

PINELLAS COUNTY

Wastewater-Stormwater Technical Working Group Action Plan Progress Update

May 2018



Wastewater ● Stormwater

Partnership

www.pinellascounty.org/taskforce

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Executive Summary

The Pinellas County Wastewater/Stormwater Technical Working Group was formed to address the challenge of managing wastewater infrastructure between different organizations within Pinellas County. Members of the Technical Working Group include community leaders and technical experts representing Pinellas County, cities within Pinellas County, community organizations, and investor-owned utilities. The focused goals of the Technical Working Group include:

- Avoid and mitigate spills, overflows, and releases of sewage into the environment, particularly water bodies;
- Increase the capacity and resiliency of the collective sewer system and wastewater treatment infrastructure; and
- Seek opportunities to address drainage and stormwater issues that impact the sewer system.

The Technical Working Group was tasked with identifying comprehensive solutions for stormwater inflow, groundwater infiltration, and the potential need for increased treatment and/or storage capacity. Further, the Technical Working Group was charged with developing both short-term and long-term solutions, as well as ways to mitigate emergency situations.

The Technical Working Group developed an Action Plan, which provided specific recommendations to improve countywide management of stormwater and wastewater, especially during heavy rain events. A link to the Task Force Website can be found in Section 11 of this report. The action plan items fall into seven main categories which include:

- Inflow and Infiltration Initiatives (51 projects detailed in Appendix C),
- Address System Hydraulic Bottlenecks (18 projects detailed in Appendix D),
- Rehabilitation/Replacement Programs for Aging Infrastructure (31 projects detailed in Appendix E),
- Stormwater Drainage Improvements to Benefit Wastewater System (82 projects detailed in Appendix F),
- Resource Sharing/Maximization,
- Develop Public Dialogue Program, and
- Legislation, Regulations, and Local Ordinances.

The Working Group made progress on each of the seven action items, which is presented throughout this report. Through further collaboration, communication, and mutual support, this action plan will continue to improve countywide management of stormwater and wastewater in the sanitary sewer systems. Appendix A summarizes the current and planned projects throughout Pinellas County, and Appendix B provides their locations along with additional project details. A summary of the capital and operating expenses is highlighted in Table ES-1 and links to municipal capital improvement plans and budgets are provided in Table 11-1.

Table ES-1. Funding throughout Pinellas County for Wastewater and Stormwater Projects.

Wastewater Budget		Stormwater Budget	
Capital Improvements	Operating Expenses	Capital Improvements	Operating Expenses
\$141 M	\$400 M	\$23 M	\$71 M

1. Pinellas County Wastewater/Stormwater Technical Working Group

The Pinellas County Wastewater/Stormwater Technical Working Group was initiated as a means to collaboratively address the challenge of managing wastewater infrastructure within the network of city, county, and investor-owned systems. Goals were created by the working group, which would result in beneficial outcomes to the community. These include:

- Ensuring public health and safety of the citizens,
- Practicing superior environmental stewardship by protecting the water, land, air, and wildlife habitats,
- Planning for climate resiliency, and
- Fostering economic growth and vitality

The Technical Working Group members include community leaders and technical experts representing Pinellas County, cities within Pinellas County, community organizations, and investor-owned utilities. The current members of the task force can be found in Tables 1-1 and 1-2 provided below.

The Initial Action Plan presented in January 2017, included seven main items as previously identified in the Executive Summary (page ES-1).

The members of the Working Group have made progress on each of the action plan items this past year. It is expected, that with further collaboration, and continued efforts, plans of action will continue to improve county-wide management of stormwater and wastewater infrastructure. There are currently 182 active or planned projects throughout Pinellas County that benefit the reduction of stormwater and groundwater inflow and infiltration into the wastewater collection system. The following sections highlight the progress in each of the seven categories, as well as where the additional improvements are needed.

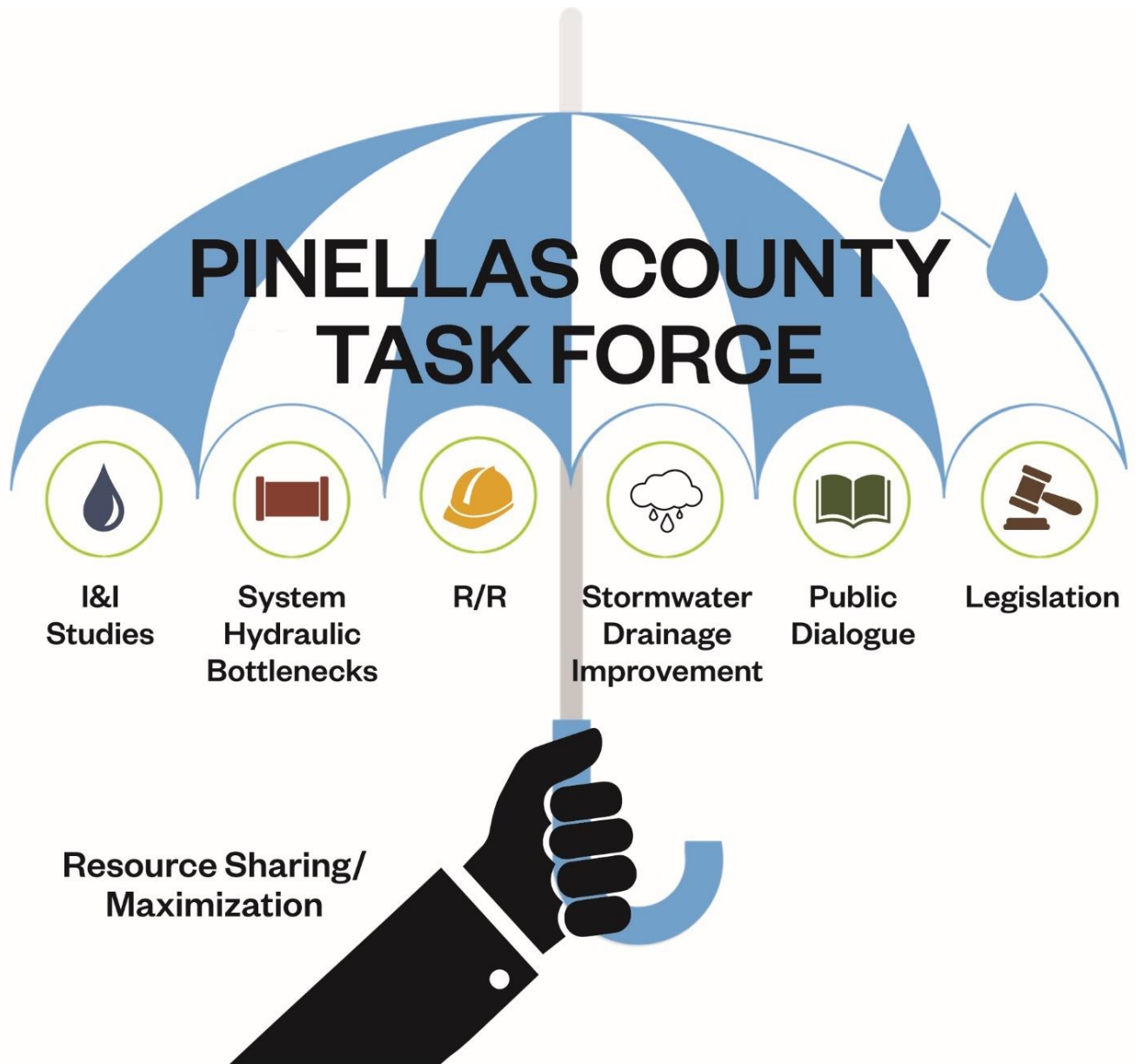


Figure 1-1. The seven action items that have become the foundation of the Technical Working Group.

