



3.6 Selection of the Preferred Alternative

3.6.1 Identification of Preferred Alternative

The Preferred Alternative was selected through a multi-stage process that involved extensive analysis of traffic performance, environmental impacts and costs, as well as consideration of input from resource agencies, local elected and appointed officials and the public. Section 3.1, Preliminary Alternatives Analysis and Screening, described the screening process that was utilized in the Preliminary Alternatives Analysis and Screening and the Draft Environmental Impact Statement (DEIS) for this project. Section 3.2, Modifications to the Alternatives Recommended for Further Analysis, discussed modifications that were made to preliminary alternatives aimed at avoidance and minimization of impacts; consideration of alternatives not fully considered in the DEIS; and the evaluation of hybrid alternatives. Following the evaluation of alternatives, five alternatives remained for further review (See Figure 3.6.35):

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

It is important to note that the US 31 Improvement Project has been a dynamic process. The information contained in the following tables is from the information and conceptual design parameters available at each of the phases in the screening 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 is evident in the following tables.

The No-Build (or No Action) Alternative constitutes the existing roadway network of the year 2000 plus roadway projects completed since 2000 and those projects that are currently planned or committed for construction (referred to as the Existing-Plus-Committed, or “E+C” Transportation Network). It is assumed that these committed improvements will be completed independent of any decision regarding the improvement of US 31 from Plymouth to South Bend.

The No-Build Alternative includes “capacity expansion” projects in the South Bend Metropolitan Area (St. Joseph, Marshall and Elkhart counties) as reported in the Michiana Area Council of Governments (MACOG), the South Bend Area Metropolitan Planning Organization, 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 adds 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. Section 3.3.1 lists the carrying capacity projects that are included in the MACOG 2003-2005 TIP and in the INSTIP that constitutes the Existing-Plus-Committed Transportation Network.

The No-Build Alternative would not address the purpose and need for this project. Since it fails to add through traffic carrying capacity, it would not reduce congestion on US 31. Referring to Section 3.1, currently many

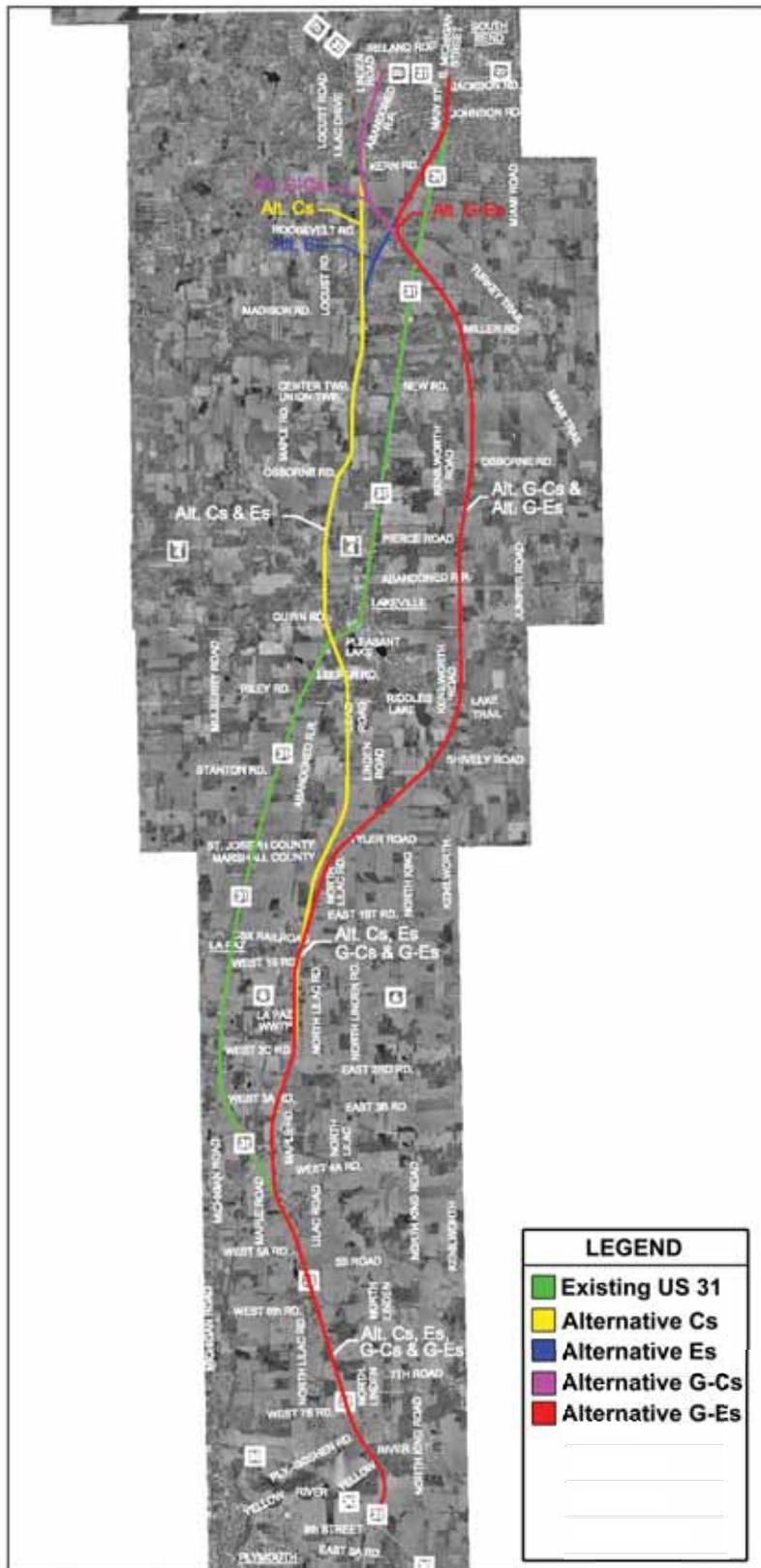


Figure 3.6.35: Preliminary Alternatives Studied in Detail – Alternatives Cs, Es, G-Cs and G-Es



segments of US 31 operate at an unacceptable LOS during a peak hour. Three of the four signalized intersections also operate at an unacceptable LOS. Referring to Section 3.4, by the year 2030, most of the segments and all four existing signalized intersections are projected to operate with unacceptable LOS. Additionally, the No-Build Alternative would not improve safety on US 31. Present and projected future crash rates on US 31 exceed the statewide averages for rural principal arterials from US 6 through LaPaz, through Lakeville, and from Lakeville to US 20. While the No-Build Alternative includes traffic-operational improvements at some intersections, it fails to address fundamental physical characteristics of existing US 31 that contribute to the above average accident rates when compared to similar facilities. Finally, the No-Build Alternative is not consistent with the INDOT 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors or with the MACOG Transportation Plan. With the No-Build Alternative, travel times and operating speeds along US 31 will continue to deteriorate over time such that the essential mobility function of US 31 suffers. This alternative would not have any direct impacts to the natural environment and would not require funds for construction.

