



Hillsborough TPO  
Transportation  
Planning Organization



Hillsborough  
County Florida

## **APPENDIX C – WATERS AVENUE CORRIDOR DESIGN CONCEPTS**



# BICYCLE NETWORK PLAN: CORRIDOR DESIGN CONCEPTS

Hillsborough County

W. Waters Ave. – Sheldon Rd. to Veterans Expressway

January 2023

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## INTRODUCTION

Committed to improving the mobility and safety of all residents, Hillsborough County, and the Hillsborough Transportation Planning Organization (TPO) have identified, evaluated, and prioritized bicycle facility needs along the County's roadway transportation network. The data-driven methodology addresses the mobility and safety needs of people on bicycles. The resulting plan will assist Hillsborough County in realizing the commitment and desire to provide a safe, connected, and inviting network of bicycle facilities.

The planning process identified four high priority corridors that are geographically dispersed across the county for further evaluation. Review and analysis of each corridor yielded a range of potential project opportunities to add or improve bicycle facilities. The recommended improvements have been grouped into tiers based on priority and screened for feasibility. This design report introduces conceptual design plans, cost estimates, and implementation considerations to construct the recommendations for W. Waters Ave. between Sheldon Rd. and Veterans Expressway.

Waters Ave. in the project corridor is a six-lane divided roadway in the community of Town 'n' Country. The 2.7 miles long corridor's land use is primarily commercial in the vicinity of the signalized intersections with a mix of commercial, single-family, and multi-family residential in the segments between. The median is curbed and restricts left turns to or from many side streets and driveways. There are many curb cuts with most parcels having their own driveways. The signalized intersections have exclusive left turn lanes throughout the corridor and exclusive right turn lanes only at each end of the corridor.

The corridor has two distinct roadway configurations to either side of Pinehurst Dr. West of Pinehurst Dr., the pavement width is 35 ft to each side of the median. The posted speed limit of 35 mph includes warning plaques noting "Senior Area." The corridor has sidewalks located at the back of the curb and Shared Lane Markings in the curb lane, though there is no signage associated with the shared lane condition. East of Pinehurst Dr., the median widens and the pavement width is 37.5 ft to each side of the median. The posted speed limit is 45 mph though operating speeds can be observed much faster. There are sidewalks with a narrow grass buffer and 4 ft wide bike lanes, though there is no signage associated with the bike lane pavement markings. Green conflict areas have been added to the keyhole bike lane areas where there are exclusive right turn lanes at the east end of the corridor. Bike lanes intersect the corridor along Sheldon Rd. at the project's western terminus.

In addition to serving local bicyclists, the corridor leads to the Channel Park Pavilion trailhead for the Upper Tampa Bay Trail west of the project limits. The Town 'n' Country Greenway runs parallel to the corridor one mile to the south.

The Hillsborough Area Regional Transit Authority (HART) operates transit service along the corridor. Route 16 operates along the entire corridor with 30-minute headways Monday-Saturday and 60-minute headways on Sunday. Route 30 operates between Sheldon Rd. and Hanley Rd. before continuing south along Hanley Rd, operating with 60-minute headways seven days a week. The HART Northwest Transfer Center is located outside the western project limits where several additional bus routes converge including: 34, 39, and route 812 operated by the Pinellas Suncoast Transit Authority (PSTA).

## RECOMMENDATIONS

The most substantial recommendation to improve conditions for bicyclists is to narrow the lane striping to add bike lanes where they do not exist and to widen and buffer the existing bike lanes. The recommendations are supportive of the new bike lanes and safety for all roadway users through elements that encourage a reduction of traffic speeds. The recommendations improve access to the bike lanes with the addition of enhanced crossings, improved bus stops, and continuing the bike lane markings through intersections. Additional recommendations add elements to improve the overall safety and comfort of roadway users including updated pavement markings, signage, landscaping, and lighting.

The recommendations have been split into three tiers and are summarized in the tables below. Conceptual design plans showing the recommendations are included in Appendix A.



Table 1: Tier 1 Recommendations

	Recommendation	Implementation Notes	Cost Estimate
A	Reconfigure the roadway striping to narrow the travel lanes east of Pinehurst Dr. and add buffers to the bike lanes.	37.5 ft. pavement width east of Pinehurst Dr. yields 10 ft interior travel lanes, 11 ft outside travel lane, and 6.5 ft buffered bike lanes. Resurfacing to be completed as part of the striping changes.	\$4,245,000
B	Install flexible delineators to feasible segments of the buffered bike lanes.	Install flexible posts to bike lane buffers at 30 ft on center where there are no conflicts with turning movements.	\$172,400
C	Reconfigure the roadway striping to narrow the travel lanes west of Pinehurst Dr. and replace shared lane markings with bike lanes.	35 ft. pavement width west of Pinehurst Dr. yields 10 ft travel lanes and 5 ft bike lanes. Resurfacing to be completed as part of striping changes.	\$1,579,500
D	Install bike lane markings through intersections and across selected driveways, including green through conflict areas.	Typical configuration is to continue the bike lane width through the intersection with 2 ft-4 ft skip through conflict areas, adding green within those skips and 40 ft solid green before and after conflict areas.	\$627,000
E	Modify the median east of Stone Run Ct. to maintain minimum widths for eastbound travel lanes and bike lane through the choke point.	Modifications required to maintain minimum width of travel lanes and bike lane, and should be completed coincident with resurfacing.	\$73,400
F	Install high visibility pedestrian crossing markings at all intersections, midblock crossings, and major driveways.	Locations shown on design plans.	\$424,000
G	Install consistent MUTCD bicycle facility signs.	Sign assembly content and placement to be determined during final design. Planning-level cost estimate included. Not shown on design plans.	\$147,700

