ES.4 Alternatives

Preliminary Alternatives 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 potential solutions to the transportation needs in the US 31 Corridor that were initially developed included:

- **No-Build Alternative** – represented by the existing roadway network plus programmed major roadway improvements in the South Bend Metropolitan Area. This alternative is the baseline for comparing "build" alternatives; its inclusion as an alternative is required by the National Environmental Policy Act of 1969 (NEPA)

- **Travel Demand Management (TDM)** – actions to spread the peak-hours of travel or to encourage the shift to alternative modes of travel to the single-occupancy vehicle (i.e. flexible workdays and road pricing (toll collection))

- **Transportation System Management (TSM)** – low-cost capital investments to reduce congestion, improve traffic flow, and measures to optimize performance of the existing transportation infrastructure (i.e. intersection improvements, signal coordination and timing, lane control (reversible lanes) and high-occupancy vehicle (HOV) lanes)

- **Intelligent Transportation System (ITS) Applications** – technology-based programs to actively manage the roadway system (i.e. providing travel information on roadway conditions to daily commuters via message boards, etc.)

- **Mass Transit** – rail or bus service along the US 31 Corridor

- **Highway Build Alternatives**

    - **Non-Freeway Alternatives** – geometric design options for upgrading existing US 31 and options involving upgrading portions of U.S. 31 on existing and new alignments

    - **Freeway Alternatives** – geometric design options for replacing existing US 31 with a full access control facility

In addition to the potential non-freeway solutions that were developed for this project, nine preliminary freeway alternatives, Alternatives A through I, were initially investigated. During the purpose and need development and identification of alternatives phase of the project, an Interagency Review meeting and project tour was held on May 15, 2003, with various federal and state environmental resource agencies. This Interagency Review meeting and project tour generated two additional preliminary freeway alternatives (Alternatives J and K). It also resulted in a slight shift of Alternative H to follow a segment of an existing high transmission powerline corridor. Figure ES.4.2 shows the eleven preliminary freeway alternatives consisting of five western alternatives (Alternatives A, B, C, D and E); four eastern alternatives (Alternatives G, H, I and K) and two central alternatives (Alternatives F and J) that utilized large portions of the existing US 31 alignment.

