

Summary

In accordance with Federal Highway Administration (FHWA) guidance, this Environmental Document incorporates by reference the 1987 Draft Environmental Impact Statement (DEIS), 1992 Final Environmental Impact Statement (FEIS) and subsequent 1992 Record Of Decision (ROD) for the Proposed Relocation of US 231 and Wabash River Crossing, Tippecanoe County, Indiana. The focus of this Environmental Document is to reevaluate alternatives for the US 231 Relocation Study from State Route (SR) 26 to US 52 - thus completing the original project. The Environmental Document reader should refer to the previous DEIS, FEIS, and ROD for information regarding the project that is unchanged, still valid, and therefore, not presented in the text of this Environmental Document.

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S.1 DESCRIPTION OF THE PROPOSED ACTION

The proposed action analyzed in this Environmental Document is to complete the original Proposed Relocation of US 231 and Wabash River Crossing project in Tippecanoe County, Indiana. The original preferred alternative was approved in the 1992 Record of Decision (ROD). Since that time, the southern portion of the project, including a new Wabash River crossing and improvements to South River Road, has been constructed. The portion of the project from South River Road to State Route (SR) 26 is currently undergoing final engineering design. The purpose of this Environmental Document is to reevaluate alternatives for the northern portion of the original project from SR 26 to US 52 and, if necessary, develop and evaluate new alternatives that meet the purpose and need of the proposed action and recommend a preferred alternative that fulfills the purpose and need of the overall project (Exhibit 1-1), as approved by the ROD. The proposed action for the US 231 Relocation Study, a four-lane divided multi-lane arterial, is being developed as a limited access urban/rural arterial between SR 26 and US 52 in Tippecanoe County, Indiana.

S.2 PROJECT LOCATION

The project is located in Tippecanoe County, Indiana, approximately 60 miles northwest of Indianapolis, Indiana (Exhibit 1-2). The project study area (study area) encompasses portions of West Lafayette, the Purdue University campus, and unincorporated areas west of the Purdue University campus, which include Wabash and Shelby Townships.

The study area (Exhibit 1-3) is approximately 23 square miles (14,912 acres) in size. The study area contains mixed land uses including agricultural, residential, commercial, and recreational. The study area's southern boundary is Baseline Road (also known as Division Road) because the study area is constrained by the Purdue University Airport immediately to the south, as well as extensive wetlands systems and floodplain along the Wabash River. The western boundary extends to County Road (CR) 700W just west of Montmorenci and east of the Purdue University pond area. The northern boundary is existing US 52/US 231, which also serves as the northern terminus of any proposed Build Alternative alignment. The eastern boundary is CR 100W, staying west of the Purdue University campus and concentrated residential development in West Lafayette.

S.3 PROJECT HISTORY

In September 1978, the transportation plan for the Lafayette area was documented in a report entitled Greater Lafayette Area Transportation and Development Study. This plan, which was adopted by the Area Plan Commission of Tippecanoe County (TCAPC), included a project to construct a new highway (US 231) with a new Wabash River crossing. The road was envisioned to begin near CR 350S, cross over the Wabash River, pass between the Purdue University Airport and the Purdue University campus, and tie into the west side of the City of West Lafayette. According to the report, "this highway would alleviate congestion on two principal Wabash River bridges and improve access to West Lafayette and Purdue University."

In 1987, a DEIS for the Proposed Relocation of US 231 and Wabash River Crossing was developed and approved for circulation by the Indiana Department of Transportation (INDOT). The DEIS evaluated purpose and need based on four criteria: 1) conformity to existing transportation plan(s); 2) existing traffic and crash characteristics; 3) future land use developments; and 4) future traffic assignments.

The DEIS discussed a No-Build Alternative, a Transportation System Management (TSM) plan, and five Build Alternatives which included three build alternatives for

sections south of the Wabash River and two build alternatives for sections north of the Wabash River. All of the build alternatives south of the river began at either CR 350S or CR 550S and ended on the north side of the Wabash River at South River Road in West Lafayette. The two northern build alternatives began at South River Road and ended at US 52 and Cumberland Avenue.