Table 1-1. Steering Committee

Steering Committee			
George Cretekos	Mayor, City of Clearwater	Rick Kriseman	Mayor, City of St. Petersburg
Julie Ward Bujalski	Mayor, City of Dunedin	Amy Foster	Council Chair, St. Petersburg City Council
Sam Henderson	Mayor, City of Gulfport	Alan Johnson	Mayor, City of St. Pete Beach
Matthew Campbell	Manager, Town of Kenneth City	Chris Alahouzos	Mayor, City of Tarpon Springs
Woody Brown	Mayor, City of Largo	Robert Mining	Mayor, City of Treasure Island
Bill Queen	Mayor, Town of North Redington Beach	Terry Hamilton-Wollin	Chairman and President, Big C
Doug Bevis	Mayor, City of Oldsmar	Marlene Murray	President, CONA, St. Petersburg
Charlie Justice	Commission Chairman, Pinellas County	Tim Lima	President, CNCN
Mark S. Woodard	County Administrator, Pinellas County	Linda Umberger	President, Lealman Community Association
Sandra Bradbury	Mayor, City of Pinellas Park	Gary Katica	President, Mayors' Council
Nick Simons	Mayor, Town of Redington Beach	Patrick C. Flynn	Vice President of Operations, Utilities Inc. of Florida
MaryBeth Henderson	Mayor, Town of Redington Shores	Corey Givens	Vice President, NAACP
Joe Ayoub	Mayor, City of Safety Harbor	Kenneth D. Colen	President, On Top of the World
Jim Quinn	Councilor, City of Seminole	Jerry Frulio	President, Tierra Verde Association
Max Elson	Mayor, City of South Pasadena		

Table 1-2. Technical Working Group Committee

Technical Working Group	
David Porter	Utility Director, City of Clearwater
Jorge M. Quintas	Public Works & Utilities Director / City Engineer, City of Dunedin
Paul Stanek	Assistant Public Works & Utilities Director, City of Dunedin
Tom Nicholls	Public Works Director, City of Gulfport
Irvin Kety	Director Environmental Service Department, City of Largo
Patrick C. Flynn	Vice President of Operations, Utilities Inc. of Florida
Nan Bennett	Director of Public Works, City of Oldsmar
Stacey Boyles	Assistant Director of Public Works, City of Treasure Island
Rahim Harji	Assistant County Administrator and Public Works Director, Pinellas County
Megan Ross	Interim Utilities Director, Pinellas County
Marty Reich	Director of Public Utilities, City of Pinellas Park
John Branch	Sewers/Stormwater Supervisor, Town of Redington Shores
Ray Boler	Public Works Director, City of Safety Harbor
Shawn Shimko	Assistant Director of Public Works, City of South Pasadena
Claude Tankersley	Public Works Administrator, City of St. Petersburg
Keith Bodeker	Construction Project Supervisor, Town of Belleair
Michael F. Clarke	Public Works Director, City of St. Pete Beach
Paul Smith	Public Services Director, City of Tarpon Springs
Mike Helfrich	Director of Public Works, City of Treasure Island

2. Inflow and Infiltration Initiatives

Inflow and infiltration (I/I) allows unwanted water sources (stormwater, surface water, groundwater, roof runoff, subsurface drainage) to enter the sanitary sewer system. The Florida Administrative Code, Section 62-604.130 (4), prohibits the introduction of these sources into the wastewater system, and solutions must be implemented to mitigate their impact. Inflow typically occurs through misdirected stormwater, and infiltration is typically the result of aging infrastructure. The capacity of collection systems and wastewater treatment systems is often exceeded because of I/I during severe wet weather events.

Efforts that reduce inflow and infiltration are generally more effective than construction and operation of additional treatment capacity designed primarily for peak conditions. Municipalities must balance between accepting some levels of I/I with capacity improvements. Flow monitoring during wet weather conditions can help to pinpoint sources of increased flow due to inflow and infiltration. Some utilities have already installed flow monitors while others are just beginning. Results of the I/I studies will help guide where solutions for rehabilitation or replacement of utilities is required. Progress and future initiatives of the member municipalities are identified below. Figure 2-1 shows the locations of I/I initiatives throughout Pinellas County and details for the current projects can be found in Appendix C.

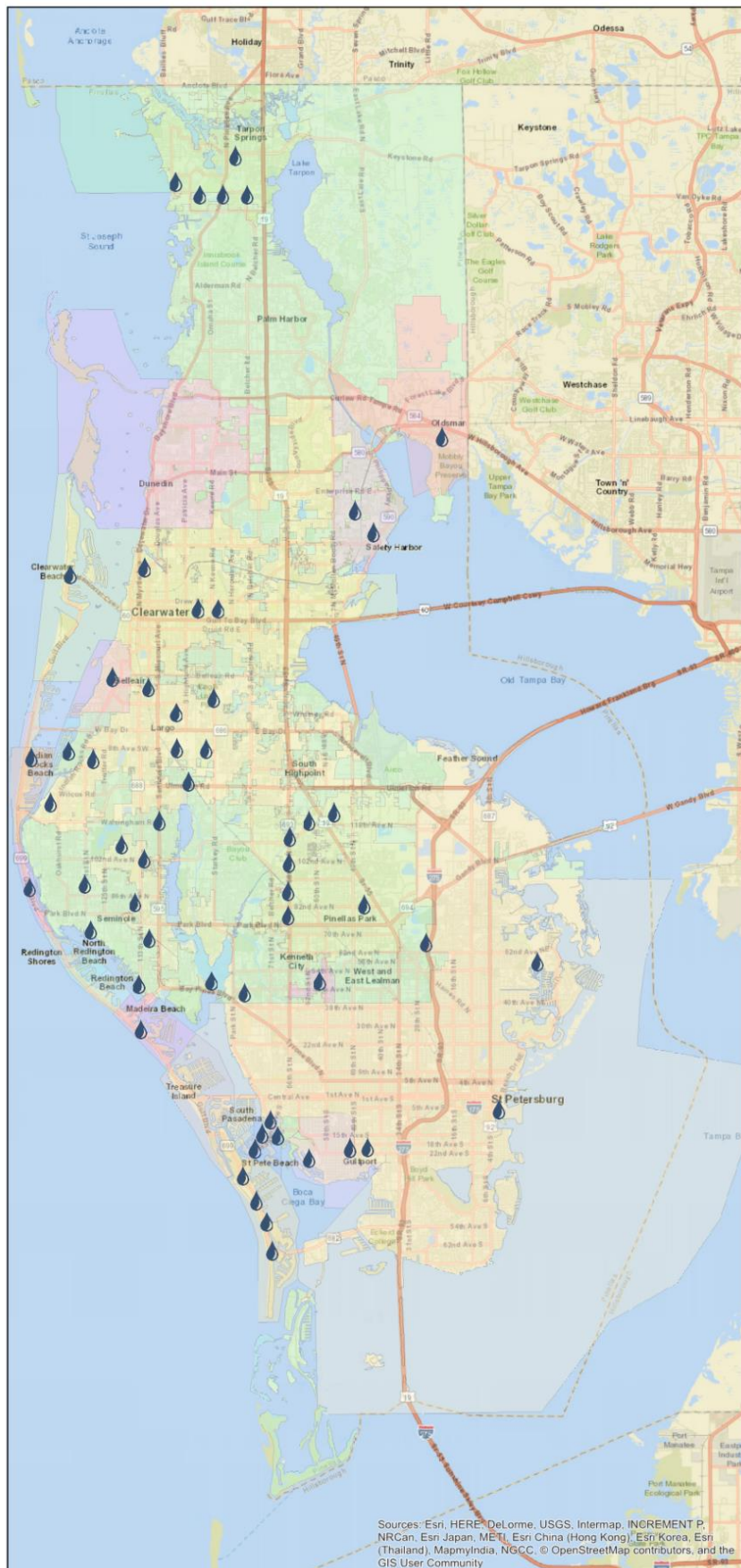


Figure 2-1. Locations of Inflow and Infiltration projects throughout Pinellas County.

City of Clearwater

- Currently in progress is a manhole inspection and night flow isolation project for the Clearwater Beach service area. This multi-phase project will identify and repair manhole defects and sources of I/I.
- A permanent sewer collection system flow monitoring project is ongoing for the East Water Reclamation Facility (WRF) and Marshall Street Water Reclamation Facility Service Areas and is beginning for the Northeast WRF Service Area. This project is intended to provide sub-system flow data to target I/I efforts to minimize the I/I entering the sanitary sewer system.
- A multi-year sewer relining project is ongoing for pipes that have known defects.
- Preparing a bid for sewer line point repair as an annual contract to allow for rapid repair of defects that cannot be repaired through lining.

