



Chapter 6: Mitigation

6.1 Relocation Assistance

All acquisitions and relocations required by this project will be completed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended, 49 CFR (Code of Federal Regulations) 24, and Title VI of the Civil Rights Act of 1968. No person displaced by this project will be required to move from a displaced dwelling unless comparable replacement housing is available to that person. INDOT will take required actions to ensure fair and equitable treatment of persons displaced as a result of this project up to and including providing replacement housing of last resort as defined in 49 CFR 24 Section 24.404. Relocation resources for this project are available to those relocated residents and businesses without discrimination. Advisory services will be made available to farms and businesses, with the aim of minimizing the economic harm to those businesses and farm establishments.

No known or unique relocation situations are anticipated. If a displaced resident cannot be relocated due to the unavailability of comparable housing, or because comparable housing is not available within the statutory limit of the Uniform Relocation Act, then housing of last resort will be made available to these persons. Last resort housing includes, but is not limited to, rental assistance, additions to existing replacement dwellings, construction of new dwellings, and dwelling relocation. Replacement dwellings must meet the requirements of decent, safe, and sanitary standards as established by the Federal Highway Administration (FHWA).

Relocation resources would be available to all residential relocatees without regard to race, creed, color, sex, national origin, or economic status, as required by the Uniform Act and Title VI of 1964. Financial assistance will be available to eligible persons displaced by this project. Payments received are not considered as income under the provisions of the Internal Revenue Code of 1954, or for the purposes of determining any person's eligibility or the extent of eligibility for assistance under the Social Security Act or any other federal law.

The single-family homes to be acquired by any of the three alternatives represent a wide range of values. The following information was taken from multiple listing services and local publications to determine the availability of replacement housing in the St. Joseph and Marshall County areas. Generally, about 60% of the homes on the market have three or more bedrooms. In addition, it appears that there is sufficient available housing to accommodate the expected number of relocations.

Out of the three alternatives, Alternative Es has the most residential relocations at 90, while Alternative Cs and G-C require the relocation of 49 and 58 homes respectively. Table 6.1.1 shows the available housing in the project area during late November and early December of 2003. This is historically the lowest point for residential sales and listings during the year.

Table 6.1.1: Available Residential Housing Units*			
Price Range of Available Housing Units	Marshall County	St. Joseph County	Southern St. Joseph County**
\$0 - \$50,000	13	239	5
\$50,000 – 100,000	102	555	28
\$100,000 – 150,000	91	246	22
\$150,000 – 200,000	33	167	11
\$200,000 – 250,000	14	94	14
\$250,000 +	18	161	19
Total	271	1462	99
* Source: Greater South Bend-Mishawaka Association of Realtors and North Central Indiana Association of Realtors. ** Includes Madison, Union, Liberty, Lincoln, Centre, and Greene Townships			



The mitigation of negative social impacts can be accomplished in the same way as relocation impacts are mitigated. Where reasonable, impacts to neighborhoods and subdivisions can be reduced through the use of frontage and access roads to maintain access to specific properties that are impacted by US 31 construction. Rights-of-way will be minimized, where reasonable, in urbanized areas.

The availability of commercial real estate is most prevalent in the South Bend area at the north end of the corridor. In general, there appears to be adequate availability of commercial property. Commercial properties are most heavily affected by Alternative Es because it utilizes a section of existing US 31 north of Kern Road. If Alternative Es is selected, it is expected that there

will be some small remnant commercial parcels adjacent to the new US 31 frontage roads following construction of a new facility. These parcels may allow opportunities for relocated businesses to rebuild in the same general vicinity.

Benefits would be made available for all commercial properties displaced by this project in accordance with 42 USC 4601-4655, 49 CFR 24 Section 24.404, Title VI of the Civil Rights Act of 1964, and IC 8-23-17. Mitigation measures for displaced businesses include moving expenses, reimbursement for direct loss of tangible property, and replacement property search. Table 6.1.2 shows the availability of commercial property in the counties of St. Joseph and Marshall in the fall of 2003.