H	Identify and repair areas of sidewalk damage, poor drainage, and ADA compliance issues.	Quantities and locations to be determined following ADA inventory. Planning-level cost estimate included. Not shown on design plans.	\$112,400
I	Modify timing plans to add Leading Pedestrian Intervals (LPI) at all signal-controlled intersections.	Planning-level cost estimate for new signal timing plan. Should they be needed, add the following costs per location: controller upgrade \$13,400, blank out sign \$104,800, mast arm upgrade \$1,310,400.	\$70,000
J	Install wayfinding signs at the intersections with Sheldon Rd. and Hanley Rd., leading to the following destinations: Upper Tampa Bay Trail, parks, YMCA, schools, transit hubs, and Town 'N Country Trail.	Sign assembly content and placement to be determined during final design. Planning-level cost estimate included. Not shown on design plans.	\$98,500

Table 2: Tier 2 Recommendations

	Recommendation	Implementation Notes	Cost Estimate
A	Install concrete separators to feasible segments of buffered bike lanes.	Install 8 in wide concrete separators instead of flexible posts in locations where there are no conflicts with turning movements. Not shown on design plans.	\$114,700
B	Modify intersection at Northbridge Blvd. to add crossing on the west side of the intersection.	Elements include decreasing the southwest corner radius, median modifications, crosswalk ramps and markings, and relocated bus stops to far side of crossings.	\$1,130,200
C	Install midblock crossing to existing median at Riverwood Blvd.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, FDOT-standard Midblock Pedestrian Signals (MPS), mast arms, and relocate bus stops to far side of crossings.	\$1,130,200
D	Install midblock crossing between Royal Sand Cir. driveways pair.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, FDOT-standard Midblock Pedestrian Signals (MPS), mast arms, and relocate westbound bus stop to far side of crossing.	\$1,130,200

E	Install full traffic signal at Rustic Dr.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$1,381,400
F	Install midblock crossing east of JR Manor Dr.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$1,130,200
G	Install midblock crossing between Waters Ave Car Wash & Baycare Urgent Care.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$1,130,200
H	Install bus stop pads and amenities.	Planning-level cost estimated to add the following bus stop elements: 30 ft x 10 ft concrete pad and typical HART shelter. Individual locations may have increased construction elements dependent on easements or right-of-way required during design phase.	\$1,398,100
I	Install raised bike lane through feasible bus stops.	Cost estimate per bus stop location is based on typical configuration from NACTO Urban Transit Design Guide: 30 ft x 6 ft concrete pad, 15 ft x 6 ft concrete ramps, 30 ft curb and gutter, and 30 ft detectable warning. Not shown on design plans.	\$242,600
J	Install landscaping with trees to feasible segments of the median to create a boulevard feel.	Feasible areas shown on plans. Tree placement to be determined during final design.	\$170,500
K	Conduct speed study to reduce posted speed limit.	Planning-level cost estimate for required speed study and replacement signage. Not shown on design plans.	\$76,000
L	Install bicycle detection at signal-controlled intersections.	Planning-level cost estimate for new microwave detection equipment.	\$333,200

Table 3: Tier 3 Recommendations

	Recommendation	Implementation Notes	Cost Estimate
A	Install lighting at all signalized intersections and crossings.	Planning-level cost estimate for lighting at each intersection and midblock crossing, both existing and those added in Tier 2. Not shown on design plans.	\$2,109,700
B	Install pedestrian-scale lighting throughout the corridor.	Planning-level cost estimate for pedestrian-scale lighting on both sides, spaced at 50' on center. Additional right-of-way or easements to be acquired prior to final design. Not shown on design plans.	\$3,466,000
C	Remove and reconstruct duplicate driveways.	Coordination and approvals required from adjacent property owners prior to final design. Planning-level cost estimate to reconstruct six 24 ft wide commercial driveways.	\$75,300
D	Extend median noses to roadway edge to provide pedestrian refuge areas.	Locations noted on plans: Riverwood Blvd., Rustic Dr. (both sides), Hulsey Rd. (north side), Sand Beach St., Henderson Rd., and Sitka St.	\$90,000

## COST ESTIMATES SUMMARY

Cost estimates for each recommendation are included above in Tables 1-3. The estimates have been developed using pay items and expected unit costs sourced from District 7 of the Florida Department of Transportation, the Department’s Long Range Estimating (LRE) system, and engineering judgement. The planning-level estimates include percentage-based multipliers applied to the construction costs as shown in Table 4. Any needed right-of-way acquisition is not included in the estimates. An overview of the cost estimates aggregated by tier are shown in Table 5. Cost estimate details for each recommendation are provided in Appendix B.

Table 4: Cost Estimates Assumptions

Cost Element	Multiplier
Maintenance of Traffic (MOT)	20%
Mobilization (MOB)	15%
Contingency	30%
Design	25%
CEI	15%

Table 5: Cost Estimates by Tier

Implementation Tier	Cost Estimates
Tier 1	\$7,549,900
Tier 2	\$9,367,500
Tier 3	\$5,741,000
Corridor Total	\$22,658,400

## IMPLEMENTATION GUIDANCE

The recommendations for bicycle facilities on the corridor were developed in collaboration with Hillsborough County staff and subsequently screened for feasibility. The screening for feasibility and development of design plans included conformance with the applicable local, state, and federal design standards and guidance. The designs applied engineering judgement and contemporary best practices for the safety of all users within the right-of-way. Implementation notes are included for each recommendation in the tables above. The following content identifies general issues and considerations to be addressed along the entire corridor as the recommendations are advanced through the forthcoming stages of design and implementation.

### RIGHT-OF-WAY, DRAINAGE, AND UTILITIES

The right-of-way information used to develop the design concept is based on Hillsborough County's GIS data and field investigation. The next stage of project development will require survey to verify property lines, topography, and utilities.

Based on the available property line data, the property lines generally lie beyond the back of the sidewalks with an additional buffer. However, there are two segments along the north side of the corridor where the private property boundaries appear to extend well into the curb lane of the roadway. Those segments are from Sheldon Rd. to Pinehurst Dr. and again from just east of Sandy Beach St. to Henderson Rd.

Other than the segments along the north side of the corridor noted above, all recommendations fall within the public right-of-way. Additional right-of-way may be required for the relocation of impacted utilities or to add the recommended traffic signals equipment and lighting.

Utility relocations, adjustment, or additions may be required to install the recommended traffic signals and lighting.

