



## 3.4 Identification of Alternatives Studied Further

A comparison of the four modified Freeway Build Alternatives recommended for further study was completed and is discussed in detail in Chapter 4, Affected Environment; Chapter 5, Environmental Consequences; Chapter 6, Mitigation; and Chapter 7, Section 4(f) Evaluation, of this Final Environmental Impact Statement (FEIS). As discussed in Section 3.3, Description of Alternatives Selected for Detailed Study, the following five alternatives were studied further (see Figure 3.4.29).

- No-Build Alternative
- Alternative Cs (Freeway Alternative)
- Alternative Es (Freeway Alternative)
- Alternative G-Cs (Freeway Alternative)
- Alternative G-Es (Freeway “hybrid” Alternative)

Based on the following findings, Alternatives Cs, Es, G-Cs and G-Es were identified as the alternatives studied in detail (see Figure 3.4.29). This FEIS was prepared following the Draft Environmental Impact Statement (DEIS) public comment period, the public hearing and additional fieldwork. Section 3.6, Selection of the Preferred Alternative, of this document discusses the process of identifying and describes the Preferred Alternative G-Es.

For each 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 (Pierce Road)
- SR 4 (Pierce Road) to Miller Road
- Miller Road to Roosevelt Road
- Roosevelt Road to US 20

