6.0 EAST CORRIDOR EVALUATION & RECOMMENDATIONS

6.1 Land Use/Developed Areas

The East Corridor is served by State Route 9, a north-south link between Madison, Hancock and Shelby Counties (See Figure 6-1, Corridor Location Map). Anderson, Pendleton, Greenfield and Shelbyville are served by SR 9, along with the unincorporated areas of Huntsville, Eden and Maxwell. Other parts of the SR 9 corridor are rural.

No major parallel routes serve all three counties, although a statewide mobility corridor has been proposed to the east, between SR 9 and SR 3. The potential need for this roadway is indicated by the spacing of existing routes in the eastern portion of the state, but it has not been evaluated in the context of future traffic demand. That evaluation is included in the traffic modeling phase of this study.

SR 9 links three county seats in the East Corridor: Anderson, Greenfield and Shelbyville. It is a two-lane highway on rural sections.

6.2 Demographic Characteristics/Trends

Population – Modest population growth occurred in the communities of Greenfield, Shelbyville and Pendleton between 1990 and 2000. Pendleton, a town of 3,873 in 2000, experienced the highest rate of growth at 68%. Greenfield and Shelbyville grew by 25% and 17%, respectively.

Households – Households grew at a higher rate than population between 1990 and 2000 in cities and towns in the study area. U.S. Census Bureau data indicates growth rates of 41% in Greenfield, 19% in Shelbyville, and 71% in Pendleton.

Housing Units – Housing units grew in a manner similar to households between 1990 and 2000: 46% in Greenfield, 21% in Shelbyville, and 67% in Pendleton.

6.3 Existing Transportation System

As with other study corridors, transportation facilities in the East Corridor reflect a strong orientation toward the City of Indianapolis. That is, the highest capacity facilities are east-west, including I-70, I-74, US 36, US 40, US 52. I-69 is essentially an east-west roadway through Madison County. All of these roadways are multi-lane and several are built to freeway or expressway standards. North-south roadway capacity is much more limited. In the absence of another continuous route, combinations of urban roadways and county highways provide the only options to SR 9.

Traffic operations for the existing primary state routes have been estimated based on the procedures of the Highway Capacity Manual 2000 (HCM2000). Estimated travel speed and time (delay) are primary determinates of the quality of service. Based on data provided by INDOT through the road inventory

FIGURE 6-1
LOCATION MAP

See oversized figures file for Chapter 6

database, video log data compilation and traffic data from the periodic count program, most of the parameters required by the HCM2000 analysis procedures were available for this study.

6.4 Overview of Parallel Arterials

Outside of SR 9, there is no continuous north-south route through the East Corridor. The main parallel arterial is Mount Comfort Road (CR 600W) in Hancock County, which links with Olio Road (CR 500E) in Hamilton County. This route links SR 38 on the north with I-74 in Shelby County. It also has interchanges with I-70 in Hancock County and I-69 in Hamilton County, and it crosses US 52, US 40, US 36, SR 238, and SR 38. Mount Comfort Road is identified as an arterial in the Hancock County Thoroughfare Plan and improvements have recently been made to Olio Road in Hamilton County.

SR 9 interchanges with I-69 on the south side of Anderson.

Other parallel roadways are not designated as arterials, although some may offer the opportunity to develop them for that role in the future. Greenfield Avenue and Fortville Pike link Noblesville with Fortville and Greenfield. CR 200W and CR 600E are designated minor collectors in Hancock County. As with any of the county roadways in the area, new linkages and connections would be necessary to provide an alternative for continuous north-south travel through all three counties of the East Corridor.

Due to its continuity and close proximity to Marion County, current plans to improve the Olio/Mount Comfort corridor are well founded. Other existing parallel routes offer little opportunity for diverting significant volumes of traffic from SR 9.

6.5 Overview of State and Local Plans

Interviews were held with INDOT district staff as well as local planning and engineering officials for the purpose of identifying planned and/or programmed roadway improvements near or within the South Corridor. No major new north-south roadways are proposed within the East Corridor although local bypasses for SR 9 are under consideration by two communities.

Both Greenfield and Shelbyville have adopted local plans intended to provide options for north-south travel through their communities. Dispersion of local traffic in either city would benefit SR 9 since these locations are critical with respect to congestion. The communities would benefit to the extent truck volumes are reduced. These and other East Corridor projects and studies are reviewed below.

- SR 9 Reconstruction/Rehabilitation; Madison, Hancock and Shelby Counties (INDOT)

  Although no new roadways or added travel lane projects are currently programmed, several rehabilitation projects are planned by INDOT for the next five years. The largest is a road reconstruction project from 53rd Street (SR 236) to SR32/232 in Anderson, scheduled for construction in 2009.

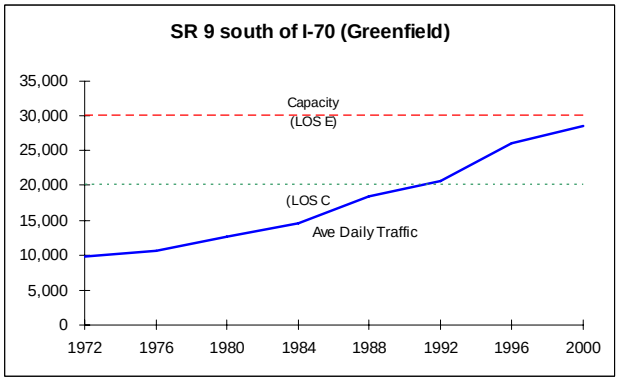
- SR 9 Environmental Assessment/Corridor Study, Greenfield (INDOT)

  The objective of this study is to assess the feasibility of improvements and/or other alternatives to SR 9 from SR 234 to US 52 along a corridor ten miles wide. The study is analyzing bypass alternatives as well as other options for improving mobility in the Greenfield area. This study is being performed to satisfy the requirements of a congressional mandate as outlined in the 1998 Transportation Equity Act of the Twenty First Century (TEA-21) legislation, Section 1602 Program for High Priority Demonstration Projects. A Purpose and Need Statement has been prepared and the project is at the stage of developing and analyzing alternatives. The final product will be recommended projects for future programming by INDOT. Study completion is scheduled for 2005.

- Progress Parkway (Shelbyville)

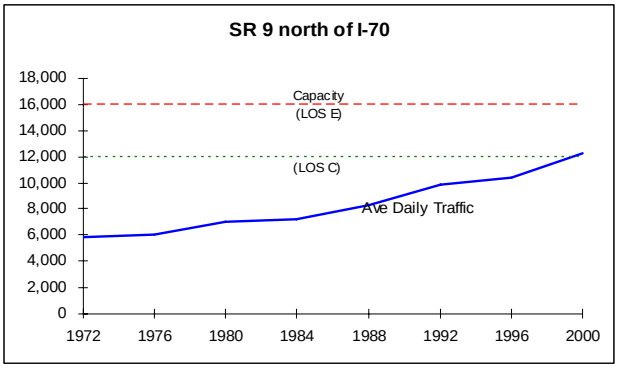
  The City of Shelbyville is planning a major corridor upgrade to link SR 44 near the I-74 interchange on the east side of the city with SR 9 south of the city. Progress Parkway will follow the alignment of Progress Road and Clark Road south to CR 225S, which will be extended on new alignment to intersect with SR 9. This proposed roadway is intended to provide relief for traffic levels in the downtown area and improve access to one of the city's emerging economic development areas. The project has been programmed for federal aid funding and construction is scheduled for 2005.

6.6 SR 9 Traffic Review



SR 9 plays an important role in serving the north-south travel needs of the East Corridor, where alternative routes are limited. It is essentially a rural corridor, with increased traffic volumes where land use changes from rural to urban. It is significant to note, however, that the entire route is experiencing traffic increases commensurate with the growth of population and employment in nearby communities.

Traffic volumes on SR 9 are heaviest in Shelbyville, Greenfield and Anderson. Currently, the most heavily travelled section of SR 9 is on the northern entry to Greenfield, just south of I-70. Traffic volumes approach 30,000 vehicles per day on four lanes at this location. Congestion on this section is exacerbated by the commercial character of the area and the associated number of entrance points and truck movements.



