



City of Bradenton | March 2017
RESTORE Act Funding

CITY OF BRADENTON
RESTORE Act Funding
Updated and Revised Project Proposal

March 2017

TABLE OF CONTENTS

1	INTRODUCTION.....	1-1
2	Initial Project Proposals	2-1
2.1	Riverside Drive from 18th Street East to 26th Street East; Manatee River	2-1
2.2	19 th Street East and Riverside Drive; Manatee River	2-2
2.3	Riverview Blvd from 19 th St W to 26 th St W; Manatee River	2-3
3	Updated and Revised Project Proposals.....	3-1
3.1	2016 Watershed Management Plan	3-1
3.1.1	Riverview Boulevard; Manatee River	3-1
3.1.2	71 st Street West; Palma Sola Bay	3-2
3.2	2017 Water Quality Improvement Strategy.....	3-4
3.2.1	Riverside Drive and 2 nd Avenue East from 18 th Street East to 21 st Street East; Manatee River	3-4
3.2.2	14 th Street East; Braden River	3-5
3.2.3	Southern Parkway and 33 rd Ave Drive West along Cedar Hammock; Palma Sola Bay	3-6
4	Project Status	4-1

LIST OF TABLES

Table 2-1	ROM* Opinion of Probable Cost (2006).....	2-1
Table 2-2	ROM Opinion of Probable Cost (2006)	2-2
Table 2-3	ROM Opinion of Probable Cost (2006)	2-3
Table 3-1	Pollutant Removal Estimate	3-6
Table 4-1	Opinion of Probable Cost* (2016)	4-2
Table 4-2	Cost-Benefit Summary.....	4-2

1 INTRODUCTION

The City of Bradenton watershed is highly urbanized, consisting of mainly high-density residential and commercial land uses. Approximately 54% of the watershed is classified as high-density residential and commercial areas account for 13% of the watershed. The natural drainage pattern is generally from south to north into the Manatee River, with Wares Creek passing through the center of the City. Portions of the City also drain to Braden River and to Palma Sola Bay. The City's constructed drainage facilities consist of a complex network of inlets and pipes. Many of these systems date back to the 1960s and earlier.

In November 2012 the City of Bradenton submitted an application to the Sarasota Bay Estuary Program with consideration for RESTORE Act Ecosystem Restoration Projects. The project named in this application is City of Bradenton Stormwater Facility Plan Water Quality Improvements based on the 2006 Stormwater Facility Plan project priorities 13, 14, and 15 (project descriptions shown below). The net environmental result indicates 20 tons of sediment per year would be prevented from entering the Manatee River. Additionally the application cited the reduction of water quality hazards and reduction of coastal flooding.

Subsequent to the date of this application submittal, the City has completed a Watershed Management Plan in cooperation with the Southwest Florida Water Management District. Project descriptions were updated during this process and additional areas of concern identified. The City has also commenced a Water Quality Improvement Strategy; while still at the beginning stages of a comprehensive look across the City, several project areas have been studied at a greater level of detail.

Below are project descriptions from the 2006 Facilities Plan, 2016 Watershed Management Plan and the 2017 Water Quality Improvement Strategy followed by the City's proposed projects updated cost estimates and a cost-benefit summary.

2 INITIAL PROJECT PROPOSALS

In 2006 the city of Bradenton completed a Stormwater Facilities Plan. The purpose of this Plan was to evaluate and make recommendations to address the City's obligations and regulatory requirements in the area of stormwater management. The plan is a result of a thorough assessment of the major drainage basins within the jurisdiction of the City of Bradenton. The plan will focus on the development of a feasible and comprehensive storm drainage management and improvement program to correct the existing serious deficiencies and provide a long-range schedule for maintenance and improvements to obtain a finished system adequate to meet the City's needs for the next five years. The plan did not include a comprehensive stormwater model and very briefly touched on water quality.

The project descriptions and associated costs originally identified in the City's application for RESTORE Act funding are summarized below.

2.1 RIVERSIDE DRIVE FROM 18TH STREET EAST TO 26TH STREET EAST; MANATEE RIVER

Identified as Project 13, the proposed improvements consist of upsizing the stormwater collection system and constructing additional stormwater drainage inlets along Riverside Drive. Upsizing the existing stormwater collection system and constructing additional stormwater drainage inlets will result in the more efficient collection and conveyance of stormwater runoff away from the area. It must be noted that during periods of high tidal surges that nuisance flooding occurs along Riverside Drive. Red Valve, Tideflex valves, or equivalent valves, can be placed on each of the outfalls in order to minimize the tidal influence from the Manatee River backing up into Riverside Drive collection system. The proposed improvements will also consist of reconstruction of the existing roadway, construction of new curb and gutter and replacement of existing underground utilities as necessary.

