Appendix 10-D

ACCESS MANAGEMENT PLAN: BUCKWALTER PARKWAY

US 278 TO BLUFFTON PARKWAY PHASE 4
BEAUFORT COUNTY, SOUTH CAROLINA

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INTRODUCTION

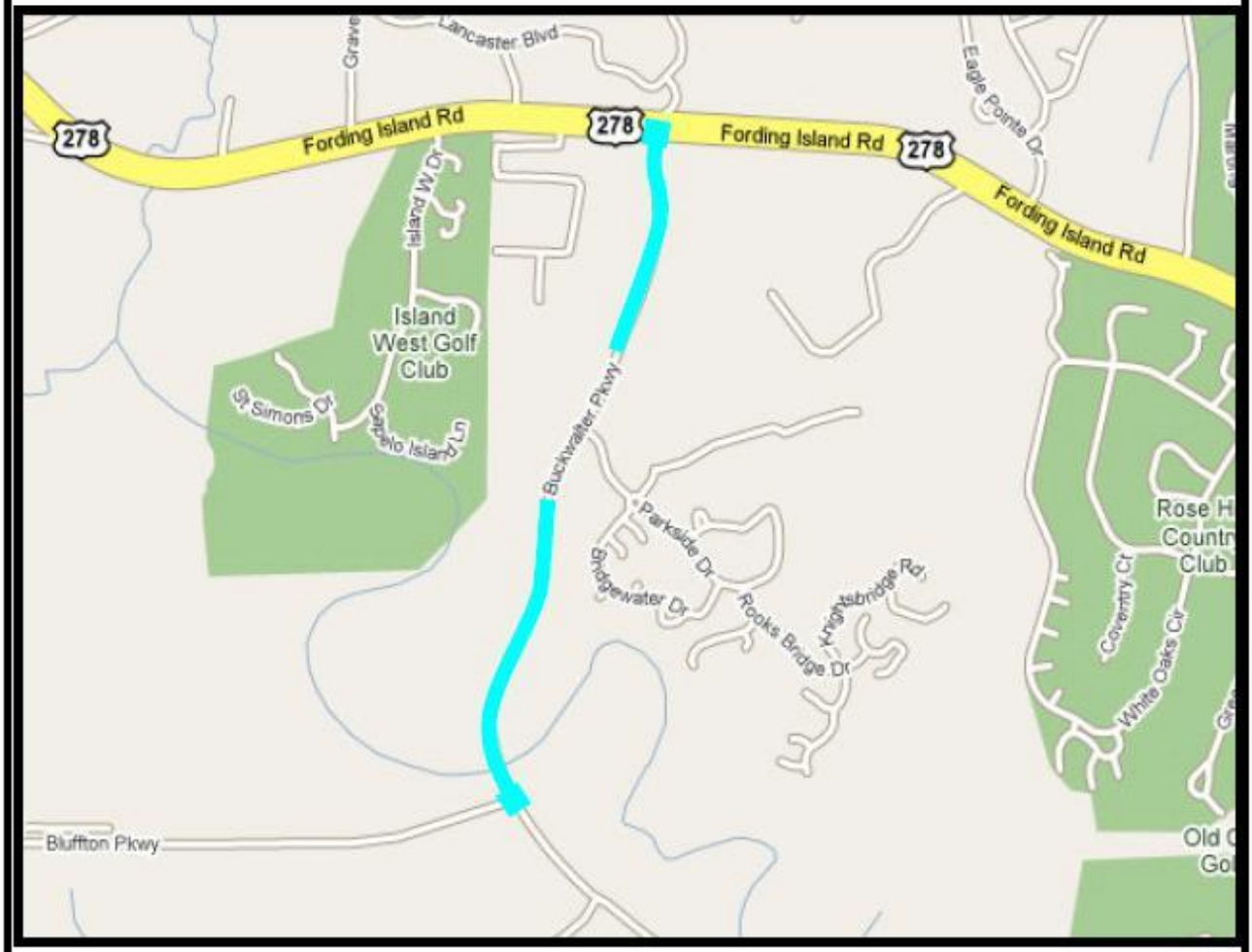
SRS Engineering, LLC (SRS) has been retained by a combination of the Beaufort County Engineering and the Town of Bluffton Planning Departments to complete an analysis of the northerly segment of the Buckwalter Parkway which is both an existing and planned future north/south orientated arterial located in Southern Beaufort County.

As planned by the County's Comprehensive Plan, in it's entirely, the Buckwalter Parkway will provide a multi-lane divided facility between US 278 and SC 46. This facility is anticipated to serve not only north/south orientated traffic, but also east/west orientated traffic along the middle/shared section of the Parkway which is currently designated as a combined route with the future Bluffton Parkway.

PROJECT OVERVIEW

The segment of the Buckwalter Parkway to be studied is the northerly portion of the Parkway. In total, this segment is approximately 1.6-miles in length beginning at the signalized intersection with US 278 and ending at the future signalized intersection of the northerly leg of the Bluffton Parkway (Phase 4) which is currently under construction.

The purpose of this study is to review the planned/future development that will access this section of the Buckwalter Parkway and define appropriate locations for development access; specifically signalized intersections. By properly planning these access points and strategically locating future signals along this corridor, the greatest roadway capacity will be achieved while providing good access to development. **Figure 1** illustrates the general section of the Buckwalter Parkway being studied.



= Study Area Corridor

N

NOT TO SCALE

Figure 1

STUDY AREA LIMITS

Buckwalter Parkway Access Management: Bluffton, SC

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FUTURE CONDITIONS

To estimate the traffic flow conditions under Future conditions, the County's newly updated transportation model has been utilized which reflects the anticipated traffic loading for the Year 2025. Traffic volumes on the roadway network at this time will include all existing traffic, traffic due to normal growth and traffic due to anticipated development in the area as well as all planned roadway improvements anticipated to be completed as stated in the County's transportation model.

TRAFFIC VOLUME PROJECTIONS

The daily traffic volume projections were obtained from the County's Transportation model for the year 2025. These future traffic volumes were obtained for the two intersections which define the limits of this study, US 278 to the north and the Bluffton Parkway (northern leg/Phase 4 intersection) to the south. In addition, daily two-way traffic volumes were also obtained for the segment of the Buckwalter Parkway being studied.

According to the County's Transportation model, the northern segment of the Buckwalter Parkway is anticipated to carry between 15,700 vehicles per day (vpd) to 18,100 vpd. **Table 1** depicts the daily volumes for the Buckwalter Parkway. For comparative purposes; the adjoining roadways/segments of US 278 to the east and west of the Buckwalter Parkway, the Bluffton Parkway (Phase 4) west of the Buckwalter Parkway and the shared route segment of the Buckwalter/Bluffton Parkway are also presented.

Table 1
2025 DAILY TRAFFIC VOLUMES
Buckwalter Parkway Access Management

Arterial Roadways	Segments	Daily Two-Way Traffic Volume (vpd)
Buckwalter Parkway	South of US 278	15,692
	North of Bluffton Parkway	18,116
	Shared Route with Bluffton Parkway	38,607
US 278	West of Buckwalter Parkway	85,188
	East of Buckwalter Parkway	80,634
Bluffton Parkway	West of Buckwalter Parkway	26,630

1. Source: WSA Transportation Model completed for Beaufort County.
vpd=Vehicles-per-day.

As shown by the table, the Buckwalter Parkway is anticipated to serve a high of 18,166 vpd in within the defined study area. However; just to the south of the study area, the daily volume is expected to increase to 38,607 vpd. This significant increase is due to the fact that at this point, the Buckwalter Parkway is a

combination route with the Bluffton Parkway. Other volumes in the area indicate that US 278 is expected to serve over 80,000 vpd in the vicinity of the intersection with the Buckwalter Parkway and the Bluffton Parkway just west of the Buckwalter Parkway is expected to serve approximately 26,600 vpd.

In addition to the daily traffic volumes, design peak-hour volumes have also been developed for the study area intersections along the Buckwalter Parkway using multiple sources including the County's Transportation model and individual Traffic Impact Studies conducted for developments along the corridor. Developments for which traffic studies were provided are as follows:

1. Sea Turtle Cinema (SRS Engineering):
2. Sea Turtle Phase II: Commercial Shopping Center (SRS Engineering);
3. Willow Run PUD (Kimley Horn Associates); and
4. Bluffton Town Center (Thomas & Hutton).

It should be noted that the Bluffton Town Center report does not reflect the development proposal as is currently being planned. According to the property owner, a more dense development is proposed. Based on this, adjustments have been made to the traffic volumes associated with the access drives to/from Buckwalter Parkway.

In addition to this project specific information, assumptions regarding development on some of the smaller tracts adjacent to the Buckwalter Parkway have been made. These assumptions are outlined below:

1. C1 Tract: Located on the east side of the Buckwalter Parkway just south of US 278 opposite the Cinema's north access. Assumed to be developed as a 200-Room Hotel and 50,000 sf of office space based on information provided by current owner;
2. C2 Tract: Located to the south of C1. Assumed to be a 5,000 sf drive-up bank. Southerly access assumed to ultimately provide a connection into the Willow Run PUD; and
3. C6 Tract: Located opposite the Buckwalter Town Center proposed development, the southern access currently serves the Lutheran Church; development on the northern section is currently unknown.

Figure 2 illustrates the study area corridor and summarizes the land development proposals along the Buckwalter Parkway by indicating points of access, depicting site development plans where applicable in addition to indicting the future Bluffton Parkway intersection.

Using this information, trip generation estimates have been completed in order to estimate traffic loadings at each intersection along the Parkway. The results of compiling this data are design peak-hour traffic volumes for the future 2025 condition which are illustrated in **Figure 3**. These volumes are the basis on which to conduct the alternatives analyses for the corridor in order to best determine appropriate locations for traffic signals and access drives to serve the expected development.

