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# Beaufort County Long-Term Needs Study



prepared for:  
**Beaufort County Council**

**January 2002**



ENGINEERS  
PLANNERS  
ECONOMISTS

Wilbur Smith Associates  
*50 Years*



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↓  
Adopted

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## Wilbur Smith Associates Long-Term Needs Study for US Highway 278

Mr. Lamb, as Public Works Committee Vice Chairman, reported that at the Transportation Advisory Group (hereinafter "Group") meeting held February 19, 2002, members endorsed Wilbur Smith Associates Long-Term Needs Study for US Highway 278 Alternate A Proposal. The Alternate A Proposal recommends the extension of the Bluffton Parkway to the east from Burnt Church Road and the widening of the existing four-lane Wilton Graves Bridges to six lanes. The Group also recommended that as a growth management tool, if the average daily trips on US Highway 278 exceed 90,000, then other long-term need alternatives would have to be addressed.

It was moved by Mr. Lamb, as Public Works Committee Vice Chairman (no second required), that Council adopt Wilbur Smith Associates Alternate A Proposal to the US Highway 278 Long-Range Needs Study. The vote was: FOR - Mr. Brafman, Mr. Cuttino, Mr. Covington, Mr. Dukes, Mr. Generales, Mr. Glaze, Mr. Lamb, Mr. McBride, Mr. Newton and Mr. Taylor. ABSTAINED - Mr. Ladson. The motion passed.

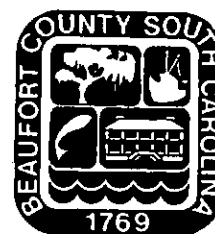
**US 278 LONG-TERM NEEDS STUDY**

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**BEAUFORT COUNTY, SOUTH CAROLINA**

*Prepared for:*

**Beaufort County, SC**



**January 2002**

*Prepared by:*

**WILBUR SMITH ASSOCIATES  
Columbia, SC**



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# EXISTING CONDITIONS

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## INTRODUCTION

Wilbur Smith Associates has been retained by Beaufort County to evaluate the Long Term traffic and transportation operations along the US 278 Corridor (Fording Island Road) in Beaufort County, South Carolina as a result of growth projected within the area over the next 20 years. The study includes the following:

- A review of previous recommendations for roadway improvements within the study area;
- Projections of future traffic growth;
- Identification of improvements to relieve the anticipated traffic congestion; and
- Conclusions and recommendations.

## PROJECT DESCRIPTION

The US 278 Corridor study area is bordered by the Beaufort/Jasper County Line to the west and Hilton Head Island to the east. This section of US 278 consists of 13 unsignalized intersections and six signalized intersections over an approximate 10-mile long corridor. Within the study area, US 278 is a four-lane divided arterial with a 55 miles per hour (mph) speed limit. Directional traffic is separated by a grass/landscaped median that varies from 20 feet (ft) to 50 ft in width. Median openings/crossovers are located along US 278 at various intervals and typically provide for separate left-turn lanes at major intersections. Approximately 36 median openings are located between Sun City Hilton Head and Mackays Creek. Land uses vary along the corridor and include large tracts of undeveloped land, gated residential communities, multi-family residential and highway commercial/retail. Intersections along US 278 include both private access drives and public roadways (county and state routes).

This report evaluates the US 278 corridor under Future Year 2020 conditions, which has been termed as the Long-Term Needs of US 278. Future plans for the US 278 Corridor are intended to serve the growing transportation facility demands in southern Beaufort County without placing additional burden on the May River Road (SC 46 through Bluffton), provide for growth in through traffic to/from Hilton Head Island and facilitate evacuation of southern Beaufort County during an emergency.

The goal of this report is to provide a transportation plan that will meet the growing demand and needs for transportation facilities along the US 278 Corridor balanced with the communities desire to maintain the qualities unique to the Beaufort area.

## PREVIOUS STUDY EFFORTS

Previous studies that have been completed for the US 278 Corridor include the Immediate Needs Study and the Short Term Needs Study.

The Immediate Needs Study defined existing roadway deficiencies and made recommendations to alleviate the identified deficiencies with safety and capacity improvements that could be accomplished within a one to two-year time frame. Recommendations included the closure of three median crossovers, the addition of right-turn lanes at four key intersections, left-turn lane improvements at six intersections, street lighting at eight intersections, installation of new pavement markings and a re-design of the US 278 at Moss Creek/Buckingham Plantation intersection to provide a six-lane cross-section between Fording Island Road Extension and Hilton Head Factory Stores 2. All of these suggested improvements would not only provide for additional capacity, but also address safety concerns relative to the corridor.

The Short Term Needs Study analyzed a five-year growth time frame for the area and recommended roadway improvements to handle the anticipated future traffic volumes. Recommendations on the mainline included the continuation of US 278 widening to six-lanes from Hilton Head Factory Stores 2 west to Simmonsville Road, and the construction of Bluffton Parkway between SC 170 and Burnt Church Road (with recommended extension to Foreman Hill Road). If the Bluffton Parkway were not constructed, the alternative was to continue the six-lane section of US 278 to SC 170 (McGarvey's Corner). Traffic signal control was suggested at seven additional intersections for a future total of 13 signalized intersections. The Short Term Needs Study also recommended further control of access drives (curb-cuts) along the US 278 Corridor through closure of median crossovers, the addition of frontage roads in high concentrated traffic areas and increased connectivity through joint access points.

## **FUTURE CONDITIONS**

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To estimate the impact of traffic volume growth on the roadway network under Future conditions, Traffic volumes have been projected to the buildout Year of 2020. Traffic volumes on the roadway network at this time have been based upon the utilization of a calibrated transportation model and growth projections of Socio-economic data (housing, school attendance and employment) within Beaufort County. Consideration of these factors resulted in the development of the future 2020 traffic volumes, which have been used within this study to define the Long-Term Needs of US 278.

For the purposes of the Long-Term Needs of US 278, it has been assumed that the improvements suggested in the Immediate Needs, and Short-Term Needs studies have been implemented.

For the process of evaluating the feasibility of the various alternatives, the model was programmed to reflect potential roadway improvements needed to alleviate capacity constraints along the US 278 corridor. Once these improvements were identified, the benefits/impacts of each roadway improvement scenario has been quantified.

### **FUTURE TRAFFIC VOLUMES**

Future traffic volumes for the year 2020 have been developed utilizing the Beaufort County Transportation Model. **Figure 1** illustrates the traffic projections along the US 278 Corridor for the Year 2020. Traffic volume projections had been completed for two scenarios assuming the implementation of capacity improvements to the US 278 Corridor. The following two alternatives have been selected for detailed study and analysis:

- A. Extension of Bluffton Parkway to Mackays Creek with an interchange at US 278, widening of US 278 to six lanes across Mackays Creek and the Atlantic Intercoastal Waterway (AIWW) to Hilton Head Island.
- B. Extension of Bluffton Parkway to Hilton Head Island with a new 4-lane bridge parallel to the existing 4-lane US 278 bridges.

