Transportation and Infrastructure Planning Committee

City Hall, Council Chambers
116 First Street, Neptune Beach, Florida 32266
Friday, September 9, 2022, 9:00 AM

Agenda

1. **Call to Order/Welcome**

2. **Critical Infrastructure Needs**

   Amy Tracy - Dewberry
   Funding Opportunities for Wastewater Treatment Facility Upgrade Project

   Brian Icerman – Jones Edmunds
   Neptune Beach Stormwater Strategic Planning

3. **Next Meeting** – TBD

*Council Members in attendance at the Committee Meeting may include:

Chair: Mayor Elaine Brown
Vice-Chair: Councilor Nia Livingston
Standing Member: Vice-Mayor Kerry Chin

Councilor Josh Messinger
Councilor Lauren Key

Attachment 1
Ranking of Fiscal Year 2022-23 Districtwide (DW) and REDI/Innovative (RI) Cost-Share Applications
Funding limit of $3M (DW) and $0.5M (RI) per project or per entity

Green-shaded cells will be submitted for Florida Department of Environmental Protection (FDEP) Outstanding Florida Springs Funding consideration.
Blue-shaded cells will be submitted for FDEP Alternative Water Supply Funding consideration.
Projects above this line ranked for consideration of District cost-share funding.

Rank	Project Name	SJR Primary Core Mission	Planning Region*	Total Score	Estimated Construction Cost	Total District Portion	Cumulative Total District Funding (running total)	Project Description
1	Orange City Volusia Blue Spring Septic-to-Sewer Program	Water Quality	CSEC	94	$1,790,000	$447,000	**$447,000**	The project includes building two lift stations with collection systems and connecting 27 septic tanks in the springshed and Priority Focus Area (PFA) of Volusia Blue Spring. The estimated nutrient load reduction water quality benefit is 199 lbs/yr Total Nitrogen (TN).
2	St. Johns County SR16 and CR 2209 Reclaimed Water Transmission Main Upsizing	Water Quality	NFRWSP	90	$11,435,600	$2,858,900	**$3,305,900**	This project includes the upsizing of an existing reclaimed water line from 8" to 16" and 20" running from SR 16 wastewater treatment facility (WWTF) to World Golf Village. The estimated nutrient load reduction water quality benefit to Cowan Creek is 18,569 lbs/yr TN and 5,479 lbs/yr Total Phosphorus (TP). The estimated water supply benefit is 0.93 million gallons per day (mgd) of reclaimed water.
3	JEA US 1 - Greenland WRF to CR 210 - Transmission Main	Water Supply	NFRWSP	87	$19,609,093	$3,000,000	**$6,305,900**	The project includes installation of a reclaimed water main along US Route 1 to serve the Nocatee and Twin Creeks areas. The estimated water supply benefit is 2.1 mgd of reclaimed water. The estimated nutrient load reduction water quality benefit to the Lower St. Johns River is 57,595 lbs/yr TN and 18,419 lbs/yr TP.
4	Corinthian Villas Association Sewer Project	Water Quality	CSEC	87	$232,825	$58,206	**$6,364,106**	The project includes the abandonment of an aging WWTF and installation of a new lift station to connect to city sewer for a 36-unit condominium. The estimated nutrient load reduction water quality benefit to the Halifax River is 250 lbs/yr of TN and 250 lbs/yr TP.
5	Orange County Wekiwa Springs Septic Tank Retrofit Project - Phase 3	Water Quality	CFWI	86	$10,200,000	$2,550,000	**$8,914,106**	The project includes the abandonment of 213 septic tanks and connection to sanitary sewer in the Palms 3 and 4 neighborhoods. This is the third phase of a six phase project. The estimated nutrient load reduction water quality benefit to the Wekiwa-Rock springshed is 2,101 lbs/yr TN and the estimated benefit water supply benefit is 0.05 mgd of reclaimed water.
6	Oak Hill 200 LLC Rosala West Water Conseravtion	Water Conservation	CFWI	85	$94,600	$47,300	**$8,961,406**	The project will consist of replacing high consumption toilets and shower heads for 344 units with 0.8 gpf toilets and low flow 1.25 gpm shower heads. The estimated water conservation benefit is 0.03 mgd.
7	Bunnell Wastewater Treatment Facility Improvements **REDI/Innovative**	Water Quality	NFRWSP	85	$14,841,777	$500,000	**$9,461,406**	The project includes improvement of the City's current wastewater treatment plant from an Alternating Anaerobic Double Filtration process to an Advanced Wastewater Treatment (AWT) process. The estimated nutrient load reduction water quality benefit is 19,057 lbs/yr TN and 3,232 lbs/yr TP.
8	Mount Dora Wastewater Treatment Facility #1 Improvements	Water Quality	CFWI	84	$15,000,000	$3,000,000	**$12,461,406**	The project includes installing a four-stage biological nutrient removal process to achieve advanced wastewater treatment standards of effluent at the Mount Dora WWTF. The estimated nutrient load reduction water quality benefit is 6,210 lbs/yr TN and 2,070 lbs/yr TP. The estimated water supply benefit is 0.5 mgd.
9	Orange County Utilities Year 2 Water Conservation Through WWNP with Advanced Targeting	Water Conservation	CFWI	84	$141,160	$70,580	**$12,531,986**	The program consists of a comprehensive water conservation program geared toward approximately 500 existing homes and includes rebates for irrigation retrofits and toilet replacements and provision of Environmental Protection Agency WaterSense devices for inside the home. The estimated water conservation benefit, within the Central Florida Water Initiative planning region, is 0.077 mgd.
10	Palm Coast London Waterway Expansion	Water Quality	NFRWSP	80	$3,618,000	$904,500	**$13,436,486**	The project consists of constructing an 11-acre stormwater lake to improve water quality of the Pelicer Creek Aquatic Preserve. The estimated nutrient load reduction water quality benefit to the Pelicer Creek Aquatic Preserve is 884 lbs/yr TN and 130 lbs/yr TP.
11	Ocala Lower Floridan Aquifer Conversion - Phase IV	Natural System	CSEC	80	$4,000,000	$1,000,000	**$14,436,486**	This project is the fourth phase of a multi-phased project identified as the Ocala Lower Floridan Aquifer (LFA) Conversion project. Phase four of the project includes construction of one (1) high service pump (HSP) building and installation of one (1) large HSP, two (2) jockey HSPs and associated equipment at the City of Ocala's Water Treatment Plant no. 2. The estimated natural systems benefit for the entire project is an estimated 10.3 cfs increase flow at Silver Springs. This phase provides approximately 16% of the benefit or 1.6 cfs of the recovery and 3.2 mgd peak of water supplied.
12	Brevard County Grand Canal Muck Removal Project - Phase IV	Water Quality	CSEC	78	$1,287,110	$321,777	**$14,758,263**	The project consists of the fourth phase of muck dredging, dewatering, and upland disposal of over 26,000 cubic yards of muck in 14 acres in the northern finger canals in Grand Canal. The estimated nutrient load reduction water quality benefit to the Banana River is 4,763 lbs/yr TN and 293 lbs/yr TP.
13	Neptune Beach Wastewater Treatment Facility Process Upgrade	Water Quality	NFRWSP	78	$1,750,000	$437,500	**$15,195,763**	The project includes the installation of recycle pumps, baffle walls, anoxic zone mixers, and associated yard piping to upgrade the existing treatment process. The estimated nutrient load reduction water quality benefit is 8,000 lbs/yr TN to the lower St. Johns River.

