

Meeting with Shore Acres Civic Association Board – Jan 31, 2024

Shore Acres Flooding Mitigation





Shore Acres Neighborhood

What Makes Shore Acres Unique

- Canals provide water access to many homes
- Neighborhood churches and schools (public and private)
- Shore Acres Elementary School
- New YMCA and soon to open Mangrove Bay Middle School
- City soccer, baseball and golf courses on 62nd Ave N.
- Bikeable to downtown
- Shore Acres Recreation Center
- Parks and greenspace
- Walkable neighborhood





Shore Acres Neighborhood

What Makes Shore Acres Unique

- Built in 1920s before City standards created in 1950s
- Shore Acres built on top of marsh with 3 feet of dredged fill in contrast to 5 feet of fill in Snell Isle
- Lowest neighborhood in the City and shaped like a flat-bottomed bowl
- Canals and lakes fluctuate with tides
- High groundwater and poorly draining soils



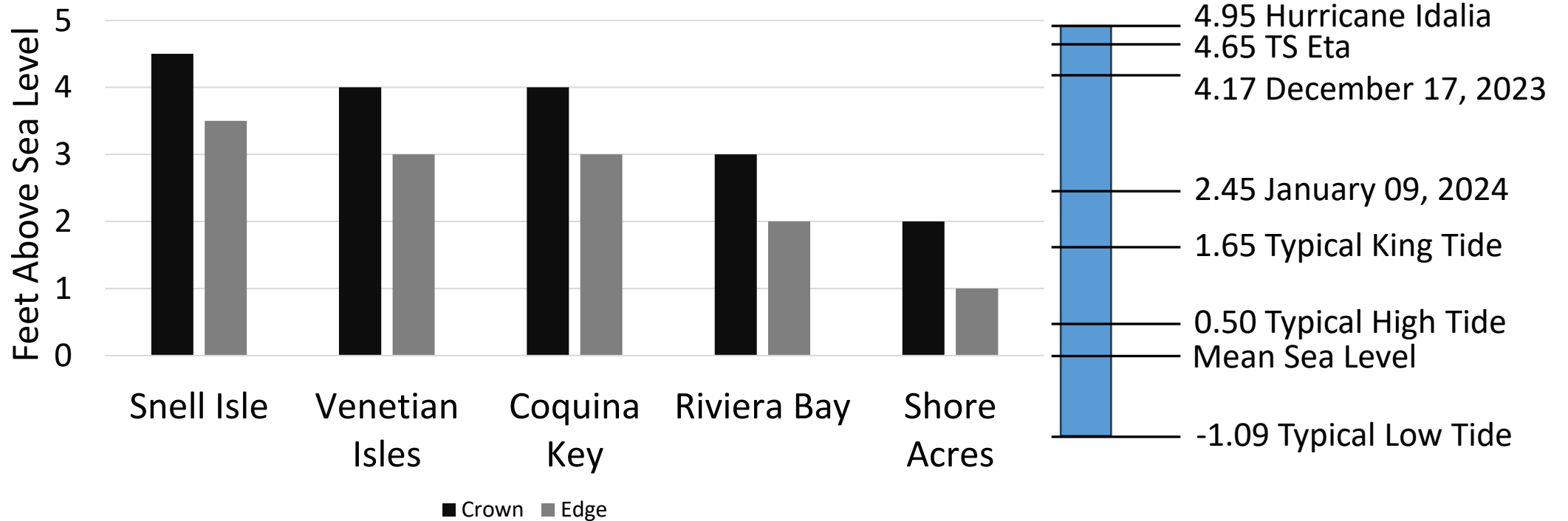
Dark gray indicates lowest elevations



Shore Acres Neighborhood

What Makes Shore Acres Unique

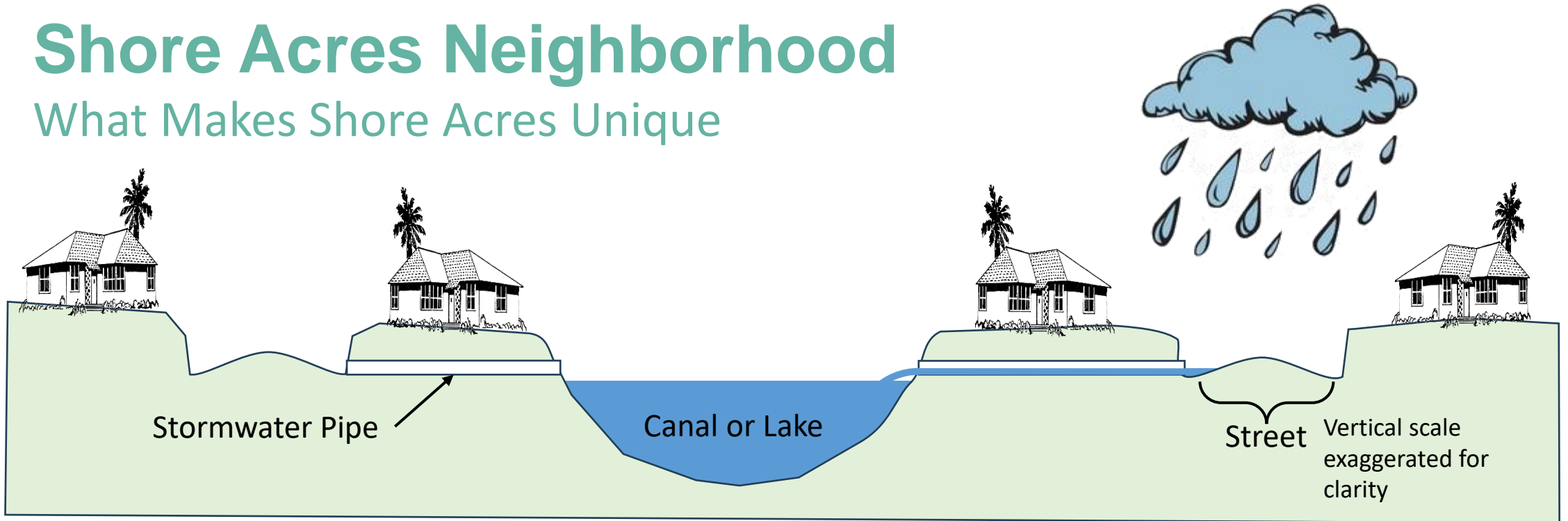
