Chapter 1: Purpose And Need

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.

1.1 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.

1.2 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, Indiana, 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.

1.3 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 1981, a *Comprehensive Plan for Tippecanoe County* (Tippecanoe Comprehensive Plan) was adopted. The 1978 study was included in this plan.

In 1984, the Tippecanoe County Commissioners, supported by the City of West Lafayette and the City of Lafayette, obtained an agreement with the Indiana Department of Highways to proceed with the US 231 project.

In 1986, a proposed relocation of US 231 with a south Wabash River bridge crossing was included in the Transportation Improvement Program (TIP) of the TCAPC, and the Indiana Department of Highways Improvement Program (HIP). In addition, the Tippecanoe Comprehensive Plan was updated by the TCAPC in response to an announcement that the Subaru-Isuzu partnership would build and operate a major automobile assembly plant in south Lafayette. The increased employment from this plant with its associated growth required an improved highway system. The *Subaru-Isuzu Site Impact Study, Levee Plaza Business Area Transportation Plan*, and *Strategic Plan for West Lafayette* also stressed the importance of the highway system. The relocation of US 231 with a Wabash River crossing was an integral part of those plans.

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 1997, the TCAPC adopted the *Transportation Plan for 2015 – Greater Lafayette Area Transportation and Development Study* (2015 Transportation Plan), a part of the Tippecanoe Comprehensive Plan. This plan called for completion by 2000 of:

- the southern section of the US 231 relocation from south of CR 500S to SR 25;
- the section from SR 25 across the Wabash River (including the new bridge) to South River Road;
- the section from South River Road to Harrison Bridge; and
- the exit and on ramps at Harrison Bridge.

For the period between 2001 and 2010, this plan called for extending US 231 from South River Road north, then east around the Purdue University Airport, then north and west around the Purdue University campus to a northern terminus at US 52. Finally, for the period between 2010 and 2015, the plan called for upgrading and widening McCormick Road from US 52 to CR 500N to create an "outer loop" for the City of West Lafayette and a connection to the relocated US 231.

In May 2001, the TCAPC adopted the *Transportation Plan for 2025 – Greater Lafayette Area Transportation and Development Study* (2025 Transportation Plan). With the southern section, new bridge, and northern section up to the Harrison Bridge complete, the remaining new location transportation improvements within the study area called for by this plan include:

- the completion of US 231 from South River Road to US 52, as described in the Transportation Plan of 2015;
- the extension of Intramural Drive south through the Purdue University campus to meet relocated US 231 near the Purdue University Airport;
- extension of Cumberland Avenue to McCormick Road, and ultimately Klondike Road, south of US 52; and
- extension of Cherry Lane to relocated US 231 (in the latter phase of the plan).

In addition to the new location projects in the study area, Lindberg Road and Klondike Road are planned to be widened to four lanes by 2010. For the period between 2011 and 2025, the plan also calls for continued construction of relocated US 231 northward from US 52 to a new interchange at I-65 in order to complete a western limited-access corridor to relieve congestion in the Cities of Lafayette and West Lafayette.

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.

1.4 PURPOSE AND NEED FOR ACTION

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.

1.4.1 Conformity to Existing Transportation Plans

The US 231 corridor is identified as a study corridor in the *INDOT Draft 2000-2025 Long-Range Plan* (INDOT LRP), which was updated in 2001. The INDOT LRP dedicates funds in the years 2000 to 2004 to construct US 231 as a four-lane facility from 0.5 miles north

of the Wabash River to SR 26. Assuming the planning process has been completed and an acceptable alternative has been identified, the four-lane construction of US 231 between SR 26 and US 52 will be funded in the years 2004 to 2009, and the section between US 52 and I-65 could be funded in the years 2010 to 2025.

