



**The Town of Hilton Head Island
Intergovernmental Relations Committee
Regular Meeting**

**Tuesday, June 15, 2010
2:00 p.m. – Conference Room 3**

AGENDA

As a Courtesy to Others Please Turn Off All Cell Phones and Pagers during the Meeting

- 1. Call to Order**
- 2. Freedom of Information Act Compliance**
Public notification of this meeting has been published, posted, and mailed in compliance with the Freedom of Information Act and the Town of Hilton Head Island requirements.
- 3. Approval of Minutes**
 - a. Regular Intergovernmental Relations Committee Meeting of March 16, 2010
- 4. Chairman's Report**
- 5. Unfinished Business**
 - a. Update of 2010 General Assembly Session Issues
- 6. New Business**
 - a. Consideration of a request to Lowcountry Council of Governments (LCOG) to include US278 Highway Projects in Statewide Transportation Improvement Program (STIP)
- 7. Adjournment**

Please note that a quorum of Town Council may result if four (4) or more of Town Council members attend this meeting.

TOWN OF HILTON HEAD ISLAND
INTERGOVERNMENTAL RELATIONS COMMITTEE

Minutes of the Tuesday, March 16, 2010
Regular Meeting

Members Present: George Williams *Chairman*; Ken Heitzke, Bill Harkins

Members Absent: None

Others Present: Thomas D. Peebles, *Mayor*; John Safay, *Councilman*; Joe Croley, *Hilton Head Area Association of Realtors*

Staff Present: Greg DeLoach, *Assistant Town Manager*; Faidra Smith, *Administrative Manager/Public Information*; Anne Cyran, *Planner*; Vicki Pfannenschmidt, *Administrative Assistant*

Media Present: None

I CALL TO ORDER

The meeting was called to order at 2:00 p.m.

II FOIA COMPLIANCE

Public notification of this meeting has been published, posted and mailed in compliance with the Freedom of Information Act and the Town of Hilton Head Island requirement.

III APPROVAL OF MINUTES

A. February 16, 2010 Regular Meeting

Mr. Heitzke moved to approve. Mr. Harkins seconded. The motion was approved by a vote of 3-0.

IV CHAIRMAN'S REPORT

Mr. Williams informed Committee Members that Senator Tom Davis was present at a community gathering in Sea Pines. Senator Davis spoke on what is going on in Columbia and also discussed the Sembler Bill. Senator Davis explained at this point the development agreement has no concrete protection of headwaters and no guarantee that the financing is coming from Sembler. Senator Davis posed a question to the audience asking if he should work on making the bill stronger or stand his ground in opposition. Those present felt he should not compromise on his position. Mr. Safay brought up that the high end stores that are supposed to be earmarked for the shopping center are in Phase 4 of the project which will take years to reach.

V UNFINISHED BUSINESS

• Update of 2010 General Assembly Session Issues

Greg DeLoach updated the Committee on activities since the last meeting. He reviewed the list of letters sent which included a letter to the Building Code Council requesting the mandatory requirement of automatic fire sprinklers in residential construction be removed from the 2009 International Residential Code; a letter to members of the House Medical, Military, Public and Municipal Affairs Committee recommending modifications to EMS Bills; a letter to all members of the House opposing any cut to the Local Government Fund; and a thank you letter to Representative Brian White for introducing the budget proviso to extend a line of credit to support the Heritage

Golf Tournament. Mr. DeLoach stated most items are still sitting in Committees and at this point staff is not requesting any action from the Committee at this time and staff will continue to monitor the bills.

VI NEW BUSINESS

- **Discussion of the Low Country Economic Network's Proposal to County Council (John Safay)**

Mr. Safay reviewed the background of the Low Country Economic Network and the purchase of the Beaufort Commerce Park. He explained the Network is working through a loan renegotiation with the banks that carry the loan and the new loan agreement has changed dramatically from the original agreement and they can only carry the loan until June, 2010. The Network has asked that Beaufort County consider the option of purchasing the Beaufort Commerce Park. Mr. Safay encouraged the Committee to recommend to Town Council to support the effort. After lengthy discussion, Mr. Harkins moved to recommend Town Council send an enthusiastic letter of support to Beaufort County to purchase Beaufort Commerce Park. Mr. Heitzke seconded the motion. The motion was approved by a vote of 3-0.

VI ADJOURNMENT

Mr. Heitzke moved to adjourn the meeting and Mr. Harkins seconded the motion. The meeting adjourned at 2:35 p.m.

Respectfully submitted:

Approved:

George Williams, Chairman

Vicki Pfannenschmidt,
Administrative Assistant

Memo

To: Intergovernmental Committee

From: Darrin Shoemaker, Traffic and Transportation Engineer (Voice (843)341-4774)
(Cell (843)384-5021)

Via: Steve Riley, Town Manager

Date: 06/09/2010

Re: Request to Lowcountry Council of Governments (LCOG) to Include US 278 Road Projects Near J. Wilton Graves Bridge in the Statewide Transportation Improvement Plan (STIP)

Recommendation: Staff recommends that Town Council authorize the attached correspondence to Mr. Chris Bickley, Director of the Lowcountry Council of Governments (LCOG) supporting the inclusion of highway improvement projects in the Statewide Transportation Improvement Plan (STIP). It is further recommended that the Town use its representation on the LCOG's board to actively support the inclusion of these projects in the STIP for potential construction as early as is practical.

Summary: One of the recommended projects is to construct a new road connection, largely across Town-owned property known as the Jenkins tract, to connect Jenkins Road to Blue Heron Point Road on the north side of US 278 and to connect Crosstree Drive to Blue Heron Point on the south side of US 278. Doing so would enable the three existing median crossovers on Jenkins Island, at Blue Heron Point Road, Harbour Passage Drive/Gateway Drive, and Jenkins Road to all be closed. Further, the potential for the US 278/Harbour Passage Drive/Gateway Drive intersection to be signalized in the foreseeable future would be eliminated, thereby potentially delaying or avoiding the need to accomplish further widening to US 278 in this vicinity.

The other recommended project is the construction of a new road to connect Beaufort County's Haigh Landing to the Pinckney Island National Wildlife Refuge beneath the western end of the J. Wilton Graves Bridge, enabling the closure of the median crossover on Pinckney Island. Successful implementation of both projects would eliminate all existing median crossovers on US 278 between Fording Island Road Extended on the mainland and the Hilton Head-Bluffton Chamber of Commerce's welcome center in the Stoney neighborhood.

Background: The STIP is funded with state "guideshare" money provided annually to the LCOG to construct transportation improvements within the four-county LCOG area, which is comprised of Beaufort, Colleton, Hampton, and Jasper Counties. The current STIP may be viewed at http://www.scdot.org/inside/pdfs/STIP/stip_statewide.pdf. The Jenkins Island project was identified by Town staff as a desirable alternative long term solution to the signalization of the US 278/Harbour Passage Drive/Gateway Drive intersection, and the Pinckney Island project was recommended in a recent U. S. Fish & Wildlife Service study on needed access improvements to the Pinckney Island National Wildlife Refuge. Town Council formally resolved to support this study's recommendation in general at its April 20th meeting.

June 4th, 2010

Mr. Chris Bickley, Executive Director
c/o Lowcountry Council of Governments
634 Campground Road
Yemassee, SC 29945

Re: Request to Include US 278 Highway Projects in Statewide Transportation Improvement Program (STIP)

Dear Mr. Bickley:

I am writing this to formally indicate the Town of Hilton Head Island's support for a pair of highway projects on US 278 near the bridges connecting Hilton Head Island to the mainland, and to request that they be given a high priority for inclusion in the Statewide Transportation Improvement Plan, or STIP.

One of the projects would construct a new frontage road along US 278 to connect Blue Heron Point Road to Jenkins Road on an alignment that largely traverses Town-owned property. Combined with the improvement or relocation of an existing road connection between Crosstree Drive in the Windmill Harbour community and Blue Heron Point Road, this new frontage road would utilize an existing underpass beneath the eastern end of the J. Wilton Graves Bridge to provide connectivity between a number of communities and developments that currently do not have signalized access to US 278, including the Windmill Harbour community located in unincorporated Beaufort County. This improvement would enable all of the communities and developments served to be accessed beneath US 278 in a manner that would eliminate the need for any ingress or egress left turns and facilitate the closure of three unsignalized median crossovers to the east of the Graves Bridge. The project will preclude the installation of a new traffic signal on US 278 to serve the Windmill Harbour community that would be highly detrimental to traffic operations on US 278, and will ensure that the existing traffic capacity in this vital section of US 278 is preserved to the extent possible. The project will greatly benefit safety, and may delay or even avoid the need to widen US 278 in this segment that includes both the Graves and Karl V. Bowers Bridges. As you are aware, this segment of US 278 generates congestion and backups associated with commuting traffic entering and leaving the island and during timeshare turnover on Saturdays, and the Town feels that the maintenance of traffic flow in this segment is absolutely imperative. I am enclosing a recent Town engineering study that describes the proposed project and its potential benefits in detail.

A second project would result in the construction of a new road connecting Beaufort County's Haigh boat landing to the Pinckney Island National Wildlife Refuge beneath US 278, thereby facilitating the closure of the median crossover on Pinckney

Island between the Bowers and Graves Bridges. This improvement was recommended as a result of a recent study commissioned by the U. S. Fish and Wildlife Service, and this study's recommendation was endorsed by Town Council at their April 20th, 2010 meeting. I am enclosing a sketch excerpted from the study that portrays the recommended improvement. The Town has budgeted \$200,000 in its fiscal year 2011 capital improvements program to do surveys and to produce an engineering design for this project.

The successful implementation of these two projects would result in the closure of the only four median crossovers within a three-mile segment of US 278 that extends from Fording Island Road Extended on the mainland to the Hilton Head-Bluffton Chamber of Commerce's welcome center, located 1.25 miles to the east of the Graves Bridge. These median crossover closures would greatly benefit our efforts to improve safety and to preserve vehicle throughput capacity on US 278. S. C. Department of Transportation officials recently met with Town staff and advised that inclusion of these projects in the STIP by LCOG is very likely the only way that these projects can receive state funding. We appreciate any consideration that can be given to these worthy projects for inclusion in the STIP, and will advocate for their inclusion to the extent practicable.

Sincerely,

Thomas D. Peoples
Mayor

Enclosures: Jenkins Island Study
Pinckney Island Sketch

cc: Town Council

TDP/SGR/DAS/das

TOWN OF HILTON HEAD ISLAND

One Town Center Court, Hilton Head Island, S.C. 29928

(843) 341-4600 Fax (843) 842-7728

www.hiltonheadislandsc.gov

February 23rd, 2010

Thomas D. Peoples
Mayor

Kenneth S. Heitzke
Mayor ProTem

Council Members

Willie (Bill) Ferguson
William D. Harkins
Drew A. Laughlin
John Safay
George W. Williams, Jr.

Mr. Andrew T. Leaphart, P.E.
c/o S. C. Dept. of Transportation
P. O. Box 191
Columbia, SC 29202-0191

Re: Engineering Study – US 278 on Jenkins Island

Dear Mr. Leaphart:

Stephen G. Riley
Town Manager

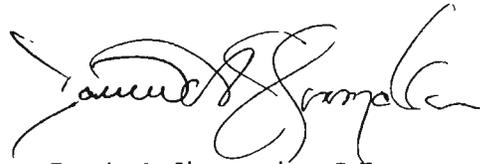
Enclosed please find an engineering study undertaken by the Town of Hilton Head Island with regard to operational issues affecting US 278 in the Jenkins Island portion of Hilton Head Island. As you will note and we have discussed, the Department's 2009 signal justification study indicated that fifty percent of the side street egress right-turn demand from Harbour Passage Drive was deleted and not considered in the warrant analysis. Since there is a channelized right-turn lane on Harbour Passage Drive and a downstream acceleration lane, we respectfully suggest that it is not appropriate to consider any of the right-turn demand in a signal warrant analysis. This right-turn movement is essentially free-flowing due to the channelization and acceleration lane, and would not be controlled with the installation of a traffic signal. With the right-turn demand deleted, I found that none of the signal warrants described in the *Manual on Uniform Traffic Control Devices* is satisfied, and could not identify a single instance where any of the warrants were even satisfied for a single hour.

As noted in the study, we continue to feel that a project to construct a parallel route on the northern side of US 278 between S-7-298 and S-7-772 remains the best long-term solution to this access issue in terms of both operations and safety. We feel that the installation of an unwarranted traffic signal in this critical segment of US 278 would unduly and adversely affect operations, and that it is vital to maintaining the available throughput capacity in this segment of US 278 without generating a near-term need to widen the highway from four to six lanes. Since the existing bridges are also a four-lane section, the aforementioned widening would likely necessarily include bridge reconstruction or replacement on both the Karl V. Bowers span across Mackay Creek and the J. Wilton Graves Span that bridges Skull Creek.

We appreciate the opportunity to submit this study. As we have discussed, it is not the intention of the Town to rigidly and indefinitely oppose a signal at this location, but we do not find that one is currently warranted by conditions. We wish to work with all of the pertinent stakeholders to find the best long-term solution for the operational and safety issues present on the Jenkins Island segment of US 278. We remain cautiously optimistic that the parallel route recommended herein can become a reality. Please

contact me at (843)341-4774 if you would like to discuss this study, and thank you in advance for your attention.

Sincerely,

A handwritten signature in black ink, appearing to read "Darrin A. Shoemaker". The signature is fluid and cursive, with the first name being the most prominent.

Darrin A. Shoemaker, P.E.
Traffic and Transportation Engineer

Enclosure: Engineering Study

cc: Mr. Robert T. Clark

DAS/das

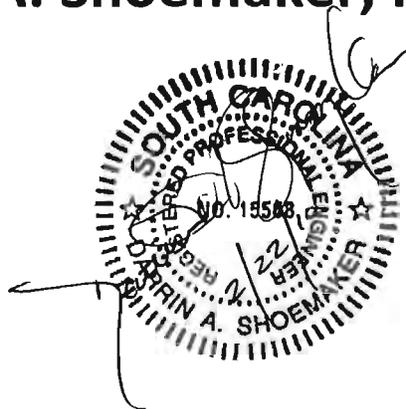
ENGINEERING STUDY

US 278 ON JENKINS ISLAND

INTERSECTION OF US 278
WITH
HARBOUR PASSAGE DRIVE
AND GATEWAY DRIVE

February 22nd, 2010

Darrin A. Shoemaker, P.E., PTOE



I. EXISTING ROADWAY NETWORK

US 278 is a major arterial that provides the only roadway connection between Hilton Head Island and the mainland via a pair of consecutive bridges. The more easterly bridge is the J. Wilton Graves Bridge spanning Skull Creek, which is the Atlantic Intracoastal Waterway. Just east of the Graves Bridge is a 1.1 mile segment of US 278 that is a four-lane section with two moving lanes of travel in each direction, divided by a grassed median. All motor vehicle traffic entering or leaving Hilton Head Island passes through this corridor.