Overall volumes in the East Corridor are not high, but traffic growth in the region has been steady and concentrated within or near the urban areas along the route. The most significant problems occur where SR 9 passes through the downtown areas of Greenfield and Shelbyville.

6.7 Detailed Route Review – SR 9 (East Corridor)

Outside urbanized areas, SR 9 is classified by INDOT as a rural minor arterial in Madison, Hancock and Shelby Counties. It is classified as an urban principle arterial in Anderson, Greenfield, and Shelbyville due to its use for moving significant volumes of traffic through these areas. The existing physical features and traffic operations for State Route 9 in each county are described in the remainder of this section.

State Route 9 – Madison County

The portion of SR 9 included in this study area begins in the City of Anderson, where SR 9 intersects with SR 32. SR 9 is a multi-lane urban roadway through Anderson as it approaches I-69 from the north. It follows I-69 for approximately 4 miles, then joins US 36 on a four-lane roadway as it passes through Pendleton to the south. SR 9 and US 36 cross SR 38 in Pendleton, and SR 9 splits from US 36 approximately one mile further south. SR 9 is a two-lane rural highway through the remainder of Madison County.

SR 9 intersects with SR 32 in a highly developed section of Anderson

For purposes of review, SR 9 has been divided into seven segments based on functional class and roadway features, as follows:

1. South county line to Pendleton (4.1 miles): two-lane, rural
2. Town of Pendleton (0.7 miles): two-lane, urban
3. Pendleton to I-69 (2.6 miles): two-lane, rural
4. City of Anderson (5.6 miles): four-lane, urban
5. Anderson to Alexandria (6.8 miles): four-lane, rural
6. South suburban Alexandria (2.4 miles): two-lane, rural
7. Alexandria to north county line (8.0 miles): two-lane, rural (some urban)

SR 9 becomes a two-lane rural highway as it nears the south Madison County line.

A summary of key traffic operational features for SR 9 within Madison County is presented by segment in Table 6A.

Figure 6-2 presents the physical features of SR 9 through Madison County. It is a four-lane roadway through Anderson, and its width reduces to two lanes south of Pendleton. Rural sections are gently rolling with relatively few curves, resulting in 57% of the roadway available for passing. Shoulder width varies greatly within the corridor. Right-of-way varies between 50 feet and 100 feet.

Figure 6-2: Physical Features - SR 9, Madison County

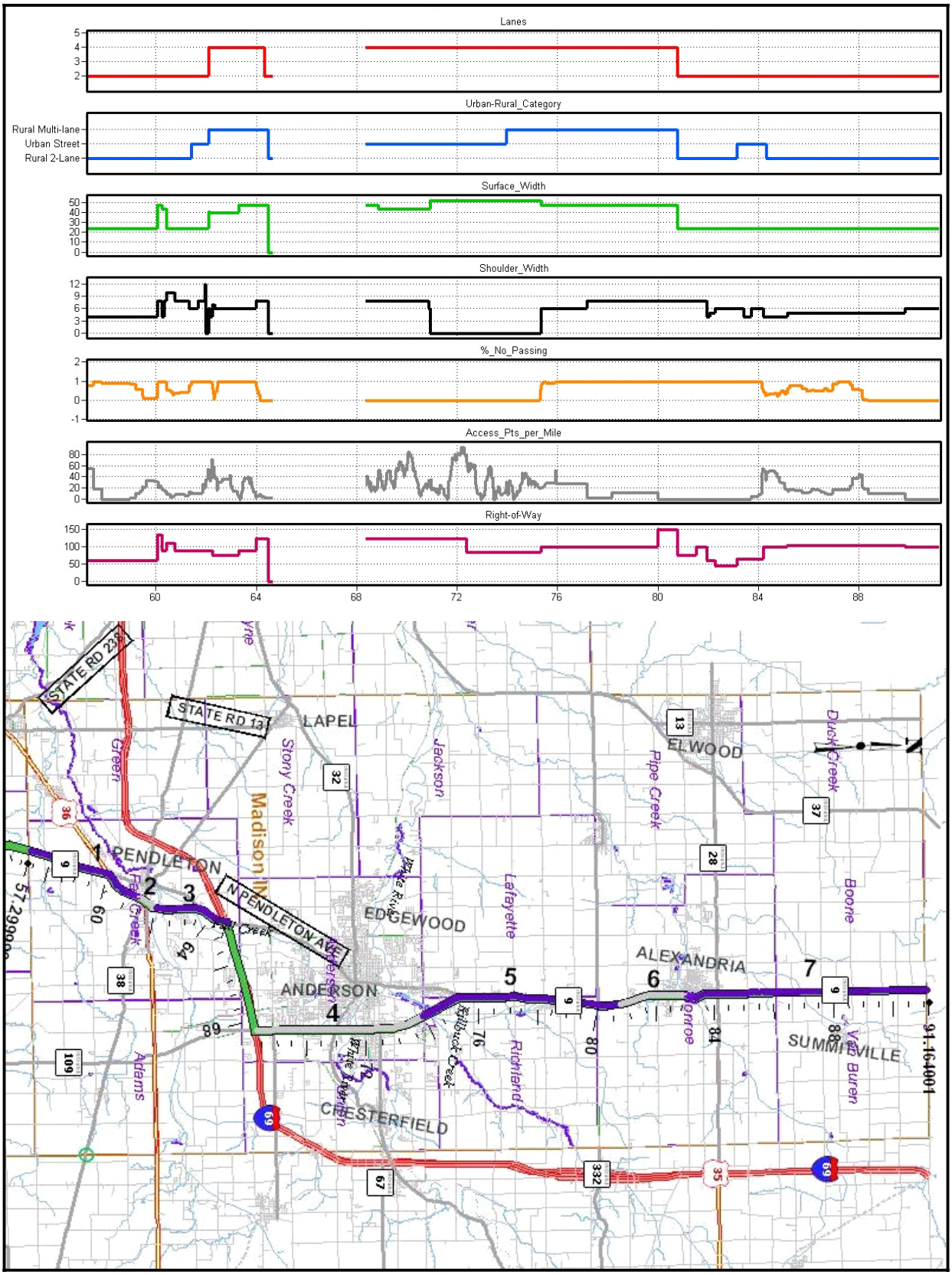


Table 6A: Key Operational Features

SR 9 -- Madison County	Segment							County Total
Data	1	2	3	4	5	6	7	
Length	4.1 mi	0.7 mi	2.6 mi	5.6 mi	6.8 mi	2.4 mi	8.0 mi	30.2 mi
Two-Way Ave Daily Traffic (ADT)	8,700	15,000	16,900	31,800	17,800	14,600	10,500	10,500
Ave One-Way Peak Hour Volume	450	700	780	1,540	800	720	520	520
Typical Speed Limit (mph)	55	40	50	45	50	45	50	50
Ave Operating Speed (mph)	45	25	35	20	40	30	35	35
Ave Traffic Signals per Mile	0.24	2.90	0.39	2.50	0.59	0	0.12	0.12
Ave No Passing Zones per Mile	0.69	1.00	0.71	0	0.79	1.00	0.43	0.43
Ave Access Points per Mile	16	24	36	21	41	32	36	36
Ave Peak Hour Level of Service	D - E	C	A - B	C - D	A - B	E	D - E	D – E
Accidents per million veh miles	1.19*	1.19*	1.19*	0.74**	1.34**	1.19+	NA	1.06

*Fall Creek Twp **Anderson Twp ***Lafayette/Richland Twp +Monroe Twp

Data related to traffic operations on this section of SR 9 are illustrated by mile point on Figure 6-3. The posted speed limit is 55 mph south of Pendleton. Daily traffic volumes are as high as 40,000 vehicles per day (vpd) in Anderson, but reduce to less than 5,000 vpd near the south Madison County line. Reductions in travel speed occur primarily where speed limits are reduced and where there are passing restrictions in the rural areas. Peak hour traffic operations exhibit an average speed of 35 mph, influenced by lower speeds in the Anderson area. Levels of service vary over the route, from LOS B to LOS E.

State Route 9 – Hancock County

SR 9 in Hancock County is a two-lane highway except for a four-lane section between I-70 and Greenfield, and at locations where auxiliary lanes are provided at major intersections in Greenfield. Approximately 72% of the route is classified as rural within the county, with exceptions comprised of urban sections in the City of Greenfield. There are few areas of significant congestion on this section of roadway, except where it passes through Greenfield.