**Figure 2** depicts a graphic representation of the two above alternatives.



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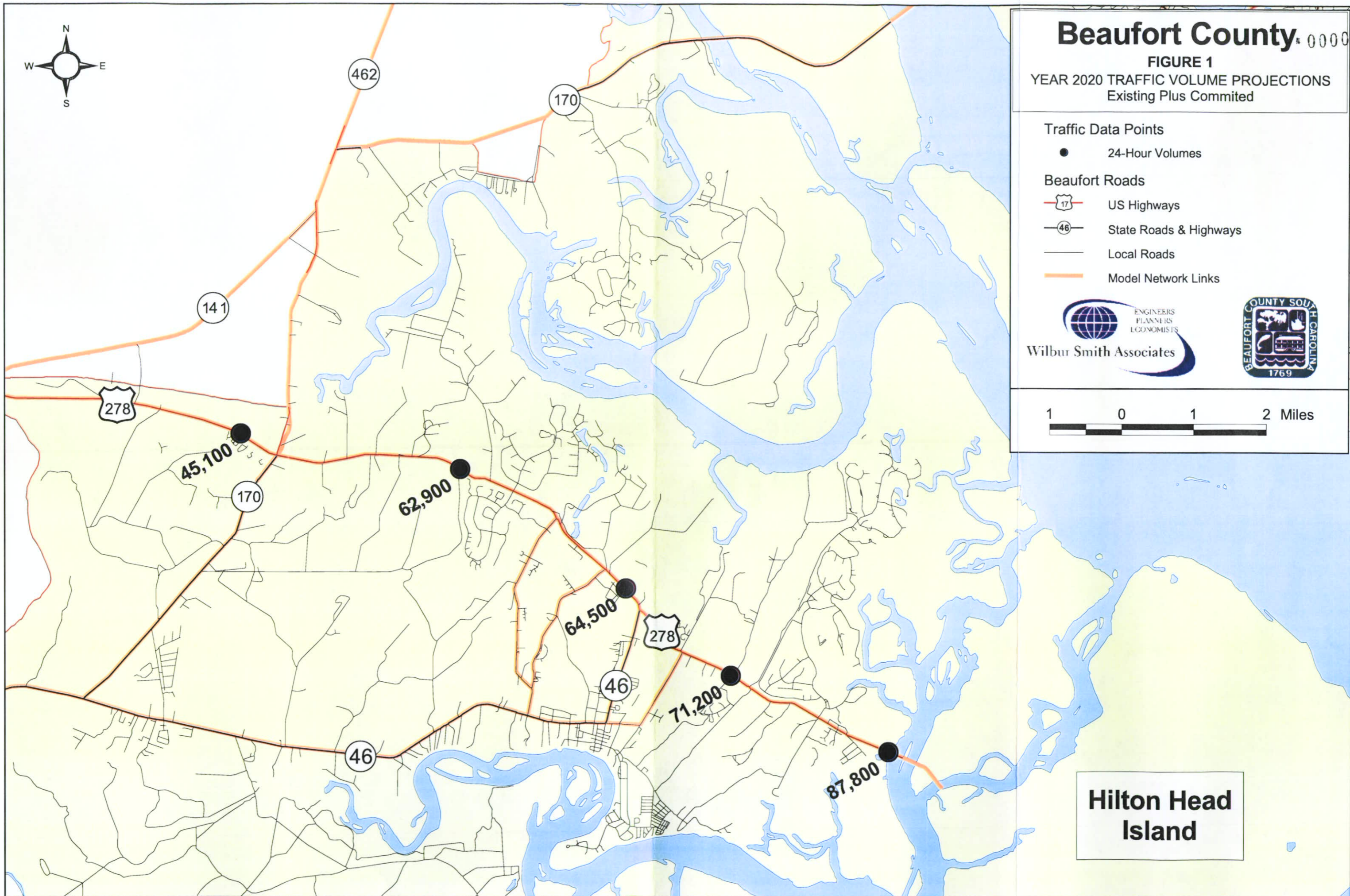
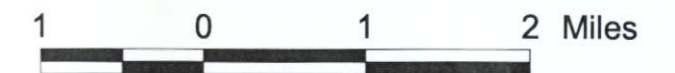
**FIGURE 1**  
YEAR 2020 TRAFFIC VOLUME PROJECTIONS  
Existing Plus Committed

### Traffic Data Points

- 24-Hour Volumes

### Beaufort Roads

- (17)— US Highways
- (46)— State Roads & Highways
- Local Roads
- Model Network Links



**Hilton Head Island**

# Beaufort County

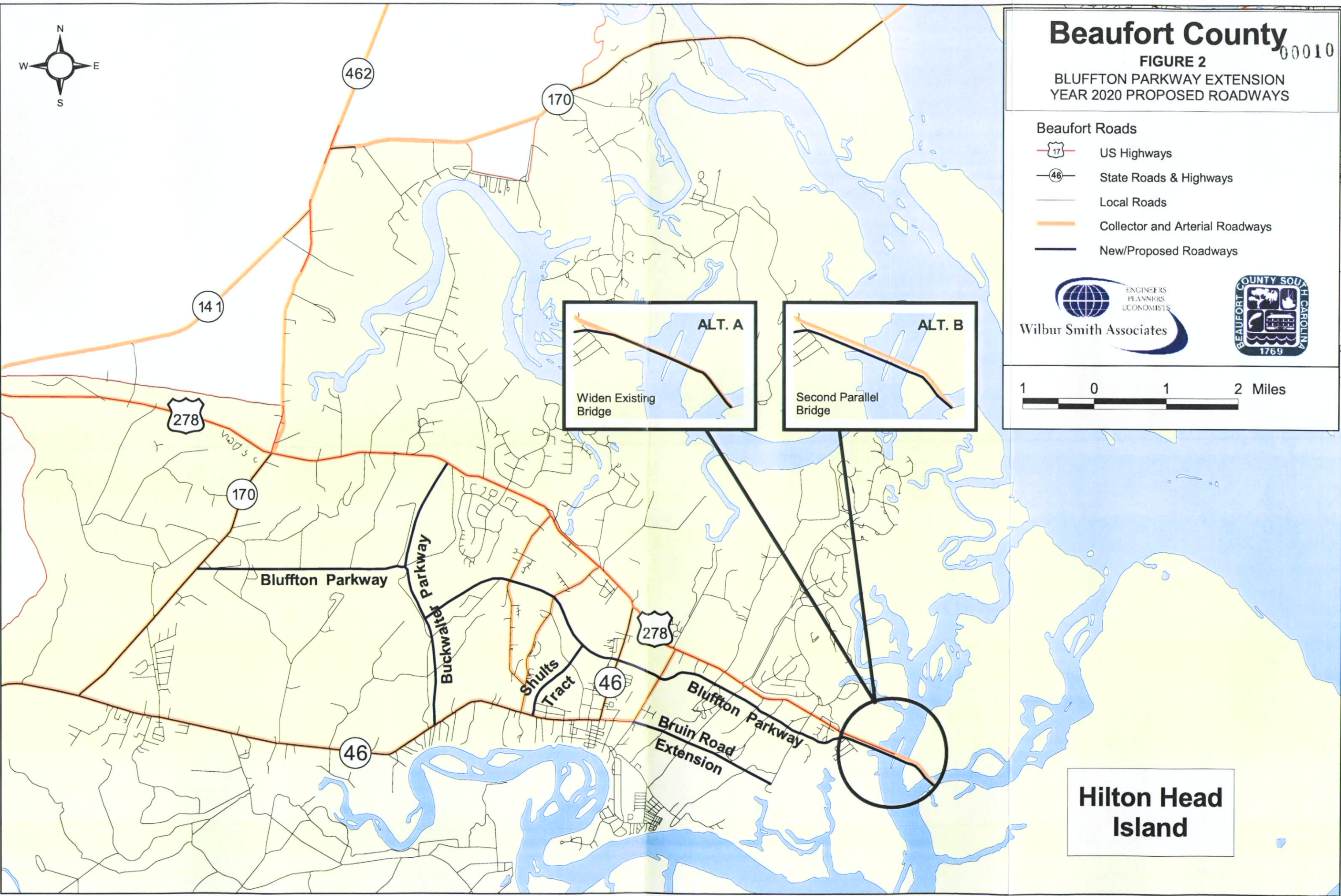
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## FIGURE 2