Table 2-1 ROM* Opinion of Probable Cost (2006)		
Professional Services		
	Design and Permitting	\$143,000
	Construction Inspection	\$66,600
	Contingency (10%)	\$21,000
Professional Services Total		\$230,900
Construction		
	Drainage System	\$223,200
	Roadway Construction	\$276,300

	Utility Relocation	\$15,000
	Maintenance of Traffic	\$15,000
	Mobilization and Site Prep	\$25,000
	Contingency (20%)	\$110,900
Construction Total		\$665,400
Total		\$896,300

*Rough Order of Magnitude

2.2 19TH STREET EAST AND RIVERSIDE DRIVE; MANATEE RIVER

Identified as Project 14, the proposed improvements consist of upsizing the stormwater collection system and constructing additional stormwater drainage inlets along Riverside Dr in the area of 19th St E. Upsizing the existing stormwater collection system and constructing additional stormwater drainage inlets will result in the more efficient and effective collection and conveyance of stormwater runoff away from the area. It must be noted that during periods of high tidal surges, nuisance flooding occurs along Riverside Dr. Tideflex valves or equivalent valves, can be placed on each of the outfalls in order to minimize the occurrence of water from the Manatee River backing up into Riverside Dr. The proposed improvements will also consist of reconstruction of the existing roadway, construction of a new curb and gutter and replacement of existing underground utilities as necessary.

Table 2-2 ROM Opinion of Probable Cost (2006)		
Professional Services		
	Design and Permitting	\$199,300
	Construction Inspection	\$92,700
	Contingency (10%)	\$29,200
Professional Services Total		\$321,200
Construction		
	Drainage System	\$374,100
	Roadway Construction	\$321,100
	Utility Relocation	\$20,900
	Maintenance of Traffic	\$20,900

	Mobilization and Site Prep	\$34,800
	Contingency (20%)	\$154,400
Construction Total		\$926,200
Total		\$1,247,400

2.3 RIVERVIEW BLVD FROM 19TH ST W TO 26TH ST W; MANATEE RIVER

Identified as Project 15, the proposed improvements consist of upsizing the stormwater collection system and constructing additional stormwater drainage inlets along Riverview Boulevard. The expected discharge from this general area directly to the Manatee River is approximately 170 cfs. There is a number of existing outfall pipes, and their combined cross-sectional areas are equivalent to a 48-inch pipe. The drainage analysis indicates that the minimum pipe size at the outfall should be 60 inches in diameter. Up-sizing the existing stormwater collection system and constructing additional stormwater drainage inlets will result in the more efficient collection and conveyance of stormwater runoff away from the area. It must be noted that during periods of high tidal surges, nuisance flooding occurs along Riverview Boulevard. Red Valve, Tideflex valves, or equivalent valves, can be placed on each of the outfalls in order to minimize the occurrence of waters from the Manatee River backing up into Riverside Drive. The proposed improvements will also consist of installing catch basin inserts to remove TSS, oil and grease, phosphorus and nitrogen, and heavy metals; installation of hydrodynamic separators for the removal of TSS and free-floating oil and debris; reconstruction of the existing roadway, construction of new curb and gutter and replacement of existing underground utilities as necessary.

Table 2-3 ROM Opinion of Probable Cost (2006)		
Professional Services		
	Design and Permitting	\$199,300
	Construction Inspection	\$92,700
	Contingency (10%)	\$29,200
Professional Services Total		\$321,200
Construction		
	Drainage System	\$399,800
	Roadway Construction	\$282,100
	Utility Relocation	\$20,500
	Maintenance of Traffic	\$20,500

	Mobilization and Site Prep	\$34,100
	Contingency (20%)	\$151,400
Construction Total		\$926,200
Total		\$1,223,500

3 UPDATED AND REVISED PROJECT PROPOSALS

The City's 2012 project proposal ranking through the Sarasota Bay Estuary Program is number one. As more than a decade has passed since the projects presented to the Estuary Program were planned, the City re-evaluated these projects using the framework established in the Watershed Management Plan completed in 2016 and the City's Water Quality Improvement Strategy scheduled to commence in 2017.

