



## 5.20 Indirect and Cumulative Impacts

### 5.20.1 Introduction

Cumulative effects analysis seeks to identify the impact on the human and natural environment which results from the direct and indirect impacts of a particular action or project when added to past, present, and reasonably foreseeable future actions of others. Impacts to the human and natural environment fall into one of three major categories, i.e., direct, indirect and “others” impacts. Direct impacts are defined by the Council on Environmental Quality (CEQ) Regulations as “*effects which are caused by the action and occur at the same time and place.*” For this project, the direct impacts are the result of the right-of-way needs of the project.

Indirect impacts are defined by the CEQ Regulations as “*effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.*” For this project, an example of an indirect impact would be the development of farmland as a result of new access provided by the project. There are also impacts of reasonably foreseeable future actions of others not associated with the US 31 project. Areas planned for future development, regardless of the present road project, have been reviewed and are considered to be “others” action on the natural resource. Such “others” actions have site plans that have been approved and the area has been identified for future development by a local planning commission, or the land is zoned or will be rezoned for development.

Cumulative impacts are the summation of direct and indirect impacts to the human or natural environment because of the proposed action, and “others” impacts which consist of actions on these resources that are not a result of the proposed action. These cumulative impacts are defined as “*the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions.*” (40 CFR 1508.7) The assessment of cumulative impacts is required by the CEQ Regulations. These regulations ensure that the US 31 project and other federal, state, and private actions will be evaluated with regard to cumulative impacts.

### 5.20.2 Methodology

The indirect and “others” impact analysis was completed as per methods detailed in “Considering Cumulative Effects Under the National Environmental Policy Act” (Council on Environmental Quality, January 1997), “Desk Reference for Estimating the Indirect Affects of Proposed Transportation Projects” (National Cooperative Highway Research Program Report 466, 2002), “Indirect and Cumulative Impact Assessment in the Highway Project Development Process” (FHWA Position Paper, HEP-32, April 1992), and “Consideration of Cumulative Impacts in EPA Review of NEPA Documents” (EPA 315-R-99-002, May 1999).

For the proposed US 31 project, three human and natural resources were identified that are being analyzed for cumulative impacts. These three resources are wetlands, forest and farmland. During meetings on 5/15/03, 12/03/04, and 7/14/04 with various federal and state resource agencies, it was identified that potential disturbances of wetlands, forest and farmland are the significant cumulative effects issues associated with this project. These meeting minutes are located in Appendix C.

The analysis of the past and present trends of these three resources show that Indiana has lost approximately 85% of its wetland areas. Wetlands serve as habitat for many plant and animal species as well as help to stabilize shorelines in lake and river areas. Nationally, approximately 35% of all rare and endangered animal species depend on wetlands for their livelihood. In Indiana alone there are more than 60 animal species that are listed as endangered, threatened, or of special concern that are dependent on wetlands. There are also over 120 plant species associated with wetland areas that are endangered, threatened or rare in Indiana. Together wetlands and forest make up the majority of



the environmentally sensitive habitat for threatened and endangered species in Indiana. These statistics show the relevance of analyzing these two resources that are extremely important to Indiana flora and fauna. In addition to providing habitat, Indiana forests are a major source of revenue for this state. In 2001 Indiana ranked 3<sup>rd</sup> nationally in hardwood lumber production, which added over \$4 billion to the state's economy. Farmland in Indiana is also a valuable economic resource. Indiana ranked in the top 10 nationally in 11 different crop production categories in 2003.

### 5.20.2.1 Study Area

The US 31 corridor is about 20 miles long, crossing from the southern terminus at US 30 near Plymouth to the northern terminus at US 20 near South Bend in Marshall and St. Joseph counties, Indiana. The land use impacts associated with the US 31 project are contained within these boundaries. Current land uses were mapped within the study area, and cross-referenced with recent and current development and transportation improvement projects.

The boundary of the study area for the impacts analysis is a two-mile corridor, one-mile on both sides of the proposed centerline, along the existing alignment up to West 4A Road, and the proposed corridor of Alternatives Cs, Es, G-Cs and G-Es through Marshall and St. Joseph Counties.

### 5.20.2.2 Time Frame

Detailed development activity was analyzed for a 30-year time span, i.e., to the year 2030. Aerial photography of the project area was evaluated for development trends along the corridor. Analysis of impacts to specific natural resources (wetlands, forest, farmland) was accomplished via trend analysis based on documented resource impacts within the study area and/or Marshall and St. Joseph counties.

### 5.20.2.3 Determination of Land Use Impacts

The analysis identifies the anticipated land use changes of the project alternatives in the project study area. These land use changes will form the basis for the indirect and cumulative effects analysis for this project. This included the US 31 indirect impacts associated with accessibility changes as a result of interchanges. Growth in residential, commercial and industrial development in the two county study area occurring independently of the US 31 project was labeled as other impacts. Specific consideration was given to the areas surrounding proposed interchanges as being high potential development areas. A one-mile corridor was identified along cross streets, defining, for purposes of the analysis, the interchange area.