US 231 between Crawfordsville and Lafayette, Indiana is also part of the National Highway System. As part of the study identified in the INDOT LRP, two environmental studies are analyzing improvements to US 231:

- One study (the subject of this Environmental Document) is an approved and programmed project as described above, and
- The other environmental study is a corridor-level planning study to assess US 231 from Cloverdale, south of I-70 to I-65 north of Tippecanoe County. That study does not include the potential relocation of US 231 between SR 26 and US 52. The results of the planning level study are expected in late 2002 and will provide recommendations for highway improvement projects along the corridor.

An alignment between SR 26 and US 52 to be completed by 2010 is included in the 2025 Transportation Plan. The 2025 Transportation Plan is an amendment to the Transportation Element of the Tippecanoe Comprehensive Plan. A new alignment for US 231 between SR 26 and US 52 is described in the 2025 Transportation Plan, which states:

> "The new alignment will go north from its intersection at South River Road, around the Purdue Airport to the east, and then head west where it will cross SR 26 just east of the SR 26/Newman Road intersection. From there, the road will go north where it ties in with McCormick Road north of the McCormick/Lindberg Road intersection. McCormick Road will be improved to four lanes up to its terminus at US 52. Intramural Drive will be extended south through campus to meet realigned US 231. It will also serve as the point of access for the new airport terminal. Cumberland Avenue will be extended across from US 52 to the new US 231 alignment."

In the 2025 Transportation Plan, the preferred alignment is to be completed by 2010. Construction dollars are planned in the transportation improvement program for 2002 and 2008.

The September 2001 *Purdue University Transportation and Parking Plan* (Purdue Transportation Plan) assumes completion of the northern section (SR 26 to US 52) of the Proposed Relocation of US 231 project, including the extension of Cherry Lane west to the relocated US 231. According to the Purdue Transportation Plan,

relocated US 231 will provide highway access to the west side of the campus. An extension of South Intramural Drive to relocated US 231 will provide a new access point to the campus. Relocated US 231 will also divert traffic traveling through the City of West Lafayette from sections of the perimeter roadway, particularly Northwestern Avenue. Reduced non-campus traffic on the perimeter roadway will increase the safety for pedestrians and bicyclists around campus.

The *Purdue University Airport Master Plan* (Airport Master Plan), updated in February 2001, assumes relocated US 231 will be built on the east side of the airport, providing a new "front door" access and allowing the airport terminal to be moved. Moving the terminal is intended to separate academic and general aviation uses from the commercial airline use, and provide more space for all users.

A reciprocal agreement was reached on March 20, 1997 between INDOT, Tippecanoe County, the City of Lafayette, and the City of West Lafayette. The agreement states that with the relocation of US 231, it will no longer be appropriate or convenient to route state traffic along several existing state routes. The State would revert jurisdiction over to local jurisdictions, and the function of the routes would be limited to local traffic circulation. The local jurisdictions would be responsible for all future maintenance, reconstruction, and construction on these routes and the State would be responsible for the design, construction, and maintenance of US 231 from South River Road to US 52. Upon completion of US 231, the following roadways would revert back to the local jurisdictions:

- SR 26 from ½ mile west of SR 526 east to US 52,
- SR 43 from US 231 north to I-65,
- SR 443,
- SR 526,
- SR 126, and
- Three bridges: one on North River Road over Happy Hollow Creek, and two over the Wabash River on Columbia and South Streets.

1.4.2 Existing Traffic and Crash Characteristics

Detailed traffic analysis information will be provided in the Engineer's Report.

Existing Traffic

Existing traffic counts for 1999 (the most recent available) were obtained from INDOT and the TCAPC. The volumes accounted for seasonal variations and

represented the Average Annual Daily Traffic (AADT). Analysis of 24-hour traffic counts on a dozen links within the study area indicated that the percentage of daily traffic occurring during the peak hour ranged from 8 to 11 percent. For analysis purposes, 10 percent was used to estimate peak hour volumes from AADTs. Commercial vehicles make up approximately four percent of the overall traffic.