### BLUFFTON PARKWAY EXTENSION YEAR 2020 PROPOSED ROADWAYS

#### Beaufort Roads

-  US Highways
-  State Roads & Highways
-  Local Roads
-  Collector and Arterial Roadways
-  New/Proposed Roadways



**ALT. A**

Widen Existing Bridge

**ALT. B**

Second Parallel Bridge

**Hilton Head  
Island**

As shown, the two alternatives analyzed concentrate on US 278 between Simmonsville Road and the bridges to Hilton Head Island. This is due to the fact that with the Immediate and Short-Term improvements assumed to have been implemented, no significant capacity constraints were anticipated between McGarvey's Corner and Simmonsville Road. The "hot spot" or area of concern is the area east of Simmonsville Road to the bridges where the bridges are assumed to continue to provide the same cross-section as exists today, two-lanes in each direction.

The results of the model runs are projected daily volumes throughout the US 278 Corridor. **Table 1** depicts the resultant 2020 Future traffic volumes for each of the alternatives along key roadway segments of US 278. For comparative purposes, the existing traffic volumes and future No-Build volumes (E+C) have also been presented.

**Table 1  
FUTURE 2020 TRAFFIC VOLUME PROJECTIONS  
(Vehicles Per Day)**

	ROADWAY VOLUMES										ROADWAY CAPACITIES			
	US 278 McGarveys Corner <sup>1</sup>	US 278 Buckwalter <sup>2</sup>	US 278 Kittles Crossing <sup>3</sup>	US 278 Foreman Hill Rd. <sup>4</sup>	US 278 Waterway Bridge <sup>5</sup>	Bluffton Parkway Shults Tract <sup>6</sup>	Bluffton Parkway Myrtle Park <sup>7</sup>	Bluffton Parkway H.H. Factory Stores <sup>8</sup>	Bluffton Parkway Buckingham Plantation Rd. <sup>9</sup>	Bluffton Parkway New Waterway Bridge <sup>10</sup>	Capacity (LOS C) US 278 @ Waterway Bridge	Capacity (LOS C) Bluffton Parkway at Waterway Bridge	Total Bridge Capacity (LOS C)	COST
EXISTING	18,000	30,900	34,900	40,200	45,500	---	---	---	---	---	42,000	N/A	42,000	---
FUTURE 2020 (E & C)	45,100	62,900	64,500	71,200	87,800 <sup>a</sup>	---	---	---	---	---	42,000	N/A	42,000	---
ALTERNATIVE A (Bluffton Parkway Extended to Fording Island Rd Extension and Existing bridge widened to 6 lanes)	39,900	49,700	50,900	53,101	87,800	29,500	27,900	29,300	35,200	---	87,800	N/A	87,800	\$80 million
ALTERNATIVE B (Bluffton Parkway Extended with new 4-lane sister bridge across waterway)	39,900	49,700	50,900	53,101	52,800	29,500	27,900	29,300	35,200	35,200	58,600	42,000	100,600 <sup>b</sup>	\$157 million

As shown by this table, the magnitude of the anticipated volume increase is substantial when comparing the Existing volumes to the Future 2020 projections. Much of this expected growth is due to permitted developments that are anticipated within southern and western areas of the County.

The review of the projected traffic volumes for US 278 indicate the following:

- The configuration of US 278 west of Simmonsville Road (four-lane divided highway provided Bluffton Parkway is constructed) will not be sufficient to handle future growth.
- The anticipate six-lane section of US 278 between Simmonsville, and Fording Island will not be sufficient to handle future growth.
- The existing four lane capacity of the Hilton Head Bridges will not be sufficient to handle future growth.

Mitigation of future traffic volumes can be accomplished through implementation of the following methods:

- Widening to provide an increase in highway capacity with additional travel lanes;
- Removal of local trips and frequent turning movements from US 278;
- New roadway connections to provide trip route alternatives;
- Access Management to limit conflict and major traffic stream disturbance points to concentrate access to key locations with defined spacing; and
- Removal of vehicles from the transportation network through encouragement of future development of the type that produces fewer vehicle trips or development of multi-modal transportation alternatives.

For the US 278 Corridor, a transportation plan should include a combination of the above methods to ensure the continued viability of the transportation system. Long-Term needs can be met through the implementation of several key elements as follows:

- Widening of US 278 between McGarvey's Corner and Mackays Creek to provide additional capacity for vehicles traveling through the study area;
- Access management through closure of minor median crossovers and concentrating turning movements at controlled access points;
- Frontage roads to remove local destination traffic from the through movement traffic stream;
- Construction of new roadways to provide additional connectivity and trip route alternatives using a combination of east-west routes (Bluffton Parkway) and north-south routes (Foreman Hill Road);
- Congestion Management through improved traffic signal progression during peak time periods and removal of travel lane blockages quickly and efficiently;

- Encourage development that provides for multimodal access between various land uses and parcels (interconnectivity); and
- Explore the possibility of alternative transportation mode options.

Many of the above elements have already been submitted as recommendations in both the Immediate and Short-Term Needs Studies.

## **CONCLUSIONS AND RECOMMENDATIONS**

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The following recommendation build on the previous recommendations made through the Immediate Needs and Short-Term Needs studies while taking into account projected traffic growth over the next 20 years. These recommendations are intended to provide additional capacity, connectivity and safety improvements to the US 278 Corridor. The proposed alternatives are designed to separate through traffic, traveling between McGarvey's Corner and Hilton Head Island, from local traffic in order to improve safety, allow high speed traffic with minimal conflict points and improve the safety at access drives to/from development by providing a new lower speed parkway style roadway.

Widening of US 278 to three through lanes in each direction is currently being designed as part of the Immediate Needs Study and the proposed Myrtle Park development. The limits of this project is from Simmonsville Road to the Hilton Head Bridges. The Short-Term Study identified the need to widen US 278 from Simmonsville to McGarvey's Corner or construct the Bluffton Parkway from SC 170 to Foreman Hill Road.

Widening US 278 will be crucial to the viability of the highway as a key arterial. The identified recommendations are intended to build upon the previously established principals of providing alternative routes and connectivity to the Bluffton area and to remove local traffic from US 278. However, continued growth on this important highway will necessitate improvements that will provide additional capacity and improve safety such as widening and increased access management.

### **US 278 IMPROVEMENTS**

Improvements suggested for US 278 have been broken into logical segments of the Study area as presented below.

#### **West of McGarvey's Corner**

No additional changes to the Corridor are recommended on this section of the roadway. The existing 4-lane divided cross-section should be sufficient to handle anticipated growth. Access Management Guidelines developed in the previous study efforts should be continued through the Long-Term.