The study corridor was reviewed from the southern terminus at US 30 near Plymouth in Marshall County to the northern terminus at US 20 near South Bend in St. Joseph County. The analysis included a review of existing road maps, aerial photography, zoning maps, planning documents and development plans as well as on-site reconnaissance. The timeframe for the analysis of development trends is from 2000 (the beginning of the project) to 2030. The future year of 2030 is the future analysis year for the transportation modeling and the population and employment forecasts. It is not reasonably foreseeable to forecast impacts beyond the year 2030. The following documents were reviewed for purposes of the indirect and cumulative impact analysis:

- *USDA Forest Service Resource Bulletin N-C 7, "Indiana's Timber" (1969); Bulletin N-C 108, "Indiana Forest Statistics, 1986" (1986); Bulletin N-C 196, "Indiana's Forest in 1998" (1998); Forest Inventory and Analysis NA-TP-03-00, "Forests of Indiana: A 1998 Overview" All are publications of the USDA Forest Service.*
- *Comprehensive Plan for South Bend/St. Joseph County, Indiana. (April 2002) City of South Bend, Indiana.*



- *Comprehensive Plan for Marshall County, Indiana.* (2003, Adopted Draft) City of Plymouth, Indiana.
- *City of Plymouth, Indiana Comprehensive Plan.* (April 2003, Adopted Draft) City of Plymouth, Indiana.
- *Zoning Ordinance of Marshall County, Indiana.* (April 1, 1974) City of Plymouth, Indiana.
- *St. Joseph County Zoning Ordinance, Title 26.* (June, 2002) City of South Bend, Indiana
- Aerial photography (2002). St. Joseph/Marshall County, Indiana.

Coordination with the Planning Commissions for Marshall and St. Joseph counties identified recent and current development, and proposed future and potential future development along the US 31 corridor. When presenting the cumulative impacts, these developments are included as other actions that are occurring presently and that are reasonably foreseeable. Current development that is occurring in the US 31 corridor includes the following commercial, industrial, and residential land uses. These developments are shown in Figure 5.20.63.

- Office Building at corner of US 31 and Whitmer Street - 1 Acre
- Locust Knolls Estates Subdivision – 50 Acres
- Lakeville Commerce Park Subdivision – 11 Acres
- Hidden Creek on Jackson Road – 31 Acres
- Lafayette Falls Subdivision – 115 Acres
- Fieldstone Centre Subdivision – 30 Acres
- Mixed Use Commercial and Housing at Old Lakeville School - 13 Acres

In addition to current development in the project study area, the cumulative analysis includes other INDOT and/or local transportation improvements planned in or near the project area. These INDOT projects are listed in the US 31 Preliminary Screening Report and include:

- Shave down the slope of a hill at Roosevelt and US 31 for site distance improvement
- Install traffic light at intersection of New Road and US 31

Forecasted population and employment growth within the project study area was obtained from the US 31 Improvement Project Travel Demand Model. The allocation of these forecasts to the Traffic Analysis Zones (TAZs) was based upon the existing and future land use plans for South Bend, Plymouth, LaPaz, St. Joseph County, and Marshall County. From the 39 TAZs included within the project study area, the population and employment forecasts were converted into acres of development. Population was first converted into households and then into acres using a value of 3 households or housing units per acre. This value is for single-family detached housing and comes from the “Trip Generation- 6<sup>th</sup> Edition” Institute of Transportation Engineers, 1997. The forecasts for employment were converted into acres of land using values from the “Trip Generation- 6<sup>th</sup> Edition” Institute of Transportation Engineers, 1997.

The result was a total of 975 acres of land is forecasted to be converted to commercial, industrial, and residential land use development within the project study area by the year 2030. The acreage related to indirect impacts from