There are three unsignalized intersections within the 1.1 mile segment east of the Graves Bridge. From west to east, these are Blue Heron Point Road, Harbour Passage Drive/Gateway Drive, and Jenkins Road. Moving eastward, the Blue Heron Point Road intersection is located near the beginning of and within a long, broad horizontal curve in US 278, and serves a side street on the south side of US 278 only. Blue Heron Point Road leaves US 278 on the south side and then turns westward parallel to US 278. It serves the Mariners Cove condominium complex before turning back to the north and passing beneath the eastern end of the Graves Bridge. It then enters the Blue Heron Point neighborhood and serves approximately 25 residences. A gated maintenance access connects Blue Heron Point Road to Crosstree Drive inside the Windmill Harbour community, and this was employed as the sole access to the Windmill Harbour community during renovations to the main entrance constructed two to three years ago.

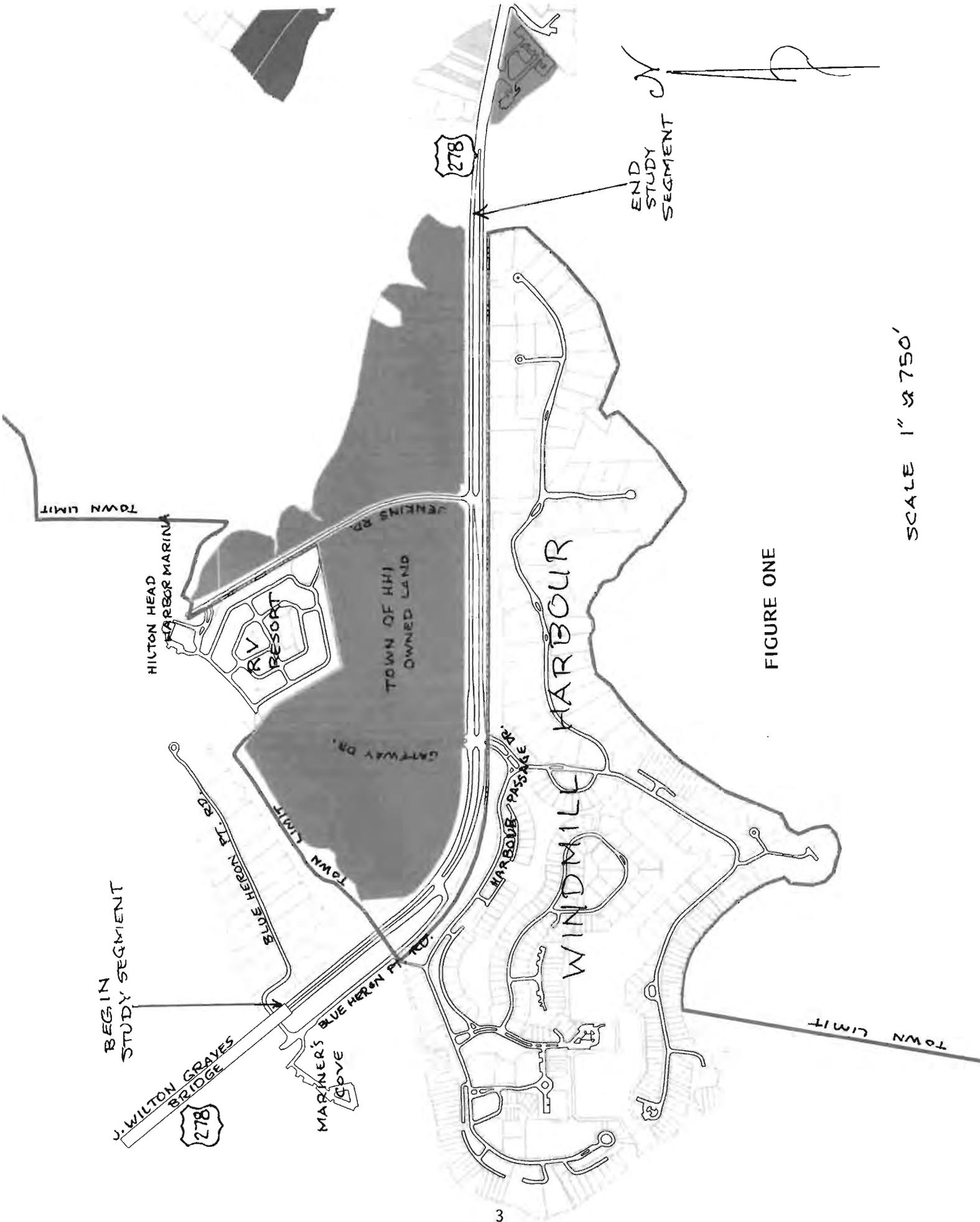
Approximately 1000 feet to the east of the Blue Heron Point Road intersection is the Harbour Passage Drive/Gateway Drive intersection. Harbour Passage Drive is the main entrance to the Windmill Harbour gated community and Gateway Drive serves an undeveloped Town-owned property popularly referred to as the Jenkins Tract. Only a reverse-osmosis water treatment facility operated by the Hilton Head Public Service District is located on this tract at present, so Gateway Drive generates very little traffic. This is the only one of the three unsignalized median crossovers that has a side street on both sides of US 278.

Approximately 1500 feet to the east of the Harbour Passage Drive/Gateway Drive intersection is the unsignalized intersection with Jenkins Road. Jenkins Road leaves US 278 to the north and serves the Hilton Head Harbor Marina and a recreational vehicle resort. This intersection experiences a significant amount of heavy vehicle traffic in the form of recreational vehicles and vehicles pulling boat trailers. The median of US 278 is generally of insufficient width to store many of these heavy vehicles, and this creates the potential for these larger vehicles to extend into the westbound through lanes of US 278 when attempting to turn left from Jenkins Road onto US 278, creating safety concerns.

Approximately one-half mile east of the Jenkins Road intersection, US 278 transitions from a divided highway to a five-lane suburban arterial lined with curbing and incorporating a paved median to accommodate ingress and egress left-turn movements from a variety of access points.

The posted speed limit on US 278 is 55 MPH west of the study area on the J. Wilton Graves Bridge. Moving eastward, the posted speed limit reduces to 50 MPH at the eastern end of the Graves Bridge and throughout the study area. The speed limit then reduces to 45 MPH in the 5-lane paved-median section to the east of the study area.

The study area is shown in Figure 1 on page three, and an aerial photograph of the area is included as Appendix A of this report. Note that the Town-owned property is shaded in color, and that the existing Hilton Head Island Town limit is depicted. It is noted that Blue Heron Point, Mariners Cove, Windmill Harbor, the Hilton Head Harbor Marina, and the recreational vehicle resort are located outside of the Town of Hilton Head Island, while the remaining study areas are located within the Town. All of US 278 within the study area is located within the Town except for an approximate 800' segment adjacent to the eastern end of the Graves Bridge. All of the three unsignalized intersections are located within the Town.



BEGIN STUDY SEGMENT

END STUDY SEGMENT

FIGURE ONE

SCALE 1" = 750'

II. US 278 CAPACITY AND DEMAND

The segment of US 278 within the study area is part of a critical corridor of US 278 that effectively extends from Burnt Church Road on the mainland east to the William Hilton Parkway/Sol Blatt Jr. Cross Island Parkway interchange on Hilton Head Island. US 278 on Hilton Head Island is named William Hilton Parkway. There are no alternate routes to carry the large east-west flow of traffic between Hilton Head Island and greater Bluffton/southern Beaufort County within this critical segment. The recent widening of US 278 on the mainland from four to six lanes has to a great extent relieved congestion associated with the large eastbound motor vehicle volume commuting to Hilton Head Island during weekday morning peak hours and the complementary westbound flow during the afternoon peak hours. US 278 is six lanes on the mainland before reducing to four lanes prior to the bridges to Hilton Head Island. The roadway expands to six lanes at the signalized intersection of William Hilton Parkway and Squire Pope Road on Hilton Head Island. The throughput motor vehicle capacity of US 278 for the six-lane sections that include signalized intersections and the four-lane sections that do not have signalized intersections are roughly equivalent. Therefore, the four-lane section of US 278/William Hilton Parkway that extends from just west of the bridges to the William Hilton Parkway/Squire Pope Road intersection does not create significant bottlenecks during peak hour flows. Following the mainland US 278 widening project, there remained only one signalized intersection within the critical segment of US 278 that had only two lanes of travel in the eastbound and westbound directions, the William Hilton Parkway/Squire Pope Road intersection. Recognizing this fact, the Town accomplished an intersection improvement project in 2008 that included the provision of a third eastbound through lane and a third westbound approach lane on US 278 at this intersection. This improvement has to a great extent mitigated the bottleneck that previously resulted from having a signalized intersection in the four-lane section of the critical US 278 segment.

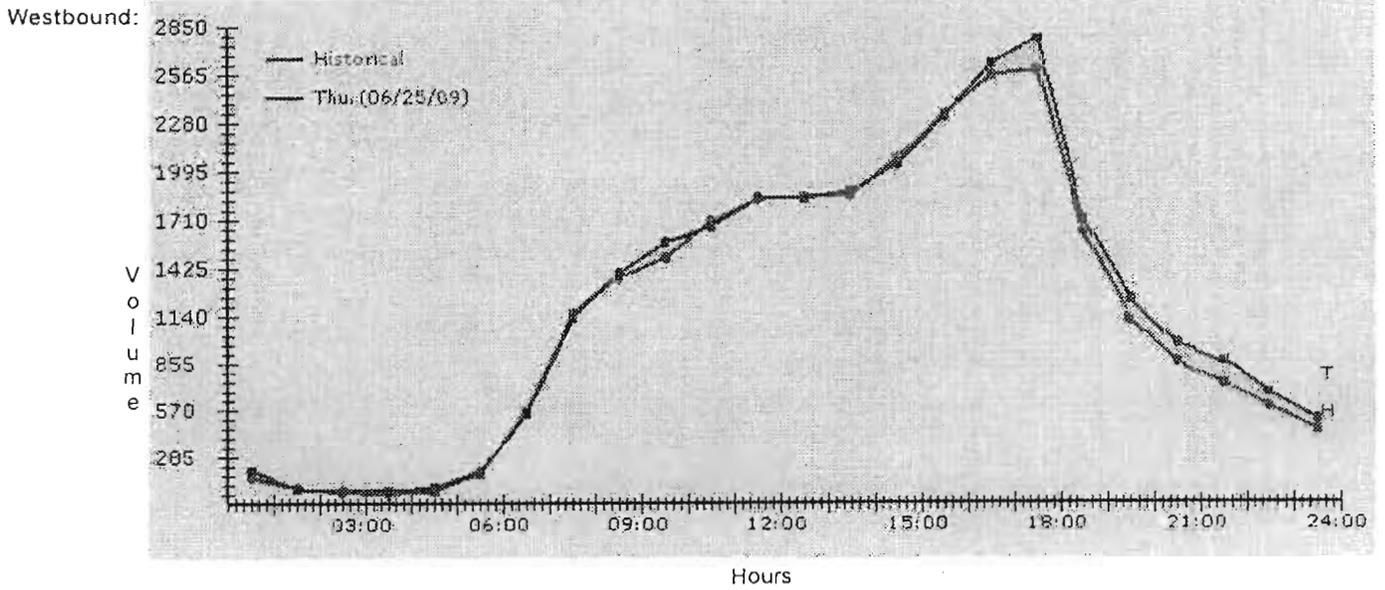
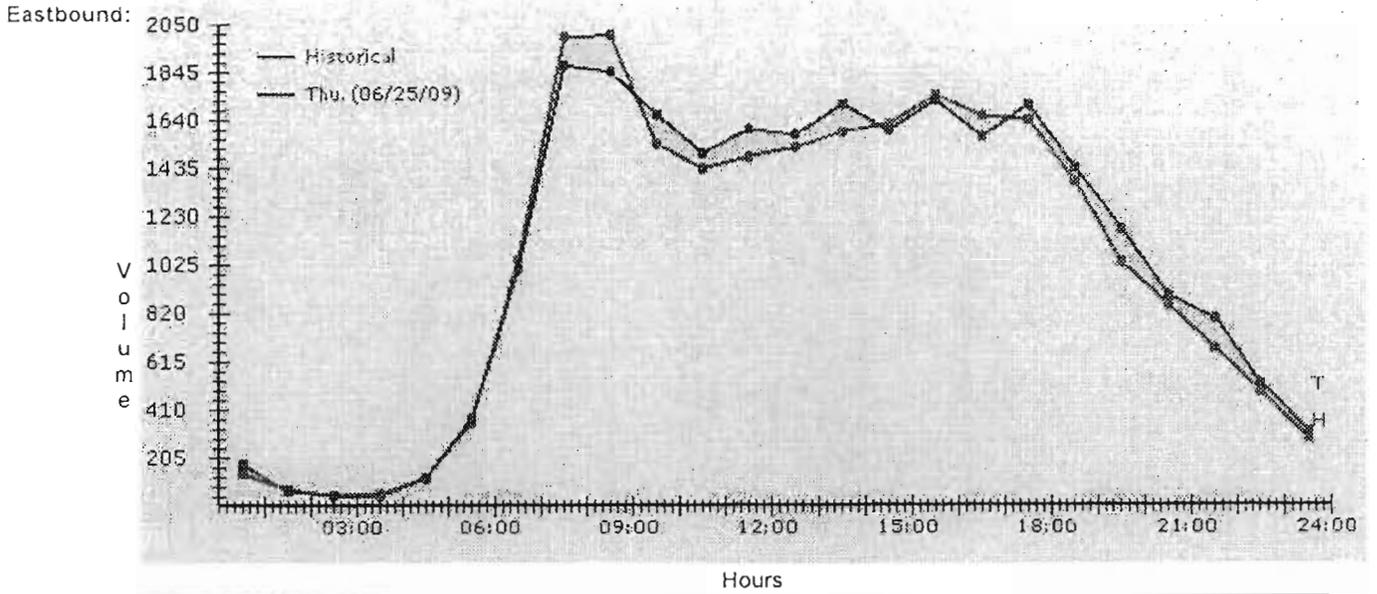
Generally, the throughput capacity of US 278 in the peak demand direction of US 278 can be summarized as shown below in Figure Two. Figures are expressed in “passenger cars per hour” and do not account for the presence of heavy vehicles in the traffic stream:

<i>US 278 Directional Capacity</i>	With Signalized Intersections	Without Signalized Intersections
Four-Lane Section	2400	3600
Six-Lane Section	3600	5400

Figure Two – Uni-directional Capacity of US 278
in passenger cars per hour

The graphs shown as Figure Three on page 6 are provided by the South Carolina Department of Transportation and depict the average hourly demand for motor vehicle traffic on US 278 within the study area in the eastbound and westbound directions. The lines on the graph labeled “H” are the average demand for weekdays in June 2009. As noted on the graphs, the westbound demand routinely exceeds the directional throughput capacity of a four-lane section with signalized intersections.

