

CHAPTER 1: PURPOSE AND NEED

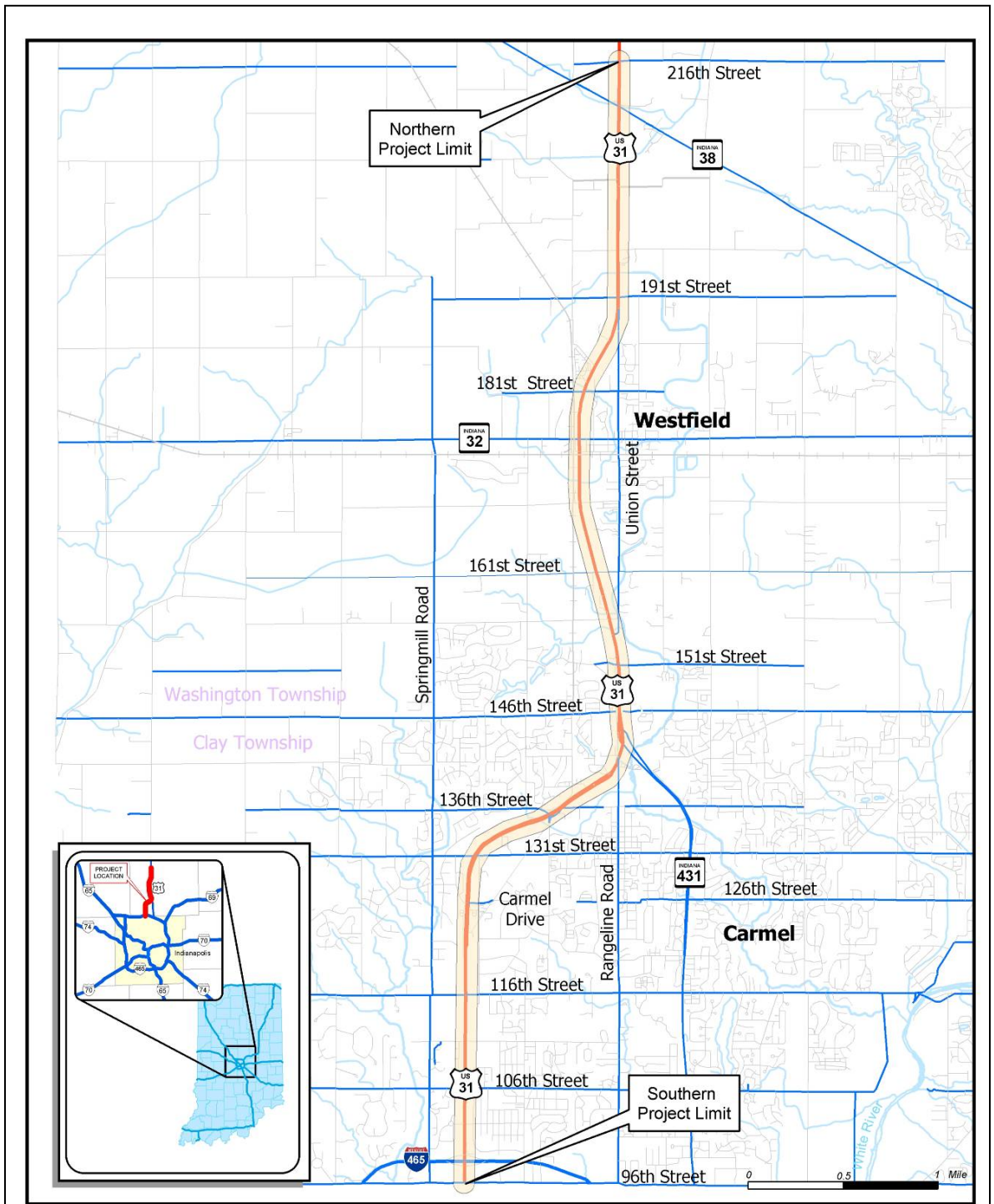
1.1 Project Description

The New US 31 Hamilton County Project is located in Hamilton County, Indiana between I-465 (north leg) and State Road (SR) 38, a distance of approximately 12.5 miles. (Figure 1.1-1). The project traverses the City of Carmel, Clay Township, the City of Westfield, and Washington Township. I-465 was designated as the southern project terminus because it represents a major origin and destination point for US 31. SR 38 was designated as the northern project terminus because it represents the next significant east-west arterial that intersects with US 31 north of Westfield. In addition, traffic patterns and volumes on US 31 along with land use and roadway characteristics change significantly beyond these termini. As such, this segment of US 31 has “independent utility”. Due to the potential for construction and easement impacts, the area of study extended beyond the termini south, approximately one-quarter mile, to 96th Street and north, approximately one-half mile, to 216th Street.

