

US 278 Corridor Independent Review

Beaufort County, South Carolina

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DRAFT



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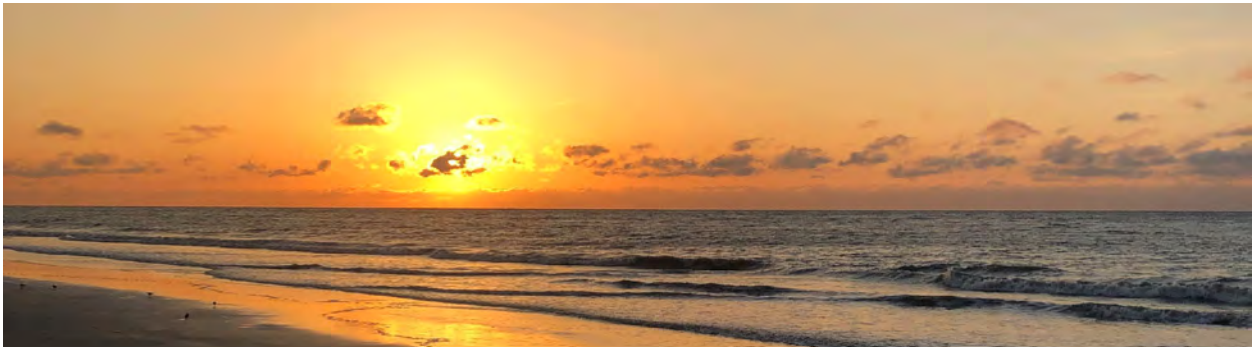


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Major Study Findings

CBB conducted an independent review and address several questions:

1. Is widening US 278 to six-lanes necessary?
2. Will the SCDOT project create downstream traffic impacts outside of the SCDOT project area?
3. Are SCDOT's future year forecasts reasonable?
4. Could strategies such as enhancing the local public transportation system, deploying adaptive traffic signals, and/or implementing Intelligent Transportation Systems (ITS) address congestion without widening US 278 to six lanes?
5. How will the SCDOT project impact non-motorized users?

Using a data-driven approach, CBB addressed the questions above through the following major tasks:

1. Reviewed previous studies,
2. Reviewed US Census Journey to Work and Hilton Head Chamber of Commerce visitor data.
3. Studied historical SCDOT traffic count data.
4. Completed field studies including traffic counts, travel pattern/traffic queue observations, and travel time runs.
5. Constructed a VISSIM model, which is a micro-simulation traffic flow model that specializes in the analysis of complex transportation systems. VISSIM evaluates all elements of the roadway system (e.g., freeways, ramps, intersections) and how these elements operate as a system. For example, VISSIM incorporates traffic dynamics such as platooning caused by nearby signals and upstream traffic flow restrictions. This VISSIM analysis expanded upon previous studies by including Business US 278 to Indigo Run and the Cross Island Parkway to the Sea Pines Circle.
6. Evaluated the bicycle and pedestrian infrastructure on Hilton Head Island and Bluffton.
7. Studied the local transit systems.
8. Reviewed the use of adaptive traffic signals and Intelligent Transportation Systems (ITS).

The major independent review findings are listed below and discussed in detail throughout the report.

1. **The widening of US 278 to six-lanes is necessary to accommodate existing and future traffic accessing Hilton Head Island. US 278 is already operating at capacity during both the morning and evening peak periods.** The result is significant congestion, which impacts travel time and travel time reliability. Congestion will continue to get worse as traffic volumes continue to grow. Read more at: Queue Observations, Page 32 and 2023 No-Build Operations, Page 57.

- a. **AM Traffic Peak:** The morning traffic peak congestion impacts the ability for workers to access jobs on Hilton Head Island, as more than 60% of the island's workforce uses US 278 for their daily commute. Although there has been a post-COVID shift in the ability for many people to work from home, those working in sectors such as the service industry, health care, and construction still need to commute to work. The heavy traffic congestion during the morning peak period adds travel time to these workers' daily commutes.

During the morning peak hour, there is a heavy flow of traffic on eastbound US 278 onto Hilton Head Island. Eastbound US 278 traffic queues from Squire Pope Road to past the Bluffton Parkway interchange. This queue is caused by insufficient capacity at the eastbound US 278 approach at Squire Pope Road. Traffic is fed onto eastbound US 278 from both US 278 to the west of Bluffton and from the Bluffton Parkway such that US 278 is at capacity east of the Bluffton Parkway interchange merge. The Squire Pope Road intersection includes 3 eastbound lanes, but the third through lane is added immediately

at the intersection. It is only approximately 100 feet long, and it is underutilized. The morning peak eastbound queue starts at this location because it is the first capacity constraint on the island.



FIGURE 1: TYPICAL EASTBOUND MORNING PEAK TRAFFIC CONGESTION NEAR BLUFFTON

- b. **PM Traffic Peak:** The evening traffic peak impacts workers and visitors alike. The evening traffic peak is significantly congested, and travel times can be highly variable from day to day. For example, a weather event can impact the travel choices of daytime visitors, changing traffic loading onto US 278. Not only does the heavy traffic congestion during the evening peak period add travel time to workers' daily commutes, but the variability in travel time from day to day impacts the ability for workers to plan after-work activities, such as attending events with family and friends.

During the evening peak hour, there is a heavy flow of traffic on westbound US 278 off the island. The westbound US 278 queue from Squire Pope Road reaches past the Museum Street intersection. This queue is caused by insufficient capacity at the westbound US 278 approach at Squire Pope Road. The basic issue is that traffic from the 3 lanes on westbound Business US 278 and traffic from the 2 lanes on northbound Cross Island Parkway are condensed into only 2 westbound lanes through the traffic signal.

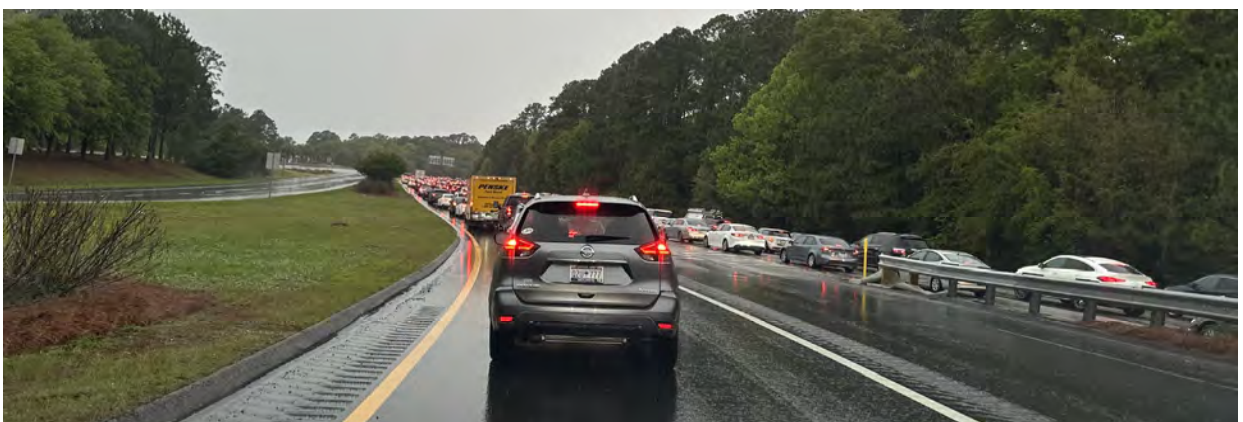


FIGURE 2: TYPICAL NORTHBOUND EVENING PEAK TRAFFIC CONGESTION ON CROSS ISLAND PARKWAY

- VISSIM modeling confirms that the proposed SCDOT US 278 Corridor Improvements will increase roadway capacity, reducing congestion and improving travel time reliability during the morning and evening traffic peak periods.** CBB constructed a VISSIM model for this evaluation. VISSIM is a micro-simulation traffic flow model used to evaluate complex transportation systems. VISSIM evaluates roadway elements as a system (e.g., freeways, ramps, intersections). For example, VISSIM incorporates dynamics such as platooning of vehicles caused by nearby signals and upstream traffic flow restrictions. The VISSIM analysis also expanded upon previous studies by including Business US 278 to Indigo Run and the Cross Island Parkway to the Sea Pines Circle.



FIGURE 3: EXAMPLE VISSIM SCREENSHOT AT CROSS ISLAND PARKWAY INTERCHANGE

- CBB provides two additional recommendations that would augment the project’s effectiveness.

Gumtree Road: The intersection of Gumtree Road/Business US 278 should be restriped with 3 eastbound through lanes as a local project in conjunction with the proposed US 278 widening.

Prior to 2012, the intersection of Gumtree Road/Business US 278 was striped with three eastbound through lanes. In the 2012-2014 timeframe, this intersection was restriped with two eastbound through lanes when crosswalks were added at the intersection. During the morning peak period, the intersection operates at capacity and the eastbound traffic queues back past the Cross Island Parkway bridges. When US 278 is widened, more traffic will be able to access this intersection during the peak periods, and the intersection will become a bottleneck if left in its current configuration. This intersection should be restriped with three eastbound through lanes to accommodate the additional traffic. It appears that this modification can be made in such a way that retains the pedestrian crosswalk, without degrading pedestrian safety, and not increasing the physical footprint of the intersection. However, design work is required to determine the best way to make the improvement.



FIGURE 4: TYPICAL EASTBOUND MORNING TRAFFIC QUEUES AT GUMTREE ROAD

Sea Pines Circle: The Sea Pines Circle currently operates at capacity and with significant congestion during both the morning and evening traffic peak periods. The congestion at this intersection impacts the attractiveness of the Cross Island Parkway as an alternative to Business US 278. Congestion at the Sea Pines Circle makes the travel times longer for traffic using Cross Island Parkway, as most of the trips using the Cross Island Parkway need to go through this intersection. At the same time, this intersection provides critical access to the public beach area, to Sea Pines, and to Business US 278 on this part of the Island. In this role, the Sea Pines Circle serves as a gateway, slowing and calming traffic accessing these areas.



FIGURE 5: TYPICAL SOUTHBOUND MORNING TRAFFIC QUEUES NEAR TARGET ROAD FROM SEA PINES CIRCLE

For this study, we modeled the Sea Pines Circle as a traffic signal 1) to explore if a traffic signal would be able to accommodate traffic demands at this location and 2) to remove the Sea Pines Circle as a bottleneck in the model. Removing this bottleneck is necessary for the traffic from this area to reach other study intersections. ***This study does not recommend reconstruction of this intersection to a traffic signal. Our recommendation is for the local community to consider options to improve the capacity of the Sea Pines Circle intersection while, if possible, maintaining it as a gateway to slow traffic transitioning from the Cross Island Parkway to the local roadway network.***

The local community should consider options to improve the capacity of the Sea Pines Circle intersection while, if possible, maintaining it as a gateway to slow traffic transitioning from the Cross Island Parkway to the local roadway network. We understand that the Town of Hilton Head is currently studying ways to improve this intersection. Read more at: 2023 Gumtree Road and Sea Pines Improvements Operations, Page 78.

4. **CBB agrees that SCDOT's future year forecasts are reasonable and consistent with historical growth trends and ongoing local development. The proposed SCDOT improvements will have a long-term benefit for the Hilton Head Island community by increasing the traffic capacity of US 278 and improving traffic operations.** Read more at: Traffic Forecasts, Page 98 and Future Growth Analysis, Page 103.
5. **Given finding 4 above, there is a limit on how much future traffic growth can be accommodated by the proposed project. Slowing the future growth of traffic on US 278 will extend the road's long-term functionality. The Hilton Head community can proactively slow future traffic growth through Travel Demand Management (TDM) strategies.**

An example of a tourist-oriented community that is proactively promoting TDM is Summit County, Colorado. Summit County is home to several popular ski resorts like Arapahoe Basin, Breckenridge, Copper Mountain, and Keystone, which bring many visitors each year.



FIGURE 6: THE BREEZE TROLLEY SYSTEM MAP

There has been a significant growth in traffic both in the Summit County region and on I-70, which is the primary highway connecting Summit County to the Denver community and to Colorado's front range. I-70 is often congested during the winter months with people driving to Summit County and other regional ski resorts. One way in which Summit County is dealing with this traffic is with the Summit Stage, the area's transit system. This system began in 1977 initially as a service for moving skiers from their lodgings to the slopes. Due to the popularity of the system, Summit County has continuously expanded the system. Today, the system includes 28

buses and is used by both tourists coming to ski and commuters who live in the area and work at the area's ski resorts. The transit system has become a popular way to get around with ridership steadily increasing over the years. Ridership has grown from around 432,000 annual trips in 1992 to around 1.7-1.9 million annual trips today, making Summit Stage the second busiest rural transit system in Colorado. ***This program could be an example for the Hilton Head community to look at as it develops its own TDM strategy.***

We see opportunities for the Hilton Head community to create functional and attractive alternatives to single vehicle travel through investments in programs that promote public transportation/shuttles, micro-mobility (e.g., e-bikes), and park-and-ride/car-pool systems. ***Hilton Head Island already has the foundational elements for these types of systems to build upon.***

Based on our analysis and discussions with Palmetto Breeze, we offer several short-term recommendations to improve the transit service to and on Hilton Head Island. ***These enhancements would leverage the island's robust bicycle/pedestrian network and the proposed SCDOT US 278 multi-use path for a robust multi-modal transportation system that provides travel options. Short term recommendations include:***

- Secure a dedicated local transit sales tax to provide stable and increased funding.
- Establish strategic park-and-ride locations to allow visitors to "park once" and then use other travel modes to get around the island, lessening the number of automobile trips taken.
- Explore a design that would support a future bus-on-shoulder program with SCDOT.
- Provide better connections between the Breeze Trolley and other local routes such as the Bluffton Breeze and Sea Pines Trolley to increase the range of travel for transit riders.
- Increase marketing/branding to increase awareness of transit options.
- Develop a dial-a-ride service to provide a direct service for people to get to work.
- Develop new routes to untapped ridership markets, particularly retirement communities.
- Work with partners, such as the business community, to encourage transit ridership.
- Provide quality transit service to Hilton Head Island airport.

Note – Travel Demand Managing strategies, like transit expansion, will not eliminate the need for the SCDOT US 278 Corridor Improvements project. TDM strategies should be used alongside the project to help extend the project's functional life. Read more at Extending the Life of Improved US 278, Page 111.

6. Operational Improvements, such as adaptive traffic signal systems and Intelligent Transportation Systems (ITS), make traffic flow better and enhance the ability of system operators (DOT staff and emergency responders) to respond to incidents and optimize traffic management. These systems should be pursued and implemented where appropriate. ***The Town of Hilton Head Island is currently deploying an adaptive traffic signal system that will be operational in 2023.*** ITS deployments will not negate the need for the SCDOT US 278 Corridor Improvements project, but they will help system operators maximize the benefits from this investment.

Introduction

CBB Transportation Engineers + Planners (CBB) has completed an independent review of the South Carolina Department of Transportation’s (SCDOT) US 278 Corridor Improvements Environmental Assessment (EA) to evaluate the long-term mobility performance of the SCDOT preferred alternative.

Background

As shown in **Figure 7**, the SCDOT EA Preferred Alternative widens US 278 to six lanes between Salt Marsh Drive and the Cross Island Parkway with a new right-in/right-out interchange at the Pickney Island National Wildlife Refuge, minor intersection improvements between Salt Marsh Drive and Gumtree Road, and a new multi-use path from the east end of the Skull Creek Bridge to Spanish Wells Road.

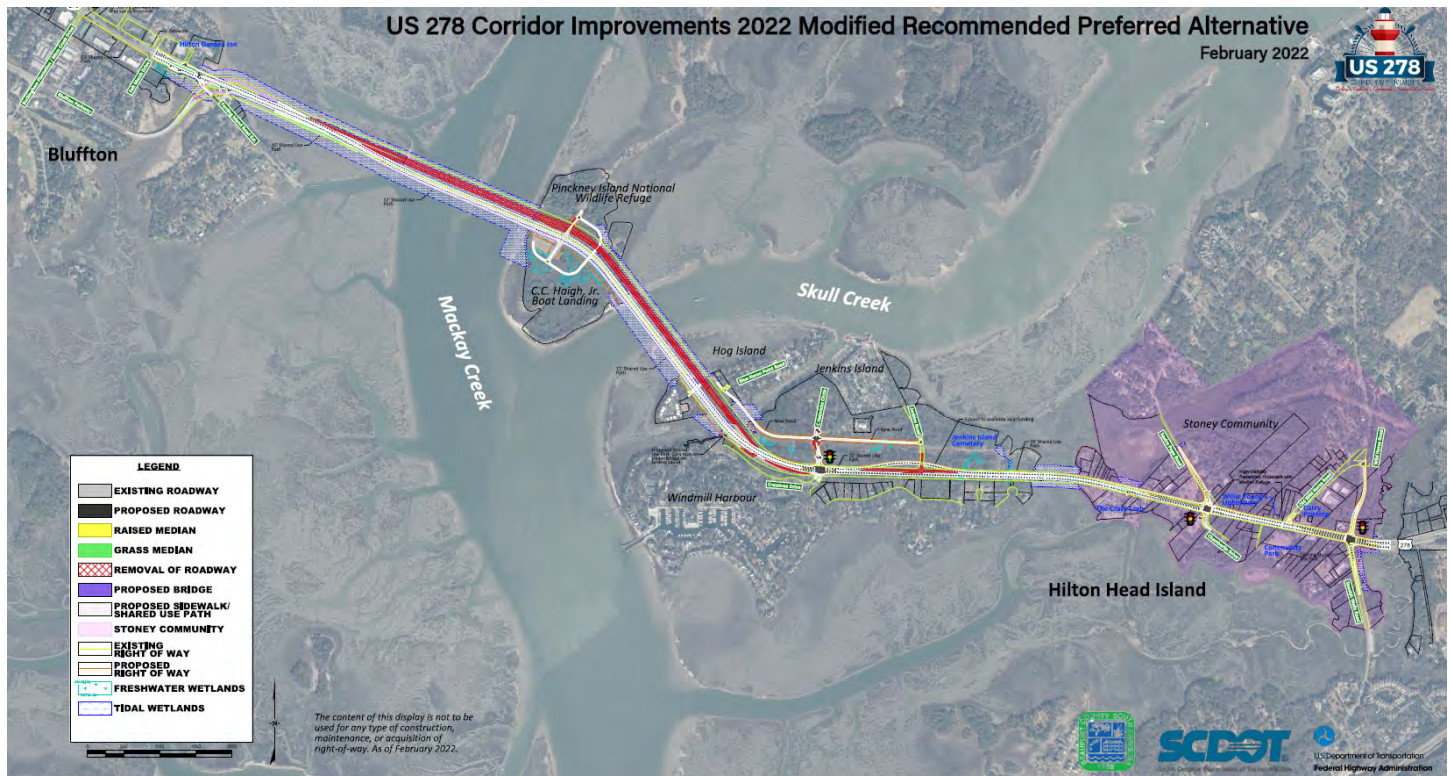


FIGURE 7: SCDOT PROJECT AREA

Specifically, and as stated in the EA:

The Mackay Creek bridges are located along US 278 and connect the Moss Creek area on the Bluffton side (mainland) to Pinckney Island National Wildlife Refuge (PINWR). The bridge that carries US 278 eastbound lanes over Mackay Creek is 2,190 feet in length and was constructed in 1956. The bridge that carries US 278 westbound lanes over Mackay Creek is 2,231 feet in length and was constructed in 1983. The roadway width, curb to curb, on the eastbound and westbound bridges is 36.1 feet. The Skull Creek bridges are located along US 278 and connect Pinckney Island to Hilton Head Island. The bridges carrying US 278 eastbound and westbound over Skull Creek are 2,821.9 feet in length and were constructed in 1982. The roadway width, curb to curb, on the eastbound and westbound bridges is 36.1 feet. Mackay Creek and Skull Creek are primarily used by recreational vessels. Public boat ramps and private docks are located along both creeks.

Project Purpose: The purpose of this project is to address structural deficiencies at the existing eastbound Mackay Creek bridge and reduce congestion within the project study area (PSA). An alternative would successfully reduce congestion if it would decrease travel delays within the US 278 corridor relative to the 2045 No Build condition during peak traffic hours. While the original purpose of this project was to replace the structurally deficient eastbound Mackay Creek Bridge, at the request of Beaufort County, the project was expanded to include improvements throughout the corridor between Moss Creek Drive and Wild Horse/Spanish Wells Road. The eastbound Mackay Creek bridge (traveling to Hilton Head Island) would be replaced as part of the South Carolina Department of Transportation (SCDOT) bridge replacement program. The other three bridges in the PSA - the westbound bridge over Mackay Creek and the eastbound and westbound bridges over Skull Creek - have also been identified for potential improvements. In addition, access to Pinckney Island National Wildlife Refuge (PINWR) and the C.C. Haigh, Jr. Boat Landing have also been considered for possible improvements.

Project Need: The Mackay Creek bridge was built during the 1950s and is scheduled for replacement as part of SCDOT's bridge replacement program. However, based on discussions with local officials, the scope of the proposed bridge replacement project was expanded to include the US 278 Corridor from Moss Creek Drive to Wild Horse/Spanish Wells Road to address traffic congestion within the project limits. A traffic analysis was used to determine base year conditions and to analyze future needs. The need for this project is derived from the following factors: Growth in population and employment and Decreased mobility and increased traffic congestion.

In 2021, the consulting firms MKSK and HDR completed an independent review of the US 278 Corridor Improvements EA on behalf of Beaufort County and the Town of Hilton Head Island. Overall, the independent review found SCDOT's project to be reasonable. For the review, MKSK and HDR completed a SimTraffic analysis which indicated that extensive queueing would occur if US 278 was not widened from four to six lanes. A crash analysis was also completed and indicated a need for a reduction in vehicular conflict points and congestion. The independent review also agreed with SCDOT's decision to not pursue a reversible lane, agreed with SCDOT's alternative analysis methodology, and agreed that the preferred alternative meets the purpose and need of the project. When exploring other opportunities for intersection improvements within the project corridor, the independent review recommended using two-phase signals on US 278, limiting conflict points at intersections, setting a 45-mph speed limit on US 278 through the study area, and providing bike, pedestrian, and bridge aesthetic enhancements.

SCDOT's preferred alternative has since been refined to further avoid environmental impacts and enhance safety. Modifications that have been made to the preferred alternative include: (1) removing the Jenkins Road intersection and rerouting to C. Heinrichs Circle, (2) adding dual left-turns from US 278 onto Squire Pope Road, (3) retaining left-turns from US 278 at Wild Horse Road and adding dual left-turns at Spanish Wells Road, (4) reducing the width of the inside four lanes between the Crazy Crab and Spanish Wells Road along the Stoney Community, meandering the westbound lanes of US 278 on Jenkins Island to create a parkway effect, and (6) adding a scenic look-out point along the multi-use path over each creek.

Study Purpose

In 2023, Beaufort County contracted with CBB to conduct an independent review and address several questions:

6. Is widening US 278 to six-lanes necessary?
7. Will the SCDOT project create downstream traffic impacts outside of the SCDOT project area?
8. Are SCDOT's future year forecasts reasonable?
9. Could strategies such as enhancing the local public transportation system, deploying adaptive traffic signals, and/or implementing Intelligent Transportation Systems (ITS) address congestion without widening US 278 to six lanes?
10. How will the SCDOT project impact non-motorized users?

CBB employed a data-driven approach to evaluate the transportation network as a complex system serving multiple users and unique traffic patterns. We addressed the questions above through the following major tasks:

9. Reviewed previous studies (e.g., 2021 US 278 Corridor Improvements EA and associated documents and the 2021 independent review).
10. Reviewed Journey to Work data from US Census Bureau and visitor data from the Hilton Head Chamber of Commerce.
11. Studied historical SCDOT traffic count data to understand the patterns and variations of traffic flow using the US 278 bridges.
12. Conducted a field visit, collected traffic counts, observed traffic patterns and queues, and completed travel time runs in March 2023.
13. Constructed a VISSIM model, which is a micro-simulation traffic flow model that specializes in the analysis of complex transportation systems. VISSIM evaluates all elements of the roadway system (e.g., freeways, ramps, intersections) and how these elements operate as a system. For example, VISSIM incorporates traffic dynamics such as platooning caused by nearby signals and upstream traffic flow restrictions. This VISSIM analysis expanded upon previous studies by including Business US 278 to Indigo Run and the Cross Island Parkway to the Sea Pines Circle. The intersections included in this VISSIM model are shown in **Figure 8**.
14. Evaluated the bicycle and pedestrian infrastructure on Hilton Head Island and in the Bluffton community to identify ways in which the proposed US 278 multi-use path can connect to existing infrastructure and enhance mobility options for people traveling to and from Hilton Head Island.
15. Studied the local transit systems to identify opportunities to enhance connectivity to Hilton Head Island through public transportation.
16. Commented on the ability of adaptive traffic signals and ITS to address capacity and mobility deficiencies on US 278.



FIGURE 8: CBB STUDY AREA

Review of Demographic and Trip Data

As a starting point for our analysis, we explored the Hilton Head Island Chamber of Commerce, US Census, and SCDOT count station data to better understand travel patterns on US 278. This analysis helped us to gain an understanding of who uses US 278 and is impacted by its congestion. It also provides an understanding of how travel patterns on US 278 vary throughout the year. Given the nature of Hilton Head Island as a recreation and vacation destination, we know that people traveling on US 278 are a mixture of residents, workers, and visitors.

Hilton Head Island Chamber of Commerce Visitor Data

Figure 9 provides monthly visitor data for the years 2018-2023. This data shows that tourist activity varies between 150,000 visitors to over 300,000 visitors per month, with peak season occurring during the summer months. Hilton Head Island hosted over 3,000,000 visitors in 2021 and 2022. The data also shows a growing number of visitors year over year from the 2018 to 2023 period.

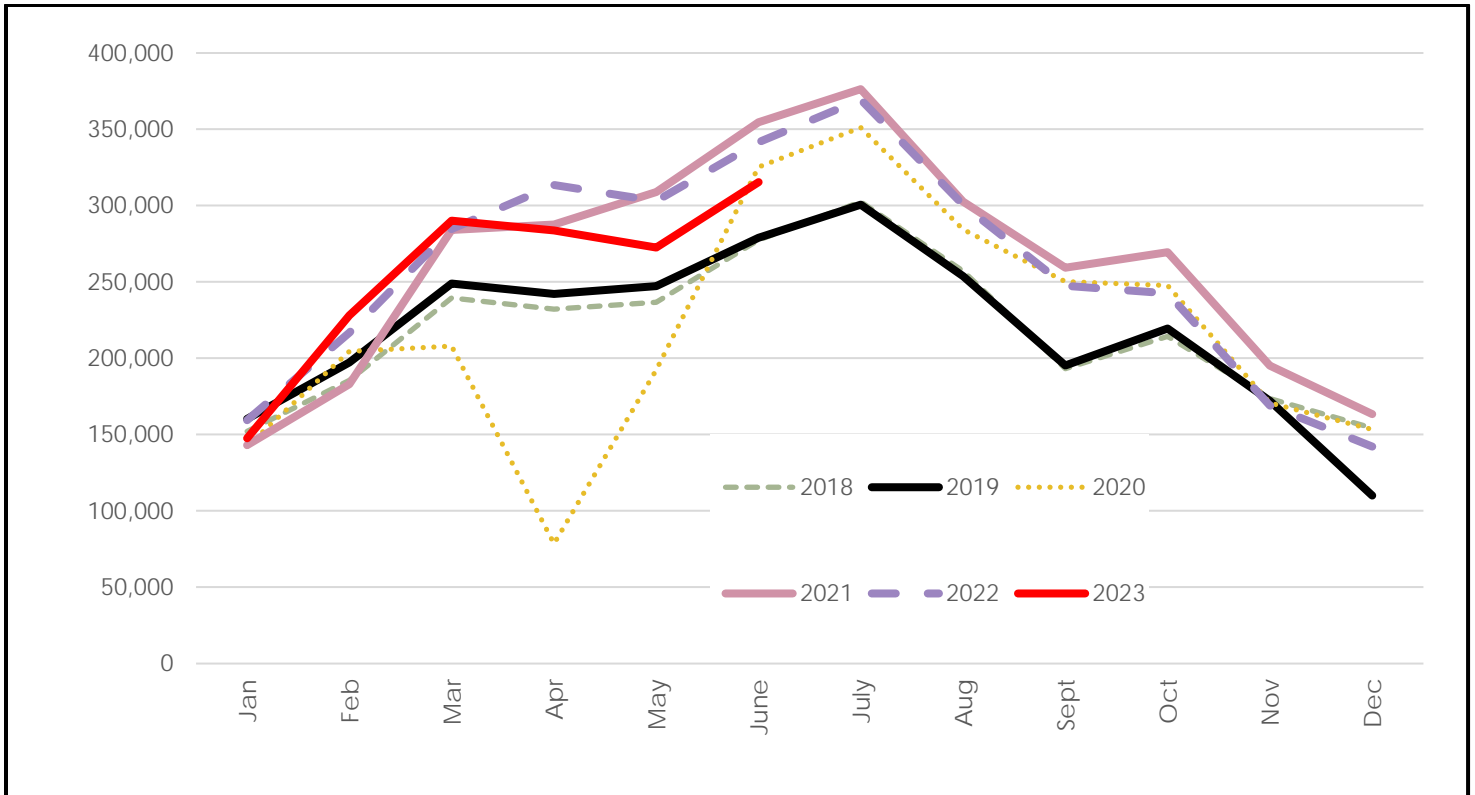


FIGURE 9: HILTON HEAD ISLAND VISITORS BY MONTH¹

US Census Workforce Journey to Work Data

A review of US Census Bureau data shows that there were 23,321 jobs on Hilton Head Island in 2019². **Of these, 36% of the workers were reported to live on Hilton Head Island and 64% of the workers were reported to live on the mainland.** A US Census Bureau distribution of where Hilton Head workers live is shown in **Figure 10**.

¹ Hilton Head Island Chamber of Commerce

²<https://onthemap.ces.census.gov/>

Counts of All Jobs from Work Selection Area to Home Places (Cities, CDPs, etc.) in 2019
All Workers

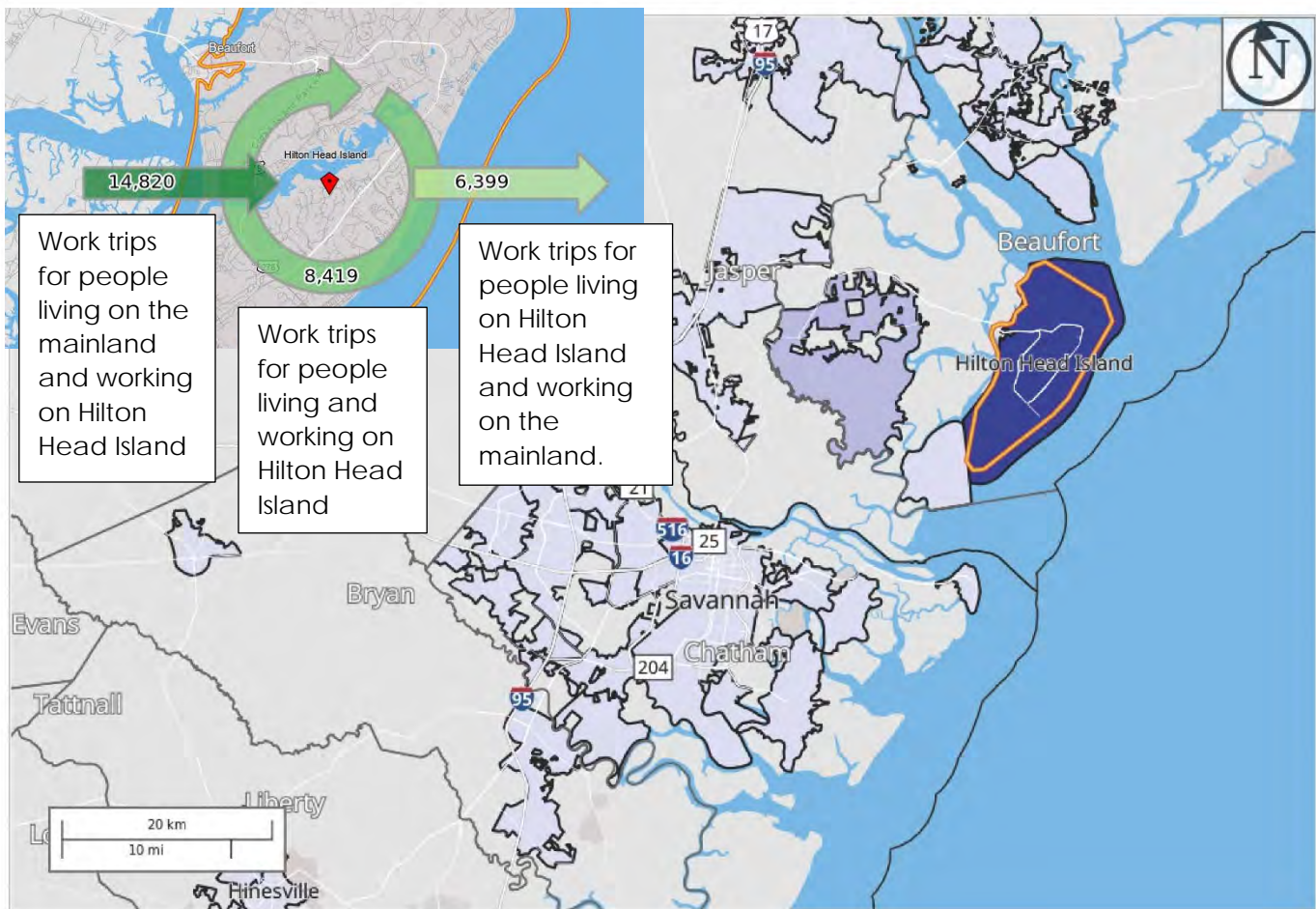


FIGURE 10: US CENSUS JOURNEY TO WORK DATA FOR HILTON HEAD WORKFORCE

The number of overall workers commuting to Hilton Head Island from the mainland is likely underreported because it does not include the many jobs that have a business address on the mainland, but which perform services on Hilton Head Island (e.g., landscape and construction). In our observations, we saw many work vehicles during the morning commute that fit this category (see **Figure 11**).

Looking at the US Census data, we know that more than **50% of the jobs on Hilton Head Island are jobs related to accommodation, food service, retail trade, construction, and health care**. These types of jobs are typically in-person and schedule driven. This data, combined with observations made during our field visit, supports the conclusion that the existing morning traffic peak congestion is largely workforce driven. The early morning traffic has a significant number of workers going to their jobs on Hilton Head Island. Similarly, the evening traffic peak congestion is also largely driven by workers, but with a greater influence from visitors and other non-working trips.



FIGURE 11: MORNING WORK VEHICLES ON EASTBOUND US 278 HEADING TO HILTON HEAD ISLAND

SCDOT Count Station Data

We also reviewed the variability of traffic accessing Hilton Head Island throughout the year to assess the extent to which the peak tourist season drives traffic congestion. To complete this analysis, we obtained 2022 daily and hourly traffic volume data from a SCDOT count station on US 278³. This analysis helps to choose a “design travel day” for the VISSIM traffic modeling. This design day should be representative of a “heavy traffic day” but not the “heaviest traffic day” of the year. If the corridor were designed to accommodate the heaviest peak hour volumes that occur over the year, the system would be overbuilt for much of the year. This would lead to the need for an unnecessary roadway footprint and impacts on the local community. If the corridor were designed to accommodate the average of the peak hour volumes over the year, the system would be over capacity for approximately half of the year. Given this, we sought to use the “85th percentile day” as a representative design threshold for traffic volumes.

Figure 12 provides the daily traffic volumes for every weekday in 2022. Total annual US 278 volumes are just over 20,000,000 trips per year. The plot shows that traffic volumes generally ranged from 53,000 vehicles per day to nearly 70,000 vehicles per day. The R value for this data is 0.0083. The R value is a measure of consistency in the data. The closer the R value is to 1, the more consistent the data. This plot shows that daily traffic volumes are heaviest corresponding with the March through August tourist season. The low count in late September coincides with Hurricane Ian’s landfall in South Carolina.

³ <https://scdottrafficdata.drakewell.com/publicmultinodemap.asp>

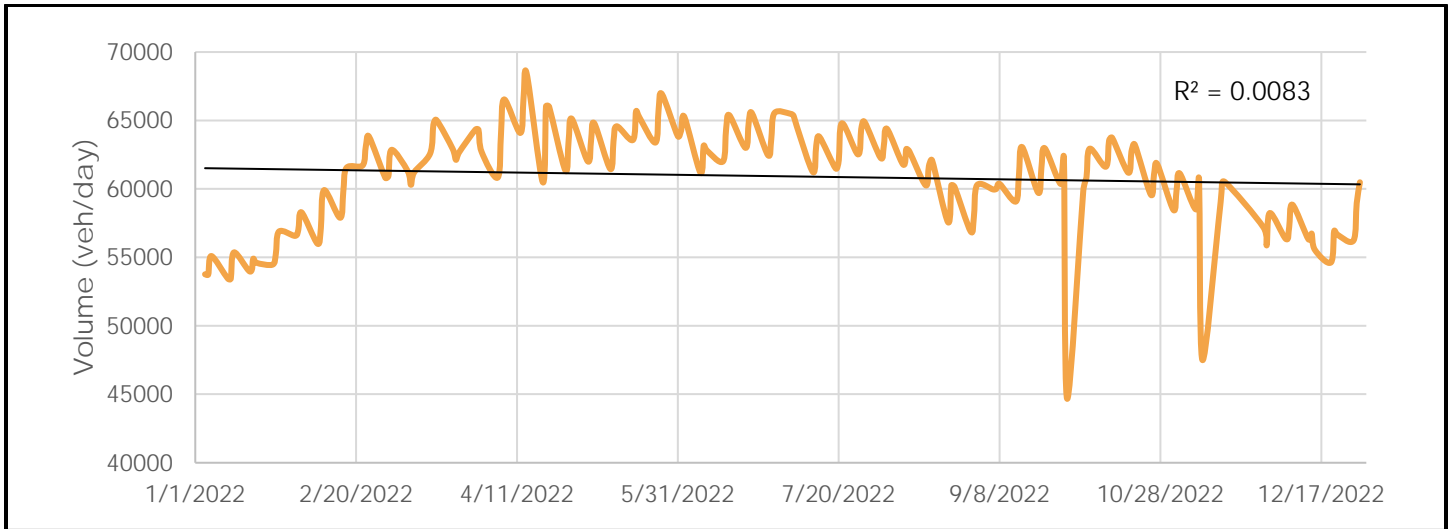


FIGURE 12: 2022 US 278 DAILY TRAFFIC VOLUMES

Figure 13 provides the morning peak hour traffic volumes for eastbound traffic for every weekday in 2022. Eastbound is the predominant direction for the morning peak traffic. The plot shows that traffic volumes generally ranged from 2,400 vehicles per hour (vph) to 2,800 vph. The R value for this data is 0.0614, indicating a greater degree of consistency as compared to the daily traffic in **Figure 12**. This is consistent with both 1) the morning peak period being largely influenced by work trips and 2) the morning peak period being congested. Congested facilities operating at capacity tend to display greater consistency.

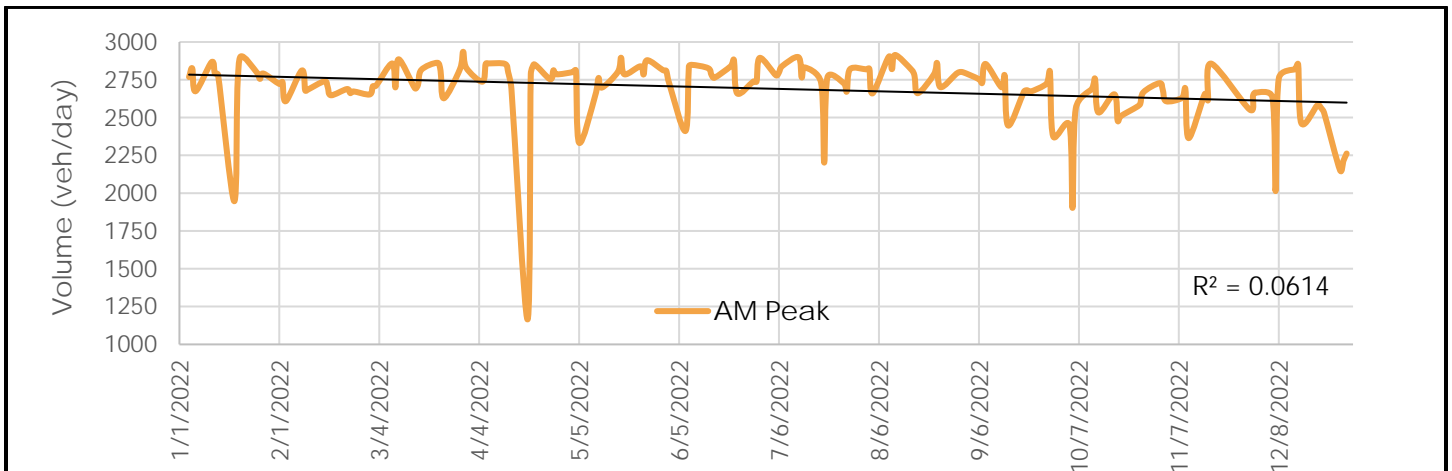


FIGURE 13: 2022 US 278 AM PEAK HOUR EASTBOUND TRAFFIC VOLUMES

Figure 14 provides the evening peak hour traffic volumes for westbound traffic for every weekday in 2022. Westbound is the predominant direction for the evening peak traffic. The plot shows that traffic volumes generally ranged from 2,700 vehicles per hour (vph) to 3,200 vph. The R value for this data is 0.0229, indicating a greater degree of consistency as compared to the daily traffic in **Figure 12**, but less consistency as compared to the morning peak traffic shown in **Figure 13**. This is consistent with the evening peak period being largely influenced by work trips but with a greater influence from other types of trips. Anecdotally, we heard that occurrences such as weather events can also have a significant impact on evening peak traffic. An afternoon rainstorm can send people home from the beaches, increasing the number of people seeking to leave the island during evening peak traffic.

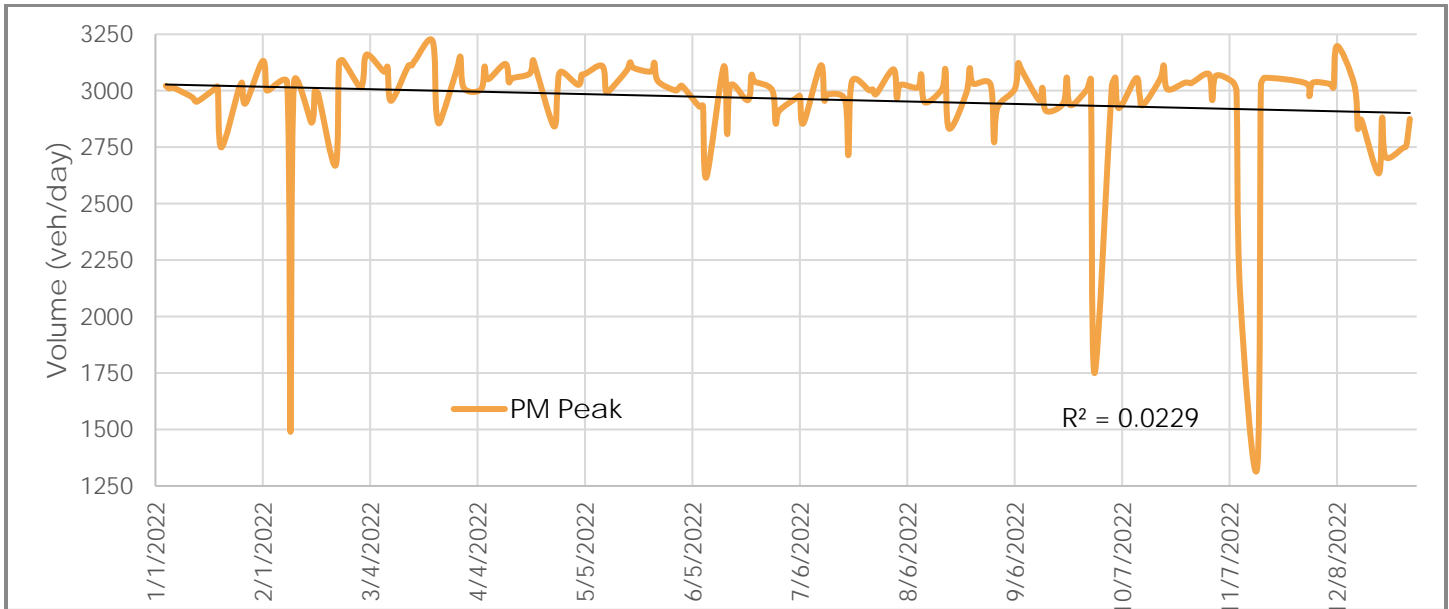


FIGURE 14: 2022 US 278 PM PEAK HOUR WESTBOUND TRAFFIC VOLUMES

In summary, this data shows the following:

- The Hilton Head Island Chamber of Commerce estimates that Hilton Head Island hosts around 3,000,000 visitors per year. While we do not have data on how many trips to Hilton Head Island are made by these visitors, if we assume that there is an average of 3 people per vehicle and 2-4 trips per visit (1-2 trips onto the island and 1-2 trips off the island), that equates to approximately 2,000,000-4,000,000 trips per year.
- Total annual bridge US 278 volumes are just over 20,000,000 trips per year. Based on this and the visitor data, we would estimate that approximately 10-20% of the annual trips are made by the 3,000,000 people visiting the island annually.
- US Census shows 23,321 jobs on Hilton Head Island, with 36% of the workers living on Hilton Head Island and 64% of the workers living on the mainland. More than 50% of these jobs are jobs related to accommodation, food service, retail trade, construction, and health care, which are typically in-person and schedule driven.
- A combination of this data supports the conclusion that the existing morning traffic peak congestion is largely workforce driven. The early morning traffic has a significant number of workers going to their jobs on Hilton Head Island. Similarly, the evening traffic peak congestion is also largely driven by workers, but with a greater influence from non-working trips. This trip pattern is consistent with trip patterns across the United States.
- The consistency of the peak period volumes throughout the year supports the use of March for the “design travel day”. The morning and evening peak period traffic is relatively consistent throughout the year, presenting less of a risk in either over-designed or under-designed the facility for the various needs during different times of the year. Consistent peak period traffic volumes throughout the year suggest that improvements recommended by an analysis of the “design travel day” will be appropriate to meet the corridor’s needs throughout the year.

Public Transportation

As a next step, we reviewed the local public transportation systems to understand the role that they play in local mobility and explored opportunities for transit to absorb a portion of the future travel growth. Transit service within the Town of Hilton Head Island and its vicinity includes both public and private entities. The public transit service provider is Palmetto Breeze, who offers bus services to all members of the public, to tourists, and to commuters across the Lowcountry Region. Private transit is offered by a variety of different small operators, but the biggest and most viable private transit system is the Sea Pines Trolley, though it only offers service around the Sea Pines resort. The Sea Pines Trolley is considered a private transit service because it is funded by the private company that manages the Sea Pines resort and is only concerned with offering transportation services to those who have been granted access to the resort, which are primarily tourists. Sea Pines requires that all visitors (and, by circumstance, users of the Sea Pines Trolley system) either have accommodations on the Sea Pines resort property or pay an entry fee to access the resort. The following sections provide an overview of both the public transit in the Town of Hilton Head as well as the private Sea Pines Trolley system.

Palmetto Breeze

Palmetto Breeze is operated by the Lowcountry Regional Transportation Authority. It is the only public transportation system for the Town of Hilton Head Island and the greater Lowcountry region, including Beaufort, Jasper, Hampton, Allendale, and Colleton Counties. Currently, Palmetto Breeze has about 40 buses in its fleet and 60 employees service wide. There are 19 routes serving the Lowcountry region, with 10 routes providing service to and/or within the Town of Hilton Head Island. Two routes are currently suspended while they are being redesigned.

Palmetto Breeze routes can fall into one of three categories: commuter, local, and shuttle. The commuter routes run twice per day- once for the morning commute and once for the evening commute. Most of the commuter routes are designed to bring employees to Hilton Head Island from communities throughout the Lowcountry region. The morning buses begin their route with the stop furthest away from Hilton Head. There is one bus per route. Most routes are timed to reach a transfer center in Bluffton at about the same time. At that point, passengers can transfer among each of the different routes before each bus continues its journey to Hilton Head Island, leaving the transfer center at the same time. Each of these routes has two, three-digit identifying numbers. Routes on the Hilton Head side of the transfer center begin with an 8XX while routes on the other side begin with 3XX. The other two digits are the same for each route. Most of the commuter buses are also equipped with bike racks on the front to allow passengers to store their bikes if needed.

The second type of routes are local routes. Local buses operate on shorter fixed routes. Like the commuter routes, most local routes only operate twice per day. However, Breeze routes (the Bluffton Breeze and the Breeze Trolley) operate throughout the day. Local buses generally operate in denser parts of the Lowcountry area, particularly the Bluffton Breeze and Breeze Trolley.

The third type of routes are shuttle routes. These routes are short, fixed routes, generally with only a couple of stops. Most shuttles are tourist-oriented, like the Coligny Beach Parking Shuttle which provides service between Coligny Beach and an overflow parking lot. However, some shuttles serve other groups, like the USCB Sand Shark Shuttle which transports USCB students between the Bluffton and Beaufort campuses. **Figure 15** provides a map of the system and **Figure 16** provides an overview of the current routes.



FIGURE 15: PALMETTO BREEZE SYSTEM MAP

Route Number	Name	Type	Serves Hilton Head Island?	Status
302/802	St. Helena/Beaufort to Hilton Head	Commuter	Yes	Active
307/807	Gifford to Hilton Head	Commuter	Yes	Active
308	Pineland/Ridgeland to Hilton Head	Commuter	No	Active
309	Big Estate/Sheldon to Hilton Head	Commuter	No	Active
310/810	Fairfax/Hampton to Hilton Head	Commuter	Yes	Active
311/811	Allendale to Hilton Head	Commuter	Yes	Active
320/820	Ruffin/Walterboro to Hilton Head	Commuter	Yes	Active
429	Walterboro Works	Local	No	Active
501	Sheldon/Seabrook to Beaufort	Local	No	Active
502	St. Helena Island to Beaufort	Local	No	Active
503	Bluffton to Hilton Head Island	Local	Yes	Suspended
507	Mariott Resorts Shuttle	Local	Yes	Suspended
508	USCB Sand Shark Shuttle	Shuttle	No	Active
509	Daufuskie Ferry Shuttle	Local	No	Active
511	Bluffton Breeze	Local	No	Active
702	Beaufort Loop	Local	No	Active
804	Bluffton – RSI/Buckwalter	Local	No	Active
863	Bluffton to Palmetto Bluff	Shuttle	No	Active
505	Breeze Trolley	Local	Yes	Active
510	Coligny Beach Parking Shuttle	Shuttle	Yes	Active

FIGURE 16: PALMETTO BREEZE BUS ROUTES

Part of the reason that the Palmetto Breeze has limited service is because it lacks a stable, dedicated funding source. Instead, it is funded through grants. Nearly half of Palmetto Breeze’s fixed route operating funds are provided through the Federal Transit Administration (FTA) 5307 and 5311 grants, which aid with transportation-related planning in urban (5307) and rural (5311) areas. The other half of the funding comes from primarily local sources, including the Town of Hilton Head Island and the City of Beaufort.

Sea Pines Trolley

In addition to the public transportation offerings, there is also a small transit network within the Sea Pines resort, privately run by the resort operator. Due to the expansive size of the Sea Pines resort, the Sea Pines Trolley operates three fixed routes seasonally from May to December. **Figure 17** provides a map of the Sea Pines Trolley system. The trolleys are free to ride, though there is a fee to enter the resort for anyone not staying in the Sea Pines Resort.



FIGURE 17: SEA PINES TROLLEY NETWORK

CBB Observations and Site Visits

To make first-hand observations and gather more detailed information on transit in Hilton Head Island, CBB staff conducted a site visit from March 27-29 in 2023. CBB also conducted a virtual interview with Palmetto Breeze Executive Director and General Manager Mary Lou Franzoni on April 12, 2023. These experiences allowed CBB staff to better tell the story of transit in Hilton Head Island and provide recommendations for how it can play a significant role in addressing the congestion challenges present along US-278.

CBB staff first investigated the current transfer center in Bluffton, which is a product of the *Palmetto Breeze Small Urban Area Transit Development Plan* approved in 2018. All morning and afternoon commuter routes pass through the transfer center at approximately the same time. During the morning commute, this allows passengers commuting in on each of the various commuter routes to transfer to the bus that will provide continuing service closest to their destination in Hilton Head. The opposite occurs in the afternoon. The commuter bus routes operate on a hub and spoke system, with the transfer center being the hub.

Due to budgetary constraints, the transfer center has been combined with the Palmetto Breeze maintenance facility (shown in **Figure 18**). Making the facility multi-use does save money, but its location presents problems. The facility is in a low-density, industrial part of Bluffton. For a maintenance facility, this is a good location because activities such as storing and maintaining buses are allowed. However, for a transfer facility, it is not ideal. Even for those who would be willing to come to the facility to catch a bus, “no trespassing” signs and a barbed wire fence lining the perimeter suggest that the

facility is not an accessible public facility. A transfer center that was in a more central or dense location could be a better choice.



FIGURE 18: BUS PARKING; PALMETTO BREEZE MAINTENANCE FACILITY AND TRANSFER CENTER

CBB staff subsequently explored the operation, visibility, and accessibility of the various bus stops. The Bluffton Breeze was chosen to examine and CBB staff decided to run a couple scenarios from the following five locations:

- Bluffton Walmart/Sam’s Club,
- Tanger Outlet Mall Hilton Head I,
- Tanger Outlet Mall Hilton Head II,
- Old Town Bluffton, and
- Beaufort County Government Center.

Signage for the Old Town Bluffton (**Figure 19**) and Beaufort County Government Center stops were easy enough to find. The stops were safe to get to from the points of origin but may prove tricky for anyone in a wheelchair.



FIGURE 19: BUS STOP IN OLD TOWN BLUFFTON

The three other stops caused significant confusion, however. As much as CBB staff tried to find the stop at the Bluffton Walmart and Sam’s Club, it was either overlooked or non-existent. A Breeze bus was seen meandering through the parking lot (on-time), but no passengers boarded or disembarked, making the location of the stop unable to be determined. As shown in **Figure 20**, the mall directory at both Tanger Outlet Mall locations indicates a location within the mall property for a “bus check in.” The symbol resembles a transit bus. However, when at the location indicated on the map at each mall, no bus stop signage is visible. In both situations, the stop indicated on the mall directory is NOT for Bluffton Breeze buses. Rather, it is for tour buses – private charters on a shopping trip. The actual transit stops are located on a road behind the malls. Although these roads are indicated on the map, the Bluffton Breeze stops located on these roads are not.