Below are project descriptions with water quality benefits for total nitrogen (TN) and total suspended solids (TSS) conceptually quantified, flood control impacts, intangible benefits and opinion of probable costs.

3.1 2016 WATERSHED MANAGEMENT PLAN

The purpose of the Watershed Management Plan (WMP) is to develop a stormwater model framework to evaluate and make recommendations to address the City's flood risk concerns. This also includes developing feasible and comprehensive stormwater management projects to address opportunities to reduce flood risks. Several projects areas described below are identified in the WMP project recommendations section.

3.1.1 RIVERVIEW BOULEVARD; MANATEE RIVER

The highly urbanized drainage subbasin area along Riverview Blvd between 19th St W and 26th St W is ±80 acres of residential structures generally built between 1900 and 1950 and as such very little attenuation or water quality treatment is found. There are nine existing outfall pipes with some of the pipes being undersized and significant siltation that all contribute to the flooding problems observed during large (>4") rainfall events as well as the less than 2" events seen frequently during the wet season. Additionally, Riverview Boulevard is located adjacent to the Manatee River and floods during periods of high tidal surge. Seven of the outfall pipes have Tideflex valves installed which are maintained twice a year by City staff.

Adding additional storage along the river is not an option the city wants to pursue at this time. Completing the Tideflex valve installation, upsizing smaller pipes to provide some storage capacity, replacing catch basins that no longer function appropriately, retrofitting catch basins with inserts, and installing two hydrodynamic separators will alleviate some of the ponding on the roadways, provide gross solid removal, and provide some measure of water quality improvements.

The general benefits sought when considering installing the Best Management Practices (BMP) are:

- Tideflex valves allow one direction of flow, i.e. discharge from the stormwater system into the receiving body. Managing the flow direction of stormwater minimizes flooding hazards, keeping stormwater off the roadways, curbs and sidewalks and improving community safety. The uni-direction of stormwater flow also improves water quality by preventing the re-introduction of pollutants into the stormwater system. The valves are typically installed within a buried structure (manhole, basin or pipe).

- Hydrodynamic separators (HDS) use a tornado-like swirling motion to reduce the speed of the stormwater to allow floatables and sediment to settle out and fall to the bottom of the separator. Separator units are relatively quiet when operating and can easily be paired with other BMPs such as basin inserts to provide additional benefit of capturing dissolved pollutants. HDS are installed underground, with a manhole visible at ground level, and are connected to storm pipes that discharge into the receiving body.
- Catch basin inserts capture visible pollutants such as trash and sediment and can provide dissolved pollutant removal of nutrients and hydrocarbons. Inserts are relatively low cost and easy to install. The basin insert performance is linked to frequency of maintenance. Inserts installed within the catch basin are visible through the basin's grating.

3.1.1.1 Benefit

The annual reduction of total suspended solids not discharging directly to the Manatee River is estimated conservatively at 500 lb/yr.

The metrics of the cost of time lost due to roadway flooding hazards that would be alleviated yields $\pm$ \$20,000 annually.

3.1.1.2 Cost

The total cost of this project is estimated at \$507,200 for design, permitting and construction. The City anticipates the entire project to be completed within FY2018. See Table 4-1 and 4-2 for a more detailed Opinion of Probable Cost and Cost-Benefit Summary.

3.1.2 71ST STREET WEST; PALMA SOLA BAY

The project site is approximately 2800 linear feet along 71st St W from 29th Ave W to Seabreeze Blvd. The project area crosses over Palma Sola Creek approximately 0.5 mile upstream of Palma Sola Bay and has a direct outfall to Palma Sola Creek. On the west side of 71st St W is an existing 1600 linear foot swale with six at-grade drop inlets and a 30-inch pipe running the length of the swale discharging to Palma Sola Creek. The roadway cross slope forces stormwater runoff to the east side of the street where it ponds as there are only two catch basins. The roadway lacks a defined crown and curb and gutter system so little if any runoff actually reaches the swale on the west side. The contributing area to the swale system is $\pm$ 5.0 acres and the total retention volume is $\pm$ 20,500 ft³.

The project proposes adding three roadway inlets and a piping system as well as a 700 linear foot vegetated swale along the east side of the roadway to convey runoff, alleviate the roadway flooding and provide treatment prior to entering Palma Sola Creek. Additionally, the project would create a crowned roadway to send runoff to the existing west side swale. The project will increase treatment volume in the existing swale by raising the six existing drop inlets within the swale and improving the outlet structure to Palma Sola Creek.