The existing US 31 facility is a four-lane (six lanes between I-465 and 106th Street), divided roadway with limited access right-of-way and at-grade intersections. South of 196th Street, US 31 is classified as Urban Other Principal Arterial. North of 196th Street, it is a Rural Other Principal Arterial. There are currently 15 signalized and seven unsignalized intersections along US 31 within the project area and interchanges with SR 431 and I-465. Direct driveways or private access is prohibited south of SR 431. Although access is also controlled (limited access right-of-way) north of SR 431, there are several private properties that have direct access to US 31. In general, access to the facility is limited primarily to major intersections, with spacing of one-half to one mile. Travel lanes are 12 feet in width and are bordered by an 11-foot paved outside shoulder and a 1.4-foot paved inside shoulder. The through travel lanes are separated by a 50 to 60 foot wide median. Right turn and left turn auxiliary lanes exist along US 31 at all major intersections. The typical existing right-of-way width is 145 feet each side of the centerline (290 feet total) south of 146th Street and 87 feet each side of the centerline (174 feet total) north of 146th Street.

The Preferred Alternative outlined in the FEIS is an upgrade of the existing facility to a full access-controlled freeway facility with a typical right-of-way width of 270 feet and grade separated interchanges. Right-of-way widths may vary up to 290 feet pending variations in the current right-of-way within the project area. The history of the project and the development of the alternatives are described in detail in Chapter 2 – Alternatives.

This Final Environmental Impact Statement (FEIS) for the New US 31 Hamilton County Project has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; Indiana Department of Transportation (INDOT) *Procedural Manual for Preparing Environmental Studies (December 2004)*; the Federal Highway Administration’s (FHWA) *Indiana’s Streamlined EIS Procedures (July 2001)*; INDOT *Public Involvement Procedures (Draft May 2007)*; FHWA (Indiana) *Section 106 Procedures (March 2002)*; INDOT *Traffic Noise Policy (February 2007)*; and, the FHWA Technical Advisory T 6640.8A - *Guidance for Preparing and Processing Environmental and Section 4(f) Documents (1987)*.



**Figure 1.1-1
Project Location
Final Environmental Impact Statement
Hamilton County, Indiana**

1.2 Traffic Capacity and Congestion Needs

As the area’s population, employment, and internal and external travel have continued to increase, so has congestion and delay on area roadways. Many of the intersections along US 31 are currently operating at minimally acceptable levels during peak hours of travel. These delays are expected to increase with forecasted changes in traffic volumes.

1.2.1 Existing Traffic Volumes and Levels of Service (Year 2007)

The current Level of Service (LOS) data has been updated since the Draft Environmental Impact Statement (DEIS) to reflect 2007 measures rather than 2000. Existing 2007 traffic volumes, projected (in 2035, under the “No-Action” Alternative) traffic volumes, and projected 2035 truck percentages are shown in Table 1.2-1. LOS provides a measure of congestion on roadways. LOS ranges from A to F, with LOS A indicating the least traffic congestion and LOS F indicating the most traffic congestion. INDOT standards state that for a multi-lane urban arterial, LOS C is desirable while the minimum is LOS D.

**Table 1.2-1
Average Daily Traffic Volumes and Truck Percentages**

	Existing 2007 Daily	“No-Action” 2035 Daily	2035 Truck Percentage*
I-465 to 106 th Street	73,700	104,700	9% NB, 7% SB
106 th Street to 116 th Street	58,800	83,500	9% NB, 7% SB
116 th Street to 131 st Street	50,200	71,300	10% NB, 9% SB
131 st Street to 136 th Street	43,900	62,300	7% NB, 8% SB
136 th Street to Keystone Parkway	41,000	58,200	7% NB, 8% SB
Keystone Parkway to 146 th Street	60,100	85,400	7% NB, 8% SB
146 th Street to 151 st Street	48,600	69,000	9% NB, 8% SB
151 st Street to 161 st Street	46,800	66,500	9% NB, 8% SB
161 st Street to SR 32	40,300	57,200	7% NB, 7% SB
SR 32 to 191 st Street	33,700	47,900	10% NB, 9% SB
191 st Street to SR 38	31,200	44,300	10% NB, 10% SB
North of SR 38	28,700	40,800	10% NB, 11% SB

Truck volume as a percentage of Daily Traffic volume (NB = Northbound, SB = southbound)

Existing LOS at major intersections along US 31 are consistently fair to poor. Seven of the fifteen signalized intersections between 96th Street and SR 38 are experiencing LOS E or F during the morning peak. Similar levels of congestion occur during the evening peak, with seven of the fifteen intersections operating at LOS E or F.

Traffic congestion is most severe between 116th Street and Keystone Ave (Parkway), where three of the four intersections reach LOS E or F during the morning peak and two of the four reach this level during the evening peak. North of Keystone Ave (Parkway), delay is less common during the morning peak, with LOS D or better at three of the six signalized intersections. During the evening peak, five of the six intersections operate at LOS D or better.

On the southern segment of US 31 (between 96th Street and 116th Street), four of the five intersections operate at LOS B or C in both the AM and PM peak hour with 96th Street operating at LOS F for both peaks. As traffic volumes continue to increase on both US 31 and intersecting

arterials, the warrants for new signals within the corridor would continue to be met, as would the potential for additional points of congestion and delay.

