

Lakeshore Shared-Use Path Final Feasibility Study

City of Deltona



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EXECUTIVE SUMMARY

This report assesses the feasibility of a 12-foot wide shared-use pathway approximately 4,700 feet long, in the City of Deltona, which will connect Thornby Park on Providence Boulevard with the Lake Monroe Boat Ramp Park and Green Springs Park on Lake Shore Drive. The project will comprise a short loop off of the East Central Florida Regional Rail Trail, providing access to the three parks, local residences, Lake Monroe, and the Deltona Community Center.

A recommended conceptual alignment is described in this report. This recommended alignment includes trail facilities adjacent to the west side of Providence Boulevard and the north side of Lake Shore Boulevard, as well as connecting pathways into Thornby and Green Springs Park. A construction estimate of \$374,000 was calculated (in 2011 dollars) for this recommended alignment. Long Range Estimates were also developed for Fiscal Years 2012 to 2015, at which time the total cost would rise to \$490,000. Cost estimates for several alternate segments were also prepared including:

- Connecting to Thornby Park through a wooded area north of the existing playground (adds 20% to the base cost);
- Using the existing sidewalk along the east side of Providence Boulevard (saves 10% off the base cost);
- Using Shared Lane Markings and sidewalks in lieu of a full trail in Green Springs Park (Saves 6% off the base cost): and
- Using alternative grading practices to enhance tree protection along Lake Shore Drive (adds 24% to the base cost).

The project is found to be technically feasible. Financial feasibility is subject to funding constraints of the sponsoring agencies.

INTRODUCTION

The City of Deltona is considering the construction of a shared-use path between Thornby Park and Green Springs Park, which would run adjacent to Providence Boulevard and Lakeshore Drive, along which it connects to the Lake Monroe Boat Ramp Park, and also passing through the properties of the parks at each end. This path will provide a scenic detour from the East Central Florida Regional Rail Trail, providing users of that trail access to the amenities of three parks as well as to Lake Monroe and the Deltona Community Center on Lakeshore Drive.

Currently, cyclists share Providence Boulevard and Lakeshore Drive and the two park driveways with motorized traffic. A sidewalk on the east side of Providence Boulevard and a crosswalk to the park driveway provides some pedestrian access at the east end of the project. An existing unpaved pathway also provides some pedestrian mobility along Lakeshore Drive between Providence Boulevard and Perimeter Drive. Bicyclists may also be using these existing pedestrian facilities. There is an existing sidewalk adjacent to the parking area in Green Springs Park, and asphalt pathways and unpaved trails internal to Green Springs Park connect that parking lot to park amenities, as well as back out to the East Central Florida Regional Rail Trail. There is no walkway of any sort along Lakeshore Drive east of Perimeter Drive.

The project is very feasible from a technical standpoint. No “fatal flaws” were discovered in the development of this study. The ultimate design of the trail will have to carefully manage operational safety of the trail as the alignment is situated with respect to conflicts with traffic on the adjacent roadways and efforts to minimize impacts to canopy trees on the project site. These challenges are certainly manageable by a conscientious designer.

PROJECT PURPOSE & SCOPE

The proposed project is to construct a pathway that connects the three parks, providing diversionary loop from the East Central Florida Regional Rail Trail, mostly using a 12-foot wide pathway and roadway crossings, where appropriate. The option of using the existing eight-foot wide sidewalk along Providence Boulevard for portions of the trail will be considered. This study evaluates existing conditions and proposes recommendations for the construction of the desired shared-use path. The length of the proposed route is approximately 4,680 feet. A recommended conceptual alignment and several alternative options are presented for specific segments. Cost estimates for the recommended

alignment and alternate segments are summarized in this report. Detailed cost estimates are provided in the appendix to assist the TPO and the City in budgeting and planning.

DESIGN CRITERIA

The following Florida Department of Transportation (FDOT) documents are the basis of the design criteria used in this study: *Plans Preparation Manual, 2010 edition (PPM)* and the *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, 2007 edition (Florida Greenbook)*.

The US Department of Transportation – Federal Highway Administration’s: *Manual on Uniform Traffic Control Devices for Street and Highways (MUTCD)* 2009 edition is used for signalization design criteria.

Shared-use Path Width

The Florida *Greenbook* recommends a minimum width of 10 feet for shared-use paths, and allows the paths to be narrowed down to eight feet, under constrained conditions. The *PPM*’s minimum width for shared-use paths is 12 feet, and allows paths to be narrowed under severely constrained conditions. Volusia County has a practice of designing trails at 12 feet. To maximize consistency with County facilities, this study considers the feasibility of a 12-foot wide path, which may be narrowed as necessary (to a minimum of eight feet) under constrained conditions.

Roadway Separation

Both the *PPM* and the Florida *Greenbook* require a minimum five-foot separation between the outside edge of the roadway’s shoulder and the shared-use path. This study considers this criterion met if a four-foot separation from the back of curb, or a five-foot separation from the edge of the roadway shoulder when there is no curbing. As neither Providence Boulevard nor Lakeshore Drive has a paved shoulder presently, a shoulder zone of six feet (equal to the Florida *Greenbook*’s minimum shoulder width), will be assumed for each road. Thus a minimum separation of 11 feet from the edge of pavement will be sought for this project. Any portion with less separation will require some sort of vertical barrier be installed.

Vertical and Horizontal Clearance

Both the *PPM* and the Florida *Greenbook* require a minimum eight-foot vertical clearance, and a two-foot shoulder on both sides of the path with a maximum slope of 1:6. The *PPM* requires a four-foot clearance from horizontal obstruction on both sides of the path, while the Florida *Greenbook* requires a two-foot clearance. For both manuals, the horizontal clearance is measured from the edge of the path. This study considers a minimum eight-foot vertical and four-foot horizontal clearance as a minimum. Under constrained conditions, this is reduced to two-foot horizontal clearance.

Cross-slopes and Grades

Both the *PPM* and the Florida *Greenbook* require shared-use paths to meet the Americans with Disability Act Accessibility Guidelines, if the path is to be opened to pedestrian traffic. This study allows for a maximum cross-slope of 2%, and a maximum longitudinal slope of 5%, except for curb ramps, which have a maximum slope of 8.33% and up to a 6-inch rise.

Surrounding Land Use and Major Destinations

The project provides a link between a regional shared-use pathway and several recreational destinations (three parks, Lake Monroe, and the Deltona Community Center), and so will accommodate bicyclists from outside the immediate vicinity. It also runs adjacent to several multi-family residential condominium complexes, and thus will provide access to the parks and the East Central Florida Regional Rail Trail for residents. The project is adjacent to Votran's #21 and #22 bus routes, and is near a commercial node at the intersection of Providence Boulevard and Doyle Road.

PHYSICAL INVENTORY & RIGHT-OF-WAY ASSESSMENT

Volusia County provided GIS files with parcel boundaries and topographic information for the study area, as well as site plans for Green Springs Park. Aerial imagery from commercial sources and Florida DOT were also consulted. Actual survey data was not available. Two site visits were conducted to evaluate onsite conditions, opportunities and constraints. This information was evaluated and compiled to form the basis of the feasibility study and conceptual plan.

The consultant team has developed a recommended conceptual alignment, which is broken into seven segments. Alternate options were also considered for many of these segments.

The following is a narrative inventory of the proposed shared-use path corridor, listing both the recommended conceptual alignment and alternates, where appropriate. The discussion describes the segments of the recommended conceptual alignment (Segments 1.1 through 1.7, shown in Figure 1) in sequence and then various alternates (Segments A1 through A8 shown in Figure 2).



Figure 1
 Recommended Conceptual Alignment



Figure 2
Alternative Conceptual Alignments

RECOMMENDED CONCEPTUAL ALIGNMENT

Segment 1.1: East Central Florida Regional Rail Trail to potential new crossing (opposite Magnolia Woods Court); +/-675 feet.

The shared-use path is proposed to start at the intersection of Providence Boulevard and the East Central Florida Regional Rail Trail, on the west side of Providence Boulevard (Figure 3). There is an existing sidewalk ramp to the north of the trail, but none to the south. The new trail could be developed along the west side of Providence Boulevard (Figure 4), thus also providing sidewalk continuity on this side of the street, connecting to the entrance of Thornby Park to the East Central Florida Regional Rail Trail and to Debarry Avenue.



Figure 3: Proposed trail terminus near intersection of Providence Boulevard and the East Central Florida Regional Rail Trail.



Figure 4: Right-of-way west of Providence Boulevard has room for addition of a trail.

There are several inlets along the roadside south of the trail (Figure 5). The back of these inlets are each set approximately 11 or 12 feet from the edge of pavement, and thus are generally clear of the preferred pathway position which is separated from the roadway by at least 11 feet. The existing roadside is mowed to about 25 feet from the edge of

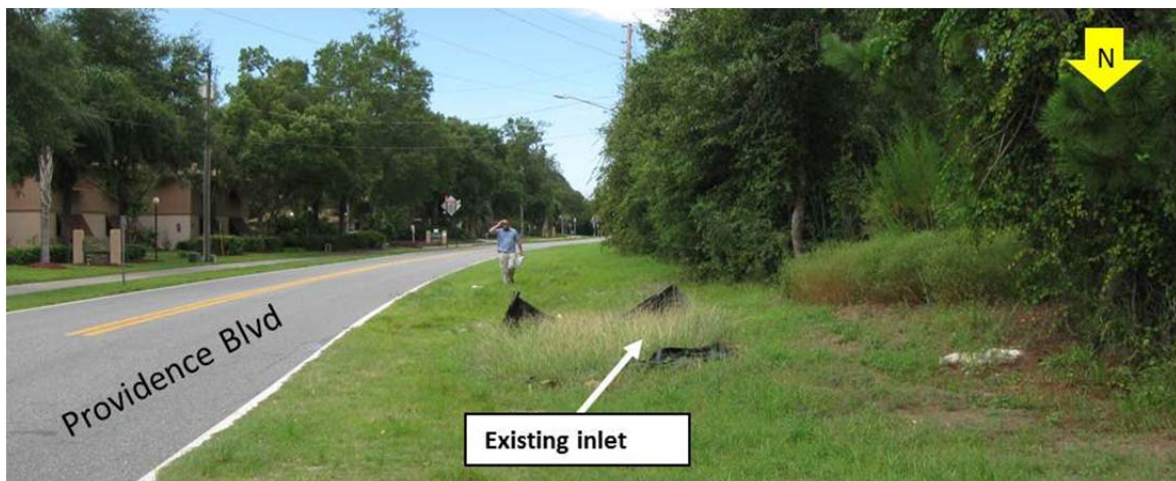


Figure 5: Inlets adjacent to Providence Boulevard will need to be designed around or modified.

pavement, and so a 12-foot wide trail will fit into this corridor but may require minimal grading or vegetation trimming near the right-of-way line. This area also includes one utility pole, positioned approximately 15 feet from the edge of pavement (Figure 6). Avoidance of this pole will also require moving the alignment closer to the outside of the right-of-way. Pending survey, this may require some vegetation clearing and minor grading. Alternately, the pole could be relocated or the trail could divide around the pole. The ultimate trail



Figure 6: The trail will need to avoid utility poles along the west side of Providence Boulevard.

alignment may require some minor grading and clearing of vegetation toward the edge of this area.