For purposes of review, SR 9 within Hancock County has been divided into four segments for physical and operational reviews. These sections are generally described as follows:

1. South county line to Greenfield (4.4 miles): two-lane, rural
2. City of Greenfield (2.6 miles): two-lane, urban
3. Greenfield to I-70 (2.0 miles): four-lane, urban
4. I-70 to north county line (7.5 miles): two-lane, rural

A summary of key traffic operational features for SR 9 within Hancock County is presented by segment in Table 6B.

SR 9 is widened to four lanes as it approaches the I-70 interchange.

Figure 6-3: Traffic Operations - SR 9, Madison County

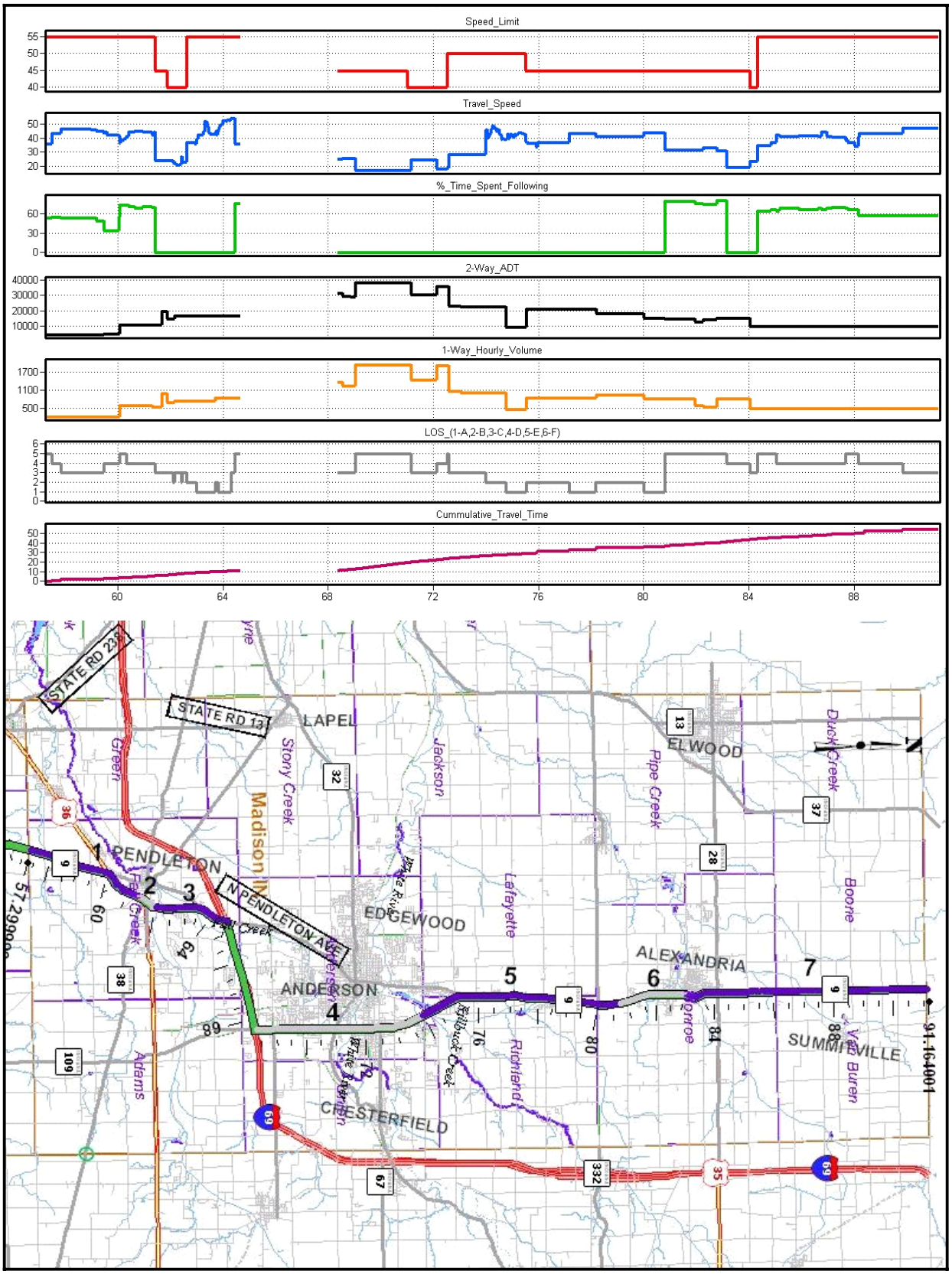


Table 6B: Key Operational Features

SR 9 -- Hancock County	Segment				
Data	1	2	3	4	County Total
Length	4.4 mi	2.6 mi	2.0 mi	7.5 mi	16.5 mi
Two-Way Ave Daily Traffic (ADT)	8,600	14,200	27,100	8,900	15,100
Ave One-Way Peak Hour Volume	300	590	1,200	490	650
Typical Speed Limit	55 mph	35 mph	45 mph	50 mph	45 mph
Ave Operating Speed	45 mph	25 mph	30 mph	30 mph	35 mph
Ave Traffic Signals per Mile	0	1.53	3.52	0	0.67
Ave No Passing Zones per Mile	0.39	0.30	0.23	0.32	0.32
Ave Access Points per Mile	20	27	29	31	33
Ave Peak Hour Level of Service	C - D	C - D	C – D	D - E	C - D
Accidents per million vehicle miles	1.15*	4.69**	4.69**	1.33***	3.42
	*Brandywine Twp	**Center Twp		***Green Twp	

Physical features by mile point for SR 9 through Hancock County are described on Figure 6-4. SR 9 is a two-lane rural roadway through most of the county. A five-lane roadway with a two-way center left turn lane and twelve-foot shoulders exists on the north side of Greenfield at I-70. Within Greenfield, the roadway utilizes city streets flanked by curb and gutter sections. Shoulder widths on rural sections vary between four and seven feet.

Approximately 68% of the roadway is available for passing within Hancock County. The roadway is relatively straight through flat or slightly rolling terrain. Existing curves are gradual, with little impact on operating speeds. There is minimal access control on SR 9, resulting in multiple intersections and drives over the full length of the roadway. Right of way is generally 80 to 90 feet south of Greenfield and 60 feet north of Greenfield.

SR 9 is a two-lane street with curb and gutter where it passes through Greenfield.

Data related to traffic operations on this section of SR 9 are illustrated by mile point on Figure 6-5. The posted speed limit is 50 to 55 mph on most sections outside Greenfield. Daily traffic volumes decrease gradually in each direction from 30,000 vehicles per day (vpd) to about 9,000 vpd south of Greenfield and about 12,000 vpd north of I-70. Reductions in travel speed occur primarily where speed limits are reduced through Greenfield. Existing traffic operations exhibit an average 35 mph speed and about half the route operates at LOS C or better. The two-lane section north of I-70 operates at LOS E for about the first three miles.

State Route 9 – Shelby County

SR 9 in Shelby County is two-lane except for a four-lane section between Shelbyville and I-74, and on sections where auxiliary lanes are provided at major intersections in Shelbyville. Approximately 86% of the route is classified as rural within the county, with exceptions comprised of urban sections in the City of Shelbyville. There are few areas of significant congestion on this section of roadway.