FIGURE THREE



US 278 DIRECTIONAL DEMAND BY HOUR
JUNE 2009

III. TRAFFIC SIGNAL WARRANT ANALYSIS - US 278 @ HARBOUR PASSAGE DRIVE/GATEWAY DRIVE

The Windmill Harbour community has long sought the installation of a traffic signal on US 278 at Harbour Passage Drive/Gateway Drive. As stated earlier, Gateway Drive serves only a Hilton Head Public Service District water treatment plant and generates negligible traffic demand. South Carolina Department of Transportation conducted a signal warrant analysis of the intersection of US 278 with Harbour Passage Drive in March 2009, which is attached to this study as Appendix B. The study indicated that the installation of a traffic signal was not warranted. The SCDOT study deleted fifty-percent of the side street right-turn demand from Harbour Passage Drive on the basis that right-turn movements from side streets can often be made without the benefit of a signal. It is important to note that, due to the presence of a channelized right-turn lane on the approach of Harbour Passage Drive to US 278 and an associated downstream acceleration lane serving this right-turn demand, the right-turn movement from Harbour Passage Drive is a “free” movement that flows continuously with or without traffic signal control. Since this movement would not be controlled by a traffic signal were one installed, it is inappropriate to include *any* of the right-turn demand from Harbour Passage Drive in a signal warrant analysis. The volume data collected by SCDOT for their March 2009 study was reanalyzed against the traffic signal warrants outlined in the recently-released 2009 Edition of the Federal Highway Administration’s *Manual on Uniform Traffic Control Devices*.

The results are summarized on the following pages:

WARRANT 1 – Vehicle Volume - Condition A

Hour	Major Street Warrant	Major Street Demand	Minor Street Warrant	Minor Street Demand	Hour Satisfied?
0700-0800	420	3407	105	14	NO
0800-0900	420	3875	105	22	NO
1100-1200	420	3221	105	30	NO
1200-1300	420	3008	105	34	NO
1400-1500	420	3557	105	32	NO
1500-1600	420	3372	105	24	NO
1600-1700	420	3428	105	25	NO
1700-1800	420	3760	105	30	NO

WARRANT 1- Vehicle Volume - Condition B

Hour	Major Street Warrant	Major Street Demand	Minor Street Warrant	Minor Street Demand	Hour Satisfied?
0700-0800	630	3407	53	14	NO
0800-0900	630	3875	53	22	NO
1100-1200	630	3221	53	30	NO
1200-1300	630	3008	53	34	NO
1400-1500	630	3557	53	32	NO
1500-1600	630	3372	53	24	NO
1600-1700	630	3428	53	25	NO
1700-1800	630	3760	53	30	NO

WARRANT 1 – Combination of Conditions A and B

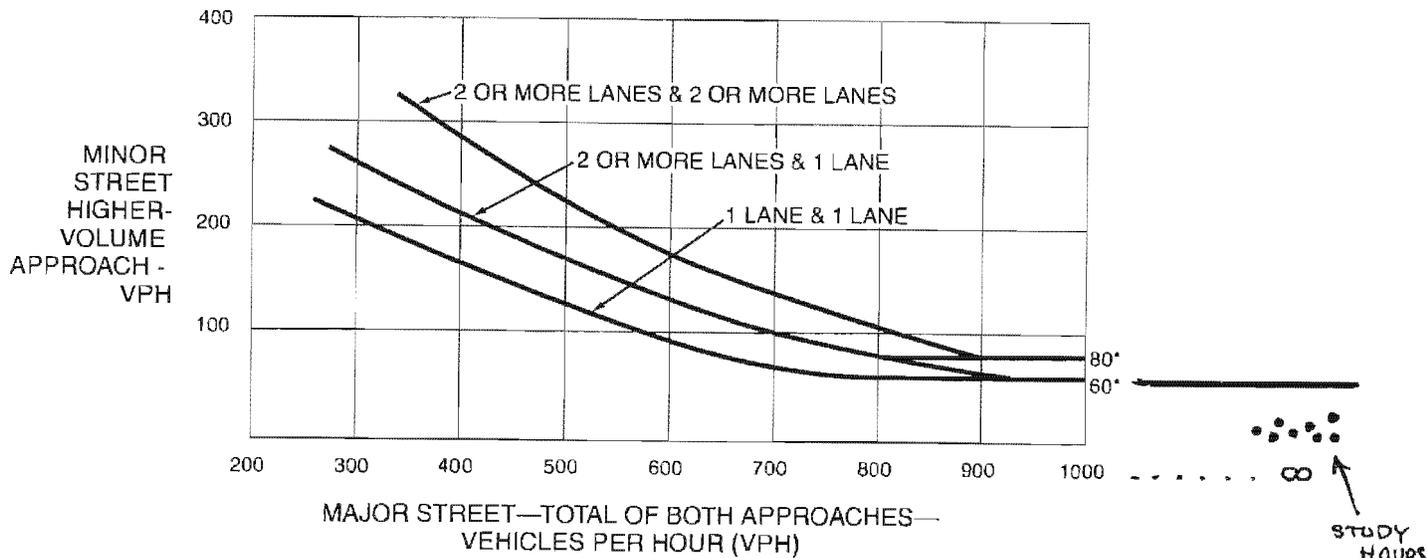
Hour	Major Street Warrant	Major Street Demand	Minor Street Warrant	Minor Street Demand	Hour Satisfied?
0700-0800	336	3407	42	14	NO
0800-0900	336	3875	42	22	NO
1100-1200	336	3221	42	30	NO
1200-1300	336	3008	42	34	NO
1400-1500	336	3557	42	32	NO
1500-1600	336	3372	42	24	NO
1600-1700	336	3428	42	25	NO
1700-1800	336	3760	42	30	NO

WARRANT 1 is not satisfied during any of the SCDOT study hours.

WARRANT 2 – Four-Hour Vehicular Volume

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)

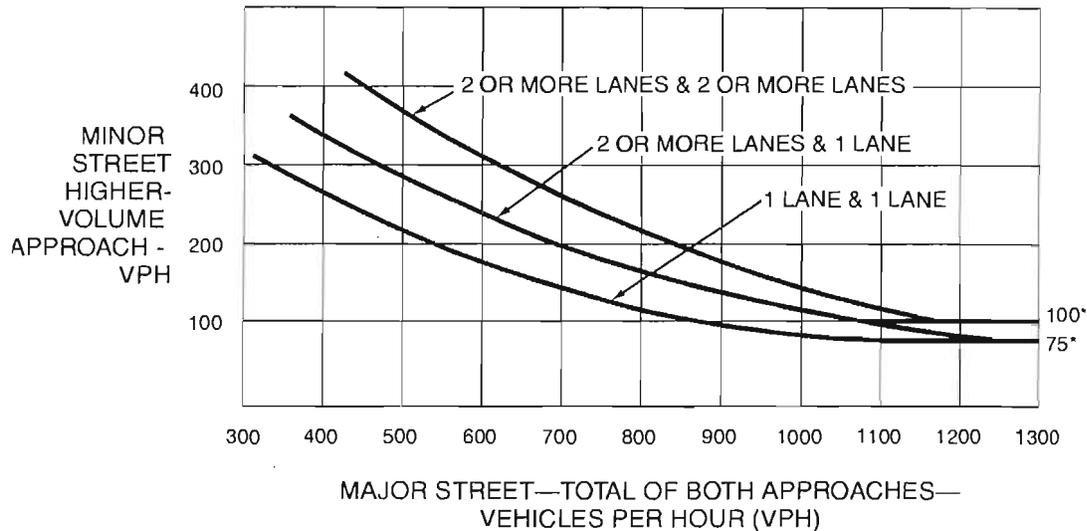


*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

This warrant is satisfied if volume data for any of four study hours falls above the middle line on the above graph labeled “2 OR MORE LANES & 1 LANE”. Since the Harbour Passage Drive approach consists of a single lane, the labeled line on the graph continues down to the 60 vehicle side-street volume threshold for hours in which the total major street approach volume exceeds 930 vehicles. Since all of the study hours have major street totals exceeding 3000 vehicles and a minor street volume far less than 60 vehicles, this warrant is not satisfied.

WARRANT 3 – Peak Hour Volume

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)
 (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

This warrant is satisfied if any of the study hours fall above the middle line on the graph labeled “2 OR MORE LANES & 1 LANE” and continuing down to the 75-vehicle side street approach threshold for hours with a major street total volume exceeding 1270 vehicles. Since none of the study hours have a side street volume exceeding 75 vehicles, this warrant is not satisfied.

IV. COLLISION EXPERIENCE – US 278 @ HARBOUR PASSAGE DRIVE/GATEWAY DRIVE

The Town cooperates with the Beaufort County Sheriff's Office and the South Carolina Highway Patrol to maintain collision records for the segment of US 278 within the study area. The Town currently has a record of all reported collisions from July 1st, 2006 through December 31st, 2009 in its database. A review of the database indicates that nine collisions have been reported at or near the US 278/Harbour Passage Drive intersection during this period. Three of these nine collisions, shown in bold below, were two-vehicle collisions between a motorist on William Hilton Parkway and a motorist entering from Harbour Passage Drive and are of the type that would be considered potentially correctable with traffic signal control. One of these three, occurring in November of 2006, resulted in a minor injury to a single person. A summary of the reported collision experience at this intersection is shown below in Figure Four:

FIGURE FOUR – COLLISION EXPERIENCE
US 278 @ HARBOUR PASSAGE DR./GATEWAY DR.

Date	Time	Type of Collision	# of Injuries
10/05/09	0715	Rear End on EB US 278	0
08/09/09	0610	Run Off Road – EB US 278	0
07/07/09	1733	Right Angle – 278 vs. Harbour Passage	0
09/01/08	0059	Run Off Road – WB US 278	0
01/29/08	1712	Right Angle – 278 vs. Harbour Passage	0
03/18/07	1618	Rear End – WB US 278	0
02/14/07	0920	Rear End – EB US 278	0
01/30/07	0737	Rear End – EB US 278	0
11/18/06	1013	Right Angle – 278 vs. Harbour Passage	1

Traffic Signal Warrant 7 (Crash Experience) requires that five or more collisions of the type correctable by traffic signal control be reported within a 12-month period to be satisfied. Clearly, warrant 7 is not satisfied, and this means that none of the signal warrants outlined in the *Manual on Uniform Traffic Control Devices* are satisfied. In fact, the nine collisions in the three-and-one-half year period results in a collision rate of 0.13 collisions per

million entering vehicles. A generally accepted engineering maxim is that intersection collision rates of less than 1.0 per million entering vehicles are difficult to lower with safety improvements due to inevitable recurring errors in human judgment. Due to spikes in rear-end collisions typically associated with the installation of new signals, it is safe to assume that collision experience would *increase* at this location with the installation of a traffic signal.

V. ANALYSIS OF IMPACT OF SIGNAL CONTROL AT HARBOUR PASSAGE DRIVE ON US 278 TRAFFIC

With traffic signal control, a maximum side street green interval of 15 seconds is likely the practical minimum allocation of green time to the side street. A three-minute signal cycle is the practical maximum cycle length. Therefore, the “best-case scenario” with regard to minimizing the disruption to the traffic stream on US 278 under traffic signal control would be a scenario where the signal stops traffic on US 278 every three minutes to time a 15 second maximum side street green. It is likely that the SCDOT would require left-turn phases to serve left-turns into the side streets from US 278 under the installation of a traffic signal, and a 15-second green interval would be appropriate for these turn phases as well. This creates the potential for red signals displayed to US 278 of 35 to 45 seconds in length and recurring at three-minute intervals.

Analyses were conducted using the *Highway Capacity Manual* software developed by the McTrans institute of the University of Florida. Printouts summarizing the results of these analyses are included as Appendix C of this report. The *Highway Capacity Manual* signalized intersection analyses indicates conditions during both weekday morning and afternoon peak hours that exceed 120 percent of the intersection’s capacity and that generate inordinately long delays for US 278 motorists. Stopped vehicle queues regularly exceeding one-quarter mile in length are projected. It is clear that through demand on US 278 exceeds the capacity afforded by a signalized intersection without accomplishing widening to a six-lane section of US 278 within the study area. Therefore, it can be stated to a high degree of confidence that the signalization of this intersection would greatly increase

the need for and urgency associated with widening the four-lane section of US 278 between Fording Island Road Extended on the mainland and the Squire Pope Road signal on Hilton Head Island, which in turn would result in the need to reconstruct or replace both four-lane bridges connecting Hilton Head Island to the mainland.

The intersection of US 278 with Harbour Passage Drive and Gateway Drive is located at the eastern end of a long, broad horizontal curve in US 278. The intersection's location at the end of this horizontal curve and its proximity to the foot of the Graves Bridge also tend to make this an undesirable location for a traffic signal. To repeat, the intersection's collision history is very low for an intersection such as this one, and it is extremely likely that overall collision frequency would increase with the institution of traffic signal control.