*Planning Region: CSEC - Central Springs/East Coast, CFWI - Central Florida Water Initiative, NFRWSP - North Florida Regional Water Supply Partnership

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Green-shaded cells will be submitted for Florida Department of Environmental Protection (FDEP) Outstanding Florida Springs Funding consideration.
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14	Putnam County Port Buena Vista Sewer Plant Conversion **REDI/Innovative**	Water Quality	NFRWSP	77	$500,000	$500,000	**$15,695,763**	The project includes conversion of direct discharge at the Port Buena Vista WWTF to a lift station and transmission of sewage to the Gilbert Road Regional Sewer Treatment Plant. The estimated nutrient load reduction water quality benefit to the Lower St. Johns River is 296 lbs/yr TN and 35 lbs/yr TP.
15	Seminole County Toilet Rebate Program Phase 2	Water Conservation	CFWI	76	$10,000	$5,000	**$15,700,763**	The program includes a toilet rebate program to incentivize replacement of existing high volume toilets (3.5 gallons or greater per flush) with low flow toilets (1.6 gpf or less). The estimated water conservation benefit is 0.04 mgd.
16	JEA Demand-Side Management Water Conservation Program	Water Conservation	NFRWSP	75	$10,950,145	$0	**$15,700,763**	The water conservation program includes rebates for high efficiency toilets, clothes washers, dishwashers and smart irrigation tools for homeowners. It will also include incentives to commercial customers for implementing the Green Restaurant program, retrofitting ice machines, and cooling tower cost-sharing. The estimated water supply benefit is 1.5 mgd. The $3 million funding cap for this entity was reached for another ranked project. Therefore funding is not available for this project.
17	Deland Reclaimed Water Main Extension - Phase 5	Water Supply	CSEC	75	$3,024,495	$756,124	**$16,456,887**	The project includes the installation of 4,700 linear feet (LF) of reclaimed water main and 13,500 LF of reclaimed distribution main to serve the Cross Creek subdivision and community park. The estimated water supply benefit is 1.47 mgd of reclaimed water.
18	JEA H2.0 Purification Demonstration Facility	Water Supply	NFRWSP	70	$34,205,833	$0	**$16,456,887**	The project includes the construction of a water purification demonstration facility to further purify reclaimed water to drinking water quality. The estimated water supply benefit is 1 mgd. The $3 million funding cap for this entity was reached for another ranked project. Therefore funding is not available for this project.
19	Marion County CP 59 Country Gardens Stormwater Remediation	Flood Protection	CSEC	70	$338,873	$84,718	**$16,541,605**	The project includes the construction of a dry retention area and infrastructure for the stormwater conveyance system. The estimated flood protection benefit to the Country Gardens subdivision is 14 acres.
20	Brevard County Pioneer Road Denitrification	Water Quality	CSEC	69	$220,000	$55,000	**$16,596,605**	The project consists of installing a fiberglass continuous skimmer to capture the floating vegetation entering the ditch that flows to the Banana River (Sykes Creek/ Barge Canal). The estimated nutrient load reduction water quality benefit to the Banana River is 382 lbs/yr TN and 49 lbs/yr TP.
21	Brevard County Flamingo Drive Denitrification	Water Quality	CSEC	69	$218,929	$54,732	**$16,651,337**	The project includes the installation of an underground stormwater treatment chamber fitted with biosorption activated media. The estimated nutrient load reduction water quality benefit is 151 lbs/yr TN and 31 lbs/yr TP.
22	Flagler Beach Sewer Infrastructure Lining Rehabilitation - Phase 3 **REDI/Innovative**	Water Quality	NFRWSP	69	$750,000	$500,000	**$17,151,337**	The project is the third phase of the 4-phase project and includes slip-lining approximately 200 leaking sewer laterals plus two wet wells in the wastewater collection system that was originally constructed in the early 1970's. The estimated nutrient load reduction water quality benefit to the Matanzas River is 1,880 lbs/yr TN and 824 lbs/yr TP.
23	Interlachen Water Supply System Replacements - Phase 4 **REDI/Innovative**	Water Conservation	NFRWSP	68	$523,600	$500,000	**$17,651,337**	This project includes upgrades to a water distribution supply system by replacing approximately 6,300 LF of aged, undersized, and leaking 1-inch, 1.5-inch, and 4-inch galvanized steel water mains with 6-inch and 8-inch polyvinyl chloride (PVC) water mains, along with new valves, fire hydrants, and water services. The estimated water conservation benefit is 0.012 mgd.
24	Volusia County Southwest Regional Water Reclamation Facility Expansion	Water Supply	CSEC	66	$33,816,704	$2,348,663	**$20,000,000**	The project includes the expansion of the Southwest Regional Wastewater Reclamation Facility (WRF) to increase treatment capacity from 2.7 to 5 mgd to treat flows from two non-Advance Wastewater Treatment (AWT) plants slated for decommissioning. The project also includes the construction of a 10 MG reclaimed water storage tank to provide additional reclaimed water. The estimated water supply benefit is 0.39 mgd reclaimed water and 10 MG storage capacity created in the Volusia Blue springshed. The estimated nutrient load reduction water quality benefit is 364 lbs/yr TN.
25	Callahan Force Main Extension to Fairgrounds **REDI/Innovative**	Water Quality	NFRWSP	65.5	$642,400	$500,000		The project includes the construction of a wastewater force main to extend the existing wastewater collection system from the county's fairgrounds to the Town of Callahan's Advanced Waste Treatment Wastewater Treatment Facility. The estimated nutrient load reduction water quality benefit is 325 lbs/yr TN.
26	Brevard County Fay Lake Park Water Quality Improvements	Water Quality	CSEC	62	$157,826	$39,456		The project includes construction of two ditch denitrification bioreactors within the existing drainage ditches to treat a drainage basin of 5,217 acres. The estimated nutrient load reduction water quality benefit is 845 lbs/yr TN and 333 lbs/yr TP.

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27	Brevard County West Arlington Denitrification Project	Water Quality	CSEC	62	$86,832	$21,708		The project includes construction of a 0.08 acre dry retention facility treating a 7.1 acre drainage area that discharges to the Banana River. The estimated nutrient load reduction water quality benefit is 39 lbs/yr TN and 8 lbs/yr TP.
28	Hilliard North & South Ditch Drainage Improvements - Phase 1 **REDI/Innovative**	Flood Protection	NFRWSP	59	$712,900	$424,400		The project includes the restoration of approximately 5,000 LF of drainage ditches. Restoration of these ditches will re-establish the normal flow of stormwater across the town providing enhanced flood protection to 78 acres with 1 structure and 194 parcels.
29	Palatka Water Main Improvements - Madison Street **REDI/Innovative**	Water Conservation	NFRWSP	59	$500,000	$500,000		The project includes replacing approximately 1,981 LF of aged and failing cast iron pipe, within the City's central downtown area, with PVC to eliminate leaks and line breakage. The estimated water conservation benefit is 0.004 mgd.
30	Marion County CP 80 Silver Springs Shores Units 29 & 30 Innovative Stormwater Retrofit	Water Quality	CSEC	57	$1,322,049	$330,512		This project includes retrofitting two drainage retention areas in Silver Springs Shores Units 29 & 30, with biosorption activated media to promote denitrification. The estimated nutrient load reduction water quality benefit to Silver Springs is 112 lbs/yr TN.
31	Belle Isle Barby Lane Drainage Project	Water Quality	CFWI	56	$336,841	$84,210		The project consists of the installation of a second generation baffle box with up-flow filter and nutrient reducing media to treat stormwater from a nearly 15-acre contributing area that currently discharges to Lake Conway without treatment. The estimated nutrient load reduction water quality benefits to Lake Conway are 12 lbs/yr TN and 2 lbs/yr TP.
32	Glen St. Mary Southside Sewer Extensions **REDI/Innovative**	Water Quality	NFRWSP	54	$485,000	$485,000		The project includes abandoning 3 aging septic systems and extending the city sewer system by adding 1,700 LF of 8 PVC gravity sewer extensions, 7 manholes, and service connections. The estimated nutrient load reduction water quality benefit is 3 lbs/yr of TN.
33	Macclenny System-Wide Sewer Rehabilitation - Phase 1B **REDI/Innovative**	Water Quality	NFRWSP	54	$500,000	$500,000		The project includes lining and rehabilitating approximately 11,800 LF of 8" and 10" vitrified clay pipe and/or asbestos cement pipe. The estimated nutrient load reduction water quality benefit is 16 lbs/yr TN and 2 lbs/yr TP.
34	Green Cove Springs Julia Street Stormwater Basin Improvements	Flood Protection	NFRWSP	53	$578,000	$133,250		The project includes the replacement of approximately 1,500 LF of stormwater pipe and the construction of a wet detention pond. This upgrade to the storm water system will provide an estimated flood protection benefit to 7.3 acres commensurate with that of a 10-year, 24-hour storm event.
35	New Smyrna Beach Historic Westside Stormwater Management Improvements	Flood Protection	CSEC	53	$2,500,000	$625,000		The project includes construction of multiple flood reduction elements including the installation of new stormwater inlets and piping in the City's historic West Side neighborhood. The project is estimated to reduce flooding to a 50-acre area.
36	Marion County Irish Acres to Silver Springs Regional Interconnect	Natural System	CSEC	53	$7,520,000	$1,880,000		The project includes constructing approximately 47,600 LF of water main to interconnect two public water systems. It will shift approximately 0.25 mgd currently withdrawn from the upper Floridan aquifer (UFA) by the East Side Public Water Supply (PWS) to the Irish Acres PWS. Irish Acres PWS is located approximately 7 miles northwest of Silver Springs. The estimated natural systems benefit will be an increase spring flow to Silver Springs by 0.11 cubic feet per second (cfs).
37	St. Augustine West 3rd Street Septic-to-Sewer Program	Water Quality	NFRWSP	52	$1,174,972	$293,743		This project includes converting 28 existing septic systems to sewer in the West Augustine neighborhood along West 3rd Street. The estimated nutrient load reduction water quality benefit to Oyster Creek is 24 lbs/yr of TN.
38	New Smyrna Beach Corbin Park Stormwater Management Improvements	Flood Protection	CSEC	44	$2,500,000	$625,000		The project consists of a mixture of trunkline extensions, trunkline upsizing, the addition of inlets, as well as regrading of swales within the Corbin Park neighborhood of New Smyrna Beach. The project is estimated to provide flood protection to a 50-acre area.