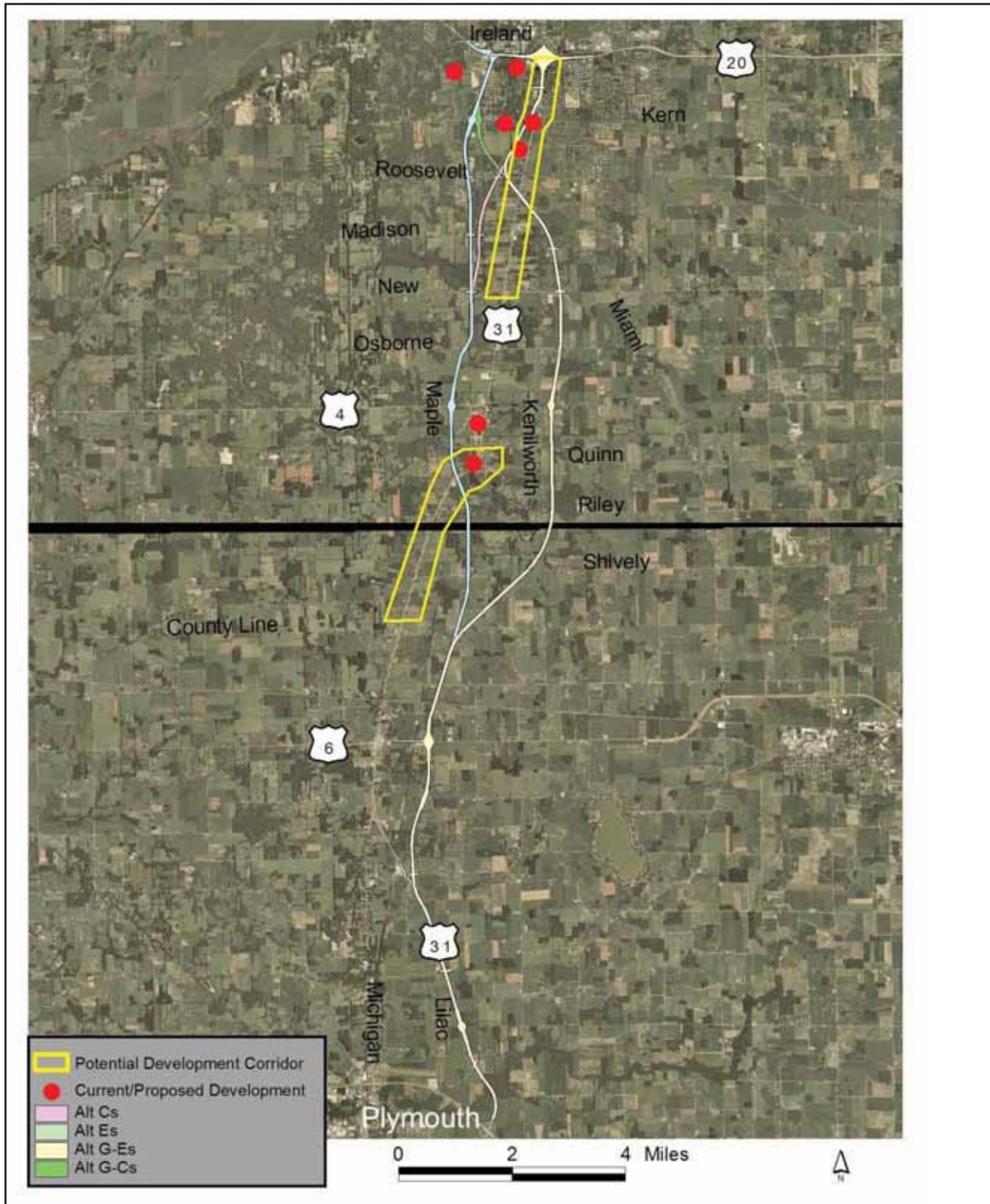


Figure 5.20.63: Recent, Proposed, and Potential Future Development along US 31



the proposed project was subtracted from the total of 975 acres of total development. The remaining acreage was the result of “other actions” and was determined to be wetland, forests and farmland acreage based on current land zoning, land uses, aerials and NWI maps.

#### 5.20.2.4 Current Zoning and Land Use Trends

##### Plymouth/Marshall County

Little to no development exists along Alternatives Cs, Es, G-Es and G-Cs particularly from US 30 to US 6. Primarily row crops such as corn and soybeans characterize approximately 80% of the land use in this portion of Marshall County. The balance of this section contains fragmented forest along with some fallow fields. All of the land within this section of Marshall County is zoned agricultural. The Marshall County Zoning Ordinance defines the Agricultural District (A-1) as agriculture including confined feeding operations, migrant housing, nurseries and greenhouses, produce market stands, public and parochial schools, riding stables and academies, government owned parks and recreational areas, single family dwellings, manufactured and modular homes, home occupations and accessory uses normally permitted. Given the wide range of uses allowed under this designation, Marshall County’s Comprehensive Planned Growth policy statement calls for the establishment of a multiple agricultural zoning district to adequately differentiate agricultural uses and residential uses.

Marshall County Comprehensive Plan Vision Statement 1 states, “Marshall County will plan growth in order to protect County’s rural nature, which is comprised of a healthy agricultural base, open spaces, forestlands, and wetlands.” The associated goal to this statement indicates, “Marshall County should prevent nonfarm development (such as residential subdivisions or shopping centers) from spreading across agriculture/open space land at random.” A survey outcome in the plan also states, “commercial development should focus on existing communities and cities within the county.” All US 31 alternatives will be designed as a limited access rural freeway in Marshall County. Access to US 31 will be limited to interchanges, which will control the development activity on agricultural land along the roadway. This follows the development goals stated in the Marshall County Comprehensive Plan. Given that the City of Plymouth is outside of the study area, we should expect nominal growth particularly for this area in the future.

##### LaPaz/Marshall County

Little to no development exists along Alternatives Cs, Es, G-Es and G-Cs from US 6 to the County Line. The land within this section of Marshall County is also zoned agricultural (A-1). Although it is out of the boundaries of the study area, the City of LaPaz may experience some controlled development in the future. The results of a land use survey published inside the Marshall County Comprehensive Plan states, “workshop participants felt that commercial development should focus on existing communities and cities within the county.” Consistent with that outcome, the Land Use element of the Comprehensive Plan purports to, “support the continued vitality of LaPaz as a mixed use activity center,” (particularly at the intersection of US 31 and US 6 near the City of LaPaz). Given that, the LaPaz area may experience some managed growth in the future.