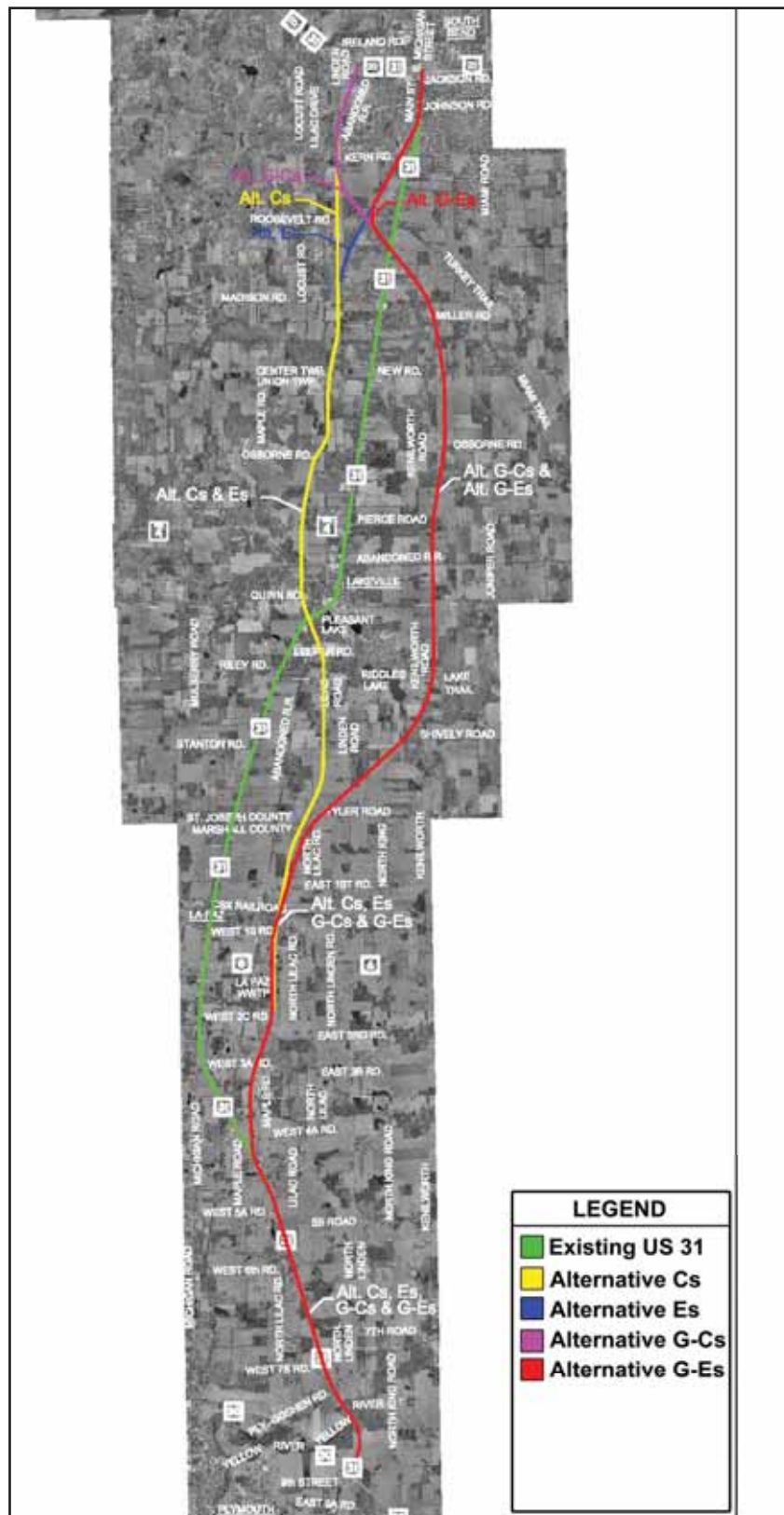


Figure 3.4.29: Preliminary Alternatives Studied in Detail – Alternatives Cs, Es, G-Cs and G-Es



#### 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 West 5A Road
- US 31 and Tyler Road
- US 31 and New Road
- US 31 and Madison Road
- US 31 and Roosevelt Road

Table 3.4.30 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 3.4.30 shows the extent to which each freeway alternative achieves an acceptable LOS in the year 2030 for the existing US 31 corridor from US 30 to US 20. Because the alternatives are four-lane freeways in the rural area with some six-lane urban 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 LOS 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 3.4.31. 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.

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 3.4.32 shows that the rankings for the alternatives.



Table 3.4.30: Future Traffic and LOS on Existing US 31 for the Alternatives Studied in Detail (Daily Traffic Volumes (LOS) in Year 2030 – Unacceptable LOS\* Shaded)

Alternative	Segments (location of daily volume reported)							
	Rural	Rural	Rural	Rural	Rural	Rural	Rural	Urban
	US 30 to Michigan Road (north of W6A Rd)	Michigan Road to US 6 (south of US 6)	US 6 to Tyler Road (south of Tyler Road)	Tyler Road to Lake Trail (south of S. Quinn Trail)	Lake Trail to SR 4 (north of Patterson Street)	SR 4 to New Road (south of New Road)	New Road to Roosevelt Road (south of Roosevelt Road)	Roosevelt Road to US 20 (north of Kern Road)
No-Build	21,215(C)	26,542(D)	23,279(F)	23,362(D)	29,691(F)	26,789(F)	29,445(F)	39,323 (F)
Alternatives Cs	512(A)	4,485(A)	2,695(A)	2,998(A)	5,327(A)	5,435(A)	7,681(A)	18,369(D)
Alternatives Es	514(A)	4,324(A)	2,530(A)	2,837(A)	5,227(A)	4,072(A)	6,684(A)	7,987(B)**
Alternatives G-Cs	612(A)	4,593(A)	3,885(A)	4,147(A)	5,441(A)	7,001(A)	9,407(B)	19,587(D)
Alternatives G-Es	426(A)	4,450(A)	3,193(A)	3,339(A)	3,355(A)	5,187(A)	7,990(A)	9,133(B)**

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

\*\* Volume south of Kern Road is shown because it is higher than north of Kern Road.

Source: US 31 Improvement Project Travel Demand Model for 2030 daily volumes.