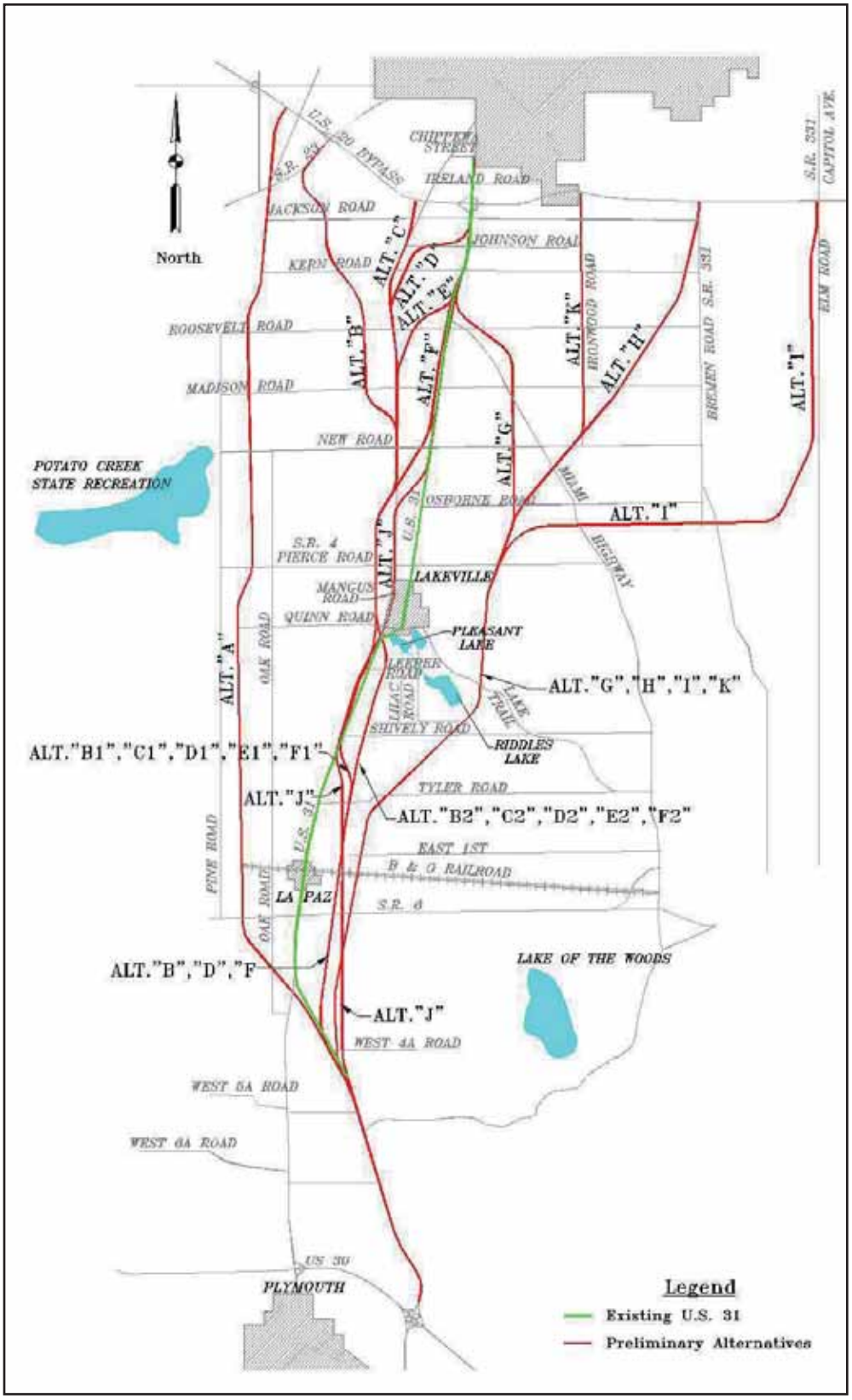

Figure ES.4.2: Preliminary Freeway Alternatives (A-K)

In order to narrow the number of preliminary alternatives under consideration for further analysis, screening measures were developed for use in evaluating the overall performance and impacts associated with each preliminary alternative. During this initial screening process, each of the preliminary 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 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

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 soley based on the third 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 LOS. 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 associated with travel on existing US 31 between US 30 and US 20.

It should be noted that the focus of this project is to address transportation problems related to the US 31 corridor and not to address all transportation problems in the South Bend-Elkhart Metropolitan Area. Therefore, the evaluation of alternatives focuses on the effectiveness of alternatives in addressing the needs along the US 31 corridor. Addressing the transportation problems in the entire metropolitan area is a very important issue and is the purpose of the MACOG Long Range Transportation Plan, which identifies the need to improve the US 31 corridor from South Bend to Plymouth. That Long Range Transportation Plan identifies many other transportation improvement projects aimed at addressing other transportation needs in the metropolitan area, and considers the most effective combination of transportation improvement projects (including the US 31 improvement) to address the transportation needs of the 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 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.

During Phase 1 of the screening process, TDM, TSM, ITS, Mass Transit, Non-Freeway Alternatives, and Freeway Alternatives A, B, H, I and K did not meeting the purpose and need of the project and were not advanced to Phase 2 of the screening process. Even though the No-Build Alternative would not address the purpose and need for this project, it was carried forward for evaluation throughout the development of the Environmental Impact Statement and served as a baseline when comparing the effectiveness and potential impacts of other alternatives; however, it is not considered the preferred alternative. Alternatives C, D, E, F, G, and J met the project purpose and need and were advanced to Phase 2 of the screening process (Table ES.4.1). The No-Build Alternative would not address the purpose and need for this project; however, this alternative was carried forward for evaluation throughout this study and served as a baseline when comparing the effectiveness and potential impacts of other alternatives.

Table ES.4.1: Phase 1: Purpose and Need Evaluation

Alternative	Reduces Congestion On Existing US 31 (Acceptable LOS for all segments)1	Improves Safety2	Consistent with INDOT & MACOG Transportation Plans3	Advanced to Phase 2 Screening
No-Build Alternative	NO	NO	NO	YES[4]
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.
4. No-Build Alternative – does not meet purpose and need of the project; however, it will be carried forward for detailed study in the DEIS.

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. It should also be noted that a Non-Freeway Alternative that includes combinations of various transportation management (TM) alternatives (TDM, TSM, ITS, mass transit, etc.) performs only slightly better than the Non-Freeway Alternative that bypasses LaPaz and Lakeville. Due to the low-density rural character of the corridor, the Non-Freeway Alternative in combination with TM alternatives considered for this project are expected to only minimally reduce traffic volumes on US 31 and would not result in improvements to levels of service on US 31.

Phase 2: Environmental Impacts

Phase 2 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 (Table ES.4.2). 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-foot 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.

Table ES.4.2: 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 $) (Year 2003 Dollars)	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[1]	M	M	M	M	M	M	L	L	L	L
Farmland (acres)	824	810	809	797	755	742	727	731	702	833

Table ES.4.2: Potential Socio-Economic and Environmental Impact Evaluation
For Alternatives Advanced to Phase 2 of Screening Process (Continued)

Socio-Economic and/or Environmental Measure	Alternative Location									
	Western						Central			Eastern
	C1	C2	D1	D2	E1	E2	F1	F2	J	G
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	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[3]	No	Yes	No	No	No	Yes	No	Yes	No	Yes

NOTES: Alternatives recommended for further study shaded.