The Land Use element of the Marshall County Comprehensive Plan supports the continued vitality of LaPaz as a mixed-use activity center. Policy statement 1 of the plan focuses on the businesses and restaurants located in the town center and the significant commercial development, which has occurred at the intersection of US 31 and US 6. As a result of the various planning initiatives and land use trends, we can expect the City of LaPaz to experience some indirect impacts as a result of the proposed interchange.



## Lakeville/St. Joseph County

The Comprehensive Plan states, “The St. Joseph County’s agricultural protection zone has effectively provided constraint to unlimited growth in some areas. Still some challenges exist. Incomes in unincorporated areas of the county are high relative to the two central cities. Transportation in new growth areas is automobile-oriented. Some leapfrog development has occurred to the north and east of existing incorporated areas as well as south along US 31.”

The Land Use Element of the Comprehensive Plan for South Bend and St. Joseph County designates the City of Lakeville and most of the land fronting US 31 to the east and west as “Special Study Areas.” Section 4.3 of the Comprehensive Plan describes the Lakeville Individual Town Plan as follows: “This community constitutes a major entry way into the county from the south side. As such, particular attention should be paid to urban design. A corridor plan for US 31 is already proposed; this concept should be expanded upon with gateway markers at the north and south sides of town, and a corridor overlay zone that controls setbacks, architectural design, signage and lighting along the commercial portion of the corridor.” The undertaking of a “special study” for the City of Lakeville, as designated in the Comprehensive Plan, would allow for more consideration of appropriate mixed land uses to ensure that growth occurs in an orderly fashion and assists in addressing growth projections more accurately.

This portion of the county is zoned primarily agriculture (A) and includes residential (R), commercial (C) and manufacturing (M) in the area contiguous to the southeast boundaries of the City of Lakeville. The 10.5 acre Lakeville Commerce Park Subdivision, which already contains a Subway Sandwich Store, is currently being developed at the northwest corner of US 31 and Mangus Drive in the City of Lakeville. The 13-acre mixed-use commercial and residential development of the Old Lakeville High School area is a proposed activity located at the intersection of Jefferson and US 31.

## South Bend/ St. Joseph County

Development increases along Alternatives Cs, Es, G-Es and G-Cs as you approach the city of South Bend. Particularly, the area between Kern Road and the US 20 Bypass, which is characterized by mixed use residential, commercial, light industrial and manufacturing. As residential subdivisions expand outside the city limits, so does the associated neighborhood serving commercial and retail businesses. The Land Use element of the Comprehensive Plan for South Bend and St. Joseph County has several areas of focus for residential growth. “The residential growth has three facets, the first being new growth focused on the northwestern and southern parts of the City of South Bend, infill growth in the northeastern part of the county, and rural growth in some of the smaller towns and communities throughout the county.”

In addressing the roadway network, the Transportation Conditions element of the Comprehensive Plan for South Bend and St. Joseph County states, “providing connections between subdivisions continues to be an issue, and its practice should be promoted. Interconnections provide multiple options for access to collector and secondary roadways, thereby easing congestion and lowering accident rates.”

The properties along US 31 where Alternatives Es and G-Es merge into existing US 31 and continue to the northern terminus at US 20 Bypass is zoned by the City of South Bend and is designated commercial (C-c) from Kern Road to the US 20 Bypass. This area is characterized by mixed commercial and residential uses. Residential subdivisions exist east and west of existing US 31 corridor along this section. The new developments in this area are the proposed 30-acre Fieldstone hotel development site along US 31 and Kern Road south of Es and G-Es. The 50-acre Locust Knolls subdivision, which is currently being developed is located along Jackson Road west of Locust Road. This subdivision is west of Alternatives Cs and G-Cs. Another proposed development in this area is Hidden Creek Subdivision, which is located along Johnson Road west of Alternatives Cs and G-Cs. The last known proposed development



in the area is Lafayette Falls Subdivision. This 115 acre subdivision is located along Kern Road between Alternative Cs and existing US 31.

The South Bend/St. Joseph County Comprehensive Plan designates land contiguous east and west to the US 31 Corridor as a “special study area” from US 20 to Tyler Road. The Future Land Use Plan element of the South Bend/St. Joseph County Comprehensive Plan shows two residential growth areas along US 31. One area is in Lakeville and the other is between US 20 and Kern Road. Land from Kern Road to south of Roosevelt Road is highlighted as a commercial growth area reserve. The South Bend/ St. Joseph County Comprehensive Plan states, “The plan has several areas of focus for residential growth. The residential growth has three facets, the first being new growth focused on the northwestern and southern parts of the City of South Bend, infill growth in the northeastern part of the county, and rural growth in some of the smaller towns and communities throughout the county.”

