeway Alternative)

3.3.1 No-Build Alternative

The No-Build Alternative includes “capacity expansion” projects in the South Bend Metropolitan Area (St. Joseph, Marshall and Elkhart counties) as reported in the MACOG Transportation Improvement Program (2003-2005 TIP) and the balance of Indiana as reported in the Indiana Statewide Transportation Improvement Program (INSTIP). Capacity expansion projects include major roadway investments, such as a major widening that add through traffic lanes, the extension of existing roadways or construction of new roadways, new interchanges and major roadway realignments or reconstructions that add through traffic carrying capacity.

The No-Build Alternative constitutes the existing roadway network of the year 2000 plus capacity expansion projects, those projects that are committed for construction or that have been completed since the year 2000 (Existing-Plus-Committed Network). It is assumed that these committed improvements will be completed independent of any decision regarding the improvement of US 31 from Plymouth to South Bend.

The committed capacity expansion projects in St. Joseph and Marshall counties include:

- Bittersweet Road widening to four lanes from Vistula Drive to McKinley Highway
- SR 331 (Capital Avenue) widening from four to six lanes from Douglas Road to SR 23
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Douglas Road to Day Road (recently completed)
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Day Road to Jefferson Boulevard,
- SR 331 (Capital Avenue) extension of a six-lane divided arterial from Jefferson Boulevard to Harrison Road (12th Street)
- SR 331 (Capital Avenue) new construction as a six-lane divided arterial from Harrison Road (12th Street) to the US 20 Bypass
- SR 331 (Capital Avenue) widening from four to six lanes from Jackson Road to US 20.
- Cleveland Road widening to four lanes from Brick Road to Bendix Drive
- Douglas Road widening to four lanes from SR 23 to west of Grape Road and from Main Street to Fir Road



- Gumwood Road widening to four lanes from Cleveland Road to Brick Road
- Harrison Road (12th Street) widening to four lanes from Merrifield Road to Fir Road
- Ironwood Road widening to four lanes from Ridgedale Road to Randolph Street (completed)
- Jefferson Boulevard widening to four lanes from Fir Road to Capital Avenue
- McKinley Highway widening to five lanes from Elder Road to Birch Road
- Miami Highway widening to four lanes from Kern Road to Jackson Road
- Portage Avenue widening to four lanes from Lathrop Drive to Toll Road
- SR 17 (N. Michigan Street in Plymouth) widening to five lanes from Klinger Street to US 30
- SR 23 (Edwardsburg Highway) widening to four lanes from Cleveland Road to Brick Road
- SR 23 widening to four lanes from Campeau Street to Edison Road

Along the US 31 corridor, INDOT has programmed traffic-operational improvements for intersections at Kern Road, Roosevelt Road, Madison Road, New Road, and SR 4. The new traffic signal at New Road is the most significant of these “capacity preservation” projects. As these projects do not involve major capital investments that alter the through lane traffic-carrying capacity of US 31, these projects will proceed regardless of the decision to improve the US 31 corridor. On the other hand, a pavement resurfacing project that would have added a continuous center left-turn lane along US 31 from Madison Road to Kern Road has been suspended until the completion of this NEPA document.

3.3.2 Alternative Cs (Freeway Alternative)

Alternative Cs is an upgrade of existing US 31, a four-lane divided facility, from the US 31 and US 30 interchange to just north of West 4A Road (Referring to Figure 3.3.27). From West 4A Road, it is a new roadway facility that runs east of LaPaz and parallels US 31. It crosses existing US 31 on the south edge of Lakeville and continues northward. It runs west of Lakeville and terminates at US 20, approximately one mile west of the existing US 31 and US 20 interchange.

The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses (grade-separations) or access closures. See Section 5.1, Traffic and Transportation, for a more detailed description of the alternative and associated access points.

It is anticipated that there will be five new interchanges along Alternative Cs, not including the use of the existing interchange at US 30 and US 31. All anticipated interchange locations and types are conceptual and will be refined in later phases. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at West 5A Road

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



- Diamond interchange at US 6
- Diamond interchange at SR 4 (Pierce Road)
- Diamond interchange at Kern Road
- Trumpet Interchange at US 20

There will be grade separations (overpasses) and local service (frontage) roads for many public roads intersecting with US 31 and not listed as a likely interchange location. It is anticipated that there will be ten grade separations along Alternative Cs; however, the details of access will be refined as the project advances through the development phases. Likely grade separation locations would be:

- Plymouth-Goshen Trail
- West 3A Road
- Tyler Road
- Leeper Road
- Existing US 31 just south of Lakeville
- Quinn Road
- New Road
- Madison Road
- Roosevelt Road
- Johnson Road

There will be public roads that are not listed as a likely interchange or grade separation (overpass) locations. When two public roads are close to one another, a grade separation may be provided at one road and the other road relocated to use the same grade separation. Frontage or local service roads are provided where land may be landlocked by full access control of the alternative. It is anticipated that there will be three such public roads along Alternative Cs that will likely be relocated to an adjacent overpass. However, the details of access will be refined as the project advances through the development phases. Likely road relocation locations to an alternate site of access would be:

- Maple Road
- Quinn Trail
- Linden Road

There will be public roads that are not listed as a likely interchange or grade separation (overpass) locations or listed as a road likely to be relocated to an alternate access point. Access across the new freeway for these roads



will be eliminated and a cul-de-sac constructed on either side of the new freeway. It is anticipated that there will be nine such public roads along Alternative Cs; however, the details of access will be refined as the project advances through the development phases. Roadways likely to lose access and be cul-de-saced would be:

- West 7B Road
- Lilac Road/West 6th Road
- Existing US 31 near 4A Road
- West 4A Road
- West 2C Road
- West 1B Road
- East 1st Road
- Shively Road
- Osborne Road

In addition to the likely locations of interchanges, grade separations, and road closures, there would also be a grade separation for a railroad crossing at the following location:

- CSX Railroad on the north edge of LaPaz, between West 1B Road and East 1st Road

3.3.3 Alternative Es (Freeway Alternative)

Alternative Es is an upgrade of existing US 31, a four-lane divided facility, from the US 31 and US 30 interchange to just north of West 4A Road (Referring to Figure 3.3.27). From West 4A Road, it is a new roadway facility that runs east of LaPaz and parallels US 31. It crosses existing US 31 on the south edge of Lakeville and continues northward. It runs west of Lakeville and ties into existing US 31 just north of Kern Road. Alternative Es terminates at the existing US 31 and US 20 interchange.

The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses (grade-separations) or access closures. See Section 5.1, Traffic and Transportation, for a more detailed description of the alternative and associated access points.

It is anticipated that there will be four new interchanges along Alternative Es, not including the use of the existing interchange at US 30 and US 31 and the reconstruction of the existing interchange at US 31 and US 20. All anticipated interchange locations and types are conceptual and will be refined in later phases. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at West 5A Road

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



- Diamond interchange at US 6
- Diamond interchange at SR 4 (Pierce Road)
- Diamond interchange at Kern Road
- Reconstruction of existing interchange at US 20.

There will be grade separations (overpasses) and local service (frontage) roads for many public roads intersecting with US 31 and not listed as a likely interchange location. It is anticipated that there will be 11 grade separations along Alternative Es. However, the details of access will be refined as the project advances through the development phases. Likely grade separation locations would be:

- Plymouth-Goshen Trail
- West 3A Road
- Tyler Road
- Leeper Road
- Existing US 31 just south of Lakeville
- Quinn Road
- New Road
- Madison Road
- Roosevelt Road
- Main Street
- Johnson Road

There will be public roads that are not listed as a likely interchange or grade separation (overpass) locations. When two public roads are close to one another, a grade separation may be provided at one road and the other road relocated to use the same grade separation. Frontage or local service roads are provided where land may be landlocked by full access control of the alternative. It is anticipated that there will be two such public roads along Alternative Es that will likely be relocated to an adjacent overpass. However, the details of access will be refined as the project advances through the development phases. Likely road relocations to an alternate site of access would be:

- Maple Road
- Quinn Trail

There will be public roads that are not listed as a likely interchange or grade separation (overpass) location or listed as a road likely to be relocated to an alternate access point. Access across the new freeway for these roads will be



eliminated and a cul-de-sac constructed on either side of the new freeway. It is anticipated that there will be 11 such public roads along Alternative E. However, the details of access will be refined as the project advances through the development phases. Roadways likely to lose access and be cul-de-saced would be:

- West 7B Road
- Lilac Road/West 6th Road
- Existing US 31 near 4A Road
- West 4A Road
- West 2C Road
- West 1B Road
- East 1st Road
- Shively Road
- Osborne Road
- Louise Drive
- Roycroft Road

In addition to the likely locations of interchanges, grade separations, and road closures, there would also be a grade separation for a railroad crossing at the following location:

- CSX Railroad on the north edge of LaPaz, between West 1B Road and East 1st Road.

3.3.4 Alternative G-C (Freeway Alternative)

Alternative G-C is an upgrade of existing US 31, a four-lane divided facility, from the US 31 and US 30 interchange to just north of West 4A Road (Referring to Figure 3.3.27). From West 4A Road, it is a new roadway facility that runs east of LaPaz and Lakeville and parallels US 31. It crosses existing US 31 south of Roosevelt Road, continues northward and terminates at US 20, approximately one mile west of the existing US 31 and US 20 interchange.

The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses (grade-separations), or access closures. See Section 5.1, Traffic and Transportation, for a more detailed description of the alternative and associated access points.

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



It is anticipated that there will be five new interchanges along Alternative G-C, not including the use of the existing interchange at US 30 and US 31. All anticipated interchange locations and types are conceptual and will be refined in later phases. Likely interchange locations and types would be:

- Utilize existing interchange at US 30,
- Diamond Interchange at West 5A Road,
- Diamond interchange at US 6,
- Diamond interchange at SR 4 (Pierce Road),
- Diamond interchange at Kern Road,
- Trumpet Interchange at US 20.

There will be grade separations (overpasses) and local service (frontage) roads for many public roads intersecting with US 31 and not listed as a likely interchange location. It is anticipated that there will be ten grade separations along Alternative G-C. However, the details of access will be refined as the project advances through the development phases. Likely grade separation locations would be:

- Plymouth-Goshen Trail,
- West 3A Road,
- Tyler Road,
- Kenilworth Road,
- Lake Trail,
- New Road,
- Miller Road,
- Existing US 31 south of Kern Road,
- Roosevelt Road,
- Johnson Road.