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.

A comparison of the remaining freeway alternatives, Alternatives Cs, Es, G-Cs and G-Es identified different types of impacts related to each alternative. Some generalizations related to the impacts of the alternatives included (note that the generalizations are based on data shown in Table 3.6.39):

- The alternatives that were west of existing US 31 (Alternatives Cs, Es and the northern most portion of G-Cs) exhibited higher impacts to the natural environment, particularly wetlands and forests
- The alternatives that were east of existing US 31 (Alternatives G-Cs and G-Es) exhibited higher farmland impacts but had lower wetland and forest impacts
- The alternatives that utilized more of the existing US 31 corridor (Alternatives Es and G-Es) exhibited higher impacts to the human environment, particularly residential and business relocations
- The alternatives that utilized more of the existing US 31 corridor (Alternatives Es and G-Es) generally exhibited higher total costs than those that were largely new terrain corridors
- The alternatives that utilized more of the existing US 31 corridor (Alternatives Es and G-Es) were generally better traffic performers; however, all remaining freeway alternatives meet the project's purpose and need and the associated performance measures

It should be noted that the information contained in Table 3.6.39 is based on the best data available at the time that the preferred alternative was identified (September 2004). Section 3.6.2, Description of the Preferred Alternative, contains more detailed data related to the Preferred Alternative G-Es as more detailed studies were performed on the Preferred Alternative G-Es following its identification.



Table 3.6.39: Comparison of Preliminary Alternatives Cs, Es, G-Cs, G-Es, and Final Preferred Alternative G-Es

Socio-Economic/Environmental Measure	ALTERNATIVE				
	Cs	Es	G-Cs	G-Es	Final Pref. Alt. G-Es ¹
COSTS (Total) (Mil. Of \$) (year 2005 dollars)	324.7 to 327.9	362.3 to 365.9	332.2 to 339.7	366.9 to 374.4	371.0 to 378.3
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
TRAFFIC PERFORMANCE					
Meet Purpose and Need	Yes	Yes	Yes	Yes	Yes
Performance (Compared to Other Alternatives, 1 is Best Performer)	3	1	4	2	2
LAND USE	961 Ac.	968 Ac.	1,012 Ac.	1,011 Ac.	1,061 Ac.
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.				
Herbaceous Cover	51 Ac.	48 Ac.	68 Ac.	52 Ac.	53 Ac.
Open Water	<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.



Table 3.6.39: Comparison of Preliminary Alternatives Cs, Es, G-Cs,G-Es, and Final Preferred Alternative G-Es (Continued)

Socio-Economic/Environmental Measure	ALTERNATIVE				Final Pref. Alt. G-Es ¹
	Cs	Es	G-Cs	G-Es	
RELOCATIONS					
Residences Acquired	50	128	59	124	131
Businesses Acquired ²	7	40	5	39	39
Businesses Damaged	5	13	5	13	13
Churches Acquired	1	1	1	1	1
HISTORIC PROPERTIES (Listed or Eligible)					
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
ARCHAEOLOGICAL SITES					
Within Alignment	2	3	2	3	3
TOTAL WETLANDS (NWI + FARMED)	51.6 Ac.	35.6 Ac.	30.7 Ac.	23.9 Ac.	29.93 Ac.³
WETLANDS (From NWI Maps)	49.6 Ac.	33.7 Ac.	27.8 Ac.	21.1 Ac.	
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.
ESTIMATED FARMED WETLANDS	2.0 Ac.	1.9 Ac.	2.9 Ac.	2.8 Ac.	0.44 Ac.⁴
STREAM IMPACTS (No. of Impact Locations) (USGS)	18	19	18	17	17
WILDLIFE HABITAT AREAS					
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
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



Table 3.6.39: Comparison of Preliminary Alternatives Cs, Es, G-Cs, G-Es, and Final Preferred Alternative G-Es (Continued)

Socio-Economic/Environmental Measure	ALTERNATIVE				
	Cs	Es	G-Cs	G-Es	Final Pref. Alt. G-Es ¹
INDIRECT IMPACTS					
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, 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.

A comparative evaluation of the data contained in Table 3.6.39 above resulted in the identification of Alternative Cs as a Non-Preferred Alternative. The data contained in Table 3.6.39 indicated that the impacts associated with Alternatives Cs and G-Cs were very similar with respect to both social and environmental impacts, particularly costs, relocations and land use. A comparison of Alternatives Cs and G-Cs revealed that Alternative Cs had a slightly lower associated engineering (total) cost, slightly lower residential impacts and significantly lower agricultural (row crops) impacts. However, its associated business impacts were slightly higher and environmental impacts to wetlands and forests (woodland) were significantly higher than those associated with Alternative G-Cs. In fact, the impacts to wetlands and forests associated with Alternative Cs were the highest among the remaining freeway alternatives. **Alternative Cs was considered a Non-Preferred Alternative due to its higher relative environmental impacts to wetlands and forests while exhibiting similar impacts to residences and businesses.**

A comparative evaluation of the data contained in Table 3.6.39 above also resulted in the identification of Alternative Es as a Non-Preferred Alternative. The data contained in Table 3.6.39 indicated that the impacts associated with Alternatives Es and G-Es were very similar with respect to both social and environmental impacts, particularly costs, relocations and land use. A comparison of Alternatives Es and G-Es revealed that Alternative Es had slightly lower engineering (total) cost and significantly lower agricultural (row crops) impacts; however, its residential and business impacts were slightly higher and environmental impacts to wetlands and forests were significantly higher than those associated with Alternative G-Es. **Alternative Es was considered a Non-Preferred Alternative due to its higher relative environmental impacts to wetlands and forests while exhibiting similar impacts to residences and businesses.**