Development of vacant properties is being actively encouraged in the southern section of South Bend. Most vacant properties have either been zoned or planned for future development. Based on land use trends and planning initiatives, it is likely that development would occur between Kern and the US 20 Bypass regardless of which US 31 Alternative is selected. However, the interchanges proposed for Kern Road have resulted in some indirect impacts for this area.

The South Bend and St. Joseph County Planning Commission’s “smart growth” policy encourages the compact urban form with integrated land uses (employment, shopping, and residential). The South Bend/St. Joseph County Comprehensive Plan also designates US 31 as part of “Special Study Areas” from South Bend (including the City of Lakeville) to Tyler Road.

The undertaking of a “special study” for the City of Lakeville, as designated in the Comprehensive Plan, would allow for more consideration of appropriate mixed land uses to ensure that growth occurs in an orderly fashion and to assist in addressing growth projections more accurately. The area along US 31, which is proposed for the Lakeville Commerce Centre and the mixed-use residential/commercial subdivision as part of the Old Lakeville High School project, coupled with the interchanges proposed for SR 4, has resulted in some indirect impacts for this area.

There are four access controlled interchanges associated with each of the four alternatives. These interchanges are at 7<sup>th</sup> road, US 6, Pierce Road (SR 4) and Kern Road. The acreages of indirect impacts at these interchanges were determined using a model developed for a national study entitled Commercial Development at Rural and Small-Town Interstate Exits (Hartgen and Kim, 1998). This model takes factors such as traffic data, surrounding land use, nearest towns, populations of nearest towns and how far the area is from other interchanges and estimates the amount of development that will take place at that area. Once a number of establishments is given it is converted into acreages.

The interchange at 7<sup>th</sup> Road was proposed by Marshall County as a result of comments to the DEIS. Initially, the interchange was planned for 5A Road since no intersecting roadway currently exists at 7<sup>th</sup> Road and US 31. The interchange was shifted to 7<sup>th</sup> Road with the understanding that Marshall County would construct a new road at this interchange before construction of US 31. The estimated amount of growth at this interchange was estimated at 10 acres.

There was little new development predicted to occur at the proposed interchange with US 6. The main reason for this is the existing businesses along US 6 will be close enough to the new interchange that they will be visible to motorist and likely will not need to move. With regard to new residential development, the future land use plans show no residential areas on the east side of La Paz in the US 6 area.

The proposed Pierce Road (SR 4) interchange is expected to have 14 acres of commercial development according to the model by Hartgen and Kim. There was also an estimated 16 additional acres of residential development to occur



at this interchange for Alternatives Cs and Es. The 16 acres would result from the nearby commercial development in the area and the attractiveness of Newton Park to families. Alternatives G-Cs and G-Es would have little development associated with this interchange, because they are located east of US 31 in an area that is forecasted in the future land use plan to remain an agricultural area.

Alternatives Cs and G-Cs will have the most indirect impacts related to the proposed Kern Road interchange. At each of these interchanges there is anticipated to be 10 acres of commercial development and 75 acres of residential development. The commercial development is expected to happen just west of existing US 31 near Main Street. This commercial development would fill in the small amount of open land in that area. The residential development is projected to occur in an open field at the northeast corner of Kern and Locust Road. There are subdivisions and a park proposed for the area just north this area that could attract more residences to locate here.

Alternatives Es and G-Es will only have 10 acres of commercial indirect impacts associated with the proposed interchange to be located at Kern Road. The commercial development is expected to happen just west of existing US 31 near Main Street. This commercial development would fill in the small amount of open land in that area.

### 5.20.2.5 Past and Future Trends of the Effected Environment

The significant natural resources that may be impacted by the US 31 project are forests, wetlands, and farmland. Each resource has been analyzed based on available documentation of past and present data from which projections have been derived for this cumulative impacts analysis. The following includes a description of each of these major natural resources.

#### Forests

Information regarding forest is limited to countywide data. Based on the USDA Forest Service's Forest Inventory and Analysis, forested acreage has increased in St Joseph County from 21,800 acres in 1967 to 47,764 acres in 2002. Forested acreage has decreased in Marshall County from 25,400 acres in 1967 to 17,634 acres in 2002 (Table 5.20.43 and Figure 5.20.64). Restrictive land management practices and zoning designations may have contributed to the trend of decreased forests in Marshall County. In St. Joseph County, changing land management practices and zoning designations such as the 20 acres per residence requirement, have contributed to the trend of increased forests as some cropland and pasture are allowed to revert to forest and existing narrow wooded strips were allowed to expand by new home owners. The increase in forests due to these changing practices has been greater than the losses associated with conversion of forests to agriculture, urban/suburban expansion, and other uses.

The future trend for forests in Marshall County seems to indicate that forest is decreasing. This decrease is likely a result of various comprehensive plan policies and land use trends. A linear regression analysis of forest in Marshall County indicates that the small trees have reached a plateau and the medium sized trees are slowly decreasing (see Table 5.20.44 and Figure 5.20.65). The future trend for forests in St. Joseph County indicates that forests are increasing due to programs such as the Classified Wildlife Habitat, the Classified Forest, and the Conservation Reserve Program. A linear regression analysis of forest in St. Joseph County indicates the small and particularly medium sized trees are experiencing a strong and steady increase.