Road Crown and Edge Elevations





Shore Acres Neighborhood

What Makes Shore Acres Unique

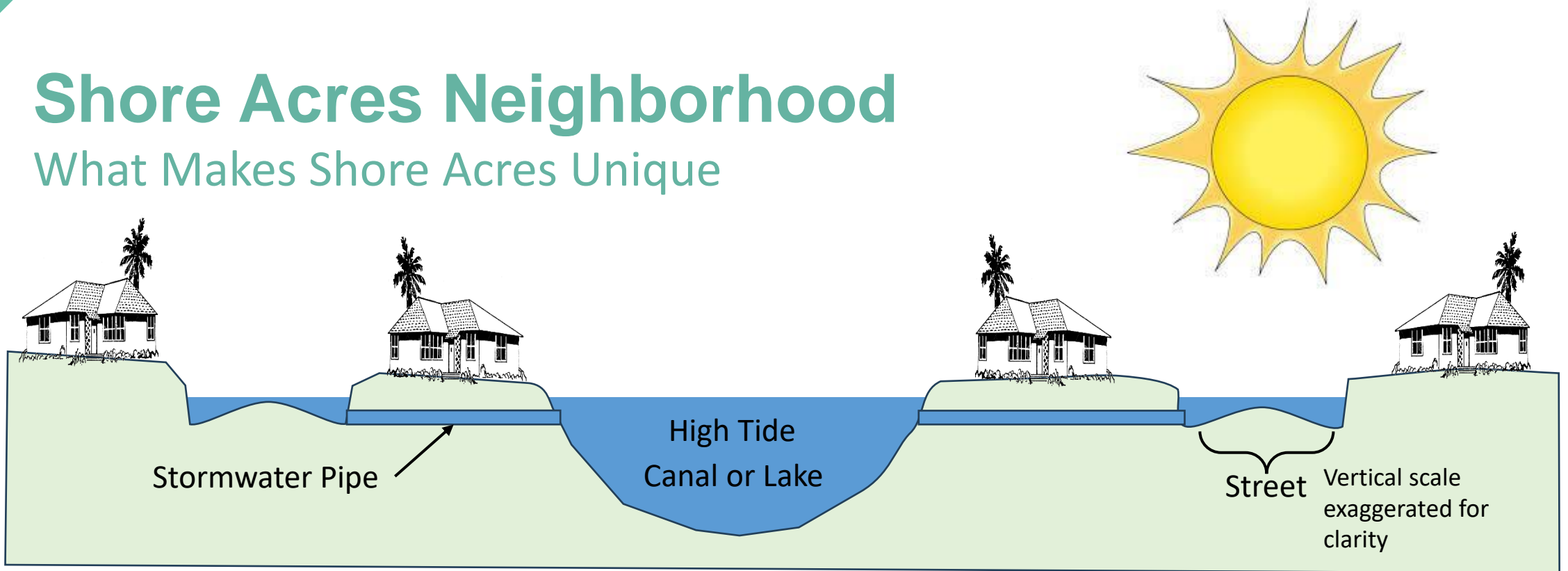


- When tides are low, rainwater drains into canal or lake
- Sea level is only 1 foot below street edge which means that water drains slowly and edge of street may hold some water



Shore Acres Neighborhood

What Makes Shore Acres Unique

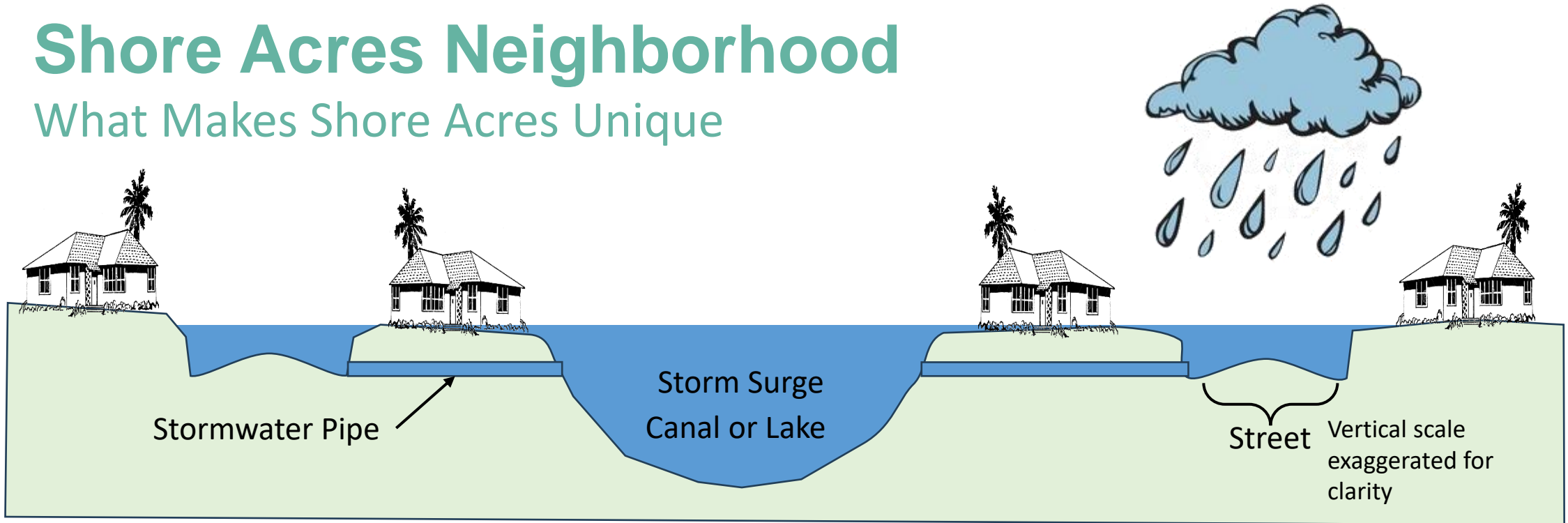


- Sunny day flooding
- When tides are high, canal or lake may back up into streets
- Streets will drain when tide recedes