The alignment may meander as appropriate in order to minimize impacts to any mature trees close to the parcel line.

The inlets are the most likely complication to this segment. As mentioned above, some modification may be necessary, but how much will be determined after survey is obtained.

Segment 1.2: From Opposite Magnolia Woods Court to Thornby Park

Playground Area; +/- 50 feet.

This segment would connect the shared-use path along Providence Boulevard to the parking lot, playground and restroom facilities at Thornby Park. This segment would be a lateral spur from the continuing pathway adjacent to the roadway into the park. (This same segment would also be used to connect to Segment A1 to the pathway by the roadside if such an alternative were chosen.)

The ultimate design of the alignment of this connection will need to be careful to minimize impacts to mature trees in the buffer area between the park and the roadway, as well as avoid the lift station infrastructure near the park restroom. An alignment that connects to the northeast corner of the parking lot, near the existing bike racks, can make a direct connection out to Providence Boulevard and generally avoid the lift station (Figure 7). This segment will require some minor grading as well as clearing of vegetation.



Figure 7: A short connection from Thornby Park to Providence Boulevard could be made from near the park restrooms.

Segment 1.3: Opposite Magnolia Woods Court to Thornby Park Driveway; +/- 350 feet.

This segment would continue along the west side of Providence Boulevard to the north side of the existing park driveway. The segment would be similar to Segment 1.1, placed at least 11 feet from the edge of pavement. There are some existing utility poles, each placed approximately 15 feet from the edge of pavement (Figure 8). A 12-foot path will likely be able to pass behind these poles and occasion only minor clearing and minor grading toward the outside of the right-of-way. (And as the adjacent parcel is park property, it is assumed that, if necessary, the trail envelope could cross the parcel line without much complication.)

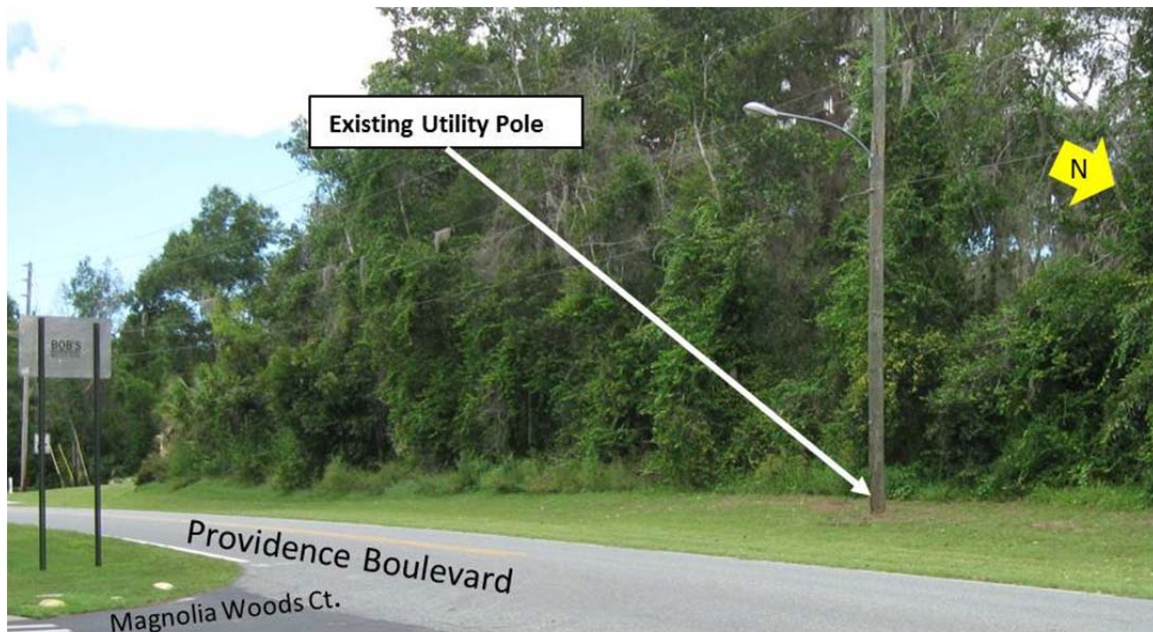


Figure 8: A trail along Providence Boulevard will need to pass behind existing utility poles.

Segment 1.4: Thornby Park Driveway to NE Corner of Providence Boulevard/Lakeshore Drive; +/- 525 feet.

This segment includes a crossing of the Thornby Park Driveway, the continuation of a pathway along the west side of Providence Boulevard to the intersection with Lakeshore Drive, and the crossing of Providence Boulevard at the intersection.

A utility pole is located at the north side of the Thornby Park driveway, supported by guy wires positioned to the west. This configuration may need to be altered pending the final placement of the trail and curb ramps to allow crossing of the driveway. A curb ramp will need to be cut into the existing sidewalk at the park driveway (Figure 9). This ramp shall be the full width of the trail. While no curb is currently installed on the south side of the driveway, a concrete ramp or connector is also recommended to transition back to the trail from the driveway.



Figure 9: A curb ramp and utility adjustments will be necessary for the trail to cross the driveway of Thornby Park.

The traffic exiting the park driveway is already controlled by a STOP (R1-1) sign so the trail crossing could be given the same priority of the adjacent roadway, allowing continuous

travel southbound. Crosswalk markings would need to be installed over the driveway, with possible relocation of the driveway stop bar pending final design. Warning signs on the approaches along Providence Drive and the park driveway are recommended to increase awareness among motorists of likely trail traffic. Warning signs would be appropriate on both north and southbound Providence Boulevard to alert motorists turning into the park, while the BICYCLE AND PEDESTRIAN TRAIL WARNING (W11-15) signs would be appropriate for the outbound lane of the Park Driveway.

The pathway between the park driveway and the intersection to the south will be very similar to the Segments 1.1 and 1.3 described previously. There is one utility pole approximately 16 feet from the edge of the roadway, which the trail could pass west of with some minor clearing and grading (or which could be relocated or around which the trail could be split.) There is an inlet very near the intersection with Lakeshore Drive (Figure 10), but the trail will actually turn to allow the crossing of Providence Boulevard before reaching the inlet (as described below). The trail will cross Providence Boulevard on the north approach to the intersection with Lakeshore Drive. It is recommended that the crossing be placed approximately 20 feet back (one car length) from this unsignalized intersection, to allow for separation of the conflicts between motorists and trail users from the motorist-to-motorist conflicts being scanned for by turning drivers. Concrete connecting ramps are recommended at each side of the roadway.



Figure 10: View of the inlet at the intersection of Lakeshore Drive and Providence Boulevard.

Segment 1.5: NE Corner of Providence Boulevard/Lakeshore Drive to west of Green Springs Park driveway; +/- 1625 feet.

This segment covers the majority of the trail's run adjacent to Lakeshore Drive. It represents an upgrade of the existing unpaved trail (Figure 11) between Providence Boulevard and Perimeter Drive. Between Perimeter Drive and the Green Springs Park driveway, a new path will traverse the frontage of the Deltona Community Center. This segment will also include two small stream crossings and a crossing of Perimeter Drive.

The first portion of this segment, between the Providence Drive and Perimeter Drive, runs adjacent to the north side of Lakeshore Drive. As Lakeshore Drive is an open-shouldered roadway, the trail surface must be at least 11 feet from the edge of the roadway pavement. The existing right-of-



Figure 11: Existing path and trees along Lake Shore Drive near Providence Boulevard.

way should be sufficient to accommodate this easily; however, the roadside area features a relatively dense tree canopy provided by a considerable number of mature and attractive trees. The ultimate alignment design will need to be very careful to minimize impacts to mature trees, both with regard to tree removal and to root impacts that may compromise the health of remaining trees. As a general rule, canopy trees such as oaks and sweetbay should be given preference, and palm trees should be considered first for removal before considering removal of these canopy trees.

While the exact alignment of the pathway will be designed with the assistance of site survey that includes tree locations, field review indicates that a carefully designed alignment that avoids most large canopy trees is likely feasible. There are locations where the trail may need to be narrowed to stay two feet clear of a tree or a protective railing may

need to be installed in order to shield trail users from tree trunks that come closer. Some alignment design may veer more closely to the road than 11 feet in order to protect a tree. This can also be accommodated with a protective railing for short stretches if necessary.

For example, just east of the intersection of Providence Boulevard and Lakeshore Drive, a sweetbay tree and a pine tree stand just 16 feet apart. The 12-foot trail could pass between these two trees, with two feet clear on either side, or the trail could be temporarily narrowed to provide greater clearance.

In addition to the 62-foot right-of-way, the City has negotiated a 17-foot easement with the adjacent Edgewater Condominiums. Lacking survey, it is difficult to ascertain exactly how much space is available at any one point (survey markers were observed in the field, at one point 48 feet from the edge of pavement).

Avoiding trees with an undulating alignment may

well require using portions of the negotiated easement. In the first 300 or so feet of this segment, however, several condominium structures are very close to the back line of the easement, so design will also need to consider the privacy and good will of the condominium residents.

Approximately 300 feet down this segment, the portion of the condominium complex immediately adjacent to the roadway is a wooded area with no structures yet developed. In this area, however, the existing tree cover on the right-of-way is more dense near the right-of-way line (Figure 12). Diversion of the trail into the easement and avoiding tree impacts may require more than the 17 feet currently granted. Field review confirms that the closest substantial tree is 24 feet from the existing edge of pavement, and then trees are more densely established from that point out to the edge of the right-of-way. This means that, if necessary, the pathway could run between the closest large trees and the



Figure 12: Trees are dense near ROW line.

roadway and mostly be well outside the 11-foot separation zone. Final design may reveal isolated stretches that come closer, which could be protected with a railing or other vertical barrier.