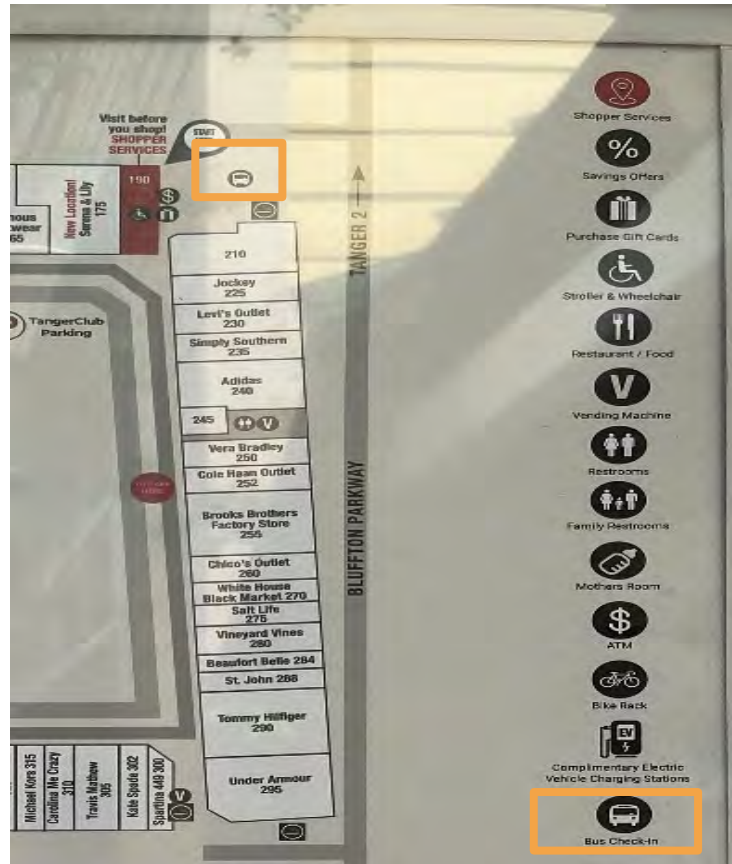


FIGURE 20: MALL SIGNAGE INDICATING A "BUS CHECK-IN" BUT NO ON-SITE SIGNAGE FOR TRANSIT SERVICE

Encouraging ridership is another area where budget constraints appear to have led Palmetto Breeze leadership to make specific choices. The bus vehicles themselves are standard as far as US transit buses are concerned. They appear clean, comfortable, modern, and well-maintained. Many of the buses include bike racks on the front to encourage multimodal commuting. Signage and branding on each bus use hues of green and blue with an eye-catching font and logo (see **Figure 21**).



FIGURE 21: PALMETTO BREEZE VEHICLES, INCLUDING A BLUFFTON BREEZE BUS (FAR LEFT) AND COMMUTER BUSES

There are two apps that can be downloaded to a smartphone to help with the ridership experience- BreezePass and CatchTheBreeze(**Figure 22**). BreezePass allows users to purchase and redeem tickets as well as view routes on the Breeze Trolley and the Palmetto Breeze commuter buses. CatchTheBreeze allows riders to track buses on each of Palmetto Breeze’s routes. Both apps should be simple and intuitive to those with smartphone experience. However, that generally appears to be the extent of Palmetto Breeze’s capability to market itself.

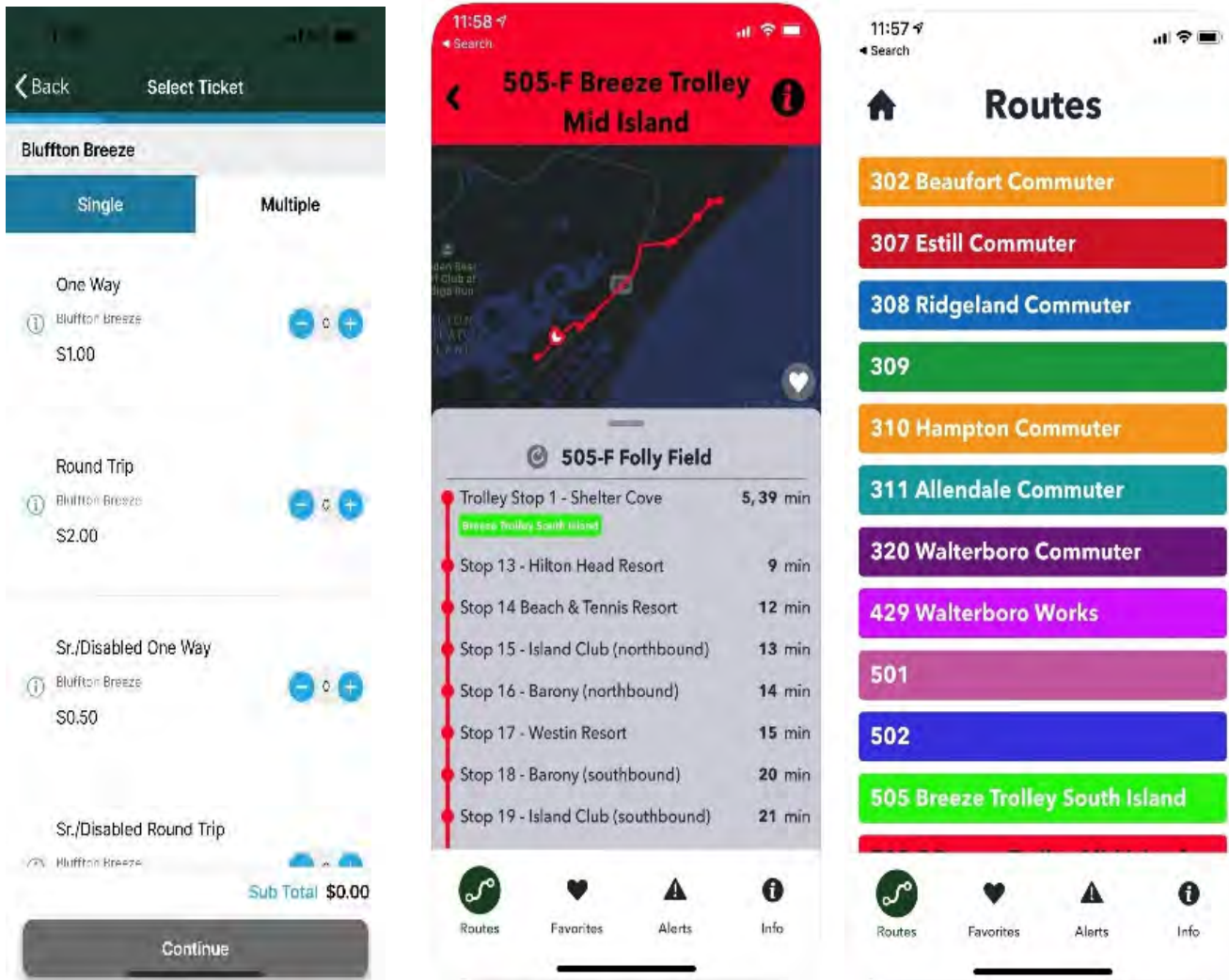


FIGURE 22: TRANSIT APP SCREENSHOTS: BREEZEPASS (FAR LEFT) AND CATCHTHEBREEZE (CENTER/RIGHT)

Whereas many transit agencies engage in some level of marketing, including everything from billboards with taglines regarding the benefits of the service to stations that are about form as much as they are function, this is not an area Palmetto Breeze has been able to allocate a lot of resources. There is some targeted marketing, but not to the level of many transit agencies. This may be limiting Palmetto Breeze’s ability to reach potential riders who may not be aware of what Palmetto Breeze is, what services it provides, and what to expect from taking a trip on Palmetto Breeze.

In essence, what CBB staff found during their investigation is a transit service that maximizes its budget to offer the best possible service under funding and land use constraints. Palmetto Breeze has been

rather clever in this area, using its maintenance facility as a transfer center and investing in a useful app to help riders use the system. However, the system could achieve much more with a dedicated funding source. There also appear to be opportunities to create partnerships with trip generators, such as the Tanger Outlet Malls, to create better visibility and awareness of the service for customers.

Bicycle Network

A transportation network requires a variety of different modes to serve a variety of different purposes. Whether commuting or running errands, going a short distance or a long distance, on a journey with a purpose or just traveling aimlessly, each mode has its place. Bicycles as a mode of transportation provide benefits to any transportation network. They can be used for recreation, providing physical and mental health benefits to riders. They can also help fill in the gaps of transit, allowing commuters to reach destinations not viably reachable by transit. And, of course, they can provide mobility to access moderately nearby destinations. Providing a safe, comfortable, comprehensive bike network for bicyclists of all ages and abilities is key to integrating bicycling as a viable form of transportation into a transportation network. Hilton Head Island understands this and has created a robust and functional bicycle network. In fact, Hilton Head Island has achieved gold-level status Bicycle Friendly Community as determined by The League of American Bicyclists.

Hilton Head Island Bicycle Network

Hilton Head Island currently provides 64 miles of public pathways and nature trails that can be used by both pedestrians and bicyclists. On top of that, beaches on Hilton Head Island are rideable at low tide. There are 12 miles of coastline accessible from the Town’s beach parks. Furthermore, among Hilton Head Island’s private developments, there are an additional 50 miles of bicycle pathways and shared roadways for use by residents and guests of those communities. Collectively, this amounts to over 120 miles of public and private bike pathways offered throughout the island. It is easy to get around Hilton Head Island via bicycle. Examples of bicycle facilities on Hilton Head Island are shown in **Figure 23**.

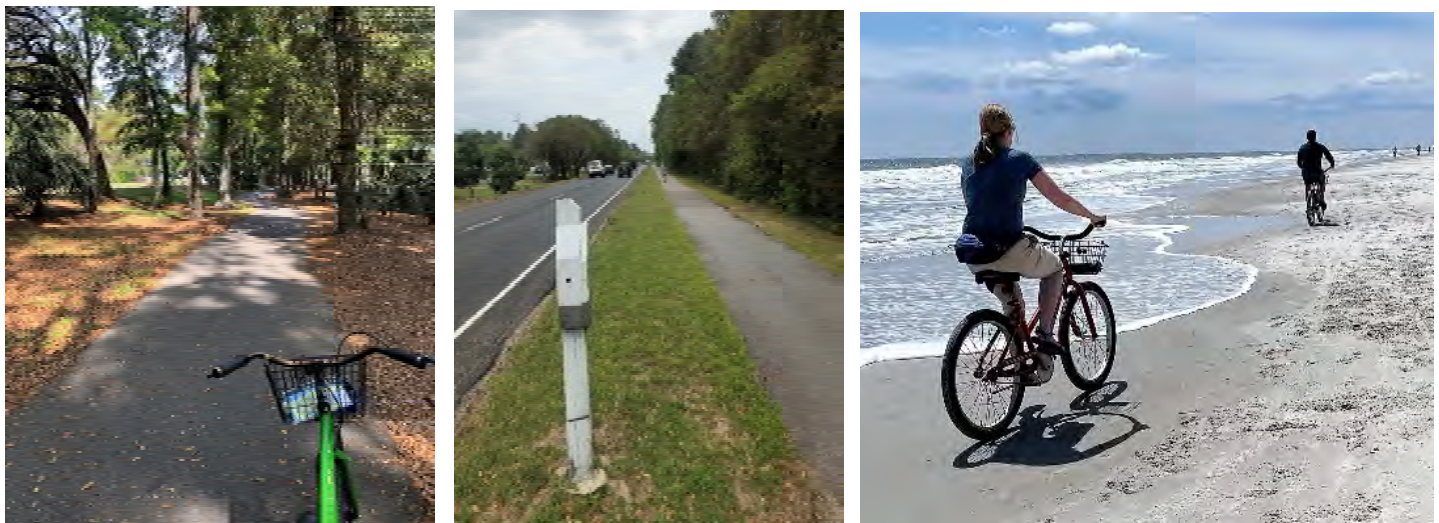


FIGURE 23: TYPICAL BICYCLE FACILITIES ON HILTON HEAD ISLAND

The Hilton Head bicycle network can support the SCDOT US 278 Corridor project in two ways. First, the US 278 Corridor project includes the construction of a new multi-use path on the south side of US 278, which will connect the mainland with Hilton Head Island. It is 4.7 miles between Moss Creek Drive and Gumtree Road, which is a rideable distance, especially with current technology such as electric

bicycles. This presents an opportunity for trips to be made to Hilton Head Island via bicycle. Second, the robust bicycle network on Hilton Head Island can be leveraged with an enhanced public transportation system to provide local circulation options for people who choose to take public transportation to reach Hilton Head Island.

The bicycle network allows bicycles to travel to most of the primary destinations on the island. However, the prevailing low-density style of land use in Hilton Head coupled with many gated communities where access by the public is not allowed may present issues to bicyclists. What seems to aid in this is that the primary part of the network follows the arterial loop around the island composed of the Cross Island Parkway/ William Hilton Parkway, the island’s primary roadway for getting around. Many points of origin and destination can be found along this corridor, including a significant number of the shopping centers, hotels, as well as many of the residential communities, gated or otherwise.

This loop is divided into two sections- the Long Pathway and the Short Pathway. This presumably allows bicyclists to have options for how long or how far they wish to ride based on available time or physical ability. From different parts of the loop, bicyclists can access two other sections of the primary pathway network, the Historic Pathway, and the Beach Pathway. Both are loops themselves and allow bicyclists to experience different types of scenery, as each pathway includes a variety of Points of Interest. These pathways are composed of asphalt, with some wooden bridges used to pass over creeks and lagoons. In some areas, the pathways are composed of dirt. There are a few parks around the island that are reachable from the pathways, providing a destination of sorts for cyclists on a recreational ride, including: Fish Haul Creek, Barker Field Observation Deck, Greens Shell Community Park, Shelter Cover Community Park, and Old House Creek. A map of current public pathways is shown in **Figure 24**.

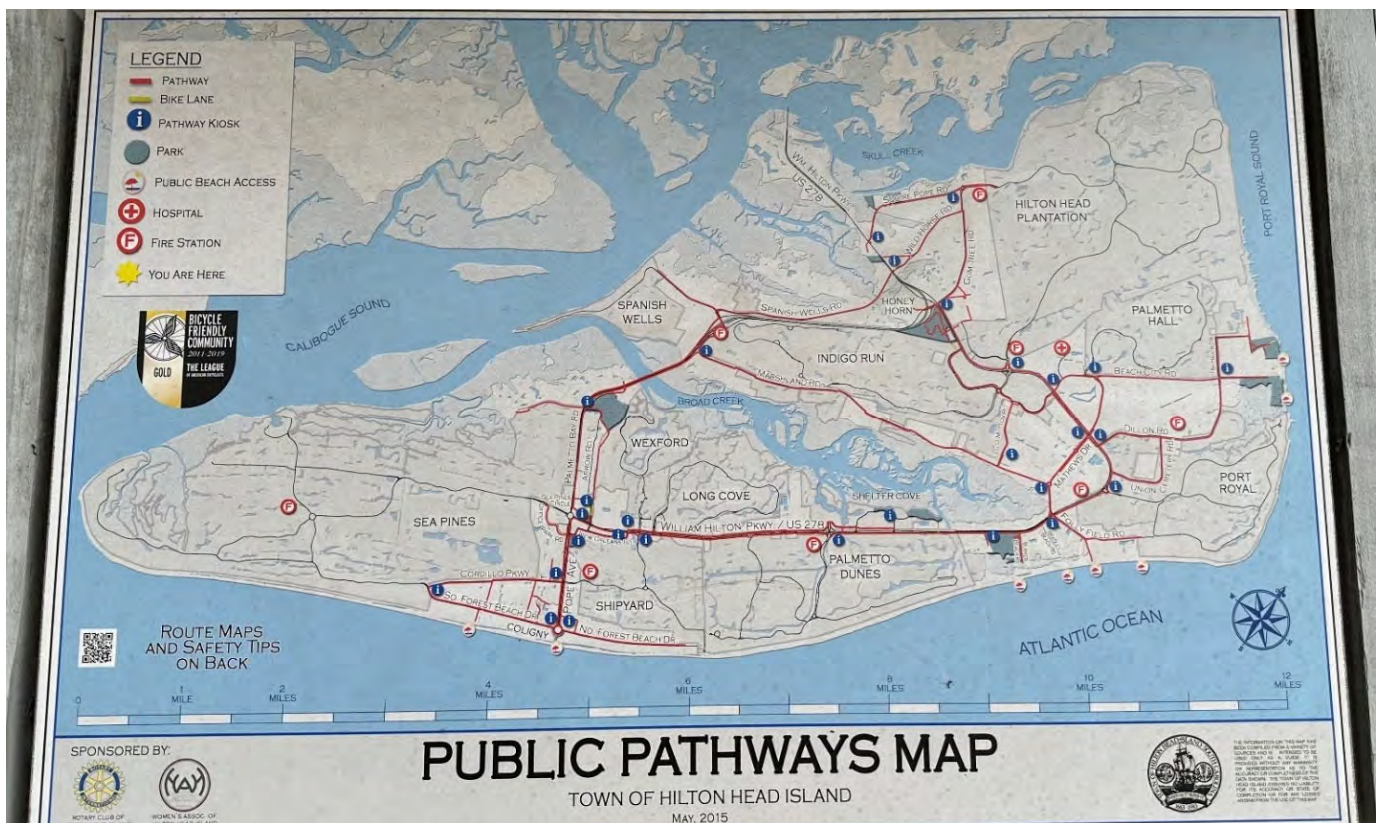


FIGURE 24: HILTON HEAD ISLAND PUBLIC PATHWAYS MAP

The level of safety and comfort in the network is notable. There are only two on-street bike facilities: a bike lane on Arrow Road between just west of the Motorcoach Resort and just northwest of Dunnagans Alley (about 720 feet) and a bike-on-shoulder facility across the Coligny Beach Bridge. The rest of the network largely operates as a system of side paths, running parallel to roadways and buffered by landscaping, providing a level of safety from motor vehicles. However, some pathways do run directly next to roadways, many of which may be considered sidewalks. The Town continues to replace these with buffered, wider pathways. Hilton Head's Capital Improvement Program (CIP) currently shows three sections of sidewalk are in the process of being replaced by pathways.

During the site visit conducted by CBB from March 27-29, 2023, CBB staff rented a bike and explored the bicycle network across Hilton Head Island. Doing so allowed CBB to get a sense of what bicycling is like from a rider's perspective on the island and allowed CBB to evaluate how well the bike network fits into the greater transportation network. One of the first things CBB observed during the field visit was just how comfortable and inviting the pathways feel to ride on. Being primarily off-street did correlate with a sense of safety from other motor vehicle traffic. This made for a relaxing and leisurely ride where cyclists of all ages and abilities can indeed feel comfortable and confident riding the pathway network around Hilton Head Island. Many people were observed taking advantage of the pathways. The weather was mostly favorable during CBB's visit with little precipitation and mild temperatures. The pathways were busy, but not crowded. They were certainly not near maximum capacity or at a point where too many users could compromise enjoyment of the pathways.

Wayfinding is easy with attractive signage, wooden maps posted strategically along the pathways and other directional and informational signs are posted with good visibility and frequency, making it easy to get around and know where you are. Stop signs are posted at each crossing to remind cyclists to stop and look for cross traffic. The pathways are in good shape with little need for immediate upkeep. At the time of the site visit, the pathways were smooth and were free of brush. Nor were there any wayfinding signs that appeared to be missing or broken. This is a rich network to build from, as discussed in later sections.

Collected Data

The following sections describe the traffic data collection and VISSIM modeling effort undertaken by CBB in this study. CBB undertook an extensive data collection effort. This included peak hour turning movement volume counts, 7-day midblock volume counts, travel time runs, and queue observations. All Traffic Data Services, LLC collected the peak hour turning movement and 7-day midblock volume counts. Members of the CBB team visited the project location in March of 2023 to collect the travel time data and make queue observations.

Peak Hour Turning Movement Counts

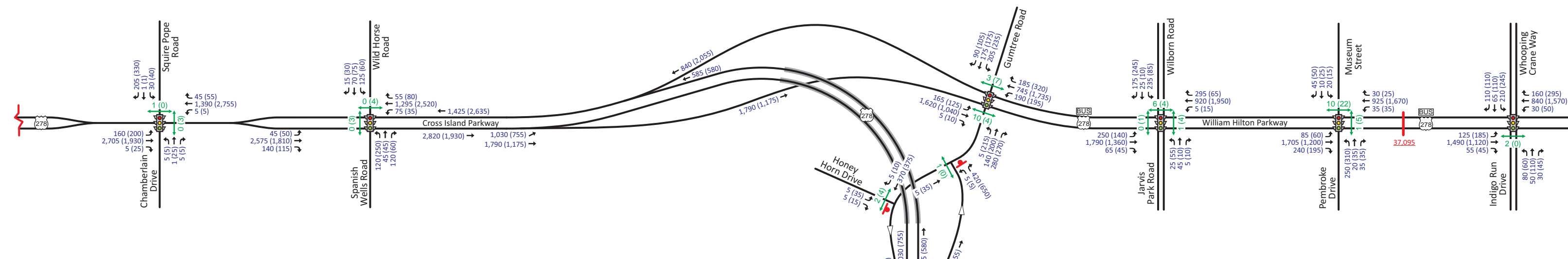
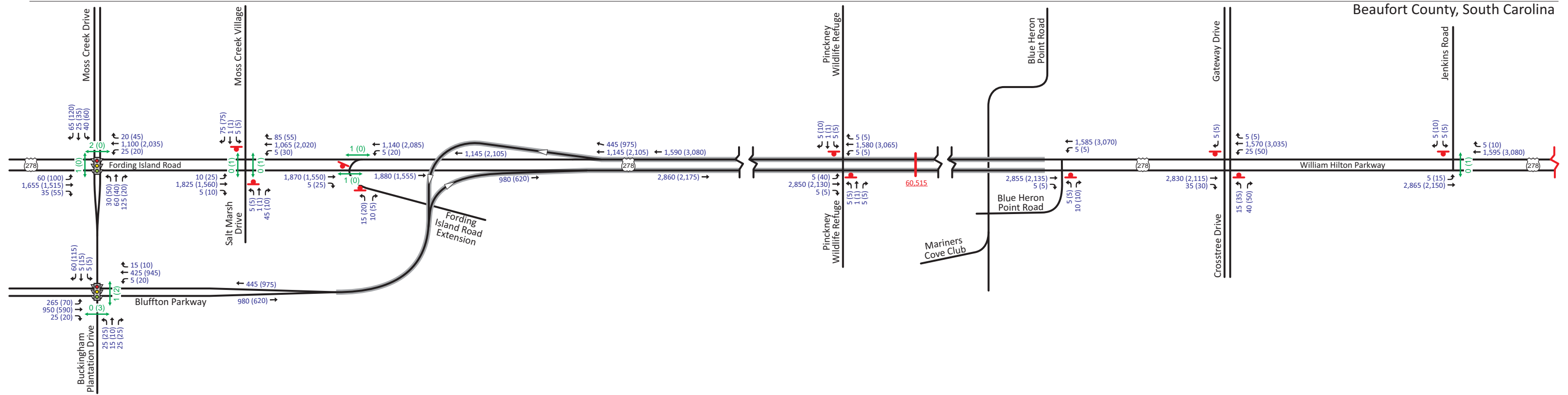
Peak hour turning movement volume counts were collected at 26 study intersections. Data was collected from 6:00 AM to 9:00 AM and 4:00 PM to 6:00 PM to determine when the peak hour occurs. Ultimately, the existing morning peak hour was 7:30 AM to 8:30 AM, and the existing evening peak hour was 4:00 PM to 5:00 PM. Peak turning movement volume counts are summarized in Exhibit 1.

Compared to the 2018 Design Year traffic volumes collected in the SCDOT Environmental Assessment Study, the 2023 volumes collected by CBB are, on average, within 3%. The peak hour volumes between the two data sets are similar due to the existing capacity constraints within the study area, which will be discussed in detail in later sections of the report.

7-Day Midblock Counts

Midblock segment volume counts were collected in both directions at three locations in the study area: US 278 between Pickney Wildlife Refuge and Blue Heron Point Road, Business US 278 between Pembroke Drive and Indigo Drive, and US 278 between Marshland Road and Gum Tree Road. These counts took place over seven consecutive days, from March 22, 2023, to March 28, 2023. This midblock volume count data allowed CBB to develop bi-directional average daily traffic (ADT) volumes that account for traffic variations throughout the week the data was collected. ADT values are shown in Exhibit 1.

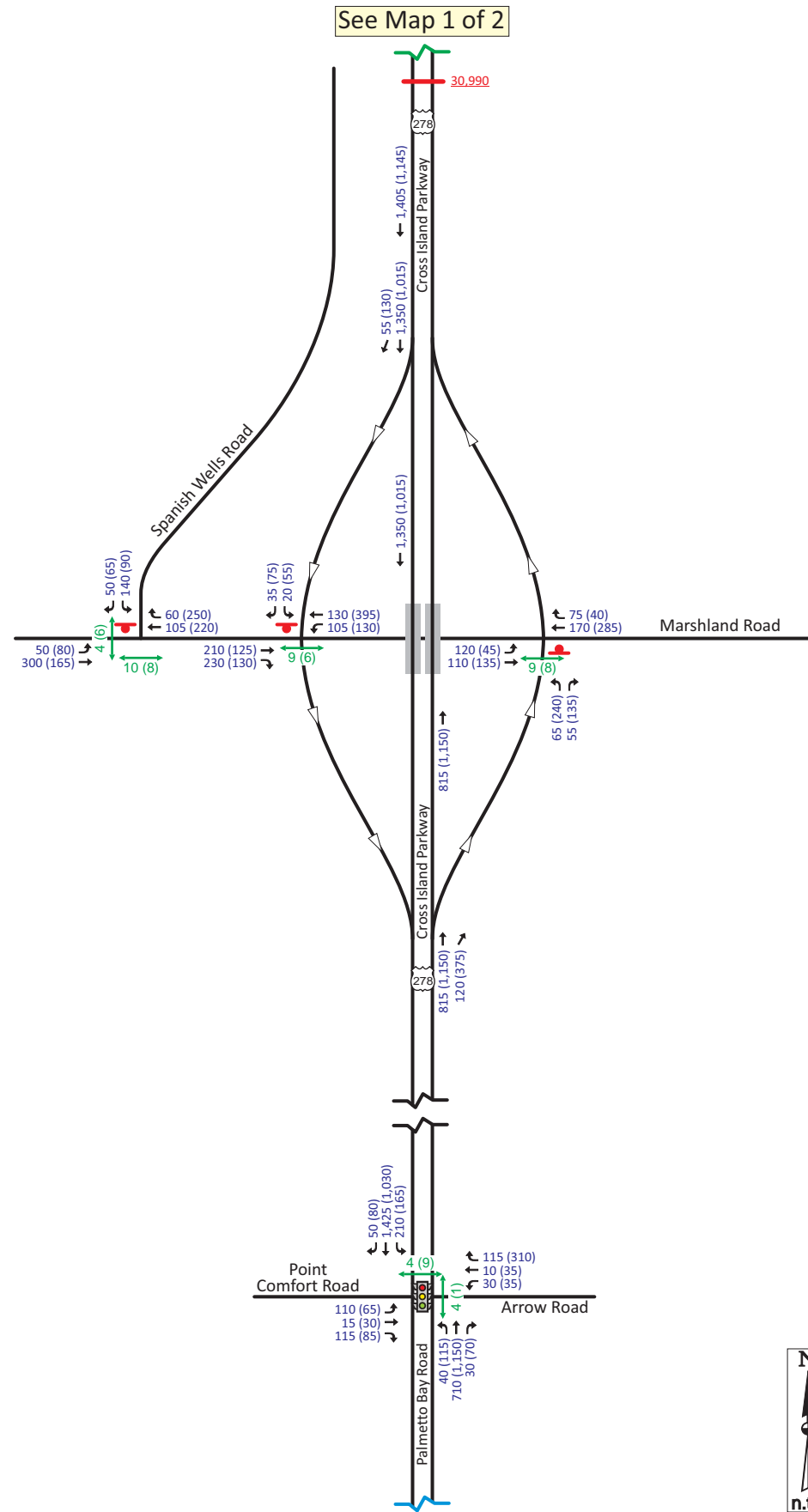
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Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- XX** = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX)** = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X.XXX** = Average Daily Traffic (ADT)
- X (X)** = Pedestrian/Bicycle Crossing Volumes

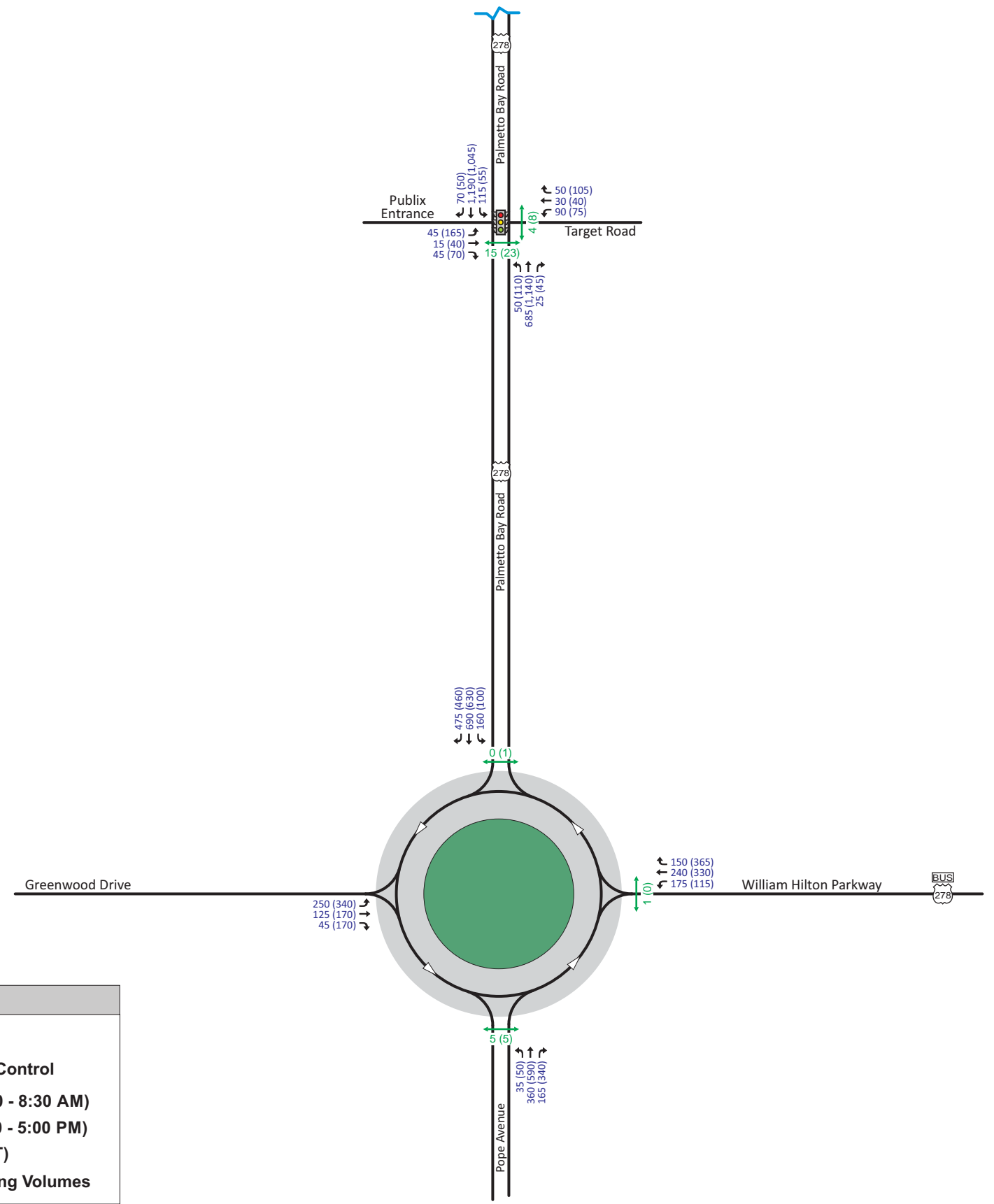
Note: Map is a Graphical Representation Only.



Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- XX = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX) = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X,XXX = Average Daily Traffic (ADT)
- X (X) = Pedestrian/Bicycle Crossing Volumes

Note: Map is a Graphical Representation Only.



Map 2 of 2

Travel Time Data

Travel time data was collected for two main routes within the project area: US 278 between Moss Creek Drive and Indigo Drive and Cross Island Parkway between Wild Horse Road and Greenwood Drive. An aerial view of the two travel time routes is shown in **Figure 25**. The CBB project team collected this data by driving the routes during their field visit from March 27, 2023, to March 29, 2023. Using a GPS device connected to a computer, latitude, longitude, and speed data points were collected every second of each trip along the routes. These data points were processed and summarized to produce a travel time summary for both routes. Summarized travel time data for the morning and evening peak hours are included in **Appendix A**.

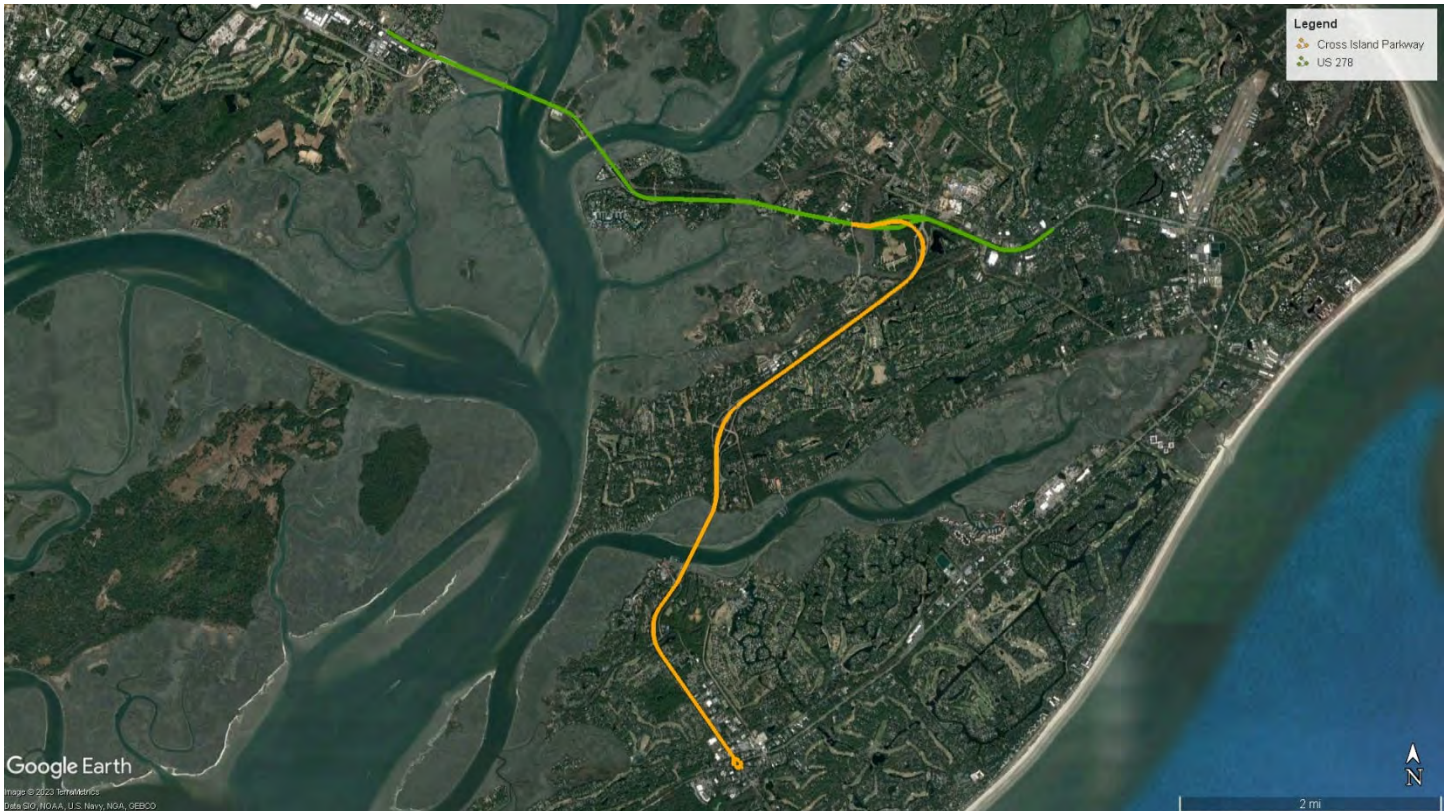


FIGURE 25: TRAVEL TIME ROUTES

Queue Observations

In addition to travel time data, the project team made queue observations during their field visit from March 27, 2023, to March 29, 2023. Queue observations were performed during the morning and evening peak periods across the entire study area.

Morning Peak Hour Observations

During the morning peak hour, there is a heavy flow of traffic on eastbound US 278 onto Hilton Head Island. We observed that the eastbound US 278 approach queue at Squire Pope Road reached the Bluffton Parkway interchange. Based on our observations, the queue is caused by insufficient capacity at the eastbound US 278 approach at Squire Pope Road. **Traffic is fed onto eastbound US 278 from both US 278 to the west of Bluffton and from the Bluffton Parkway such that US 278 is at capacity east of the Bluffton Parkway merge. The Squire Pope Road intersection includes 3 eastbound lanes, but the third through lane is added immediately at the intersection. It is only approximately 100 feet long, and it is underutilized. The morning peak eastbound queue starts at this location because it is the first capacity constraint on the island.**

Figure 26 shows the eastbound US 278 approach queue at Squire Pope Road, reaching Blue Heron Point Road. **Figure 27** shows the eastbound US 278 approach queue at Squire Pope Road, reaching the Bluffton Parkway interchange.



FIGURE 26: EASTBOUND US 278 QUEUE AT SQUIRE POPE, REACHING BLUE HERON POINT ROAD



FIGURE 27: EASTBOUND US 278 QUEUE FROM SQUIRE POPE ROAD REACHING BLUFFTON PARKWAY INTERCHANGE

After the Spanish Wells Road intersection, vehicles can either utilize the Cross Island Parkway or Business US 278 to travel further on Hilton Head Island. Currently, most of the traffic utilizes Business US 278, resulting in lengthy eastbound Business US 278 approach queues. **Figure 28** shows the eastbound Business US 278 approach queue at Gumtree Road.

The traffic on Cross Island Parkway travels to the Sea Pines Circle. We observed that the heavy southbound Palmetto Bay Road and eastbound Greenwood Drive traffic is served by a single-lane roundabout, resulting in lengthy queues. **Figure 29** shows the southbound Palmetto Bay Road approach queue reaching past Target Road intersection. **Figure 30** shows the southbound Palmetto Bay Road approach queue at Target Road. **Figure 31** shows the eastbound Greenwood Drive approach queue.

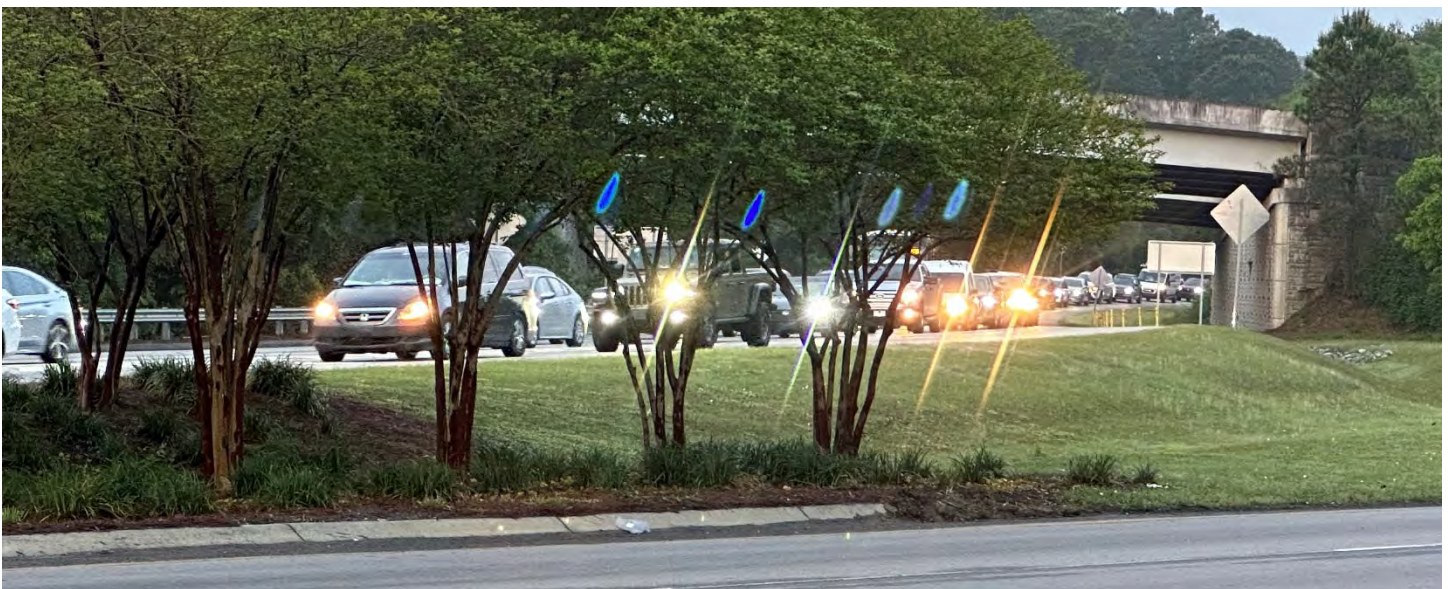


FIGURE 28: EASTBOUND BUSINESS US 278 APPROACH QUEUE AT GUMTREE ROAD



FIGURE 29: SOUTHBOUND PALMETTO BAY ROAD QUEUE AT SEA PINES CIRCLE, REACHING PAST TARGET ROAD



FIGURE 30: SOUTHBOUND PALMETTO BAY ROAD APPROACH QUEUE AT TARGET ROAD



FIGURE 31: EASTBOUND GREENWOOD DRIVE APPROACH QUEUE

Hilton Head elementary school, middle school, and high school are all located north of US 278 on Wilborn Road. The schools have staggered start times, with elementary school starting at 7:45 AM, high school starting at 8:00 AM, and middle school starting at 8:45 AM. However, the current drop-off operations result in an extensive queue impacting US 278. **Figure 32** shows the drop-off queue along Wilborn Road. **Figure 33** shows the drop-off queue reaching westbound Business US 278.



FIGURE 32: SCHOOL DROP-OFF QUEUE ALONG WILBORN ROAD



FIGURE 33: DROP-OFF QUEUE, REACHING WESTBOUND BUSINESS US 278

Evening Peak hour Observations

During the evening peak hour, there is a heavy flow of traffic on westbound US 278 off the island. We observed that the westbound US 278 approach queue at Squire Pope Road reached past the Museum Street intersection. Based on our observations, the queue is caused by insufficient capacity at the westbound US 278 approach at Squire Pope Road. **The basic issue is that traffic from the 3 lanes on westbound Business US 278 and traffic from 2 lanes from northbound Cross Island Parkway are condensed to 2 westbound lanes through the traffic signal.** Figure 34 shows the westbound US 278 approach queue at Squire Pope Road. Figure 35 shows the westbound US 278 approach queue at Squire Pope Road, reaching Spanish Wells Road. Figure 36 shows the westbound US 278 approach queue at Squire Pope Road, reaching pass the Museum Street intersection. Figure 37 shows the westbound US 278 approach queue at Squire Pope Road, near the Indigo Run Drive intersection.



FIGURE 34: WESTBOUND US 278 APPROACH QUEUE AT SQUIRE POPE ROAD



FIGURE 35: WESTBOUND US 278 QUEUE FROM SQUIRE POPE ROAD REACHING SPANISH WELLS ROAD



FIGURE 36: WESTBOUND US 278 QUEUE FROM SQUIRE POPE ROAD, REACHING MUSEUM STREET



FIGURE 37: WESTBOUND US 278 FROM SQUIRE POPE ROAD NEAR INDIGO RUN DRIVE

We also observed several lengthy queues on the crossroads along US 278 impacted by the westbound US 278 approach queue at Squire Pope Road. **Figure 38** shows the northbound Spanish Wells Road approach queue at US 278. **Figure 39** shows the northbound Gumtree Road approach queue at Business US 278. **Figure 40** shows the northbound Museum Street approach queue at Business US 278. **Figure 41** shows the northbound Cross Island Parkway queue near the Gumtree Road Off-Ramp. **Figure 42** shows the northbound Cross Island Parkway queue near Spanish Wells Road. We observed several extensive queues at the Sea Pines roundabout on the northbound Pope Avenue approach and the westbound Business US 278 approach.



FIGURE 38: NORTHBOUND SPANISH WELLS ROAD APPROACH QUEUE AT US 278



FIGURE 39: NORTHBOUND GUMTREE ROAD APPROACH QUEUE AT BUSINESS US 278



FIGURE 40: NORTHBOUND MUSEUM STREET APPROACH QUEUE AT BUSINESS US 278



FIGURE 41: NORTHBOUND CROSS ISLAND PARKWAY QUEUE, NEAR THE GUMTREE ROAD OFF-RAMP



FIGURE 42: NORTHBOUND CROSS ISLAND PARKWAY QUEUE, NEAR THE SPANISH WELLS ROAD INTERSECTION

Traffic Modeling Software

It is our understanding that the SCDOT Environmental Assessment Study used SYNCHRO for the traffic analysis. SYNCHRO is a macro-level analytical traffic flow model based on study procedures outlined in the Highway Capacity Manual, published by the Transportation Research Board. SYNCHRO is recognized as the most widely used tool in the traffic engineering field for analyzing and optimizing traffic flows at signalized intersections, but SYNCHRO does have its limitations. SYNCHRO is a macroscopic software that analyzes roadway geometry in isolation and does not consider the effects on and from the surrounding roadway system.

CBB constructed a VISSIM model for this evaluation. VISSIM is a micro-simulation traffic flow model used to evaluate complex transportation systems. VISSIM evaluates roadway elements as a system (e.g., freeways, ramps, intersections). For example, VISSIM incorporates dynamics such as platooning caused by nearby signals and upstream traffic flow restrictions.

VISSIM Model Development

Several traffic characteristics are taken into consideration in the development of the no-build VISSIM model. Each input ensures that the no-build VISSIM model accurately represents observed traffic conditions so that the build VISSIM models can accurately determine the impacts of potential roadway changes.

Geometric Data

Links and Connectors form the foundation of any VISSIM network. Links and Connectors represent the roadway network in the VISSIM. To assist in the coding of the model network, aerial photography was obtained using VISSIM 22's built-in Bing Maps aerial feature. In addition, site photographs and the Beaufort County GIS Public Mapping site were also used to gather the geometrical information of the study area. Additionally, Beaufort County provided the grades (gradient) on the existing bridges, which is 4%. Grades are an important element of the microsimulation model as they directly impact the vehicle acceleration and deceleration parameters.

Signal-Controlled Intersections

VISSIM can model signal timing plans using either the built-in fixed-time control or various other external signal control logic formats. The external logic format is the Ring Barrier Controller (RBC), which was used in this model at signalized intersections. The settings on this controller type are saved to an external data file with the extension *.rbc. The traffic signal timing plans for the signalized intersections within the study area were obtained from the Town of Hilton Head Island and Beaufort County. 2023 No-Build AM and PM peak hour SYNCHRO models were developed and converted into RBC files for VISSIM. The RBC files were imported into VISSIM, and signal heads and detectors were added to the VISSIM model at each signalized intersection.

Stop-Controlled Intersections

Stop-controlled intersections were modeled in VISSIM using a combination of stop signs and conflict areas. The stop sign defines the location at which vehicles must stop. Stop signs were coded based on the aerial data. Conflict areas allow the modeler to specify right-of-way at any location where two or more links intersect. Conflict areas were coded at stop-controlled and signal-controlled intersections.

Speed Data

The posted speed limit on the roadways was obtained from Google Maps's Street View function. Desired Speed Decision points are used to define the speed limits within the network to represent the variation in driver behavior, VISSIM assigns speed distributions for each speed limit. For example, a 40-mph speed limit will have a distribution of vehicles traveling between 35 mph and 45 mph. VISSIM assigns different distributions to different vehicle classes (e.g., cars and trucks).

Reduced Speed Areas were used to model short sections with reduced speeds (curves or turns). Like the Desired Speed Decision points, a new set of desired speed distributions (in this case, 'reduced' speeds) are assigned to each vehicle class to account for slower speeds within the reduced speed area. However, unlike the Desired Speed Decision Point, when encountering a Reduced Speed Area, each vehicle begins to decelerate in advance to reach the lower desired speed as it enters the defined area. After leaving the reduced speed area, the vehicle returns to its actual desired speed. The Reduced Speed Areas coded in the model correspond to turns (left and right) and locations that, due to roadway geometry, will impose a mandatory reduction on the speed of vehicles, independently of their originally desired speed.

Vehicle Routing

VISSIM supports two different forms of vehicle routing: dynamic and static. In dynamic routing, the vehicle travels from its origin to designation based on the best available route when there are multiple routes between each origin and destination. Static routing codes mean the vehicle will follow an assigned path or route from origin to destination irrespective of the best available route. A route is a sequence of links and connectors from a routing decision point to the destination(s). The study corridor does not have a multiple routes option, meaning that there is only one route available for a vehicle to travel between any origin and destination. Hence, it was determined that static routing would be the most suitable to replicate the existing conditions for the no-build. The static routing can be coded as the "intersection" method, where a new routing decision is provided at each intersection, or as the "end-to-end" method, where a single continuous route is provided from the link where vehicles enter the network to the link where vehicles exit the network. The "intersection" method is often easier to code, but "end-to-end routes" accounts for travel patterns within a VISSIM network. For this study, static routing was coded with the "end-to-end" method.

Vehicle Composition

The default vehicle types available in VISSIM are Car, HGV (truck), Bus, Tram (transit), Bike, and Pedestrian. These can be used to define traffic composition for a microsimulation model. For this study, only two default vehicle types, Car and HGV (truck), were utilized. Traffic compositions are the proportions of each vehicle type present in each of the vehicle input sources. Based on the traffic counts collected, it was determined that the US 278 corridor has approximately 2% of trucks during peak hours, thus 2% of trucks and 98% of cars were utilized as the vehicle composition.

Vehicle Inputs

Vehicle Inputs determine the actual volume of vehicles entering the VISSIM network in vehicles per hour. Vehicle Inputs are assigned to specific Links within the VISSIM network and different flow rates can be set for specific Time Intervals relative to the Simulation Period. The Vehicle Inputs were coded

on “entry links” (i.e., Links with no upstream connectors) as these Links represent the outer bonds of the VISSIM network.

Driver Behavior Parameters

During the simulation, the driver behavior parameters are used to guide the vehicles through the model network. VISSIM uses five driving behavior models, out of which only the Urban (Motorized) was used for the model network.

Simulation Setting and Random Seed Variation

The AM model was set to run from 6:30 – 9:30 AM with a 1-hour pre-peak, 1-hour peak, and 1-hour post-peak. Hence, the peak hour analysis period was 7:30-8:30 AM. Similarly, the PM model was set to run from 3:00 – 6:00 PM with 1-hour pre-peak, 1 -hour peak, and 1-hour post-peak. Hence, the peak hour analysis period was 4:00 – 5:00 PM. Since VISSIM represents variation and randomness in the traffic models, multiple simulation runs were completed, and the peak hour analysis results are average together. The models were run ten times with different random seeds.

Calibration and Visual Validation

To achieve logical microsimulation results, it is imperative to calibrate and validate the model using observed field data. Once the calibration targets are achieved, the same parameters can then be applied to the future year models.

Calibration Criteria

To ensure satisfactory calibration of the model, standards were used to establish targets regarding traffic flows and travel times. The targets of this calibration effort were set at the values included in Traffic Analysis Toolbox Volume III –Guidelines for Applying Traffic Microsimulation Modeling Software published by the Federal Highway Administration (FHWA), shown below in **Figure 43**. Based on the purpose of this study, it was determined that no-build model calibration will be based on the US 278 bridge throughput, travel time, and speed criteria.

Criteria and Measures	Calibration Acceptance Targets
Hourly Flows, Model Versus Observed	
Individual Link Flows	
Within 15%, for 700 veh/h < Flow < 2700 veh/h	> 85% of cases
Within 100 veh/h, for Flow < 700 veh/h	> 85% of cases
Within 400 veh/h, for Flow > 2700 veh/h	> 85% of cases
Sum of All Link Flows	Within 5% of sum of all link counts
GEH Statistic < 5 for Individual Link Flows*	> 85% of cases
GEH Statistic for Sum of All Link Flows	GEH < 4 for sum of all link counts
Travel Times, Model Versus Observed	
Journey Times, Network	
Within 15% (or 1 min, if higher)	> 85% of cases
Visual Audits	
Individual Link Speeds	
Visually Acceptable Speed-Flow Relationship	To analyst's satisfaction
Bottlenecks	
Visually Acceptable Queuing	To analyst's satisfaction

FIGURE 43: FHWA MODEL CALIBRATION CRITERIA

Calibration Process

As previously mentioned, count data was collected from a count station on US 278 from the hours of 6:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. From these data sources, specific vehicle input flow rates were developed for the pre-peak, peak, and post-peak hours for the AM and PM models. Initial runs of the model did not yield calibration results within the target ranges as well as visual validation. To calibrate the model, the vehicle input flow rates at specific locations were increased during the pre-peak hour for both the AM and PM models. Due to the extensive queuing present in the US 278 corridor, the collected counts represent the capacity of the corridor, but not the demand. The inputs were adjusted to include the vehicles in the queue to fully represent the demand. Increasing the vehicle input flow rates during the pre-peak hour was necessary to load the network and generate similar queues on eastbound US 278 at Squire Pope Road during the AM peak hour and on westbound US 278 at Squire Pope Road during the PM peak hour. The adjustments of vehicle input flow rates yielded calibrated results and visual validation.

Calibration Results

Travel Time and Speed

A model is reasonably calibrated when the modeled travel times and speeds are within 15% of the average field collected travel time and speeds. **Table 1** shows the AM and PM peak hour travel time calibration results.