Alternatives' recommendations are discussed in detail in Chapter 3.1.

1. Unique geological / ecological area evaluations (M-Medium, L-Low) indicate that the impact of the alternatives relative to each other.
2. 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.
3. No-Build Alternative – does not meet purpose and need of the project; however, it was carried forward for detailed study.

It is important to note that the US 31 Improvement Project has been a dynamic process. The information contained in Table ES.4.2 was 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 detailed field reviews later in the progress of the study, and the numbers contained in the detailed analysis of the alternatives studied further in the FEIS, may be slightly different than those contained in Table ES.4.2.

Freeway Alternatives B to F each consist of two options and are listed in the tables as B1, B2, C1, etc. 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. 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 the purpose and need identified for the project, both options were directly advanced to Phase 2 of the screening process, and were viewed in terms of advantages and disadvantages. If a freeway alternative did not meet the purpose and need 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. This was the case for Alternative B, which did not meet the purpose and need for the project, and therefore, was not advanced to Phase 2 of the screening process. Alternatives C to F did meet the purposes and needs for the project and were advanced to Phase 2 of the screening process. Given the higher residential, farm, and business relocations, impacts to potential historic sites, and higher overall cost, Option 1 of Alternatives C to F was not advanced for further study. Thus, Option 2 was used for the further screening of Alternatives C through F.

In Phase 2 of the screening process, Alternative D was eliminated from further consideration due to environmental impacts when compared to the other alternatives. Alternative D crosses through the large Whispering Hills subdivision, resulting in a high number of residential relocations and neighborhood impacts. Alternative D also connects to existing US 31 approximately 1/3 of a mile south of the existing US 20 interchange through very tight curves from the proposed Kern Road interchange. The proximity to the existing interchange and tight curves makes it extremely difficult for existing US 31 traffic to enter the freeway north of the proposed Kern Road. Due to the insufficient geometrics in the vicinity of the US 20/US 31 interchange, high relocations and neighborhood impacts, Alternative D was eliminated from further consideration.

In Phase 2 of the screening process, Alternative J was also eliminated from further consideration due to environmental impacts when compared to the other alternatives. Alternative J was one of the best performers with regard 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 alternative. 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 and the highest cost among the alternatives. Alternative J would require 235 residential relocations; 2 to 6 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 Italianate-style Ullery/Farneman House (c. 1860), which has been deemed eligible for listing in the National Register, and the Southlawn Cemetery (including the small caretaker's building). Alternative J is adjacent to both Newton Park in Lakeville and 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. In conclusion, 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.

Based on the findings of the Preliminary Alternatives Analysis and Screening, the No-Build Alternative, Alternative C, Alternative E, Alternative F, and Alternative G were advanced for further analysis in the DEIS.

Modifications of Alternatives Recommended for Further Analysis

The following data is from the information and conceptual design parameters available at each of the phases in the evaluation and screening of alternatives process. As the study progressed, additional information was collected and analyzed, more specific design parameters and details were developed, and the associated impacts were revised and

updated. As the project continued to progress, the study team continually investigated potential modifications to the alternatives that would avoid and/or minimize impacts to both the natural and human environment. Often these modifications were initiated by comments received from the public, local officials and/or resource agencies. The modifications ranged from slight shifts in the alignment to the development of "hybrid" alternatives. The goal of alternative modifications was to avoid and/or minimize environmental and socio-economic impacts.

Following the completion of the Preliminary Alternatives Analysis and Screening, comments from the public and resource agencies were received and additional field data was collected for Alternatives C, E, F, and G. 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. These concerns focused on both socio-economic and environmental impacts, particularly concerns related to wetland impacts, residential and business relocations, and historic property impacts.

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. 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.

Following the completion of the Preliminary Alternatives Analysis and Screening, Alternatives C, E, F, and G were modified due to major concerns raised by the study team, public, elected officials, resource agencies and Section 106 consulting parties. These concerns focused on both socio-economic and environmental impacts, particularly concerns related to wetland impacts, residential and business relocations, and historic property impacts. The goal of the modifications was to minimize these impacts.

Modifications to Alternative F

Modifications to Alternative F were investigated just south of the Ullery/Farneman House and the Southlawn Cemetery, and came about in an attempt to minimize impacts to the sites and to eliminate the likely Section 4(f) impacts. Modified Alternative F in this area involved a shift to the west in order to go to the west side of (behind) the Ullery/Farneman House. Westward modifications to Alternative F would significantly impact two residential subdivisions; one just north of Madison Road and west of US 31 and the other at Roosevelt Road and west of US 31. Further modifications to Alternative F that involved the relocation of the alternative further 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, modified Alternative F was eliminated from further consideration. Additionally, due to the potential Section 4(f) issues associated with Alternative F and the two historically significant structures discussed above, and the presence of prudent and feasible alternatives without potential Section 4(f) issues, Alternative F was also eliminated from further consideration.