Table 3.4.31: US 31 Residual Vehicle-Miles of Travel and Vehicle-Hours of Travel by Freeway Alternative (in Year 2030)

Alternative	VMT			VHT		
	Miles	% Change from No-Build	Rank	Hours	% Change from No-Build	Rank
No-Build	452,698			7,795		
Alternatives Cs	71,491	-84%	3	1,249	-84%	3
Alternatives Es	51,242	-89%	1	879	-89%	1
Alternatives G-Cs	87,897	-81%	4	1,528	-80%	4
Alternatives G-Es	58,901	-87%	2	1,004	-87%	2

Source: US 31 Improvement Project Travel Demand Model



Table 3.4.32: South Bend Metro Area Congested Vehicle-Miles of Travel and Vehicle-Hours of Travel by Freeway Alternative (in Year 2030)

Alternative	VMT with Unacceptable LOS			VHT with Unacceptable LOS		
	Miles	% Change from No-Build	Rank	Hours	% Change from No-Build	Rank
No-Build	2,397,910			66,479		
Alternatives Cs	2,379,539	-0.77%	3	66,246	-0.35%	3
Alternatives Es	2,386,746	-0.47%	4	66,312	-0.25%	4
Alternatives G-Cs	2,351,290	-1.90%	1	65,550	-1.40%	1
Alternatives G-Es	2,368,817	-1.20%	2	65,945	-0.80%	2

Source: US 31 Improvement Project Travel Demand Model for roadway segments with volume-to-capacity ratio greater than 0.70.

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 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

Table 3.4.33 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 3.4.33: Existing US 31 and South Bend Metro Area Reduction in Total Accidents by Freeway Alternative (In Year 2030)

Alternative	Existing US 31 Total Accidents			Metro Area Total Accidents		
	Crashes	% Change from No-Build	Rank	Crashes	% Change from No-Build	Rank
No-Build	346			11,153		
Alternative Cs	65	-81%	3	11,004	-1.34%	1
Alternative Es	42	-88%	1	11,021	-1.18%	3.5
Alternative G-Cs	79	-77%	4	11,006	-1.32%	2
Alternative G-Es	49	-86%	2	11,021	-1.18%	3.5

Source: US 31 Improvement Project Travel Demand Model

Table 3.4.34 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 lowest total crash rates.

Table 3.4.34: 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)

Alternative	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
Alternative Cs	15.91	29.05	5.78	81.82	79.81
Alternative Es	15.34	27.27	5.47	80.28	47.11
Alternative G-Cs	16.30	41.88	8.00	83.57	91.04
Alternative G-Es	15.79	34.42	6.44	51.53	56.02

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

A comparative summary of the socio-economic and environmental impacts of the four freeway alternatives, Alternatives Cs, Es, G-Cs and G-Es is contained in Table 3.4.35. Regarding the values contained in Table 3.4.35, the following should be noted:

- All costs are in millions of dollars and year 2005 dollars
- All values are based on a 300-foot total right-of-way with additional right-of-way required at interchange locations, at grade separations (overpasses and underpasses), and at other locations related to local access issues as is reflected in the footprint of the alternative



- Local Road Improvement Projects include preliminary engineering, right-of-way, and construction costs and are further discussed in Section 3.5
- Businesses Acquired includes large farming operations
- Estimated Farmed Wetlands are calculated as 2% of all Hydric Soils on agricultural land. The percentage is an estimate based on coordination with the Natural Resources Conservation Service (NRCS)