Following the initial comparative evaluation of the data contained in Table 3.6.39, Alternatives Cs and Es were identified as Non-Preferred Alternatives. Alternatives G-Cs and G-Es remained as alternatives to be further evaluated. These alternatives follow the same alignment from US 30 northward to near Roosevelt Road. From this point northward, Alternative G-Cs assumes a northwesterly direction and terminates approximately 1 mile west of the existing US 31 and US 20 interchange while Alternative G-Es assumes a northeasterly direction and terminates at the existing US 31 and US 20 interchange. Alternative G-Cs exhibited lower engineering (total) costs, relatively lower residential and business relocations, relatively higher environmental impacts to wetlands and forests, and



utilized very little of the existing US 31 alignment, making it a poorer traffic performer than Alternative G-Es. Alternative G-Es exhibited the lowest environmental impacts related to wetlands and forests, it utilized more of the existing US 31 alignment, making it a better traffic performer, and its engineering (total) costs and residential and business relocations were relatively higher.

As the process of identifying a single preferred alternative continued, the Federal Highway Administration (FHWA) and the Indiana Department of Transportation (INDOT) agreed that additional field data should be collected and analyzed, roadway engineering and associated costs should be refined and further developed and the human and natural environmental impacts should be re-assessed. Since Alternatives G-Cs and G-Es follow the same alignment from US 30 to near Roosevelt Road, FHWA and INDOT agreed that the additional studies in this area were not necessary at this time in the decision-making process, as impacts would be the same for each of the alternatives. Instead, the additional analysis focused on the area in which Alternatives G-Cs and G-Es did not follow a common alignment, essentially from Roosevelt Road northward to US 20. Some of the additional items included in the additional analysis of Alternatives G-Cs and G-Es from Roosevelt Road to US 20:

- Delineation and quality evaluation of wetland complexes and refinement of wetland impacts;
- Refinement of forest and farmland impacts;
- Further conceptual design and cost update for the US 31 and US 20 interchange associated with each of the alternatives including reconstruction of US 20 within the interchange limits;
- Further conceptual design and cost update of local access issues, particularly related to Alternative G-Es from Kern Road to US 20 and northward to Ireland Road;
- Refinement of residential and business relocations and the associated costs; and
- Determination of potential mitigation measures and estimation of associated mitigation costs;
 - Wetland Mitigation and Bridging of Wetlands;
 - Context Sensitive Solutions;
 - Noise Mitigation.

Table 3.6.40 contains the results of the additional analysis that focused on the area in which Alternatives G-Cs and G-Es did not follow a common alignment, essentially from Roosevelt Road northward to US 20.



Table 3.6.40: Comparison of Preliminary Alternatives G-Cs and G-Es		
SOCIO-ECONOMIC/ENVIRONMENTAL MEASURE	ALTERNATIVE	
	G-Cs	G-Es
COST (Without Mitigation) (Mil. Of \$) (Year 2005 Dollars)	309.8 to 317.3	345.7 to 352.7
CONSTRUCTION COSTS (Mil. Of \$)	213.4 to 220.9	221.7 to 228.7
RECONSTRUCTION OF US 20 RIGHT-OF-WAY & CONSTRUCTION (Mil. Of \$)	29.6	21.1
LOCAL & STATE ROAD IMPROVEMENT PROJECTS RIGHT-OF-WAY & CONSTRUCTION (Mil. Of \$)	5.8	13.7
US 31 MAINLINE RIGHT-OF-WAY COSTS (Mil. Of \$)	47.1	70.9
ENGINEERING (DESIGN) FEES (Mil. Of \$)	13.9	18.3
* MITIGATION COST (Mil. Of \$)	32.8 to 36.2	21.0 to 24.0
WETLAND MITIGATION (Mil. Of \$)	3.6 to 4.1	2.0 to 2.5
BRIDGING OF WETLANDS (Mil. Of \$)	10.7	0.0
CONTEXT SENSITIVE SOLUTIONS (Mil. Of \$)	16.8 to 19.7	17.5 to 20.0
NOISE MITIGATION (Mil. Of \$)	1.7	1.5
TOTAL PROJECT COSTS (Mil. Of \$)	342.6 to 353.5	366.7 to 376.7
TRAFFIC PERFORMANCE		
Meet Purpose and Need	Yes	Yes
Traffic Operational problems with US 31 and us 20 interchange	Yes	No
RELOCATIONS		
RESIDENCES ACQUIRED	58	124
** BUSINESSES ACQUIRED	5	39
BUSINESSES DAMAGED	5	13
CHURCHES ACQUIRED	1	1
*** WETLANDS (NWI + FARMED)	30.7 Acres	23.9 Acres
FORESTS	115 Acres	91 Acres
FARMLAND (ROW CROPS)	504 Acres	503 Acres

NOTES:

- * Wetland Mitigation Ratios are based off of the INDOT MOU signed January 28, 1991, and investigators professional judgment on quality. Costs estimates associated with Mitigation for Bridging Wetlands only include those areas north of Roosevelt Road.
- ** Businesses Acquired Include Large Farming Operations
- *** Wetland Impacts are from NWI Maps and 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).



A comparative evaluation of the data contained in Table 3.6.40 resulted in the identification of Alternatives G-Cs as a Non-Preferred Alternative and Alternative G-Es as the Preferred Alternative. Alternative G-Cs had lower associated total project cost and lower residential and business impacts than those associated with Preferred Alternative G-Es. While residential and business impacts associated with Preferred Alternative G-Es are higher than those for Alternative G-Cs, Chapter 6.1 – Relocation Assistance, states that it appears that there is sufficient availability of comparable housing to accommodate the expected number of residential relocations. Chapter 6.1 – Relocation Assistance, also states that the availability of commercial real estate is most prevalent in the South Bend area at the north end of the corridor (near the US 20 Bypass) and that there appears to be adequate availability of commercial property. It is anticipated that there will be opportunities for many of the relocated businesses to rebuild in the same general vicinity with little or no loss in business in the long term.