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Fw: First Street & Fourth Street Updates

Colin Moore <colinmoore@nbfl.us>
Thu 9/8/2022 3:53 PM
To: Catherine Ponson <clerk@nbfl.us>

From: Stefen Wynn <cm@nbfl.us>
Sent: Thursday, September 8, 2022 3:42 PM
To: Colin Moore <colinmoore@nbfl.us>
Cc: Cheryl Bäck <acm@nbfl.us>
Subject: FW: First Street & Fourth Street Updates

For tomorrow's TIP Committee meeting.

Stefen Wynn, *M.P.A.*
Neptune Beach City Manager
City of Neptune Beach
116 1st St.
Neptune Beach, Fl. 32266
Phone: (904) 270-2400; ext.31
Email: CM@nbfl.us

From: Jim French <dpw@nbfl.us>
Sent: Thursday, September 8, 2022 2:59 PM
To: Stefen Wynn <cm@nbfl.us>
Subject: First Street & Fourth Street Updates

Stefen:

- On August 29 the Stormwater Division cleaned 400 LF of drainage pipes on both First Street and on 4th Street to check for potential blockages in the storm sewers.

- The picture below shows an example of a tee intersection on First Street that when flow is greater in one direction it can impede the flow from the other direction until the pipes can catch up:

- On September 9th the Stormwater Division cleaned out gutters, edged curbs, and checked and cleaned inlet grates in preparation for weekend rains on First Street and 4th Street.




- FYI, one of the hydraulic motors died this week on the street sweeper. The vendor that we ordered the new street sweeper from is still waiting for a cab and chasis. In the meantime we will try and bypass the one hydraulic motor that spins the broom, and sweep from the alternate side.
- Tomorrow the Streets Division is planning to mow, trim, and edge R-O-Ws on First Street. I asked Paul to manually clean out the gutters he can while on First Street mowing since the street sweeper is down for repairs.

Cheers,

Jim French, PE *(Licensed in Florida & Georgia)*
Public Works Director
Public Works
City of Neptune Beach
2010 Forest Ave.
Neptune Beach, FL 32266
Office (904) 270-2423, ext. 4108

PUBLIC WORKS

FIRST RESPONDER

DRAFT

TECHNICAL MEMORANDUM

Neptune Beach Stormwater Strategic Planning

TO: City of Neptune Beach Public Works

FROM: Jarrod Hirneise, PE; Brian Icerman, PE, ENV SP

DATE: August 1, 2022

SUBJECT: Data Collection, Drainage Issue Prioritization, and Drainage Issue Improvement Identification and Budgeting Summary
Jones Edmunds Project No. 03940-002-01

1 INTRODUCTION AND BACKGROUND

The City of Neptune Beach (CONB) has drainage issues that cause repeated localized flooding and would like to make improvements in these areas to alleviate the issues. Parsons Corporation completed a drainage study in 2020 that identified drainage improvement projects to alleviate flooding east of 3rd Street but did not address localized drainage issues throughout the rest of CONB. Typically, the flooding in these areas results in standing water in street and/or yards following moderate rainfall events. In some cases, the water does not drain for several days after the rainfall occurs, which results in CONB receiving complaints from residents. The causes, severity, and potential solutions of the flooding in these areas vary by location.

CONB asked Jones Edmunds to assist with developing a prioritized list of capital improvement projects to alleviate the issues in these areas. This included:

- Collecting existing drainage-related data.
- Conducting public outreach and engaging with residents.
- Compiling a list of drainage issues throughout the City.
- Investigating the causes of localized drainage issues.
- Prioritizing the drainage issues.
- Identifying potential solutions and rough order of magnitude (ROM) costs for alleviating the drainage issues.

The following sections of this Technical Memorandum summarize the methodology, findings, and recommendations from this evaluation.

2 EXISTING DATA COLLECTION

Jones Edmunds collected drainage-related data to assist with identifying drainage issues, evaluating causes of drainage issues, and developing improvement options. The following data were collected:

- 2007 and 2018 Duval County light detection and radar (LiDAR) derived digital elevation models (DEMs).
- 2017 and 2020 Florida Department of Transportation (FDOT) aerial imagery.
- CONB stormwater geographic information system (GIS) asset data.
- CONB water and sewer GIS asset data.
- CONB's drainage complaint tracking spreadsheet.
- FDOT's *State Road A1A Drainage Study*.
- FDOT's *5th Street Outfall Improvement Study* report, hydrologic and hydraulic (H&H) model, and GIS data.
- Parsons' *Preliminary Storm Sewer Design Report* that was completed for CONB in 2020. This includes the preliminary design for stormwater collection system improvements east of 3rd Street and improvements to the stormwater laterals that cross 3rd Street.
- Various email correspondence between residents and CONB staff regarding drainage issues.
- Photographs of flooding from CONB staff.
- CONB's 1998 *Stormwater Master Plan* report, which was completed by PBS&J.

3 DRAINAGE ISSUE IDENTIFICATION AND PRIORITIZATION

Jones Edmunds reviewed existing data, conducted interviews with CONB staff, distributed a drainage survey to residents, conducted a public outreach meeting, and conducted site visits during storm events to compile a list of drainage issues for CONB.

Jones Edmunds interviewed CONB staff about specific drainage issues on two occasions. The first discussion occurred during the Project Kickoff Meeting on December 5, 2021. Jones Edmunds visited several areas with drainage issues with CONB staff and discussed causes and potential options for improvement. Jones Edmunds also conducted an interview with CONB stormwater maintenance staff on January 26, 2022, to identify additional drainage issues that had not been identified during the Kickoff Meeting or from existing data and discuss causes and potential options for improvement.