As the trail would cross the eastern portion of the condominium frontage, there is a small stream which passes under the road via a culvert reinforced with a concrete bag retaining wall (Figure 13). This wall and culvert could be extended to allow a trail crossing, but a more feasible solution may be the construction of a boardwalk, 12 feet wide

(to accommodate an eight-foot wide trail with two-foot shoulders on each side) and estimated to be 50 feet long. There are oak and sweetbay trees near the stream bank, and so the positioning of the bridge will need to be carefully designed to minimize impacts to trees.

After crossing the stream, the trail would approach Perimeter Drive. A monument sign for the Lakeside Condominium complex is situated at the northwest corner of the intersection with Perimeter Drive. This monument sign is only 12 feet from a cluster of oak trees, and a pathway would have to squeeze between both to avoid impacting either. An eight-foot trail could maintain adequate clearance through this constrained point, perhaps with minor



Figure 13: First stream crossing along Lake Shore Drive.

modifications to the planting bed around the monument sign (Figure 14). An alternative might be to divert the pathway around the back of the monument sign, allowing a crossing somewhat up the neck of the driveway.

The crossing of Perimeter Drive will need to be carefully designed to ensure that motorists and bicyclists alike can anticipate and respond to the conflicts as they approach. Traffic exiting Perimeter Drive is currently subject to a STOP sign at the intersection with Lakeshore Drive. For this and other reasons, the trail should have priority at this intersection.



Figure 14: Pathway would pass between an existing tree and the monument sign for Lakeside Condominiums.

On the east side of perimeter drive there are several trees and some lift station equipment around which the trail alignment will need to be carefully designed (Figure 15). Field measurements show that at one point the distance between the lift



Figure 15: Existing utilities and trees will provide a design challenge on the south side of Perimeter Drive.

station and a large oak tree is only 13 feet, and so will likely necessitate a brief narrowing of the trail to 9 feet to allow sufficient clearance (Figure 16).



Figure 16: Limited horizontal clearance between an existing tree and lift station equipment may require a brief narrowing of the trail.

Between perimeter drive and the entrance to the Deltona Community Center, positioning the trail 11 feet from the roadway will require the trimming of some small trees and other vegetation, as well as some minor grading. A properly separated trail will easily pass behind the utility pole just west of the first Community Center Driveway (Figure 17).



Figure 17: The trail should pass behind existing utilities east of the Community Center, thus requiring some clearing of vegetation.

There are four driveways across the senior center property (Figure 18). The more westerly two are primarily for a parking lot for vehicles with trailers associated with the Lake Monroe

boat ramp across Lakeshore Drive. Two others are for the Community Center/Senior Center, and accommodate Votran buses at a turn-around point. While consolidating these entrances would reduce the conflict points for trail users, doing so would require re-design of the parking lots to assure that the buses and trailers can maneuver adequately using the reduced entry points. However



Figure 18: The trail will need to be designed to manage potential conflicts at the driveways of the Community Center, Senior Center, and Boat Ramp.

many driveways remain; if they remain unpaved, then concrete aprons should be installed at the trail crossings to preserve the trail edge and keep gravel and other debris off the trail surface. Such an apron should fill the entire area between the trail and the street and extend at least 10 feet into the parking area from the back side of the trail.

There are several medium sized trees, including oaks, which will need to be designed around or removed. An oak just east of the boat ramp may be spared, but is just 8 feet from a small cypress which may need to be removed. The trail design will also likely impact the sign for the Community Center. Avoiding the sign altogether may be possible if the trail veers into the existing parking lot. Even so, the sign may impede



Figure 19: View of culvert under Lake Shore Drive between the Senior Center and Green Springs Park.

visibility between trail users and motorists and will most likely need to be relocated.

On the east side of the Community Center property is another small stream (Figure 19), which would best be crossed with a short boardwalk, at least 12 feet wide. Field observations indicate that a boardwalk will need to be approximately 25 feet long and positioned to minimize impacts to oak trees, with several palm trees likely to be removed.

An alternate construction method has been priced as segment 1.7A, where trail grading is achieved with fill only, thus avoiding the cutting of tree roots in this densely covered area. It should be noted that compaction can also be very stressful to tree roots and this approach will in no way guarantee the survival of any trees.

Segment 1.6: West of Green Springs Park driveway to point north and east of landscaped median; +/- 500 feet.

This segment turns north off of Lakeshore Drive and then runs adjacent to the west side of the Green Springs Park driveway (Figure 20). It crosses the park driveway at about the landscape island situated where the park road goes through a sharp S-curve. The exact alignment design

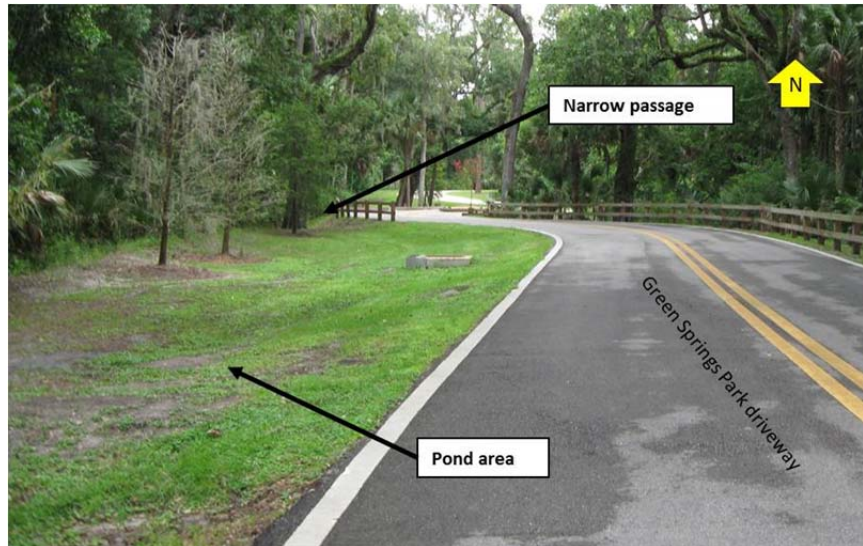


Figure 20: View of the south end of the west side of the driveway into Green Springs Park.

will be very dependent upon an accurate survey, because the park parcel narrows to approximately 40 feet (as measured on Volusia County’s GIS parcel maps) at one point. The park road itself is 20 feet wide and appears to be situated very near the center of that narrow stretch. The ground alongside the roadway has been graded into several small ponds/retention areas (likely to accommodate the construction of the new driveway (Figure 21).

Due the presence of the retention areas, a trail through this portion will likely require extensive boardwalking, the railings of which will also provide the vertical barrier necessary for a trail placed so



Figure 21: View of the north end of the west side of the driveway into Green Springs Park.

closely to the roadway. Field estimates anticipate about half this length will require

boardwalking to minimize impacts to the pond areas, and moderate grading may be required to facilitate construction over the rest of the segment.

After threading the narrow point of the parcel, the trail should cross to the east side of the park road. Again, an accurate survey will be necessary to develop a truly representative design concept. But based on field observations, crossing could likely be made north of the landscaped median and the tight S-curve in the driveway. The park driveway is curved several times over its course, so trail crossing warning signs should be placed in advance of and at the crossing point to heighten motorists' awareness of the trail.

Segment 1.7.: East side of Green Springs Park driveway to end; +/- 525 feet.

This segment continues north from the east side of the park driveway just north of the existing landscaped median. The segment runs parallel to the east side of the park driveway and comes to the semicircular sidewalk around the parking area, where it will terminate at a junction with the existing asphalt trail which runs through the park and out to the East Central Florida Regional Rail Trail. The trail will necessitate the widening of the south portion of the sidewalk to a width of 12 feet.

This trail also traverses a pond at the eastward bend of the park driveway (Figure 22), and will require boardwalking over approximately 175 feet of the segment, while moderate grading will be necessary to accommodate new trail construction and the widening of the sidewalk (Figure 23). A mitered end section that drains the pond at the center of the circular drive will need to be extended in a manner commensurate with the widening of the sidewalk (Figure 24).

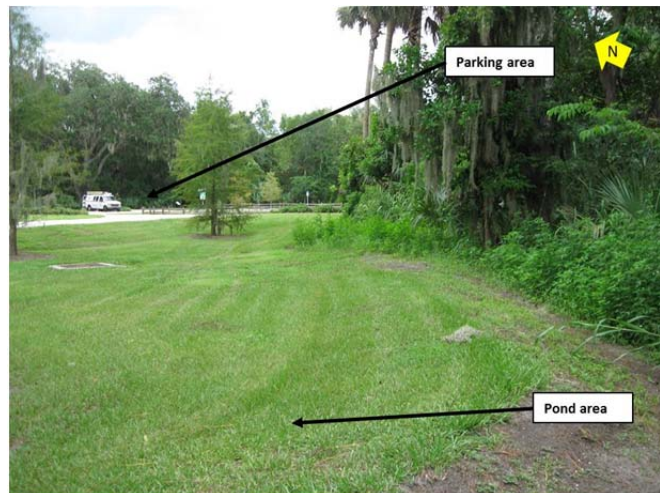


Figure 22: View of the south side of the Green Springs Park Driveway, approaching the parking lot.

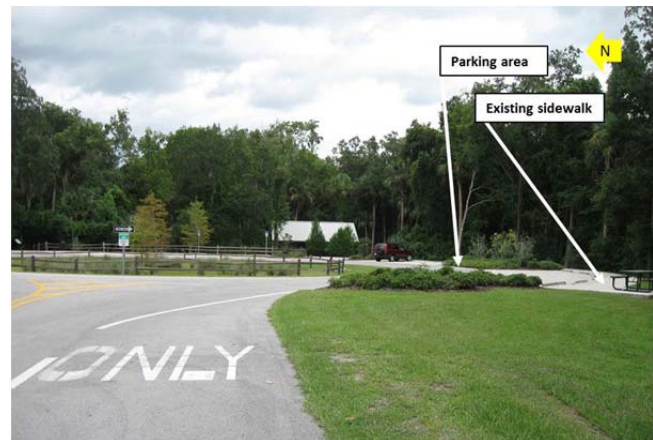


Figure 23: View of parking area and sidewalk at Green Springs Park.



Figure 24: Mitered end section would need to be lengthened with sidewalk widening.