### ADDITIONAL CONSIDERATIONS

All curb ramps are to be ADA-compliant. They are not specifically shown on the conceptual design plans, though they are included in the cost estimate for the corresponding recommendation. The width of each curb ramp and detectable warning pads are to match the corresponding path or sidewalk width.

Field assessment of ADA compliance is required to identify any needed associated modifications.

A speed study will be required prior to advancing the recommendation to lower the posted speed limit.

The addition of Leading Pedestrian Intervals (LPI) and bicycle detection equipment to intersections with existing traffic signals may require replacement of the traffic controller cabinet if required to enable that capability.

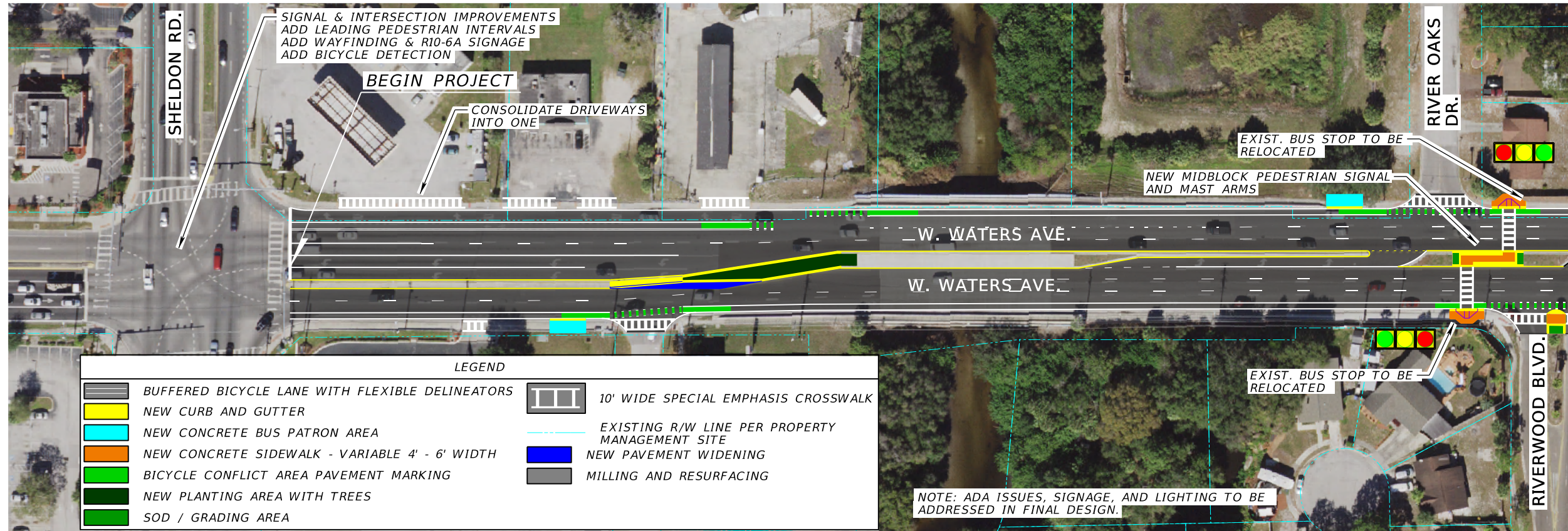
The recommended lighting will require assessment of existing lighting conditions, impacts to trees, and right-of-way once the grading design has been established.

All pavement markings should be thermoplastic.



**Appendix A**  
Design Concept Plans





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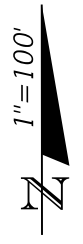
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HILLSBOROUGH COUNTY  
601 E. KENNEDY BLVD. TAMPA, FLORIDA 33602