Table 3.4.35: Alternatives Studied in Detail

Socio-Economic/Environmental Measure	ALTERNATIVE				
	Cs	Es	G-Cs	G-Es	Final Pref. Alt. G-Es <sup>1</sup>
<b>COSTS (Total) (Mil. Of \$) (year 2005 dollars)</b>	<b>324.7 to 327.9</b>	<b>362.3 to 365.9</b>	<b>332.2 to 339.7</b>	<b>366.9 to 374.4</b>	<b>371.0 to 378.3</b>
Length (Miles)	19.5	19.9	20.3	20.5	20.5
No. of New Interchanges (Total Interchanges)	5 (7)	5 (6)	5 (7)	5 (6)	5 (6)
No. of Grade Separations (Overpass/Underpass)	16	16	16	16	16
No. of Grade Separations (Railroad Crossings)	2	1	2	1	1
CONSTRUCTION COSTS (Mil. of \$)	208.6 to 211.8	218.2 to 221.3	213.4 to 220.9	221.7 to 228.7	223.2 to 230.2
RECONSTRUCTION of US 20 Right-of-Way & Construction (Mil. of \$)	29.6	21.1	29.6	21.1	21.1
LOCAL & STATE ROAD IMPROVEMENT PROJECTS Right-of-Way & Construction (Mil. Of \$)	3.6	11.5	5.8	13.7	13.6
US 31 MAINLINE RIGHT-OF-WAY COSTS (Mil. of \$)	44.7	70.7	47.1	70.9	72.5
ENGINEERING COSTS (Mil. of \$)	13.7	18.1	13.9	18.3	18.3
UTILITY RELOCATION COSTS (Mil. of \$)	17.2	17.2	17.2	17.2	17.2
MITIGATION COSTS (Mil. of \$)	7.3	5.5 to 6.0	5.2	4.0 to 4.5	5.1 to 5.4
<b>TRAFFIC PERFORMANCE</b>					
Meet Purpose and Need	Yes	Yes	Yes	Yes	Yes
Performance (Compared to Other Alternatives, 1 is Best Performer)	3	1	4	2	2
<b>LAND USE</b>	<b>961 Ac.</b>	<b>968 Ac.</b>	<b>1,012 Ac.</b>	<b>1,011 Ac.</b>	<b>1,061 Ac.</b>
Agricultural (row crop)	390 Ac.	395 Ac.	504 Ac.	503 Ac.	537 Ac.
Commercial	15 Ac.	23 Ac.	16 Ac.	23 Ac.	23 Ac.
Church/Religious	2 Ac.	2 Ac.	2 Ac.	2 Ac.	2 Ac.
Herbaceous Cover	51 Ac.	48 Ac.	68 Ac.	52 Ac.	53 Ac.



Table 3.4.35: Alternatives Studied in Detail (Continued)

Socio-Economic/Environmental Measure	ALTERNATIVE				
	Cs	Es	G-Cs	G-Es	Final Pref. Alt. G-Es <sup>1</sup>
Open Water	<1 Ac.	<1 Ac.	<1 Ac.	<1 Ac.	<1 Ac.
Pasture	14 Ac.	12 Ac.	3 Ac.	4 Ac.	4 Ac.
Transportation	213 Ac.	220 Ac.	217 Ac.	222 Ac.	226 Ac.
Residential	51 Ac.	86 Ac.	55 Ac.	77 Ac.	82 Ac.
Scrub/Shrub	38 Ac.	46 Ac.	31 Ac.	36 Ac.	37 Ac.
Woodland (Wetland & Non-Wetland) (Forests)	186 Ac.	135 Ac.	115 Ac.	91 Ac.	96 Ac.
<b>RELOCATIONS</b>					
Residences Acquired	50	128	59	124	131
Businesses Acquired <sup>2</sup>	7	40	5	39	39
Businesses Damaged	5	13	5	13	13
Churches Acquired	1	1	1	1	1
<b>HISTORIC PROPERTIES (Listed or Eligible)</b>					
SECTION 4(f) PROPERTIES	0	0	0	0	0
PROPERTIES WITHIN A.P.E.	5	4	9	8	8
PROPERTIES ADVERSELY AFFECTED BUT NO SUBSTANTIAL LOSS OF INTEGRITY	0	0	1	1	1
<b>ARCHAEOLOGICAL SITES</b>					
Within Alignment	2	3	2	3	3
<b>TOTAL WETLANDS (NWI + FARMED)</b>	<b>51.6 Ac.</b>	<b>35.6 Ac.</b>	<b>30.7 Ac.</b>	<b>23.9 Ac.</b>	<b>29.93 Ac.<sup>3</sup></b>
<b>WETLANDS (From NWI Maps)</b>	<b>49.6 Ac.</b>	<b>33.7 Ac.</b>	<b>27.8 Ac.</b>	<b>21.1 Ac.</b>	
Forested	21.8 Ac.	17.8 Ac.	17.7 Ac.	14.8 Ac.	13.21 Ac.
Scrub/Shrub	3.0 Ac.	1.6 Ac.	1.4 Ac.	0.0 Ac.	1.45 Ac.
Emergent	24.0 Ac.	13.6 Ac.	8.7 Ac.	6.3 Ac.	15.27 Ac.
Aquatic Bed	0.8 Ac.	0.7 Ac.	0.0 Ac.	0.0 Ac.	0.0 Ac.
<b>ESTIMATED FARMED WETLANDS</b>	<b>2.0 Ac.</b>	<b>1.9 Ac.</b>	<b>2.9 Ac.</b>	<b>2.8 Ac.</b>	<b>0.44 Ac.<sup>4</sup></b>
<b>STREAM IMPACTS (No. of Impact Locations) (USGS)</b>	<b>18</b>	<b>19</b>	<b>18</b>	<b>17</b>	<b>17</b>
<b>WILDLIFE HABITAT AREAS</b>					
Potato Creek State Park & Swamp Rose Nature Preserve	0	0	0	0	0
Notable Wildlife Habitat (IDNR)	2	1	0	0	0
Classified Wildlife Habitat (IDNR)	4	3	0	0	0