1.2.2 Projected Traffic Volumes and Levels of Service (Year 2035)

Traffic volumes on US 31 are expected to continue to increase by 20 to 40 percent over the next twenty-five years (Note: Future traffic volumes are generated using a project-specific travel demand model, with the Indianapolis Metropolitan Planning Organization (MPO) forecasting model used for calibration as described in Chapter 3, Section 3.1.2). As a result, delay and congestion found in the corridor would exceed that existing today. If no improvements were made to the corridor by 2035, all fifteen signalized intersections are expected to have LOS F during the morning peak and thirteen of the fifteen are expected to reach LOS E or F during the evening peak. Congestion is expected throughout the entire US 31 corridor, where all of the signalized intersections are expected to reach LOS F during at least a portion of the day. Table 1.2-2 compares the levels of service between the years 2007 and 2035 for each signalized intersection based on the existing US 31 corridor roadway configuration. Figures 1.2-1 and 1.2-2 are graphical representations of the data in Table 1.2-2.

**Table 1.2-2
US 31 Intersection Levels of Service – “No-build” Alternative**

Intersection	Existing Level of Service (2007)		Projected Level of Service (2035)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
96 th Street	F	F	F	F
I-465 Eastbound Ramps	C	B	F	B
I-465 Westbound Ramps	C	B	F	C
103 rd Street	C	C	F	F
106 th Street	C	C	F	F
116 th Street	D	F	F	F
126 th Street/Carmel Drive	F	F	F	F
136 th Street	E	C	F	E
Rangeline Road	E	C	F	F
Greyhound Pass	C	C	F	E
151 st Street	E	C	F	F
161 st Street	F	D	F	F
SR 32	E	F	F	F
181 st Street	B	C	F	F
SR 38	C	C	F	E

E, F = Substandard Level of Service

Projected LOS for US 31 in the year 2035 assume that all projects included in the Indianapolis MPO’s 2030 Regional Transportation Plan, except the US 31 upgrade, would be constructed by this date.