Table 6.1.2: Availability of Commercial Property				
Price Range and County	Commercial or Retail with Building	Industrial or Manufacturing With Building	Commercial or Retail Parcels	Industrial Parcels
St. Joseph County				
\$0 – 100,000	3		1	3
\$100,000 – 300,000	21	8	27	13
\$300,000 – 500,000	8	4	9	4
\$500,000 – 1,000,000	5	7	10	3
\$1,000,000 – 2,000,000	2	4	4	
\$2,000,000+	4	3	2	2
Marshall County				
\$0 – 100,000	2	1	1	
\$100,000 – 300,000	6	3	3	2
\$300,000 – 500,000	3		1	
\$500,000 – 1,000,000	2			
Source: Online Commercial Real Estate Listing Service				

6.2 Historic and Archaeological Resources Mitigation

Section 106 requires consultation with the SHPO and other consulting parties to develop and evaluate alternatives or modifications that could avoid, minimize, or mitigate historic and archaeological impacts. In this project, consulting parties have been contacted on an ongoing basis in order to avoid and minimize the impacts of the undertaking on historic and archaeological properties. For example, the Ullery/Farneman House, a National Register (NR) eligible property, would have been demolished by a number of alternatives that used existing US 31 into South Bend. However, at a consulting party meeting held in September 4, 2003, Historic Landmarks Foundation of Indiana (HLFI) suggested a shift in these alternatives to avoid this NR-eligible property. This shift was incorporated in Alternative Es and other alternatives that used existing US 31 into South Bend were discarded, in part, to avoid the impact to the Ullery/Farneman House.



Also, another consulting party, Historic Preservation Commission of South Bend and St. Joseph County (HPC), expressed dismay in meetings and in written communication with Alternative G, because it cut through rural landscapes. These landscapes did not qualify for listing in the NR. Shifts made to Alternative G resulted in a new Alternative G-C, which avoids the Ullery/Farneman House and minimizes the impacts to the rural landscape. Also, Alternative G-C does not bisect Turkey Trail as did Alternative G and is farther from Miami Trail than was Alternative G. Although there was not enough left of the resource of Miami/Turkey Trail to qualify for listing in the NR as a historic property, the shifted Alternative G-C avoids it. The HLCI identified this resource as a historic trail.

Many of the effects on historic properties associated with Alternatives Cs, Es, and G-C will be visual and contextual. FHWA and INDOT are seeking feedback from SHPO and the consulting parties in order to determine if the introduction of an elevated and lighted interchange may be reasonably foreseen to change the context of the historic property, if setting is integral to its listing in the NR. If FHWA concludes there is any adverse effect, an MOA will be drafted to address those effects. If necessary, the MOA will be included in the FEIS.

6.3 Air Quality

The project would be designed to minimize any impacts on ambient air quality in or around the project vicinity. No violations of the NAAQS are projected for this project. Therefore, no air quality mitigation measures are required for the roadway improvements. During construction, the contractor will comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures will be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

6.4 Noise Impacts

At all sensitive receivers where traffic noise impacts are predicted under the Build Alternatives, noise mitigation measures will be considered. The typical method of mitigating traffic noise impacts is to construct a noise barrier in the form of an earthen berm and/or vertical wall. According to INDOT's Highway Traffic Noise Policy, when impacts have been identified, there must be consideration of any reasonable and feasible measures that would abate the traffic noise impacts. Some abatement must be implemented if it is feasible and reasonable on any segment of the project. INDOT's definition of feasible and reasonable noise abatement is provided below.

Feasibility of Abatement

"Feasible" means that it is structurally and acoustically possible to attenuate traffic noise occurring at a receiver by at least 5 dBA Leq(h). Traffic noise abatement measures include traffic control measures (TCM), alteration of vertical or horizontal alignment, acquisition of buffering land, noise insulation of impacted receivers, and construction of traffic noise barriers.

Reasonableness of Abatement

"Reasonable" means that INDOT believes abatement of traffic noise impacts is prudent based on consideration of all the following factors:

1. The number of benefited receivers, those for whom the mitigation will benefit by at least 5 dBA Leq(h) at the noisiest hour conditions. This number is not necessarily the number of receiver impacts.
2. The cost of abatement on a benefited receiver basis and on a project level basis. INDOT has set the acceptable cost per benefited receiver range as \$20,000 - \$30,000. This cost should be arrived at by applying a



square footage cost basis on the square footage of the noise barrier. A reasonable square footage cost basis will be determined by INDOT.

