City of Sebastian

Stormwater Master Plan Update

December 13, 2023

Project Goals & Highlights

1. **Stormwater System Mapping and Modeling** – Documentation Reviews, GIS System Surveys, Condition Assessment, H&H Model Development

2. **Capital Improvements Program** – Prepared a 10-yr CIP Program, with capital projects prioritized based on effectiveness.

3. **Stormwater Quality Analysis** – SWIL Model, BMAP Credits

4. **Sea Level Rise Analysis** – Published report data and tide gauge trend data

5. **Stormwater Rate Sufficiency Analysis**

6. **O&M Plan Development** – Stormwater Dept operations analysis (tasks, labor & equipment costs, etc.), minimum maintenance tasks required, calculation of staffing and equipment needs

Project Adaptation

To Maintain the Project Schedule, the Project Approach was Adapted

Finding Solutions To Move The Project Forward

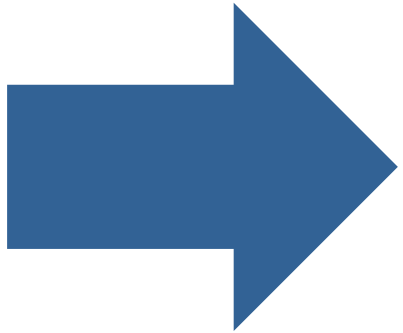
Lack of Stormwater System Component Data, GIS Map, or H&H Model Data

No Detailed Stormwater System Operations Plan

No Financial Model of the Stormwater Department

No O&M Activity Analyses

No 10-Year CIP Program Funding Analysis



Rented Survey Equipment, Deployed Survey Team, Reviewed Hundreds of Archived City File Documents Inspected and Surveyed System Components, Acquired System Data for H&H Model and Built the GIS Map

Analyzed Current O&M Activities and Created Proposed Operations Plan Based on Minimum Needed Activities

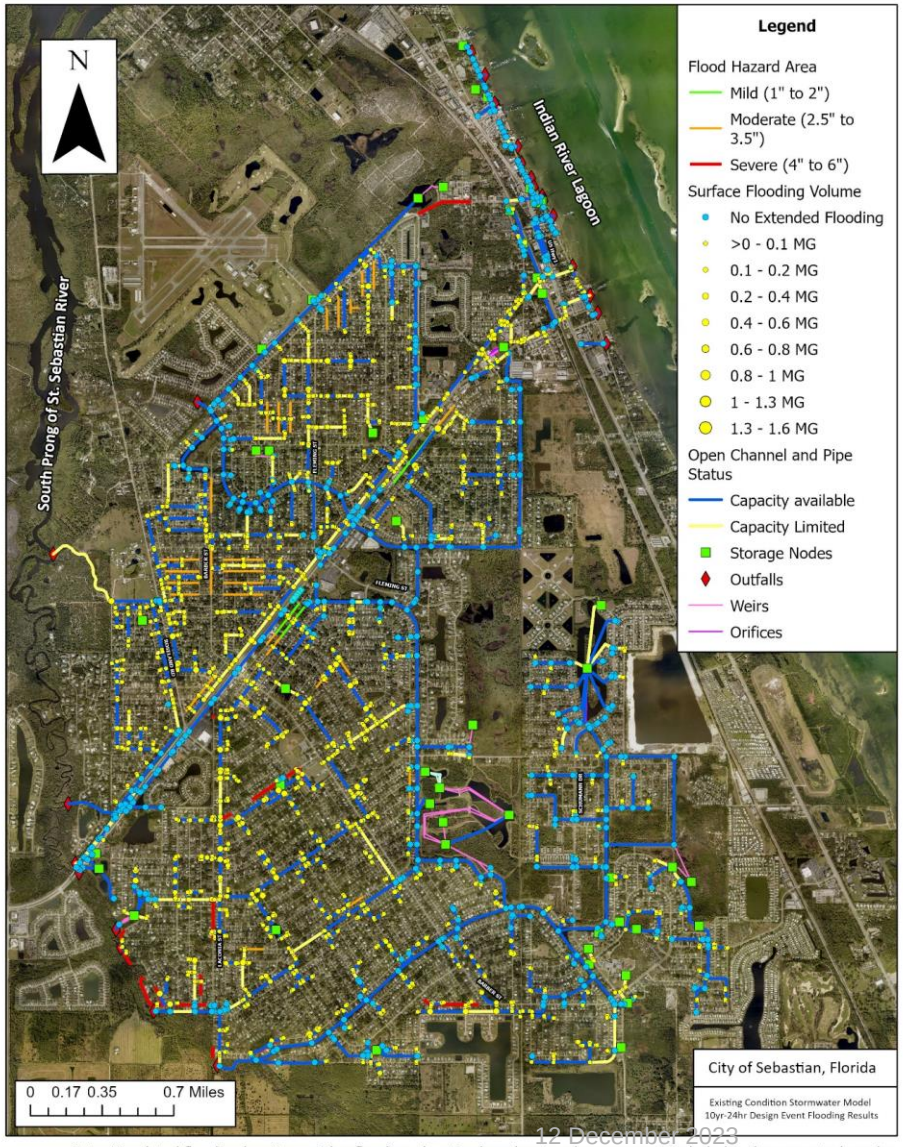
Created 10-Year Financial Model of the Stormwater Department to Verify Revenues Could Support Proposed O&M and Capital Projects Plan