In addition to the Build Alternatives, the DEIS addressed several system improvements. These improvements were deemed crucial for the success of the Build Alternatives in reducing traffic flow problems in Lafayette, West Lafayette, and Tippecanoe County. The improvements included:

- extending CR 350S between US 231 and CR 50E;
- widening South River Road from the Conrail overpass to Harrison Bridge;
- extending Harrison Street from Chauncey Street to South River Road (0.25 miles); and
- constructing new ramps at the Harrison Bridge interchange.
- The DEIS concluded that the Build Alternatives improved traffic conditions over the No-Build Alternative by:
 - providing a safer and quicker route between the Purdue University campus/West Lafayette and the south side of Lafayette;
 - reducing congestion and delay on US 231, Fourth Street, State Street, and Grant Street;
 - improving access to the south part of Purdue University using the Harrison Street extension;
 - opening up the Harrison Bridge and South River Road interchange to access from all directions; and
 - reducing crashes on State Street, Fourth street, Third Street, and US 231.

In 1992, the FEIS for the Proposed Relocation of US 231 and Wabash River Crossing was completed and approved. The preferred alternative identified in the FEIS consisted of Line A from south of CR 500S to Harrison Bridge, and Line 1 from South River Road to US 52. Construction of the southern section was slated to begin in 1993, while construction of the northern section was not planned to "occur in the immediate future" (1992 FEIS).

In September 1992, FHWA issued a ROD for the project. The ROD concluded that the preferred Build Alternative better met the purpose and need for the project than the No-Build Alternative or TSM plan, as well as minimized social, economic, and environmental impacts to the area.

In June 2001, the southern section of the project, including the new bridge crossing the Wabash River and improvements to South River Road, was completed and opened for traffic. The project section between South River Road and SR 26 (around the Purdue University Airport) is currently undergoing final engineering design.

Also in June 2001, this Environmental Document was initiated for the northern segment of the Proposed US 231 Relocation Project. This Environmental Document evaluates and documents the environmental impacts which were not evaluated in the prior DEIS and FEIS that would result from any changes to the proposed action contained in the 1992 ROD. Relevant new information and circumstances that have a bearing on the environmental impacts from the proposed action, which were not evaluated in prior studies, are also brought forward in this Environmental Document. The focus of this Environmental Document is twofold: 1) to demonstrate the environmental consequences of the alternatives carried forward for detailed study and 2) to identify a preferred alternative for the northern segment.

The purpose and need for the US 231 Relocation Study was established in the DEIS and FEIS. The subsequent ROD for the original project approved the preferred alternative of Line A from south of CR 500S to Harrison Bridge, and Line 1 from South River Road to US 52. Four elements of purpose and need were identified in the DEIS and remain valid:

- Conformity to existing transportation plans,
- Existing traffic and crash characteristics,
- Future land use developments, and
- Future traffic assignments.

S.4 HISTORY OF ALTERNATIVES CONSIDERED

The Proposed Relocation of US 231 and Wabash River Crossing has been described and discussed in three previous documents that involved the evaluation of alternatives that met the approved purpose and need for the overall project. Each document contains a complete discussion of alternatives developed, considered, and eliminated from or carried forward for detailed study. An annotated list of these documents is as follows:

- **1987 Draft Environmental Impact Statement for the Proposed Relocation of US 231 and Wabash River Crossing in Tippecanoe County (DEIS):** The DEIS studied three alternatives including the No-Build Alternative, Transportation System Management (TSM) plan, and a Build Alternative. The Build

Alternative featured six alignments. Of the six alignments, three were southern routes to Harrison Bridge and three were northern routes from South River Road to US 52. Of the three northern routes (Lines 1, 2, and 3), Line 3 was dismissed from further consideration. Lines 1 and 2 were carried forward for detailed study.