BICYCLE NETWORK PLAN  
W. WATERS AVE. PLANS

SHEET NO.  
1





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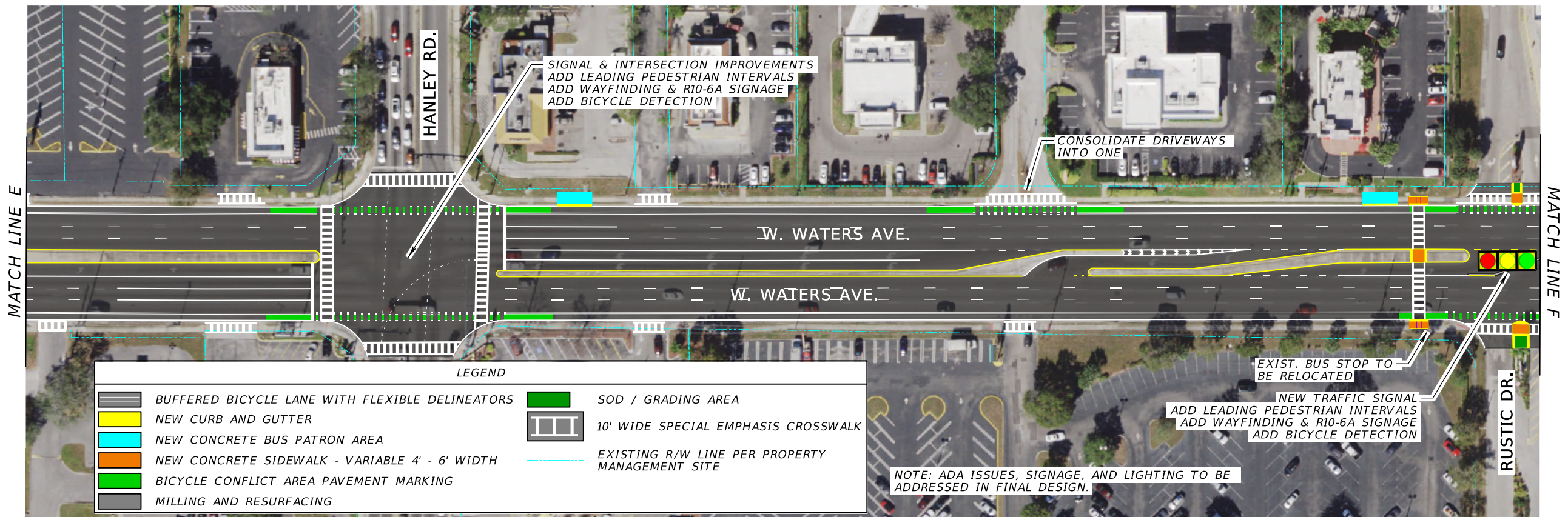
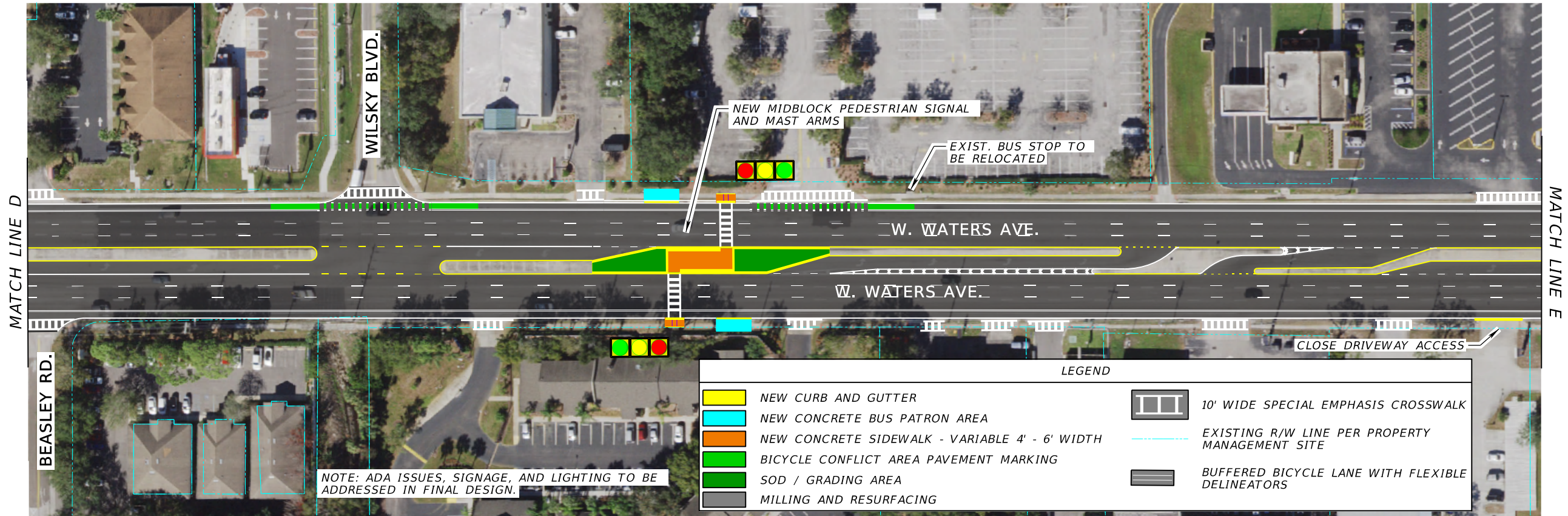
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BICYCLE NETWORK PLAN  
 W. WATERS AVE. PLANS

SHEET NO.  
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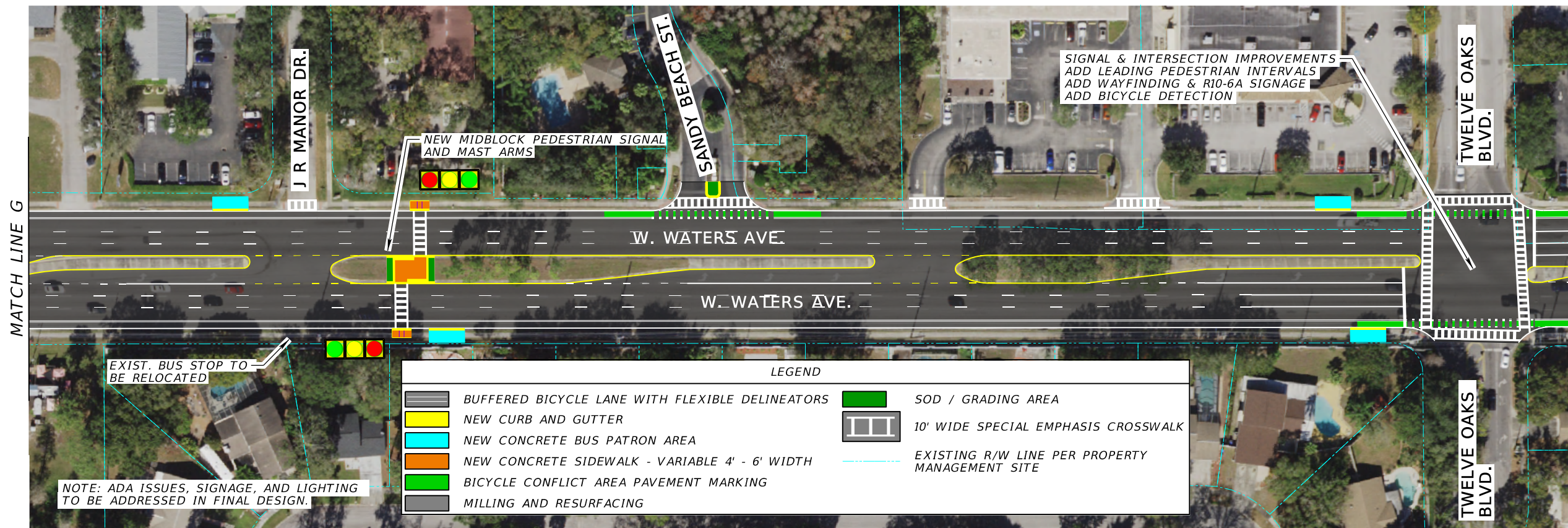
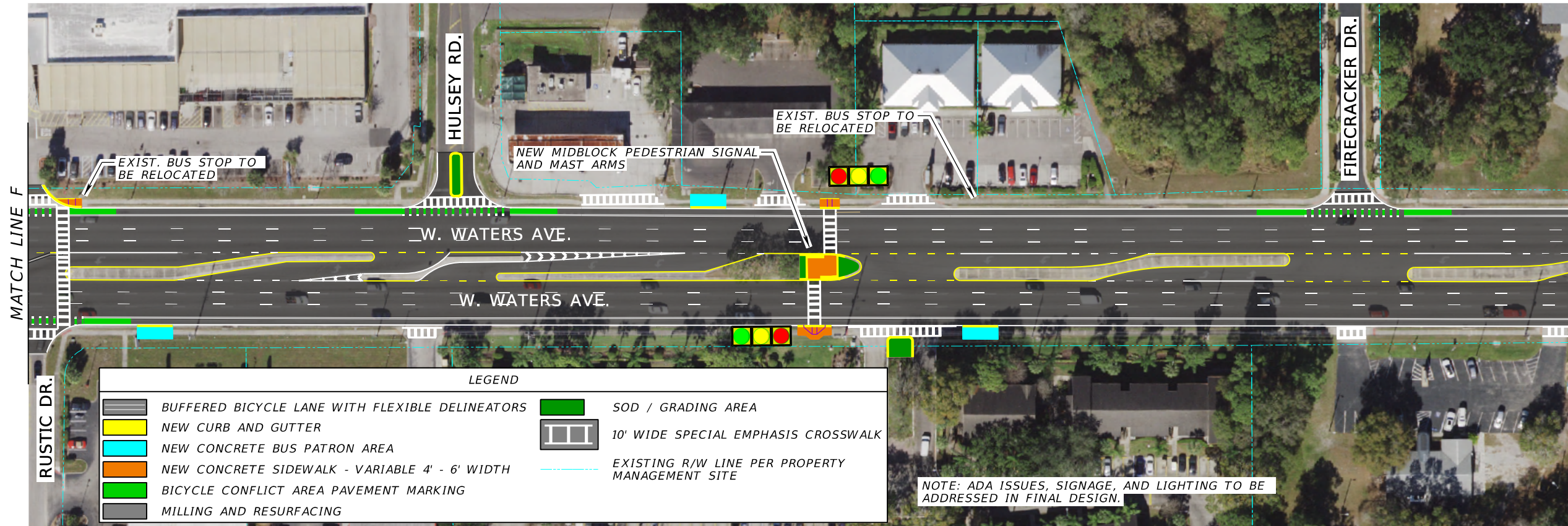
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BICYCLE NETWORK PLAN  
 W. WATERS AVE. PLANS