#### **McGarvey's Corner to SC 46**

The Short-Term Needs Study recommended one of two solutions for US 278 along this section: 1.) Construction of the Bluffton Parkway between SC 170 and Burnt Church Road; or 2.) Widen the section of US 278 between McGarvey's Corner to Simmonsville Road, which when combined

with the Immediate Needs recommendations would result in a 6-lane cross section from McGarvey's Corner to the bridges. Growth in traffic over the next 20-years will necessitate the need for both the widening of US 278 to a six-lane divided highway and completion of the Bluffton Parkway. The anticipated traffic volume along Bluffton Parkway will require a roadway designed to accommodate the projected heavy traffic volumes and controlled access points to ensure that this roadway is a viable high capacity alternative to US 278.

### SC 46 to Hilton Head Island

In order to serve the projected traffic load on US 278 approaching close to 90,000 VPD, two key principals have been used to develop the proposed improvements for US 278:

1. Minimize the mixing of through traffic from local traffic; and
2. Provide safe and efficient access to existing and future developments.

In order to promote these principals, it is suggested that US 278 serve as a high-speed through route for traffic traveling primarily between McGarvey's Corner and Hilton Head Island. Bluffton Parkway would serve as a local arterial route to serve traffic in and around Bluffton, and provide for planned localized access at properly spaced intersections. US 278 would have greater access management where access would be mainly at signalized intersections which are properly spaced for optimal progression and operation. Bluffton Parkway would have more frequent access points but would be designed as a parkway with a landscaped median and controlled spacing between access points to ensure sufficient capacity for the projected high volumes.

Continue to provide frontage road along the southside of US 278 to connect existing and proposed developments located between Burnt Church Road and Buckingham Plantation as opportunities exist. By providing a frontage road, additional access points to/from US 278 can be closed and/or consolidated. The location of a frontage road network would connect existing parking areas to allow traffic between businesses without obstructing access to existing developments or impacting existing buildings.

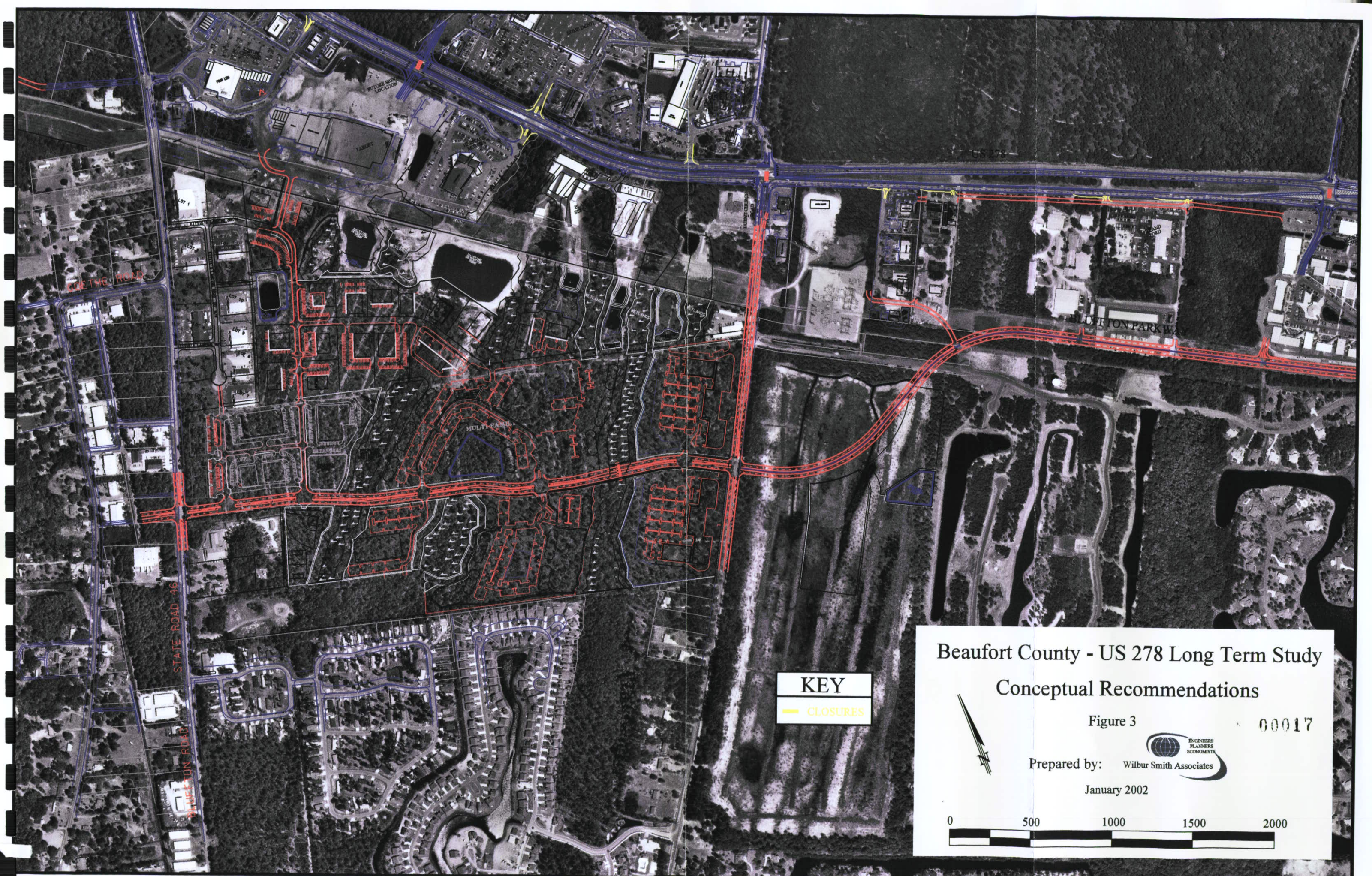
Closure of existing access drives onto US 278 would be conditioned with the construction of a frontage road and Bluffton Parkway between Burnt Church Road and Buckingham Plantation to provide access to properties along this section of US 278.

Bluffton Parkway would be extended as a 4-lane divided parkway from its current planned terminus at Burnt Church Road and follow the existing powerline easement to the US 278 causeway at Mackays Creek. This section of Bluffton Parkway would have a 40 mph design speed and have a minimum access spacing of 1,000 ft.

US 278 would be widened to a 6-lane divided highway between the SC 170 interchange (McCarvey's Corner) and the US 278 causeway at Mackays Creek. Dual left-turn lanes would be needed at key signalized intersections (Buckwalter Parkway, Simmonsville Road, SC 46, Target/Home Depot, Burnt Church Road, Foreman Hill Road, etc.) to allow traffic to efficiently enter and/or exit US 278.

All access points between Simmonsville Road and the Causeway along US 278 would be limited to existing signalized intersections only. Only right-in/right-out access drives at select areas (Sheridan Park, Hilton-Head National, The Gatherings) would be allowed. Right-in/right-out drives should be modified to provide full length deceleration lanes. **Figures 3 and 4** illustrate the conceptual recommendations for the widening of US 278 and extension of Bluffton Parkway between Burnt Church Road and the causeway at Mackays Creek.