- **1992 *Final Environmental Impact Statement for the Proposed Relocation of US 231 and Wabash River Crossing in Tippecanoe County (FEIS)***: The FEIS further evaluated the alternatives carried forward in the DEIS. For the southern portion of the project, Line A (and its Wabash River crossing) was identified as the preferred alternative. For the northern portion of the project, Line 1 was identified as the preferred alternative. The FEIS reaffirmed the DEIS's finding that the No-Build Alternative and the TSM plan did not meet the purpose and need of the project.
- **1992 *US 231 Relocation and Wabash River Crossing - Tippecanoe County-Record of Decision (ROD)***: The ROD approved the preferred alternative identified in the FEIS for the entire relocation of US 231 and Wabash River crossing in Tippecanoe County, Indiana. The ROD also discussed the rationale for the selection of the preferred alternative.

S.5 RANGE OF ALTERNATIVES CONSIDERED

The FHWA and INDOT have evaluated a range of alternatives for the portion of the Proposed Relocation of US 231 project between SR 26 and US 52. This range includes the No-Build Alternative, and a Build Alternative featuring three alignments previously considered and seven newly developed alignments. Although the No-Build Alternative was dismissed in previous studies as not meeting the purpose and need of the project, the Council on Environmental Quality (CEQ) regulations governing all federal agencies specifically require analysis of a No Action (i.e., No-Build) Alternative. Therefore, while the No-Build Alternative does not achieve the purpose and need for the project, it has been defined and carried forward for comparison purposes with the Build Alternative. The project's location and definition of the Project Study Area (study area) are included in Chapter 1 of this Environmental Document.

A list of all alternatives considered is provided in Table S-1. The cost of each alternative is preliminary and is not considered for this alternative analysis.

**Table S-1
Alternatives Considered**

Alternative Considered	Length (miles)	Preliminary Cost Estimate¹ (In millions of dollars)
No-Build Alternative	0	NA
Build Alternative Alignments		
Original Preferred Alternative-Line 1	3.1	12.6
Line 2	2.7	10.0
Line 3	3.3	12.2
Line 4	4.3	13.0
Line 5	5.0	18.1
Line 6	6.7	24.8
Line 7	3.2	11.5
Line 8	4.2	15.2
Line 9	3.4	12.2
Line 10	4.2	12.6

Source: Michael Baker Jr., Inc. 2002.

¹ Preliminary cost estimates are based on \$960 per linear foot of roadway; approximately \$3.7 million a mile, current average construction costs and do not include ROW or utility relocations.

NA = Not Applicable

S.6 SCREENING OF ALTERNATIVES CONSIDERED

The No-build Alternative and the Build Alternative alignment Line 1 were automatically carried forward for detailed study, without regard to the screening criteria. The No-build Alternative was carried forward as required by federal regulations (40 CFR §1502.14), and used as a baseline for environmental analysis. Line 1 is carried forward as a basis for comparison because it is the original preferred alternative in the ROD.

All 10 Build Alternative alignments were evaluated by a screening process to determine whether they warranted detailed study. The elimination of alternatives from detailed study is consistent with FHWA regulations (23 CFR §771.123).

A consistent set of screening criteria was applied to all of the alternatives under consideration. If an alternative does not meet purpose and need, or if it has a Section 4(f) impact, such as an unavoidable impact to a Section 4(f) resource, it will not be considered for further study (except for Build Alternative alignment Line 1 and the No-Build Alternative).

The alternative screening process resulted in the elimination of Build Alternative alignments Lines 2, 3, 5, 6, and 8. Five of the Build Alternative alignments (Lines 1,

4, 7, 9, and 10) along with the No-build Alternative were carried forward for detailed study. Environmental consequences of the No-Build Alternative and the Build Alternative alignments carried forward for detailed study are presented in Chapter 3 of this Environmental Document.

S.6.1 Purpose and Need Requirements

Chapter 1 describes the proposed action and the purpose and need for the project. As discussed in Chapter 1, four elements of purpose and need were identified in the DEIS:

- Conformity to existing transportation plans,
- Existing traffic and crash characteristics,
- Future land use developments, and
- Future traffic assignments.

A screening criterion was developed for each element to determine whether an alternative meets the purpose and need for the project.