ALTERNATE SEGMENTS

Segment A.1: From East Central Florida Regional Rail Trail to Thornby Park Playground area; +/- 700 feet.

As an alternate to segment 1.1, which travels adjacent to Providence Boulevard, this segment begins on the eastbound East Central Florida Regional Rail Trail, in advance of the intersection with Providence Boulevard and follows a course through a wooded portion of Thornby Park towards the playground and parking lot. It would provide a scenic, shaded, approach into the park. Detailed design of this segment will require survey information to confirm the existing topography and the location of large canopy trees. The design will likely require extensive boardwalking over low-lying and wet areas (Figure 25), as well careful routing to minimize impacts to mature oak, sweetbay, and pine trees.

Field observations and review of GIS topographic data indicate that approximately 300 feet of boardwalk may be needed, with significant grading necessary over the balance of the segment. This segment would emerge to the east of the park playground and also pass east of the lift station and restroom facility to meet segment 1.2, which would connect it back out toward Providence Boulevard.



Figure 25: View of low lying wooded area at north end of Thornby Park.

Segment A.2: From Opposite Magnolia Woods Court to existing crosswalk on east side of Providence Boulevard; +/- 250 feet.

This segment would allow the trail to make use of the existing eight-foot wide sidewalk on the east side of Providence Boulevard. It would require a connection to the street, a ramp into the street, a crosswalk, a ramp out of the street and a connection to the existing sidewalk.

A crossing near this point should preferably be to the south side of Magnolia Woods Court, thereby avoiding the need for requiring trail users to also cross that street where they would have additional potential conflicts with turning vehicles. The crossing will require some warning sign and perhaps an advanced treatment such as the RECTANGULAR RAPID FLASHING BEACON (RRFB) (a standard W11-2 (PEDESTRIAN WARNING) sign) augmented by on-demand flashing amber strobe-type lights) on both approaches of Providence Boulevard and for traffic turning left on to Providence from Magnolia Woods. There is a drain inlet in the boulevard strip just south of Magnolia Woods Court, which the trail connection will either need to design around or modify.

The connections to the street, ramps, and crosswalks should all be the same width as the trail. The existing sidewalk is only 8 feet wide. The goal of this project is to have a trail 12 feet wide, consistent with Volusia County practice, with the possibility of narrowing to as little as eight feet for short constrained sections. While this segment is relatively short, it is not necessarily constrained. It is straight and clear of obstructions near the edges, and so may work as an interim measure. Trail signage should advise trail users of the narrower conditions and also remind bicyclists of their duty to yield to pedestrians.

Segment A.2A: From Opposite Magnolia Woods Court to existing crosswalk on east side of Providence Boulevard; +/- 250 feet.

This segment is a variation on segment A2 described above. The existing sidewalk could be widened to 12 feet to be consistent with the rest of this facility. This modification would require some moderate grading as the sidewalk is built out into the boulevard strip (parcel maps and aerials seem to indicate that the back of the sidewalk is at or very near the right-of-way line, and so expanding toward the roadway would likely be required.)

Segment A.3: Existing crosswalk north of Thornby Park Driveway; +/- 75 feet.

This segment would allow the trail to make use of the established crossing at the Thornby Park driveway, connecting Segment 1.3 (described above), to the existing sidewalk east of Providence Boulevard.

This segment would require the widening of the existing ramps and crosswalks to the full width of the trail facility. It may be advisable to enhance the warning signs with the RRFB described for Segment A2. Warnings would be needed for both approaches of Providence Boulevard and for left turning outbound traffic from the park driveway.

Segment A.4: From existing crosswalk (east side) to northeast corner of Providence Boulevard/Lakeshore Drive intersection; +/- 400 feet.

Like segment A2 described above, this segment is mostly makes use of the existing sidewalk for approximately 350 feet, and then transitions into the asphalt trail, curving west to join with the previously described Segment 1.5.

As with segment A2, the sidewalk is only 8 feet wide, narrower than the recommended minimum width for shared-use paths. If this segment is used, trail users should be warned of the narrower facility and bicyclists reminded to yield to pedestrians. This segment is straight and free of adjacent obstructions. The ground immediately adjacent to sidewalk should be evenly graded and an inlet near the west side of the sidewalk should be shielded due to a 6-inch drop on the side facing the roadway.

Segment A.4A: From existing crosswalk (east side) to northeast corner of Providence Boulevard/Lakeshore Drive intersection; +/- 400 feet.

Segment A4A would consist of widening the existing sidewalk to meet trail specifications. Such a segment would also require moderate grading and the modification of one inlet at about the midpoint of the segment, as the trail would best expand toward the roadway (Figure 26).



Figure 26: View of existing sidewalk on east side of Providence Boulevard.

Segment A.5: West of Green Springs Park driveway; +/- 275 feet.

This segment would “short cut” segment 1.6, cutting through a wooded portion of the park, providing some shade cover and maximizing separation from the park driveway. It would require specific tree survey and careful design to minimize impacts to large canopy trees and also traverse low-lying, possible wetland areas. Based on field observations, it is estimated that just over half of the distance may need to be covered with boardwalk, with the remainder subject to major grading.

Segment A.6: From west of Green Springs Park driveway to east of Green Springs Park driveway; +/- 100 feet.

This segment would continue the trail alongside Lakeshore Drive to a point just west of the Green Springs Park driveway. It would include a crosswalk over the park driveway, necessitating warning signs for both approaches on Lakeshore Drive and for traffic exiting the park. It would facilitate a connection to either segment A7 or A8, described below.

Segment A.7: Green Springs Park Driveway; +/- 1225 feet.

This segment would route bicyclists onto the park driveway and also feature a newly constructed pedestrian walkway, consisting of sidewalks and boardwalks along the sequence described for Segments 1.6 and 1.7.

The use of the park driveway by bicyclists would be facilitated by the application of SHARED LANE MARKINGS along the length of the driveway. SHARED LANE MARKINGS are a marking used to indicate the best position for bicyclists in lanes which are too narrow for bicyclists to share laterally with passing motorists. Supplemented WITH BICYCLES MAY USE FULL LANE (R4-11) signs; these marking will encourage bicyclists to use the park driveway and for motorists to respect their right to do so.

The accompanying walkway will be about evenly split between sidewalk (requiring moderate grading) and boardwalk to traverse pond areas.

Segment A.8: From east of Green Springs Park Driveway to north and east of landscaped median in park driveway; +/- 450 feet.

This segment would travel up the east side of the park driveway from Lakeshore Drive and meet the previously described segment 1.7 to the north and east of the landscaped median in the driveway. It would consist of a combination of trail (leveled with major grading) and boardwalk (Figure 27). Care in design would need to be taken to maintain separation from the park driveway and to minimize impacts to mature canopy trees.



Figure 27: View of east side of Green Springs Park driveway.

ADDITIONAL CONCERNS

This section describes additional items that could be addressed during the construction of the shared-use path. Inaction on these items would not prevent the feasibility of the path; however, they are worth special attention.

Existing Signage

All existing signs within the shared-use path alignment would need to be relocated at a minimum two feet from the edge of the path, and provide an eight-foot vertical clearance.

Tree Care

An arborist's opinion should be obtained for any substantial tree work, including root pruning. Tree canopies that extend over the shared-use path would need to be trimmed to provide an eight-foot vertical clearance.

Public Involvement

Construction of this facility may be more easily accepted by adjacent property owners if they are included in the final project design.

Underground Utilities

The City of Deltona has identified the presence of several underground utilities along Providence Boulevard which may impact several segments. A sanitary force main is located along the east side of the road, potentially under segments A2, A3, and A4. A potable water main and storm sewer are located along the west side of the road, potentially under segments 1.1, 1.2.,1.3, and 1.4. These may present impacts to trail construction ranging from ensuring any access lids are set flush with the finished trail surface to possible relocation of utilities depending on their depth.

Permitting

A draft of this study was reviewed by the St. Johns River Water Management Agency. The text of the Agency's comments is pasted below:

1. Most of the trail is sited in uplands and would not require a 40c-42 F.A.C. stormwater permit owing to 40C-42.0225(6), F.A.C.:

40C-42.0225 Exemptions From Permitting for Stormwater Management Systems. *The following types of stormwater management systems are exempt from the notice and permit requirements of this chapter.*

(6) *Recreational paths which do not allow motorized vehicles powered by internal combustion engines, except for maintenance and emergency vehicles.*

2. There probably will be surface water impacts where the trail will cross two flow ways:
 - a) Intermittent ditch (identified on p.21 of Sprinkle's draft report to the county TPO that you sent me on September 23).
 - b) Ditched slough (p.18).

Either of these impacts could require a 40C-40 F.A.C. permit unless you limit the impacts to the minimum described by Noticed General Permit (NGP) or a suitable exemption. In this case, I think the ditch crossing can be exempt by 40C-4.051(12)(t)., F.A.C., that exemption for "bridges of artificial waterways" that I sent you last week (below). No construction plan was available for the slough crossing so I can't determine whether your crossing dimensions comply with the very specific NGP criteria but I bet you can erect a boardwalk over it via NGP 40C-400.475 (1)(a), F.A.C.:

40C-400.475 General Permit for Minor Activities

(1) *A general permit is hereby granted for the construction, alteration, maintenance, operation, abandonment and removal of the following minor systems:*

(a) *Piling supported structures of less than 1,000 square feet over wetlands or other surface waters, which are not designated Outstanding Florida Waters;*

3. You would not have to modify the existing permits for Thornby or Green Springs Parks so long as you do not alter the surface water management systems that were permitted for those developments. Avoid them if you can (you said that was likely).

This determination is based on my observations during our September 23, 2011 site visit and the material you submitted. If you believe that I may have misunderstood any part of the project, then advise me immediately.

FINANCIAL FEASIBILITY

To estimate the preliminary cost for the shared-use path several items were evaluated. The methods for estimating: right-of-way, permitting, utility relocation and construction costs are described on their respective sections below.

Right of Way Easements / Acquisitions

Based on the right-of-way shown in the GIS data, additional right-of-way, other than the easement already under negotiation, should not be necessary.

Construction

Construction unit prices were calculated for each of the described segments for Fiscal Years 2011 through 2015. Detailed Long Range Estimate calculations for each segment are included in the appendix. The item numbers and unit of measure are based on the Florida Department of Transportation (FDOT) Basis of Estimate Manual.

The FDOT Basis of Estimates Manual describes that detectable warnings (truncated domes) at the beginning of ramps are incidental to the construction for concrete sidewalks. Short ramps/sidewalk are indicated for points where the asphalt trail crosses a vehicular way. The cost to remove trees identified in this study is considered within the Clearing and Grubbing pay item.