Jones Edmunds assisted CONB with planning, advertising, and conducting an open-house public outreach meeting on March 30, 2022. This meeting provided residents with an overview of the project, provided public education about stormwater management and planning, discussed potential options for drainage improvements, and identified/discussed specific drainage issues that residents have concerns about. Before the meeting, Jones Edmunds and CONB staff developed a web-based survey, using ArcGIS Survey123, for residents to identify specific drainage issues and provide detailed information about their concerns. The survey was distributed on CONB's social media platforms, on a flyer

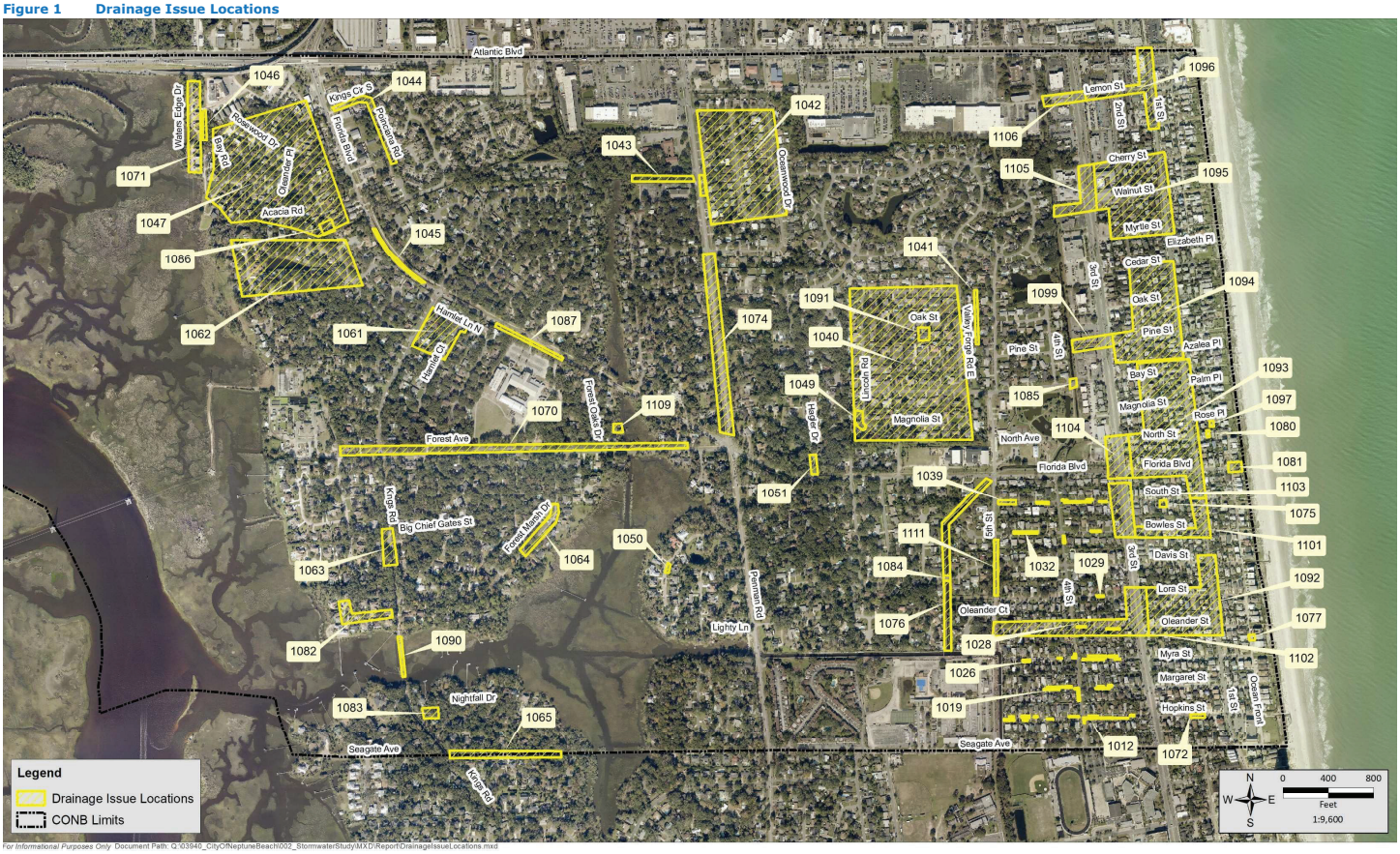
advertising the public outreach meeting that was sent with every resident's utility bill, and in a newspaper advertisement. The survey received responses from 48 residents.

In total, 55 drainage issues were identified throughout CONB. Figure 1 shows the locations of the drainage issues. Table 1 summarizes the drainage issues by describing the issues, the potential causes of the issues, the ownership/maintenance entity responsible for drainage where the issue is located, and a categorization of the issues. Table 1 categorizes the drainage issues as follows:

- Closed drainage basin with no outfall – These issues occur in low-lying areas that do not have a positive outfall and result in standing water.
- Collection system capacity – These issues occur when the stormwater collection inlet, pipes, etc. lack capacity to handle runoff from the drainage basin.
- Primary outfall capacity – These issues occur when the primary outfall ditches and/or pipes downstream of the collection systems lack capacity to handle runoff from the drainage basin.
- Drainage system maintenance/repair – These issues occur when the stormwater system is not properly maintained or is not functional because it is in disrepair.
- Localized nuisance drainage – These issues result in localized shallow ponding on roads, driveways, sidewalks, etc. and generally impact only a handful of residents or a small area. Standing water in these areas can sometime take days to clear during the rainy season.
- Widespread nuisance drainage – These issues result in more widespread shallow ponding on roads, driveways, sidewalks, etc. and impact several residents and larger areas (i.e., entire blocks). Standing water in these areas can sometime take days to clear during the rainy season.
- Tidal flooding – These issues occur in low-lying areas that are subject to tidal flooding without rainfall.

DRAFT

Figure 1 Drainage Issue Locations



For Informational Purposes Only Document Path: Q:\03940_CityOfNeptuneBeach\002_StormwaterStudy\MXD\Report\DrainageIssueLocations.mxd

Table 1 Summary of Drainage Issues

Map ID	Location	Description	Cause(s)	Owner/ Maintenance Entity	Category
1012	400 and 500 Blocks of Hopkins Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Speed bumps, flat roads, no drainage system. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1019	400 and 500 Blocks of Margaret Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Speed bumps, flat roads, no drainage system. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1026	400 and 500 Blocks of Myra Street	Ponding in roadways, sidewalks, yards, and driveways. Depth can be up to 6 inches. Water can sit for extended periods when the soil is saturated.	Flat road, no drainage system, isolated depression with no outfall. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1028	400 and 500 Blocks of Oleander Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Flat road, no drainage system. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1029	400 and 500 Blocks of Lora Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Flat road, no drainage system. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1032	400 and 500 Blocks of Bowles Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Speed bumps, flat roads, no drainage system. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1039	400 and 500 Blocks of South Street	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	Speed bumps, flat roads, no drainage system, isolated depression at the west end with no outfall. Problems worsened after utility improvements and related road repaving.	CONB	Widespread Nuisance Drainage Issue
1040	Bal Harbor Neighborhood	Significant roadway flooding with flooding of private property and structures.	The collection system outfall pipe is undersized.	CONB	Primary Outfall Capacity Issue
1041	Valley Forge Road East Ditch	The ditch behind the homes between Valley Forge Road North and Pine Street has standing water in it.	The ditch has not been maintained over time because it is behind private residences with fences across the ditch. A portion of the ditch is also a bird sanctuary.	CONB	Drainage System Maintenance/ Repair Issue
1042	Oceanwood Drive	Collection system pipes are failing.	Aging infrastructure.	CONB	Drainage System Maintenance/ Repair Issue
1043	Penman Road Outfall Ditch	The Penman Road outfall ditch between 440 and 400 Penman Road is overgrown and has not been maintained. May be contributing to upstream drainage issues along Penman Road.	Lack of maintenance and access limitation for crews to maintain the ditch.	CONB	Drainage System Maintenance/ Repair Issue