Table 2 shows the AM and PM peak hour speed calibration results. As shown, in both the AM and PM models, the travel time and speed results are within the target range.

TABLE 1: FIELD AND 2023 NO-BUILD VISSIM TRAVEL TIME COMPARISON

AM			
Direction	Field Average (secs)	VISSIM Average (secs)	Percent Difference
EB US 278	1165	1178	1%
WB US 278	509	517	2%
NB Cross Island Parkway	413	402	-3%
SB Cross Island Parkway	469	533	14%
PM			
Direction	Field Average (secs)	VISSIM Average (secs)	Percent Difference
EB US 278	547	580	6%
WB US 278	1750	1742	0%
NB Cross Island Parkway	1053	1023	-3%
SB Cross Island Parkway	461	447	-3%

TABLE 2: FIELD AND 2023 NO-BUILD VISSIM SPEED COMPARISON

AM			
Direction	Field Average (MPH)	VISSIM Average (MPH)	Percent Difference
EB US 278	18.4	17.8	-3%
WB US 278	41.1	40.3	-2%
NB Cross Island Parkway	51.4	51.5	0%
SB Cross Island Parkway	45.2	38.4	-15%
PM			
Direction	Field Average (MPH)	VISSIM Average (MPH)	Percent Difference
EB US 278	38.3	36.0	-6%
WB US 278	12.0	12.0	0%
NB Cross Island Parkway	19.4	20.3	4%
SB Cross Island Parkway	44.4	45.8	3%

US 278 Bridge Throughput

A model is reasonably calibrated when the modeled US 278 bridge throughputs are within 15% of the average field collected throughput. **Table 3** shows the AM and PM peak hour US 278 bridge throughput. As shown, in both the AM and PM models, the US 278 bridge throughputs are within the target range.

TABLE 3: FIELD AND 2023 NO-BUILD VISSIM US 278 BRIDGE THROUGHPUT

AM			
Direction	Field Average (Vehicles)	VISSIM Average (Vehicles)	Percent Difference
WB US 278	1590	1474	-7%
EB US 278	2860	3240	13%
PM			
Direction	Field Average (Vehicles)	VISSIM Average (Vehicles)	Percent Difference
WB US 278	3075	2930	-5%
EB US 278	2140	2102	-2%

Visual Inspection of the Model Operations

Visual validation of the models is an imperative step in the development and calibration of the model. It is essential for the modeler to perform a thorough visual validation to eliminate any coding errors and achieve logical results. After coding, the models were run and visually inspected multiple times. Any errors pertaining to the lane change decision, yield, conflict area, etc., were then addressed to achieve realistic vehicle movements.

2023 No-Build AM Queues

Figure 44 – Figure 50 show several queues from the study area during the 2023 No-Build AM.

- **Figure 44** shows the eastbound US 278 approach queue at Squire Pope Road, reaching the Bluffton Parkway Interchange.
- **Figure 45** shows the eastbound US 278 queues between Squire Pope Road and Crosstree Drive.
- **Figure 46** shows the eastbound Business US 278 approach queue at Gumtree Road.
- **Figure 47** shows the southbound Palmetto Bay Road approach queue at Sea Pines Circle.
- **Figure 48** shows the southbound Palmetto Bay Road approach queue at Target Road.
- **Figure 49** shows the eastbound Greenwood Drive approach queue at Sea Pines Circle.
- **Figure 50** shows the drop-off queue on northbound Wilborn Road near Business US 278.

Generally, these queue lengths agree with field observations.



FIGURE 44: EASTBOUND US 278 QUEUE AT BLUFFTON PARKWAY INTERCHANGE – 2023 NO-BUILD AM



FIGURE 45: EASTBOUND US 278 QUEUE BETWEEN SQUIRE POPE RD & CROSSTREE DR – 2023 NO-BUILD AM



FIGURE 46: EASTBOUND BUSINESS US 278 APPROACH QUEUE AT GUMTREE ROAD – 2023 NO-BUILD AM



FIGURE 47: SOUTHBOUND PALMETTO BAY ROAD QUEUE AT SEA PINES CIRCLE – 2023 NO-BUILD AM



FIGURE 48: SOUTHBOUND PALMETTO BAY ROAD APPROACH QUEUE AT TARGET ROAD – 2023 NO-BUILD AM



FIGURE 49: EASTBOUND GREENWOOD DRIVE APPROACH QUEUE AT SEA PINES CIRCLE – 2023 NO-BUILD AM

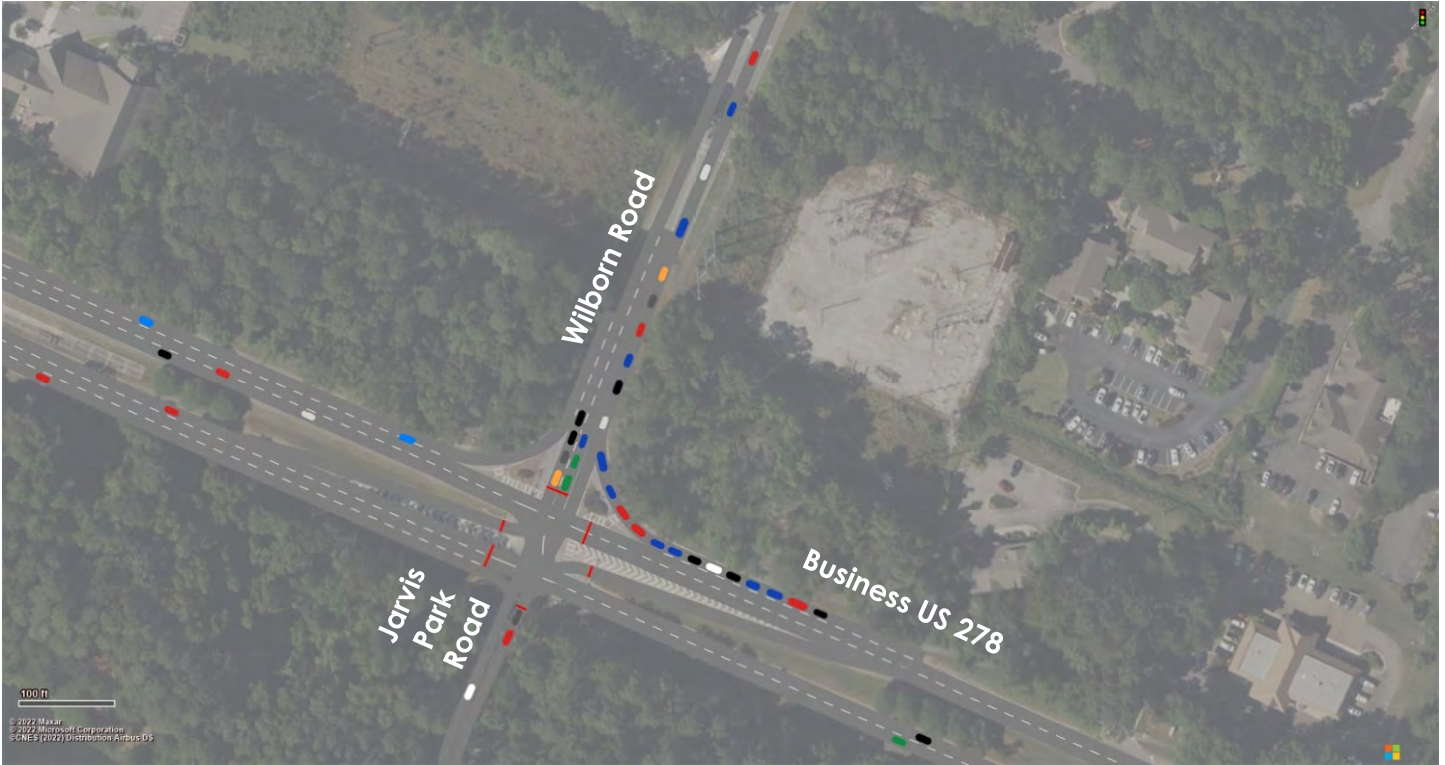


FIGURE 50: DROP-OFF QUEUE ON NORTHBOUND WILBORN ROAD NEAR BUSINESS US 278 – 2023 NO-BUILD AM

2023 No-Build PM Queues

Figure 51 – Figure 56 show several queues from the study area during the 2023 No-Build PM.

- **Figure 51** shows the westbound US 278 approach queue at Squire Pope Road, reaching Spanish Wells Road.
- **Figure 52** shows the westbound Business US 278 approach queues between Gumtree Road and Indigo Run Drive.
- **Figure 53** shows the northbound Gumtree Road approach queue at Business US 278.
- **Figure 54** shows the westbound US 278 approach queue at Spanish Wells Road along the northbound Cross Island Parkway.
- **Figure 55** shows the northbound Pope Avenue queue at Sea Pines Circle.
- **Figure 56** shows the westbound Business US 278 approach queue at Sea Pines Circle.

Again, generally, these queue lengths agree with field observations.

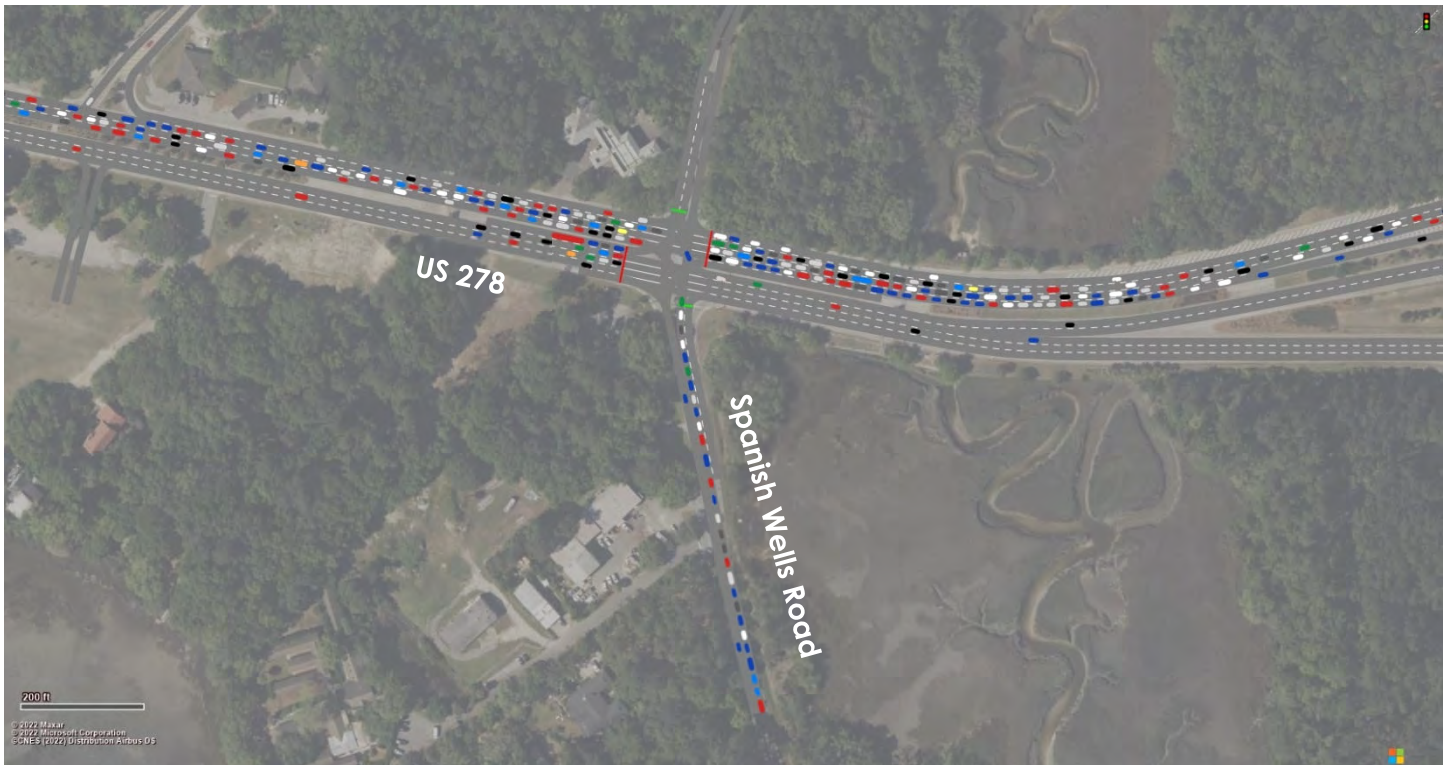


FIGURE 51: WESTBOUND US 278 APPROACH QUEUE AT SPANISH WELLS ROAD – 2023 NO-BUILD PM



FIGURE 52: WESTBOUND BUSINESS US 278 QUEUES BETWEEN GUMTREE & INDIGO RUN – 2023 NO-BUILD PM

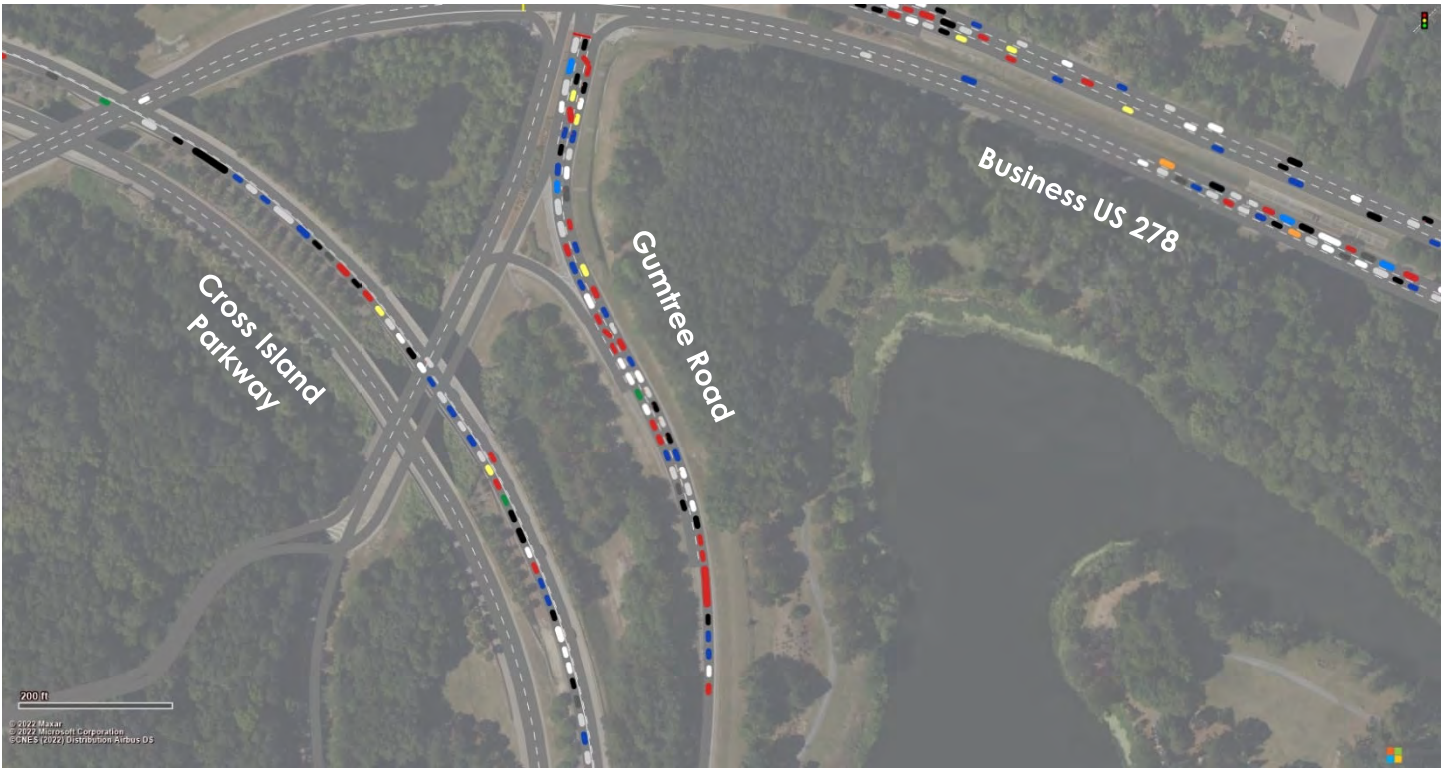


FIGURE 53: NORTHBOUND GUMTREE ROAD APPROACH QUEUE AT BUSINESS US 278 – 2023 NO-BUILD PM



FIGURE 54: WESTBOUND US 278 QUEUE FROM SPANISH WELLS RD ON CROSS ISLAND PKWY– 2023 NO-BUILD PM

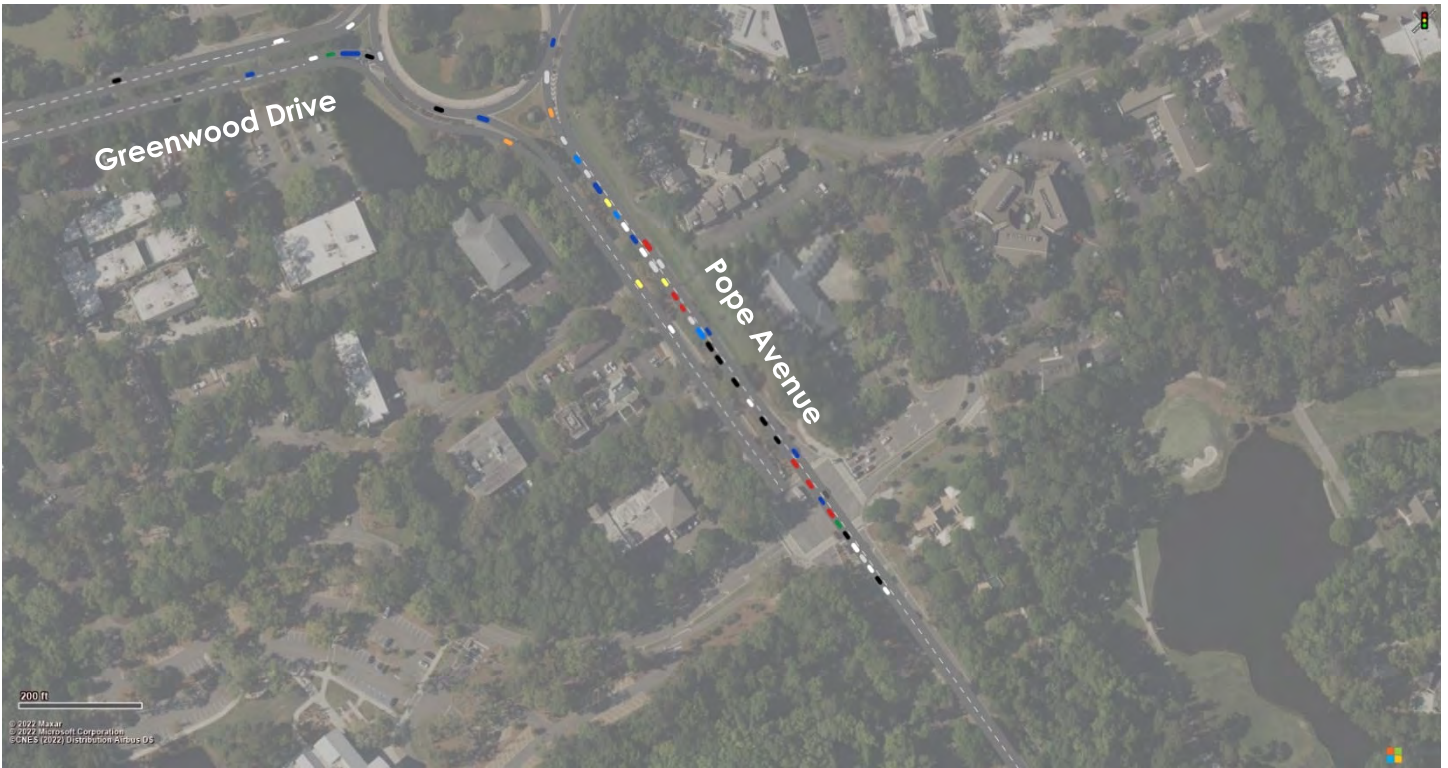


FIGURE 55: NORTHBOUND POPE AVENUE QUEUE AT SEA PINES CIRCLE – 2023 NO-BUILD PM



FIGURE 56: WESTBOUND BUSINESS US 278 APPROACH QUEUE AT SEA PINES CIRCLE – 2023 NO-BUILD PM

Study Procedures

The VISSIM model operations were evaluated by conducting a capacity analysis of the intersections in the study area. These analyses are based on many characteristics, including no-build and build traffic volumes, peaking characteristics, roadway and intersection geometry, and traffic control/traffic signal patterns.

As previously mentioned, a VISSIM model was developed for the study area since the software can examine how various elements in the roadway network impact and influence each other. A SYNCHRO model was developed to create RBC files for the VISSIM model as well as examine certain intersections in isolation from the rest of the network. In addition, SIDRA was utilized for the Sea Pines Circle roundabout. This software package is the most widely recognized tool available for evaluating roundabouts and is consistent with methods supported by the Highway Capacity Manual.

Note that the results will not be identical between VISSIM and the SYNCHRO and SIDRA models due to differences in software methodologies. All the software packages provide different information that is useful in understanding how the proposed roadway geometrics will work in the field. Considering both analysis methods is important to see how the entire system works together (VISSIM) and how each individual element works independently (SYNCHRO and SIDRA).

Several Measures of Effectiveness (MOE) were used in this evaluation, including level of service (LOS), volume-to-capacity ratio (v/c), intersection capacity utilization (ICU), vehicular delay, travel time, and queue length.

Operating conditions were graded in accordance with six levels of traffic service (Level A "Free Flow" to Level F "Fully Saturated") established by the HCM. LOS are measures of traffic operations that consider speed, delay, traffic interruptions, safety, driver comfort, and convenience. LOS C, which is normally used for design, represents a roadway with volumes ranging from 70% to 80% of its capacity. LOS D is generally considered acceptable for peak hours in urban and suburban areas. In addition to LOS, queue lengths provide important measures of intersection operations.

For intersections, LOS is directly related to control delay. At signalized intersections, the LOS criteria differ from that at unsignalized intersections primarily because different transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes and, consequently, may experience greater delay than an unsignalized intersection. **Table 4** summarizes the LOS thresholds used in the analysis for intersections.

TABLE 4: LEVEL OF SERVICE THRESHOLDS

Level of Service (LOS)	Control Delay per Vehicle (sec/veh)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

In addition to LOS and queue lengths, v/c and ICU ratios provide important measures of intersection operations. Intersection movements can operate an acceptable LOS (D or better) yet still have unacceptably high v/c ratios. In general, a v/c or ICU ratio of approximately 0.9 corresponds to occasional queuing and cycle failure, and a v/c or ICU ratio between 0.9 and 1.0 corresponds to frequent queuing and cycle failure. A v/c or ICU ratio greater than 1.0 results in general failure of the movement or intersection, respectively. Therefore, v/c and ICU ratios were considered in addition to LOS and queue length when evaluating an intersection's operations. Cells highlighted in yellow in the intersection MOE tables indicate LOS E, while cells highlighted in red indicate LOS F. Furthermore, cells highlighted in yellow indicate v/c and ICU ratios between 0.9 and 1.0, and cells highlighted in red indicate v/c and ICU ratios over 1.0.

In addition to intersection operations, the VISSIM models provide travel time data and network-wide performance measures. The travel time data provides a measure of corridor operations along each direction of US 278 and Cross Island Parkway. The corridor travel times were compared between No-Build and Build scenarios. Network-wide performance measures were also used to see the overall differences between the No-Build and Build scenarios. The following performance measures were compared:

- Average Delay Per Vehicle (seconds);
- Average Speed Per Vehicle (miles per hour);
- Total Delay (Hours); and
- Unmet Demand (Vehicles).

Analysis Scenarios

- 2023 No-Build (Existing Geometrics);
- 2023 SCDOT Preferred Alternative;
- 2023 Build (Gumtree Road and Sea Pines Improvements); and
- 2023 Build (No Widening Through Stoney Community).

Near-Term (2023) Traffic Operations

2023 No-Build Operations

The 2023 No-Build VISSIM evaluation results are illustrated in **Exhibit 2** for the AM peak hour and **Exhibit 3** for the PM peak hour. Comprehensive VISSIM and SYNCHRO tables are provided in **Appendix B. Table 5** summarizes the travel time results for the US 278 and Cross Island Parkway corridors under 2023 No-Build conditions.

TABLE 5: 2023 NO-BUILD VISSIM TRAVEL TIMES

Direction	AM (Minutes)	PM (Minutes)
EB US 278	19.6	9.7
WB US 278	8.6	29.0
NB Cross Island Parkway	6.7	17.0
SB Cross Island Parkway	8.9	7.5

During the AM peak, the eastbound US 278 route has an excessive travel time of over 19 minutes due to insufficient roadway capacity along eastbound US 278. West of the Bluffton Parkway interchange, eastbound US 278 provides three through lanes, but a through lane is dropped at the Fording Island Road Extension intersection. This lane drop results in slower speeds on eastbound US 278, as shown in **Figure 57**. The VISSIM link speeds at the lane drop are less than 20 mph. Between the Bluffton Parkway interchange and Squire Pope Road, eastbound US 278 provides two through lanes. At the Bluffton Parkway interchange, the eastbound US 278 and Bluffton Parkway merge carries 1,880 vph on eastbound US 278 and 980 vph on the Bluffton Parkway On-Ramp during the AM peak hour, which results in failing operations. **Table 6** shows the eastbound US 278 and Bluffton Parkway merge operations during the AM peak hour, which currently operates at LOS F at a density of 87.2 pc/mi/ln and at an average speed of 12.4 mph. **Figure 58** shows the VISSIM link speeds at the Bluffton Parkway interchange during the AM peak hour. As shown, eastbound US 278 near the Bluffton Parkway interchange has speeds between 10 and 30 mph.

TABLE 6: EASTBOUND US 278 & BLUFFTON PARKWAY MERGE OPERATIONS – 2023 NO-BUILD AM

Number of Lanes	LOS	Density (pc/mi/ln)	Average Speed (mph)
3	F	87.2	12.4

At the Squire Pope Road intersection, the eastbound US 278 approach provides two full-through lanes and a short third-through lane for the eastbound through movement that currently carries 2,405 vph. We observed that the third-through lane is rarely utilized since it is short (around 100 feet in length). The v/c ratio in SYNCHRO for the eastbound US 278 approach at Squire Pope Road with two through lanes is 0.99 during the AM peak hour, indicating that the approach is operating at capacity. **Figure 59** shows the VISSIM link speeds at the Squire Pope Road intersection during the AM peak hour. As shown, the eastbound US 278 approach at Squire Pope Road has a speed of less than 30 mph.

The eastbound US 278 travel time is further extended by insufficient capacity at the eastbound US 278 approach at Gumtree Road. The eastbound US 278 approach provides two through lanes for 1,620 vph. The v/c ratio in SYNCHRO for the eastbound US 278 approach at Gumtree Road is 1.02 during the AM peak hour, which indicates that the traffic signal is operating at capacity. The VISSIM results show

the eastbound approach currently operating at LOS F at a delay of 84 secs/veh during the AM peak hour. **Figure 60** shows the VISSIM link speeds at the Gumtree Road intersection during the AM peak hour. As shown, the eastbound US 278 approach at Gumtree Road has a speed of less than 10 mph.

The southbound Cross Island Parkway route has a travel time of nearly 9 minutes. We observed that the southbound Cross Island Parkway has ample capacity until the Sea Pines Circle. The roundabout provides free-flow right-turn movements but a single circulating lane for the through and left-turn movements at each approach. The v/c ratio in SIDRA for the southbound Palmetto Bay Road approach at Sea Pines Circle is 1.06 during the AM peak hour, which indicates that the approach is operating at capacity. **Figure 61** shows the VISSIM link speeds at the Sea Pines Circle during the AM peak hour. As shown, the southbound Palmetto Bay Road approach at Sea Pines Circle has a speed of less than 15 mph.

During the PM peak, the westbound US 278 and northbound Cross Island Parkway routes have excessive travel times of over 29 minutes and over 17 minutes, respectively, due to the insufficient capacity at the westbound US 278 approach at Squire Pope Road. Westbound US 278 between the Squire Pope Road and Bluffton Parkway interchange provides two through lanes. The two through lanes at the westbound US 278 approach at Squire Pope Road carries 2,755 vph. The v/c ratio in SYNCHRO for the westbound US 278 approach at Squire Pope Road is 1.07 during the PM peak hour, which indicates the intersection is operating at capacity. The VISSIM results show that the westbound US 278 approach queue at Squire Pope Road results in failing overall intersection operations at several intersections upstream. **Figure 62** shows the VISSIM link speeds along westbound US 278 between Squire Pope Road and Jarvis Park Road during the PM peak hour. As shown, westbound US 278 generally has a speed of less than 10 mph.

Additionally, VISSIM results show that the eastbound Greenwood Drive and westbound Business US 278 approaches at Sea Pines Circle currently operate at LOS E and F, respectively, during the PM peak. Again, the poor operations are due to the insufficient capacity provided by the single-lane roundabout. **Figure 63** shows the VISSIM link speeds at the Sea Pines Circle during the PM peak. As shown, the eastbound Greenwood Drive approach has a roadway speed of less than 15 mph, and the westbound Business US 278 approach has a roadway speed of less than 5 mph.

In summary, the two through lanes provided along eastbound and westbound US 278 between the Bluffton Parkway interchange and Squire Pope Road result in a bottleneck along the peak directions of the US 278 corridor during the AM and PM peaks. Additional capacity along this section of US 278 is needed to relieve the bottlenecks during both peaks.

- ***During the morning, peak period traffic is fed onto eastbound US 278 from both US 278 to the west of Bluffton and from the Bluffton Parkway such that US 278 is at capacity east of the Bluffton Parkway merge. The Squire Pope Road intersection includes 3 eastbound lanes, but the third through lane is added immediately at the intersection. It is only approximately 100 feet long, and it is underutilized. The morning peak eastbound queue starts at this location because it is the first capacity constraint on the island.***
- ***In the evening, peak period traffic from the 3 lanes on westbound Business US 278 and traffic from 2 lanes from northbound Cross Island Parkway are condensed to 2 westbound lanes through the traffic signal. These two lanes do not have enough capacity for the traffic volumes.***

Table 7 summarizes the network performance measures under 2023 No-Build conditions. Overall, the high average delay per vehicle and total delay during both peaks is due to the US 278 bottlenecks. The 677 unmet demand number during the PM peak period is a result of roadway constraints causing queuing that extends into the post peak period.

TABLE 7: 2023 NO-BUILD VISSIM NETWORK RESULTS

Scenario	Average Delay (Seconds)	Average Speed (MPH)	Total Delay (Hour)	Unmet Demand (Vehicles)
2023 No-Build AM	216.2	27.1	709	0
2023 No-Build PM	346.2	20.1	1324	677



FIGURE 57: VISSIM LINK SPEEDS AT EASTBOUND US 278 LANE DROP – 2023 NO-BUILD AM



FIGURE 58: VISSIM LINK SPEEDS AT THE BLUFFTON PARKWAY INTERCHANGE – 2023 NO-BUILD AM

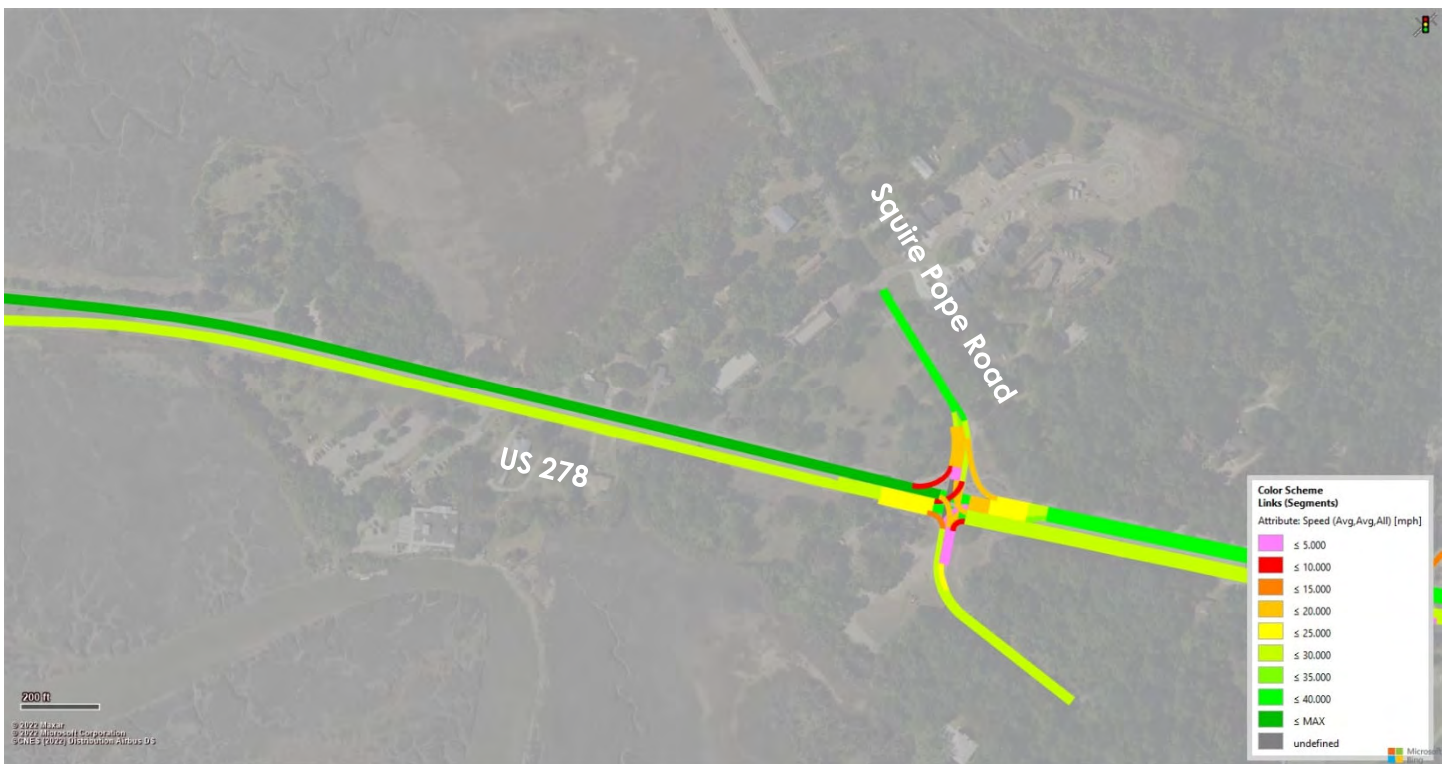


FIGURE 59: VISSIM LINK SPEEDS AT THE SQUIRE POPE ROAD INTERSECTION – 2023 NO-BUILD AM

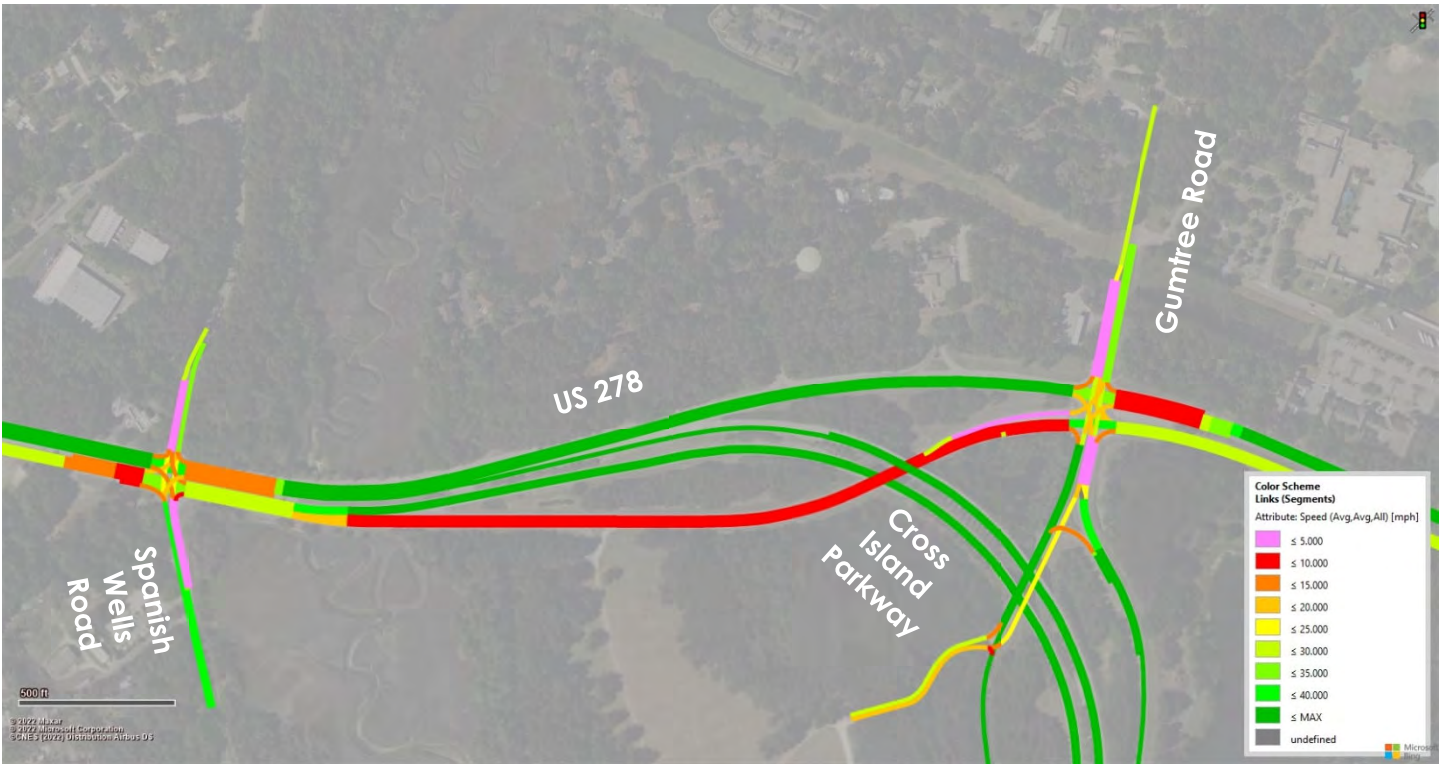


FIGURE 60: VISSIM LINK SPEEDS AT THE GUMTREE ROAD INTERSECTION – 2023 NO-BUILD AM



FIGURE 61: VISSIM LINK SPEEDS AT THE SEA PINES CIRCLE – 2023 NO-BUILD AM

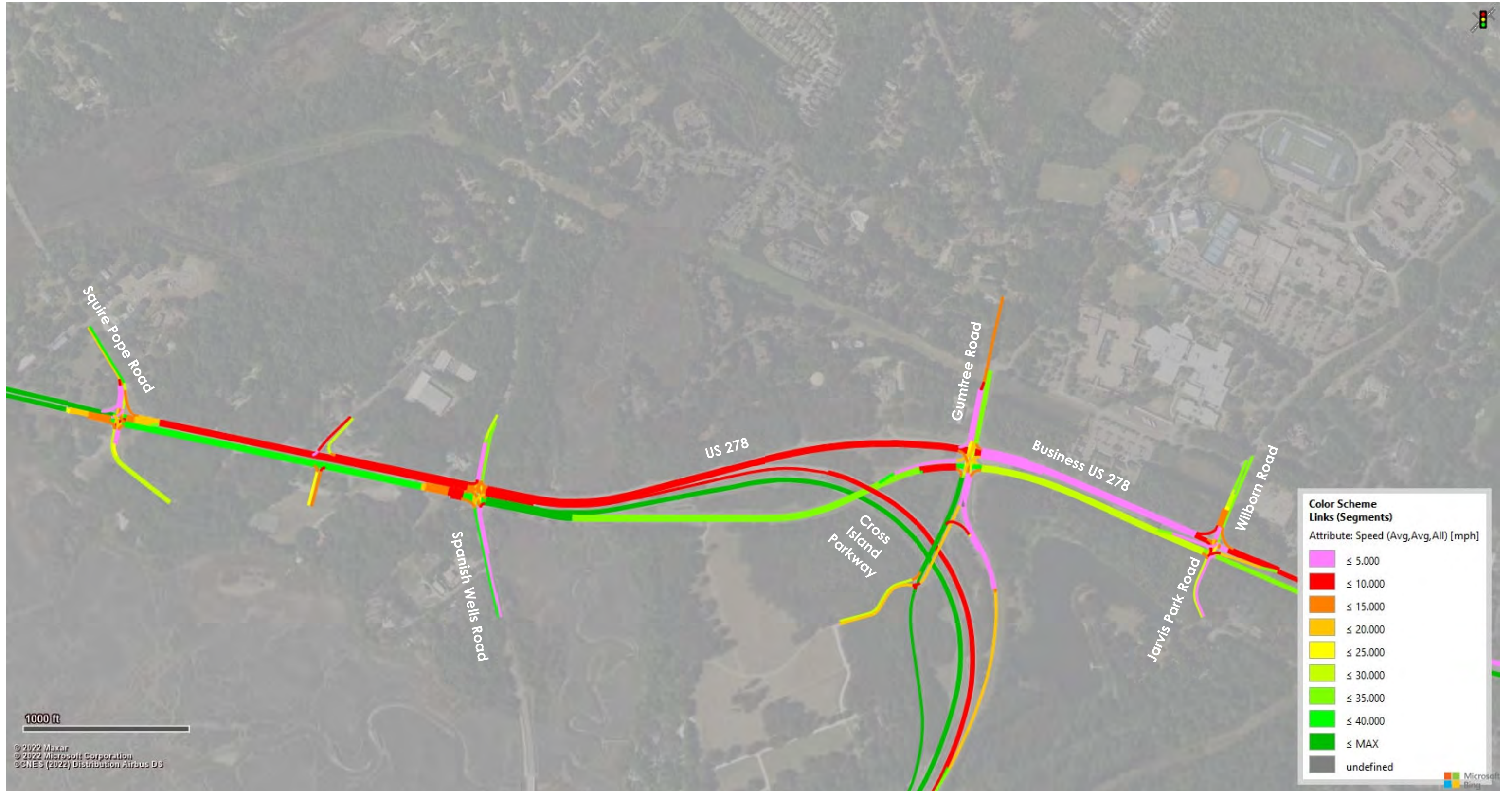
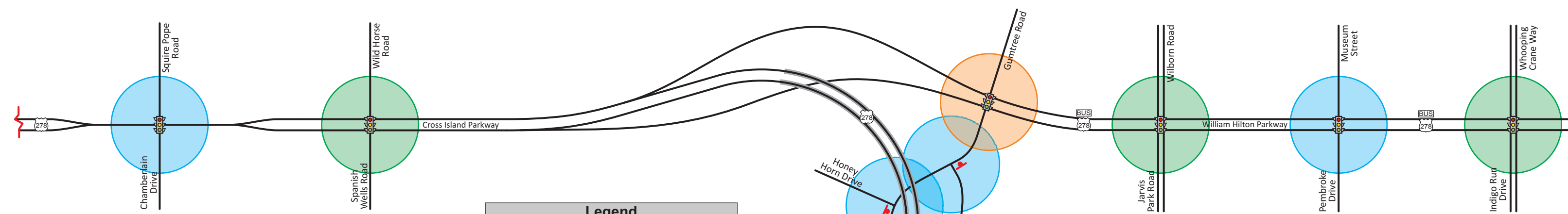
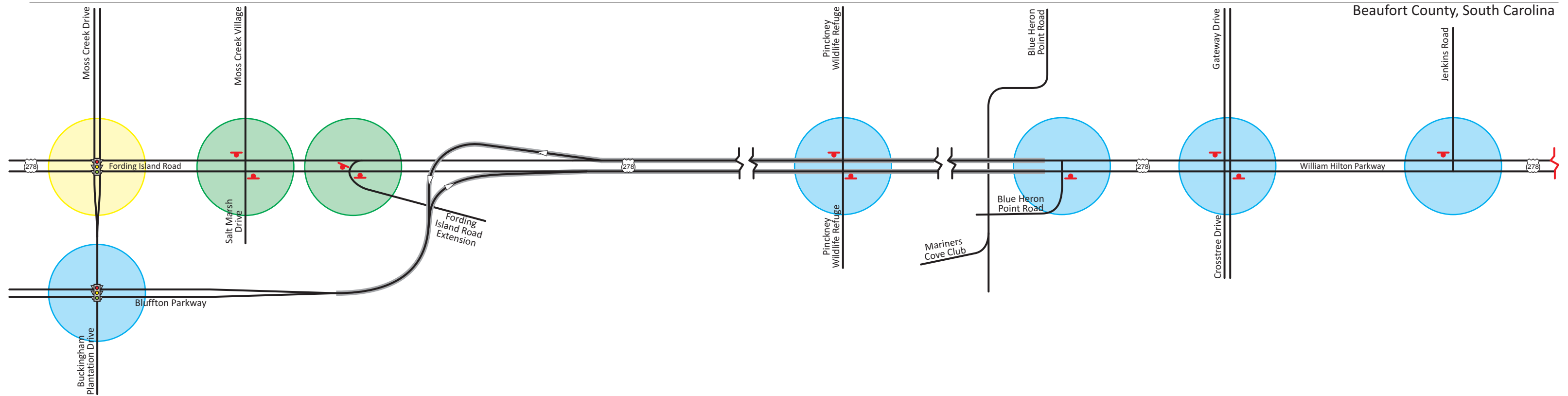


FIGURE 62: VISSIM SPEEDS ON WESTBOUND US 278- SQUIRE POPE RD TO JARVIS PARK RD-2023 NO-BUILD PM





FIGURE 63: VISSIM LINK SPEEDS AT THE SEA PINES CIRCLE – 2023 NO-BUILD PM








Legend

General

-  = Existing Traffic Signal
-  = Existing Side-Street Stop Control

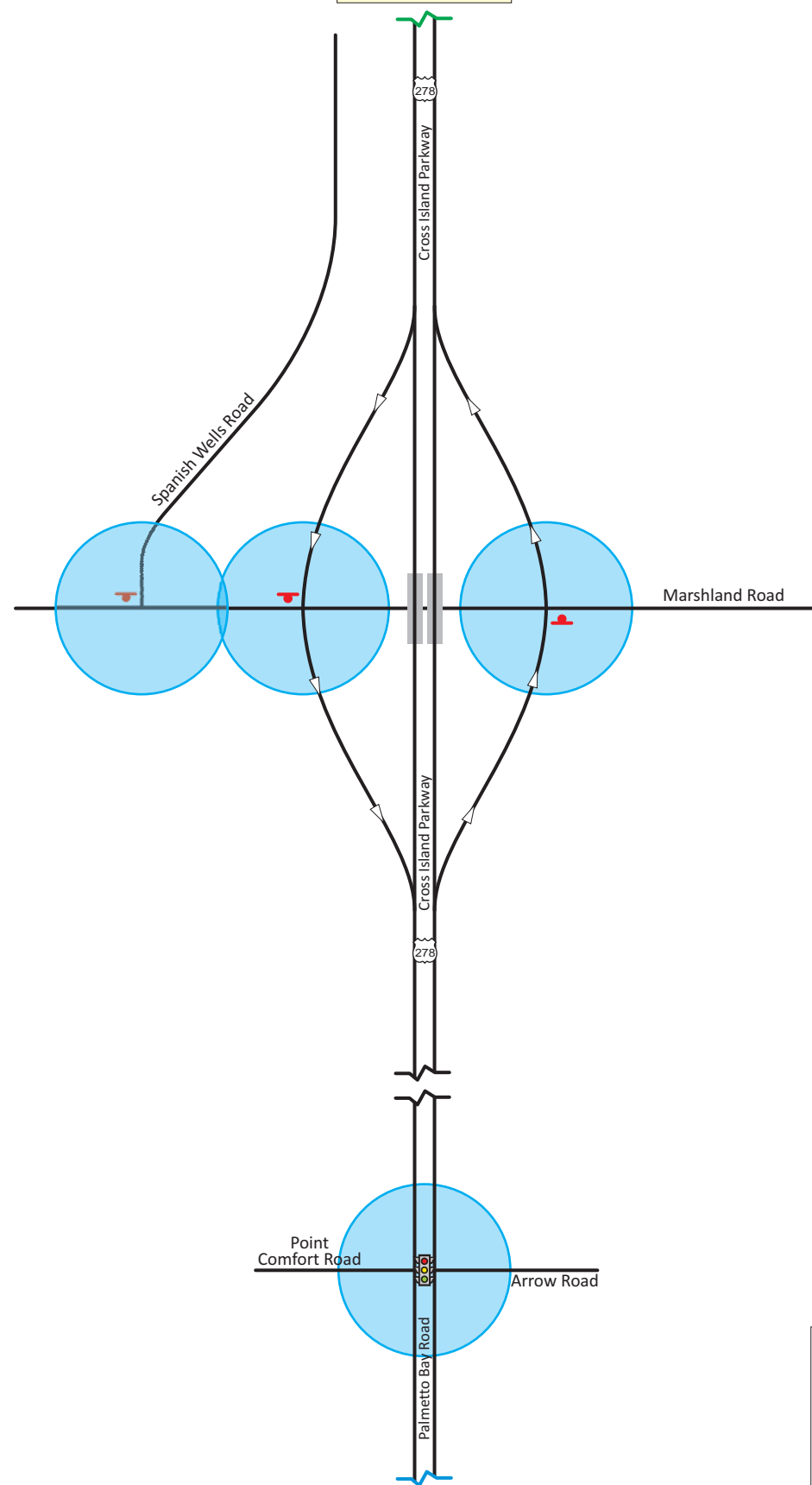
Levels of Service

-  = A, B Level of Service
-  = C Level of Service
-  = D Level of Service
-  = E Level of Service
-  = F Level of Service





Note: Map is a Graphical Representation Only.

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Legend

General

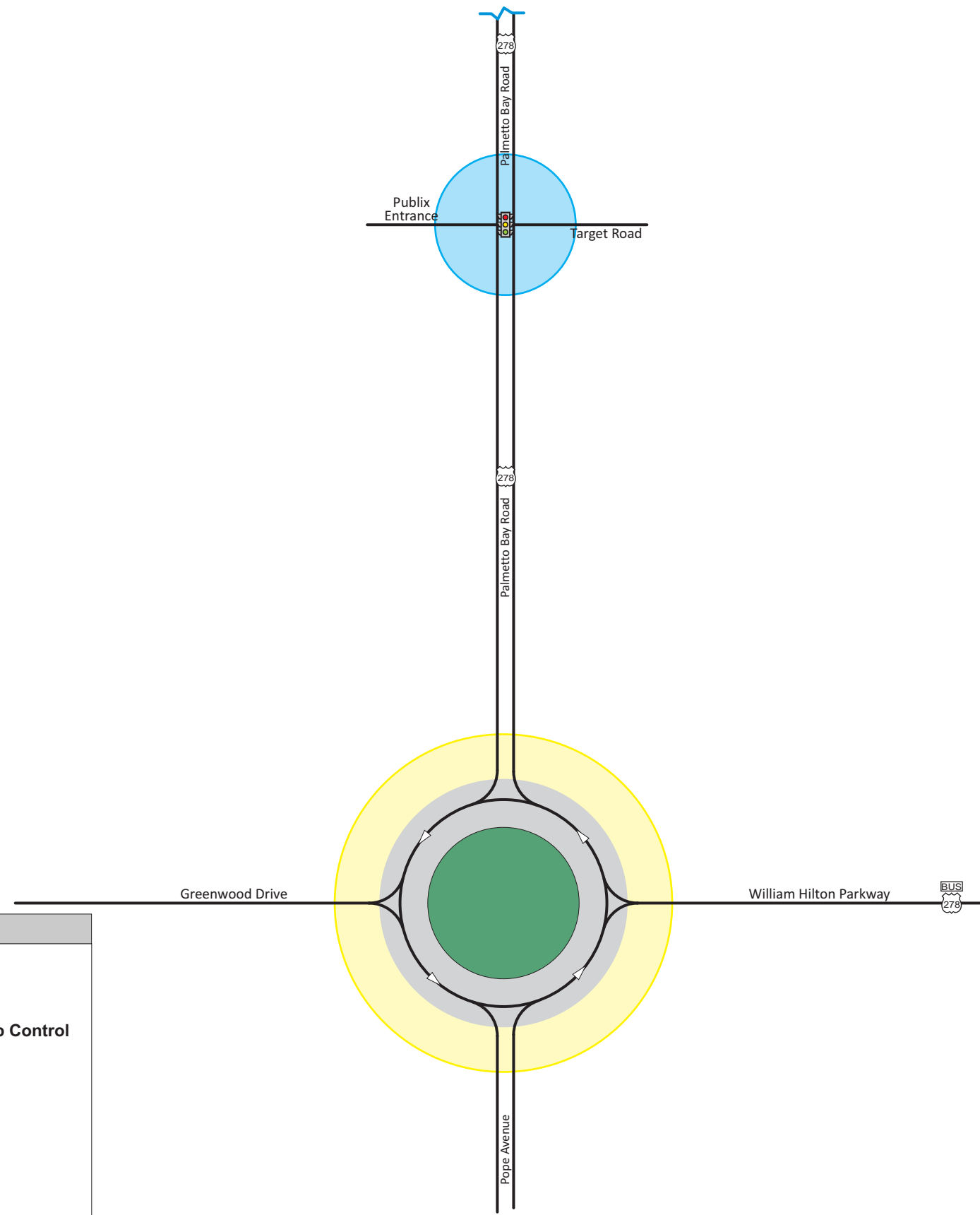
-  = Existing Traffic Signal
-  = Existing Side-Street Stop Control

Levels of Service

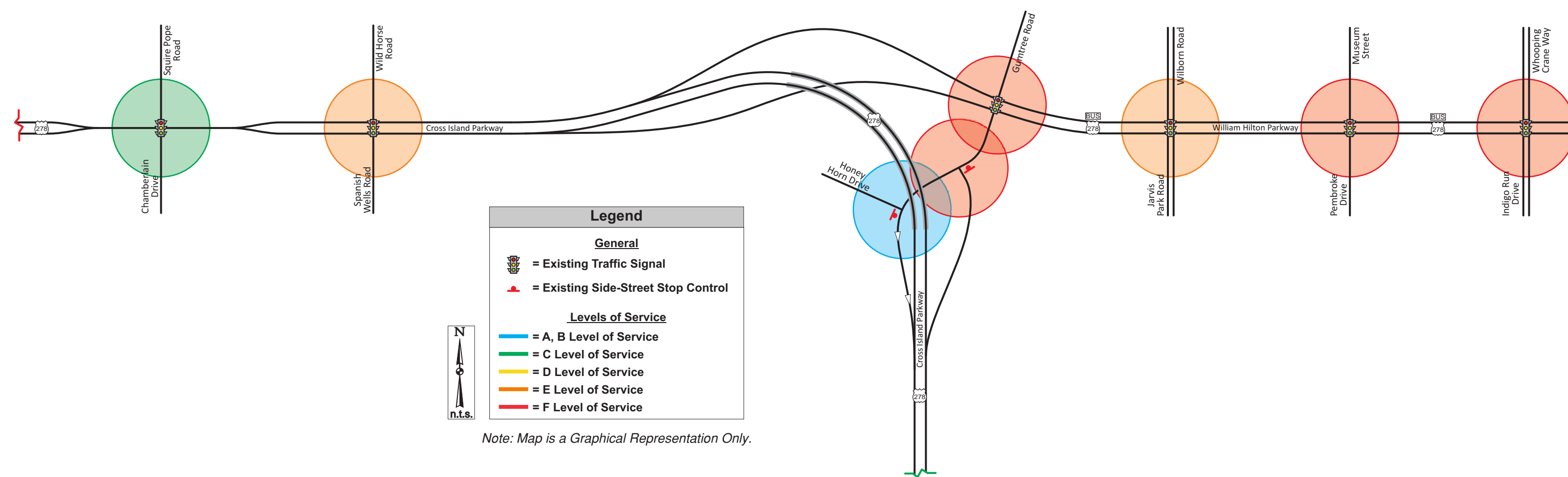
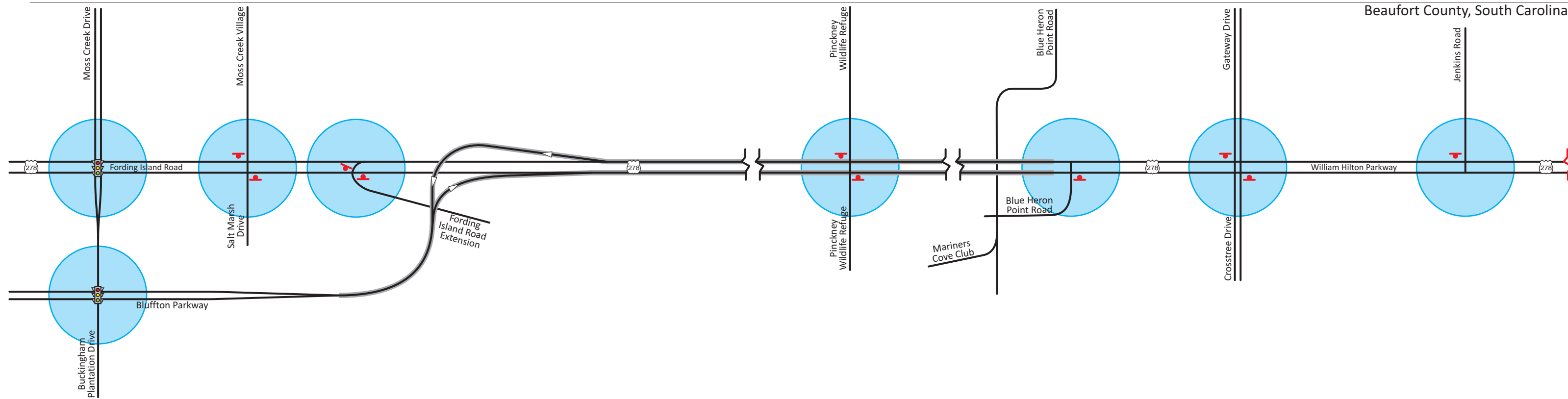
-  = A, B Level of Service
-  = C Level of Service
-  = D Level of Service
-  = E Level of Service
-  = F Level of Service



Note: Map is a Graphical Representation Only.