VI. TRAFFIC SIGNAL ALTERNATIVE RECOMMENDATION

As stated earlier and as apparent in Figure One on page three, Blue Heron Point Road extends away from US 278 on the south side of the highway before passing beneath the J. Wilton Graves Bridge to provide access to the Blue Heron Point residential community on the north side of the highway. The construction of a secondary road parallel to and on the northern side of US 278 connecting Blue Heron Point Road to Jenkins Road would give all motorists entering or leaving the Hilton Head Harbor marina, the recreational vehicle resort, Blue Heron Point neighborhood, the Town's Jenkins Tract, the Hilton Head Public Service District's water treatment plant, and Mariner's Cove access to Blue Heron Point Road and its associated underpass beneath the Graves Bridge. It was also stated earlier that the Windmill Harbour community has a secured maintenance access on Blue Heron Point Road that connects it to Crosstree Drive within the community. Were this secured and made permanently available to Windmill Harbour residents and guests, Windmill Harbour could gain access to Blue Heron Point Road as well. The construction of the frontage road and enhancement of the Windmill Harbour maintenance access as described above could give all of the above traffic generators ingress and egress from both directions of US 278 without requiring that any left turn maneuvers be executed.

Westbound US 278 motorists wishing to access Blue Heron Point could do so by turning right onto Gateway Drive instead of having to turn left onto Blue Heron Point Road as they do now. Westbound US 278 motorists destined for Mariner's Cove or Windmill Harbor could also turn right onto Gateway Drive and pass beneath the Graves Bridge to reach their destination. Eastbound motorists desiring to turn left to reach the Hilton Head Harbor or recreational vehicle resort could do so by turning right onto Blue Heron Point Road and circulating around beneath the bridge. Motorists desiring to make egress left turns onto US 278 from any of these traffic generators could do so by simply using Blue Heron Point Road to reach the opposite side of US 278 and entering with a right turn movement. This improvement is shown conceptually in Figure Five below.

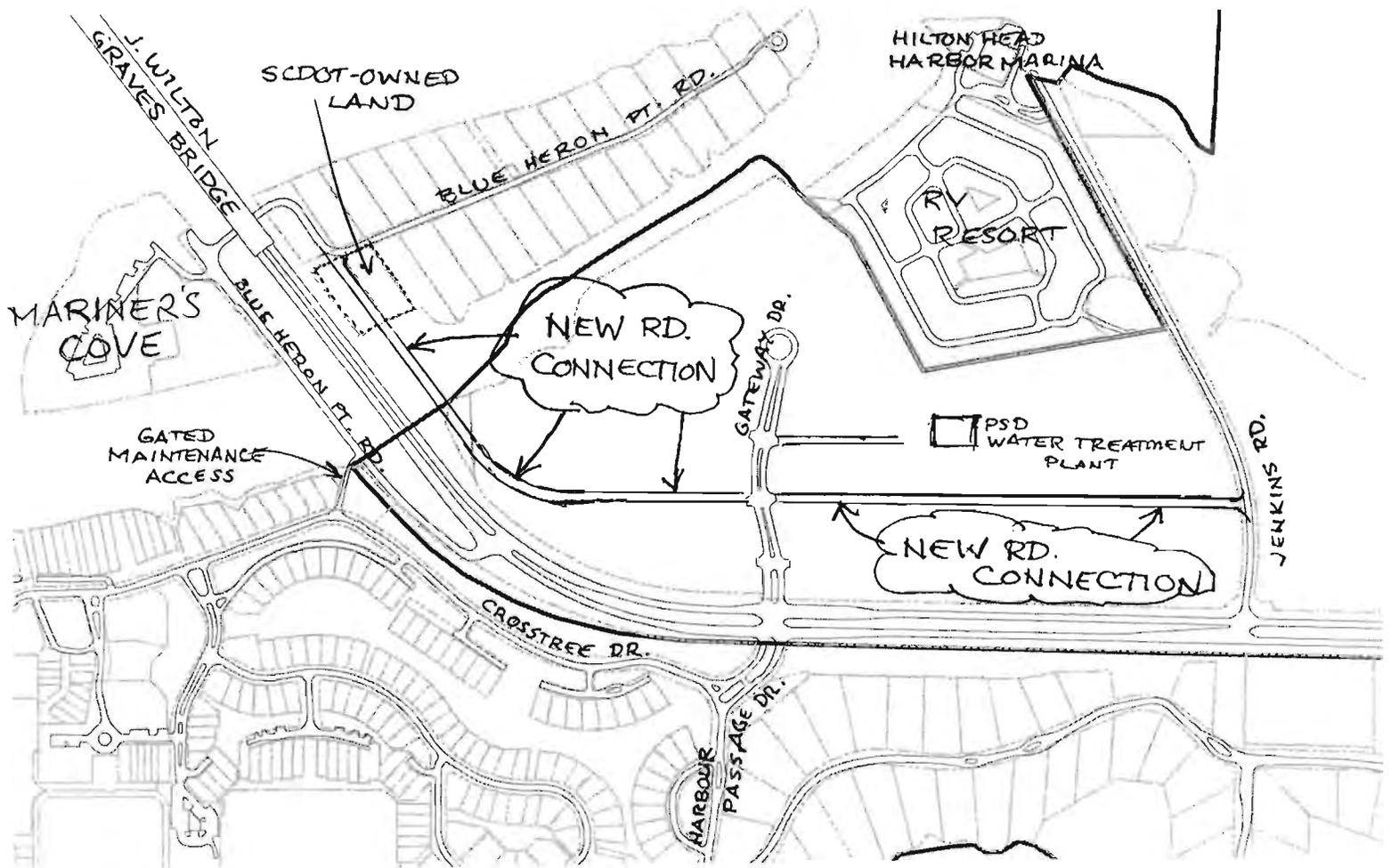


FIGURE FIVE – PROPOSED FRONTAGE ROAD IMPROVEMENT

The construction of the new roadway segments depicted in Figure Five accompanied by improvements to the existing Windmill Harbour maintenance access on Blue Heron Point Road in tandem would potentially eliminate all ingress and egress left turn maneuvers on US 278 within the study segment, and would facilitate the closure of all three median crossovers at Blue Heron Point Road, Harbour Passage Drive/Gateway Drive, and Jenkins Road. The improvements combined with the closure of the three median crossovers offer the following benefits:

- Improved safety via the elimination of all ingress and egress left-turn movements within the US 278 study segment
- Ability to further median beautification within this gateway area in areas that must now be kept clear to afford sight distance to and from the median crossovers
- Ability to improve safety by placing a median barrier throughout the study segment in a manner that would eliminate the potential for motorists crossing the median and creating head-on collisions
- Increasing through traffic capacity on US 278 via the removal of “friction” associated with ingress and egress turning maneuvers associated with the existing median crossovers
- Removal of oversized recreational vehicles that are too long to effectively be stored in the US 278 median from the Jenkins Road median crossover

While the Blue Heron Point Road and Jenkins Road median crossovers are similar to the Harbour Passage Drive/Gateway Drive median crossover in the fact that they do not exhibit inordinate collision frequencies, the potential for two-vehicle collisions involving movements that pass through the median crossovers would be eliminated at these locations. The Town has observed for a number of years that single-vehicle cross-the-median-into-oncoming-traffic head-on traffic collisions have occurred with some regularity in this segment of US 278, due in part to the long, broad horizontal curve present in the alignment of US 278. A summary of these frequently severe collisions is shown on the following page in Figure Six.

FIGURE SIX
 “RUN OFF THE ROAD” VEHICLE COLLISIONS WITHIN THE US 278 STUDY
 SEGMENT
 7/1/06 – 12/31/09

Date	Time	Type of Collision	# of Fatalities	#of Injuries
11/23/09	1749	EB motorist crossed median-no impact	0	1
11/22/09	0215	WB motorist ran off road on right	0	0
10/24/09	0305	WB motorist ran off road on right	1	1
10/16/09	1358	WB motorist ran off road on right	0	0
10/08/09	1600	WB motorist ran off road on right	0	0
06/27/09	0323	WB motorist ran into median-tree impact	0	1
02/26/09	1420	EB motorist ran into median-sign impact	0	0
01/28/09	1615	EB motorist crossed median-vehicle impact	1	0
10/12/08	0650	EB motorist ran into median-tree impact	0	0
07/25/08	0412	EB motorist ran off road on right	0	0
07/24/08	1548	EB motorist ran into median-tree impact	0	0
07/10/08	0307	EB motorist ran off road on right	0	0
06/15/08	0731	WB motorist crossed median-no impact	0	0
04/30/08	1255	WB motorist ran off road on right	0	0
04/26/08	0710	EB motorist crossed median-sign impact	0	0
02/26/08	1330	WB motorist ran into median-no impact	0	0
10/31/07	2320	WB motorist crossed median-no impact	0	0
10/28/07	0800	WB motorist crossed median-no impact	0	0
08/20/07	1921	WB motorists hit trees in median after coll.	0	0
08/04/07	2337	EB motorists entered median after coll.	0	1
06/17/07	0810	WB motorist entered median-no impact	0	0
05/06/07	0059	WB motorist ran off road on right	0	1
02/05/07	0310	WB motorist entered median-no impact	0	1
01/01/07	1555	EB motorist crossed median-sign impact	0	0
10/21/06	0517	EB motorist ran into median-tree impact	0	0
10/14/06	0645	WB motorist crossed median after coll.	0	0

09/09/06	0534	WB motorist ran off road on right	0	0
09/02/06	0302	WB motorist ran off road on right	0	0
07/20/06	1344	WB motorist crossed median-vehicle impact	0	3
07/09/06	0132	WB motorist ran off road on right	0	0
07/03/06	1701	WB motorist entered median-sign impact	0	0

The Town has documentation on 32 collisions involving “out of control” motorists within the study segment during the last three-and-one-half years, resulting in a total of two fatalities and injuries to nine persons. Nineteen of these collisions involved intrusion into or across the median of US 278. It would appear that the ability to remove the three unsignalized crossovers, thereby allowing the placement of median barrier in the form of additional landscaping or cable safety barrier should be considered.

Recognizing the imperative nature in maintaining the optimum future throughput capacity on US 278 within the study section considering that it remains a four-lane highway, the closure of all three unsignalized median crossovers would be one of the most proactive modifications that could be undertaken in this regard. The removal of the friction associated with left-turn movements that use the median crossovers would further the goal of retaining optimum throughput capacity in this area. It would also eliminate the problem that now exists with heavy recreational vehicles that use the Jenkins Road crossover and that regularly encounter inadequate storage width in the median of US 278.

The Town owns all of the land north of US 278 required to construct the two frontage road links recommended herein from Jenkins Road west to the marsh that lies just east of the Blue Heron Point neighborhood. A utility easement containing high-voltage electrical transmission lines that is believed to be held by Santee-Cooper traverses this entire Town-owned portion in roughly the same alignment that is proposed for the new frontage road links. The new frontage road segments may be constructed within or roughly parallel to this easement. The extreme western portion of the two new frontage road segments, within the Blue Heron Point neighborhood,

traverses two vacant parcels that Beaufort County tax records indicate are publicly-held by the South Carolina Department of Transportation.

VII. OBSTACLES TO THE FRONTAGE ROAD ALTERNATIVE

A large amount of additional fill would need to be placed parallel to and on the northern side of US 278 to cross the marsh that is just east of the Blue Heron Point neighborhood. This would doubtlessly present challenges in getting a permit for the project from the South Carolina Department of Health and Environmental Control and U. S. Army Corps of Engineers. A similar fill section was constructed and placed in the early 1980's on the southern side of US 278, however, to accommodate the current alignment of Blue Heron Point Road. This location is shown in Figure Seven below.



FIGURE SEVEN – US 278 @ MARSH DIVIDING JENKINS ISLAND FROM BLUE HERON POINT

The other major obstacle to the project is the negotiation of a plan to improve and secure the existing access point between Blue Heron Point road and the Windmill Harbour community. While this access has been temporarily employed as the exclusive ingress and egress to the Windmill Harbour community during recent renovations to the main entrance, the access as it now exists appears to lie very close to a pair of existing residences in Windmill Harbour, and enhancing this access may be resisted by the community. The relocation of this access to the southeast opposite an existing intersection on Crosstree Drive appears to be the most workable solution. This area is shown in Figure Eight below, with the red cross marking the potential access relocation.



FIGURE EIGHT – AREA BETWEEN BLUE HERON POINT ROAD AND WINDMILL HARBOUR W/ EXISTING AND PROPOSED ACCESS LOCATIONS SHOWN

VII. OTHER ALTERNATIVES / RECOMMENDATIONS

It is occasionally proposed that the existing three median crossovers be closed and replaced with median U-turn lanes or “jughandles” to serve the associated left-turn demands. The median of US 278 within the study segment is of insufficient width to propose U-turn lane constructions within the median, and accommodating U-turn movements by larger vehicles would require the use of jughandles, which are essentially turnaround lanes that extend onto the roadway’s shoulder on the outer edge of the roadway. A jughandle or U-turn lane in the median may actually be workable to the east of the study segment due to the large 1700’ separation between the Jenkins Island median crossover and the marsh dividing Jenkins Island from the remainder of Hilton Head Island to the east. The existing roadway geometrics would appear to accommodate either a jughandle or a median crossover U-turn lane at this location, although providing this treatment within the median may require some rather significant relocations of the through lanes of US 278. Providing a similar treatment near the western end of the study segment to serve left-turn egress demand from Gateway Drive and Jenkins Road would present substantial challenges, however, as the median width decreases between Gateway Drive and the foot of the Graves Bridge. The provision of any sort of turnaround in the form of a median U-turn lane or jughandle that is of sufficient distance from the Gateway Drive crossover to allow motorists entering from this street ample distance to change lanes to the left in preparation for a left turn is judged to be of low feasibility. The U-turn median lanes, sometimes referred to as “Michigan Lefts”, or jughandles generally work better in longer segments of road where multiple successive treatments can be provided to afford motorists an opportunity to turn around at the next downstream treatment if the traffic stream is sufficiently congested to prevent the required lane changes in preparation for a left-turn lane into the median.

Moving from west to east, the speed limit is 45 MPH on US 278 on the mainland from Simmonsville Road to the western end of the bridges leading to Hilton Head Island. It increases to 55 MPH for a 1.5 mile segment that spans the consecutive bridges to Hilton Head Island and ends at the eastern foot of the Graves Bridge, at which point the speed limit drops to 50 MPH.