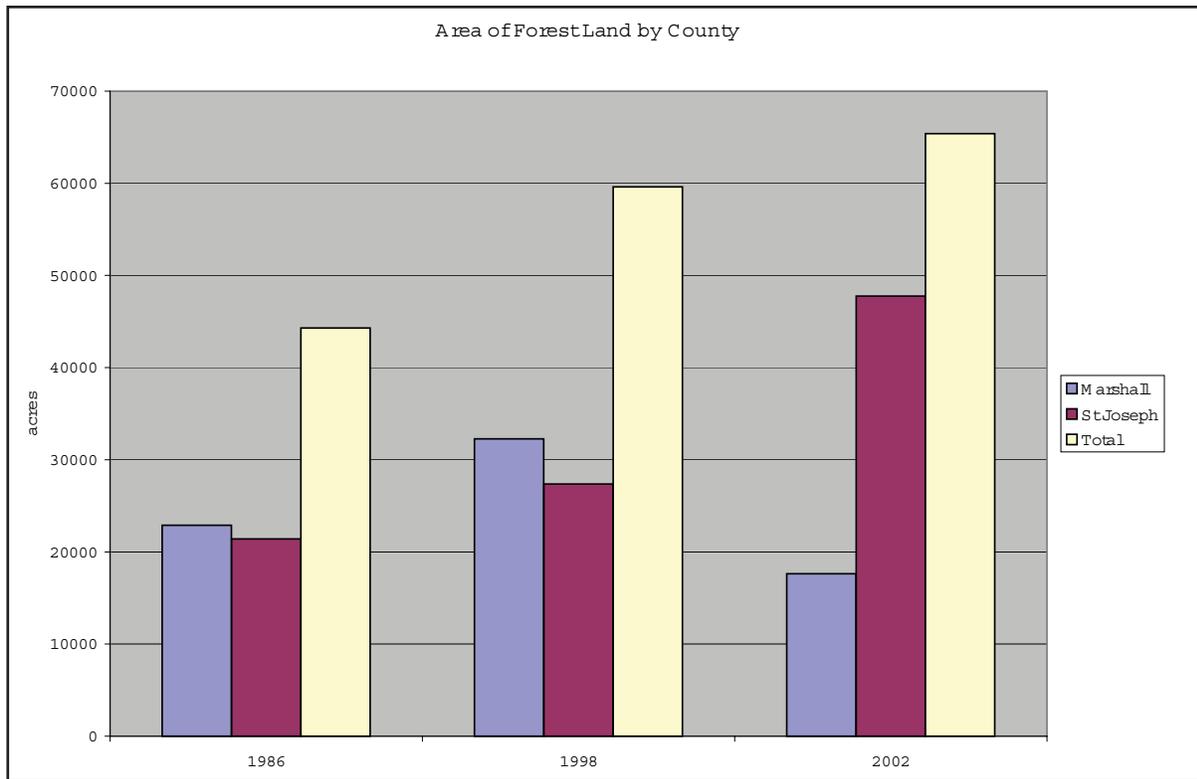


Figure 5.20.64: Area of Forest Land by County

County	Forest				Non-Forest		
	1967	1986	1998	2002	1986	1998	2002
Marshall	25,400	22,900	32,262	17,634	264,300	252,159	257,911
St. Joseph	21,800	21,400	27,355	47,764	284,900	265,328	236,816
Total	47,200	44,300	59,617	65,398	549,200	517,488	494,728