S.6.2 Consideration of Section 4(f) Resources

Each alternative was evaluated to determine whether it possessed any Section 4(f) impacts. Section 4(f) of the USDOT Act of 1966 includes the use (or potential use) of Section 4(f)-protected resources within the study area. Section 4(f) protected resources include public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Any alternative that impacts Section 4(f) resources cannot be selected if a feasible and prudent alternative avoids Section 4(f) resources.

Any alternative that does not meet the objectives of the Screening of Alternatives Considered criteria has been eliminated from detailed study (except the No-Build alternative and Build Alternative alignment Line 1).

**Table S-2
Screening of Alternatives Considered**

Screening Criteria	No-Build Alternative	Build Alternative Alignments									
		Line 1 (Original Preferred Alternative)	Line 2	Line 3	Line 4	Line 5	Line 6	Line 7	Line 8	Line 9	Line 10
Purpose and Need Requirements:											
1. Consistency with Local Plans											
INDOT LRP	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2025 Transportation Plan	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
Purdue Transportation Plan	No	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes
Land Use Plans ²	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
2. Accommodate existing and projected traffic volumes and address safety concerns											
Carries at least 10,000 AADT on both sections	No	No	NA	Yes	Yes	No	No	Yes	No	Yes	Yes
Carries at least 50% of the AADT of the highest volume alignment (Line 7)	NA	Yes	NA	Yes	Yes	No	No	Yes	No	Yes	Yes
Section 4(f) impacts:											
Potential involvement with Section 4(f) resources?	NA	No	Yes	Yes	No	Yes	Yes	No	Yes	No	No
Carried forward for detailed study?	Yes¹	Yes	No	No	Yes	No	No	Yes	No	Yes	Yes

Source: Michael Baker Jr., Inc. 2002.

¹To be carried forward (per CEQ regulations)

²Land Use plans include the Tippecanoe Comprehensive Plan, the Focus on the Future plan, and the Purdue Transportation Plan.

The alignments that have been eliminated from detailed study are shaded.

NA=Not applicable

S.7 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The criteria for the Screening of Alternatives Considered was described in the previous section. The following discussion of each alignment eliminated (from further consideration and thus detailed study) explains how the alignment failed to meet project purpose and need. If the alignment did meet project purpose and need, the discussion explains how the alignment failed the screening due to potential involvement with a Section 4(f) resource.

In sum, Build Alternative alignments Lines 2, 3, 5, 6, and 8, have been considered and eliminated from further consideration and thus detailed study in this Environmental Document (Table S-3). These alignments lack consistency with local transportation and land use plans or, as is the case with Lines 2 and 3, result in impacts to Section 4(f) resources. Although the No-Build Alternative was considered and dismissed in previous environmental documents for the project and continues to inadequately address purpose and need, it will be carried forward for detailed study in this Environmental Document, consistent with FHWA and CEQ regulations.

**Table S-3
Screening of Alternatives Considered Results**

Alternative Considered	Eliminated from further consideration and detailed study?	Carried forward for detailed study in Chapter 3 of this Environmental Document?
No-Build Alternative ¹	No	Yes
Build Alternative Alignments		
Original Preferred Alternative- Line 1	No	Yes
Line 2	Yes	No
Line 3	Yes	No
Line 4	No	Yes
Line 5	Yes	No
Line 6	Yes	No
Line 7	No	Yes
Line 8	Yes	No
Line 9	No	Yes
Line 10	No	Yes

Source: Michael Baker Jr., Inc. 2002.

Alignments eliminated from further consideration and thus detailed study are shaded.

¹To be carried forward (per CEQ regulations)

S.8 ALTERNATIVES CARRIED FORWARD FOR DETAILED STUDY

The No-Build Alternative, and Build Alternative alignments, Line 1 (original Preferred Alternative) and Lines 4, 7, 9, and 10 (Table S-3), will be carried forward for detailed study in Chapter 3 of this Environmental Document. The alternatives carried forward for detailed study are shown in Exhibit 2-2.