Figure 6-4: Physical Features - SR 9, Hancock County

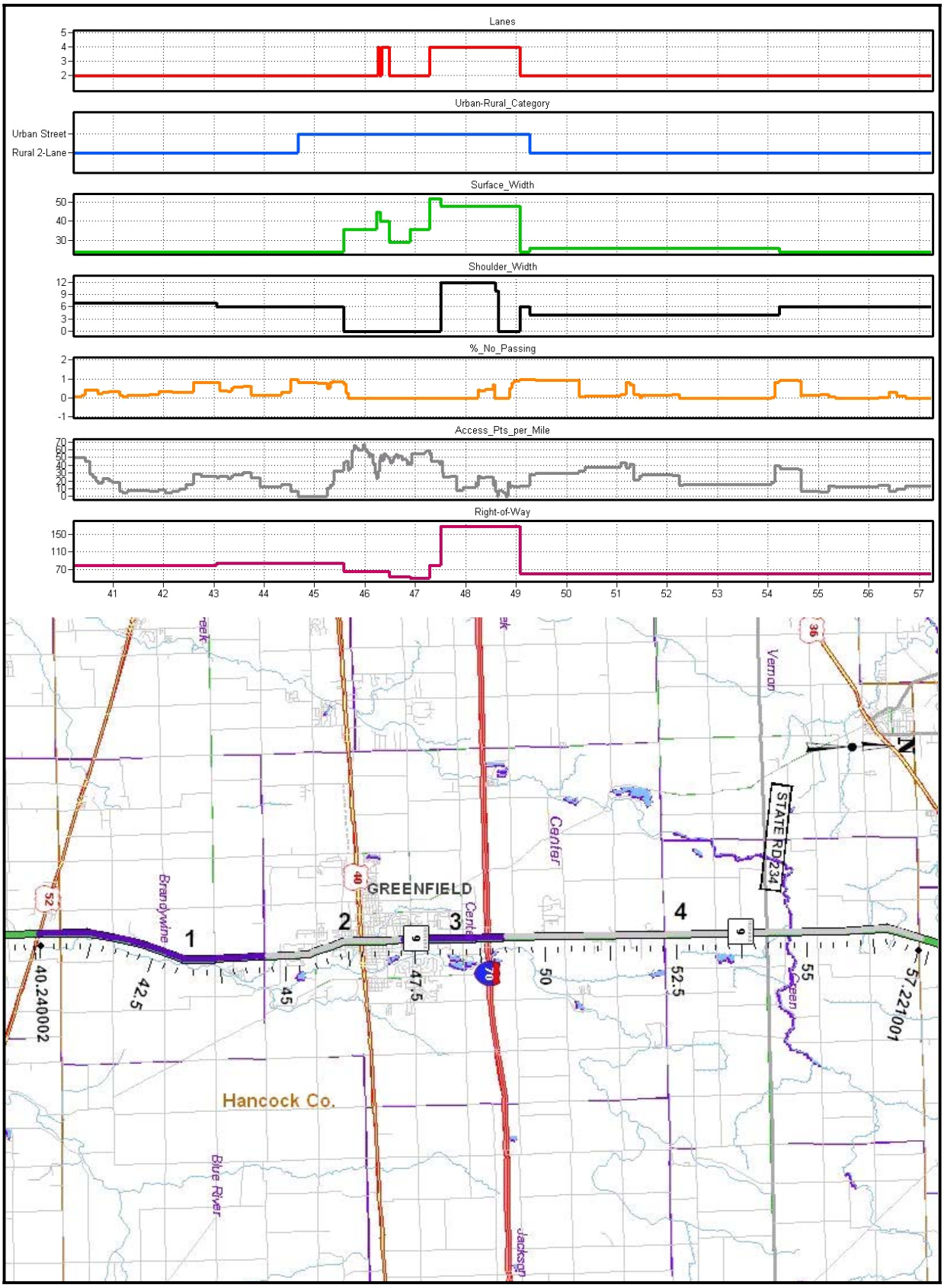
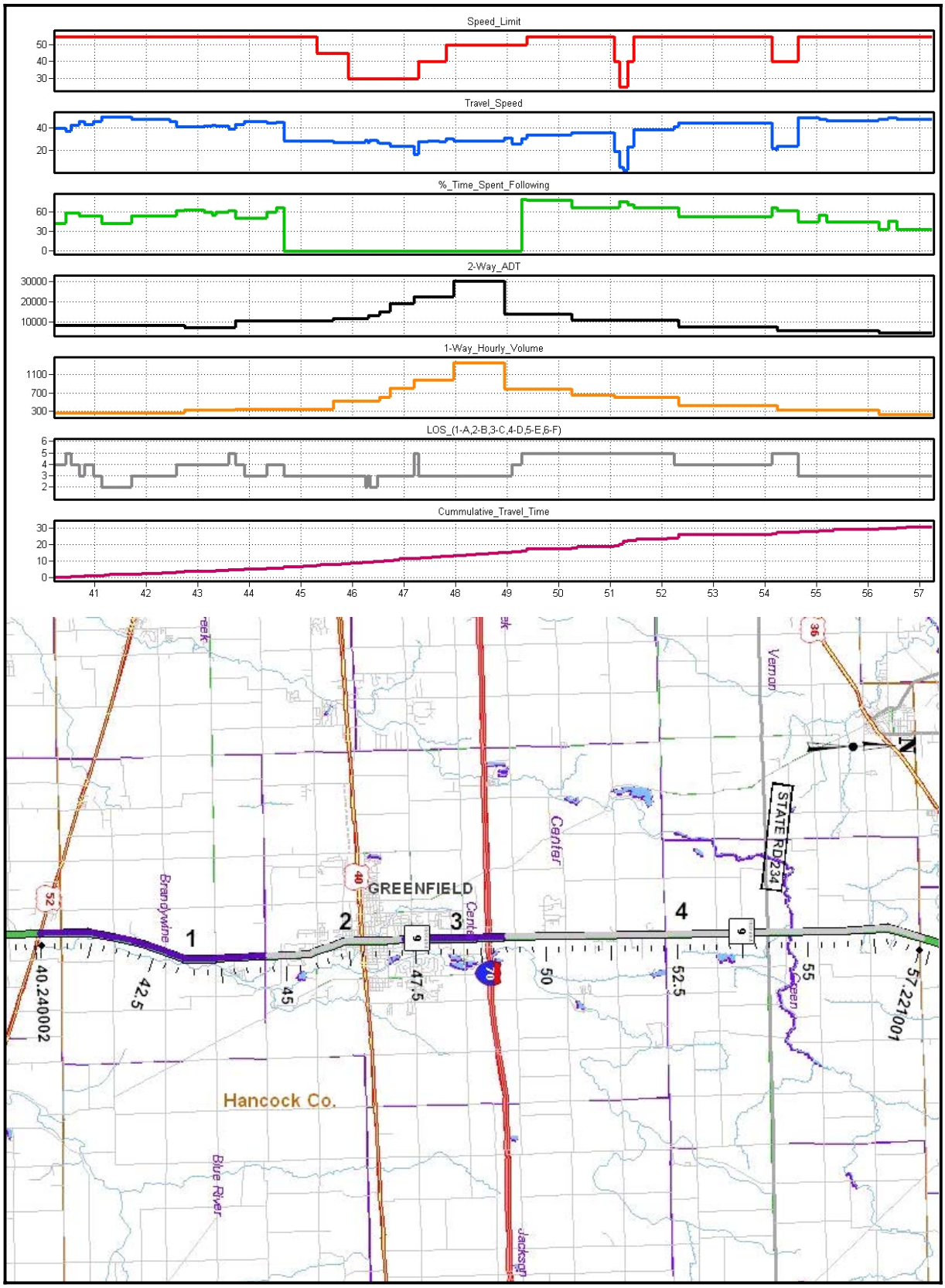


Figure 6-5: Traffic Operations - SR 9, Hancock County



For purposes of review, SR 9 within Shelby County has been divided into six segments, as generally described below:

1. South county line to Shelbyville (11.0 miles): two-lane, rural
2. City of Shelbyville (1.1 miles): two-lane, urban
3. Downtown Shelbyville (0.7 miles): two-lane, urban
4. Shelbyville to I-74 (1.7 miles): four-lane, urban
5. I-74 interchange area (0.5 miles): four-lane, urban
6. I-74 to north county line (9.7 miles): two-lane, rural

A summary of key traffic operational features for SR 9 within Shelby County is presented by segment in Table 6C.