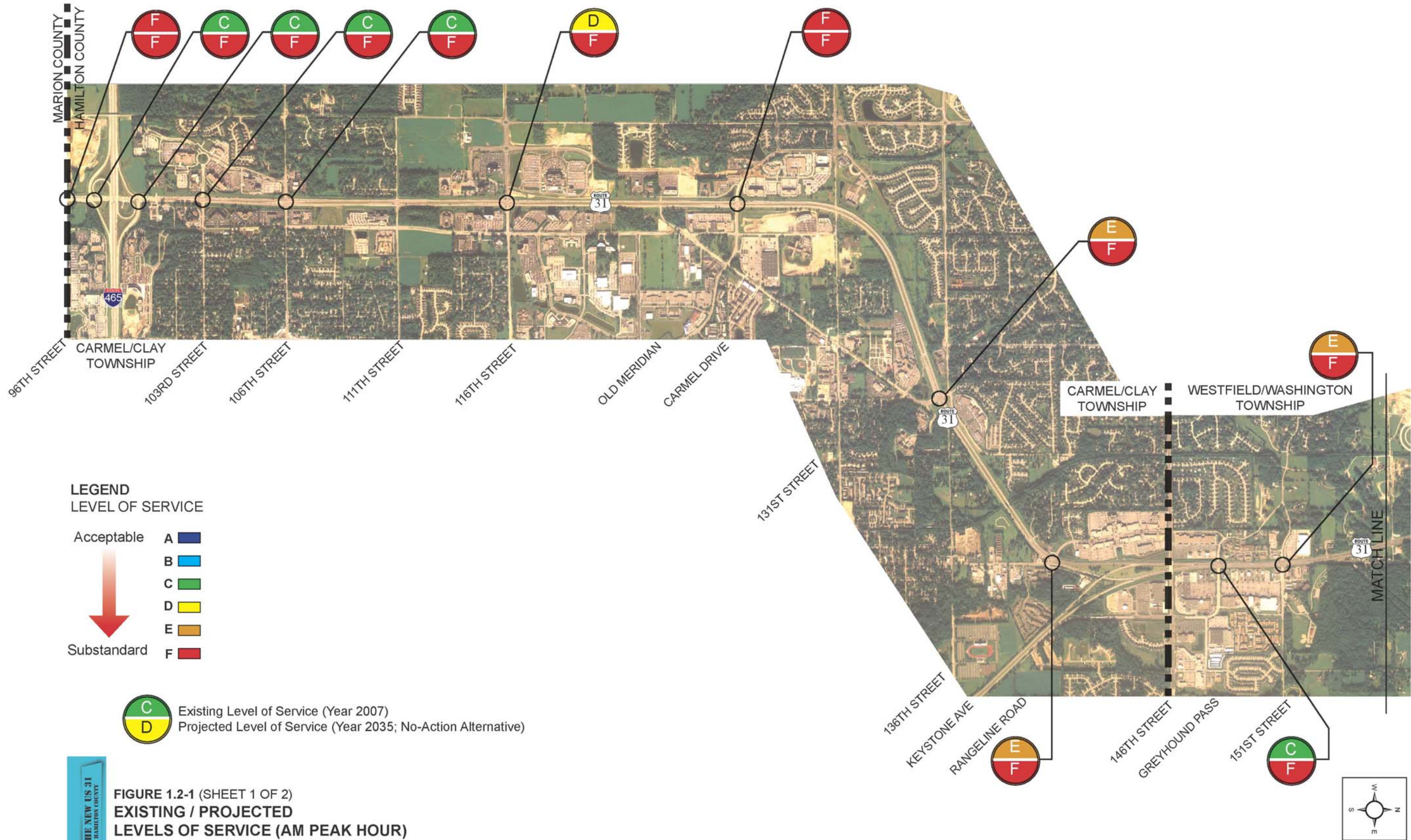


FIGURE 1.2-1 (SHEET 1 OF 2)
**EXISTING / PROJECTED
LEVELS OF SERVICE (AM PEAK HOUR)**

LEGEND
LEVEL OF SERVICE

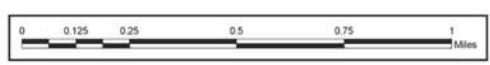