City of Gulfport

- A two-phase study has been implemented by the City. Phase One, a flow monitoring study that consisted of 19-meter sites throughout the City's collection system, is complete. Gravity sewer flows were monitored at the sites from July 18, 2014, through September 22, 2014. Approximately 38% of the City's sanitary sewer pipes were cleaned and inspected via closed circuit television (CCTV) inspection. The pipe segments were then ranked based on priority for repair and maintenance. A total of 37 repairs were completed, which included traditional open cut construction methods for point repairs and Cured in place pipe (CIPP) liners.
- Phase Two is currently ongoing and includes the remainder of the gravity sewers to be inspected via CCTV, reviewed, and prioritized, and the completion of repairs to the highest priority defects from Phase One. This program started in May 2017 and is expected to be a 30-month program. The Notice to Proceed for the open cut and the trenchless contracts was issued in November 2017.

City of Largo

- The City has current projects to evaluate the wastewater collection system and lift station basins to identify sources of I/I. Investigative methods include flow monitoring, smoke testing (Figure 2-2), and CCTV investigation.
- Lift station projects included in the City of Largo Inflow and Infiltration Mitigation Strategy include:
 - Lift Station 15 Sanitary Sewer Basin I/I Abatement Evaluation
 - Lift Station 2 Wet Season Flow Monitoring
 - Lift Station 2 Sanitary Sewer Basin I/I Abatement Phase I, Phase II, and Phase III
 - Lift Station 2 and 19 Phase IV Sanitary Sewer Basin I/I Abatement
 - Lift Station 10 Sanitary Sewer Basin I/I Abatement
 - Lift Station 3 and 6 Sanitary Sewer Basin I/I Abatement
 - Lift Station Construction and Repair Projects



Figure 2-2. Largo has initiated a City-wide smoke testing initiative to identify locations of inflow and infiltration throughout the sewer system.

City of Oldsmar

- A sanitary sewer pipe assessment is planned for 2019 through 2024. This assessment of 8-inches and larger sanitary sewer lines will use CCTV to identify areas in need of repair. This is a proactive approach for maintaining the sanitary sewer system to identify damaged pipes before failure.

City of Pinellas Park

- Annual ongoing CIPP in targeted locations and annual manhole rehabilitation.
- New equipment was purchased for the ability to perform in-house smoke testing.
- Continued programs include in-house cleaning and inspections.
- Additional manhole inflow protectors will be purchased and installed.
- To monitor flows from private customers and low-lying lift station basins, SmartCover systems are being evaluated.
- Plans for 2019 include completing Capital Improvement Program (CIP) and updating the Utilities Master Plan to include stormwater.

City of Safety Harbor

- Currently under way is a citywide wastewater lining project estimated at \$1,000,000.
- An I/I study is budgeted and RFQs were released in the first quarter of 2018 for a complete citywide wastewater inspection (Figure 2-3), inventory, and flow monitoring study.



Figure 2-3. Left – Guide for camera in a manhole, Right – Camera used to inspect manholes

City of South Pasadena

- Numerous projects and initiatives have taken place related to I/I improvements, including:
 - The installation of new flow meters.
 - Inflow protectors installed in sanitary manholes.
 - 24,200 linear feet of sewer main slip lined.
 - I/I visual inspections completed and four cleanouts repaired in December 2017.
 - Repair completion of two sanitary manholes to stop inflow.
 - CCTV inspection and cleaning of 1,900 LF of sewer main in 2017.
 - The repair of laterals on an as-needed basis. Four laterals were repaired from 2011 to 2015.

City of St. Pete Beach

- Funds have been committed to reduce I/I, 96 pipe sections have been lined, point repairs completed, and 356 manholes rehabilitated.

City of St. Petersburg

- A two phase Wet Weather Overflow Mitigation Program is in process (Figure 2-4). Phase I (December 2015 through April 2016) included the development of preliminary recommendations and budgetary costs to mitigate I/I, provide wastewater collection system relief, upgrade wastewater treatment capacity, and upgraded disposal capacities. Phase II (June 2016 through June 2018) includes wastewater collection system flow, rainfall, and groundwater monitoring, updating and calibrating the wastewater collection system hydraulic model, and performing a stress test/capacity analysis.

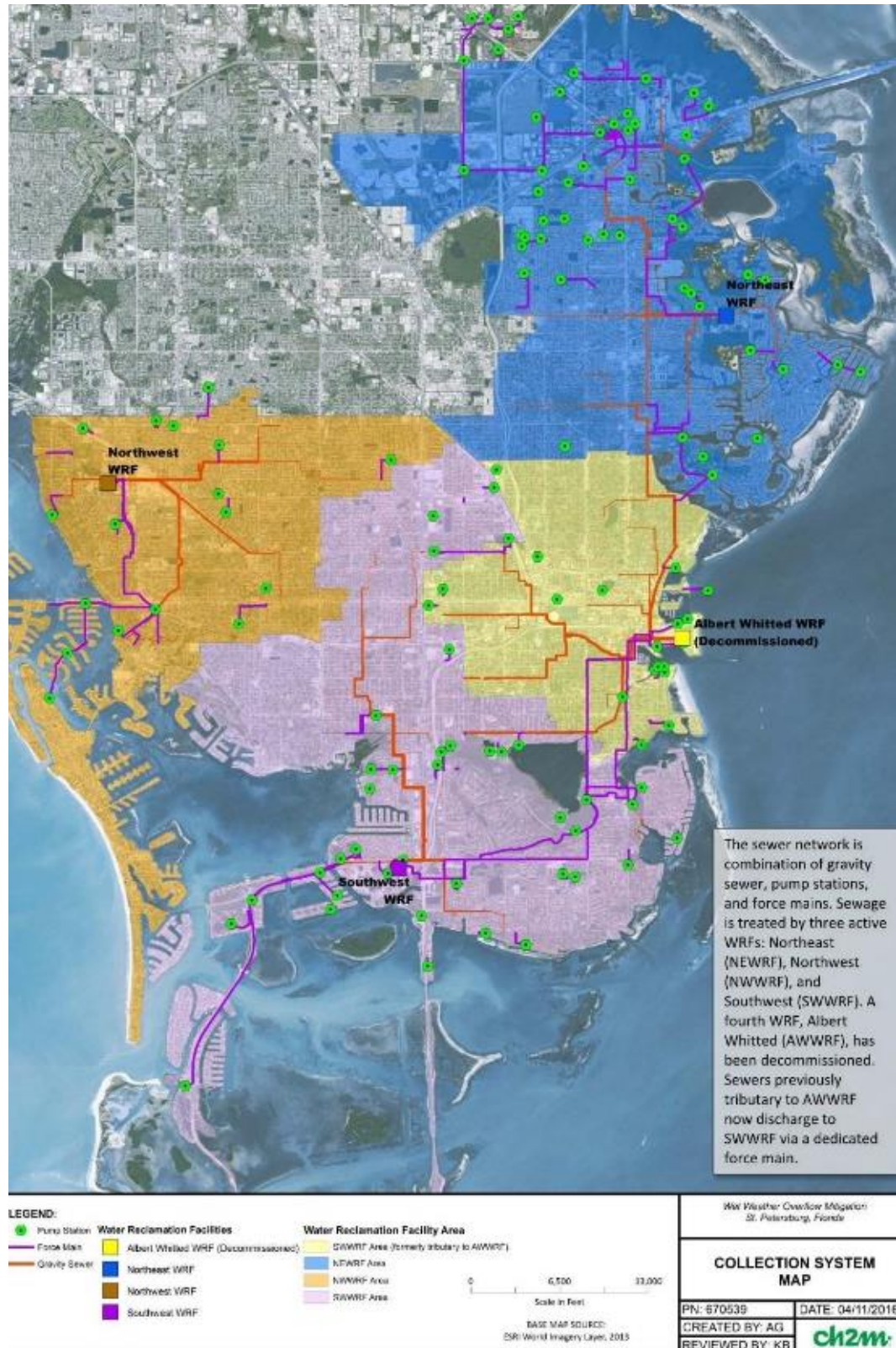


Figure 2-4. The two-phase study by the City of St. Petersburg indicated that improvements to the water reclamation facility was the most cost-effective solution.