Shore Acres Neighborhood

What Makes Shore Acres Unique



- During storm surge, canal or lake will back up into streets
- High tide prevents rainwater from draining

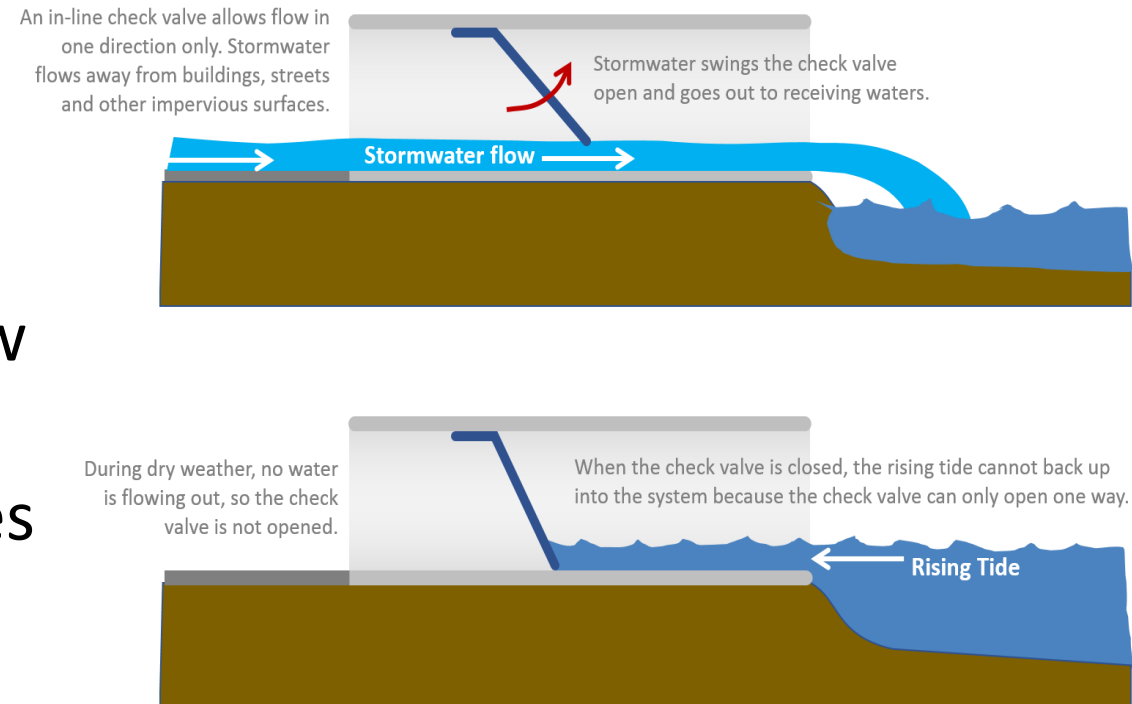


Shore Acres Neighborhood

Current Mitigation Measures – Backflow Preventers

- Used since the 1970s
 - Flap gate (1970s)
 - Check valve vaults
 - Inline membrane
- Third generation of backflow preventers
 - Each generation improves on the one before

HOW DOES AN IN-LINE CHECK VALVE WORK?