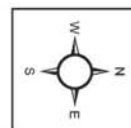
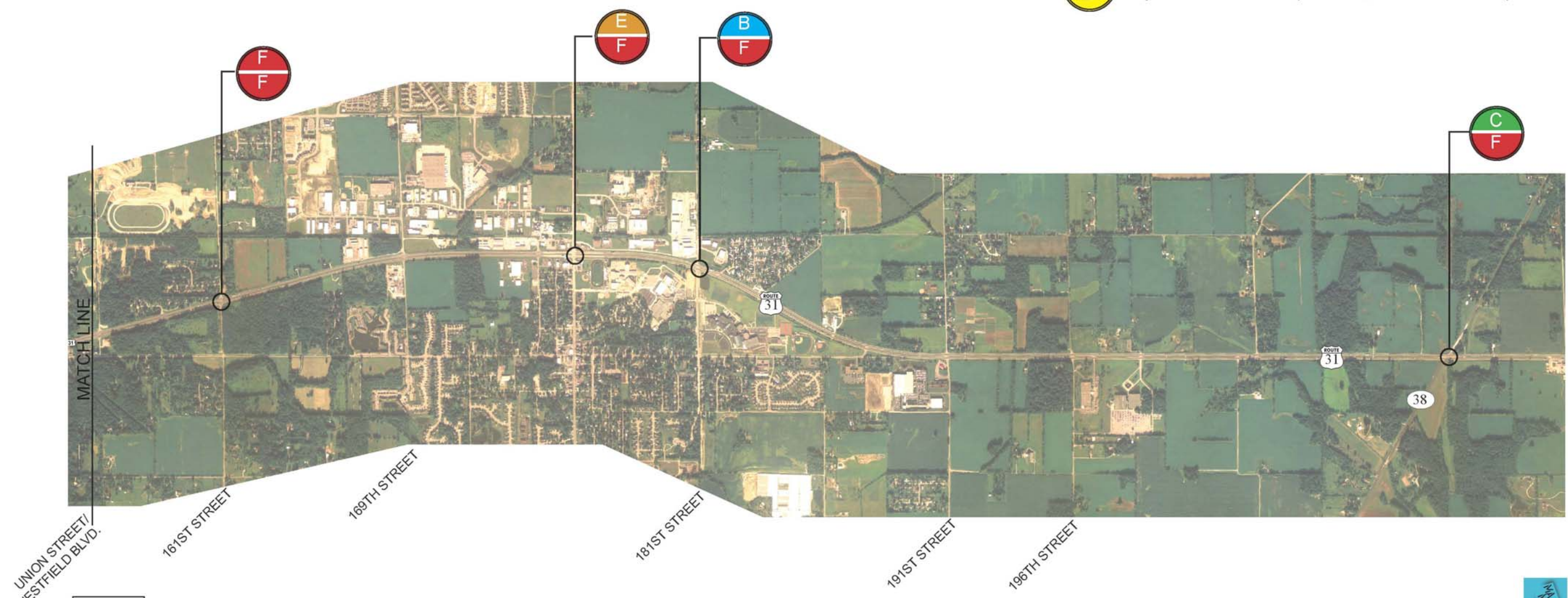
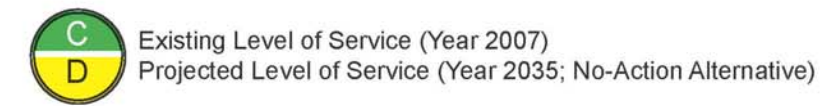
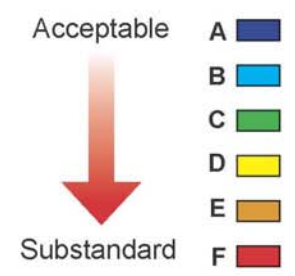
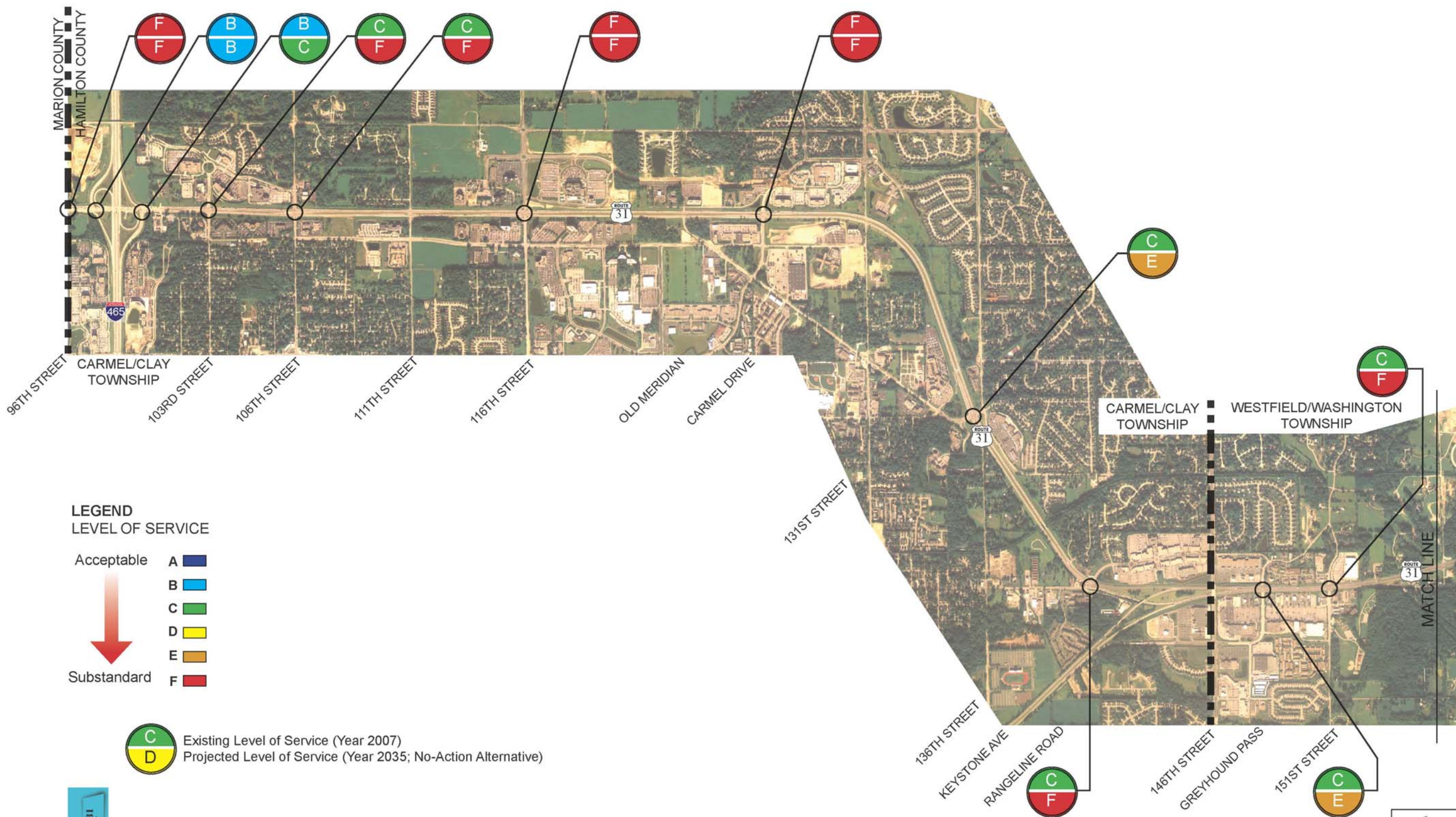