The 50 MPH limit is existing throughout the study segment, and the speed limit drops to 45 MPH again at the beginning of the paved median five-lane section to the east of the study segment. Revisions to existing speed limits should be based on thorough engineering studies of the road in question, but observations indicate that the 45 MPH limit present on the mainland may be too slow and that the 55 MPH limit on the bridges may be too fast. It is recommended that the SCDOT initiate studies that would result in a potential continuous 50 MPH limit from Simmonsville Road eastward across the bridges, throughout the study segment and ending at the beginning of the paved median section to the east where the limit drops to 45 MPH. It is felt that this treatment may lower speeds in the study segment by eliminating the 55 MPH zone on the bridges and creating a more consistent treatment over a highway segment that is several miles in length. Another alternative that may be considered exclusively or in tandem with the above recommendation would be to simply lower the speed limit from 50 MPH to 45 MPH within the study segment, matching the paved-median segment to the east, although observations tend to indicate that the existing 50 MPH limit within the study segment is appropriate for conditions.

IX. SUMMARY AND CONCLUSIONS

When disregarding the egress right-turn demand from Harbour Passage Drive, as is appropriate considering the channelized nature of this right-turn lane and the presence of a complementary downstream acceleration lane, the intersection of US 278 with Harbour Passage Drive/Gateway Drive does not satisfy any of the traffic signal warrants outlined in the 2009 Edition of the *Manual on Uniform Traffic Control Devices*, and none of the warrants are even satisfied by conditions for even a single study hour as reflected in the South Carolina Dept. of Transportation's 2009 engineering study. The installation of a traffic signal at this location has the potential to result in highly adverse operational impacts on the US 278 traffic stream. For this reason, an alternative treatment that better serves the needs of the entire study area in general should be considered. The construction of a frontage road across publicly held land on the north side of US 278 from Jenkins Road to Blue Heron Point Road is the most desirable alternative for a number of reasons. It improves safety and operations by potentially facilitating the

closure of all three unsignalized median crossovers within the 1.5 mile segment of US 278 that lies just east of the bridges to Hilton Head Island, and improves the existing throughput capacity of the study segment of US 278 to the point where a major widening project, including bridge replacements, may be delayed or avoided altogether. There are obstacles to this undertaking, but the long-range benefits are too substantive to ignore. Consideration of revisions to the existing posted speed limit on US 278 between Simmonsville Road on the mainland and the paved median five-lane section on Hilton Head Island, including the study segment, should be given by the South Carolina Department of Transportation.

APPENDIX A

AERIAL PHOTOGRAPH OF STUDY AREA



APPENDIX B

S. C. D. O. T.
SIGNAL WARRANT STUDY
DATED 4/13/09



South Carolina
Department of Transportation

Beaufort County
Berkeley County
Charleston County
Colleton County
Dorchester County
Jasper County

April 13, 2009

Ms. Dianne Earle
155 Harbour Passage
Hilton Head Island, South Carolina 29926

RE: US-278 at Windmill Harbour Plantation (Harbour Passage) –
Signal Warrant Analysis

Dear Ms. Earle:

At your request, the Department has conducted additional studies at the intersection of US-278 and Windmill Harbour Plantation to determine the need for additional safety measures. A twelve hour signal warrant analysis as well as a conflict analysis was recently conducted. Attached is a summary report of the referenced studies.

Based on the results of these additional studies, we are not able to justify signalization of this intersection at this time. The side-street volume is not at a level where signalization would be justified nor did the collision history reveal a pattern of collisions that could be corrected with the installation of a traffic signal. The advantages a signal would provide to the motoring public are outweighed by the disadvantages.

During the conflict analysis review, observations were made regarding operational issues with the channelized right turn movement from Harbour Passage onto EB US-278. Also, operational issues were observed regarding multiple vehicles turning left from Harbour Passage onto WB US-278 queuing in the median. Based on these observations, certain geometric improvements could be considered that may possibly improve operations at this intersection. These improvements include extending the right turn acceleration lane in the EB direction and also channelizing the median area to better identify and control turning movements into and out of Harbour Passage.

As you know, the Harbour Passage/Gateway Drive intersection with US-278 is one of three intersections located on Jenkins Island. Action taken at Windmill Harbour will impact the other intersections as well as traffic operations beyond Jenkins Island in both directions. Since any improvements that might be made will require coordination with local governments, we will review our findings with the Transportation and Traffic Engineers for both the Town of Hilton Head Island and Beaufort County. We will endeavor to find a set of recommendations that can be implemented to improve traffic conditions for Windmill Harbour traffic.



If you have any additional questions or concerns regarding this issue, please don't hesitate to contact me directly at 843-740-1665. Thank you for your interest in the safety of South Carolina highways.

Sincerely,



Robert T. Clark
District Engineering Administrator

Enclosures

cc: H. B. Limehouse, Jr., Secretary of Transportation
Tony L. Chapman, P.E., Deputy Secretary for Engineering
Colin Kinton, Beaufort County
Darrin Shoemaker, Town of Hilton Head Island ✓

File: D6/Beaufort/NSR
CTS 29493

March 31, 2009
Engineering Study Summary Report
US-278 at Harbour Passage (OS) & Gateway Drive (OS)

This report will serve as a summary of the finding of a comprehensive engineering study that was conducted over numerous days at the intersection of US-278, Harbour Passage, and Gateway Drive. A full description of the intersection geometry can be found in the reports for both the Signal Warrant analysis, dated March 30, 2009, and the Conflict Analysis, dated March 24, 2009.

A signal warrant analysis was conducted based on the warrants put forth in the *Manual on Uniform Traffic Control Devices 2003 Edition*. The following warrants were considered in this study: Warrant 1 Condition A (Vehicular Volume), Warrant 1 Condition B (Interruption to Continuous Traffic), Warrant 2 (Four Hour Vehicular Volume), Warrant 3 (Peak Hour), Warrant 4 (Pedestrian Volume), and Warrant 7 (Crash Experience).

Traffic at this intersection was observed and recorded for a twelve hour period over two days. The count started on March 10, 2009, at 11:00 A.M. and ended at 7:00 P.M. The counted restarted on March 11, 2009, at 7:00 A.M. and ended at 11:00 A.M. This data was used to determine what signalization warrants were met. Warrant 1 Condition A was not met for any of the twelve hours observed. Warrant 1 Condition B was met for seven of the twelve hours observed. Warrant 2 was met for two of the twelve hours observed. Warrant 3 was not met. Warrant 4 was not met for any of the twelve hours observed. Warrant 7 was not met.

In addition, the count data was entered into a traffic modeling program, Synchro 7, to model how the intersection might function under signalization. This program is capable of modeling projected vehicle delay at an intersection. Based on the overall peak hour traffic volumes (7:30 A.M. – 8:30 A.M.) the addition of a traffic signal at this intersection would create a marked increase in the overall delay for US-278 through traffic while minimally reducing delay for left turns entering Windmill Harbour and reducing exiting left turn delay by approximately two-thirds.

A conflict analysis was conducted at the intersection based on the information put forth in *Traffic Conflict Techniques for Safety and Operations – Observers Manual, January 1989*. The intersection was observed on March 19, 2009 from 6:45 A.M. to 9:00 A.M. and from 3:00 P.M. to 6:00 P.M. The time observing traffic was split evenly in both the morning and evening between EB and WB traffic.

The primary conflict noted during both the morning and evening observation was a “slow vehicle” type. This type of conflict is caused by a “lead” vehicle slowing for a reason and the “follow” vehicle driver subsequently pressing the brakes in a quick response fashion. A total of 78 slow vehicle conflicts were noted at this intersection for EB traffic. A total 15 slow vehicle conflicts were noted at this intersection for WB traffic. Our observation attributed the majority of these conflicts in the EB direction to the reduction of speed on US-278 East of Harbour Passage.

A “slow vehicle” type of conflict can be viewed as a rear-end type collision that did not manifest. An addition of a signal at this intersection would likely increase these “slow vehicle” type conflicts and ultimately increase the number of rear-end type collisions at this intersection.

During the conflict analysis observation period, a total of four school buses utilized the intersection with two in the morning and two in the evening. All school buses approached the intersection from the East and made left turns onto Harbour Passage (Windmill Harbour). All school buses exited Windmill Harbour via Harbour Passage utilizing the channelized right turn lane and acceleration lane onto US-278 and proceeding EB. None of the four buses were able to reach roadway travel speed prior to entering traffic due to the substandard (under current SCDOT standards) length of the acceleration lane. In the afternoon a 90 second delay (to turn left) was noted for the bus arriving at Windmill Harbour at 3:01 P.M. A 65 second delay (to turn left) was noted for the bus arriving at Windmill Harbour at 4:05 P.M. Delay was not recorded for the busses arriving at Windmill Harbour in the morning. Only one conflict was observed as a direct result of a school bus. A school bus exited Windmill Harbour (at 3:06 P.M.), turning right to travel EB, pulled out in front of a motorist traveling US-278 EB and this caused the motorist to hit their brakes quickly.

While not a direct conflict to US-278 traffic, I observed that multiple vehicles making a left turn from Harbour Passage (to travel US-278 WB) would store in the US-278 median cross over. This multiple vehicle stacking caused obvious sight distance issues for all vehicles within the median cross over. While the frequency was not catalogued, it was noted that the most vehicles to store in the median cross over was three (to travel US-278 WB) and two waiting to turn left into Windmill Harbour.

While not a direct conflict to US-278 traffic, I observed that all drivers making a right turn from Harbour Passage utilized the channelized lane and acceleration lane. However, I noted that due to the short length of the acceleration lane (approximately 125 feet with a 125 foot taper) often drivers attempting to merge into US-278 EB traffic had to stop at the end of the acceleration lane because they could not gain adequate speed to enter the flow of traffic. Once at the end of the acceleration lane, drivers were positioned parallel to the flow of traffic which caused them to have to look over their shoulder to view oncoming traffic. This result could be considered a reduction in driver sight distance.

A traffic speed study was conducted on February 11, 2009, through the 50 mph section of US-278 that includes the intersection of Harbour Passage. The section studied was approximately 5,488 feet long. One hundred vehicles were radar surveyed, and the speeds of these vehicles ranged from 45 mph to 58 mph with the average speed being 51.3 mph. Eighty-eight percent of the vehicles surveyed fell within the 10 mph pace from 48 to 57 mph. The ten travel runs using the floating car method averaged a speed of 53.7 mph. The 85th percentile speed, a statistical measure employed by engineers to determine what most prudent drivers find to be an appropriate and comfortable speed, was determined to be 54 mph. The study found that fifty-two percent of drivers were exceeding the posted speed limit.

A collision history analysis was performed from January 2005 to September 2008 at the intersection of US-278 and Harbour Passage. During this time, there were three reported collisions at or very near this intersection. One collision was a right-angle type and the other two were rear-end types. The rear-end type collisions occurred one in 2006 and one in 2007 with both happening in the EB direction. The right angle collision occurred in 2008 in the EB direction.

It should be noted that three additional collisions were found but did not happen at this intersection. Two were rear-end types and occurred at the intersection of US-278 and Blue Heron Point with both in the EB direction. One occurred in 2006 and one in 2007. An additional rear-end type collision occurred in 2006 on US-278 between the Hilton Head Bridges in the EB direction.

Recommendations:

Based on the results of our study, signalization of this intersection is not recommended. The side-street volume is not at a level where signalization would be justified. In addition, the collision history did not reveal a pattern of collisions that could be corrected with the installation of a traffic signal. The conflict analysis showed a pattern of slow vehicle conflicts. While at this time there is not a pattern of rear-end type collisions; with the current conflict pattern, it is likely that the addition of a traffic signal at this intersection would create a marked increase in rear-end type collisions. The speed study conducted revealed that the posted speed limit is appropriate for the roadway conditions and roadside development.

It is recommended that the acceleration lane for right turns from Harbour Passage be lengthened to create adequate space for a driver to reach the traveling speed of US-278 EB traffic. If the acceleration lane cannot be lengthened, its removal would allow right turning drivers to enter natural gaps in the US-278 traffic stream from a stopped position perpendicular (approximately 90 degrees) to US-278. This would eliminate the reduction in driver sight distance that could be caused by the acceleration lane.

It is recommended that the length of the US-278 median cross over be modified to prohibit multiple vehicles turning left from Harbour Passage (to travel US-278 WB) to store within the median cross over.

N. Rebovich, Traffic Engineering
Reviewed: DMW 4/14/09
Checked: MC

March 30, 2009
Signal Warrant Analysis – 12 Hour Count
US-278 at Harbour Passage (OS) & Gateway Drive (OS)

On March 11, 2009, an engineering study of the intersection of US-278 with Harbour Passage (OS) was completed. This study included a twelve hour manual count of traffic and a review of the collision history at this intersection. This report summarizes the findings of the engineering study and assesses the operating conditions to determine if a traffic signal is warranted.

Harbour Passage intersects US-278 to form a cross-type intersection with the stop control on Harbour Passage and Gateway Drive. US-278 runs in an east/west direction with each direction separated by a 42 foot wide grass median. The westbound approach has two through lanes, a left-turn lane, and a right-turn lane. The eastbound approach has two through lanes and a right-turn lane. The right-turn movement from the eastbound US-278 approach onto Harbour Passage is channelized and controlled by a yield sign. The pavement markings on US-278 in this area are in good condition. Harbour Passage intersects US-278 from the south. Harbour Passage has a single shared through/left-turn exit lane, and the right-turn movement onto US-278 is channelized prior to entering an acceleration lane along US-278. Even though the approach is not marked with separate left/through and right-turn lanes, motorists use the approach as a two-lane approach. Gateway Drive has separate left/through and right lanes. Neither Harbour Passage nor Gateway Drive is maintained by the State. The posted speed limit on US-278 in this area is 50 mph. Sight distance is adequate at this intersection.

During the twelve hour survey, a total of 41,080 vehicles entered the intersection with 935 vehicles entering from Harbour Passage and 18 from Gateway Drive. The right turn movement was approximately 67 percent of the volume from the Harbour Passage approach. During the peak hour from 7:30 A.M. to 8:30 A.M., a total of 4,136 vehicles entered the intersection with 80 vehicles entering from Harbour Passage. The right-turn movement was approximately 78 percent of the total approach volume. No abnormal delays were noticed for motorists entering from Harbour Passage.