SHEET NO.  
 3





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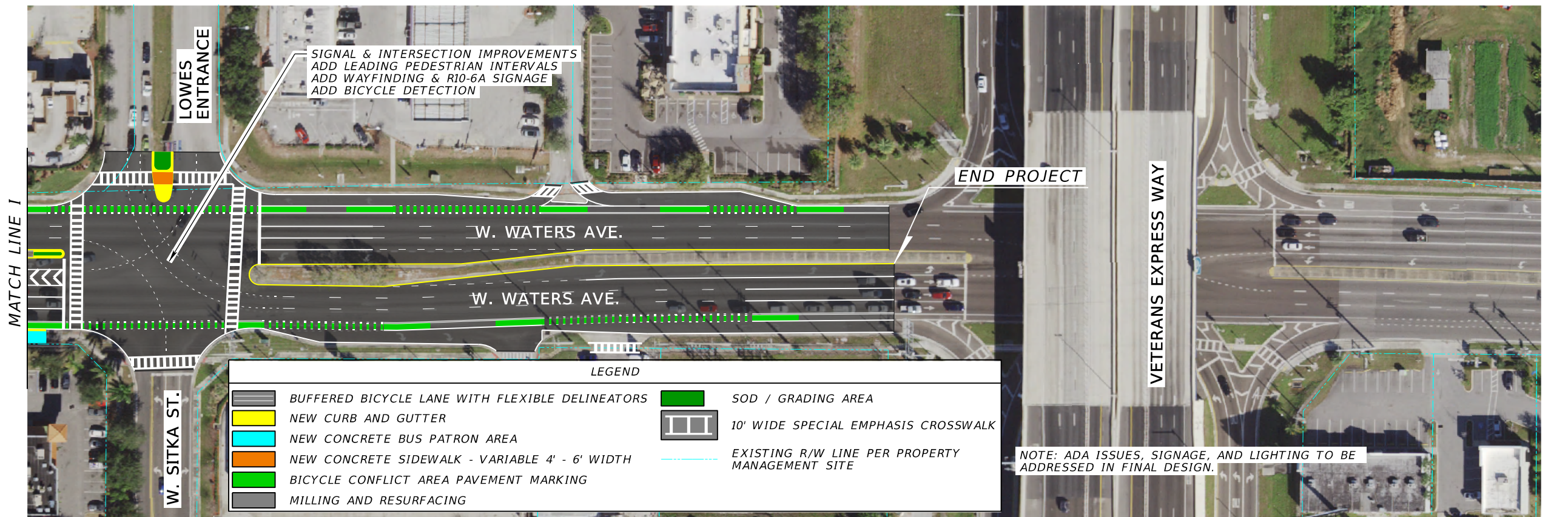
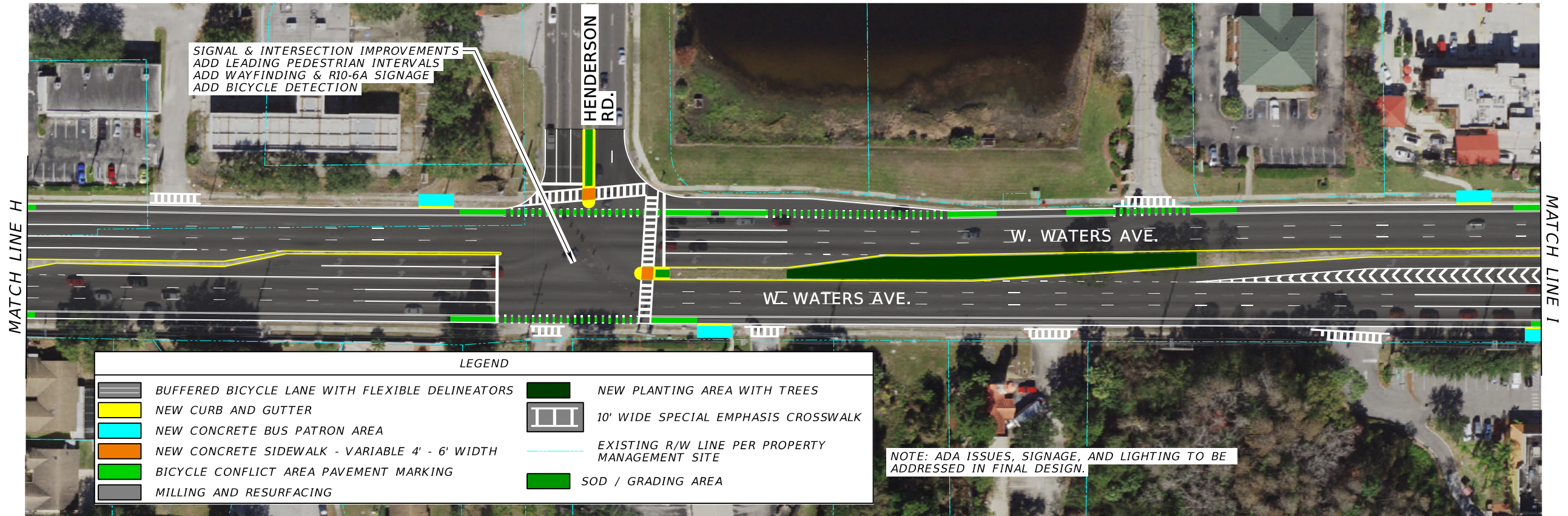
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BICYCLE NETWORK PLAN  
 W. WATERS AVE. PLANS