Table 1-1 summarizes the 1999 AADT, peak hour volume, and level of service (LOS) for the selected links for the Traffic Analysis Area (TAA). According to the American Association of State Highway and Transportation Officials (AASHTO) guidelines, *A Policy on Geometric Design of Highways and Streets*, 2001, the desirable LOS for urban/suburban highways is LOS C or better. The INDOT Design Manual states that LOS B is the desirable LOS and LOS C is the minimum LOS for suburban arterial streets. As shown in Table 1-1, links along US 52, US 231 (Northwestern Avenue), River Road, and across the Harrison Bridge operate at a LOS D or LOS E, which represent unacceptable levels of congestion. The 1999 AADT on portions of existing US 231 (Northwestern Avenue) exceeded 26,000 vehicles resulting in LOS D. Some urban streets in Table 1-1 have a higher volume than other streets, but operate at a better LOS. This occurs because there are fewer or farther spaced traffic signals along the first street than the second street.

Table 1-1
1999 Existing Traffic Conditions

		Segment		1999 Existing Traffic Conditions					
Link Number	**Roadway**	**From**	**To**	**Functional Class**	**Design Class**	**Number of Lanes**	**AADT**	**Peak Hour Volume**	**Level of Service**
1	**US 52**	Beyond study area	US 231 (Moore St)	Multilane Rural Arterial	Rural	4	8,200	820	A
2		US 231 (Moore St)	CR 400W	Multilane Rural Arterial	Rural	4	9,000	900	A
3		**CR 300W (Klondike Rd)**	**McCormick Rd**	**Multilane Urban Arterial**	**Suburban**	**4**	**16,600**	**1,660**	**D**
4		McCormick Rd	CR 350N	Multilane Urban Arterial	Suburban	4	25,100	2,510	C
5		Existing US 231	Cumberland Ave	Multilane Urban Arterial	Suburban	4	28,500	2,850	C
6		**Yeager Rd**	**Salisbury St**	**Multilane Urban Arterial**	**Intermediate**	**4**	**27,600**	**2,760**	**D**
7	**Existing US 231**	**Stadium Ave**	**SR 126 (Cherry Ln)**	**Multilane Urban Arterial**	**Intermediate**	**4**	**20,100**	**2,010**	**D**
8		**CR 200 N (Lindberg Rd)**	**US 52 (Jct E)**	**Multilane Urban Arterial**	**Intermediate**	**4**	**26,700**	**2,670**	**D**
9		US 52 (Jct W)	Beyond study area	Rural Arterial	Rural	2	1,700	170	B
10	SR 26	CR 500W	CR 200N	Urban Arterial	Suburban	2	3,300	330	B
11		CR 250W	Newman Rd	Urban Arterial	Suburban	2	4,300	430	C
12		New US 231	McCormick	Urban Arterial	Suburban	2	7,000	700	C
13		North River Rd	2nd Street	Multilane Urban Arterial	Intermediate	4	32,500	3,250	C
14	CR 200N (Lindberg Rd)	McCormick Rd	Existing US 231	Urban Arterial	Suburban	2	3,300	330	B
15		CR 300W	McCormick Rd	Urban Arterial	Suburban	2	2,500	250	B
16	CR 300W	Cumberland Ave Extension	CR 200N	Urban Arterial	Suburban	2	3,800	380	C

		Segment		1999 Existing Traffic Conditions					
Link Number	**Roadway**	**From**	**To**	**Functional Class**	**Design Class**	**Number of Lanes**	**AADT**	**Peak Hour Volume**	**Level of Service**
17	CR 400W	CR 200N	US 52	Urban Arterial	Suburban	2	900	90	A
18	McCormick Rd	Cumberland Ave	CR 200N	Urban Arterial	Suburban	2	1,600	160	A
19		SR 126 (Cherry Ln)	Stadium Ave	Urban Arterial	Suburban	2	6,700	670	C
20	Jackson Hwy	SR 26	CR 600W	Rural Arterial	Rural	2	1,200	120	A
21	SR 126 (Cherry Ln)	Beyond study area	McCormick Rd	Urban Arterial	Suburban	2	2,800	280	B
22	Stadium Ave	Beyond study area	McCormick Rd	Urban Arterial	Intermediate	2	4,000	400	C
23	Newman Rd	CR 250W	SR 26	Urban Arterial	Suburban	2	2,200	220	B
24	**River Road**	CR 500W	CR 350W	Urban Arterial	Suburban	2	2,400	240	B
25		US 231	Williams St	Multilane Urban Arterial	Suburban	4	26,200	2,620	B
26		**Robinson St**	**SR 443**	**Urban Arterial**	**Intermediate**	**2**	**14,500**	**1,450**	**D**
27	**Harrison Bridge**	**West Lafayette**	**East Lafayette**	**Multilane Urban Arterial**	**Intermediate**	**4**	**29,500**	**2,950**	**E**