Modifications to Alternatives C and E

Alternatives C and E follow the same alignment from the US 30 and US 31 interchange to just north of Madison Road. 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. Thus, modifications made to one alternative or the other north of Madison Road would be independent. Each of the alternatives contains three separate areas in which modifications were made in an attempt to minimize impacts.

- The southern segment of the modifications to Alternatives C and E extends from West 4A Road to the south edge of Lakeville. 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.
    - These modifications reduced wetland impacts by 50% (from 26 acres to 13 acres) in this area while having a modest impact on relocations (one additional residential relocation) and no impact to historic properties
    - These alignment modifications were included in the alternatives carried forward for detailed study in the DEIS
- The central segment of the modifications to Alternatives C and E extends from SR 4 (Pierce Road) to just north of Osborne Road. This modification involved the shift of the two alternatives to the east. Alternatives Cs and Es continue northward and connect with Alternatives C and E just north of Osborne Road.
    - These modifications reduce the wetland impacts by one acre (form three acres to two acres) 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
    - These alignment modifications were included in the alternatives carried forward for detailed study in the DEIS
- The northern segment of the modifications to Alternative C, called Alternative Cs, extends from just north of Madison Road to US 20. This modification involved the shift of the alternative to the east
    - This modification increased the wetland impacts by seven acres (from 31 acres to 38 acres) and had no impact on residential relocations or to historic properties
    - This modification to Alternative C was not included in the alternative carried forward for more detailed study in the DEIS
- The northern segment of the modifications to Alternative E, called Alternative Es, extends from just north of Madison Road to US 20. This modification involved the shift of the alternative to the west
    - This modification, relocating it to the west and behind the Ullery/Farneman House, reduced the wetland impacts by 12 acres (from 26 acres to 14 acres), decreased residential relocations by 23 (from 73 to 50) and business relocations by 20 (from 46 to 26), and eliminated the Section 4(f) issue related to historic properties
    - This modification to Alternative E were included in the alternatives carried forward for detailed study in the DEIS

Modifications to Alternatives G

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 northwest, 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.

The socio-economic and environmental impacts of modified Alternatives Gs and G-C were compared to those of Alternative G.

- Alternative Gs reduced the wetland impacts by four acres (from 34 acres to 30 acres), increased residential relocations by 33 (from 97 to 130) and business relocations by two (from 52 to 54), and reduced the historic impacts to those structures located within the area of potential impact (APE) by three (from 8 to 5 properties). It did not eliminate the Section 4(f) issue related to the Ullery/Farneman House and the Southlawn Cemetery

    - Due to increases in both residential and business relocations and the failure to eliminate the potential Section 4(f) issue related to historic properties, Alternative Gs was eliminated from further consideration. Additionally, due to the potential Section 4(f) issues associated with Alternative G and the two historically significant structures discussed above, and the presence of prudent and feasible alternatives without potential Section 4(f) issues, Alternative G was also eliminated from further consideration

- Alternative G-C increased wetland impacts by nine acres (from 34 acres to 43 acres), a 26% increase. However, it reduced residential relocations by 31 (from 97 to 66), a 32% reduction and business relocations by 43, (from 52 to 9), an 83% reduction. Alternative G-C reduced the historic impacts to those structures located within the APE by two (from 8 to 6) and it eliminated the Section 4(f) issue related to the Ullery/Farneman House and Southlawn Cemetery

    - Due to reductions in both residential and business relocations and the elimination of the potential Section 4(f) issue related to historic properties, Alternative G-C was carried forward for more detailed study in the DEIS

Evaluation of Hybrid Alternatives

Following publication of the DEIS, comments were received from resource agencies and the public that requested a review of modifications to alternatives that would maximize the use of the existing US 31 corridor and would also avoid impacts to natural resources. Public comments also requested the investigation of the combination of Alternatives Es and G-C north of Roosevelt Road. In response to these comments, a “hybrid” alternative, Alternative G-E was developed.

Alternative G-E is a hybrid alternative consisting of a combination of the southern portion of Preliminary Alternative G-C and the northern portion of Preliminary Alternative Es. Additional analysis indicated that the hybrid alternative resulted in a reduction of wetland impacts, and avoidance of many high quality wetland complexes west of existing US 31, a reduction in forest impacts, was a good traffic performer, was an alternative that utilized more of the existing US 31 corridor, and had relocation impacts and cost estimates that were consistent with the other alternatives being studied in the DEIS. Therefore, the range of reasonable alternatives in the decision-making process was expanded to include Alternative G-E, along with the No-Build Alternative and Alternatives Cs, Es and G-C.