FIGURE 1.2-1 (SHEET 2 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (AM PEAK HOUR)

Final Environmental Impact Statement





LEGEND
LEVEL OF SERVICE

Acceptable

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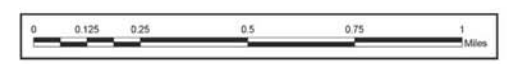
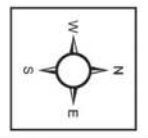
Substandard

A	Dark Blue
B	Light Blue
C	Green
D	Yellow
E	Orange
F	Red

Existing Level of Service (Year 2007)
 Projected Level of Service (Year 2035; No-Action Alternative)



FIGURE 1.2-2 (SHEET 1 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (PM PEAK HOUR)



LEGEND
LEVEL OF SERVICE

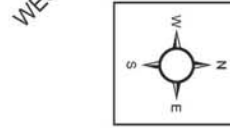
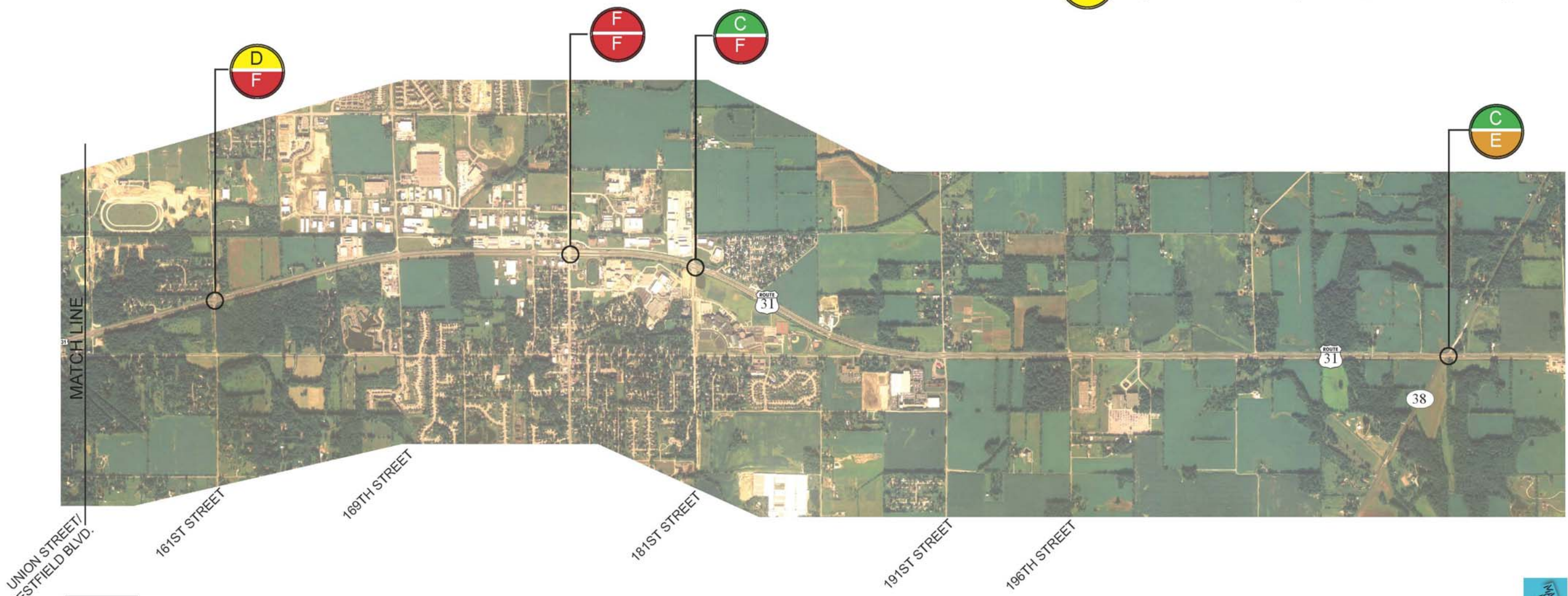
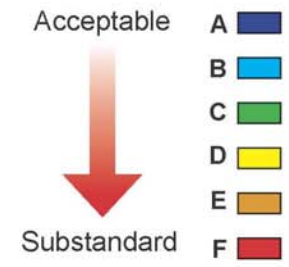


FIGURE 1.2-2 (SHEET 2 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (PM PEAK HOUR)



1.3 Safety

An analysis of collisions (accidents) on US 31 from 96th Street to SR 38 using data from INDOT Crash Location Reports for a four year period, January 1995 through December 1998, was performed in preparation of the Draft Environmental Impact Statement (DEIS), June 2003. Data from this analysis were re-evaluated along with more recent data available through INDOT from the Indiana State Police Vehicle Crash Reporting System (VCRS) for an equivalent four year period, January 2003 through December 2006.

From the data, collision locations were identified along each of the ten segments of US 31. Collision rates were calculated for each segment based on the number of collisions per hundred million vehicle miles traveled (HMVMT) in the four-year periods 1995-98 and 2003-06. Segment rates were compared against each other and against the most recent available (2006) Indiana Statewide rate for non-Interstate US Routes in Indiana. This normalized rate is an indicator of motorist exposure to other vehicles each mile of the roadway over time. Table 1.3-1 shows that calculated HMVMT has increased on each examined segment of US 31 and on the existing corridor as a whole.

**Table 1.3-1
Comparison of US 31 Collision Rates by Segment, 1995-98 and 2003-06**

US 31 Segment	Four-Year Period Hundred Million Vehicle Miles Traveled [HMVMT]			US 31 Collision Rate per HMVMT [1995-1998]		US 31 Collision Rate per HMVMT [2003-2006]	
	1995-98	2003-06	Pct. Change	Total	With Injury	Total	With Injury
96 th to 103 rd	0.3813	0.5688	49.2%	241.3	52.5	309.4	45.7
103 rd to 106 th	0.2264	0.3377	49.2%	353.4	106.0	322.7	56.3
106 th to 116 th	0.5898	0.8112	37.5%	262.8	74.6	205.9	56.7
116 th to 126 th	0.4668	0.6798	45.6%	186.4	53.6	210.4	33.8
126 th to 136 th	0.6023	0.7024	16.6%	119.5	34.9	197.9	52.7
136 th to Rangeline	0.3717	0.4430	19.2%	250.2	35.0	185.1	33.9
Rangeline to 151 st	0.5593	0.7065	26.3%	180.6	66.1	396.3	87.8
151 st to 161 st	0.5797	0.7461	28.7%	234.6	82.8	306.9	65.7
161 st to SR 32	0.8032	0.9959	24.0%	184.3	83.4	195.8	62.3
SR32 to SR 38, to 216 th	1.6890	2.0597	21.9%	101.8	29.6	122.4	31.6
US 31 Corridor	6.2694	8.0512	28.4%	181.2	55.7	220.1	50.2

Figures 1.3-1 and 1.3-2 graphically compare rates of overall collisions on each US 31 segment and the rates of collisions with injuries.

The analysis revealed that nine of ten segments along US 31 have had overall collision rates higher than the Statewide average rate for similar facilities (Figure 1.3-1). Four of these segments have rates at least 50% higher than the Statewide rate. The two southernmost US 31 segments, 96th to 103rd Streets and 103rd to 106th Streets, have been widened recently with one additional travel lane in each direction and carry high volumes of daily traffic associated with the I-465 interchange at US 31, north of 96th. US 31 between Rangeline Road and 151st Street carries high volumes associated with weaving merge lanes between US 31 and SR 431. The latter location has experienced the greatest increase in overall collisions.

