William Hilton Parkway Gateway Corridor Independent Review Council Workshop

June 17th, 2024

LOCHMUELLER GROUP

New Bridge vs. Rehabilitation

- Lochmueller performed a cursory, high-level review of the SCDOT approved US 278 Bridge Seismic Study (dated April 2020) which included an evaluation of options to retrofit, widen, or replace the existing US 278 bridges onto HHI.
- The study included the following options to retrofit, widen, or replace the existing US 278 bridges onto HHI:
  - **Option #1** – Construct new EB bridge over Mackay Creek & Skull Creek; widen existing WB bridge over Mackay Creek; modify existing Skull Creek bridges for WB movements.
  - **Option #2** – Construct new EB bridge over Mackay Creek & Skull Creek; replace existing WB bridge over Mackay; modify existing Skull Creek bridges for WB movements.
  - **Option #3** – Construct new 6-lane bridge; remove all existing bridges.
- The Seismic Study also provided information to SCDOT to implement best replacement strategies, as well as detailed Life Cycle Cost Analysis (LCCA) results, considering three Options noted above. A copy of the LCCS prepared by SCDOT's Design team is shown below:

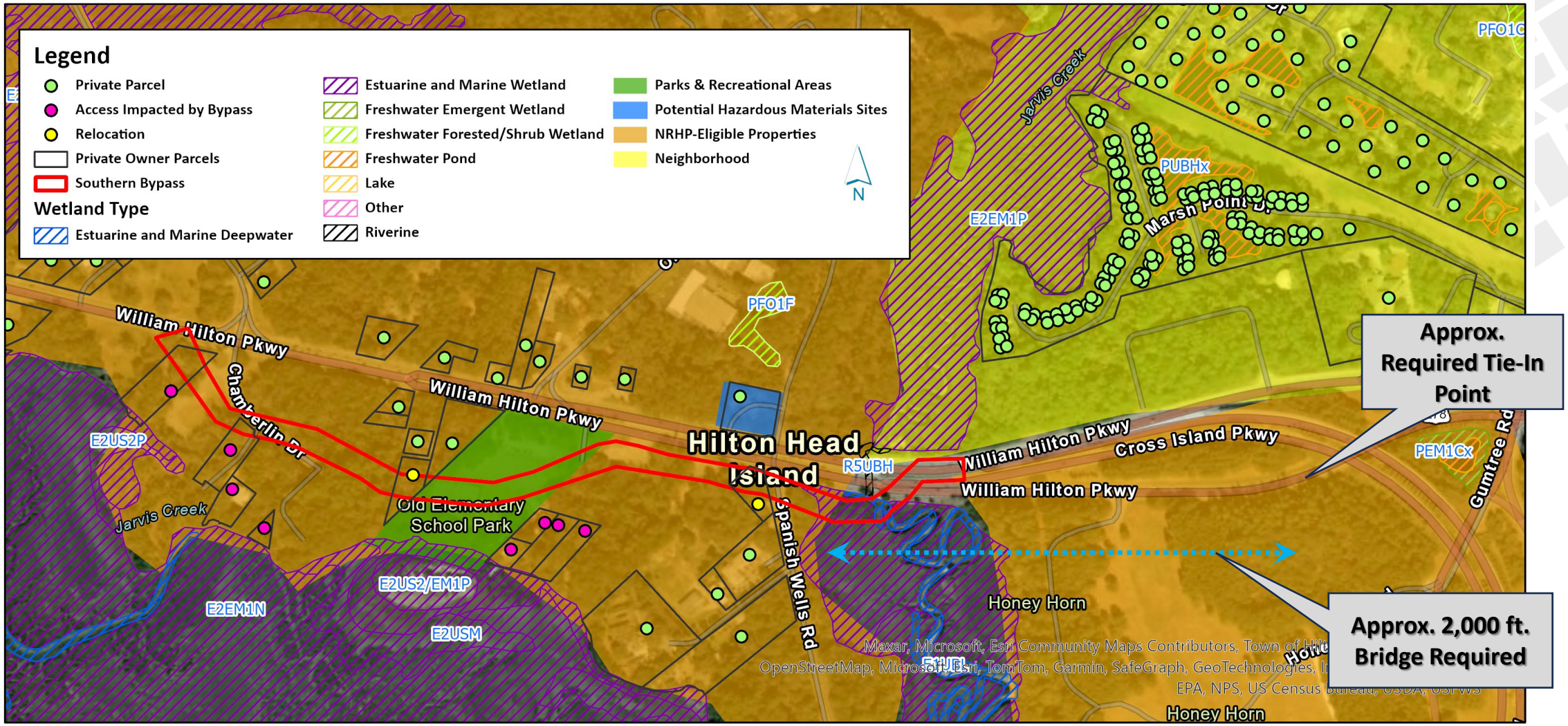
	Option 1	Option 2	Option 3
Initial Construction Cost	$ 129,560,000.00	$ 137,837,000.00	$ 171,108,500.00
Future Construction Cost	$ 85,233,000.00	$ 53,151,000.00	$ -
User Cost	$ 10,920,000.00	$ 10,920,000.00	$ -
Maintenance Cost	$ 22,900,000.00	$ 20,850,000.00	$ 11,350,000.00
Total LCCA Cost	$ 248,613,000.00	$ 222,758,000.00	$ 182,458,500.00
Construction Schedule	60 Months	60 Months	36 Months