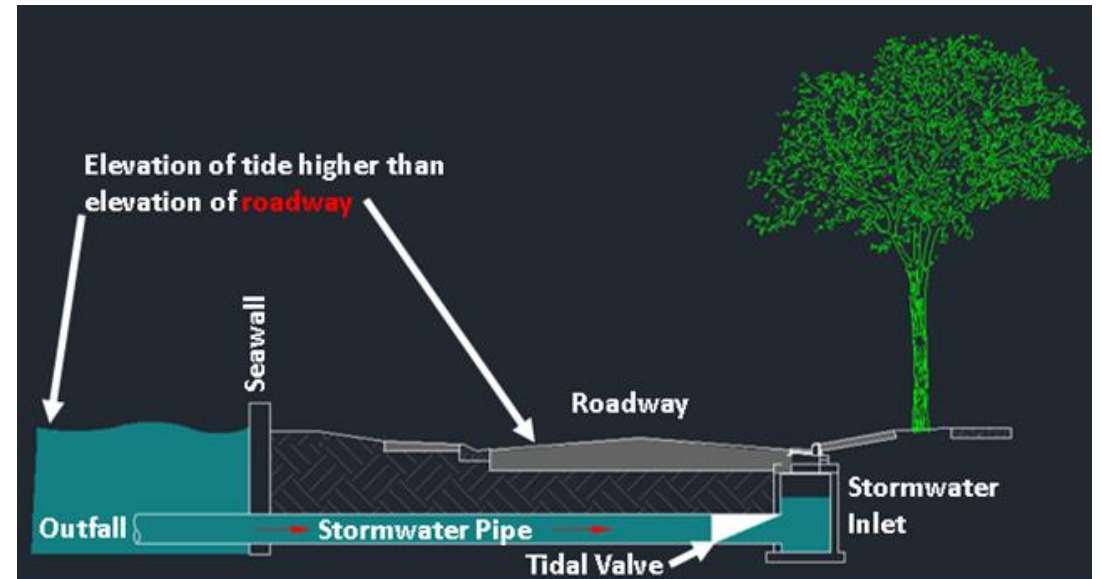


Shore Acres Neighborhood

Current Mitigation Measures – Backflow Preventers

Backflow preventers not 100% effective

- Debris blocks valve from closing
- Wear and tear of valve material reduces watertight seal
- Corrosion of metal parts (reduced when silicone MVQ, EPDM and polyurethane membranes are used)
- Require up to 6-12 inches of water pressure to open





Shore Acres Neighborhood

History of Mitigation Measures – Studies and Recommendations

- Eleven studies over 70 years
 - 1952 – Hurricane Easy
 - 1959 – mosquito infestation
 - 1964 – No Name Storm (1963)
 - 1975 – Hurricane Agnes (1972)
 - 1987 – Hurricane Elena (1985)
 - 1989 – No Name Storm (1986)
 - 1991 – High tide events
 - 1994 – Replace flap gates
 - 2010 – Add backflow vaults
 - 2019 – Repetitive loss report
 - 2023 – Citywide drainage plan
- Common recommendations
 - 1952 – minimum house elevations and storm drains
 - 1959 – minimum house elevations and storm drains
 - 1964 – minimum house elevations and storm drains
 - 1975 – elevate houses, flap gates, pump stations
 - 1987 – canal locks and flood gates, pump stations
 - 1989 – raise sea walls, elevate homes and streets
 - 1991 – elevate homes and streets
 - 1994 – replace flap gates with backflow vaults
 - 2008 – add more backflow vaults
 - 2019 – elevate homes
 - 2023 – pump stations and larger storm drain pipes



Shore Acres Neighborhood

History of Mitigation Measures – Opposition to Past Recommendations

Why so many studies over and over?

- Hope of new technologies
- Advances in flood engineering
- Study recommendations rejected
 - By neighborhood as being too disruptive
 - By City as being infeasible or too expensive
- New flooding event occurs and study cycle starts over again...



“The neighborhood is not going to accept any of the solutions because they’re all so dramatic. The City’s not going to accept them because they’re too expensive”. – Ron Mason, City Councilmember for Shore Acres (1988)

Source: St. Petersburg Times, March 4, 1988



Shore Acres Neighborhood

History of Mitigation Measures – Opposition to Past Recommendations

1989 Study Performed by Army Corp of Engineers

- City developed 3 options
 - Option A – Do nothing
 - Options B & C – pump stations, backflow preventers, raise private property seawalls
- The City held a 30-week series of meetings within Shore Acres residents
 - Residents concerned with price of raising seawalls or having to pay for improvements
- Residents rejected recommendations in referendum with following results:
 - Majority (39%) preferred Option A – do nothing
- City Council approved plan to add drainage capacity with larger pipes



Shore Acres Neighborhood

History of Mitigation Measures – Summary of Past Mitigation Measures

Mitigation measures taken in the past include:

- 1950s through 1970s – expanded neighborhood stormwater system
- 1980s – raised public sea walls, initial flap gates (type of backflow preventer)
- 1990s – backflow preventer vaults, upsized stormwater pipes
- 2000s through 2010s – upgraded backflow vaults, upsized stormwater pipes

Recommended options rejected in the past include:

- Elevate houses
- Canal locks
- Raise sea walls
- Pump stations
- Flood gates
- Build a levee



Shore Acres Neighborhood

Stormwater System Description

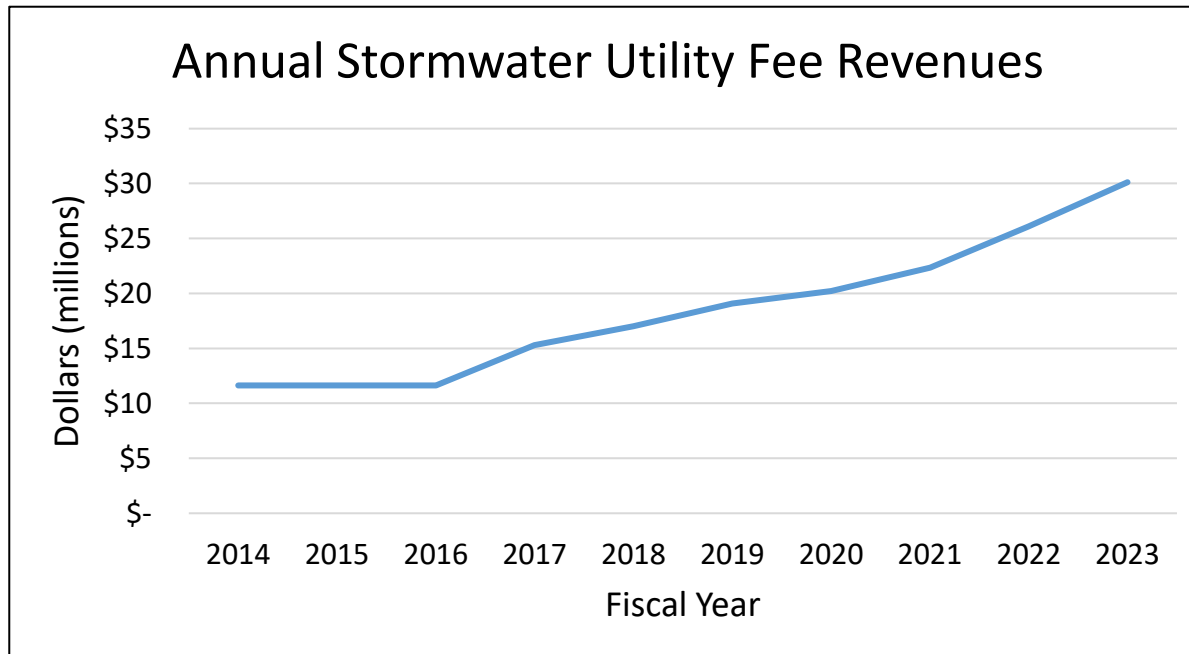
- 574 inlets/catch basins
- 91,185 feet of pipe (17.27 miles)
- 146 outfalls
- 106 manholes
- 56 backflow preventers





Shore Acres Neighborhood

City Stormwater Utility



- 1991-2016 – stormwater utility revenues grew slowly
- 2017 – City began escalation of stormwater fees in preparation for 2024 Stormwater Master Plan
- 2019 – City implemented Tiered Stormwater Utility Rate Structure
- Prior to 2017, approximately 30% of the stormwater utility revenue went towards capital projects