Source: Michael Baker Jr., Inc. 2002
Segments with unacceptable LOS D or E are in bold.

Crash Characteristics

Historic crash data at intersections within or adjacent to the project study area were compiled for years 1997 to 1999 from the TCAPC 1999 *Vehicle Crash Study Report* and crash databases. Table 1-2 summarizes the 1997-1999 TCAPC data as well as 1984 crash data from the DEIS. Five intersections along (current) US 231 experienced ten or more crashes per year. Two additional intersections (Stadium Avenue/University Drive and SR 26/Grant Street) potentially affected by cut-through traffic on the west side of US 231, also experienced ten or more crashes per year. The crash rate per million entering vehicles (MEV) was calculated for each intersection. In 1999, three intersections had a crash rate over two crashes per MEV, which is the threshold at which the Institute of Transportation Engineers recommends that improvements be evaluated for intersections. Three intersections: Stadium Avenue/US 231 (Northwestern Avenue), Stadium Avenue/University Drive, SR 26 (State Street)/Grant Street are ranked between number one and number 16 out of 74 for the highest crash rate intersections in the TCAPC 1999 *Vehicle Crash Study Report*. The 1999 average crash rate for Tippecanoe County intersections (contained in the *Vehicle Crash Study Report*) was 1.6 crashes per MEV.

As shown in Table 1-2, the crash rate for a particular intersection often varies from year to year making it difficult to predict crash trends at an individual intersection. However, assuming that the crash rate at a particular intersection remains constant, the number of crashes at that intersection will decrease if the number of vehicles entering the intersection decreases. Therefore, relocation of US 231 should remove through traffic and some Purdue University destined traffic from Northwestern Avenue (US 231); thus, potentially reducing the number of crashes at the intersections along Northwestern Avenue due to decreased entering volumes. Crashes should also be reduced on other local roadways from which traffic is diverted to relocated US 231. Although crashes will occur on the new US 231, statewide average crash rates show that the crash rate for an urban principal arterial (4.04 million vehicle miles of travel [VMT]) is lower than that for urban minor arterials (4.76 million VMT) and two-lane collector streets (4.91 million VMT). Therefore, the overall crash rate in the study area should be reduced as traffic is diverted to US 231 from urban minor arterials and collector streets.

Table 1-2
Summary of Intersection Crash Rates

	Intersection	1984 Number	1984 ADT	1984 Rate (MEV)	1997 Number	1997 ADT	1997 Rate (MEV)	1998 Number	1998 ADT	1998 Rate (MEV)	1999 Number	1999 ADT	1999 Rate (MEV) Rank in ( )[1]
1	Stadium Ave./US 231 (Northwestern Ave.)	NA	NA	NA	22	35,320	1.71	20	35,319	1.55	27	33,255	**2.22** (12)
2	Stadium Ave./University Dr.	NA	NA	NA	12	33,960	0.97	14	33,953	1.15	14	17,773	**2.15** (16)
3	Grant St./US 231 (Northwestern Ave.)	19	30,887	1.69	12	36,770	0.89	14	36,771	1.04	12	31,901	1.03 (70)
4	SR 26 (State St.)/US 231 (Northwestern Ave.)	8	21,606	1.01	19	36,770	1.42	25	36,771	1.86	17	39,281	1.19 (66)
5	SR 26 (State St.)/Grant St.	19	31,893	1.63	26	32,220	**2.21**	14	32,218	1.19	24	29,650	**2.22** (13)
6	Chauncey St./SR 26-US 231 (State St.)	NA	NA	NA	21	35,370	1.63	8	35,370	0.62	15	30,905	1.33 (52)
7	Salisbury St./SR 26-US 231 (State St.)	20	16,879	**4.22**	14	34,670	1.11	13	34,670	1.03	NA	NA	NA