Stormwater System Mapping and Modeling

- **SWMS Asset Inventory (5,039 features)**
  - 756 bulkheads
  - 2,381 inlets/nodes
  - 1,875 conduits (canals, ditches, etc.)
  - 27 outfalls

- **H&H Model** - A dynamic 1D Hydrologic and Hydraulic (H&H) computer model of the stormwater network was developed to evaluate the system performance in response to various conditions.

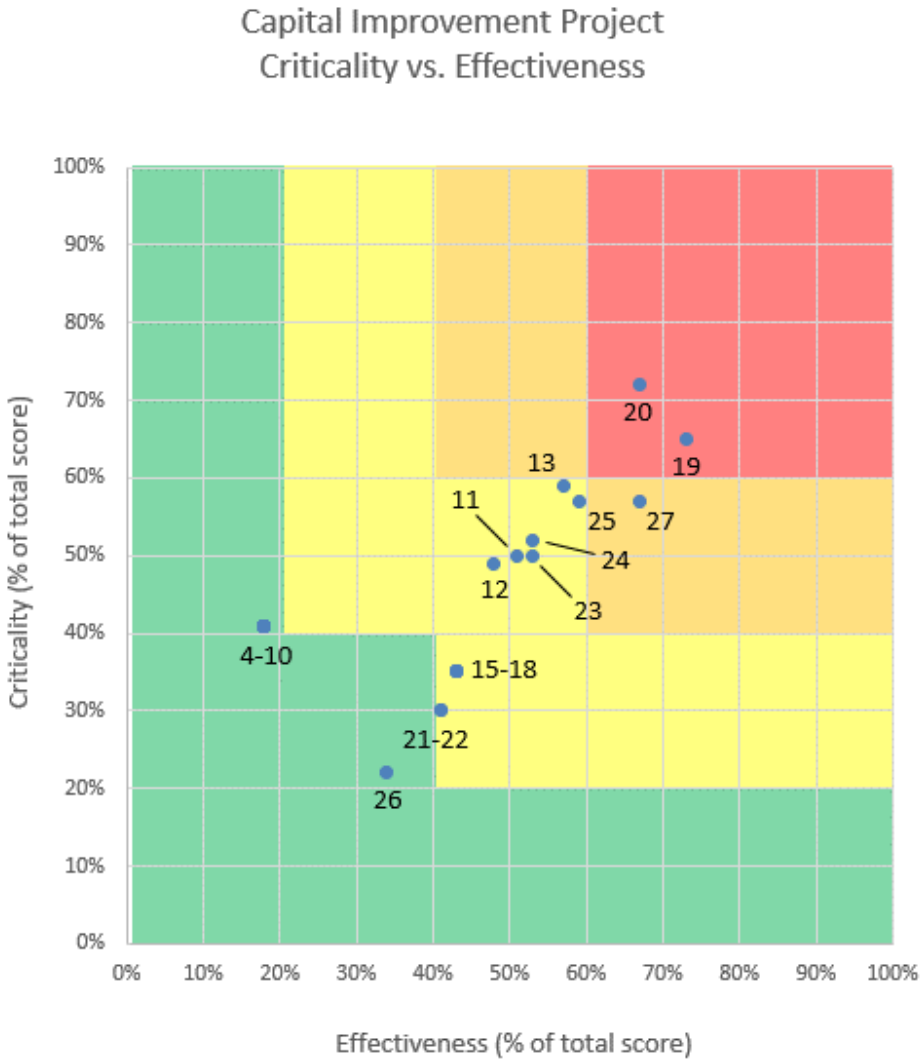
- **Model Results** - The existing stormwater network performance was evaluated for the 10yr-24hr, 25yr-24hr, and the 100yr-24hr design storm events
  - H&H model showed many locations across the City experience flooding for more than two hours under the 10yr-24hr, 25yr-24hr, and 100yr-24hr design storm events