As a summary of the construction cost estimating, the total estimated cost of the recommended conceptual alignment (Segments 1.1 through 1.7) is approximately \$374,000.

Comparisons may be made between different configurations of alternate segments, including:

- Alternative grading treatment to protect trees along Lake Shore Drive (substituting Segment 1.5A for Segment 1.5) would add around \$91,000 (in the base year) to the project, or about 24% over and above the base cost of the project.
- Connecting to the East Central Florida Regional Rail Trail through the woods on the north end of Thornby Park instead of along Providence Boulevard would cost (in the base year) an additional \$76,000 (20% over the base cost).
- Connecting to the existing sidewalk and using it “as is”, instead of building new trail all the way down the west side of Providence boulevard would save \$36,000 in the base year, or about 10% from the base cost.

- Widening the existing sidewalk would cost \$24,000 in the base year (7%) more than the base, and would be \$60,000 more than using the sidewalk “as is”.
- Using Shared Lane Markings and sidewalks within Green Springs Park would save \$24,000 in the base year (6%) from the base cost of building a separate full-width trail.
- Building a trail connection on the west side of the Green Springs Park driveway would cost \$4,000 more (1%) than the base.

Future year costs for all items were calculated, with an annual inflationary factor of 7%. The resulting rise in the total cost of the recommended conceptual alignment is shown in Table 1.

Table 1: Estimated total construction costs for Recommended Conceptual Alignment					
Fiscal Year	2011	2012	2013	2104	2015
Total Cost	\$374,000	\$400,000	\$428,000	\$458,000	\$490,000

APPENDIX:

DETAILED

LONG RANGE ESTIMATES

LONG RANGE ESTIMATE - SEGMENT 1.1, VOLUSIA COUNTY FLORIDA

FROM EXISTING TRAIL TO SEGMENT A2 (NORTH CROSSING)
APPROXIMATE LENGTH 675'

675

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$3,000.00	\$3,000.00	\$3,210.00	\$3,210.00	\$3,434.70	\$3,434.70	\$3,675.13	\$3,675.13	\$3,932.39	\$3,932.39
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$3,000.00	\$3,000.00	\$3,210.00	\$3,210.00	\$3,434.70	\$3,434.70	\$3,675.13	\$3,675.13	\$3,932.39	\$3,932.39
104-20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$2,313.39	\$2,313.39	\$2,475.33	\$2,475.33	\$2,648.60	\$2,648.60	\$2,834.00	\$2,834.00	\$3,032.38	\$3,032.38
	SIGNING & PAVEMENT MARKING	1	LS	\$1,156.69	\$1,156.69	\$1,237.66	\$1,237.66	\$1,324.30	\$1,324.30	\$1,417.00	\$1,417.00	\$1,516.19	\$1,516.19
522-1	CONCRETE SIDEWALK, 4" THICK (5' WIDE)	-	SY	\$81.33	\$0.00	\$87.02	\$0.00	\$93.11	\$0.00	\$99.63	\$0.00	\$106.61	\$0.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	45	TN	\$77.06	\$3,467.70	\$82.45	\$3,710.44	\$88.23	\$3,970.17	\$94.40	\$4,248.08	\$101.01	\$4,545.45
285-704	OPTIONAL BASE GROUP 4	900	SY	\$11.09	\$9,981.00	\$11.87	\$10,679.67	\$12.70	\$11,427.25	\$13.59	\$12,227.15	\$14.54	\$13,083.05
110-1-2	CLEARING & GRUBBING	0.19	AC	\$13,268.00	\$2,467.19	\$14,196.76	\$2,639.89	\$15,190.53	\$2,824.69	\$16,253.87	\$3,022.41	\$17,391.64	\$3,233.98
120-1	REGULAR EXCAVATION	300	CY	\$7.43	\$2,229.00	\$7.95	\$2,385.03	\$8.51	\$2,551.98	\$9.10	\$2,730.62	\$9.74	\$2,921.76
120-6	EMBANKMENT	300	CY	\$10.38	\$3,114.00	\$11.11	\$3,331.98	\$11.88	\$3,565.22	\$12.72	\$3,814.78	\$13.61	\$4,081.82
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	375	SY	\$5.00	\$1,875.00	\$5.35	\$2,006.25	\$5.72	\$2,146.69	\$6.13	\$2,296.96	\$6.55	\$2,457.74
	SUB- TOTAL				\$33,603.97		\$35,956.25		\$38,473.19		\$41,166.31		\$44,047.95
	DESIGN FEES (10%)				\$3,360.40		\$3,595.63		\$3,847.32		\$4,116.63		\$4,404.80
	CEI FEES (10%)				\$3,696.44		\$3,955.19		\$4,232.05		\$4,528.29		\$4,845.27
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$33,603.97		\$35,956.25		\$38,473.19		\$41,166.31		\$44,047.95

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT 1.2, VOLUSIA COUNTY FLORIDA

FROM SEGMENT 1.1 TO SEGMENT A1 (THORNBY PARK TRAILHEAD) APPROXIMATE LENGTH 50'

50

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$500.00	\$500.00	\$535.00	\$535.00	\$572.45	\$572.45	\$612.52	\$612.52	\$655.40	\$655.40
	SIGNING & PAVEMENT MARKING	1	LS	\$250.00	\$250.00	\$267.50	\$267.50	\$286.23	\$286.23	\$306.26	\$306.26	\$327.70	\$327.70
522-1	CONCRETE SIDEWALK, 4" THICK (5' WIDE)	-	SY	\$81.33	\$0.00	\$87.02	\$0.00	\$93.11	\$0.00	\$99.63	\$0.00	\$106.61	\$0.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	3	TN	\$77.06	\$256.87	\$82.45	\$274.85	\$88.23	\$294.09	\$94.40	\$314.67	\$101.01	\$336.70
285-704	OPTIONAL BASE GROUP 4	67	SY	\$11.09	\$739.33	\$11.87	\$791.09	\$12.70	\$846.46	\$13.59	\$905.72	\$14.54	\$969.12
110-1-2	CLEARING & GRUBBING	0.01	AC	\$13,268.00	\$182.75	\$14,196.76	\$195.55	\$15,190.53	\$209.24	\$16,253.87	\$223.88	\$17,391.64	\$239.55
120-1	REGULAR EXCAVATION	22	CY	\$7.43	\$165.11	\$7.95	\$176.67	\$8.51	\$189.04	\$9.10	\$202.27	\$9.74	\$216.43
120-6	EMBANKMENT	22	CY	\$10.38	\$230.67	\$11.11	\$246.81	\$11.88	\$264.09	\$12.72	\$282.58	\$13.61	\$302.36
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	28	SY	\$5.00	\$138.89	\$5.35	\$148.61	\$5.72	\$159.01	\$6.13	\$170.14	\$6.55	\$182.06
	SUB- TOTAL				\$5,463.62		\$5,846.07		\$6,255.30		\$6,693.17		\$7,161.69
	DESIGN FEES (10%)				\$546.36		\$584.61		\$625.53		\$669.32		\$716.17
	CEI FEES (10%)				\$601.00		\$643.07		\$688.08		\$736.25		\$787.79
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$5,463.62		\$5,846.07		\$6,255.30		\$6,693.17		\$7,161.69

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT 1.3, VOLUSIA COUNTY FLORIDA

FROM SEGMENT A2(NORTH CROSSING) TO SEGMENT A3
(EXISTING CROSSING) APPROXIMATE LENGTH 350'

350

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$2,000.00	\$2,000.00	\$2,140.00	\$2,140.00	\$2,289.80	\$2,289.80	\$2,450.09	\$2,450.09	\$2,621.59	\$2,621.59
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$2,000.00	\$2,000.00	\$2,140.00	\$2,140.00	\$2,289.80	\$2,289.80	\$2,450.09	\$2,450.09	\$2,621.59	\$2,621.59
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$1,275.44	\$1,275.44	\$1,364.72	\$1,364.72	\$1,460.25	\$1,460.25	\$1,562.47	\$1,562.47	\$1,671.85	\$1,671.85
	SIGNING & PAVEMENT MARKING	1	LS	\$637.72	\$637.72	\$682.36	\$682.36	\$730.13	\$730.13	\$781.24	\$781.24	\$835.92	\$835.92
522-1	MISC. CONCRETE, 4" THICK	9	SY	\$81.33	\$759.08	\$87.02	\$812.22	\$93.11	\$869.07	\$99.63	\$929.91	\$106.61	\$995.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	23	TN	\$77.06	\$1,798.07	\$82.45	\$1,923.93	\$88.23	\$2,058.61	\$94.40	\$2,202.71	\$101.01	\$2,356.90
285-704	OPTIONAL BASE GROUP 4	467	SY	\$11.09	\$5,175.33	\$11.87	\$5,537.61	\$12.70	\$5,925.24	\$13.59	\$6,340.01	\$14.54	\$6,783.81
110-1-2	CLEARING & GRUBBING	0.10	AC	\$13,268.00	\$1,279.28	\$14,196.76	\$1,368.83	\$15,190.53	\$1,464.65	\$16,253.87	\$1,567.18	\$17,391.64	\$1,676.88
120-1	REGULAR EXCAVATION	156	CY	\$7.43	\$1,155.78	\$7.95	\$1,236.68	\$8.51	\$1,323.25	\$9.10	\$1,415.88	\$9.74	\$1,514.99
120-6	EMBANKMENT	156	CY	\$10.38	\$1,614.67	\$11.11	\$1,727.69	\$11.88	\$1,848.63	\$12.72	\$1,978.04	\$13.61	\$2,116.50
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	194	SY	\$5.00	\$972.22	\$5.35	\$1,040.28	\$5.72	\$1,113.10	\$6.13	\$1,191.01	\$6.55	\$1,274.39
	SUB- TOTAL				\$19,667.59		\$21,044.33		\$22,517.43		\$24,093.65		\$25,780.21
	DESIGN FEES (10%)				\$1,966.76		\$2,104.43		\$2,251.74		\$2,409.36		\$2,578.02
	CEI FEES (10%)				\$2,163.44		\$2,314.88		\$2,476.92		\$2,650.30		\$2,835.82
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$19,667.59		\$21,044.33		\$22,517.43		\$24,093.65		\$25,780.21

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT 1.4, VOLUSIA COUNTY FLORIDA