Beaufort County - US 278 Long Term Study  
Conceptual Recommendations

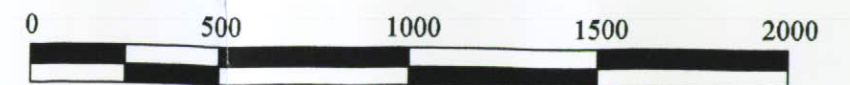
Figure 3

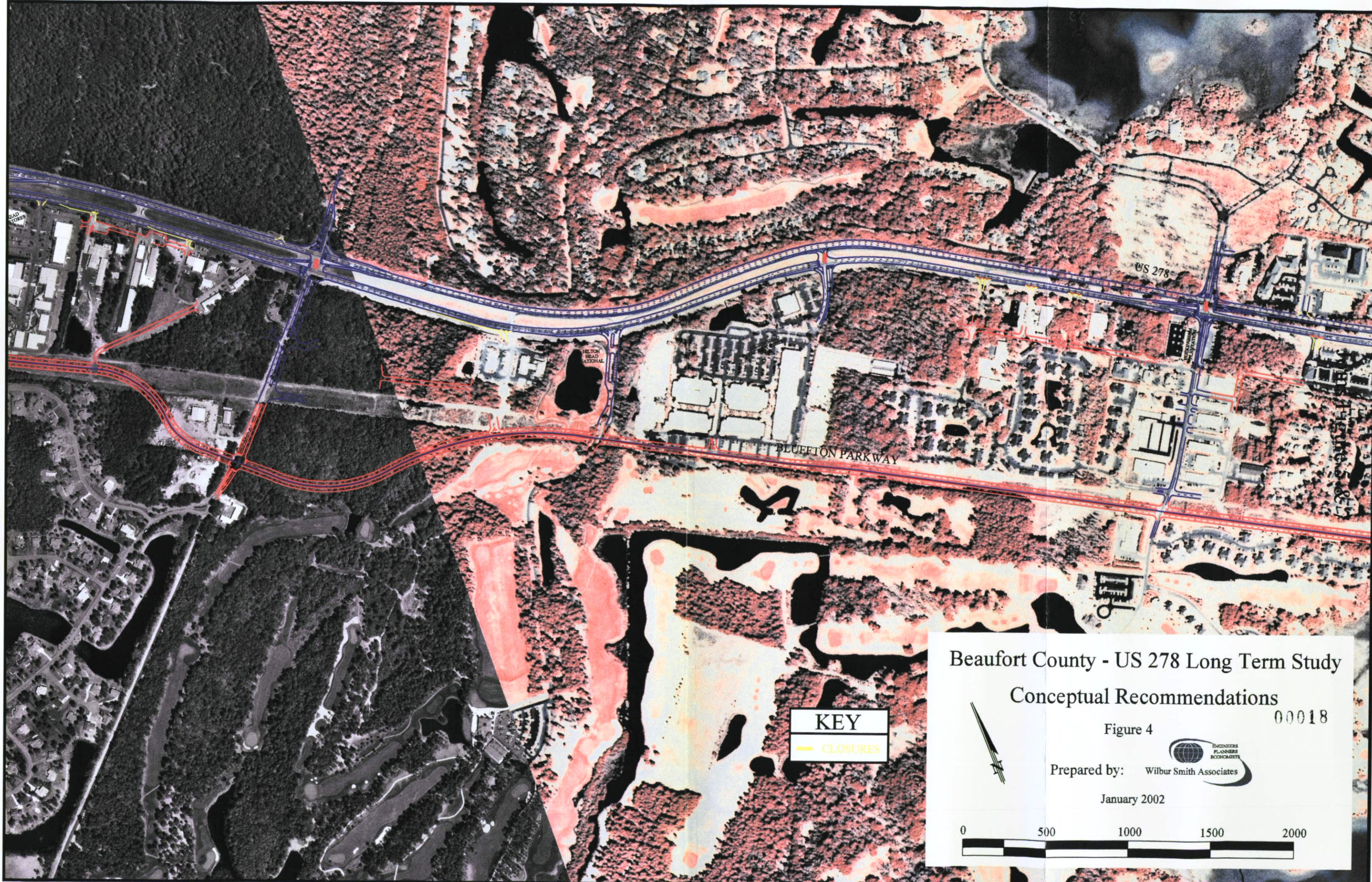
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Conceptual Recommendations

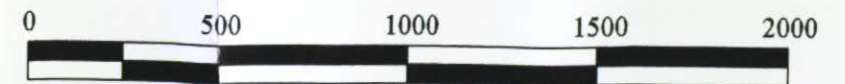
Figure 4

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**KEY**  
— CLOSURES



## **HILTON HEAD BRIDGE ALTERNATIVES**

As indicated by the projected traffic volumes, assuming the widening of US 278 to a 6-lane section, and the construction of the Bluffton Parkway, capacity constraints are not anticipated to the west of Burnt Church Road. However, east of Burnt Church, US 278 will not be capable of accommodating the near 90,000 vpd flow expected at the Hilton Head Island Bridges.

Because of this constraint, alternatives for the provision of additional roadway capacity across Mackays Creek and the Atlantic Intercoastal Waterway have been examined. It should be noted that each of the alternatives presented below require the Bluffton Parkway extension that was presented in the earlier section.

### **Alternative A: Widen Existing US 278 Bridge**

Bluffton Parkway would be designed to intersect US 278 at the causeway (Mackays Creek) with grade separated on and off ramps via a flyover. Fording Island Road Extension would continue to be provided access to/from US 278 only; Bluffton Parkway would cross over Fording Island Road Extension to US 278.

Where US 278 and Bluffton Parkway intersect, US 278 would be widened to provide 4-lanes in each direction to allow the free-flow movements (merging and diverging) of vehicles entering and exiting US 278 from Bluffton Parkway. This 8-lane highway section would taper down to a 6-lane cross section which would continue to Hilton Head Island matching the existing 6-lane section of US 278 in the vicinity of Spanish Wells/The Cross Island Parkway.