New Bridge vs. Rehabilitation (cont.)

Key Observations by Lochmueller Group:

- The SCDOT Design Team's structural analysis findings; LCCA results; and noted benefits/risks with Options 1/2/3 appear valid and appear to follow standard engineering practices.
- The LCCA results do not account for costs that would be required to improve seismic conditions for Options 1 & 2. Therefore, **true costs associated with Options 1 & 2 would be significantly higher to implement, than what is shown in the LCCA table**.
- Options 1 & 2 would take approximately 2 years longer to construct vs Option 3. **The rehabilitated structures would still need to be replaced at some point, and time required to do so is not accounted for in this table**.
- Existing bridge structures would be approximately 50 years old after improvements made by Options 1 or 2, with rehab efforts likely to extend life of existing structures by approximately 25 to 35 years. By comparison, **typical design life for Option 3 newly constructed bridges approximately 75 to 100 years**.
- **Options 1 & 2** being pursued for use solely as temporary condition would require more than $130M to construct initially (using 2020 costs), and **these costs do not account for needed Functional Evaluation Earthquake (FEE) seismic design improvements**. Depending upon when remaining structures were replaced, the future/user/maintenance costs req'd over that time would assuredly lead to higher overall cost than building new at outset.
- **Options 1 & 2** would put maintenance/replacement schedules of the structures on varying timeframes, which **would cause additional user disruptions in the future**.
- **Existing structures under Options 1 & 2 would never meet Safety Evaluation Earthquake (SEE) seismic design requirements**. New structures can be built to meet SEE seismic design requirements.
- In summary, Lochmueller does not recommend rehabilitation and/or retrofit options being pursued for this project, in lieu of constructing a new six-lane bridge connecting Bluffton and Hilton Head Island.

“Southern Bypass” | Cursory Overview Map #1



- **NOTE:** Proposed Southern Bypass roadway alignment (shown in red above) taken directly from **Version “3.1”** of the Southern Bypass prepared by the TWG and provided to Lochmueller on 4/3024 at 10:27 AM EST.
- **NOTE:** Aerial/parcel map, legend, comment boxes created by Lochmueller Group and shared with Advisory Committee on 5/8/24.

“Southern Bypass” | Cursory Overview Map #2

2 x 1 Lane Elevated Bypass to CIP - Uses Almost No Private Land

Squire Pope Road end needs NO Gullah Geechee or other Private land

CIP end needs a small section of vacant General Store land

Other land needed is owned by HHI or SCDOT, or can be routed around

Flyover Over Chamberlin includes return to westbound 278

Bridge over Spanish Wells Rd. continues CIP elevation

Approx. 3700’ (0.7 miles) **directly onto** the CIP

- **NOTE:** Illustration shown was taken directly from **Version “5B”** of the Southern Bypass prepared by the TWG and provided to Lochmueller on 5/8/24 at 11:48 AM EST