Map ID	Location	Description	Cause(s)	Owner/ Maintenance Entity	Category
1044	Kings Circle/ Poinciana Road	Flooding along Poinciana Road that spills over to the townhomes east of Poinciana Road and the businesses west of Poinciana Road.	No outfall exists for this area.	CONB	Closed Drainage Basin with No Outfall
1045	Florida Boulevard	Standing water at times along north side of Florida Boulevard between the roadway and ditch.	Grading between the roadway and ditch is not sloped towards the ditch in places.	City of Jacksonville	Drainage System Maintenance/ Repair Issue
1046	Waters Edge Drive Ditch	Waters Edge residents have had water come into their homes from the north-south ditch east of their properties.	The ditch collects offsite runoff from a large mostly impervious area to the east. The ditch and cross-culvert under Pine Place appear under-sized for the drainage area.	CONB	Primary Outfall Capacity Issue
1047	Marsh Point, Oleander Place, Rosewood Drive, Bay Road	Shallow ponding in roadways and driveways. Water can sit for extended periods when the soil is saturated.	This neighborhood was developed with no real drainage system. Apparently drainage swales have filled in over time, and driveways that had low areas were raised.	CONB	Widespread Nuisance Drainage Issue
1049	1032 Lincoln Road	Resident complaint of standing water in front of home.	The road was built on a hardpan layer with an underdrain system. The underdrain is old and does not function.	CONB	Localized Nuisance Drainage Issue
1050	1529 Emma Lane	Residents complain of standing water in swales for extended periods.	Swales are connected to an homeowners association- (HOA) maintained stormwater pond. May be related to pond drawdown or functionality.	Sunset Bay HOA	Localized Nuisance Drainage Issue
1051	Hagler Drive	Standing water in low spot on Hagler Drive.	CONB staff reported that a culvert handles drainage here, but the pipes get clogged with leaves and debris from the large trees in the area.	CONB	Drainage System Maintenance/ Repair Issue
1061	Hamlet Court	Flooding along Hamlet Lane North, Hamlet Court, and Kings Road. Water reported in garages on Kings Road. Yard drains have been installed along Kings Road.	Outfall pipe from Hamlet Lane North to Florida Boulevard appears to be undersized. The downstream end of the outfall pipe also appears to be below the ditch along Florida Boulevard.	CONB	Primary Outfall Capacity Issue
1062	Secluded Woods	Pipe condition issues and complaints from residents about flooding. CONB staff mentioned tidal issues, but elevations are well above mean higher high water (MHHW) level.	This neighborhood has an HOA that is responsible for maintaining the drainage system.	Secluded Woods HOA	Drainage System Maintenance/ Repair Issue
1063	Kings Road at Big Chief Gates Street	CONB staff noted complaints about flooding in the low spot at the intersection of Kings Road and Big Chief Gates Street, but water clears pretty quickly following storms.	Isolated depression with no positive outfall.	CONB	Localized Nuisance Drainage Issue

Map ID	Location	Description	Cause(s)	Owner/ Maintenance Entity	Category
1064	Forest Marsh Drive	Tidal flooding in the low spot along Forest Marsh Drive. Residents also complain of standing water in the road during heavy rainfall.	This area is low-lying (elevation 3.5 to 4 feet North American Vertical Datum of 1988 [NAVD88]) and the outfall pipe to Hopkins Creek may be undersized.	CONB	Tidal Flooding Issues/Primary Outfall Capacity Issue
1065	Seagate Avenue	CONB staff noted standing water issues along Seagate Avenue.	No stormwater collection system exists along Seagate Avenue, which causes localized ponding in the roads and driveways.	CONB	Localized Nuisance Drainage Issue
1070	North side of Forest Avenue	Standing water in a driveway and in the right of way along Forest Avenue particularly on the east end.	Lack of drainage conveyance in the swale on the north side of Forest Avenue causes standing water. Swales have filled over time.	CONB	Localized Nuisance Drainage Issue
1071	Waters Edge	Road/parking lot is in bad condition with large potholes and standing water.	No roadway maintenance has been performed. Property is very low-lying. Part of the road is owned by JEA and the other part is owned by the Waters Edge HOA.	Waters Edge HOA	Drainage System Maintenance/ Repair Issue
1072	213 Hopkins Street	Water ponds behind the speedbump at this location.	The speedbump blocks the flow of water to 3rd Street.	CONB	Localized Nuisance Drainage Issue
1074	Penman Road between Florida Boulevard and Oceanwood Drive	Flooding along Penman Road during heavy rainfall.	Lack of swale conveyance in places. May be related to the Penman Road outfall ditch maintenance condition.	City of Jacksonville	Drainage System Maintenance/ Repair Issue
1075	225 South Street	Standing water in the road and driveways.	The speedbump at this location blocks flow and a low spot is in the road.	CONB	Localized Nuisance Drainage Issue
1076	5th Street Outfall Ditch	Erosion along the ditch banks from Florida Boulevard to the FDOT outfall ditch.	Likely caused by the improvement to the FDOT outfall ditch as well as the improvements to the Florida Boulevard culverts.	CONB	Drainage System Maintenance/ Repair Issue
1077	1820 Ocean Front Road	Standing water in driveway during and following storm events.	A yard inlet is at this location. The outfall pipe is likely clogged and needs to be maintained.	CONB	Localized Nuisance Drainage Issue
1080	118 North Street	Water from the street runs off into this resident's garage.	Lack of curb line and repeated overlays without proper milling.	CONB	Localized Nuisance Drainage Issue
1081	1224 Ocean Front Road	Water pools in an isolated depression at the intersection of Florida Boulevard and Ocean Front Road.	A layer of concrete and asphalt appears to be below the sand/dirt at this location that block water from infiltrating. This location may have been a beach access point for vehicles in the past.	CONB	Localized Nuisance Drainage Issue
1082	Tara Court	Residents complain of standing water and sheet flow onto property.	The swale system was not built/maintained as permitted. This neighborhood has an HOA responsible for maintaining the stormwater system.	Sunset Point/Tara Court HOA	Widespread Nuisance Drainage Issue

Map ID	Location	Description	Cause(s)	Owner/ Maintenance Entity	Category
1083	1871 Nightfall Drive	Standing water in the low area along Nightfall Drive just east of Kings Road.	A ridge on the north side of Nightfall Drive is keeping water from draining north to Hopkins Creek. An isolated depression is on the private property south of Nightfall Drive that does not have an outfall.	CONB	Localized Nuisance Drainage Issue
1084	Davis Street Culvert	Flooding occurs upstream of the culverts at Davis Street, which are in the primary outfall ditch that drains a large portion of CONB.	Cross-culverts at Davis Street are undersized.	CONB	Primary Outfall Capacity Issue
1085	Bay Street Culvert	Flooding occurs upstream of the culverts at Bay Street, which are in the primary outfall ditch that drains a large portion of CONB.	Cross-culverts at Bay Street are undersized.	CONB	Primary Outfall Capacity Issue
1086	Acacia Road and Rosewood Drive	Standing water at the intersection of Acacia Road and Rosewood Drive.	Isolated depressions along the north side of the road that cause shallow ponding.	CONB	Localized Nuisance Drainage Issue
1087	Florida Boulevard Side Drain	Overtopping onto Florida Boulevard occurs in front of Neptune Beach Elementary School during heavy rainfalls.	The side-drain in the ditch on the south side of Florida Boulevard is undersized.	City of Jacksonville	Primary Outfall Capacity Issue
1090	Tidal flooding of Kings Road	Kings Road on the north side of the FDOT bridge at Hopkins Creek experiences tidal flooding during extreme tide events and blocks access to the homes south of Hopkins Creek.	This stretch of Kings Road is low-lying (approximately 3 feet NAVD88).	CONB	Tidal Flooding Issue
1091	617 Oak Street	Resident noted the formation of sinkholes in their yard due to the condition of the outfall pipe running through their property.	Pipe may have cracks or holes in it, which can create sinkholes.	CONB	Drainage System Maintenance/ Repair Issue
1092	Stormwater Collection Improvements – Oleander Street Outfall	Flooding east of 3rd Street between Davis Street and Oleander Street.	Undersized collection system and lateral pipe crossings under 3rd Street at Oleander Street.	CONB	Collection System and Primary Outfall Capacity Issue
1093	Stormwater Collection Improvements – Florida Boulevard North	Flooding east of 3rd Street between Bay Street and South Street.	Undersized collection system and lateral pipe crossings under 3rd Street at North Street.	CONB	Collection System and Primary Outfall Capacity Issue
1094	Stormwater Collection Improvements – Pine Street Outfall	Flooding east of 3rd Street between Cedar Street and Bay Street.	Undersized collection system and lateral pipe crossings under 3rd Street at Pine Street.	CONB	Collection System and Primary Outfall Capacity Issue
1095	Stormwater Collection Improvements – Walnut Street Outfall	Flooding east of 3rd Street between Cherry Street and Myrtle Street.	Undersized collection system and lateral pipe crossings under 3rd Street at Cherry Street and Walnut Street.	CONB	Collection System and Primary Outfall Capacity Issue