Modifications to Alternatives G-C and G-E

During one of many field investigations aimed at collecting additional data for Alternatives Cs, Es, G-C and G-E, a team of environmental scientists identified a high quality wetland complex that was being impacted by Alternatives G-C and G-E. This wetland complex was located between the eastward extension of SR 4 (Pierce Road) and Miller Road, just south of New Road. The team of environmental scientists coordinated with a team of engineers to investigate potential modifications in the form of shifts in the alignment of Alternatives G-C and G-E to the east, called G-Cs and G-Es. Again, the goal of these modifications was avoidance and/or minimization of impacts to the natural and human environment.

The modifications or shifts to Alternatives G-C and G-E, called G-Cs and G-Es, provided positive results as impacts to both the human and natural environments were further reduced. This included a slight reduction in residential relocations and further reductions to wetlands and forests. This particular avoidance/minimization measure also provided an opportunity to avoid the high quality wetland complex associated with both of the alternatives. Due to the positive results related to impact reductions seen by this shift in the alignments, Alternatives G-C and G-E were eliminated from further consideration and Alternatives G-Cs and G-Es were added to the range of reasonable alternatives in the decision-making process, that includes the No-Build Alternative and Alternatives Cs, Es, G-Cs and G-Es.

Consideration of Alternative G – Ironwood Road Connection

During resource agency meetings and in comments received during the comment period on the DEIS, it was requested that a review of options not fully considered in the DEIS be completed. Identified, in particular, were modifications to Alternative G that would terminate at the existing US 20 and Ironwood Road interchange, as was the case for the previously eliminated Preliminary Alternative K. In response to those comments, INDOT and FHWA considered Alternative G - Ironwood Road Connection. Alternative G – Ironwood Road Connection follows the same alignment as Alternative G-Cs from the existing US 30 and US 31 interchange to New Road. At that point, the alternatives diverge. Alternative G-Cs continues northward 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. The US 20 and Ironwood Road interchange was the north terminus of Preliminary Alternative K that was eliminated from further consideration during the initial Preliminary Alternatives Analysis and Screening due to its failure to meet the purpose and need of the project.

The additional analysis included an investigation of the alternative, including additional major roadway improvements to existing roadway facilities that would be required to make the alternative meet the purpose and need of the project. It was found that in addition to construction of the new freeway Alternative G – Ironwood Road Connection, two additional major roadway improvement projects would be required to meet the minimum LOS D for the alternative and satisfy the purpose and need of the project. The first major additional roadway improvement project would consist of the improvement of Ironwood Road from US 20 northward to SR 933 (Lincolnway)

(approximately 2-miles) from an existing four-lane facility to a seven-lane facility. The second major additional roadway improvement project would consist of the improvement of existing US 31 from Roosevelt Road northward to US 20 (approximately 2-miles) from an existing four-lane facility to a seven-lane facility.

For Alternative G – Ironwood Road Connection, data related to socio-economic and environmental impacts was also examined. In regards to potential historic impacts to properties eligible or potentially eligible for the National Register of Historic Places (NR), local historic landmarks and adverse impacts requiring mitigation, it was found that the alternative would have a direct impact on one historic property that is eligible for the NR (a Section 4(f) issue), the Ullery/Farneman House, which is located on the west side of existing US 31 just south of Kern Road. The alternative would also have direct impacts on two properties that are potentially eligible for the NR as well as adverse effects on several properties that would require mitigation. In regards to socio-economic impacts, it was found that the alternative would directly impact the St. Joseph County Fairgrounds, would require from 1.75 to 4 times more residential relocations than any other alternative and would have a total cost that was from 15% to 50% higher than any of the other alternatives. In regards to potential environmental impacts, it was found that the alternative slightly reduced forest and wetland impacts but it slightly increased farmland impacts.

Modified Alternative G – Ironwood Road Connection, as a stand-alone alternative, fails to address the first purpose and need for the project (i.e., reduced congestion). In order for the Alternative G – Ironwood Road Connection to adequately address the purpose of reducing congestion on the existing US 31, the residual traffic on US 31 requires further major roadway investment projects, besides the cost of the alternative itself, to achieve acceptable traffic operating conditions. These improvements include the widening of existing US 31 from a four-lane to a seven-lane section from Roosevelt Road to US 20 to reach a minimum LOS D and the widening of Ironwood Road from four to seven lanes from US 20 to SR 933 (Lincolnway) to reach a minimum LOS D. A combination of these two roadway investment projects along with the alternative would provide an acceptable LOS.

In Phase 2 of the screening process, it was found that while the wetland and forest impacts associated with Alternative G – Ironwood Road Connection were slightly less than those of the alternatives to be studied further. However, they were still higher than the wetland and forest impacts associated with the hybrid Alternative G-Es.