Table 3.4.35: Alternatives Studied in Detail (Continued)

Socio-Economic/Environmental Measure	ALTERNATIVE				Final Pref. Alt. G-Es <sup>1</sup>
	Cs	Es	G-Cs	G-Es	
Classified Forest (IDNR)	2-3	2-3	1-2	1-2	1-2
Conservation Reserve Program (CRP) (NRCS)	1	2	2	1	1
Wetland Reserve Program (WRP) (NRCS)	1	1	0	0	0
Partners for Fish and Wildlife Program (USFWS)	2	1	0	0	0
<b>INDIRECT IMPACTS</b>					
Farmland	115 Ac.	50 Ac.	105 Ac.	45 Ac.	45 Ac.
Wetland	3 Ac.	3 Ac.	3 Ac.	3 Ac.	3 Ac.
Forests	30 Ac.	25 Ac.	10 Ac.	10 Ac.	10 Ac.

NOTES: The final impacts associated with Preferred Alternative G-Es are Shaded

1. Following the identification of Alternative G-Es as the Preferred Alternative, additional, in-depth studies were performed on the alternative. These additional studies included, but were not limited to, refinement of local access plan and proposed right-of-way requirements, wetland delineations, wetland quality evaluations, Phase 1a Archaeological Review, etc.
2. Businesses acquired include large farming operations
3. Delineations of wetlands resulted in 29.93 acres of wetlands impacted, of which, 25.51 acres of which were jurisdictional and 4.42 acres were isolated wetlands.
4. One farmed wetland area was identified. This area met the three U.S. Army Corps of Engineers wetland criteria and was considered an emergent wetland. This farmed wetland was included in the emergent wetland total.

It is important to again note that the US 31 Improvement Project has been a dynamic process. Similar impact information presented in previous sections of this document was from data and conceptual design parameters available at an earlier stage in the progress of the study. The study team has continued to collect and analyze data related to social and environmental impacts for each of the preliminary freeway alternatives under consideration, including detailed field reviews, throughout the study. 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 continually developed and the associated impacts updated. Impact information contained in previous tables may be slightly different than those contained in Table 3.4.35. Additionally, impact information contained in subsequent sections of this document will likely be different as additional information will be collected and design will be further developed.

South of Tyler Road, Alternatives Cs, Es, G-Cs and G-Es 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 Alternatives G-Cs and G-Es remain 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 20 interchange. Alternative Es terminates at the existing US 31 and US 20 interchange. Alternatives G-Cs and G-Es cross from the east side to the west side of existing US 31 just south of Roosevelt Road, where they then diverge. Alternative G-Cs 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. Alternative G-Es, as it approaches Kern Road, 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.