Map ID	Location	Description	Cause(s)	Owner/ Maintenance Entity	Category
1096	Stormwater Collection Improvements – Lemon Street Outfall	Flooding east of 3rd Street between Atlantic Boulevard and Orange Street.	Undersized collection system and lateral pipe crossings under 3rd Street at Lemon Street.	CONB	Collection System and Primary Outfall Capacity Issue
1097	111 Rose Place	Water drains down Rose Place towards a homeowner's garage.	Appears to be caused by overlays without proper milling. The garage is also built below the road so water naturally flows towards it.	CONB	Localized Nuisance Drainage Issue
1099	Stormwater Laterals – Pine Street	Flooding east of 3rd Street upstream of the Pine Street pipe crossing under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1101	Stormwater Collection Improvements – Florida Blvd South	Flooding east of 3rd Street between South Street and Bowles Street.	Undersized collection system and lateral pipe crossings under 3rd Street at Bowles Street.	CONB	Primary Outfall Capacity Issue
1102	Stormwater Laterals – Oleander Street	Flooding east of 3rd Street upstream of the Oleander Street pipe crossing under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1103	Stormwater Laterals – Florida Boulevard South	Flooding east of 3rd Street upstream of the Bowles Street pipe crossing under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1104	Stormwater Laterals – Florida Boulevard North	Flooding east of 3rd Street upstream of the North Street pipe crossing under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1105	Stormwater Laterals – Walnut Street	Flooding east of 3rd Street upstream of the Cherry Street and Walnut Street pipe crossings under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1106	Stormwater Laterals – Lemon Street	Flooding east of 3rd Street upstream of the Lemon Street pipe crossing under 3rd Street.	The pipe crossing under 3rd Street is undersized for the upstream contributing area.	CONB	Primary Outfall Capacity Issue
1109	Forest Oaks Drive	The headwall for the pipe outfall into Hopkins Creek has erosion issues and the headwall is being undermined.	Tidal flushing of Hopkins Creek and stormwater flows.	CONB	Drainage System Maintenance/ Repair Issue
1111	5th Street between Bowles Street and Lora Street	Ponding on 5th Street and on the sidewalk on the east side of 5th Street.	Localized depressions with no drainage collection system.	CONB	Localized Nuisance Drainage Issue

4 DRAINAGE ISSUE PRIORITIZATION

Jones Edmunds developed a scoring criteria/matrix that CONB can use to prioritize its stormwater issues. The criteria included the following evaluation categories:

- Extent/Scale – How much of CONB is impacted by the issue?
- Frequency – How often does the issue occur?

- Duration – How long does the issue last?
- Structure Flooding – Is flooding in structures caused by this issue?
- Pedestrian Impacts – How much does the issue impact pedestrian traffic?
- Roadway Flooding – How much does the issue cause roadway flooding?
- Ownership/Maintenance Entity – Who is responsible for maintaining the drainage system?
- Impacts Upstream Improvements – Do improvements need to be made at this location to create capacity for additional upstream improvements?

Each alternative received a score 0 to 5 for each evaluation category based on the evaluation criteria summarized in Table 2. That score was then multiplied by a significance factor used to weight the importance of the evaluation categories. The weighted scores from all the categories were summed to determine each drainage issues total score. The total scores were used to rank/prioritize the drainage issues. Drainage issues with higher scores were ranked/prioritized ahead of those with lower scores. Table 3 provides the scoring and priority ranking for each of the drainage issues and is sorted from highest ranked issue to lowest ranked issue.

Table 2 Drainage Issue Evaluation Criteria

Evaluation Category	Significance Factor	Score	Scoring Criteria
Extent/Scale	4.0	1	Impacts one or two properties
		3	Impacts multiple blocks/entire neighborhood
		5	Regional impact – multiple neighborhood or large portions of CONB
Frequency	3.0	1	Occurs every couple of years
		3	Occurs a couple of times a year
		5	Occurs during most rainfall events
Duration	3.0	1	Standing water clears in less than an hour
		3	Standing water clears in 1 to 12 hours
		5	Standing water takes longer than a day to clear
Structure Flooding	4.0	1	None documented
		3	Garage and/or other non-habitable structure flooding
		5	Habitable structure flooding above the finished floor elevation
Pedestrian Impacts	2.0	1	No impact on pedestrian traffic
		3	Sidewalk/roadway flooding occurs but clears within a couple of hours following a storm
		5	Sidewalks/roadways inundation for extended periods
Roadway Flooding	2.5	1	Shallow roadway flooding – no roadway closures documented
		3	Roadway flooding to the crown of a single residential road
		5	Roadway flooding to the crown of multiple residential roads or higher-use roads

Evaluation Category	Significance Factor	Score	Scoring Criteria
Ownership/ Maintenance Entity	3.0	0	Privately owned, City of Jacksonville, FDOT, JEA, etc.
		3	CONB right-of-way with HOA
		5	Owned/maintained by CONB
Impacts Upstream Improvements	1.0	0	Does not impact upstream improvements
		1	Improvement must be implemented to create additional capacity for other upstream improvements

Table 3 Drainage Issue Scoring and Prioritization

ID	Location	Extent/ Scale	Freq.	Duration of Flooding	Structure Flooding	Ped. Impacts	Road	Ownership	Impacts Upstream Projects	Score
		Significance Factor								
		4	3	3	4	2	2.5	3	1	
1084	Davis Street Culvert	5	3	3	5	3	5	5	1	92.5
1085	Bay Street Culvert	5	3	3	5	3	5	5	1	92.5
1105	Stormwater Laterals – Walnut Street	3	3	3	5	3	5	5	1	84.5
1040	Bal Harbor	3	3	3	5	3	5	5	0	83.5
1095	Stormwater Collection Improvements – Walnut Street Outfall	3	3	3	5	3	5	5	0	83.5
1091	617 Oak Street	3	3	3	5	3	5	5	0	83.5
1044	Kings Circle/ Poinciana Road	3	5	5	3	5	1	5	0	81.5
1046	Waters Edge Drive Ditch	3	3	5	5	3	1	5	0	79.5
1026	400 and 500 Blocks Myra Street	3	5	5	1	5	3	5	0	78.5
1012	400 and 500 Blocks Hopkins Street	3	5	5	1	5	3	5	0	78.5
1019	400 and 500 Blocks Margaret Street	3	5	5	1	5	3	5	0	78.5
1032	400 and 500 Blocks Bowles Street	3	5	5	1	5	3	5	0	78.5
1039	400 and 500 Blocks South Street	3	5	5	1	5	3	5	0	78.5
1099	Stormwater Laterals – Pine Street		3	3	3	3	5	5	1	76.5
1102	Stormwater Laterals – Oleander Street	3	3	3	3	3	5	5	1	76.5
1103	Stormwater Laterals – Florida Boulevard South	3	3	3	3	3	5	5	1	76.5
1104	Stormwater Laterals – Florida Boulevard North	3	3	3	3	3	5	5	1	76.5