Note: Simulated flooding locations with a flooding duration less than two hours are not included in the presented results.

Updated 10-yr Capital Improvement Program

1. Reprioritized projects based on criticality, effectiveness, and funding availability
2. Approximately $800k to $1.3M per year for 10 years
3. Based on available funds from the Department, other City funding sources, and outside sources.
4. Many CIP projects that would improve the SWMS performance can be completed with available City funds



Stormwater Quality

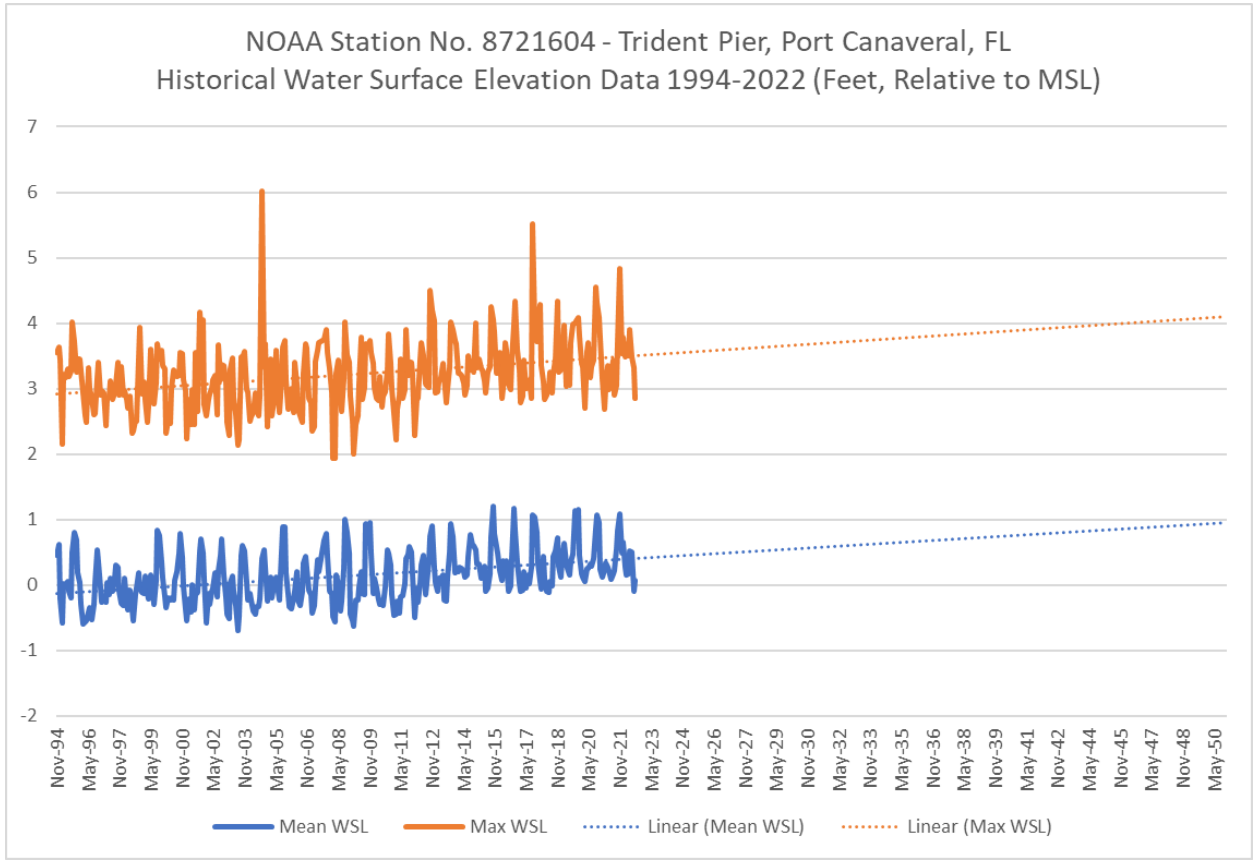
- State water quality standards are regulated by FDEP and include Total Maximum Daily Load Requirements for Total Nitrogen (TN) and Total Phosphorus (TP) for the Indian River Lagoon
- City's allowable loadings were established under the Central Indian River Lagoon Basin Management Action Plan as follows:

Parameter	Starting Load (lbs./year)	Anthropogenic % in CIRL BMAP	Required Reduction (lbs./year)	Required Reduction (%)	Allowable Load (lbs./year)
Total Nitrogen (TN)	61,820	3.86	33,196	53.7	28,264
Total Phosphorus (TP)	8.901	3.84	6,015	67.6	2,886

- **The City is progressing towards meeting its required reduction goals.** To date, the City has begun or completed 16 management actions (projects), resulting in load reduction credits of 5,223 lbs./year of TN (15.7% of required reduction) and 620 lbs./year of TP (10.3% of required reduction)
- While the City's performance appears to be lower than the overall progress reported for CIRL Project Zone SEB, the City has not yet received reduction credits for seven completed projects, including the Stormwater Park. That single project may account for a significant part of the City's required reduction goals.

Sea Level Rise

- **Based on the data available, the estimated increase in mean sea levels through 2050 are not expected to have a significant effect on the performance of the City's SWMS**
- Relative sea level along the contiguous U.S. coastline is expected to rise on average as much over the next 30 years (0.25–0.30 m from 2020 to 2050) as it has over the last 100 years (1920–2020)*
- Tidal data collected from the National Oceanic and Atmospheric Administration (NOAA) Tide Station closest to the City of Sebastian from 1994 to 2022 show the mean sea level elevation increasing at a rate of approximately 0.5 feet (0.15 m) between 2020 and 2050 and the maximum sea level elevations increasing at a rate of approximately 0.6 feet (0.18 m) over the same period. These rates appear to be generally consistent with the lower range of the 0.25 – 0.30 m increase projected in the report.



*Source: *Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines.* U.S. Sea Level Rise and Coastal Flood Hazard Scenarios and Tools Interagency Task Force, February 2022.