S.9 FINAL SCREENING OF ALTERNATIVES

The No-Build Alternative, and Build Alternative alignments Line 1 (the original Preferred Alternative), 4, 7, 9, and 10 have been carried forward for detailed study based on the screening of alternatives considered. These alternatives were fully evaluated for potential environmental consequences. Detailed environmental consequences of the No-Build Alternative and the Build Alternative alignments

carried forward for detailed study are presented in Chapter 3 of this Environmental Document. Table S-4 is a Summary Matrix for Environmental Impacts.

**Table S-4
Summary Matrix of Environmental Impacts**

Environmental Impacts	No-Build Alternative	Build Alternative Alignments				
		Line 1	Line 4	Line 7	Line 9	Line 10
SOCIO-ECONOMIC ENVIRONMENT						
Land Use - Direct (acres)						
Agriculture/Undeveloped	0	96.8	147.1	117.4	132.2	145.7
Community	0	0	1.5	4.1	4.1	1.5
Multi-family	0	19.8	0	2.5	2.7	0.5
Office and Industrial	0	3.3	4.2	0	0	3.5
Parks and Recreation	0	0.6	5.3	0	0	5.3
Retail	0	3.2	5.0	0	0	0.4
Single-family	0	0.2	1.7	5.8	6.6	7.3
TOTAL ACRES	0	120.8	164.8	129.8	145.7	164.2
Farmland Soils (prime and state-wide in acres)	0	91	124	52	117	122
Consistency with local plans¹	2	4	2	8	8	2
Displacements (#)						
Residential (units)	0	335	124	18	109	36
Businesses	0	3	4	0	0	2
Community Facility	0	0	1	1	1	1
Environmental Justice Disproportionate Impacts (yes or no)	No	No	No	No	No	No
NATURAL ENVIRONMENT						
Stream Impacts (# of crossings/Length of impact in ft)	0/0	2/694	4/1412	2/636	3/1022	4/1356
Floodplain Impacts (acres)	0	0	3.8	0	0	3.0
Wetland Impacts²(acres)						
PAB	0	0	0	0	0	0
PEM	0	0	1.0	0.5	1.2	2.0
PSS	0	0	0.8	0	0	0
PFO	0	0	1.0	1.2	1.0	1.0
TOTAL ACRES	0	0	2.8	1.7	2.2	3.0
Land cover (total acres of conversion)	0	139.0	165.0	129.9	145.7	164.1
PHYSICAL ENVIRONMENT						
Hazardous Waste Site Impacts (#)	0	0	1	0	0	0
OTHER ENVIRONMENT						
Noise Impacts (#)	6	3	0	3	5	2

Source: Michael Baker Jr., Inc.

¹Eight plans were reviewed and consistency with these plans is discussed in Chapter 3.

²Initial wetland impacts for all Build Alternative alignments were calculated based on verified NWI wetlands within the study area.

S.10 RECOMMENDED PREFERRED ALTERNATIVE

Based upon the intent of the proposed action, purpose and need of the project, technical analyses presented in Chapters 1, 2, and 3 of this Environmental Document, and overall environmental consequences to the study area, Line 7 has been identified as the recommended preferred alternative to complete the US 231 Relocation Study from SR 26 to US 52. Chapter 4 discusses the recommended preferred alternative in detail and outlines potential mitigation measures.

Line 7 completes the proposed action, meets the purpose and need of the project, does not impact Section 4(f) resources, and does not result in substantial impacts to the environment. Environmental impacts associated with Line 7 are discussed in detail in Chapter 2 and Chapter 3 of this Environmental Document. Comparatively, the environmental consequences of Line 7 are generally less than those of Line 1 - the original preferred alternative identified in the 1992 ROD - and are preferred over all other Build Alternative alignments carried forward for detailed study. A synopsis of environmental impacts associated with Line 7 as compared to the No-Build Alternative and Line 1 (the original preferred alternative) is provided in Table S-5 below; and comparison with all of the Alternatives is provided in Chapter 2 (Table 2-5).