3.1.2.1 Benefit:

The reconfiguration of the roadway and addition of the east side swale add a water quality component to the basin that does not currently exist, as well as the reduction of floodplain on

the roadway. Multiple benefits will be seen by the public in the construction of the proposed project:

- Removing total nitrogen and total suspended solids
- Alleviating roadway flooding
- Creating safe passage to a critical facility

The annual reduction of total nitrogen through the treatment swale is approximately 9.5 lbs/yr. This equates to 380 lb of nitrogen removal and a cost of ±\$1700-lb TN removed over the 40 year life span of the project based on the \$645,000 project cost estimate. The annual reduction of total suspended solids is conservatively estimated at 1500 lb/yr.

As part of the Watershed Management Plan, Capital Improvement Projects were identified and ranked based on several economic metrics; one of the metrics was the cost of time lost due to roadway flooding hazards.

For each project the annual average daily traffic was estimated and converted to an hourly value. The hourly value was multiplied by a delay time due to flooding and an average cost of delay (Jones Edmunds, 2014 Hernando County WMP) which yields an economic value for loss of time per rain event. The City of Bradenton experiences ±50 rain days per year. The value associated with lost time based on roadway ponding or flooding is ±\$120,000 annually for this segment of roadway. For the expected 40-year lifespan of the project the value of time saved is approximately \$4,800,000.00.

Example:

*$(AADT/24) * Delay\ Time * Delay\ Cost = Value\ of\ Time\ Lost\ per\ Rain\ Event$*

*$(3000/24) * (.50\ hours) * \$38.15 = \$2384\ per\ Rain\ Event$*

Seabreeze Elementary is on the east side of 71st St W within the project area and is designated as a Disaster Shelter. During wet weather daily rain events, City staff has observed the ponding of runoff on the roadway as well as on the adjacent sidewalk. During larger storm events the ponding on the roadway is hazardous and the sidewalk can remain impassable for several days due to the lack of a suitable drainage outlet.

The intangible benefit found in this project is the public safety aspect where stormwater runoff is captured and treated in vegetated swales instead of ponding on the sidewalks. The sidewalk is heavily trafficked with ±120 schoolchildren walking and riding along the path twice a day to get and from Seabreeze Elementary as well as regular use by retirees in an adjacent mobile home community. The project intent is to capture, convey and treat the runoff in roadside swales taking the ponding off both the roadway and sidewalk.

The section above describes the economic value of reducing roadway flooding. The City investigated means to place a value on the benefit associated with safe passage for school children. Our conclusion from these efforts is that it is infeasible to establish an economic value for something that is ultimately priceless; the safety of a child that needs to use the sidewalk to

get to and from school. Therefore, the City is considering this benefit of public safety as an intangible benefit.

3.1.2.2 Cost

The total cost of this project is estimated at \$648,000 for design, permitting and construction. The City anticipates the entire project to be completed within FY2018. See Table 4-1 and 4-2 for a more detailed Opinion of Probable Cost and Cost-Benefit Summary.

3.2 2017 WATER QUALITY IMPROVEMENT STRATEGY

Most retrofit low impact development (LID) practices focus on existing sites and attempt to replicate the predevelopment hydrologic regime. Research has indicated roadways within urbanized areas are a significant contributor to pollutant loads; roadways fall squarely in the lap of municipal responsibility. Therefore, the City of Bradenton has started researching LID practices to incorporate into a Water Quality Improvement Strategy within existing right-of-way (ROW).

A common LID strategy is to provide bio or vegetated swales to capture and treat runoff. Bioswales are shallow vegetated landscape areas with gently sloped sides designed to capture, convey and temporarily store rainfall. Bioswales mimic important functions of the natural environment by using a combination of gravel, soils, mulch and plants. Bioswales recapture the loss of eroded sediments and promote the reduction of stormwater volume by percolation and evaporation. Plants and mulch in bioswales uptake nutrients like nitrogen and phosphorus; they also create a natural breakdown of bacteria and pesticides to keep our waterways clean and healthy.

For road ROW, bioretention units are most commonly located along boulevards, but may also be constructed in medians, cul-de-sac islands and in curb extensions. The City has initially identified multiple areas within existing ROW with potential to retrofit or reconfigure roadway features (traditional medians) and create treatment swales for roadway runoff. Individually these sites would have a limited impact to nutrient and TSS reduction but collectively will provide water quality enhancement to stormwater runoff entering the Manatee River, Palma Sola Bay, Braden River and Wares Creek.