Shore Acres neighborhood generates 2.6% of the Stormwater Utility revenues



Shore Acres Neighborhood

City Commitment to Shore Acres

Completed Stormwater Projects Prior to 2017	
Project	Total Cost
Shore Acres Backflow Prevention Vaults	\$ 187,000
Bayou Grande Blvd	\$ 516,000
Nebraska Avenue NE	\$ 166,000
Bayou Grande Blvd - Ventetian to 62nd Ave NE	\$ 1,107,000
Delaware, Arizona, & Vicinity SDI	\$ 4,029,000
Arrowhead Dr NE	\$ 1,421,000
Shore Acres Tidal Backflow Prevention Vaults Phase 1	\$ 805,000
Shore Acres Tidal Backflow Prevention Vaults Phase 2	\$ 905,000
Shore Acres Tidal Backflow Prevention Vaults Phase 3	\$ 1,371,000
	\$ 10,507,000

- Shore Acres generated \$2.0 million in stormwater capital project revenues prior to 2017
- \$5.15 in capital projects returned to Shore Acres for every \$1.00 in capital revenue collected ($10.5/2.0=5.15$)

This represents 13% of all capital project spending prior to 2017



Shore Acres Neighborhood

City Commitment to Shore Acres

- After 2017, approximately 55% of stormwater utility revenues go towards capital projects
- Shore Acres will generate \$2.8 million in stormwater capital project revenues between 2017-2029
- \$17.36 is expected to be returned to Shore Acres for every \$1.00 of capital revenue collected in FY25-FY29 ($48.6/2.8=17.36$)

\$48.6 million (30% of total)

Stormwater Capital Improvement Projects (FY17 - FY29)			
Project Name	FY17-FY23	FY24-FY29	Total
1st Ave N at 58th St SDI	\$ 1,000,000	\$ -	\$ 1,000,000
37th Street South and 42nd Avenue South SDI	\$ 300,000	\$ -	\$ 300,000
46th Ave S & 37th St S SDI	\$ -	\$ -	\$ -
50th Ave Northwest of 4th St SDI	\$ 7,728,500	\$ 750,000	\$ 8,478,500
5th Avenue North at 74th Street to 76th Street	\$ 300,000	\$ -	\$ 300,000
62nd Ave N Stormwater System Resiliency	\$ -	\$ 5,750,000	\$ 5,750,000
7th St S Sustainable Improvement	\$ 2,350,000	\$ -	\$ 2,350,000
88th Avenue North SDI	\$ -	\$ 10,000,000	\$ 10,000,000
8th Ave S at 44th St S	\$ -	\$ -	\$ -
Appian Way & Vicinity Resiliency Project	\$ 750,000	\$ 1,000,000	\$ 1,750,000
Bartlett Lake/Salt Creek Pump Station	\$ 1,700,000	\$ 21,000,000	\$ 22,700,000
Crescent Lake Water Quality Improvements	\$ 350,000	\$ 2,400,000	\$ 2,750,000
Drainage Line Rehab/Replacement	\$ 7,650,000	\$ 11,000,000	\$ 18,650,000
Gandy Blvd & Oak St NE SDI	\$ 900,900	\$ -	\$ 900,900
Harbor Isle Lake Restoration	\$ -	\$ 3,000,000	\$ 3,000,000
Lake Improvements	\$ 1,050,000	\$ 3,000,000	\$ 4,050,000
Little Bayou Water Quality Improvements	\$ 825,000	\$ -	\$ 825,000
Minor Storm Drainage	\$ 3,000,000	\$ 3,750,000	\$ 6,750,000
MLK at 62 A/N Improvements	\$ 850,000	\$ -	\$ 850,000
MLK Channel Improvements	\$ 250,000	\$ 2,000,000	\$ 2,250,000
MLK South of Salt Creek to 32nd Avenue South SDI	\$ -	\$ 6,900,000	\$ 6,900,000
Old NE Stormwater Drainage Improvements	\$ 300,000	\$ -	\$ 300,000
PTC Ditch SDI	\$ 200,000	\$ -	\$ 200,000
Stormwater Master Plan	\$ 3,187,773	\$ 1,500,000	\$ 4,687,773
Stormwater Pump Stations (capital repairs of existing stations)	\$ 1,090,000	\$ 1,750,000	\$ 2,840,000
Stormwater System Resiliency Enhancements	\$ 2,000,000	\$ 4,000,000	\$ 6,000,000
Stormwater Master Plan Projects (unidentified)	\$ -	\$ -	\$ -
SW Facility Master Plan (replace buildings at end-of-life)	\$ 400,000	\$ 1,319,000	\$ 1,719,000
Stormwater Vaults & Backflow Preventers	\$ 1,020,000	\$ 1,400,000	\$ 2,420,000
Shore Acres Connecticut Ave NE & Vicinity Resiliency Project	\$ 500,000	\$ 7,500,000	\$ 8,000,000
Shore Acres Denver SDI	\$ -	\$ 5,700,000	\$ 5,700,000
Shore Acres Arizona SDI	\$ -	\$ 9,500,000	\$ 9,500,000
Shore Acres Flood Gate System Evaluation/Implementation	\$ -	\$ 23,000,000	\$ 23,000,000
	\$ 37,702,173	\$ 126,219,000	\$ 163,921,173