Table 6C: Key Operational Features

SR 9 -- Shelby County	Segment						County Total
Data	1	2	3	4	5	6	
Length	11.0 mi	1.1 mi	0.7 mi	1.7 mi	0.5 mi	9.7 mi	24.6 mi
Two-Way Ave Daily Traffic (ADT)	5,000	7,000	17,000	23,200	19,700	10,900	10,800
Ave One-Way Peak Hour Volume	190	330	680	1,010	850	370	440
Typical Speed Limit (mph)	55	30	30	50	50	55	45
Ave Operating Speed (mph)	50	30	30	35	50	45	45
Ave Traffic Signals per Mile	0	1.88	4.12	0.60	0	0	0.24
Ave No Passing Zones per Mile	0.39	0.70	1.00	0.91	0	0.43	0.47
Ave Access Points per Mile	9	32	29	36	50	44	44
Ave Peak Hour Level of Service	B - C	B	B - C	B	A - B	C - D	B – C
Accidents per million veh miles	NA	1.38*	1.38*	1.38*	1.38*	1.58**	1.50

*Addison Twp **Marion & Van Buren Twp

Physical features by mile point for SR 9 through Shelby County are described on Figure 6-6. Operations features are shown on Figure 6-7. SR 9 is a two-lane rural roadway with shoulder widths varying from five to seven feet, except within Shelbyville, where the SR 9 is a city street flanked by curb and gutter sections. Between Shelbyville and I-74, SR 9 is as a five-lane roadway, with a two-way center left turn lane and ten-foot shoulders on each side.

SR 9 is a relatively good two-lane highway through most of Shelby County, with ample shoulder width.

The roadway is relatively straight, with little vertical or horizontal relief. Site distance is typically compromised only by slight changes in the rolling terrain. Curves on the roadway have little impact on operating speeds. Approximately 53% of the roadway is available for passing within Shelby County.

There is minimal access control on SR 9, resulting in multiple intersections and drives over the full length of the roadway. Near Shelbyville, many of these access points reflect modern design, including the provision of passing blisters and/or turn lanes. Right of way is generally 100 feet south of Shelbyville and 80 feet north of Shelbyville.

Figure 6-6: Physical Features - SR 9, Shelby County

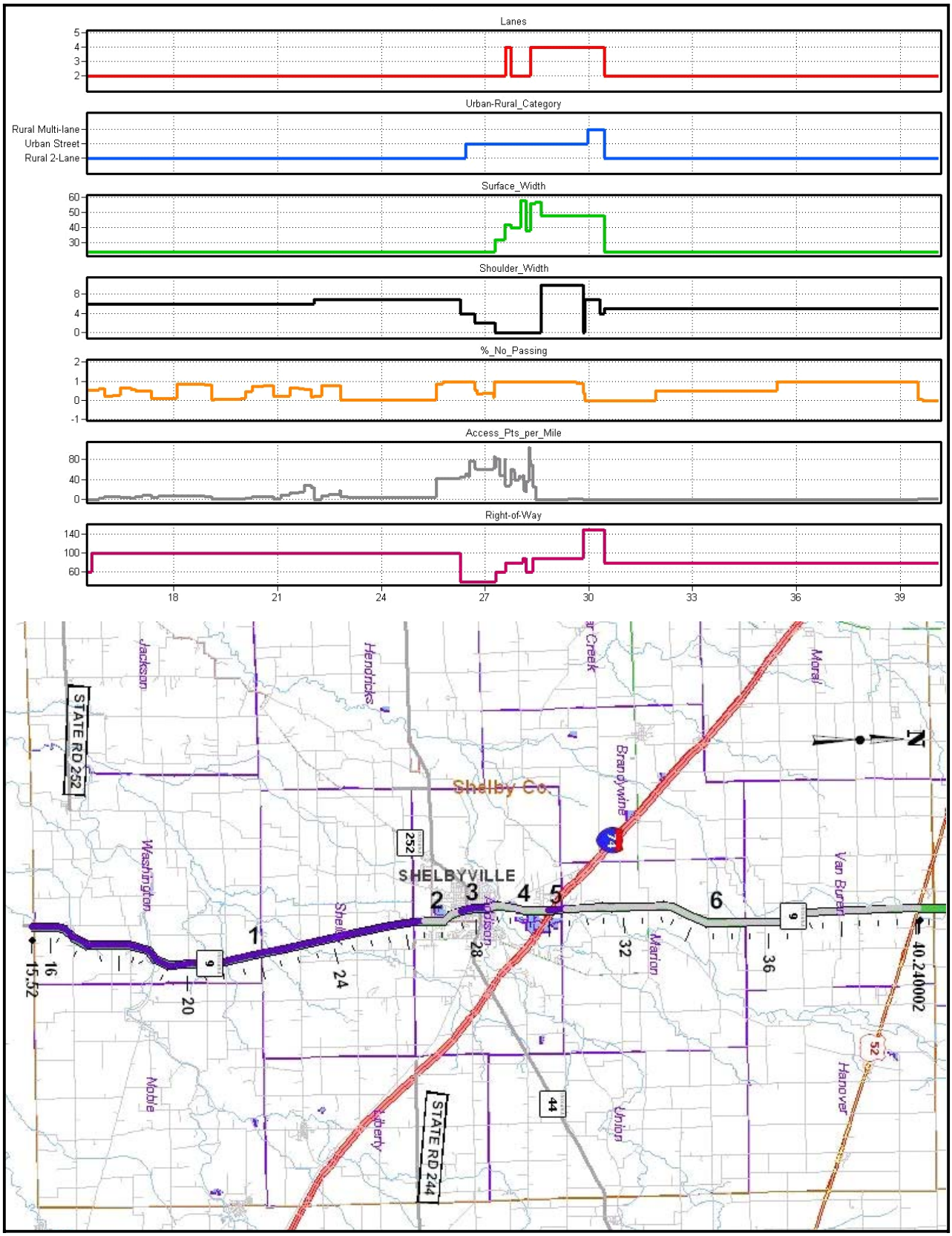
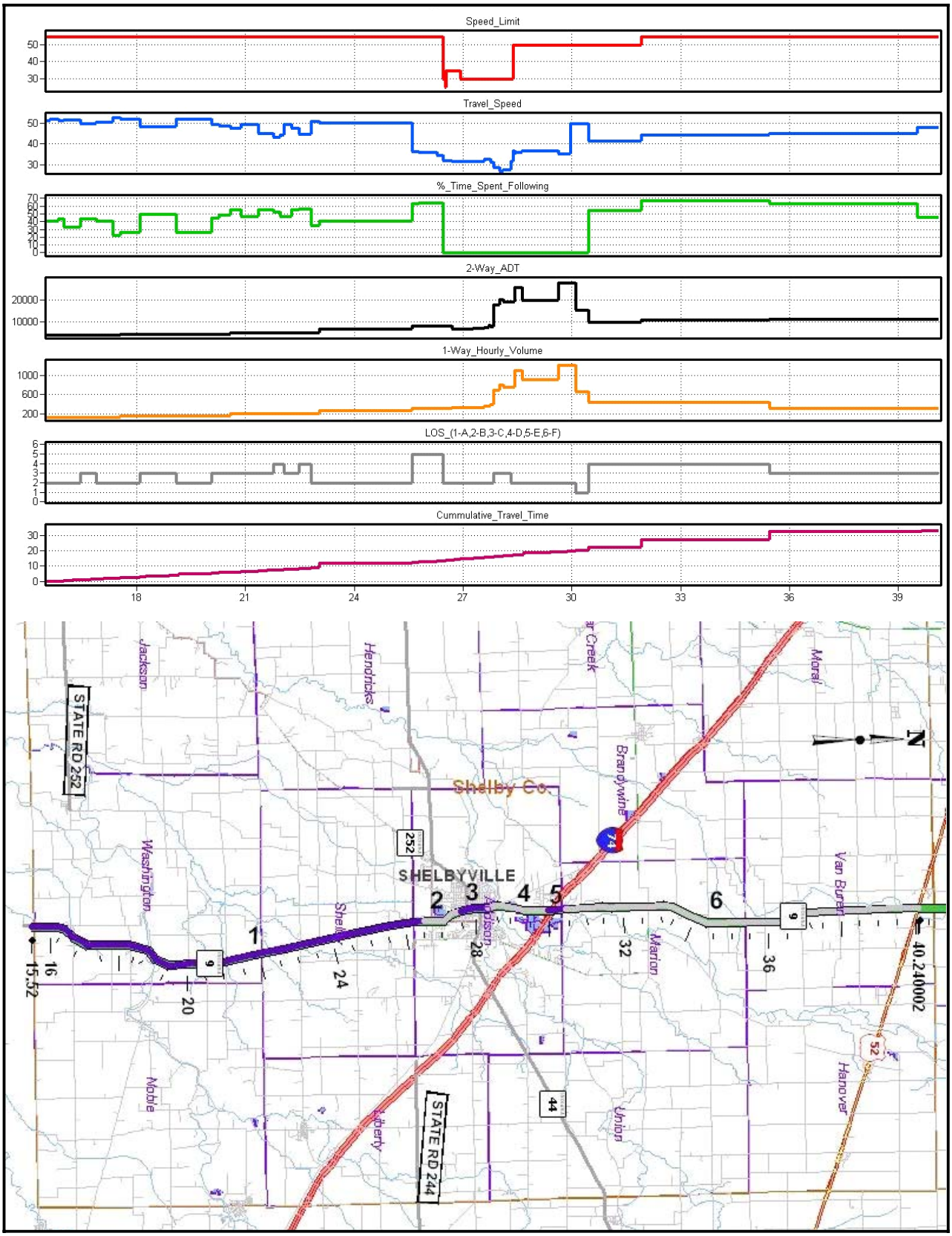


Figure 6-7: Traffic Operations - SR 9, Shelby County



SR 9 is four lanes from I-74 to downtown Shelbyville, but capacity is limited through the downtown area.

