

RESOLUTION NO. ____

PROPOSED RESOLUTION NO. 22-003

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF LAKE LAND, FLORIDA EXPRESSING SUPPORT FOR THE WEST LAKE HUNTER TRAIL AND THE FLORIDA DEPARTMENT OF TRANSPORTATION'S FEASIBILITY STUDY; AUTHORIZING THE CITY MANAGER TO SUBMIT FUNDING REQUESTS TO THE POLK TRANSPORTATION PLANNING ORGANIZATION AND THE FLORIDA DEPARTMENT OF TRANSPORTATION FOR PHASES OF OR THE ENTIRE WEST LAKE HUNTER TRAIL CORRIDOR ON BEHALF OF THE CITY; PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Lakeland (City) Comprehensive Plan: Our Community 2030 contains goals, objectives and policies aimed at improving the safety and efficiency of the area transportation network and enhancing multi-modal transportation opportunities, thereby reducing automobile dependence; and

WHEREAS, the City Comprehensive Plan incorporates a Citywide Pathways Plan that identifies priority corridors for investments in active transportation facilities for bicyclists and pedestrians, including the West Lake Hunter Trail corridor along State Road 563/Sikes Boulevard between Lime Street and Ariana Street; and

WHEREAS, the City is a designated bronze-level Bicycle Friendly Community and a bronze-level Walk Friendly Community; and

WHEREAS, the City adopted Resolution No. 5004, adopting the Polk County Local Government Complete Streets Policy that was formalized through Polk Transportation Planning Organization (TPO) Resolution No. 2012-15; and

WHEREAS, the West Lake Hunter Trail corridor is included in the Polk Transportation Planning Organization's (TPO) *Momentum 2045* long-range transportation plan; and

WHEREAS, the City Commission has expressed support for past West Lake Hunter Trail funding applications to the TPO and FDOT, including Resolutions 4843 (July 6, 2010), 5054 (February 18, 2013), 5515 (January 22, 2019) and 5598 (February 3, 2020); and

WHEREAS, the West Lake Hunter Trail is the spine of Lakeland's west side trail network, extending the New York Avenue Cycle Track in Downtown Lakeland that opened in 2019 and the New York Avenue Bicycle/Pedestrian Overpass that is currently under design by FDOT (FPID# 436656-1-32-01), for which the City Commission expressed support through Resolution No. 5732 on December 6, 2021; and

WHEREAS, the Lakeland Area Mass Transit District operates its Orange Line fixed-route bus route along State Road 563/Sikes Boulevard adjacent to the West Lake Hunter Trail corridor; and

WHEREAS, FDOT conducted the West Lake Hunter Trail Feasibility Study and Conceptual Design in 2020 and 2021, which included significant stakeholder engagement, identification of phasing options and the evaluation of alternative alignment and construction alternatives to fulfill purpose and need; and

WHEREAS, the West Lake Hunter Trail Feasibility Study and Conceptual Design generally recommends Alignments 1-A and 1-B, using grassed slopes and/or retaining walls, to replace the existing concrete sidewalk along State Road 563/Sikes Boulevard with a 10 to 12-foot wide multi-use trail; and

WHEREAS, FDOT and City representatives conducted a workshop with the City Commission on October 18, 2021 to solicit additional feedback for inclusion in the final West Lake Hunter Trail Feasibility Study and Conceptual Design report; and

WHEREAS, the recommendations contained in the West Lake Hunter Trail Feasibility Study and Conceptual Design report will form the basis of additional funding requests to the TPO and FDOT, including for project phases that could be programmed in FDOT's Five-Year Work Program, effective on July 1, 2023; and

WHEREAS, FDOT has determined that a Project Development and Environment (PD&E) Study will not be necessary for the West Lake Hunter Trail project for Alignments 1-A and 1-B, but that: 1) an environmental document is needed, a Type I Categorical Exclusion produced and an Environmental Certification issued by FDOT; and 2) due to the adjacent historic neighborhoods, it is anticipated that a Cultural Resources Assessment and coordination with the State Historic Preservation Office will be needed, which evaluations can occur as part of the overall trail design process;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF LAKELAND, FLORIDA:

SECTION 1. The City of Lakeland supports and endorses the West Lake Hunter Trail Feasibility Study and Conceptual Design (Attachment A) and proposed trail segmentation (Attachment B) for Segments 1, 3, 5 and 6.

SECTION 2. The City also supports the Pedestrian Intersection Improvements that are recommended within this study to improve safe access to this citywide and regional trail facility.

SECTION 3. The City requests that, in addition to the recommended Pedestrian Intersection Improvements, FDOT further evaluate and install paved

shoulders, transit stop improvements and other treatments along the State Road 563/Sikes Boulevard corridor to improve safety and comfort of the trail users.

SECTION 4. For Segments 2 and 4, The City ~~supports additional future evaluation of boardwalks, off-road trail sections and other enhancements to improve~~ prefers the construction of over-the-water alignment options that enhance the trail users' experience, ~~and to~~ take advantage of the natural and aesthetic attributes of the West Lake Hunter Trail corridor and establish a landmark recreation facility connecting and complementing significant complete street and park investments, including Bonnet Springs Park, being made by the private and public sectors within Lakeland's central city area.

SECTION 5. The City further understands that a PD&E Study and or other environmental analyses will likely be needed to identify specific alignments and that the City will need to be a funding partner for these Segments.

SECTION 56. The City Manager is authorized to execute and submit, on behalf of the City of Lakeland, all related application documents to the TPO and FDOT for project phases and segments for the West Lake Hunter Trail.

SECTION 67. If any word, sentence, clause, phrase, or provision of this Resolution, for any reason, is held to be unconstitutional, void, or invalid, the validity of the remainder of this Resolution shall not be affected thereby.

SECTION 78. This Resolution shall become effective upon passage.

PASSED AND CERTIFIED AS TO PASSAGE this 18th day of January, A.D.
2022.

ATTEST: _____
KELLY S. KOOS
CITY CLERK

H. WILLIAM MUTZ, MAYOR

APPROVED AS TO FORM AND CORRECTNESS: _____
PALMER C. DAVIS
CITY ATTORNEY

West Lake Hunter Trail

Trail Alternatives Evaluation Report



Financial Project No. 447075-1-12-01

July 2021



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Background

FDOT District One, in partnership with the City of Lakeland and other stakeholders, is evaluating the feasibility of constructing a twelve-foot-wide multi-use trail on Sikes Boulevard between Ariana Street and Lime Street. This project will help determine a preferred design concept and alignment for the proposed West Lake Hunter Trail and provide contextual information supportive of a subsequent Project Development and Environment (PD&E) Study.

Trails can provide multiple benefits and help a community achieve many of its long-term goals, such as:

- **Health:** Trails create transportation and recreation opportunities by providing people of all ages and abilities with safe, accessible places to walk, bicycle, jog, and ride. They are a convenient and affordable way to travel and encourage physical activity that increases public health and wellness.
- **Livability:** Trails are an important part of an urban multimodal transportation network and help connect people with the places they want or need to go. They improve quality of life.
- **Economy:** Trails increase value of nearby properties, boost spending at local businesses, attract visitors, and make a community a more attractive place to live.
- **Social:** People who walk and bicycle have more opportunities to connect with each other and be socially engaged.
- **Environmental:** Shifting vehicle trips to walking or bicycling reduces green house gas emissions and contributes to cleaner air and water with less noise pollution.
- **Community Identity:** Trails are a source of community pride, enhance historic corridors, and provide areas for community space and public art.

FDOT is developing an Active Transportation Master Plan to support strategies that ensure better options for walking, biking and transit, promoting a robust transportation framework that contributes to economic prosperity and improves multimodal network access, mobility, and safety.

Study Context

The proposed trail is approximately 1.4 miles long, located on the eastern side of Sikes Boulevard and wrapping around the western shoreline of Lake Hunter just south of downtown Lakeland (see **Figure 1**). A five-foot-wide concrete sidewalk currently exists parallel to the roadway. The project study area encompasses a ¼ mile radial buffer surrounding the proposed trail, although the existing residential neighborhoods and business centers extending beyond this buffer were also a relevant part of the evaluation.

Sikes Boulevard is a four-lane divided arterial with a posted speed limit varying from 40 mph to 45 mph within the study area. It operates at Level of Service D during peak periods and has a current annual average daily traffic volume of approximately 28,400 vehicles.

From 2015 to mid-2019, 211 vehicle crashes were recorded in the study area, 59 of which were directly along the proposed trail length. Six crashes involved pedestrians, none of which were fatal. Four crashes involved cyclists, one of which was fatal.

Existing land uses within the study area are mixed, with residential, office, and commercial uses intensifying near downtown. There are three historically-designated neighborhoods in and around the study area – Dixieland, Lake Hunter Terrace, and Munn Park – with seven parks interspersed throughout these areas.



FDOT uses Roadway Context Classifications to describe development patterns and to support an intentional link between land use and transportation facilities. Sikes Boulevard is classified as C3C: Suburban Commercial for the length of the study area, indicating a suburban-urban fabric. This is a common designation for larger arterial roadways. North of the study area, the roadway transitions to C4: Urban General, reflecting the gridded street network and densities of downtown Lakeland.

Approximately 19,500 people live in the neighborhoods comprising the study area. The median income of the study area is \$37,137, which is lower than the State median income of \$53,267. There are a substantial number of non-atomobile dependent people in these neighborhoods.

An Existing Conditions Report was compiled that provides additional context for the study and background for the design conditions.



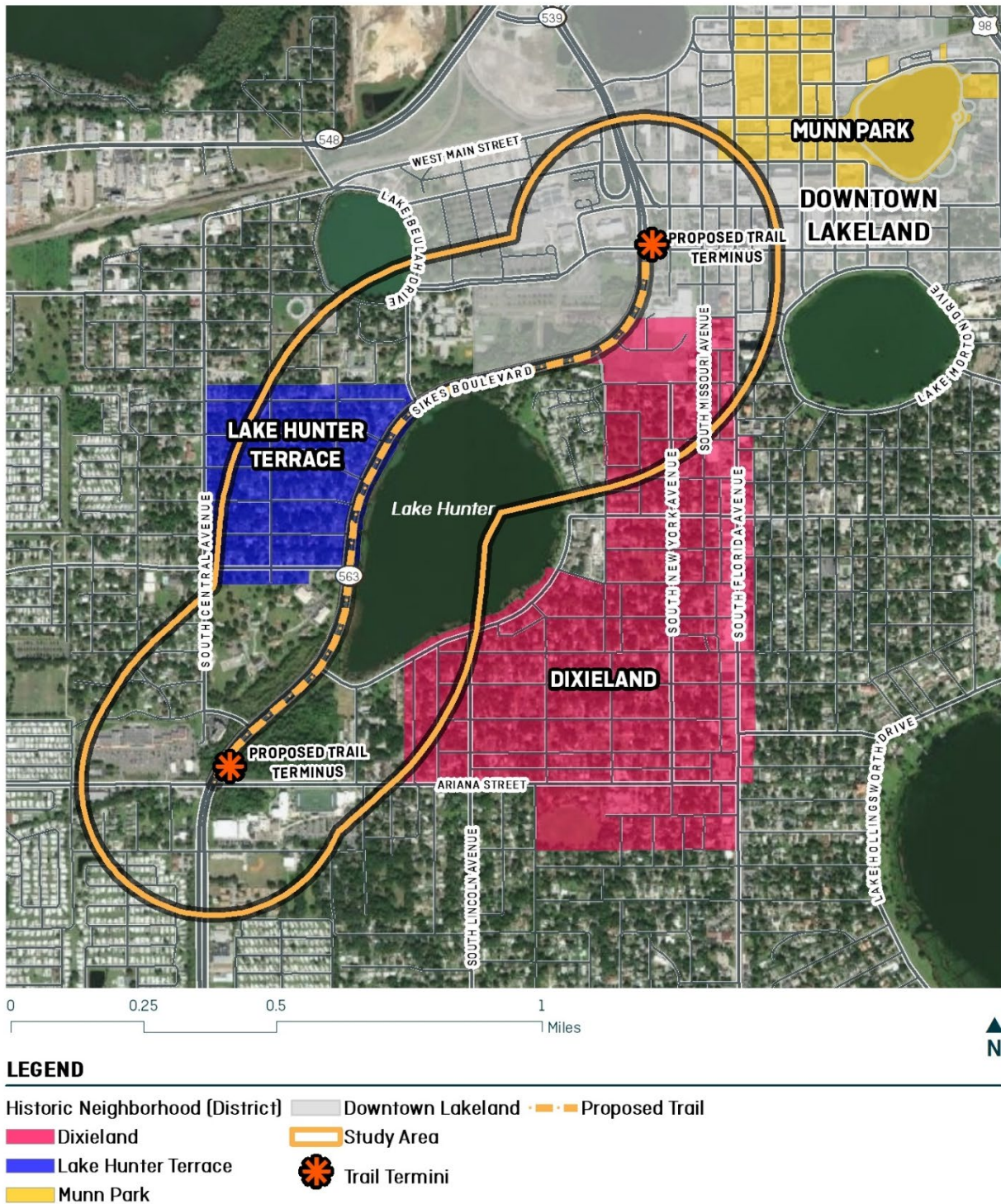


Figure 1: Study Area Map

Project Purpose and Need

The purpose of the project is to enhance regional connectivity and accessibility for pedestrians and bicyclists to local residential communities, employment and entertainment destinations in Downtown Lakeland, and fixed-route transit service throughout the area. Additionally, the project will improve bicycle and pedestrian safety in the study corridor.

The need for the project is based on the following criteria:

- Safety: Improve safety conditions

Safety plays an important role in a person's decision to use the existing sidewalk. Along the study corridor, the edge of sidewalk is approximately five feet from the face of curb along a busy roadway, separated only by a grass strip - this does not create a comfortable or safe atmosphere for people walking on the sidewalk. Some of the key safety-related concerns along the corridor include:

- The posted speed limit is 45 mph; however, vehicles heading northbound through the study corridor often exceed that speed as the roadway to the south (from the Central Polk Parkway area) has a wider cross-section and higher posted speed limit. Stakeholders have noted that vehicle speeds present a barrier for people to cross Sikes Boulevard in the study corridor.
- There is no pedestrian-scale lighting for enhanced visibility. Stakeholders noted this to be a problem during dawn and dusk hours. This is also a safety issue at night.
- Key intersections do not include audible announcements or pedestrian refuge islands for pedestrians crossing Sikes Boulevard.
- The sidewalk has obstacles between Sikes Boulevard and Lake Hunter including drainage ditches, trees, handrails, and utility poles. These can be dangerous to pedestrians and/or bicyclists if they are forced to leave the sidewalk during an emergency maneuver.
- The five-foot sidewalk width makes it hard for bicyclists or people using mobility devices/e-scooters to safely pass each other.

- Area wide network/system linkage: Improve bicycle and pedestrian connectivity

The proposed project aligns with the goals of the City of Lakeland and Polk County to create a connected multimodal transportation system. The project links existing and planned trails in the area through the *Lake-to-Lake Greenway and Bikeway Network* and bridges a gap in the regional trail system by creating a more connected and comfortable bicycle and pedestrian network and providing an attractive parallel corridor along busy roadways. Greater linkages provide opportunities to reach more destinations, especially to shops and businesses in the downtown area.

- Social and economic demand: Enhance mobility choices and support economic development

Compared to the demographic characteristics for Polk County, the study corridor contains a notable lower median income (\$37,137 in 2018, which is less than Polk County's median income of \$48,500 and Florida's median income of \$53,267). Additionally, the study corridor includes approximately 876 households that are identified as zero-vehicle households. In the study area, transportation costs often make up a larger percentage of household expenditures than do housing costs. This indicates a population with a higher propensity to walk, bike, or take transit to access essential services and recreate in the area.

The proposed project improvements are intended to provide bicycle and pedestrian infrastructure that delivers substantial health benefits, creates more opportunities to get people outside, provides movement corridors,



supports a high quality of life, presents recreational opportunities and provides access to essential services for neighborhoods along the corridor and downtown Lakeland. It will also renew the aesthetic appeal of the surrounding area, thereby stimulating revitalization, interest and investment in the adjacent neighborhoods. As such, the project aligns with the economic development initiatives of the proximate, local communities and downtown Lakeland.

The FDOT District One will continue to coordinate with the City of Lakeland, Polk County, and the Polk TPO to ensure that the project promotes consistency with local government comprehensive and transportation plans.



Feasible Alternatives

Feasible alternatives were identified based on their consistency with the project purpose and need, as well as the roadway characteristics, operational conditions, safety concerns, and physical constraints documented in the Existing Conditions Report. These factors, as well as input from project stakeholders, provide the baseline from which potential trail alternatives were considered.

Corridor Segments

Based on different character and physical conditions along the length of the corridor, the proposed trail has been separated into six segments (see **Figure 2**) to facilitate more location-specific design considerations. The segments and notable existing conditions for each, are as follows:





Figure 2: Trail Segments

Segment 1: Ariana Street to Lake Hunter Drive

- Drainage ditches parallel to roadway with grassed slopes and cross drains
- Dense wetland vegetation
- Double box culvert under Sikes Boulevard north of Ariana Street

Segment 2: Lake Hunter Drive to Greenwood Street

- Dense wetland vegetation near Lake Hunter Drive
- Dense vegetation along lake edge
- Steep slopes – long stretch with handrail at back edge of sidewalk
- Grassed slopes near Greenwood Street

Segment 3: Greenwood Street to Hartsell Avenue

- Grassed bank with gentle slopes and wider distance to lake edge
- Cross drain outlets at lake in poor condition
- Isolated groupings of trees along slope and lake edge

Segment 4: Hartsell Avenue to Lake Hunter Boat Ramp

- Dense vegetation along lake edge
- Steep slopes – long stretch with handrail at back edge of sidewalk
- Erosion issues and undercutting along lake edge
- Wide grassed slope near boat ramp entrance

Segment 5: Lake Hunter Boat Ramp to RP Funding Center parking entrance

- Drainage ditch parallel to roadway with grassed slopes
- Pedestrian bridge across drainage ditch connecting to adjacent residential neighborhood
- Triple elliptical culverts under Sikes Boulevard connecting drainage ditch on north side of boat ramp parcel

Segment 6: RP Funding Center parking entrance to Lime Street

- Drainage swale parallel to roadway
- Grassed slopes with landscape berm on back slope
- Culverts and drainage flume at Ledger entrance driveway



Trail Design Options

Based on existing site conditions at different locations along the length of the corridor, the following general design concepts were developed to facilitate more detailed construction options for a multi-use trail, recognizing that different design treatments will likely be required along the length of the trail to complete a single design concept:

- Trail on existing grade – considered for wooded areas away from Sikes Boulevard.

