



Chapter 7 - Mitigation

7.1 Summary

In this study, effort has been made to avoid environmentally sensitive resources. One purpose of the Tier 1 Environmental Impact Statement is to identify these resources and their significance. This information is used in the decision process to identify a preferred alternative to be advanced into the final Environmental Impact Statement. In the Tier 2 NEPA studies, the mitigation identified in Tier 1 (and summarized in Table 7-1) will be refined with greater detail.

The following discussion presents the mitigation sections from the impacts described in Chapter 5, *Environmental Consequences*.

Land Use Impacts

Mitigation measures need to focus on coordination with local planning commissions and local elected officials concerning land use controls.

The indirect impacts around areas with karst features are a concern with regard to water drainage and the impacts to the cave systems. While the Indiana Department of Transportation has a memorandum of

Table 7-1: Mitigation for I-69

Impacts	Mitigation
Land Use	Coordination with local officials concerning land use controls
Social and Neighborhood	Where reasonable, use frontage roads and access roads to maintain accessibility for neighborhoods
	Minimize right-of-way needs, where reasonable, in urbanized areas through the use of design practices, including retaining walls
Pedestrians and Bicyclists	If bike trails in Martin State Forest are impacted, mitigation may include bridging, relocation, or enhancement of the trails
Air Quality	Conformity of the preferred corridor with the mobile source emission budgets will be demonstrated
Noise	Abatement measures including noise barriers will be analyzed in the Tier 2 environmental documentation
	Coordination with local officials to identify areas susceptible to noise impacts for guidance in future land use decisions
	Fugitive dust emissions shall be controlled through water spraying and tarping of vehicles
	Temporary erosion control devices such as silt fencing, check dams, sediment basins, and sodding shall be used
MOU of October, 1993 for karst shall be followed	
Section 106 – Historic Resources	Consideration will be given to mitigation such as plant screenings, earth embankments, and painting and the use of compatible building materials for bridges and overpasses
Hazardous Waste Sites	Coordination with appropriate agencies to insure proper clean-up of contaminated sites
Floodplain	Impacts to longitudinal and latitudinal floodplain encroachments will be minimized, where reasonable, through design practices such as longer bridges and right-angle stream crossings
Wetlands	MOU of January 28, 1991 for wetlands
	Wetland Mitigation and Monitoring Plans will be prepared as part of the wetland loss replacement
	One possible method of wetland mitigation is wetland banking
Agriculture	Corridors should follow existing property lines and minimize dividing or splitting of large tracts of farmland where reasonable
Forest	INDOT will consult with appropriate resource agencies regarding forest mitigation measures
Water Body Modifications	Best Management Practices (BMP) should be used to avoid and minimize impacts to rivers and streams



understanding for construction in karst regions (see Appendix U), the indirect impacts would be caused by private developers who are subject to local ordinances and codes. These local ordinances and codes may not address drainage in karst areas. Cave systems may experience changes in drainage patterns as a result of indirect impacts. Once a preferred alignment is identified and if it traverses karst topography, the Indiana Department of Transportation will contact local officials to encourage them to initiate planning mechanisms that will review development requests in light of impacts to sensitive resources.

Social Impacts

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 I-69 construction. Rights-of-way will be minimized, where reasonable, in urbanized areas.

Pedestrians and Bicyclists

At the present time, there will be a direct impact on the Martin State Forest Mountain Bike Trail. The Bloomington Rail Trail crosses under the already existing SR 37 and should not have a direct impact. No public owned paths were found in the other four alternatives using the available data. The proposed highway is designated a freeway and as such, pedestrians and bicyclists are prohibited from using the roadway. Mitigation would be implemented if impacts to the paths cannot be avoided. Both of the trails are on 4(f) land, which refers to lands that are publicly owned, public parks, recreation lands, or wildlife and waterfowl refuges. Mitigation measures may include bridging, relocation, or enhancement of the trail.