The traffic signal warrant analysis was conducted using the warrants in the *Manual on Uniform Traffic Control Devices 2003 Edition*. The warrant analysis allows for the removal of right turn movements (from a side street) if the movement is channelized. In this case the right movement from Harbour Passage is channelized and a high percentage of the total side street volume. Therefore, we have removed fifty percent of the right turns (from the side street) from the warrant analysis as a conservative reduction. We noted that the Passenger Car Equivalent for both trucks and buses on level terrain is 1.5. This means that a bus or truck counted could be multiplied by a factor of 1.5. The study showed that a total of four buses and fourteen trucks entered the intersection. This number factored does not induce a significant change to the over all analysis.

The signal warrants considered were Warrant 1 Condition A (Vehicular Volume) and Condition B (Interruption to Continuous Traffic), Warrant 2 (Four Hour Vehicular Volume), and Warrant 3 (Peak Hour). Warrant 1A was not met for any of the twelve hours studied. Warrant 1B was met for seven of the twelve hours studied. Warrant 2 was met for two of the twelve hours studied. Warrant 3 was not met.

A collision history analysis was performed from January 2005 to September 2008 at the intersection of US-278 and Harbour Passage. During this time, there were three reported collisions at or very near this intersection. One collision was a right angle type and the other two were rear end type. The rear-end type collisions occurred one in 2006 and one in 2007 with both happening in the EB direction. The right angle collision occurred in 2008 in the EB direction.

It should be noted that three additional collisions were found but did not happen at this intersection. Two were rear end type and occurred at the intersection of US-278 and Blue Heron Point with both in the EB direction. One occurred in 2006 and one in 2007. An additional rear end type collision occurred in 2006 on US-278 between the Hilton Head Bridges in the EB direction.

Recommendations:

Based on the results of our study, signalization of this intersection is not recommended. The side-street volume is not at a level where signalization would be justified. In addition, the collision history did not reveal a pattern of collisions that could be corrected with the installation of a traffic signal

N. Rebovich

Traffic Engineering

Reviewed: ERM 4/14/09

Checked: [Signature]

March 24, 2009
Conflict Analysis
US-278 at Harbour Passage (OS) & Gateway Drive (OS)

On March 19, 2009 a Conflict Analysis was conducted at the intersection of US-278 at Harbor Passage (Windmill Harbour) and Gateway Drive. Conflicts were observed from 6:45 am until 9:00 am and from 3:00 pm to 6:00pm. Time was split evenly between viewing east bound and west bound US-278 traffic.

Harbour Passage intersects US-278 to form a cross-type intersection with the stop control on Harbour Passage and Gateway Drive. US-278 runs in an east/west direction with each direction separated by a 42 foot wide grass median. The westbound approach has two through lanes, a left-turn lane, and a right-turn lane. The eastbound approach has two through lanes and a right-turn lane. The right-turn movement from the eastbound US-278 approach onto Harbour Passage is channelized and controlled by a yield sign. The pavement markings on US-278 in this area are in good condition. Harbour Passage intersects US-278 from the south. Harbour Passage has a single shared through/left-turn exit lane and the right-turn movement onto US-278 is channelized prior to entering an acceleration lane (approximately 125 feet long with a 125 foot taper) along US-278. I observed that all drivers making a right turn exiting from Windmill Harbour used the channelized right turn lane and the acceleration lane. Gateway Drive has separate left/through and right lanes. Neither Harbour Passage nor Gateway Drive is maintained by the State. The posted speed limit on US-278 in this area is 50 mph. There are no potential problems associated with sight distance at this intersection.

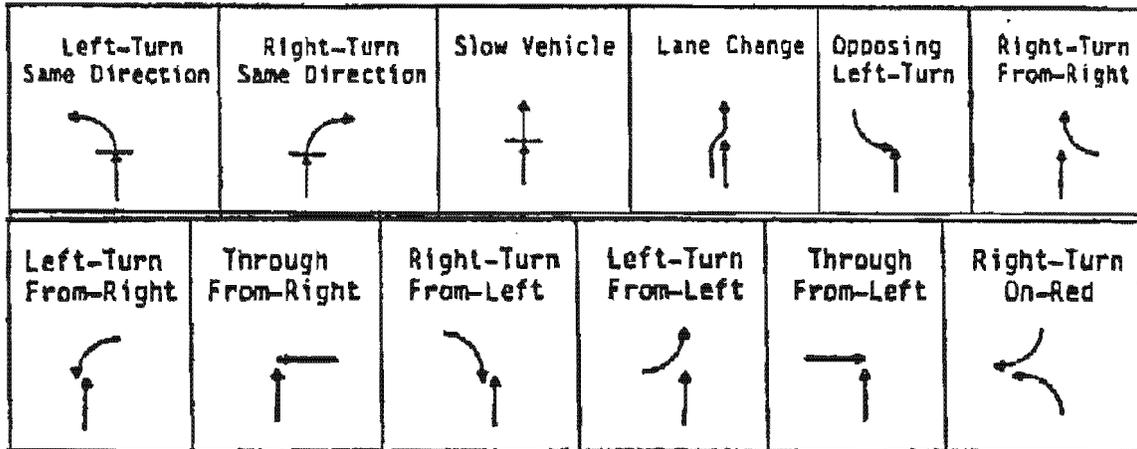
During the conflict analysis school buses were observed entering and exiting Windmill Harbour. Two school buses entered Windmill Harbour from US-278 WB and exited going EB during the morning observation. The first entered at 6:58 am and exited at 7:03 am. The second entered at 8:00 am and exited at 8:05 am. No conflicts were observed as a result of the school buses.

Two school buses entered Windmill Harbour from US-278 WB and exited going EB during the evening observation. The first entered at 3:01 pm and exited at 3:06 pm. A delay of 90 seconds for the school bus to make a left turn into Windmill Harbour was noted. The second entered at 4:05 pm and exited at 4:13 pm. A delay of 65 seconds for the school bus to make a left turn into Windmill Harbour was noted. One conflict was observed as a direct result of one of the school buses exiting Windmill Harbour, turning right to travel EB. The bus pulled out in front of a motorist traveling US-278 EB and this caused the motorist to hit their brakes quickly. No other conflicts were noted as a result of school buses.

The primary conflict noted during both the morning and evening reviews was a "slow vehicle" type. This conflict is caused by a "lead" vehicle slowing for a reason and a "follow" vehicle driver pressing the brakes in a quick response fashion. During the morning review a total of 35 slow vehicle conflicts were noted for EB traffic. Only 2 were noted for WB traffic. During the evening review 43 slow vehicle conflicts were noted for EB traffic. For WB traffic, 13 slow vehicle conflicts were noted.

The following additional conflicts were noted during the morning review for EB traffic: 5 right turn from right conflicts and 2 left turn from right conflicts. No additional conflicts were noted during the morning review for WB traffic.

The following additional conflicts were noted during the evening review for EB traffic: 1 opposing left turn conflict, 4 right turn from right conflicts, and 5 left turn from right conflicts. One left turn from left conflict was noted during the evening review for WB traffic. The diagram below gives a visual explanation of the conflicts described above.



While not a direct conflict, it was noted that multiple vehicles would store in the US-278 median cross over to make a left turn to US-278 WB. This multiple vehicle stacking caused obvious sight distance issues for all vehicles attempting to make a left maneuver from the median cross over (both into and out of Windmill Harbour).

N. Rebovich

Traffic Engineering

Reviewed: DMN 4/14/09

Checked: [Signature]

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DISTRICT 6
TRAFFIC ENGINEERING

County: Beaufort City: Hilton Head Date: 3/11/2009
 Major Rt: Hwy 278 Minor Rt: Harbour Passage & Gateway Drive
 Day of Week: Tuesday Weather: Clear Name: Mark Short
 Type of Control: Stop Sign Speed Limit (major st) 50
 Direction of Minor Street: N-S Intersection ADT - 41360 (Calc)
 Number of Lanes (major st)* 2 Number of Lanes (minor st)* 1
* Each Direction

INTERSECTION VOLUME SUMMARY

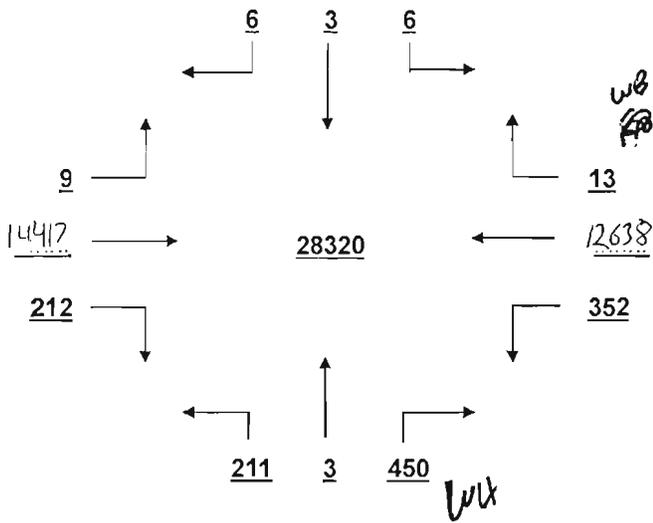
	From N Harbour Passage &				From S Harbour Passage &				From E Hwy 278				From W Hwy 278				Total Vol	Total Peds
	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT		
7:00 - 7:15	0	0	0	0	3	0	4	7	4	152	0	156	0	443	0	443	606	0
7:15 - 7:30	0	0	0	0	3	0	12	15	3	220	0	223	0	524	3	527	765	0
7:30 - 7:45	0	0	0	0	5	0	11	16	7	295	0	302	0	628	6	634	952	0
7:45 - 8:00	0	0	0	0	3	0	23	26	8	384	0	392	0	724	6	730	1148	0
8:00 - 8:15	0	0	0	0	6	0	13	19	7	335	0	342	0	681	5	686	1047	0
8:15 - 8:30	1	0	0	1	3	0	15	18	6	345	1	352	0	612	6	618	989	0
8:30 - 8:45	0	0	0	0	3	0	13	16	9	315	2	326	0	561	9	570	912	0
8:45 - 9:00	0	0	0	0	10	0	17	27	5	366	1	372	0	605	8	613	1012	0
11:00 - 11:15	0	0	0	0	7	0	14	21	17	319	0	336	0	503	9	512	869	0
11:15 - 11:30	1	0	0	1	10	1	15	26	16	355	0	371	0	409	9	418	816	0
11:30 - 11:45	0	0	0	0	7	0	13	20	14	365	0	379	0	381	6	387	786	0
11:45 - 12:00	0	0	0	0	6	0	12	18	14	395	0	409	0	396	13	409	836	0
12:00 - 12:15	0	0	0	0	14	0	11	25	14	379	1	394	0	395	7	402	821	0
12:15 - 12:30	0	0	0	0	8	0	10	18	14	400	1	415	0	388	14	402	835	0
12:30 - 12:45	0	0	0	0	4	0	10	14	5	303	1	309	2	384	7	393	716	0
12:45 - 13:00	0	1	1	2	8	0	17	25	5	303	0	308	1	379	8	388	723	0
14:00 - 14:15	0	0	0	0	10	0	13	23	15	635	0	650	0	348	8	356	1029	0
14:15 - 14:30	0	0	0	0	8	0	12	20	11	543	0	554	0	384	0	384	958	0
14:30 - 14:45	0	0	1	1	7	0	14	21	10	395	0	405	1	389	3	393	820	0
14:45 - 15:00	0	0	1	1	7	0	17	24	12	393	0	405	0	401	9	410	840	0
15:00 - 15:15	2	0	1	3	6	0	24	30	13	464	1	478	2	394	6	402	913	0
15:15 - 15:30	0	0	1	1	7	0	23	30	12	435	1	448	0	354	7	361	840	0
15:30 - 15:45	0	0	0	0	6	0	16	22	8	422	0	430	0	418	9	427	879	0
15:45 - 16:00	0	0	0	0	5	0	17	22	17	403	0	420	1	403	4	408	850	0
16:00 - 16:15	0	0	0	0	8	0	21	29	14	444	0	458	0	354	8	362	849	0
16:15 - 16:30	0	0	0	0	6	0	7	13	23	424	0	447	0	389	6	395	855	0
16:30 - 16:45	0	0	0	0	7	1	10	18	10	417	0	427	0	477	7	484	929	0
16:45 - 17:00	0	0	0	0	4	0	10	14	11	436	1	448	1	401	6	408	870	0
17:00 - 17:15	1	2	0	3	7	1	12	20	9	497	0	506	1	383	3	387	916	0
17:15 - 17:30	0	0	0	0	6	0	19	25	14	465	0	479	0	480	4	484	988	0
17:30 - 17:45	1	0	1	2	8	0	12	20	13	501	1	515	0	442	10	452	989	0
17:45 - 18:00	0	0	0	0	9	0	13	22	12	533	2	547	0	387	6	393	962	0
TOTAL	6	3	6	15	211	3	450	664	352	12638	13	13003	9	14417	212	14638	28320	0
Trucks	0	0	0	0	0	0	0	0	0	10	0	10	0	4	0	4	14	0.0%
School Buses	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	4	0.0%

TOTAL AND PEAK HOUR VOLUME DIAGRAMS

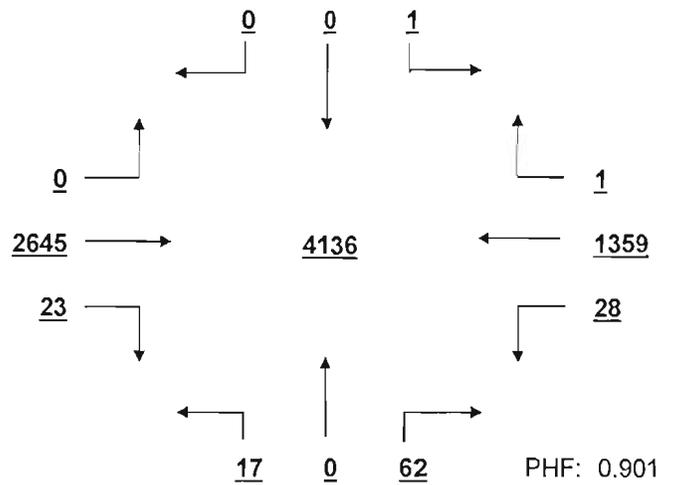
Hwy 278 AT Harbour Passage & Gateway Drive