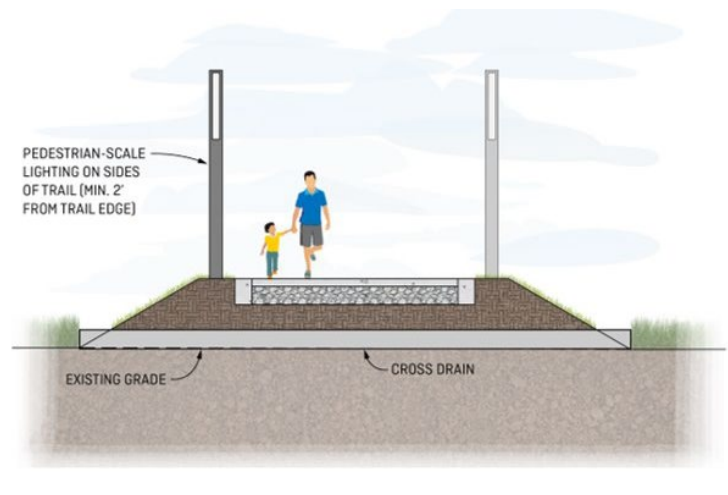


Figure 3: Concept for Trail on Grade

- Trail on fill with grassed slopes – considered for areas where existing edge condition width cannot accommodate the proposed trail. Depending on the steepness of the grassed slope, handrails may be needed along the edge of the trail for safety.

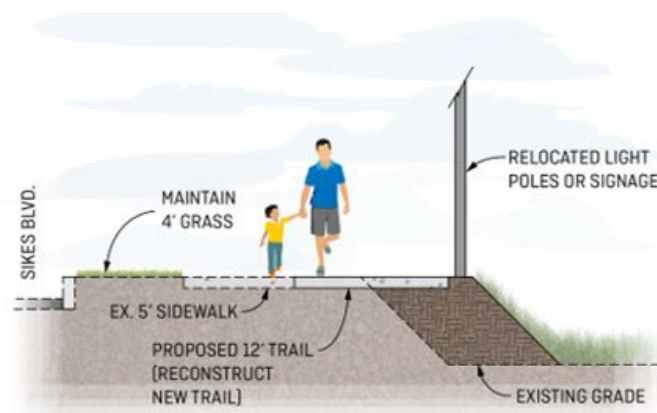


Figure 4: Concept for Trail with Grassed Slope

- Trail on fill with retaining wall – considered where lake edge is too steep or edge condition width cannot accommodate the proposed trail.

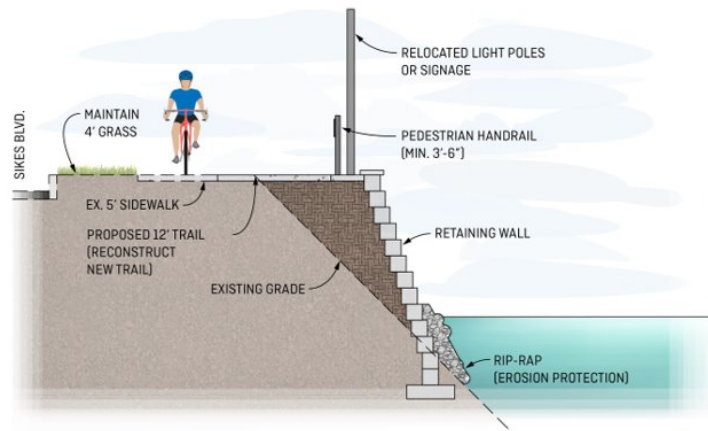


Figure 5: Concept for Trail with Retaining Wall

- Trail on fill with cantilever – considered where lake edge is too steep or edge condition width cannot accommodate the proposed trail.

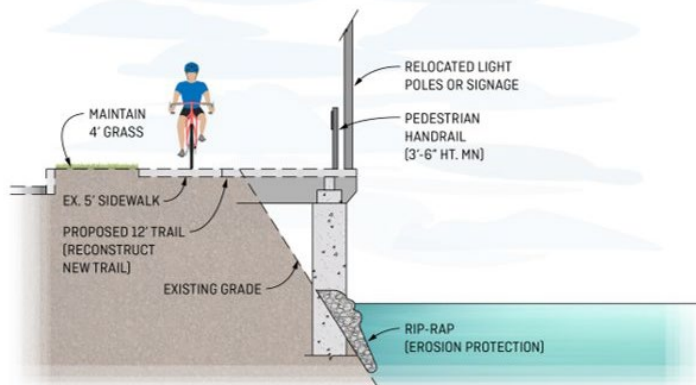


Figure 6: Concept for Cantilevered Trail

- Boardwalk over land – considered for wooded areas away from Sikes Boulevard and near Lake Hunter. Boardwalk to be concrete construction for durability and reduced maintenance.

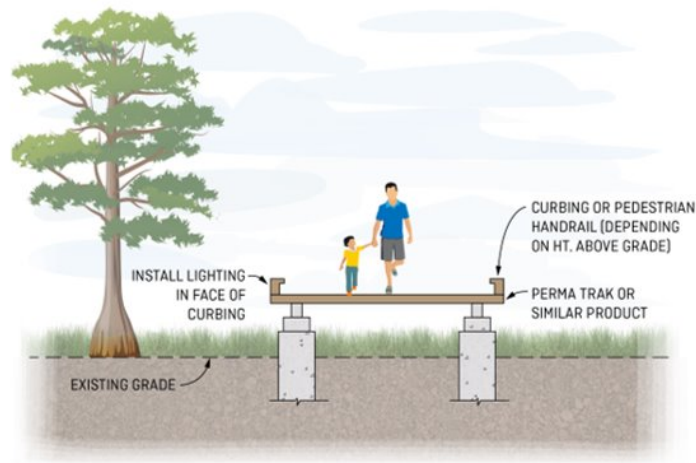


Figure 7: Concept for Boardwalk over Land

- Boardwalk over water – considered where lake edge is too steep or edge condition does not accommodate the proposed trail, or where a scenic overlook or vantage point is desired. Boardwalk to be concrete construction for durability and reduced maintenance.

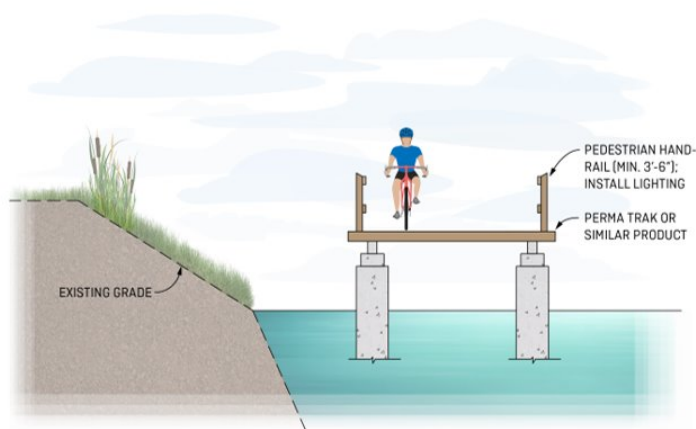


Figure 8: Concept for Boardwalk over Water

- Trail utilizing green infrastructure – alternative that allows rainwater to slowly infiltrate into the ground through pervious pavement materials.

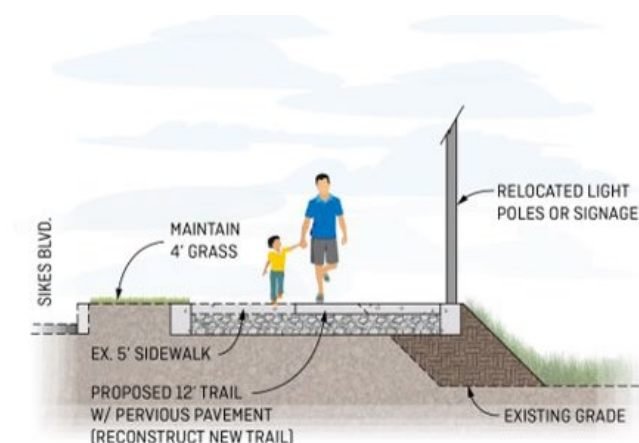


Figure 9: Concept for Trail using Green Infrastructure

Trail Design Options - Summary

The appropriateness of the identified design concepts are aligned with each segment of the proposed trail in **Table 1** below.

Design Option	Segment					
	1	2	3	4	5	6
Trail on existing grade	X	X				
Trail on fill with grassed slope	X	X	X	X	X	X
Trail on fill with retaining wall	X	X	X	X	X	
Trail on fill with cantilever		X	X	X		
Boardwalk over land	X	X				
Boardwalk over water		X	X	X		
Trail utilizing green infrastructure	X	X	X	X	X	X

Table 1: Feasible Design Alternatives by Segment

Speed Management

Stakeholders have repeatedly mentioned speeding as one of the most important concerns along the study corridor. It reduces pedestrian safety and comfort and makes crossing the roadway hazardous. Potential options to slow vehicle speeds and reduce risks for both drivers and non-motorized users include:

- Reducing lane widths, so that motorists slow the vehicle in order to maintain an acceptable level of comfort, safety, and control in traffic.
- Creating a sense of enclosure by adding street trees that provide a frame of reference and make drivers more aware of their speed. Trees narrow a driver's visual field and create rhythm along the street.
- Adding landscaping and streetscape amenities to create an edge effect and aesthetic that cues drivers to slow down. This produces an added benefit of increased safety and an enhanced experience for those walking or bicycling.

Amenities and Other Trail Features

An important part to success of the trail, both as a neighborhood asset and within the larger Lakeland Citywide Pathways Plan network, will be providing a comfortable, safe, convenient, and accessible environment that encourages people to use the trail for work commutes, recreation, and social interaction. Some of the trail design elements that should be considered during evaluation of the design concepts include the following:

Comfort/Safety/Convenience

- ***Pedestrian scale lighting*** to improve visibility of, and for, pedestrians and bicyclists, especially during time periods near dusk and dawn.
- ***Call boxes*** provide sense of security and offers quick notification for emergency situations.
- ***Trees and new plantings*** for shade and mitigation.
- ***Selective tree trimming*** to improve visibility and safety.
- ***Intersection improvements*** to increase crossing time, enhance connections, and improve safety for pedestrians.
- ***Mid-block pedestrian crossings*** to connect and provide access to trail network.
- ***Wayfinding signage*** at both the vehicular and pedestrian levels of use.
- ***Transit stop upgrades*** to improve comfort, enhance security, and provide real time bus arrival information, making transit a more attract travel option.
- ***Bicycle repair station*** can facilitate maintenance, keep cyclists safe, and attract more trail users.
- ***Technology enhancements*** such as sensors, eco-counters, or other embedded technology applications to provide additional safety and sustainability, as well as performance measurement.

Community Aesthetics

- ***Seating/benches*** that provide shaded resting spots overlooking Lake Hunter.
- ***Gazebo or similar structure on boardwalk*** as a focal point along trail and scenic overlook of Lake Hunter and downtown Lakeland.
- ***Public art*** to enhance the physical environment, enrich the aesthetic along the trail, and provide a community/cultural identity.
- ***Educational signs/placards*** that identify flora, fauna, and natural resources/systems along Lake Hunter.



Alternatives Analysis

Each of the alignments and design concepts was evaluated for their consistency with the project purpose and need, as well as its relationship to the surrounding area, neighborhoods, and the larger urban fabric of Lakeland, carefully addressing the context to create an enjoyable, functional, and safe experience for users that coexists comfortably with the Lake Hunter setting.

Trail options were combined using location-specific placement to create a series of potential alignments and design concepts for each trail segment. The design concepts were then evaluated for their consistency with the project purpose and need; support of project objectives; engineering constraints and considerations; potential impacts to community, cultural, and natural resources; and the order of magnitude implementation costs, as described in greater detail below.

Segment 1 Alignments

Segment 1, which runs between Ariana Street and Lake Hunter Drive, has two alignment options, with four design concepts, as shown below on **Figure 10**.

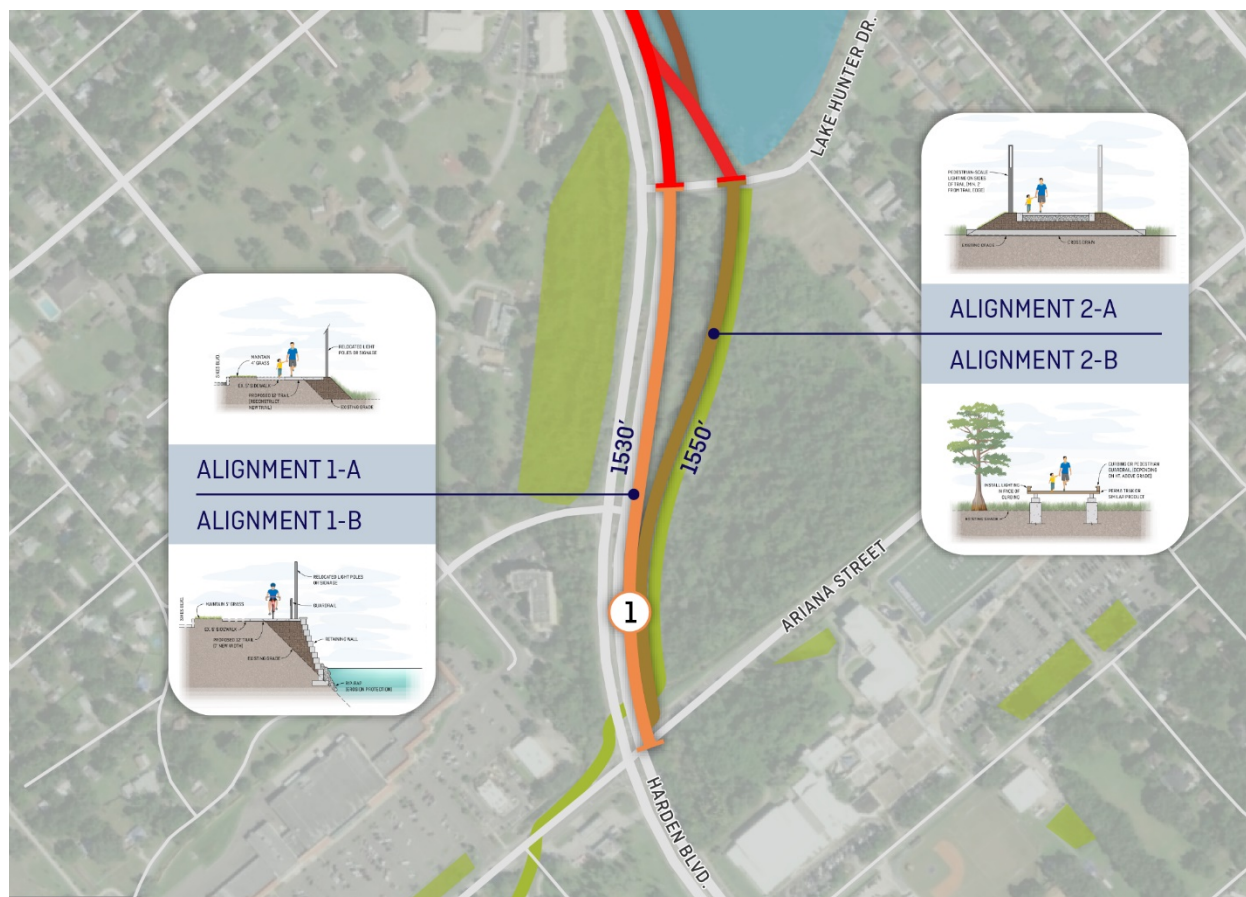


Figure 10: Segment 1 Alignment Options and Design Concepts

Segment 1, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	North of Ariana Street there presently exists Flood Zones A and AE on the east side of Sikes Boulevard. Flood Zone A runs adjacent to Sikes Boulevard within 15 feet of the existing sidewalk edge. Expansion of the existing sidewalk on fill will result in direct impacts to the adjacent flood zone requiring cup for cup compensation to mitigate for impacted floodplain volume.	\$8,000
Structures	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the NE quadrant of the Ariana Street intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall. Concrete signal poles at the intersection of Sikes Boulevard and Central Avenue and Sikes Boulevard and Lake Hunter Drive would require relocation. A number of roadside signs would require relocation.	\$101,000
Utilities	On the east side of Sikes Boulevard, seven light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Central Avenue and Sikes Boulevard and Lake Hunter Drive due to the relocation of signal poles.	\$228,000
Environmental	Potential impacts (direct and secondary) could occur after the Sikes Boulevard and Central Avenue intersection on the southeast side of the road to Lake Hunter Drive. Direct impacts are approximately 0.1 or less acres and secondary impacts are approximately 0.5 or less acres.	\$33,660
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$258,000

Table 2: Segment 1, Alignment 1-A Summary Evaluation

Segment 1, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	Similar to Alignment 1-A, impacts to existing floodplains will require cup for cup compensation to meet SWFWMD requirements. Inclusion of retaining wall will reduce floodplain impacts.	\$229,000
Structures	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the NE quadrant of the Ariana Street intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall. Concrete signal poles at the intersection of Sikes Boulevard and Central Avenue and Sikes Boulevard and Lake Hunter Drive would require relocation. A number of roadside signs would require relocation.	\$1,202,000
Utilities	On the east side of Sikes Boulevard, seven light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Central Avenue and Sikes Boulevard and Lake Hunter Drive due to the relocation of signal poles.	\$228,000
Environmental	This alignment option would alleviate an additional 5 feet of impact area to wetlands along the same path mentioned in Alignment 1-A. Potentially no direct impacts could occur with this option and decrease secondary impacts to approximately 0.3 or less acres.	\$10,800
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$222,000

Table 3: Segment 1, Alignment 1-B Summary Evaluation

Segment 1, Alignment 2-A: trail on existing grade		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment runs parallel between Flood Zone A on the west side of the trail and a regulatory floodway on the east. The horizontal distance between these flood zones is approximately 21 feet at some locations. A 30 foot wide impact area would directly impact both flood zones resulting in a need for cup for cup compensation. Impacts north of Flood Zone A should be minimized. Due to the slope of the existing grade and proximity to flood zones, this area is likely to be inundated during high rain events, potentially rendering the trail unusable.	\$8,000
Structures	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the NE quadrant of the Ariana Street intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall.	\$3,000
Utilities	One light pole will require relocation.	\$11,000
Environmental	Approximately 300 feet of the proposed alignment from the Sikes Boulevard and Central Avenue intersection to the northeast towards Lake Hunter could potentially impact wetland systems. Potential for up to 0.45 acres of direct impacts and up to 0.40 acres of secondary impacts.	\$84,870
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$270,000

Table 4: Segment 1, Alignment 2-A Summary Evaluation

Segment 1, Alignment 2-B: boardwalk over land		
Topic Area	Impacts	Design Costs
Storm Drainage	Implementating a boardwalk over existing grade reduces impacts to flood zone areas. Impacts to flood zones is negligible as long as the boardwalk elevation is constructed above the base flood elevation. Due to the slope of the existing grade and proximity to flood zones, this area is likely to be inundated during high rain events, potentially rendering the trail unusable.	\$0
Structures	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution. Assuming the path has a width of ten feet or less in the area of the existing drainage culvert (located in the NE quadrant of the Ariana Street intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall.	\$2,263,000
Utilities	One light pole will require relocation.	\$11,000
Environmental	Implementing a boardwalk over existing land/wetlands would reduce overall wetland impacts compared to at-grade options. Potential for up to 0.02 acres of direct wetland impacts from piles. Potential for 0.10 acres of secondary shading impacts from boardwalk.	\$6,732
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$31,000

Table 5: Segment 1, Alignment 2-B Summary Evaluation

Evaluation Notes

Flood Zones A and AE are present on the east side of Sikes Boulevard. Flood Zone A runs adjacent to Sikes Boulevard within 15 feet of the existing sidewalk edge. While expansion of the existing sidewalk on fill will result in direct impacts to the adjacent flood zone requiring cup for cup compensation to mitigate for impacted floodplain volume, the mitigation costs are significantly less than the cost of a retaining wall over this same length.