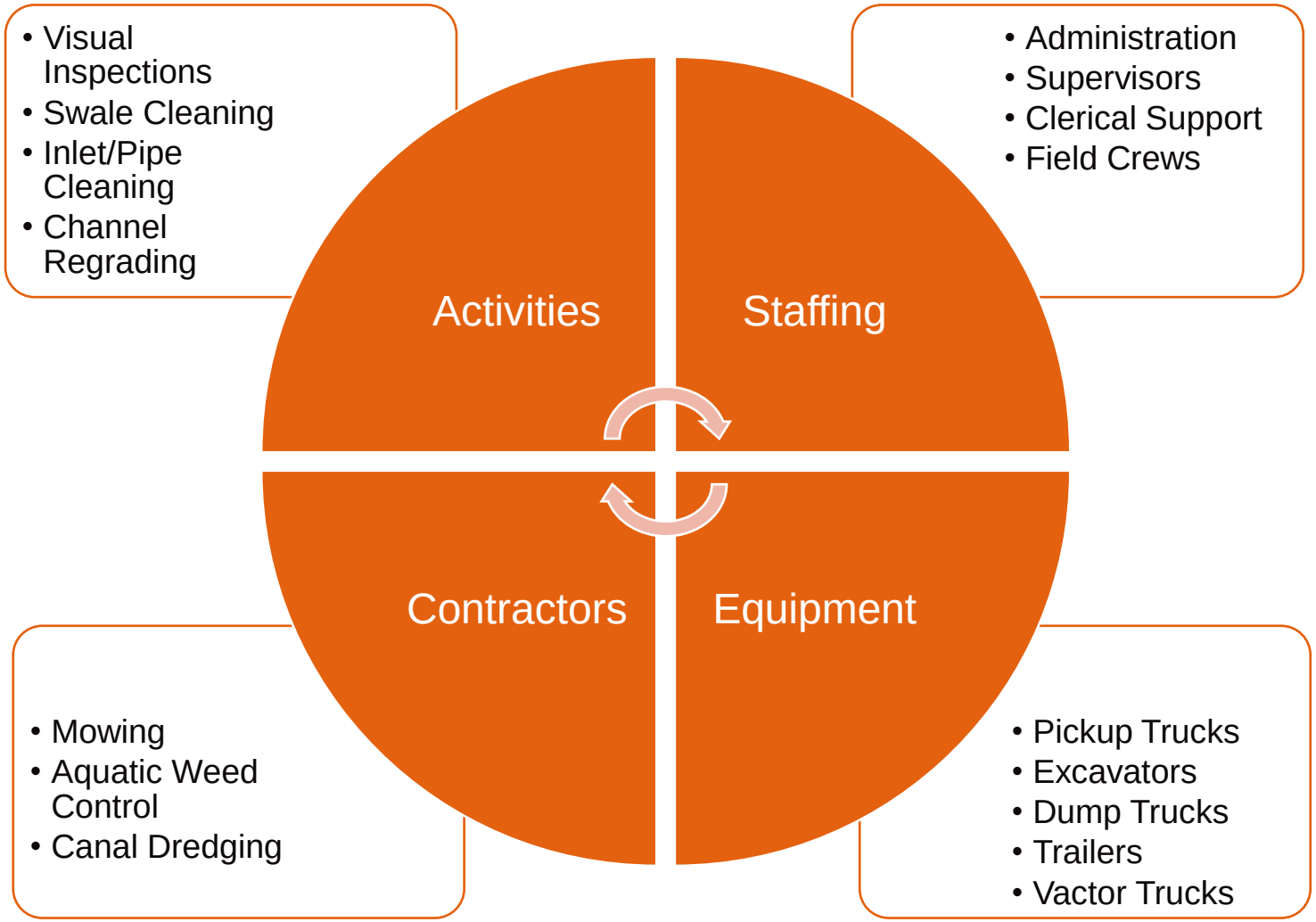
Stormwater Operations Analysis

In coordination with City staff, Arcadis developed an MS-Excel O&M model that calculates the full labor and equipment cost per hour and applies them to each activity based on labor crew size and composition and equipment used

Costs for maintenance activities performed by City contractors were also included in the total cost calculations