Shore Acres Neighborhood

Stormwater System Maintenance

Structure	# Citywide	# in Shore Acres	% in Shore Acres
Storm Drain Inlets	22,498	574	3%
Manholes	8385	106	1%
Outfalls	525	146	28%
Backflow Preventers	73	56	77%
Pipe (feet)	2,666,400	91,185	3%
Properties Served	107,672	2683	2.5%



- Line cleaning – 3 hrs per crew
 - Starts at inlet, ends at outfall
- Backflow Preventers – 4.5 hrs per crew
 - De-water vault
 - Clean sump and screens
 - Examine backflow for proper operation
 - Isolate and clean outfall side of vault



Shore Acres Neighborhood

Stormwater System Maintenance

Shore Acres Cleaning Schedule

- Line cleaning
 - 574 storm drain inlets
 - 574 at 2.6 inlets per day = 215 days = 11 months
- Backflow Preventers
 - 56 backflow preventers
 - 56 at 1.8 backflows per day = 31 days = 1 month
- To clean entire Shore Acres stormwater system:
 - One crew: 12 months (once per year)
 - Two crews: 6 months (twice per year)
 - Three crews: 3 months (once per quarter)

The City has two (2) crews for the entire City:

- 8 personnel (4 persons per crews)
- 3 vacuum trucks (Vactor)
- 3 basin trucks (crane truck)
- 1 mobile pump
- \$1.5 million per year



Shore Acres Neighborhood

Stormwater System Maintenance

- The City inspects and cleans Shore Acres backflow preventers once per year
- Line cleaning is done in Shore Acres on an as-needed basis:
 - Before every storm: inspect and clean thirteen (13) “Hot Grates” (critical drainage systems)
 - When reported by a citizen through SeeClickFix (SCF), email, or phone call
 - When noticed by a City crew

Cost to dedicate three (3) crews to Shore Acres to clean entire system every three months:

- \$2.3 million per year

Options to fund this:

- 9% utility rate increase (all City neighborhoods share cost burden), or
- \$860/year for Shore Acres customers only



Shore Acres Neighborhood

Moving Forward

- **Infrastructure**
 - 2024 – Replace 14 old model backflows for \$500,000 (2024)
 - 2025 – 100,000 gallons per minutes pump station to drain Connecticut Ave
 - 2026 – Upsize storm pipe to drain Denver/Dover/Ohio/54th Ave area
 - 2028 – Upsize storm pipe to drain Arizona/Arkansas/Alabama Ave area
 - 2025-2029 – Evaluate feasibility of canal locks and flood gates (2025-2026) and construct if feasible (2028-2030)
- **Community Support**
 - Administer FEMA grant programs including assistance in raising homes
 - Work to improve City’s Community Rating System (CRS) score to provide discounts on FEMA flood insurance policies citywide
 - Prepare annual Repetitive Loss Area Analysis reports to identify methods to mitigate and drainage improvements
 - Expedite permitting for flood damaged homes
- **Collaboration with State and Federal Agencies**
 - Continue to seek state and federal grant money for stormwater projects
 - Develop flood mitigation and adaptation action plan in partnership with Tampa Regional Planning Council
 - Support Florida’s Save Our Florida Homes expansion to include flood-proofing (2024 SB 7028)

End of Presentation



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Public Works Administration