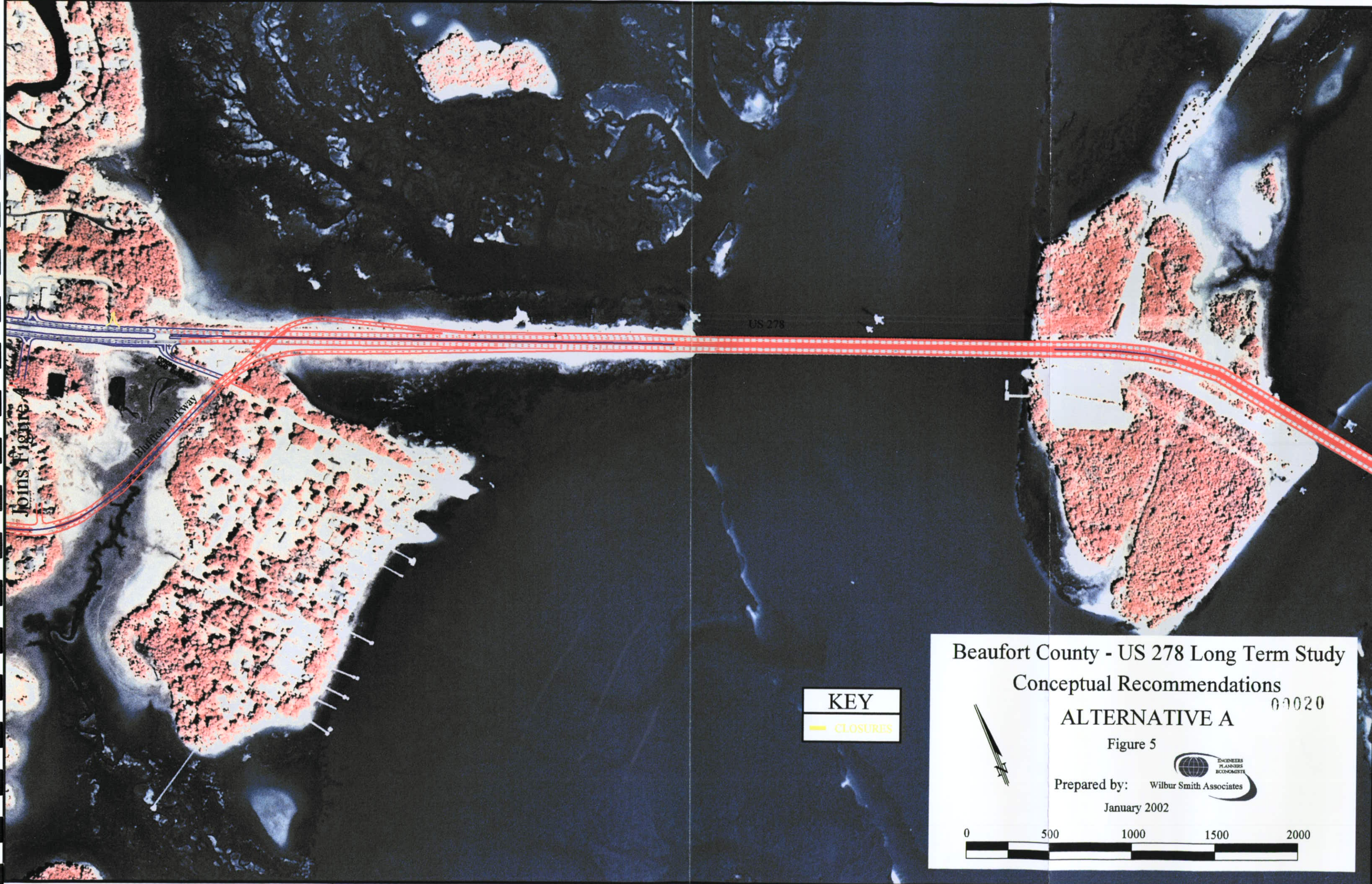
**Figures 5 and 6** illustrate the proposed access ramps of US 278 at Bluffton Parkway and the widened 6-lane bridges to Hilton Head Island.

### **Alternative B – New Parallel Bridge**

The Bluffton Parkway extension would cross the waterway with a new 4-lane bridge and continue on to the Cross Island Parkway Interchange. This structure would follow a new alignment parallel to the existing alignment of US 278. US 278 would remain as the existing 4-lane roadway/bridge between Fording Island Road Extension and Windmill Harbor. At Hilton Head Island (near Windmill Harbor), the new bridge would align with the existing US 278 alignment, and US 278 would shift to a new limited access alignment adjacent to the powerline easement extending to/intersecting at the Cross Island Parkway Interchange. This proposed alignment would promote US 278 as a controlled access "by-pass" route and the new bridge would serve as the "local" route. Two 4-lane divided roadways crossing between Beaufort County and Hilton Head Island would have sufficient capacity to handle the projected 20 year volumes based on both Beaufort County and the Hilton Head transportation models. The US 278 at Cross Island Parkway Interchange would be redesigned to allow connection with the new facility.

In order to provide access between the new roadway and US 278, a partial interchange would be provided at Windmill Harbor.

**Figures 7, 8 and 9** illustrate the proposed new bridge between Hilton Head Island and the mainland along with the proposed interchange alignment where the new bridge would intersect at the Cross Island Parkway.



**KEY**  
— CLOSURES

Beaufort County - US 278 Long Term Study  
Conceptual Recommendations

ALTERNATIVE A

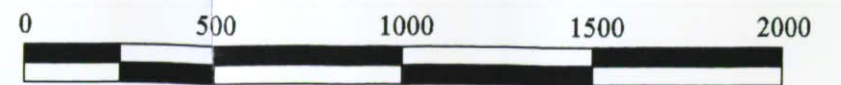
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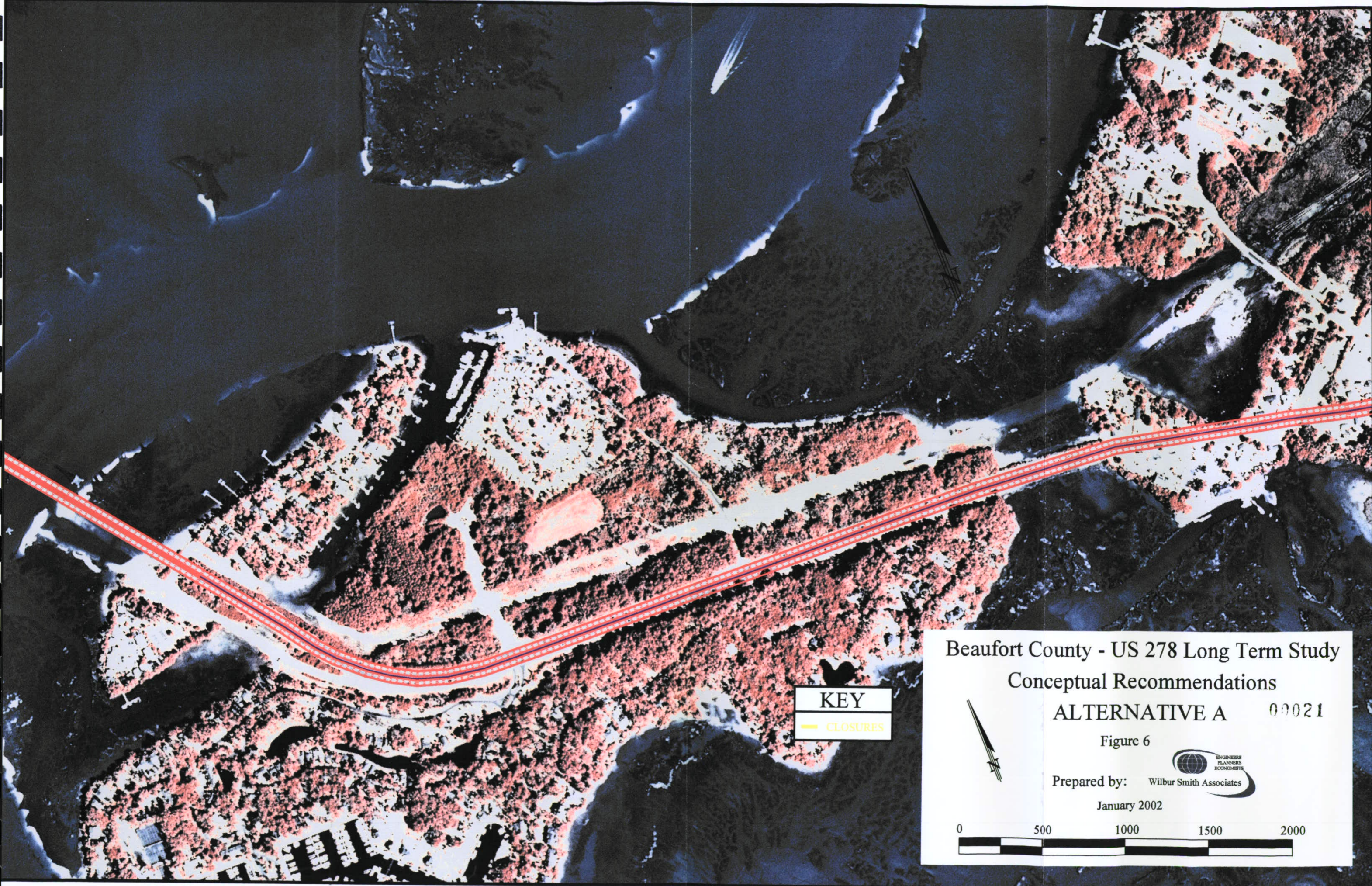
Figure 5