As discussed above, Alternative G – Ironwood Road Connection had a much higher associated total cost; higher residential relocations; higher potential historic impacts; including a Section 4(f) issue; and higher farmland impacts. Based on these considerations, FHWA and INDOT concluded that Alternative G – Ironwood Road Connection was not a reasonable alternative and was not added to the range of reasonable alternatives to be considered in the decision-making process.

Description of the Alternatives Selected for Detailed Study

Following the modifications made to the preliminary alternatives throughout the study process, as detailed above, the range of reasonable alternatives in the decision-making process was expanded to include the No-Build Alternative and four Freeway Alternatives Cs, Es, G-Cs and G-Es (see Figure ES.4.3).

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.

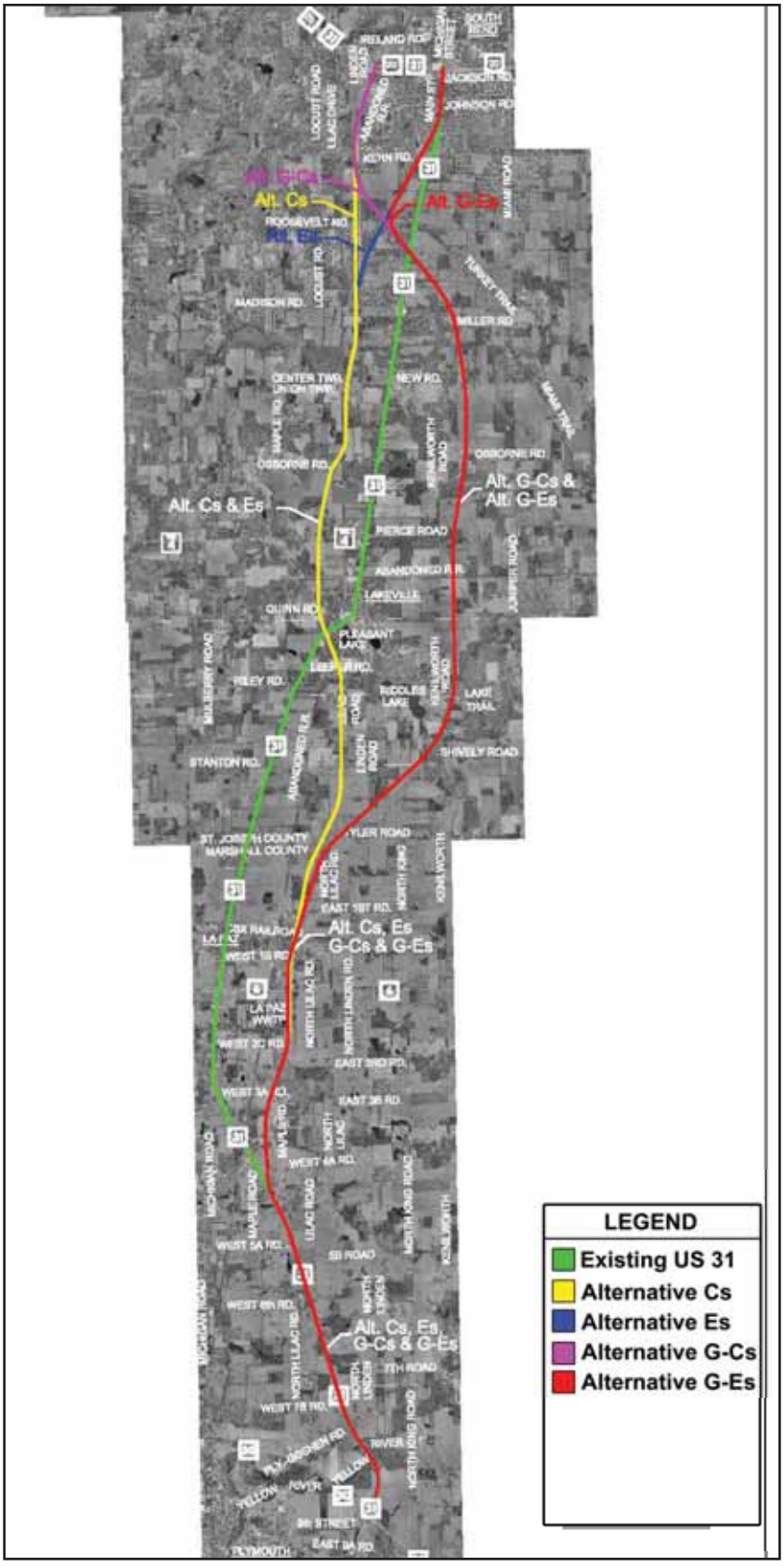

Figure ES.4.3: Preliminary Alternatives Cs, Es, G-Cs and G-Es

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 committed improvements will be completed independent of any decision regarding the improvement of US 31 from Plymouth to South Bend.

Even though the No-Build Alternative does not address the purpose and need for this project, it is carried forward and also serves as a baseline when comparing the effectiveness and potential impacts of other alternatives.