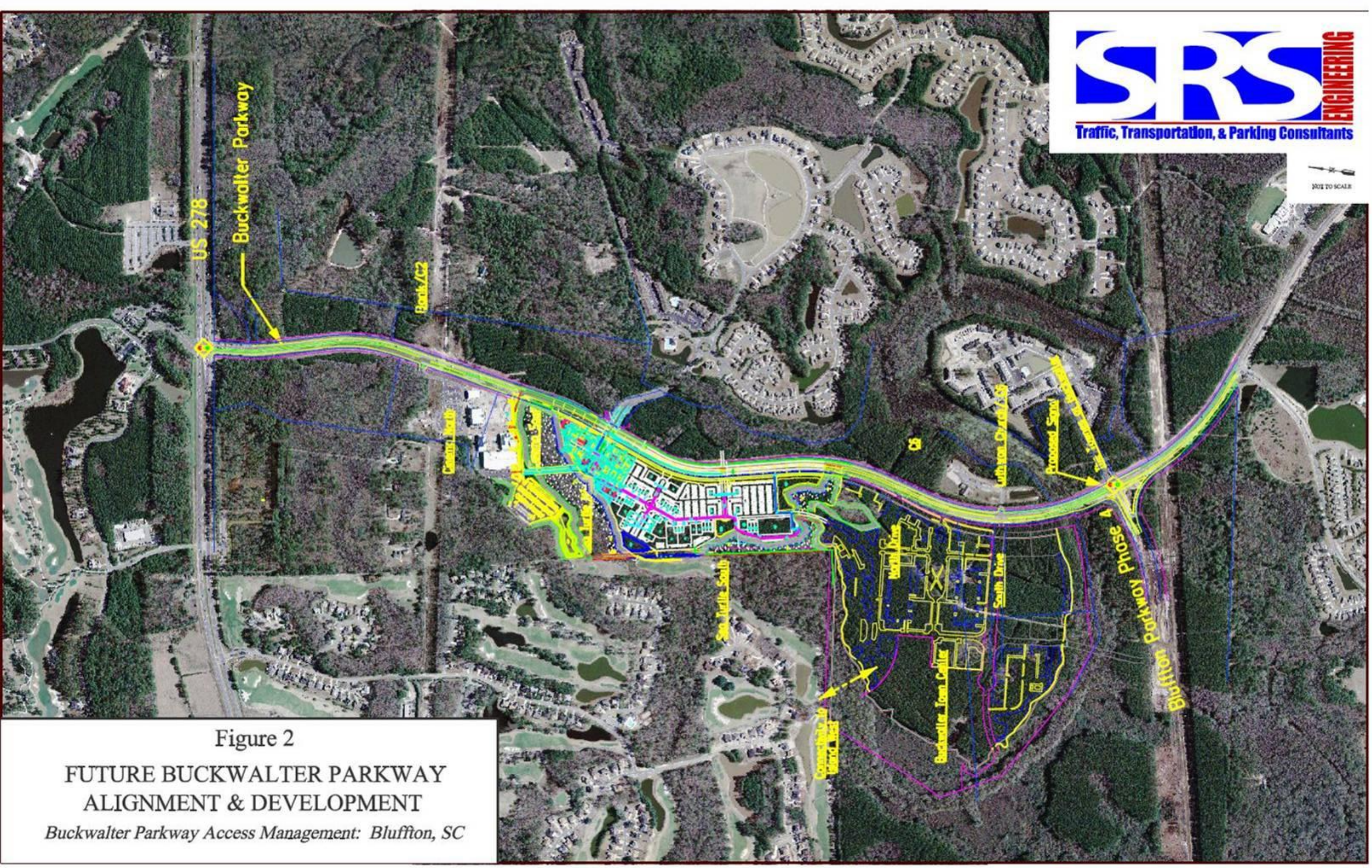

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Figure 2

FUTURE BUCKWALTER PARKWAY
ALIGNMENT & DEVELOPMENT

Buckwalter Parkway Access Management: Bluffton, SC

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NOT TO SCALE

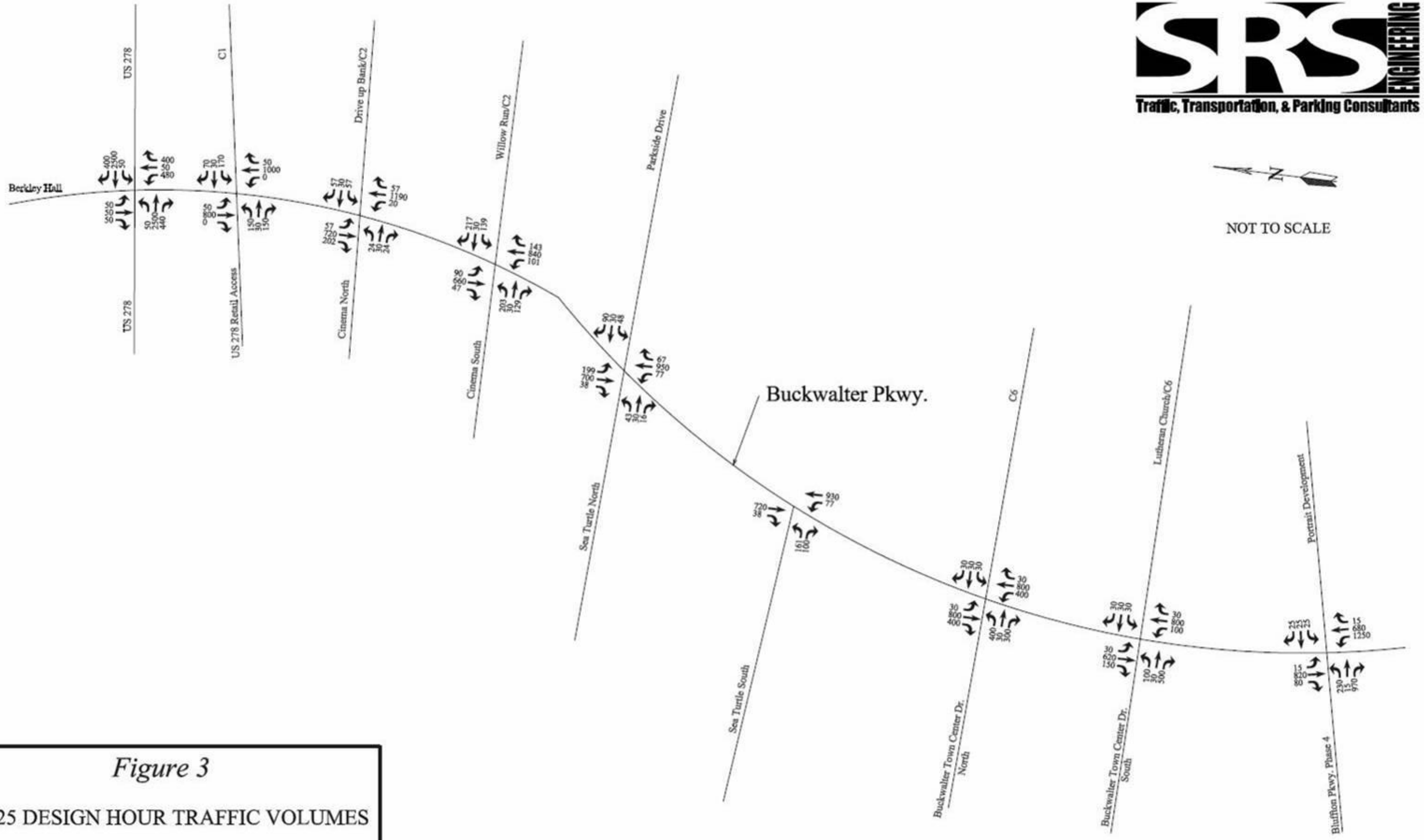


Figure 3

2025 DESIGN HOUR TRAFFIC VOLUMES

Buckwalter Parkway Access Management

TRAFFIC OPERATIONS

To assess quality of flow, capacity analyses were conducted to provide an indication of how well the study area intersections and roadway segments are anticipated to serve future traffic demands. The following provides a description of the methodology utilized to complete these analyses.

METHODOLOGY

Level-of-Service

A primary result of capacity analyses is the assignment of level-of-service (LOS) to traffic facilities under various traffic flow conditions[1]. The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels-of-service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst.

Since the level-of-service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels-of-service, depending on the time of day, day of week, or period of a year.

Signalized Intersections

The six levels-of-service for signalized intersections may be described as follows:

- LOS A describes operations with very low delay; most vehicles do not stop at all.
- LOS B describes operations with relatively low delay. However, more vehicles stop than LOS A.
- LOS C describes operations with higher delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- LOS D describes operations with delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- LOS E describes operations with high delay values. Individual cycle failures are frequent occurrences.

[1] The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

- LOS F describes operations with high delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels-of-service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual*. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based solely on the criterion of calculated control delay per vehicle, since delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time.

Roadway Segment Analyses

The determination of how a roadway segment serves traffic is an investigation of multiple factors including roadway geometry, number of operating lanes, provision of auxiliary lanes (left-turn & right-turn), traffic volumes and directional splits of traffic, access drives per mile, and the separation of signalized intersections. These factors result in an assignment of arterial speed and level of service which is used to assess the roadway operations.

Signalized Intersection Spacing

The proper spacing of traffic signals along the Buckwalter Parkway will be critical so that the corridor can provide the greatest/most efficient capacity that it is capable of providing. Without proper spacing, vehicle queues may be created which back into/through adjacent intersections resulting in a "gridlock" pattern which causes a significant degradation in roadway capacity and traffic flow. According to access management guidelines, the ideal spacing of signalized intersections along a major arterial such as the Buckwalter Parkway is ideally 2,640-feet or a 1/2-mile (ref. *Access Management Manual*, TRB). This separation provides a progression speed ranging between 30 and 40 miles per hour (mph).

However, this spacing may not be achievable in all circumstances due to constraints such as topography, environmental issues/wetlands, etc. While the most advantageous separation is 1/2-mile and should be provided if feasible, shorter separation distances of 1,500-1,700-feet will allow progressions speeds along the Buckwalter Parkway that are in the 30 mph range.

In planning signal locations, one must also account for the classification of roadways that intersect the corridor. For instance, when interesting a major roadway/arterial which presumably serves a large volume of traffic, separation to the next adjacent intersection(s) is extremely important so that vehicle speeds and resulting queues/stacking do not interfere with the operations of adjacent traffic signal.