Source: Data from TCAPC 1999 Vehicle Crash Study Report, except 1984 data which is from the 1987 DEIS.
Compiled by: Michael Baker Jr., Inc., November 2001.
NA=Not applicable
ADT= Average Daily Traffic
MEV= Million Entering Vehicles
Note: Intersections off US 231 are shown where they may be affected by cut-through traffic to the west.
The numbers in bold exceed the 2.0 crashes per MEV, which is the threshold at which the Institute of Transportation Engineers recommends that improvements be evaluated for intersections.
[1] Rank by MEV for all intersections in Tippecanoe County with 10 or more crashes in 1999.

Table 1-3 summarizes the intersections within or adjacent to the project study area where more than one pedestrian or bicycle crash was reported in the three year period from 1997 to 1999. Three intersections within the study area experienced more than one crash per year for the period between 1997 and 1999. The majority of the intersections within the study area did not have a bicycle or pedestrian crash during the analysis period. All three intersections are located within the Purdue University campus along SR 26 (State Street). Relocation of US 231 will facilitate Purdue University in closing sections of State Street to vehicular traffic (as mentioned in the Purdue Transportation Plan) thus reducing the potential for crashes along State Street. Bicycle and pedestrian crashes along US 231 (Northwestern Avenue) would likely decrease due to reduced traffic volumes and the removal of statewide through traffic that may be less familiar than local traffic with interacting with bicycles and pedestrians.

Table 1-3
Summary of Pedestrian and Bicycle Crashes

Roadway	Intersecting Roadway	Number of Crashes (1997 to 1999)
SR 26	University Street	7
SR 26	Grant Road	6
SR 26	Russell Street	4
Stadium Avenue	US 231	3
SR 26	Vine Street	3
US 231	Dodge Street	2
SR 26	Salisbury Street	2
Fowler Street	Vine Street	2
US 231	Fowler Street	2
Fowler Street	Salisbury Street	2

1.4.3 Future Land Use Developments

Tippecanoe Comprehensive Plan

The Tippecanoe Comprehensive Plan divides Tippecanoe County into three categories for land use planning: urban, urbanizing, and rural. All of the City of West Lafayette is considered urban. Wabash Township is considered urbanizing, and Shelby Township is considered rural. The plan notes that urbanizing and rural areas are pressured to become more urban, often conflicting with agricultural activities.

The land use plan is phased temporarily, providing more detail in near-term phases and more general observations in later years with regard to the anticipated location of development. Projected land use changes for urbanizing and rural areas include residential expansion in Wabash Township north of the urban boundary and west

along Cherry Lane, as well as scattered along CR 300W, CR 350W, and Klondike Road. The plan identifies industrial expansion adjacent to the Purdue University Airport, but does not identify any locations for commercial expansion. The plan does not identify any areas for residential, industrial, or commercial expansion in Shelby Township (i.e., west of CR 500W). Urban, urbanizing, and rural boundaries are subject to revision as specific development factors change. For example, extension of a sanitary sewer line can be accompanied by an adjustment to the type of land use category. Existing and future planned development within the study area is depicted in Exhibit 1-4.

Table 1-4 presents the existing and anticipated population and employment growth for the county, localities, and study area. These projections were developed for the 2025 Transportation Plan and are distributed within the county based on existing and planned development, as well as current zoning and the objectives of the Tippecanoe Comprehensive Plan.