City of Tarpon Springs

- Since July 2016, the Collection Crew has completed several tasks related to I/I which includes CCTV inspection of 114,742 LF of sewer and stormwater pipe, cleaning of 158,868 LF of sewer pipe, and inspection of 720 manholes.

Pinellas County

- A Flow Monitoring Project for the South County sewer system was initiated for 16 sewer zones (Figure 2-5) over the duration of three years. This study will identify the areas of the sewer system where the most amount of I/I is experienced. The studies in 2017 were able to evaluate sixty-seven sub-sewersheds in eight of the 16 study zones.

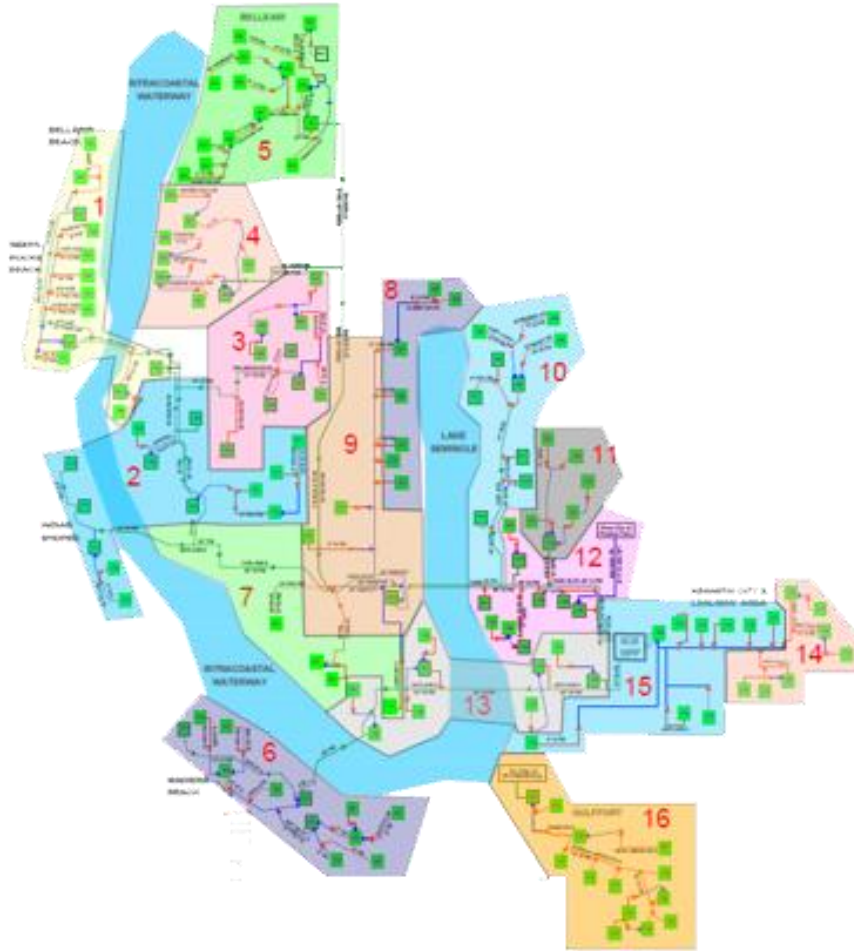


Figure 2-5. Map identifying the boundaries of the 16 South County sewer zones in Pinellas County.

3. Address System Hydraulic Bottlenecks

Utilities in Pinellas County have identified hydraulic “bottlenecks” in their respective wastewater collection systems during recent severe storm events. Bottlenecks are a reduction in downstream conveyance capacity. They could result from overloading existing collection systems with higher flows than these pipes were originally designed to convey. They can also be obstructed with fat oil and grease (F.O.G.) buildup, flushable wipes, personal care products and natural obstructions such as tree roots or sedimentation buildup. The system typically has enough capacity to handle average or peak flow conditions but these obstructions can cause hydraulic restrictions or “bottlenecks” during severe storm events.

Hydraulic modeling can be used to test options for eliminating the hydraulic restrictions by enlarging the lines, increasing storage, increasing pumping capacities, or changing operating protocols to manage pumping of high wastewater flows. Projects can then be initiated to remove the bottlenecks. Figure 3-1 shows the locations of system hydraulic bottlenecks projects throughout Pinellas County and details for the current projects can be found in Appendix D.

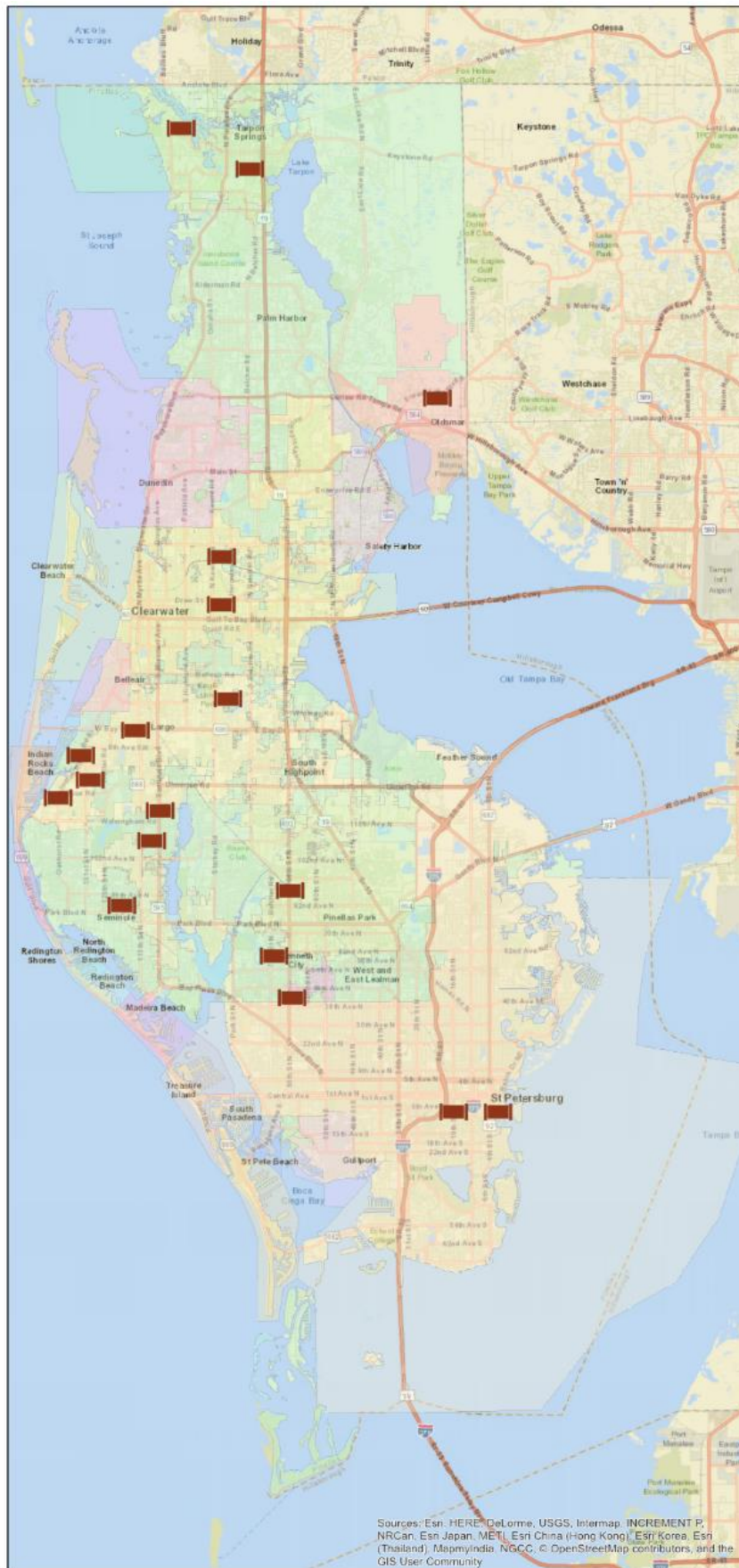


Figure 3-1. Locations of system hydraulic bottleneck projects throughout Pinellas County.