Figure 1.3-1
US 31 Rates of Overall Collisions, 1995-98 and 2003-06

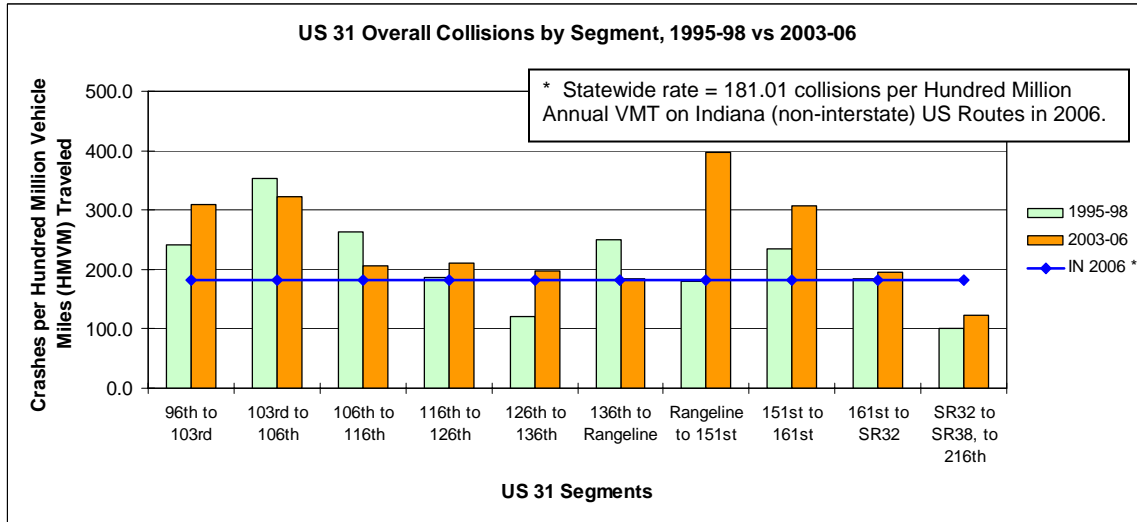
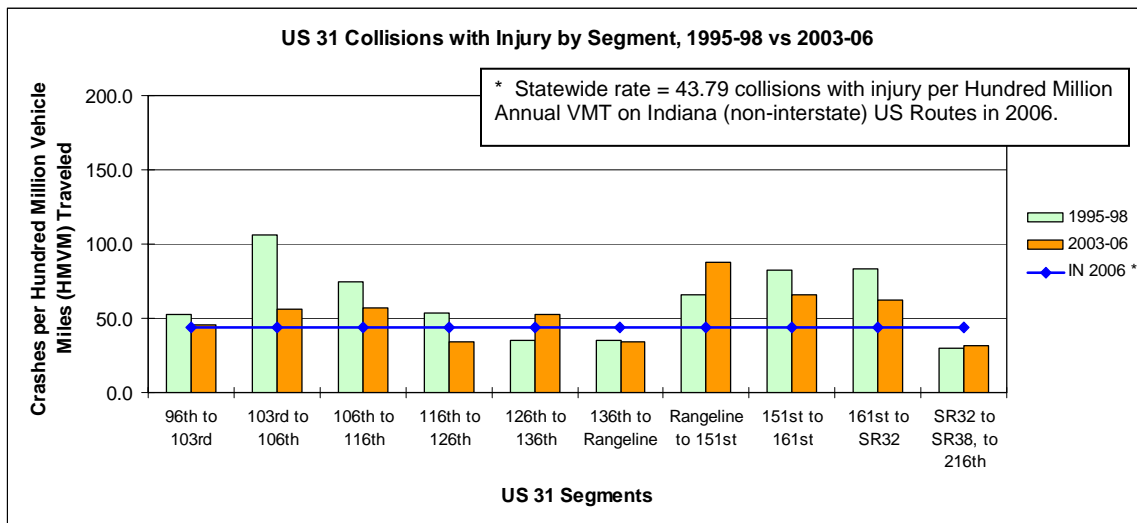


