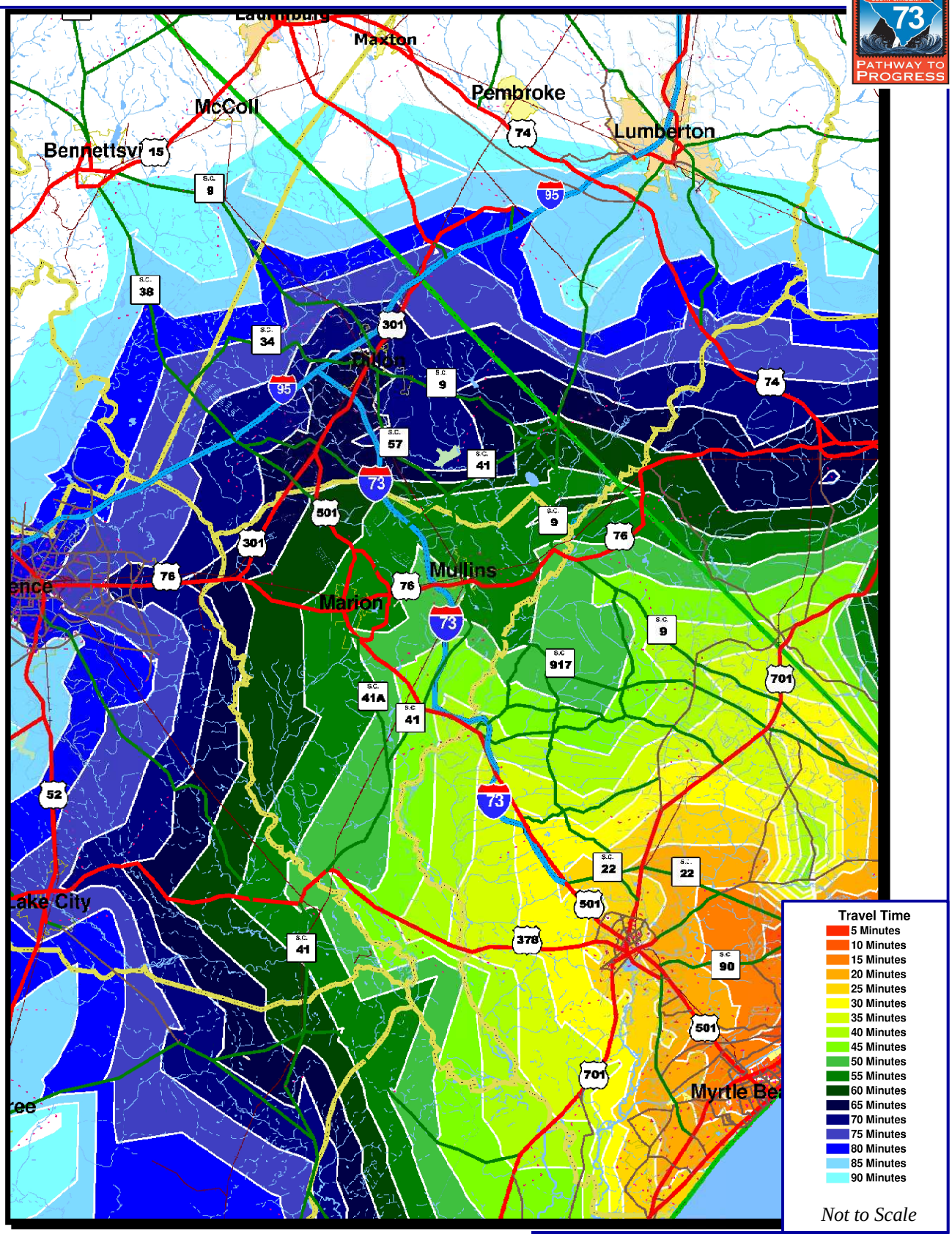

FIGURE 2-23

2030 AADT TRAVEL TIME
ALTERNATIVE 8

Table 2.6
Minimum Trip Time Between I-95 and U.S. Route 17 in Year 2030
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

	No-build	Alt. 1	Alt. 2	Alt. 3 (Preferred)	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Minimum Travel Time (Minutes)	75-80	60-65	60-65	55-60	60-65	55-60	55-60	55-60	60-65
Peak Day Travel Time (Minutes)	90-95	65-70	65-70	60-65	65-70	60-65	60-65	60-65	65-70

Additional analyses were completed to determine the extent that traffic increases as a result of higher seasonal tourism and vacation travel. Peak day traffic assignments were developed for the year 2030 in order to investigate the ability of the traffic network to handle the anticipated traffic during the peak travel days of the year. Comparison of the 2030 Peak Day traffic to the 2030 AADT indicated that the increased peak period traffic would be primarily carried by I-73, with moderate increases along U.S. Route 501, and smaller increases along I-95, S.C. Route 38, S.C. Route 34, S.C. Route 9, and U.S. Route 378. In 2030, Alternative 3 would carry the highest traffic volume, 40,100 vehicles per peak day, while Alternative 7 would carry the least amount of traffic, 27,000 vehicles per peak day.