City of Clearwater

- A project has been designed, bid, and construction contract awarded to begin work on the Corona Avenue Interceptor Sewer bottleneck (Figure 3-2 and Figure 3-3). The anticipated completion of this project is July 2018.



Figure 3-2. Corona Avenue Sanitary Sewer Project is currently under construction to relieve a bottleneck identified in Clearwater, FL.



Figure 3-3. Active construction to relieve a bottleneck in Clearwater, FL.

- The source of a bottleneck was identified for an interceptor sewer that transported sewage from the southern portion of the East WRF service area to the East WRF. The

configuration and operation of the East WRF Master Pumping Station was modified to correct the bottleneck.

City of Largo

- A program will be implemented to identify the underlying cause of past sanitary sewer overflows (SSOs), and to minimize the risk of future SSOs. This will involve identifying sources of stormwater inflow and groundwater infiltration, identifying hydraulic limitations, assisting in I/I abatement, documenting I/I reduction, providing updates to the City's Capital Improvement Plan, and performing design and construction services to implement improvements. Current projects under the Hurricane Hermine Engineering Evaluation include:
 - Wilcox Road/Indian Rocks Road Area
 - Pinecrest Brookedale
 - Crescent Drive
 - Saint Paul's Drive
 - Private Lift Station #28 – Seminole Blvd
- A five-million-gallon equalization tank was constructed to reduce peak flow conditions from impacting the plant and to avoid sanitary sewer overflows (Figure 3-4). The equalization tank was sized based on a 10-year, 24-hour rain event and the resultant increase in flow due to I/I.



Figure 3-4. Largo equalization tank constructed to reduce peak flow conditions associated with wet weather events.

City of Oldsmar

- In 2012, three filter bays were completed at the WRF and put into service. A fourth filter bay was constructed for future capacity but did not include the piping, underdrain, valving, or media. The new project will include the installation of the missing components and connection to the electrical panel. The additional filter bay will allow for increased treatment capacity of 30% allowing the processing of peak flows during wet weather events.

City of Pinellas Park

- The City has provided Pinellas County with historical flows to help in the design of the Belcher Road 42nd Interceptor Bottleneck. Several alternatives are being evaluated by the County.

City of St. Petersburg

- Interim capacity improvements took place from May 2017 through December 2017 and were designed and constructed to improve wet weather hydraulic treatment capacity limitations at the Southwest Water Reclamation Facility (SWWRF).
- Late track capacity improvements will provide resiliency and redundancy to the treatment and capacity process. The design was completed in December 2017 and the construction is estimated to be completed September 2019.

City of Tarpon Springs

- To resolve groundwater infiltration and hydraulic bottlenecks, Seminole Lift Station's main line was repaired. The cause was determined to be that an 8-inch diameter pipe was poorly connected to a 10-inch diameter pipe, with the poured in place concrete joint partially filling the line. The bottleneck was corrected by installing a new 10-inch diameter PVC pipe from the collection manhole to the lift station.
- The collection system is continually monitored for water levels. Unexpected high-water levels are investigated for potential bottleneck conditions.

Pinellas County

- Flow data has been collected, and predictive curves were developed through extrapolation to identify storm events that would cause the gravity system to fail for the 67 sub-sewersheds in the current I/I study area. This can be used as a tool to identify where sanitary sewer overflows may occur during severe wet weather events.
- Six projects were initiated to evaluate specific known historic SSO locations. Flow metering analyses were used to quantify peaking flows in the sewer systems during dry and wet weather conditions. This aided in identifying areas where overflows may be mitigated by increasing the hydraulic capacity. This initiative used a dynamic computer model to assess the sanitary sewer overflows. Figure 3-5 show a long-section of a wastewater line. The highlighted pipe segment in Figure 3-5 shows where overflow are

likely to occur. The results of the model lead to maintenance efforts, pipe replacement, and increase in capacity or flow diversion.

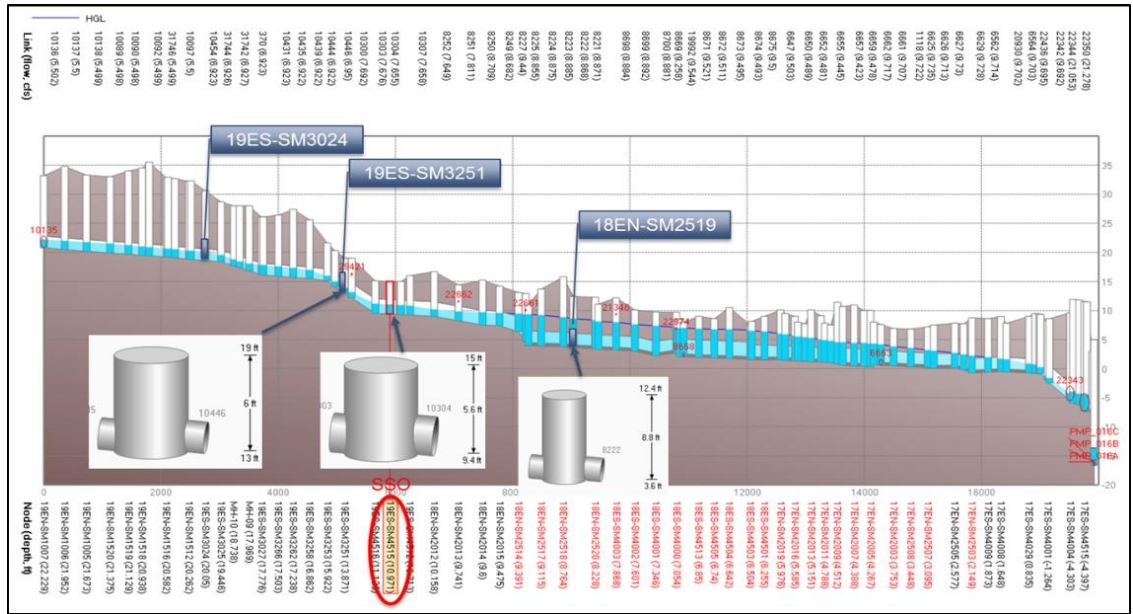


Figure 3-5. Hydraulic modeling tool used to identify the cause of a historic SSO which is the result of a system bottleneck.

4. Rehabilitation and Replacement Programs for Aging Infrastructure

As with most municipalities, the effects of an aging infrastructure will have negative impacts on the sanitary sewer system. Utilities have ongoing inspection, maintenance, repair, rehabilitation, and replacement (R/R) programs to address aging infrastructure and to control inflow and infiltration into the sanitary sewer system.

Common challenges associated with these programs include high demand for and limited availability of pipelining contractors, technology challenges regarding force main condition inspection tools, durability of lining materials utilized for manholes, gaining adequate access to facilities with requisite equipment and materials, high restoration costs, and impacts to the community during construction. Utilities should take advantage of the latest technological advancements when conducting inspections and rehabilitating sewer pipelines. Figure 4-1 shows the locations of rehabilitation/replacement projects throughout Pinellas County and details for the current projects can be found in Appendix E. These projects include gravity sewer cleaning and CCTV inspection, flow monitoring to assess relative contributions of inflow and infiltration within the sewer network, gravity sewer pipelining (Figure 4-2), gravity sewer pipeline rehabilitation and replacement, public lateral pipelining, force main sewer replacement programs, air release valve inspection and replacement, manhole lining, and lift station rehabilitation and replacement.