The conservation areas between Sikes Boulevard and the alignments away from the roadway are densely vegetated – selective thinning/clearing of vegetation for increased visibility is unlikely due to regulatory restrictions for these areas.

For the design concepts away from Sikes Boulevard, potential flooding of the area during heavy rainfall events is an important consideration, not only for trail closing, but in terms of additional maintenance required to keep the trail operational after these events. Raising the trail above flood elevations using a boardwalk significantly increases cost for this segment.

Recommendation

It is recommended that Alignments 1-A and 1-B be carried forward to PD&E.

Alignments 2-A and 2-B pose potential issues in several areas, including safety (visibility from road), perception of homelessness and drug use in the area, the possibility for this segment of the trail to be unusable during/after heavy rainfall events due to flooding, cost, and location outside of FDOT right-of-way, eliminating these design concepts as recommendations.

Segment 2 Alignments

Segment 2, which runs between Lake Hunter Drive and Greenwood Street, has two alignment options, with six design concepts, as shown below on **Figure 11**.



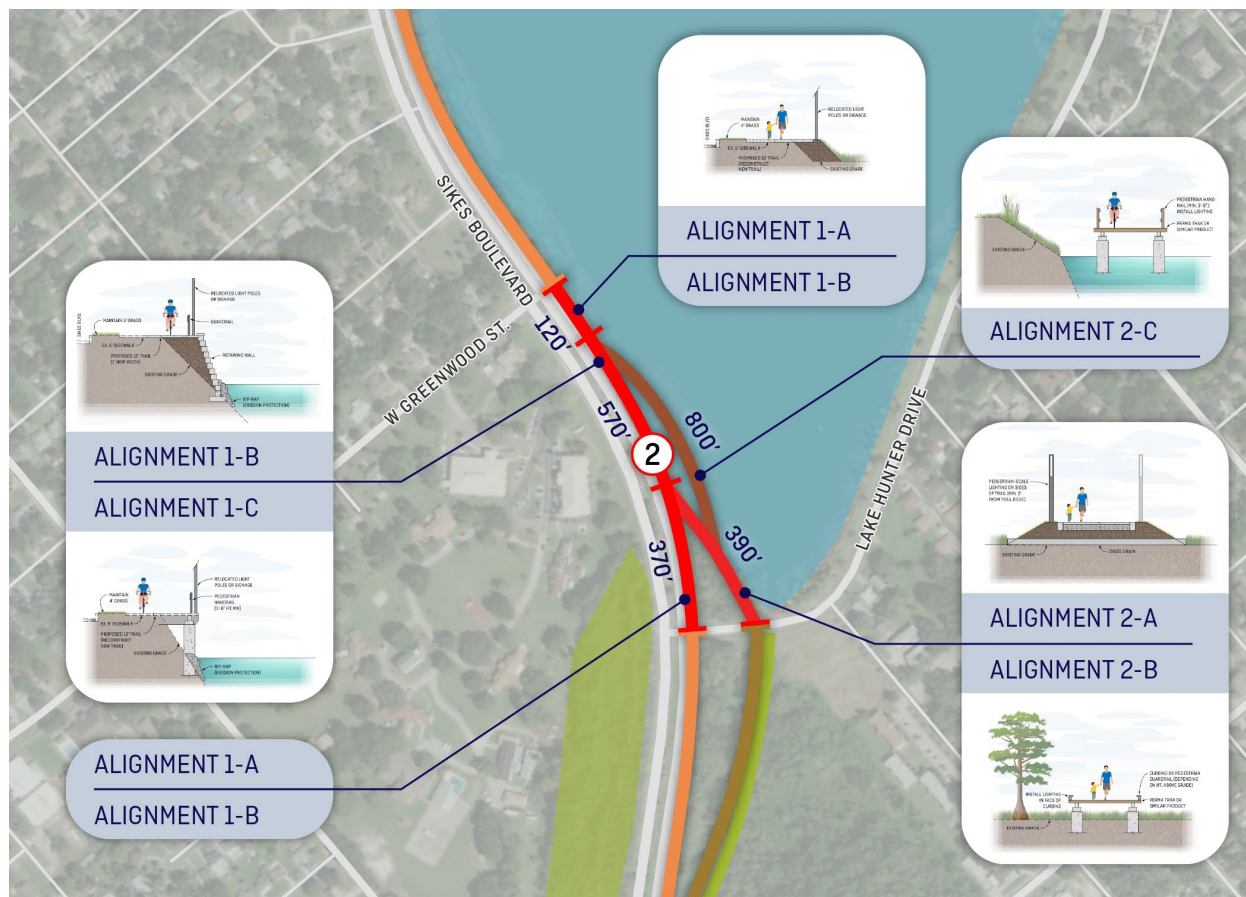


Figure 11: Segment 2 Alignment Options and Design Concepts

Segment 2, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	Proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is designated Flood Zone AE. Areas with minimal clear zone width will require retaining walls to meet FDOT requirements. Impacts to Lake Hunter due to fill will require cup for cup compensation.	\$1,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Lake Hunter Drive and the intersection of Sikes Boulevard and Greenwood Street would require relocation. A number of roadside signs would require relocation.	\$66,000
Utilities	On the east side of Sikes Boulevard, two light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Greenwood Street due to the relocation of signal poles.	\$95,000
Environmental	This alignment could have up to 0.07 acres of direct wetland impacts and 0.20 acres of secondary wetland impacts. This area of impact occurs on the southern portion of the alignment. The northern portion of the alignment appears to fit within the transportation land use area with minimal secondary impacts anticipated.	\$18,162
Roadway	Requires the removal of guard rail.	\$0

Other	Site work	\$44,000
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Table 6: Segment 2, Alignment 1-A Summary Evaluation

Segment 2, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment reduces impacts to the Lake Hunter flood zone. Any impacts to the existing flood zone will require cup for cup compensation.	\$159,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Lake Hunter Drive and the intersection of Sikes Boulevard and Greenwood Street would require relocation. A number of roadside signs would require relocation.	\$1,039,000
Utilities	On the east side of Sikes Boulevard, four light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Greenwood Street due to the relocation of signal poles.	\$123,000
Environmental	The retaining wall option would decrease direct impacts compared to Alignment 1-A. Direct wetland impacts could be up to 0.02 acres with 0.01 acres of secondary impacts.	\$3,492
Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$173,000

Table 7: Segment 2, Alignment 1-B Summary Evaluation

Segment 2, Alignment 1-C: trail on fill with cantilever		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment seems to fit the 20 foot threshold between the edge of trail to Lake Hunter water line. Impacts from this alignment are potentially negligible.	\$139,000
Structures	A number of roadside signs would require relocation.	\$990,000
Utilities	On the east side of Sikes Boulevard, two light poles and the existing fiber/cable markers will have to be relocated.	\$27,000
Environmental	This option would have impacts similar to the retaining wall option in alignment 1-B.	\$3,492
Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$60,000

Table 8: Segment 2, Alignment 1-C Summary Evaluation

Segment 2, Alignment 2-A: trail on existing grade		
Topic Area	Impacts	Design Costs
Storm Drainage	Implementation of the proposed trail on existing grade meets slope and clear zone requirements. The existing grade for this alignment is low and in close proximity to the Lake Hunter flood zone, which likely causes inundation during high rain events, potentially rendering the trail unusable. Impacts to the flood zone should be minimized.	\$1,000
Structures	A single roadside sign would require relocation.	\$4,000
Utilities	There are no impacts anticipated.	\$0
Environmental	This alignment option could have up to 0.3 acres of direct impacts and 0.2 acres for surrounding secondary impacts.	\$54,180

Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$67,000

Table 9: Segment 2, Alignment 2-A Summary Evaluation

Segment 2, Alignment 2-B: boardwalk over land		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	\$0
Structures	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	\$728,000
Utilities	There are no impacts anticipated.	\$0
Environmental	Direct impacts from pilings would be approximately 0.2 acres. With this option, secondary shading impacts could be approximately 0.13 acres and secondary impacts associated with construction of the boardwalk would be approximately 0.2 acres.	\$15,012
Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$0

Table 10: Segment 2, Alignment 2-B Summary Evaluation

Segment 2, Alignment 2-C: scenic boardwalk over water		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	\$0
Structures	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	\$1,685,000
Utilities	There are no impacts anticipated.	\$0
Environmental	There is potential for 0.04 acres of direct impacts from pilings and 0.3 acres of secondary shading impacts from the boardwalk.	\$17,064
Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$0

Table 11: Segment 2, Alignment 2-C Summary Evaluation

Evaluation Notes

In the northern portion of this segment, the proposed trail edge comes within twenty-feet of the lake, bringing into play consideration of both wetland impacts and floodplain compensation, as well as modification of the existing Lake Hunter stormwater permit.

The conservation areas between Sikes Boulevard and the alignments away from the roadway are densely vegetated – selective thinning/clearing of vegetation for increased visibility is unlikely due to regulatory restrictions for these areas.

For the design concepts away from Sikes Boulevard, potential flooding of the area during heavy rainfall events is an important consideration, not only for trail closing, but in terms of additional maintenance required to keep the trail operational after these events. Raising the trail above flood elevations using a boardwalk significantly increases cost for this segment.

Recommendation

It is recommended that Alignments 1-A (southern portion) and 1-B (northern portion), used in combination for this segment, be carried forward to PD&E.

Alignment 1-C offers little additional benefit over Alignment 1-B and has increased construction costs and potential maintenance issues, eliminating this design concept as a recommendation.

Alignments 2-A and 2-B pose potential issues in several areas, including safety (visibility from road), perception of homelessness and drug use in area, the possibility for this segment of the trail to be unusable during/after heavy rainfall events due to flooding, cost, and location outside of FDOT right-of-way, eliminating these design concepts as recommendations.

Although Alignment 2-C would provide a picturesque scenic lake overlook and help mitigate the grade change between the lake bank and Sikes Boulevard, the construction and maintenance costs, as well as the location outside the FDOT right-of-way, eliminate this design concept as a recommendation.

Segment 3 Alignments

Segment 3, which runs between Greenwood Street and Hartsell Avenue, has two alignment options, with four design concepts, as shown below on **Figure 12**.





Figure 12: Segment 3 Alignment Options and Design Concepts

Segment 3, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	The proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is designated Flood Zone AE. Areas with minimal clear zone width will require retaining walls. Impacts to Lake Hunter due to fill will require compensation. There are existing stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	\$33,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Greenwood Street would require relocation. A number of roadside signs would require relocation.	\$35,000
Utilities	On the east side of Sikes Boulevard, seven light poles and the existing fiber/cable markers will have to be relocated.	\$89,000
Environmental	There is potential for 0.02 acres of direct wetland impacts toward the northern portion of this alignment across from Hartzell Avenue. Potential for up to 0.2 acres of secondary impacts. The remaining stretch of the alignment appears to fit without any major impacts between Sikes Boulevard and the wetland edge of Lake Hunter.	\$10,332

Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$161,000

Table 12: Segment 3, Alignment 1-A Summary Evaluation

Segment 3, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	The addition of a retaining wall reduces flood zone impacts as well as fill requirements. Minimal impacts are anticipated with this alignment. There are estimated to be six stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	\$56,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Greenwood Street and the intersection of Sikes Boulevard and Hartsell Avenue would require relocation. A number of roadside signs would require relocation.	\$1,123,000
Utilities	On the east side of Sikes Boulevard, eight light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Hartsell Avenue due to the relocation of signal poles.	\$171,000
Environmental	This alignment would alleviate an additional five feet of impact area to wetlands along the same path mentioned in Alignment 1-A. There are potentially no direct impacts that would occur with this option and it would have potential secondary impacts of 0.1 acres.	\$3,600
Roadway	Requires the removal of a guard rail.	\$0
Other	Site work	\$292,000

Table 13: Segment 3, Alignment 1-B Summary Evaluation

Segment 3, Alignment 1-C: trail on fill with cantilever		
Topic Area	Impacts	Design Costs
Storm Drainage	Fill within the Lake Hunter flood zone will require floodplain compensation. Fill outside of the flood zone poses minimal to no impacts. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	\$29,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Hartsell Avenue would require relocation. A number of roadside signs would require relocation.	\$301,000
Utilities	On the east side of Sikes Boulevard, one light pole will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Boulevard and Hartsell Avenue due to relocation of signal poles.	\$82,000
Environmental	This alignment option appears to fit within the existing area between Sikes Boulevard and the edge of Lake Hunter. Potential for up to 0.1 acres of secondary impacts.	\$3,600
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$16,000

Table 14: Segment 3, Alignment 1-C Summary Evaluation

Segment 3, Alignment 2-A: scenic boardwalk over water		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	\$24,000
Structures	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	\$905,000
Utilities	There are no impacts anticipated.	\$0
Environmental	Potential for 0.01 acres of direct impacts from piles and up to 0.06 acres of secondary shading impacts.	\$3,726
Roadway	Requires the removal of guard rail.	\$0
Other	Site work	\$0

Table 15: Segment 3, Alignment 2-A Summary Evaluation

Evaluation Notes

In the northern portion of this segment, the proposed trail edge comes within twenty-feet of the lake, bringing into play consideration of both wetland impacts and floodplain compensation, as well as modification of the existing Lake Hunter stormwater permit.

The southern portion of this segment has the greatest distance between proposed trail edge and lake, making it an area that can have gently sloping grass banks with a variety of amenities such as benches, shade trees, and public art. Handrails may not be needed along this segment. There may be an opportunity here to provide an arbor or gazebo that provides the scenic overlook to Lake Hunter and downtown Lakeland.

Recommendation

It is recommended that Alignments 1-A (southern portion) and 1-B (northern portion), used in combination for this segment, be carried forward to PD&E.

Alignment 1-C offers little additional benefit over Alignment 1-B and has increased construction costs and potential maintenance issues, eliminating this design concept as a recommendation.

Although Alignment 2-A would provide a picturesque scenic lake overlook and lake access, the construction and maintenance costs, as well as the location outside the FDOT right-of-way, eliminate this design concept as a recommendation.

Segment 4 Alignments

Segment 4, which runs between Hartsell Avenue and the Lake Hunter boat ramp entrance, has two alignment options, with four design concepts, as shown below on **Figure 13**.





Figure 13: Segment 4 Alignment Options and Design Concepts

Segment 4, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	The proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is designated Flood Zone AE. Areas with minimal clear zone width will require retaining walls. Impacts to Lake Hunter due to fill will require compensation. There are existing stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions. Impacts to the previously permitted retention pond (No. 4814.000) east of Sikes Boulevard could require permit modification and compensation.	\$12,000
Structures	There are no structural impacts.	\$0
Utilities	On the east side of Sikes Boulevard, two light poles and the existing fiber/cable markers will have to be relocated.	\$28,000
Environmental	The first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sikes Boulevard and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	\$26,460
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$36,000

Table 16: Segment 4, Alignment 1-A Summary Evaluation

Segment 4, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	Addition of retaining wall reduces flood zone impacts as well as fill requirements. Minimal impacts are anticipated with this alignment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions. Impacts to the existing permitted retention pond could require a permit modification and compensation.	\$106,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Hartsell Avenue would require relocation. A number of roadside signs would require relocation.	\$814,000
Utilities	On the east side of Sikes Boulevard, two light poles and the existing fiber/cable markers will have to be relocated.	\$55,000
Environmental	The first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sikes Boulevard and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	\$26,460
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$162,000

Table 17: Segment 4, Alignment 1-B Summary Evaluation

Segment 4, Alignment 1-C: trail on fill with cantilever		
Topic Area	Impacts	Design Costs
Storm Drainage	Fill within the Lake Hunter flood zone will require floodplain compensation. Fill outside of the flood zone poses minimal to no impacts. Construction of the trail or fill impacting the existing stormwater MES structures will require pipe extensions. Impacts to the existing permitted retention pond could require a permit modification and compensation.	\$102,000
Structures	Concrete signal poles at the intersection of Sikes Boulevard and Hartsell Avenue would require relocation. A number of roadside signs would require relocation.	\$1,091,000
Utilities	On the east side of Sikes Boulevard, two light poles and the existing fiber/cable markers will have to be relocated.	\$28,000
Environmental	The first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sikes Boulevard and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	\$26,460
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$65,000

Table 18: Segment 4, Alignment 1-C Summary Evaluation

Segment 4, Alignment 2-A: scenic boardwalk over water		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment poses minimal impacts to the existing flood zones for stormwater conveyance.	\$93,000

Structures	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	\$1,478,000
Utilities	There are no impacts anticipated.	\$0
Environmental	Potential for 0.03 acres of direct impacts from pilings and 0.2 acres of secondary shading impacts from the boardwalk.	\$11,898
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$0

Table 19: Segment 4, Alignment 2-A Summary Evaluation

Evaluation Notes

In the western portion of this segment, the proposed trail edge comes within twenty-feet of the lake, bringing into play consideration of both wetland impacts and floodplain compensation, as well as modification of the existing Lake Hunter stormwater permit. While expansion of the existing sidewalk on fill will result in direct impacts to the adjacent flood zone requiring cup for cup compensation to mitigate for impacted floodplain volume, the mitigation costs are significantly less than the cost of a retaining wall over this same length.

Recommendation

It is recommended that Alignments 1-A (eastern portion) and 1-B (western portion), used in combination for this segment, be carried forward to PD&E.

Alignment 1-C offers little additional benefit over Alignment 1-B and has increased construction costs and potential maintenance issues, eliminating this design concept as a recommendation.

Although Alignment 2-A would provide a picturesque scenic lake overlook and lake access, the construction and maintenance costs, as well as the location outside the FDOT right-of-way, eliminate this design concept as a recommendation.

Segment 5 Alignments

Segment 5, which runs between the Lake Hunter boat ramp entrance and the RP Funding Center parking entrance, has one alignment options, with two design concepts, as shown below on **Figure 14**.