“Southern Bypass” | Cursory Engineering Overview

Categories	Prior SCDOT Findings / Considerations	Southern Bypass Constraints / Issues	Southern Bypass Overall Risks
Engineering Feasibility	• Concept not considered	• The horizontal alignment to the east tying back into US 278, as presented, is not feasible • Current at-grade alignment creates access issues at Chamberlin Drive that requires consideration (i.e., bridge) • Tie-in point requires moving east to the Cross Island Parkway ramp (US 278 East)	• Challenges in addressing the horizontal and vertical alignments need to be addressed – affects time and cost • New bridge, approximately 2,000 ft. in length required between Spanish Wells Road and Cross Island Parkway ramp
Right-of-Way	• Total of 34 acres of right-of-way required for the recommended preferred alternative	• Estimated 6 additional acres required • Eliminates approximately 1.2 acres from SCDOTs proposed right-of-way needed for recommended preferred alternative 4(a) • 23 total parcels impacted (18 publicly owned 5 privately owned) • Creates 8 private parcels with access concerns (2 of which are partially impacted)	• Additional right-of-way increases impacts to sensitive environmental resources • Additional time necessary to address access issues with the 8 parcels (total purchase or additional access road to Spanish Wells Road)
Relocations	• Two commercial relocations	• Results in at least 2 additional relocations	• Additional impacts to Stoney TCP

- **NOTE:** Table created by Lochmueller Group and shared with Advisory Committee on 5/8/24. Above findings directly related to Map #1; however, it is Lochmueller Group’s professional opinion that similar findings would hold true to alignment shown in Map #2.

"Southern Bypass" | Cursory Environmental Overview

Categories	Prior SCDOT Findings / Considerations	Southern Bypass Constraints / Issues	Southern Bypass Overall Risks
Section 106 (Cultural)	• "Adverse Effect" finding for the project due to impacts to Archaeological Site 38BU66; "No Adverse Effect" for Stoney TCP	• Greater impacts to Stoney TCP • New impacts to Honey Horn Plantation if tie-in corrected	• Change in effect finding for Stoney TCP to "Adverse Effect" • New "Adverse Effect" likely for Honey Horn Plantation • Amendment to the Memorandum of Agreement likely
Section 4(f)	• De *minimis* impact finding for both Stoney TCP and the Old Elementary School Park • Honey Horn Plantation was not impacted	• Additional "use" of Stoney TCP & Old Elementary School Park • New "use" of Honey Horn Plantation	• Additional use of non-transportation land from Stoney TCP & the Old Elementary School Park likely to elevate to an Individual 4(f) evaluation • Time and cost expended to complete the Individual evaluation ≠ a feasible & prudent option
Environmental Justice / Community Impacts	• 1 EJ community identified – Stoney • Determined project effects are not disproportionately high & adverse compared to non-EJ areas	• New impacts to the EJ Stoney community requires: ✓ Outreach & engagement ✓ Benefits & burdens analysis ✓ Noise considerations	• New terrain route introduces potential added benefits & burdens to evaluate • Potential unacceptance by the EJ community • Added mitigation costs
Ecological Impacts	• Impacts 22.9 acres of wetlands / streams • Impacts 145 acres of floodplain • "May Affect – Not Likely to Adversely Affect" finding for threatened & endangered from U.S. Fish & Wildlife Service	• Creation of segmented forest block (Approx. 4 acres of tree clearing) • Approx. 0.7 acre of NWI wetland impact; 140 linear ft. of stream impact • Approx. 1 acre of floodplain impact	• Agency concerns with added forest, wetland, stream, & floodplain impacts • Potential elevation in Threatened & Endangered Species finding • Added mitigation costs

- **NOTE:** Table created by Lochmueller Group and shared with Advisory Committee on 5/8/24. Above findings directly related to Map #1; however, it is Lochmueller Group's professional opinion that similar findings would hold true to alignment shown in Map #2.

“Southern Bypass” | Cursory Overview Findings

- Current modified version of SCDOT Alternative #1 would require acquisition of ~2.89 acres of new ROW and relocation of two commercial establishments from within TCP boundary, along north side of WHP.

- It appears current version of Southern Bypass would require acquisition of ~ +/- 6 acres of new ROW and relocation of three residences and one commercial establishment from within TCP boundary, along south side of WHP. Substantial portion of the new ROW to be acquired would convert Non-Transportation land use to a permanent Transportation land use.