Source: USDA, Forest Service

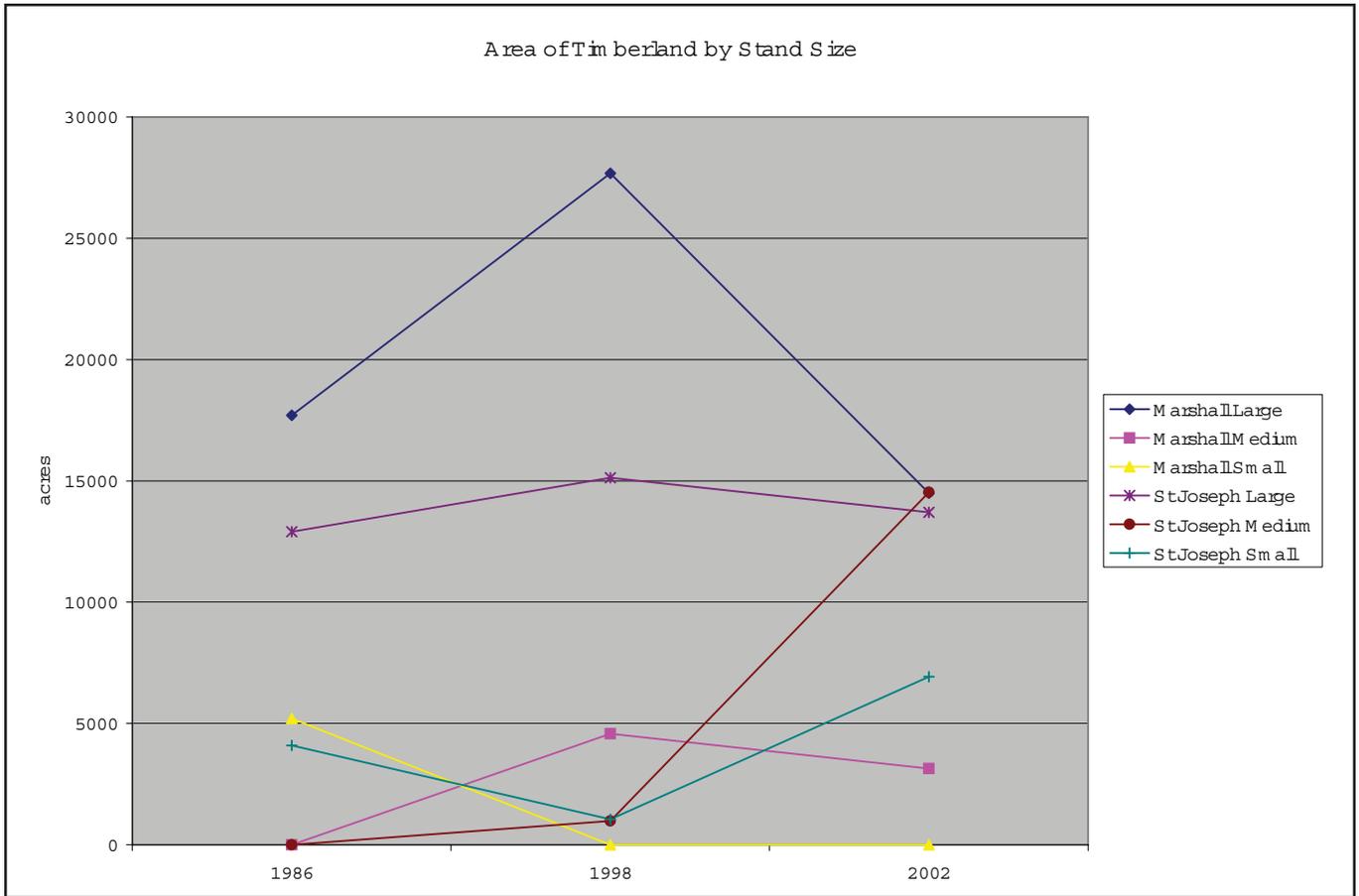


Figure 5.20.65: Area of Timberland by Stand Size

Table 5.20.44: Area of Timberland by County and Stand Size Class (acres)

County	1986			1998			2002		
	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
Marshall	17,700	0	5,200	27,682	4,581	0	14,492	3,142	0
St. Joseph	12,900	0	4,100	15,131	981	1,047	13,708	14,533	6,924
<b>Total</b>	<b>30,600</b>	<b>0</b>	<b>9,300</b>	<b>42,813</b>	<b>5,562</b>	<b>1,047</b>	<b>28,200</b>	<b>17,675</b>	<b>6,924</b>

Source: USDA, Forest Service



## Wetlands

The U.S. Fish and Wildlife Service estimated that Indiana had about 5,600,000 acres of wetland prior to European settlement 200 years ago, which covered approximately 24.1% of the State. (Indiana Department of Natural Resources, 1996) Today wetlands cover about 813,000 acres or approximately 3.5% of total area in Indiana. Indiana and other states have lost many acres of wetlands, especially during the late 1800s and early 1900s, in developing farmland. According to the latest wetland inventory conducted during the mid 1980s by the Indiana Department of Natural Resources, Marshall County had 21,231 acres and St. Joseph County had 12,716 acres.

Legislation in the 1970s and 1980s, coupled with permit requirements for construction in wetland areas, has reversed the downward trend in wetlands in Indiana. At both the federal and state level, the policy is a “no net loss of wetlands.” Officials at the state level indicate that this statement currently provides the best information as to the future direction of wetlands. Efforts have been and will be made to avoid impacting wetlands during the development of the preferred alternative. Delineated jurisdictional wetland impacts for the Preferred Alternative G-Es are described in Chapter 5.12 FEIS.

## Farmland

Since early settlement in Indiana, agricultural land has been, and continues to be, one of the most valuable natural resources within the state. However, there is a continued loss of farmland, specifically prime farmland, as cities expand and rural development for industry and housing becomes more attractive. This trend holds true for Marshall and St. Joseph counties as well. Figures 4.5.20 and 4.5.21 in Chapter 4 illustrate the historic decline of farmland use in Marshall and St. Joseph counties, respectively, from 1900 to 1997. Projections indicate a similar downward trend in farmland acres in the future. The rate of farmland conversion appears to be greater for St. Joseph County than Marshall County.