3.2.1 RIVERSIDE DRIVE AND 2ND AVENUE EAST FROM 18TH STREET EAST TO 21ST STREET EAST; MANATEE RIVER

Riverside Drive between 18th St E and 20th St E discharges directly to the Manatee River at the confluence with the Braden River. An inadequate number of inlets available to intercept the stormwater runoff and multiple undersized piping contributes to ponding in the roadway even during typical Florida 1" rainfall events. Riverside Drive is located adjacent to the Manatee River, the roadway tends to flood during periods of high tidal surges. Another contributing factor to the flooding in this area is the undersized pipe sizes in the existing system.

From 1st Avenue East north to Riverside Dr, the stormwater infrastructure needs to be replaced or upsized to help alleviate some of the flooding issues on 1st Ave E. Tideflex valves, hydrodynamic separators and inserts and catch basins are the appropriate BMPs along Riverside Drive (as was described more fully in section 3.1.1 for Riverview Blvd).

Two blocks upstream of Riverside Drive East is 2nd Avenue East; 2nd Avenue East is a boulevard with a 60-foot wide ROW. The ±2800 length between 18th St E and 24th St W is ideal for creating bioretention swales for both attenuation and treatment of stormwater that will provide approximately 1 ac-ft of storage and treatment volume.

3.2.1.1 Benefit:

The annual reduction of total nitrogen through the treatment swale is approximately 10 lbs/yr. This equates to ±400 lb of nitrogen removal. The annual reduction of total suspended solids not discharging directly to the Manatee River is estimated conservatively at 2000 lb/yr.

The metrics of the cost of time lost due to roadway flooding hazards that would be alleviated yields ±\$40,000 annually.

3.2.1.2 Cost

The total cost of this project is estimated at \$1,107,000 for design, permitting and construction. The City anticipates the entire project to be completed between FY2018 and FY2019. See Table 4-1 and 4-2 for a more detailed Opinion of Probable Cost and Cost-Benefit Summary.

3.2.2 14TH STREET EAST; BRADEN RIVER

The project is within a 9-acre basin encompassing the 14th St E residential neighborhood to the east of the Tropicana plant. Runoff flows in the curblane south approximately 1300 feet on 14th St E into a cul de sac with two culvert connections to the Tropicana stormwater ditch (downstream system) flowing east along 17th Ave E. While the size of the culverts is adequate to convey runoff without significant ponding, the tailwater condition in the ditch does not provide adequate space for the runoff at the peak and post peak times of the storm event. Water quality treatment is not provided as the runoff flows down a curb line into the culverts.

The project proposes to construct two dry retention ponds at the midpoint of the neighborhood on either side of the roadway with a capacity of approximately 0.5 ac-ft of pond storage. The ponds will have emergency pop off weirs to allow flow to re-enter the roadway curb and gutter system when the runoff exceeds the pond capacity. The area on the west side of the roadway is right-of-way; the area on the east side of the roadway requires property acquisition. No changes are proposed to the downstream culvert or ditch system.

The contributing area upstream of these ponds is ±5.0 acres on either side of 14th St E. In a 1-inch rain event, approximately 0.4 ac-ft of runoff is generated. The proposed ponds will treat 1-inch of runoff from the northern portion of the basin and delay the amount of runoff the downstream system sees at the peak of the storm.

Additionally, at the north end of 14th St E is a small park and sports field along 13th Ave E. The runoff along this roadway does not receive any treatment and contributes to an over loaded system to the north so the runoff stages up in 13th Ave E until the downstream condition improves. The right-of-way area on the north side of 13th Ave E is approximately 18 feet wide and provides adequate space for a bioretention system. The system will keep runoff from staging up in the roadway and provide stormwater treatment to remove TN and TSS from 17,000 square feet of impervious area that is currently untreated.

3.2.2.1 Benefit:

The benefits are in both water quality improvement and floodplain reduction.

Table 3-1 Pollutant Removal Estimate			
	14 th St E Dry Pond	13 th Ave E Bioretention Area	Total
TN Removal (lb/yr)	5.5	6.6	12.1
TSS Removal (lb/yr)	175	250	425
Floodplain Reduction (LF of roadway)	400	250	650

3.2.2.2 Cost:

The total cost of this project is estimated at \$210,200 for design, permitting and construction; it does not include the land acquisition. The City anticipates the entire project will be complete within FY2018. See Table 4-1 and 4-2 for a more detailed Opinion of Probable Cost and Cost-Benefit Summary.