Alternative Cs (Freeway Alternative)

Alternative Cs begins at the existing US 31 and US 30 interchange, utilizing the existing cloverleaf configuration, and proceeds northward along the existing US 31 alignment to just south of West 4A Road in Marshall County, just south of LaPaz. It then continues northward on new alignment east of LaPaz and parallels existing US 31. Just south of Lakeville, in St. Joseph County, it crosses existing US 31 and continues northward, west of Lakeville, paralleling existing US 31. It 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. 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 or the modifications required at the existing US 31 and US 20 interchange. All anticipated interchange locations and types are conceptual and will be refined in later phases of the project development. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at the Marshall County proposed extension of 7th Road
- Diamond interchange at US 6 (with provisions for a potential future partial cloverleaf)
- Diamond interchange at SR 4 (Pierce Road)
- Diamond interchange at Kern Road
- Trumpet Interchange at US 20
- Modify existing interchange at existing US 31 and 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 14 grade separations along Alternative Cs, including an additional reconstruction of the existing grade separation at Linden Road over US 20 due to the addition of ramp lanes along US 20 associated with the new interchange; 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
- Lilac Road/West 6th Road
- West 4A Road

- West 3A Road
- East 1st Road
- Tyler Road
- Leeper Road
- Existing US 31 just south of Lakeville
- Quinn Road
- New Road
- Madison Road
- Roosevelt Road
- Johnson Road
- Linden Road over US 20 reconstruction

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 four 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 connection to existing US 31 near West 4A Road
- Maple Road connection to West 2C Road
- Quinn Trail connection to existing US 31
- Linden Road connection to Johnson 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 seven 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 terminated with a cul-de-sac would be:

- West 7B Road
- West 5A Road

- Existing US 31 near 4A Road
- West 2C Road
- West 1B Road
- Shively Road
- Osborne Road

In addition to the likely locations of interchanges, grade separations, and road closures, there would also be two grade separations for railroad crossings at the following locations:

- CSX Railroad on the north edge of LaPaz, between West 1B Road and East 1st Road
- Abandoned Railroad corridor just south of US 20

Alternative Es (Freeway Alternative)

Alternative Es begins at the existing US 31 and US 30 interchange, utilizing the existing cloverleaf configuration, and proceeds northward along the existing US 31 alignment to just south of West 4A Road in Marshall County, just south of LaPaz. It then continues northward on new alignment east of LaPaz and parallels existing US 31. Just south of Lakeville, in St. Joseph County, it crosses existing US 31 and continues northward, west of Lakeville, paralleling existing US 31. Just north of Madison Road the alternative assumes a northeasterly direction and ties into existing US 31 just north of Kern Road. It then terminates at the existing US 31 and US 20 interchange. It should be noted that Alternative Es between Kern Road and the US 31/US 20 interchange was modified to be an "at grade" facility and not an elevated roadway, constructed on retaining walls as presented in the DEIS.

The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses (grade-separations) or access closures. 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 of the project development. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at the Marshall County proposed extension of 7th Road
- Diamond interchange at US 6 (with provisions for a potential future partial cloverleaf)
- 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 16 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
- Lilac Road/West 6th Road
- West 4A Road
- West 3A Road
- East 1st Road
- Tyler Road
- Leeper Road
- Existing US 31 just south of Lakeville
- Quinn Road
- New Road
- Madison Road
- Roosevelt Road
- Main Street
- Johnson Road
- Johnson Road bridge over Main Street
- Jackson 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 seven 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 connection to existing US 31 near West 4A Road
- Maple Road connection to West 2C Road
- Quinn Trail connection to existing US 31
- Existing US 31 connection to Main Street north of Kern Road
- Existing US 31 connection to Hildebrand Street south of Johnson Road

- Connection between Johnson Road and W. Ritter Avenue to Main Street
- Main Street connection to Jackson 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 10 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 terminated with a cul-de-sac would be:

- West 7B Road
- West 5A Road
- Existing US 31 near 4A Road
- West 2C Road
- West 1B Road
- Shively Road
- Osborne Road
- Louise Drive
- Roycroft Road
- Jewell Avenue

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

Alternative G-Cs (Freeway Alternative)