The traffic performance of Alternative G-Cs was not as good as Preferred Alternative G-Es. Alternative G-Cs utilized very little of existing US 31, although it did meet the purpose and need of the project and the associated performance measures. As a more detailed conceptual design of the interchange of Alternative G-Cs with US 20 developed (see Figure 3.6.36), engineers expressed concerns with operational problems associated with the interchanges proximity to the existing US 31 and US 20 interchange. The operation problems associated with the interchange configuration focused on insufficient traffic weaving lengths for several traffic movements. Traffic weaving lengths are essentially a distance that a driver has to weave through other lanes of traffic in order to get to an appropriate lane that allows the traffic movement that a driver desires. Inadequate weaving lengths or lengths near minimum allowable values tend to lead to traffic congestion and generally less safe driving conditions as driver actions become less predictable. The proposed interchange at US 20 for Preferred Alternative G-Es consists of the reconstruction of the existing interchange (see Figure 3.6.37) and did not exhibit operational problems.

The associated environmental impacts to wetlands and forests for Alternative G-Cs were higher than those for Preferred Alternative G-Es. Alternative G-Cs had severe impacts on several high quality wetland complexes located north of Roosevelt Road, south of US 20 and west of existing US 31. Wetlands in this portion of the study area are among the highest quality wetland complexes within the entire study area. Impacts to these wetland complexes would be very difficult to mitigate as they are in many cases forested wetlands that cannot be reconstructed and take many years to develop. Bridging of these wetlands as a mitigation measure was evaluated but this method of mitigation is relatively expensive and often still results in the destruction of considerable amounts of forested wetlands. By utilizing the existing US 31 alignment north of Kern Road, Preferred Alternative G-Es does not impact these high quality wetland complexes. In comments received during the DEIS Public Comment Period, the U.S. Environmental Protection Agency (USEPA) emphasized the importance of selecting a preferred alternative in accordance with the wetlands permitting requirements under Section 404 of the Clean Water Act. In particular, the USEPA mentioned the need to ensure consistency with the Section 404(b)(1) Guidelines, which require (in the context of Section 404 permit decisions) selection of the “least environmentally damaging practicable alternative” or “LEDPA” (See Appendix T for Section 404(b)(1) LEDPA analysis). This alternative would also have resulted in a higher loss of forestland and the fragmentation of forest habitat.

Alternatives G-Cs and G-Es have their own unique impacts (see Table 3.6.40). The No-Build Alternative has no impacts but does not address the needs of the project. Alternative G-Cs had the lowest associated total project cost and the lower residential and business impacts. It was generally a poorer traffic performer, had operational problems associated with its interchange at US 20 and had high environmental impacts to wetlands and forests. Due to this,