There will be public roads that are not listed as a likely interchange or grade separation (overpass) locations. When two public roads are close to one another, a grade separation may be provided at one road and the other road relocated to use the same grade separation. Frontage or local service roads are provided where land may be landlocked by full access control of the alternative. It is anticipated that there will be two such public roads along Alternative G-C that will likely be relocated to an adjacent overpass. However, the details of access will be refined as the project advances through the development phases. Likely road relocation locations to an alternate site of access would be:



- Maple Road,
- Linden Road.

There will be public roads that are not listed as a likely interchange or grade separation (overpass) location or listed as a road likely to be relocated to an alternate access point. Access across the new freeway for these roads will be eliminated and a cul-de-sac constructed on either side of the new freeway. It is anticipated that there will be eleven such public roads along Alternative G-C; however, the details of access will be refined as the project advances through the development phases. Roadways likely to lose access and be cul-de-saced would be:

- West 7B Road,
- Lilac Road/West 6th Road,
- Existing US 31 near 4A Road,
- West 4A Road,
- West 2C Road,
- West 1B Road,
- East 1st Road,
- North Lilac Road,
- Linden Road,
- Rockstroth Road,
- Quinn Road,
- Osborne Road,

In addition to the likely locations of interchanges, grade separations and road closures, there would also be a grade separation for a railroad crossing at the following location:

- CSX Railroad on the north edge of LaPaz, between West 1B Road and East 1st Road.



3.4 Identification of Alternatives Studied Further

A comparison to the three modified Freeway Build Alternatives recommended for further study in the Draft Environmental Impact Statement (DEIS) was completed and is discussed in detail in Chapter 4, Affected Environment; Chapter 5, Environmental Consequences; Chapter 6, Mitigation; and Chapter 7, Draft Section 4(f) Evaluation. As discussed in Section 3.3, Description of Alternatives Selected for Detailed Study, the following four alternatives were studied further in the DEIS (see Figure 3.3.28).

- No-Build Alternative
- Alternative Cs (Freeway Alternative)
- Alternative Es (Freeway Alternative)
- Alternative G-C (Freeway Alternative)

A comparative summary of the socio-economic and environmental impacts of the three freeway alternatives, Alternatives Cs, Es and G-C is contained in Table 3.4.27. Regarding the values contained in Table 3.4.27, the following should be noted:

- All costs are in millions of dollars and year 2003 dollars
- All values are based on a 300-370 foot total right-of-way
- Traffic Performance Comparison – High is best performer
- Businesses Acquired includes large farming operations
- Estimated Farmed Wetlands are calculated as 2% of all Hydric Soils on agricultural land. The percentage is based on an estimate from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO).

Based on the following findings, Alternatives Cs, Es, and G-C have been identified as the alternatives studied in detail (see Figure 3.4.29). Following the DEIS public comment period and the public hearing, the Final Environmental Impact Statement (FEIS) will be presented and a final preferred alternative will be identified in the FEIS.

It is important to again note that the US 31 Improvement Project has been a dynamic process. The information previously presented in Table 3.1.9 was from the best-known existing secondary source data and conceptual design parameters available at the time that the preliminary screening of alternatives was conducted. Additional information was identified during a detailed field review later in the progress of the study, and the numbers contained in Table 3.2.10 were slightly different than those contained in Table 3.1.9. Additional information has again been identified during a more in-depth analysis as the study has again progressed. The numbers contained in Table 3.4.27 are likely slightly different than those contained in either Table 3.1.9 or Table 3.2.26.

South of Tyler Road, Alternatives Cs, Es and G-C all follow the same alignment located east of existing US 31; therefore, their impacts are equal. From Tyler Road to Madison Road, Alternatives Cs and Es follow the same alignment and are for the most part located on the west side of existing US 31, while Alternative G-C remains on the east side of existing US 31. From Madison Road to US 20, Alternatives Cs and Es diverge and continue northward to US 20. Alternative Cs terminates at a new interchange at US 20 approximately one mile west of the existing US 31 and US