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Legend

General

- = Existing Traffic Signal
- = Existing Side-Street Stop Control

Levels of Service

- = A, B Level of Service
- = C Level of Service
- = D Level of Service
- = E Level of Service
- = F Level of Service

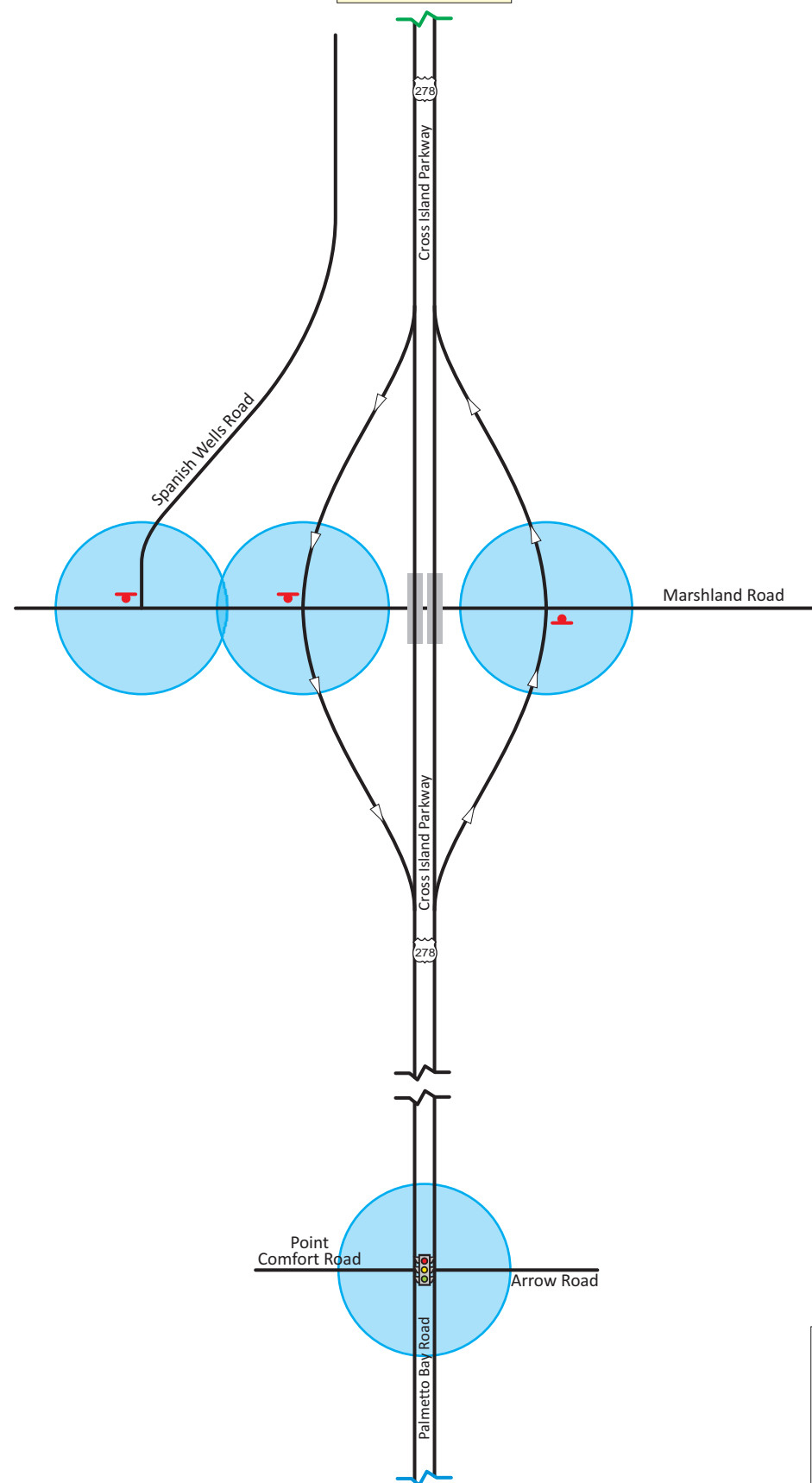


Note: Map is a Graphical Representation Only.

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Legend

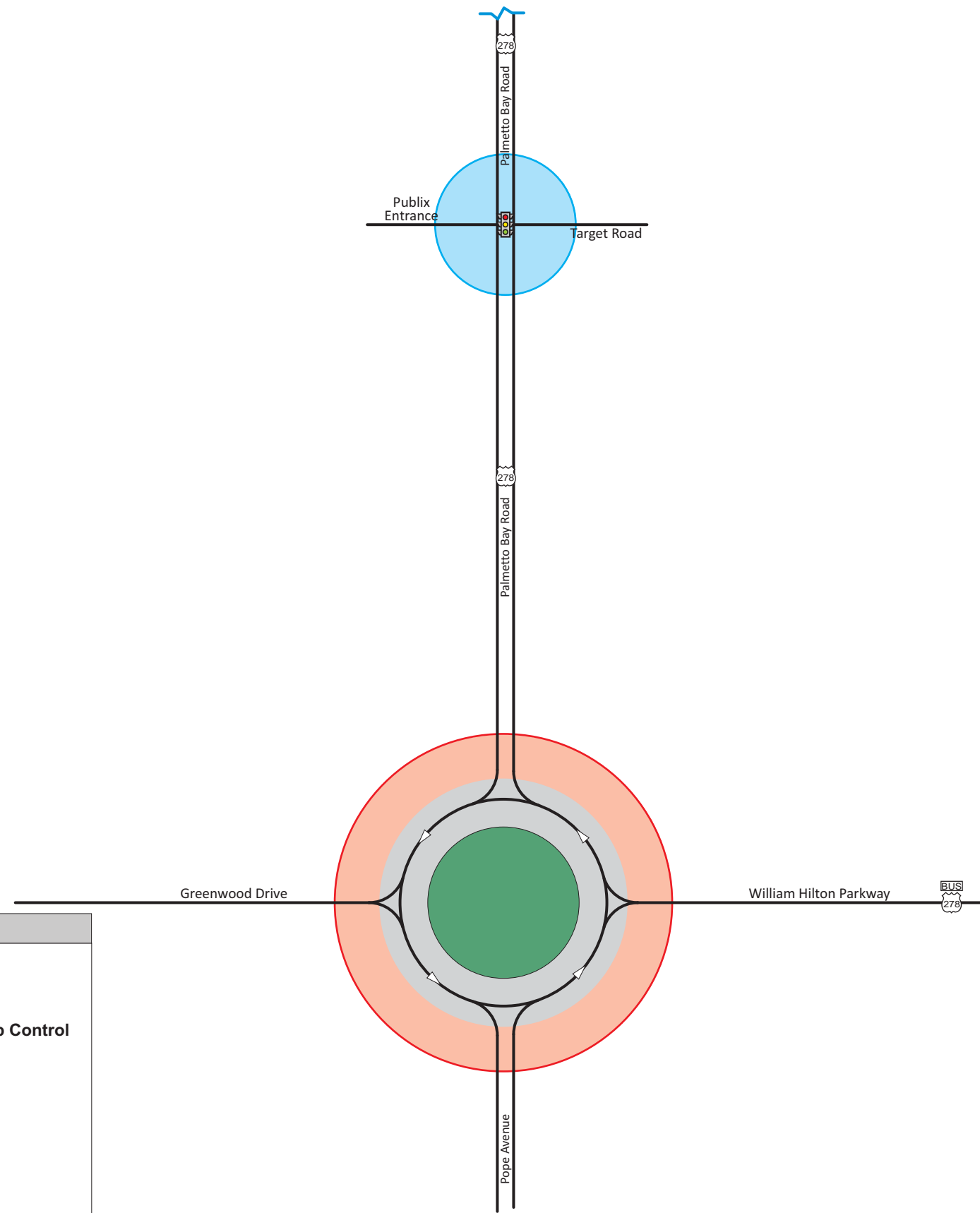
General

-  = Existing Traffic Signal
-  = Existing Side-Street Stop Control

Levels of Service

-  = A, B Level of Service
-  = C Level of Service
-  = D Level of Service
-  = E Level of Service
-  = F Level of Service

Note: Map is a Graphical Representation Only.



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2023 SCDOT Preferred Alternative Operations

The 2023 No-Build traffic volumes were adjusted to account for the revised geometrics under the SCDOT EA Preferred Alternative configuration (Build conditions). **Exhibit 4** summarizes the anticipated 2023 Build traffic volumes during the AM and PM peak hours. The 2023 SCDOT VISSIM evaluations are illustrated in **Exhibit 5** for the AM peak hour and **Exhibit 6** for the PM peak hour. **Table 8** summarizes the travel time results for the US 278 and Cross Island Parkway corridors under 2023 SCDOT preferred alternative conditions.

TABLE 8: 2023 SCDOT VISSIM TRAVEL TIMES

Direction	AM (Minutes)		PM (Minutes)	
	2023 No-Build	2023 SCDOT	2023 No-Build	2023 SCDOT
EB US 278	19.6	19.9	9.7	9.4
WB US 278	8.6	8.8	29.0	9.8
NB Cross Island Parkway	6.7	6.7	17.0	6.9
SB Cross Island Parkway	8.9	10.2	7.5	7.7

Under 2023 SCDOT AM conditions, the eastbound US 278 travel time increases by approximately 1% from 2023 No-Build AM conditions. The slight increase in travel time from 2023 No-Build AM conditions is due to the insufficient capacity at the eastbound US 278 approach at Gumtree Road. As previously mentioned, eastbound US 278 at Gumtree Road is at capacity during the AM peak hour. The VISSIM results show the eastbound approach operates at LOS F at a delay of 95.3 secs/veh during the AM peak hour. **Figure 64** shows the eastbound US 278 approach queue at Gumtree Road during the AM peak. During the AM peak period, the SCDOT configuration shifts the existing eastbound US 278 bottleneck from Squire Pope Road to Gumtree Road.

The bottleneck shifting past the southbound Cross Island Parkway ramp results in additional vehicles accessing the southbound Cross Island Parkway. Additional vehicles on the southbound Cross Island Parkway would worsen the southbound Palmetto Bay Road approach at the Sea Pines Circle. Under 2023 SCDOT AM conditions, the southbound Cross Island Parkway travel time increases by approximately 15% from 2023 No-Build AM conditions.

Under 2023 SCDOT configuration, westbound US 278 and northbound Cross Island Parkway travel times decrease in travel time compared to No-Build conditions due to the additional capacity provided along the westbound US 278 corridor under the SCDOT roadway configuration.

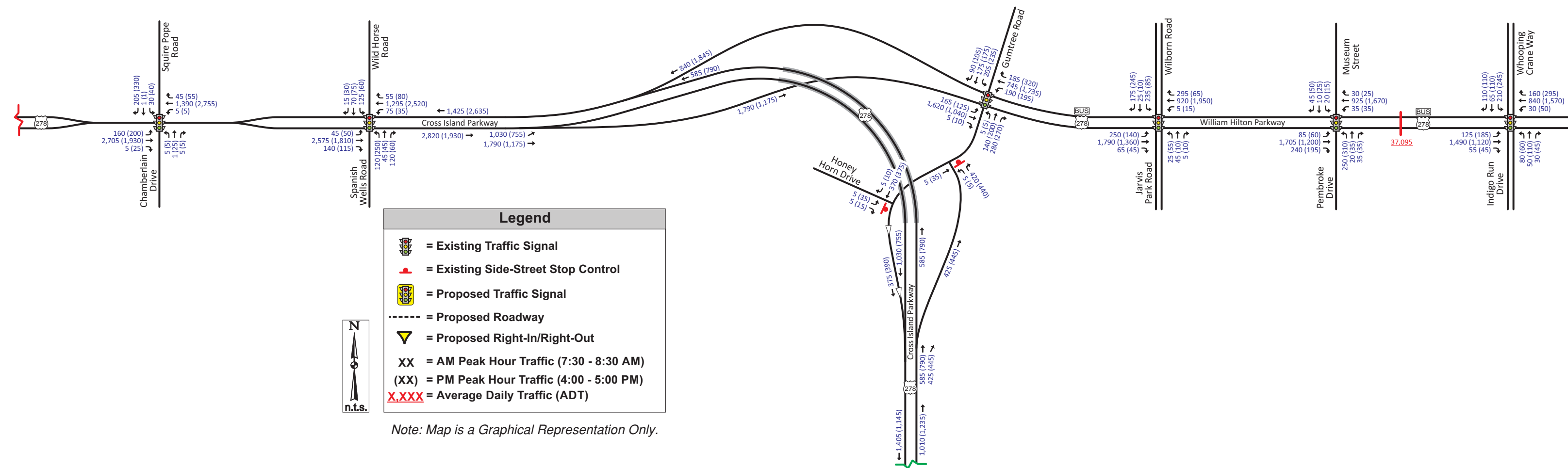
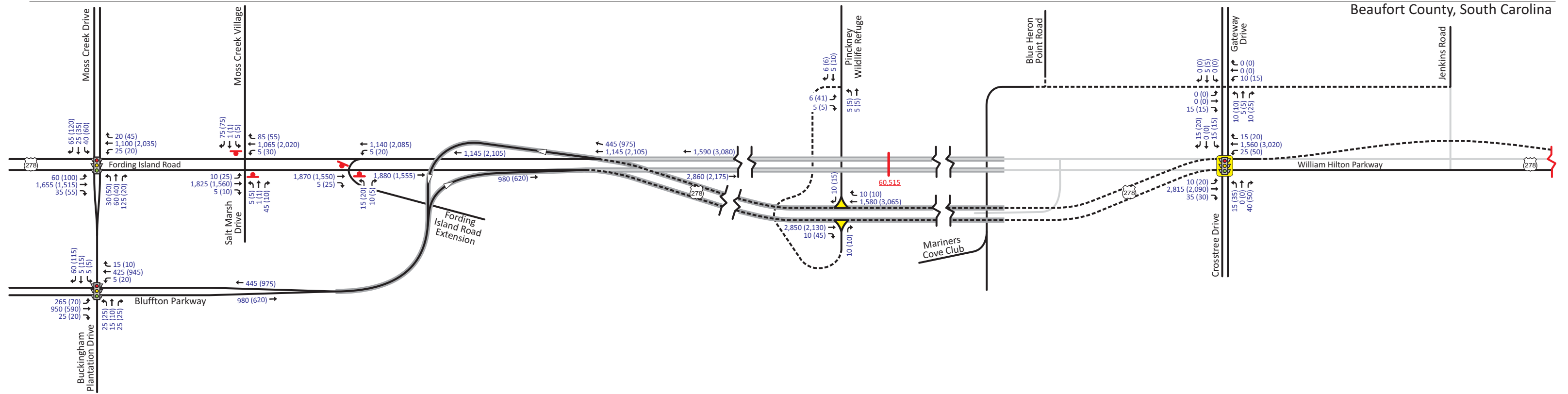
Table 9 summarizes the network performance measures under 2023 SCDOT conditions. During the AM peak, the overall average delay and total delay decreases by 3% from 2023 No-Build to 2023 SCDOT. However, the average speed is the same and the unmet demand increases by 10 vehicles because of the shifted eastbound US 278 bottleneck from Squire Pope Road to Gumtree Road. During the PM peak, the average delay and total delay decreases by 69%, the average speed increases by 68%, and the unmet demand decreases by 88% due to the SCDOT configuration. Note, the unmet demand under 2023 SCDOT PM conditions is still caused by the insufficient capacity at the westbound Business US 278 approach at the Sea Pines Circle.

TABLE 9: 2023 SCDOT VISSIM NETWORK RESULTS

Scenario	Average Delay (Seconds)	Average Speed (MPH)	Total Delay (Hour)	Unmet Demand (Vehicles)
2023 No-Build AM	216.2	27.1	709	0
2023 SCDOT AM	210.6	27.1	684	10
2023 No-Build PM	346.2	20.1	1324	677
2023 SCDOT PM	108.4	34.0	408	81

The SCDOT configuration provides improved lane utilization at the eastbound US 278 approach at Spanish Wells Road during the AM peak. However, the eastbound US 278 bottleneck is expected to shift downstream to the Gumtree Road intersection due to insufficient capacity provided at the eastbound US 278 approach at Gumtree Road. Note- the bottleneck shifting past the southbound Cross Island Parkway ramp allows additional vehicles to access the southbound Cross Island Parkway, which worsens traffic operations at the southbound Palmetto Bay Road approach at the Sea Pines Circle.

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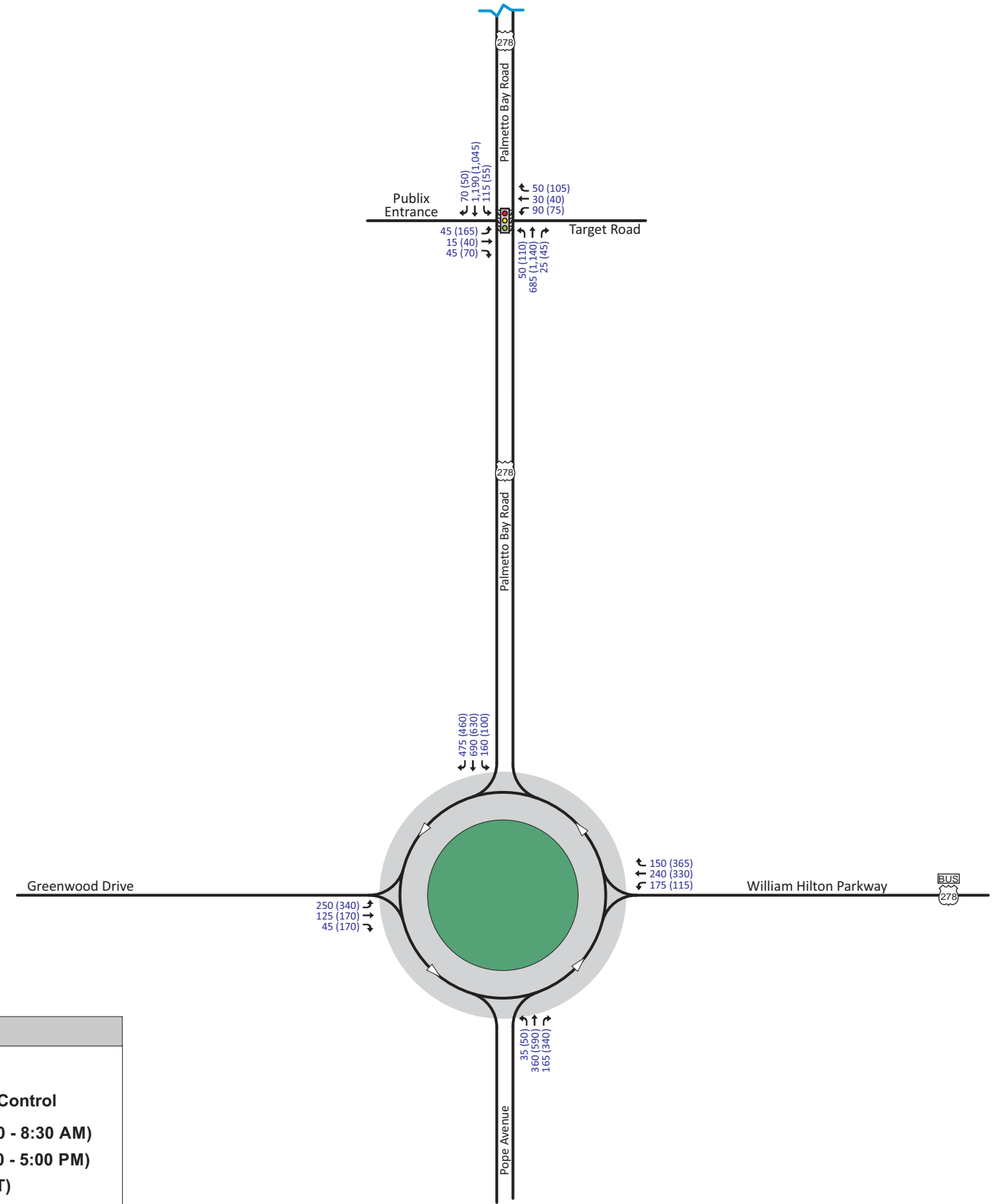
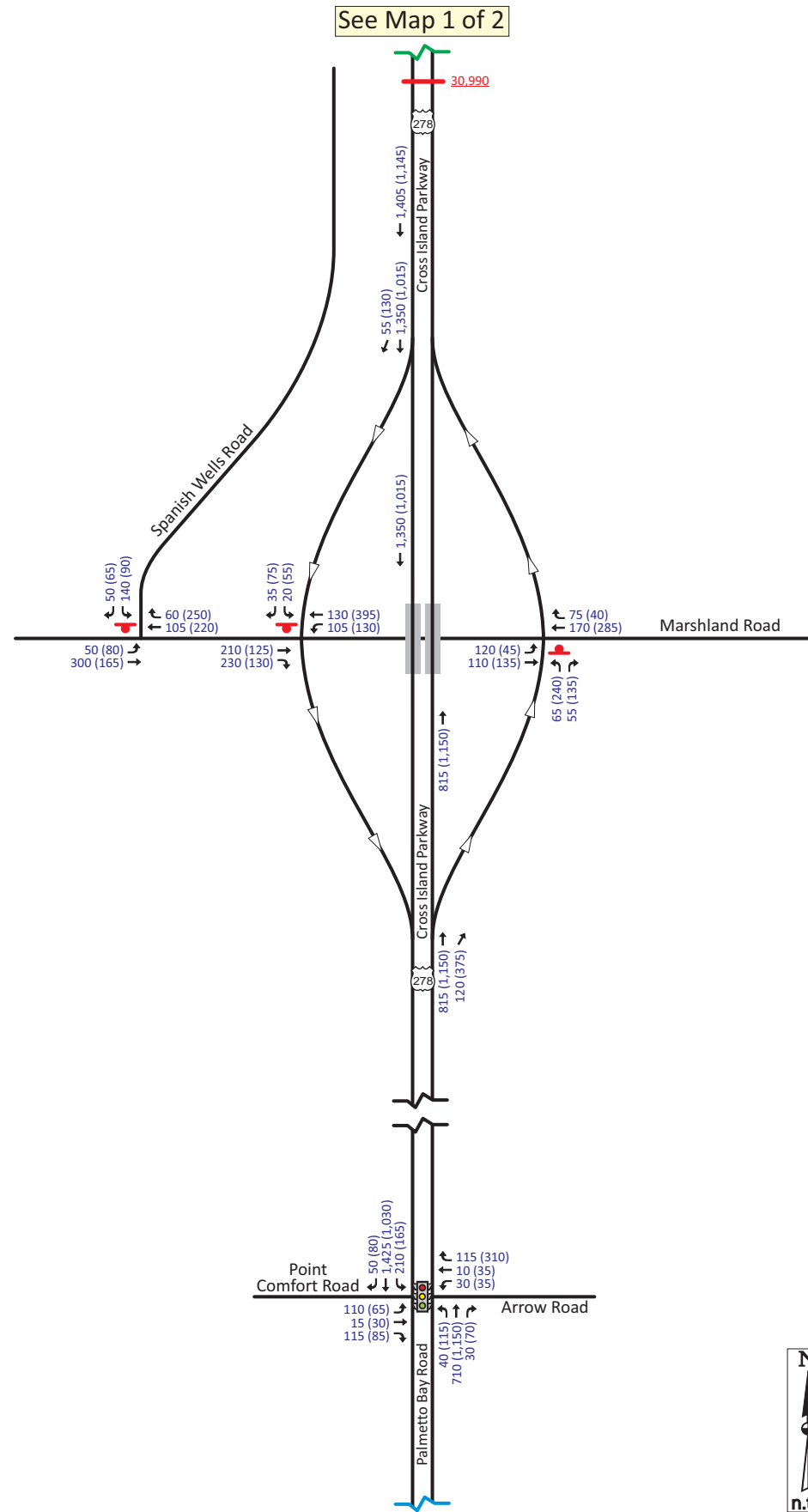


Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal
- = Proposed Roadway
- = Proposed Right-In/Right-Out
- XX = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX) = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X,XXX = Average Daily Traffic (ADT)



Note: Map is a Graphical Representation Only.

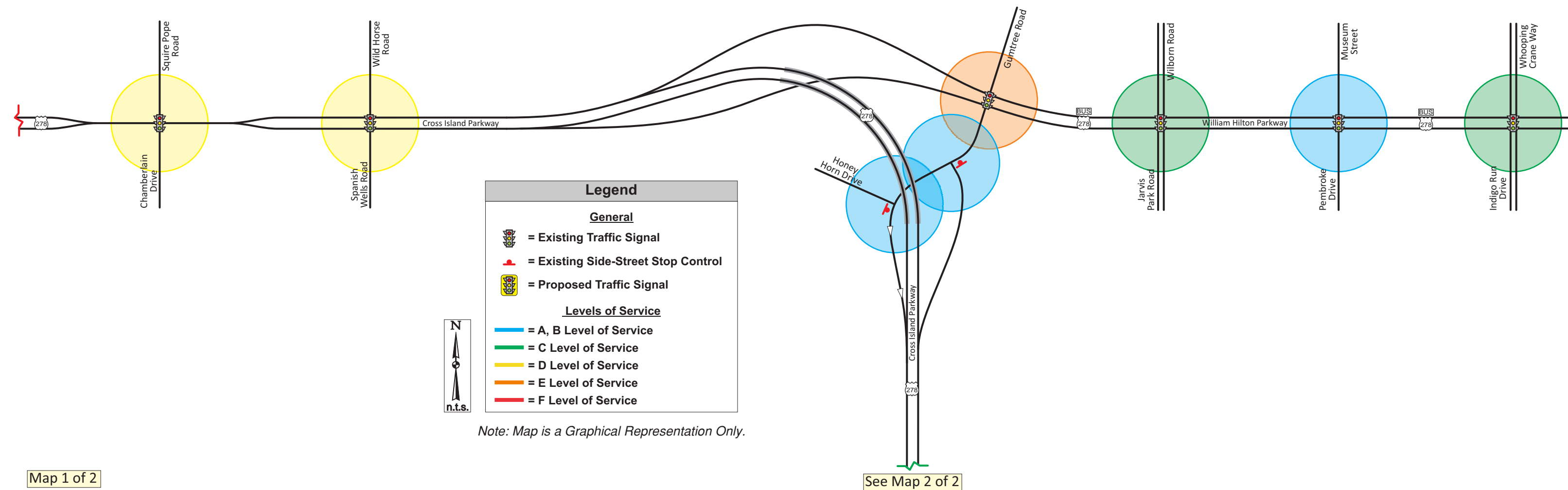
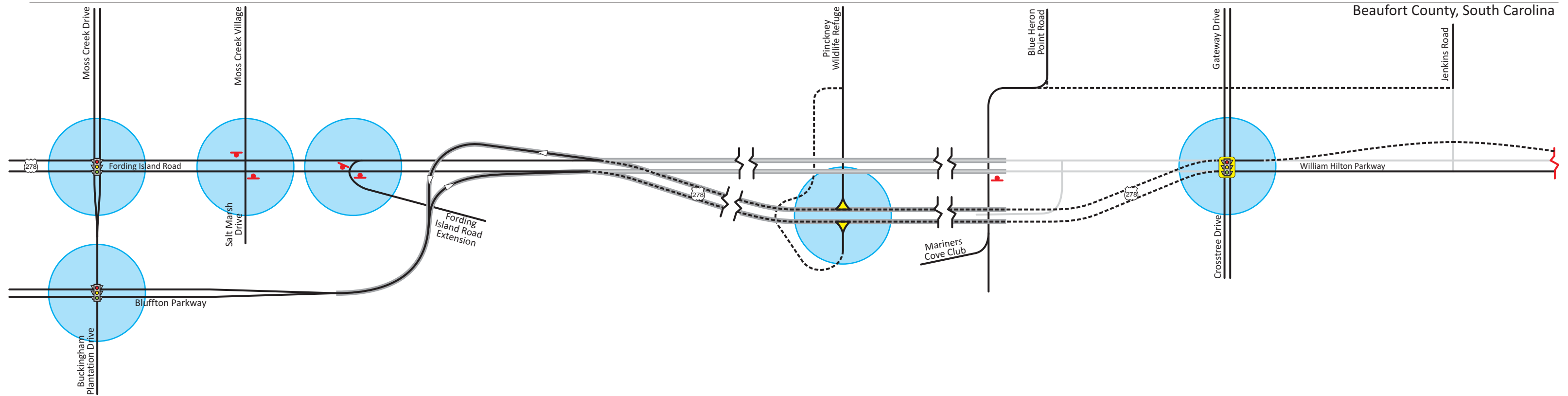


Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- XX** = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX)** = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X,XXX** = Average Daily Traffic (ADT)



Note: Map is a Graphical Representation Only.



Legend

General

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal

Levels of Service

- = A, B Level of Service
- = C Level of Service
- = D Level of Service
- = E Level of Service
- = F Level of Service

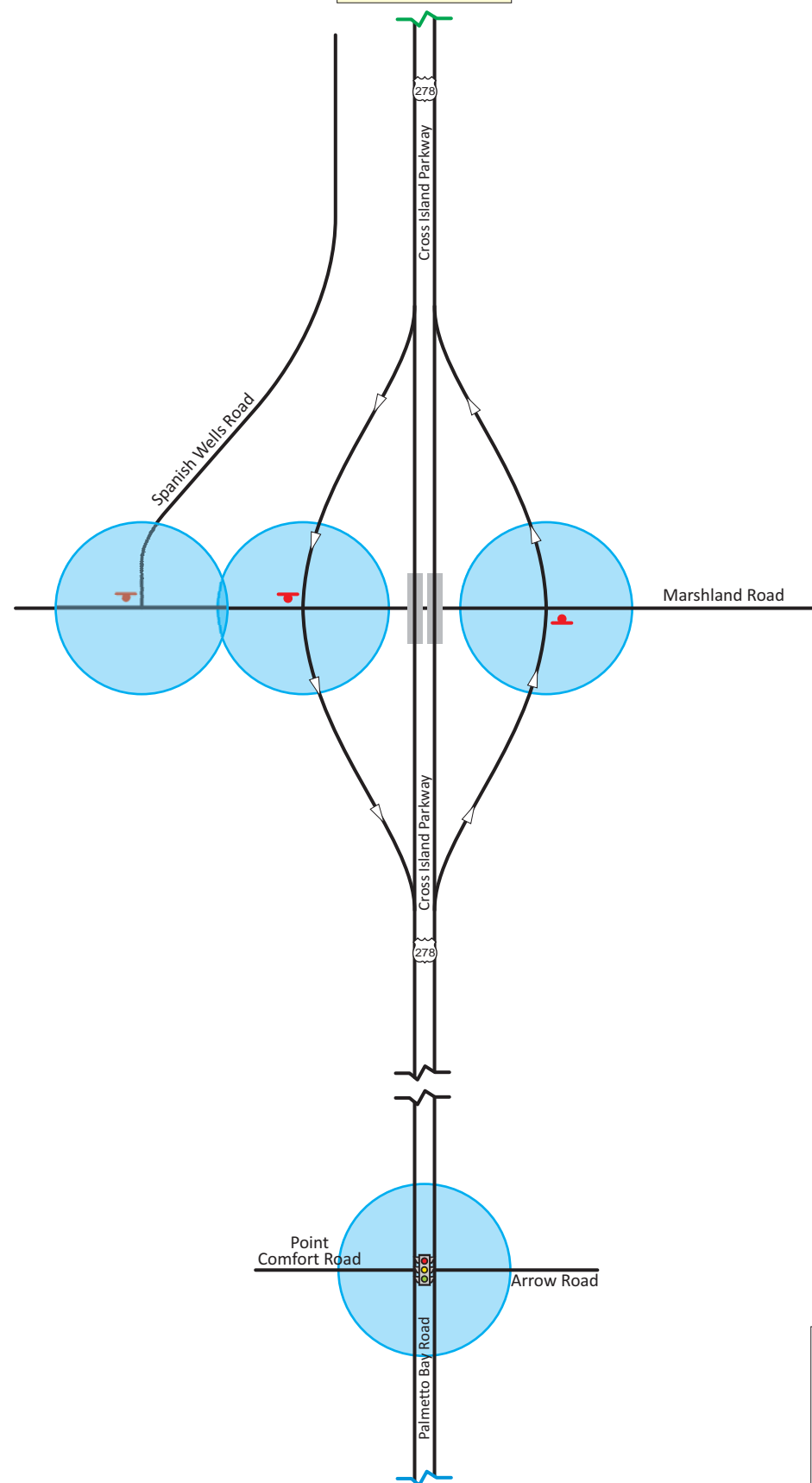


Note: Map is a Graphical Representation Only.

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See Map 2 of 2

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Legend

General

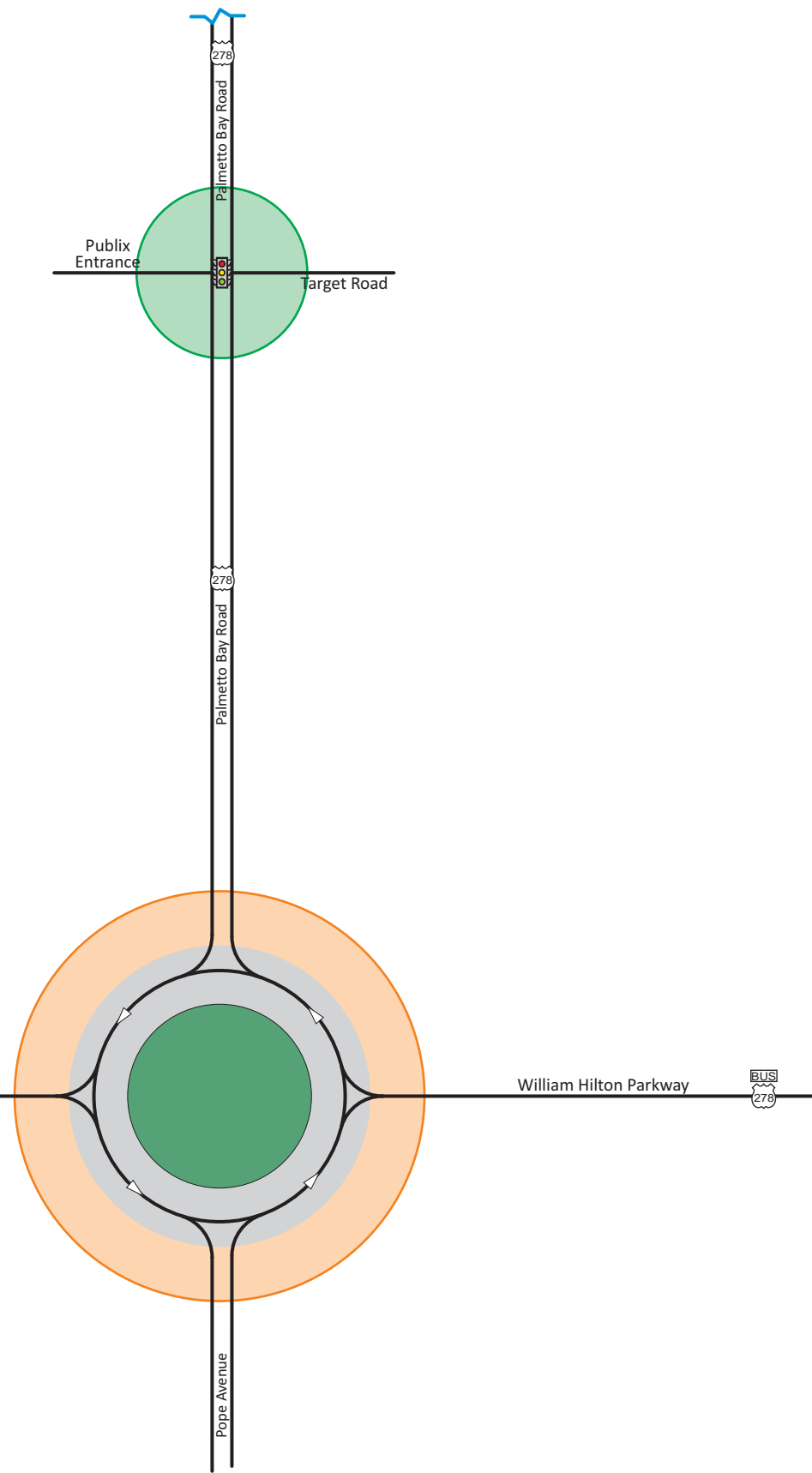
-  = Existing Traffic Signal
-  = Existing Side-Street Stop Control

Levels of Service

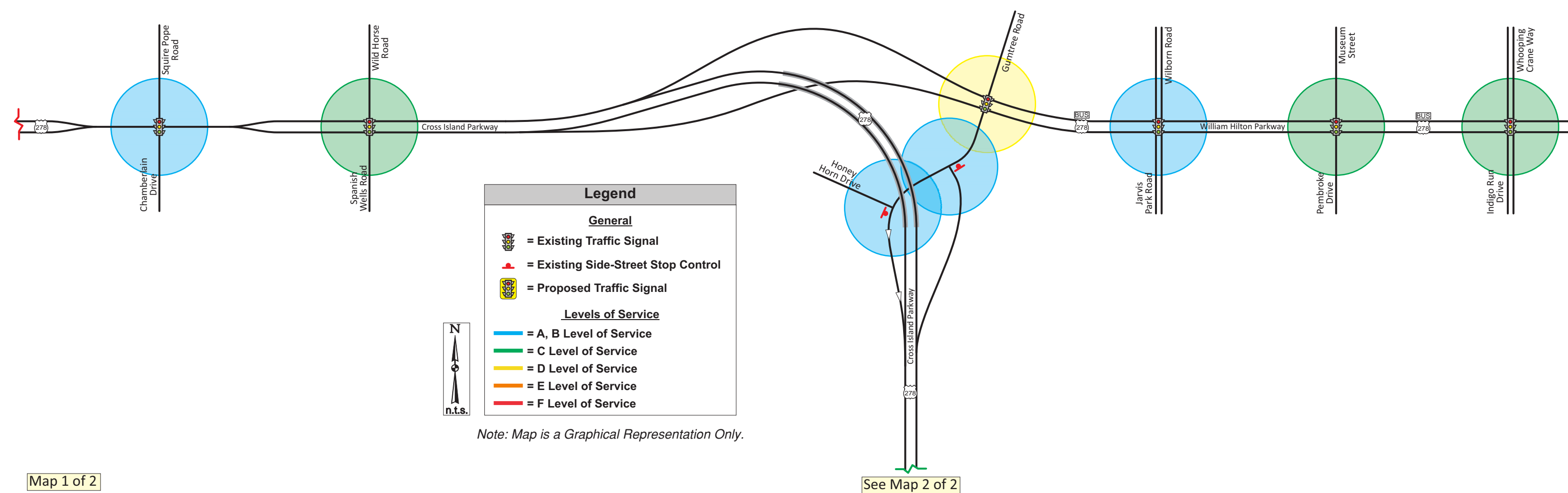
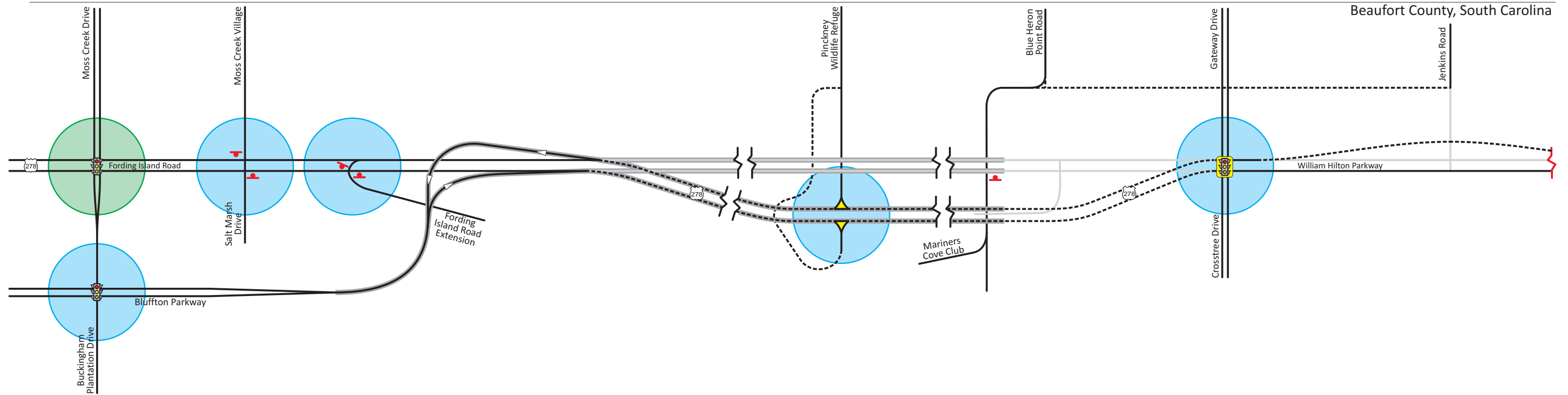
-  = A, B Level of Service
-  = C Level of Service
-  = D Level of Service
-  = E Level of Service
-  = F Level of Service



Note: Map is a Graphical Representation Only.



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Legend

General

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal

Levels of Service

- = A, B Level of Service
- = C Level of Service
- = D Level of Service
- = E Level of Service
- = F Level of Service

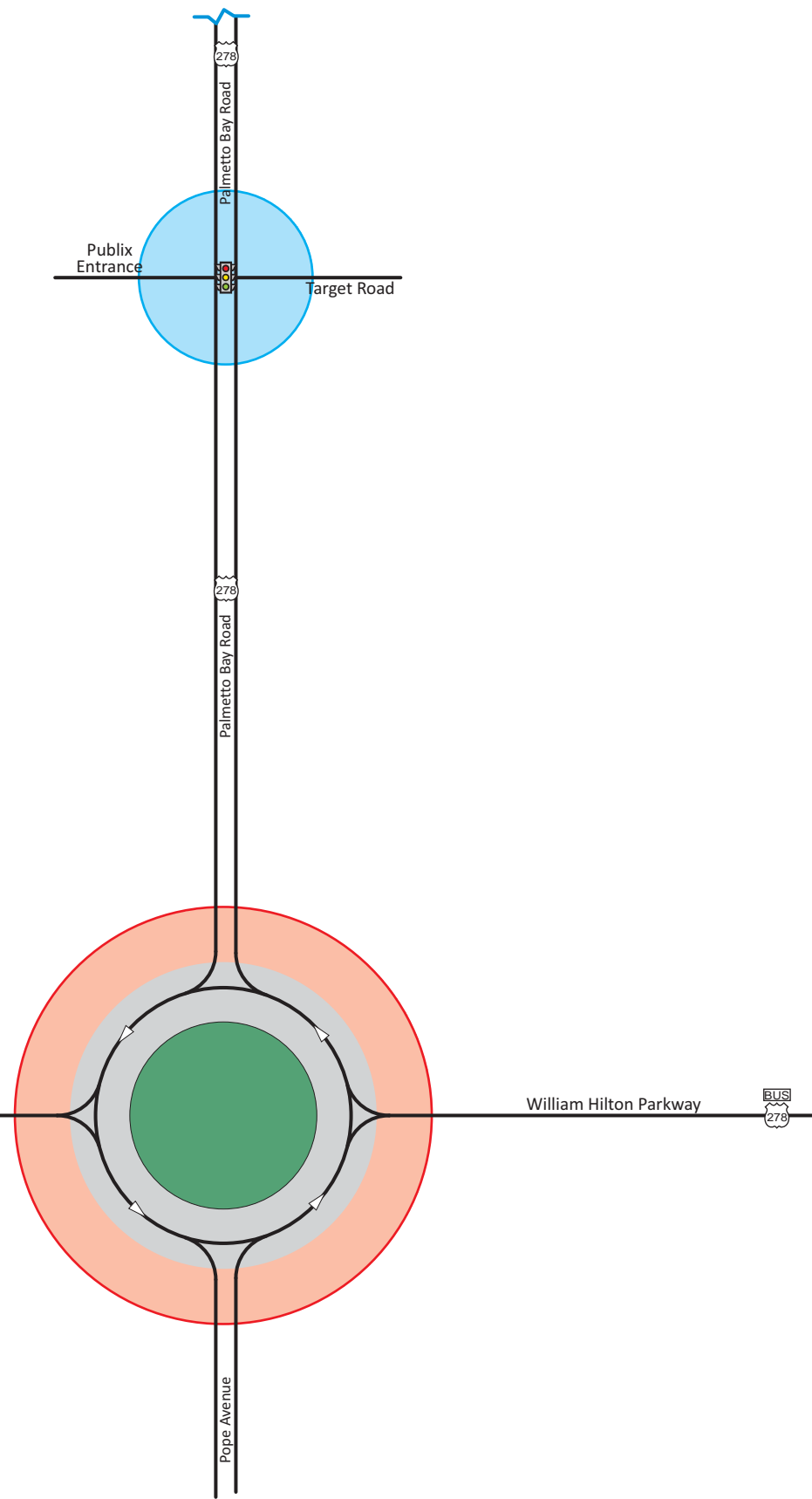
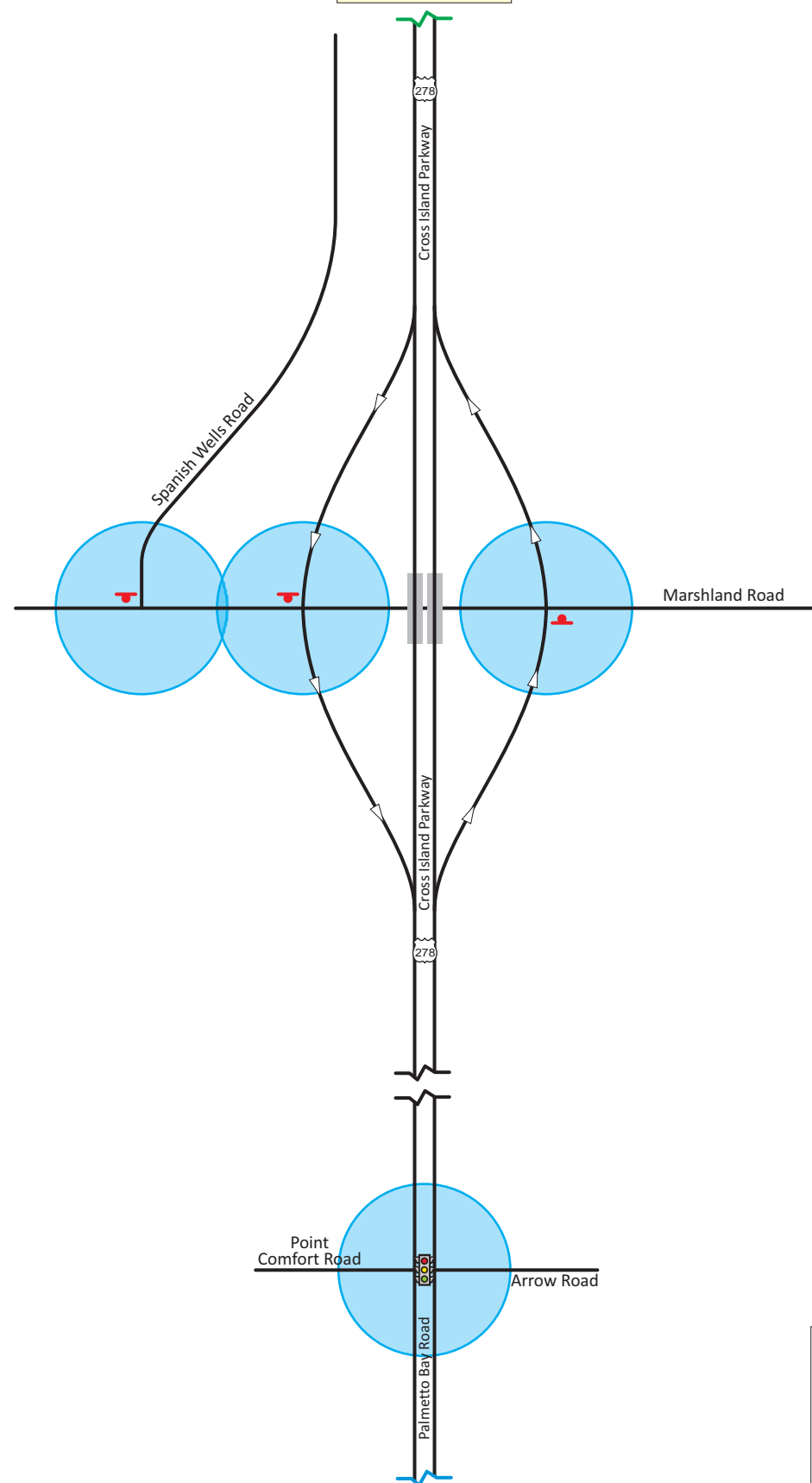


Note: Map is a Graphical Representation Only.

Map 1 of 2



See Map 2 of 2

See Map 1 of 2








Legend

General

-  = Existing Traffic Signal
-  = Existing Side-Street Stop Control

Levels of Service

-  = A, B Level of Service
-  = C Level of Service
-  = D Level of Service
-  = E Level of Service
-  = F Level of Service



Note: Map is a Graphical Representation Only.

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FIGURE 64: EASTBOUND US 278 QUEUE FROM GUMTREE – 2023 SCDOT PREFERRED ALTERNATIVE AM

2023 Gumtree Road and Sea Pines Improvements Operations

The SCDOT EA preferred alternative will relieve the existing westbound US 278 bottleneck during the PM peak period. However, the configuration will worsen congestion at the Gumtree Road traffic signal and Sea Pines Circle during the AM peak period. These intersections already operate at capacity and the SCDOT project will allow more traffic to reach the intersections during heavy morning traffic. The queue from the Gumtree Road intersection will spill back onto US 278, lessening the value of this project. Congestion at the Sea Pines Circle would make use of the Cross Island Parkway less attractive, sending more traffic to Business US 278 and the Gumtree Road traffic signal. Roadway improvements were examined at both intersections to provide recommendations for improved traffic operations.

Gumtree Road: Figure 65 illustrates the recommended change to the eastbound US 278 approach at Gumtree Road. As shown, the eastbound US 278 right-turn lane would be converted to a thru/right-turn lane. The additional through lane would be terminated at the next downstream intersection of Jarvis Park Road via a right-turn lane. This roadway improvement could be achieved through restriping and traffic signal modifications without increasing the intersection’s footprint. Prior to 2012, the intersection of Gumtree Road and Business US 278 was striped with three eastbound through lanes. In the 2012-2014 timeframe, this intersection was restriped with two eastbound through lanes when crosswalks were added at the intersection. ***This intersection should be restriped with three eastbound through lanes as a local project in conjunction with the SCDOT project to accommodate the additional traffic.*** It appears that this modification can be made in such a way that retains the pedestrian crosswalk, without degrading pedestrian safety, and not increasing the physical footprint of the intersection. However, design work is required to determine the best way to make the improvement.