Table 1-4
Current and Projected Population and Employment Growth

Locality[1]	1999 Total Population	2025 Total Population	Change in Population 1999-2025	1999 Total Employment	2025 Total Employment	Change in Employment 1999-2025
Tippecanoe County	149,654	195,715	31%	95,976	130,781	36%
West Lafayette[2]	26,756	30,537	14%	13,117	16,705	27%
Unincorporated Wabash Township[2]	26,265	36,536	39%	16,443	17,207	5%
Shelby Township	2,097	2,418	15%	550	550	0%
Study area	**27,934**	**37,952**	**36%**	**10,393**	**14,785**	**42%**

Source: TCAPC
[1] Population and employment data are calculated for each municipality based on the total population and employment within each Traffic Analysis Zone (TAZ) contained partially or completely within the corporate boundaries. The population and employment for West Lafayette and the unincorporated portion of Wabash Township reported in the table may be overestimates.
[2] The City of West Lafayette is part of Wabash Township. The total population and employment for Wabash Township is equal to the sum of population and employment for West Lafayette and Unincorporated Wabash Township.

2025 Transportation Plan

The 2025 Transportation Plan incorporates the current INDOT LRP. As discussed earlier in this chapter, the 2025 Transportation Plan identifies two roadways within the study area that are planned to be extended westward to meet or cross relocated US 231. Cumberland Avenue is to be extended from US 52 to CR 300W (Klondike Road) as a two-lane roadway; and SR 126 (Cherry Lane) is planned to be extended to relocated US 231. Also, Intramural Drive is planned to be extended southward to the portion of relocated US 231, currently under design, that is adjacent to the Purdue University Airport.

Purdue University Strategic Plan

The *Purdue University Strategic Plan* (Purdue Strategic Plan) calls for over $156 million annually in new resources, including infrastructure enhancements. Future land use changes identified in the Airport Master Plan include a new passenger terminal, a new parallel runway, and expansion of the general aviation apron. The Athletic Facilities Master Plan identifies the creation, enhancement, and expansion of four athletic sites: Black Fields, Central, Northwest, and Stadium. The Northwest athletic site would extend from McCormick Road to the Kankakee, Beaverville and Southern Railroad (KBS Railroad) south of Cherry Lane (extended). Discovery Park, an interdisciplinary research and entrepreneurial center, is planned to replace the existing student housing in the northern portion of Purdue Village at the southeast corner of McCormick Road and State Street. Replacement student housing is planned for the southwest corner of McCormick Road and Third Street, south of the Central athletic site. The gravel pit south of the Purdue University Airport is projected to accommodate research and industrial development beyond the project horizon of 2025.

Purdue Transportation Plan

The Purdue Transportation Plan outlines the short and long-range solutions for the movement of people around the Purdue University campus and includes pedestrian, bicycle, transit, vehicular, and parking elements. Key features of the Purdue Transportation Plan include:

- A perimeter roadway to facilitate travel through and around the campus. The four-lane parkway would include the upgraded Northwestern Avenue, Grant Street, Harrison Street, Nimitz Drive, Airport Road, and Stadium Avenue. The parkway would have a raised landscaped median and some bicycle and pedestrian lanes/paths;
- Restriction of some internal campus streets to pedestrians, bicycles, transit, and emergency vehicles including sections of University Street, Third Street, and State Street;
- Installation of traffic calming devices throughout campus and direction changes for some one-way streets;
- Relocation of student parking to the parking garages and surface lots located at the perimeter of campus; and
- Enhancement of transit service potential by providing bus stops at parking locations, allowing transit to use internal streets from which private vehicles are restricted, and changing the street network to create better transit routes.

Implementation of the Purdue Transportation Plan is phased over 20 years in four five-year increments and is estimated to cost over $20 million in addition to right-of-

way (ROW) and utility relocation costs. An additional $48 million is required to construct four parking garages.

Focus on the Future of Unincorporated Wabash Township, an Action Plan

Focus on the Future of Unincorporated Wabash Township, an Action Plan (Focus on the Future Plan) was developed in 1996 during a series of meetings with Wabash Township residents to identify the township's strengths and weaknesses and determine community goals. The fundamental land use goal identified in the plan is preserving the rural character of the area by preserving prime farmland and encouraging low-density development. Actions to implement this goal include considering incorporation, involvement with planning at the city and county level, and a plan amendment for Wabash Township in the Tippecanoe Comprehensive Plan. This plan further recognizes the need for the continuation of US 231 to address traffic congestion at the intersection of State Street, River Road (SR 43), and Harrison Bridge.