3. The severity of existing and future traffic noise level. The absolute level and the increase of the future noise are two aspects with which to assess the severity of the noise impacts.
4. The timing of development near the project. The state considers it appropriate to give more consideration for development that occurs before initial highway construction.
5. The views of noise impacted residents. Potential negative impacts of noise barriers include unsightliness, shortened daylight, poor air circulation, degradation by weather, reduced safety, vandalism, and restriction of access for emergency vehicles.

Based on INDOT’s Highway Traffic Noise Policy, the feasibility and reasonableness of noise barriers were evaluated at all locations in the project area where noise impacts were identified for the Build Alternatives. Based on this preliminary evaluation, it is assumed that noise barriers would be feasible at nearly all of the locations where a noise impact was identified in the project area. However, because several locations where noise impacts are predicted consist of isolated or loosely clustered residences, abatement in the form of noise barriers may not be reasonable. To provide significant noise reduction at these locations, a barrier’s length is normally eight times the distance from the barrier to the residence. For example, a single residence located 100 feet from the barrier would typically require a barrier 800 feet long and cost approximately \$192,000 for a 12 foot tall wall. Under these conditions, noise abatement is not considered reasonable since the cost would be well above the \$30,000 per benefited receivers established in INDOT’s noise policy and would not be given further consideration. When impacts were predicted in locations with more concentrated or clustered residences, additional evaluation was performed.

Five areas were evaluated for potential noise barrier reasonableness based on the relative density of housing and proximity to each of the proposed alternatives (Table 6.4.3). Preliminary analysis indicates that all of the sites included benefited receivers when evaluated with barrier segments ranging from 10 to 14 feet in height. These preliminary results indicate that noise barriers may be required in some areas (e.g., Sun Communities Mobile Home Park on Locust Road and South Bend from Dice Street to US 20), and possibly not be required in other areas (e.g., along Maple Road, Madison Road, and Whispering Hills). Noise barrier impacts will be re-analyzed in greater detail during the final design phase, when a single Preferred Alternative is selected.

Table 6.4.3: Noise Barrier Evaluations for US 31 Alternatives							
Alternative	Description	No. of Impacted Receivers	No. of Benefited Receivers	Approx. Barrier Length	Approx. Barrier Height	Approx. Barrier Cost	Cost per Benefited Receiver
Cs, Es, G-C	Maple Rd.	8	5	2200 ft.	12-14 ft.	\$551,397	\$110,279
Es	Madison Rd.	6	13	2190 ft.	12-16 ft.	\$604,534	\$46,502
Es	South Bend from Dice Street to US20	12	42	4560 ft.	11-14 ft.	\$1,095,400	\$26,080
Cs	Sun Communities MHP on Locust	50	53	2590 ft.	12-14 ft.	\$678,192	\$12,796
G-C	Whispering Hills and Kern Road Subdivisions	49	30	1000 ft. 3100 ft.	11–13 ft. 11-14 ft.	\$970,974	\$32,358



Additional noise abatement measures (altering vertical or horizontal alignment, eliminating truck traffic, and reducing vehicle speed limits) were evaluated and found to be either unwarranted or not feasible for any of the Build Alternatives. Federal guidelines allow for the insulation of public use or non-profit institutional structures. However, no such properties were identified as sensitive noise receivers along Alternatives Cs, Es, or G-C

6.5 Farmland

Agricultural impacts in the form of permanent conversion of farmland to non-farmland use generally cannot be mitigated easily by the creation of new farmland elsewhere. For this reason, the mitigation of agricultural impacts tends to focus on those practices that assist in avoiding and/or minimizing conversion, or designing alignments to minimize disruption to existing agricultural patterns. The following lists a few general practices that can be taken into consideration to avoid or minimize farmland impacts.