Air Quality Impacts

Conformity of the preferred alternative corridor with the mobile source emissions budgets of the SIP will be demonstrated per Section 176 of the Clean Air Act Amendments.

Noise Impacts

Since site specific impacts are not determined in this Tier 1 EIS study, a detailed discussion of noise impact mitigation is inappropriate. However, some generalities can be made regarding potential mitigation measures. Once highway noise impacted sites have been identified, they must be further evaluated to determine whether abatement is both feasible and reasonable. Abatement measures include:

- Alternation of horizontal and/or vertical alignments.
- Noise insulation of public use or non-profit institutional structures.
- Construction of highway noise barriers (inside of right-of-way).



INDOT policy considers abatement to be feasible if it is structurally and acoustically possible to reduce predicted noise levels at a specific receiver by at least 5 dBA. Furthermore, INDOT considers abatement reasonable only if such a measure is prudent based on the following:

- The number of receivers that will experience a benefit of at least 5 dBA at the noisiest hour through implementation of the abatement.
- The cost of abatement on a benefited receiver basis and on a project level basis. INDOT policy states that an acceptable cost for a noise barrier wall is \$20,000 to \$30,000 per benefited receiver as determined by applying a square footage cost to the total square footage of the wall required to achieve the necessary 5 dBA reduction. In rural areas where the residences are widely scattered, the construction of short noise barriers for individual residences or tiny clusters is typically not cost effective and therefore, may not be a reasonable solution.
- The severity of existing and future traffic noise levels. Severity is determined by comparing the decibel difference between the predicted level and existing level at a site to that of the decibel difference between the predicted level and the criteria level. Figure 5.9-14 is referenced to determine the severity of impact: no impact, minor impact, moderate impact, or severe impact.
- The timing of development near the project. The state considers it appropriate to give more consideration for development that occurs before initial highway construction.
- The views of noise impacted residents. Although noise barrier walls offer adjacent residents a reduction in highway-related noise levels, negative impacts associated with these walls such as, unsightliness, vandalism, degradation by weather, poor air circulation, shortened daylight, reduced safety, and restriction of access for emergency vehicles, can be prohibitive in the eyes of the public under certain circumstances.

Although the Tier 1 level noise analysis makes no attempt to determine where barrier walls would be required and whether they meet the feasible and reasonable criteria; a table top evaluation using field verified topographic data was conducted to locate areas where residential receivers appear to be of sufficient density and proximity to the proposed working alignment to warrant further evaluation. More detailed analyses in the subsequent Tier 2 studies may conclude that some of these areas do not meet the criteria and/or may reveal other areas not listed here which do require mitigation.

Wild and Scenic Rivers

No Wild and Scenic Rivers are present in the proposed I-69 Study Area. However, several of the proposed alternatives cross rivers listed on the NPS NRI, the East and West Forks of the White River. The Federal Highway Administration, as a federal agency, is required to try and avoid or mitigate adverse effects on rivers identified in the NRI as part of the normal planning and environmental review processes of a project. All federal agencies are required to consult with the NPS prior to taking actions that could effectively foreclose wild, scenic, or recreational status for rivers on the inventory. An Early Coordination letter was sent to the NPS, along with a number of environmental review agencies, on May 12, 2002. The NPS provided no response to the Early Coordination letter. Coordination with NPS will continue in the Tier 2 NEPA studies.



Construction Impacts

Reasonable precautions are typically sufficient to control fugitive dust emissions. These precautions include water spraying and tarping of vehicles carrying particulate matter.

Tier 2 NEPA studies will determine the best location for the Interstate and will focus in particular on karst impacts and mitigation. The design of roadside drainage ditches connected to “filter strips” and containment basins for spill prevention/containment, as well as other Best Management Practices will be implemented to minimize impacts if applicable.

Construction activities may also impact wetlands within and outside of the proposed right-of-way for this Interstate. All efforts to avoid, minimize and mitigate for wetlands shall be implemented as much as possible. The Memorandum of Understanding dated January 28, 1991 between INDOT, IDNR and USFWS for wetlands shall be followed.