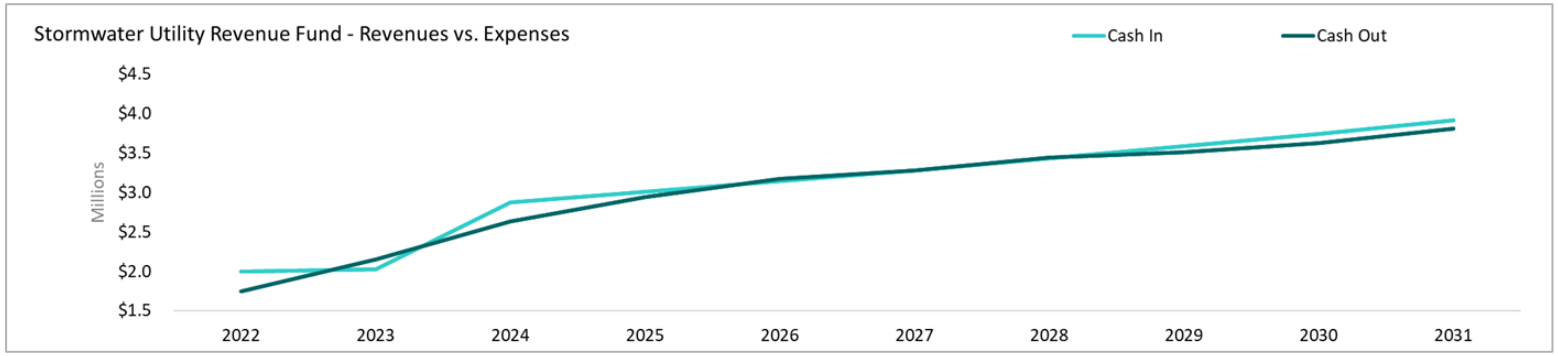
The model generates a breakdown of total costs and full-time equivalent labor required for each maintenance activity on an annual basis

Based on the results of the analysis, additional maintenance activities, staffing and equipment are required to meet minimum maintenance levels needed for the City's stormwater management system



Financial Analysis

- Arcadis prepared a Revenue Sufficiency Analysis and forecast for the City's Stormwater Department for FY2022 through FY2031
- The Revenue Sufficiency Analysis is a determination of the annual revenue from rates which, combined with other sources of funds, will provide sufficient funds to meet the fiscal requirements of the system.
- The O&M model prepared by Arcadis estimates that the Department has a need of approximately twenty FTEs versus the fourteen FTEs currently budgeted.
- The O&M model prepared by Arcadis assumes an increase in need of operating equipment associated with maintenance activities due to increased maintenance frequencies for some activities and the resulting projected operational hours of equipment.
- All capital projects and capital outlay (vehicles, equipment, etc.) during the forecast period assume full funding via the DST Fund or an alternative third-party funding source. No capital in the financial model is currently being funded from operating revenues or fund balance/cash reserves.
- **The revenue requirements and financial goals of the Department during the forecast period identified the need for additional revenue.** The annual adjustments required during the forecast period are as follows:
  - October 1, 2023: 41.00% revenue increase. If applied to the Stormwater Fee, the monthly fee would increase approximately $4.10 per customer, from $10.00 to $14.10.
  - October 1, 2024 (and annually thereafter): 3.00% revenue increase.



Conclusions & Recommendations

- **Increase Funding** – The financial analysis showed that the current Stormwater Department revenues were insufficient to fund minimal O&M activities. The City's stormwater fees have not changed since 2018.
- **Increase SWMS Maintenance Activities** – The current level of effort is insufficient to operate and maintain the SWMS at minimum levels.
- **Increase Stormwater Department Staffing** - Based on the labor needs to perform the minimum level of maintenance on the City's SWMS, ten additional FTE positions will be needed.
- **Modernize and Increase the Capital Equipment Fleet** – Additional equipment resources are needed to operate and maintain the SWMS at minimum levels.
- **Reprioritized 10-Year CIP Program** - The CIP projects were reorganized and scheduled based on available funding to prioritize the most cost-effective projects. Large canal projects were postponed as no funding is available. Completion of key projects are expected to improve SWMS performance.
- **Increase Available Canal Storage Volume** - Include an adjustable weir in the Concha Dam replacement design to allow the City to decrease canal water elevations by approximately 1.5 feet. This will increase the storage capacity of the canal system available at the beginning of a storm event and will reduce peak discharges to the South Prong of the St. Sebastian River.
- **Establish a Certification Program for Private Systems** - Ensuring that privately-owned BMPs are properly operated and maintained is very important, as they typically discharge into the City's SWMS. For this reason, it is recommended that the City establish a program for annual certifications for all privately-owned stormwater systems.

Questions?

Why Does The Revenue Need To Be Increased?