### ***Natural Resource Impacts***

Regarding wetland impacts, based on calculations from the National Wetland Inventory (NWI) Maps and an estimate of farmed wetland impacts, Alternative G-Es has the least amount of wetland impacts at 23.9 acres, followed by Alternative G-Cs at 30.7 acres, followed by Alternative Es at 35.6 acres, and then Alternative Cs with the highest amount at 51.6 acres. The No-Build Alternative would have no impact on this resource.

Wetland delineations were performed from the Preferred Alternative G-Es during July - October 2004. A total of 29.93 acres of wetland were delineated within the Preferred Alternative G-Es footprint. Representatives from the United States Army Corps of Engineers (USACE) and IDEM reviewed the potential wetland impacts for the Preferred Alternative G-Es during a field review on November 4-6, 2004. In a jurisdictional determination letter dated February 24, 2005, the USACE identified 25.51 acres as falling under federal jurisdiction and 4.42 acres as isolated wetlands. Isolated wetland impacts will likely fall under state jurisdiction under the Indiana Department of Environmental Management (IDEM) Isolated Wetlands Regulatory Program.

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 5.9.15). 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-Cs 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. Alternative G-Es is located east of and avoids this complex glacial drift area.

Regarding floodplain impacts and water crossings for this analysis, an interim version of the Indiana Department of Natural Resources Division of Water Digital Flood Insurance Rate Maps (DFIRM) was used to determine potential floodplain impacts. The purpose of this interim digital data is to provide much of the same information as the paper Federal Emergency Management Agency (FEMA) FIRM. Hard copy FEMA FIRM were also checked for floodplain impacts. Section 5.11, Floodplains, provides a more detailed analysis related to potential floodplain impacts associated with each of the alternatives studied in detail. Based on this analysis, Alternative Cs and Es have the least amount of potential floodplain impacts with 1,400 and 1,450 feet in length of impacts, respectively, along with 10.3 and 9.9 acres in area. Alternatives G-Cs and G-Es have similar potential floodplain impacts at 1,995 and 2,045 feet in length of impacts, respectively, along with 11.4 acres in area. Related to the floodplain impacts is the number of water crossings noted for each of the alternatives studied in detail. Alternative Es has the most stream impacts with 19, followed by Cs and G-Cs with 18. Alternative G-Es has 17 stream impact locations. The No-Build Alternative would have no impact on these resources.

### ***Agricultural Land/Farmland Impacts***

Regarding farmland impacts (agricultural, row crops), Alternatives Cs at 390 acres and Es at 395 acres impact essentially the same amount of farmland while Alternative G-Cs at 504 acres and Alternative G-Es at 503 acres would impact approximately 115 acres more than the other two alternatives studied in detail. The No-Build Alternative would have no impact on this resource.

### ***Purpose and Need***

Although Alternatives Cs, Es, G-Cs and G-Es 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 four 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 G-Es performs very similarly to Alternative Es 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. The difference between the performance of Alternatives Es and G-Es is that Alternative G-Es has a future daily traffic volume that is approximately 1,150 vehicles per day higher than that of Alternative Es (see Table 3.4.30).

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-Cs 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.

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.

## Other Considerations

### *Community Opinion:*

Meetings with the St. Joseph County Chamber of Commerce, business groups and local developers during the initial screening phase of the project indicated a general 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-Cs. 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 Alternatives Es and G-Es.

Additionally, local commercial development is expected in the area immediately north of US 20 and west of existing US 31 along Ireland Road. 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-Cs, would better serve this planned commercial development. This is confirmed in a letter from Mark N. Egan, CCE, President and CEO of the Chamber of Commerce of St. Joseph County, and contained in Appendix C.

Following publication of the DEIS, City of South Bend officials expressed concerns with Preliminary Alternative Es related to the proposed facility being an elevated roadway, constructed on retaining walls, from Kern Road northward to the US 31/US 20 interchange. Along with this, they were also concerned with local access to the subdivisions on the east and west sides of the alternative between Kern Road and the US 31/US 20 interchange. These concerns were expressed in two separate letters from the City of South Bend Mayor Stephen Luecke and contained in Appendix C.