For this section of SR 9, data related to traffic operations are illustrated by mile point on Figure 6-7. The posted speed limit is 50 to 55 mph on most sections outside Shelbyville. Daily traffic volumes approach 24,000 vehicles per day (vpd) on the north side of Shelbyville, with nearly 20,000 vpd near I-74 and 17,000 vpd in downtown Shelbyville.

Approximately 10,000 vpd travel on SR 9 north of Shelbyville. Average daily traffic volumes south of the city diminish from 10,000 to less than 2,000 vpd near the south county line.

Due to the relatively straight alignment of SR 9 through Shelby County, reductions in travel speed occur primarily within the urbanized area of Shelbyville. Existing traffic operations exhibit an average 45 mph speed and most of the route operates at LOS C or better under normal conditions.

6.8 Planning Recommendations for SR 9

SR 9 is the primary north-south highway route serving Madison, Hancock, and Shelby Counties. Traffic volumes on SR 9 vary considerably by location, with the highest volumes in the urbanized areas of Anderson, Greenfield and Shelbyville. Four-lane roadway sections are provided in each of these urban areas. The existing two-lane roadway provides adequate capacity for the traffic volumes currently being served in rural areas. Right of way is adequate, shoulders are provided, and vertical and horizontal alignment is relatively good over the entire route.

Although traffic volumes on SR 9 are not currently resulting in congestion at most locations, travel demand has been growing steadily over time as areas east of Indianapolis have become more urbanized. The underlying land use and population trends driving the travel demand models suggest this will continue.

Table 6D lists forecasted traffic volumes for each section of SR 9 analyzed in this report. Many locations are expected to grow by 50% or more between now and 2025 (See previous tables for current traffic estimates.) In general, future traffic flow patterns will be similar to those that exist today. That is, the highest volumes will be in Anderson, followed by concentrated demand near the SR 9 interchanges with I-70 and I-74 (Greenfield and Shelbyville).

Table 6D also shows anticipated 2025 levels of service with the Base Scenario, which assumes existing conditions and currently planned improvements. In the East Corridor, these projects are limited to roadway reconstruction in Anderson and added travel lanes where SR 9 and US 36 share a common roadway south of Pendleton.

Table 6E summarizes the recommendations for the East Corridor and provides estimates of associated 2025 traffic forecasts and levels of service. Corridor recommendations are also show shown

Table 6D: Estimated 2025 Conditions, Base Scenario – SR 9

SR 9 -- Shelby County	Lanes	Area	Previously Planned Improvements	Length	2025 Daily Traffic	Peak Hour Traffic	Speed Limit	Ave Op Speed	Level of Service
1. South county line to Shelbyville	2	Rural		11.0 mi	11,700	440	55 mph	45 mph	C - D
2. South Shelbyville	2	Urban		1.1 mi	12,900	600	30 mph	30 mph	B
3. Downtown Shelbyville	2	Urban		0.7 mi	19,000	760	30 mph	30 mph	B
4. Shelbyville to I-74	4	Urban		1.7 mi	26,100	1,130	50 mph	35 mph	B
5. I-74 interchange area	4	Urban		0.5 mi	21,600	930	50 mph	50 mph	A - B
6. I-74 to north county line	2	Rural		9.7 mi	15,200	500	55 mph	45 mph	C - D
SR 9 – Hancock County	**Lanes**	**Area**	**Previously Planned Improvements**	**Length**	**2025 Daily Traffic**	**Peak Hour Traffic**	**Speed Limit**	**Ave Op Speed**	**Level of Service**
1. South county line to Greenfield	2	Rural		4.4 mi	13,400	460	55 mph	40 mph	C - D
2. City of Greenfield	2	Urban		2.6 mi	19,300	800	35 mph	25 mph	C - D
3. Greenfield to I-70	4	Urban		2.0 mi	33,900	1,510	45 mph	20 mph	D - E
4. I-70 to north county line	2	Rural		7.5 mi	16,600	920	50 mph	30 mph	D - E
SR 9 -- Madison County	**Lanes**	**Area**	**Previously Planned Improvements**	**Length**	**2025 Daily Traffic**	**Peak Hour Traffic**	**Speed Limit**	**Ave Op Speed**	**Level of Service**
1. South county line to Pendleton	2 & 4	Rural	Added lanes for overlap with US 36	4.1 mi	17,800	920	55 mph	45 mph	B - C
2. Town of Pendleton	2	Urban		0.7 mi	25,100	1,180	40 mph	20 mph	D - E
3. Pendleton to I-69	4	Rural		2.6 mi	31,800	1,470	50 mph	35 mph	C - D
4. City of Anderson I-69 to Cross St.	4	Urban	Road reconstruction	5.6 mi	41,700	2,010	45 mph	10 mph	D - E
5. Anderson to Alexandria	4 & 6	Rural		6.8 mi	26,500	1,210	50 mph	40 mph	B - C
6. South suburban Alexandria	2	Rural		2.4 mi	19,900	990	45 mph	30 mph	E
7. Alexandria to north county line	2	Rural		8.0 mi	14,000	690	50 mph	30 mph	D - E

Table 6E: Estimated 2025 Conditions, Recommended Improvements – SR 9

SR 9 -- Shelby County	Lanes	Area	Recommended Improvements	Length	2025 Daily Traffic	Peak Hour Traffic	Speed Limit	Ave Op Speed	Level of Service
1. South county line to Shelbyville	2	Rural	No Recommendation	11.0mi	11,700	440	55 mph	45 mph	C - D
2. South Shelbyville	2	Urban	Maintain (no new construction)	1.1 mi	12,900	600	30 mph	30 mph	B
3. Downtown Shelbyville	2	Urban	Maintain (no new construction)	0.7 mi	19,000	760	30 mph	30 mph	B
4. Shelbyville to I-74	4	Urban	Maintain (no new construction)	1.7 mi	26,100	1,130	50 mph	35 mph	B
5. I-74 interchange area	4	Urban	Maintain (no new construction)	0.5 mi	21,600	930	50 mph	50 mph	A - B
6. I-74 to north county line	2	Rural	Maintain (no new construction)	9.7 mi	15,200	500	55 mph	45 mph	C - D
SR 9 – Hancock County	**Lanes**	**Area**	**Recommended Improvements**	**Length**	**2025 Daily Traffic**	**Peak Hour Traffic**	**Speed Limit**	**Ave Op Speed**	**Level of Service**
1. South county line to Greenfield	2	Rural	Improve local roadways[1]	4.4 mi	13,400	460	55 mph	40 mph	C - D
2. City of Greenfield	2	Urban	Improve local roadways[1]	2.6 mi	18,000	740	35 mph	25 mph	C - D
3. Greenfield to I-70	4	Urban	Improve local roadways[1]	2.0 mi	34,100	1,520	45 mph	20 mph	D - E
4. I-70 to north county line	**4**	Rural	Added travel lanes	7.5 mi	35,200	1,930	50 mph	45 mph	**C - D**
SR 9 -- Madison County	**Lanes**	**Area**	**Recommended Improvements**	**Length**	**2025 Daily Traffic**	**Peak Hour Traffic**	**Speed Limit**	**Ave Op Speed**	**Level of Service**
1. South county line to Pendleton	**4**	Rural	Added travel lanes	4.1 mi	26,100	920	55 mph	**50 mph**	**B**
2. Town of Pendleton	2	Urban	Maintain (no new construction)	0.7 mi	25,100	1,180	40 mph	20 mph	D - E
3. Pendleton to I-69	4	Rural	Maintain (no new construction)	2.6 mi	31,800	1,470	50 mph	35 mph	C - D
4. City of Anderson I-69 to Cross St.	**6**	Urban	Added travel lanes	5.6 mi	45,200	2,010	45 mph	**25 mph**	**C - D**
5. Anderson to Alexandria	4 & 6	Rural	No Recommendation	6.8 mi	26,500	1,210	50 mph	40 mph	B - C
6. South suburban Alexandria	2	Rural	No Recommendation	2.4 mi	19,900	990	45 mph	30 mph	E
7. Alexandria to north county line	2	Rural	No Recommendation	8.0 mi	14,000	690	50 mph	30 mph	D - E