FROM SEGMENT A3(EXISTING CROSSING) TO SEGMENT 1.5(NW
CORNER OF INTERSECTION) APPROXIMATE LENGTH 525'

500

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$2,000.00	\$2,000.00	\$2,140.00	\$2,140.00	\$2,289.80	\$2,289.80	\$2,450.09	\$2,450.09	\$2,621.59	\$2,621.59
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$2,000.00	\$2,000.00	\$2,140.00	\$2,140.00	\$2,289.80	\$2,289.80	\$2,450.09	\$2,450.09	\$2,621.59	\$2,621.59
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$1,941.35	\$1,941.35	\$2,077.24	\$2,077.24	\$2,222.65	\$2,222.65	\$2,378.23	\$2,378.23	\$2,544.71	\$2,544.71
	SIGNING & PAVEMENT MARKING	1	LS	\$970.67	\$970.67	\$1,038.62	\$1,038.62	\$1,111.32	\$1,111.32	\$1,189.12	\$1,189.12	\$1,272.35	\$1,272.35
522-1	MISC. CONCRETE, 4" THICK	28	SY	\$81.33	\$2,277.24	\$87.02	\$2,436.65	\$93.11	\$2,607.21	\$99.63	\$2,789.72	\$106.61	\$2,985.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	33	TN	\$77.06	\$2,568.67	\$82.45	\$2,748.47	\$88.23	\$2,940.87	\$94.40	\$3,146.73	\$101.01	\$3,367.00
285-704	OPTIONAL BASE GROUP 4	667	SY	\$11.09	\$7,393.33	\$11.87	\$7,910.87	\$12.70	\$8,464.63	\$13.59	\$9,057.15	\$14.54	\$9,691.15
110-1-2	CLEARING & GRUBBING	0.14	AC	\$13,268.00	\$1,827.55	\$14,196.76	\$1,955.48	\$15,190.53	\$2,092.36	\$16,253.87	\$2,238.83	\$17,391.64	\$2,395.54
120-1	REGULAR EXCAVATION	222	CY	\$7.43	\$1,651.11	\$7.95	\$1,766.69	\$8.51	\$1,890.36	\$9.10	\$2,022.68	\$9.74	\$2,164.27
120-6	EMBANKMENT	222	CY	\$10.38	\$2,306.67	\$11.11	\$2,468.13	\$11.88	\$2,640.90	\$12.72	\$2,825.77	\$13.61	\$3,023.57
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	278	SY	\$5.00	\$1,388.89	\$5.35	\$1,486.11	\$5.72	\$1,590.14	\$6.13	\$1,701.45	\$6.55	\$1,820.55
SUB- TOTAL					\$27,325.47		\$29,238.26		\$31,284.93		\$33,474.88		\$35,818.12
					DESIGN FEES (10%)		\$2,732.55		\$2,923.83		\$3,128.49		\$3,581.81
					CEI FEES (10%)		\$3,005.80		\$3,216.21		\$3,441.34		\$3,939.99
TOTAL ESTIMATED CONSTRUCTION COST (2011) :					\$27,325.47		\$29,238.26		\$31,284.93		\$33,474.88		\$35,818.12

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT 1.5, VOLUSIA COUNTY FLORIDA

FROM SEGMENT 1.4(NW CORNER OF INTERSECTION) TO
SEGMENT 1.6(EAST OF GREEN SPRINGS ENTRY DRIVE)
APPROXIMATE LENGTH 1625'

1525

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$10,000.00	\$10,000.00	\$10,700.00	\$10,700.00	\$11,449.00	\$11,449.00	\$12,250.43	\$12,250.43	\$13,107.96	\$13,107.96
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$10,000.00	\$10,000.00	\$10,700.00	\$10,700.00	\$11,449.00	\$11,449.00	\$12,250.43	\$12,250.43	\$13,107.96	\$13,107.96
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$8,789.01	\$8,789.01	\$9,404.24	\$9,404.24	\$10,062.54	\$10,062.54	\$10,766.92	\$10,766.92	\$11,520.60	\$11,520.60
	SIGNING & PAVEMENT MARKING	1	LS	\$4,357.01	\$4,357.01	\$4,662.00	\$4,662.00	\$4,988.34	\$4,988.34	\$5,337.52	\$5,337.52	\$5,711.15	\$5,711.15
	GEOTECHNICAL FOR BOARDWALK	1	LS	\$750.00	\$750.00	\$802.50	\$802.50	\$858.68	\$858.68	\$918.78	\$918.78	\$983.10	\$983.10
470-1	12' WIDE TREATED TIMBER STRUCTURAL BOARDWALK (75'LF)	75	LF	\$200.00	\$15,000.00	\$214.00	\$16,050.00	\$228.98	\$17,173.50	\$245.01	\$18,375.65	\$262.16	\$19,661.94
522-1	MISC. CONCRETE, 4" THICK	241	SY	\$81.33	\$19,600.53	\$87.02	\$20,972.57	\$93.11	\$22,440.65	\$99.63	\$24,011.49	\$106.61	\$25,692.30
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	102	TN	\$77.06	\$7,834.43	\$82.45	\$8,382.84	\$88.23	\$8,969.64	\$94.40	\$9,597.52	\$101.01	\$10,269.34
285-704	OPTIONAL BASE GROUP 4	2,033	SY	\$11.09	\$22,549.67	\$11.87	\$24,128.14	\$12.70	\$25,817.11	\$13.59	\$27,624.31	\$14.54	\$29,558.01
110-1-2	CLEARING & GRUBBING	0.44	AC	\$13,268.00	\$5,848.15	\$14,196.76	\$6,257.53	\$15,190.53	\$6,695.55	\$16,253.87	\$7,164.24	\$17,391.64	\$7,665.74
120-1	REGULAR EXCAVATION	678	CY	\$7.43	\$5,035.89	\$7.95	\$5,388.40	\$8.51	\$5,765.59	\$9.10	\$6,169.18	\$9.74	\$6,601.02
120-6	EMBANKMENT	678	CY	\$10.38	\$7,035.33	\$11.11	\$7,527.81	\$11.88	\$8,054.75	\$12.72	\$8,618.59	\$13.61	\$9,221.89
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	847	SY	\$5.00	\$4,236.11	\$5.35	\$4,532.64	\$5.72	\$4,849.92	\$6.13	\$5,189.42	\$6.55	\$5,552.68
SUB- TOTAL					\$122,036.14		\$130,578.66		\$139,719.17		\$149,499.51		\$159,964.48
					DESIGN FEES (10%)		\$12,203.61		\$13,057.87		\$13,971.92		\$14,949.95
					CEI FEES (10%)		\$13,423.97		\$14,363.65		\$15,369.11		\$16,444.95
					TOTAL ESTIMATED CONSTRUCTION COST (2011) :		\$122,036.14		\$130,578.66		\$139,719.17		\$149,499.51
							\$130,578.66		\$139,719.17		\$149,499.51		\$159,964.48

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Estimate includes geotechnical costs (5% of boardwalk costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT 1.7, VOLUSIA COUNTY FLORIDA

FROM SEGMENT 1.6(EAST SIDE OF PARK DRIVEWAY) TO END
APPROXIMATE LENGTH 525'

200

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$7,000.00	\$7,000.00	\$7,490.00	\$7,490.00	\$8,014.30	\$8,014.30	\$8,575.30	\$8,575.30	\$9,175.57	\$9,175.57
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$7,000.00	\$7,000.00	\$7,490.00	\$7,490.00	\$8,014.30	\$8,014.30	\$8,575.30	\$8,575.30	\$9,175.57	\$9,175.57
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$5,654.69	\$5,654.69	\$6,050.52	\$6,050.52	\$6,474.06	\$6,474.06	\$6,927.24	\$6,927.24	\$7,412.15	\$7,412.15
	SIGNING & PAVEMENT MARKING	1	LS	\$2,739.85	\$2,739.85	\$2,931.64	\$2,931.64	\$3,136.85	\$3,136.85	\$3,356.43	\$3,356.43	\$3,591.38	\$3,591.38
	GEOTECHNICAL FOR BOARDWALK	1	LS	\$1,750.00	\$1,750.00	\$1,872.50	\$1,872.50	\$2,003.58	\$2,003.58	\$2,143.83	\$2,143.83	\$2,293.89	\$2,293.89
470-1	12' WIDE TREATED TIMBER STRUCTURAL BOARDWALK (175' LF)	175	LF	\$200.00	\$35,000.00	\$214.00	\$37,450.00	\$228.98	\$40,071.50	\$245.01	\$42,876.51	\$262.16	\$45,877.86
522-1	CONCRETE SIDEWALK, 4" THICK (5' WIDENING)	117	SY	\$81.33	\$9,488.50	\$87.02	\$10,152.70	\$93.11	\$10,863.38	\$99.63	\$11,623.82	\$106.61	\$12,437.49
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	13	TN	\$77.06	\$1,027.47	\$82.45	\$1,099.39	\$88.23	\$1,176.35	\$94.40	\$1,258.69	\$101.01	\$1,346.80
285-704	OPTIONAL BASE GROUP 4	267	SY	\$11.09	\$2,957.33	\$11.87	\$3,164.35	\$12.70	\$3,385.85	\$13.59	\$3,622.86	\$14.54	\$3,876.46
110-1-2	CLEARING & GRUBBING	0.13	AC	\$13,268.00	\$1,690.48	\$14,196.76	\$1,808.82	\$15,190.53	\$1,935.43	\$16,253.87	\$2,070.91	\$17,391.64	\$2,215.88
120-1	REGULAR EXCAVATION	206	CY	\$7.43	\$1,527.28	\$7.95	\$1,634.19	\$8.51	\$1,748.58	\$9.10	\$1,870.98	\$9.74	\$2,001.95
120-6	EMBANKMENT	206	CY	\$10.38	\$2,133.67	\$11.11	\$2,283.02	\$11.88	\$2,442.83	\$12.72	\$2,613.83	\$13.61	\$2,796.80
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	194	SY	\$5.00	\$972.22	\$5.35	\$1,040.28	\$5.72	\$1,113.10	\$6.13	\$1,191.01	\$6.55	\$1,274.39
	SUB- TOTAL				\$79,941.49		\$85,537.40		\$91,525.01		\$97,931.76		\$104,786.99
	DESIGN FEES (10%)				\$7,994.15		\$8,553.74		\$9,152.50		\$9,793.18		\$10,478.70
	CEI FEES (10%)				\$8,793.56		\$9,409.11		\$10,067.75		\$10,772.49		\$11,526.57
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$79,941.49		\$85,537.40		\$91,525.01		\$97,931.76		\$104,786.99