ANALYSIS SCENERIOS

Review of the Buckwalter Parkway corridor and the submitted/approved traffic studies begins to identify logical intersections for installation of traffic signal control which meet signal warrants. Two intersections are obviously going to either maintain traffic signal control (US 278 at Buckwalter Parkway) or to be placed under traffic signal control (future intersection of Bluffton Parkway Phase 4 at Buckwalter Parkway).

There are multiple intersections located along the Buckwalter Parkway that are built and/or planned as part of development proposals. **Table 2** depicts the approximate spacing of intersections along the Parkway using US 278 as the starting point.

Table 2
INTERSECTION SPACING
Buckwalter Parkway Access Management

Corridor	Major Intersecting Cross Streets	Separation (Feet)	Cumulative Distance to US 278 (Feet)
Buckwalter Parkway	US 278 to C1 Access (est.)	950	950
	C1 Access (est.) to Cinema North/C2	950	1,900
	Cinema North/C2 to Cinema South/C2	900	2,800
	Cinema South/C2 to Sea Turtle North/Parkside Dr	1,000	3,800
	Sea Turtle North/Parkside Dr to Sea Turtle South	1,050	4,850
	Sea Turtle South to Buckwalter Town Center Rt/Rt Access	1,100	5,950
	Buckwalter Town Center Rt/Rt Access to Buckwalter Town Center North	500	6,450
	Buckwalter Town Center North to Buckwalter Town Center Promenade	450	6,900
	Buckwalter Town Center Promenade to Buckwalter Town Center South/C6	500	7,400
	Buckwalter Town Center South/C6 to Bluffton Parkway Phase 4/Portrait	1,075	8,475

As shown, the entire corridor being studied is approximately 8,475-feet (1.6-miles) and typical separation of access points is typically 900 to 1,000-feet with the exception of the distance between Sea Turtle and the northerly Buckwalter Town Center access (approx. 1,900-feet) and the separations between the Buckwalter Town Center access drives (approx. 500-feet).

Applying the "ideal" separation of signalized intersections to the corridor length of 8,475-feet results in the possibility of signalizing three (3) intersections between US 278 and the Bluffton Parkway (8,475/2,640=3.2) in order to meet ideal spacing.

Review of the future 2025 traffic volumes from the prior completed traffic studies for the Cinema and Sea Turtle development indicate that traffic signals are planned at the southerly Cinema access opposite parcel C2 and at the southern Sea Turtle access. Based on Table 2, the location of the first traffic signal; at the southern Cinema access; results in a separation of approximately 2,800-feet (US 278 to Cinema south). This separation is recommended due to the fact that US 278 is a Principal Arterial and maintaining the ideal separation of ½-mile between signals will provide good operations for these intersections.

Separation between the southerly Cinema access and Sea Turtle south is approximately 2,050-feet which is less than the ideal ½-mile spacing however, due to the fact that the intersecting roadways with the Buckwalter Parkway are <u>not</u> major collectors (Cinema access and Sea Turtle access) the separation can be slightly less (note that the separation is greater than 1/3-mile).

The remaining section of the Buckwalter Parkway between Sea Turtle South and the Bluffton Parkway intersection is approximately 3,625-feet. Separation between the southern Sea Turtle access and the northern Buckwalter Town Center access is approximately 1,600-feet. The key separation in this remaining segment would be the separation from the Bluffton Parkway intersection (major cross street intersection) to the next signalized intersection to the north along the Buckwalter Parkway. While ½-mile would be preferred, this separation would be unreasonable due to the fact that this would leave approximately 900-feet separation between the traffic signal at the southern Sea Turtle access. Based on the current development plans, the most appropriate location for this signal would be the future planned northern Buckwalter Town Center access which would provide a separation of approximately 2,000-feet to the Bluffton Parkway and approximately 1,600-feet to the traffic signal at the southern Sea Turtle access.

Assuming the location of signals as referenced above, both intersection and arterial analyses have been completed which are summarized in **Table 3**.

Table 3
ANALYSES RESULTS
Buckwalter Parkway Access Management

	Intersection Analyses Results			Northbound Buckwalter Arterial Analyses Results		Southbound Buckwalter Arterial Analyses Results	
Signalized Intersections	**Delay[2]**	**V/C[3]**	**LOS[4]**	**Speed[5]**	**LOS**	**Speed**	**LOS**
Buckwalter Parkway @							
US 278	53.0	1.30	D	17.1	D	Starting Point	
Cinema South	28.1	0.57	C	23.3	C	26.6	C
Sea Turtle South	8.3	0.41	A	30.2	B	36.0	A
Buckwalter Town Center North	26.4	0.61	C	27.9	C	17.2	D
Bluffton Parkway Phase 4	40.5	0.98	D	Starting Point		**13.0**	**E**

1. Calculations completed using the 2000 HCM methodology.
2. Delay in seconds-per-vehicle.
3. V/C=Volume to capacity ratio.
4. Level-of-Service.
5. Speed in mph.

GENERAL NOTES:

1. For signalized intersections, delay is representative of the overall intersection operations.
2. For arterial, LOS is a function of speed on corridor segment.

As shown, each of the signalized study area intersections are expected to operate at a LOS D or better based on future design hour volumes. As was expected, due to the high volumes of traffic, the intersections of US 278 at Buckwalter Parkway and Bluffton Parkway Phase 4 at Buckwalter Parkway are the intersections that are anticipated to operate at a LOS D. These service levels are due to the high volumes of traffic on both the major intersecting arterials (US 278 and Bluffton Parkway) and on the Buckwalter Parkway.

The arterial analyses indicate that the northbound direction of Buckwalter Parkway will operate at good service levels with a LOS D only in the segment approaching US 278 operating at a LOS D (approx. 17 mph). The southbound flow operates at good service levels until your reach the section approaching the Bluffton Parkway Phase 4 intersection when the arterial degrades to a LOS E at the Bluffton Parkway (13 mph). The reasoning for this degradation in service levels at the Bluffton Parkway intersection is due to the long southbound delays and vehicular queues that are expected.

A second scenario was reviewed regarding the location of the southerly traffic signal at the Buckwalter Town Center development. Rather than signalize the northern access of the Buckwalter Town Center, signalize the southern access of the Buckwalter Town Center which is located approximately 1,075-feet north of the Bluffton Parkway intersection.

In reviewing this scenario, the southern access provides slightly less 1,100-feet of separation between it and the major intersection of the Bluffton Parkway Phase 4. This 1,100-feet is less than desirable based on the suggested spacing of signalized intersection along the corridor. **Table 4** depicts the results of the intersection and arterial analyses assuming this location.

Table 4
ALTERNATIVE ANALYSES
SIGNAL AT SOUTH BUCKWALTER TOWN CENTER ACCESS
Buckwalter Parkway Access Management

	Intersection Analyses Results			Northbound Buckwalter Arterial Analyses Results		Southbound Buckwalter Arterial Analyses Results	
Signalized Intersections	**Delay[2]**	**V/C[3]**	**LOS[4]**	**Speed[5]**	**LOS**	**Speed**	**LOS**
Buckwalter Parkway @							
US 278	53.9	1.30	D	17.1	D	Starting Point	
Cinema South	20.9	0.59	C	28.1	B	33.0	B
Sea Turtle South	9.4	0.41	A	33.5	B	33.6	B
Buckwalter Town Center South	26.4	0.54	C	24.9	C	22.2	C
Bluffton Parkway Phase 4	40.0	0.98	D	Starting Point		**10.1**	**F**

1. Calculations completed using the 2000 HCM methodology.
2. Delay in seconds-per-vehicle.
3. V/C=Volume to capacity ratio.
4. Level-of-Service.
5. Speed in mph.

GENERAL NOTES:

1. For signalized intersections, delay is representative of the overall intersection operations.
2. For arterial, LOS is a function of speed on cooridor segment.

As shown, each of the signalized study are intersections are expected to operate at a LOS D or better. Just as under the prior scenario, LOS D's are expected at the intersections of US 278 at Buckwalter Parkway and Bluffton Parkway Phase 4 at Buckwalter Parkway.

The arterial analyses indicate that the northbound direction of Buckwalter Parkway will also continue to operate as under the prior scenario, good service levels with only a LOS D in the segment approaching US 278 operating at a LOS D (approx. 17 mph). The southbound flow operates at good service levels until your reach the section approaching the Bluffton Parkway Phase 4 intersection when the arterial degrades to a LOS F (10 mph) at the Bluffton Parkway.

As indicated, operations on the Buckwalter Parkway are impacted due to the close proximity of the signal at the southern access. In addition, vehicle queues were also reviewed for the critical movements of the southbound through at the Bluffton Parkway intersection. This southbound queue could extend to/through the southerly Buckwalter Town Center access resulting in poor operations/"grid-lock".

Queue calculations indicate that the northbound left-turn into the southern Buckwalter Town Center access can be accommodated assuming that dual left-turn lanes are provided. However, operations at Buckwalter Parkway at Bluffton Parkway intersection indicate that the southbound through volume will result in significant vehicular queues which could stack back into the southern Buckwalter Town Center intersection. The reasoning for this large queue is due to the large volume of northbound left-turn traffic anticipated at the Buckwalter Parkway at Bluffton Parkway intersection (estimated at 1,250 vehicles) which represents drivers continuing to travel on the Bluffton Parkway in a westerly direction. Because of this large volume, timing of the traffic signal at this intersection must favor the northbound movement which detracts from the southbound through movement, resulting in the long vehicle queues.

DEVELOPMENT ACCESS/CONNECTIVITY

In order to maintain traffic flow on the northern section of the Buckwalter Parkway, the location of signalized intersections must be properly planned and maintained. As such, not all access points will be allowed signalization at "front door" locations along the frontage of the site.

With this, the planning of good connectivity between developments is critical so that drivers can travel from one facility to another without having to get on the Buckwalter Parkway and to allow access for traffic to one of the planned signalized intersections.

Connectivity is especially important for many of the parcels along the Buckwalter Parkway due to development parcel size, environmental constraints/wetlands and proximity to major arterials such US 278 and the Bluffton Parkway. For parcels which front US 278, connectivity to the Buckwalter Parkway is critical as the approved access plan for US 278 limits full-access movement drives and signalized intersections.