- Any iteration of the Southern Bypass would need to be elevated, thereby negatively impacting access to several private parcels along south side of WHP. Would require grade separated intersection at Squire Pope Road. Additionally, an approximate 2,000 ft bridge spanning marshland would be required, to then ultimately tie directly into CIP.

- With respect to areas along WHP just west of Squire Pope and a connection to CIP, any iteration of the Southern Bypass would be more expensive and take longer to construct, as compared to the current modified version of SCDOT Alternative #1.

“Southern Bypass” | Cursory Overview Findings (cont.)

- Any iteration of the Southern Bypass is likely to lead to an Environmental Impact Statement (EIS) to be prepared, thereby delaying progress of the project by at least two years.

- In comparison to current modified version of SCDOT Alternative #1, any version of the Southern Bypass would yield more negative results to Section 106 (Cultural); Section 4(f); Environmental Justice/Community Impacts; and Ecological Impact categories shown on “Cursory Environmental Overview” table (see previous slide).

- The FHWA and SCDOT will not accept any version of a route that extends on new terrain creating more direct impacts to the Stoney TCP and other Section 4(f) resources. As such, it is Lochmueller Group’s professional opinion is that SCDOT and FHWA will reject any iteration of a Southern Bypass, regardless of its location south of WHP, because such a premise fails to regard the basic NEPA principles applied to projects of avoid, minimize, and mitigate.

- The above stated independent findings generated by Lochmueller Group were presented to the Advisory Committee during the 5/8/24 meeting. Immediately prior to the meeting, Lochmueller was provided with a copy of a letter from SCDOT (dated 5/2/24) that outlined SCDOT’s review findings related to the Southern Bypass. SCDOT’s findings were similar to the independent findings generated by Lochmueller.

4-Lane Viability

- In order for the existing four-lane section to operate acceptably, the total reduction in vehicles along US 278 would need to be between 30-40%.

- While implementing transportation strategies such as an improved transit/ferry system or congestion pricing would help slow future traffic growth on US 278, it is Lochmueller's opinion that even if all of these strategies are implemented, the reduction in vehicles would not reach 30%. For reference:
  - In 2021, the existing transit mode share was less than 1% in the region and would therefore have to grow exponentially to be effective enough to reduce the need for six lanes along US 278 in the area under study.
  - South Carolina State laws prohibit tolls/fees from being implemented on existing roads. Only new roads may instate tolls/fees. If a facility usage fee could be implemented, the fee would largely impact commuters, not tourists, who enter and exit the island for work, as the majority of traffic during the AM and PM peak hours is a result of commuter traffic. Even still, if a facility usage fee could be implemented, it is highly unlikely the resulting reduction in traffic would allow for a four-lane section to be maintained.

- Therefore, it is Lochmueller's opinion that the traffic volumes along US 278 would not be able to be reduced between 30-40% in order to maintain a four-lane section along US 278 within the study area.

Measures of Effectiveness

- Reported Results Include the Following:
  - Level of Service (LOS) A - F
  - Delay (seconds)
  - 95th Percentile Queue Length (feet)
    - Specifies a queue that is typically exceeded only once or twice during the day
  - Maximum Queue Length (feet)
  - Lane Capacity