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Estimate includes geotechnical costs (5% of boardwalk costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A1, VOLUSIA COUNTY FLORIDA

FROM EXISTING TRAIL TO SEGMENT 1.2
APPROXIMATE LENGTH 700'

400

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$9,000.00	\$9,000.00	\$9,630.00	\$9,630.00	\$10,304.10	\$10,304.10	\$11,025.39	\$11,025.39	\$11,797.16	\$11,797.16
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$9,000.00	\$9,000.00	\$9,630.00	\$9,630.00	\$10,304.10	\$10,304.10	\$11,025.39	\$11,025.39	\$11,797.16	\$11,797.16
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$7,914.91	\$7,914.91	\$8,468.95	\$8,468.95	\$9,061.78	\$9,061.78	\$9,696.10	\$9,696.10	\$10,374.83	\$10,374.83
	SIGNING & PAVEMENT MARKING	1	LS	\$3,807.45	\$3,807.45	\$4,073.98	\$4,073.98	\$4,359.15	\$4,359.15	\$4,664.30	\$4,664.30	\$4,990.80	\$4,990.80
	GEOTECHNICAL FOR BOARDWALK	1	LS	\$3,000.00	\$3,000.00	\$3,210.00	\$3,210.00	\$3,434.70	\$3,434.70	\$3,675.13	\$3,675.13	\$3,932.39	\$3,932.39
470-1	12' WIDE TREATED TIMBER STRUCTURAL BOARDWALK (300' LF)	300	LF	\$200.00	\$60,000.00	\$214.00	\$64,200.00	\$228.98	\$68,694.00	\$245.01	\$73,502.58	\$262.16	\$78,647.76
522-1	MISC. CONCRETE, 4" THICK	-	SY	\$81.33	\$0.00	\$87.02	\$0.00	\$93.11	\$0.00	\$99.63	\$0.00	\$106.61	\$0.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	27	TN	\$77.06	\$2,054.93	\$82.45	\$2,198.78	\$88.23	\$2,352.69	\$94.40	\$2,517.38	\$101.01	\$2,693.60
285-704	OPTIONAL BASE GROUP 4	533	SY	\$11.09	\$5,914.67	\$11.87	\$6,328.69	\$12.70	\$6,771.70	\$13.59	\$7,245.72	\$14.54	\$7,752.92
110-1-2	CLEARING & GRUBBING	0.19	AC	\$13,268.00	\$2,558.57	\$14,196.76	\$2,737.67	\$15,190.53	\$2,929.30	\$16,253.87	\$3,134.36	\$17,391.64	\$3,353.76
120-1	REGULAR EXCAVATION	178	CY	\$7.43	\$1,320.89	\$7.95	\$1,413.35	\$8.51	\$1,512.29	\$9.10	\$1,618.15	\$9.74	\$1,731.42
120-6	EMBANKMENT	178	CY	\$10.38	\$1,845.33	\$11.11	\$1,974.51	\$11.88	\$2,112.72	\$12.72	\$2,260.61	\$13.61	\$2,418.86
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	1	EA	\$1,343.59	\$1,343.59	\$1,437.64	\$1,437.64	\$1,538.28	\$1,538.28	\$1,645.96	\$1,645.96	\$1,761.17	\$1,761.17
570- 1	SODDING	222	SY	\$5.00	\$1,111.11	\$5.35	\$1,188.89	\$5.72	\$1,272.11	\$6.13	\$1,361.16	\$6.55	\$1,456.44
	SUB- TOTAL				\$109,871.45		\$117,562.46		\$125,791.83		\$134,597.26		\$144,019.06
	DESIGN FEES (10%)				\$10,987.15		\$11,756.25		\$12,579.18		\$13,459.73		\$14,401.91
	CEI FEES (10%)				\$12,085.86		\$12,931.87		\$13,837.10		\$14,805.70		\$15,842.10
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$109,871.45		\$117,562.46		\$125,791.83		\$134,597.26		\$144,019.06

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Estimate includes geotechnical costs (5% of boardwalk costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A2, VOLUSIA COUNTY FLORIDA

FROM SEGMENTS 1.1/1.2 (PARK CONNECTION) TO SEGMENT A4
EXISTING CROSSING, APPROXIMATE LENGTH 250'

30

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$500.00	\$500.00	\$535.00	\$535.00	\$572.45	\$572.45	\$612.52	\$612.52	\$655.40	\$655.40
	SIGNING & PAVEMENT MARKING	1	LS	\$250.00	\$250.00	\$267.50	\$267.50	\$286.23	\$286.23	\$306.26	\$306.26	\$327.70	\$327.70
522-1	MISC. CONCRETE, 4" THICK	19	SY	\$81.33	\$1,518.16	\$87.02	\$1,624.43	\$93.11	\$1,738.14	\$99.63	\$1,859.81	\$106.61	\$1,990.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	2	TN	\$77.06	\$154.12	\$82.45	\$164.91	\$88.23	\$176.45	\$94.40	\$188.80	\$101.01	\$202.02
285-704	OPTIONAL BASE GROUP 4	40	SY	\$11.09	\$443.60	\$11.87	\$474.65	\$12.70	\$507.88	\$13.59	\$543.43	\$14.54	\$581.47
110-1-2	CLEARING & GRUBBING	0.01	AC	\$13,268.00	\$109.65	\$14,196.76	\$117.33	\$15,190.53	\$125.54	\$16,253.87	\$134.33	\$17,391.64	\$143.73
120-1	REGULAR EXCAVATION	13	CY	\$7.43	\$99.07	\$7.95	\$106.00	\$8.51	\$113.42	\$9.10	\$121.36	\$9.74	\$129.86
120-6	EMBANKMENT	13	CY	\$10.38	\$138.40	\$11.11	\$148.09	\$11.88	\$158.45	\$12.72	\$169.55	\$13.61	\$181.41
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	17	SY	\$5.00	\$83.33	\$5.35	\$89.17	\$5.72	\$95.41	\$6.13	\$102.09	\$6.55	\$109.23
	SUB- TOTAL				\$6,296.33		\$6,737.08		\$7,208.67		\$7,713.28		\$8,253.21
					DESIGN FEES (10%)		\$629.63		\$673.71		\$720.87		\$825.32
					CEI FEES (10%)		\$692.60		\$741.08		\$792.95		\$907.85
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$6,296.33		\$6,737.08		\$7,208.67		\$7,713.28		\$8,253.21

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A3, VOLUSIA COUNTY FLORIDA

FROM SEGMENTS 1.3 TO SEGMENT A2/A4,
APPROXIMATE LENGTH 75'

30

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$500.00	\$500.00	\$535.00	\$535.00	\$572.45	\$572.45	\$612.52	\$612.52	\$655.40	\$655.40
	SIGNING & PAVEMENT MARKING	1	LS	\$250.00	\$250.00	\$267.50	\$267.50	\$286.23	\$286.23	\$306.26	\$306.26	\$327.70	\$327.70
522-1	MISC. CONCRETE, 4" THICK	19	SY	\$81.33	\$1,518.16	\$87.02	\$1,624.43	\$93.11	\$1,738.14	\$99.63	\$1,859.81	\$106.61	\$1,990.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	2	TN	\$77.06	\$154.12	\$82.45	\$164.91	\$88.23	\$176.45	\$94.40	\$188.80	\$101.01	\$202.02
285-704	OPTIONAL BASE GROUP 4	40	SY	\$11.09	\$443.60	\$11.87	\$474.65	\$12.70	\$507.88	\$13.59	\$543.43	\$14.54	\$581.47
110-1-2	CLEARING & GRUBBING	0.01	AC	\$13,268.00	\$109.65	\$14,196.76	\$117.33	\$15,190.53	\$125.54	\$16,253.87	\$134.33	\$17,391.64	\$143.73
120-1	REGULAR EXCAVATION	13	CY	\$7.43	\$99.07	\$7.95	\$106.00	\$8.51	\$113.42	\$9.10	\$121.36	\$9.74	\$129.86
120-6	EMBANKMENT	13	CY	\$10.38	\$138.40	\$11.11	\$148.09	\$11.88	\$158.45	\$12.72	\$169.55	\$13.61	\$181.41
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	17	SY	\$5.00	\$83.33	\$5.35	\$89.17	\$5.72	\$95.41	\$6.13	\$102.09	\$6.55	\$109.23
	SUB- TOTAL				\$6,296.33		\$6,737.08		\$7,208.67		\$7,713.28		\$8,253.21
					DESIGN FEES (10%)		\$629.63		\$673.71		\$720.87		\$771.33
					CEI FEES (10%)		\$692.60		\$741.08		\$792.95		\$848.46
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$6,296.33		\$6,737.08		\$7,208.67		\$7,713.28		\$8,253.21

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A4A, VOLUSIA COUNTY FLORIDA

FROM SEGMENTS A2/A3 TO SEGMENT 1.5
APPROXIMATE LENGTH 400'