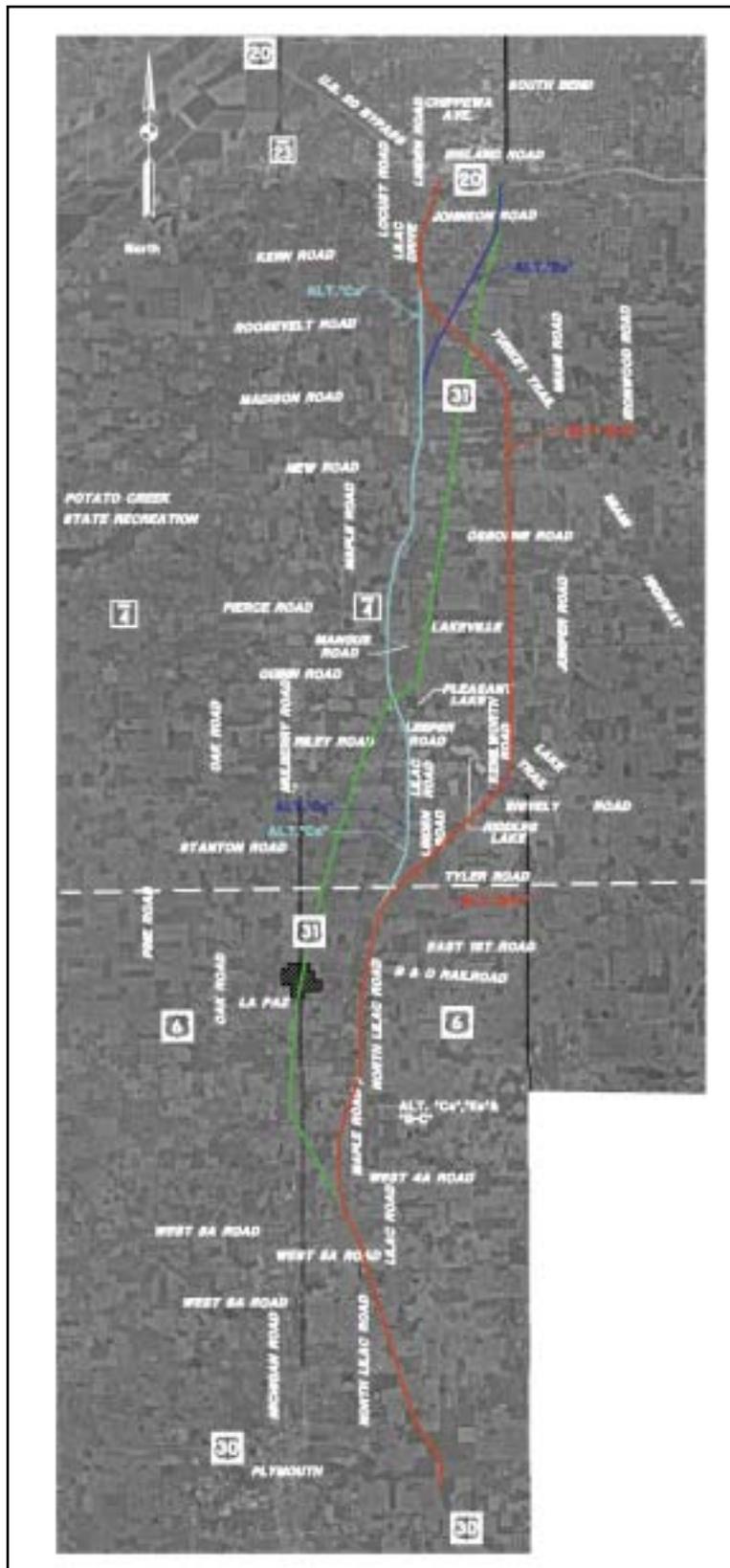


Figure 3.4.28: Alternatives Studied in Detail – Alternatives Cs, Es and G-C



| Socio-Economic/Environmental Measure | ALTERNATIVE | | |
|--|----------------|----------------|----------------|
| | Cs | Es | G-C |
| COSTS (Total) (Mil. Of \$) (year 2003 dollars) | 209.1 to 228.9 | 241.1 to 262.0 | 224.4 to 244.9 |
| Length (Miles) | 19.4 | 19.9 | 20.4 |
| No. of New Interchanges (Total Interchanges) | 5 (7) | 4 (6) | 5 (7) |
| No. of Grade Separations (Overpass/Underpass) | 10 | 11 | 10 |
| No. of Grade Separations (Railroad Crossings) | 1 | 1 | 1 |
| CONSTRUCTION COSTS (Mil. of \$) | 152.3 to 171.5 | 165.8 to 185.9 | 163.5 to 183.2 |
| RIGHT-OF-WAY COSTS (Mil. of \$) | 45.6 | 61.4 | 48.4 |
| ENGINEERING COSTS (Mil. of \$) | 11.1 to 11.8 | 13.9 to 14.7 | 12.5 to 13.2 |
| TRAFFIC PERFORMANCE | | | |
| Meet Purpose and Need | Yes | Yes | Yes |
| Performance (Compared to Other Alternatives) | Medium | High | Low |
| LAND USE | | | |
| Agricultural (row crop) | 403 Ac. | 406 Ac. | 485 Ac. |
| Commercial | 22 Ac. | 20 Ac. | 21 Ac. |
| Church/Religious | 2 Ac. | 2 Ac. | 2 Ac. |
| Herbaceous Cover | 41 Ac. | 39 Ac. | 56 Ac. |
| Open Water | 1 Ac. | 1 Ac. | 2 Ac. |
| Pasture | 14 Ac. | 12 Ac. | 3 Ac. |
| Transportation | 187 Ac. | 174 Ac. | 187 Ac. |
| Residential | 51 Ac. | 70 Ac. | 61 Ac. |
| Scrub/Shrub | 43 Ac. | 38 Ac. | 42 Ac. |
| Woodland | 196 Ac. | 139 Ac. | 139 Ac. |
| RELOCATIONS | | | |
| Residences Acquired | 49 | 90 | 58 |
| Businesses Acquired | 8 | 32 | 6 |
| Businesses Damaged | 5 | 2 | 5 |
| Churches Acquired | 1 | 1 | 1 |