- Where reasonable, corridors should follow existing property lines and minimize dividing or splitting large tracts of farmland
- Follow agricultural property lines as much as possible or cross fields at perpendicular angles to reduce point rows and the creation of uneconomic remnants
- Work with local officials to control access through interchange locations. In so doing, subsequent development can possibly be directed away from large expanses of prime farmland, thus preserving this resource

6.6 Wetland Mitigation

Wetland mitigation is based on requirements set forth in Section 404 of the Clean Water Act (33 USC 1344). In 1991, the IDNR, USFWS, and INDOT signed a Memorandum of Understanding (MOU) that established standard mitigation ratios for impacts to wetland resources. While not signatory to the agreement, the Corps and IDEM typically follow the MOU. The agreed mitigation ratios of 2:1 for emergent wetlands, 3:1 for scrub/shrub wetlands, and 3:1 to 4:1 for forested wetlands are still used as guidance for regulatory determination of a permit applicant's request for wetland mitigation. The Corps and IDEM may require more or less impact acreage depending on the quality, location, size, function, and value of the wetland. Compensatory mitigation for disturbances to natural resources is the final alternative that should be considered when a project is planned. The sequence to follow during project planning is 1) avoidance of disturbance, 2) minimization of disturbance, and 3) where these two alternatives do not dispose of the issue, compensatory mitigation for the loss of natural resources will be required.

Compensatory wetland mitigation for transportation projects traditionally requires restoration of wetland conditions at an off-site location that is currently not identified as a wetland by Corps standards. This is generally followed by three to five years of monitoring to ensure the wetland's proper development. Several locations exhibiting characteristics for potential wetland mitigation sites have been identified throughout the project. Upon selection of a Preferred alternative, wetland determinations and delineations will be completed and appropriate ratios used to arrive at a total number of acres for wetland mitigation. The FEIS and supplemental documentation will provide all available impact information, and commitments for mitigation. The location, designing, purchasing, and construction (with planting) of any wetland mitigation site would occur after Phase 1 Design and usually at the time of construction for the roadway.

6.7 Mitigation of Visual Impacts and Aesthetics

This project will consider visual mitigation measures for associated visual impacts. Potential aesthetic enhancements for possible incorporation into the project would reflect input from the affected communities. The adjacent



communities of Plymouth, LaPaz, Lakeville, and South Bend offer natural, cultural, historical, and scenic resources. The setting and character of the study area and the needs of the highway users are factors that must be considered within the US 31 corridor. Impacts would result primarily from road reconstruction for the upgrade of US 31 to a freeway which include such elements as cut and fill slopes, increased pavement surface, removal of vegetation, bridges, lighting standards, guardrails, and other roadway features.

The US 31 project would incorporate cost-effective design features for the purpose of mitigating adverse aesthetic impacts. Specific mitigation measures and aesthetic design features should be refined during the final design phase, coordinated with local communities. These communities will be granted the opportunity to underwrite enhanced design amenities and/or architectural elements and maintenance.

Interchanges and overpasses along US 31 could provide effective opportunities for incorporation of reasonable aesthetic enhancements. Whenever possible, opportunities for maintaining the views of existing landmarks within the visual corridor could also be included in the project. Supplemental gateway elements, including distinctive signage, lighting, and landscaping associated with entry features, if so desired by the communities, would be integrated into the final design where feasible based upon current safety standards and funding availability.

Walls, landscaping, and signage should not block the views of the corporate office buildings and commercial facilities within the visual corridor. Mitigation measures involving landscaping, bridge treatments, lighting, signing, and contour grading could be incorporated into the final design to minimize these potential impacts. Where practicable, design elements could match prominent architectural elements and styles within each of the adjacent communities. The design for these structures could be incorporated into the landscape and site context to lessen its visual impact upon the corridor.

Natural topography, stormwater detention ponds, trees, shrubs, and native Indiana prairie grasses would also provide continuity throughout the landscape and influence the view of the roadway. Landscape plantings within established safety guidelines and clear zone setbacks could be used to mitigate impacts and buffer noise and undesired views. The project should be designed to retain existing trees and vegetation to the extent possible to create a natural screen between the roadway and residential areas. Additional plantings could be introduced in areas where impacts are unavoidable, especially within areas where vegetation is limited. In areas where trees are being removed for additional right-of-way, irregular feather cut lines with selective tree removal should be considered.