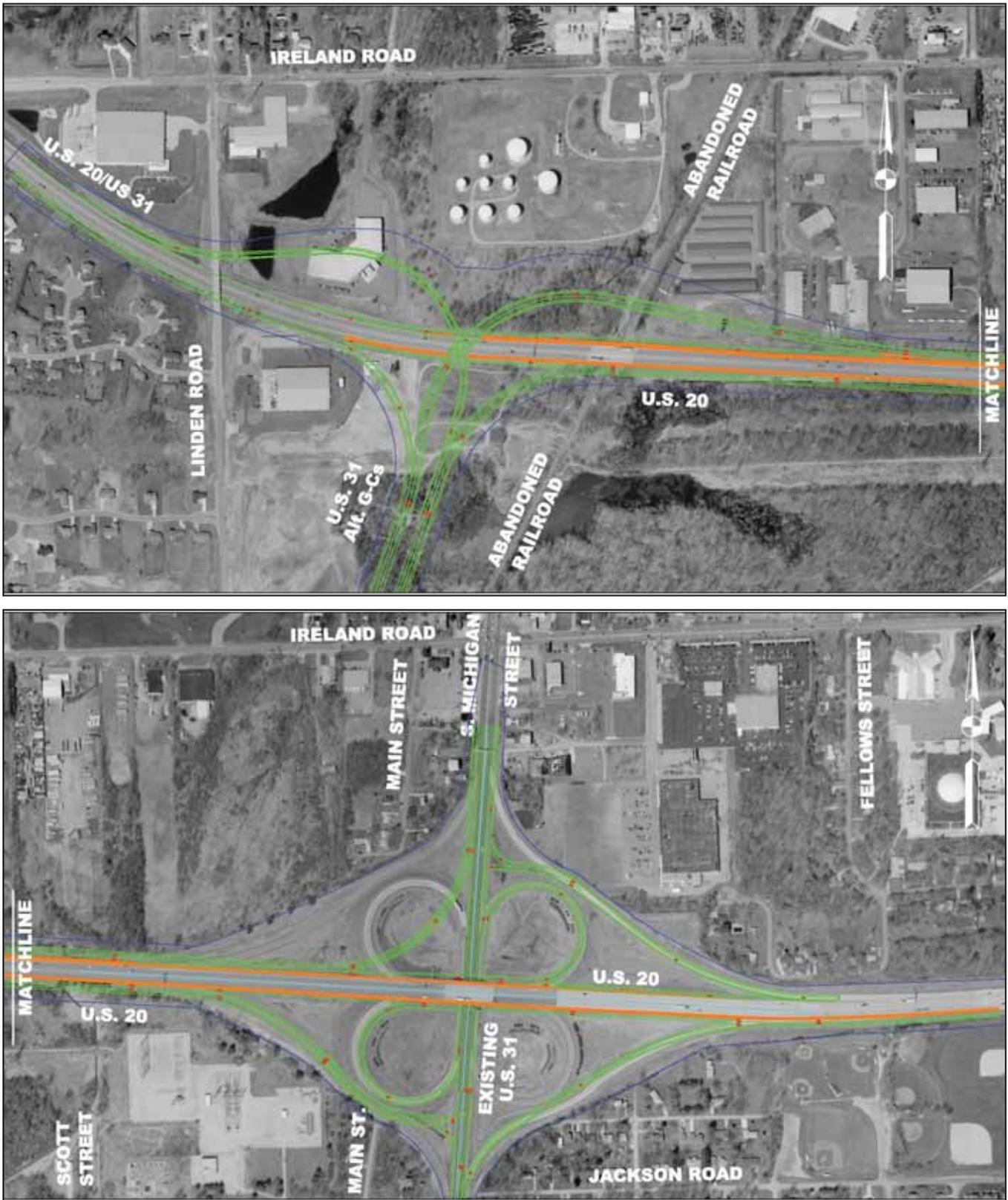


Figure 3.6.36: Proposed Interchange at Alternative G-Cs and US 20

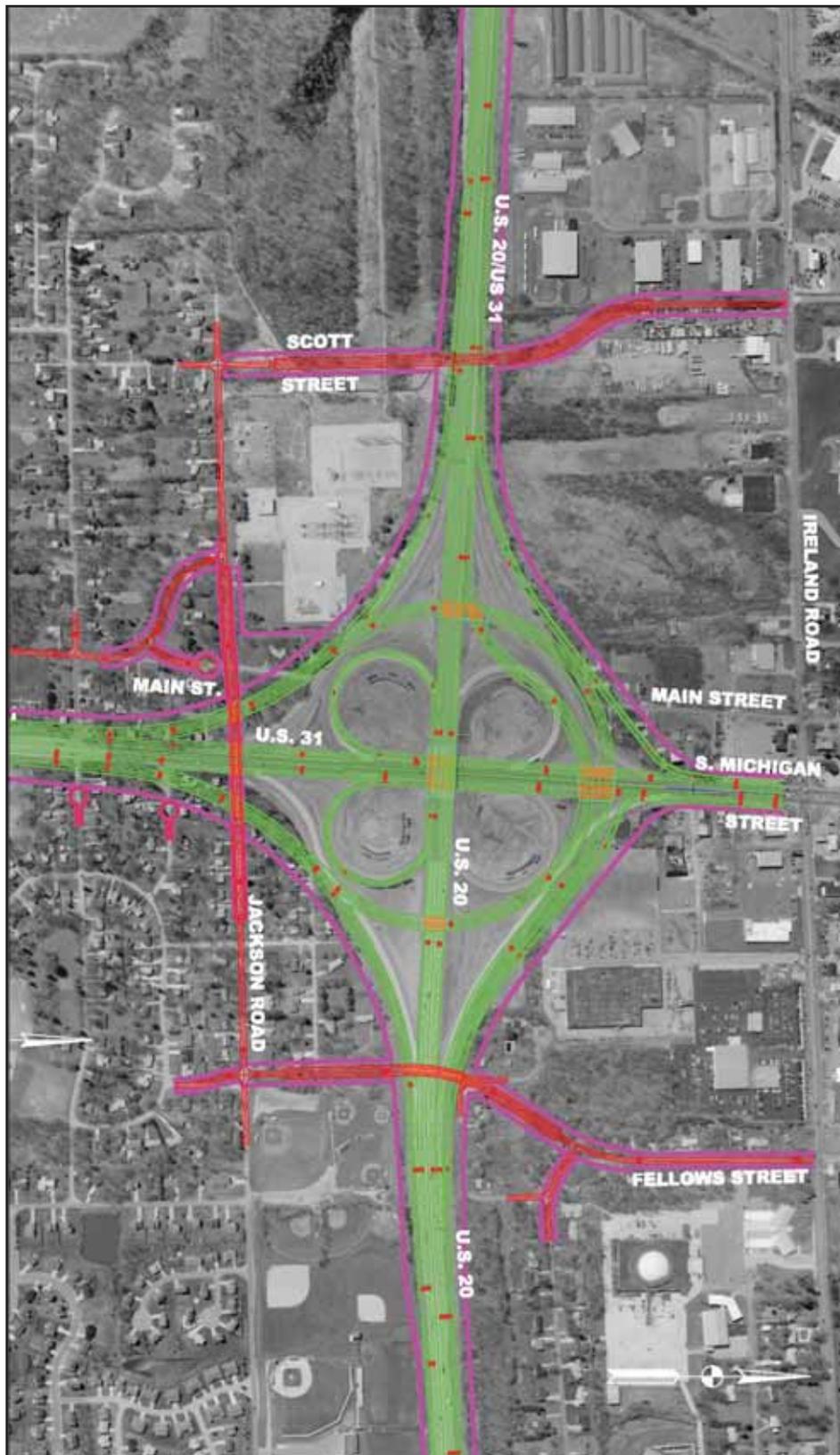


Figure 3.6.37: Proposed Interchange at Alternative G-Es and US 20



Alternative G-Cs is considered a Non-Preferred Alternative. While Alternative G-Es had a higher associated total project cost and higher residential and business impacts, it was a better traffic performer and did not exhibit operational problems associated with its interchange at US 20. Alternative G-Es also has lower environmental impacts to wetlands and forests and meets the Section 404(b)(1) Guidelines that require selection of the “least environmentally damaging practicable alternative”.

3.6.2 Description of the Preferred Alternative

Preferred Alternative G-Es (see maps contained in Appendix A) 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 departs the existing US 31 alignment and 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, Preferred Alternative G-Es turns in a northwesterly direction and crosses existing US 31 just south of Roosevelt Road. As the Preferred Alternative G-Es approaches Kern Road, it assumes a northeasterly direction and ties into existing US 31. It then uses the existing US 31 alignment northward and terminates at the existing US 31 and US 20 interchange location. Proposed interchange locations include the use of the existing interchange at US 30, new interchanges at the proposed extension of 7th Road, and at US 6 in Marshall County; as well as at Pierce Road (extension of SR 4), at Kern Road and a reconfiguration of the existing US 31 and US 20 interchange (see Appendix S) in St. Joseph County. The alternative is approximately 20.5 miles in length.

A comparison of the four modified Freeway Build Alternatives recommended for further study, Alternative Cs, Es, G-Cs and G-Es 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). Also contained in these chapters is a more comprehensive discussion of the impacts associated with the Preferred Alternative G-Es. 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. Table 3.6.41 summarizes some of the impacts related to Preferred Alternative G-Es and further described in Chapters 5, 6 and 7.