Figure 14: Segment 5 Alignment Options and Design Concepts

Segment 5, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	This alignment runs parallel along a steeply sloped conveyance ditch. The existing ditch slope begins within 5-10 feet of the edge of sidewalk. Fill within the ditch directly impacts the flow rate and conveyance of stormwater runoff. Impacts to conveyance should be quantified during design. This alignment impacts an existing MES structure north of the Lake Hunter boat ramp entrance. Impacts to existing side drains and a previously permitted sidewalk culvert are anticipated.	\$116,000
Structures	One roadside sign would require relocation.	\$400
Utilities	On the east side of Sikes Boulevard, four light poles will have to be relocated.	\$57,000
Environmental	This alignment would only have impacts to conveyance ditches. It appears that this impact would be characterized as an "Other Surface Water" impact.	\$0
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$209,000

Table 20: Segment 5, Alignment 1-A Summary Evaluation

Segment 5, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	Addition of retaining wall reduces impacts to the existing conveyance ditch. Fill below the retaining wall and within the ditch impacting conveyance should be quantified during the design phase. This alignment impacts an existing MES structure north of the Lake Hunter boat ramp entrance. Impacts to existing side drains and sidewalk culvert are not likely but could occur.	\$276,000
Structures	One roadside sign would require relocation.	\$736,000
Utilities	On the east side of Sikes Boulevard, four light poles will have to be relocated.	\$57,000
Environmental	This alignment would only have impacts to conveyance ditches. It appears that this impact would be characterized as an "Other Surface Water" impact.	\$0
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$183,000

Table 21: Segment 5, Alignment 1-B Summary Evaluation

Evaluation Notes

The drainage ditch cross-section will a major factor in the final design for this segment. Options for maintaining ditch conveyance capacity may be hindered by both trail expansion and the far embankment, which has shallow slopes and a wood fence marking the rear lot lines of adjacent single-family residential lots.

Recommendation

Despite the significant difference in cost between the two design concepts, it is recommended that both Alignment 1-A and Alignment 1-B be carried forward to PD&E due to the importance of accommodating the storm drainage conveyance system.

Segment 6 Alignments

Segment 6, which runs between the RP Funding Center parking entrance and Lime Street, has one alignment option, with two design concepts, as shown below on **Figure 15**.



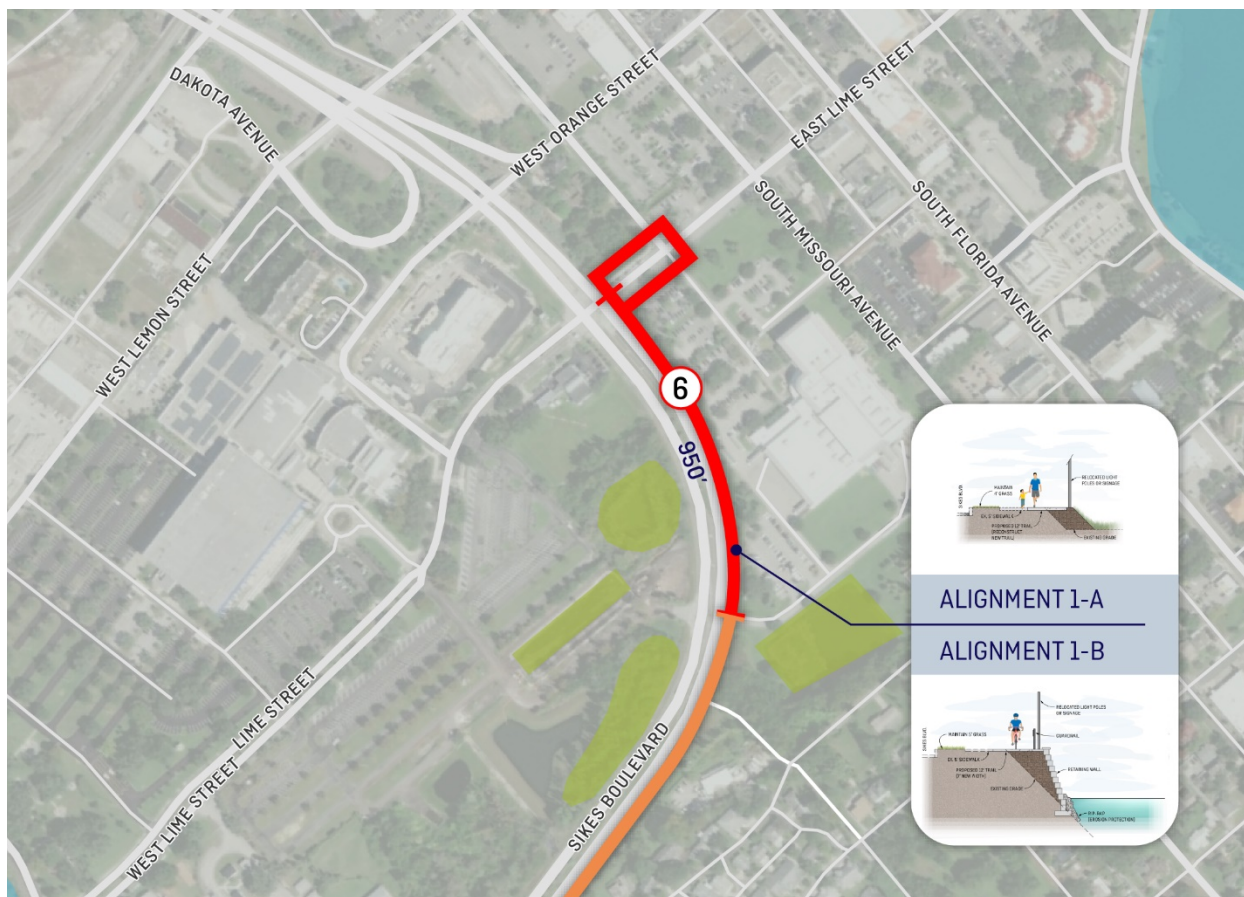


Figure 15: Segment 6 Alignment Options and Design Concepts

Segment 6, Alignment 1-A: trail on fill with grassed slope		
Topic Area	Impacts	Design Costs
Storm Drainage	Existing conveyance ditches run parallel to the to the proposed alignment and have steep side slopes. Analysis of ditch impacts will be quantified during design.	\$0
Structures	The two mast arms on the east side of the Sikes Boulevard and Lime Street intersection may require relocation. A number of roadside signs will require relocation.	\$130,000
Utilities	On the east side of Sikes Boulevard, four light poles will have to be relocated. Four pedestrian signals will have to be relocated at the Sikes Boulevard and Lime Street intersection.	\$51,000
Environmental	The majority of this alignment appears to be within the Transportation land use designation and it appears that there would be no wetland impacts.	\$0
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$176,000

Table 22: Segment 6, Alignment 1-A Summary Evaluation

Segment 6, Alignment 1-B: trail on fill with retaining wall		
Topic Area	Impacts	Design Costs
Storm Drainage	Addition of retaining wall reduces impacts to the existing conveyance ditch. Analysis of ditch impacts will be quantified during design.	\$161,000
Structures	The two mast arms on the east side of the Sikes Boulevard and Lime Street intersection may require relocation. A number of roadside signs will require relocation.	\$824,000
Utilities	On the east side of Sikes Boulevard, four light poles will have to be relocated. Four pedestrian signals will have to be relocated at the Sikes Boulevard and Lime Street intersection.	\$51,000
Environmental	The majority of this alignment appears to be within the Transportation land use designation and it appears that there would be no wetland impacts.	\$0
Roadway	No impacts to existing roadway.	\$0
Other	Site work	\$154,000

Table 23: Segment 6, Alignment 1-B Summary Evaluation

Evaluation Notes

The drainage ditch cross-section will a major factor in the final design for this segment. Options for maintaining ditch conveyance capacity may be hindered by both trail expansion and the far embankment, which has shallow slopes with landscaping consisting of both hedge plants and shade trees, both meant as buffers for the Ledger Building parking areas.

Recommendation

Despite the significant difference in cost between the two design concepts, it is recommended that both ALignment 1-A and Alignment 1-B be carried forward to PD&E due to the importance of accommodating the storm drainage conveyance system.

Speed Management - Roadway Median Reduction

This option runs the entire length of the corridor and involves shifting the northbound travel lanes to the west by reducing the width of center median. The primary purpose of this shift is to provide additional buffer/green space between the curbline and the proposed trail, but it can also serve as a speed management tool by reducing the lane widths.

Evaluation Notes

The cost for this work is estimated at \$1,383,000. Further investigation will be needed to evaluate the median reduction impact in locations where there will be no physical separation between left turning vehicles and opposing traffic. It may not be possible to reduce the median width uniformly along the length of the corridor.

Recommendation

It is recommended that this option be carried forward to PD&E due to stakeolder input regarding vehicle speeds, as well as the lack of ambiance and safety with the curbline being only five feet from the trail.

Amenities and Other Trail Features

Although the W. Lake Hunter Trail exists as part of the larger urban trail network throughout Lakeland, work still needs to be done in conjunction with the trail widening to stimulate its use and get people outside and

walking or bicycling. The trail should attract diverse users by including amenities that make the trail a comfortable, convenient, and safe place to exercise and socialize. The following amenities, safety features, and technology are recommended for inclusion as trail enhancements:

Trail Amenities, Safety Features and Technology		
Item	Notes	Cost
Benches	Match street furniture palette in downtown area. Priority locations – Segments 3 and 4.	\$1,500
Trash receptacle	Match street furniture palette in downtown area. Locate in conjunction with benches.	\$1,000
Bicycle repair station	Provide a stand to hold bikes off the ground, tire pump, and a variety of tools (attached to station aircraft grade cables).	\$750
Bicycle rack	Work in conjunction with art organizations to create themed racks.	\$500
Wayfinding signage	Should be part of a larger directional system within Lakeland or part of the <i>Lake to Lake Greenway and Bikeway Network</i> . Replace damaged and weathered signs.	\$3,000
Reference location markers	Mile or location markers on trail pavement	\$50
Doggie waste station	Aluminum system with sign, dispenser, and waste receptacle.	\$250
Pedestrian scale lighting	Match lighting on the west side of Sikes Boulevard that extends into neighborhoods. Use for entire length of trail – locate pedestrian-scale fixtures between existing vehicular light poles at approximately 120' o.c.	\$3,500
Lighted bollards	Locate at pedestrian crossing locations at intersections.	\$750
Emergency call box	Solar powered, ADA compliant communication box with camera and strobe light.	\$2,500
Eco-counters	Eco-counters provide real time trail user data. An urban multi-counter can differentiate bicycles from pedestrians and indicate direction of travel.	\$10,000
Street trees	For shade (priority location – Segment 3) and mitigation necessitated by construction of other improvements. Match tree palette in area.	\$500
Pergola or shade sail	For shade (priority location – Segment 3) and to provide a scenic viewing spot for lake and downtown.	\$5,000
Public art	Work with the Mayor's Council on the Arts, Platform Art, and other city organizations to create public art installations along the Lake Hunter banks and boat ramp area.	\$0

Table 24: Recommended Trail Amenities, Safety Features, and Technology

Pedestrian Intersection Improvements

A common issue cited by stakeholders is that crossing Sikes Boulevard is often times a daunting adventure, due to speeding vehicles and lack of pedestrian amenities at crossing locations. This is especially troublesome crossing Lime Street at the north end of the study corridor, where the largest numbers of

pedestrians and bicyclists (based on Streetlight data gathered for this study) are heading towards destinations downtown or to the NY Avenue cycle track. The northbound right turn lane from Sikes Boulevard to Lime Street has a large curb radius, which makes some vehicles treat this turn more as a yield condition than a stop condition, creating danger for non-motorists crossing the street. The City would also like to expand transit service in this area, so being able to cross the roadway to access bus stops takes on an added importance. While some of the amenities/safety features/technology elements listed above will improve pedestrian visibility, there are other measures recommended to enhance pedestrian safety, including:

- Enhanced high visibility crosswalk striping or taping
- In-roadway LED warning lights/flashing crosswalk (priority – Sikes Blvd./Lime St. intersection)
- All direction pedestrian crossing phase (for Sikes Blvd./Lime St. intersection and Sikes Blvd./Ariana St. intersection)
- Leading pedestrian interval in the signal timing cycle
- Shorter timing cycle lengths on Sikes Boulevard
- No right turn on red when pedestrian crossing button has been activated (priority – Sikes Blvd./Lime St. intersection)
- RRFB (rectangular rapid flashing beacons) at pedestrian crossing locations (except the Sikes Blvd./Lime St. and Sikes Blvd./Ariana St. intersections)
- Improved lighting specifically aimed at crossing locations

General Design Notes

Design considerations that apply project-wide include the following:

- There may be soil concerns due to high water and organic content. This could affect the construction and maintenance of slopes for the trail near the lake, as well as long term protection of boardwalks or retaining walls.
- This area contains historic and socioeconomic assets that may require additional cultural resource and public involvement activities.

Summary

This project provides an opportunity to enhance linkages within the City of Lakeland trail system, especially connecting the Lake Hunter neighborhoods with the downtown area, Lake Beulan, Veteran's Memorial Park, and Bonnet Springs Park, the new core of the City's park system.

Trails help build great communities. The W. Lake Hunter Trail enhances the City's *Lake-to-Lake Greenway and Bikeway Network* and FDOT's active transportation goals by:

- Improving quality of life
- Connecting destinations
- Improving mobility choices for residents of adjacent neighborhoods
- Reducing vehicle trips/congestion/crashes
- Improving health and physical activities
- Maintaining a safe environment for people of all ages and abilities



- Increasing accessibility and equity
- Providing opportunities for social engagement
- Increasing property values
- Protecting natural resources



Appendix A – Drainage Costs

The following spreadsheet details costs for drainage items summarized in each of the alignments:



Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
1	1-A Trail on fill with grassed slope	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the north-east quadrant of the Ariana St intersection), no extension of the culvert is anticipated. North of Adriana St. there presently exists Flood Zones A and AE on the East side of Sikes Blvd. Flood Zone A runs adjacent to Sikes Blvd. within 15 feet of the existing sidewalk edge. Expansion of the existing sidewalk on fill will result in direct impacts to the adjacent flood zone requiring cup for cup compensation to compensate for impacted floodplain volume.	MITERED END SECTION, OPTIONAL ROUND, 24"CD	430-982-129	1	EA	\$1,859.09	\$1,859.09	\$8,000.00	Cross drain extension, excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	430-175-124	16	LF	\$108.27	\$1,732.32		
			REGULAR EXCAVATION (FPC)	120-1	510	CY	\$9.14	\$4,661.40		
	1-B Trail on fill with retaining wall	See drainage impacts for Alignment 1-A. Inclusion of retaining wall will reduce floodplain impacts.	RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	1,235.2	TN	\$130.00	\$160,571.97	\$229,000.00	Cross drain extension, excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs), riprap along wall.
			BEDDING STONE	530-74	439.9	TN	\$147.78	\$65,004.73		
			MITERED END SECTION, OPTIONAL ROUND, 24"CD	430-982-129	1	EA	\$1,859.09	\$1,859.09		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	430-175-124	16	LF	\$108.27	\$1,732.32		
			REGULAR EXCAVATION (FPC)	120-1	397	CY	\$9.14	\$3,625.53		
	2-A Trail on existing ground	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the north-east quadrant of the Ariana St intersection), no extension of the culvert is anticipated. This alignment runs parallel between Flood Zone A on the west side of the trail and a regulatory floodway on the east. The horizontal distance between these flood zones is approximately 21 feet at some locations. A 30 foot wide impact area would directly impact both flood zones resulting in a need for cup for cup compensation. Impacts north of Flood Zone A should be minimized.	MITERED END SECTION, OPTIONAL ROUND, 24"CD	430-982-129	1	EA	\$1,859.09	\$1,859.09	\$8,000.00	Cross drain extension, excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	430-175-124	16	LF	\$108.27	\$1,732.32		
			REGULAR EXCAVATION (FPC)	120-1	516.7	CY	\$9.14	\$4,722.33		
	2-B Boardwalk over land	Implementing a boardwalk over existing grade reduces impacts to flood zone areas. Impacts to flood zones is negligible as long as the boardwalk elevation is constructed above the base flood elevation.	NO DRAINAGE COMPONENTS						\$0.00	No drainage components.
2	1-A Trail on fill with grassed slope	Proximity of the proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is a designated Flood Zone AE. Impacts to Lake Hunter due to fill will require cup for cup compensation.	REGULAR EXCAVATION (FPC)	120-1	163.3	CY	\$9.14	\$1,492.87	\$1,000.00	Excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
	1-B Trail on fill with retaining wall	This alignment reduces impacts to the Lake Hunter flood zone. Any impacts to the existing flood zone will require cup for cup compensation.	RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	855.7	TN	\$130.00	\$111,245.94	\$159,000.00	Excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs), riprap along wall.
			REGULAR EXCAVATION (FPC)	120-1	275	CY	\$9.14	\$2,511.81		
			BEDDING STONE	530-74	304.8	TN	\$147.78	\$45,035.96		
	1-C Trail on fill with cantilever	This alignment seems to fit the 20 foot threshold between edge of trail to Lake Hunter water line. Impacts from this alignment are potentially negligible.	RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	758.9	TN	\$130.00	\$98,652.06	\$139,000.00	Riprap along wall.
			BEDDING STONE	530-74	270.3	TN	\$147.78	\$39,937.55		
	2-A Trail on existing grade	Implementation of the proposed trail on existing grade meets slope and clear zone requirements. The existing grade for this alignment is low and in close proximity to the Lake Hunter flood zone. Impacts to flood zone should be minimized.	REGULAR EXCAVATION (FPC)	120-1	130	CY	\$9.14	\$1,188.20	\$1,000.00	Excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
	2-B Boardwalk over land	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	NO DRAINAGE COMPONENTS						\$0.00	No drainage components.
	2-C Scenic boardwalk over water	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	NO DRAINAGE COMPONENTS						\$0.00	No drainage components.