In particular, three developments have plans to access the Buckwalter Parkway identified via their approved traffic studies and in some instances, their respective development agreements. The Willow Run PUD, Island West and the proposed Buckwalter Commons retail site located along US 278 (opposite the Berkeley Hall maintenance access) are each planned to have access to/from the Buckwalter Parkway.

Suggestions to provide for and/or enhance connectivity and allow access to/from developments are depicted by **Figure 4** for the Buckwalter Parkway northern corridor and are briefly described below:

- **Buckwalter Commons/C1 Tract-** A new intersection to be planned as part of the on going development in the area. This access is suggested to be located approximately 950-feet south of US 278 and will be an unsignalized intersection to due its proximity to the signalized intersection of US 278. Based on the location of this access and the anticipated inability to provide connectivity to other development sites to the south (Cinema and C2), this access is anticipated to be a full-movement access and should provide separate left and right-turn lanes on both the Buckwalter Parkway and the site access approaches. Vehicles exiting the respective sites should be placed under STOP sign control.

- **Cinema North Access/C2 Tract-** Is currently a three-legged intersection which currently serves as a secondary access for the cinema. This access is approximately 1,900-feet south of US 278 (950-feet south of the proposed Buckwalter Commons/C1 Tract access). Opposite the cinema development is the C2 tract which is currently anticipated to be developed as a drive-up bank. This access was planned as a full-movement access due to the evening activity of the theatre and should remain as an unsignalized access when the Buckwalter Parkway is fully constructed. As such, separate turning lanes (left and right) are suggested on both the Buckwalter Parkway and access approaches, with the acess drives being placed under STOP sign control.

- **Cinema South Access/C2 Tract-** Currently an unsignalized intersection three-legged intersection which is planned to be placed under traffic signal control after the Buckwalter

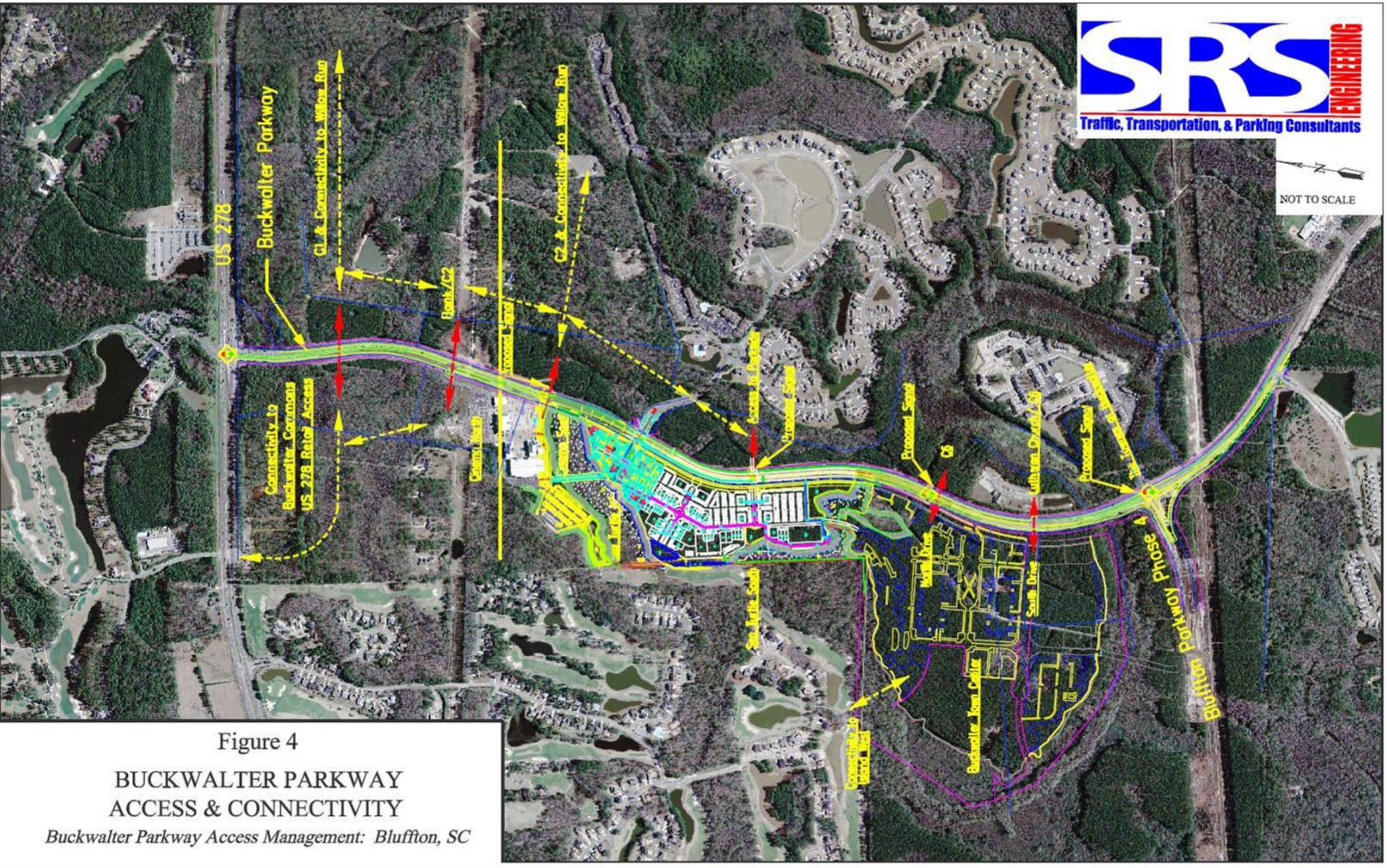


Figure 4

BUCKWALTER PARKWAY
ACCESS & CONNECTIVITY

Buckwalter Parkway Access Management: Bluffton, SC

Parkway is fully constructed. Alignment of the future C2 tract access once planned will result in a four-legged signalized intersection. Buckwalter Parkway approaches to this intersection should provide separate left and right-turn lanes on all applicable approaches. Approaches for the Cinema and C2 tracts should provide a separate left-turn lane, a through lane and a separate right-turn lane. Access to/from the Willow Run PUD is suggested at this intersection by providing connectivity through adjacent property owners to the Willow Run project.

- **Sea Turtle North Access/Parkside Drive-** Currently an unsignalized full-movement access located approximately 1,000-feet south of the proposed signalized intersection at the Cinema south access. Access to remain as a full-movement unsignalized intersection access with completion of the Buckwalter Parkway and the Sea Turtle development. On the west side of the Buckwalter Parkway, connectivity between the Sea Turtle development and the cinema development is suggested in order to provide accessibility to the proposed signal at the southerly cinema access.

  It should be noted that this intersection was investigated in order to determine if signalization is currently warranted at the existing access currently serving Wood Bridge sub-division. Based on counts conducted in March 2007 and historical counts conducted in November 2005, the site access will not meet signalization requirements based on either the 4 or 8 hour warrant analyses. It should also be noted that while the peak-hour signal warrant is marginally met, installation of a signal based solely on this warrant and not substantiated by either of the greater warrants is not typical.

- **Sea Turtle South Access/C5 & C6 Tracts-** A planned future four-legged intersection which is suggested to be placed under traffic signal control. Access to be located approximately 1,050-feet south of the Sea Turtle north access. If possible, extend the westerly leg of the intersection to the Woodbridge neighborhood in order to provide access for the neighborhood to a signalized intersection. Buckwalter Parkway approaches to this intersection should provide separate left and right-turn lanes on all applicable approaches. Approaches from the Sea Turtle and C5 & 6 tracts should provide a separate left-turn lane, a through lane and a separate right-turn lane. If connectivity to the Woodbridge neighborhood is not provided, the need for the separate eastbound and westbound through lanes on the minor street approaches will no longer be needed/required.

- **Buckwalter Town Center-** In total, five access drives have been proposed for this site one of which is planned to be placed under traffic signal control. The suggested location of this signalized location is discussed later in this report. Connectivity of this development to planned development to the west, the Sea Turtle development to the north and connectivity to the Island West development should be planned/provided.

  Access to/from this development should be planned by providing two full-movement access drives (one of which will be signalized) and spacing of the limited movement (right-in/right-out) access drives at a minimum of 500-600 feet from a full-movement access. Full-movement access drives should provide separate turning lanes on all approaches (Buckwalter Parkway and access drives) and align opposite access drives serving the C6 tract located on the west side of the Buckwalter Parkway.

  Depending on the final development proposal, which should include the entire Town Center project, the proposed access drives and separation should be refined which will likely reduce the number of access drives to the Buckwalter Parkway. It should be noted that the northbound left-turn movement entering the Buckwalter Town Center at the signalized access will likely require

dual left-turn lanes entering the development due to the projected left-turn volumes. Limited movement access drives should provide separate right-turn deceleration lanes on the Buckwalter Parkway.

As discussed later in this report, the separation of access drives to this tract and the future intersection of the Buckwalter and Bluffton Parkways will be important. Depending on which alignment of the Bluffton Parkway is selected will depend on the future access to/from this site and the suggested location of the anticipated signalized access.

BLUFFTON PARKWAY PHASE 5B DESIGN IMPACTS

A study is currently underway which illustrates a relocation of the Bluffton Parkway resulting in a 4-legged intersection in contrast to the current "S" curve alignment. This alternative would result in a true east/west corridor of the Bluffton Parkway with a single point of intersection with the Buckwalter Parkway rather than the two intersections with a combination route of the Buckwalter/Bluffton Parkway between the two intersections.

As was indicated earlier in this report, a capacity issue that was created by the current "S" curve design resulted in operational issues not only at the intersection of the Buckwalter Parkway at Bluffton Parkway Phase 4, but also at the adjacent intersection of the Buckwalter Parkway at the southern Buckwalter Town Center access. If the alternative of straightening out the Bluffton Parkway is approved, a new 4-legged intersection will result. According to current concept planning, this new intersection would be located approximately 1,100-feet south of the current intersection of the Buckwalter Parkway at Bluffton Parkway Phase 4. This new location of the Bluffton Parkway would then be approximately 2,100-feet from the proposed southern Buckwalter Town Center access. It should be noted that the re-location of the Bluffton Parkway to this location would also result in the re-location of the traffic signal at the current location (Bluffton Parkway Phase 4/Townes access at Buckwalter Parkway) to this new intersection.