Socio-Economic/Environmental Measure		ALTERNATIVE G-Es
COSTS (Total) (Mil. Of \$) (year 2005 dollars)		371.0 to 378.3
Length (Miles)		20.5
No. of New Interchanges (Total Interchanges)		5 (6)
No. of Grade Separations (Overpass/Underpass)		16
No. of Grade Separations (Railroad Crossings)		1
CONSTRUCTION COSTS (Mil. of \$)		223.2 to 230.2
RECONSTRUCTION of US 20 Right-of-Way & Construction (Mil. of \$)		21.1
LOCAL & STATE ROAD IMPROVEMENT PROJECTS Right-of-Way & Construction (Mil. Of \$)		13.6
US 31 MAINLINE RIGHT-OF-WAY COSTS (Mil. of \$)		72.5
ENGINEERING COSTS (Mil. of \$)		18.3
UTILITY RELOCATION COSTS (Mil of \$)		17.2
MITIGATION COSTS (Mil of \$)		5.1 to 5.4
TRAFFIC PERFORMANCE		
Meet Purpose and Need		Yes
Performance (Compared to Other Alternatives (Cs, Es and G-Cs), 1 is Best Performer)		2
LAND USE		1,061 Ac.
Agricultural (row crop)		537 Ac.
Commercial		23 Ac.
Church/Religious		2 Ac.
Herbaceous Cover		53 Ac.
Open Water		<1 Ac.
Pasture		4 Ac.
Transportation		226 Ac.
Residential		82 Ac.
Scrub/Shrub		37 Ac.
Woodland (Wetland & Non-Wetland) (Forests)		96 Ac.
RELOCATIONS		
Residences Acquired		131
Businesses Acquired ¹		39
Businesses Damaged		13
Churches Acquired		1



Table 3.6.41: Impacts Associated with Preferred Alternative G-Es (Continued)

Socio-Economic/Environmental Measure	ALTERNATIVE G-Es
HISTORIC PROPERTIES (Listed or Eligible)	
SECTION 4(f) PROPERTIES	0
PROPERTIES WITHIN A.P.E.	8
PROPERTIES ADVERSELY AFFECTED BUT NO SUBSTANTIAL LOSS OF INTEGRITY	1
ARCHAEOLOGICAL SITES	
Within Alignment	3
TOTAL WETLANDS (DELINEATED)²	29.93 Ac.
Forested	13.21 Ac.
Scrub/Shrub	1.45 Ac.
Emergent	15.27 Ac.
Aquatic Bed	0.0 Ac.
ESTIMATED FARMED WETLANDS³	0.44 Ac.
STREAM IMPACTS (No. of Impact Locations) (USGS)	17
WILDLIFE HABITAT AREAS	
Potato Creek State Park & Swamp Rose Nature Preserve	0
Notable Wildlife Habitat (IDNR)	0
Classified Wildlife Habitat (IDNR)	0
Classified Forest (IDNR)	1-2
Conservation Reserve Program (CRP) (NRCS)	1
Wetland Reserve Program (WRP) (NRCS)	0
Partners for Fish and Wildlife Program (USFWS)	0
INDIRECT IMPACTS	
Farmland	45 Ac.
Wetland	3 Ac.
Forests	10 Ac.

NOTES:

1. Businesses Acquired Include Large Farming Operations
2. 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.
3. 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.



The Preferred Alternative G-Es is a freeway alternative that will have full access control. Control of access refers to the regulation of public access rights to and from properties abutting the highway. With full control of access, preference is given to through traffic on US 31 by providing access connections with selected public roads only at interchanges, by prohibiting crossings at grade utilizing stop controlled or traffic signalized intersections, and by prohibiting direct private and commercial driveway connections.

The alignment of the alternative, as with all of the alternative that were evaluated for this study, is based on the guidelines established by the American Association of State Highway and Transportation Officials (AASHTO) in *A Policy on Geometric Design of Highways and Streets, 2001*, and supplemented by the INDOT Road Design Manual. The proposed facility is to provide a highway designed to freeway design standards and would be signed and identified as US 31.

Typical cross sections were developed for the determination of costs and potential impacts to environmental resources. Typical cross sections for the portion of the study considered rural, from US 30 to Kern Road, are shown in Figures 3.6.38 and 3.6.39. Typical cross sections for the portion of the study area considered urban, from Kern Road to US 20, are shown in Figures 3.6.40 and 3.6.41.

Refined roadway typical cross sections, as approved by INDOT, will be determined during subsequent project design phases. For use in this study, the rural section of the Preferred Alternative G-Es from US 30 to just south of West 4A Road in Marshall County is shown in Figure 3.6.38. This segment consists of an upgrade of existing US 31 and the rural typical section will consist of a four-lane freeway with two lanes in each direction. It will have a depressed grass median that will vary in width from 50 to 76 feet from north of the US 30 interchange to the bridge over the Yellow River. The grass median will be 76 feet north of the Yellow River Bridge. It will have 4-foot paved inside shoulders, 12-foot paved outside shoulders, on a total of approximately 300 feet of right-of-way, with a design speed of 70 mph. The existing median in this segment was widened to a total of 84 feet in order to provide adequate room for the potential expansion of the facility to a six-lane freeway, with three lanes in each direction. This would be accomplished, if warranted by future traffic volumes, with the addition of the third lane in the median of both the northbound and southbound sides and would result in a 60-foot (required minimum median width) grass median following the expansion.

The rural section of the Preferred Alternative G-Es from just south of West 4A Road in Marshall County to the proposed interchange at Kern Road in St. Joseph County is shown in Figure 3.6.39. In this segment, the rural typical section will consist of a four-lane freeway with two-lanes in each direction. It will have an 76-foot depressed grass median width, 4-foot paved inside shoulders, 12-foot paved outside shoulders, on a total of approximately 300 feet of right-of-way, with a design speed of 70 mph. The median in this segment was widened to a total of 84 feet in order to provide adequate room for the potential expansion of the facility to a six-lane freeway, with three lanes in each direction. This would be accomplished, if warranted by future traffic volumes, with the addition of the third lane in the median of both the northbound and southbound sides and would result in a 60-foot (required minimum median width) median following the expansion.

The section of the Preferred Alternative G-Es between Kern Road and US 20 is considered an urban section as shown in Figures 3.6.40 and 3.6.41. The urban section of the Preferred Alternative G-Es between the Kern Road interchange and the Johnson Road overpass is shown in Figure 3.6.40. In this segment, the urban typical section will consist of an eight-lane freeway with four lanes in each direction. This section will have a 30.5-foot depressed grass median, 12-foot paved inside shoulders, 14-foot paved outside shoulders with concrete median barrier, on a total of approximately 300 feet of right-of-way, with a design speed of 55 mph. The median width in this section is sufficient for an additional future travel lane.