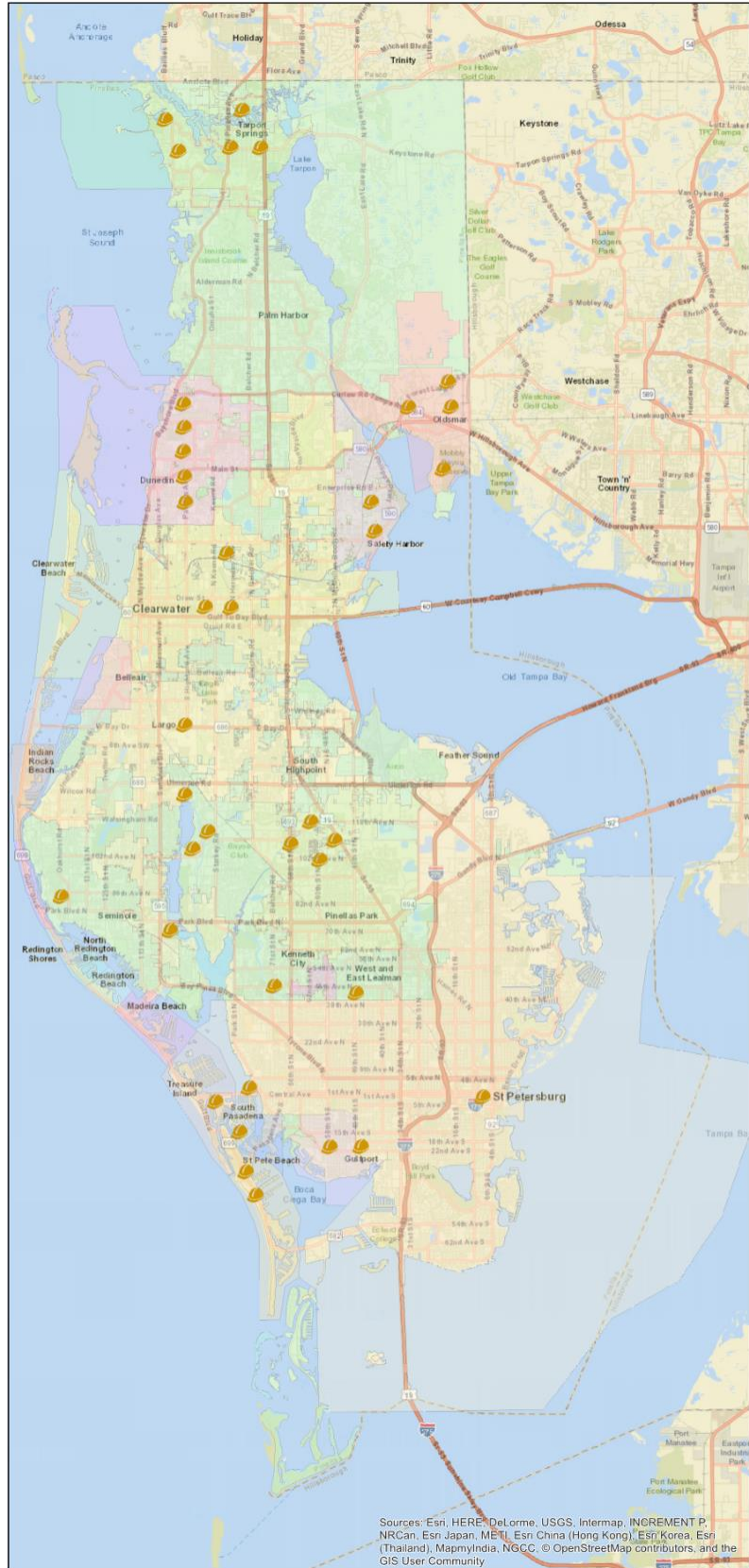


Figure 4-1. Locations of R/R efforts throughout Pinellas County.



Figure 4-2. Top left, top right, and bottom left show pipe rehabilitation efforts to combat the aging infrastructure within Pinellas County. Bottom left image shows the result of a broken main.

City of Clearwater

- An extensive CIP program has been funded and is being implemented to renew, replace, and upgrade existing facilities.
- A work order is being developed and negotiated with a consulting engineer to complete an extensive collection system master plan to include a collection system management, operation, and maintenance (CMOM) update.
- Additional master plan projects for wastewater treatment and reclaimed water and water supply and treatment systems are planned over the next two years.

City of Dunedin

- Projects to rehab/replace the aging infrastructure include manhole lining, pipe lining, raising of manholes, lift station replacement and refurbishment, and installation of permanent emergency backup pumps.
- On-going monthly study reports for each lift station area are in place to identify I/I. Rain data is also being compared with pump run time and flows so efforts can be directed where needed most. GIS, CCTV and cleaning of main lines are used to identify areas in need of sectional liner repairs and manhole repairs/flood dome installation.
- The annual budget for sewer pipe lining and manhole lining has increased approximately 400% in response to heavy rains caused by Hurricane Hermine in September 2016.
- Plans to rebuild/relocate Lift Stations (LS) #20 and #32 have started with preliminary survey work for both lift stations. It is expected that these lift station projects will be included in the Capital Improvement Program (CIP).
- Currently in the research and preliminary design phase, permanent emergency backup pumps for LS #8 and #15 have been budgeted for fiscal year 2018.
- Based on the operation and performance of the upgrades planned for LS #8 and #15, additional lift stations will be evaluated for emergency backup pumps.

City of Gulfport

- An ongoing program is in place as described in Phase Two of the I/I Studies.
- Additional programs are outlined in the Sanitary Sewer Evaluation Survey, Phase 1 (SSES PH1) Final Report.

City of Largo

- A critical assessment of the wastewater force mains and reclaimed pressure pipes will provide insight on different methods that can be used to identify locations within the collection system where repairs are needed. This will also help the City develop a Capital Improvement Plan with a prioritized schedule and allocating funds for the repairs.

City of Oldsmar

- A gravity sewer lining project to take place 2018-2024 will line the gravity sewer clay pipe using a cure-in-place pipe. It is anticipated that this will reduce the groundwater infiltration and extend the life of the existing collection system.
- A sewer camera will be purchased in 2020 to inspect the integrity of collection system piping and investigate any obstructions. This will help maintain regulatory compliance and prevent sewage overflows and spills.
- The rehabilitation of lift stations will occur between 2018-2024. The work will include assessment of lift station capacity, evaluating pumps, replacing rail systems, repairing wetwell concrete and coatings, replacing/repairing valves and adding isolation valves for maintenance.

- A lift station radio upgrade is planned for 2020. The lift stations are connected remotely to the WRF and on-call devices for rapid response to equipment failures, pump ragging, power loss, and water quality for industrial areas.

City of Pinellas Park

- Annual CIPP and manhole rehabilitation projects
- Lift Station Rebuild Program

City of Safety Harbor

- Funds are budgeted for current and future years.
- A lining project is currently under way.
- Approximately 300-feet of pipe bursting was recently accomplished for a broken 8-inch diameter main.

City of St. Pete Beach

- An engineering study currently is in progress for a Force Main Assessment.
- An engineering design currently is in progress for New Force Main Capacity. The construction is estimated to be completed in 2022.

City of St. Petersburg

- Cured-in-place lining for sewer mains throughout the City began in November 2016 and is ongoing.

City of Tarpon Springs

- The City has completed numerous repairs that include:
 - Replacement of 40 linear feet of a deteriorated eight-inch sewer line that was allowing infiltration into the River Village Lift Station (Figure 4-4).
 - The replacement of the deteriorated manhole on Division Street that was seeping groundwater.
 - A repaired lateral at Cottage Grove Road due to an excessive amount of groundwater infiltration.
 - Placing rain tray manhole covers into manholes in areas of the greatest benefit.
 - The identification of eight pipe lining areas and 10 manhole coating/bench repairs for 2018 Fiscal Year.



Figure 4-3. Rehabilitation and replacement efforts in Tarpon Springs.