Also shown in Table 2.6, with the Build Alternatives the peak day travel times between I-95 and U.S. Route 17 would decrease from between 25 to 30 minutes for the approximately 65 miles. This means that with I-73, the trip would take 60 to 70 minutes, whereas without I-73 the trip would take 90 to 95 minutes, based upon the peak day traffic volume. This reduction multiplied by 40,100 vehicles per day, results in a substantial improvement in travel efficiency for Alternative 3.

The effect of the peak day traffic on the local network congestion was also examined. The projected 2030 peak day roadway levels of service for the No-build and the eight Build Alternatives were determined using the SCDOT level of service (LOS) criteria. U.S. Route 501, between U.S. Route 76 west of Marion and S.C. Route 22, as well as U.S. Route 378, between S.C. Route 41 and Conway, are projected at LOS F during the 2030 peak day No-build. The Build Alternatives are generally projected to operate at LOS C during 2030 peak day.

Level of Service (LOS)

Level of Service (LOS) indicates the relative operating conditions of a roadway.

LOS A – (V/C<0.50) Free-flowing traffic with relatively high speeds.

LOS B – (0.50<V/C< 0.75) Stable traffic flow, but speeds beginning to be restricted by traffic conditions.

LOS C – (0.75 <V/C<1.00) Stable traffic flow, but most drivers are restricted in freedom to select speed.

LOS D – (1.00<V/C<1.15) Traffic approaches unstable flow, drivers have little room to maneuver.

LOS E – (1.15<V/C<1.35) Traffic flow is unstable and there may be short stoppages.

LOS F – (V/C>1.35) Forced flow with low speeds, congested, stop and go conditions.

***V/C means as volume to capacity ratio.**

2.7.1.2 How do the reasonable Build Alternatives meet the primary need of economic development?

The other primary need identified was the ability to enhance economic opportunities and tourism in South Carolina. An analysis was performed that examined two sources of potential economic impacts arising from I-73: travel efficiencies and strategic development benefits. The economic impact evaluation involves the estimation of the nature and magnitude of potential transportation efficiency gains and an assessment of the strategic development economic impact.

In general, there are four categories of benefits that arise from transportation investments including:

- Travel Efficiencies: Benefits that accrue to potential facility users upon project completion. These are measured in terms of travel time savings, vehicle operating cost savings, accident savings and emission benefits.
- Construction Impacts: Impacts that arise as a result of the expenditures on local labor and materials to build the facility.
- Operating and Maintenance Impacts: Benefits that arise from the expenditures on local labor and supplies to operate and maintain the facility upon completion.
- Strategic Development Impacts: The economic development impacts associated with attracting and retaining business activity as a result of increased accessibility, mobility and connectivity.

Travel Efficiency

The results are based on a forecast period between 2015 and 2030. These estimates represent only the economic impacts arising from travel efficiency savings and strategic development opportunities. They do not include benefits arising from construction and operations and maintenance impacts due to data limitations, as well as the short-term nature of construction benefits and the substitution effects related to operating and maintenance. Because the forecasts presented in this report represent only two categories of the above-listed benefits (travel efficiencies and strategic development impacts), the results of this study should be considered as conservative estimates.

The travel efficiency benefits arose as a result of savings accruing to users of the facility such as travel time savings, vehicle operating costs savings and accident savings. The Project Team used output generated by the travel demand model to model the economic impacts of travel changes using a regional economic model developed by Regional Economic Models Incorporated (REMI). This model estimated the economic impacts associated with travel efficiencies, i.e., reduced travel time, vehicle operating costs and other direct user benefits.

In general, Tables 2.7 and 2.8, reveal that all I-73 Build Alternatives yield substantial economic benefits arising from travel efficiencies. The impacts indicated for each alternative are increases over the No-

Build Alternative. The economic benefits from the increased travel efficiency would result in $152 to $197 million over a 15 year time period. While the absolute values vary between alternatives, examination of the relative differences reveal that there is very little difference between the Build Alternatives in terms of the magnitude of economic impacts. Table 2.9 (refer to page 2-44) presents the estimated cumulative impact of each of the Build Alternatives on the area's economic output.