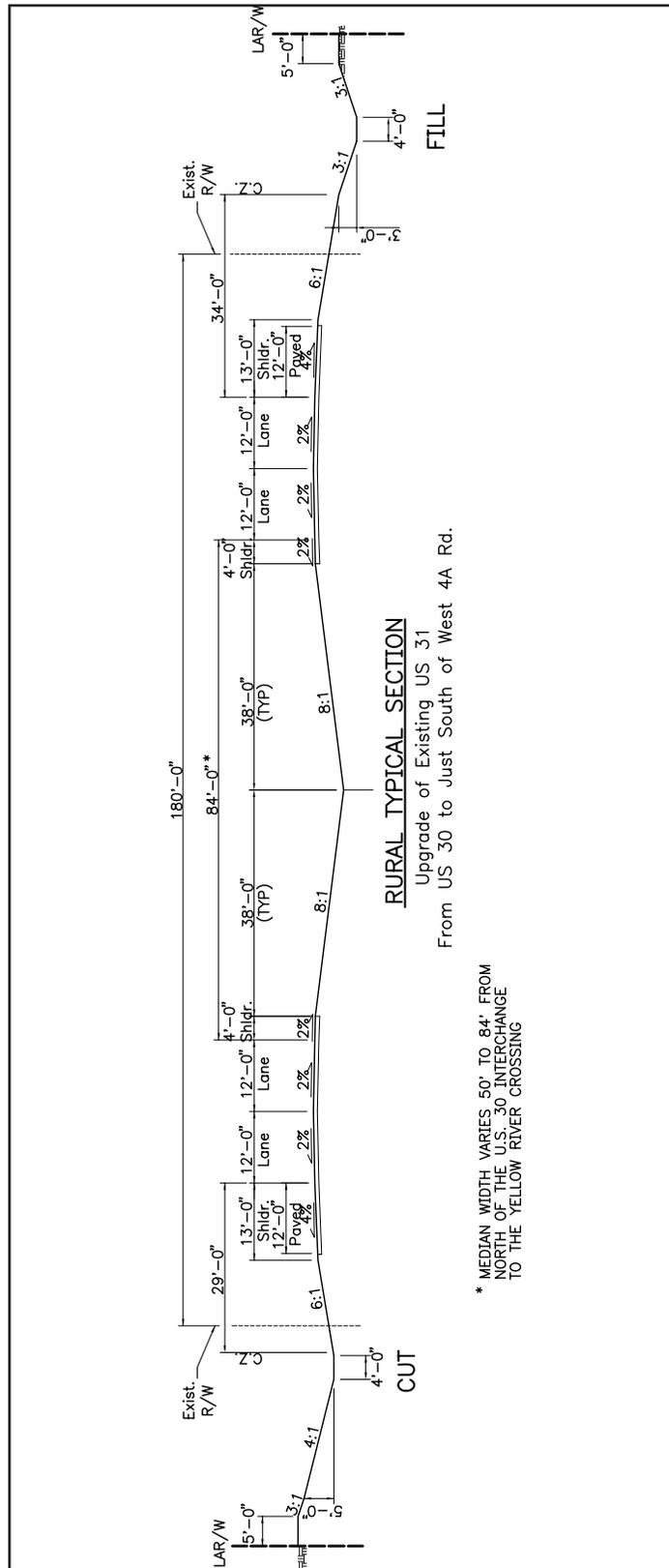


Figure 3.6.38: Rural Typical Section (From US 30 to Just South of West 4A Road)

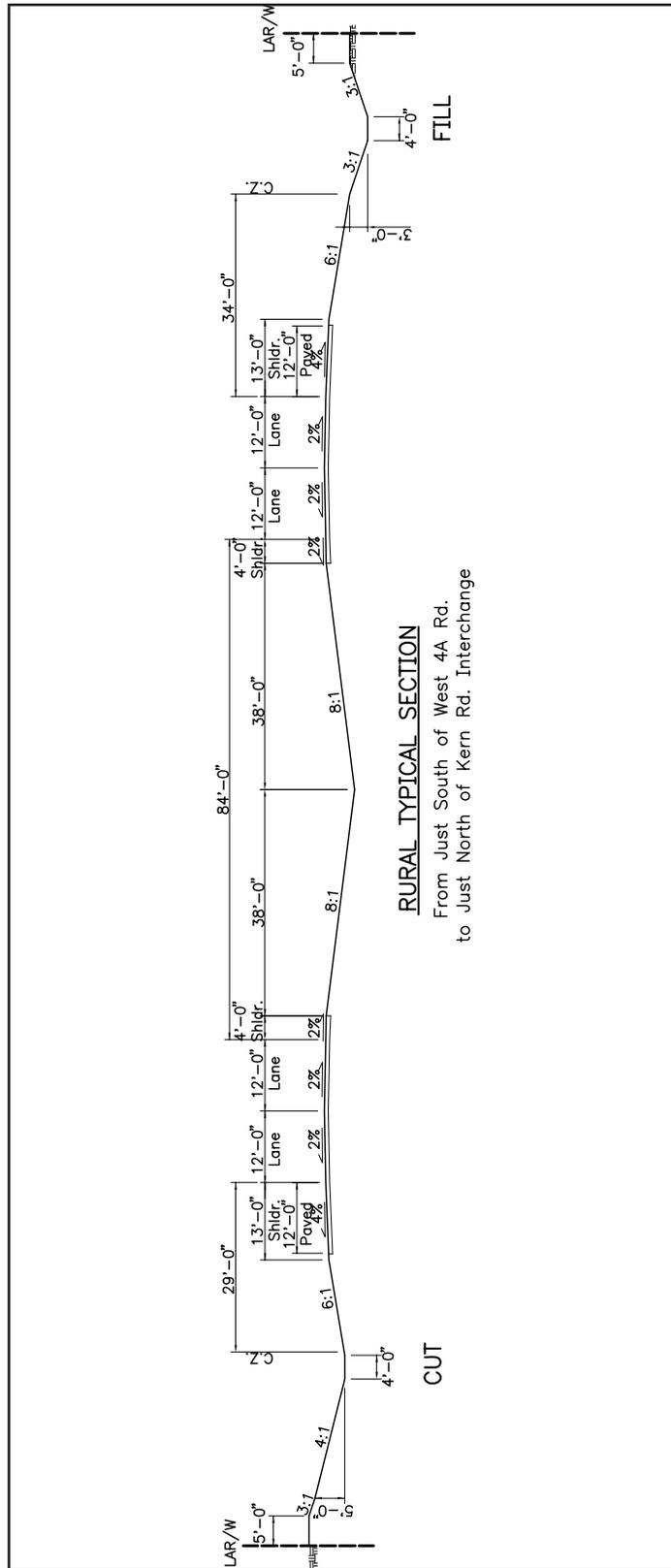


Figure 3.6.39: Rural Typical Section (From Just South of West 4A Road to Just North of the Kern Road Interchange)