FIGURE 65: POTENTIAL ROADWAY IMPROVEMENTS AT GUMTREE ROAD

Sea Pines Circle: The Sea Pines Circle currently operates at capacity and with significant congestion during both the morning and evening traffic peak periods. The congestion at this intersection impacts the attractiveness of the Cross Island Parkway as an alternative to Business US 278. Congestion at the Sea Pines Circle makes the travel times longer for traffic using Cross Island Parkway, as most of the trips using the Cross Island Parkway need to go through this intersection. At the same time, we recognize that this intersection provides critical access to the public beach area, to Sea Pines, and to Business US 278 on this part of the Island. In this role, the Sea Pines Circle serves as a gateway, slowing and calming traffic accessing these areas. **The local community should consider options to improve the capacity of the Sea Pines Circle intersection while, if possible, maintaining it as a gateway to slow traffic transitioning from the Cross Island Parkway to the local roadway network. It is our understanding that the Town of Hilton Head Island has a separate study examining the Business US 278 corridor, and that the Sea Pines Circle will also be evaluated in this study.**

For this study, we modeled the Sea Pines Circle as a traffic signal 1) to explore if a traffic signal would be able to accommodate traffic demands at this location and 2) to remove the Sea Pines Circle as a bottleneck in the model. Removing this bottleneck is necessary for the traffic from this area to reach other study intersections. **This study does not recommend reconstruction of this intersection to a traffic signal. Our recommendation is for the local community to consider options to improve the capacity of the Sea Pines Circle intersection while, if possible, maintaining it as a gateway to slow traffic transitioning from the Cross Island Parkway to the local roadway network.**

The 2023 Gumtree Road and Sea Pines Improvements VISSIM evaluations are illustrated in **Exhibit 7** for the AM peak hour and **Exhibit 8** for the PM peak hour. **Table 10** summarizes the travel time results for the US 278 and Cross Island Parkway corridors under 2023 Gumtree Road and Sea Pines Improvements conditions.

TABLE 10: 2023 GUMTREE ROAD AND SEA PINES IMPROVEMENTS VISSIM TRAVEL TIMES

Direction	AM (Minutes)		PM (Minutes)	
	2023 No-Build	2023 Gumtree Road and Sea Pines Improvements	2023 No-Build	2023 Gumtree Road and Sea Pines Improvements
EB US 278	19.6	9.9	9.7	9.4
WB US 278	8.6	8.7	29.0	9.9
NB Cross Island Parkway	6.7	6.4	17.0	6.7
SB Cross Island Parkway	8.9	7.4	7.5	7.4

Under 2023 Gumtree Road and Sea Pines Improvements AM conditions, the eastbound US 278 and southbound Cross Island Parkway travel times decrease by approximately 50% and 17%, respectively, from 2023 No-Build AM conditions. **Figure 66** shows the VISSIM link speeds along eastbound US 278 between Squire Pope Road and Gumtree Road during the AM peak hour. Eastbound US 278 generally has improved to between 30 and 45 mph.

Table 11 compares the eastbound US 278 and Bluffton Parkway merge operations under the 2023 No-Build and 2023 Gumtree Road and Sea Pines Improvements conditions during the AM peak hour. As

shown, the additional eastbound US 278 lane is expected to improve the merge from LOS F under 2023 No-Build conditions to LOS B under 2023 Gumtree Road and Sea Pines Improvements. Furthermore, the speed is expected to improve from 12.4 mph under 2023 No-Build conditions to 49.9 under 2023 Gumtree Road and Sea Pines Improvements conditions.

TABLE 11: EASTBOUND US 278 & BLUFFTON PARKWAY OPERATIONS – AM PEAK HOUR

Number of Lanes	LOS	Density (pc/mi/ln)	Average Speed (mph)
2023 No-Build (Merge)			
3	F	87.2	12.4
2023 Gumtree Road and Sea Pines Improvements (Merge)			
4	B	14.4	49.9

Table 12 compares the intersection operations at Gumtree Road during the AM peak hour under 2023 No-Build and 2023 Gumtree Road and Sea Pines Improvements conditions. As shown, the eastbound Business US 278 approach at Gumtree Road is expected to improve from LOS F under 2023 No-Build conditions to LOS C under 2023 Gumtree Road and Sea Pines Improvements conditions.

TABLE 12: INTERSECTION OPERATING CONDITIONS (VISSIM)

Intersection/Approach	2023 No-Build AM				2023 Gumtree Road and Sea Pines Improvements AM			
	LOS	Delay	Average Queue	Max Queue	LOS	Delay	Average Queue	Max Queue
US 278 & Gumtree Road (Signalized)								
Eastbound Business US 278	F	84.0	1475'	1690'	C	34.3	155'	705'
Westbound Business US 278	C	28.8	115'	385'	C	28.9	120'	395'
Northbound Gumtree Road	C	23.1	60'	260'	C	25.0	75'	300'
Southbound Gumtree Road	E	66.9	150'	630'	E	67.1	150'	690'
Overall Intersection	E	60.6	---	---	D	35.8	---	---

Table 13 compares the intersections operations at the Sea Pines Circle during the AM peak hour under 2023 No-Build and 2023 Gumtree Road and Sea Pines Improvements conditions. As shown, the eastbound Greenwood Drive approach is expected to improve from LOS F under 2023 No-Build conditions to LOS D under 2023 Gumtree Road and Sea Pines Improvements conditions. Furthermore, the maximum southbound Palmetto Bay Road queue at Greenwood Drive is expected to decrease from 920 feet under 2023 No-Build conditions to 300 feet under 2023 Gumtree Road and Sea Pines Improvements conditions.

TABLE 13: INTERSECTION OPERATING CONDITIONS (VISSIM)

Intersection/Approach	2023 No-Build AM				2023 Gumtree Road and Sea Pines Improvements AM			
	LOS	Delay	Average Queue	Max Queue	LOS	Delay	Average Queue	Max Queue
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout/Signalized)								
Eastbound Greenwood Drive	F	146.6	585'	1240'	D	54.8	80'	265'
Westbound Business US 278	C	16.5	60'	500'	D	47.0	165'	610'
Northbound Pope Avenue	A	6.8	<25'	320'	B	12.0	<25'	180'
Southbound Palmetto Bay Road	C	24.5	330'	920'	A	8.9	25'	300'
Overall Intersection	D	34.7	---	---	C	23.8	---	---

Table 14 compares the intersections operations at the Sea Pines Circle during the PM peak hour under 2023 No-Build and 2023 Gumtree Road and Sea Pines Improvements conditions. As shown, the eastbound Greenwood Drive and westbound approaches are expected to improve from LOS E and F, respectively, under 2023 No-Build conditions to LOS D under 2023 Gumtree Road and Sea Pines Improvements conditions. Furthermore, the overall intersection delay is expected to improve from LOS F under 2023 No-Build conditions to LOS C under 2023 Gumtree Road and Sea Pines Improvements conditions.

TABLE 14: INTERSECTION OPERATING CONDITIONS (VISSIM)

Intersection/Approach	2023 No-Build PM				2023 Gumtree Road and Sea Pines Improvements PM			
	LOS	Delay	Average Queue	Max Queue	LOS	Delay	Average Queue	Max Queue
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout/Signalized)								
Eastbound Greenwood Drive	E	43.4	305'	995'	D	44.1	100'	385'
Westbound Business US 278	F	199.8	1310'	1695'	D	39.8	220'	775'
Northbound Pope Avenue	D	34.9	310'	930'	B	16.6	50'	355'
Southbound Palmetto Bay Road	B	11.1	65'	670'	B	10.8	30'	320'
Overall Intersection	F	56.8	---	---	C	25.2	---	---

Under 2023 Gumtree Road and Sea Pines Improvements PM conditions, the westbound US 278 and northbound Cross Island Parkway travel times are similar to the 2023 SCDOT PM conditions. The decrease in travel time compared to No-Build conditions is still due to the additional capacity provided along the westbound US 278 corridor under the SCDOT roadway configuration.

Table 15 summarizes the network performance measures under 2023 conditions. During the AM peak, the average delay decreases by 65%, the average speed increases by 39%, and the total delay decreases by 66% from 2023 No-Build to 2023 Gumtree Road and Sea Pines Improvements conditions due to the improvements at Gumtree Road. During the PM peak, the average delay decreases by 76%, the average speed increases by 82%, the total delay decreases by 76% the unmet demand

decreases by 100% from 2023 No-Build to 2023 Gumtree Road and Sea Pines Improvements conditions due to the signal at Sea Pines Circle.

TABLE 15: 2023 GUMTREE ROAD AND SEA PINES IMPROVEMENTS VISSIM NETWORK RESULTS

Scenario	Average Delay (Seconds)	Average Speed (MPH)	Total Delay (Hour)	Unmet Demand (Vehicles)
2023 No-Build AM	216.2	27.1	709	0
2023 Gumtree Road and Sea Pines Improvements AM	76.6	37.6	242	0
2023 No-Build PM	346.2	20.1	1324	677
2023 Gumtree Road and Sea Pines Improvements PM	83.7	36.5	317	0

The SCDOT EA preferred alternative will relieve the existing westbound US 278 bottleneck during the PM peak period. However, the configuration will worsen congestion at the Gumtree Road traffic signal and Sea Pines Circle during the AM peak period. These intersections already operate at capacity and the SCDOT project will allow more traffic to reach the intersections during heavy morning traffic. The queue from the Gumtree Road intersection will spill back onto US 278, lessening the value of SCDOT's project. Congestion at the Sea Pines Circle would make use of the Cross Island Parkway less attractive, sending more traffic to Business US 278 and the Gumtree Road traffic signal. Roadway improvements were examined at both intersections to provide recommendations for improved traffic operations.

The Gumtree Road intersection should be restriped with three eastbound through lanes as a part of the SCDOT project to accommodate the additional traffic. This roadway improvement could be achieved through restriping and traffic signal modifications and without increasing the intersection's footprint. Prior to 2012, the intersection of Gumtree Road and Business US 278 was striped with three eastbound through lanes. In the 2012-2014 timeframe, this intersection was restriped with two eastbound through lanes when crosswalks were added at the intersection.

While the Sea Pines Circle operates at capacity and with significant congestion, the intersection also serves as a gateway, slowing and calming traffic accessing these areas. The local community should consider options to improve the capacity of the Sea Pines Circle intersection while, if possible, maintaining it as a gateway to slow traffic transitioning from the Cross Island Parkway to the local roadway network.

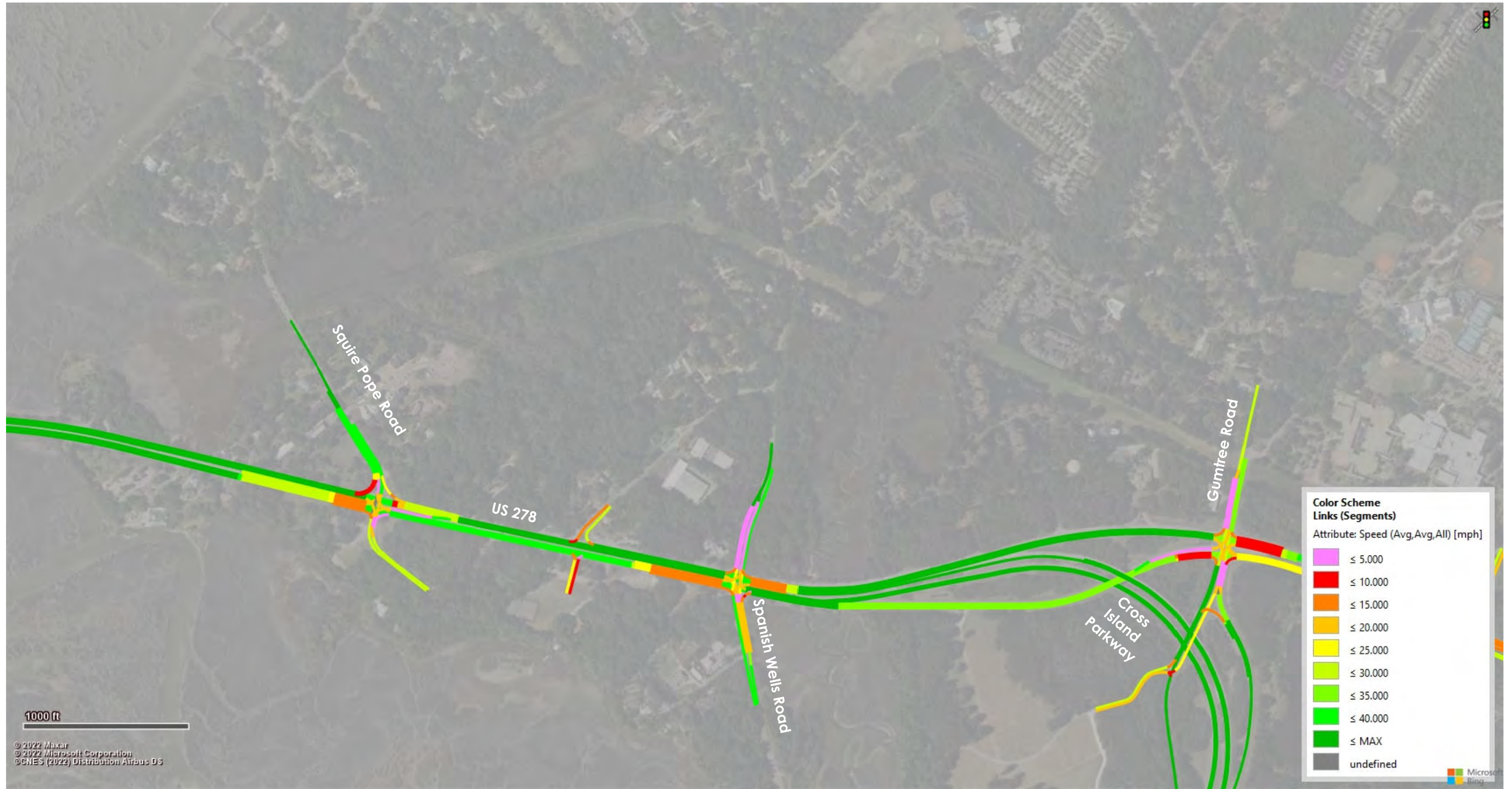
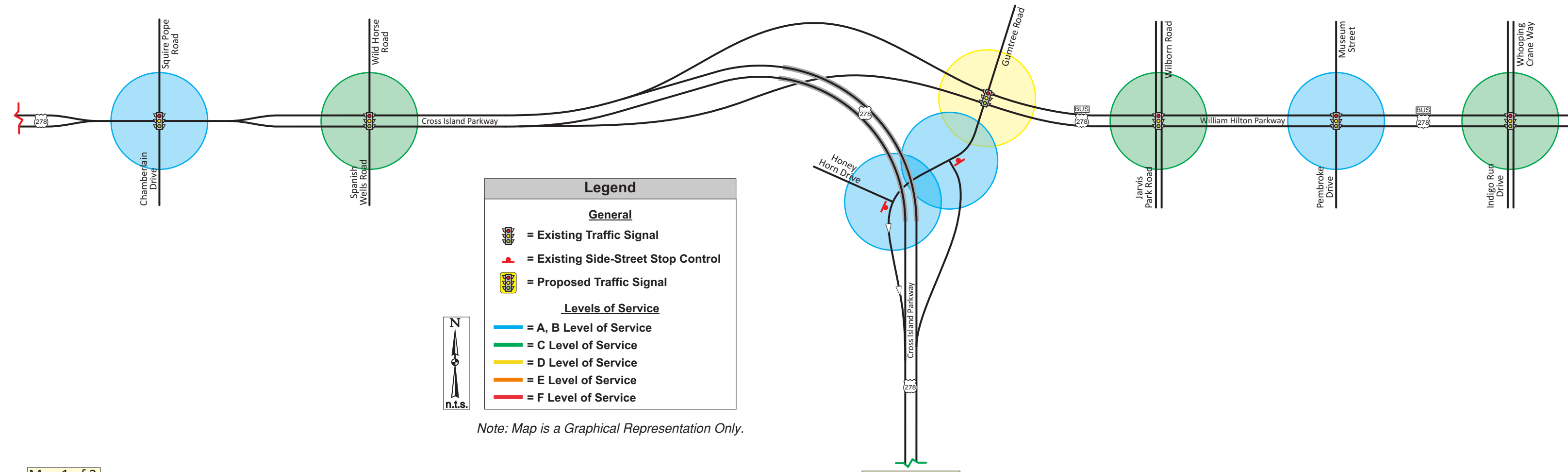
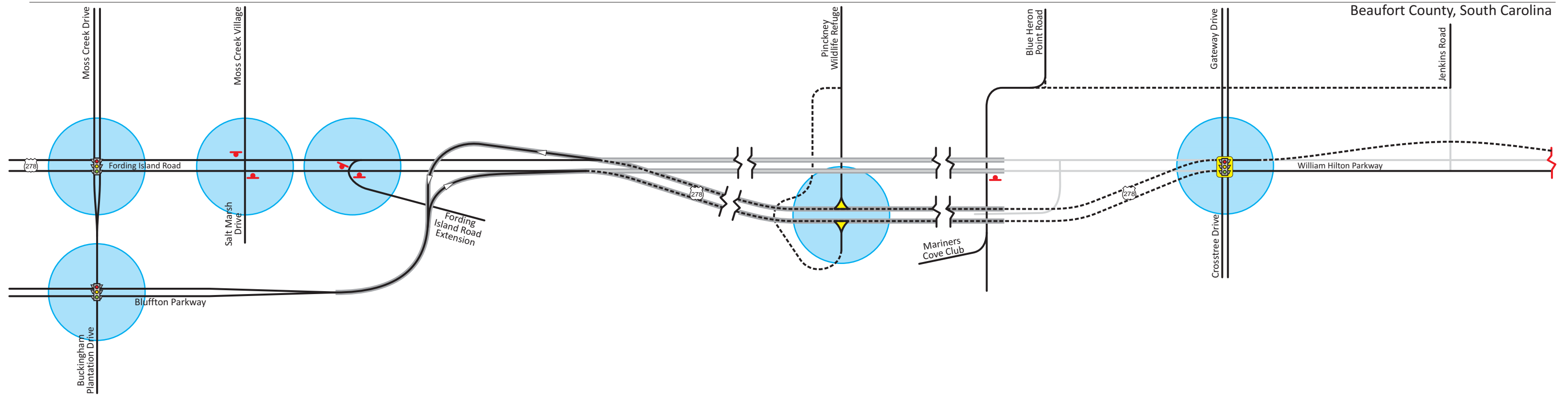
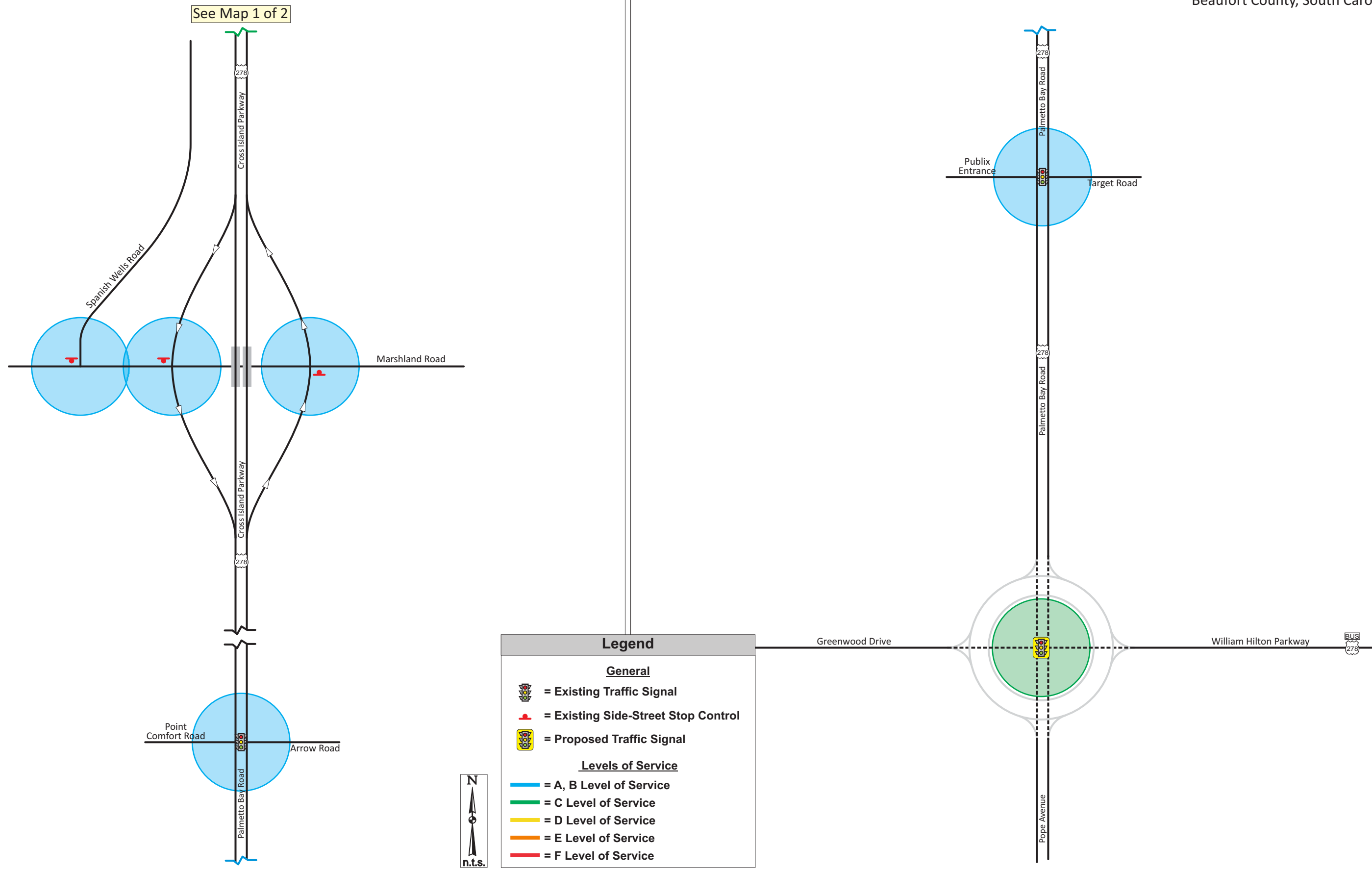


FIGURE 66: VISSIM SPEEDS EASTBOUND US 278-SQUIRE POPE TO GUMTREE-2023 GUMTREE/SEA PINES AM

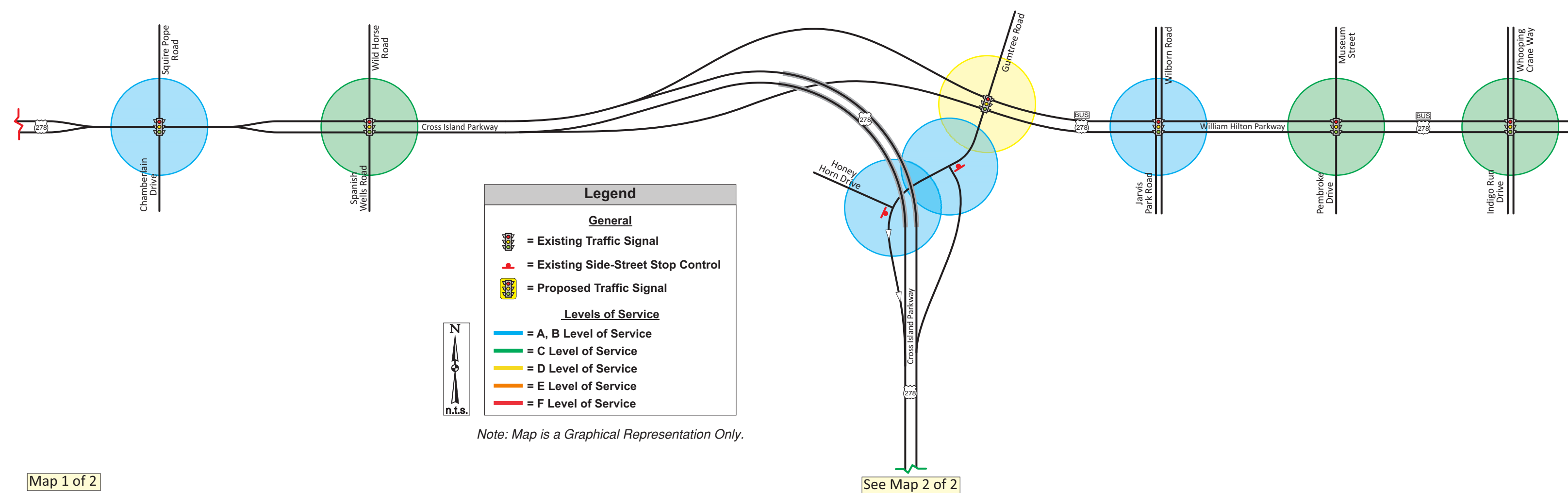
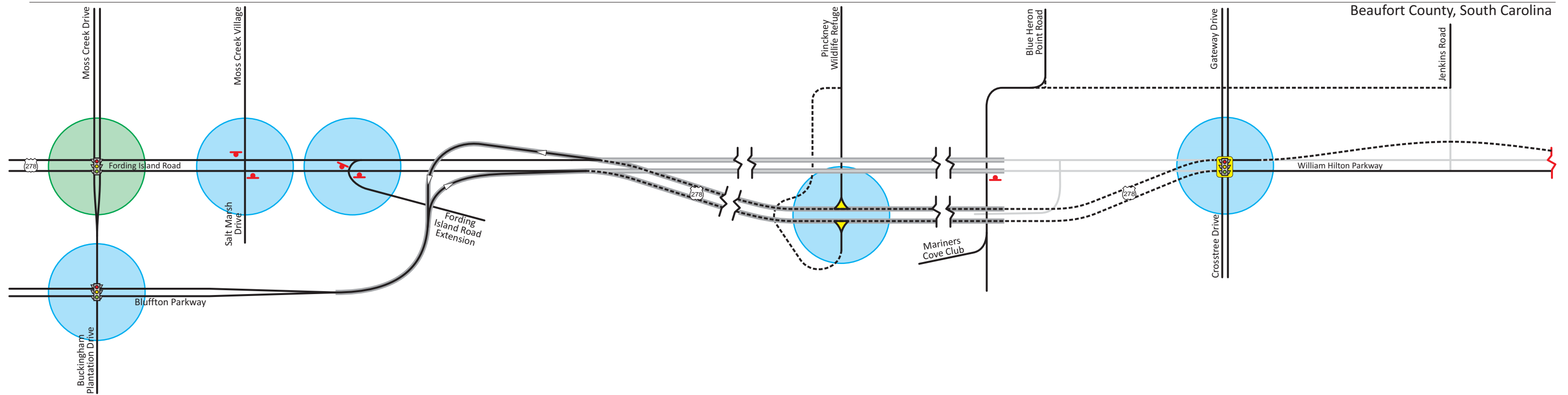


Map 1 of 2

See Map 2 of 2



Map 2 of 2



Legend

General

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal

Levels of Service

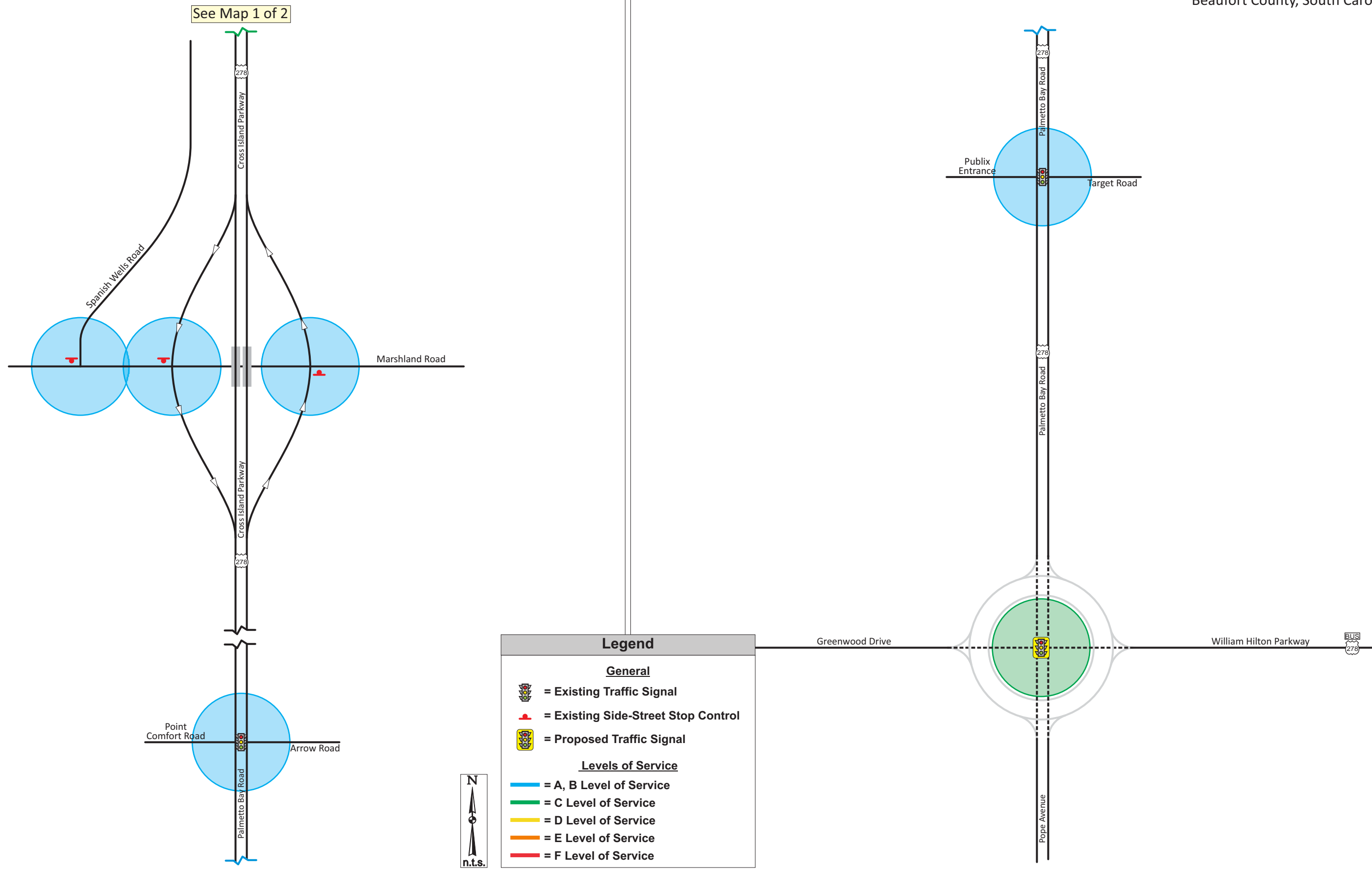
- = A, B Level of Service
- = C Level of Service
- = D Level of Service
- = E Level of Service
- = F Level of Service



Note: Map is a Graphical Representation Only.

Map 1 of 2

See Map 2 of 2



Note: Map is a Graphical Representation Only.

Map 2 of 2

2023 No Widening Through Stoney Community Operations

We understand that there is a community desire to minimize impacts to the Stoney Community from the US 278 Corridor Improvements. **Figure 67** shows the parcel map of the Stoney Community provided in the US 278 Corridor Improvements EA Appendix M as Figure 17.

Current Parcel Map Showing Long Lot Parcels the Stoney Community



(Source: Beaufort County, 2020; Bing Maps Imagery 2018)

FIGURE 67: PARCEL MAP OF THE STONEY COMMUNITY

An additional scenario was examined to understand traffic operations if the proposed SCDOT project were built with no roadway widening through the Stoney Community. This scenario would maintain 4 through lanes (2 in each direction) on US 278 through this area. **Figure 68** shows a VISSIM screenshot of the roadway geometry with 4 lanes through the Stoney community while maintaining the proposed SCDOT improvements and CBB recommendations in the remainder of the project area.

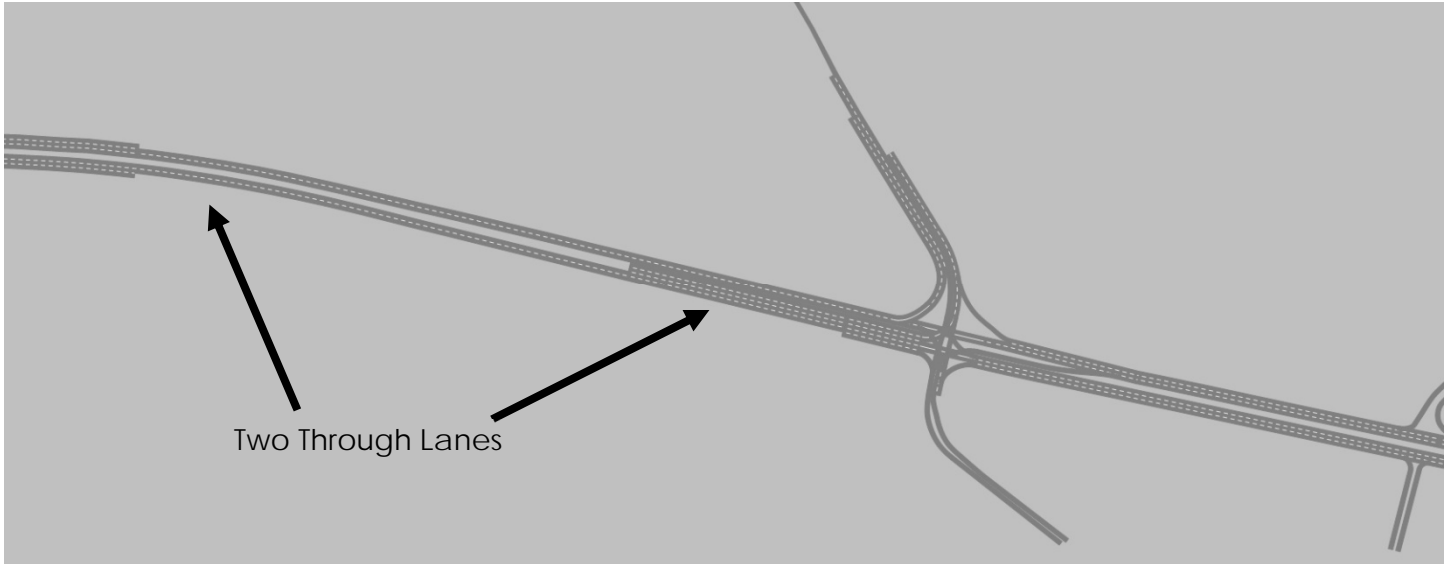


FIGURE 68: POTENTIAL ROADWAY GEOMETRY OF 4 LANES WITHIN STONEY COMMUNITY

The 2023 No Widening Through Stoney Community VISSIM evaluations are illustrated in **Exhibit 9** for the AM peak hour and **Exhibit 10** for the PM peak hour. **Table 16** summarizes the travel time results for the US 278 and Cross Island Parkway corridors under 2023 No Widening Through Stoney Community conditions.

TABLE 16: 2023 NO WIDENING THROUGH STONEY COMMUNITY VISSIM TRAVEL TIMES

Direction	AM (Minutes)		PM (Minutes)	
	2023 No-Build	2023 No Widening Through Stoney Community	2023 No-Build	2023 No Widening Through Stoney Community
EB US 278	19.6	24.4	9.7	9.5
WB US 278	8.6	8.8	29.0	30.6
NB Cross Island Parkway	6.7	6.5	17.0	32.2
SB Cross Island Parkway	8.9	7.3	7.5	7.4

Under 2023 No Widening Through Stoney Community conditions:

- The eastbound US 278 travel time **increases** by 24% from 2023 No-Build AM conditions,
- The westbound US 278 travel time **increases** by 5% from 2023 No-Build PM conditions, and
- The northbound Cross Island Parkway travel time **increases** by 89% from 2023-No-Build PM conditions.

The additional roadway capacity provided by SCDOT and Downstream Improvements allows vehicles to reach the Squire Pope Road intersection more quickly than the existing roadway configuration. However, the reduced capacity at the Squire Pope Road intersection causes extensive queues and slower speeds which also increases the travel times.

- **Figure 69** shows the VISSIM link speeds at the Squire Pope Road intersection during the AM peak hour. As shown, the eastbound US 278 approach at Squire Pope Road has a speed of less than 20 mph.
- **Figure 70** shows the VISSIM link speeds at the Crosstree Drive intersection during the AM peak hour. As shown, the eastbound US 278 approach at Crosstree Drive has a speed of less than 10 mph.
- **Figure 71** shows the VISSIM link speeds along westbound US 278 between Squire Pope Road and Jarvis Park Road during the PM peak hour. As shown, westbound US 278 generally has speeds between 5 and 10 mph.

Table 17 summarizes the network performance measures under 2023 No Widening Through Stoney Community conditions. During the AM and PM peaks, the network performance measures are expected to degrade from 2023 No-Build to 2023 No Widening Through Stoney Community conditions caused by the 4 lane US 278 configuration.

TABLE 17: 2023 NO WIDENING THROUGH STONEY COMMUNITY VISSIM NETWORK RESULTS

Scenario	Average Delay (Seconds)	Average Speed (MPH)	Total Delay (Hour)	Unmet Demand (Vehicles)
2023 No-Build AM	216.2	27.1	709	0
2023 No Widening Through Stoney Community AM	303.4	22.4	1012	0
2023 No-Build PM	346.2	20.1	1324	677
2023 No Widening Through Stoney Community PM	405.0	17.8	1577	568

Reducing capacity at the Squire Pope Road intersection to maintain 4 through lanes (2 in each direction) on US 278 within the Stoney community is expected to result in a bottleneck along the peak directions of the US 278 corridor during the AM and PM peaks similar to 2023 No-Build conditions.



FIGURE 69: VISSIM SPEEDS AT SQUIRE POPE– 2023 NO WIDENING THROUGH STONEY COMMUNITY AM

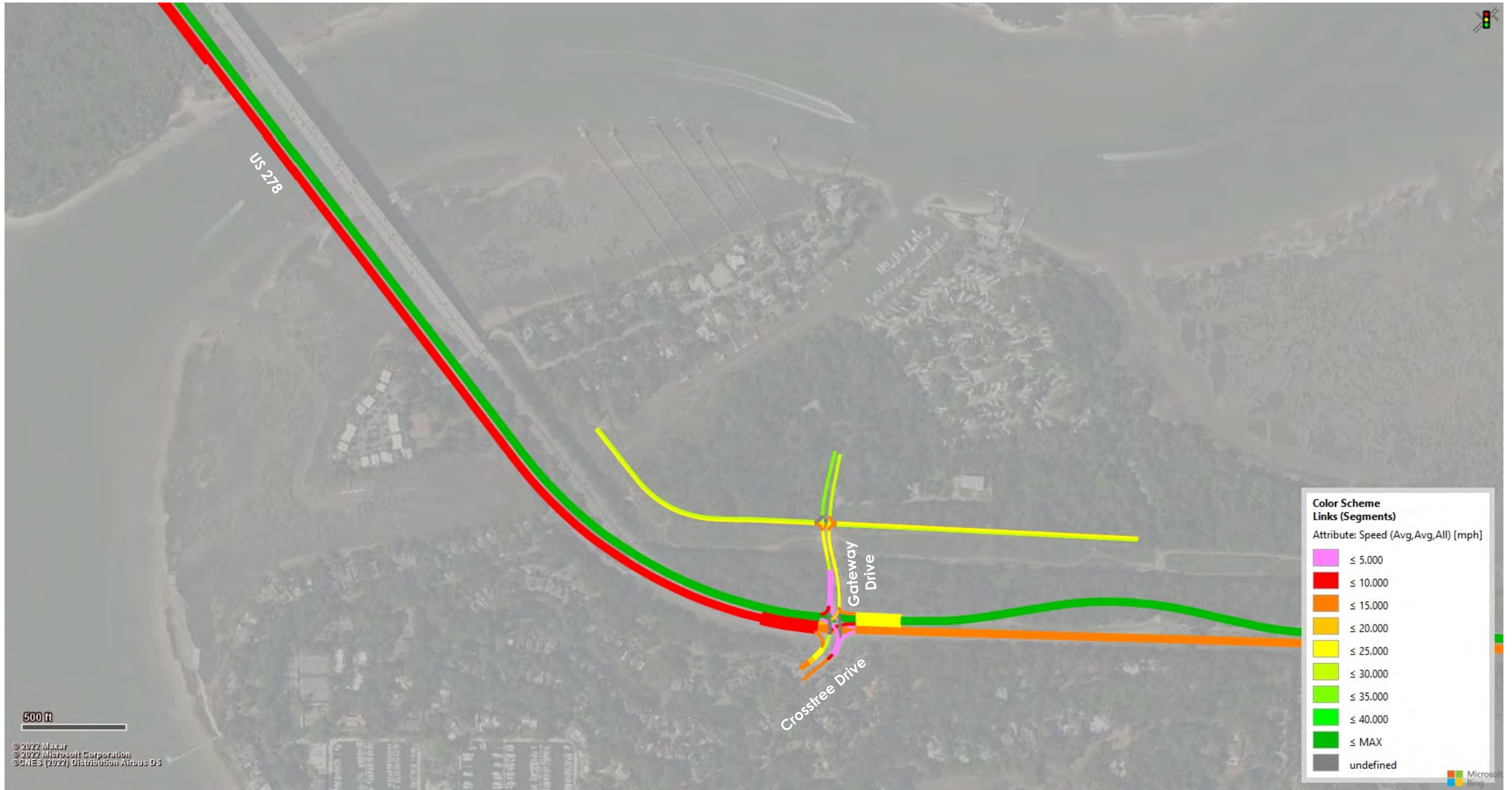


FIGURE 70: VISSIM SPEEDS-CROSSTREE TO GATEWAY-2023 NO WIDENING THROUGH STONEY COMMUNITY AM

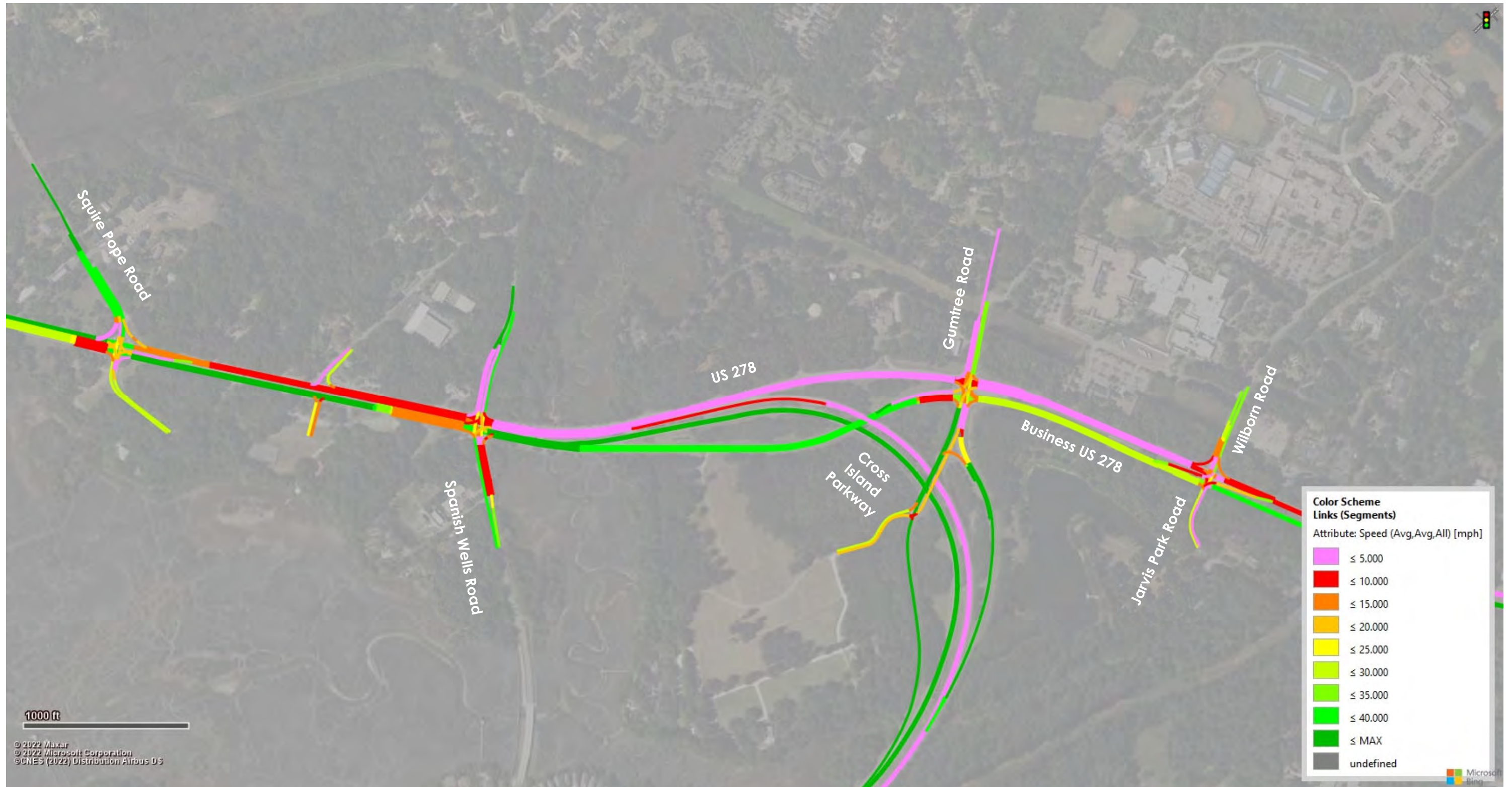
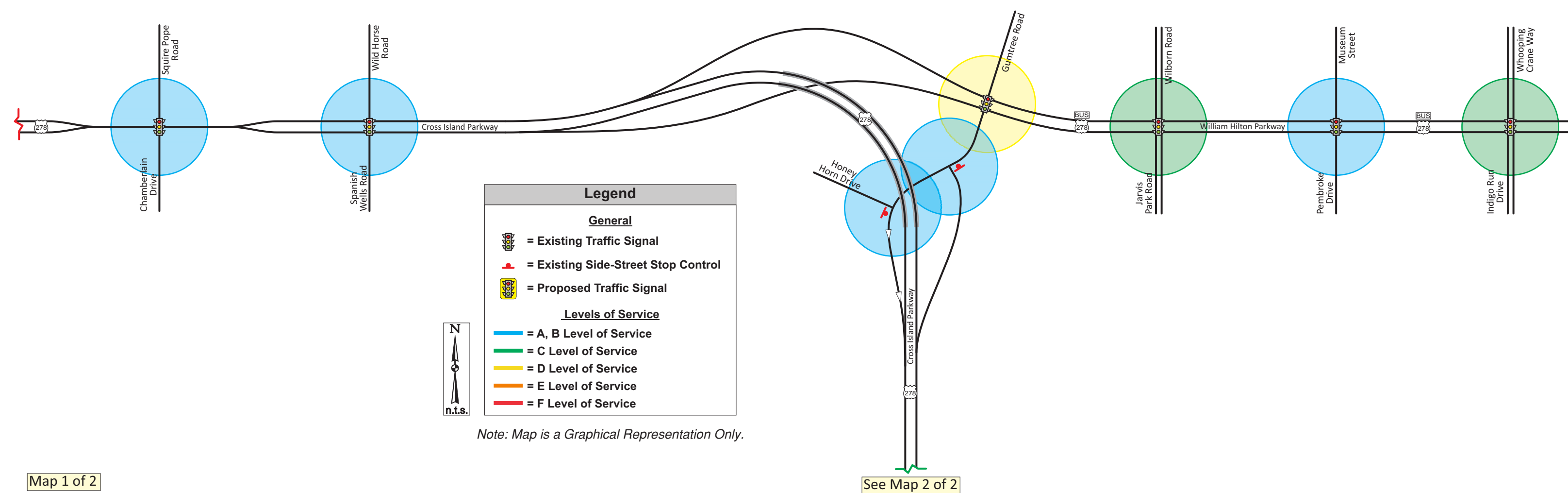
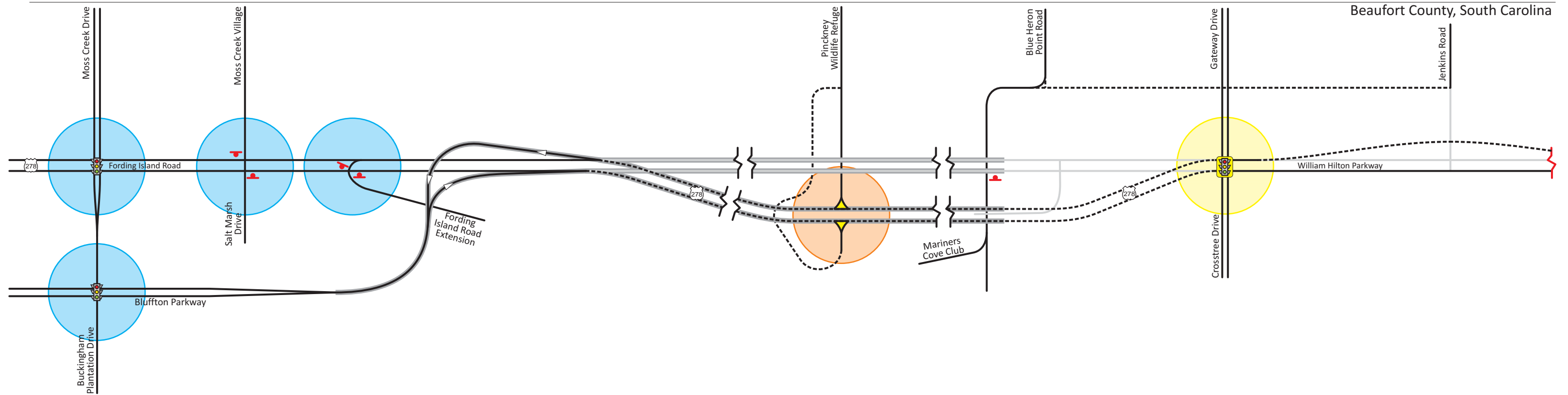


FIGURE 71: VISSIM SPEEDS ON WESTBOUND US 278- SQUIRE POPE TO JARVIS PARK– 2023 NO WIDENING THROUGH STONEY COMMUNITY PM



Legend

General

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal

Levels of Service

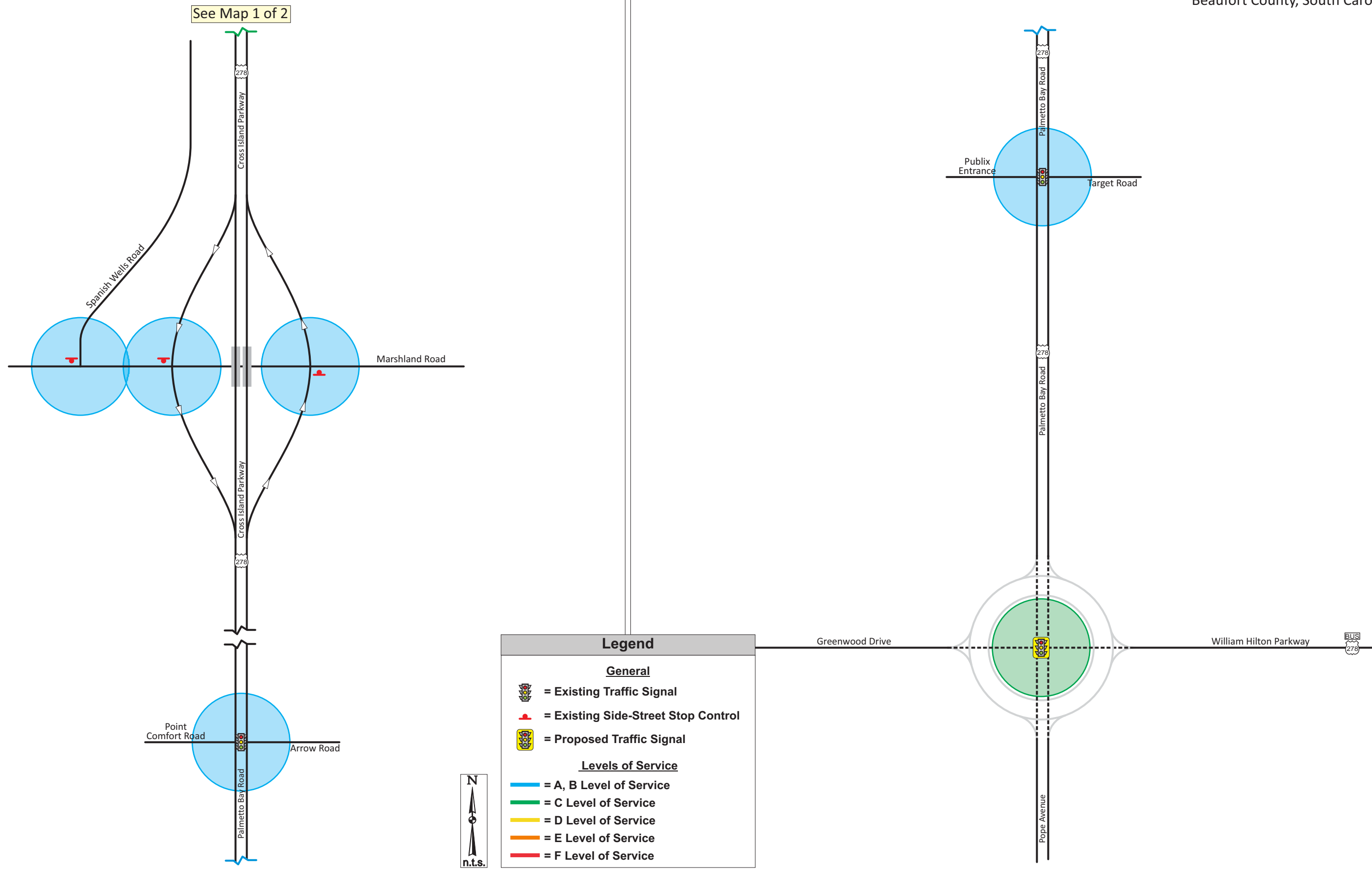
- = A, B Level of Service
- = C Level of Service
- = D Level of Service
- = E Level of Service
- = F Level of Service



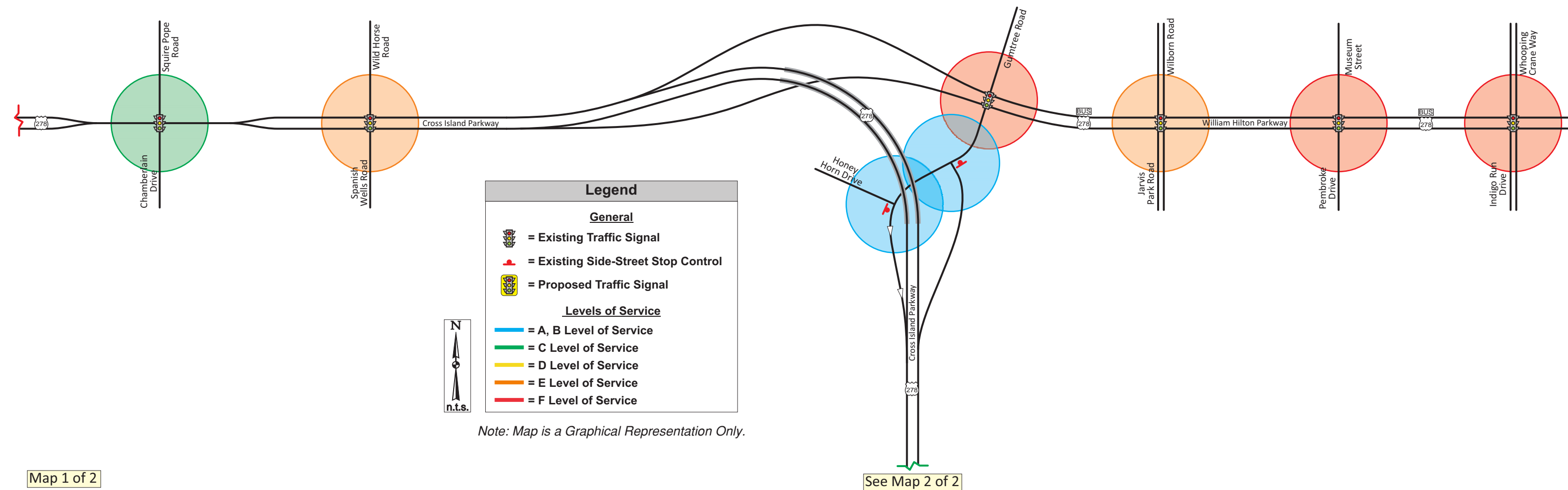
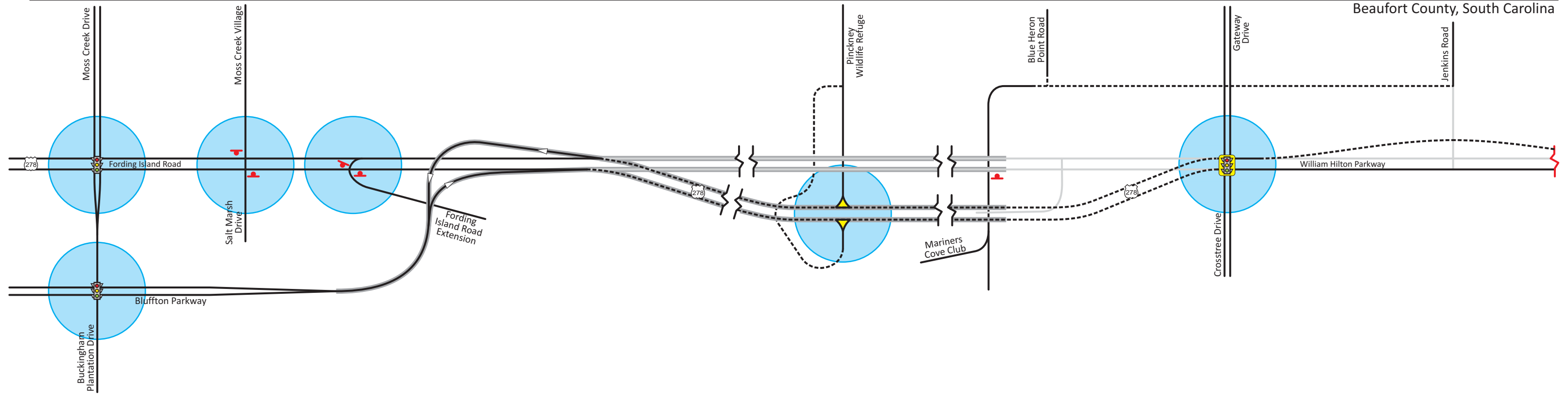
Note: Map is a Graphical Representation Only.