6.8 Construction

6.8.1 Construction Noise

There would be unavoidable short-term noise impacts as a result of project construction. The primary source of noise expected would be generated from construction activities such as earth removal, hauling, grading, and paving. The U.S. Report to the President and Congress on Noise (February 1972) showed earth-moving equipment (e.g., compactors or rollers, front loaders, backhoes, tractors, scrapers, graders, pavers, and trucks) to range in noise levels (50 feet from the source) at approximately 72 to 96 dBA. Materials handling equipment (e.g., concrete mixers, concrete pumps, movable cranes, and derrick cranes) ranged from 75 to 88 dBA, while stationary equipment ranged from 69 to 87 dBA. Impact equipment ranged appreciably higher than equipment powered by internal combustion engines. Impact equipment (e.g., pneumatic wrenches, jack hammers, rock drills, and pile drivers) ranged between 81 to 106 dBA. Other equipment such as vibrators and saws ranged from 69 to 82 dBA.

Noise abatement measures may be necessary during construction to restrict noise levels in the vicinity of noise sensitive sites. These measures may include, but are not necessarily limited to the following:



- Provide sound-dampening equipment housing or enclosures for stationary noise-producing machinery such as drills and augers, cranes, derricks, compactors, pile drivers, generators, etc.
- Provide efficient intake and exhaust mufflers on internal combustion engines
- Perform proper maintenance on all noise producing equipment to prevent excessive rattling and vibration of metal surfaces
- Locate equipment staging areas away from sensitive noise receptors
- Establish construction noise limits to be incorporated into the contract specifications for sensitive areas

6.8.2 Erosion Control

Erosion on the construction site is accelerated due to vegetation clearing and the prominence of bare disturbed soils on the site during construction. Procedures to reduce the impact of erosion and runoff into streams will be implemented. BMPs shall be used in the construction of this roadway to minimize impacts of erosion. These measures may include, but are not necessarily limited to the following:

- Minimize disturbance to existing vegetation, including no clearing of vegetation outside of the construction limits
- Develop site-specific revegetation plans to provide adequate post-construction ground cover
- Implement temporary erosion and siltation control devices such as covering exposed areas with erosion control materials and grading slopes to retain runoff in sedimentation basins
- Revegetate all disturbed soil areas immediately upon project completion

6.8.3 Stream Crossings

There are multiple stream crossings under any proposed alternative that could be adversely affected by construction activity. To avoid any adverse effects to these streams, the following measures will be implemented during construction.

- Avoid construction activities during periods of peak stream flow
- Restrict low-water work to placement of piers, pilings and /or footings, shaping of spill slopes around bridge abutments, and placement of riprap
- Restrict channel work and vegetation clearing to within the width of the normal approach road right-of-way
- Minimize the extent of artificial bank stabilization
- If riprap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat
- Avoid channel work during the fish spawning season (April 1 through June 30)



6.8.4 Vibration Impacts

Vibration impacts are not anticipated in this project. Any vibrations emanating from vehicular traffic on the northbound or southbound lanes for the proposed US 31 would effectively be absorbed by the materials (concrete, soils, and vegetation) of the shoulder, median, sideslopes, and roadside ditches. Similarly, residential and commercial structures are located at distances from the roadway that would not present vibration concerns.

6.9 Design

This project would require no permanent or temporary use of the following Section 4(f) resources:

- Pleasant Lake Public Access Site
- Evergreen Hill National Register Property
- Lakeville High School National Register Property
- Cover House Property
- Emil Johnson House Property
- Ullery/Farneman House Property
- Francis Donaghue Farmstead Property
- W.O. Bunch Farm Property

6.10 Ecosystem Impacts

The following measures will be utilized to address impacts on ecosystems:

- DO NOT SPRAY OR MOW – Where woody vegetation, wetlands, wildflowers or environmentally sensitive areas occur, “DO NOT SPRAY OR MOW” signs will be posted
- Forest Fragmentation – All efforts will be made to avoid or minimize forest fragmentation
- Invasive Plant Species – INDOT is a member of the Invasive Plant Species Assessment Group (IPSAWG), and as a member, develops recommendations for selling and planting plant species in the State. INDOT will use appropriate herbicides and / or physical mechanisms to control invasive plants, such as purple loosestrife, reed canary grass, kudzu, and others, in mitigation sites and within the proposed US 31 right-of-way
- Conservation Measures for Wildlife – Transportation designers will work with appropriate agencies to determine the most feasible and practical conservation measures for the maintenance of wildlife movements and landscape connectivity