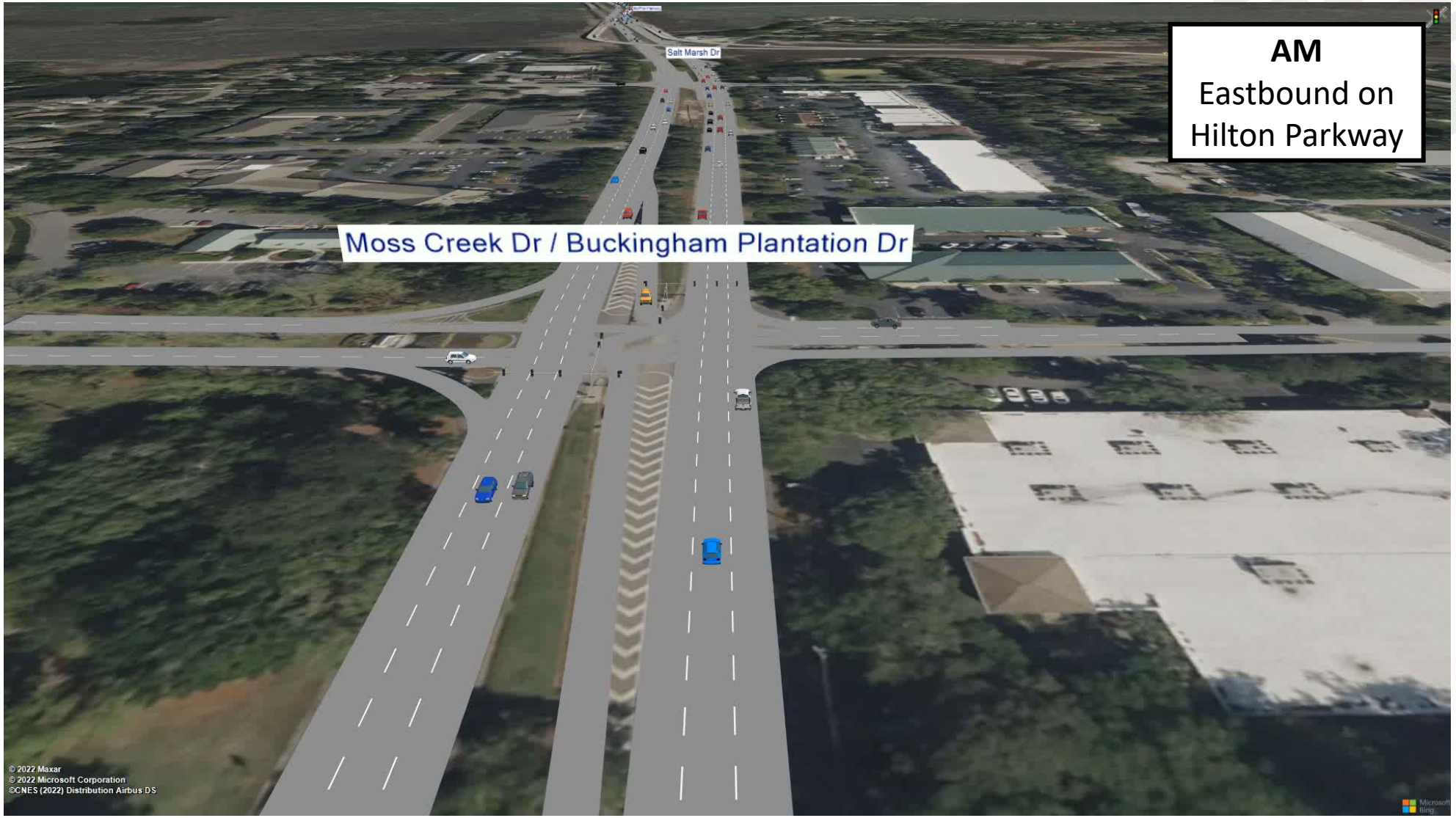
Level of Service	Control Delay per Vehicle (sec/veh)	
	Signalized	Unsignalized
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)

- VISSIM travel time results:
  - Under the 2045 No Build scenario, it is expected that it would take approximately 26.3 minutes to travel eastbound along Hilton Parkway between Moss Creek and Indigo Run during the AM peak hour. It is expected that the travel time will be reduced to approximately 10.5 minutes under the modified Alternative 1.
  - Under the 2045 No Build scenario, it is expected that it would take approximately 25.7 minutes to travel westbound along Hilton Parkway between Moss Creek and Indigo Run during the PM peak hour. It is expected that the travel time will be reduced to approximately 10.3 minutes under the modified Alternative 1.

Corridor		2045 No Build Simulated travel time (secs)		2045 Modified Alternative 1 Simulated Travel Time (secs)		% Difference	
		AM	PM	AM	PM	AM	PM
Hilton Parkway between Moss Creek and Indigo Run	EB	1579	642	628	631	**-60.23%**	**-1.71%**
	WB	584	1544	597	616	**2.23%**	**-60.10%**
Hilton Parkway @Moss Creek to **Cross Island Parkway** @Sea Pine	SB	1984	873	1387	874	**-30.09%**	**0.11%**
	NB	823	2465	848	904	**3.04%**	**-63.33%**

Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)



Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)