Temporary erosion control devices such as silt fencing, check dams, sediment basins, inlet protection and sodding will be used. Disturbed soil areas will be revegetated in a timely manner. Any riprap used will be of a large diameter in order to allow space for habitat for aquatic species after placement. In order to reduce the opportunity for the spill of fuel or other volatile chemicals into a stream, all servicing of construction equipment will take place away from the streambed in a designated maintenance area.

A major concern for limestone is the effects of heavy blasting. The main concern for limestone is shock waves that could travel from the highway sites through the rock and possibly fracture marketable limestone. Strict blasting specifications will be prepared and followed including special excavation measures during blasting.

Section 106 Impacts - Historic Resources

An adverse effect occurs when “an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property.” [36 CFR 800.5(a)(1)] Specifically, the introduction of “visual, audible, or atmospheric elements” constitutes adverse effects. If adverse effects are unavoidable, there are several general ways to mitigate these effects. Please note that these are general mitigation techniques. Specific mitigation will be designed to address the particular affects on each individual property; this will occur in Tier 2.

In Tier 2, an alignment that attempts to avoid all properties on or eligible for the NRHP will be developed. However, if an alignment cannot avoid all such properties, or adversely impacts such properties, mitigation will be developed. Plant screenings can be added to mask sight and diminish noise effects of the proposed highway. Earth embankments also create noise and sight buffers. Additionally, ramps and overpasses can be disguised through painting and the use of compatible building materials.

Final eligibility and effect determinations will be made in the Tier 2 NEPA studies. Tier 1 mitigation is general in nature. The Section 106 Compliance Plan presents the scope for Tier 1 and Tier 2.



Section 106 Impacts - Archaeological Resources

As part of the Tier 2 environmental documentation, archaeological investigations will be undertaken. These include Phase 1a field reconnaissances to discover unrecorded prehistoric and historic resources; Phase 1c subsurface investigations for buried archaeological resources; Phase 2 testing of potentially significant archaeological sites, and possibly Phase 3 mitigation/data recovery if archaeological sites determined to be of National or State Registers significance cannot be avoided by construction.

Visual Impacts

Mitigation for visual impacts may include vegetative screening, a depressed highway, wide medians, and use of independent alignments both vertically and horizontally, or the shifting of the whole alignment.

This project should use context sensitive designs to create positive impacts and reduce negative impacts without compromising safety. Visual and aesthetic resource issues will be addressed in greater detail in Tier 2 NEPA studies.

Hazardous Waste Sites Impacts

Appropriate cleanup of hazardous materials and/or removal of USTs will be required. INDOT will coordinate with the appropriate agencies to see that proper cleanup of any contaminated sites are completed.

Floodplain Impacts

Impacts to floodplains, where reasonable, will be avoided. In areas that are located adjacent to streams or rivers and have a longitudinal floodplain encroachment, the alignments may be shifted to avoid these floodplain impacts. In areas that have latitudinal floodplain encroachments, the alignment can be shifted to cross the stream or river in a narrow floodplain area and at a right angle to the stream or river if reasonable. Also, in areas of latitudinal floodplain encroachments, the alignments may be raised and longer bridges utilized to avoid affecting the floodplain areas.

Wetlands

Mitigation for wetland losses is an important process for “no net loss” of wetlands in the United States. Recommendations of the National Governor’s Association Provision (Senate Bill 1304) of the Wetlands stated “that regulatory policies should include a clear preferred sequence of mitigation options that begins with avoidance of adverse impacts on wetlands and the reduction of unavoidable adverse impacts and allows the use of environmental compensation only as a last resort, while allowing regulators sufficient flexibility to approve practical options that provide the most protection to the resource and that balance the effects of such actions on the total human environment,



recognizing socioeconomic factors.” Section 7 of the Watershed Management Act of 1993 provides for a clear sequence of mitigation options.