Given this scenario, traffic volumes at the Buckwalter Parkway at Bluffton Parkway would change significantly such that the heavy northbound left-turn movement would now become significantly lower while the eastbound through movement would increase. This would result in a significant improvement in intersection operations and improves traffic flow not only along the Bluffton Parkway, but also the Buckwalter Parkway. This change in directional traffic flow, as well as the revised separation of approximately 2,100-feet to the southern Buckwalter Town Center access, would feasibly allow the installation of traffic signal control at this intersection. The main reasoning for allowing this signal under this scenario is the increased separation and the anticipation that vehicle queues will no longer impact the intersection operations. **Table 5** depicts the resultant service levels (intersection and arterial) for this scenario. **Figure 5** illustrates this access alternative as the Preferred Solution which depicts the preferred location of traffic signals, intersection separation and connectivity along the Buckwalter Parkway corridor.

The installation of a temporary signal is permitted at Parker Drive which may be removed upon completion of Phase 5B of the Bluffton Parkway, and the median opening at Parker Drive may be closed upon completion of Phase 5B. Phase 5B alignment may remain as is, and as part of Phase 5B construction, two additional residential access points may be simultaneously built to provide three residential access points for adjacent residents.

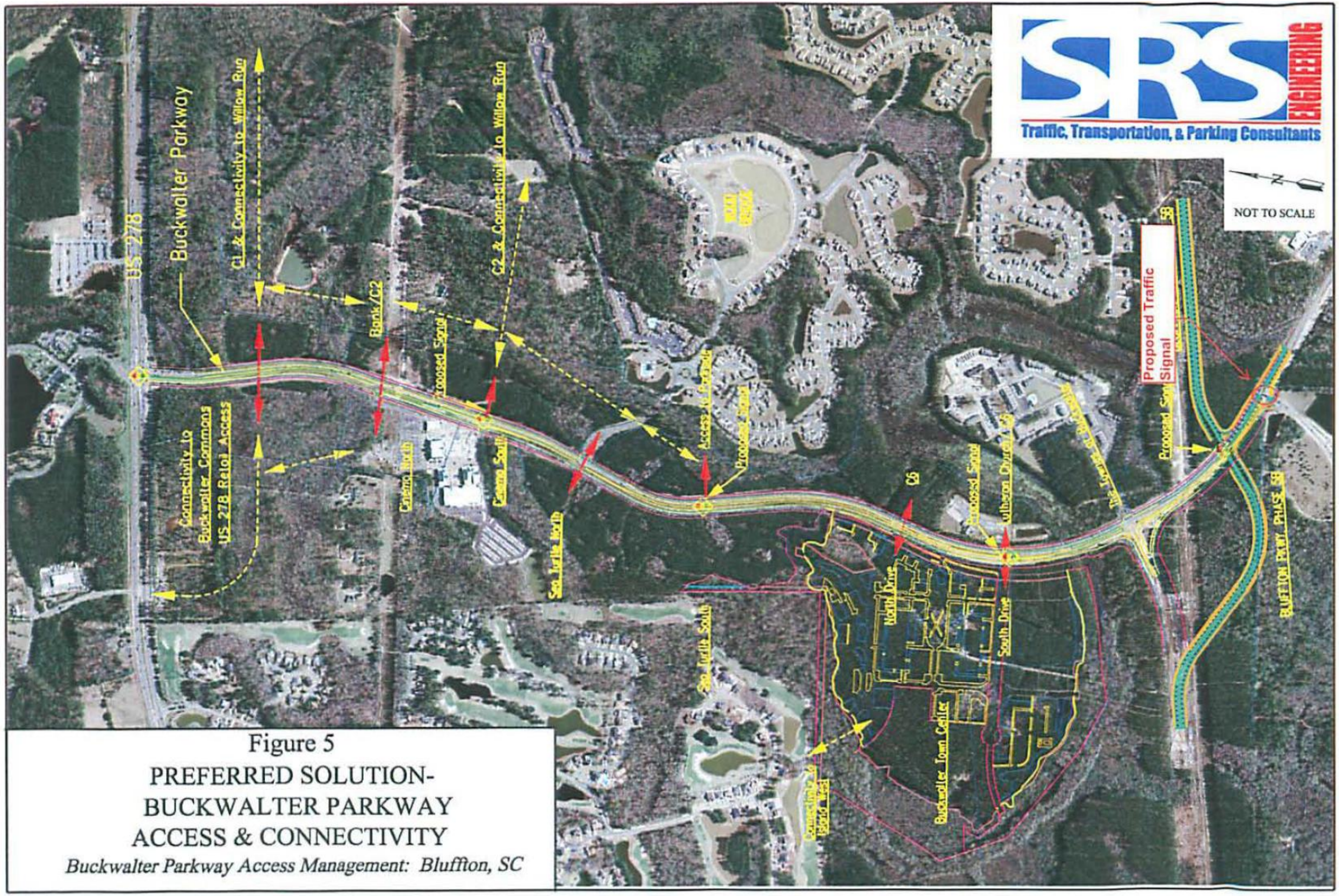


Figure 5
PREFERRED SOLUTION-
BUCKWALTER PARKWAY
ACCESS & CONNECTIVITY
Buckwalter Parkway Access Management: Bluffton, SC

Table 5
ALTERNATIVE ANALYSES
BLUFFTON PARKWAY RE-ALIGNMENT
Buckwalter Parkway Access Management

	Intersection Analyses Results			Northbound Buckwalter Arterial Analyses Results		Southbound Buckwalter Arterial Analyses Results	
Signalized Intersections	**Delay[2]**	**V/C[3]**	**LOS[4]**	**Speed[5]**	**LOS**	**Speed**	**LOS**
Buckwalter Parkway @							
US 278	53.9	1.30	D	17.1	D	Starting Point	
Cinema South	20.9	0.59	C	28.1	B	33.0	B
Sea Turtle South	9.6	0.41	A	33.1	B	33.6	B
Buckwalter Town Center South	27.1	0.54	C	31.9	B	22.5	C
Bluffton Parkway Phase 4	52.8	1.29	D	Starting Point		19.5	D

1. Calculations completed using the 2000 HCM methodology.
2. Delay in seconds-per-vehicle.
3. V/C=Volume to capacity ratio.
4. Level-of-Service.
5. Speed in mph.

GENERAL NOTES:

1. For signalized intersections, delay is representative of the overall intersection operations.
2. For arterial, LOS is a function of speed on corridor segment.

As shown, if the Bluffton Parkway alignment becomes a 4-legged intersection rather than the "S" curve alignment, the intersection will now be located approximately 1,100-feet father to the south of the current Bluffton Phase 4 alignment. This additional separation and re-assignment of traffic will allow better operations at the new Buckwalter Parkway at Bluffton Parkway intersection as well as improving on the flow of through traffic on the arterial as shown by the southbound serve levels which indicate LOS D or better as compared to the LOS E or LOS F as indicated by the prior scenarios.

A second alternative assuming the scenario of the Bluffton Parkway was analyzed assuming that the first signal to the north of the now relocated Bluffton Parkway intersection would be 2,600-feet to the north placing the signal in the vicinity of the Buckwalter Town Center project at the proposed "promenade" access. Based on these analyses, if the signal were located at this point (Buckwalter Town Center south access not signalized) the arterial analyses for the southbound direction of the Buckwalter Parkway indicate a slight improvement in the arterial analyses of approximately 2 mph (21.7 mph) which continues to operate at a LOS D.

CONCLUSIONS

This report has been prepared in an effort to plan major access points/signalized intersections along the section of the Buckwalter Parkway between US 278 and the intersection of the future Phase 4 leg of the Bluffton Parkway which has been referred to as the northern segment of the Buckwalter Parkway.

Two intersections are either already signalized (US 278) or are defined/planned for traffic signal control (Bluffton Parkway Phase 4). The subject of this report is to investigate the location of additional future traffic signals and access drives between these two major intersections.

Based on the projected traffic volumes and planned access drives, two intersections are recommended for installation of traffic signal control once warrants are met. These two intersections are the southern Cinema access which aligns opposite the C2 Tract and the southern Sea Turtle retail access which aligns opposite the C5 Tract. Separation of these proposed signalized locations to each other and to/from the signal at US 278 provide adequate spacing as well as provide for good operations.

The placement of the third/last traffic signal is not as clear due to current unknowns regarding the future alignment of the Bluffton Parkway Phase 4 intersection. If the current "S" alignment of the Bluffton Parkway continues as is currently being designed, the next traffic signal to the north of the Bluffton Parkway intersection should be located a minimum of approximately 2,000-feet to the north placing it in the vicinity of the northerly access to/from the Buckwalter Town Center development. However, if the alignment of the Bluffton Parkway is modified resulting in a new four-legged signalized intersection approximately 1,100-feet south of the current alignment, signalization of the southerly Buckwalter Town Center development could occur which would now be located approximately 2,100-feet to the north of this new 4-legged Bluffton Parkway intersection.

Operations at the signalized intersections are anticipated to be LOS D or better under either scenario of the alignment of the Bluffton Parkway however; arterial analyses are improved if the intersection of Buckwalter Parkway and the Bluffton Parkway becomes a single 4-legged intersection.