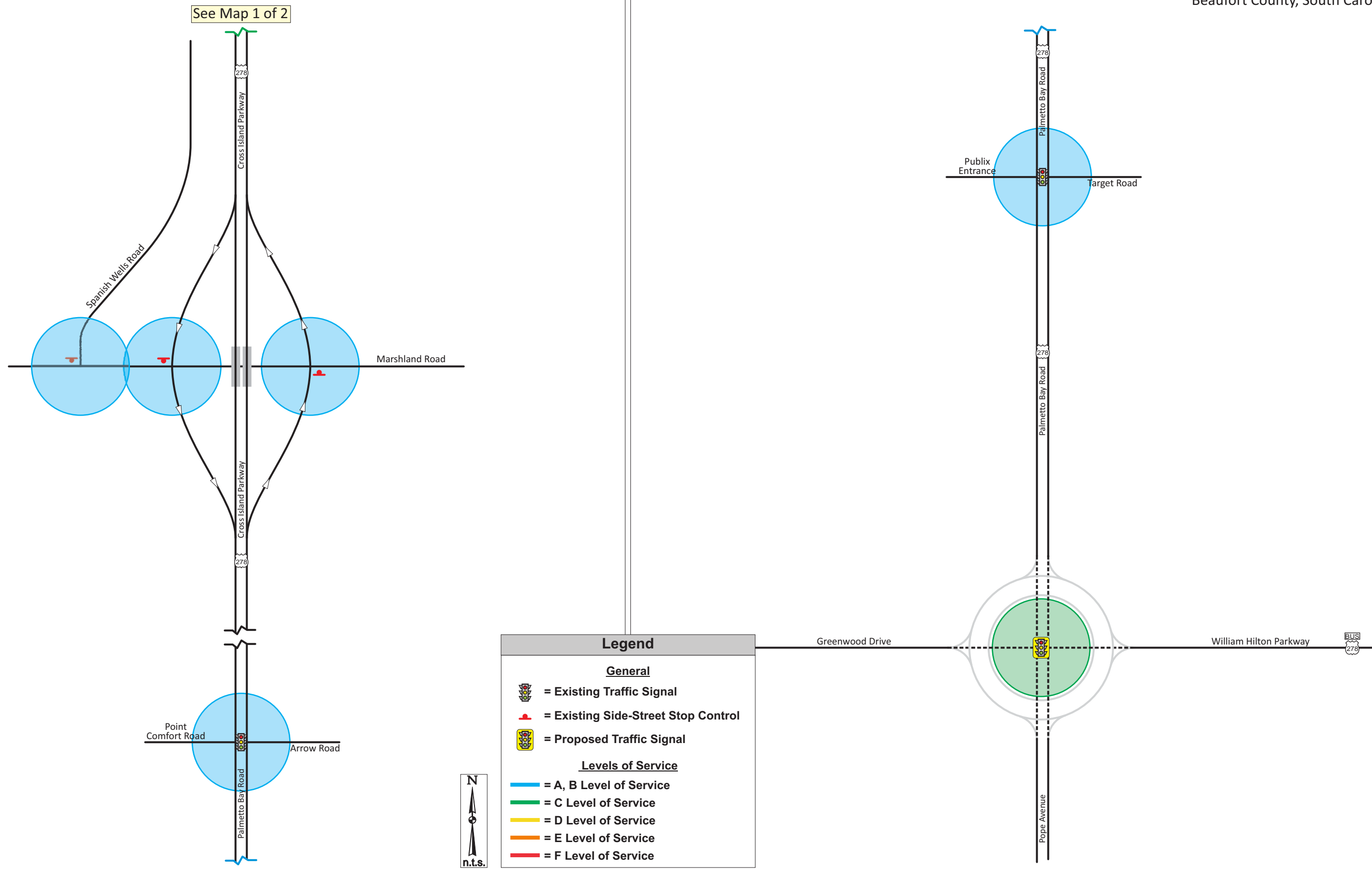
Map 1 of 2

See Map 2 of 2



Map 2 of 2





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Traffic Forecasts

The SCDOT Environmental Assessment Study determined a forecasted traffic growth rate of 1.19%. To determine if the 1.19% growth rate is a reasonable rate, CBB obtained historical traffic volumes on the US 278 corridor from the SCDOT count website. **Figure 72** illustrates the historic and the forecasted Average Annual Daily Traffic (AADT) for the US 278 corridor based on the 1.19% growth rate. As shown, the US 278 corridor has experienced steady annual traffic growth since 2010, except for 2020, which was a result of the COVID-19 pandemic. A trend line was added based on the historical AADT between 2010 and 2022 without 2020.

As previously mentioned, the 2023 volumes collected by CBB are, on average, within 3% of the 2018 Design Year traffic volumes collected in the SCDOT Environmental Assessment Study. However, as shown in **Figure 72**, the AADT has grown by approximately 4,400 vehicles per day (or 8%) from 2018 to 2023. The significant growth in AADT, but not peak hour volumes, is caused by the existing capacity constraints along the US 278 corridor. The current peak hour demands are higher than the current capacity provided by the US 278 corridor which constrains the number of vehicles the US 278 corridor can accommodate during the peak hours.

The SCDOT Environmental Assessment Study developed the 2045 forecasted AADT by applying an annual compounded growth rate of 1.19% to their 2018 traffic counts, which would be an overall growth rate of approximately 37.6% over 27 years. The 2045 CBB forecasted AADT was developed by applying an annual compounded growth rate of 1.19% to our 2023 traffic counts, which would be an overall growth rate of approximately 29.7% over 22 years. As shown in **Figure 72**, the 2045 EA AADT and the 2045 CBB AADT are similar even though both values were developed based on different count years. Furthermore, both 2045 forecasts are slightly higher than the trend line developed based on historical data. **Thus, the 1.19% growth rate is a reasonable rate.**

The SCDOT Environmental Assessment Study developed the 2045 No-Build traffic volumes by applying an annual compounded growth rate of 1.19% to their 2018 traffic counts, which would be an overall growth rate of approximately 37.6% over 27 years. CBB applied an annual compounded growth rate of 1.19% to our 2023 traffic counts for 27 years and developed 2050 Build traffic volumes to have a consistent growth timeframe. The 2050 Build traffic volumes have an overall growth rate of approximately 37.6%. 2050 Build traffic volumes are summarized in **Exhibit 11**. The 2050 Build traffic volumes are generally within 4% of the 2045 No-Build traffic volumes developed in the SCDOT Environmental Assessment Study.

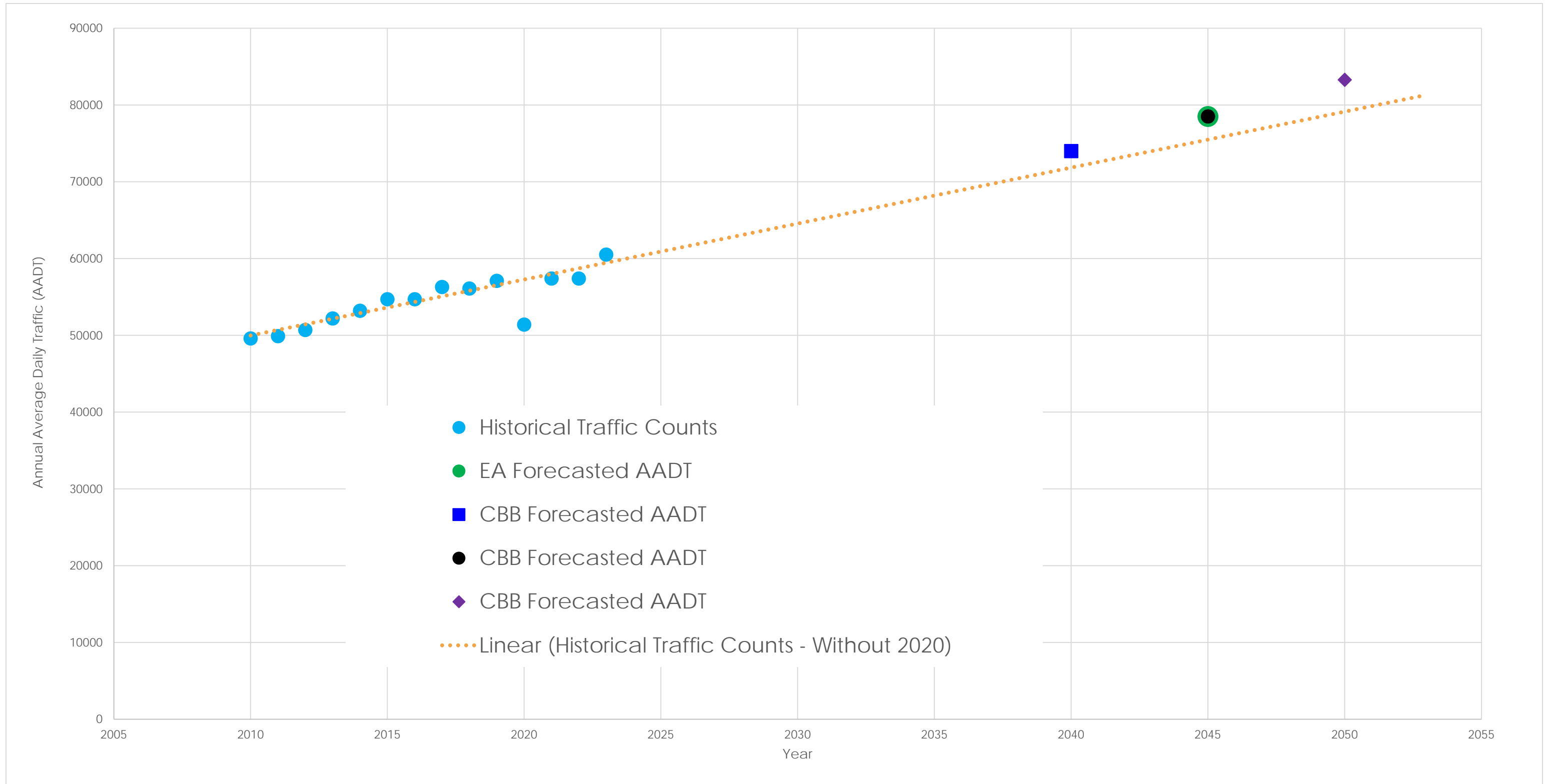
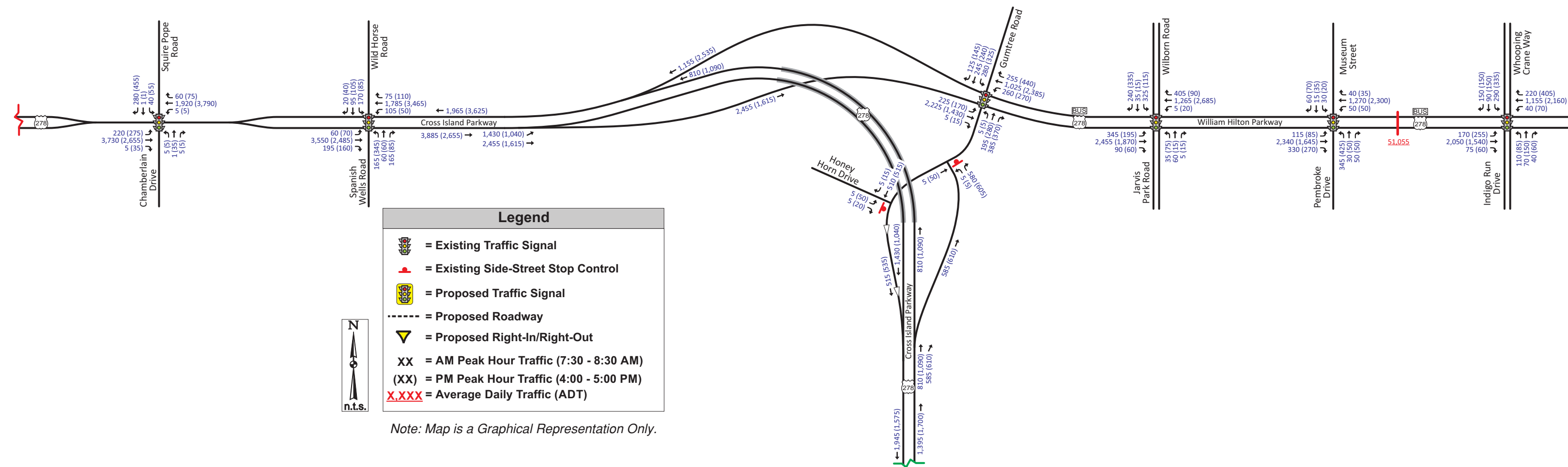
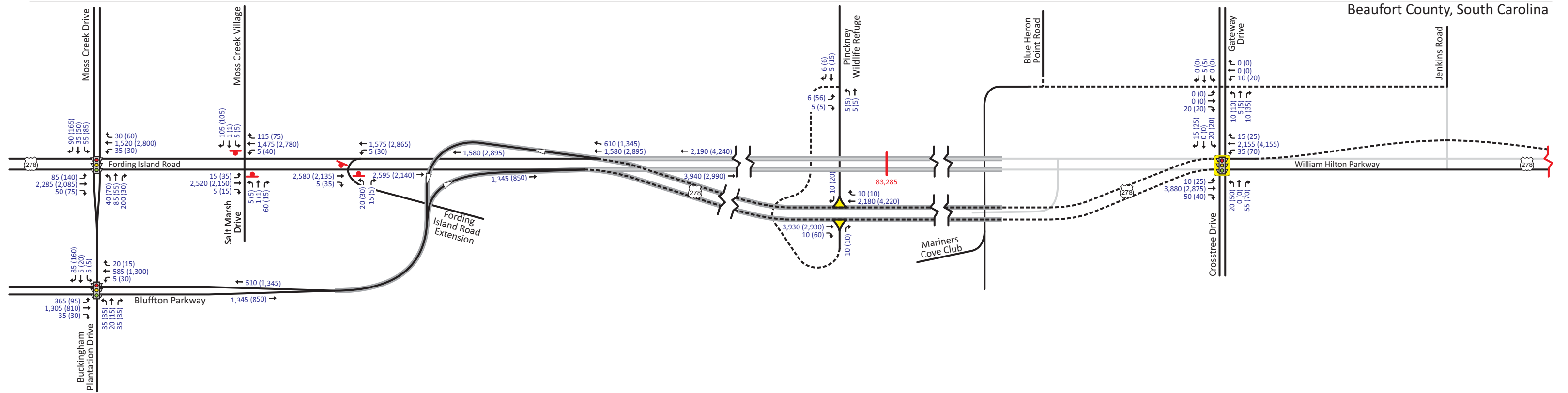


FIGURE 72: US 278 (EAST OF JENKINS ISLAND ROAD) HISTORICAL AND FORECASTED AADT

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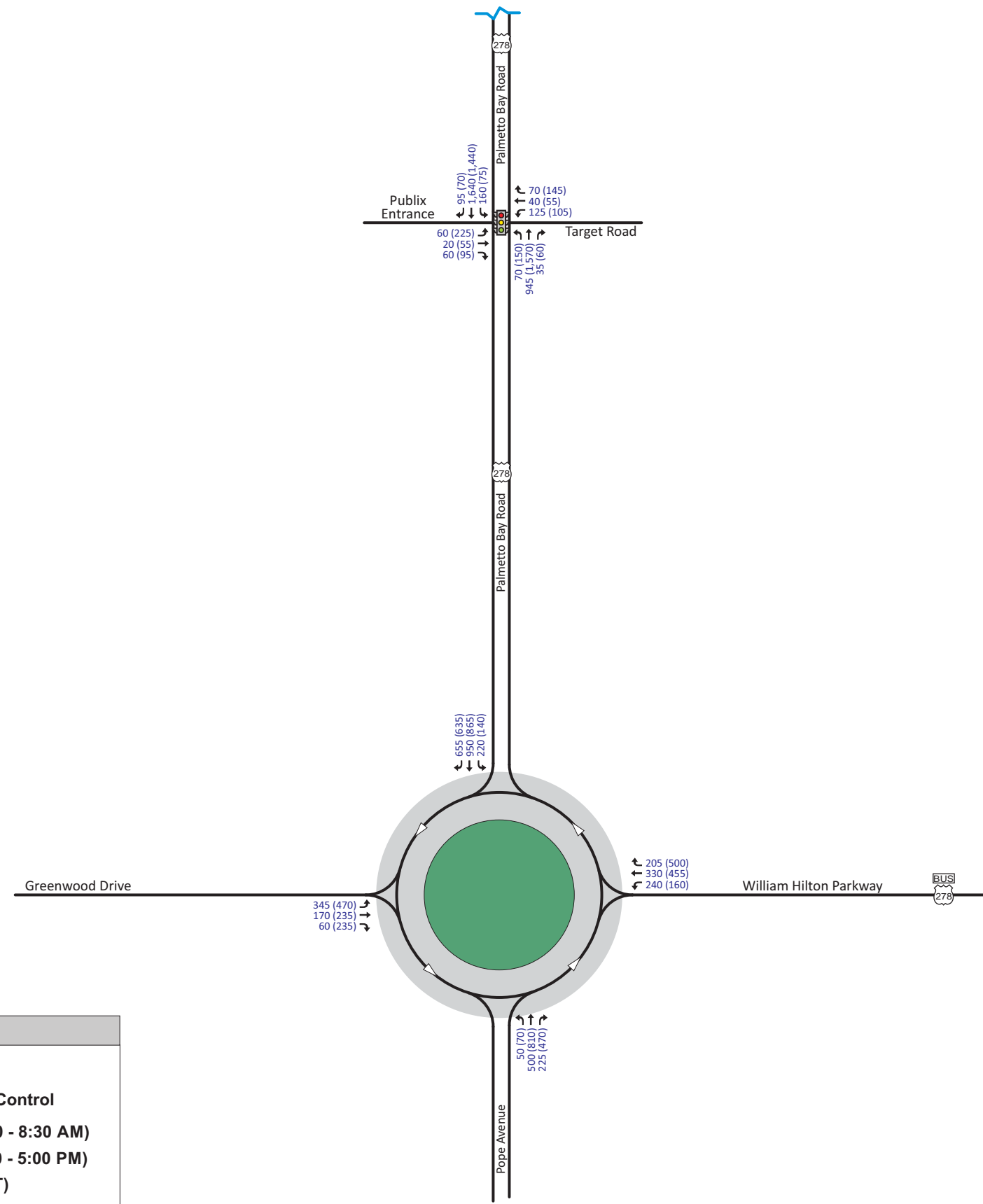
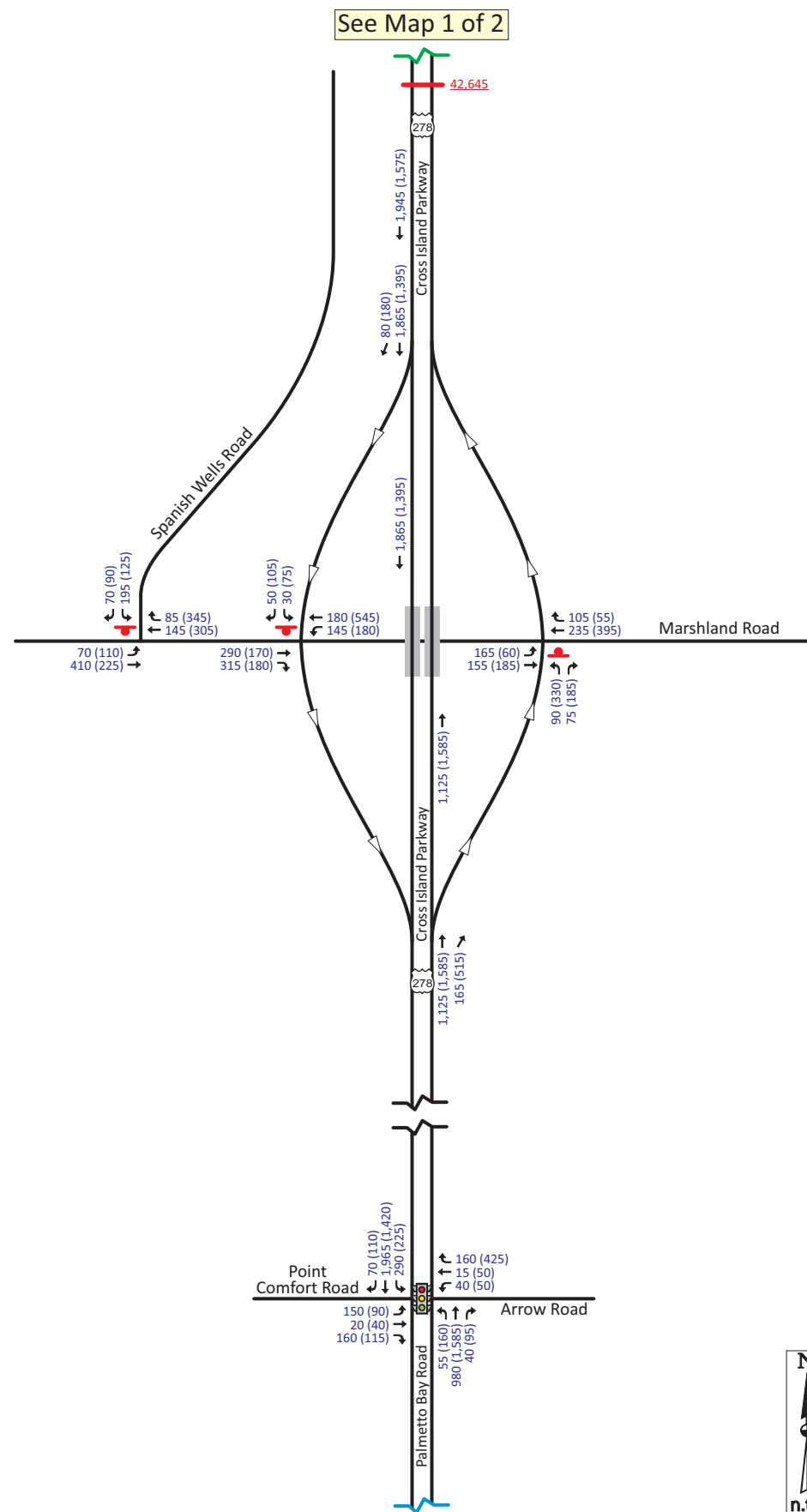


Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- = Proposed Traffic Signal
- = Proposed Roadway
- = Proposed Right-In/Right-Out
- XX = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX) = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X,XXX = Average Daily Traffic (ADT)

n.t.s.

Note: Map is a Graphical Representation Only.



Legend

- = Existing Traffic Signal
- = Existing Side-Street Stop Control
- XX** = AM Peak Hour Traffic (7:30 - 8:30 AM)
- (XX)** = PM Peak Hour Traffic (4:00 - 5:00 PM)
- X,XXX** = Average Daily Traffic (ADT)



Note: Map is a Graphical Representation Only.

Map 2 of 2

Future Growth Analysis

CBB ran future year VISSIM models of the SCDOT EA preferred alternative updated with the following changes discussed in previous sections of this study report:

- Restriping of the Gumtree Road intersection to allow for three eastbound through lanes, and
- The assumption of the Sea Pines Circle converted to a signalized intersection to allow traffic to flow through this part of the traffic model.

We ran these models in 5-year increments from 2025 to 2050 to explore the long-term operations of the proposed improvements. The results of this analysis are provided in the following sections.

AM Peak Period Future Growth Analysis

Several performance measures are included in the AM peak period (6:30 AM to 9:30 AM) future growth analysis. First, **Figure 73 (Eastbound US 278 AM Hourly Peak Period Throughput Volume)** provides morning peak hour throughput volumes on eastbound US 278 for both historical data (2013-2022) and future years out to 2050 as generated by the VISSIM models. Historically, eastbound US 278 throughput volumes increased steadily from 2,300 vph to 2,600 vph between 2012 and 2018 and leveled off at around 2,600 vph between 2018 and 2022. This is indicative of US 278 reaching its morning peak hour capacity around 2018. The proposed SCDOT project will increase the roadway's capacity from 2,600 vph to 3,600 vph. The VISSIM modeling shows AM peak hour throughput volumes growing from the current value of 2,600 vph to the new capacity of 3,600 vph by 2045 and leveling off at around 3,600 vph when US 278 reaches its new capacity.

Figure 74 (AM Peak Period Unmet Demand) provides VISSIM unmet demand calculations for the various scenarios. Unmet demand in VISSIM modeling reflects the number of vehicles that are unable to enter a facility at the end of a model run because the facility is at capacity and cannot accommodate additional vehicles. The unmet demand represents the vehicles that are "in line" waiting to enter the model at the end of this period. The AM build models show zero unmet demand from 2023 to 2035. However, the unmet demand increases to 39 in 2040 and 154 vehicles in 2045. The 2040 and 2045 unmet demand is specifically at Gumtree Road, indicating that this intersection is nearing capacity. The AM peak period unmet demand increases at a greater rate in the 2050 build model to 473 vehicles. By 2050 the VISSIM models are showing traffic queueing back to Bluffton Parkway from the traffic signals at Squire Pope Road, Gumtree Road, and the Business US 278 traffic signals.

As shown in **Figure 75 (Travel Time)**, the eastbound US 278 AM peak period travel time is expected to increase between 2023 Build and 2050 Build conditions due to the increase in vehicles on the roadway. When the SCDOT improvements are first made travel times will drop from about 16 minutes (current average travel times between 6:30 AM to 9:30 AM), to around 10 minutes. Travel times will increase to current no-build levels by the 2040 timeframe.

Finally, **Figure 76 (Eastbound US 278 AM Speed Heat Map)** provides heat speed plots for eastbound US 278 during the morning peak period. The colors on this map denote speeds on various roadway segments in 15-minute intervals through the morning peak period. This map shows a significant improvement to traffic operations when the SCDOT project is opened. The red portions of the graph (speeds of 10 mph and lower) and orange (speeds between 11 mph and 20 mph) improve to yellow (speeds between 21 mph and 30 mph) and green (speeds above 30 mph). By the 2040 timeframe, however, the maps start to show a degrading of speeds at the traffic signals at Squire Pope Road,

Gumtree Road, and the eastern part of Business US 278. The queues from these traffic signals begin to spill back to Bluffton, as occurs today.

Capacity failures in the morning peak traffic period occur at 2 major points in the VISSIM models. First, vehicles traveling on eastbound US 278 pass through the Squire Pope Road and Spanish Wells Road traffic signals whether they are traveling to destinations along Business US 278 to the east or the Cross Island Parkway to the south. The Squire Pope Road and Spanish Wells Road traffic signals become the primary bottleneck on this section of US 278 as they are today. Second, Business US 278 is a four-lane signalized corridor after Gumtree Road. This section of roadway becomes congested with the anticipated future traffic growth. One strategy to keep Business US 278 from becoming congested is to divert more traffic to the Cross Island Parkway. Another strategy is to slow the future growth of traffic on US 278 through Travel Demand Management (TDM) strategies (see Extending the Life of Improved US 278, page 111).

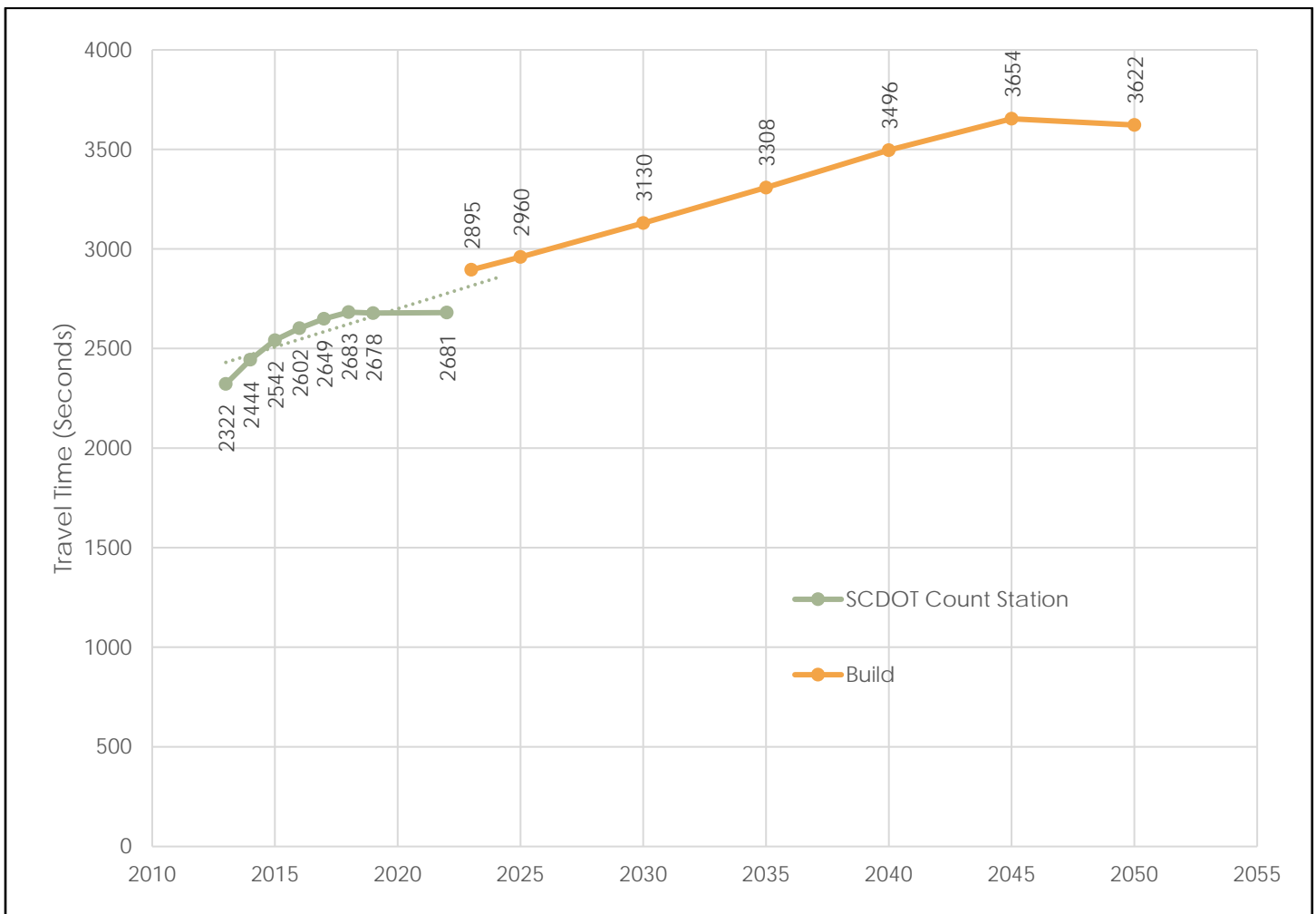


FIGURE 73: EASTBOUND US 278 AM HOURLY PEAK PERIOD THROUGHPUT VOLUME

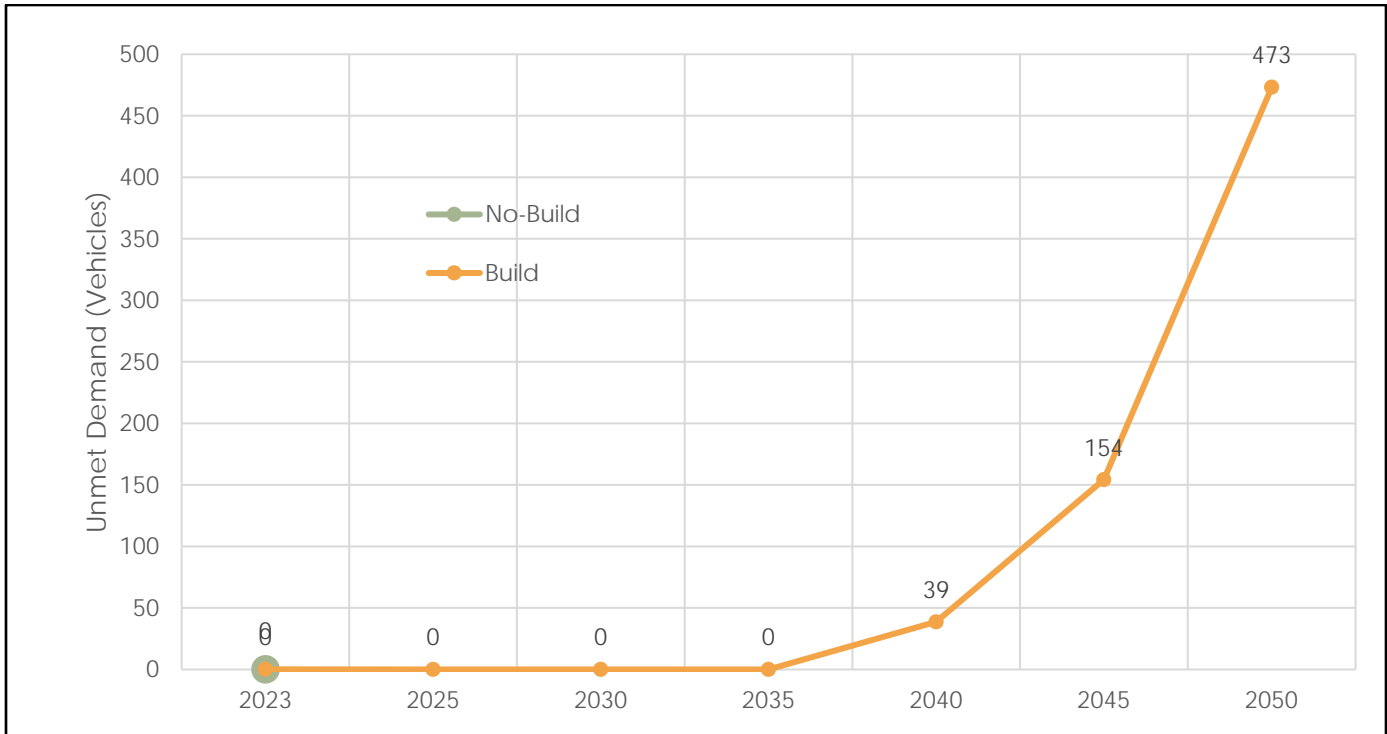


FIGURE 74: AM PEAK PERIOD UNMET DEMAND

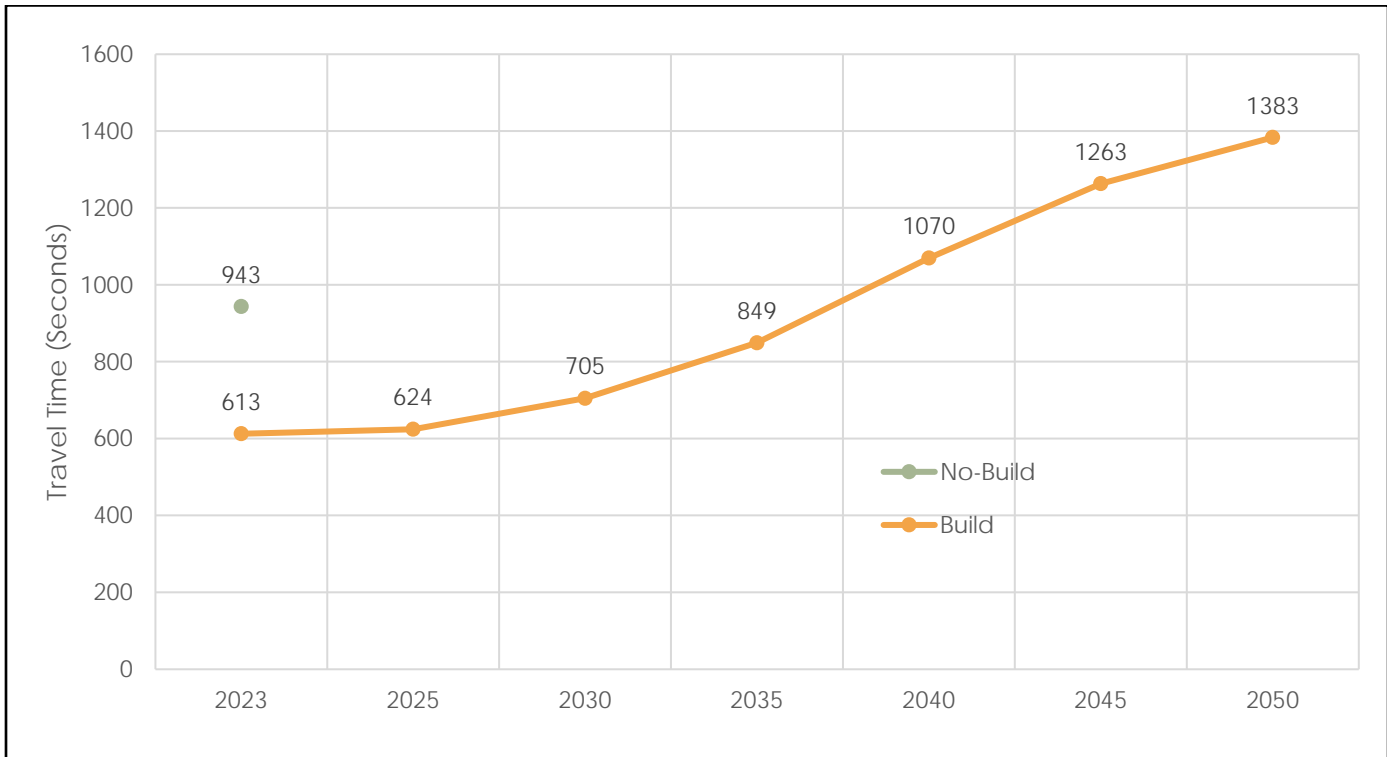


FIGURE 75: EASTBOUND US 278 AM PEAK PERIOD TRAVEL TIME

PM Peak Period Future Growth Analysis

As with the AM peak period analysis, several performance measures are included in the PM peak period (3:00 AM to 6:00 PM) future growth analysis. First, **Figure 77 (Westbound US 278 PM Hourly Peak Period Throughput Volume)** provides evening peak hour throughput volumes on westbound US 278 for both historical data (2013-2022) and future years out to 2050 as generated by the VISSIM models. Historically, westbound US 278 throughput volumes increased steadily from 2,650 vph to 2,950 vph between 2013 and 2016 and leveled off at around 2,950 vph between 2016 and 2022. This is indicative of US 278 reaching its evening peak hour capacity around 2016. The proposed SCDOT project will increase the roadway's capacity from 2,950 vph to around 3,800 vph. The VISSIM modeling shows PM peak hour throughput volumes growing from the current value of 2,950 vph to 3,750 vph by 2050.

Figure 78 (PM Peak Period Unmet Demand) provides the unmet demand calculations for the various scenarios. The PM build models show less than 5 vehicles of unmet demand from 2023 to 2045. Unmet demand spikes to 262 vehicles in 2050. In the 2050 models, the traffic volume is not able to enter the model from the model inputs on westbound Business US 278 at Indigo Run. This section of Business US 278 is at capacity. As with the morning peak period analysis, one strategy to keep Business US 278 from becoming congested is to divert more traffic to the Cross Island Parkway. Cross Island Parkway has ample capacity with the only real bottleneck being at Sea Pines Circle.

As shown in **Figure 79 (Travel Time)**, the westbound US 278 PM peak period travel time is expected to increase between 2023 Build and 2050 Build conditions due to the increase in vehicles on the roadway. When the SCDOT improvements are first made, travel times will drop from about 23 minutes (current average travel times between 3:00 PM to 6:00 PM) to around 10 minutes. Travel times will increase to around 13 minutes by the 2050 timeframe. One reason that PM travel times do not increase to existing travel times as they do in the morning peak period models is because the capacity constraints in the PM peak period models are at the eastern extents of the traffic models. These capacity constraints meter traffic into the models. Once the traffic passes through these capacity constrained areas, it flows smoothly through the rest of the network.

Figure 80 (Westbound US 278 PM Speed Heat Map) provides heat speed plots for westbound US 278 during the evening peak period. This map shows a significant improvement to traffic operations when the SCDOT project is opened. By the 2040 timeframe, however, the maps start to show a degrading of speeds along Business US 278 from Indigo Run to the Squire Pope Road traffic signal. The Squire Pope Road and Spanish Wells Road traffic signals become a bottleneck because they process all traffic on westbound US 278 whether it comes from Business US 278 to the east or the Cross Island Parkway. One strategy to improve this condition is to slow the future growth of traffic on US 278 through Travel Demand Management (TDM) strategies (see Extending the Life of Improved US 278, page 111).

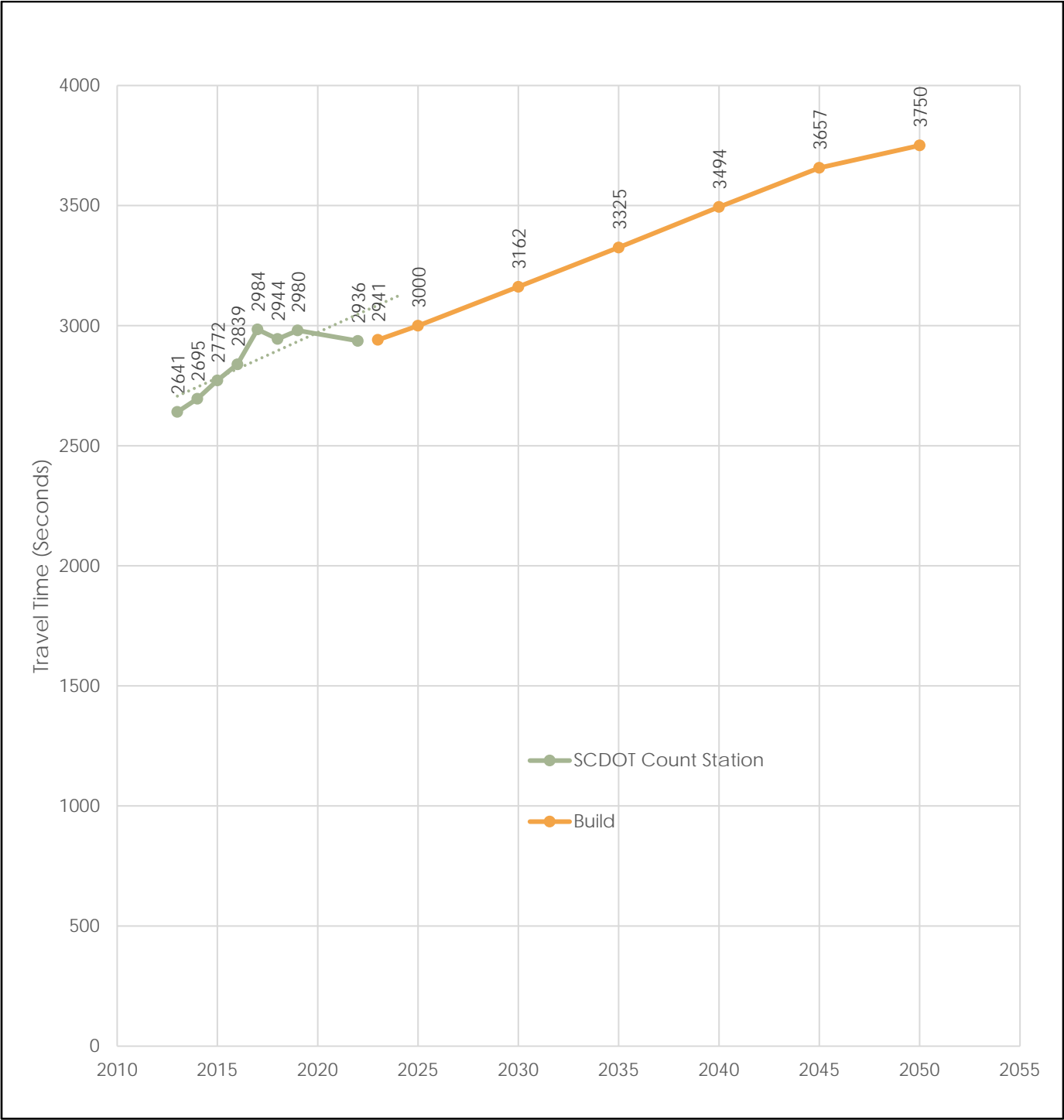


FIGURE 77: WESTBOUND US 278 PM HOURLY PEAK PERIOD THROUGHPUT

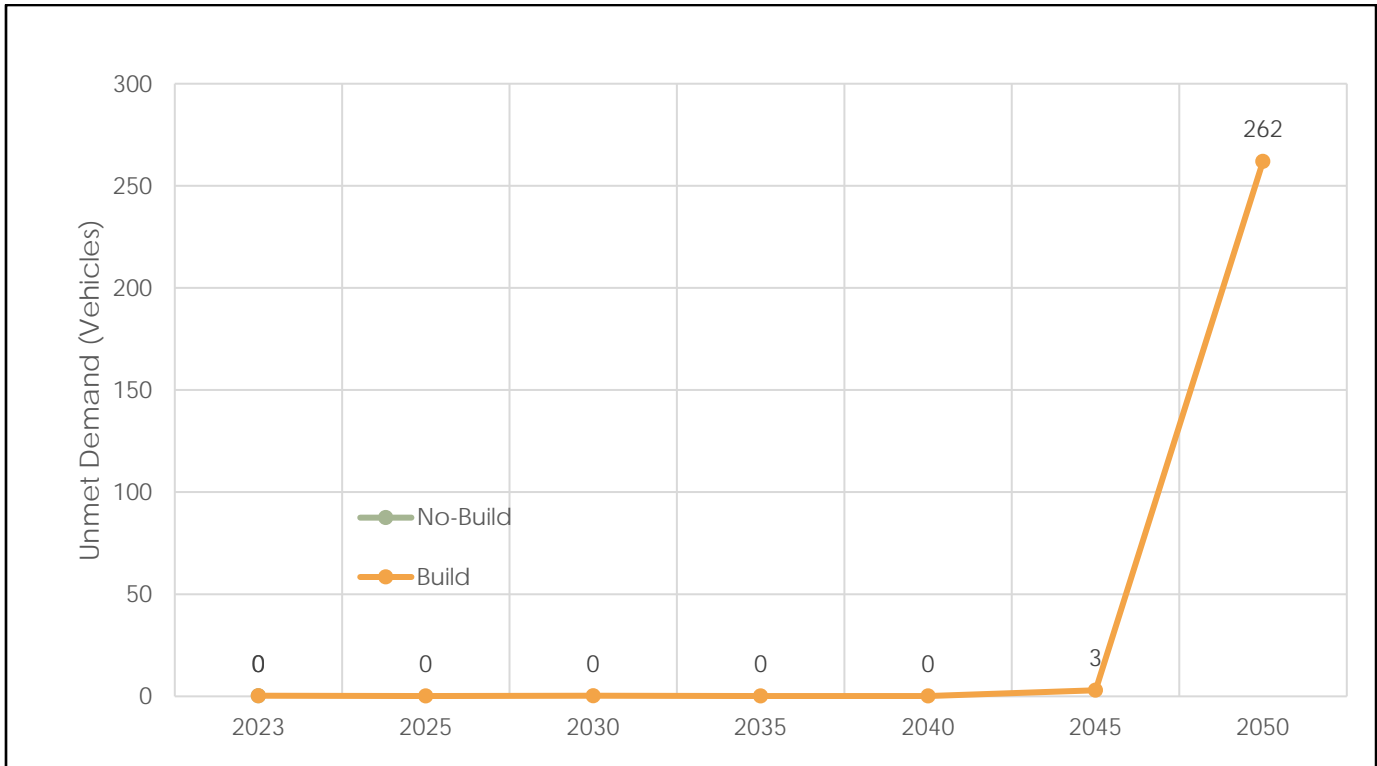


FIGURE 78: PM PEAK PERIOD UNMET DEMAND

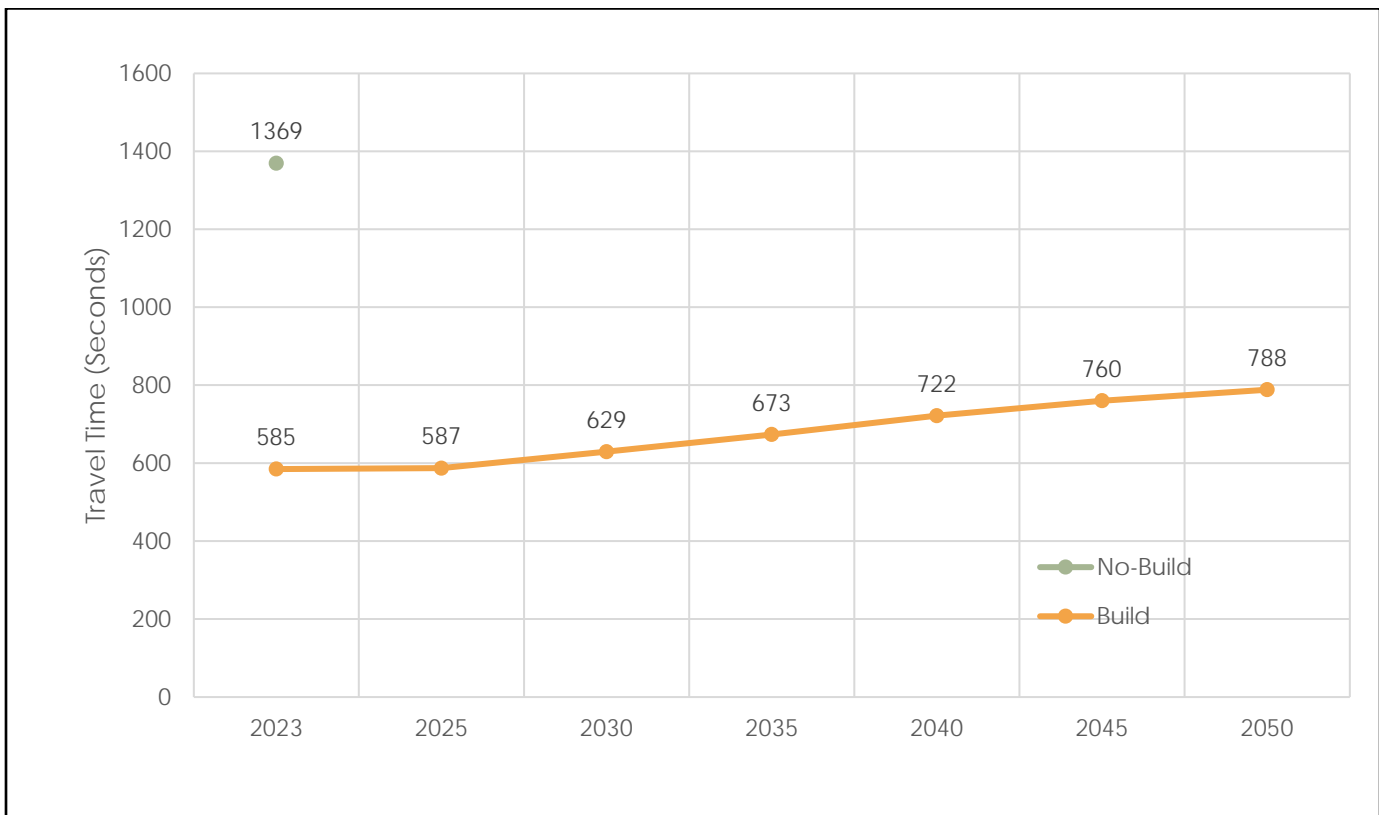


FIGURE 79: WESTBOUND US 278 PM PEAK PERIOD TRAVEL TIME

Extending the Life of Improved US 278

As displayed in the previous section, the proposed SCDOT US 278 Corridor Improvements will increase roadway capacity, reducing congestion and improving travel time reliability during the morning and evening traffic peak periods. The proposed SCDOT improvements will have a long-term benefit for the Hilton Head Island community by increasing the traffic capacity of US 278 and improving traffic operations. However, there is a limit on how much future traffic growth can be accommodated by the proposed project.