Conditions of the permit(s) typically include mitigation measures. Typical conditions include (but are not limited to): do not change hydrology of wetlands’ areas, do not allow discharge of fill materials into the wetlands, and adhere to strict erosion control methods adjacent to wetlands. Permits will often require construction of replacement wetlands as a mitigation measure. The different types of wetlands require different mitigation ratios. All impacted wetlands will require a “Wetland Mitigation and Monitoring Plan” for their replacement at another location within the same watershed. The “Wetland Mitigation and Monitoring Plan” will report that in the deed, the property will remain as a wetland in perpetuity. This means that the land is protected from future development. The overall goal of wetland mitigation is to have no net loss of wetlands.

Enhancing existing wetlands by adding to them will provide a better habitat for wildlife and improve the existing wetlands and also improve the chance of success of the mitigation site. Coordination with review agencies will assure that the wetland mitigation sites are suitable, and that they are located in excellent areas for successful ecosystems for wildlife, plants, and humans.

Agricultural Impacts

Where reasonable, corridors should follow existing property lines and minimize dividing or splitting of large tracts of farmland.

Forest Impacts

INDOT will consult with appropriate resource agencies regarding forest mitigation measures.

Water Body Modifications

Mitigative measures for potential water quality impacts should be followed, where reasonable. Some such measures are:

- (1) DO NOT DISTURB signs shall be posted at the construction zone boundaries.
- (2) Tree clearing shall be kept to a minimum and limited to the construction limits within the permanent right-of-way.
- (3) Trees or under story vegetation outside the boundaries shall not be cleared.
- (4) Low-water work shall be restricted to placement of piers, pilings and/or footings, shaping of the spill slopes around the bridge abutments, and placement of riprap.
- (5) Channel work and vegetation clearing shall be restricted to within the width of the normal approach road right-of-way.
- (6) The extent of artificial bank stabilization will be minimized to provide for adequate scour protection.



- (7) If riprap is utilized for bank stabilization, it shall be a minimum average of six inch graded stone and extended below low-water elevation to provide aquatic habitat.
- (8) Temporary erosion control devices such as straw bales, burlap, jute matting, grading, seeding and sodding shall be used to minimize sediment and debris in tributaries of the project.
- (9) Culverts and other devices will be used to preserve existing drainage patterns.
- (10) It is anticipated that the Patoka River channel, backwaters and floodplain will be spanned.

Ecosystem Impacts

All efforts have been made to minimize ecosystem impacts by identifying such resources and avoiding them as much as possible. Existing GIS layers, resource agency consultation, and field reviews have been used to identify, avoid, and minimize impacts. This is an ongoing process and will continue throughout the project. Wetland, stream, and forest impacts will be mitigated as determined by consultation with resource agencies.

Water Quality Impacts

Mitigative measures for potential water quality impacts are:

- (1) cross rivers and streams at their narrowest floodway width, and reduce the number of stream relocations and floodplain encroachments where reasonable,
- (2) develop stream mitigation plans that provide for the relocated stream “in like kind or better kind” with the impacted stream,
- (3) disturbed in stream habitat should be returned to its original condition when possible upon completion of construction in the area,
- (4) minimize tree clearing near streams and rivers,
- (5) avoid wetlands as much as possible and follow the Memorandum of Understanding dated January 28, 1991 between INDOT, IDNR and USFWS for wetlands,
- (6) replace all wetlands at an appropriate mitigation ratio at mitigation sites that provide the best opportunities for successful and functional wetlands that include both human and natural values and goals,
- (7) follow Best Management Practices for erosion control in the project,
- (8) avoid sinking basins and sinkholes as much as possible and follow the Memorandum of Understanding dated October 13, 1993 between INDOT, IDNR, IDEM and USFWS for crossing karst areas, and
- (9) provide in the highway design for “filter strips” and detention basins in karst areas.



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