3.2.3 SOUTHERN PARKWAY AND 33RD AVE DRIVE WEST ALONG CEDAR HAMMOCK; PALMA SOLA BAY

The development adjacent to southern Parkway occurred between 1965 and 1975, preceding regulatory requirements for stormwater by two decades. Runoff from Southern Parkway travels down a curb and enters a central storm sewer system via curb inlets and discharges directly to Cedar Hammock Canal prior to any water quality treatment.

Between 26th St W and Sandpointe Drive on Southern Parkway is ±3500 LF of 20-foot wide roadway median. The landscaping is minimal; roadway runoff is directed away from the medians so little stormwater treatment is provided in the 1.6-acre green space. The City proposes altering the ±70,000 square feet of medians to accommodate both attenuation and treatment primarily using bioretention.

Along the top-of-bank on the Cedar Hammock Canal, immediately adjacent to Southern Parkway is an area maintained by the City would be ideal for a bioretention system in conjunction with the system along Southern Parkway.

3.2.3.1 Benefit:

The medians provide 1.6-acres of green space for bioretention as well as floodplain management.

The annual reduction of total nitrogen through the treatment swale is approximately 12 lbs/yr. This equates to ±480 lb of nitrogen removal. The annual reduction of total suspended solids not discharging directly to the Cedar Hammock Canal is estimated conservatively at 2200 lb/yr.

The metrics of the cost of time lost due to roadway flooding hazards that would be alleviated yields ±\$400,000 annually.

Prine Elementary is on the east side of Southern Parkway within several hundred feet of the proposed project area. The intangible benefit found in this project is the public safety aspect where stormwater runoff is captured and treated in vegetated swales instead of standing on the roadways.

3.2.3.2 Cost:

The total cost of this project is estimated at \$939,000 for design, permitting and construction. The City anticipates the entire project will be complete between FY2018 and FY2019. See Table 4-1 and 4-2 for a more detailed Opinion of Probable Cost and Cost-Benefit Summary.

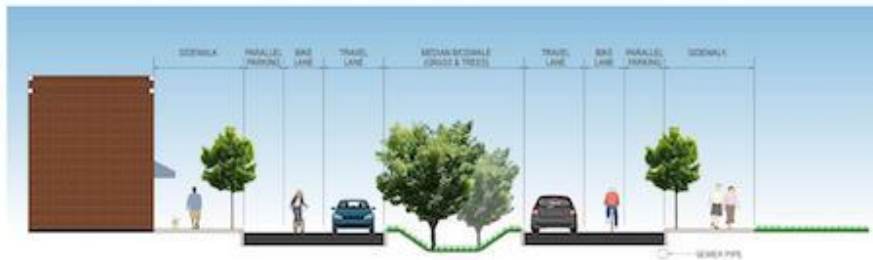
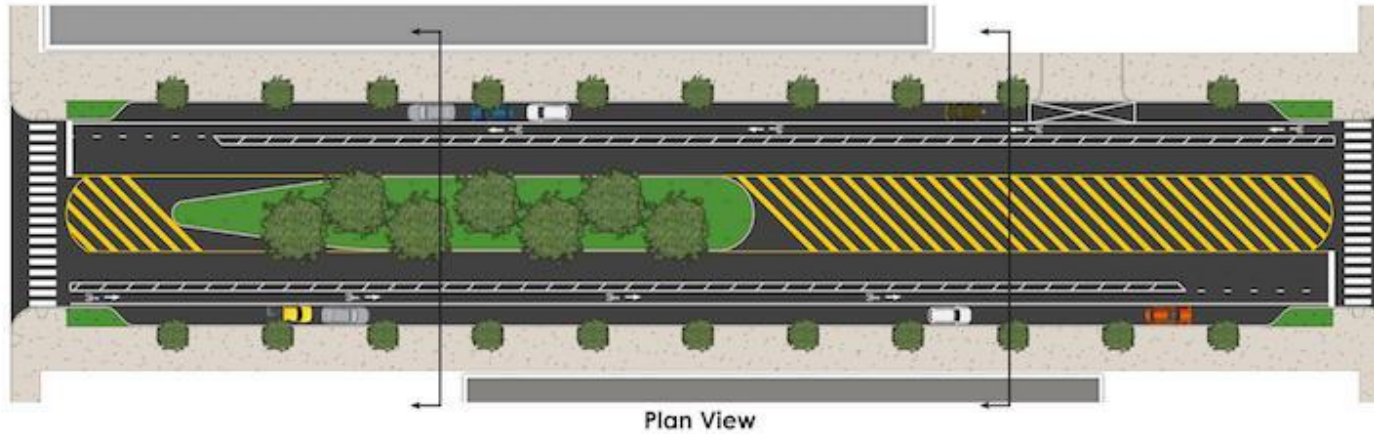