1. Local roadway improvements being evaluated by INDOT and the City of Greenfield in a separate study.

Estimated Costs: Added travel lanes, I-70 to the Madison/Hancock county line $31 million
Added travel lanes, Madison/Hancock county line to Pendleton $13 million
Added travel lanes, I-69 to Cross Street in Anderson $65 million

graphically on Figure 6-9, located at the end of this chapter. For long range planning purposes, the alternate improvement scenarios described in Chapter 4 were used to test various alternatives to improve service levels and the results were reviewed with staff of INDOT and the Indianapolis and Anderson MPOs.

SR 9 roadway sections in the CISTMS study area that are anticipated to experience significant congestion (level of service E or F) include the following:

1. East side of Anderson, from I-69 to Cross Street: level of service D – E.
2. Central part of Pendleton: level of service D – E.
3. North side of Greenfield, across I-70 to US 36: level of service D – E.

Traffic forecasts show that the highest volume section of SR 9 will continue to be in Anderson, north of I-69. This section currently serves over 30,000 vehicles per day and is predicted to carry over 40,000 vehicles per day in 2025. Widening to six lanes should be considered for planning purposes although the available right of way in some sections is limited (See Figure 6-2). Effective access management and traffic engineering should be a priority to optimize capacity while the roadway remains four lanes.

SR 9 narrows to two lanes for about a mile in Pendleton, and although it would be desirable to add travel lanes from the standpoint of capacity, that is not recommended due to the potentially significant impacts on this historic area. It is recommended that this section of SR 9 be maintained as a two-lane roadway, while maximizing the utility of the existing roadway through effective access management and sound traffic engineering techniques.

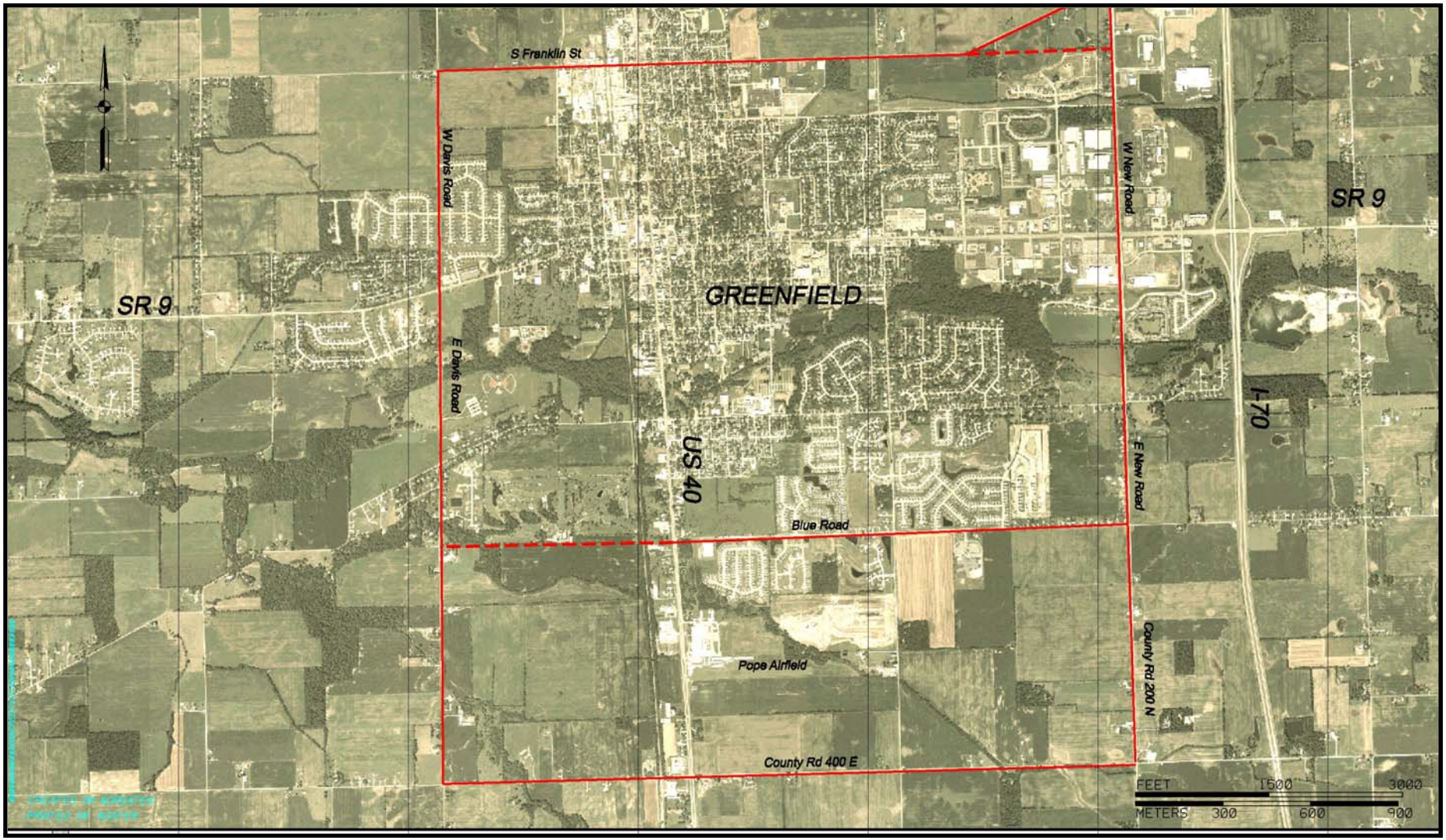
It is recommended that added travel lanes be planned for the full 11.6 mile section of SR 9 between Pendleton and Greenfield to serve the increase in forecasted traffic demand. The need is not urgent on most sections and the timing for this construction should be driven by increased congestion as the area continues to develop.

Although the forecasted level of service through the older part of Greenfield is acceptable for an urban condition, average operating speeds are low (20 – 25 mph), and the level of service on the four-lane section near I-70 is forecasted to be D – E. Since opportunities for adding travel lanes through Greenfield are limited, improvement scenarios were tested to evaluate the effectiveness of an SR 9 bypass. The volume of diverted traffic was insufficient to warrant construction of the bypass, indicating that many trips on SR 9 have an origin or a destination in Greenfield. It is recommended that improvements to local routes be pursued to better serve these trips and reduce the traffic demand on SR 9.

A study of a potential Greenfield bypass was underway concurrently with CISTMS. In meetings held to share information from the two studies, it was learned that similar observations were being made using two different approaches to the identification of future needs. Figure 6-8 shows the local routes being considered in that study. The Greenfield Bypass Study is expected to yield specific recommendations regarding alternate routes that should be improved parallel to SR 9.

South of Greenfield and through Shelbyville, forecasted levels of service on SR 9 are acceptable without major changes to the existing two-lane roadway. This section of roadway should be monitored

Figure 6-8 SR 9 Potential Local Greenfield Bypass Route Improvements



for changing needs as development occurs and the capacity of the existing two lanes should be maintained by applying strategies to maximize efficiency, as discussed in the next section.

6.9 Strategies to Maximize System Efficiency (SR 9)

Given the absence of parallel routes and the likelihood of continued growth in the counties served, care should be taken over the long term to preserve the SR 9 corridor, manage access and make improvements as needed to meet changing needs. At most locations, SR 9 is a good two-lane highway, with adequate right of way and good geometric design. Should the need arise, added travel lanes could be provided without major realignment except through or near Anderson, Greenfield and Shelbyville.