REMI Model

The REMI model is a dynamic forecasting model that combines input-output modeling with economic geography, resulting in a dynamic economic impact forecasting tool. It models the economic impact of transportation by modeling the impacts in five sectors of the economy – output, production and labor supply, labor and capital demand, wages, costs and prices and market share.

Table 2.7
I-73 Economic Impact Summary in 2030 - Value Change
(Alternatives compared to No-Build)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Variable	Alt. 1	Alt. 2	Alt. 3 (Preferred)	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Gross Regional Product (Millions of Dollars, 2000)	152	182	194	176	178	197	194	190
Personal Income (Millions of Dollars, 2000)	29	34	36	33	32	37	36	35
Total Employment	1,820	2,150	2,240	2,075	2,100	2,280	2,260	2,230
Population	2,670	3,090	3,225	2,980	2,935	3,280	3,190	3,150

Note: Population and employment values are rounded to the nearest 5.

Table 2.8
I-73 Economic Impact Summary Percentage Increase in 2030
(Alternatives compared to No-Build)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Variable	Alt. 1	Alt. 2	Alt. 3 (Preferred)	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Gross Regional Product (Millions of Dollars, 2000)	0.85%	1.01%	1.09%	0.98%	1.00%	1.10%	1.09%	1.05%
Personal Income (Millions of Dollars, 2000)	0.56%	0.65%	0.70%	0.64%	0.65%	0.71%	0.70%	0.68%
Total Employment	0.93%	1.09%	1.15%	1.07%	1.08%	1.17%	1.16%	1.13%
Population	0.71%	0.77%	0.85%	0.79%	0.78%	0.87%	0.84%	0.78%

Table 2.9
I-73 Cumulative Economic Output Impact from 2015 to 2030
(Alternatives compared to No-Build)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

	Alt. 1	Alt. 2	Alt. 3 (Preferred)	Alt. 4	Alt. 5	Alt. 6	Alt. 7	Alt. 8
Gross Regional Product (Billions of Dollars, 2000)	1.59	1.89	2.00	1.82	1.77	2.02	1.97	1.95

Gross Domestic Product is defined as the dollar value of all final goods and services that are produced within a given period of time.[1] The Gross Regional Product (GRP) is a local equivalent of Gross Domestic Product and provides a measure of the total income within an area. The GRP includes such economic generators as employee compensation, commercial taxes, and property income. The GRP over the fifteen-year period is forecasted to range between about $1.6 billion (Alternative 1) and $2 billion (Alternative 6).

Strategic Development

EDGE Model

Based on two (2) point/year historical employment data, EDGE framework evaluates the mix and performance of industries in each county. The model compares a county in the study area with the rest of the State and with national averages. In case of I-73 investment, each of the counties in the study area: Marion, Dillon and Horry, is compared with the rest of the State of South Carolina and with the U.S. as a whole.

The estimation of development benefits that arise as a result of improved accessibility and connectivity was assessed using the Economic Development and Growth Evaluation (EDGE) model. Strategic development benefits arise as a result of improving the accessibility and connectivity to regions which may currently be underserved. These benefits result from the ability of the new facility to generate more traffic as opposed to moving existing traffic more efficiently. Since access to the proposed interstate would be fully-controlled, interchanges were anticipated to be the main points of development. Existing water and sewer infrastructure, as well as current development, were determined to be features that would attract development. Table 2.10 quantifies the projected employment impact from the Build Alternatives. The product of the number of jobs and the industrial wage yields an increase in income ranging from $51.8 million to $70.9 million annually (refer to Table 2.11).

Table 2.12 displays the combined income and employment impacts for each of the eight Build Alternatives. The impacts indicated for each alternative are increases over the No-Build Alternative. As indicated, all alternatives give rise to substantial economic benefits for the region. Alternatives 2 and 8 appear to have higher total benefits to the area. However, given the margin of error inherent in this type of modeling and since the total impact for each Build Alternative represents less than 0.5 percent of the region's total projected future employment, the differences between Build Alternatives are not considered large enough to affect the designation of the Preferred Alternative. Therefore, while

[1] Merriam Webster, "Gross domestic product." Referenced on June 6, 2007 from http://www.merriam-webster.com.