Alternative G-Cs begins at the existing US 31 and US 30 interchange, utilizing the existing cloverleaf configuration, and proceeds northward along the existing US 31 alignment to just south of West 4A Road in Marshall County, just south of LaPaz. It then continues northward on new alignment east of LaPaz and parallels existing US 31. Just south of the Marshall-St. Joseph County line, the alternative assumes a northeasterly direction around the east side of Riddles Lake, where it then continues in a northerly direction bypassing Lakeville on the east and paralleling existing US 31. Near Miller Road, the alternative turns in a northwesterly direction and crosses to the west side of existing US 31 just south of Roosevelt Road. The alternative then turns in a northerly direction, paralleling existing US 31, 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. It is anticipated that there will be five new interchanges along Alternative G-Cs, not including the use of the existing interchange at US 30 and US 31 or modifications required at the existing US 31 and US 20 interchange. All anticipated interchange locations and types are conceptual and will be refined in later phases of the project development. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at the Marshall County proposed extension of 7th Road
- Diamond interchange at US 6 (with provisions for a potential future partial cloverleaf)
- Diamond interchange at SR 4 (Pierce Road)
- Diamond interchange at Kern Road
- Trumpet Interchange at US 20
- Modify existing interchange at existing US 31 and 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 14 grade separations along Alternative G-Cs, including an additional reconstruction of the existing grade separation at Linden Road over US 20 due to the addition of ramp lanes along US 20 associated with the new interchange; 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
- Lilac Road/West 6th Road
- West 4A Road
- West 3A Road
- East 1st Road
- Tyler Road
- Kenilworth Road
- Lake Trail
- New Road
- Miller Road
- Existing US 31 south of Kern Road

- Roosevelt Road
- Johnson Road
- Linden Road over US 20 reconstruction

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 four such public roads along Alternative G-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 connection to existing US 31 near West 4A Road
- Maple Road connection to West 2C Road
- North Lilac Road connection to Tyler Road
- Linden Road connection to Johnson 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 nine such public roads along Alternative G-Cs; however, the details of access will be refined as the project advances through the development phases. Roadways likely to lose access and be terminated with a cul-de-sac would be:

- West 7B Road
- West 5A Road
- Existing US 31 near 4A Road
- West 2C Road
- West 1B 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 two grade separations for railroad crossings at the following locations:

- CSX Railroad on the north edge of LaPaz, between West 1B Road and East 1st Road
- Abandoned Railroad corridor just south of US 20

Alternative G-Es (Freeway Alternative)

Alternative G-Es begins at the existing US 31 and US 30 interchange, utilizing the existing cloverleaf configuration, and proceeds northward along the existing US 31 alignment to just south of West 4A Road in Marshall County, just south of LaPaz. It then continues northward on new alignment east of LaPaz, paralleling existing US 31. Just south of the Marshall-St. Joseph County line, the alternative assumes a northeasterly direction east of Riddles Lake, and then continues north, east of Lakeville, paralleling existing US 31. Near Miller Road, the alternative turns in a northwesterly direction and crosses existing US 31 just south of Roosevelt Road. As the alternative approaches Kern Road, it assumes a northeasterly direction and ties into existing US 31, just north of Kern Road. It then follows existing US 31 northward and terminates at the existing US 31 and US 20 interchange location. It should be noted that Alternative G-Es between Kern Road and the US 31/US 20 interchange includes the same modifications as those made to Alternative Es to be an "at grade" facility and not an elevated roadway, constructed on retaining walls.

The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses (grade-separations), or access closures. It is anticipated that there will be five new interchanges along Alternative G-Es, not including the use of the existing interchange at US 30 and US 31 or modifications required at the existing US 31 and US 20 interchange. All anticipated interchange locations and types are conceptual and will be refined in later phases of the project development. Likely interchange locations and types would be:

- Utilize existing interchange at US 30
- Diamond Interchange at the Marshall County proposed extension of 7th Road
- Diamond interchange at US 6 (with provisions for a potential future partial cloverleaf)
- Diamond interchange at SR 4 (Pierce Road)
- Diamond interchange at Kern Road
- Reconstruction of the existing interchange at existing US 31 and 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 16 grade separations along Alternative G-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
- Lilac Road/West 6th Road
- West 4A Road
- West 3A Road

- East 1st Road
- Tyler Road
- Kenilworth Road
- Lake Trail
- New Road
- Miller Road
- Existing US 31 south of Kern Road
- Roosevelt Road
- Main Street
- Johnson Road
- Johnson Road bridge over Main Street
- Jackson 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 seven such public roads along Alternative G-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 relocation locations to an alternate site of access would be:

- Maple Road connection to existing US 31 near West 4A Road
- Maple Road connection to West 2C Road
- North Lilac Road connection to Tyler Road
- Existing US 31 connection to Main Street north of Kern Road
- Existing US 31 connection to Hildebrand Street south of Johnson Road
- Connection between Johnson Road and W. Ritter Avenue to Main Street
- Main Street connection to Jackson 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 10 such

public roads along Alternative G-Es; however, the details of access will be refined as the project advances through the development phases. Roadways likely to lose access and be terminated with a cul-de-sac would be:

- West 7B Road
- West 5A Road
- Existing US 31 near 4A Road
- West 2C Road
- West 1B Road
- Linden Road
- Rockstroth Road
- Quinn Road
- Osborne Road
- Jewell Avenue

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