**Table S-5
Summary Matrix of Environmental Impacts for Line 1 and Line 7**

Environmental Impacts	No-Build Alternative	Build Alternative Alignments	
		Line 1	Line 7
SOCIO-ECONOMIC ENVIRONMENT			
Land Use - Direct (acres)			
Agriculture	0	96.8	117.4
Community	0	0	4.1
Multi-family	0	19.8	2.5
Office and Industrial	0	3.3	0
Parks and Recreation	0	0.6	0
Retail	0	3.2	0
Single-family	0	0.2	5.8
TOTAL ACRES	0	120.8	129.8
Farmland Soils (prime and state-wide in acres)	0	91	52
Consistency with local plans ¹	2	4	8
Displacements (#)			
Residential (units)	0	335	18
Businesses	0	3	0
Community	0	0	1
Environmental Justice Disproportionate Impacts (yes or no)	No	No	No

Environmental Impacts	No-Build Alternative	Build Alternative Alignments	
		Line 1	Line 7
NATURAL ENVIRONMENT			
Stream Impacts (# of crossings/Length of impact in ft)	0/0	2/694	2/636
Floodplain Impacts (acres)	0	0	0
Wetland Impacts² (acres)			
PAB	0	0	0
PEM	0	0	3.4
PSS	0	0	0
PFO	0	0	1.1
TOTAL ACRES	0	0	4.5
Land cover (total acres of impacts)	0	139.0	129.9
PHYSICAL ENVIRONMENT			
Hazardous Waste Site Impacts (#)	0	0	0
OTHER ENVIRONMENT			
Noise Impacts (#)	6	3	3

Source: Michael Baker Jr., Inc.

¹ Eight plans were reviewed and consistency with these plans is discussed in Chapter 3.

²Detailed wetland delineations, using Army Corp of Engineers methodology, were performed only on the recommended preferred alternative.

S.10.1 Wetland Mitigation

Field personnel trained in the USACE 1987 Wetland Delineation manual performed wetland delineations on the recommended preferred alternative (Line 7). The purpose of this additional fieldwork was to determine more precise boundaries for the wetlands that may be impacted by Line 7. The delineated wetland impacts were assessed by GIS analysis on a 300-foot wide buffer of Line 7 (150 feet on either side of the centerline).

Line 7 will result in impacts to three wetlands within the 300-ft wide buffer. These wetlands are identified as Wetland 2, Wetland 6, and Wetland 8, and are displayed on Figure 4-2. In total, the preferred alternative will impact 4.5 acres of wetlands (Table S-6).

**Table S-6
Wetland Type, Impacts, and Mitigation**

Wetland ID	Wetland Type	Acres Impacted	Amount of Mitigation Required (acres)
Wetland 2	PEM	2.3	6.9
Wetland 6	PEM	1.1	3.3
Wetland 8	PFO	1.1	4.4
Totals:		4.5	14.3

Mitigation, based on the established mitigation requirements, is as follows:

- 4:1 for PFO wetland impacts, and
- 3:1 for all other wetland impacts.

The total mitigation required for the impacts associated with Line 7 is 14.3 acres.

To the extent possible, impacts to wetlands have been avoided or minimized through the interdisciplinary, interagency approach and the use of GIS analysis. A mitigation site located in the northeast quadrant of the Wabash River crossing was established for wetland impacts resulting from construction of the preferred alternative selected in the 1992 FEIS. The mitigation site is approximately 48 acres; 33 acres of which have been constructed as wetlands. Of the 33 acres of created wetlands, approximately 18.6 acres have been used as mitigation for the portions of US 231 already constructed and in the final engineering design stage. Therefore, 14.4 acres remain available for mitigation on this portion of the project (from SR 26 to US 52).

Impacts to wetlands will be considered during the mitigation development phase; additional avoidance and minimization measures will be implemented, if feasible.

S.10.2 Community Impact Mitigation

Community Impact issues that remain a concern with the preferred alternative will be addressed with mitigation proposals. These proposals will be developed with the Community Advisory Committee's (CAC) input, and may include landscaping of the median, pedestrian treatments at crossings, and measures to mitigate the project's impacts on access to neighborhoods and community facilities.

All project impacts will be reviewed for additional avoidance, minimization, and mitigation measures. Feasible measures be explored and any applicable preliminary design changes will be documented in FHWA's final project decision document, as well as the projects Engineer's Report.