Example of a Bioswale Median



Examples of Bioswale Storm Inlets

American Street Streetscape Partial Median Bioswale Conceptual Plan



Typical Sections

Conceptual Median Design with Bioretention

4 PROJECT STATUS

The City of Bradenton is highly urbanized and a great candidate for retrofitting existing right-of-way with LID BMP. Urban areas with high density and intensity of development (i.e. significant amounts of impervious surfaces) are much more difficult to implement regional, system-wide stormwater solutions versus opportunities in a more suburban or exurban development context. In addition to allowing and encouraging property owners to implement light imprint stormwater solutions on tight urban lots (green, roofs, green walls, the City's zoning code also allows for creative stormwater solutions in the public right of way, including but not limited to bioswales, rainwater planters, depression greens, and formal watercourses, to name a few.

Residents and visitors to the City will enjoy the benefits of bioswales and bioretention through:

- Reducing stormwater runoff volume, rate, and pollutants and increase soil and groundwater infiltration
- Improving urban air quality and contributing to lower urban air temperatures
- Retrofitting of aging infrastructure the is also aesthetically pleasing

Unfortunately, most professionals realize the cost of retrofitting is far greater than breaking virgin earth when constructing infrastructure projects. All of the project descriptions above demonstrate the need for water quality treatment within the City boundary. Shown below are the cost estimates and the cost-benefit summary.

Based on the more current information in the updated project summary, the City ranks the projects as follows:

1. 71st Street West
2. Southern Parkway and 33rd Ave Drive West
3. Riverside Drive and 2nd Avenue East
4. 14th Street East
5. Riverview Boulevard