30

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$4,000.00	\$4,000.00	\$4,280.00	\$4,280.00	\$4,579.60	\$4,579.60	\$4,900.17	\$4,900.17	\$5,243.18	\$5,243.18
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$4,000.00	\$4,000.00	\$4,280.00	\$4,280.00	\$4,579.60	\$4,579.60	\$4,900.17	\$4,900.17	\$5,243.18	\$5,243.18
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$3,172.53	\$3,172.53	\$3,394.60	\$3,394.60	\$3,632.23	\$3,632.23	\$3,886.48	\$3,886.48	\$4,158.54	\$4,158.54
	SIGNING & PAVEMENT MARKING	1	LS	\$1,586.26	\$1,586.26	\$1,697.30	\$1,697.30	\$1,816.11	\$1,816.11	\$1,943.24	\$1,943.24	\$2,079.27	\$2,079.27
522-1	CONCRETE SIDEWALK, 4" THICK	333	SY	\$81.33	\$27,110.00	\$87.02	\$29,007.70	\$93.11	\$31,038.24	\$99.63	\$33,210.92	\$106.61	\$35,535.68
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	2	TN	\$77.06	\$154.12	\$82.45	\$164.91	\$88.23	\$176.45	\$94.40	\$188.80	\$101.01	\$202.02
285-704	OPTIONAL BASE GROUP 4	40	SY	\$11.09	\$443.60	\$11.87	\$474.65	\$12.70	\$507.88	\$13.59	\$543.43	\$14.54	\$581.47
110-1-2	CLEARING & GRUBBING	0.08	AC	\$13,268.00	\$1,023.43	\$14,196.76	\$1,095.07	\$15,190.53	\$1,171.72	\$16,253.87	\$1,253.74	\$17,391.64	\$1,341.50
120-1	REGULAR EXCAVATION	124	CY	\$7.43	\$924.62	\$7.95	\$989.35	\$8.51	\$1,058.60	\$9.10	\$1,132.70	\$9.74	\$1,211.99
120-6	EMBANKMENT	124	CY	\$10.38	\$1,291.73	\$11.11	\$1,382.15	\$11.88	\$1,478.91	\$12.72	\$1,582.43	\$13.61	\$1,693.20
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	156	SY	\$5.00	\$777.78	\$5.35	\$832.22	\$5.72	\$890.48	\$6.13	\$952.81	\$6.55	\$1,019.51
	SUB- TOTAL				\$45,484.07		\$48,667.96		\$52,074.71		\$55,719.94		\$59,620.34
													\$8,943.05
					\$4,548.41		\$4,866.80		\$5,207.47		\$5,571.99		\$6,856.34
					\$5,003.25		\$5,353.48		\$5,728.22		\$6,129.19		\$7,541.97
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$45,484.07		\$48,667.96		\$52,074.71		\$55,719.94		\$68,563.39

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A5, VOLUSIA COUNTY FLORIDA

FROM SEGMENTS 1.5 TO SEGMENT 1.6,
APPROXIMATE LENGTH 275'

125

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$4,000.00	\$4,000.00	\$4,280.00	\$4,280.00	\$4,579.60	\$4,579.60	\$4,900.17	\$4,900.17	\$5,243.18	\$5,243.18
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$4,000.00	\$4,000.00	\$4,280.00	\$4,280.00	\$4,579.60	\$4,579.60	\$4,900.17	\$4,900.17	\$5,243.18	\$5,243.18
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$3,751.97	\$3,751.97	\$4,014.60	\$4,014.60	\$4,295.62	\$4,295.62	\$4,596.32	\$4,596.32	\$4,918.06	\$4,918.06
	SIGNING & PAVEMENT MARKING	1	LS	\$1,800.98	\$1,800.98	\$1,927.05	\$1,927.05	\$2,061.94	\$2,061.94	\$2,206.28	\$2,206.28	\$2,360.72	\$2,360.72
	GEOTECHNICAL FOR BOARDWALK	1	LS	\$1,500.00	\$1,500.00	\$1,605.00	\$1,605.00	\$1,717.35	\$1,717.35	\$1,837.56	\$1,837.56	\$1,966.19	\$1,966.19
470-1	12' WIDE TREATED TIMBER STRUCTURAL BOARDWALK (150' LF)	150	LF	\$200.00	\$30,000.00	\$214.00	\$32,100.00	\$228.98	\$34,347.00	\$245.01	\$36,751.29	\$262.16	\$39,323.88
522-1	CONCRETE SIDEWALK, 4" THICK	-	SY	\$81.33	\$0.00	\$87.02	\$0.00	\$93.11	\$0.00	\$99.63	\$0.00	\$106.61	\$0.00
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	8	TN	\$77.06	\$642.17	\$82.45	\$687.12	\$88.23	\$735.22	\$94.40	\$786.68	\$101.01	\$841.75
285-704	OPTIONAL BASE GROUP 4	167	SY	\$11.09	\$1,848.33	\$11.87	\$1,977.72	\$12.70	\$2,116.16	\$13.59	\$2,264.29	\$14.54	\$2,422.79
110-1-2	CLEARING & GRUBBING	0.08	AC	\$13,268.00	\$1,005.15	\$14,196.76	\$1,075.51	\$15,190.53	\$1,150.80	\$16,253.87	\$1,231.35	\$17,391.64	\$1,317.55
120-1	REGULAR EXCAVATION	122	CY	\$7.43	\$908.11	\$7.95	\$971.68	\$8.51	\$1,039.70	\$9.10	\$1,112.48	\$9.74	\$1,190.35
120-6	EMBANKMENT	122	CY	\$10.38	\$1,268.67	\$11.11	\$1,357.47	\$11.88	\$1,452.50	\$12.72	\$1,554.17	\$13.61	\$1,662.96
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	69	SY	\$5.00	\$347.22	\$5.35	\$371.53	\$5.72	\$397.53	\$6.13	\$425.36	\$6.55	\$455.14
	SUB- TOTAL				\$52,072.60		\$55,717.68		\$59,617.92		\$63,791.17		\$68,256.56
					DESIGN FEES (10%)		\$5,207.26		\$5,571.77		\$5,961.79		\$6,825.66
					CEI FEES (10%)		\$5,727.99		\$6,128.94		\$6,557.97		\$7,508.22
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$52,072.60		\$55,717.68		\$59,617.92		\$63,791.17		\$68,256.56

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Estimate includes geotechnical costs (5% of boardwalk costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

LONG RANGE ESTIMATE - SEGMENT A7, VOLUSIA COUNTY FLORIDA

FROM SEGMENTS A6 TO END, APPROXIMATE LENGTH 1225'

0

Prepared by TranSystems

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	Fiscal Year 2011		Fiscal Year 2012		Fiscal Year 2013		Fiscal Year 2014		Fiscal Year 2015	
				UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST	UNIT PRICE	TOTAL COST
101- 1	MOBILIZATION	1	LS	\$11,000.00	\$11,000.00	\$11,770.00	\$11,770.00	\$12,593.90	\$12,593.90	\$13,475.47	\$13,475.47	\$14,418.76	\$14,418.76
102- 1	MAINTENANCE OF TRAFFIC	1	LS	\$11,000.00	\$11,000.00	\$11,770.00	\$11,770.00	\$12,593.90	\$12,593.90	\$13,475.47	\$13,475.47	\$14,418.76	\$14,418.76
104- 20	EROSION CONTROL	1	LS	\$1,000.00	\$1,000.00	\$1,070.00	\$1,070.00	\$1,144.90	\$1,144.90	\$1,225.04	\$1,225.04	\$1,310.80	\$1,310.80
	DESIGN SURVEY	1	LS	\$9,756.20	\$9,756.20	\$10,439.13	\$10,439.13	\$11,169.87	\$11,169.87	\$11,951.76	\$11,951.76	\$12,788.39	\$12,788.39
	SIGNING & PAVEMENT MARKING	1	LS	\$4,728.10	\$4,728.10	\$5,059.07	\$5,059.07	\$5,413.20	\$5,413.20	\$5,792.13	\$5,792.13	\$6,197.57	\$6,197.57
	GEOTECHNICAL FOR BOARDWALK	1	LS	\$3,000.00	\$3,000.00	\$3,210.00	\$3,210.00	\$3,434.70	\$3,434.70	\$3,675.13	\$3,675.13	\$3,932.39	\$3,932.39
470-1	5' WIDE TREATED TIMBER STRUCTURAL BOARDWALK (600' LF)	600	LF	\$100.00	\$60,000.00	\$107.00	\$64,200.00	\$114.49	\$68,694.00	\$122.50	\$73,502.58	\$131.08	\$78,647.76
522-1	CONCRETE SIDEWALK, 4" THICK (5' WIDE)	333	SY	\$81.33	\$27,110.00	\$87.02	\$29,007.70	\$93.11	\$31,038.24	\$99.63	\$33,210.92	\$106.61	\$35,535.68
334-1-13	ASPHALT TRAIL, 1" THICK (12' WIDE)	-	TN	\$77.06	\$0.00	\$82.45	\$0.00	\$88.23	\$0.00	\$94.40	\$0.00	\$101.01	\$0.00
285-704	OPTIONAL BASE GROUP 4	-	SY	\$11.09	\$0.00	\$11.87	\$0.00	\$12.70	\$0.00	\$13.59	\$0.00	\$14.54	\$0.00
110-1-2	CLEARING & GRUBBING	0.14	AC	\$13,268.00	\$1,827.55	\$14,196.76	\$1,955.48	\$15,190.53	\$2,092.36	\$16,253.87	\$2,238.83	\$17,391.64	\$2,395.54
120-1	REGULAR EXCAVATION	222	CY	\$7.43	\$1,651.11	\$7.95	\$1,766.69	\$8.51	\$1,890.36	\$9.10	\$2,022.68	\$9.74	\$2,164.27
120-6	EMBANKMENT	222	CY	\$10.38	\$2,306.67	\$11.11	\$2,468.13	\$11.88	\$2,640.90	\$12.72	\$2,825.77	\$13.61	\$3,023.57
400-0-11	CONCRETE CLASS NS, GRAVITY WALL	-	CY	\$423.28	\$0.00	\$452.91	\$0.00	\$484.61	\$0.00	\$518.54	\$0.00	\$554.83	\$0.00
425-4	INLET ADJUSTMENT	-	EA	\$1,343.59	\$0.00	\$1,437.64	\$0.00	\$1,538.28	\$0.00	\$1,645.96	\$0.00	\$1,761.17	\$0.00
570- 1	SODDING	333	SY	\$5.00	\$1,666.67	\$5.35	\$1,783.33	\$5.72	\$1,908.17	\$6.13	\$2,041.74	\$6.55	\$2,184.66
	SUB- TOTAL				\$135,046.29		\$144,499.53		\$154,614.50		\$165,437.51		\$177,018.14
	DESIGN FEES (10%)				\$13,504.63		\$14,449.95		\$15,461.45		\$16,543.75		\$17,701.81
	CEI FEES (10%)				\$14,855.09		\$15,894.95		\$17,007.59		\$18,198.13		\$19,472.00
	TOTAL ESTIMATED CONSTRUCTION COST (2011) :				\$135,046.29		\$144,499.53		\$154,614.50		\$165,437.51		\$177,018.14

ESTIMATE BASIS AND ASSUMPTIONS:

- Estimate does not include utility relocation costs.
- The mobilization costs are based on 10% of the construction cost
- Estimate includes maintenance of traffic costs (10% of construction costs).
- Estimate includes signing and paving marking costs (5% of construction costs).
- Estimate includes geotechnical costs (5% of boardwalk costs).
- Regular excavation & embankment to 1 ft depth
- No R/W Impact
- No specialized landscaping (beyond sodding)
- Utility relocations by others
- 7% Yearly Escalation
- Assume 1 inlet adjustment per 500 feet