Seq.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
3	1-A Trail on fill with grassed slope	Proximity of the proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is a designated Flood Zone AE. Impacts to Lake Hunter due to fill will require compensation. There are estimated to be 6 stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	MITERED END SECTION, OPTIONAL ROUND, 24"CD	430-982-129	2	EA	\$1,859.09	\$3,718.18	\$33,000.00	Cross drain extensions, excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
			MITERED END SECTION, OPTIONAL ROUND, 30"CD	430-982-133	2	EA	\$2,775.20	\$5,550.40		
			MITERED END SECTION, OPTIONAL ROUND, 36"CD	430-982-138	2	EA	\$3,454.95	\$6,909.90		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	430-175-124	32	LF	\$108.27	\$3,464.64		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	430-175-130	32	LF	\$127.33	\$4,074.56		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	430-175-136	32	LF	\$140.05	\$4,481.60		
	1-B Trail on fill with retaining wall	The addition of a retaining wall reduces flood zone impacts as well as fill requirements. Minimal impacts are anticipated with this alignment. There are estimated to be 6 stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	REGULAR EXCAVATION (FPC)	120-1	546.7	CY	\$9.14	\$4,996.53	\$56,000.00	Cross drain extensions, excavation to provide floodplain compensation (draft estimates provided, design required to confirm floodplain impacts and compensation needs), riprap along wall.
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	129.2	TN	\$130.00	\$16,791.84		
			BEDDING STONE	530-74	46.0	TN	\$147.78	\$6,797.88		
			MITERED END SECTION, OPTIONAL ROUND, 24"CD	430-982-129	2	EA	\$1,859.09	\$3,718.18		
			MITERED END SECTION, OPTIONAL ROUND, 30"CD	430-982-133	2	EA	\$2,775.30	\$5,550.60		
			MITERED END SECTION, OPTIONAL ROUND, 36"CD	430-982-138	2	EA	\$3,454.95	\$6,909.90		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"S/CD	430-175-124	32	LF	\$108.27	\$3,464.64		
			PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 30"S/CD	430-175-130	32	LF	\$127.33	\$4,074.56		
	1-C Trail on fill with cantilever	Fill within the Lake Hunter flood zone will require floodplain compensation. Fill outside of the flood zone poses minimal to no impacts. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions.	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 36" S/CD	430-175-136	32	LF	\$140.05	\$4,481.60	\$29,000.00	Cross drain extension, riprap along wall.
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	129.2	TN	\$130.00	\$16,791.84		
	2-A Scenic boardwalk over water	This alignment poses minimal impacts to the existing flood zones and stormwater conveyance.	BEDDING STONE	530-74	46.0	TN	\$147.78	\$6,797.88	\$24,000.00	Riprap along wall.
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	129.2	TN	\$130.00	\$16,791.84		
			BEDDING STONE	530-74	46.0	TN	\$147.78	\$6,797.88		
4	1-A Trail on fill with grassed slope	Proximity of the proposed trail is within 20 feet of the Lake Hunter water line in some locations. According to FEMA, Lake Hunter is a designated Flood Zone AE. Areas with minimal clear zone width will require retaining walls. Impacts to Lake Hunter due to fill will require compensation. There are existing stormwater MES structures with outfall into Lake Hunter within this segment. Construction of the trail or fill impacting existing stormwater MES structures will require pipe extensions. Impacts to the previously permitted retention pond (No. 4814.000) east of Sikes Blvd. could require permit modification and compensation.	PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELIP/ARCH, 30"S/CD	430-175-230	32	LF	\$140.23	\$4,487.36	\$12,000.00	Cross drain extension, excavation to provide floodplain compensation and to expand existing pond (draft estimates provided, design required to confirm floodplain impacts and compensation needs).
			REGULAR EXCAVATION (FPC)	120-1	123.3	CY	\$9.14	\$1,127.27		
			REGULAR EXCAVATION (SMF)	120-1	200	CY	\$9.14	\$1,828.00		
			MITERED END SECTION, OPTIONAL - ELLIPTICAL/ARCH, 30" CD	430-982-633	2	EA	\$2,196.77	\$4,393.54		
	1-B Trail on fill with retaining wall	Addition of a retaining wall reduces flood zone impacts as well as fill requirements. Minimal impacts are anticipated with this alignment. Construction of a trail or fill impacting existing stormwater MES structures will require pipe extensions. Impacts to the existing permitted retention pond could require permit modification and compensation.	REGULAR EXCAVATION (FPC)	120-1	259	CY	\$9.14	\$2,369.63	\$106,000.00	Cross drain extension, excavation to provide floodplain compensation and to expand existing pond (draft estimates provided, design required to confirm floodplain impacts and compensation needs), riprap along wall.
			REGULAR EXCAVATION (SMF)	120-1	156	CY	\$9.14	\$1,421.78		
			PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELIP/ARCH, 30"S/CD	430-175-230	32	LF	\$140.23	\$4,487.36		
			MITERED END SECTION, OPTIONAL - ELLIPTICAL/ARCH, 30" CD	430-982-633	2	EA	\$2,196.77	\$4,393.54		
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	508.6	TN	\$130.00	\$66,117.87		
			BEDDING STONE	530-74	181.1	TN	\$147.78	\$26,766.65		
	1-C Trail on fill with cantilever	Fill within the Lake Hunter flood zone will require floodplain compensation. Fill outside of the flood zone poses minimal to no impacts. Construction of a trail or fill impacting the existing stormwater MES structures will require pipe extensions. Impacts to the existing permitted retention pond could require a permit modification and compensation.	MITERED END SECTION, OPTIONAL - ELLIPTICAL/ARCH, 30" CD	430-982-633	2	EA	2196.77	\$4,393.54	\$102,000.00	Cross drain extension, riprap along wall.
			PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELIP/ARCH, 30"S/CD	430-175-230	32	LF	\$140.23	\$4,487.36		
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	508.599	TN	\$130.00	\$66,117.87		
			BEDDING STONE	530-74	181.1	TN	\$147.78	\$26,766.65		
	2-A Scenic boardwalk over water	This alignment poses minimal impacts to the existing flood zones for stormwater conveyance.	RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	508.6	TN	\$130.00	\$66,117.87	\$93,000.00	Riprap along wall.
			BEDDING STONE	530-74	181.1	TN	\$147.78	\$26,766.65		

Seq.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
5	1-A Trail on fill with grassed slope	This alignment runs parallel along a steeply sloped conveyance ditch. The existing ditch slope begins within 5 to 10 feet of the edge of sidewalk. Fill within the ditch directly impacts the flow rate and conveyance of stormwater runoff. Impacts to conveyance should be quantified during design. This alignment impacts an existing MES structure north of the Lake Hunter Boat Ramp. Impacts to existing side drains and a previously permitted sidewalk culvert are anticipated.	PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELIP/ARCH, 36"S/CD	430-175-236	48	LF	\$192.50	\$9,240.00	\$116,000.00	Cross drain extension, SD extension due to encroachments into ditch.
			MITERED END SECTION, OPTIONAL - ELLIPTICAL/ARCH, 36" CD	430-982-638	3	EA	\$4,273.79	\$12,821.37		
			PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELLIP/ARCH, 36" SD	430-174-236	600	LF	\$136.49	\$81,894.00		
			MITERED END SECTION, OPTIONAL/ELLIP/ARCH, 36' SD	430-984-638	2	EA	\$5,803.00	\$11,606.00		
	1-B Trail on fill with retaining wall	Addition of a retaining wall along this segment reduces impacts to the exiting conveyance ditch. Fill below the retaining wall and within the ditch impacting conveyance should be quantified during the design phase. This alignment impacts an existing MES structure north of the Lake Hunter Boat Ramp. Impacts to existing side drains and sidewalk culvert are not likely but could occur.	PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELIP/ARCH, 36"S/CD	430-175-236	48	LF	\$192.50	\$9,240.00	\$276,000.00	Cross drain extension, SD extension due to encroachments into ditch, riprap along wall.
			RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	880.0	TN	\$130.00	\$114,394.41		
			BEDDING STONE	530-74	313.4	TN	\$147.78	\$46,310.56		
			MITERED END SECTION, OPTIONAL - ELLIPTICAL/ARCH, 36" CD	430-982-638	3	EA	\$4,273.79	\$12,821.37		
			PIPE CULVERT, OPTIONAL MATERIAL, OTHER SHAPE - ELLIP/ARCH, 36" SD	430-174-236	600	LF	\$136.49	\$81,894.00		
6	1-A Trail on fill with grassed slope	This alignment is similar to Alignment 1-A of Segment 5. Existing conveyance ditches run parallel to the proposed alignment and have steep side slopes. Analysis of ditch impacts will be quantified during design.	NO DRAINAGE COMPONENTS						\$0.00	No drainage components.
	1-B Trail on fill with retaining wall	Addition of a retaining wall along this segment reduces impacts to the exiting conveyance ditch. Analysis of ditch impacts will be quantified during design.	RIPRAP-RUBBLE, BANK AND SHORE	530-3-3	880.0	TN	\$130.00	\$114,394.41	\$161,000.00	Riprap along wall.
			BEDDING STONE	530-74	313	TN	\$147.74	\$46,298.02		
Unit Costs are based on the FDOT Historical Averages for Area Market 08 from 3/1/2020 through 2/28/2021. If not available, then the FDOT Historical Averages Statewide from 3/1/2020 through 2/28/2021 were used.										

RIPRAP - APPLIES TO RETAINING WALL AND CANTILEVER OPTIONS

W=	WEIGHT OF STONE	LBS
VOL.=	VOLUME OF STONE	FT3
S.G.=	SPECIFIC GRAVITY	
WW=	WEIGHT OF WATER	LB/FT3
VF=	VOID FACTOR	
W=	VOL.S X S.G. X WW X VF	

SEGMENT	Alignment	VOL.S (FT3)	DEPTH (FT)	LENGTH (FT)	WIDTH (FT)	S.G	WW (LB/FT3)	VF	W (LBS)	W (TN)
1	1B	19125	2.5	1530	5	2.3	62.4	0.9	2470338	1,235.2
2	1B	13250	2.5	1060	5	2.3	62.4	0.9	1711476	855.7
	1C	11750	2.5	940	5	2.3	62.4	0.9	1517724	758.9
3	1B	2000	2.5	160	5	2.3	62.4	0.9	258336	129.2
	1C	2000	2.5	160	5	2.3	62.4	0.9	258336	129.2
	2A	2000	2.5	160	5	2.3	62.4	0.9	258336	129.2
4	1B	7875	2.5	630	5	2.3	62.4	0.9	1017198	508.6
	1C	7875	2.5	630	5	2.3	62.4	0.9	1017198	508.6
	2A	7875	2.5	630	5	2.3	62.4	0.9	1017198	508.6
5	1B	13625	2.5	1090	5	2.3	62.4	0.9	1759914	880.0
6	1B	13625	2.5	1090	5	2.3	62.4	0.9	1759914	880.0

BEDDING STONE - APPLIES TO RETAINING WALL AND CANTILEVER OPTIONS

SEGMENT	Alignment	VOL (FT3)	DEPTH (FT)	LENGTH (FT)	WIDTH (FT)	W (LBS)	W (TN)
1	1B	7650	1	1530	5	879750	439.9
2	1B	5300	1	1060	5	609500	304.8
	1C	4700	1	940	5	540500	270.3
3	1B	800	1	160	5	92000	46.0
	1C	800	1	160	5	92000	46.0
	2A	800	1	160	5	92000	46.0
4	1B	3150	1	630	5	362250	181.1
	1C	3150	1	630	5	362250	181.1
	2A	3150	1	630	5	362250	181.1
5	1B	5450	1	1090	5	626750	313.4
6	1B	5450	1	1090	5	626750	313.4

Floodplain Compensation - Applies to Fill Sections

SEGMENT	Alignment	LENGTH (FT)	DEPTH (FT)	W1	W2	SLOPE	AREA (FT2)	VOLUME (FT3)	VOLUME (CY)
1	1A	1530	1	5	13	4	9	13770	510.0
	1B	1530	1	3	11	4	7	10710	396.7
	2A	1550	1	5	13	4	9	13950	516.7
2	1A	490	1	5	13	4	9	4410	163.3
	1B	1060	1	3	11	4	7	7420	274.8
	2A	390	1	5	13	4	9	3510	130.0
3	1A	1640	1	5	13	4	9	14760	546.7
	1B	1800	1	3	11	4	7	12600	466.7
4	1A	370	1	5	13	4	9	3330	123.3
	1B	1000	1	3	11	4	7	7000	259.3

SMF Compensation - Applies to Segment 4 Only Impacts to Existing Pond

SEGMENT	Alignment	LENGTH (FT)	DEPTH (FT)	W1	W2	SLOPE	AREA (FT2)	VOLUME (FT3)	VOLUME (CY)
4	1A	200	3	5	13	4	27	5400	200.0
	1B	200	3	3	11	4	21	4200	155.6

Appendix B – Structures Costs

The following spreadsheet details costs for structures summarized in each of the alignments:



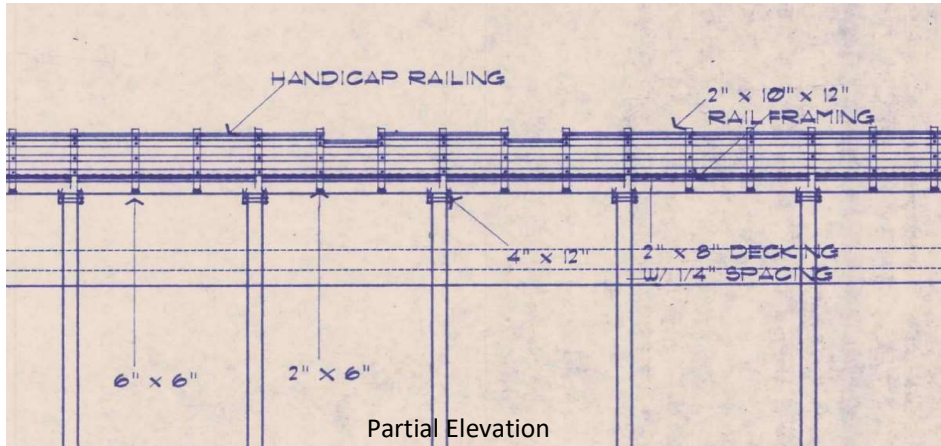
Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
1	1-A Trail on fill with grassed slope	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the north-east quadrant of the Ariana St. intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall. Concrete signal poles at the intersection of Sikes Blvd. and S. Central Ave. and the intersection of Sikes Blvd. and Lake Hunter Dr. would require relocation. A number of other roadside signs would require relocation.	PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	6	EA	\$4,985.26	\$29,911.56	\$101,000	
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	6	EA	\$10,145.00	\$60,870.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	3	AS	\$354.16	\$1,062.48		
			SINGLE POST SIGN, REMOVE	700-1-60	3	AS	\$39.04	\$117.12		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	2	AS	\$3,635.77	\$7,271.54		
			MULTI- POST SIGN, REMOVE	700-2-60	2	AS	\$740.72	\$1,481.44		
	1-B Trail on fill with retaining wall	See structural impacts for Alignment 1-A.	CONC CLASS IV, BULKHEAD	400-4-8	178	CY	\$1,382.55	\$245,786.67	\$1,202,000	
			REINFORCING STEEL- BULKHEAD	415-1-8	8317	LB	\$1.07	\$8,898.83		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	25200	SF	\$33.59	\$846,468.00		
			PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	6	EA	\$4,985.26	\$29,911.56		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	6	EA	\$10,145.00	\$60,870.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	3	AS	\$354.16	\$1,062.48		
			SINGLE POST SIGN, REMOVE	700-1-60	3	AS	\$39.04	\$117.12		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	2	AS	\$3,635.77	\$7,271.54		
			MULTI- POST SIGN, REMOVE	700-2-60	2	AS	\$740.72	\$1,481.44		
	2-A Trail on existing ground	Assuming the path has a width of 10 feet or less in the area of the existing drainage culvert (located in the north-east quadrant of the Ariana St. intersection), it will be necessary to install a pedestrian railing atop the existing drainage culvert headwall and wingwall.	PEDESTRIAN / BICYCLE RAILING, STEEL, 42" TYPE 1	515-2-211	35	LF	\$87.59	\$3,065.65	\$3,000	
	2-B Boardwalk over land	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution. Structural impacts shown for Alignment 2-A also apply.	TREATED TIMBER, STRUCTURAL	470-1	105.0	MB	\$14,500.00	#####	\$2,263,000	
			PRESTRESSED CONCRETE PILING, 14" SQ.	455-34-2	4000	LF	\$185.00	\$740,000.00		
2	1-A Trail on fill with grassed slope	Concrete signal poles at the intersection of Sikes Blvd. and Lake Hunter Dr. and the intersection of Sikes Blvd. and W. Greenwood St. would require relocation. A number of roadside signs would require relocation.	PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	4	EA	\$4,985.26	\$19,941.04	\$66,000	
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	4	EA	\$10,145.00	\$40,580.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	3	AS	\$354.16	\$1,062.48		
			SINGLE POST SIGN, REMOVE	700-1-60	3	AS	\$39.04	\$117.12		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77		
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72		
	1-B Trail on fill with retaining wall	See structural impacts for Alignment 1-A.	CONC CLASS IV, BULKHEAD	400-4-8	157	CY	\$1,382.55	\$217,111.56	\$1,039,000	
			REINFORCING STEEL- BULKHEAD	415-1-8	7346	LB	\$1.07	\$7,860.64		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	22260	SF	\$33.59	\$747,713.40		
			PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	4	EA	\$4,985.26	\$19,941.04		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	4	EA	\$10,145.00	\$40,580.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	3	AS	\$354.16	\$1,062.48		
			SINGLE POST SIGN, REMOVE	700-1-60	3	AS	\$39.04	\$117.12		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77		
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72		
	1-C Trail on fill with cantilever	A number of roadside signs would require relocation.	CONCRETE CLASS IV, SUPERSTRUCTURE	400-4-4	296	CY	\$1,663.72	\$491,721.67	\$990,000	
			REINFORCING STEEL - BRIDGE SUPERSTRUCTURE	415-1-4	68973	LB	\$0.95	\$65,524.01		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	11970	SF	\$33.59	\$402,072.30		
			PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	2	EA	\$4,985.26	\$9,970.52		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	2	EA	\$10,145.00	\$20,290.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	2	AS	\$354.16	\$708.32		
			SINGLE POST SIGN, REMOVE	700-1-60	2	AS	\$39.04	\$78.08		
	2-A Trail on existing grade	A single roadside sign would require relocation.	MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77	\$4,000	
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72		

Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
	2-B Boardwalk over land	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	TREATED TIMBER, STRUCTURAL	470-1	33.6	MB	\$14,500.00	\$487,213.82	\$728,000	
			PRESTRESSED CONCRETE PILING, 14" SQ.	455-34-2	1280	LF	\$185.00	\$236,800.00		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77		
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72		
	2-C Scenic boardwalk over water	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	TREATED TIMBER, STRUCTURAL	470-1	67.2	MB	\$14,500.00	\$974,427.64	\$1,685,000	
			PRESTRESSED CONCRETE PILING, 14" SQ.	455-34-2	3840	LF	\$185.00	\$710,400.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	1	AS	\$354.16	\$354.16		
			SINGLE POST SIGN, REMOVE	700-1-60	1	AS	\$39.04	\$39.04		