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BICYCLE NETWORK PLAN  
 W. WATERS AVE. PLANS

SHEET NO.  
 5





**Appendix B**  
Cost Estimates Details

Hillsborough County Bike Network - Conceptual Design Cost Estimate Details  
W. Waters Ave. – Sheldon Rd. to Veterans Expressway

Tier 1		Implementation Notes	Final Cost Estimate	Construction			CONTINGENCY						Total Cost	Cost Estimate Notes
				Cost	MOT (20%)	Sub-Total	MOB (15%)	Sub-Total	(30%)	Sub-Total	DESIGN (25%)	CEI (15%)		
A	Reconfigure the roadway striping to narrow the travel lanes east of Pinehurst Dr. and add buffers to the bike lanes.	37.5 ft. pavement width east of Pinehurst Dr. yields 10 ft interior travel lanes, 11 ft outside travel lane, and 6.5 ft buffered bike lanes. Resurfacing to be completed as part of the striping changes.	\$ 4,245,000	\$ 1,690,174	\$ 338,035	\$ 2,028,209	\$ 304,231	\$ 2,332,440	\$ 699,732	\$ 3,032,172	\$ 758,043	\$ 454,826	\$ 4,245,041	Obtained the construction cost from the design file.
B	Install flexible delineators to feasible segments of the buffered bike lanes.	Install flexible posts to bike lane buffers at 20 ft on center where there are no conflicts with turning movements.	\$ 172,400	\$ 68,649	\$ 13,730	\$ 82,379	\$ 12,357	\$ 94,736	\$ 28,421	\$ 123,156	\$ 30,789	\$ 18,473	\$ 172,419	Measured 9340 ft that tubular posts could be applied with a spacing of 20 ft for a total of 467 posts. Each post costs 147 dollars
C	Reconfigure the roadway striping to narrow the travel lanes west of Pinehurst Dr. and replace shared lane markings with bike lanes.	35 ft. pavement width west of Pinehurst Dr. yields 10 ft travel lanes and 5 ft bike lanes. Resurfacing to be completed as part of striping changes.	\$ 1,579,500	\$ 628,866	\$ 125,773	\$ 754,639	\$ 113,196	\$ 867,835	\$ 260,351	\$ 1,128,186	\$ 282,046	\$ 169,228	\$ 1,579,460	Obtained the construction cost from the design file.
D	Install bike lane markings through intersections and across selected driveways, including green through conflict areas.	Typical configuration is to continue the bike lane width through the intersection with 2 ft-4 ft skip through conflict areas, adding green within those skips and 40 ft solid green before and after conflict areas.	\$ 627,000	\$ 249,624	\$ 49,925	\$ 299,549	\$ 44,932	\$ 344,481	\$ 103,344	\$ 447,825	\$ 111,956	\$ 67,174	\$ 626,956	Obtained the construction cost from the design file.
E	Modify the median east of Stone Run Ct. to maintain minimum widths for eastbound travel lanes and bike lane through the choke point.	Modifications required to maintain minimum width of travel lanes and bike lane, and should be completed coincident with resurfacing.	\$ 73,400	\$ 29,206	\$ 5,841	\$ 35,047	\$ 5,257	\$ 40,304	\$ 12,091	\$ 52,396	\$ 13,099	\$ 7,859	\$ 73,354	Obtained the construction cost from the design file.
F	Install high visibility pedestrian crossing markings at all intersections, midblock crossings, and major driveways.	Locations shown on design plans.	\$ 424,000	\$ 168,821	\$ 33,764	\$ 202,585	\$ 30,388	\$ 232,973	\$ 69,892	\$ 302,865	\$ 75,716	\$ 45,430	\$ 424,011	Obtained the construction cost from the design file.
G	Install consistent MUTCD bicycle facility signs.	Sign assembly content and placement to be determined during final design. Planning-level cost estimate included. Not shown on design plans.	\$ 147,700	\$ 58,824	\$ 11,765	\$ 70,589	\$ 10,588	\$ 81,177	\$ 24,353	\$ 105,530	\$ 26,383	\$ 15,830	\$ 147,742	Using 700 1 12 assembly and putting an assembly every 500 ft along the project limits. Project length is 12,209 ft in one direction Original Cost of Sign = 1,634. Estimate includes 36 signs.
H	Identify and repair areas of sidewalk damage, poor drainage, and ADA compliance issues.	Quantities and locations to be determined following ADA inventory. Planning-level cost estimate included. Not shown on design plans.	\$ 112,400	\$ 44,748	\$ 8,950	\$ 53,698	\$ 8,055	\$ 61,752	\$ 18,526	\$ 80,278	\$ 20,069	\$ 12,042	\$ 112,389	Assumed 5% of project length. Project length is 24,418 ft in both directions with a 5 ft width. 6" concrete is at 66 dollars a SY.
I	Modify timing plans to add Leading Pedestrian Intervals (LPI) at all signal-controlled intersections.	Planning-level cost estimate for new signal timing plan. Should they be needed, add the following costs per location: controller upgrade \$13,400, blank out sign \$104,800, mast arm upgrade \$1,310,400.	\$ 70,000	\$ 70,000	\$ -	\$ 70,000	\$ -	\$ 70,000	\$ -	\$ 70,000	\$ -	\$ -	\$ 70,000	Flat rate of 70k for the study. Controller upgrade use pay item 671 2 11 at a price of \$5,130 ea. Blank out sign use \$40,000 ea. Mast Arm upgrade use \$500,000 ea.
J	Install wayfinding signs at the intersections with Sheldon Rd. and Hanley Rd., leading to the following destinations: Upper Tampa Bay Trail, parks, YMCA, schools, transit hubs, and Town 'N Country Trail.	Sign assembly content and placement to be determined during final design. Planning-level cost estimate included. Not shown on design plans.	\$ 98,500	\$ 39,216	\$ 7,843	\$ 47,059	\$ 7,059	\$ 54,118	\$ 16,235	\$ 70,354	\$ 17,588	\$ 10,553	\$ 98,495	Using 700 1 12 assembly. Original Cost of Sign = \$1,634. 24 total signs.
Total Costs for Tier 1:			\$ 7,549,900	\$ 3,048,128	\$ 595,626	\$ 3,643,754	\$ 536,063	\$ 4,179,817	\$ 1,232,945	\$ 5,412,762	\$ 1,335,690	\$ 801,414	\$ 7,549,866	