Local officials in South Bend met with the Project Management Team on two occasions to discuss these concerns and potential modifications to the alternative to address these concerns. Through the course of discussions at these



meetings, modifications were made to the alternative as well as the local access plan that was in the best interests of both the City of South Bend and INDOT. These modifications included revising the alternative between Kern Road and the US 31/US 20 interchange to be an “at grade” facility and not an elevated roadway, constructed on retaining walls. A revised local access plan was also developed to improve north-south connectivity between Kern Road and Ireland Road, just north of US 20 as discussed in Section 3.5, Local Road Improvements. East-west connectivity across US 31 was improved with the addition of grade-separated crossings at Johnson Road and Jackson Road and the extension of Main Street southward, under the proposed US 31, to existing US 31 near Kern Road. Following these modifications to the alternative and the associated local access plan, City of South Bend officials expressed in a letter (see Appendix C) that they were prepared to support an alternative that terminates at the existing US 20 and US 31 interchange, Alternatives Es and G-Es, if chosen as the preferred route.

#### ***Compatibility with Local Land Use Plans:***

The Plymouth Comprehensive Plan includes the upgrade of US 31. There were 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 the DEIS. Instead of an interchange located at West 5A Road as was included in the DEIS, the Draft Plymouth Comprehensive Plan indicated an interchange to be located at 7<sup>th</sup> 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 was consistent with the DEIS. At both West 7B Road and Lilac Road/West 6<sup>th</sup> Road, the comprehensive plan recommends a road closure, which was consistent with the DEIS.

The Marshall County Thoroughfare Plan assumes the upgrade of existing US 31 throughout Marshall County. The alternatives under consideration each leave the existing US 31 alignment near West 4A Road, prior to the north border of Marshall County. The thoroughfare plan recommends the closure of West 5A Road, which was identified as an interchange location the DEIS. It also identifies a grade separation at West 4A Road. However, the DEIS identified 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. The local access plan contained in the DEIS recommended access across the new freeway for West 4A Road 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 was consistent with the DEIS.

Following publication of the DEIS, local officials in Marshall County and Plymouth expressed concerns with the local access plan associated with the preliminary alternatives within the county and met with the Project Management Team on two occasions to discuss these access issues. These issues focused on interchange, overpass/underpass and cul-de-sac locations. Through the course of discussions at these meetings, Marshall County, Plymouth and INDOT officials were able to modify the Marshall County local access plan and produce a plan that was in the best interest of both parties. The most significant change related to the revised Marshall County local access plan involved the elimination of a proposed interchange at West 5A Road and the addition of an interchange at 7<sup>th</sup> Road. This change in local access is consistent with the Marshall County Comprehensive Plan and the Plymouth Comprehensive Plan. No interchange had been proposed at the 7<sup>th</sup> Road location initially as no intersecting roadway currently exists at 7<sup>th</sup> Road and US 31. Due to the lack of a connecting roadway at the 7<sup>th</sup> Road interchange location, Marshall County officials made a written commitment to complete a 7<sup>th</sup> Road extension project that would begin at Michigan Road and extend eastward to the western limits of the proposed US 31 interchange at 7<sup>th</sup> Road. It would then begin on the east side of the proposed 7<sup>th</sup> Road interchange and continue eastward to 7<sup>th</sup> Road. This commitment included funding associated with preliminary engineering, environmental studies, right-of-way acquisition and construction costs. It is anticipated that Marshall County will utilize Federal funding for the construction of the 7<sup>th</sup> Road Extension Project, which will require the associated environmental evaluation



to follow the NEPA process. It should be noted that while the US 31 and 7th Road interchange, including the US 31 Bridge over 7th Road and the associated interchange ramps, is identified as a part of this EIS, the timing of the construction of the interchange is directly related to the timing of the construction of the 7th Road Extension Project. Construction of the interchange ramps that will provide access to and from US 31 at 7th Road will not be completed by INDOT prior to the completion of the 7th Road Extension NEPA process and the construction of the 7th Road Extension Project by the county.