CBB agrees that SCDOT's future year traffic forecasts are reasonable and consistent with historical growth trends and ongoing local development. However, the local Hilton Head Island community can influence how this growth occurs. Specifically, traffic can be shifted to other travel modes through Travel Demand Management (TDM) strategies. We see opportunities to create functional and attractive alternatives to single vehicle travel through investments in programs that promote public transportation/shuttles, micro-mobility (e.g., e-bikes), and park-and-ride/car-pool systems. Hilton Head Island already has the foundational elements for these types of systems to build upon.

TDM strategies can slow the traffic growth by shifting some future travel growth to other travel modes. Slowing the future growth of traffic on US 278 will extend the road's long-term functionality. TDM will not negate the need for the SCDOT US 278 Corridor Improvements project but can help to extend its functional life.

Summit County Case Study

An example of a tourist-oriented community that is proactively promoting TDM is Summit County, Colorado. Summit County is home to several popular ski resorts, like Arapahoe Basin, Breckenridge, Copper Mountain, and Keystone. The area brings in millions of visitors each year, with Breckenridge alone attracting approximately 1.5 million visitors each year. There has been a significant growth in traffic both in the Summit County region and on I-70, which is the primary highway connecting Summit County to the Denver Community and Colorado's front range. I-70 is often congested during the winter months with people driving to Summit County and other regional ski resorts.

One way in which Summit County is dealing with this traffic is with the Summit Stage, the area's transit system⁴. The system began in 1977 initially as a service for moving skiers from their lodgings to the slopes. Due to the popularity of the system, Summit County has continuously expanded the system. Today, the system includes 28 buses and is used by both tourists coming to ski and commuters who live in the area and work at the area's ski resorts. The transit system has become a popular way to get around, with ridership steadily increasing over the years. Ridership has grown from around 432,000 annual trips in 1992 to around 1.7-1.9 million annual trips today, making Summit Stage the second busiest rural transit system in Colorado. A Summit Stage route map is provided in **Figure 81**.

Summit Stage's success can be attributed to several things, with one being its convenience. To avoid searching for and possibly paying for parking at ski resorts, tourists use the Summit Stage to get to ski resorts without the hassle of parking. The stable revenue source for the Summit Stage has also contributed to the system's success, with funding coming from a sales tax in the area. The revenue

⁴ <https://summitcountyco.gov/ImageRepository/Document?documentID=31594>

source for the Summit Stage is so stable that users of the system can ride for free, which is another reason why the system is so popular.

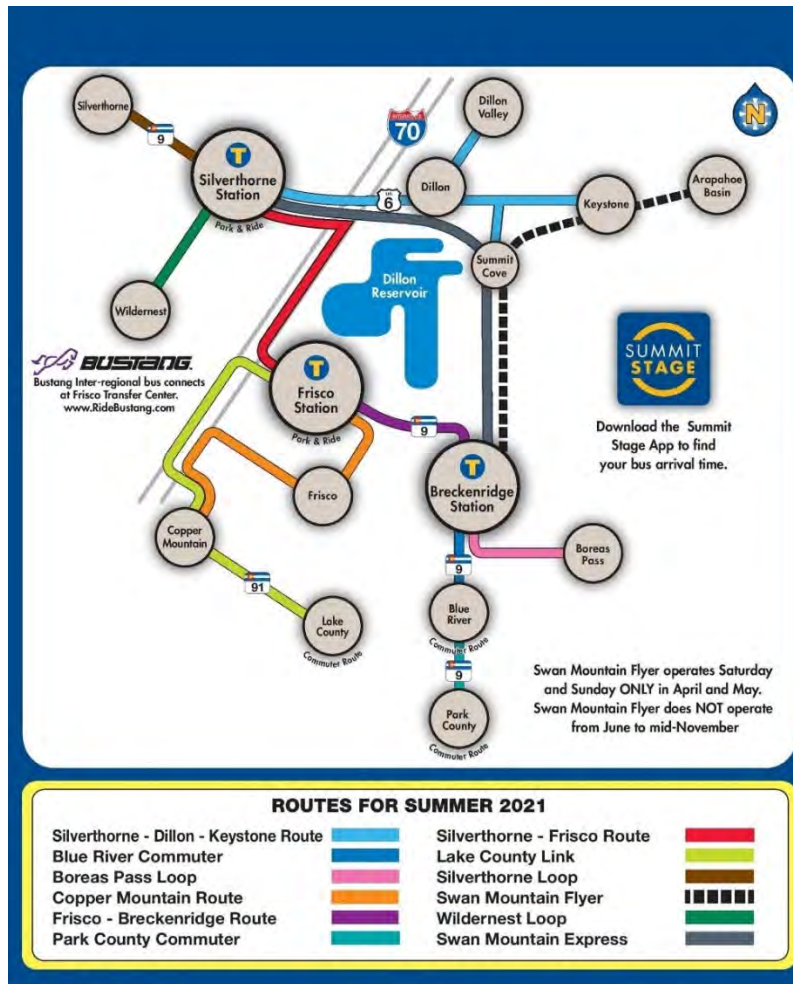


FIGURE 81: SUMMIT STAGE ROUTE MAP⁵

Summit Stage service is supplemented by several private shuttle services that bring skiers from Denver to Summit County. A few of these services include:

- <https://www.summitexpress.com/>
- <https://www.mountainshuttle.com/>
- <https://www.mtnshuttle.com/>
- <https://www.epicmountainexpress.com/>
- <https://freshtrackstransportation.com/>

The result is a system by which people can travel to and around Summit County without a car.

While the system is relatively successful, Summit County's 2020 Short Range Transportation Plan indicates that there is still room for improvement within the system. One area in which the Summit Stage system currently struggles is the accessibility of bus stops. Many in the area complain that bus stops are

⁵ <https://summitcountyco.gov/ImageRepository/Document?documentID=31594>

not located close to where they live. Solutions to this include expanding the bus routes or creating park-and-ride lots, which would allow users of the Summit Stage to drive a short distance to a stop, where they could then take the bus the rest of the way to their destination. The park-and-ride is already being used in some places within Summit County and seems to be a popular option. Another area within the Summit Stage system that the 2020 transportation plan indicates will be getting more attention is the balance of service provided between tourists and commuters. While skiers and snowboarders are the primary group using the Summit Stage, the needs of commuters should be prioritized as well, especially since the commuters are often employees of the ski resorts that work to keep the ski resorts functioning. If employees of the ski resorts cannot reach the ski resorts due to the lack of transit service, ski resorts cannot function.

Summit County Colorado is an example of a town that has faced many of the same issues as Hilton Head Island, including issues with their transportation systems and their capacity to deal with high levels of tourists as well as commuters. In Summit County, the Summit Stage transit system has been a major part of a solution.

TDM Solutions for Hilton Head Island

As previously discussed, Hilton Head Island has a starting point to develop a functional and attractive multi-modal system to provide people with an alternative to using an automobile. Hilton Head Island has 120 miles of public and private bike pathways offered throughout the island. The Lowcountry Regional Transportation Authority operates Palmetto Breeze with 40 buses and 19 routes, 10 of which provide service to and/or within the Town of Hilton Head Island. There are other local shuttle services that provide additional mobility. As with Summit County Colorado, these systems can be built upon to absorb future travel growth. Given current growth trends, CBB recommends the adoption of a goal to shift 10% of total trips to other modes of travel by 2045. It will take a deliberate effort, but we believe that goal is achievable.

CBB interviewed Palmetto Breeze Executive Director and General Manager Mary Lou Franzoni to shed light on Palmetto Breeze's aspirations to increase transit usage in the Lowcountry. Ms. Franzoni believes that transit can play a vital role in a region's transportation network. However, the importance and benefits of transit are not being fully understood in the Lowcountry region. The Palmetto Breeze commuter bus service has provided access to better employment opportunities in Hilton Head Island to those living in outlying counties. There has also been significant population growth in the Hilton Head region, especially since the pandemic. That growth is expected to continue with future dense development anticipated to be concentrated around the US-278 loop.

The biggest challenge to Palmetto Breeze is limited funding. There is not a dedicated local tax funding the service like there is for most transit agencies. Even now, the FTA 5307 and 5311 grants cannot cover the full cost of operations for the Palmetto Breeze. The rest of funding largely comes from local sources, including the Town of Hilton Head Island and Beaufort County, who Palmetto Breeze often needs to convince each year to continue providing adequate funding. A sales tax referendum will be on local ballots in 2024 for Lowcountry voters to decide to provide a consistent stream of funding for Palmetto Breeze and reduce its reliance on other sources. There was a similar referendum a few years ago, but it was pulled before the day of polling. Ms. Franzoni strongly believes that the ballot measure passing would bring substantial, positive change for Palmetto Breeze and its ability to provide transit services.

Ridership and expansion were two topics discussed at considerable length with Ms. Franzoni. Future commuter service expansions have been hard to predict lately. Traditionally, Allendale County, for example, has supplied a large number of workers for Hilton Head Island, despite the long commute. But recently, there has been a shift wherein there are more job alternatives for those who would normally commute from far away. Currently and for the foreseeable future, there may not be enough ridership demand to expand the commuter route headways from one AM and one PM run, much less to different parts of the county. Expansion of commuter service is usually done when a locality requests (and pays for) service.

The Hilton Head Island Breeze Trolley (Route 505) began in 2018 as a solution to summer traffic issues during peak tourist season. The idea is that the trolley would take riders to popular tourist destinations, reducing the need for parking and short motorized vehicle trips. It is estimated that the Trolley eliminates 15,000-16,000 personal vehicle trips during its run between April 1 and Labor Day. Palmetto Breeze would like to operate the service during a longer season, but there is not currently funding available to do so. The goal is for it to reach 65,000 riders. During the 2021 and 2022 seasons, ridership was about 52,000 and 48,000 respectively. To achieve this ridership goal, Palmetto Breeze adjusted the Trolley's schedule to match that of regional commercial jets that flew into Hilton Head Island airport. Unfortunately, a significant amount of regional air service has been cut from Hilton Head Island airport, so that source of ridership is currently limited. However, the airport has secured funding for a significant expansion that should begin within the next five years. There should be significant opportunity to capitalize on ridership from the predicted new air service once the terminal expansion is complete.

Most people who fly to Hilton Head Island travel through the larger Savannah-Hilton Head Island Airport. Palmetto Breeze has explored a route to this airport but found the logistics too challenging. Finding enough local match has been tricky and crossing state lines into Georgia makes things difficult.

The Bluffton Breeze began operating local transit service to the Bluffton community in 2021. It aims to provide connectivity among the community's larger employers and largest apartment complexes. So far, ridership has been low, and the route has been reformatted. Transit in Bluffton is somewhat tricky given the low-density of the built environment. However, Ms. Franzoni is optimistic and has an idea for how to increase ridership. Bluffton is home to several large retirement communities, both existing and under development, including Sun City, Hampton Hall, and Latitude Margaritaville. These present a significant ridership opportunity if appropriate connections can be made. The senior citizens populating these communities in many cases no longer wish to drive or are no longer capable of driving. Offering service between these communities and shopping and recreational opportunities is an opportunity for ridership growth. Furthermore, Ms. Franzoni noted that USCB offers classes to adults 60 and older. The Bluffton Breeze could take advantage of this by offering transit service from these retirement communities to the USCB campus.

One strategy to create a pathway for increasing ridership and transit's role in the greater Lowcountry transportation network is to increase connectivity among routes. The commuter routes are connected through the transfer center, but local service does not offer much connectivity to other routes on the system. One option considered was to connect the Breeze Trolley with the private Sea Pines Trolley. Palmetto Breeze actively looked at how to make such a connection work, including alternative locations for connections, but nothing has been implemented at this time.

Another option would be to connect the Breeze Trolley with the Bluffton Breeze. There has not been much movement on this lately, but SCDOT has considered building a park-and-ride where both the Bluffton Breeze and Breeze Trolley could have a stop. Having stops for both routes at a park-and-ride would allow connectivity between Bluffton and Hilton Head. It would also allow commuters and visitors to park once to get to destinations in either Bluffton or Hilton Head. With the recent rise in short-term rental properties (Airbnb, VRBO, etc.), traffic congestion has increased. Such a park-and-ride could lessen the increase in traffic by offering such short-term visitors (generally without much luggage to carry) an ability to ditch their car and get around by transit during their stay. Further into the future, Ms. Franzoni believes two park-and-rides, one on either side of the US-278 bridge, would be beneficial. One option considered to circumvent the need for a dedicated park-and-ride parking lot is to partner with local businesses who already have large parking lots to offer. Walmart, for example, could be a resource for providing park-and-ride opportunities without a dedicated park-and-ride needed.

In a place largely built around the automobile, like Hilton Head, some incentive may be necessary to encourage visitors to use transit and a park-and-ride option. One of those may be by happenstance; the large public parking lot on the northeast corner of Pope Avenue and S Forest Beach Drive is set to become a paid parking lot. If the commuter lot is free or costs less than this parking lot, that could encourage some, particularly those visiting for the day, to use the commuter lot.

Another incentive could be a bus-on-shoulder program. In essence, such programs allow transit buses to divert to the shoulder when congestion is encountered, allowing buses to bypass the congestion. The buses travel at a speed much lower than the speed limit on the shoulder for safety. This would require that the reconstructed US-278 bridges be built with a wide shoulder.

Ms. Franzoni believes that another strategy to provide viable transit for the Lowcountry is to offer a dial-a-ride option with subscription service. This service would use smaller buses or passenger vans and offer riders a direct ride to work without the need to run large buses around the island.

Considering the research conducted on the Palmetto Breeze transportation network, the observations made during the site visit to Hilton Head Island and vicinity, and the phone interview with Mary Lou Franzoni, CBB is making the following recommendations as a starting point for Beaufort County and the Town of Hilton Head Island to help build a functional and attractive transit system to serve Hilton Head Island.

Thus, based on our analysis and discussions with Palmetto Breeze, we offer several short-term recommendations to improve the transit service to and on Hilton Head Island in **Table 18. *These enhancements would leverage the island's robust bicycle/pedestrian network and the proposed SCDOT US 278 multi-use path for a robust multi-modal transportation system that provides travel options.***

Note – Travel Demand Managing strategies, like transit expansion, will not eliminate the need for the SCDOT US 278 Corridor Improvements project. TDM strategies should be used alongside the project to help extend the project's functional life.

TABLE 18: HILTON HEAD ISLAND TDM RECOMMENDATIONS

Recommendation:	Result:
<ul style="list-style-type: none"> • A dedicated local sales tax for transit 	<ul style="list-style-type: none"> • Increased and stable funding to properly fund the service and increase its viability
<ul style="list-style-type: none"> • Establish strategic park-and-ride locations 	<ul style="list-style-type: none"> • Visitors will “park once” at the park-and-ride and use transit to get around the island, lessening the number of automobile trips made
<ul style="list-style-type: none"> • Explore a bus-on-shoulder program 	<ul style="list-style-type: none"> • If congestion returns and shoulders on the new US-278 bridge are wide enough, a bus-on-shoulder allows for transit service faster than a private automobile could provide, encouraging a reduction in automobile traffic
<ul style="list-style-type: none"> • Connect the Breeze Trolley with other local routes, such as the Bluffton Breeze and Sea Pines Trolley, and any similar, future service 	<ul style="list-style-type: none"> • Increases the range of travel for riders in both Hilton Head Island and Bluffton.
<ul style="list-style-type: none"> • Increase marketing for branding and campaigns geared toward untapped ridership markets. 	<ul style="list-style-type: none"> • Transit can often be about form just as much as it is about function. If it looks fun to ride, people will be encouraged to ride it. • The more people know about a service, the higher number of possible riders there will be.
<ul style="list-style-type: none"> • Develop dial-a-ride service 	<ul style="list-style-type: none"> • Provides more direct service for people to get to work
<ul style="list-style-type: none"> • Develop new routes to untapped ridership markets, particularly retirement communities 	<ul style="list-style-type: none"> • Expanding local service to retirement communities could encourage residents to use transit
<ul style="list-style-type: none"> • Develop and work with partners to encourage transit ridership 	<ul style="list-style-type: none"> • Marketing doesn’t always reach everyone. Working with major employers, destinations, etc., to explore how transit could better serve them and how they could encourage their employees or patrons to use transit could increase ridership and remove some private automobiles from Hilton Head roadways
<ul style="list-style-type: none"> • Ensure adequate service is offered to the Hilton Head Island airport 	<ul style="list-style-type: none"> • Many may prefer to skip the expense of renting a car or taxi/rideshare services when visiting a place. Ensuring adequate airport service to HHH and making travelers aware of the service will discourage the use of rental cars and taxi/rideshare services.

Acknowledgment

Thank you to all the representatives from the Town of Hilton Head Island, Beaufort County, and the South Carolina Department of Transportation who assisted in completing this project. This complex project would not have been able to be completed without their support. CBB is honored to be given the opportunity to work on such an impactful project. We wish the best for this community.

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Appendix A- Field Travel Time Data



CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 EB AM**
 Study Date : **3/27/2023**
 Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/ After	Run Type
US 278 AM-EB-001	03/27/23	06:33	30573	Before	Primary
US 278 AM-EB-002	03/27/23	07:15	30579	Before	Primary
US 278 AM-EB-003	03/27/23	08:02	30685	Before	Primary
US 278 AM-EB-004	03/27/23	06:42	30468	Before	Primary
US 278 AM-EB-005	03/27/23	07:20	30457	Before	Primary

Node Info

#	Len	Name
1	0	Buckingham Plantation
2	19543	Squire Pope Road
3	2225	Wild Horse Road
4	3051	Gumtree Road
5	1573	Wilborn Road
6	1237	Museum Street
7	3100	Indigo Run Drive

Length of Study Route = 30,729 feet

Notes:

AM EB

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 EB AM**
 Study Date : **3/27/2023**
 Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Buckingham Plantation Drive							
2	19543	Squire Pope Road	910.4	17.2	14.6	668.0	884.0	909.2	910.4
3	2225	Wild Horse Road	55.8	0.4	27.2	27.8	31.4	55.8	55.8
4	3051	Gumtree Road	93.2	0.6	22.3	55.2	56.4	87.2	93.2
5	1573	Wilborn Road	33.4	0.0	32.1	13.4	20.8	33.4	33.4
6	1237	Museum Street	21.4	0.0	39.4	5.8	3.4	20.6	21.4
7	3100	Indigo Run Drive	50.4	0.2	41.9	15.2	9.8	44.2	49.4
Total	30,729		1164.6	18.4	18.0	785.4	1005.8	1150.4	1163.6

Stats based on 5 BEFORE runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 55 MPH.

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 WB AM**
 Study Date : **3/27/2023**
 Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/ After	Run Type
US 278 AM-WB-001	03/27/23	06:17	30610	Before	Primary
US 278 AM-WB-002	03/27/23	06:59	30595	Before	Primary
US 278 AM-WB-003	03/27/23	07:44	30630	Before	Primary
US 278 AM-WB-004	03/27/23	06:22	30463	Before	Primary
US 278 AM-WB-005	03/27/23	07:45	30886	Before	Primary

Node Info

#	Len	Name
1	0	Indigo Run Drive
2	3100	Museum Street
3	1237	Wilborn Road
4	1573	Gumtree Road
5	3051	Wild Horse Road
6	2225	Squire Pope Road
7	19543	Buckingham Plantation

Length of Study Route = 30,729 feet

Notes:

WB AM

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **US 278 WB AM**

Study Date : **3/27/2023**

Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Indigo Run Drive							
2	3100	Museum Street	64.6	0.4	32.7	25.6	27.6	57.0	64.6
3	1237	Wilborn Road	26.4	0.0	31.9	10.6	15.8	26.4	26.4
4	1573	Gumtree Road	70.0	0.6	15.3	50.0	50.6	68.4	70.0
5	3051	Wild Horse Road	56.2	0.4	37.0	18.2	15.0	32.2	52.8
6	2225	Squire Pope Road	36.2	0.2	41.9	8.2	4.0	22.0	36.2
7	19543	Buckingham Plantation Drive	255.8	0.0	52.1	15.4	6.6	16.4	180.8
Total	30,729		509.2	1.6	41.1	128.0	119.6	222.4	430.8

Stats based on 5 BEFORE runs.

Stops based on a Stop Speed of 5 MPH.

Total Delay based on a Normal Speed of 55 MPH.

CBB

US 278 Corridor Independent Review CBB #2023-20

Study Name : **Cross Island Parkway NB AM**
Study Date : **3/27/2023**
Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
Cross Island AM-NB-R001	03/27/23	07:08	31154	Before	Primary
Cross Island AM-NB-R002	03/27/23	07:13	30926	Before	Primary
Cross Island AM-NB-R003	03/27/23	07:28	27993	Before	Primary
Cross Island AM-NB-R004	03/27/23	07:36	31013	Before	Primary
Cross Island AM-NB-R005	03/27/23	07:51	30968	Before	Primary

Node Info

#	Len	Name
1	0	College Center Drive
2	1085	Roundabout
3	984	Target Road
4	4831	Arrow Road
5	24206	Wild Horse Road

Length of Study Route = 31,106 feet

Notes:

NB AM

CBB

US 278 Corridor Independent Review CBB #2023-20

Study Name : **Cross Island Parkway NB AM**
Study Date : **3/27/2023**
Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 45 MPH	Time <= 50 MPH	Time <= 55 MPH
1	0	College Center Drive							
2	1085	Roundabout	42.8	0.8	17.3	29.0	42.8	42.8	42.8
3	984	Target Road	20.6	0.0	32.6	8.2	20.6	20.6	20.6
4	4831	Arrow Road	71.6	0.0	46.0	11.6	24.2	69.4	71.6
5	24206	Wild Horse Road	277.8	0.0	59.4	0.8	7.6	32.0	63.2
Total	31,106		412.8	0.8	51.4	49.6	95.2	164.8	198.2

Stats based on 5 BEFORE runs.

Stops based on a Stop Speed of 5 MPH.

Total Delay based on a Normal Speed of 55 MPH.

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **Cross Island Parkway SB AM**

Study Date : **3/27/2023**

Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
Cross Island AM-SB-R001	03/27/23	07:19	31020	Before	Primary
Cross Island AM-SB-R002	03/27/23	07:25	31019	Before	Primary
Cross Island AM-SB-R003	03/27/23	07:39	30954	Before	Primary
Cross Island AM-SB-R004	03/27/23	07:46	33259	Before	Primary
Cross Island AM-SB-R005	03/27/23	08:03	30948	Before	Primary

Node Info

#	Len	Name
1	0	Wild Horse Road
2	24206	Arrow Road
3	4831	Target Road
4	984	Roundabout
5	1085	College Center Drive

Length of Study Route = 31,106 feet

Notes:

SB AM

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **Cross Island Parkway SB AM**

Study Date : **3/27/2023**

Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 45 MPH	Time <= 50 MPH	Time <= 55 MPH
1	0	Wild Horse Road							
2	24206	Arrow Road	304.8	0.2	54.1	9.6	30.6	63.8	128.0
3	4831	Target Road	82.8	0.4	39.8	22.8	61.0	73.2	80.8
4	984	Roundabout	49.4	1.2	13.6	37.2	49.4	49.4	49.4
5	1085	College Center Drive	31.8	0.6	23.3	19.0	31.0	31.0	31.0
Total	31,106		468.8	2.4	45.2	88.6	172.0	217.4	289.2

Stats based on 5 BEFORE runs.

Stops based on a Stop Speed of 5 MPH.

Total Delay based on a Normal Speed of 55 MPH.

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 EB PM**
 Study Date : **3/27/2023**
 Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/ After	Run Type
US 278 PM-EB-001	03/27/23	14:33	30667	Before	Primary
US 278 PM-EB-002	03/27/23	15:29	30809	Before	Primary
US 278 PM-EB-003	03/27/23	16:12	30653	Before	Primary
US 278 PM-EB-004	03/27/23	16:25	30752	Before	Primary
US 278 PM-EB-005	03/27/23	16:59	30625	Before	Primary

Node Info

#	Len	Name
1	0	Buckingham Plantation
2	19543	Squire Pope Road
3	2225	Wild Horse Road
4	3051	Gumtree Road
5	1573	Wilborn Road
6	1237	Museum Street
7	3100	Indigo Run Drive

Length of Study Route = 30,729 feet

Notes:

PM EB

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 EB PM**
 Study Date : **3/27/2023**
 Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Buckingham Plantation Drive							
2	19543	Squire Pope Road	276.2	0.0	48.2	35.4	23.0	75.6	217.0
3	2225	Wild Horse Road	52.2	0.4	29.1	24.2	21.6	45.8	52.2
4	3051	Gumtree Road	80.6	0.8	25.8	42.6	43.2	60.6	80.6
5	1573	Wilborn Road	33.2	0.2	32.3	13.2	21.0	31.4	33.2
6	1237	Museum Street	47.8	0.6	17.6	32.2	33.4	43.2	47.8
7	3100	Indigo Run Drive	56.6	0.2	37.3	18.8	18.2	44.2	55.8
Total	30,729		546.6	2.2	38.3	166.4	160.4	300.8	486.6

Stats based on 5 BEFORE runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 55 MPH.

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 WB PM**
 Study Date : **3/27/2023**
 Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/ After	Run Type
US 278 PM-WB-001	03/27/23	14:47	30118	Before	Primary
US 278 PM-WB-002	03/27/23	14:55	30158	Before	Primary
US 278 PM-WB-003	03/27/23	15:32	30111	Before	Primary
US 278 PM-WB-004	03/27/23	15:44	30105	Before	Primary
US 278 PM-WB-005	03/27/23	16:40	30368	Before	Primary

Node Info

#	Len	Name
1	0	Indigo Run Drive
2	3100	Museum Street
3	1237	Wilborn Road
4	1573	Gumtree Road
5	3051	Wild Horse Road
6	2225	Squire Pope Road
7	19543	Buckingham Plantation

Length of Study Route = 30,729 feet

Notes:

PM WB

CBB
 US 278 Corridor Independent Review
 CBB #2023-20

Study Name : **US 278 WB PM**
 Study Date : **3/27/2023**
 Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Indigo Run Drive							
2	3100	Museum Street	455.6	11.4	4.6	417.0	455.6	455.6	455.6
3	1237	Wilborn Road	86.2	1.6	9.8	70.8	86.2	86.2	86.2
4	1573	Gumtree Road	152.4	2.6	7.0	132.4	150.0	152.4	152.4
5	3051	Wild Horse Road	445.6	9.2	4.7	407.6	444.4	445.6	445.6
6	2225	Squire Pope Road	164.6	2.6	9.2	136.6	164.2	164.6	164.6
7	19543	Buckingham Plantation Drive	445.8	1.8	29.9	211.0	296.0	394.2	439.2
Total	30,729		1750.2	29.2	12.0	1375.4	1596.4	1698.6	1743.6

Stats based on 5 BEFORE runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 55 MPH.

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **Cross Island Parkway PM NB**

Study Date : **3/29/2023**

Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
Cross Island PM-NB-001	03/29/23	14:18	30203	Before	Primary
Cross Island PM-NB-002	03/29/23	14:43	30035	Before	Primary
Cross Island PM-NB-003	03/29/23	15:18	32016	Before	Primary
Cross Island PM-NB-004	03/29/23	16:03	31876	Before	Primary
Cross Island PM-NB-005	03/27/23	14:28	32720	Before	Primary

Node Info

#	Len	Name
1	0	Roundabout
2	984	Target Road
3	4831	Arrow Road
4	24206	Wild Horse Road

Length of Study Route = 30,021 feet

Notes:

PM NB

CBB
 US 278 Corridor Independent Review
 CBB# #2023-20

Study Name : **Cross Island Parkway PM NB**
 Study Date : **3/29/2023**
 Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Roundabout							
2	984	Target Road	55.6	0.8	12.1	43.2	55.6	55.6	55.6
3	4831	Arrow Road	82.6	0.2	39.9	22.4	15.4	61.8	82.6
4	24206	Wild Horse Road	914.6	14.8	18.0	614.6	657.8	671.8	772.0
Total	30,021		1052.8	15.8	19.4	680.2	728.8	789.2	910.2

Stats based on 5 BEFORE runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 55 MPH.

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **Cross Island Parkway PM SB**

Study Date : **3/27/2023**

Page No. : **1**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
Cross Island PM-SB-01	03/27/23	14:14	32127	Before	Primary
Cross Island PM-SB-02	03/29/23	15:02	32224	Before	Primary
Cross Island PM-SB-03	03/29/23	15:02	32224	Before	Primary
Cross Island PM-SB-04	03/29/23	15:47	32112	Before	Primary
Cross Island PM-SB-05	03/27/23	16:07	31841	Before	Primary

Node Info

#	Len	Name
1	0	Wild Horse Road
2	24206	Arrow Road
3	4831	Target Road
4	984	Roundabout

Length of Study Route = 30,021 feet

Notes:

SB PM

CBB

US 278 Corridor Independent Review

CBB #2023-20

Study Name : **Cross Island Parkway PM SB**

Study Date : **3/27/2023**

Page No. : **2**

Overall Output Statistics

Node #	Length	Node	Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 35 MPH	Time <= 45 MPH	Time <= 55 MPH
1	0	Wild Horse Road							
2	24206	Arrow Road	340.8	0.8	48.4	39.8	56.6	80.4	182.0
3	4831	Target Road	104.8	1.2	31.4	44.8	40.2	83.4	104.8
4	984	Roundabout	15.8	0.0	42.5	3.6	0.0	15.2	15.8
Total	30,021		461.4	2.0	44.4	88.2	96.8	179.0	302.6

Stats based on 5 BEFORE runs.

Stops based on a Stop Speed of 5 MPH.

Total Delay based on a Normal Speed of 55 MPH.

Appendix B- SYNCHRO and VISSIM Measure of Effectiveness Tables



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Table 1: Intersection Operating Conditions – 2023 No-Build (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
Bluffton Parkway & Buckingham Plantation Drive (Signalized)								
Eastbound Bluffton Parkway	A	4.4	<25'	175'	A	3.2	<25'	125'
Westbound Bluffton Parkway	A	5.6	<25'	225'	A	4.2	<25'	205'
Northbound Buckingham Plantation Drive	D	54.6	<25'	135'	D	48.1	<25'	125'
Southbound Buckingham Plantation Drive	B	18.3	<25'	120'	C	26.2	<25'	200'
Overall Intersection	A	7.0	---	---	A	7.2	---	---
US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)								
Eastbound US 278	D	54.6	305'	1515'	B	15.4	60'	385'
Westbound US 278	B	14.0	30'	370'	B	20.0	120'	745'
Northbound Buckingham Plantation Drive	D	44.3	35'	245'	D	49.9	25'	120'
Southbound Moss Creek Drive	D	38.7	<25'	145'	C	32.9	30'	220'
Overall Intersection	D	40.6	---	---	B	19.6	---	---
US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)								
Eastbound US 278	D	34.9	400'	1185'	A	0.8	<25'	120'
Westbound US 278	A	0.4	<25'	70'	A	0.5	<25'	50'
Northbound Salt Marsh Drive	C	20.1	<25'	75'	B	13.3	<25'	60'
Southbound Moss Creek Village	B	11.6	<25'	85'	A	9.7	<25'	85'
Overall Intersection	C	23.0	---	---	A	0.9	---	---
US 278 & Fording Island Road Extension (Unsignalized)								
Eastbound US 278	C	17.9	405'	1040'	A	0.1	<25'	90'
Westbound US 278	A	0.4	<25'	30'	A	0.4	<25'	30'
Northbound Fording Island Road Extension	F	522.5	75'	225'	C	18.5	<25'	70'
Overall Intersection	C	16.2	---	---	A	0.4	---	---
US 278 & Pinckney Wildlife Refuge (Unsignalized)								
Eastbound US 278	A	8.5	490'	1670'	A	1.0	<25'	80'
Westbound US 278	A	0.5	<25'	65'	A	0.5	<25'	60'
Northbound Pinckney Wildlife Refuge	F	110.2	<25'	55'	C	24.9	<25'	50'
Southbound Pinckney Wildlife Refuge	D	25.8	<25'	50'	B	14.8	<25'	55'
Overall Intersection	A	6.2	---	---	A	0.8	---	---
US 278 & Blue Heron Point Road (Unsignalized)								
Eastbound US 278	A	9.5	635'	1675'	A	0.4	<25'	<25'
Westbound US 278	A	0.7	<25'	35'	A	0.5	<25'	<25'
Northbound Blue Heron Point Road	F	187.6	<25'	80'	C	18.2	<25'	65'
Overall Intersection	A	7.2	---	---	A	0.5	---	---
US 278 & Crosstree Drive/Gateway Drive (Unsignalized)								
Eastbound US 278	B	13.2	275'	1060'	A	0.7	<25'	<25'
Westbound US 278	A	2.3	<25'	105'	A	1.1	<25'	70'
Northbound Crosstree Drive	E	46.8	<25'	105'	C	18.6	<25'	95'
Southbound Gateway Drive	B	11.1	<25'	40'	C	16.5	<25'	40'
Overall Intersection	B	10.2	---	---	A	1.2	---	---

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Table 1: Intersection Operating Conditions – 2023 No-Build (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 & Jenkins Road (Unsignalized)								
Eastbound US 278	B	12.7	430'	1365'	A	1.0	<25'	60'
Westbound US 278	A	0.8	<25'	70'	A	0.8	<25'	<25'
Southbound Jenkins Road	F	132.7	<25'	50'	D	31.7	<25'	60'
Overall Intersection	A	9.2	---	---	A	0.9	---	---
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)								
Eastbound US 278	A	8.4	600'	1685'	B	15.8	200'	1195'
Westbound US 278	A	6.4	<25'	640'	B	18.5	1540'	1705'
Northbound Chamberlin Drive	C	33.1	<25'	45'	E	73.1	<25'	70'
Southbound Squire Pope Road	B	15.9	<25'	150'	E	69.2	75'	525'
Overall Intersection	A	8.3	---	---	C	21.4	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)								
Eastbound US 278	C	24.9	385'	1375'	C	21.4	110'	695'
Westbound US 278	B	13.3	55'	435'	F	83.3	1490'	1690'
Northbound Spanish Wells Road	D	44.4	80'	335'	F	222.6	550'	720'
Southbound Wild Horse Road	E	75.4	80'	295'	E	65.1	55'	225'
Overall Intersection	C	25.0	---	---	E	66.7	---	---
US 278 & Gumtree Road (Signalized)								
Eastbound Business US 278	F	84.0	1475'	1690'	D	48.6	170'	735'
Westbound Business US 278	C	28.8	115'	385'	F	128.6	1275'	1610'
Northbound Gumtree Road	C	23.1	60'	260'	E	79.6	420'	595'
Southbound Gumtree Road	E	66.9	150'	630'	F	120.1	420'	895'
Overall Intersection	E	60.6	---	---	F	98.8	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)								
Eastbound Business US 278	B	17.8	190'	1115'	B	15.2	65'	905'
Westbound Business US 278	B	18.7	70'	550'	F	114.9	960'	1305'
Northbound Jarvis Park Road	E	69.1	35'	205'	F	314.5	155'	355'
Southbound Wilborn Road	D	47.5	80'	470'	D	52.1	35'	275'
Overall Intersection	C	22.3	---	---	E	71.2	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)								
Eastbound Business US 278	B	14.1	160'	1135'	B	19.5	100'	865'
Westbound Business US 278	B	11.0	30'	385'	F	167.8	1485'	1685'
Northbound Pembroke Drive	D	54.2	60'	235'	F	306.4	480'	800'
Southbound Museum Street	C	32.8	<25'	85'	F	144.7	35'	175'
Overall Intersection	B	17.0	---	---	F	116.9	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)								
Eastbound Business US 278	C	24.2	205'	1105'	C	31.9	110'	775'
Westbound Business US 278	B	15.5	45'	335'	F	214.0	1450'	1690'
Northbound Indigo Run Drive	D	47.4	30'	105'	E	74.5	45'	135'
Southbound Whooping Crane Way	D	41.5	50'	185'	E	70.2	80'	305'
Overall Intersection	C	24.6	---	---	F	116.1	---	---

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Table 1: Intersection Operating Conditions – 2023 No-Build (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)								
Westbound US 278 Off-Ramp	A	3.0	<25'	65'	F	176.3	560'	1455'
Northbound Gumtree Road	A	9.7	<25'	70'	F	60.3	<25'	100'
Southbound Gumtree Road	A	0.2	<25'	<25'	A	0.2	<25'	<25'
Overall Intersection	A	1.7	---	---	F	109.1	---	---
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)								
Eastbound Honey Horn Drive	A	7.4	<25'	55'	A	8.3	<25'	80'
Southbound Gumtree Road	A	0.1	<25'	<25'	A	0.2	<25'	<25'
Overall Intersection	A	0.3	---	---	A	1.2	---	---
Marshland Road & Spanish Wells Road (Unsignalized)								
Eastbound Marshland Road	A	0.5	<25'	40'	A	0.8	<25'	50'
Westbound Marshland Road	A	0.4	<25'	<25'	A	0.9	<25'	55'
Southbound Spanish Wells Road	A	8.4	<25'	100'	A	7.8	<25'	95'
Overall Intersection	A	2.6	---	---	A	2.1	---	---
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.3	<25'	<25'	A	0.3	<25'	<25'
Westbound Marshland Road	A	0.5	<25'	50'	A	0.5	<25'	35'
Southbound Cross Island Parkway Off-Ramp	A	6.9	<25'	100'	A	8.5	<25'	110'
Overall Intersection	A	0.9	---	---	A	1.5	---	---
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.7	<25'	40'	A	0.7	<25'	35'
Westbound Marshland Road	A	0.6	<25'	40'	A	0.5	<25'	<25'
Northbound Cross Island Parkway Off-Ramp	A	7.2	<25'	100'	A	10.0	25'	185'
Overall Intersection	A	1.9	---	---	A	4.5	---	---
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)								
Eastbound Point Comfort Road	D	46.2	55'	240'	D	45.1	40'	200'
Westbound Arrow Road	C	20.4	<25'	85'	C	22.9	35'	205'
Northbound Palmetto Bay Road	A	5.8	<25'	230'	A	5.5	<25'	335'
Southbound Palmetto Bay Road	A	7.6	40'	675'	A	6.6	<25'	405'
Overall Intersection	B	11.1	---	---	B	10.6	---	---
Target Road & Palmetto Bay Road (Signalized)								
Eastbound Target Road	D	45.7	<25'	145'	D	53.2	70'	230'
Westbound Target Road	D	50.0	40'	125'	C	33.0	30'	120'
Northbound Palmetto Bay Road	A	6.1	<25'	250'	A	9.2	45'	425'
Southbound Palmetto Bay Road	B	16.1	295'	1335'	A	7.1	40'	550'
Overall Intersection	B	16.7	---	---	B	14.7	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout)								
Eastbound Greenwood Drive	F	146.6	585'	1240'	E	43.4	305'	995'
Westbound Business US 278	C	16.5	60'	500'	F	199.8	1310'	1695'
Northbound Pope Avenue	A	6.8	<25'	320'	D	34.9	310'	930'
Southbound Palmetto Bay Road	C	24.5	330'	920'	B	11.1	65'	670'
Overall Intersection	D	34.7	---	---	F	56.8	---	---

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Table 2: Intersection Operating Conditions – 2023 No-Build (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
Bluffton Parkway & Buckingham Plantation Drive (Signalized)										
Eastbound Bluffton Parkway	A	2.8	0.37	90'	125'	A	2.5	0.21	50'	80'
Westbound Bluffton Parkway	A	6.0	0.18	65'	100'	A	6.9	0.38	165'	235'
Northbound Buckingham Plantation Drive	E	61.9	0.36	30'	65'	E	70.1	0.59	30'	65'
Southbound Buckingham Plantation Drive	C	31.1	0.46	<25	60'	C	29.9	0.64	<25	90'
Overall Intersection	A	6.7	0.64	---	---	A	9.0	0.69	---	---
US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)										
Eastbound US 278	B	15.5	0.54	370'	430'	B	17.9	0.65	330'	405'
Westbound US 278	B	15.4	0.36	215'	280'	C	25.5	0.73	605'	765'
Northbound Buckingham Plantation Drive	D	41.5	0.59	70'	125'	D	54.5	0.36	50'	90'
Southbound Moss Creek Drive	D	47.9	0.52	40'	105'	E	57.7	0.77	85'	195'
Overall Intersection	B	18.6	0.63	---	---	C	24.9	0.81	---	---
US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)										
Eastbound US 278	A	<1.0	0.47	--	<25'	A	<1.0	0.40	--	<25'
Westbound US 278	A	<1.0	0.27	--	<25'	A	<1.0	0.52	--	<25'
Northbound Salt Marsh Drive	B	14.4	0.13	--	<25'	D	30.9	0.11	--	<25'
Southbound Moss Creek Village	B	13.7	0.14	--	<25'	D	26.2	0.24	--	25'
Overall Intersection	A	0.6	0.50	--	--	A	0.9	0.58	--	--
US 278 & Fording Island Road Extension (Unsignalized)										
Eastbound US 278	A	<1.0	0.60	--	<25'	A	<1.0	0.50	--	<25'
Westbound US 278	A	<1.0	0.36	--	<25'	A	<1.0	0.67	--	<25'
Northbound Fording Island Road Extension	F	>200	0.94	--	80'	F	>200	1.78	--	100'
Overall Intersection	A	2.9	0.62	--	--	A	6.0	0.68	--	--
US 278 & Pinckney Wildlife Refuge (Unsignalized)										
Eastbound US 278	A	<1.0	0.91	--	<25'	A	1.6	0.68	--	<25'
Westbound US 278	A	<1.0	0.51	--	<25'	A	<1.0	0.98	--	<25'
Northbound Pinckney Wildlife Refuge	F	>200	0.60	--	40'	F	>200	--	--	--
Southbound Pinckney Wildlife Refuge	F	80.9	0.19	--	<25'	F	>200	1.00	--	65'
Overall Intersection	A	1.0	0.89	--	--	C	21.4	0.95	--	--
US 278 & Blue Heron Point Road (Unsignalized)										
Eastbound US 278	A	<1.0	0.91	--	<25'	A	<1.0	0.68	--	<25'
Westbound US 278	A	<1.0	0.51	--	<25'	A	<1.0	0.98	--	<25'
Northbound Blue Heron Point Road	F	>200	2.57	--	80'	F	>200	1.00	--	80'
Overall Intersection	A	6.1	0.89	--	--	A	5.1	0.95	--	--
US 278 & Crosstree Drive/Gateway Drive (Unsignalized)										
Eastbound US 278	A	<1.0	0.90	--	<25'	A	<1.0	0.68	--	<25'
Westbound US 278	A	<1.0	0.50	--	<25'	A	<1.0	0.97	--	<25'
Northbound Crosstree Drive	F	>200	--	--	--	F	>200	--	--	--
Southbound Gateway Drive	C	17.1	0.02	--	<25'	E	48.5	0.06	--	<25'
Overall Intersection	F	120.3	0.88	--	--	F	159.3	1.01	--	--

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Table 2: Intersection Operating Conditions – 2023 No-Build (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 & Jenkins Road (Unsignalized)										
Eastbound US 278	A	<1.0	0.92	--	<25'	A	<1.0	0.69	--	<25'
Westbound US 278	A	<1.0	0.68	--	<25'	A	<1.0	1.31	--	<25'
Southbound Jenkins Road	F	>200	0.80	--	45'	F	>200	--	--	--
Overall Intersection	A	1.2	0.89	--	--	D	28.1	0.95	--	--
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)										
Eastbound US 278	C	26.9	0.99	1005'	1835'	B	17.9	1.07	310'	565'
Westbound US 278	B	12.2	0.56	180'	425'	F	85.9	1.13	2030'	2120'
Northbound Chamberlin Drive	D	49.8	0.05	<25	<25	E	76.9	0.30	30'	70'
Southbound Squire Pope Road	D	45.2	0.82	45'	140'	F	466.9	2.04	530'	745'
Overall Intersection	C	23.3	1.01	---	---	F	84.9	1.17	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)										
Eastbound US 278	B	19.1	0.93	850'	805'	C	24.4	0.70	630'	465'
Westbound US 278	B	16.1	0.59	170'	235'	D	38.9	0.71	890'	790'
Northbound Spanish Wells Road	D	51.8	0.61	120'	195'	F	102.4	1.04	325'	520'
Southbound Wild Horse Road	F	98.2	0.96	135'	275'	D	53.9	0.29	95'	160'
Overall Intersection	C	23.7	0.95	---	---	D	38.2	0.73	---	---
US 278 & Gumtree Road (Signalized)										
Eastbound Business US 278	E	67.8	1.02	985'	1120'	E	57.6	0.74	670'	735'
Westbound Business US 278	D	36.9	0.91	230'	355'	F	113.0	1.21	1125'	1225'
Northbound Gumtree Road	D	37.4	0.88	150'	285'	E	63.8	0.94	260'	435'
Southbound Gumtree Road	F	113.1	1.04	235'	420'	F	86.0	0.90	265'	425'
Overall Intersection	E	60.9	0.93	---	---	F	88.6	0.93	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)										
Eastbound Business US 278	C	20.2	0.80	665'	880'	C	20.2	0.79	470'	580'
Westbound Business US 278	B	12.9	0.52	225'	260'	C	24.4	0.95	390'	1535'
Northbound Jarvis Park Road	F	83.0	0.60	75'	135'	F	89.6	0.60	85'	145'
Southbound Wilborn Road	D	49.9	0.72	145'	215'	C	25.4	0.48	60'	110'
Overall Intersection	C	22.5	0.98	---	---	C	24.1	0.88	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)										
Eastbound Business US 278	B	14.7	0.82	830'	790'	C	21.9	0.59	560'	660'
Westbound Business US 278	B	16.9	0.46	285'	360'	D	35.2	0.86	845'	1195'
Northbound Pembroke Drive	E	80.0	0.78	145'	255'	F	86.4	0.81	220'	310'
Southbound Museum Street	C	32.4	0.34	30'	70'	D	41.8	0.43	45'	90'
Overall Intersection	C	21.6	0.82	---	---	D	35.4	0.78	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)										
Eastbound Business US 278	A	6.3	0.74	60'	550'	C	35.0	0.86	540'	800'
Westbound Business US 278	B	17.3	0.44	245'	355'	D	38.8	0.91	900'	1235'
Northbound Indigo Run Drive	E	59.6	0.43	50'	100'	E	69.6	0.71	130'	205'
Southbound Whooping Crane Way	D	51.2	0.65	110'	155'	E	63.2	0.70	150'	195'
Overall Intersection	B	17.8	0.76	---	---	D	42.1	0.84	---	---

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Table 2: Intersection Operating Conditions – 2023 No-Build (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)										
Westbound US 278 Off-Ramp	F	>200	--	--	--	F	>200	--	--	--
Northbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.02	--	<25'
Southbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.12	--	<25'
Overall Intersection	F	>200	0.25	--	--	F	>200	0.33	--	--
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)										
Eastbound Honey Horn Drive	B	10.5	0.02	--	<25'	B	11.1	0.08	--	<25'
Southbound Gumtree Road	A	<1.0	0.24	--	<25'	A	<1.0	0.24	--	<25'
Overall Intersection	A	0.3	0.29	--	--	A	1.3	0.30	--	--
Marshland Road & Spanish Wells Road (Unsignalized)										
Eastbound Marshland Road	A	1.1	0.04	--	<25'	A	2.9	0.08	--	<25'
Westbound Marshland Road	A	<1.0	0.11	--	<25'	A	<1.0	0.30	--	<25'
Southbound Spanish Wells Road	B	13.0	0.28	--	30'	C	15.3	0.26	--	25'
Overall Intersection	A	4.0	0.30	--	--	A	3.5	0.46	--	--
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	<1.0	0.13	--	<25'	A	<1.0	0.08	--	<25'
Westbound Marshland Road	A	3.9	0.11	--	<25'	A	2.0	0.25	--	<25'
Southbound Cross Island Parkway Off-Ramp	B	11.3	0.06	--	<25'	C	16.5	0.23	--	25'
Overall Intersection	A	2.1	0.33	--	--	A	3.5	0.36	--	--
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	4.2	0.10	--	<25'	A	2.0	0.09	--	<25'
Westbound Marshland Road	A	<1.0	0.08	--	<25'	A	<1.0	0.12	--	<25'
Northbound Cross Island Parkway Off-Ramp	B	12.3	0.16	--	<25'	C	15.6	0.50	--	75'
Overall Intersection	A	4.1	0.33	--	--	A	7.1	0.36	--	--
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)										
Eastbound Point Comfort Road	E	57.8	0.86	115'	185'	E	69.0	0.99	70'	180'
Westbound Arrow Road	C	22.7	0.40	30'	70'	C	33.0	0.70	160'	285'
Northbound Palmetto Bay Road	D	30.6	0.81	--	270'	B	17.9	0.62	455'	575'
Southbound Palmetto Bay Road	B	18.2	0.62	--	670'	B	18.8	0.63	335'	410'
Overall Intersection	B	19.0	0.79	--	---	C	23.0	0.88	---	---
Target Road & Palmetto Bay Road (Signalized)										
Eastbound Target Road	D	42.2	0.33	45'	85'	E	62.5	0.79	170'	245'
Westbound Target Road	E	59.9	0.68	95'	155'	D	35.4	0.44	75'	120'
Northbound Palmetto Bay Road	A	7.9	0.30	125'	190'	B	13.5	0.53	315'	465'
Southbound Palmetto Bay Road	A	6.7	0.52	145'	175'	A	7.7	0.51	115'	140'
Overall Intersection	B	12.4	0.66	---	---	B	17.4	0.68	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout)										
Eastbound Greenwood Drive	D	30.6	0.81	--	185'	E	39.4	0.95	--	420'
Westbound Business US 278	B	12.1	0.63	--	130'	D	31.5	0.95	--	365'
Northbound Pope Avenue	A	6.5	0.53	--	95'	D	28.3	0.94	--	530'
Southbound Palmetto Bay Road	E	44.3	1.06	--	50'	D	26.3	0.95	--	680'
Overall Intersection	D	27.3	---	---	---	D	30.4	---	---	---

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Table 3: Intersection Operating Conditions – 2023 SCDOT (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
<i>Bluffton Parkway & Buckingham Plantation Drive (Signalized)</i>								
Eastbound Bluffton Parkway	A	3.1	<25'	175'	A	3.3	<25'	125'
Westbound Bluffton Parkway	A	6.0	<25'	225'	A	4.0	<25'	300'
Northbound Buckingham Plantation Drive	D	54.2	<25'	135'	D	48.1	<25'	125'
Southbound Buckingham Plantation Drive	B	18.1	<25'	120'	C	26.3	<25'	200'
Overall Intersection	A	6.2	---	---	A	6.8	---	---
<i>US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)</i>								
Eastbound US 278	B	14.1	55'	415'	B	15.0	45'	365'
Westbound US 278	B	13.9	30'	365'	C	23.8	160'	980'
Northbound Buckingham Plantation Drive	D	36.1	35'	240'	D	50.0	25'	120'
Southbound Moss Creek Drive	C	33.5	<25'	135'	C	33.7	30'	220'
Overall Intersection	B	16.5	---	---	C	21.5	---	---
<i>US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)</i>								
Eastbound US 278	A	0.2	<25'	45'	A	0.4	<25'	70'
Westbound US 278	A	0.3	<25'	95'	A	0.7	<25'	45'
Northbound Salt Marsh Drive	B	11.2	<25'	75'	B	14.3	<25'	60'
Southbound Moss Creek Village	A	9.1	<25'	85'	B	12.0	<25'	95'
Overall Intersection	A	0.6	---	---	A	0.9	---	---
<i>US 278 & Fording Island Road Extension (Unsignalized)</i>								
Eastbound US 278	A	0.1	<25'	<25'	A	0.2	<25'	70'
Westbound US 278	A	0.2	<25'	25'	A	0.3	<25'	30'
Northbound Fording Island Road Extension	B	11.3	<25'	55'	C	15.2	<25'	60'
Overall Intersection	A	0.2	---	---	A	0.4	---	---
<i>US 278 & Pinckney Wildlife Refuge (Unsignalized)</i>								
Eastbound US 278	A	0.3	<25'	30'	A	0.3	<25'	<25'
Westbound US 278	A	0.2	<25'	<25'	A	0.4	<25'	<25'
Northbound Pinckney Wildlife Refuge	A	0.6	<25'	<25'	A	0.6	<25'	<25'
Southbound Pinckney Wildlife Refuge	A	0.5	<25'	<25'	A	0.6	<25'	<25'
Overall Intersection	A	0.3	---	---	A	0.4	---	---
<i>US 278 & Crosstree Drive/Gateway Drive (Signalized)</i>								
Eastbound US 278	A	5.4	55'	715'	A	7.1	40'	500'
Westbound US 278	A	4.2	<25'	395'	A	6.8	105'	905'
Northbound Crosstree Drive	D	38.2	<25'	70'	D	50.4	<25'	125'
Southbound Gateway Drive	D	42.6	<25'	100'	D	41.1	<25'	95'
Overall Intersection	A	5.6	---	---	A	7.7	---	---