Tier 2		Implementation Notes	Final Cost Estimate	Construction			CONTINGENCY						Total Cost	Cost Estimate Notes
				Cost	MOT (20%)	Sub-Total	MOB (15%)	Sub-Total	(30%)	Sub-Total	DESIGN (25%)	CEI (15%)		
A	Install concrete separators to feasible segments of buffered bike lanes.	Install 8 in wide concrete separators instead of flexible posts in locations where there are no conflicts with turning movements. Not shown on design plans.	\$ 114,700	\$ 45,662	\$ 9,132	\$ 54,795	\$ 8,219	\$ 63,014	\$ 18,904	\$ 81,918	\$ 20,480	\$ 12,288	\$ 114,685	Measured 9340 ft that 8 in wide concrete separators could be applied. 6" concrete is 66 dollars per SY.
B	Modify intersection at Northbridge Blvd. to add crossing on the west side of the intersection.	Elements include decreasing the southwest corner radius, median modifications, crosswalk ramps and markings, and relocated bus stops to far side of crossings.	\$ 1,130,200	\$ 450,000	\$ 90,000	\$ 540,000	\$ 81,000	\$ 621,000	\$ 186,300	\$ 807,300	\$ 201,825	\$ 121,095	\$ 1,130,220	\$450,000 midblock crossing and signal.
C	Install midblock crossing to existing median at Riverwood Blvd.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, FDOT-standard Midblock Pedestrian Signals (MPS), mast arms, and relocate bus stops to far side of crossings.	\$ 1,130,200	\$ 450,000	\$ 90,000	\$ 540,000	\$ 81,000	\$ 621,000	\$ 186,300	\$ 807,300	\$ 201,825	\$ 121,095	\$ 1,130,220	\$450,000 midblock crossing and signal.
D	Install midblock crossing between Royal Sand Cir. driveways pair.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, FDOT-standard Midblock Pedestrian Signals (MPS), mast arms, and relocate westbound bus stop to far side of crossing.	\$ 1,130,200	\$ 450,000	\$ 90,000	\$ 540,000	\$ 81,000	\$ 621,000	\$ 186,300	\$ 807,300	\$ 201,825	\$ 121,095	\$ 1,130,220	\$450,000 midblock crossing and signal.
E	Install full traffic signal at Rustic Dr.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$ 1,381,400	\$ 550,000	\$ 110,000	\$ 660,000	\$ 99,000	\$ 759,000	\$ 227,700	\$ 986,700	\$ 246,675	\$ 148,005	\$ 1,381,380	\$550,000 full traffic signal.
F	Install midblock crossing east of JR Manor Dr.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$ 1,130,200	\$ 450,000	\$ 90,000	\$ 540,000	\$ 81,000	\$ 621,000	\$ 186,300	\$ 807,300	\$ 201,825	\$ 121,095	\$ 1,130,220	\$450,000 midblock crossing and signal.
G	Install midblock crossing between Waters Ave Car Wash & Baycare Urgent Care.	Traffic study and warrant analysis to be completed. Elements include median modifications, crosswalk ramps and markings, traffic signal heads, mast arms, and relocate bus stops to far side of crossings.	\$ 1,130,200	\$ 450,000	\$ 90,000	\$ 540,000	\$ 81,000	\$ 621,000	\$ 186,300	\$ 807,300	\$ 201,825	\$ 121,095	\$ 1,130,220	\$450,000 midblock crossing and signal.