1.4.4 Future Traffic Assignments

Detailed traffic analysis information will be provided in the Engineer's Report.

Forecast traffic volumes for the No-Build Alternative were obtained from the TCAPC forecasting model. The AADT on US 231 is expected to exceed 26,000 vehicles north of the bridge over the Wabash River. Table 1-5 summarizes the 2025 No-Build Alternative traffic operating conditions AADT, peak hour volume, and LOS for key roadway segments within the TAA.

According to the AASHTO guidelines outlined in the 2001 *A Policy on Geometric Design of Highways and Streets*, the desirable LOS for urban/suburban highways is LOS C or better. The INDOT Design Manual states that LOS B is the desirable LOS and LOS C is the minimum LOS for suburban arterial streets. As shown in Table 1-5, links along US 52, US 231 (Northwestern Avenue), SR 26, CR 300W (Klondike Road), River Road, and across the Harrison Bridge operate at LOS D or LOS E, which represent unacceptable levels of congestion. The 2025 AADTs on portions of existing US 231 (Northwestern Avenue) are expected to exceed 33,000 vehicles resulting in LOS D.

Table 1-5
2025 No-Build Alternative Traffic Operating Conditions

		Segment		2025 No-Build Traffic Operating Conditions					
Link Number	**Roadway**	**From**	**To**	**Functional Class**	**Design Class**	**Number of Lanes**	**AADT**	**Peak Hour Volume**	**Level of Service**
1	**US 52**	Beyond study area	US 231 (Moore St)	Multilane Rural Arterial	Rural	4	13,900	1,390	A
2		US 231 (Moore St)	CR 400W	Multilane Rural Arterial	Rural	4	13,700	1,370	A
3		**CR 300W (Klondike Rd)**	**McCormick Rd**	**Multilane Urban Arterial**	**Suburban**	**4**	**21,000**	**2,100**	**D**
4		McCormick Rd	CR 350N	Multilane Urban Arterial	Suburban	4	34,400	3,440	C
5		Existing US 231	Cumberland Ave	Multilane Urban Arterial	Suburban	4	36,500	3,650	C
6		**Yeager Rd**	**Salisbury St**	**Multilane Urban Arterial**	**Intermediate**	**4**	**35,500**	**3,550**	**D**
7	**Existing US 231**	Stadium Ave	SR 126 (Cherry Ln)	Multilane Urban Arterial	Intermediate	4	23,600	2,360	C
8		**CR 200 N (Lindberg Rd)**	**US 52 (Jct E)**	**Multilane Urban Arterial**	**Intermediate**	**4**	**33,500**	**3,350**	**D**
9		US 52 (Jct W)	Beyond study area	Rural Arterial	Rural	2	2,100	210	B
10	**SR 26**	CR 500W	CR 200N	Urban Arterial	Suburban	2	5,900	590	C
11		**CR 250W**	**Newman Rd**	**Urban Arterial**	**Suburban**	**2**	**10,100**	**1010**	**D**
12		**New US 231**	**McCormick Rd**	**Multilane Urban Arterial**	**Suburban**	**4**	**12,300**	**1,230**	**D**
13		North River Rd	2nd Street	Multilane Urban Arterial	Intermediate	4	44,200	4,420	C
14	CR 200N (Lindberg Rd)	McCormick Rd	Existing US 231	Multilane Urban Arterial	Suburban	4	6,200	620	B
15		CR 300W	McCormick Rd	Multilane Urban Arterial	Suburban	4	4,000	400	B