Table 2.10
Strategic Development Impacts of I-73,
Employment Increases by Alternative and County (Number of Jobs)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	Dillon	Horry	Marion	Total
1	87	1,897	306	2,290
2	82	1,802	290	2,175
3 (Preferred)	66	1,454	234	1,755
4	79	1,739	280	2,099
5	78	1,707	275	2,061
6	71	1,549	250	1,870
7	71	1,549	250	1,870
8	91	1,992	321	2,404

Table 2.11
Annual Income Impacts based on Strategic Development Impacts of I-73,
by Alternative and County (in Millions of Dollars)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	Dillon	Horry	Marion	Total
1	2.5	55.2	9.9	67.5
2	2.4	52.4	9.4	64.2
3 (Preferred)	1.9	42.3	7.6	51.8
4	2.3	50.6	9.1	61.9
5	2.2	49.7	8.9	60.8
6	2.0	45.1	8.1	55.2
7	2.0	45.1	8.1	55.2
8	2.6	57.9	10.4	70.9

Table 2.12
Summary Economic Impacts of I-73 in 2030, by Alternative
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	Travel Efficiency		Strategic Development		Total	
	Income (Millions of Dollars)	Employment (Number of Jobs)	Income (Millions of Dollars)	Employment (Number of Jobs)	Income (Millions of Dollars)	Employment (Number of Jobs)
1	29	1,820	67.5	2,290	96.5	4,110
2	34	2,150	64.2	2,175	98.2	4,325
3 (Preferred)	36	2,240	51.8	1,755	87.8	3,995
4	33	2,075	61.9	2,099	94.9	4,174
5	32	2,100	60.8	2,061	92.8	4,161
6	37	2,280	55.2	1,870	92.2	4,150
7	36	2,260	55.2	1,870	91.2	4,130
8	35	2,230	70.9	2,404	105.9	4,634

all Build Alternatives are projected to have a considerable positive economic impact on the region, the magnitude of that impact between alternatives is too similar for economic development to be the deciding factor in determining which alternative is preferred.

2.7.2 How would the alternatives meet the secondary needs of the project?

2.7.2.1 How would the alternatives meet the secondary need of hurricane evacuation?

A secondary need of the project is to facilitate a more effective evacuation of the Myrtle Beach region during emergencies. The hurricane evacuation study completed for the proposed project indicated that each of the eight Build Alternatives would provide similar time savings (refer to Chapter 1, Section 1.7 and the *I-73 Hurricane Evacuation Technical Memorandum*).

2.7.2.2 How would the alternatives relieve local traffic congestion?

Reducing existing traffic congestion on roads accessing the Myrtle Beach region is a secondary need of the project. As a measure of the effectiveness of the proposed facility to relieve local traffic congestion, the vehicle hourse traveled (VHT) for the average annual daily traffic (AADT) on the project study area roadway network, minus the Grand Strand Area Transportation Study (GSATS) area, was determined for each alternative (refer to Table 2.6, page 2-41). The GSATS area was removed because of the different roadway capacities and daily traffic criterion used in the GSATS model. The roadway capacities are not set equivalent to the actual roadway capacity, and the daily traffic criterion is for peak daily, not average annual daily traffic. Lower VHT indicates a savings of time and money that can result from the proposed action. The ratio of vehicle miles traveled (VMT) to VHT, shown in Table 2.13 shows the average speed of each trip in the network within the study area. Although the difference between the highest speed (56.59) and the lowest (55.78) of the Build Alternatives is slight,

Table 2.13
Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) in Network For Alternatives Using Average Annual Daily Traffic Volumes (Year 2030)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	VMT	VHT	VMT/VHT	VHT Savings Per Year
No-build	5,050,429.68	97,562.54	51.77	
1	5,383,233.51	96,500.64	55.78	-387,595
2	5,450,402.11	96,977.01	56.20	-213,719
3 (Preferred)	5,462,506.35	96,903.01	56.37	-240,735
4	5,422,521.99	96,722.79	56.06	-306,509
5	5,446,095.46	97,593.40	55.80	11,260
6	5,415,238.48	95,687.37	56.59	-684,440
7	5,489,286.56	97,234.29	56.45	-119,812
8	5,434,873.84	96,924.22	56.07	-232,987

the difference between the No-build (51.77) and the lowest of the Build Alternatives (55.78) has meaning, especially when evaluated in light of the number of miles per day traveled on the network.

As shown in Table 2.14, the relationship between the No-Build and Build Alternatives is the same for the peak season (June, July, and August) speeds and subsequent time savings. This impact on the local road network is even more evident when the I-73 trips are taken out of the calculations. The reduction in VMT and VHT without I-73 shows the amount of traffic taken off the rest of the network (reduction in vehicle hours traveled) because of I-73 (refer to Table 2.15). The influence of I-73 on travel speed (VMT/VHT) is shown in the drop in the average network speeds with the I-73 trips removed.