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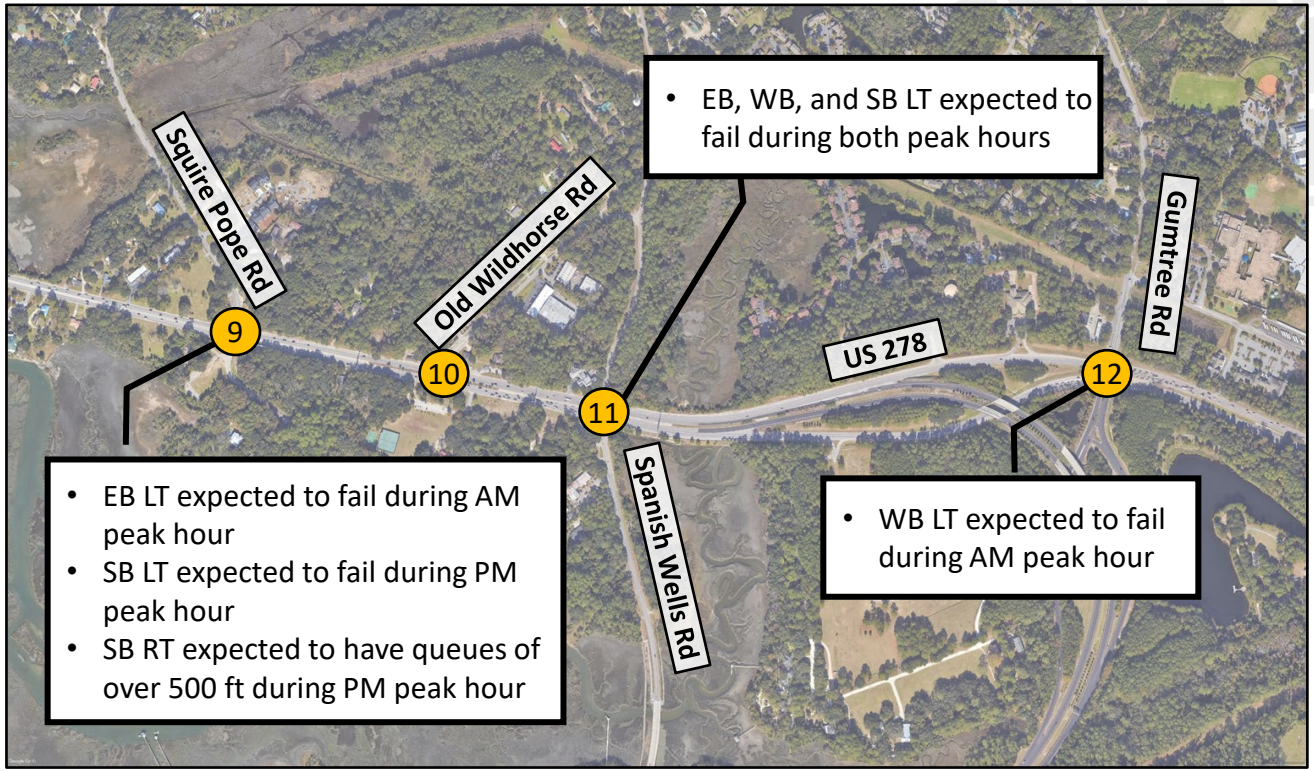
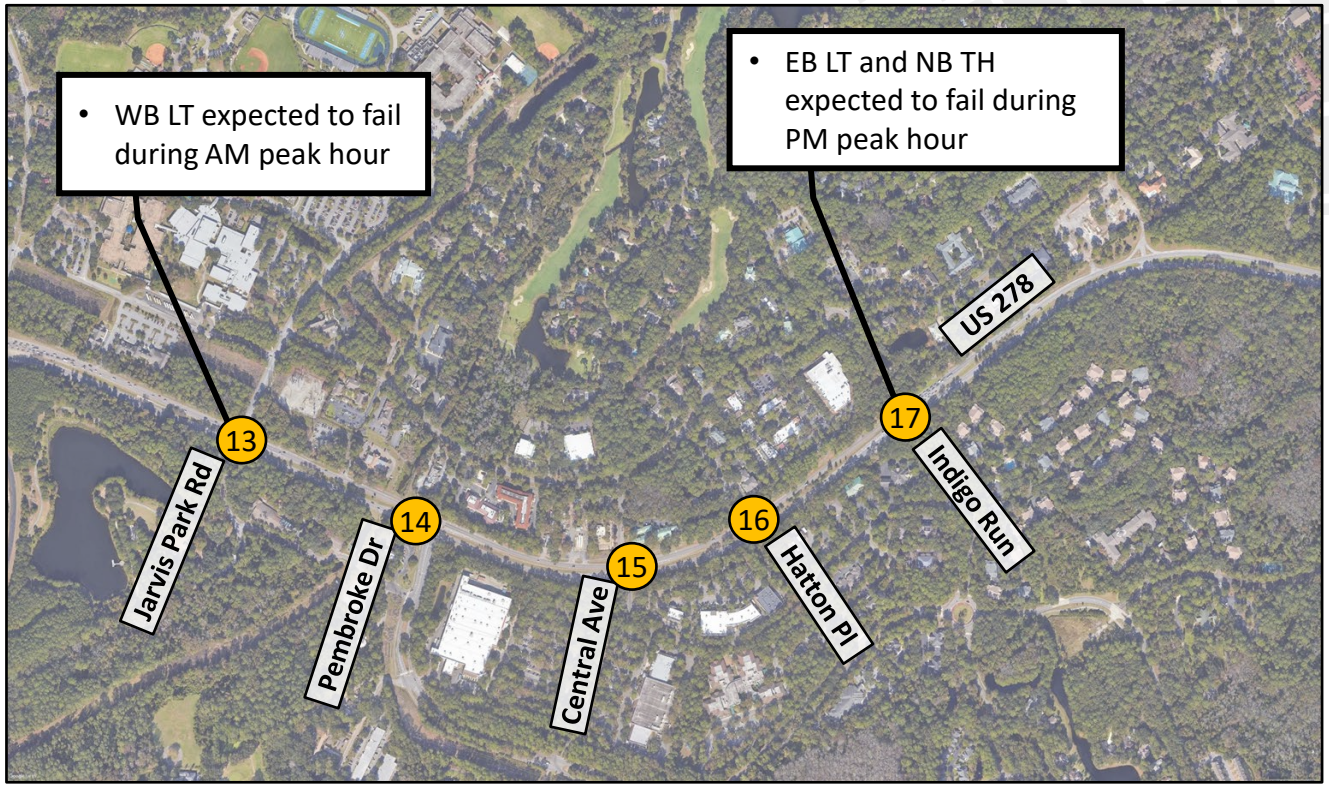
Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)