| Table 3.4.27: Comparison of Alternatives Studied in Detail (continued) | | | |
|--|-------------|----------|----------|
| Socio-Economic/Environmental Measure | ALTERNATIVE | | |
| | Cs | Es | G-C |
| HISTORIC PROPERTIES | Medium | Low | High |
| SECTION 4(f) | 0 | 0 | 0 |
| ARCHAEOLOGICAL SITES | | | |
| Within Alignment | 2 | 3 | 2 |
| TOTAL WETLANDS (NWI + FARMED) | 57.7 Ac. | 40.5 Ac. | 45.3 Ac. |
| WETLANDS (From NWI Maps) | 55.9 Ac. | 38.8 Ac. | 42.7 Ac. |
| Forested | 25.8 Ac. | 20.8 Ac. | 24.7 Ac. |
| Scrub/Shrub | 3.0 Ac. | 1.6 Ac. | 1.4 Ac. |
| Emergent | 26.3 Ac. | 15.7 Ac. | 15.6 Ac. |
| Aquatic Bed | 0.8 Ac. | 0.7 Ac. | 1.0 Ac. |
| ESTIMATED FARMED WETLANDS | 1.8 Ac. | 1.7 Ac. | 2.6 Ac. |
| STREAM IMPACTS (No. of Impact Locations) | 14 | 13 | 10 |
| WILDLIFE HABITAT AREAS | | | |
| Potato Creek State Park & Swamp Rose Nature Preserve | 0 | 0 | 0 |
| Notable Wildlife Habitat (IDNR) | 2 | 1 | 0 |
| Classified Wildlife Habitat (IDNR) | 4 | 3 | 1 |
| Classified Forest (IDNR) | 2-3 | 2-3 | 1-2 |
| Conservation Reserve Program (CRP) (NRCS) | 1 | 2 | 2 |
| Wetland Reserve Program (WRP) (NRCS) | 1 | 1 | 0 |
| Partners for Fish and Wildlife Program (USFWS) | 3 | 2 | 1 |
| INDIRECT IMPACTS | | | |
| Farmland | 45 Ac. | 35 Ac. | 85 Ac. |
| Wetland | 2 Ac. | 2 Ac. | 0 Ac. |
| Forests | 25 Ac. | 20 Ac. | 5 Ac. |
| Note: <ul style="list-style-type: none"> • All values are based on a 300-370 foot total right-of-way, • Traffic Performance Comparison – High is best performer, • Businesses Acquired includes large farming operations, • Estimated Farmed Wetlands are calculated as 2% of all Hydric Soils on agricultural land | | | |

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



20 interchange. Alternative Es terminates at the existing US 31 and US 20 interchange. Alternative G-C crosses from the east side to the west side of existing US 31 just south of Roosevelt Road. It continues northwest and ties into the Alternative Cs alignment and also terminates at a new interchange at US 20, approximately one mile west of the existing US 31 and US 20 interchange.

Natural Resource Impacts

Regarding wetland impacts, based on calculations from the National Wetland Inventory (NWI) Maps, Alternative Es has the least amount of wetland impacts at 38.8 acres, followed by Alternative G-C at 42.7 acres, and then Alternative Cs with the highest amount at 55.9 acres.

Alternatives Cs and Es traverse an area of complex glacial drift in the northwestern quarter of the study area, from approximately the north edge of Lakeville to US 20, formerly the Maxinkukee Moraine (see Figure 5.9-19). The unique glacial deposits in this area are also unique from a wildlife habitat perspective. These areas are less conducive to agriculture, thus many forested and wetland communities remain. The majority of threatened and endangered species records from the Indiana Natural Heritage Data Center are from this area, as are many of the notable wildlife habitat areas as identified by the Indiana Department of Natural Resources (IDNR), and lands enrolled in state and federal programs that promote and manage wildlife habitat. Alternative G-C avoids this area for the most part, with the exception of the northern most portion from approximately Roosevelt Road to its northern terminus at US 20.

Regarding floodplain impacts and water crossings, based on calculations from digital floodplains, Alternative Cs and Es have an identical amount of potential floodplain impacts at 1,990 linear feet. Alternative G-C has approximately 4,305 linear feet of floodplain impacts. Related to the floodplain impacts is the number of water crossings noted for each of the alternatives studied in detail. Alternatives Cs has the most stream impacts with 14, followed by Es with 13. Alternative G-C has ten stream impact locations.

Agricultural Land/Farmland Impacts

Regarding farmland impacts (Agricultural, row crops), Alternatives Cs at 403 acres and Es at 406 acres impact essentially the same amount of farmland while Alternative G-C at 485 acres would impact approximately 80 acres more than the other two alternatives studied in detail.

Purpose and Need

Although Alternatives Cs, Es and G-C all meet the purpose and need of the project, they perform at different levels with regard to reduction in congestion. Section 5.1, Traffic and Transportation, provides a more detailed analysis related to traffic performance of each of the alternatives studied in detail.

Alternative Es is the best traffic performer of the three alternatives studied in detail as it provides existing US 31 with an LOS of A from the southern terminus at the US 31 and US 30 interchange to Roosevelt Road. From Roosevelt Road to the northern termini at US 20, the alternative provides an LOS of B

Alternative Cs provides existing US 31 with an LOS of A from the southern terminus at the US 31 and US 30 interchange to Roosevelt Road. From Roosevelt Road to the northern termini at US 20, the alternative provides an LOS of D, the minimum acceptable LOS for an urban section.