Based on these analyses, the solution that provides the best operations while also making provisions for access to/from development along the northern segment of the Buckwalter Parkway is the alternative of aligning the Bluffton Parkway to the south and signalizing the following intersections as indicated in **Table 6**:

Table 6
PREFERRED ALTERNATIVE BLUFFTON PARKWAY RE-ALIGNMENT
SIGNALIZED INTERSECTION SPACING
Buckwalter Parkway Access Management

Corridor	Signalized Cross Streets	Separation (Feet)
Buckwalter Parkway	US 278	
		2,800
	Cinema South	
		2,050
	Sea Turtle South	
		2,550
	Buckwalter Town Center South	
		2,100
	Bluffton Parkway Aligned	

If alignment of the Bluffton Parkway is **not** shifted to the south and maintains its current proposal of the "S" alignment/shared route, then the following intersections should be signalized as indicated in **Table 7**:

Table 7
BLUFFTON PARKWAY CURRENT LOCATION
SIGNALIZED INTERSECTION SPACING
Buckwalter Parkway Access Management

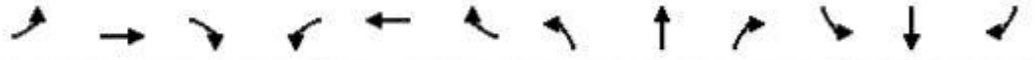
Corridor	Signalized Cross Streets	Separation (Feet)
Buckwalter Parkway	US 278	
		2,800
	Cinema South	
		2,050
	Sea Turtle South	
		1,600
	Buckwalter Town Center North	
		2,025
	Bluffton Parkway Phase 4/Portrait	

APPENDIX

- **Capacity & Arterial Analyses**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583		1817	1583
Flt Permitted	0.03	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.81	1.00
Satd. Flow (perm)	64	5085	1583	3433	5085	1583	3433	1863	1583		1516	1583
Volume (vph)	50	2500	440	400	2500	50	480	50	400	50	50	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2717	478	435	2717	54	522	54	435	54	54	54
RTOR Reduction (vph)	0	0	72	0	0	11	0	0	0	0	0	5
Lane Group Flow (vph)	54	2717	406	435	2717	43	522	54	435	0	108	49
Turn Type	Perm		pm+ov	Prot		Perm	Prot		Free	Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4			8			Free	6		6
Actuated Green, G (s)	116.0	116.0	136.0	18.1	139.1	139.1	20.0	40.9	190.0		15.9	15.9
Effective Green, g (s)	117.0	117.0	138.0	19.1	140.1	140.1	21.0	41.9	190.0		16.9	16.9
Actuated g/C Ratio	0.62	0.62	0.73	0.10	0.74	0.74	0.11	0.22	1.00		0.09	0.09
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	39	3131	1183	345	3750	1167	379	411	1583		135	141
v/s Ratio Prot		0.53	0.04	c0.13	0.53		c0.15	0.03				
v/s Ratio Perm	c0.85		0.22			0.03			0.27		c0.07	0.03
v/c Ratio	1.38	0.87	0.34	1.26	0.72	0.04	1.38	0.13	0.27		0.80	0.34
Uniform Delay, d1	36.5	30.1	9.5	85.5	14.1	6.7	84.5	59.4	0.0		84.9	81.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	276.9	2.8	0.2	138.7	0.7	0.0	185.6	0.7	0.4		37.6	6.6
Delay (s)	313.4	32.9	9.7	224.2	14.8	6.7	270.1	60.1	0.4		122.5	87.9
Level of Service	F	C	A	F	B	A	F	E	A		F	F
Approach Delay (s)		34.2			43.1			142.9			111.0	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1637		1770	1618		1770	3539	1583	1770	3539	1583
Flt Permitted	0.41	1.00		0.56	1.00		0.35	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	764	1637		1047	1618		644	3539	1583	498	3539	1583
Volume (vph)	203	30	129	139	30	217	101	840	143	90	660	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	221	33	140	151	33	236	110	913	155	98	717	51
RTOR Reduction (vph)	0	100	0	0	71	0	0	0	56	0	0	18
Lane Group Flow (vph)	221	73	0	151	198	0	110	913	99	98	717	33
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.1	28.1		28.1	28.1		64.9	64.9	64.9	64.9	64.9	64.9
Effective Green, g (s)	29.1	29.1		29.1	29.1		65.9	65.9	65.9	65.9	65.9	65.9
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	216	462		296	457		412	2264	1013	319	2264	1013
v/s Ratio Prot		0.04			0.12			c0.26			0.20	
v/s Ratio Perm	c0.29			0.14			0.17		0.06	0.20		0.02
v/c Ratio	1.02	0.16		0.51	0.43		0.27	0.40	0.10	0.31	0.32	0.03
Uniform Delay, d1	36.9	27.7		31.0	30.2		8.1	9.0	7.1	8.3	8.4	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.4	0.2		1.5	0.7		1.6	0.5	0.2	2.5	0.4	0.1
Delay (s)	104.3	27.9		32.5	30.9		9.6	9.5	7.3	10.8	8.7	6.9
Level of Service	F	C		C	C		A	A	A	B	A	A
Approach Delay (s)		70.8			31.4			9.3			8.9	
Approach LOS		E			C			A			A	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.34	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	638	3539	3539	1583
Volume (vph)	161	100	77	930	720	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	175	109	84	1011	783	41
RTOR Reduction (vph)	0	94	0	0	0	8
Lane Group Flow (vph)	175	15	84	1011	783	33
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	15.8	15.8	94.2	94.2	94.2	94.2
Effective Green, g (s)	16.8	16.8	95.2	95.2	95.2	95.2
Actuated g/C Ratio	0.14	0.14	0.79	0.79	0.79	0.79
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	222	506	2808	2808	1256
v/s Ratio Prot	c0.10			c0.29	0.22	
v/s Ratio Perm		0.01	0.13			0.02
v/c Ratio	0.71	0.07	0.17	0.36	0.28	0.03
Uniform Delay, d1	49.2	44.8	3.0	3.6	3.3	2.6
Progression Factor	1.00	1.00	0.72	0.71	1.00	1.00
Incremental Delay, d2	8.8	0.1	0.7	0.3	0.2	0.0
Delay (s)	58.1	44.9	2.8	2.9	3.5	2.7
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.0			2.9	3.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1599		1770	1723		3433	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.15	1.00		0.95	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	2580	1599		276	1723		3433	3539	1583	607	3539	1583
Volume (vph)	400	30	500	30	30	30	400	800	30	30	620	400
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	33	543	33	33	33	435	870	33	33	674	435
RTOR Reduction (vph)	0	381	0	0	26	0	0	0	10	0	0	218
Lane Group Flow (vph)	435	195	0	33	40	0	435	870	23	33	674	218
Turn Type	Perm			Perm			Prot		Perm	Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8					2	6		6
Actuated Green, G (s)	26.0	26.0		26.0	26.0		20.0	84.0	84.0	59.0	59.0	59.0
Effective Green, g (s)	27.0	27.0		27.0	27.0		21.0	85.0	85.0	60.0	60.0	60.0
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.18	0.71	0.71	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	581	360		62	388		601	2507	1121	304	1770	792
v/s Ratio Prot		0.12			0.02		c0.13	0.25			c0.19	
v/s Ratio Perm	c0.17			0.12					0.01	0.05		0.14
v/c Ratio	0.75	0.54		0.53	0.10		0.72	0.35	0.02	0.11	0.38	0.27
Uniform Delay, d1	43.3	41.1		40.9	36.9		46.8	6.8	5.2	15.9	18.5	17.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.91	0.92	0.82
Incremental Delay, d2	5.3	1.7		8.5	0.1		4.3	0.4	0.0	0.7	0.6	0.9
Delay (s)	48.6	42.7		49.5	37.0		51.1	7.1	5.2	15.1	17.6	15.1
Level of Service	D	D		D	D		D	A	A	B	B	B
Approach Delay (s)		45.3			41.2			21.4			16.6	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.13	1.00	1.00	0.16	1.00	1.00	0.95	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	246	3539	1583	301	3539	1583	3433	3539	1583	680	3539	1583
Volume (vph)	190	1010	160	190	1100	60	360	450	100	160	600	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	1098	174	207	1196	65	391	489	109	174	652	152
RTOR Reduction (vph)	0	0	15	0	0	32	0	0	70	0	0	30
Lane Group Flow (vph)	207	1098	159	207	1196	33	391	489	39	174	652	122
Turn Type	Perm		pm+ov	Perm		Perm	Prot		Perm	pm+pt		Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	51.0	51.0	61.0	51.0	51.0	51.0	10.0	28.0	28.0	34.0	26.0	26.0
Effective Green, g (s)	52.0	52.0	63.0	52.0	52.0	52.0	11.0	29.0	29.0	36.0	27.0	27.0
Actuated g/C Ratio	0.51	0.51	0.62	0.51	0.51	0.51	0.11	0.28	0.28	0.35	0.26	0.26
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	125	1804	1040	153	1804	807	370	1006	450	336	937	419
v/s Ratio Prot		0.31	0.02		0.34		c0.11	0.14		0.05	c0.18	
v/s Ratio Perm	c0.84		0.08	0.69		0.02			0.02	0.14		0.08
v/c Ratio	1.66	0.61	0.15	1.35	0.66	0.04	1.06	0.49	0.09	0.52	0.70	0.29
Uniform Delay, d1	25.0	17.8	8.2	25.0	18.5	12.5	45.5	30.3	26.8	23.9	33.8	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	327.9	0.6	0.1	195.5	0.9	0.0	62.5	1.7	0.4	1.3	4.3	1.8
Delay (s)	352.9	18.4	8.3	220.5	19.4	12.5	108.0	32.0	27.2	25.3	38.1	31.6
Level of Service	F	B	A	F	B	B	F	C	C	C	D	C
Approach Delay (s)		64.0			47.5			61.5			34.8	
Approach LOS		E			D			E			C	

Intersection Summary			
HCM Average Control Delay	52.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Bluffton Pkwy Phase	II	45	20.9	32.3	53.2	0.19	12.9	F
Lutheran Church/C6	II	45	39.8	7.9	47.7	0.42	31.9	B
Sea Turtle South	II	45	31.4	3.1	34.5	0.32	33.1	B
Willow Run/C2	II	45	33.7	11.2	44.9	0.35	28.1	B
US 278	II	45	43.2	59.9	103.1	0.49	17.1	D
Total	II		169.0	114.4	283.4	1.77	22.5	C

Arterial Level of Service: SB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 278	II	45	7.9	121.0	128.9	0.07	2.0	F
Cinema South	II	45	43.2	10.3	53.5	0.49	33.0	B
Sea Turtle South	II	45	33.7	3.9	37.6	0.35	33.6	B
Buckwalter Town Cntr	II	45	31.4	19.4	50.8	0.32	22.5	C
Bluffton Pkwy Phase	II	45	39.8	38.4	78.2	0.42	19.5	D
Total	II		156.0	193.0	349.0	1.65	17.1	D