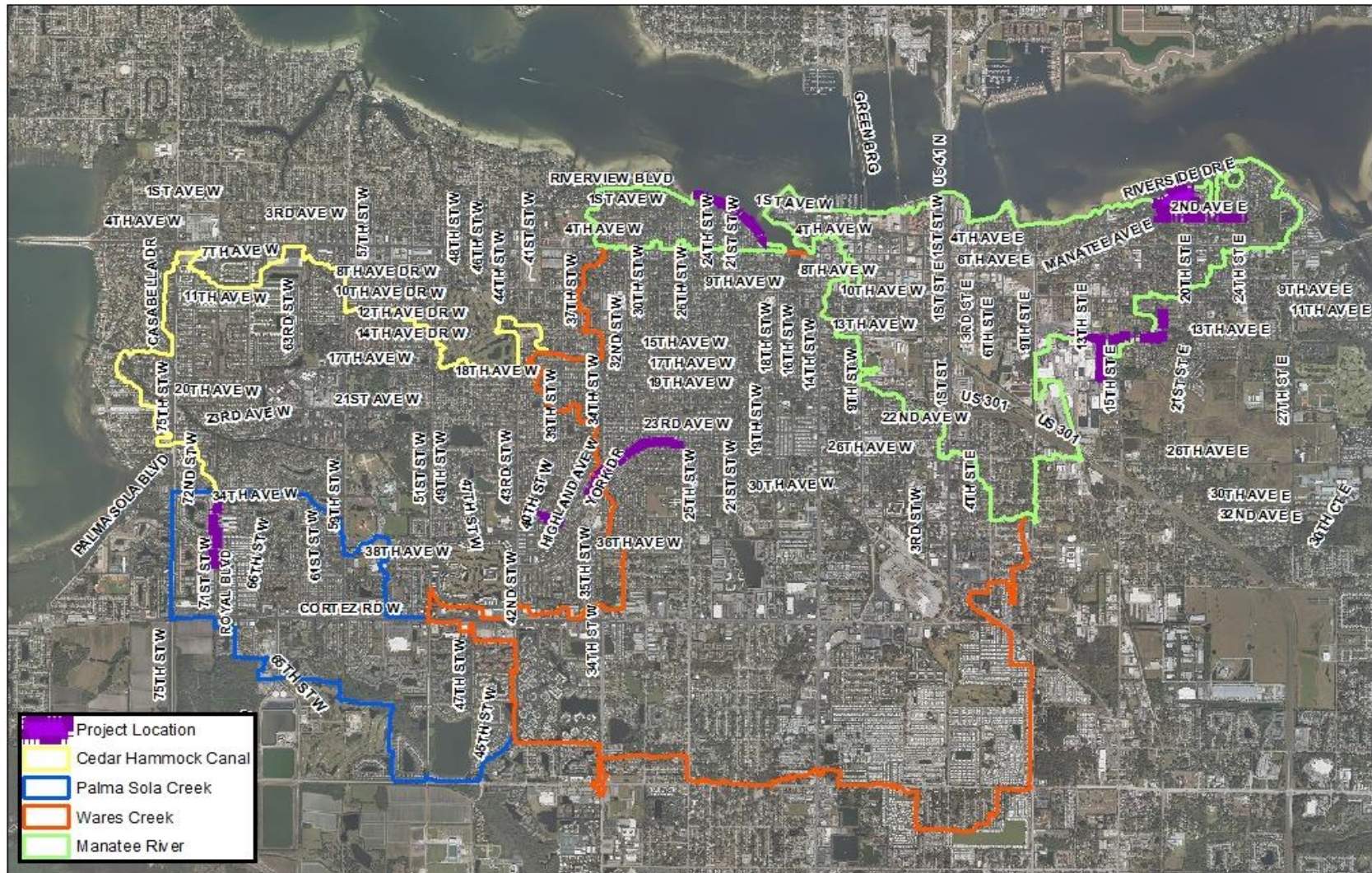
Table 4-1 Opinion of Probable Cost* (2016)					
	3.1 Riverview Blvd	3.2 71st St W	4.1 Riverside Dr and 2nd Ave E	4.2 14th St E	4.3 Southern Pkwy and 33rd Ave Dr W
Professional Services					
Design and Permitting	\$ 30,000.00	\$ 50,000.00	\$ 75,000.00	\$ 30,000.00	\$ 75,000.00
Construction Inspection	\$ 10,000.00	\$ 10,000.00	\$ 15,000.00	\$ 10,000.00	\$ 15,000.00
Subtotal	\$ 40,000.00	\$ 60,000.00	\$ 90,000.00	\$ 40,000.00	\$ 90,000.00
Contingency (10%)	\$ 4,000.00	\$ 6,000.00	\$ 9,000.00	\$ 4,000.00	\$ 9,000.00
Construction					
Earthwork		\$ 25,000.00		\$ 15,000.00	\$ 50,000.00
Drainage System	\$ 251,000.00	\$ 95,000.00	\$ 410,000.00	\$ 31,000.00	\$ 305,000.00
Roadway Construction	\$ 70,000.00	\$ 230,000.00	\$ 150,000.00	\$ 50,000.00	\$ 180,000.00
Landscape	\$ 10,000.00	\$ 20,000.00	\$ 30,000.00	\$ 5,000.00	\$ 30,000.00
Utility Relocation		\$ 30,000.00	\$ 110,000.00	\$ 5,000.00	\$ 40,000.00
Maintenance of Traffic	\$ 5,000.00	\$ 25,000.00	\$ 30,000.00	\$ 7,500.00	\$ 20,000.00
Mobilization and Site Prep	\$ 50,000.00	\$ 60,000.00	\$ 110,000.00	\$ 25,000.00	\$ 75,000.00
Subtotal	\$ 386,000.00	\$ 485,000.00	\$ 840,000.00	\$ 138,500.00	\$ 700,000.00
Contingency (20%)	\$ 77,200.00	\$ 97,000.00	\$ 168,000.00	\$ 27,700.00	\$ 140,000.00
Project Total	\$ 507,200.00	\$ 648,000.00	\$ 1,107,000.00	\$ 210,200.00	\$ 939,000.00

*Rough Order of Magnitude Cost Estimate

Table 4-2 Cost-Benefit Summary					
Total Nitrogen (\$/lb removed)*	N/A	\$ 1,700.00	\$ 2,700.00	\$ 430.00	\$ 1,950.00
Total Suspended Solids (\$/lb removed)*	\$ 25.00	\$ 11.00	\$ 14.00	\$ 12.00	\$ 10.00
Cost of Time Saved by Removing FP"	\$ 800,000.00	\$ 4,800,000.00	\$ 1,600,000.00	\$ 150,000.00	\$ 16,000,000.00

*Annual Cost over the 40-year lifespan of the project

"For the 40-year lifespan of the project



City of Bradenton
RESTORE Act
Proposed Project Locations