H	Install bus stop pads and amenities.	Planning-level cost estimated to add the following bus stop elements: 30 ft x 10 ft concrete pad and typical HART shelter. Individual locations may have increased construction elements dependent on easements or right-of-way required during design phase.	\$ 1,398,100	\$ 556,644	\$ 111,329	\$ 667,973	\$ 100,196	\$ 768,169	\$ 230,451	\$ 998,619	\$ 249,655	\$ 149,793	\$ 1,398,067	\$10,000 for aluminum bus shelter. 15,302 construction cost from the design file. 22 locations.
I	Install raised bike lane through feasible bus stops.	Cost estimate per bus stop location is based on typical configuration from NACTO Urban Transit Design Guide: 30 ft x 6 ft concrete pad, 15 ft x 6 ft concrete ramps, 30 ft curb and gutter, and 30 ft detectable warning. Not shown on design plans.	\$ 242,600	\$ 96,580	\$ 19,316	\$ 115,896	\$ 17,384	\$ 133,280	\$ 39,984	\$ 173,265	\$ 43,316	\$ 25,990	\$ 242,570	Cost of 6" concrete is 66 dollars per SY and cost of curb is 35 dollars per ft. Concrete Pad is 20 SY and the concrete ramps are 2x 10 SY.
J	Install landscaping with trees to feasible segments of the median to create a boulevard feel.	Feasible areas shown on plans. Tree placement to be determined during final design.	\$ 170,500	\$ 67,900	\$ 13,580	\$ 81,480	\$ 12,222	\$ 93,702	\$ 28,111	\$ 121,813	\$ 30,453	\$ 18,272	\$ 170,538	Used a lump sum pay item 580 1 2 Landscape Complete - Large Plants. This covers the entire project limits. The construction cost was determined from the FDOT Historical Averages.
K	Conduct speed study to reduce posted speed limit.	Planning-level cost estimate for required speed study and replacement signage. Not shown on design plans.	\$ 76,000	\$ 16,340	\$ 3,268	\$ 19,608	\$ 2,941	\$ 22,549	\$ 6,765	\$ 29,314	\$ 7,328	\$ 4,397	\$ 76,040	Flat rate of \$35,000 for the study. Using 700 1 12 assembly. Original Cost of Sign = \$1,634. 10 total signs.
L	Install bicycle detection at signal-controlled intersections.	Planning-level cost estimate for new microwave detection equipment.	\$ 333,200	\$ 132,664	\$ 26,533	\$ 159,197	\$ 23,880	\$ 183,076	\$ 54,923	\$ 237,999	\$ 59,500	\$ 35,700	\$ 333,199	Use 1 (660 3 11) at a cost of \$4,252 and 2 (660 3 12) at a cost of \$12,331 pay items per intersection. 8 intersections.
Total Costs for Tier 2:			\$ 9,367,500	\$ 3,715,790	\$ 743,158	\$ 4,458,948	\$ 668,842	\$ 5,127,791	\$ 1,538,337	\$ 6,666,128	\$ 1,666,532	\$ 999,919	\$ 9,367,579	

Tier 3		Implementation Notes	Final Cost Estimate	Construction Cost	MOT (20%)	Sub-Total	MOB (15%)	Sub-Total	CONTINGENCY (30%)		Sub-Total	DESIGN (25%)	CEI (15%)	Total Cost	Cost Estimate Notes
A	Install lighting at all signalized intersections and crossings.	Planning-level cost estimate for lighting at each intersection and midblock crossing, both existing and those added in Tier 2. Not shown on design plans.	\$ 2,109,700	\$ 840,000	\$ 168,000	\$ 1,008,000	\$ 151,200	\$ 1,159,200	\$ 347,760	\$ 1,506,960	\$ 376,740	\$ 226,044	\$ 2,109,744	\$70,000 for lighting at each crossing based on a previous LRE. 12 crossings.	
B	Install pedestrian-scale lighting throughout the corridor.	Planning-level cost estimate for pedestrian-scale lighting on both sides, spaced at 50' on center. Additional right-of-way or easements to be acquired prior to final design. Not shown on design plans.	\$ 3,466,000	\$ 1,380,000	\$ 276,000	\$ 1,656,000	\$ 248,400	\$ 1,904,400	\$ 571,320	\$ 2,475,720	\$ 618,930	\$ 371,358	\$ 3,466,008	\$300,000 per mile based on a previous LRE. 4.6 miles.	
C	Remove and reconstruct duplicate driveways.	Coordination and approvals required from adjacent property owners prior to final design. Planning-level cost estimate to reconstruct six 24 ft wide commercial driveways.	\$ 75,300	\$ 30,000	\$ 6,000	\$ 36,000	\$ 5,400	\$ 41,400	\$ 12,420	\$ 53,820	\$ 13,455	\$ 8,073	\$ 75,348	\$5,000 per driveway. 6 locations.	
D	Extend median noses to roadway edge to provide pedestrian refuge areas.	Locations noted on plans: Riverwood Blvd., Northbridge Blvd., Rustic Dr. (both sides), Hulsey Rd. (north side), Sand Beach St., Henderson Rd., and Sitka St.	\$ 90,000	\$ 35,816	\$ 7,163	\$ 42,979	\$ 6,447	\$ 49,426	\$ 14,828	\$ 64,254	\$ 16,063	\$ 9,638	\$ 89,955	Avg. Cost from design file per location is \$4,477.	
Total Costs for Tier 3:			\$ 5,741,000	\$ 2,285,816	\$ 457,163	\$ 2,742,979	\$ 411,447	\$ 3,154,426	\$ 946,328	\$ 4,100,754	\$ 1,025,188	\$ 615,113	\$ 5,741,055		
<b>Total Costs for All Tiers:</b>			<b>\$ 22,658,400</b>	<b>\$ 9,049,734</b>	<b>\$ 1,795,947</b>	<b>\$ 10,845,681</b>	<b>\$ 1,616,352</b>	<b>\$ 12,462,033</b>	<b>\$ 3,717,610</b>	<b>\$ 16,179,643</b>	<b>\$ 4,027,411</b>	<b>\$ 2,416,446</b>	<b>\$ 22,658,500</b>		

Adjacent & Supplemental Projects	Implementation Notes
A	Convert bike lane along Sheldon Road to buffered/protected bike lanes
B	Investigate the opportunity of a north/south bicycle route connector between the Upper Tampa Bay Trail and Town 'N Country Trail.
C	Identify additional speed management and traffic calming treatments throughout the corridor to facilitate the desired Target Speed of 25 mph.
D	Encourage and fund installation of bicycle racks at major commercial, civic or service destinations within the corridor.
E	Investigate a bike route connection to Memorial Bikeway along Sheldon Rd.
F	Relocate utility poles out of sidewalk on south side between Riverwood and Northbridge.
G	Reconstruct all asphalt driveway aprons to be appropriate width, concrete, and include a continuous sidewalk surface.