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Table 3: Intersection Operating Conditions – 2023 SCDOT (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)								
Eastbound US 278	E	56.0	1035'	1690'	B	17.5	100'	570'
Westbound US 278	A	7.4	<25'	70'	B	15.1	65'	740'
Northbound Chamberlin Drive	F	91.1	<25'	<25'	E	73.5	<25'	25'
Southbound Squire Pope Road	B	19.1	<25'	105'	C	32.5	40'	185'
Overall Intersection	D	40.3	---	---	B	17.6	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)								
Eastbound US 278	D	45.4	1390'	1690'	C	21.8	130'	740'
Westbound US 278	B	17.1	70'	450'	B	14.9	210'	1290'
Northbound Spanish Wells Road	F	111.4	95'	265'	E	61.8	70'	230'
Southbound Wild Horse Road	F	170.2	205'	595'	E	55.9	55'	190'
Overall Intersection	D	46.6	---	---	C	22.0	---	---
US 278 & Gumtree Road (Signalized)								
Eastbound Business US 278	F	95.3	1540'	1695'	D	43.0	150'	780'
Westbound Business US 278	C	29.0	115'	400'	C	34.8	245'	820'
Northbound Gumtree Road	C	23.1	60'	255'	C	30.4	95'	325'
Southbound Gumtree Road	E	66.1	145'	660'	E	65.5	160'	760'
Overall Intersection	E	66.1	---	---	D	40.1	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)								
Eastbound Business US 278	B	18.1	185'	1105'	B	12.0	50'	765'
Westbound Business US 278	B	19.4	75'	575'	B	18.8	240'	1235'
Northbound Jarvis Park Road	E	71.9	35'	195'	E	75.3	40'	190'
Southbound Wilborn Road	D	45.6	75'	440'	C	21.6	30'	135'
Overall Intersection	C	22.5	---	---	B	17.5	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)								
Eastbound Business US 278	B	14.9	175'	1150'	B	14.7	75'	775'
Westbound Business US 278	B	12.2	35'	380'	C	24.9	180'	1105'
Northbound Pembroke Drive	D	53.6	60'	240'	E	59.7	80'	275'
Southbound Museum Street	C	32.5	<25'	85'	D	45.1	<25'	115'
Overall Intersection	B	17.8	---	---	C	25.1	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)								
Eastbound Business US 278	C	22.9	180'	1075'	C	22.0	85'	765'
Westbound Business US 278	B	15.3	45'	330'	C	24.9	185'	940'
Northbound Indigo Run Drive	D	47.9	30'	100'	D	53.2	40'	135'
Southbound Whooping Crane Way	D	41.6	50'	180'	D	52.2	70'	255'
Overall Intersection	C	23.9	---	---	C	28.6	---	---

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Table 3: Intersection Operating Conditions – 2023 SCDOT (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)								
Westbound US 278 Off-Ramp	A	2.9	<25'	50'	A	7.9	<25'	120'
Northbound Gumtree Road	B	10.2	<25'	70'	B	10.1	<25'	100'
Southbound Gumtree Road	A	0.2	<25'	<25'	A	0.2	<25'	<25'
Overall Intersection	A	1.6	---	---	A	4.5	---	---
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)								
Eastbound Honey Horn Drive	A	8.8	<25'	55'	A	8.7	<25'	85'
Southbound Gumtree Road	A	0.1	<25'	<25'	A	0.1	<25'	<25'
Overall Intersection	A	0.3	---	---	A	1.1	---	---
Marshland Road & Spanish Wells Road (Unsignalized)								
Eastbound Marshland Road	A	0.5	<25'	25'	A	0.8	<25'	45'
Westbound Marshland Road	A	0.4	<25'	<25'	A	0.9	<25'	60'
Southbound Spanish Wells Road	A	8.4	<25'	100'	A	7.8	<25'	95'
Overall Intersection	A	2.6	---	---	A	2.1	---	---
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.3	<25'	<25'	A	0.3	<25'	<25'
Westbound Marshland Road	A	0.5	<25'	50'	A	0.5	<25'	35'
Southbound Cross Island Parkway Off-Ramp	A	6.9	<25'	100'	A	8.9	<25'	120'
Overall Intersection	A	0.9	---	---	A	1.6	---	---
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.7	<25'	45'	A	0.7	<25'	35'
Westbound Marshland Road	A	0.6	<25'	35'	A	0.5	<25'	<25'
Northbound Cross Island Parkway Off-Ramp	A	7.1	<25'	95'	A	9.8	25'	185'
Overall Intersection	A	1.9	---	---	A	4.4	---	---
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)								
Eastbound Point Comfort Road	D	45.8	55'	235'	D	45.2	40'	200'
Westbound Arrow Road	C	20.3	<25'	80'	C	22.9	35'	205'
Northbound Palmetto Bay Road	A	5.2	<25'	235'	A	5.4	<25'	340'
Southbound Palmetto Bay Road	A	6.7	35'	520'	A	6.8	<25'	410'
Overall Intersection	B	10.4	---	---	B	10.5	---	---
Target Road & Palmetto Bay Road (Signalized)								
Eastbound Target Road	D	46.1	<25'	145'	D	53.2	70'	230'
Westbound Target Road	D	52.5	40'	125'	C	32.9	30'	120'
Northbound Palmetto Bay Road	A	6.4	<25'	240'	A	9.6	45'	420'
Southbound Palmetto Bay Road	C	27.2	630'	1510'	A	8.8	60'	750'
Overall Intersection	C	23.2	---	---	B	15.4	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout)								
Eastbound Greenwood Drive	F	129.0	545'	1160'	F	55.9	400'	1105'
Westbound Business US 278	C	20.8	80'	560'	F	192.2	1300'	1695'
Northbound Pope Avenue	A	7.1	<25'	290'	D	31.4	265'	860'
Southbound Palmetto Bay Road	D	30.6	415'	925'	C	15.3	120'	775'
Overall Intersection	E	37.2	---	---	F	58.3	---	---

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Table 4: Intersection Operating Conditions – 2023 SCDOT (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
Bluffton Parkway & Buckingham Plantation Drive (Signalized)										
Eastbound Bluffton Parkway	A	2.8	0.37	90'	125'	A	2.5	0.21	50'	80'
Westbound Bluffton Parkway	A	6.0	0.18	65'	100'	A	6.9	0.38	165'	235'
Northbound Buckingham Plantation Drive	E	61.9	0.36	30'	65'	E	70.1	0.59	30'	65'
Southbound Buckingham Plantation Drive	C	31.1	0.46	<25	60'	C	29.9	0.64	<25	90'
Overall Intersection	A	6.7	0.64	---	---	A	9.0	0.69	---	---
US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)										
Eastbound US 278	B	15.5	0.54	370'	430'	B	17.9	0.65	330'	405'
Westbound US 278	B	15.4	0.36	215'	280'	C	25.5	0.73	605'	765'
Northbound Buckingham Plantation Drive	D	41.5	0.59	70'	125'	D	54.5	0.36	50'	90'
Southbound Moss Creek Drive	D	47.9	0.52	40'	105'	E	57.7	0.77	85'	195'
Overall Intersection	B	18.6	0.63	---	---	C	24.9	0.81	---	---
US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)										
Eastbound US 278	A	<1.0	0.47	--	<25'	A	<1.0	0.40	--	<25'
Westbound US 278	A	<1.0	0.27	--	<25'	A	<1.0	0.52	--	<25'
Northbound Salt Marsh Drive	B	14.4	0.13	--	<25'	D	30.9	0.11	--	<25'
Southbound Moss Creek Village	B	13.7	0.14	--	<25'	D	26.2	0.24	--	25'
Overall Intersection	A	0.6	0.50	--	--	A	0.9	0.58	--	--
US 278 & Fording Island Road Extension (Unsignalized)										
Eastbound US 278	A	<1.0	0.60	--	<25'	A	<1.0	0.50	--	<25'
Westbound US 278	A	<1.0	0.36	--	<25'	A	<1.0	0.67	--	<25'
Northbound Fording Island Road Extension	F	>200	0.94	--	80'	F	>200	1.78	--	100'
Overall Intersection	A	2.9	0.62	--	--	A	6.0	0.68	--	--
US 278 & Pinckney Wildlife Refuge (Unsignalized)										
Eastbound US 278	A	<1.0	0.61	--	<25'	A	<1.0	0.45	--	<25'
Westbound US 278	A	<1.0	0.34	--	<25'	A	<1.0	0.65	--	<25'
Northbound Pinckney Wildlife Refuge	C	21.5	0.05	--	<25'	C	15.9	0.03	--	<25'
Southbound Pinckney Wildlife Refuge	B	13.0	0.02	--	<25'	C	24.2	0.08	--	<25'
Overall Intersection	A	<1.0	0.65	--	--	A	<1.0	0.69	--	--
US 278 & Crosstree Drive/Gateway Drive (Signalized)										
Eastbound US 278	A	7.8	0.71	485'	590'	A	7.7	0.54	325'	385'
Westbound US 278	A	2.3	0.39	25'	60'	A	3.7	0.76	65'	75'
Northbound Crosstree Drive	C	30.8	0.33	<25	40'	D	47.6	0.51	40'	85'
Southbound Gateway Drive	D	40.6	0.27	<25	40'	D	36.1	0.22	<25	45'
Overall Intersection	A	6.3	0.72	---	---	A	6.2	0.77	---	---

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Table 4: Intersection Operating Conditions – 2023 SCDOT (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
<i>US 278 & Chamberlin Drive/Squire Pope Road (Signalized)</i>										
Eastbound US 278	A	8.9	0.70	120'	130'	B	13.6	0.78	130'	195'
Westbound US 278	A	4.3	0.41	65'	75'	C	23.3	0.85	935'	1000'
Northbound Chamberlin Drive	E	57.3	0.09	<25	<25	F	83.3	0.39	30'	70'
Southbound Squire Pope Road	C	25.1	0.64	35'	70'	E	62.1	0.94	75'	185'
Overall Intersection	A	8.4	0.79	---	---	C	22.5	0.85	---	---
<i>US 278 & Wild Horse Road/Spanish Wells Road (Signalized)</i>										
Eastbound US 278	B	19.2	0.85	460'	460'	B	19.9	0.63	345'	360'
Westbound US 278	B	16.2	0.59	240'	320'	A	6.0	0.68	135'	125'
Northbound Spanish Wells Road	E	61.1	0.76	65'	120'	E	75.1	0.80	155'	210'
Southbound Wild Horse Road	E	71.0	0.66	120'	190'	E	63.5	0.60	90'	150'
Overall Intersection	C	23.2	0.84	---	---	B	18.0	0.66	---	---
<i>US 278 & Gumtree Road (Signalized)</i>										
Eastbound Business US 278	D	53.8	1.04	1000'	1135'	E	62.1	0.80	680'	750'
Westbound Business US 278	D	40.7	0.90	215'	355'	E	72.7	1.11	1075'	1185'
Northbound Gumtree Road	D	36.5	0.87	150'	280'	D	48.6	0.92	245'	415'
Southbound Gumtree Road	F	109.3	1.03	230'	410'	F	85.4	0.89	265'	415'
Overall Intersection	D	54.8	0.93	---	---	E	68.7	0.92	---	---
<i>Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)</i>										
Eastbound Business US 278	B	10.4	0.80	145'	150'	B	17.6	0.79	405'	525'
Westbound Business US 278	A	9.2	0.52	130'	350'	B	18.4	0.95	225'	1535'
Northbound Jarvis Park Road	F	83.0	0.60	75'	135'	F	89.6	0.60	85'	145'
Southbound Wilborn Road	D	49.9	0.72	145'	215'	C	25.4	0.48	60'	110'
Overall Intersection	B	15.9	0.98	---	---	C	20.1	0.88	---	---
<i>Business US 278 & Pembroke Drive/Museum Street (Signalized)</i>										
Eastbound Business US 278	B	15.7	0.82	400'	690'	C	29.7	0.59	650'	740'
Westbound Business US 278	C	34.2	0.46	485'	550'	B	13.8	0.86	75'	1220'
Northbound Pembroke Drive	E	80.0	0.78	145'	255'	F	86.4	0.81	220'	310'
Southbound Museum Street	C	32.4	0.34	30'	70'	D	41.8	0.43	45'	90'
Overall Intersection	C	27.2	0.82	---	---	C	28.3	0.78	---	---
<i>Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)</i>										
Eastbound Business US 278	A	3.3	0.74	25'	60'	D	48.0	0.86	730'	810'
Westbound Business US 278	B	17.3	0.44	245'	355'	D	38.8	0.91	900'	1235'
Northbound Indigo Run Drive	E	59.6	0.43	50'	100'	E	69.6	0.71	130'	205'
Southbound Whooping Crane Way	D	51.2	0.65	110'	155'	E	63.2	0.70	150'	195'
Overall Intersection	B	16.2	0.76	---	---	D	46.5	0.84	---	---

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Table 4: Intersection Operating Conditions – 2023 SCDOT (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)										
Westbound US 278 Off-Ramp	F	>200	--	--	--	F	>200	--	--	--
Northbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.02	--	<25'
Southbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.12	--	<25'
Overall Intersection	F	>200	0.25	--	--	F	>200	0.25	--	--
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)										
Eastbound Honey Horn Drive	B	10.5	0.02	--	<25'	B	11.1	0.08	--	<25'
Southbound Gumtree Road	A	<1.0	0.24	--	<25'	A	<1.0	0.24	--	<25'
Overall Intersection	A	0.3	0.29	--	--	A	1.3	0.30	--	--
Marshland Road & Spanish Wells Road (Unsignalized)										
Eastbound Marshland Road	A	1.1	0.04	--	<25'	A	2.9	0.08	--	<25'
Westbound Marshland Road	A	<1.0	0.11	--	<25'	A	<1.0	0.30	--	<25'
Southbound Spanish Wells Road	B	13.0	0.28	--	30'	C	15.3	0.26	--	25'
Overall Intersection	A	4.0	0.30	--	--	A	3.5	0.46	--	--
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	<1.0	0.13	--	<25'	A	<1.0	0.08	--	<25'
Westbound Marshland Road	A	3.9	0.11	--	<25'	A	2.0	0.25	--	<25'
Southbound Cross Island Parkway Off-Ramp	B	11.3	0.06	--	<25'	C	16.5	0.23	--	25'
Overall Intersection	A	2.1	0.33	--	--	A	3.5	0.36	--	--
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	4.2	0.10	--	<25'	A	2.0	0.09	--	<25'
Westbound Marshland Road	A	<1.0	0.08	--	<25'	A	<1.0	0.12	--	<25'
Northbound Cross Island Parkway Off-Ramp	B	12.3	0.16	--	<25'	C	15.6	0.50	--	75'
Overall Intersection	A	4.1	0.33	--	--	A	7.1	0.36	--	--
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)										
Eastbound Point Comfort Road	E	57.8	0.86	115'	185'	E	69.0	0.99	70'	180'
Westbound Arrow Road	C	22.7	0.40	30'	70'	C	33.0	0.70	160'	285'
Northbound Palmetto Bay Road	A	8.1	0.33	180'	270'	B	17.9	0.62	455'	575'
Southbound Palmetto Bay Road	B	11.1	0.62	315'	400'	B	18.8	0.63	335'	410'
Overall Intersection	B	14.8	0.79	---	---	C	23.0	0.88	---	---
Target Road & Palmetto Bay Road (Signalized)										
Eastbound Target Road	D	42.2	0.33	45'	85'	E	62.5	0.79	170'	245'
Westbound Target Road	E	59.9	0.68	95'	155'	D	35.4	0.44	75'	120'
Northbound Palmetto Bay Road	A	7.9	0.30	125'	190'	B	13.5	0.53	315'	465'
Southbound Palmetto Bay Road	A	8.9	0.52	170'	225'	A	7.7	0.51	115'	140'
Overall Intersection	B	13.6	0.66	---	---	B	17.4	0.68	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Roundabout)										
Eastbound Greenwood Drive	D	30.6	0.81	--	185'	E	39.4	0.95	--	420'
Westbound Business US 278	B	12.1	0.63	--	130'	D	31.5	0.95	--	365'
Northbound Pope Avenue	A	6.5	0.53	--	95'	D	28.3	0.94	--	530'
Southbound Palmetto Bay Road	E	44.3	1.06	--	50'	D	26.3	0.95	--	680'
Overall Intersection	D	27.3	---	---	---	D	30.4	---	---	---

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Table 5: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
<i>Bluffton Parkway & Buckingham Plantation Drive (Signalized)</i>								
Eastbound Bluffton Parkway	A	3.1	<25'	175'	A	3.3	<25'	125'
Westbound Bluffton Parkway	A	6.0	<25'	205'	A	4.2	<25'	300'
Northbound Buckingham Plantation Drive	D	54.2	<25'	135'	D	48.1	<25'	125'
Southbound Buckingham Plantation Drive	B	18.2	<25'	120'	C	26.2	<25'	200'
Overall Intersection	A	6.2	---	---	A	6.9	---	---
<i>US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)</i>								
Eastbound US 278	B	14.0	55'	430'	B	15.2	50'	370'
Westbound US 278	B	13.4	30'	345'	C	23.4	160'	1005'
Northbound Buckingham Plantation Drive	D	36.0	35'	240'	D	50.0	25'	120'
Southbound Moss Creek Drive	C	33.5	<25'	135'	C	33.6	30'	220'
Overall Intersection	B	16.2	---	---	C	21.4	---	---
<i>US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)</i>								
Eastbound US 278	A	0.2	<25'	45'	A	0.4	<25'	70'
Westbound US 278	A	0.3	<25'	75'	A	0.7	<25'	100'
Northbound Salt Marsh Drive	B	11.1	<25'	75'	B	12.5	<25'	60'
Southbound Moss Creek Village	A	9.0	<25'	85'	B	11.2	<25'	85'
Overall Intersection	A	0.6	---	---	A	0.8	---	---
<i>US 278 & Fording Island Road Extension (Unsignalized)</i>								
Eastbound US 278	A	0.1	<25'	<25'	A	0.2	<25'	75'
Westbound US 278	A	0.2	<25'	<25'	A	0.4	<25'	40'
Northbound Fording Island Road Extension	B	11.0	<25'	55'	B	14.9	<25'	60'
Overall Intersection	A	0.2	---	---	A	0.4	---	---
<i>US 278 & Pinckney Wildlife Refuge (Unsignalized)</i>								
Eastbound US 278	A	0.3	<25'	<25'	A	0.3	<25'	30'
Westbound US 278	A	0.2	<25'	<25'	A	0.5	<25'	25'
Northbound Pinckney Wildlife Refuge	A	0.6	<25'	<25'	A	0.6	<25'	<25'
Southbound Pinckney Wildlife Refuge	A	0.5	<25'	<25'	A	0.6	<25'	<25'
Overall Intersection	A	0.3	---	---	A	0.4	---	---
<i>US 278 & Crosstree Drive/Gateway Drive (Signalized)</i>								
Eastbound US 278	A	4.7	30'	605'	A	6.7	35'	450'
Westbound US 278	A	4.2	<25'	390'	A	6.8	100'	1000'
Northbound Crosstree Drive	C	34.3	<25'	60'	D	50.3	<25'	145'
Southbound Gateway Drive	D	43.5	<25'	100'	D	43.1	<25'	95'
Overall Intersection	A	5.0	---	---	A	7.6	---	---

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Table 5: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)								
Eastbound US 278	B	12.3	115'	1080'	B	18.2	105'	590'
Westbound US 278	A	7.3	<25'	85'	B	16.5	80'	805'
Northbound Chamberlin Drive	D	43.7	<25'	<25'	E	72.3	<25'	<25'
Southbound Squire Pope Road	B	17.8	<25'	105'	C	32.7	40'	190'
Overall Intersection	B	11.2	---	---	B	18.6	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)								
Eastbound US 278	B	17.4	270'	1630'	C	21.8	130'	730'
Westbound US 278	B	14.7	60'	435'	B	15.9	220'	1255'
Northbound Spanish Wells Road	D	44.5	40'	140'	E	60.4	70'	225'
Southbound Wild Horse Road	E	63.9	55'	275'	D	54.6	50'	190'
Overall Intersection	C	20.3	---	---	C	22.3	---	---
US 278 & Gumtree Road (Signalized)								
Eastbound Business US 278	C	34.3	155'	705'	D	39.1	95'	490'
Westbound Business US 278	C	28.9	120'	395'	C	34.5	260'	960'
Northbound Gumtree Road	C	25.0	75'	300'	C	30.0	115'	370'
Southbound Gumtree Road	E	67.1	150'	690'	E	65.4	160'	760'
Overall Intersection	D	35.8	---	---	D	38.9	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)								
Eastbound Business US 278	C	23.7	220'	1305'	B	14.0	55'	775'
Westbound Business US 278	B	19.4	75'	590'	B	18.7	220'	1170'
Northbound Jarvis Park Road	E	72.7	40'	200'	E	78.1	40'	195'
Southbound Wilborn Road	D	46.6	75'	440'	C	22.0	30'	130'
Overall Intersection	C	25.8	---	---	B	18.3	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)								
Eastbound Business US 278	B	16.0	190'	1220'	B	14.9	75'	755'
Westbound Business US 278	B	12.2	35'	415'	C	26.9	205'	1160'
Northbound Pembroke Drive	D	53.1	60'	250'	E	59.9	80'	270'
Southbound Museum Street	C	32.3	<25'	80'	D	45.5	<25'	115'
Overall Intersection	B	18.4	---	---	C	26.1	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)								
Eastbound Business US 278	C	21.6	165'	1075'	C	20.4	75'	620'
Westbound Business US 278	B	15.4	45'	340'	C	24.5	185'	950'
Northbound Indigo Run Drive	D	48.2	30'	105'	D	53.7	40'	130'
Southbound Whooping Crane Way	D	42.1	50'	180'	D	51.4	65'	255'
Overall Intersection	C	23.3	---	---	C	27.9	---	---

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Table 5: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)								
Westbound US 278 Off-Ramp	A	3.9	<25'	75'	A	8.5	<25'	135'
Northbound Gumtree Road	A	9.8	<25'	70'	B	10.1	<25'	95'
Southbound Gumtree Road	A	0.2	<25'	<25'	A	0.2	<25'	<25'
Overall Intersection	A	2.2	---	---	A	4.8	---	---
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)								
Eastbound Honey Horn Drive	A	8.7	<25'	55'	A	8.7	<25'	80'
Southbound Gumtree Road	A	0.1	<25'	<25'	A	0.1	<25'	<25'
Overall Intersection	A	0.3	---	---	A	1.1	---	---
Marshland Road & Spanish Wells Road (Unsignalized)								
Eastbound Marshland Road	A	0.5	<25'	25'	A	0.8	<25'	45'
Westbound Marshland Road	A	0.4	<25'	25'	A	0.9	<25'	60'
Southbound Spanish Wells Road	A	8.4	<25'	100'	A	8.0	<25'	95'
Overall Intersection	A	2.6	---	---	A	2.1	---	---
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.3	<25'	<25'	A	0.3	<25'	<25'
Westbound Marshland Road	A	0.5	<25'	50'	A	0.5	<25'	35'
Southbound Cross Island Parkway Off-Ramp	A	6.9	<25'	100'	A	8.7	<25'	115'
Overall Intersection	A	0.9	---	---	A	1.6	---	---
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)								
Eastbound Marshland Road	A	0.7	<25'	45'	A	0.7	<25'	30'
Westbound Marshland Road	A	0.6	<25'	40'	A	0.5	<25'	25'
Northbound Cross Island Parkway Off-Ramp	A	7.3	<25'	95'	B	10.2	25'	180'
Overall Intersection	A	1.9	---	---	A	4.6	---	---
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)								
Eastbound Point Comfort Road	D	46.2	55'	240'	D	45.2	40'	200'
Westbound Arrow Road	C	20.3	<25'	85'	C	23.4	35'	210'
Northbound Palmetto Bay Road	A	6.5	<25'	300'	A	5.5	<25'	380'
Southbound Palmetto Bay Road	A	7.1	40'	595'	A	6.8	<25'	430'
Overall Intersection	B	10.9	---	---	B	10.5	---	---
Target Road & Palmetto Bay Road (Signalized)								
Eastbound Target Road	D	45.3	<25'	145'	D	53.8	75'	235'
Westbound Target Road	D	47.8	35'	125'	C	33.2	30'	120'
Northbound Palmetto Bay Road	A	9.8	30'	275'	B	10.6	55'	465'
Southbound Palmetto Bay Road	A	3.7	<25'	420'	A	8.6	40'	535'
Overall Intersection	B	10.5	---	---	B	15.6	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Signalized)								
Eastbound Greenwood Drive	D	54.8	80'	265'	D	44.1	100'	385'
Westbound Business US 278	D	47.0	165'	610'	D	39.8	220'	775'
Northbound Pope Avenue	B	12.0	<25'	180'	B	16.6	50'	355'
Southbound Palmetto Bay Road	A	8.9	25'	300'	B	10.8	30'	320'
Overall Intersection	C	23.8	---	---	C	25.2	---	---

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Table 6: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
Bluffton Parkway & Buckingham Plantation Drive (Signalized)										
Eastbound Bluffton Parkway	A	2.8	0.37	90'	125'	A	2.5	0.21	50'	80'
Westbound Bluffton Parkway	A	6.0	0.18	65'	100'	A	6.9	0.38	165'	235'
Northbound Buckingham Plantation Drive	E	61.9	0.36	30'	65'	E	70.1	0.59	30'	65'
Southbound Buckingham Plantation Drive	C	31.1	0.46	<25	60'	C	29.9	0.64	<25	90'
Overall Intersection	A	6.7	0.64	---	---	A	9.0	0.69	---	---
US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)										
Eastbound US 278	B	15.5	0.54	370'	430'	B	17.9	0.65	330'	405'
Westbound US 278	B	15.4	0.36	215'	280'	C	25.5	0.73	605'	765'
Northbound Buckingham Plantation Drive	D	41.5	0.59	70'	125'	D	54.5	0.36	50'	90'
Southbound Moss Creek Drive	D	47.9	0.52	40'	105'	E	57.7	0.77	85'	195'
Overall Intersection	B	18.6	0.63	---	---	C	24.9	0.81	---	---
US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)										
Eastbound US 278	A	<1.0	0.47	--	<25'	A	<1.0	0.40	--	<25'
Westbound US 278	A	<1.0	0.27	--	<25'	A	<1.0	0.52	--	<25'
Northbound Salt Marsh Drive	B	14.4	0.13	--	<25'	D	30.9	0.11	--	<25'
Southbound Moss Creek Village	B	13.7	0.14	--	<25'	D	26.2	0.24	--	25'
Overall Intersection	A	0.6	0.50	--	--	A	0.9	0.58	--	--
US 278 & Fording Island Road Extension (Unsignalized)										
Eastbound US 278	A	<1.0	0.60	--	<25'	A	<1.0	0.50	--	<25'
Westbound US 278	A	<1.0	0.36	--	<25'	A	<1.0	0.67	--	<25'
Northbound Fording Island Road Extension	F	>200	0.94	--	80'	F	>200	1.78	--	100'
Overall Intersection	A	2.9	0.62	--	--	A	6.0	0.68	--	--
US 278 & Pinckney Wildlife Refuge (Unsignalized)										
Eastbound US 278	A	<1.0	0.61	--	<25'	A	<1.0	0.45	--	<25'
Westbound US 278	A	<1.0	0.34	--	<25'	A	<1.0	0.65	--	<25'
Northbound Pinckney Wildlife Refuge	C	21.5	0.05	--	<25'	C	15.9	0.03	--	<25'
Southbound Pinckney Wildlife Refuge	B	13.0	0.02	--	<25'	C	24.2	0.08	--	<25'
Overall Intersection	A	<1.0	0.65	--	--	A	<1.0	0.69	--	--
US 278 & Crosstree Drive/Gateway Drive (Signalized)										
Eastbound US 278	A	7.8	0.71	485'	590'	A	7.7	0.54	325'	385'
Westbound US 278	A	2.3	0.39	25'	60'	A	3.8	0.76	65'	75'
Northbound Crosstree Drive	C	30.8	0.33	<25	40'	D	47.6	0.51	40'	85'
Southbound Gateway Drive	D	40.6	0.27	<25	40'	D	36.1	0.22	<25	45'
Overall Intersection	A	6.4	0.72	---	---	A	6.3	0.77	---	---

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Table 6: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)										
Eastbound US 278	A	9.0	0.70	155'	170'	B	13.8	0.78	130'	195'
Westbound US 278	A	4.3	0.41	65'	75'	C	23.3	0.85	935'	1000'
Northbound Chamberlin Drive	E	57.3	0.09	<25	<25	F	83.3	0.39	30'	70'
Southbound Squire Pope Road	C	25.1	0.64	35'	70'	E	62.1	0.94	75'	185'
Overall Intersection	A	8.5	0.79	---	---	C	22.6	0.85	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)										
Eastbound US 278	B	19.7	0.85	495'	460'	B	19.8	0.63	345'	360'
Westbound US 278	B	16.8	0.59	255'	325'	A	6.7	0.68	160'	135'
Northbound Spanish Wells Road	E	61.1	0.76	65'	120'	E	75.1	0.80	155'	210'
Southbound Wild Horse Road	E	71.0	0.66	120'	190'	E	63.5	0.60	90'	150'
Overall Intersection	C	23.6	0.84	---	---	B	18.3	0.66	---	---
US 278 & Gumtree Road (Signalized)										
Eastbound Business US 278	C	23.3	0.79	370'	390'	D	53.1	0.58	475'	525'
Westbound Business US 278	D	41.9	0.90	215'	355'	D	50.7	1.05	1005'	1140'
Northbound Gumtree Road	D	36.5	0.87	150'	280'	D	48.6	0.92	245'	415'
Southbound Gumtree Road	F	109.3	1.03	230'	410'	F	85.4	0.89	265'	415'
Overall Intersection	D	40.9	0.80	---	---	E	55.2	0.90	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)										
Eastbound Business US 278	B	15.7	0.80	290'	265'	C	21.0	0.79	370'	465'
Westbound Business US 278	B	10.8	0.52	210'	170'	B	18.4	0.95	225'	1535'
Northbound Jarvis Park Road	F	83.0	0.60	75'	135'	F	89.6	0.60	85'	145'
Southbound Wilborn Road	D	49.9	0.72	145'	215'	C	25.4	0.48	60'	110'
Overall Intersection	B	19.3	0.98	---	---	C	21.4	0.88	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)										
Eastbound Business US 278	B	10.8	0.82	260'	690'	C	30.5	0.59	645'	735'
Westbound Business US 278	C	31.0	0.46	380'	550'	B	13.8	0.86	75'	1220'
Northbound Pembroke Drive	E	80.0	0.78	145'	255'	F	86.4	0.81	220'	310'
Southbound Museum Street	C	32.4	0.34	30'	70'	D	41.8	0.43	45'	90'
Overall Intersection	C	23.4	0.82	---	---	C	28.7	0.78	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)										
Eastbound Business US 278	A	8.6	0.74	130'	160'	D	47.9	0.86	730'	810'
Westbound Business US 278	B	17.3	0.44	245'	355'	D	38.8	0.91	900'	1235'
Northbound Indigo Run Drive	E	59.6	0.43	50'	100'	E	69.6	0.71	130'	205'
Southbound Whooping Crane Way	D	51.2	0.65	110'	155'	E	63.2	0.70	150'	195'
Overall Intersection	B	19.0	0.76	---	---	D	46.5	0.84	---	---

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Table 6: Intersection Operating Conditions – 2023 Gumtree Road and Sea Pines Improvements (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)										
Westbound US 278 Off-Ramp	F	>200	--	--	--	F	>200	--	--	--
Northbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.02	--	<25'
Southbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.12	--	<25'
Overall Intersection	F	>200	0.25	--	--	F	>200	0.25	--	--
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)										
Eastbound Honey Horn Drive	B	10.5	0.02	--	<25'	B	11.1	0.08	--	<25'
Southbound Gumtree Road	A	<1.0	0.24	--	<25'	A	<1.0	0.24	--	<25'
Overall Intersection	A	0.3	0.29	--	--	A	1.3	0.30	--	--
Marshland Road & Spanish Wells Road (Unsignalized)										
Eastbound Marshland Road	A	1.1	0.04	--	<25'	A	2.9	0.08	--	<25'
Westbound Marshland Road	A	<1.0	0.11	--	<25'	A	<1.0	0.30	--	<25'
Southbound Spanish Wells Road	B	13.0	0.28	--	30'	C	15.3	0.26	--	25'
Overall Intersection	A	4.0	0.30	--	--	A	3.5	0.46	--	--
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	<1.0	0.13	--	<25'	A	<1.0	0.08	--	<25'
Westbound Marshland Road	A	3.9	0.11	--	<25'	A	2.0	0.25	--	<25'
Southbound Cross Island Parkway Off-Ramp	B	11.3	0.06	--	<25'	C	16.5	0.23	--	25'
Overall Intersection	A	2.1	0.33	--	--	A	3.5	0.36	--	--
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	4.2	0.10	--	<25'	A	2.0	0.09	--	<25'
Westbound Marshland Road	A	<1.0	0.08	--	<25'	A	<1.0	0.12	--	<25'
Northbound Cross Island Parkway Off-Ramp	B	12.3	0.16	--	<25'	C	15.6	0.50	--	75'
Overall Intersection	A	4.1	0.33	--	--	A	7.1	0.36	--	--
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)										
Eastbound Point Comfort Road	E	57.8	0.86	115'	185'	E	69.0	0.99	70'	180'
Westbound Arrow Road	C	22.7	0.40	30'	70'	C	33.0	0.70	160'	285'
Northbound Palmetto Bay Road	A	7.2	0.33	145'	215'	B	17.5	0.62	410'	465'
Southbound Palmetto Bay Road	B	11.2	0.62	325'	400'	B	18.8	0.63	335'	410'
Overall Intersection	B	14.6	0.79	---	---	C	22.8	0.88	---	---
Target Road & Palmetto Bay Road (Signalized)										
Eastbound Target Road	D	42.2	0.33	45'	85'	E	62.5	0.79	170'	245'
Westbound Target Road	E	59.9	0.68	95'	155'	D	35.4	0.44	75'	120'
Northbound Palmetto Bay Road	B	11.9	0.30	120'	180'	B	14.8	0.53	355'	400'
Southbound Palmetto Bay Road	A	8.8	0.52	165'	225'	A	7.7	0.51	115'	140'
Overall Intersection	B	14.9	0.66	---	---	B	18.0	0.68	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Signalized)										
Eastbound Greenwood Drive	E	59.7	0.69	135'	180'	D	47.0	0.76	180'	230'
Westbound Business US 278	D	47.3	0.80	250'	330'	D	44.8	0.84	340'	430'
Northbound Pope Avenue	B	15.6	0.22	105'	180'	C	20.5	0.41	220'	340'
Southbound Palmetto Bay Road	B	10.8	0.38	155'	175'	B	10.6	0.41	145'	230'
Overall Intersection	C	26.1	0.58	---	---	C	27.6	0.64	---	---

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Table 7: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
<i>Bluffton Parkway & Buckingham Plantation Drive (Signalized)</i>								
Eastbound Bluffton Parkway	A	6.7	<25'	215'	A	3.1	<25'	125'
Westbound Bluffton Parkway	A	5.8	<25'	215'	A	4.7	<25'	230'
Northbound Buckingham Plantation Drive	E	56.5	<25'	135'	D	48.1	<25'	125'
Southbound Buckingham Plantation Drive	B	18.7	<25'	120'	C	26.2	<25'	200'
Overall Intersection	A	8.7	---	---	A	7.5	---	---
<i>US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)</i>								
Eastbound US 278	B	13.8	50'	415'	B	14.6	45'	365'
Westbound US 278	B	14.2	30'	350'	B	19.5	105'	670'
Northbound Buckingham Plantation Drive	D	36.1	35'	240'	D	50.0	25'	120'
Southbound Moss Creek Drive	C	33.4	<25'	135'	C	32.6	30'	220'
Overall Intersection	B	16.4	---	---	B	19.0	---	---
<i>US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)</i>								
Eastbound US 278	A	0.2	<25'	45'	A	0.4	<25'	70'
Westbound US 278	A	0.2	<25'	40'	A	0.4	<25'	75'
Northbound Salt Marsh Drive	B	11.1	<25'	75'	B	13.3	<25'	60'
Southbound Moss Creek Village	A	8.8	<25'	85'	B	10.8	<25'	85'
Overall Intersection	A	0.6	---	---	A	0.7	---	---
<i>US 278 & Fording Island Road Extension (Unsignalized)</i>								
Eastbound US 278	A	0.1	<25'	<25'	A	0.2	<25'	70'
Westbound US 278	A	0.2	<25'	<25'	A	0.3	<25'	40'
Northbound Fording Island Road Extension	B	10.7	<25'	55'	B	13.7	<25'	60'
Overall Intersection	A	0.2	---	---	A	0.4	---	---
<i>US 278 & Pinckney Wildlife Refuge (Unsignalized)</i>								
Eastbound US 278	F	72.6	1405'	1690'	A	0.3	<25'	<25'
Westbound US 278	A	0.2	<25'	<25'	A	0.3	<25'	<25'
Northbound Pinckney Wildlife Refuge	C	20.9	<25'	<25'	A	0.6	<25'	<25'
Southbound Pinckney Wildlife Refuge	A	0.5	<25'	<25'	A	0.6	<25'	<25'
Overall Intersection	E	48.3	---	---	A	0.3	---	---
<i>US 278 & Crosstree Drive/Gateway Drive (Signalized)</i>								
Eastbound US 278	D	50.1	1405'	1695'	A	6.1	30'	430'
Westbound US 278	A	4.1	<25'	310'	A	6.8	55'	525'
Northbound Crosstree Drive	F	85.9	<25'	85'	D	48.3	<25'	140'
Southbound Gateway Drive	E	70.6	<25'	105'	D	41.1	<25'	95'
Overall Intersection	D	35.4	---	---	A	7.4	---	---

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Table 7: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)								
Eastbound US 278	B	17.2	890'	1680'	B	17.3	150'	1095'
Westbound US 278	A	9.5	<25'	290'	D	35.5	1530'	1710'
Northbound Chamberlin Drive	D	37.0	<25'	<25'	E	74.2	<25'	35'
Southbound Squire Pope Road	B	15.9	<25'	100'	D	44.3	45'	210'
Overall Intersection	B	14.8	---	---	C	28.7	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)								
Eastbound US 278	B	16.5	180'	1130'	C	21.1	135'	750'
Westbound US 278	B	14.2	60'	465'	F	105.6	1560'	1700'
Northbound Spanish Wells Road	D	44.0	45'	140'	F	97.6	110'	355'
Southbound Wild Horse Road	E	61.5	50'	265'	E	68.9	55'	200'
Overall Intersection	B	19.5	---	---	E	69.5	---	---
US 278 & Gumtree Road (Signalized)								
Eastbound Business US 278	C	33.1	160'	655'	D	36.9	90'	445'
Westbound Business US 278	C	30.1	115'	400'	F	136.4	1310'	1615'
Northbound Gumtree Road	C	25.4	75'	325'	C	31.6	95'	390'
Southbound Gumtree Road	E	66.0	145'	670'	F	164.0	595'	920'
Overall Intersection	D	35.4	---	---	F	99.9	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)								
Eastbound Business US 278	C	24.0	240'	1305'	B	17.8	70'	790'
Westbound Business US 278	B	19.2	75'	575'	F	117.3	970'	1305'
Northbound Jarvis Park Road	E	71.5	40'	195'	F	471.4	205'	380'
Southbound Wilborn Road	D	48.4	80'	470'	D	53.2	40'	280'
Overall Intersection	C	26.1	---	---	E	76.1	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)								
Eastbound Business US 278	B	15.2	185'	1190'	B	19.0	90'	785'
Westbound Business US 278	B	14.1	40'	445'	F	164.3	1475'	1690'
Northbound Pembroke Drive	D	53.2	60'	235'	F	389.8	560'	855'
Southbound Museum Street	C	33.7	<25'	80'	F	177.0	50'	205'
Overall Intersection	B	18.5	---	---	F	124.2	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)								
Eastbound Business US 278	C	20.4	160'	1230'	C	29.4	95'	755'
Westbound Business US 278	B	14.8	40'	330'	F	200.5	1430'	1690'
Northbound Indigo Run Drive	D	47.0	30'	100'	E	72.8	45'	150'
Southbound Whooping Crane Way	D	42.3	50'	180'	E	67.4	75'	285'
Overall Intersection	C	22.4	---	---	F	111.5	---	---

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Table 7: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (VISSIM)

Intersection/Approach	AM Peak Hour				PM Peak Hour			
	LOS	Delay	Average Queue	Maximum Queue	LOS	Delay	Average Queue	Maximum Queue
<i>US 278 Off-Ramp & Gumtree Road (Unsignalized)</i>								
Westbound US 278 Off-Ramp	A	4.2	<25'	95'	A	8.1	<25'	160'
Northbound Gumtree Road	A	9.9	<25'	70'	B	10.2	<25'	95'
Southbound Gumtree Road	A	0.2	<25'	<25'	A	0.2	<25'	<25'
Overall Intersection	A	2.3	---	---	A	4.7	---	---
<i>US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)</i>								
Eastbound Honey Horn Drive	A	8.0	<25'	55'	A	8.6	<25'	80'
Southbound Gumtree Road	A	0.1	<25'	<25'	A	0.1	<25'	<25'
Overall Intersection	A	0.3	---	---	A	1.3	---	---
<i>Marshland Road & Spanish Wells Road (Unsignalized)</i>								
Eastbound Marshland Road	A	0.5	<25'	30'	A	0.8	<25'	55'
Westbound Marshland Road	A	0.4	<25'	<25'	A	0.9	<25'	50'
Southbound Spanish Wells Road	A	8.4	<25'	100'	A	7.8	<25'	95'
Overall Intersection	A	2.6	---	---	A	2.1	---	---
<i>Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)</i>								
Eastbound Marshland Road	A	0.3	<25'	<25'	A	0.3	<25'	<25'
Westbound Marshland Road	A	0.5	<25'	50'	A	0.5	<25'	40'
Southbound Cross Island Parkway Off-Ramp	A	6.8	<25'	90'	A	8.5	<25'	110'
Overall Intersection	A	0.9	---	---	A	1.5	---	---
<i>Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)</i>								
Eastbound Marshland Road	A	0.7	<25'	45'	A	0.8	<25'	30'
Westbound Marshland Road	A	0.6	<25'	40'	A	0.5	<25'	<25'
Northbound Cross Island Parkway Off-Ramp	A	7.2	<25'	100'	B	10.1	25'	180'
Overall Intersection	A	1.9	---	---	A	4.6	---	---
<i>Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)</i>								
Eastbound Point Comfort Road	D	45.7	55'	235'	D	45.1	40'	205'
Westbound Arrow Road	C	20.3	<25'	80'	C	23.5	35'	215'
Northbound Palmetto Bay Road	A	6.8	<25'	280'	A	5.2	<25'	375'
Southbound Palmetto Bay Road	A	6.8	30'	445'	A	6.4	<25'	405'
Overall Intersection	B	10.9	---	---	B	10.3	---	---
<i>Target Road & Palmetto Bay Road (Signalized)</i>								
Eastbound Target Road	D	45.7	<25'	145'	D	53.8	75'	230'
Westbound Target Road	D	47.7	35'	125'	C	33.4	30'	120'
Northbound Palmetto Bay Road	A	9.7	30'	280'	B	10.6	55'	470'
Southbound Palmetto Bay Road	A	3.8	<25'	385'	A	7.9	35'	480'
Overall Intersection	B	10.8	---	---	B	15.5	---	---
<i>Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Signalized)</i>								
Eastbound Greenwood Drive	D	54.7	80'	265'	D	44.1	100'	385'
Westbound Business US 278	D	47.0	165'	625'	D	40.1	225'	780'
Northbound Pope Avenue	B	11.7	<25'	185'	B	16.4	50'	335'
Southbound Palmetto Bay Road	A	8.8	25'	270'	B	10.9	30'	320'
Overall Intersection	C	23.9	---	---	C	25.4	---	---

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Table 8: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
Bluffton Parkway & Buckingham Plantation Drive (Signalized)										
Eastbound Bluffton Parkway	A	2.8	0.37	90'	125'	A	2.5	0.21	50'	80'
Westbound Bluffton Parkway	A	6.0	0.18	65'	100'	A	6.9	0.38	165'	235'
Northbound Buckingham Plantation Drive	E	61.9	0.36	30'	65'	E	70.1	0.59	30'	65'
Southbound Buckingham Plantation Drive	C	31.1	0.46	<25	60'	C	29.9	0.64	<25	90'
Overall Intersection	A	6.7	0.64	---	---	A	9.0	0.69	---	---
US 278 & Buckingham Plantation Drive/Moss Creek Drive (Signalized)										
Eastbound US 278	B	15.5	0.54	370'	430'	B	17.9	0.65	330'	405'
Westbound US 278	B	15.4	0.36	215'	280'	C	25.5	0.73	605'	765'
Northbound Buckingham Plantation Drive	D	41.5	0.59	70'	125'	D	54.5	0.36	50'	90'
Southbound Moss Creek Drive	D	47.9	0.52	40'	105'	E	57.7	0.77	85'	195'
Overall Intersection	B	18.6	0.63	---	---	C	24.9	0.81	---	---
US 278 & Salt Marsh Drive/Moss Creek Village (Unsignalized)										
Eastbound US 278	A	<1.0	0.47	--	<25'	A	<1.0	0.40	--	<25'
Westbound US 278	A	<1.0	0.27	--	<25'	A	<1.0	0.52	--	<25'
Northbound Salt Marsh Drive	B	14.4	0.13	--	<25'	D	30.9	0.11	--	<25'
Southbound Moss Creek Village	B	13.7	0.14	--	<25'	D	26.2	0.24	--	25'
Overall Intersection	A	0.6	0.50	--	--	A	0.9	0.58	--	--
US 278 & Fording Island Road Extension (Unsignalized)										
Eastbound US 278	A	<1.0	0.60	--	<25'	A	<1.0	0.50	--	<25'
Westbound US 278	A	<1.0	0.36	--	<25'	A	<1.0	0.67	--	<25'
Northbound Fording Island Road Extension	F	>200	0.94	--	80'	F	>200	1.78	--	100'
Overall Intersection	A	2.9	0.62	--	--	A	6.0	0.68	--	--
US 278 & Pinckney Wildlife Refuge (Unsignalized)										
Eastbound US 278	A	<1.0	0.61	--	<25'	A	<1.0	0.45	--	<25'
Westbound US 278	A	<1.0	0.34	--	<25'	A	<1.0	0.65	--	<25'
Northbound Pinckney Wildlife Refuge	C	21.5	0.05	--	<25'	C	15.9	0.03	--	<25'
Southbound Pinckney Wildlife Refuge	B	13.0	0.02	--	<25'	C	24.2	0.08	--	<25'
Overall Intersection	A	<1.0	0.65	--	--	A	<1.0	0.69	--	--
US 278 & Crosstree Drive/Gateway Drive (Signalized)										
Eastbound US 278	A	7.8	0.71	485'	590'	A	7.7	0.54	325'	385'
Westbound US 278	A	2.1	0.39	25'	45'	A	2.2	0.76	65'	55'
Northbound Crosstree Drive	C	30.8	0.33	<25	40'	D	47.6	0.51	40'	85'
Southbound Gateway Drive	D	40.6	0.27	<25	40'	D	36.1	0.22	<25	45'
Overall Intersection	A	6.3	0.72	---	---	A	5.4	0.77	---	---

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Table 8: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 & Chamberlin Drive/Squire Pope Road (Signalized)										
Eastbound US 278	C	33.0	1.01	940'	1935'	B	18.0	0.78	175'	925'
Westbound US 278	A	9.2	0.59	345'	320'	F	126.1	1.22	2200'	2295'
Northbound Chamberlin Drive	E	57.3	0.09	<25	<25	F	83.3	0.39	30'	70'
Southbound Squire Pope Road	C	25.1	0.64	35'	70'	E	62.1	0.94	75'	185'
Overall Intersection	C	25.1	0.93	---	---	E	78.1	1.08	---	---
US 278 & Wild Horse Road/Spanish Wells Road (Signalized)										
Eastbound US 278	C	20.6	0.85	635'	485'	C	23.4	0.63	350'	475'
Westbound US 278	B	16.8	0.59	255'	325'	A	6.7	0.68	160'	135'
Northbound Spanish Wells Road	E	61.1	0.76	65'	120'	E	75.1	0.80	155'	210'
Southbound Wild Horse Road	E	71.0	0.66	120'	190'	E	63.5	0.60	90'	150'
Overall Intersection	C	24.2	0.84	---	---	B	19.7	0.66	---	---
US 278 & Gumtree Road (Signalized)										
Eastbound Business US 278	C	23.3	0.79	485'	390'	D	53.2	0.58	475'	525'
Westbound Business US 278	D	41.9	0.90	215'	355'	D	50.7	1.05	1005'	1140'
Northbound Gumtree Road	D	36.5	0.87	150'	280'	D	48.6	0.92	245'	415'
Southbound Gumtree Road	F	109.3	1.03	230'	410'	F	85.4	0.89	265'	415'
Overall Intersection	D	40.9	0.80	---	---	E	55.2	0.90	---	---
Business US 278 & Jarvis Park Road/Wilborn Road (Signalized)										
Eastbound Business US 278	B	15.8	0.80	260'	265'	C	21.0	0.79	370'	465'
Westbound Business US 278	B	10.8	0.52	210'	170'	B	18.4	0.95	225'	1535'
Northbound Jarvis Park Road	F	83.0	0.60	75'	135'	F	89.6	0.60	85'	145'
Southbound Wilborn Road	D	49.9	0.72	145'	215'	C	25.4	0.48	60'	110'
Overall Intersection	B	19.4	0.98	---	---	C	21.4	0.88	---	---
Business US 278 & Pembroke Drive/Museum Street (Signalized)										
Eastbound Business US 278	B	10.8	0.82	260'	690'	C	30.5	0.59	645'	735'
Westbound Business US 278	C	31.0	0.46	380'	550'	B	13.8	0.86	75'	1220'
Northbound Pembroke Drive	E	80.0	0.78	145'	255'	F	86.4	0.81	220'	310'
Southbound Museum Street	C	32.4	0.34	30'	70'	D	41.8	0.43	45'	90'
Overall Intersection	C	23.4	0.82	---	---	C	28.7	0.78	---	---
Business US 278 & Indigo Run Drive/Whooping Crane Way (Signalized)										
Eastbound Business US 278	A	8.6	0.74	130'	160'	D	47.9	0.86	730'	810'
Westbound Business US 278	B	17.3	0.44	245'	355'	D	38.8	0.91	900'	1235'
Northbound Indigo Run Drive	E	59.6	0.43	50'	100'	E	69.6	0.71	130'	205'
Southbound Whooping Crane Way	D	51.2	0.65	110'	155'	E	63.2	0.70	150'	195'
Overall Intersection	B	19.0	0.76	---	---	D	46.5	0.84	---	---

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Table 8: Intersection Operating Conditions – 2023 No Widening Through Stoney Community (SYNCHRO)

Intersection/Approach	AM Peak Hour					PM Peak Hour				
	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue	LOS	Delay	Max V/C & ICU	50th % Queue	95th % Queue
US 278 Off-Ramp & Gumtree Road (Unsignalized)										
Westbound US 278 Off-Ramp	F	>200	--	--	--	F	>200	--	--	--
Northbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.02	--	<25'
Southbound Gumtree Road	A	<1.0	0.00	--	<25'	A	<1.0	0.12	--	<25'
Overall Intersection	F	>200	0.25	--	--	F	>200	0.25	--	--
US 278 On-Ramp/Gumtree Road & Honey Horn Drive (Unsignalized)										
Eastbound Honey Horn Drive	B	10.5	0.02	--	<25'	B	11.1	0.08	--	<25'
Southbound Gumtree Road	A	<1.0	0.24	--	<25'	A	<1.0	0.24	--	<25'
Overall Intersection	A	0.3	0.29	--	--	A	1.3	0.30	--	--
Marshland Road & Spanish Wells Road (Unsignalized)										
Eastbound Marshland Road	A	1.1	0.04	--	<25'	A	2.9	0.08	--	<25'
Westbound Marshland Road	A	<1.0	0.11	--	<25'	A	<1.0	0.30	--	<25'
Southbound Spanish Wells Road	B	13.0	0.28	--	30'	C	15.3	0.26	--	25'
Overall Intersection	A	4.0	0.30	--	--	A	3.5	0.46	--	--
Marshland Road & Southbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	<1.0	0.13	--	<25'	A	<1.0	0.08	--	<25'
Westbound Marshland Road	A	3.9	0.11	--	<25'	A	2.0	0.25	--	<25'
Southbound Cross Island Parkway Off-Ramp	B	11.3	0.06	--	<25'	C	16.5	0.23	--	25'
Overall Intersection	A	2.1	0.33	--	--	A	3.5	0.36	--	--
Marshland Road & Northbound Cross Island Parkway Ramps (Unsignalized)										
Eastbound Marshland Road	A	4.2	0.10	--	<25'	A	2.0	0.09	--	<25'
Westbound Marshland Road	A	<1.0	0.08	--	<25'	A	<1.0	0.12	--	<25'
Northbound Cross Island Parkway Off-Ramp	B	12.3	0.16	--	<25'	C	15.6	0.50	--	75'
Overall Intersection	A	4.1	0.33	--	--	A	7.1	0.36	--	--
Point Comfort Road/Arrow Road & Palmetto Bay Road (Signalized)										
Eastbound Point Comfort Road	E	57.8	0.86	115'	185'	E	69.0	0.99	70'	180'
Westbound Arrow Road	C	22.7	0.40	30'	70'	C	33.0	0.70	160'	285'
Northbound Palmetto Bay Road	A	7.2	0.33	145'	215'	B	17.5	0.62	410'	465'
Southbound Palmetto Bay Road	B	11.2	0.62	325'	400'	B	18.8	0.63	335'	410'
Overall Intersection	B	14.6	0.79	---	---	C	22.8	0.88	---	---
Target Road & Palmetto Bay Road (Signalized)										
Eastbound Target Road	D	42.2	0.33	45'	85'	E	62.5	0.79	170'	245'
Westbound Target Road	E	59.9	0.68	95'	155'	D	35.4	0.44	75'	120'
Northbound Palmetto Bay Road	B	11.9	0.30	120'	180'	B	14.8	0.53	355'	400'
Southbound Palmetto Bay Road	A	8.8	0.52	165'	225'	A	7.7	0.51	115'	140'
Overall Intersection	B	14.9	0.66	---	---	B	18.0	0.68	---	---
Greenwood Drive/Business US 278 & Pope Avenue/Palmetto Bay Road (Signalized)										
Eastbound Greenwood Drive	E	59.7	0.69	135'	180'	D	47.0	0.76	180'	230'
Westbound Business US 278	D	47.3	0.80	250'	330'	D	44.8	0.84	340'	430'
Northbound Pope Avenue	B	15.6	0.22	105'	180'	C	20.5	0.41	220'	340'
Southbound Palmetto Bay Road	B	10.8	0.38	155'	175'	B	10.6	0.41	145'	230'
Overall Intersection	C	26.1	0.58	---	---	C	27.6	0.64	---	---