Arterial Level of Service: NB Buckwalter Pkwy

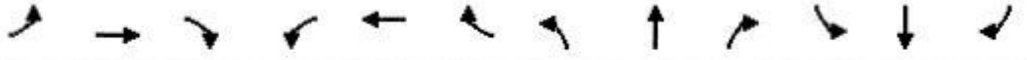
Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Bluffton Pkwy Phase	II	45	20.9	32.3	53.2	0.19	12.9	F
Lutheran Church/C6	II	45	43.3	7.9	51.2	0.49	34.6	B
Sea Turtle South	II	45	25.1	3.3	28.4	0.24	30.6	B
Willow Run/C2	II	45	33.7	11.2	44.9	0.35	28.1	B
US 278	II	45	43.2	59.9	103.1	0.49	17.1	D
Total	II		166.2	114.6	280.8	1.77	22.7	C

Arterial Level of Service: SB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
US 278	II	45	7.9	121.0	128.9	0.07	2.0	F
Cinema South	II	45	43.2	10.3	53.5	0.49	33.0	B
Sea Turtle South	II	45	33.7	3.9	37.6	0.35	33.6	B
Buckwalter Town Cntr	II	45	25.1	18.9	44.0	0.24	19.8	D
Bluffton Pkwy Phase	II	45	43.3	38.4	81.7	0.49	21.7	D
Total	II		153.2	192.5	345.7	1.65	17.2	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583		1817	1583
Flt Permitted	0.03	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.81	1.00
Satd. Flow (perm)	64	5085	1583	3433	5085	1583	3433	1863	1583		1516	1583
Volume (vph)	50	2500	440	400	2500	50	480	50	400	50	50	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2717	478	435	2717	54	522	54	435	54	54	54
RTOR Reduction (vph)	0	0	72	0	0	11	0	0	0	0	0	5
Lane Group Flow (vph)	54	2717	406	435	2717	43	522	54	435	0	108	49
Turn Type	Perm		pm+ov	Prot		Perm	Prot		Free	Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4			8			Free	6		6
Actuated Green, G (s)	116.0	116.0	136.0	18.1	139.1	139.1	20.0	40.9	190.0		15.9	15.9
Effective Green, g (s)	117.0	117.0	138.0	19.1	140.1	140.1	21.0	41.9	190.0		16.9	16.9
Actuated g/C Ratio	0.62	0.62	0.73	0.10	0.74	0.74	0.11	0.22	1.00		0.09	0.09
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	39	3131	1183	345	3750	1167	379	411	1583		135	141
v/s Ratio Prot		0.53	0.04	c0.13	0.53		c0.15	0.03				
v/s Ratio Perm	c0.85		0.22			0.03			0.27		c0.07	0.03
v/c Ratio	1.38	0.87	0.34	1.26	0.72	0.04	1.38	0.13	0.27		0.80	0.34
Uniform Delay, d1	36.5	30.1	9.5	85.5	14.1	6.7	84.5	59.4	0.0		84.9	81.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	276.9	2.8	0.2	138.7	0.7	0.0	185.6	0.7	0.4		37.6	6.6
Delay (s)	313.4	32.9	9.7	224.2	14.8	6.7	270.1	60.1	0.4		122.5	87.9
Level of Service	F	C	A	F	B	A	F	E	A		F	F
Approach Delay (s)		34.2			43.1			142.9			111.0	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1637		1770	1618		1770	3539	1583	1770	3539	1583
Flt Permitted	0.41	1.00		0.56	1.00		0.35	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	764	1637		1047	1618		644	3539	1583	498	3539	1583
Volume (vph)	203	30	129	139	30	217	101	840	143	90	660	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	221	33	140	151	33	236	110	913	155	98	717	51
RTOR Reduction (vph)	0	100	0	0	71	0	0	0	56	0	0	18
Lane Group Flow (vph)	221	73	0	151	198	0	110	913	99	98	717	33
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	28.1	28.1		28.1	28.1		64.9	64.9	64.9	64.9	64.9	64.9
Effective Green, g (s)	29.1	29.1		29.1	29.1		65.9	65.9	65.9	65.9	65.9	65.9
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	216	462		296	457		412	2264	1013	319	2264	1013
v/s Ratio Prot		0.04			0.12			c0.26			0.20	
v/s Ratio Perm	c0.29			0.14			0.17		0.06	0.20		0.02
v/c Ratio	1.02	0.16		0.51	0.43		0.27	0.40	0.10	0.31	0.32	0.03
Uniform Delay, d1	36.9	27.7		31.0	30.2		8.1	9.0	7.1	8.3	8.4	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.4	0.2		1.5	0.7		1.6	0.5	0.2	2.5	0.4	0.1
Delay (s)	104.3	27.9		32.5	30.9		9.6	9.5	7.3	10.8	8.7	6.9
Level of Service	F	C		C	C		A	A	A	B	A	A
Approach Delay (s)		70.8			31.4			9.3			8.9	
Approach LOS		E			C			A			A	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.34	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	638	3539	3539	1583
Volume (vph)	161	100	77	930	720	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	175	109	84	1011	783	41
RTOR Reduction (vph)	0	94	0	0	0	8
Lane Group Flow (vph)	175	15	84	1011	783	33
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	15.8	15.8	94.2	94.2	94.2	94.2
Effective Green, g (s)	16.8	16.8	95.2	95.2	95.2	95.2
Actuated g/C Ratio	0.14	0.14	0.79	0.79	0.79	0.79
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	222	506	2808	2808	1256
v/s Ratio Prot	c0.10			c0.29	0.22	
v/s Ratio Perm		0.01	0.13			0.02
v/c Ratio	0.71	0.07	0.17	0.36	0.28	0.03
Uniform Delay, d1	49.2	44.8	3.0	3.6	3.3	2.6
Progression Factor	1.00	1.00	0.62	0.60	1.00	1.00
Incremental Delay, d2	8.8	0.1	0.7	0.3	0.2	0.0
Delay (s)	58.1	44.9	2.5	2.5	3.5	2.7
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.0			2.5	3.5	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1599		1770	1723		3433	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.15	1.00		0.95	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	2580	1599		276	1723		3433	3539	1583	607	3539	1583
Volume (vph)	400	30	500	30	30	30	400	800	30	30	620	400
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	33	543	33	33	33	435	870	33	33	674	435
RTOR Reduction (vph)	0	381	0	0	26	0	0	0	10	0	0	220
Lane Group Flow (vph)	435	195	0	33	40	0	435	870	23	33	674	215
Turn Type	Perm			Perm			Prot		Perm	Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8					2	6		6
Actuated Green, G (s)	26.0	26.0		26.0	26.0		20.6	84.0	84.0	58.4	58.4	58.4
Effective Green, g (s)	27.0	27.0		27.0	27.0		21.6	85.0	85.0	59.4	59.4	59.4
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.18	0.71	0.71	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	581	360		62	388		618	2507	1121	300	1752	784
v/s Ratio Prot		0.12			0.02		c0.13	0.25			c0.19	
v/s Ratio Perm	c0.17			0.12					0.01	0.05		0.14
v/c Ratio	0.75	0.54		0.53	0.10		0.70	0.35	0.02	0.11	0.38	0.27
Uniform Delay, d1	43.3	41.1		40.9	36.9		46.2	6.8	5.2	16.2	18.9	17.7
Progression Factor	1.00	1.00		1.00	1.00		0.89	0.95	0.83	0.91	0.92	0.82
Incremental Delay, d2	5.3	1.7		8.5	0.1		3.5	0.4	0.0	0.7	0.6	0.9
Delay (s)	48.6	42.7		49.5	37.0		44.8	6.8	4.3	15.4	18.0	15.4
Level of Service	D	D		D	D		D	A	A	B	B	B
Approach Delay (s)		45.3			41.2			19.1			17.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	1378	1863	1583	1392	1863	1583	3433	3539	1583	691	3539	1583
Volume (vph)	230	15	970	25	25	25	1250	680	15	15	820	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	16	1054	27	27	27	1359	739	16	16	891	87
RTOR Reduction (vph)	0	0	4	0	0	22	0	0	4	0	0	50
Lane Group Flow (vph)	250	16	1050	27	27	5	1359	739	12	16	891	37
Turn Type	Perm		pm+ov	Perm		Perm	Prot		Perm	Perm		Perm
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	21.0	21.0	74.0	21.0	21.0	21.0	53.0	89.0	89.0	31.0	31.0	31.0
Effective Green, g (s)	22.0	22.0	76.0	22.0	22.0	22.0	54.0	90.0	90.0	32.0	32.0	32.0
Actuated g/C Ratio	0.18	0.18	0.63	0.18	0.18	0.18	0.45	0.75	0.75	0.27	0.27	0.27
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	342	1055	255	342	290	1545	2654	1187	184	944	422
v/s Ratio Prot		0.01	c0.45		0.01		0.40	0.21			c0.25	
v/s Ratio Perm	0.18		0.22	0.02		0.00			0.01	0.02		0.02
v/c Ratio	0.99	0.05	1.00	0.11	0.08	0.02	0.88	0.28	0.01	0.09	0.94	0.09
Uniform Delay, d1	48.9	40.4	21.8	40.8	40.6	40.1	30.0	4.7	3.8	33.0	43.1	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.75	0.80	0.53
Incremental Delay, d2	52.7	0.1	26.4	0.2	0.1	0.0	6.1	0.3	0.0	0.8	16.3	0.3
Delay (s)	101.6	40.4	48.2	41.0	40.7	40.2	36.1	5.0	3.8	25.7	50.9	17.8
Level of Service	F	D	D	D	D	D	D	A	A	C	D	B
Approach Delay (s)		58.2			40.6			25.0			47.6	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Towne Portrait	II	45	20.9	5.0	25.9	0.19	26.6	C
Lutheran Church/C6	II	45	22.9	7.5	30.4	0.21	24.9	C
Sea Turtle South	II	45	31.4	2.7	34.1	0.32	33.5	B
Willow Run/C2	II	45	33.7	11.2	44.9	0.35	28.1	B
US 278	II	45	43.2	59.9	103.1	0.49	17.1	D
Total	II		152.1	86.3	238.4	1.56	23.6	C