Figure 1.3-2
US 31 Rates of Collisions with Injury, 1995-98 and 2003-06



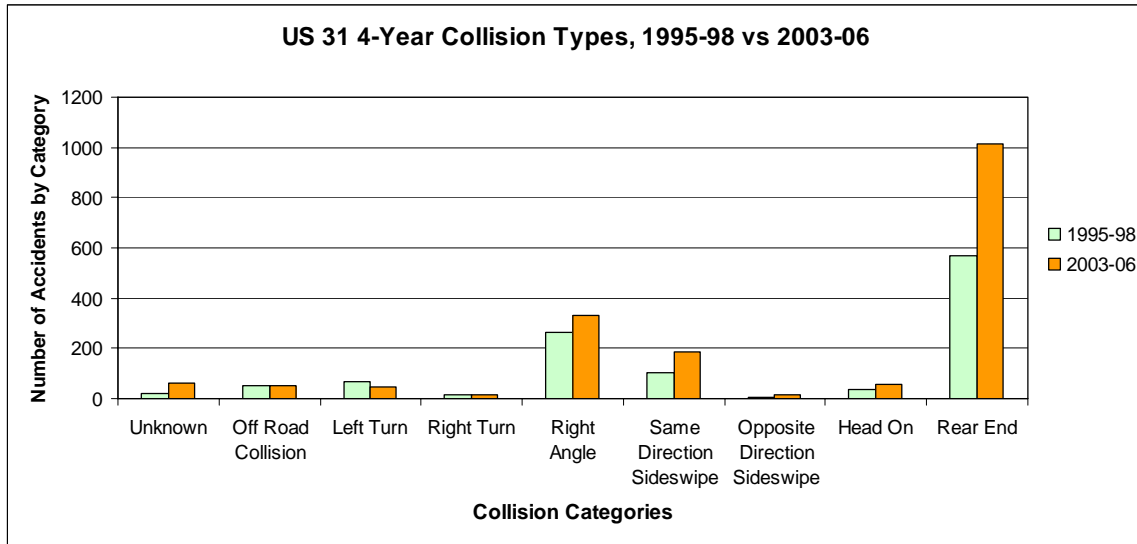
Collisions with injury are displayed in Figure 1.3-2. Collisions with injury may be correlated to higher speeds as evidenced by the decreasing rates in the heavily congested US 31 segments south of 116th Street. Located in the developing area between the communities of Carmel and Westfield, an increasing rate of collisions with injury is clearly evident in the segment between Rangeline Road and 151st Street where high volumes of traffic and complex weaving movements are present.

There were three collisions with fatality along US 31 in the 1995-98 period. All were in the northern half of the corridor, one each in the segments 151st to 161st, 161st to SR 32, and SR 32 to SR 38. In 2003-06 collisions with fatality doubled to a total of six, all in the northern half of the corridor. Three segments (Rangeline to 151st, 151st to 161st, and 161st to SR 32) each had one

fatality; and an additional three collisions with fatality occurred in the segment from SR 32 to SR 38 as US 31 becomes rural in character, with fewer signals and higher speeds.

The two four-year periods of data were further analyzed to determine the types of collisions in the US 31 corridor. There were a total of 1,136 collisions from 1995 to 1998. In the four years from 2003 to 2006 there were 1,772 collisions. Rear-end and right angle collisions accounted for an increasing majority of all accidents along the US 31 corridor as shown in Figures 1.3-3.

**Figure 1.3-3
Compared Collision Categories (Counts)**



From 1995 to 1998, the 567 rear-end collisions were half of the 1,136 total. In the same period 265 right-angle collisions accounted for another 23% of the total. From 2003 to 2006 there were 1,013 (57%) rear-end collisions and 329 (19%) right-angle collisions. In both four-year periods same-direction sideswipe collisions represented about 10% of total incidents.

Rear-end and right-angle crashes are indicative of high traffic volumes and are associated with congestion. As congestion on a roadway increases, distance or time headway between vehicles decreases, leaving less room to maneuver and react to changing traffic conditions. In addition, traffic backing up from intersections and from turning lanes into through-travel lanes increases the probabilities for rear-end or same-direction sideswipe collisions.

Although most intersection access to the US 31 corridor is controlled, there are intersections, some unsignalized in the northern half, allowing for crossover traffic. In these intersections, right-angle collisions can be associated with both through traffic and turning movements across the sometimes extensive width of multiple lanes of US 31.

1.4 Project Purpose and Need Statement

1.4.1 Project Need Statement

Transportation improvements to US 31 between I-465 and SR 38 are needed for the following reasons:

Traffic Congestion and Capacity Needs

For the base year 2007, 7 out of 15 (47 percent) intersections operate at LOS E or F during the AM and/or PM peak hours. LOS D is minimally acceptable based on INDOT's current standards.

By the year 2035, all 15 (100 percent) intersections are projected to operate at LOS E or F during the AM and/or PM peak hours.

Safety

Six of the ten roadway segments on US 31 have crash rates greater than the statewide average for similar facilities.

Seven of the ten roadway segments on US 31 have injury crash rates greater than the statewide average for similar facilities.

1.4.2 Project Purpose Statement

Based on the transportation needs identified the purpose of the US 31 Improvement Project is to:

- Reduce congestion for the US 31 corridor by improving to LOS D or better;
- Improve the level of safety for motorists using the US 31 corridor; and
- Provide for the reliable and efficient movement of commerce and regional travel.

1.4.3 Consistency with Regional (MPO) and Statewide (INDOT) Long Range Transportation Plans

US 31 has been designated as a Statewide Mobility Corridor by INDOT's 2007-2030 Long Range Transportation Plan, is part of the National Highway System (NHS), and represents the only continuous transportation link between Indianapolis and north-central Indiana (e.g., South Bend). As such, the objectives of the US 31 corridor are to provide safe, free flowing, high-speed connections with characteristics consistent with Statewide Mobility Corridor designation.

Improvements to the US 31 corridor have been also identified in the Indianapolis MPO 2030 Regional Transportation Plan.

1.4.4 Evaluation Criteria for Meeting Purpose and Need

The criteria established to evaluate each project alternative's ability to meet the purpose and need of the project include the following:

- Improve congestion to LOS D or better
- Reduce crash rates
- Provide a facility with characteristics consistent with the criteria in INDOT's 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridor¹

¹ Consistency with criteria for Statewide Mobility Corridors was not a requirement to satisfy the project's purpose and need.