Table 2.14
Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) in Network For Alternatives using Peak Season Daily Traffic Volumes (Year 2030)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	VMT	VHT	VMT/VHT	VHT Savings Per Season*
No-build	5,618,781.43	115,522.28	48.64	
1	6,116,754.40	112,704.32	54.27	-253,616.26
2	6,209,121.00	114,475.73	54.24	-94,189.42
3 (Preferred)	6,180,929.13	112,022.29	55.18	-314,416.35
4	6,109,841.74	112,064.66	54.52	-311,185.82
5	6,156,181.92	113,153.62	54.41	-213,178.81
6	6,142,503.39	111,718.71	54.98	-342,321.31
7	6,220,248.34	113,396.88	54.85	-191,285.59
8	6,106,759.41	113,341.33	53.88	-196,285.11

*Season length was 90 days.

Table 2.15
Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) in Network For Alternatives using Average Annual Daily Traffic Volumes with I-73 Traffic Removed (Year 2030)
Interstate 73 FEIS: I-95 to the Myrtle Beach Region

Alternative	VMT	VHT	Difference from No-build VMT	Difference from No-build VHT	VMT/VHT
No-build	5,050,429.68	97,562.54	-		51.77
1	4,346,201.55	81,562.60	-704,228.13	-15,999.95	53.29
2	4,395,106.05	81,849.68	-655,323.63	-15,712.86	53.70
3 (Preferred)	4,419,831.82	81,908.84	-630,597.86	-15,653.71	53.96
4	4,295,749.75	80,404.84	-754,679.93	-17,157.71	53.43
5	4,470,602.50	83,614.56	-579,827.18	-13,947.98	53.47
6	4,325,224.13	80,001.84	-725,205.55	-17,560.71	54.06
7	4,395,100.48	81,463.08	-655,329.20	-16,099.46	53.95
8	4,290,856.04	80,414.28	-759,573.64	-17,148.27	53.36

A graphic portrayal of the congestion reduction is shown in Figures 2-24 through 2-32 (refer to pages 2-49 to 2-57). These show the volume to capacity ratio (V/C) for the AADT volumes that the network would have in 2030 for the No-Build and the eight Build Alternatives. The V/C ratio measures the level of traffic volume against a road segment's capacity for vehicles. The higher the V/C ratio the worse traffic conditions become. A comparison of the Build Alternatives with the No-Build Alternative shows that in the Year 2030 the Level of Service on U.S. Route 501 north of S.C. Route 22 would become E for that alternative, while it would be better for all of the Build Alternatives. The No-build LOS for U.S. Route 501 would not be less than C, while the I-73 LOS stays at B or better for all of the Build Alternatives. This means that the traffic flow would be stable for the Build Alternatives.

2.7.2.3 How would the alternatives incorporate multimodal planning?

Planning for future provision of a multimodal facility within the interstate corridor was identified as a secondary need for the project. An ultimate 400-foot typical section was developed to accommodate the number of lanes needed for the future traffic volumes as well as a multimodal corridor (refer to Figure 1-4, page 1-5). Overpasses, interchanges, and access ramps would require modification when installing a future multimodal facility, such as rail. Bridges and overpasses would be retrofitted to accommodate the increased height and length that would be needed to meet installation criteria for rail, while the railroad would be designed out of the existing right-of-way at the interchanges. Alignment of the rail would pose additional challenges for access ramps and frontage roads.

Alternative 4 was determined to be the most difficult to accommodate rail, due to the extensive use of existing U.S. Route 501. It would be more expensive and require a more complex design due to the frontage roads and access ramps needed to retain access to existing landowners in the vicinity of the corridor. Alternative 1 and Alternative 8 would also be difficult to accommodate a multimodal facility due to their use of existing U.S. Route 501. Alternative 3 and Alternative 6, which are primarily on new location, would provide the most flexible design for installing future multimodal facilities due to the use of conventional interchanges.

2.7.3 How were the alternatives compared in terms of human and environmental impacts?

Each of the Build Alternatives would have different types of impacts and somewhat different benefits. Chapter 3 provides the details for the potential impacts associated with each of the alternatives, including the No-build.

Indirect and cumulative impacts for the Build Alternatives were evaluated as well. They all had similar impacts for each category evaluated (refer to Chapter 3). The only difference was a slight edge for Alternative 3 in terms of less induced farmland impacts and less potential impacts to cultural resources.

Guidelines established by the USEPA and the USACE pursuant to Section 404(b)(1) of the *Clean Water Act* were followed during the development of each of the proposed alternatives. No practicable alternative that avoids wetland impacts that would satisfy the Purpose and Need for the project exists. This is due to