INDOT should protect and maintain the existing SR 9 corridor, and continue to coordinate with urban areas as they develop long term plans for creating additional north-south travel options that bypass their downtown areas to serve regional traffic demand. Following is a review of potential actions that INDOT and local agencies should consider to increase existing system efficiency to better serve current and future users of SR 9.

Access Management. The number of access points on SR 9 ranges generally between 20 and 40 per mile, placing the corridor in the "high" category for access points. Although this might potentially compromise the safety of the route, this is not currently reflected in accident statistics. With the exception of the Greenfield area where accidents exceed 4.6 accidents per million vehicle miles, the accident rate is relatively low on most of SR 9 (1.0 to 1.5 accidents per million vehicle miles).

Since there are few multi-lane sections of SR 9 within the study area, there are limited opportunities to separate opposing lanes with a median. One location where this has recently occurred is in Anderson, where a median with raised curbs was installed on SR 9. As stated previously, this is the most heavily traveled section of SR 9 and it is likely to remain so in the future. Anderson and INDOT should refine and extend the access management control on SR 9 to maximize the capacity and safety of this roadway section. Access locations and left turn movements should be carefully planned for and controlled by means of strategicl median placement.

Ultimately, improved access control through median construction might be accomplished on the multi-lane sections located on the north side of Greenfield and on the north side of Shelbyville, but given the commercial nature of these areas, the existing five-lane sections seem well suited for traffic conditions today. Changes to these sections, including provision of a raised median, should be considered in the future if the need is indicated by more detailed site-specific traffic engineering studies.

Overall, no new or special access management actions are recommended for SR 9, although care should be taken to manage access for new developments near the urbanized areas of Anderson, Greenfield and Shelbyville.

Traffic Engineering Improvements. It might be beneficial for traffic flow in Greenfield and Shelbyville to remove parking downtown, but the benefits would be slight. The best traffic engineering improvements in these downtown areas would be the addition of auxiliary left and

right turn lanes, but this is generally not feasible due to zero lot lines and sidewalks to the curb. There is no room to widen these intersection approaches without significant impacts to existing properties.

Outside the downtown areas, there are some locations in rural areas that will benefit by traffic engineering changes at the time they are warranted. Currently, the intersection of SR 9 and US 52 is controlled by a STOP sign. At the time a traffic signal is warranted in accordance with the Indiana Manual on Traffic Control Devices, it will improve traffic flow at this location. Until that time, the intersection should continue to operate as a STOP intersection. Studies have shown that until a traffic signal is warranted, STOP signs typically provide the safest level of control.

Likewise, the intersection of SR 9 and SR 44 in Shelbyville might be improved by the addition of auxiliary turn lanes and a traffic signal. The need for these changes should be monitored as traffic demand changes over time.

Other traffic engineering enhancements might be implemented as needed over time, including traffic signals at ramps of interchanges with SR 9, but these do not appear to be warranted at this time. In fact, no specific traffic engineering improvements have been identified for near term implementation on SR 9. Shoulder widths and geometric conditions are good over virtually all of the route. Conditions should be monitored within the urbanized areas to provide appropriate timing of traffic signals.

Intelligent Transportation Systems (ITS). The low accident rate on SR 9 does not suggest that improved incident detection and response systems are needed, particularly on the rural segments of the highway.

The best opportunities for ITS applications are likely to relate to the function of SR 9 as a local "collector" for high volume radial routes such as I-70, I-74, US 36, US 52, US 40, and I-69. The motorist information component of the regional ITS system would allow motorists to choose among these alternate corridors while still on SR 9 if the information were sufficiently informative and timely. This could occur with changeable message signs at interchanges with I-74, I-70 and I-69, or by a broader approach such as highway advisory radio (HAR). Consideration should be given to these opportunities as appropriate within an overall regional ITS strategy.

Transportation Demand Management (TDM). Staggered work hours, ridesharing and flexible working hours may be beneficial in the Anderson area, but current roadway service levels do not suggest this as a priority in terms of roadway operations. There are employment concentrations in industrial and commercial areas on the north side of Greenfield and Shelbyville. These areas would benefit from TDM actions but existing conditions do not warrant this as a high priority.

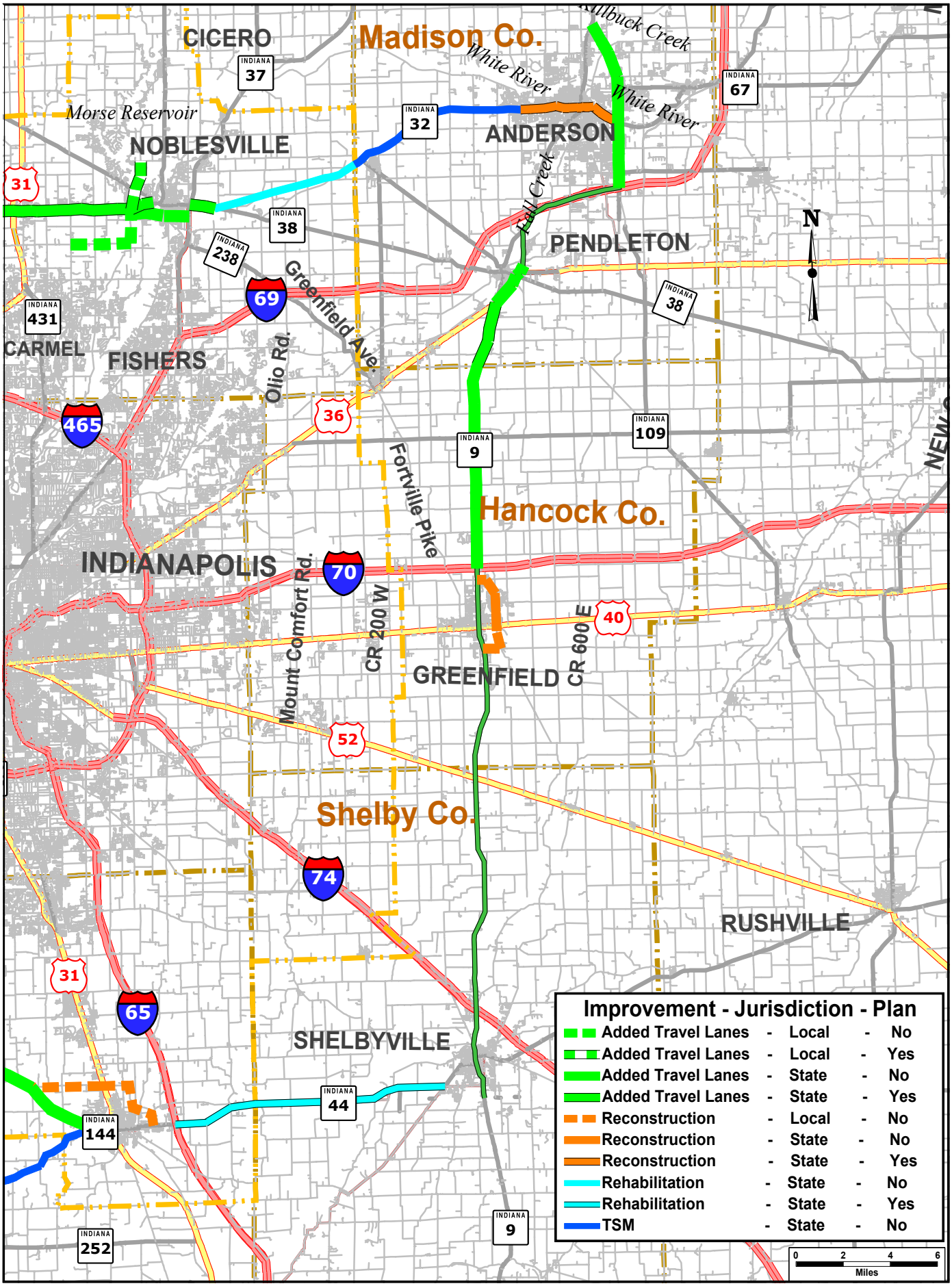


Figure 6-9: East Corridor Recommened Improvements