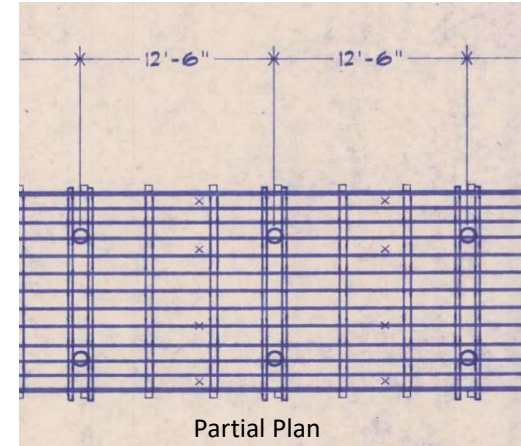
Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
3	1-A Trail on fill with grassed slope	Concrete signal poles at the intersection of Sikes Blvd. and W. Greenwood St. would require relocation. A number of roadside signs would require relocation.	PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	2	EA	\$4,985.26	\$9,970.52	\$35,000	
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	2	EA	\$10,145.00	\$20,290.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	2	AS	\$354.16	\$708.32		
			SINGLE POST SIGN, REMOVE	700-1-60	2	AS	\$39.04	\$78.08		
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77		
	1-B Trail on fill with retaining wall	Concrete signal poles at the intersection of Sikes Blvd. and W. Greenwood St. and the intersection of Sikes Blvd. and Hartsell Ave. would require relocation. A number of roadside signs would require relocation.	MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72	\$1,123,000	
			CONCRETE CLASS NS, GRAVITY WALL	400-0-11	1394	CY	\$642.20	\$895,226.80		
			CONC CLASS IV, BULKHEAD	400-4-8	24	CY	\$1,382.55	\$32,771.56		
			REINFORCING STEEL- ROADWAY	415-1-1	13120	LB	\$1.05	\$13,776.00		
			REINFORCING STEEL- BULKHEAD	415-1-8	1109	LB	\$1.07	\$1,186.51		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	3360	SF	\$33.59	\$112,862.40		
			PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	4	EA	\$4,985.26	\$19,941.04		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	4	EA	\$10,145.00	\$40,580.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	5	AS	\$354.16	\$1,770.80		
			SINGLE POST SIGN, REMOVE	700-1-60	5	AS	\$39.04	\$195.20		
	1-C Trail on fill with cantilever	Concrete signal poles at the intersection of Sikes Blvd. and Hartsell Ave. would require relocation. A number of roadside signs would require relocation.	MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77	\$301,000	
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72		
			CONCRETE CLASS IV, SUPERSTRUCTURE	400-4-4	83	CY	\$1,663.72	\$138,027.14		
			REINFORCING STEEL - BRIDGE SUPERSTRUCTURE	415-1-4	19361	LB	\$0.95	\$18,392.70		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	3360	SF	\$33.59	\$112,862.40		
4	2-A Scenic boardwalk over water	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	2	EA	\$4,985.26	\$9,970.52	\$905,000	
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	2	EA	\$10,145.00	\$20,290.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	3	AS	\$354.16	\$1,062.48		
			SINGLE POST SIGN, REMOVE	700-1-60	3	AS	\$39.04	\$117.12		
			TREATED TIMBER, STRUCTURAL	470-1	13.4	MB	\$14,500.00	\$194,885.53	\$905,000	
			PRESTRESSED CONCRETE PILING, 14" SQ.	455-34-2	3840	LF	\$185.00	\$710,400.00		
								\$0.00		
	1-A Trail on fill with grassed slope	There are no structural impacts.						\$0.00	\$0	
	1-B Trail on fill with retaining wall	Concrete signal poles at the intersection of Sikes Blvd. and Hartsell Ave. would require relocation. A number of roadside signs would require relocation.	NO STRUCTURAL COMPONENTS							
			CONCRETE CLASS NS, GRAVITY WALL	400-0-11	315	CY	\$642.20	\$201,971.90	\$814,000	
			CONC CLASS IV, BULKHEAD	400-4-8	93	CY	\$1,382.55	\$129,038.00		
			REINFORCING STEEL- ROADWAY	415-1-1	2960	LB	\$1.05	\$3,108.00		
			REINFORCING STEEL- BULKHEAD	415-1-8	4366	LB	\$1.07	\$4,671.89		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	13230	SF	\$33.59	\$444,395.70		
	1-C Trail on fill with cantilever	Concrete signal poles at the intersection of Sikes Blvd. and Hartsell Ave. would require relocation. A number of roadside signs would require relocation.	PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	2	EA	\$4,985.26	\$9,970.52		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	2	EA	\$10,145.00	\$20,290.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	2	AS	\$354.16	\$708.32		
			SINGLE POST SIGN, REMOVE	700-1-60	2	AS	\$39.04	\$78.08		
			CONCRETE CLASS IV, SUPERSTRUCTURE	400-4-4	327	CY	\$1,663.72	\$543,481.85	\$1,091,000	
			REINFORCING STEEL - BRIDGE SUPERSTRUCTURE	415-1-4	76233	LB	\$0.95	\$72,421.27		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	13230	SF	\$33.59	\$444,395.70		
			PRESTRESSED CONCRETE POLE, COMPLETE POLE REMOVAL- PO	641-2-80	2	EA	\$4,985.26	\$9,970.52		
			PRESTRESSED CONCRETE POLE, F&I, TYPE P-VII	641-2-17	2	EA	\$10,145.00	\$20,290.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	2	AS	\$354.16	\$708.32		
			SINGLE POST SIGN, REMOVE	700-1-60	2	AS	\$39.04	\$78.08		

Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
	2-A Scenic boardwalk over water	Implementation of a boardwalk would result in increased maintenance compared to an at-grade sidewalk solution.	TREATED TIMBER, STRUCTURAL	470-1	52.9	MB	\$14,500.00	\$767,361.77	\$1,478,000	
			PRESTRESSED CONCRETE PILING, 14" SQ.	455-34-2	3840	LF	\$185.00	\$710,400.00		
5	1-A Trail on fill with grassed slope	One roadside sign would require relocation.	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	1	AS	\$354.16	\$354.16	\$400	
			SINGLE POST SIGN, REMOVE	700-1-60	1	AS	\$39.04	\$39.04		
	1-B Trail on fill with retaining wall	One roadside sign would require relocation.	CONC CLASS IV, BULKHEAD	400-4-8	133	CY	\$1,382.55	\$184,340.00	\$736,000	
			REINFORCING STEEL- BULKHEAD	415-1-8	6238	LB	\$1.07	\$6,674.13		
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	16200	SF	\$33.59	\$544,158.00		
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	1	AS	\$354.16	\$354.16		
			SINGLE POST SIGN, REMOVE	700-1-60	1	AS	\$39.04	\$39.04		

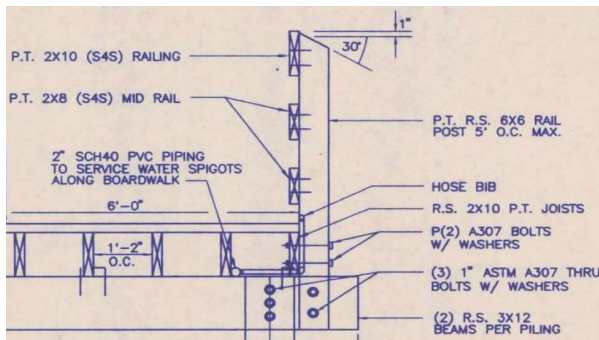
Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost
6	1-A Trail on fill with grassed slope	The two mast arms on the east side of the Sikes Blvd. and W. Lime St. intersection may require relocation. A number of roadside signs would require relocation.	STEEL MAST ARM ASSEMBLY, FURNISH AND INSTALL, SINGLE A	649-21-21	2	EA	\$55,197.77	\$110,395.54	\$130,000
			STEEL MAST ARM ASSEMBLY, REMOVE, DEEP FOUNDATION- BO	649-26-5	2	EA	\$6,630.00	\$13,260.00	
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	5	AS	\$354.16	\$1,770.80	
			SINGLE POST SIGN, REMOVE	700-1-60	5	AS	\$39.04	\$195.20	
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77	
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72	
	1-B Trail on fill with retaining wall	See structural impacts for Alignment 1-A.	CONC CLASS IV, BULKHEAD	400-4-8	126	CY	\$1,382.55	\$174,098.89	\$824,000
			REINFORCING STEEL- BULKHEAD	415-1-8	5891	LB	\$1.07	\$6,303.34	
			SHEET PILING STEEL, F&I PERMANENT	455-133-3	15300	SF	\$33.59	\$513,927.00	
			STEEL MAST ARM ASSEMBLY, FURNISH AND INSTALL, SINGLE A	649-21-21	2	EA	\$55,197.77	\$110,395.54	
			STEEL MAST ARM ASSEMBLY, REMOVE, DEEP FOUNDATION- BO	649-26-5	2	EA	\$6,630.00	\$13,260.00	
			SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	700-1-11	5	AS	\$354.16	\$1,770.80	
			SINGLE POST SIGN, REMOVE	700-1-60	5	AS	\$39.04	\$195.20	
			MULTI- POST SIGN, F&I GROUND MOUNT, 21-30 SF	700-2-13	1	AS	\$3,635.77	\$3,635.77	
			MULTI- POST SIGN, REMOVE	700-2-60	1	AS	\$740.72	\$740.72	
Unit Costs are based on the FDOT Historical Averages for Area Market 08 from 3/1/2020 through 2/28/2021. If not available, then the FDOT Historical Averages Statewide from 3/1/2020 through 2/28/2021 were used.									



Partial Elevation



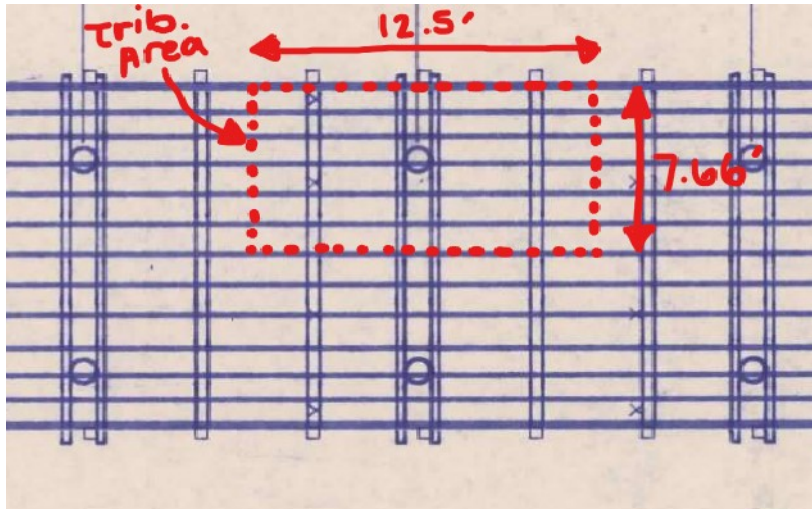
Partial Plan



Partial Cross-Section

Component	Rationale	Formula	Quantity per Foot (Board-Feet Measure)
Decking	The decking is 2" thick and has a width of 15.33'	= (15.33' wide) x (1' long) x (2" thick)	30.66
Joists at Piles	Two joist measuring 4"x 12" have a length of 15.33' at every pile location	= (2 joists) x (1' wide) x (4" thick) x (15.33' long) x (1'/12.5')	9.81
Mid-span Joists	Two joist measuring 2"x 6" have a length of 15.33' at each interior third point of all spans	= (2 joists) x (0.5' wide) x (2" thick) x (15.33' long) x (1'/12.5')	2.45
Longitudinal Beams	Thirteen beams measuring 2"x 10" span the boardwalk	= (13 beams) x (0.83' wide) x (1' long) x (2" thick)	21.58
Railing Boards	Two 2"x 8" boards and one 2"x 10" board span both sides of the boardwalk	= (2 sets of railings) x (2.17' wide) x (1' long) x (2" thick)	8.67
Railing Posts	Two posts at 4'-2" spacing measuring 6"x 6" with a length of 5'-5"	= (2 posts) x (0.5" wide) x (5.416' long) x (6" thick) x (4.17/12.5)	10.83
Total Board Feet Measures per Foot of Boardwalk=			84.00
MB per Foot of Boardwalk=			0.084

- 1 Board-Feet Measure is a volumetric unit equal to 12"x12"x1"
- The boardwalk requires 0.16 piles per foot of boardwalk



Pile on Dry Land

Pile in Water

Load into a Single Pile		Load into a Single Pile	
Board-feet per foot of boardwalk	0.08 bm/ft	Board-feet per foot of boardwalk	0.00 bm/ft
Weight per board foot of lumber	3.00 lb/bm	Weight per board foot of lumber	3.00 lb/bm
Width of boardwalk	15.33 ft	Width of boardwalk	15.33 ft
Tributary width	7.67 ft	Tributary width	7.67 ft
Tributary length	12.50 ft	Tributary length	12.50 ft
Board-feet in tributary area	0.53 bm	Board-feet in tributary area	0.00 bm
Factored Tributary force from structure (Strength I)	1.97 lb	Factored Tributary force from structure (Strength I)	0.00 lb
Live distributed load	75.00 psf	Live distributed load	75.00 psf
Factored tributary force from live load (Strength I)	12578.02	Factored tributary force from live load (Strength I)	12578.02
Width of pile	1.16666 ft	Width of pile	1.16666 ft
Assumed exposed length of the pile	8.00 ft	Assumed exposed length of the pile	15.00 ft
Assumed embedded length of pile	12.00 ft	Assumed embedded length of pile	15.00 ft
Unit weight of concrete	150.00 ft/cf	Unit weight of concrete	150.00 ft/cf
Factored self-weight of pile (Strength I)	5104.11 lb	Factored self-weight of pile (Strength I)	7656.16 lb
Total load	17684.09 ft	Total load	20234.18 ft
Shaft Resistance		Shaft Resistance	
Resistance factor using static analysis	0.45 -	Resistance factor using static analysis	0.45 -
Soil Unit Weight	120 lb/cf	Soil Unit Weight	120 lb/cf
Soil Friction Angle, ϕ_f	30 deg	Soil Friction Angle, ϕ_f	30 deg
Coefficient of lateral earth pressure, K_δ	1.2 -	Coefficient of lateral earth pressure, K_δ	1.2 -
Correction Factor, C_f	0.92 -	Correction Factor, C_f	0.92 -
Effective vertical soil pressure mid-pile, $\sigma'_{v(\text{tip})}$	720 psf	Effective vertical soil pressure mid-pile, $\sigma'_{v(\text{tip})}$	900 psf
δ/ϕ_f	0.8 -	δ/ϕ_f	0.8 -
Friction angle between soil and pile, δ	24 deg	Friction angle between soil and pile, δ	24 deg
Unit side resistance	323.3068 lb/sf	Unit side resistance	404.1335 lb/sf
Factored shaft resistance	8147.285 lb	Factored shaft resistance	12730.13 lb
Tip Resistance		Tip Resistance	

Yellow pine weighs about 3 lbs per board foot measure

Table 10.5.5.2.3-1 (Nordlund/Thurman Method in sand)

SPI 400-011

SPI 400-011

10.7.3.8.6f-2

10.7.3.8.6f-5

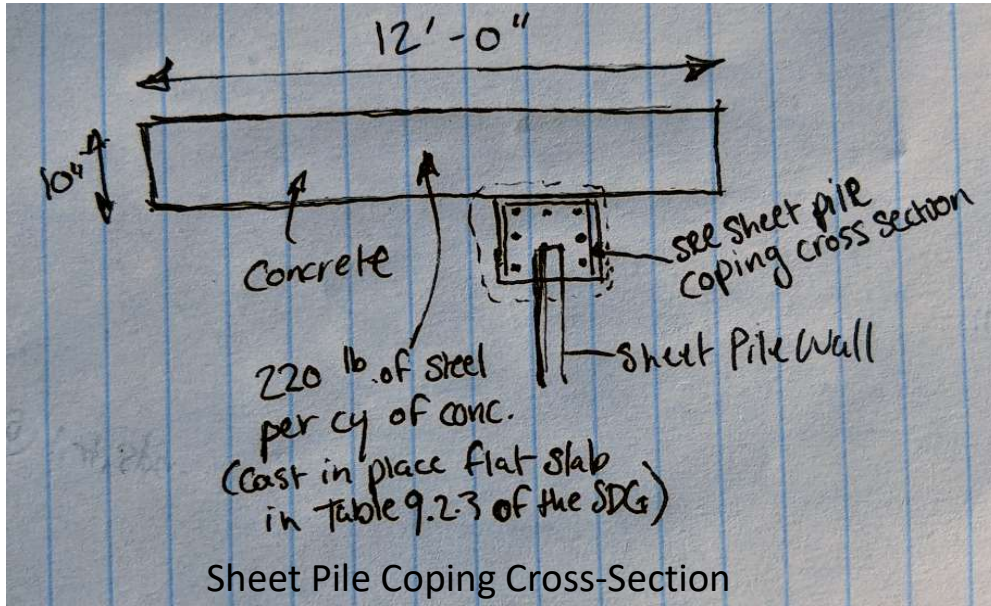
(Soil unit weight) x 0.5(pile embedment length)

10.7.3.8.6f-6

Eq. 10.7.3.8.6f-1

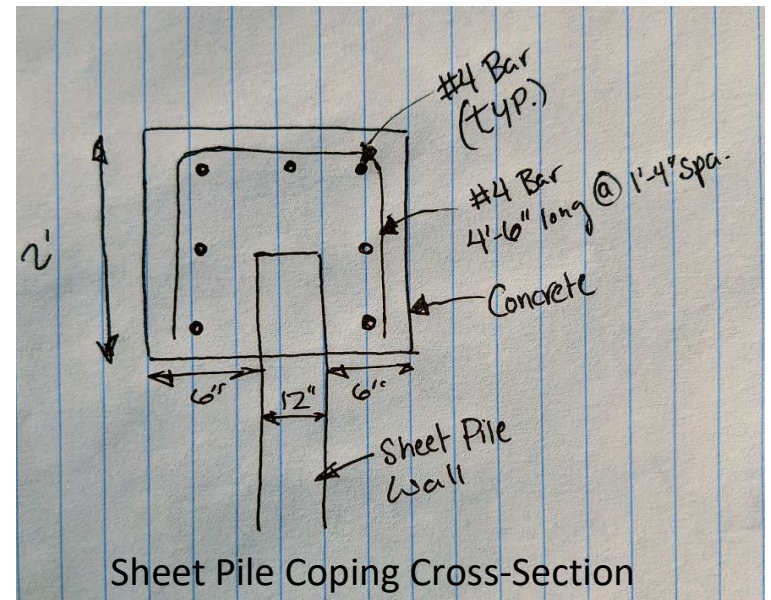
(Unit side resistance) x (embedded surface area) x (Resistance Factor)

Resistance factor using static analysis	0.45 -	Resistance factor using static analysis	0.45 -	Table 10.5.5.2.3-1 (Nordlund/Thurman Method in sand)
SPT blow count	10 ct	SPT blow count	10 ct	SPI 400-011
D/b Ratio	10.29 -	D/b Ratio	12.86 -	(Embedment depth) / (width of pile)
α	0.6 -	α	0.6 -	Figure 10.7.3.8.6f-7
Bearing Capacity Factor, N'_q	30 -	Bearing Capacity Factor, N'_q	30 -	Figure 10.7.3.8.6f-8
Effective vertical soil pressure at tip, $\sigma'_{v(tip)}$	1440 psf	Effective vertical soil pressure at tip, $\sigma'_{v(tip)}$	1800 psf	(Soil unit weight) x (depth of tip)
Unit tip resistance, q_p	25920 psf	Unit tip resistance, q_p	32400 psf	Eq. 10.7.3.8.6f-2
Limiting unit tip resistance, q_L	80000 psf	Limiting unit tip resistance, q_L	80000 psf	Eq. 10.7.3.8.6g-1
Factored tip resistance	15875.82 lb	Factored tip resistance	19844.77 lb	(Unit tip resistance) x (tip surface area) x (Resistance Factor)
Capacity Check		Capacity Check		
Total load	17684.09 lb	Total load	20234.18 lb	
Total resistance	24023.1 lb	Total resistance	32574.91 lb	
Load/capacity ratio	0.74 -	Load/capacity ratio	0.62 -	<---If this cell is red, increase embedment length
Quantities Check		Quantities Check		
Pile Spacing	12.50 ft	Pile Spacing	12.50 ft	
Length of pile required per foot of boardwalk	3.2 ft/ft	Length of pile required per foot of boardwalk	4.8 ft/ft	