Pinellas County

- The County has ongoing pipe rehabilitation efforts for large and small diameter sewer pipes. There are currently seven projects that are ongoing or planned, to include:
 - Sewer interceptor rehabilitation with CIPP – Joe’s Creek, 36’’
 - Sewer interceptor rehabilitation – Bryan Dairy Road and 102nd Avenue
 - Sewer interceptor rehabilitation – Seminole 94th Avenue to 86th Avenue, 18’’
 - Sewer interceptor rehabilitation – 86th Avenue to PS 069, 18’’ to 24’’
 - Sewer interceptor rehabilitation – North Lake Seminole, 30’’
 - Small diameter sewer rehabilitation – 51,100 LF of CIPP rehabilitation complete
 - Small diameter sewer rehabilitation – 148,000 LF of CIPP rehabilitation to be identified

5. Stormwater Drainage Improvements to Benefit Wastewater System

City and County utilities have several mechanisms to identify opportunities to address drainage and stormwater issues that impact the wastewater system. One key tool is improved collaboration with their stormwater groups, primarily through consideration of wastewater infrastructure into stormwater goals and vice versa. For instance, the County and Cities continue to develop watershed management plans and drainage improvement projects that identify the extent and duration that areas will be inundated under different storm events. These areas can be overlaid onto the wastewater system network utilizing GIS tools to identify flood-prone wastewater lines and manholes, i.e., where stormwater could enter the wastewater network through manhole tops. In addition to flood mapping, data can be leveraged from other efforts, including:

- I/I studies
- Smoke testing
- Overflow location maps
- Hydraulic bottleneck locations

Smoke and dye testing is commonly performed by utilities to identify potential stormwater inflow points and cross-connections to the sanitary sewer. Utility providers can also perform detailed inflow and infiltration studies and incorporate the results into the inflow assessment.

Areas with multiple issues across the county could be targeted for remedial actions (best management practices or BMPs) to reduce stormwater inflows into the wastewater system. This could include ensuring the manholes are secured to keep stormwater out or stormwater improvement projects to remove the inundation off the manholes. Other BMPs could have multiple benefits, such as providing flood relief, inflow reduction and conveyance improvements.

The County and Cities will continue to partner in the development of watershed management plans and ensure their individual plans are updated on a regular basis. The County and Cities could also consider stormwater impacts to the wastewater system as one of the factors in prioritizing their individual stormwater and wastewater capital improvement plans. Figure 5-1 shows the locations of potential stormwater drainage Improvement projects that benefit the wastewater system throughout Pinellas County and details for the current projects can be found in Appendix F.

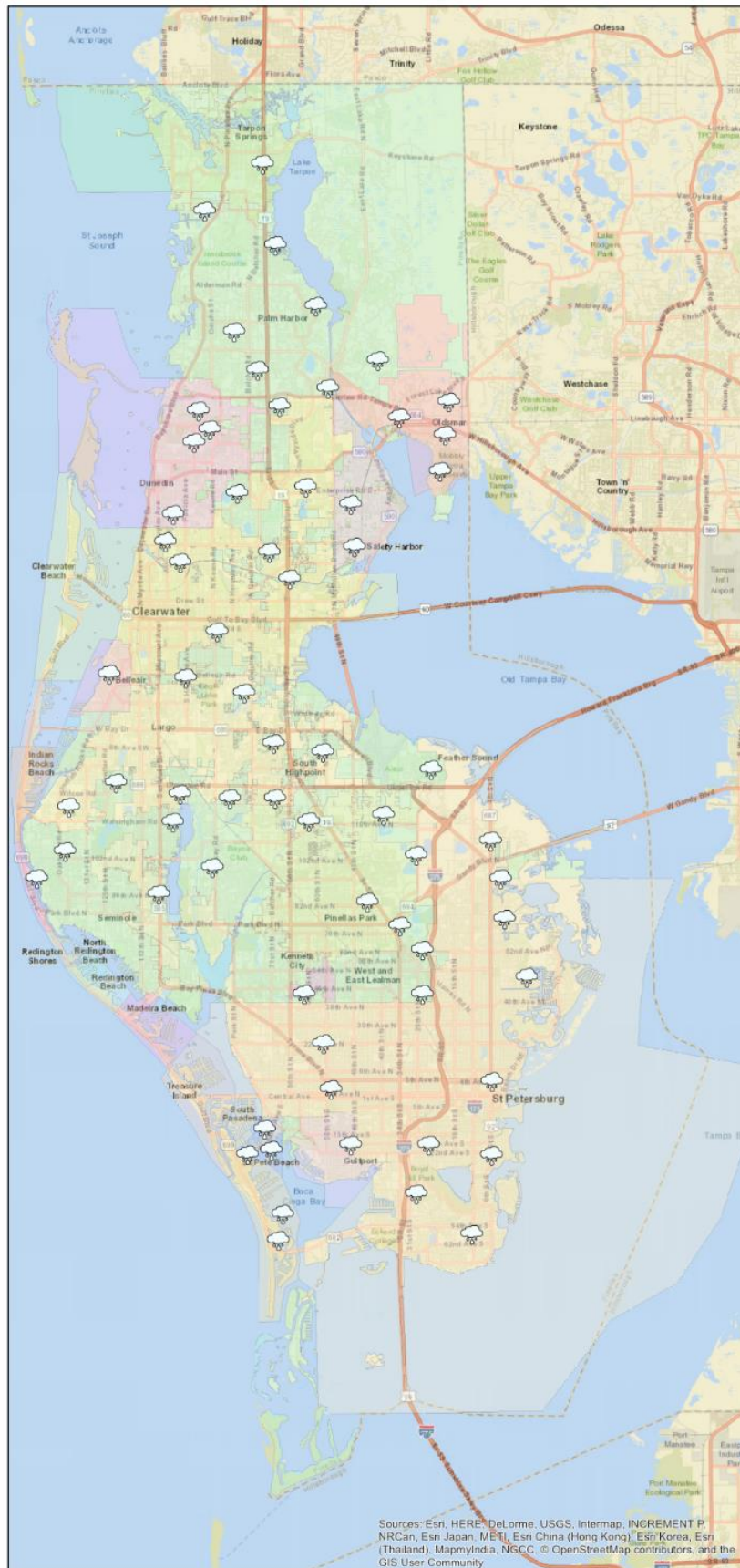


Figure 5-1. Locations of current and planned stormwater drainage improvements to benefit the wastewater system throughout Pinellas County.

City of Clearwater

- The City has current projects that address flood control and provide water quality benefits. The Hillcrest Avenue Bypass Culvert has been designed and will be bid for construction. The goal of this project is the reduce structure flooding through a box culvert installed under Browning Street to the upstream end of Linn Lake at the Evergreen Avenue footbridge.
- The East Gateway Stormwater and Sanitary Sewer project is currently under construction to increase stormwater treatment in the Stevensons Creek Watershed. Upgrades in the collection system will capture the mean annual storm and treat it through a series of nutrient separating baffle boxes. The project also includes the removal and replacement of the sanitary sewer distribution pipes in the project area, and removal and replacement of outdated potable water pipes on Hillcrest Avenue.
- The construction of the Magnolia Drive Outfall Improvement Project is nearing completion. Included were upgrades to stormwater inlets, rehabilitation and/or pipe replacement, and the installation of nutrient separating baffle boxes.
- The Curlew Creek Watershed Management Plan is being coordinated with Pinellas County and the City of Dunedin.

City of Dunedin

- A Master Drainage Plan was completed in 2003 and many of the stormwater improvements recommended in the plan have since been implemented by the City. Jones Edmunds & Associates (JEA) has been selected to provide a Stormwater Master Plan Update for the City. This plan will include developing a watershed model, mapping the model results in GIS/ESRI with floodplain delineation, conducting a vulnerability assessment, water quality and natural system assessments, considering Community Rating System (CRS) requirements, developing a Downtown Regional Stormwater Plan, and providing the City of Dunedin with a Best Management Practices Analysis Report.

City of Gulfport

- The City completed a project in 2017 to divert the first flush of stormwater from the 49th Street outfall into a nutrient removing baffle box. This will remove suspended solids and then discharge into two wet detention ponds in series on vacant land adjacent to the Gulfport Marina. These improvements provide treatment for a 244-acre drainage basin for commercial and residential land use and is estimated to keep over 7,500 pounds of pollution from Boca Ciega Bay annually.

City of Largo

- Wrens Way Flood Mitigation Project eliminated persistent nuisance flooding risk to four properties within the cul-de-sac at the end of Wrens Way. A new stormwater outfall to a local property owner's pond was established via an easement.

- 101st Street SE Channel Bank Stabilization Project included the bank stabilization of approximately 205 linear feet.
- A failed stormwater outfall for the Venetian Gardens neighborhood was replaced.
- The current drainage system for the Church Creek drainage basin is in poor condition and does not have the necessary capacity. This project is currently in the survey and design phase and is estimated to be completed in May 2019. The construction portion is currently an unfunded capital improvement project.