Intersection & Movements	LOS (Delay, sec) [95th Queue Length, ft] {Max Queue, ft}	
	AM Peak Hour	PM Peak Hour
9: Chamberlin Dr/Squire Pope Rd & Hilton Pkwy (signal)		
Overall Intersection	**A (8.4)**	**B (11.8)**
Eastbound Approach	A (7.0) [102] {697}	B (11.3) [124] {484}
Westbound Approach	A (8.2) [28] {237}	A (5.8) [36] {524}
Northbound Approach	C (30.4) [<25] {56}	E (67.0) [<25] {109}
Southbound Approach	C (22.6) [<25] {170}	D (51.1) [128] {521}
10: Old Wild Horse Rd & Hilton Pkwy (un-signalized)		
Southbound Approach	A (4.7) [<25] {56}	B (12.5) [<25] {32}
11: Spanish Wells Rd/Wild Horse Rd & Hilton Pkwy (signal)		
Overall Intersection	**B (16.6)**	**C (23.8)**
Eastbound Approach	B (11.0) [106] {998}	C (27.9) [198] {861}
Westbound Approach	B (11.2) [56] {248}	B (11.9) [84] {779}
Northbound Approach	D (48.6) [45] {135}	E (65.2) [77] {196}
Southbound Approach	E (75.9) [74] {292}	E (60.6) [49] {197}
12: Gumtree Rd & Hilton Pkwy (signal)		
Overall Intersection	**D (37.1)**	**D (43.8)**
Eastbound Approach	C (33.4) [164] {682}	E (57.1) [184] {562}
Westbound Approach	D (40.8) [130] {369}	D (35.4) [236] {786}
Northbound Approach	C (26.6) [61] {264}	D (37.3) [98] {327}
Southbound Approach	D (50.2) [93] {302}	D (52.7) [119] {453}



Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)

Intersection & Movements	LOS (Delay, sec) [95th Queue Length, ft] {Max Queue, ft}	
	AM Peak Hour	PM Peak Hour
13: Jarvis Park Rd/Wilborn Rd & Hilton Pkwy (signal)		
Overall Intersection	**C (26.7)**	**B (18.8)**
Eastbound Approach	C (25.4) [439] {1480}	B (16.3) [103] {735}
Westbound Approach	C (21.6) [101] {686}	B (18.2) [295] {1202}
Northbound Approach	E (68.6) [43] {170}	F (87.6) [56] {191}
Southbound Approach	D (39.1) [66] {228}	B (19.2) [29] {112}
14: Pembroke Dr/Museum St & Hilton Pkwy (signal)		
Overall Intersection	**C (23.1)**	**C (24.5)**
Eastbound Approach	B (18.9) [403] {1224}	B (17.2) [128] {910}
Westbound Approach	C (20.9) [75] {532}	C (21.6) [171] {903}
Northbound Approach	D (53.1) [71] {257}	E (60.1) [92] {299}
Southbound Approach	C (30.4) [<25] {89}	D (40.3) [<25] {111}
15: Central Ave & Hilton Pkwy (un-signalized)		
Eastbound Left Turn	A (7.1) [<25] {<25}	C (19.3) [<25] {25}
Westbound Left Turn	C (24.1) [<25] {26}	A (9.5) [<25] {<25}
Northbound Right Turn	C (16.5) [<25] {27}	B (13.9) [<25] {32}
Southbound Right Turn	B (12.5) [<25] {45}	C (18.3) [<25] {38}
16: Hatton Pl/Merchant St & Hilton Pkwy (un-signalized)		
Northbound Right Turn	A (9.5) [<25] {28}	A (7.8) [<25] {63}
Southbound Right Turn	B (11.3) [<25] {36}	C (22.9) [<25] {41}
17: Indigo Run Dr/Whooping Crane Way & Hilton Pkwy (signal)		
Overall Intersection	**C (25.1)**	**D (36.1)**
Eastbound Approach	C (21.1) [134] {846}	C (33.6) [128] {751}
Westbound Approach	B (17.3) [53] {359}	C (28.0) [207] {887}
Northbound Approach	E (56.6) [33] {114}	E (66.9) [65] {268}
Southbound Approach	D (47.7) [56] {192}	E (57.6) [77] {264}



*Highlighted cells indicate that the maximum queues are expected to extend into the next intersection

Downstream Impacts to Task 4 Intersections (Assuming Implementation of Modified Alternative 1)

Intersection & Movements	LOS (Delay, sec) [95th Queue Length, ft] {Max Queue, ft}	
	AM Peak Hour	PM Peak Hour
27: Palmetto Bay Rd & Target Rd (signal)		
Overall Intersection	**C (29.0)**	**B (19.0)**
Eastbound Approach	D (36.9) [1380] {1512}	B (15.9) [142] {823}
Westbound Approach	B (12.9) [39] {249}	B (15.8) [85] {539}
Northbound Approach	C (26.6) [<25] {105}	D (39.5) [65] {263}
Southbound Approach	D (35.7) [34] {151}	C (25.5) [37] {140}
28: Palmetto Bay Rd & Dunnagans Alley (un-signalized)		
Westbound Left Turn	F (1,033.8) [80] {183}	F (101.3) [<25] {99}
Westbound Right Turn	F (91.9) [109] {217}	B (13.3) [35] {134}
Southbound Left Turn	C (22.0) [278] {513}	B (13.7) [29] {465}
29: Palmetto Bay Rd & Hilton Pkwy (Sea Pines Circle, RAB)		
Overall Intersection	**F (53.4)**	**F (79.2)**
Eastbound Approach	F (314.9) [809] {838}	F (179.8) [805] {838}
Westbound Approach	B (14.0) [56] {420}	F (189.7) [1644] {1658}
Northbound Approach	A (4.1) [<25] {209}	F (52.9) [463] {788}
Southbound Approach	C (18.5) [307] {461}	A (9.1) [111] {460}