Date: 3/11/2009

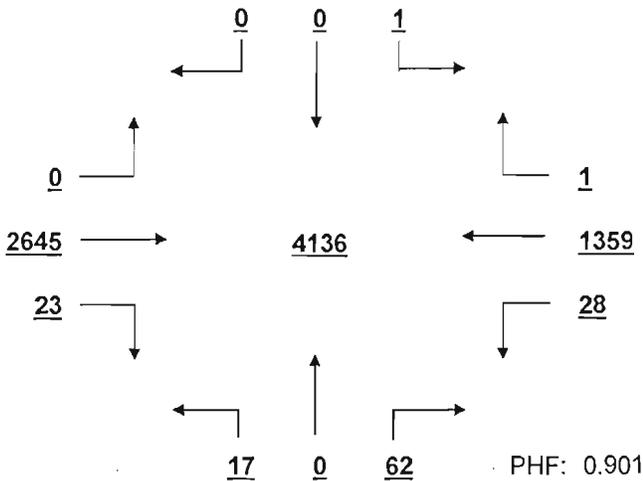
8.0 HOUR TOTAL VOLUME
FROM 7:00 TO 18:00



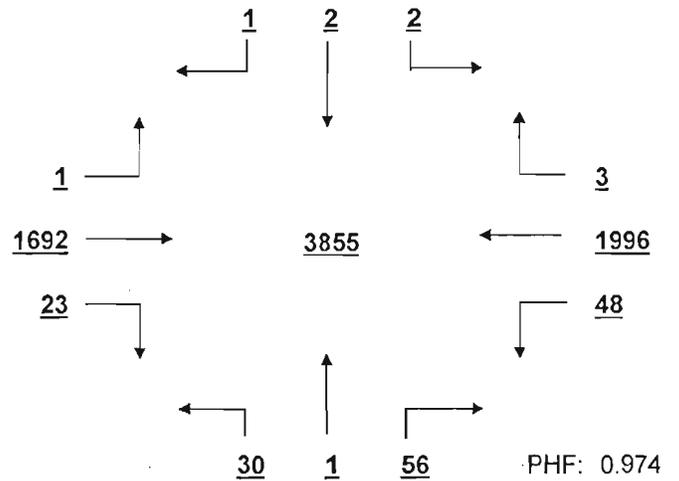
OVERALL PEAK HOUR VOLUME
FROM 7:30 TO 8:30



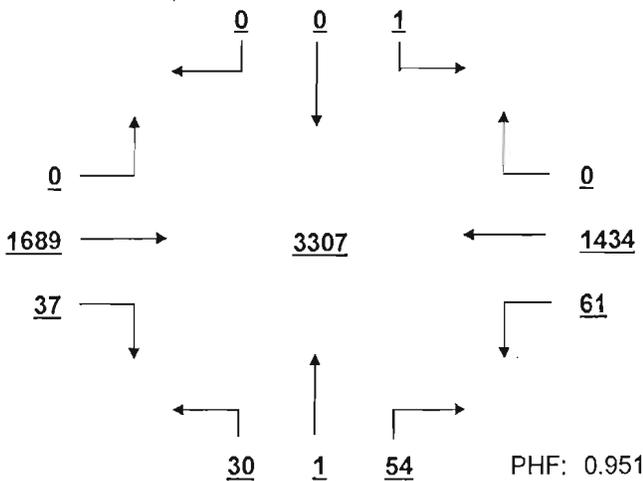
AM PEAK HOUR VOLUME (0:00-10:45)
FROM 7:30 TO 8:30



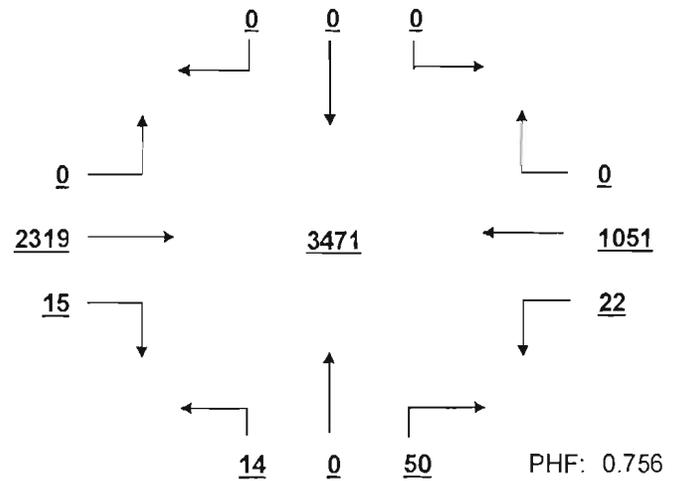
PM PEAK HOUR VOLUME (14:15-23:45)
FROM 17:00 TO 18:00



MID-DAY PEAK HOUR VOLUME (11:00-14:00)
FROM 11:00 TO 12:00



OTHER HOUR VOLUME
FROM 7:00 TO 8:00



SIGNAL WARRANT ANALYSIS

Hwy 278 AT Harbour Passage & Gateway Drive Date: 3/11/2009

Minor Street Volume, percent of total = 2.4%
 Percent of Left Turns from Minor Street = 32.0%
 Percent of Right Turns from Minor Street = 67.2%
 Percent of Minor Street Right Turns to Remove from Warrant Analysis = 50%
 WARRANT BASIS = 70%

Warrant No. 1 - Vehicular Volume is not met

Condition A - Minimum Vehicular Volume is not met

Average Major Street % of Warrant 3455.1 / 420 = 823%	Average Minor Street % of Warrant 54.9 / 105 = 52%
--	---

Hourly percent of warrant

	7:00 - 8:00	8:00 - 9:00	11:00 - 12:00	12:00 - 13:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00
Major St.	811%	924%	767%	717%	847%	803%	816%	896%
Minor St.	37%	49%	55%	55%	57%	61%	48%	56%

Condition B - Interruption to Continuous Traffic is not met

Average Major Street % of Warrant 3455.1 / 630 = 548%	Average Minor Street % of Warrant 54.9 / 53 = 105%
--	---

Hourly percent of warrant

	7:00 - 8:00	8:00 - 9:00	11:00 - 12:00	12:00 - 13:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00
Major St.	541%	616%	511%	478%	565%	536%	544%	597%
Minor St.	74%	97%	110%	110%	114%	122%	95%	112%

80% Combination of Conditions A & B is not applicable

Warrant No. 2 - Four Hour Vehicular Volume is not met

Hourly percent of warrant

	7:00 - 8:00	8:00 - 9:00	11:00 - 12:00	12:00 - 13:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00
Minor St.	65%	85%	97%	97%	100%	107%	83%	98%

Warrant No. 3 - Peak Hour is not met

	Percent of warrant	Percent of warrant
Overall Peak Hour:	7:30 - 8:30	Higher Volume Side Street Peak Hour: 14:30 - 15:30
Minor St.	64%	Minor St. 88%

Warrant No. 4 - Pedestrian Volume is not met

Major Street	Minor Street
0.0 / 100 = 0%	0.0 / 100 = 0%

Hourly percent of warrant

	7:00 - 8:00	8:00 - 9:00	11:00 - 12:00	12:00 - 13:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00
Major St.	0%	0%	0%	0%	0%	0%	0%	0%
Minor St.	0%	0%	0%	0%	0%	0%	0%	0%

Warrant No. 7 - Crash Experience (Requires 3 criteria analysis by engineering)

Total Number:	6	From:	1/1/2005	to	9/15/2008
Accident Rate:	0.11	per million entering vehicles			
Types of Accidents	No. / Avg.		No. / Avg.		
Right Angle	1 / 0.3	Rear End	5 / 1.4		
Lost Control	0 / 0.0	Side Swipe	0 / 0.0		
Left Turn	0 / 0.0	Other	0 / 0.0		

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
DISTRICT 6
TRAFFIC ENGINEERING

County: Beaufort City: Hilton Head Date: 3/10/2009

Major Rt: US-278 Minor Rt: Harbour Passage & Gateway Drive

Day of Week: Tuesday Weather: Clear Name: Mark Short

Type of Control: Stop Sign Speed Limit (major st) 50

Direction of Minor Street: N-S Intersection ADT - 34300 (Calc)

Number of Lanes (major st)* 2 Number of Lanes (minor st)* 1

* Each Direction

INTERSECTION VOLUME SUMMARY

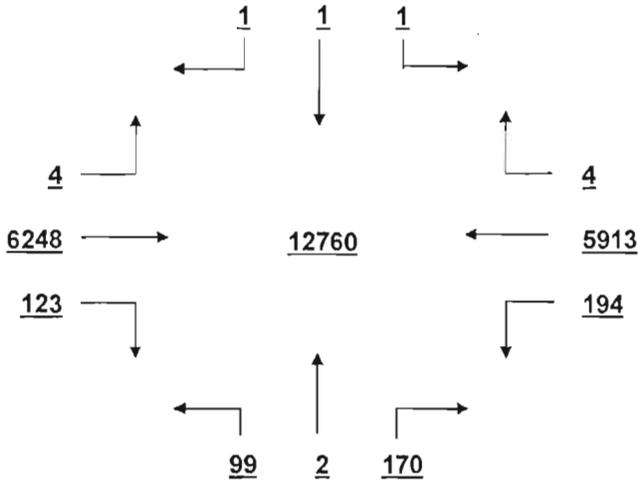
	From N Harbour Passage &				From S Harbour Passage &				From E US-278				From W US-278				Total Vol	Total Peds
	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT	LT	STR	RT	TOT		
9:00 - 9:15	0	0	0	0	7	0	13	20	17	313	0	330	0	494	9	503	853	0
9:15 - 9:30	1	0	0	1	10	1	15	26	16	347	0	363	0	398	9	407	797	0
9:30 - 9:45	0	0	0	0	7	0	13	20	14	355	0	369	0	373	6	379	768	0
9:45 - 10:00	0	0	0	0	6	0	12	18	14	386	0	400	0	377	11	388	806	0
10:00 - 10:15	0	0	0	0	14	0	10	24	13	369	1	383	0	381	6	387	794	0
10:15 - 10:30	0	0	0	0	7	0	9	16	14	384	1	399	0	375	13	388	803	0
10:30 - 10:45	0	0	0	0	4	0	10	14	5	296	1	302	2	374	7	383	699	0
10:45 - 11:00	0	1	1	2	7	0	17	24	5	291	0	296	1	374	8	383	705	0
13:00 - 13:15	0	0	0	0	8	0	21	29	14	433	0	447	0	351	8	359	835	0
13:15 - 13:30	0	0	0	0	6	0	7	13	23	413	0	436	0	381	6	387	836	0
13:30 - 13:45	0	0	0	0	7	1	10	18	10	405	0	415	0	464	7	471	904	0
13:45 - 14:00	0	0	0	0	4	0	10	14	11	429	1	441	1	393	6	400	855	0
18:00 - 18:15	0	0	0	0	2	0	5	7	8	453	0	461	0	405	4	409	877	0
18:15 - 18:30	0	0	0	0	4	0	8	12	11	404	0	415	0	404	3	407	834	0
18:30 - 18:45	0	0	0	0	4	0	6	10	11	327	0	338	0	360	11	371	719	0
18:45 - 19:00	0	0	0	0	2	0	4	6	8	308	0	316	0	344	9	353	675	0
TOTAL	1	1	1	3	99	2	170	271	194	5913	4	6111	4	6248	123	6375	12760	0
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
School Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%

TOTAL AND PEAK HOUR VOLUME DIAGRAMS

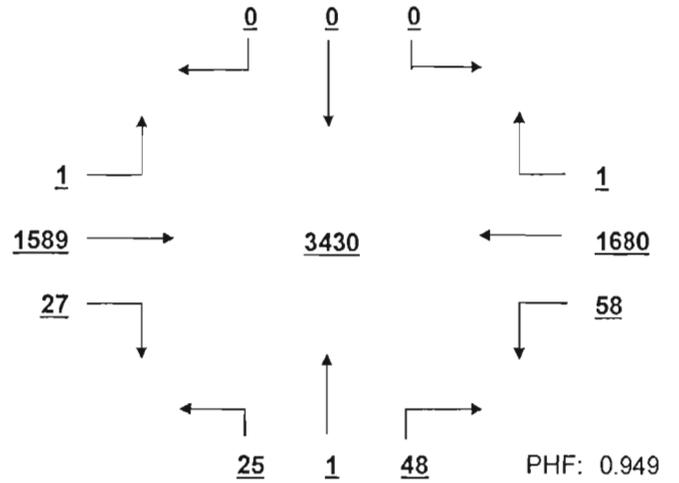
US-278 AT Harbour Passage & Gateway Drive

Date: 3/10/2009

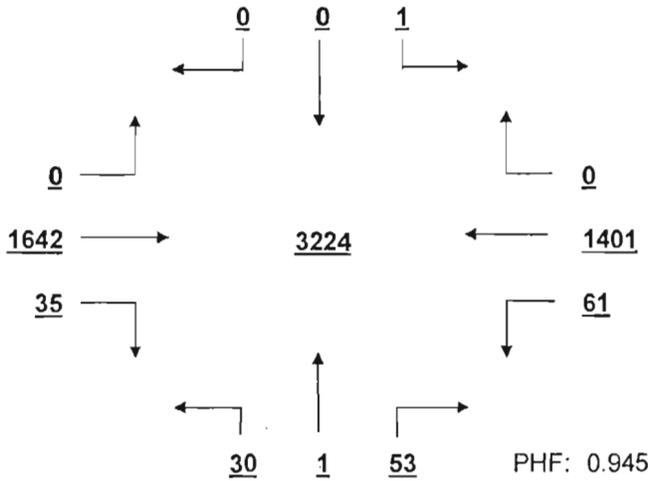
4.0 HOUR TOTAL VOLUME
FROM 9:00 TO 19:00