ID	Location	Extent/ Scale	Freq.	Duration of Flooding	Structure Flooding	Ped. Impacts	Road	Ownership	Impacts Upstream Projects	Score
		Significance Factor								
		4	3	3	4	2	2.5	3	1	
1106	Stormwater Laterals – Lemon Street	3	3	3	3	3	5	5	1	76.5
1092	Stormwater Collection Improvements – Oleander Street Outfall	3	3	3	3	3	5	5	0	75.5
1093	Stormwater Collection Improvements – Florida Boulevard North	3	3	3	3	3	5	5	0	75.5
1094	Stormwater Collection Improvements – Pine Street Outfall	3	3	3	3	3	5	5	0	75.5
1096	Stormwater Collection Improvements – Lemon Street Outfall	3	3	3	3	3	5	5	0	75.5
1101	Stormwater Collection Improvements – Florida Boulevard South	3	3	3	3	3	5	5	0	75.5
1043	Penman Outfall Ditch	5	3	3	1	3	5	5	0	75.5
1081	1224 Ocean Front Road	3	3	5	1	5	3	5	0	72.5
1061	Hamlet Court	3	3	3	3	3	3	5	0	70.5
1028	400 and 500 Blocks Oleander Street	3	5	5	1	3	1	5	0	69.5
1029	400 and 500 Blocks Lora Street	3	5	5	1	3	1	5	0	69.5
1047	Marsh Point, Oleander Place, Rosewood Drive, Bay Road	3	5	5	1	3	1	5	0	69.5
1111	5th Street between Bowles Street and Lora Street	3	5	3	1	3	3	5	0	68.5
1070	North side of Forest Avenue	3	3	5	1	5	1	5	0	67.5
1065	Seagate Avenue	3	5	3	1	3	1	5	0	63.5
1072	213 Hopkins Street	3	5	3	1	3	1	5	0	63.5
1075	225 South Street	3	5	3	1	3	1	5	0	63.5
1086	Acacia Road and Rosewood Drive	3	5	3	1	3	1	5	0	63.5
1071	Waters Edge Drive	3	5	5	1	5	3	0	0	63.5
1090	Tidal flooding of Kings Road	3	3	3	1	3	3	5	0	62.5
1080	118 North Street	1	5	3	3	1	1	5	0	59.5
1097	111 Rose Place	1	5	3	3	1	1	5	0	59.5
1049	1032 Lincoln Road	1	5	5	1	1	1	5	0	57.5
1063	Kings Road at Big Chief Gates Street	3	3	3	1	3	1	5	0	57.5

ID	Location	Extent/ Scale	Freq.	Duration of Flooding	Structure Flooding	Ped. Impacts	Road	Ownership	Impacts Upstream Projects	Score
		Significance Factor								
		4	3	3	4	2	2.5	3	1	
1064	Forest Marsh Drive	3	3	1	1	3	3	5	0	56.5
1077	1820 Ocean Front Road	1	5	3	1	3	1	5	0	55.5
1074	Penman Road between Florida Boulevard and Oceanwood Drive	5	3	1	1	3	5	0	0	54.5
1050	1529 Emma Lane	1	5	5	1	1	1	3	0	51.5
1051	Hagler Drive	3	1	3	1	3	1	5	0	51.5
1082	Tara Court	3	5	1	1	3	1	3	0	51.5
1083	1871 Nightfall Drive	1	3	3	1	3	1	5	0	49.5
1062	Secluded Woods	3	3	3	1	1	1	3	0	47.5
1041	Valley Forge Ditch	1	3	3	1	1	1	5	0	45.5
1042	Oceanwood Drive	3	1	1	1	1	1	5	0	41.5
1076	5th Street Outfall Ditch	3	1	1	1	1	1	5	0	41.5
1087	Florida Boulevard Side Drain	5	3	1	1	1	1	0	0	40.5
1109	Forest Oaks Drive	1	1	1	1	1	1	5	0	33.5
1045	Florida Boulevard	3	3	1	1	1	1	0	0	32.5

5 BUDGETARY COST ESTIMATES FOR IMPROVEMENTS

Jones Edmunds performed a desktop review of drainage data and conducted site visits where necessary for each problem area to develop conceptual improvements to be used as a basis for developing budgetary design and construction cost estimates. The improvements are meant to be high-level concepts and are subject to change based on additional site-specific data, but they provide a reasonable estimate of what costs should be to improve the issues. Conceptual improvements and costs were only developed for drainage issues where the CONB owns and maintains the drainage system. Improvement options considered included:

- Lighter, quicker, cheaper improvements – Generally smaller-diameter pipes and yard drains targeted at reducing nuisance ponding.
- Outfall capacity improvements – Flow capacity improvements to primary larger conveyance features such as outfall ditches, larger diameter pipes, etc.
- Collection system capacity improvements – Flow capacity improvements or expansion of the local collections system including upsizing smaller diameter pipes, adding new pipes, adding new inlets, etc.
- System maintenance/repair – Performing maintenance activities or repairing drainage system components that are failing including performing ditch maintenance, cleaning pipes, lining pipes, repairing headwalls, etc.
- Construction of new outfalls – Provide positive outfalls, such as a pipe or ditch, for low-lying areas that do not currently have outfalls.

- Roadway improvements to reduce nuisance ponding – Reconstructing/re-grading roads to promote drainage, e.g., inverting the road crown to drain runoff down the centerline of the road and reduce ponding along the edge of pavement.

The following factors were considered based on available data when developing the improvement concepts:

- Nature of the flooding issue, i.e., nuisance ponding, severe roadway or structure flooding, etc.
- Construction cost.
- Maintenance requirements.
- Existing drainage infrastructure.
- Conflicts with other existing utilities and infrastructure.
- Permitting requirements for adverse offsite impacts, water quality, and wetlands.
- Existing right-of-way limits and property acquisition requirements.
- Disruptions to private property from construction including temporary construction on private property, road closures, and construction duration.
- Topography based on the 2018 LiDAR DEM.

ROM engineering and construction cost estimates were developed for each improvement based on ASTM E2516, *Standard Classification for Cost Estimate Classification System*, Class 4 cost estimate ranges. Class 4 estimates are appropriate for Conceptual Plans. Unit prices were taken from FDOT 12-month moving average construction cost data when available. If FDOT cost data were not available for an item, unit costs were estimated based on other recently bid projects in CONB or adjacent communities. Up to a 50-percent contingency was also applied to the construction cost to account for project unknowns due to the lack of site-specific data at this time and for the volatility of current construction material costs. For improvements identified in the Parsons *Preliminary Storm Sewer Design* report, the cost estimates provided by Parsons were updated based on current FDOT unit price data. Table 4 summarizes the improvements and the budgetary cost estimate for each of the drainage issues. Approximately $55 million dollars of improvements were identified throughout CONB.

Table 4 Improvement Summary and Budgetary Cost Estimates

ID	Location	Improvement Category	Improvement Description for Cost Basis	Cost Estimate ($)
1084	Davis Street Culvert	Outfall Capacity Improvement	Improve culvert capacity in the 5th Street outfall ditch where it crosses Davis Street. Cost estimate is based on the Florida Boulevard culvert construction cost plus 25 percent for engineering, data collection, oversight, etc.	1,250,000
1085	Bay Street Culvert	Outfall Capacity Improvement	Improve culvert capacity in the outfall ditch that crosses Bay Street. Cost estimate is based on the Florida Boulevard culvert construction cost plus 25 percent for engineering, data collection, oversight, etc.	1,250,000
1105	Stormwater Laterals – Walnut Street	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,500,000

ID	Location	Improvement Category	Improvement Description for Cost Basis	Cost Estimate ($)
1040	Bal Harbor	Outfall Capacity Improvement	Improve capacity of the Bal Harbour stormwater system trunk line.	2,000,000
1095	Stormwater Collection Improvements – Walnut Street Outfall	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	2,750,000
1091	617 Oak Street	System Maintenance/ Repair	Clean, video inspect, and cured-in-place pipe (CIPP) lining for Oak Street or entire Bal Harbor neighborhood. Cost will vary based on linear footage of lining needed.	400,000
1044	Kings Circle/ Poinciana Road	New Outfall	Construct outfall pipe from the low area east of Poinciana Road to Florida Boulevard.	300,000
1046	Waters Edge Drive Ditch	Outfall Capacity Improvement	Improve/establish north-south ditch east of Waters Edge Drive and improve culvert crossings under Pine Place and Waters Edge Drive.	400,000
1026	400 and 500 Blocks Myra Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and a pipe connected to the existing inlets at the corner of Oleander Street and 4th Street.	300,000
1012	400 and 500 Blocks Hopkins Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and pipe connections to the existing inlets at 3rd Street and the west end of Hopkins Street.	600,000
1019	400 and 500 Blocks Margaret Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and pipe connections to the existing inlets at 3rd Street and the west end of Margaret Street.	500,000
1032	400 and 500 Blocks Bowles Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and a pipe connected to the existing inlets at the corner of Bowles Street and 4th Street. Remove speedbump on the 400 block if residents approve.	250,000
1039	400 and 500 Blocks South Street	Lighter, Quicker, Cheaper Improvement to reduce nuisance ponding	Construct lighter, quicker, cheaper improvement with yard drains and pipe connections to the existing inlets at the corner of 4th Street and 5th Street.	400,000
1099	Stormwater Laterals – Pine Street	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,000,000
1102	Stormwater Laterals – Oleander Street	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	7,000,000
1103	Stormwater Laterals – Florida Boulevard South	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,000,000