Arterial Level of Service: SB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Cinema South	II	45	43.2	10.3	53.5	0.49	33.0	B
Sea Turtle South	II	45	33.7	3.9	37.6	0.35	33.6	B
Buckwalter Town Cntr	II	45	31.4	19.9	51.3	0.32	22.2	C
Bluffton Pkwy Phase	II	45	22.9	51.7	74.6	0.21	10.1	F
Total	II		131.2	85.8	217.0	1.37	22.7	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583		1817	1583
Flt Permitted	0.03	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.81	1.00
Satd. Flow (perm)	64	5085	1583	3433	5085	1583	3433	1863	1583		1516	1583
Volume (vph)	50	2500	440	400	2500	50	480	50	400	50	50	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2717	478	435	2717	54	522	54	435	54	54	54
RTOR Reduction (vph)	0	0	72	0	0	11	0	0	0	0	0	5
Lane Group Flow (vph)	54	2717	406	435	2717	43	522	54	435	0	108	49
Turn Type	Perm		pm+ov	Prot		Perm	Prot		Free	Perm		Perm
Protected Phases		4	5	3	8		5	2			6	
Permitted Phases	4		4			8			Free	6		6
Actuated Green, G (s)	116.0	116.0	136.0	18.1	139.1	139.1	20.0	40.9	190.0		15.9	15.9
Effective Green, g (s)	117.0	117.0	138.0	19.1	140.1	140.1	21.0	41.9	190.0		16.9	16.9
Actuated g/C Ratio	0.62	0.62	0.73	0.10	0.74	0.74	0.11	0.22	1.00		0.09	0.09
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	39	3131	1183	345	3750	1167	379	411	1583		135	141
v/s Ratio Prot		0.53	0.04	c0.13	0.53		c0.15	0.03				
v/s Ratio Perm	c0.85		0.22			0.03			0.27		c0.07	0.03
v/c Ratio	1.38	0.87	0.34	1.26	0.72	0.04	1.38	0.13	0.27		0.80	0.34
Uniform Delay, d1	36.5	30.1	9.5	85.5	14.1	6.7	84.5	59.4	0.0		84.9	81.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	276.9	2.8	0.2	138.7	0.7	0.0	185.6	0.7	0.4		37.6	6.6
Delay (s)	313.4	32.9	9.7	224.2	14.8	6.7	270.1	60.1	0.4		122.5	87.9
Level of Service	F	C	A	F	B	A	F	E	A		F	F
Approach Delay (s)		34.2			43.1			142.9			111.0	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	190.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1637		1770	1618		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.30	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1770	1637		1770	1618		553	3539	1583	394	3539	1583
Volume (vph)	203	30	129	139	30	217	101	840	143	90	660	47
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	221	33	140	151	33	236	110	913	155	98	717	51
RTOR Reduction (vph)	0	116	0	0	204	0	0	0	80	0	0	26
Lane Group Flow (vph)	221	57	0	151	65	0	110	913	75	98	717	25
Turn Type	Split			Split			pm+pt		Perm	pm+pt		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	19.4	19.4		15.3	15.3		65.3	56.7	56.7	65.3	56.7	56.7
Effective Green, g (s)	20.4	20.4		16.3	16.3		67.3	57.7	57.7	67.3	57.7	57.7
Actuated g/C Ratio	0.17	0.17		0.14	0.14		0.56	0.48	0.48	0.56	0.48	0.48
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	301	278		240	220		408	1702	761	331	1702	761
v/s Ratio Prot	c0.12	0.03		c0.09	0.04		0.02	c0.26		c0.02	0.20	
v/s Ratio Perm							0.13		0.05	0.14		0.02
v/c Ratio	0.73	0.20		0.63	0.30		0.27	0.54	0.10	0.30	0.42	0.03
Uniform Delay, d1	47.2	42.8		49.0	46.7		13.1	21.8	17.0	14.0	20.3	16.4
Progression Factor	1.00	1.00		1.00	1.00		0.81	0.80	1.42	1.00	1.00	1.00
Incremental Delay, d2	8.9	0.4		5.1	0.8		0.3	1.2	0.2	0.5	0.8	0.1
Delay (s)	56.2	43.2		54.1	47.4		11.0	18.7	24.3	14.5	21.0	16.5
Level of Service	E	D		D	D		B	B	C	B	C	B
Approach Delay (s)		50.5			49.8			18.7			20.0	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.34	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	638	3539	3539	1583
Volume (vph)	161	100	77	930	720	38
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	175	109	84	1011	783	41
RTOR Reduction (vph)	0	94	0	0	0	8
Lane Group Flow (vph)	175	15	84	1011	783	33
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	15.8	15.8	94.2	94.2	94.2	94.2
Effective Green, g (s)	16.8	16.8	95.2	95.2	95.2	95.2
Actuated g/C Ratio	0.14	0.14	0.79	0.79	0.79	0.79
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	222	506	2808	2808	1256
v/s Ratio Prot	c0.10			c0.29	0.22	
v/s Ratio Perm		0.01	0.13			0.02
v/c Ratio	0.71	0.07	0.17	0.36	0.28	0.03
Uniform Delay, d1	49.2	44.8	3.0	3.6	3.3	2.6
Progression Factor	1.00	1.00	0.51	0.50	0.33	0.07
Incremental Delay, d2	8.8	0.1	0.6	0.3	0.2	0.0
Delay (s)	58.1	44.9	2.1	2.1	1.3	0.2
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.0			2.1	1.2	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1609		1770	1723		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.55	1.00		0.95	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	3433	1609		1018	1723		3433	3539	1583	607	3539	1583
Volume (vph)	400	30	300	30	30	30	400	800	30	30	800	400
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	33	326	33	33	33	435	870	33	33	870	435
RTOR Reduction (vph)	0	234	0	0	30	0	0	0	12	0	0	150
Lane Group Flow (vph)	435	125	0	33	36	0	435	870	21	33	870	285
Turn Type	Prot			Perm			Prot		Perm	Perm		pm+ov
Protected Phases	7	4			8		5	2			6	7
Permitted Phases				8					2	6		6
Actuated Green, G (s)	19.8	33.0		8.2	8.2		20.0	77.0	77.0	52.0	52.0	71.8
Effective Green, g (s)	20.8	34.0		9.2	9.2		21.0	78.0	78.0	53.0	53.0	73.8
Actuated g/C Ratio	0.17	0.28		0.08	0.08		0.18	0.65	0.65	0.44	0.44	0.62
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	595	456		78	132		601	2300	1029	268	1563	1026
v/s Ratio Prot	c0.13	0.08			0.02		c0.13	0.25			c0.25	0.05
v/s Ratio Perm				c0.03					0.01	0.05		0.13
v/c Ratio	0.73	0.27		0.42	0.27		0.72	0.38	0.02	0.12	0.56	0.28
Uniform Delay, d1	47.0	33.4		52.9	52.2		46.8	9.7	7.5	19.8	24.8	10.7
Progression Factor	1.00	1.00		1.00	1.00		0.99	0.82	0.66	0.72	0.77	1.36
Incremental Delay, d2	4.6	0.3		3.7	1.1		4.2	0.5	0.0	0.9	1.4	0.1
Delay (s)	51.6	33.7		56.5	53.3		50.6	8.5	5.0	15.1	20.6	14.7
Level of Service	D	C		E	D		D	A	A	B	C	B
Approach Delay (s)		43.5			54.4			22.1			18.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	1378	1863	1583	1392	1863	1583	3433	3539	1583	691	3539	1583
Volume (vph)	230	15	970	25	25	25	1250	680	15	15	820	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	16	1054	27	27	27	1359	739	16	16	891	87
RTOR Reduction (vph)	0	0	4	0	0	22	0	0	4	0	0	50
Lane Group Flow (vph)	250	16	1050	27	27	5	1359	739	12	16	891	37
Turn Type	Perm		pm+ov	Perm		Perm	Prot		Perm	Perm		Perm
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8			2	6		6
Actuated Green, G (s)	21.0	21.0	74.0	21.0	21.0	21.0	53.0	89.0	89.0	31.0	31.0	31.0
Effective Green, g (s)	22.0	22.0	76.0	22.0	22.0	22.0	54.0	90.0	90.0	32.0	32.0	32.0
Actuated g/C Ratio	0.18	0.18	0.63	0.18	0.18	0.18	0.45	0.75	0.75	0.27	0.27	0.27
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	342	1055	255	342	290	1545	2654	1187	184	944	422
v/s Ratio Prot		0.01	c0.45		0.01		0.40	0.21			c0.25	
v/s Ratio Perm	0.18		0.22	0.02		0.00			0.01	0.02		0.02
v/c Ratio	0.99	0.05	1.00	0.11	0.08	0.02	0.88	0.28	0.01	0.09	0.94	0.09
Uniform Delay, d1	48.9	40.4	21.8	40.8	40.6	40.1	30.0	4.7	3.8	33.0	43.1	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.82	0.60
Incremental Delay, d2	52.7	0.1	26.4	0.2	0.1	0.0	6.1	0.3	0.0	0.9	18.1	0.4
Delay (s)	101.6	40.4	48.2	41.0	40.7	40.2	36.1	5.0	3.8	27.2	53.4	20.2
Level of Service	F	D	D	D	D	D	D	A	A	C	D	C
Approach Delay (s)		58.2			40.6			25.0			50.1	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM Average Control Delay	40.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Arterial Level of Service: NB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Towne Portrait	II	45	20.9	5.0	25.9	0.19	26.6	C
C6	II	45	30.1	9.2	39.3	0.30	27.9	C
Sea Turtle South	II	45	24.3	2.3	26.6	0.22	30.2	B
Willow Run/C2	II	45	33.7	20.6	54.3	0.35	23.3	C
US 278	II	45	43.2	59.9	103.1	0.49	17.1	D
Total	II		152.2	97.0	249.2	1.56	22.5	C

Arterial Level of Service: SB Buckwalter Pkwy

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Cinema South	II	45	43.2	23.3	66.5	0.49	26.6	C
Sea Turtle South	II	45	33.7	1.4	35.1	0.35	36.0	A
Buckwalter Tn Cntr D	II	45	24.3	22.3	46.6	0.22	17.2	D
Bluffton Pkwy Phase	II	45	30.1	54.1	84.2	0.30	13.0	E
Total	II		131.3	101.1	232.4	1.37	21.2	D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