### 5.20.3 Analysis

The City of South Bend has experienced significant growth, particularly in the city’s southern portion as a result of newly annexed areas along US 31 South. The City of Lakeville has experienced nominal growth. Planning documents from both St. Joseph County and Marshall counties indicate continued growth through at least the year 2020. All recent, proposed, and potential development occurs within St. Joseph County. Marshall County reflects no development within the US 31 Improvement Project study area.

Table 5.20.45 shows the cumulative impacts for each alternative by direct, indirect, and other impacts. The indirect impacts reflect development at the proposed interchanges, such as at 7<sup>th</sup> Road, SR 6, SR 4/Pierce Road, Kern Road, and scattered residential subdivisions. Also included in these indirect impacts is an approximation of the impacts associated with the 7th Road Extension Local Road Improvement Project (see Chapter 3.5.5). The 7th Road Extension Project developed as a result of coordination between the study team and local officials from Marshall County and the City of Plymouth regarding the location of an interchange within the county. Local officials requested that an interchange be located at 7th Road instead of at 5th Road as proposed in the DEIS. Since 7th Road does not currently intersect with US 31, county officials committed to providing funding associated with preliminary engineering, environmental studies, right-of-way acquisition and construction of the extension of 7th Road westward from US 31 to Michigan Road and eastward from US 31 to North Linden Road. It is anticipated that the county will utilize Federal funding for the construction of the 7th Road Extension Project so the associated environmental evaluation will be required to follow the NEPA process and the direct impacts of the project will be determined at that time. No direct socio-economic and environmental impacts for the 7th Road Extension Project have been determined or included in the US 31 Project; however, in response to requests made at the July 14, 2004, resource agency meeting,



an estimation of the impacts associated with the project have been included as indirect impacts in the cumulative impacts of the US 31 Project.

In order to estimate the potential indirect impacts associated with the 7th Road Extension Project, a conceptual alignment for the proposed roadway was developed based on the Marshall County and City of Plymouth long-range plans. For the purpose of determining indirect impacts, a right-of-way width of 100 feet was utilized to determine a potential footprint for the project. It should be noted that the graphical representation of the 7th Road extension used for this analysis is a conceptual representation developed for this EIS only (see Figure 3.5.34). The final alignment of the 7th Road extension will be determined by Marshall County officials during the design of the local roadway project. Environmental information used for the impact analysis was collected from the best-known existing secondary sources of information including GIS data and aerial photography. An estimate of potential indirect impacts associated with the 7th Road Extension Project include wetland impacts, determined from digital NWI maps, of 3 acres; forest impacts of 5 acres; and farmland impacts of 15 acres.

A comparison of the cumulative impacts for each freeway alternative as shown in Table 5.20.45, shows that for farmland, Alternative G-Cs has the highest direct with 504 acres and second highest indirect impacts with 105 acres. Alternative G-Es had the second highest amount impacts to farmland. The farmland impacts for Alternatives Cs and Es are very similar. For forests, Alternative Cs has the highest direct and indirect impacts of the four build alternatives with 186 acres and 30 acres, respectively. Alternatives G-Cs and G-Es have the fewest acres of indirect impacts with ten acres. For wetlands, Alternative Cs has the highest direct impacts of the four build alternatives with 51 acres.

Other impacts include recent development, proposed development, and potential development. These other impacts for the alternatives are shown in Table 5.20.45.

Resource	Alternative	Direct <sup>1</sup> Impact	Indirect <sup>2</sup> Impact	Other Impacts	Cumulative Impacts Total
Farmland*	Cs	390	115	530	1035
	Es	395	50	580	1025
	G-Cs	504	105	520	1129
	G-Es (Preferred) <sup>3</sup>	503 <sup>3</sup>	45	560	1108
Forest*	Cs	186	30	290	506
	Es	135	25	305	465
	G-Cs	115	10	325	450
	G-Es (Preferred) <sup>3</sup>	91 <sup>3</sup>	10	345	446
Wetland* (NWI)	Cs	51	3	30	84
	Es	36	3	35	74
	G-Cs	31	3	35	69
	G-Es (Preferred) <sup>3</sup>	24 <sup>3</sup>	3	35	62

NOTES: \* Measured in acres

Categories encompassed in other impacts include:

1. Acreage immediately impacted by construction of US 31 improvements
2. Undeveloped land zoned agriculture where future development, inspired by the project, is likely
3. See Table 3.6.41 for Summary of Impacts Associated with Preferred Alternative G-Es following additional, in-depth studies.



## Summary of Preferred Alternative G-Es

Following the identification of Alternative G-Es as the Preferred Alternative, additional, in-depth studies were performed on the alternative. Included in these additional studies were minor refinements of the local access plan and associated proposed right-of-way requirements and number of relocations. The results of the additional analysis (see Table 3.6.41) showed that Preferred Alternative G-Es has the least amount of total indirect impacts at only 58 acres. This alternative would directly impact 537 acres of farmland. The indirect impacts to farmland are estimated at only 45 acres, which is the lowest of the proposed alternatives. This alternative also has the fewest amount of direct and cumulative impacts to wetlands and forests. This is mainly due to the fact that most of this alternative travels across farmland.