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.

### ***Total Costs:***

Total costs associated with each of the four alternatives studied in detail range from \$324.7 to \$374.4 million. These preliminary total costs include construction costs associated with the alternative, required reconstruction of US 20, local road improvement projects, right-of-way costs and preliminary engineering (design) costs. The costs are in year 2005 dollars. Alternative Cs has the lowest total cost between \$324.7 and \$327.9 million. Alternative G-Cs has a total cost between \$332.2 and \$339.7 million. Alternative Es has a total cost between \$362.3 and \$365.9 million. Alternative G-Es has the highest total cost between \$366.9 and \$374.4 million.

A comparison of construction costs indicates that Alternative Cs has the lowest construction cost between \$208.6 and \$211.8 million. Alternatives G-Cs and Es have essentially the same construction costs with Alternative G-Cs between \$213.4 and \$220.9 million and Alternative Es between \$218.2 and \$221.3 million. Alternative G-Es has construction costs between \$221.7 and \$228.7 million. The difference in construction costs associated with the alternatives is largely due to the differences in length of the alternatives as the longest alternative, Alternative G-Es, is one mile longer than the shortest alternative, Alternative Cs.

Alternative Cs also has the lowest right-of way costs at approximately \$44.7 million. Even though Alternative G-Cs is a mile longer and has a higher construction cost, its right-of-way costs of approximately \$47.1 million are only slightly higher than Cs. Alternative Es and G-Es have the highest right-of-way costs at approximately \$70.7 and \$70.9 million, respectively. Differences in the right-of way costs are largely due to the number and type of relocations associated with each alternative.

Utility relocation costs associated with Alternatives Cs, Es, G-Cs and G-Es are estimated at \$17.2 million. An estimate of wetland, noise and stream mitigation costs associated with Alternative G-Es ranges from \$4.0 to \$4.5 million. Mitigation costs associated with Alternatives G-Cs and Es are similar and estimated at \$5.2 million and ranging from \$5.5 and \$6.0 million, respectively. Alternative Cs has the highest estimated mitigation costs at \$7.3 million.

Cost associated with the No-Build Alternative would only include cost for the capacity expansion projects that are programmed for construction.

### ***Residential/Commercial Relocations:***

Relocations for each of the four alternatives studied in detail vary as related to residential and commercial



relocations. Alternatives Es and G-Es have the highest number of residential relocations with 128 and 124, respectively. Alternative G-Cs has 59 residential relocations and Cs has the fewest at 50 residential relocations. Differences in commercial relocations indicate that Alternatives Es and G-Es are substantially higher than Cs and G-Cs, which have essentially the same number. Alternatives Es and G-Es impact a commercial corridor as they join existing US 31 from just north of Kern road to US 20. Commercial relocations for Alternative Es are 40 businesses acquired and 13 businesses damaged. Commercial relocations for Alternative G-Es are 39 businesses acquired and 13 businesses damaged. Alternative Cs has seven associated business relocations and five businesses damaged. Alternative G-Cs has the least impacts to businesses with five business relocations and five businesses damaged. The No-Build Alternative would have no impacts to residents or businesses beyond those associated with the programmed capacity expansion projects.

***Noise Impacts:***

Noise impacts for each of the four 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 78 residences, one business and four recreational areas, including two baseball and two soccer fields, impacted. It should be noted that approximately 30 of the residences impacted by Alternative Cs are in very close proximity to each other as they are all located within the Sun Communities Mobile Home Park off of Locust Road. Es impacts approximately 51 residences, three businesses and four recreational areas, including two baseball and two soccer fields. Alternative G-Cs impacts approximately 64 residences, no business and four recreational areas including two baseball and two soccer fields. Preferred Alternative G-Es impacts approximately 53 residences, two businesses and four recreational areas, including two baseball and two soccer fields. No-Build Alternative would have no noise impacts beyond those associated with the programmed capacity expansion projects.