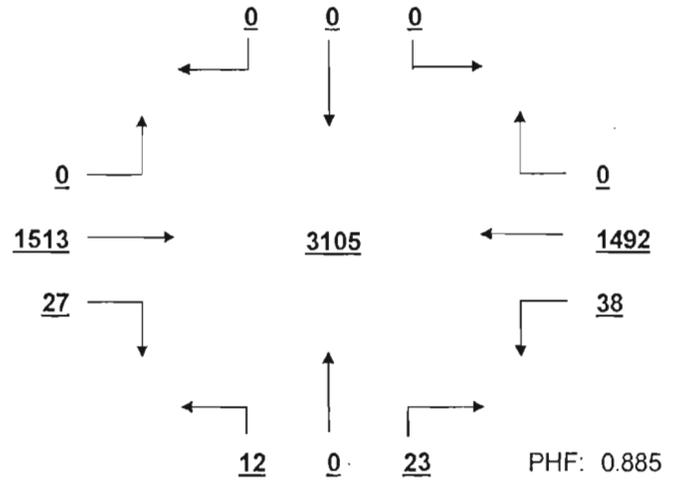
OVERALL PEAK HOUR VOLUME
FROM 13:00 TO 14:00



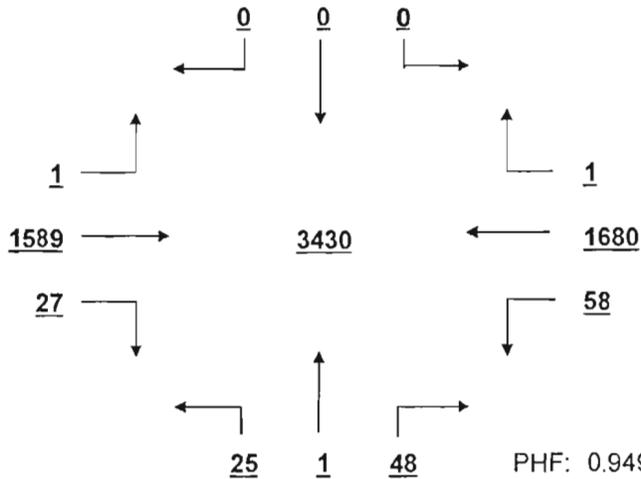
AM PEAK HOUR VOLUME (0:00-10:45)
FROM 9:00 TO 10:00



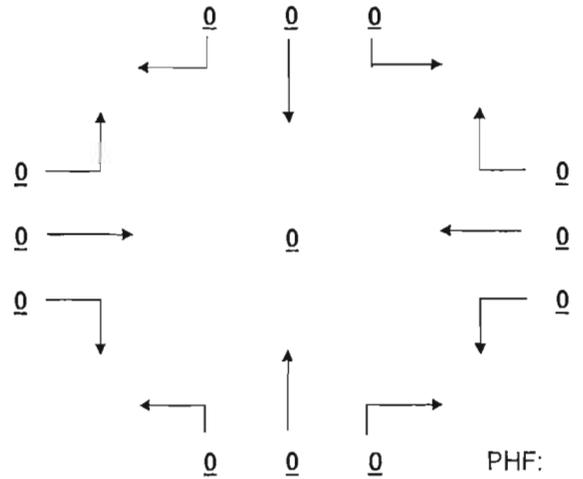
PM PEAK HOUR VOLUME (14:15-23:45)
FROM 18:00 TO 19:00



MID-DAY PEAK HOUR VOLUME (11:00-14:00)
FROM 13:00 TO 14:00



OTHER HOUR VOLUME
FROM 7:00 TO 8:00



SIGNAL WARRANT ANALYSIS

US-278 AT Harbour Passage & Gateway Drive

Date: 3/10/2009

Minor Street Volume, percent of total = 2.1%
 Percent of Left Turns from Minor Street = 36.5%
 Percent of Right Turns from Minor Street = 62.4%
 Percent of Minor Street Right Turns to Remove from Warrant Analysis = 50%
 WARRANT BASIS = 70%

Warrant No. 1 - Vehicular Volume is not met

Condition A - Minimum Vehicular Volume is not met

Average Major Street % of Warrant 3121.5 / 420 = 743%	Average Minor Street % of Warrant 46.5 / 105 = 44%
--	---

Hourly percent of warrant

	9:00 - 10:00	10:00 - 11:00	13:00 - 14:00	18:00 - 19:00
Major St.	747%	695%	799%	731%
Minor St.	55%	52%	48%	22%

Condition B - Interruption to Continuous Traffic is not met

Average Major Street % of Warrant 3121.5 / 630 = 495%	Average Minor Street % of Warrant 46.5 / 53 = 89%
--	--

Hourly percent of warrant

	9:00 - 10:00	10:00 - 11:00	13:00 - 14:00	18:00 - 19:00
Major St.	498%	464%	533%	487%
Minor St.	110%	105%	95%	45%

80% Combination of Conditions A & B is not applicable

Warrant No. 2 - Four Hour Vehicular Volume is not met

Hourly percent of warrant

	9:00 - 10:00	10:00 - 11:00	13:00 - 14:00	18:00 - 19:00
Minor St.	96%	92%	83%	39%

Warrant No. 3 - Peak Hour is not met

Percent of warrant		Percent of warrant	
Overall Peak Hour: 13:00 - 14:00		Higher Volume Side Street Peak Hour: 9:15 - 10:15	
Minor St. 67%		Minor St. 84%	

Warrant No. 4 - Pedestrian Volume is not met

Major Street		Minor Street	
0.0 / 100 =	0%	0.0 / 100 =	0%

Hourly percent of warrant

	9:00 - 10:00	10:00 - 11:00	13:00 - 14:00	18:00 - 19:00
Major St.	0%	0%	0%	0%
Minor St.	0%	0%	0%	0%

Warrant No. 7 - Crash Experience (Requires 3 criteria analysis by engineering)

Total Number:	6	From:	1/1/2005	to	9/15/2008		
Accident Rate:	0.13	per million entering vehicles					
Types of Accidents	No.	/	Avg.	No.	/	Avg.	
Right Angle	1	/	0.3	Rear End	5	/	1.4
Lost Control	0	/	0.0	Side Swipe	0	/	0.0
Left Turn	0	/	0.0	Other	0	/	0.0

US-278/Jenkins Island Corridor Management Plan
Short Term Options:

Blue Heron Point (S-7-772)

- From: EB US- 278: Right turn at existing access
From: WB US-278: Left turn at existing access median break.
- To: EB US-278: Right turn at existing access.
To: WB US-278: A. Left turn at existing access median break (install accel lane?)
B. Make u-turn at Jenkins Road median break.
C. Make u-turn at Windmill Harbor median break.

Windmill Harbor (O.S.)

- From: EB US- 278: Right turn at existing access
From: WB US-278: A. Left turn at existing access median break.
B. Make u-turn at Blue Heron Point median break.
- To: EB US-278: Right turn at existing access.
To: WB US-278: A. Make u-turn at Jenkins Road median break.
B. Left turn at existing access median break. (install accel lane?)

Jenkin's Road (S-7-298)

- From: EB US-278: Left turn at existing access median break.
From: WB US-278: Right turn at existing access.
- To: EB US-278: A. Left turn at existing access median break.
B. Make u-turn at Windmill Harbor median break
C. Make u-turn at Blue Heron Point median break.
To: WB US-278: Right turn at existing access.

Gateway Drive (O.S.)

- From: EB US-278: A. Left turn at existing access median break.
B. Make u-turn at Jenkins Road median access break.
From: WB US-278: Right turn at existing access.
- To: EB US-278: A. Left turn at existing access median break.
B. Make u-turn at Blue Heron Point.
To: WB US-278: Right turn at existing access.

US-278/Jenkins Island Corridor Management Plan
Long Term Options (With Northside Frontage Road)

Blue Heron Point (S-7-772)

- From: EB US- 278: Right turn at existing access
From: WB US-278: A. Left turn at existing access median break.
B. Use Gateway Drive and Frontage Road.
- To: EB US-278: Right turn at existing access.
To: WB US-278: A. Use Frontage Road to Gateway Drive.
B. Make u-turn at Windmill Harbor median break.

Windmill Harbor (O.S.)

- From: EB US- 278: Right turn at existing access
From: WB US-278: A. Left turn at existing access median break. (install signal?)
B. Make u-turn at Blue Heron Point median break.
C. Use Gateway Drive and Frontage Road to Blue Heron Point.
- To: EB US-278: Right turn at existing access.
To: WB US-278: A. Make u-turn at Jenkins Road median break.
B. Left turn at existing access median break. (install signal?)
C. Use Frontage Road to Gateway Drive.

Jenkin's Road (S-7-298)

- From: EB US-278: A. Left turn at existing access median break.
B. Left turn at Gateway, use Frontage Road. (install signal?)
C. Right onto Blue Heron, use Frontage Road.
- From: WB US-278: Right turn at existing access.
- To: EB US-278: A. Make u-turn at Windmill Harbor median break
B. Make u-turn at Blue Heron Point median break.
C. Use Frontage Road to Gateway (install signal?)
D. Use Frontage Road to Blue Heron.
- To: WB US-278: Right turn at existing access.

Gateway Drive (O.S.)

- From: EB US-278: A. Left turn at existing access median break. (install signal?)
B. Make u-turn at Jenkins Road median access break.
C. Use Blue Heron and Frontage Road.
- From: WB US-278: Right turn at existing access.
- To: EB US-278: A. Left turn at existing access median break. (install signal?)
B. Make u-turn at Blue Heron Point.
C. Use Frontage Road to Blue Heron.
- To: WB US-278: Right turn at existing access.

APPENDIX C

HIGHWAY CAPACITY MANUAL

SIGNALIZED INTERSECTION ANALYSES

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst	Darrin A. Shoemaker, P.E.					Intersection	Windmill Harbour					
Agency or Co.	Town of Hilton Head Island					Area Type	All other areas					
Date Performed	02/19/2010					Jurisdiction	SCDOT					
Time Period	a.m. peak hour					Analysis Year	June 2009					
						Project ID	Theoretical Traffic Signal Control					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_i	1	2	1	1	2	1	0	1	0	0	1	0
Lane group	L	T	R	L	T	R		LT			LTR	
Volume, V (vph)	0	2050	44	60	1400	0	30	1		0	0	1
% Heavy vehicles, %HV	40	5	5	5	5	40	5	5		0	40	0
Peak-hour factor, PHF	0.90	0.95	0.85	0.85	0.95	0.90	0.85	0.85		0.85	0.85	0.90
Pretimed (P) or actuated (A)	P			P			P	P		P	P	P
Start-up lost time, l_i	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Extension of effective green, e	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Arrival type, AT	3	3	3	3	3	3		3			3	
Unit extension, UE	4.0	4.0	4.0	4.0	4.0	4.0		3.0			3.0	
Filtering/metering, I	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0			0		0
Lane width	12.0	12.0	12.0	12.0	12.0	12.0		16.0			16.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0	0	0	0	0		0			0	
Min. time for pedestrians, G_p												
Phasing	Excl. Left	02	03	04	NS Perm	06	07	08				
Timing	G = 15.0	G = 131.5	G =	G =	G = 15.0	G =	G =	G =				
	Y = 6	Y = 6.5	Y =	Y =	Y = 6	Y =	Y =	Y =				
Duration of Analysis, T = 0.25							Cycle Length, C = 180.0					
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	0	2158	52	71	1474	0		36			1	
Lane group capacity, c	107	0	0	143	0	0		125			155	
v/c ratio, X	0.00			0.50				0.29			0.01	

Total green ratio, g/C	0.08	0.00	0.00	0.08	0.00	0.00		0.08			0.08	
Uniform delay, d_1	75.6			78.9				77.5			75.7	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Delay calibration, k	0.50			0.50				0.50			0.50	
Incremental delay, d_2	0.0			11.8				5.7			0.1	
Initial queue delay, d_3												
Control delay	75.6			90.7				83.2			75.7	
Lane group LOS	E			F				F			E	
Approach delay								83.2			75.7	
Approach LOS								F			E	
Intersection delay				$X_c = 0.00$				Intersection LOS				

HCS2000™ DETAILED REPORT												
General Information							Site Information					
Analyst	Darrin A. Shoemaker, P.E.						Intersection	Windmill Harbour				
Agency or Co.	Town of Hilton Head Island						Area Type	All other areas				
Date Performed	02/19/2010						Jurisdiction	SCDOT				
Time Period	p.m. peak hour						Analysis Year	June 2009				
							Project ID	Theoretical Traffic Signal Control				
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_i	1	2	1	1	2	1	0	1	0	0	1	0
Lane group	L	T	R	L	T	R		LT			LTR	
Volume, V (vph)	0	1675	35	115	2650	0	12	0		0	0	0
% Heavy vehicles, %HV	40	5	5	5	5	40	5	5		0	40	0
Peak-hour factor, PHF	0.90	0.95	0.85	0.85	0.95	0.90	0.85	0.85		0.85	0.85	0.90
Pretimed (P) or actuated (A)	P			P			P	P		P	P	P
Start-up lost time, l_i	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Extension of effective green, e	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Arrival type, AT	3	3	3	3	3	3		3			3	
Unit extension, UE	4.0	4.0	4.0	4.0	4.0	4.0		3.0			3.0	
Filtering/metering, I	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0			0		0
Lane width	12.0	12.0	12.0	12.0	12.0	12.0		16.0			16.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0	0	0	0	0		0			0	
Min. time for pedestrians, G_p												
Phasing	Excl. Left	02	03	04	NS Perm	06	07	08				
Timing	G = 15.0	G = 131.5	G =	G =	G = 15.0	G =	G =	G =				
	Y = 6	Y = 6.5	Y =	Y =	Y = 6	Y =	Y =	Y =				
Duration of Analysis, T = 0.25							Cycle Length, C = 180.0					
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	0	1763	41	135	2789	0		14			0	
Lane group capacity, c	107	0	0	143	0	0		46			128	
v/c ratio, X	0.00			0.94				0.30			0.00	

Total green ratio, g/C	0.08	0.00	0.00	0.08	0.00	0.00		0.08			0.08	
Uniform delay, d_1	75.6			82.1				77.6			75.6	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000		1.000			1.000	
Delay calibration, k	0.50			0.50				0.50			0.50	
Incremental delay, d_2	0.0			61.6				16.3			0.0	
Initial queue delay, d_3												
Control delay	75.6			143.7				93.9			75.6	
Lane group LOS	E			F				F			E	
Approach delay								93.9				
Approach LOS								F				
Intersection delay				$X_c = 0.00$				Intersection LOS				