Alternative G-C performs very similarly to Alternative Cs as it provides existing US 31 with an LOS of A from the southern terminus at the US 31 and US 30 interchange to New Road. From New Road to Roosevelt Road the



alternative provides an LOS of B. From Roosevelt Road to the northern termini at US 20, the alternative provides an LOS of D, the minimum acceptable LOS for an urban type section.

Other Considerations

Community Opinion:

Meetings with the St. Joseph County Chamber of Commerce, business groups, and local developers have indicated a collective preference in the alternatives studied in detail that terminate to the west of the existing US 31 and US 20 interchange. This would include both Alternatives Cs and G-C. Items influencing this preference include the elimination of the disruption of existing businesses along US 31 that are south of US 20 for alternatives that utilize the existing US 31 alignment. This would include Alternative Es.

Additionally, local commercial development is expected in the area immediately north of US 20 and west of existing US 31. Local chamber of commerce officials and local developers have indicated that the alternatives that terminate west of the existing US 31 and US 20 interchange, Alternatives Cs and G-C, would better serve this planned commercial development. This is confirmed in a letter from Mr. Mark N. Egan, CCE, President and CEO of the Chamber of Commerce of St. Joseph County, and contained in Appendix C.

Compatibility with Local Land Use Plans:

The Draft Plymouth Comprehensive Plan includes the upgrade of US 31. There are some inconsistencies between the draft comprehensive plan and the interchange locations, grade separation locations and road closures and potential relocations for the continuation of access contained in this study. Instead of an interchange located at West 5A Road as is included in this study, the Draft Plymouth Comprehensive Plan indicates an interchange to be located at 7th Road, where a roadway or intersection with existing US 31 does not currently exist. For the Plymouth-Goshen Road, the comprehensive plan recommends a grade separation, which is consistent with this study. At both West 7B Road and Lilac Road/West 6th Road, the comprehensive plan recommends a road closure, which is consistent with this study.

The Draft Marshall Thoroughfare Plan assumes the upgrade of existing US 31 throughout Marshall County. The Alternatives each leave the existing US 31 alignment at West 4A Road, prior to the north border of Marshall County. The thoroughfare plan recommends the closure of West 5A Road, which is identified as an interchange location in this study. It also identifies a grade separation at West 4A Road. However, this study identifies this location as a public road that is not listed as a likely interchange or grade separation (overpass) location, or listed as a road likely to be relocated to an alternate access point. Access across the new freeway for West 4A Road will be eliminated and a cul-de-sac constructed on either side of the new freeway. The thoroughfare plan recommends the closure of West 2C Road, which is consistent with this study.

The South Bend and St. Joseph County Comprehensive Plan incorporates the Michiana Area Council of Governments (MACOG), the local Metropolitan Planning Organization (MPO) plan. The plan is consistent with this study but the plan is not specifically related to interchanges, grade separations, and road closures. The MPO land use plan identifies that area immediately south of the existing US 31 and US 20 interchange as an area expected to see residential growth in the future. It also identifies the portion of US 31 included in the study area as an area that would benefit from further study.

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



Total Costs:

Total costs associated with each of the three alternatives studied in detail are very similar. These preliminary total costs include construction, right-of-way costs and preliminary engineering (design) and are in year 2003 dollars. Alternative Cs has the lowest total cost between \$209.1 and \$228.9 million. Alternative G-C has a total cost between \$224.4 and \$244.9 million. Alternative Es has the highest total cost between \$241.1 and \$262.0 million.

A comparison of construction costs indicates that Alternative Cs has the lowest construction cost between \$152.3 and \$171.5 million. Alternatives G-C and Es have essentially the same construction costs with Alternative G-C between \$163.5 and \$183.2 million and Alternative Es between \$165.8 and \$185.9 million. The higher construction costs associated with Alternative G-C are largely due to the increased length, one mile longer than Alternative Cs. Although Alternatives Cs and Es are essentially the same from US 30 to just north of Madison Road, their construction costs differ fairly substantially. This difference is largely due to the additional costs associated with the urban typical section of Alternative Es from near Roosevelt Road to US 20. Referring to Figure 3.1-3, this urban typical section will consist of an elevated US 31 freeway and access roadways on both the east and west sides of the freeway. Referring to Figure 3.1-2, Alternative Cs would likely retain a rural typical section in the section from near Roosevelt Road and US 20 as is reflected in the lower construction cost.

Alternative Cs also has the lowest right-of way costs at approximately \$45.6 million. Even though Alternative G-C is a mile longer and has a higher construction cost, its right-of-way costs of approximately \$48.4 million are only slightly higher than Cs. Alternative Es, also with a higher construction cost, has the highest right-of-way costs at approximately \$61.4 million. Differences in the right-of way costs are largely due to the number and type of relocations associated with each alternative.

Residential/Commercial Relocations:

Relocations for each of the three alternatives studied in detail vary as related to residential relocations. Alternative Es has the most residential relocations with 90. Alternative G-C has 58 residential relocations and Cs has the fewest at 49 residential relocations. Differences in commercial relocations indicate that Alternative Es is substantially higher than Cs and G-C, which have essentially the same number. Alternative Es impacts a commercial corridor as it joins existing US 31 from just north of Kern road to US 20. Commercial relocations for Es are 32 businesses acquired and two businesses damaged. Alternative Cs has eight associated business relocations and five businesses damaged. Alternative G-C has the least impacts to businesses with six business relocations and five businesses damaged.