Reinforcement per Foot of Cantilever Slab	
Width of cantilever slab	12.00 ft
Thickness of cantilever slab	0.83 ft
Volume of concrete per foot of slab	0.52 cy
Weight of steel per foot of slab	121.00 lb

*Class IV concrete used because this is potentially an extremely aggressive environment



Reinforcement per Foot of Coping	
Unit weight of #4 bars	0.67 lb/ft
Weight of steel per foot of coping	6.93 lb/ft
Concrete per Foot of Coping	
Volume of concrete per foot of Coping	0.148 cy

Appendix C – Utility Costs

The following spreadsheet details costs for utility items summarized in each of the alignments:



Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
1	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. seven light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Blvd. and S. Central Ave. and the intersection of Sikes Blvd. and Lake Hunter Dr. due to the relocation of signal poles.	BOX SPAN ADJUSTMENT (LUMP SUM, PER INTERSECTION)	-	2	PI	\$70,415.00	\$140,830.00	\$228,000	See 'Cost of Box Span Adjustment' sheet for details
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1530	LF	\$8.69	\$13,295.70		1530' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	7	EA	\$809.43	\$5,666.01		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	4590	LF	\$1.60	\$7,344.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	7	EA	\$7,413.04	\$51,891.28		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	7	EA	\$691.22	\$4,838.54		
	1-B Trail on fill with retaining wall	See impacts for Alignment 1-A.	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	7	EA	\$654.08	\$4,578.56	\$228,000	Assume one per light pole
			BOX SPAN ADJUSTMENT (LUMP SUM, PER INTERSECTION)	-	2	PI	\$70,415.00	\$140,830.00		See 'Cost of Box Span Adjustment' sheet for details
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1530	LF	\$8.69	\$13,295.70		1530' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	7	EA	\$809.43	\$5,666.01		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	4590	LF	\$1.60	\$7,344.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	7	EA	\$7,413.04	\$51,891.28		
	2-A Trail on existing ground	One light pole will require relocation.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	7	EA	\$691.22	\$4,838.54	\$11,000	
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	7	EA	\$654.08	\$4,578.56		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	100	LF	\$8.69	\$869.00		100' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	1	EA	\$809.43	\$809.43		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	300	LF	\$1.60	\$480.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	1	EA	\$7,413.04	\$7,413.04		
	2-B Boardwalk over land	One light pole will require relocation.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	1	EA	\$691.22	\$691.22	\$11,000	
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	1	EA	\$654.08	\$654.08		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	100	LF	\$8.69	\$869.00		100' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	1	EA	\$809.43	\$809.43		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	300	LF	\$1.60	\$480.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	1	EA	\$7,413.04	\$7,413.04		
2	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. two light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Blvd. and Greenwood St. due to the relocation of signal poles.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	2	EA	\$691.22	\$1,382.44	\$95,000	
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	2	EA	\$654.08	\$1,308.16		Assume one per light pole
			BOX SPAN ADJUSTMENT (LUMP SUM, PER INTERSECTION)	-	1	PI	\$70,415.00	\$70,415.00		See 'Cost of Box Span Adjustment' sheet for details
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	370	LF	\$8.69	\$3,215.30		370' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	2	EA	\$809.43	\$1,618.86		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	1110	LF	\$1.60	\$1,776.00		Assume 3' of conductors per 1' of conduit
	1-B Trail on fill with retaining wall	On the east side of Sikes Blvd. four light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Blvd. and Greenwood St. due to the relocation of signal poles.	LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	2	EA	\$7,413.04	\$14,826.08	\$123,000	
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	570	LF	\$8.69	\$4,953.30		570' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	2	EA	\$809.43	\$1,618.86		Assume one box req'd per light and three req'd per load center
	1-C Trail on fill with cantilever	On the east side of Sikes Blvd. two light poles and the existing fiber/cable markers will have to be relocated.	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	1710	LF	\$1.60	\$2,736.00	\$27,000	Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	2	EA	\$7,413.04	\$14,826.08		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	2	EA	\$691.22	\$1,382.44		
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	2	EA	\$654.08	\$1,308.16		Assume one per light pole
	2-A Trail on existing grade	There are no impacts anticipated.	NO UTILITY COMPONENTS						\$0	
	2-B Boardwalk over land	There are no impacts anticipated.	NO UTILITY COMPONENTS						\$0	
	2-C Scenic boardwalk over water	There are no impacts anticipated.	NO UTILITY COMPONENTS						\$0	

Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
3	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. seven light poles and the existing fiber/cable markers will have to be relocated.	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1640	LF	\$8.69	\$14,251.60	\$89,000	1640' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	7	EA	\$809.43	\$5,666.01		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	4920	LF	\$1.60	\$7,872.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	7	EA	\$7,413.04	\$51,891.28		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	7	EA	\$691.22	\$4,838.54		
	1-B Trail on fill with retaining wall	On the east side of Sikes Blvd. eight light poles and the existing fiber/cable markers will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Blvd. and Hartsell Ave. due to the relocation of signal poles.	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	7	EA	\$654.08	\$4,578.56	\$171,000	Assume one per light pole
			BOX SPAN ADJUSTMENT (LUMP SUM, PER INTERSECTION)	-	1	PI	\$70,415.00	\$70,415.00		See 'Cost of Box Span Adjustment' sheet for details
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1800	LF	\$8.69	\$15,642.00		1800' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	8	EA	\$809.43	\$6,475.44		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	5400	LF	\$1.60	\$8,640.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	8	EA	\$7,413.04	\$59,304.32		
	1-C Trail on fill with cantilever	On the east side of Sikes Blvd. one light pole will have to be relocated. A box span will need to be reinstalled at the intersection of Sikes Blvd. and Hartsell Ave. due to the relocation of signal poles.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	8	EA	\$691.22	\$5,529.76	\$82,000	
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	8	EA	\$654.08	\$5,232.64		
			BOX SPAN ADJUSTMENT (LUMP SUM, PER INTERSECTION)	-	1	PI	\$70,415.00	\$70,415.00		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	160	LF	\$8.69	\$1,390.40		See 'Cost of Box Span Adjustment' sheet for details
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	1	EA	\$809.43	\$809.43		160' of open bore conduit installation
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	480	LF	\$1.60	\$768.00		Assume one box req'd per light and three req'd per load center
	2-A Scenic boardwalk over water	The are no impacts anticipated.	LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	1	EA	\$7,413.04	\$7,413.04	\$0	Assume 3' of conductors per 1' of conduit
LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION			0715 4 70	1	EA	\$691.22	\$691.22			
POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL			715-500-1	1	EA	\$654.08	\$654.08	Assume one per light pole		
NO UTILITY COMPONENTS										
4	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. two light poles and the existing fiber/cable markers will have to be relocated.	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	370	LF	\$8.69	\$3,215.30	\$28,000	370' of open bore conduit installation
			CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	630-2-12	120	LF	\$25.69	\$3,082.80		120' of directional bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	2	EA	\$809.43	\$1,618.86		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	1470	LF	\$1.60	\$2,352.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	2	EA	\$7,413.04	\$14,826.08		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	2	EA	\$691.22	\$1,382.44		
	1-B Trail on fill with retaining wall	On the east side of Sikes Blvd. four light poles and the existing fiber/cable markers will have to be relocated.	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	2	EA	\$654.08	\$1,308.16	\$55,000	Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1000	LF	\$8.69	\$8,690.00		1000' of open bore conduit installation
			CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	630-2-12	120	LF	\$25.69	\$3,082.80		120' of directional bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	4	EA	\$809.43	\$3,237.72		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	3360	LF	\$1.60	\$5,376.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	4	EA	\$7,413.04	\$29,652.16		
	1-C Trail on fill with cantilever	On the east side of Sikes Blvd. two light poles and the existing fiber/cable markers will have to be relocated.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88	\$28,000	
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	630	LF	\$8.69	\$5,474.70		630' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	2	EA	\$809.43	\$1,618.86		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	1890	LF	\$1.60	\$3,024.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	2	EA	\$7,413.04	\$14,826.08		
2-A Scenic boardwalk over water	There are no impacts anticipated.	LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	2	EA	\$691.22	\$1,382.44	\$0		
		POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	2	EA	\$654.08	\$1,308.16		Assume one per light pole	
		CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11							
		NO UTILITY COMPONENTS								
5	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. four light poles will have to be relocated.	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1090	LF	\$8.69	\$9,472.10	\$57,000	1090' of open bore conduit installation
			CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	630-2-12	120	LF	\$25.69	\$3,082.80		120' of directional bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	4	EA	\$809.43	\$3,237.72		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	3630	LF	\$1.60	\$5,808.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	4	EA	\$7,413.04	\$29,652.16		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
	1-B Trail on fill with retaining wall	On the east side of Sikes Blvd. four light poles will have to be relocated.	POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32	\$57,000	Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	1090	LF	\$8.69	\$9,472.10		1090' of open bore conduit installation
			CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	630-2-12	120	LF	\$25.69	\$3,082.80		120' of directional bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	4	EA	\$809.43	\$3,237.72		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	3630	LF	\$1.60	\$5,808.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	4	EA	\$7,413.04	\$29,652.16		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32		Assume one per light pole
			CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11						
			CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	630-2-12						
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11						
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12						

Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost	
6	1-A Trail on fill with grassed slope	On the east side of Sikes Blvd. four light poles will have to be relocated.	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	950	LF	\$8.69	\$8,255.50	\$51,000	950' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	4	EA	\$809.43	\$3,237.72		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	2850	LF	\$1.60	\$4,560.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	4	EA	\$7,413.04	\$29,652.16		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32		Assume one per light pole
	1-B Trail on fill with retaining wall	On the east side of Sikes Blvd. four light poles will have to be relocated.	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	630-2-11	950	LF	\$8.69	\$8,255.50	\$51,000	950' of open bore conduit installation
			PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	635-2-11	4	EA	\$809.43	\$3,237.72		Assume one box req'd per light and three req'd per load center
			LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	715-1-12	2850	LF	\$1.60	\$4,560.00		Assume 3' of conductors per 1' of conduit
			LIGHT POLE COMPLETE, FURNISH & INSTALL STANDARD POLE S	715-4-12	4	EA	\$7,413.04	\$29,652.16		
			LIGHT POLE COMPLETE, REMOVE POLE AND FOUNDATION	0715 4 70	4	EA	\$691.22	\$2,764.88		
			POLE CABLE DISTRIBUTION SYSTEM, CONVENTIONAL	715-500-1	4	EA	\$654.08	\$2,616.32		Assume one per light pole
Unit prices from FDOT Market Area 08 Item Average Unit Costs, from 2020/03/01 to 2021/02/28										

Cost of Box Span Adjustment per Intersection

Pay Item #	Item Description	Unit	Quantity	Unit Cost	Total Cost
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	140	\$16.00	\$2,240.00
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	450	\$32.00	\$14,400.00
632-7-1	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1	\$8,206.00	\$8,206.00
632-7-6	SIGNAL CABLE, REMOVE- INTERSECTION	PI	1	\$1,923.00	\$1,923.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE POLYMER CONCRETE	EA	7	\$888.00	\$6,216.00
634-4-143	SPAN WIRE ASSEMBLY, F&I, SINGLE POINT, BOX OR DROP BOX	PI	1	\$7,091.00	\$7,091.00
634-4-600	SPAN WIRE ASSEMBLY, REMOVE- POLES REMAIN	PI	1	\$500.00	\$500.00
639-1-112	ELECTRICAL POWER SERVICE, F&I, OVERHEAD METER PURCHED BY CONTRACTOR FROM POWER COMPANY	AS	1	\$2,784.00	\$2,784.00
0639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	140	\$20.00	\$2,800.00
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	1	\$1,000.00	\$1,000.00
650-1-34	TRAFFIC SIGNAL, FURNISH & INSTALL POLYCARBONATE, 3 SECTION, 1 WAY	AS	5	\$3,090.00	\$15,450.00
650-1-39	TRAFFIC SIGNAL, FURNISH & INSTALL POLYCARBONATE, 5 SECTION CLUSTER, 1 WAY	AS	1	\$6,220.00	\$6,220.00
653-1-40	PEDESTRIAN SIGNAL, RELOCATE	AS	1	\$385.00	\$385.00
676-1-500	TRAFFIC SIGNAL CONTROLLER CABINET, ADJUST/MODIFY	EA	1	\$1,200.00	\$1,200.00
				Total Cost:	\$70,415.00

Appendix D – Environmental Costs

The following spreadsheet details costs for environmental items summarized in each of the alignments:



Seg.	Alignment	Impacts	Item to consider	Delta* ***	Acres	Functional Loss (Delta x Acres)	Mitigation Cost Per FL Credit**	Mitigation Required (FL x Mitigation Cost)	Est. Total Environmental Cost***
1	Align. 1-A Trail on fill with grassed slope	Potential impacts (direct/secondary) could occur after the S. Central Ave./Sikes Blvd. intersection on the southeast side of road to the end of this alignment at Lake Hunter Dr. Direct impacts are approximated at <0.1 acres and secondary impacts are approximated at <0.5 acres.	Potential direct impacts to wetlands	0.87	0.1	0.087	\$ 180,000.00	\$ 15,660.00	\$ 33,660.00
			Potential secondary impacts to wetlands*	0.2	0.5	0.1	\$ 180,000.00	\$ 18,000.00	
	Align. 1-B Trail on fill with retaining wall	This alignment option would alleviate an additional 5 feet of impact area to wetlands along the same path mentioned in Alignment 1-A. Potentially no direct impacts could occur with this option and decrease secondary impacts to approximately <0.3 acres.	Potential secondary impacts to wetlands*	0.2	0.3	0.06	\$ 180,000.00	\$ 10,800.00	\$ 10,800.00
	Align. 2-A Trail on existing grade	Approximately 300 feet of the proposed alignment from the S. Central Ave./Sikes Blvd. intersection to the northeast towards Lake Hunter could potentially impact wetland systems. Potential for up to 0.45 acres of direct impacts and up to 0.40 acres of secondary impacts.	Potential direct impacts to wetlands	0.87	0.45	0.3915	\$ 180,000.00	\$ 70,470.00	\$ 84,870.00
			Potential secondary impacts to wetlands*	0.2	0.4	0.08	\$ 180,000.00	\$ 14,400.00	
	Align. 2-B Boardwalk over land	Implementing a boardwalk over existing land/wetlands would reduce overall wetland impacts compared to at grade options. Potential for up to 0.02 acres of direct wetland impacts from piles. Potential 0.1 acres of secondary shading impacts from boardwalk.	Potential direct impacts to wetlands	0.87	0.02	0.0174	\$ 180,000.00	\$ 3,132.00	\$ 6,732.00
			Potential secondary impacts to wetlands*	0.2	0.1	0.02	\$ 180,000.00	\$ 3,600.00	
	Align. 1-A Trail on fill with grassed slope	This alignment could have up to 0.07 acres of direct wetland impacts and 0.20 acres of secondary wetland impacts. This area of impact occurs on the southern portion of the alignment. The northern portion of the alignment appears to fit within the transportation land use area with minimal secondary impacts anticipated.	Potential direct impacts to wetlands	0.87	0.07	0.0609	\$ 180,000.00	\$ 10,962.00	\$ 18,162.00
			Potential secondary impacts to wetlands*	0.2	0.2	0.04	\$ 180,000.00	\$ 7,200.00	
	Align. 1-B Trail on fill with retaining wall	The retaining wall option would decrease direct impacts compared to Alignment 1-A. Direct wetland impacts up to 0.02 acres and 0.01 acres of secondary impacts.	Potential direct impacts to wetlands	0.87	0.02	0.0174	\$ 180,000.00	\$ 3,132.00	\$ 3,492.00
			Potential secondary impacts to wetlands*	0.2	0.01	0.002	\$ 180,000.00	\$ 360.00	

2	Align. 1-C Trail on fill with cantilever	This option would have impacts similar to the retaining wall option in Alignment 1-B.	Potential direct impacts to wetlands	0.87	0.02	0.0174	\$ 180,000.00	\$ 3,132.00	\$ 3,492.00
			Potential secondary impacts to wetlands*	0.2	0.01	0.002	\$ 180,000.00	\$ 360.00	
	Align. 2-A Trail on existing grade	This alignment option could have up to 0.3 acres of direct impacts and 0.2 acres for surrounding secondary impacts.	Potential direct impacts to wetlands	0.87	0.3	0.261	\$ 180,000.00	\$ 46,980.00	\$ 54,180.00
			Potential secondary impacts to wetlands*	0.2	0.2	0.04	\$ 180,000.00	\$ 7,200.00	
	Align. 2-B Boardwalk over land	Direct impacts from pilings could be approximately .02 acres. With this option, Secondary shading impacts could be approximately 0.13 acres and secondary impacts associated with construction of the boardwalk would be approximately 0.2 acres.	Potential direct impacts to wetlands	0.87	0.02	0.0174	\$ 180,000.00	\$ 3,132.00	\$ 15,012.00
			Potential secondary impacts to wetlands*	0.2	0.33	0.066	\$ 180,000.00	\$ 11,880.00	
	Align. 2-C Scenic boardwalk over water	There is potential for 0.04 acres of direct impacts from pilings and 0.3 acres of secondary shading impacts from the boardwalk.	Potential direct impacts to wetlands	0.87	0.04	0.0348	\$ 180,000.00	\$ 6,264.00	\$ 17,064.00
			Potential secondary impacts to wetlands*	0.2	0.3	0.06	\$ 180,000.00	\$ 10,800.00	
3	Align. 1-A Trail on fill with grassed slope	There is potential for 0.02 acres of direct wetland impacts towards the north portion of this alignment across from Hartsell Ave. Potential for up to 0.2 acres of Secondary impacts. The remaining stretch of the alignment appears to fit without any major impacts between Sikes Blvd. and the wetland edge of Lake Hunter.	Potential direct impacts to wetlands	0.87	0.02	0.0174	\$ 180,000.00	\$ 3,132.00	\$ 10,332.00
			Potential secondary impacts to wetlands*	0.2	0.2	0.04	\$ 180,000.00	\$ 7,200.00	
	Align. 1-B Trail on fill with retaining wall	This alignment option would alleviate an additional 5 feet of impact area to wetlands along the same path mentioned in Alignment 1-A. There are potentially no direct impacts that could occur with this option and it would have potential	Potential secondary impacts to wetlands*	0.2	0.1	0.02	\$ 180,000.00	\$ 3,600.00	\$ 3,600.00
	Align. 1-C Trail on fill with cantilever	This alignment option appears to fit within the existing area between Sikes Blvd. and the edge of Lake Hunter. Potential for up to 0.1 acres of secondary impacts	Potential secondary impacts to wetlands*	0.2	0.1	0.02	\$ 180,000.00	\$ 3,600.00	\$ 3,600.00
	Align. 2-A Scenic boardwalk over water	Potential for 0.01 acres of direct impacts from piles and up to 0.06 acres of secondary shading impacts.	Potential direct impacts to wetlands	0.87	0.01	0.0087	\$ 180,000.00	\$ 1,566.00	\$ 3,726.00
			Potential secondary impacts to wetlands*	0.2	0.06	0.012	\$ 180,000.00	\$ 2,160.00	