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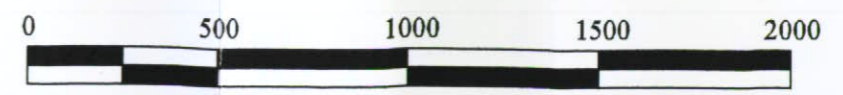
Beaufort County - US 278 Long Term Study  
Conceptual Recommendations

ALTERNATIVE A 00021

Figure 6

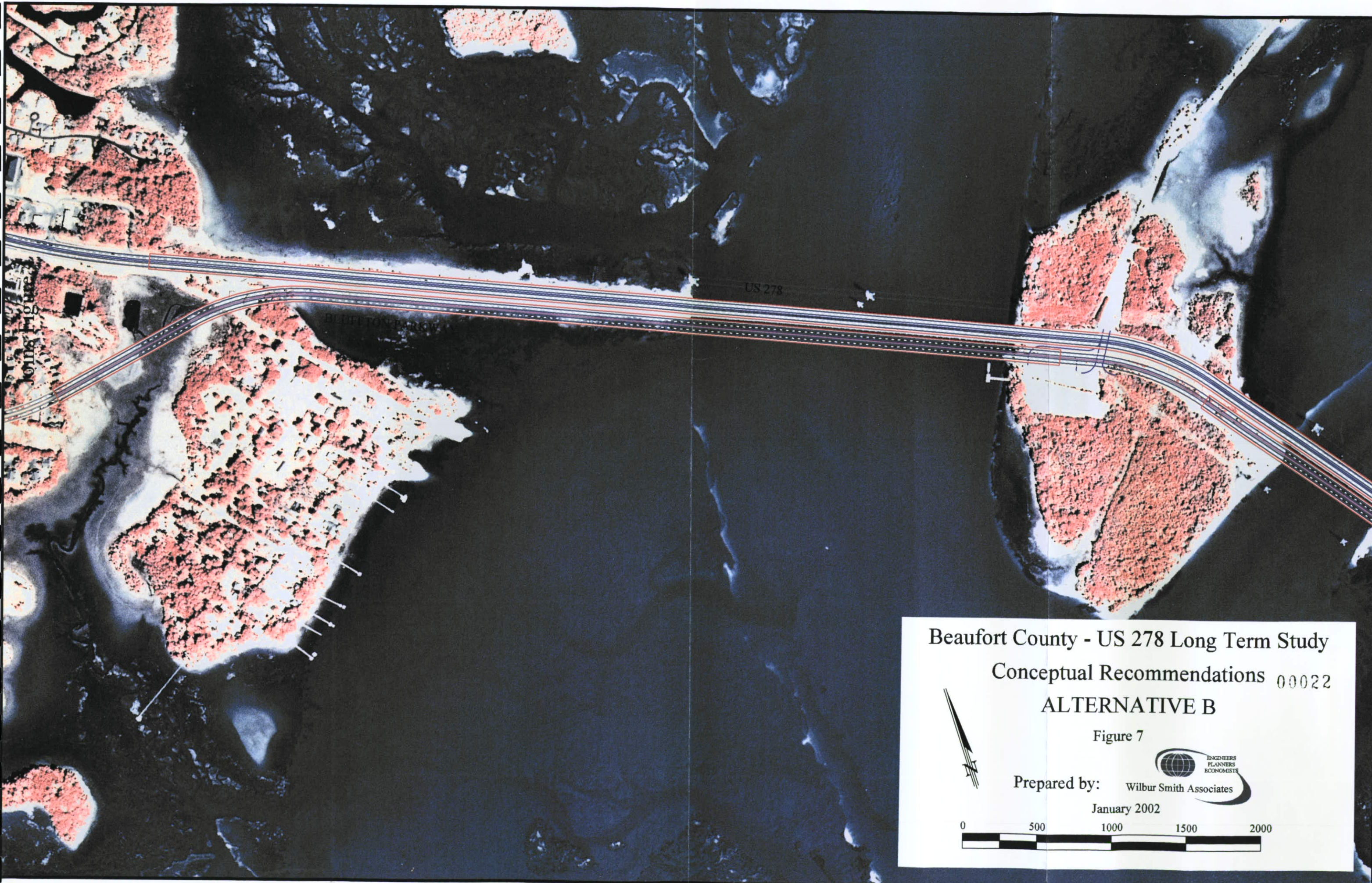
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KEY  
— CLOSURES





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Conceptual Recommendations 00022