Noise Impacts:

Noise impacts for each of the three alternatives studied in detail indicate no conclusive advantage for any one of the alternatives studied in detail. Each of the alternatives studied in detail is close to some suburban neighborhoods in the north end of the project area. Alternative Cs is slightly higher than the others with approximately 113 residences impacted. It should be noted that approximately 50 of the residences impacted by Alternative Cs are in very close proximity to each other as they are all located within a mobile home park off of Locust Road. Es impacts approximately 68 residences while G-C impacts approximately 72 residences.



3.5 Local Road Improvements

The conversion and/or replacement of a partial or no access control non-freeway facility, such as existing US 31, to a freeway facility with full access control, as is the case with each of the three alternatives studied in detail, Alternatives Cs, Es and G-C, will often have dramatic effects on the local traffic patterns. These types of projects will often concentrate the flow of local traffic to the lower-level local roadways that feed upper-level local and state roadways that provide access to the freeway. There is often a substantial increase in traffic volumes associated with the traffic migration to the local or state roadways that have access to the new freeway facility. This increase in traffic volumes can often change the facility type and functional classification of the local or state roadway and accelerate the need to improve the local or state roadway.

The upgrade of US 31 to a freeway facility with full access control will affect the flow of local traffic, as local commuters will redirect their routes to roadways with access to the freeway. These changes in traffic patterns will affect the traffic volume and change the type of facility or some of the local or state roadways that will access the new freeway. This will drive the need for expansion of the local or state roadways, the need for which is accelerated by the improvements to US 31. Local roadway improvements identified for the US 31 Improvement Project include:

- 5A Road From Michigan Road to US 31 – Alternatives Cs, Es and G-C. (See Figure 3.5-29),
- SR 4 (Pierce Road) Extension From Existing US 31 to New US 31 –Alternative G-C (see Figure 3.5-30).

Table 3.5.28 summarizes the socio-economic and environmental impacts for both the 5A Road improvements and the SR 4 (Pierce Road) extension. It is important to note that the information contained in Table 3.5.28 is from the best-known existing secondary source data and conceptual design parameters. Environmental information used was collected from Geographic Information System (GIS) data, aerial photography and a preliminary windshield survey. These areas were not studied at the same level of detail as the alternatives studied in detail in this EIS and may eventually require an environmental analysis conducted following the NEPA process.

3.5.1 Alternatives Cs and Es

Local road improvements that may be needed by the Alternatives Cs and Es involve the 5A Road extension from Michigan Road to US 31. An approximate total right-of-way width of 100 feet (50 feet north and south of the existing roadway centerline) was used to determine socio-economic and environmental impacts.

Construction Costs

The construction costs associated with the improvements to 5A Road related to Alternatives Cs and Es would be approximately \$1,500,000 (year 2003 dollars). This would include approximately one mile of reconstructed two-lane roadway and one stream crossing. Upgrading this two-lane roadway to desirable standards would include the widening of the roadway to 12-foot lanes with 10-foot paved shoulders. This construction cost estimate does not include any costs associated with right-of-way or preliminary engineering (design).

Traffic Volumes

The predicted future year 2030 traffic volumes along 5A Road associated with the improvements to 5A Road related to Alternatives Cs and Es would be between 12,300 and 12,500 vehicles per day, compared to 300 vehicles per day for the No-Build Alternative.



Figure 3.5.29: 5A Road From Michigan Road to US 31



Figure 3.5.30: SR 4 (Pierce Road) Extension From Existing US 31 to New US 31



Agricultural Land/Farmland Impacts

The improvements to 5A Road related to Alternatives Cs and Es impact approximately 7.5 acres of row crops.

Relocations

Improvements to 5A Road related to Alternatives Cs and Es involve many residences along 5A Road that are set back approximately 20 to 30 feet from the edge of the pavement. Additional right-of-way would be required along the front yards of those residences set back further and it is anticipated that there would be approximately six residential relocations required. Additionally, there are no businesses located within the limits of the 5A Road improvement area.

Historic Properties/Section 4(f)

The improvements to 5A Road related to Alternatives Cs and Es will likely have no impact on historic properties.

Natural Resource Impacts

Based on calculations from the National Wetland Inventory (NWI) Maps, the improvements to 5A Road related to Alternatives Cs and Es would have no impact on wetlands.