The urban section of Preferred Alternative G-Es between Johnson Road and the US 20 interchange is shown in Figure 3.6.41. In this segment, the urban typical section will have five through lanes (three northbound through lanes and two southbound through lanes). In addition to these through lanes, five auxiliary lanes will also be provided, (two northbound and three southbound auxiliary lanes). This section will have a 30.5-foot depressed grass median, 12-foot paved inside shoulders, 14-foot paved outside shoulders with concrete median barrier, on a total of approximately 300 feet of right-of-way, with a design speed of 55 mph. The median width in this section is sufficient for an additional future travel lane.

The topography of the land traversed by a roadway project such as this has an influence on both the horizontal and vertical alignment. Topography in the north-central region of the State of Indiana, in which this project is located, is typically classified as level terrain. In geographic areas that exhibit level terrain characteristics, highway sight distances, as governed by both horizontal and vertical restrictions, are generally long or can be made to be so without construction difficulty or major expense. Right-of-way limits associated with level terrain are generally more consistent and smaller than areas exhibiting rolling or mountainous terrain. Considering the level terrain traversed by this project and proposed typical cross sections to be utilized throughout the length of the alternative (see Figures 3.6.38 through 3.6.41), a 300-foot wide corridor was established for the Preferred Alternative G-Es. Additional right-of-way will be 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. In the absence of detailed survey data, horizontal and vertical alignments, based on the centerline of the relevant 300-foot wide corridor of the Preferred Alternative G-Es, were approximated using U.S. Geological Survey (USGS) Maps and aerial photography. Contour lines on USGS Maps are at 5-foot intervals. Based upon these intervals, the alignment and 300-foot wide corridor developed from them, aerial photography and proposed typical cross sections should be considered conceptual designs only, and do not represent final design. During the final design process that will follow the completion of this study, a field survey will be completed and construction limits and actual right-of-way requirements will be determined.

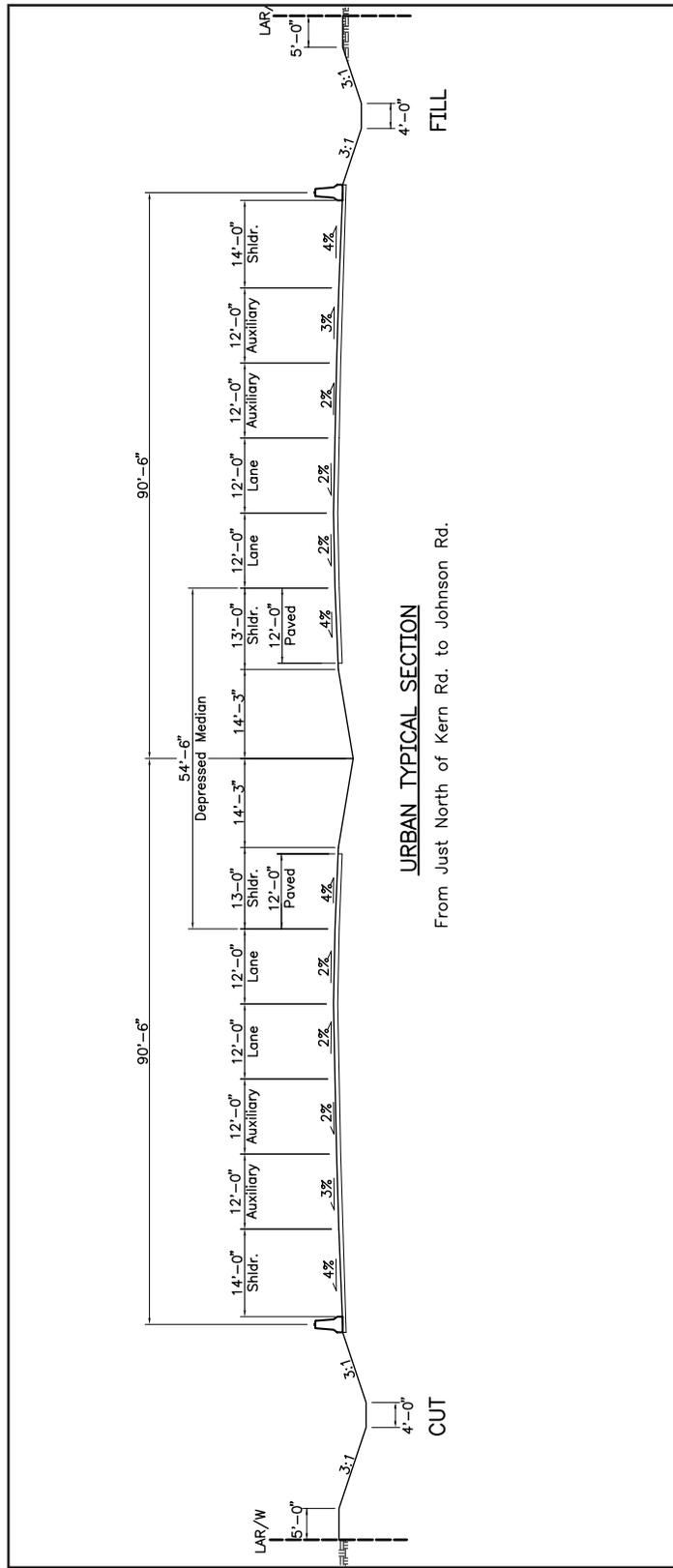


Figure 3.6.40: Urban Typical Section (From Just North of the Kern Road Interchange to Johnson Road)