		Segment		2025 No-Build Traffic Operating Conditions					
Link Number	**Roadway**	**From**	**To**	**Functional Class**	**Design Class**	**Number of Lanes**	**AADT**	**Peak Hour Volume**	**Level of Service**
16	**CR 300W**	**Cumberland Ave Extension**	**CR 200N**	**Urban Arterial**	Suburban	**2**	**8.900**	**800**	**D**
17	CR 400W	CR 200N	US 52	Urban Arterial	Suburban	2	1,100	110	A
18	McCormick Rd	Cumberland Ave	CR 200N	Urban Arterial	Suburban	2	3,300	330	B
19		SR 126 (Cherry Ln)	Stadium Ave	Urban Arterial	Suburban	2	8,500	850	C
20	Jackson Hwy	SR 26	CR 600W	Rural Arterial	Rural	2	2,400	240	B
21	SR 126 (Cherry Ln)	Beyond study area	McCormick Rd	Urban Arterial	Suburban	2	2,200	220	B
22	Stadium Ave	Beyond study area	McCormick Rd	Urban Arterial	Intermediate	2	3,900	390	B
23	Newman Rd	CR 250W	SR 26	Urban Arterial	Suburban	2	5,400	540	C
24	**River Road**	CR 500W	CR 350W	Urban Arterial	Suburban	2	4,100	410	C
25		US 231	Williams St	Multilane Urban Arterial	Suburban	4	21,100	2,110	B
26		**Robinson St**	**SR 443**	**Multilane Urban Arterial**	**Intermediate**	**4**	**23,700**	**2,370**	**D**
27	**Harrison Bridge**	**West Lafayette**	**East Lafayette**	**Multilane Urban Arterial**	**Intermediate**	**4**	**34,400**	**3,440**	**E**
28	New US 231	South of Bridge	Bridge over Wabash River	Multilane Urban Arterial	Suburban	4	42,000	4,200	C
29		Bridge over Wabash River	Intramural Dr	Multilane Urban Arterial	Suburban	4	26,700	2,670	B
30		Intramural Dr	SR 26	Multilane Urban Arterial	Suburban	4	4,400	440	A

Source: Michael Baker Jr., Inc. 2002
Segments with unacceptable LOS D or E are in bold.

1.5 CONCLUSION

The four major elements of purpose and need described in the DEIS have been "updated" for the reevaluation of alternatives in this Environmental Document. The information will be used to evaluate Build Alternative alignments in Chapter 2: Alternatives Analysis of this Environmental Document.

The US 231 Relocation Study from SR 26 to US 52 is a critical transportation and future land use development element in local planning studies (TCAPC Plans, Purdue University Plans, and the Focus on the Future Plan). Therefore, the Build Alternative of this Environmental Document is consistent with, and developed from, the local planning process.

Updated localized traffic analysis indicates that there continues to be a need to attract additional projected traffic volumes from existing roadways, particularly those roadways east of the KBS Railroad where projected volumes increase and capacity is a concern.

Thirty representative traffic links were selected along existing roadways to illustrate the traffic modeling results. These links are representative of critical roadway segments frequently traveled in the study area. Generally, existing roadways located west of the KBS Railroad will experience an increase in traffic volumes; however, these roadways will be able to absorb the additional capacity. Existing roadways to the east of the KBS Railroad will also experience an increase in traffic volumes, and several of these roadways will exceed capacity which in turn may increase the likelihood of traffic or pedestrian related crashes. Representative links to the east of the KBS Railroad, where the existing roadways will experience the greatest increase in volume, are considered the most critical for localized traffic concerns. The critical traffic influence area is shown in Exhibit 1-5.

Extensive studies at the local planning level support the traffic analysis findings. Hence, the TCAPC, Purdue University, and Focus on the Future plans, taken into consideration as a whole, all validate the need for a US 231 Relocation Study Build Alternative serving the critical traffic influence area.

In Chapter 2, previous and newly developed Build Alternative alignments will be evaluated based on potential impacts to the critical traffic influence area, consistency with local transportation and land use plans, and potential impacts to properties protected under Section 4(f) of the United States Department of Transportation Act (USDOT) of 1966.

Chapter 1: Purpose And Need Exhibits