3.5.2 Alternative G-C

Local road improvements that may be needed by the Alternative G-C include both the 5A Road extension from Michigan Road to US 31 and the SR 4 (Pierce Road) extension from existing US 31 to the new US 31. For the 5A Road extension, an approximate total right-of-way width of 100 feet (50 feet north and south of the existing roadway centerline) was used to determine socio-economic and environmental impacts. For the SR 4 (Pierce Road) extension, a total right-of-way width

Table 3.5.28: Summary of Socio-Economic and Environmental Impacts of Local Road Improvement Projects

| | 5A Road | SR 4 (Pierce Road) |
|---|-------------|-----------------------|
| CONSTRUCTION COST (2003 dollars) | \$1,500,000 | \$1,500,000 |
| TRAFFIC VOLUME (Future Year 2030 AADT) | | |
| No-Build (vehicles per day) | 300 | 900 |
| Alternative Cs (vehicles per day) | 12,300 | N/A |
| Alternative Es (vehicles per day) | 12,500 | N/A |
| Alternative G-C (vehicles per day) | 11,300 | 5,000 |
| LAND USE | | |
| Agricultural (row crop) | 7.5 acres | 9.0 acres |
| Commercial | 0.4 acre | 0.1 acre |
| Church/Religious | - | - |
| Herbaceous Cover | - | 0.4 acre |
| Open Water | - | - |
| Pasture | - | - |
| Transportation | 2.5 acres | 1.5 acres |
| Residential | 2.3 acres | 1.6 acres |
| Scrub/Shrub | - | - |
| Woodland | 0.5 acre | 0.6 acre |
| POTENTIAL RELOCATIONS | | |
| Residences Acquired | 6 | 2 |
| Businesses Acquired | 0 | 0 |
| Businesses Damaged | 0 | 0 |
| HISTORIC PROPERTIES | 0 | 1 |
| SECTION 4(f) | 0 | 0 |
| NWI WETLANDS | 0 acres | 0 acres |
| STREAMS CROSSED | 1 | 1 |



of 100 feet was used to determine socio-economic and environmental impacts; however, the roadway alignment was shifted slightly northward so that a majority of the right-of-way impacts were along the north side of Pierce Road.

Construction Costs

The construction costs associated with the improvements to 5A Road related to Alternatives G-C would be approximately \$1,500,000 (year 2003 dollars). This would include approximately one mile of new two-lane roadway and one stream crossing. Upgrading this two-lane roadway to desirable standards would include the widening of the roadway to 12-foot lanes with 10-foot paved shoulders.

The construction costs associated with the improvements to SR 4 (Pierce Road) related to Alternatives G-C would be approximately \$1,500,000 (year 2003 dollars). This would include approximately one mile of new two-lane roadway and one stream crossing.

These construction cost estimates do not include any costs associated with right-of-way or preliminary engineering (design). Total construction costs associated with local road improvements related to Alternative G-C are approximately \$3,000,000 (year 2003 dollars).

Traffic Volumes

The predicted future year 2030 traffic volumes along 5A Road associated with the improvements to 5A Road related to Alternative G-C would be between 12,300 and 12,500 vehicles per day, compared to 300 vehicles per day for the No-Build Alternative.

The predicted future year 2030 traffic volumes along SR 4 (Pierce Road) associated with the improvements to Pierce Road related to Alternative G-C would be approximately 5,000 vehicles per day, compared to 900 vehicles per day for the No-Build Alternative.

Agricultural Land/Farmland Impacts

Regarding Agricultural Land/Farmland Impacts, the improvements to 5A Road related to Alternatives G-C impact approximately 7.5 acres of row crops and the improvements to SR 4 (Pierce Road) related to Alternatives G-C impact approximately 9.0 acres of row crops. Total Agricultural Land/Farmland Impacts associated with local road improvements related to Alternative G-C are approximately 16.5 acres.

Relocations

Regarding relocations associated with the improvements to 5A Road related to Alternatives G-C, many residences along 5A Road are set back approximately 20 to 30 feet from the edge of the pavement. Additional right-of-way would be required along the front yards of those residences set back further and it is anticipated that there would be approximately six residential relocations required. Additionally, there are no businesses located within the limits of the 5A Road improvement area.

Regarding relocations associated with the improvements to SR 4 (Pierce Road) related to Alternatives G-C, the roadway alignment was shifted slightly northward so that a majority of the right-of-way impacts were along the north side of Pierce Road. This shift in alignment would reduce the number of properties impacted and would eliminate direct impacts on the Bunch Farm as discussed below in Historic Properties. Additional right-of-way would be required along the front yards of those residences set back further and it is anticipated that there would be approximately two

US 31 Plymouth to South Bend

Draft Environmental Impact Statement



residential relocations required. Additionally, there are no businesses located within the limits of the Pierce Road improvement area

Total relocations associated with local road improvements related to Alternative G-C are approximately 8 residential relocations with no additional business relocations.

Historic Properties/Section 4(f)

The improvements to 5A Road related to Alternatives G-C will likely have no impact on historic properties.

The improvements to SR 4 (Pierce Road) related to Alternative G-C will have no direct impact on historic properties. However, the W. O. Bunch Farm is located along the south side of Pierce Road between existing US 31 and new US 31. The W. O. Bunch Farm is the best example of a late-nineteenth-century, general-purpose Hoosier farm in Union Township in terms of its inventory of extant buildings and historic field patterns. Rated Notable in the county Indiana Historic Sites & Structures Inventory, the farm consists of a residence, barn, and a collection of nine outbuildings dedicated to different farm functions. The bank barn, in this case a Pennsylvania German barn, is the centerpiece of the working elements of the farm. This planned local road improvement project, the widening of Pierce Road, will likely have no direct impact if the improvement occurs to the north--rather than the south--side of the road.

Natural Resource Impacts

Based on calculations from the National Wetland Inventory (NWI) Maps, the improvements to 5A Road related to Alternatives G-C and the improvements to SR 4 (Pierce Road) would have no impact on wetlands.