ID	Location	Improvement Category	Improvement Description for Cost Basis	Cost Estimate ($)
1104	Stormwater Laterals – Florida Boulevard North	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,500,000
1106	Stormwater Laterals – Lemon Street	Outfall Capacity Improvement	Construct stormwater lateral improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	2,000,000
1092	Stormwater Collection Improvements – Oleander Street Outfall	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	3,750,000
1093	Stormwater Collection Improvements – Florida Boulevard North	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	3,500,000
1094	Stormwater Collection Improvements – Pine Street Outfall	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,750,000
1096	Stormwater Collection Improvements – Lemon Street Outfall	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	2,000,000
1101	Stormwater Collection Improvements – Florida Boulevard South	Collection System Capacity Improvement	Construct stormwater collection system improvement proposed by Parsons. Cost estimate is based on the updated Parsons cost estimate.	1,000,000
1043	Penman Road Outfall Ditch	System Maintenance/ Repair	Clean outfall ditch.	20,000
1081	1224 Ocean Front Road	System Maintenance/ Repair	Remove impervious surface below the surface, place new sand, and re-plant with natural vegetation.	300,000
1061	Hamlet Court	Outfall Capacity Improvement	Improve pipes along Kings Road and Hamlet Court and construct a new cross-culvert under Florida Boulevard.	750,000
1028	400 and 500 Blocks Oleander Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and a pipe connected to the existing inlets at the corner of Oleander Street and 4th Street.	300,000
1029	400 and 500 Blocks Lora Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Construct lighter, quicker, cheaper improvement with yard drains and a pipe connected to the existing inlets at the corner of Lora Street and 4th Street.	300,000
1047	Marsh Point, Oleander Place, Rosewood Drive, Bay Road	New Drainage Collection System	Construct new drainage system with curb and gutter and stormwater treatment ponds.	9,000,000

ID	Location	Improvement Category	Improvement Description for Cost Basis	Cost Estimate ($)
1111	5th Street between Bowles Street and Lora Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	New drainage collection system that connects to the existing inlet at Lora Street and 5th Street.	300,000
1070	North side of Forest Avenue	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Re-establish swales on the north and south sides of the east end of Forest Avenue.	100,000
1065	Seagate Avenue	Roadway Improvements to Reduce Nuisance Ponding	Reconstruct road with a swale in the right-of-way on the north side of the road.	1,000,000
1072	213 Hopkins Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Shave down the edge of the speed bump to allow water to pass by.	Self-Perform
1075	225 South Street	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Shave down the edges of the speed bump and re-grade the low section of the roadway to allow drainage to the east.	100,000
1086	Acacia Road and Rosewood Drive	Lighter, Quicker, Cheaper Improvement to Reduce Nuisance Ponding	Install inlets at the corner of Acacia Road and Rosewood Drive, re-grade the existing swale to Florida Boulevard, and construct a new pipe under Florida Boulevard.	250,000
1071	Waters Edge Drive	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1090	Tidal flooding of Kings Road	Roadway Improvements to Reduce Nuisance Ponding	Raise Kings Road north of the Hopkins Creek bridge to elevation 5 feet NAVD	1,500,000
1080	118 North Street	Roadway Improvements to Reduce Nuisance Ponding	Invert the roadway crown.	250,000
1097	111 Rose Place	Roadway Improvements to Reduce Nuisance Ponding	Invert the roadway crown.	200,000
1049	1032 Lincoln Road	System Maintenance/ Repair	Replace the Bal Harbor underdrain system.	1,250,000
1063	Kings Road at Big Chief Gates Street	New Outfall	Construct a pipe collection system with a trunk line on the east side of Kings Road that discharges to Hopkins Creek.	1,500,000
1064	Forest Marsh Drive	Outfall Capacity Improvement	Construct a new outfall pipe to Hopkins Creek and inlets at the low point on Forest Marsh Drive.	750,000
1077	1820 Ocean Front Road	System Maintenance/ Repair	Clean out drains and pipes.	Self-Perform

ID	Location	Improvement Category	Improvement Description for Cost Basis	Cost Estimate ($)
1074	Penman Road between Florida Boulevard and Oceanwood Drive	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1050	1529 Emma Lane	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1051	Hagler Drive	System Maintenance/ Repair	Keep pipes clean in this area to prevent clogging.	Self-Perform
1082	Tara Court	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1083	1871 Nightfall Drive	Right-of-way grading	Scrape down the ridge in the right-of-way on the north side of Nightfall Drive to allow sheetflow to the north.	Self-Perform
1062	Secluded Woods	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1041	Valley Forge Ditch	System Maintenance/ Repair	Clean outfall ditch.	100,000
1042	Oceanwood Drive	System Maintenance/ Repair	Clean, video inspect, and CIPP lining where needed.	350,000
1076	5th Street Outfall Ditch	System Maintenance/ Repair	Put in sheetpile grade control structures to lock in ditch profile and prevent ditch erosion.	600,000
1087	Florida Boulevard Side Drain	N/A	Not CONB owned/maintained. No improvement developed.	N/A
1109	Forest Oaks Drive	System Maintenance/ Repair	Replace/repair headwall.	100,000
1045	Florida Boulevard	N/A	Not CONB owned/maintained. No improvement developed.	N/A
Total Estimated Cost				**55,420,000**

Note: N/A = Not applicable.

6 FUNDING OPTIONS

The total cost of implementing all of these projects is significant. If CONB expects to complete all of these projects, CONB would need to significantly increase stormwater capital improvement project funding. To meet the funding needs to complete improvements, we recommend the CONB considers the following:

- Pursuing grant funding opportunities: Potential grant funding programs to consider include:
  - Florida Department of Environmental Protection's (FDEP) Florida Resilient Coastlines Program (FRCP) – Provides funding for resiliency projects that have been identified in a comprehensive vulnerability assessment. Provides a 50-percent cost share for construction projects.
  - Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP) – Provides post-disaster funding for communities to reduce future disaster losses. Generally provides funding for 75 percent of the project cost.

  - Department of Economic Opportunity's (DEO) Rebuild Florida Mitigation General Infrastructure Program – Provides funding opportunities for local governments and state agencies to develop large-scale mitigation activities that allow Florida communities to better withstand future disasters. Provides 100-percent funding.
- Pursuing funding from legislative appropriation.
- Coordinating with FDOT to improve hydraulic constrictions under 3rd Street.
- Bonding options.
- Exploring the development of municipal service taxing/benefit units (MSTBU) for specific project areas.
- Exploring the feasibility of developing a community redevelopment area (CRA).

7 CONCLUSION AND RECOMMENDATIONS

Based on public feedback, CONB staff feedback, and existing data, Jones Edmunds identified 55 drainage issues throughout CONB. The drainage issues were prioritized based on the scoring matrix summarized in Section 4 of this Technical Memorandum, and conceptual improvements and ROM engineering and construction costs were developed for the drainage issues where applicable. Approximately $55 million in improvement projects were identified to alleviate drainage issues.

Jones Edmunds recommends that CONB use the prioritized list of drainage issues along with the corresponding list of improvement projects and ROM costs to systematically identify projects to implement and funding sources. Once the projects and funding are identified, CONB can begin incorporating the projects into its stormwater capital improvement plan.