ALTERNATIVE B

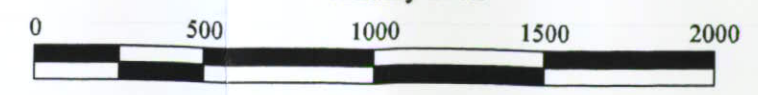
Figure 7

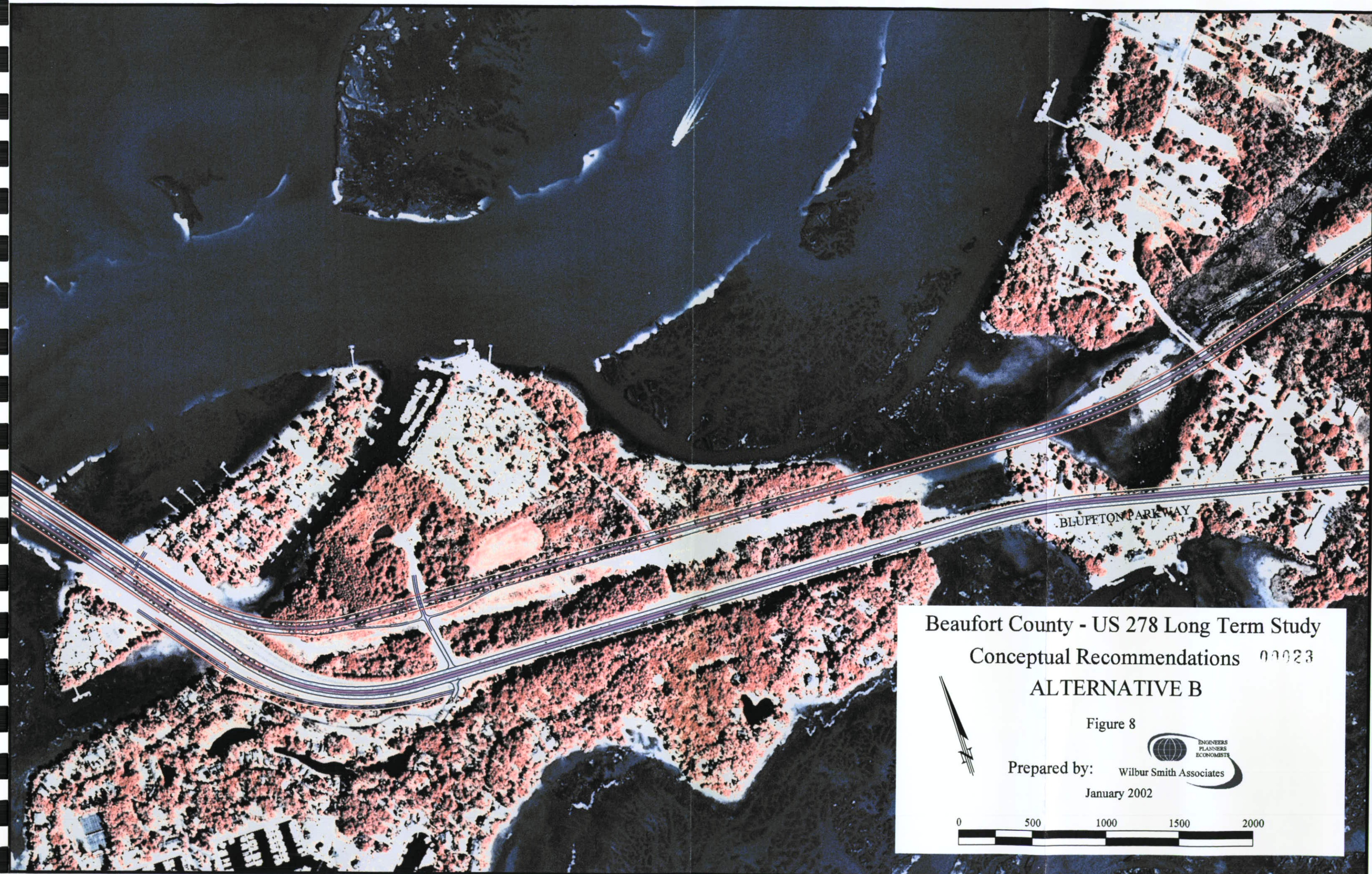


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Beaufort County - US 278 Long Term Study  
Conceptual Recommendations 00023  
ALTERNATIVE B

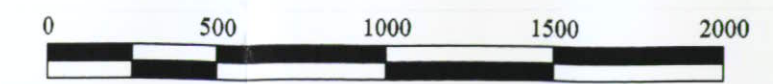
Figure 8



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Conceptual Recommendations

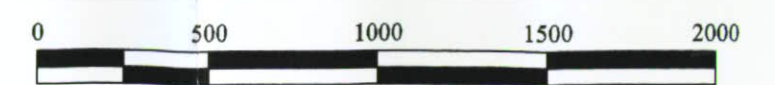
ALTERNATIVE B 00024

Figure 9



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January 2002





**COST OPINIONS**

Cost opinions for each of the proposed alternatives have been completed. These costs anticipate current costs for construction of each segment, but do not include right-of-way, utility relocation, or permitting costs. **Table 2** presents the summarized cost opinion for Alternatives A and B.

**Table 2**  
**COST OPINION FOR US 278 LONG TERM RECOMMENDATIONS**  
*Beaufort County, South Carolina*

**Cost Estimate**

**Segment 1 - Extension of Bluffton Parkway**

	<u>Feet</u>	<u>Miles</u>	<u>Cost per Mile</u>	<u>Cost</u>
4-lane divided highway	12,675	2.4	\$2,500,000.00	\$6,000,000.00

**Segment 2 - The Waterway to Cross Island Parkway**

**Bridge Widening  
Alternative A**

	<u>Feet</u>	<u>Miles</u>	<u>Cost per Mile</u>	<u>Cost</u>
Added lanes	24,000	4.55	\$710,000.00	\$3,200,000.00
Add bridge lanes	4,800	0.91	\$13,900,000.00	\$12,600,000.00
Add lanes waterway bridge w/app	8,800	1.67	\$5,400,000.00	\$9,000,000.00
New ramp bridges	3,300	0.63	\$45,600,000.00	\$28,500,000.00
<b>Total</b>				<b>\$53,300,000.00</b>

**New Parallel Bridges  
Alternative B**

	<u>Feet</u>	<u>Miles</u>	<u>Cost per Mile</u>	<u>Cost</u>
4-lane divided highway	9,500	1.8	\$2,500,000.00	\$4,500,000.00
Bridge	11,500	2.18	\$45,650,000.00	\$99,400,000.00
Waterway bridge w/approaches	4,400	0.83	\$33,800,000.00	\$28,200,000.00
2-lane bridge	600	0.11	\$28,000,000.00	\$3,200,000.00
Ramps	7,500	1.42	\$990,000.00	\$1,400,000.00
Ramp bridges	3,500	0.66	\$20,700,000.00	\$13,700,000.00
<b>Total</b>				<b>\$150,400,000.00</b>

**GRAND TOTAL A\* \$59,300,000.00**

**GRAND TOTAL B\* \$156,400,000.00**

\*Grand Totals include the \$6 million cost for the Bluffton Parkway Extension between Burnt Church and the intercostal waterway.

As shown, the total cost of Alternative A is estimated at over \$59 million with the extension of Bluffton Parkway costing \$6 million and widening the existing US 278 bridges to Hilton Head Island costing over \$53 million. Alternative B, which includes the same section of Bluffton Parkway extension at \$6 million and a new 4-lane parallel bridge to Hilton Head Island at over \$150 million, is estimated to cost over \$156 million.

It should be noted that these costs are for the purposes of this planning report. A more detailed cost should be prepared once a decision has been reached on the desired alternative and the next phase of the project has begun.

### CONCLUSIONS

As requested by Beaufort County, this report addresses the 20 year long-term transportation needs of the US 278 Corridor between the Jasper County line and Hilton Head Island. The recommendations presented build upon the recommendations presented in previous studies already completed. Within this report, it has been determined that there are two alternatives which would meet the projected transportation growth in southern Beaufort County. Both alternatives include the widening of US 278 to a 6-lane divided highway between SC 170 and Mackays Creek, closure of minor access drives onto US 278, additional frontage roads on the south side of the highway and the extension of Bluffton Parkway from Burnt Church Road to Mackays Creek. The first alternative includes merging Bluffton Parkway with US 278 at Mackays Creek and widening the existing bridge to Hilton Head Island to a 6-lane cross-section. The second alternative suggests the construction of a new 4-lane bridge parallel to the existing bridge that would allow a total of eight-traffic lanes between Hilton Head Island and the mainland.

Both alternatives are proposed based on the 20-year projections of the Beaufort County Transportation Model and should provide sufficient roadway capacity. Alternative B provides more roadway capacity, than Alternative A, which would be sufficient to carry the projections of the Town of Hilton Head Island Transportation Model which is a peak-season model. While Alternative B is intended to handle additional traffic, the total cost to implement Alternative B would be much greater than Alternative A.