4	Align. 1-A Trail on fill with grassed slope	For this alignment, the first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sykes Blvd. and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	Potential direct impacts to wetlands	0.87	0.1	0.087	\$ 180,000.00	\$ 15,660.00	\$ 26,460.00
			Potential secondary impacts to wetlands*	0.2	0.3	0.06	\$ 180,000.00	\$ 10,800.00	
	Align. 1-B Trail on fill with retaining wall	For this alignment, the first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sykes Blvd. and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	Potential direct impacts to wetlands	0.87	0.1	0.087	\$ 180,000.00	\$ 15,660.00	\$ 26,460.00
			Potential secondary impacts to wetlands*	0.2	0.3	0.06	\$ 180,000.00	\$ 10,800.00	
	Align. 1-C Trail on fill with cantilever	For this alignment, the first approximately 500 feet could have impacts to wetlands due to narrow existing ground between Sykes Blvd. and the wetland edge of Lake Hunter. Potential for direct impacts up to 0.1 acres and 0.3 acres of secondary impacts.	Potential direct impacts to wetlands	0.87	0.1	0.087	\$ 180,000.00	\$ 15,660.00	\$ 26,460.00
			Potential secondary impacts to wetlands*	0.2	0.3	0.06	\$ 180,000.00	\$ 10,800.00	
	Align. 2-A Scenic boardwalk over water	Potential for 0.03 acres of direct impacts from pilings and 0.2 acres of secondary shading impact from the boardwalk.	Potential direct impacts to wetlands	0.87	0.03	0.0261	\$ 180,000.00	\$ 4,698.00	\$ 11,898.00
			Potential secondary impacts to	0.2	0.2	0.04	\$ 180,000.00	\$ 7,200.00	
5	Align. 1-A Trail on fill with grassed slope	This alignment would only have impacts to conveyance ditches. It appears that this impact would be characterized as an 'Other Surface Water' impact.	N/a	N/a	N/a	N/a	N/a	N/a	\$ -
	Align. 1-B Trail on fill with retaining wall	This alignment would only have impacts to conveyance ditches. It appears that this impact would be characterized as an 'Other Surface Water' impact.	N/a	N/a	N/a	N/a	N/a	N/a	\$ -
6	Align. 1-A Trail on fill with grassed slope	The majority of this alignment appears to be within the Transportation land use designation and it appears that there would be no wetland impacts.	N/a	N/a	N/a	N/a	N/a	N/a	\$ -
	Align. 1-B Trail on fill with retaining wall	The majority of this alignment appears to be within the Transportation land use designation and it appears that there would be no wetland impacts.	N/a	N/a	N/a	N/a	N/a	N/a	\$ -

*Secondary impacts = a 15 foot wetland setback from the jurisdictional boundary to accommodate an "edge effect" due to impacts adjacent to the system.

Wetland mitigation credits estimated at a range of **\$120,000 - \$180,000 per credit for state and federal agencies for herbaceous and forested wetland systems within the Hillsborough River Drainage Basin. Wetland mitigation credits estimated from Fox Branch Mitigation Bank (Hillsborough River Drainage Basin) and Wiggins Prairie Mitigation Bank (Hillsborough River Drainage Basin). ~~\$180,000~~ was used as a worst case scenario estimation purposes.

***Please note that based on coordination with FDEP, impacts to the existing "FL-SOLARIS/CLEAR Conservation Easements" could result in double mitigation fees. Coordination with permitting agencies is currently ongoing; due to the age of existing permits, a copy of the conservation easement has not yet been located.

*****Estimated** worst case scenario UMAM Score for direct wetland impacts = **Delta 0.87** (*Scores of Pre Impact: Location and Landscape Support = 8, Water environment = 9, and Community Structure = 9, Scores of Post Impact: Location and Landscape Support = 0, Water environment = 0, and Community Structure = 0*). **Estimated** worst case scenario UMAM Score for secondary wetland impacts = **Delta 0.2** (*Scores of Pre Impact: Location and Landscape Support Score = 8, Water environment = 9, and Community Structure = 9, Scores of Post Impact: Location and Landscape Support = 6, Water environment = 7, and Community Structure = 7*).

Appendix E – Roadway Costs

The following spreadsheet details costs for roadway items summarized in each of the alignments:



Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost
1	1-A Trail on fill with grassed slope	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	1.05	AC	\$34,652.06	\$36,513.53	\$258,000
			EMBANKMENT	120-6	3570	CY	\$17.05	\$60,868.50	
			PEDESTRIAN/BICYCLE RAILING	515-2	1235	LF	\$87.59	\$108,173.65	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	1190	SY	\$40.83	\$48,587.70	
			PERDORMANCE TURF	570-1-1	1700	SY	\$2.48	\$4,216.00	
	1-B Trail on fill with retaining wall	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	1.05	AC	\$34,652.06	\$36,513.53	\$222,000
			EMBANKMENT	120-6	1700	CY	\$17.05	\$28,985.00	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	1190	SY	\$40.83	\$48,587.70	
			PEDESTRIAN/BICYCLE RAILING	515-2	1235	LF	\$87.59	\$108,173.65	
	2-A Trail on existing ground	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	1.78	AC	\$34,652.06	\$61,651.39	\$270,000
			EMBANKMENT	120-6	7090	CY	\$17.05	\$120,881.34	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	2067	SY	\$40.83	\$84,382.00	
			PEDESTRIAN/BICYCLE RAILING	515-2	35	LF	\$87.59	\$3,065.65	
	2-B Boardwalk over land	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.14	AC	\$34,652.06	\$4,773.01	\$31,000
			EMBANKMENT	120-6	126	CY	\$17.05	\$2,147.04	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	156	SY	\$40.83	\$6,351.33	
PEDESTRIAN/BICYCLE RAILING			515-2	200	LF	\$87.59	\$17,518.00		
2	1-A Trail on fill with grassed slope	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.08	AC	\$34,652.06	\$2,863.81	\$44,000
			EMBANKMENT	120-6	280	CY	\$17.05	\$4,774.00	
			PEDESTRIAN/BICYCLE RAILING	515-2	370	LF	\$87.59	\$32,408.30	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	93	SY	\$40.83	\$3,810.80	
			PERDORMANCE TURF	570-1-1	133	SY	\$2.48	\$330.67	
	1-B Trail on fill with retaining wall	Requires the removal of guard rail.	CLEARING & GRUBBING	110-1-1	0.73	AC	\$34,652.06	\$25,296.96	\$173,000
			EMBANKMENT	120-6	1178	CY	\$17.05	\$20,081.11	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	824	SY	\$40.83	\$33,662.07	
			PEDESTRIAN/BICYCLE RAILING	515-2	1060	LF	\$87.59	\$92,845.40	
			GUARDRAIL REMOVAL	536-73	600	LF	\$1.88	\$1,128.00	
	1-C Trail on fill with cantilever	Requires the removal of guard rail.	EMBANKMENT	120-6	517	CY	\$17.05	\$8,818.64	\$60,000
			PEDESTRIAN/BICYCLE RAILING	515-2	570	LF	\$87.59	\$49,926.30	
			GUARDRAIL REMOVAL	536-73	600	LF	\$1.88	\$1,128.00	
	2-A Trail on existing grade	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.45	AC	\$34,652.06	\$15,512.29	\$67,000
			EMBANKMENT	120-6	1784	CY	\$17.05	\$30,415.31	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	520	SY	\$40.83	\$21,231.60	
	2-B Boardwalk over land	No impacts to existing roadway.	NO ROADWAY COMPONENTS						\$0
2-C Scenic boardwalk over water	No impacts to existing roadway.	NO ROADWAY COMPONENTS						\$0	
3	1-A Trail on fill with grassed slope	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	1.13	AC	\$34,652.06	\$39,138.69	\$161,000
			EMBANKMENT	120-6	3827	CY	\$17.05	\$65,244.67	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	1276	SY	\$40.83	\$52,080.93	
			PERDORMANCE TURF	570-1-1	1822	SY	\$2.48	\$4,519.11	
	1-B Trail on fill with retaining wall	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	1.24	AC	\$34,652.06	\$42,957.10	\$292,000
			EMBANKMENT	120-6	2000	CY	\$17.05	\$34,100.00	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	1400	SY	\$40.83	\$57,162.00	
			PEDESTRIAN/BICYCLE RAILING	515-2	1800	LF	\$87.59	\$157,662.00	
	1-C Trail on fill with cantilever	No impacts to existing roadway.	EMBANKMENT	120-6	145	CY	\$17.05	\$2,475.41	\$16,000
			PEDESTRIAN/BICYCLE RAILING	515-2	160	LF	\$87.59	\$14,014.40	
	2-A Scenic boardwalk over water	No impacts to existing roadway.	NO ROADWAY COMPONENTS						\$0

Seg.	Alignment	Impacts	Items to Consider	Pay Item #	Quantity	Unit	Unit Price	Item Cost	Total Cost
4	1-A Trail on fill with grassed slope	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.25	AC	\$34,652.06	\$8,830.07	\$36,000
			EMBANKMENT	120-6	863	CY	\$17.05	\$14,719.83	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	288	SY	\$40.83	\$11,749.97	
			PERDORMANCE TURF	570-1-1	411	SY	\$2.48	\$1,019.56	
	1-B Trail on fill with retaining wall	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.69	AC	\$34,652.06	\$23,865.06	\$162,000
			EMBANKMENT	120-6	1111	CY	\$17.05	\$18,944.44	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	778	SY	\$40.83	\$31,756.67	
			PEDESTRIAN/BICYCLE RAILING	515-2	1000	LF	\$87.59	\$87,590.00	
	1-C Trail on fill with cantilever	No impacts to existing roadway.	EMBANKMENT	120-6	572	CY	\$17.05	\$9,746.92	\$65,000
			PEDESTRIAN/BICYCLE RAILING	515-2	630	LF	\$87.59	\$55,181.70	
	2-A Scenic boardwalk over water	No impacts to existing roadway.	NO ROADWAY COMPONENTS						\$0
5	1-A Trail on fill with grassed slope	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.75	AC	\$34,652.06	\$26,012.91	\$209,000
			EMBANKMENT	120-6	2543	CY	\$17.05	\$43,363.83	
			PEDESTRIAN/BICYCLE RAILING	515-2	1150	LF	\$87.59	\$100,728.50	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	871	SY	\$40.83	\$35,567.47	
			PERDORMANCE TURF	570-1-1	1211	SY	\$2.48	\$3,003.56	
	1-B Trail on fill with retaining wall	No impacts to existing roadway.	CLEARING & GRUBBING	110-1-1	0.75	AC	\$34,652.06	\$26,012.91	\$183,000
			EMBANKMENT	120-6	1211	CY	\$17.05	\$20,649.44	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	871	SY	\$40.83	\$35,567.47	
6	1-A Trail on fill with grassed slope	No impacts to existing roadway.	PEDESTRIAN/BICYCLE RAILING	515-2	1150	LF	\$87.59	\$100,728.50	\$176,000
			CLEARING & GRUBBING	110-1-1	0.65	AC	\$34,652.06	\$22,671.80	
			EMBANKMENT	120-6	2217	CY	\$17.05	\$37,794.17	
			PEDESTRIAN/BICYCLE RAILING	515-2	950	LF	\$87.59	\$83,210.50	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	739	SY	\$40.83	\$30,168.83	
	1-B Trail on fill with retaining wall	No impacts to existing roadway.	PERDORMANCE TURF	570-1-1	1056	SY	\$2.48	\$2,617.78	\$154,000
			CLEARING & GRUBBING	110-1-1	0.65	AC	\$34,652.06	\$22,671.80	
			EMBANKMENT	120-6	1056	CY	\$17.05	\$17,997.22	
			CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	522-1	739	SY	\$40.83	\$30,168.83	
			PEDESTRIAN/BICYCLE RAILING	515-2	950	LF	\$87.59	\$83,210.50	

Reduce Median by 7' Alternative (Further investigation is needed to evaluate median reduction impact where there will be no physical separation between left turning vehicles and the opposing traffic)	CLEARING & GRUBBING	110-1-1	1.75	AC	\$34,652.06	\$60,776.34	\$1,383,000
	REMOVAL OF EXISTING CONCRETE	110-4-1	3936	SY	\$20.02	\$78,803.17	
	REGULAR EXCAVATION	120-1-1	1981	CY	\$9.14	\$18,103.97	
	MILLING EXISTING ASPHALT PAVEMENT 1" AVE DEPTH	327-70-1	16129	SY	\$2.66	\$42,902.84	
	MANHOLES, P7, PARTIAL	425-2-43	18	EA	\$2,700.00	\$48,600.00	
	INLETS, CURB, TYPE P-1, <10'	425-1311	11	EA	\$6,583.08	\$72,413.88	
	INLETS, CURB, TYPE 7, <10'	425-1471	9	EA	\$4,650.78	\$41,857.02	
	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 18" S/CD	430-175-118	200	LF	\$82.06	\$16,412.00	
	CONCRETE CURB AND GUTTER TYPE F	520-1-10	7640	LF	\$24.11	\$184,200.40	
	CONCRETE CURB AND GUTTER TYPE E	520-1-7	7640	LF	\$22.27	\$170,142.80	
	TYPE B STABILIZATION	160-4	8701	SY	\$11.64	\$101,280.93	
	OPTIONAL BASE GROUP 10	285-710	5942	SY	\$27.26	\$161,984.98	
	SUPERPAVE ASPHALTIC CONCRETE	334-1-13	490.2	TN	\$129.88	\$63,671.51	
	ASPH CONC. FC	337-7-25	1377.3	TN	\$168.83	\$232,533.31	
	PERDORMANCE TURF	570-1-1	28013	SY	\$2.48	\$69,473.07	
	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 6"	710-11-101	1.447	GM	\$1,004.59	\$1,453.61	
	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SKIP, 10-30 OR 3-9 SKIP, 6"	710-11-131	1.447	GM	\$469.18	\$678.89	
	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 6"	710-11-201	1.447	GM	\$1,025.87	\$1,484.40	
	THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID	711-15-101	1.447	GM	\$4,584.25	\$6,633.27	
	THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SKIP	711-15-131	1.447	GM	\$1,681.91	\$2,433.67	
	THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES YELLOW, SOLID	711-15-201	1.447	GM	\$4,607.23	\$6,666.52	

Unit Costs are based on the FDOT Historical Averages for Area Market 08 from 3/1/2020 through 2/28/2021. If not available, then the FDOT Historical Averages Statewide from 3/1/2020 through 2/28/2021 were used.

Roadway Quantities Rationale

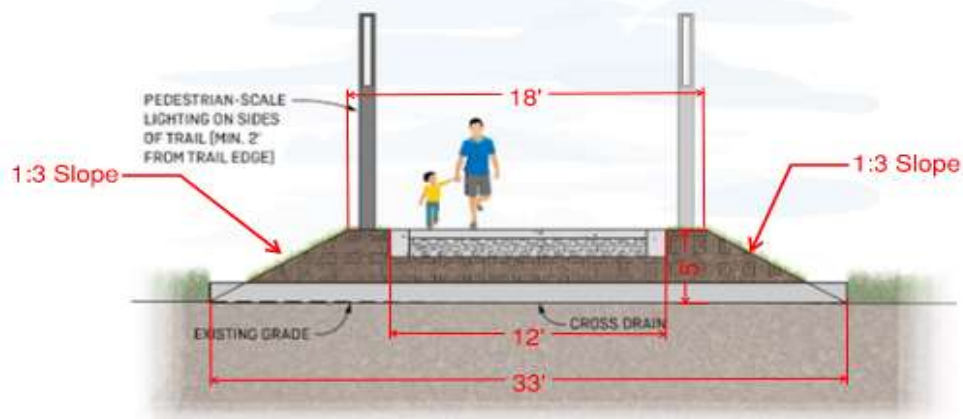
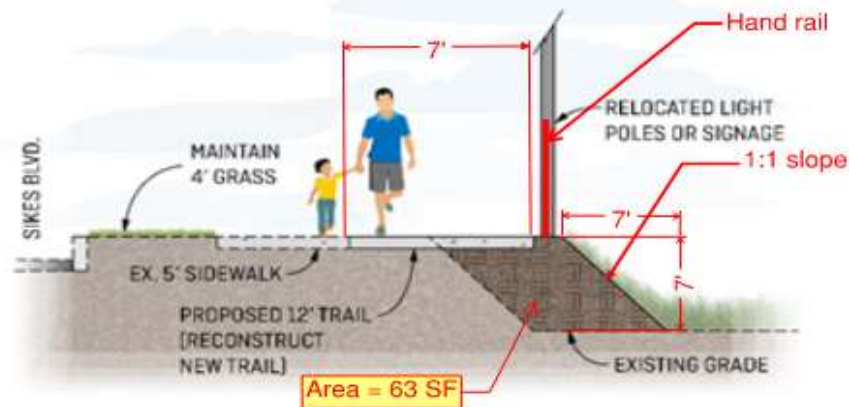


Figure 2: trail on existing grade

$$\text{Embankment Area} = ((18+33) \times (5/2)) - (0.33 \times 12) = 123.5 \text{ SF}$$

Reduced Median Option

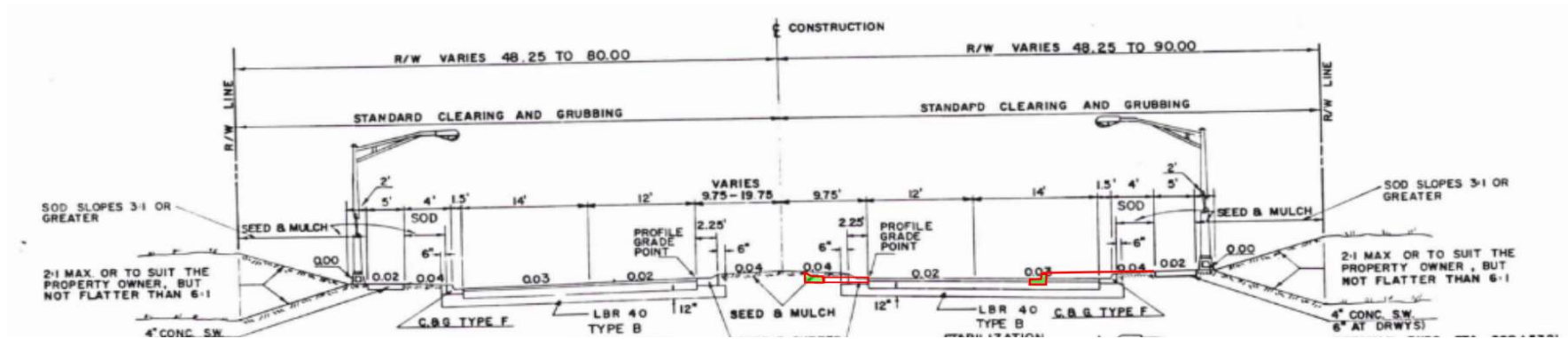




Figure 2: Trail Segments