City of Oldsmar

- The last update of the Oldsmar Watershed Management Plan was completed in 2002 and significant developments have since occurred. The completion of the plan update currently is in process and will allow the City to better prioritize the use of capital improvement funds for projects most beneficial to water quality, increasing basin storage, and alleviating local flooding.
- Projects to address drainage issues will be identified in the updated Watershed Management Plan. Solutions will include addressing undersized pipes, improving capacity and performance of the conveyance system, erosion and safety concerns, and realigning ditches to improve conveyance.
- An integrated project with Utilities currently is in the design phase to improve the infrastructure in the Harbor Palms neighborhood. Construction is planned to occur between 2019 to 2021. Stormwater infrastructure will be removed and replaced and the existing corrugated metal pipe will be lined.

City of Pinellas Park

- There are continuous cleaning and inspection and point repairs occurring. Additionally, an in-house culvert replacement program and stormwater CIP projects are underway.

City of Safety Harbor

- Two separate runs of stormwater piping are out to bid for lining. One is about 700-feet of 36-inch diameter corrugated metal pipe (CMP) and 200-feet of 24-inch diameter reinforced concrete pipe (RCP). The second is a double 500-feet of 18-inch by 24-inch diameter CMP.

City of South Pasadena

- Three fallouts were cleaned in 2017 to remove barnacles. The locations of the fallouts were Shore Drive S, Corey Way, and Pasadena Isle Bridge (southwest side.)

City of St. Pete Beach

- An engineering design is in progress for the Boca Ciega Isle Drainage Basin to reduce stormwater flooding.

- Twelve other locations have been identified for local stormwater flooding. Six of these areas are currently in design for corrective action.

City of St. Petersburg

- Funding through the Southwest Florida Water Management District (SWFWMD) will be used for a study including floodplain analysis, level of service and best management practices for proactive analysis of stormwater elements. The study is approved to start in February 2018.

City of Tarpon Springs

- The City worked with the stormwater crew to CCTV Martin Luther King Drive stormwater lines prior to its re-pavement. No cross connections were identified.

Pinellas County

- The Public Works Department is conducting a study that will identify opportunities to address drainage and stormwater issues impacting the wastewater system. Best Management Practices are to be provided across the County to reduce stormwater inflows into the wastewater system.

6. Resource Sharing/ Maximization

Through communication and sharing of information about equipment and resources, storm emergency preparedness, and utilities action during severe wet weather events, readiness can be improved among all municipalities.

Prior to major storm events, utilities initiate Emergency Response Plans to prepare for the storm. These activities typically include establishing emergency purchase orders to utilize pumper/tanker truck services and staging reserve pumper/tanker trucks in anticipation of high overflows, checking the operational readiness of all critical equipment, securing all facilities for storm readiness, and fueling vehicles and emergency generators. However, Emergency Response Plans can go awry depending on availability and competition for pumper/tanker trucks and spare parts, failure of equipment that cannot be sourced locally, limited staff resources to respond to the storm, and competition for local contractors.

During major storms and emergency events, mutual aid between local Florida utilities is facilitated through the web-based Florida Water/Wastewater Agency Response Network (FlaWARN see Figure 6-1) but other electronic tools such as WebEOC and Alert Pinellas (CodeRED) can be used to further improve communication and collaboration across local utilities organizations.



Figure 6-1. The Florida Water/Wastewater Agency Response Network facilitates mutual aid between local Florida utilities.

In addition, utilities can collectively benefit through a collaborative purchasing approach for services required during storm events as well as normal operating conditions. Representatives from the County and the cities of Dunedin, Pinellas Park, Oldsmar, and Tarpon Springs collaborated on a cooperative pipelining contract which includes a list of qualified firms on a quote list. This contract optimizes requirements coordination between the various entities and lends itself to the most advantageous pricing as firms compete consistently throughout the year for work.

Similarly, county-wide plans are underway to procure an emergency service contract that would guarantee available pumper/tanker truck services based on potential collective need. Other types of contracts are amenable to cooperative procurements which could also allow other local governmental entities partners to participate under the same contract pricing and terms (i.e., “piggyback”) as others. For instance, Pinellas County Utilities recently entered into a contract for valve inspection and maintenance services that could be leveraged by other utilities.

Countywide utilities agreed to develop a master list of contracts for utilities services that could be shared.

Utilities currently use individual Geographic Information System (GIS) platforms and would benefit by having a shared GIS model that incorporates all county wastewater and stormwater infrastructure and could be used to support infrastructure improvement decisions. Utilities are also in varying stages of migration from legacy computer maintenance management systems (CMMS) to Enterprise Asset Management (EAM) systems, which provide a better tool for managing assets based on condition and risk factors.

City of Clearwater

- Have become active members of the Task Force and are committed to working with the group to develop and initiate formal resource sharing opportunities.
- Have previously and will continue to provide mutual aid to members of the task force during operations and emergencies. Specifically, Clearwater has provided back-up sewage disposal to another task force member allowing them to repair a sewer line.

City of Largo

- There is not currently a signed Mutual Aid Agreement (MAA) with FlaWARN, but the City is aware of the resource sharing opportunities available.
- During and post emergency events, all resource requests are monitored through the Emergency Operations Center (EOC) using the Pinellas County WebEOC Website.

City of Oldsmar

- Mutual aid and piggyback use of various contracts as needed.

City of Pinellas Park

- All contracts are competitively bid per the Florida Administrative Code (FAC). CIPP pipelining, manhole coating and stormwater project information is available on request.

City of St. Pete Beach

- The City is using continuing engineering services task orders for design, and a task order contract for construction. The construction contract expires in 2018 and will be re-bid in July 2018 with an invitation for others to join.

City of Tarpon Springs

- The City is planning to partner with Pinellas County WW-SW Technical Working Group on stormwater mapping/GIS and coordinate with sewer system improvements.
- An upgrade to the Linkos Database has been authorized which will allow the City to efficiently track grease hauler activities and share the data with Pinellas County.

Pinellas County

- A pumping and tankering services contract has been awarded by Pinellas County for services to include all management, supervision, labor, and equipment to pump and transport domestic wastewater from sanitary sewer pump stations, wastewater treatment facilities, and collection systems located throughout the Utilities Department service areas. The contract has been uploaded to the Wastewater-Stormwater Taskforce SharePoint site and regional utilities have the ability to utilize the contract cooperatively.
- As a result of the Deepwater Horizon Oil Spill and its impact to the Gulf Coast, a settlement was accepted from BP (Figure 6-2). The BP Restore Fund provided some funding for flow monitoring studies and stormwater improvements.



Figure 6-2. Pinellas County received money from the BP Restore fund, which was shared with the municipalities within the Taskforce.

- An RFP for a private sewer lateral warranty program has been drafted and is ready for review prior to advertisement. The County has partnered with the cities of Clearwater, Dunedin, St. Petersburg, St. Pete Beach, and Tarpon Springs.

7. Public Dialogue Program

Outreach programs are beneficial in providing knowledge to the community regarding wastewater and stormwater conditions, as well as methods to protect the environment. Residents and business owners would benefit from a coordinated, holistic public dialog approach informing them about the current condition of county-wide wastewater and stormwater infrastructure, infrastructure maintenance and rehabilitation efforts, utility level of service expectations for normal conditions versus extreme weather conditions, and the ways they can help in prevention and mitigation efforts. Examples include avoiding disposal of non-flushables such as grease, wipes, and other personal care products into the sewer system and in maintaining building plumbing, private laterals, and cleanouts. Various communication channels can be used in partnership with state and local entities including public service announcements aired on television or at movie theaters, vehicle wraps, events, social media (Figure 7-1), and digital media.



Figure 7-1. Many municipalities are using forms of social media to relay information to residents regarding different events or ways to help maintain the sewer system.

City of Clearwater

- Is an active member in the Task Force developing the RFP to solicit proposals from vendors interested in offering private lateral warranty programs.
- Speakers are being provided at local events to inform citizens about I/I issues and roles that defective laterals play in efforts to control issues presented from I/I and to prevent sanitary sewer overflows.

City of Dunedin

- The City is a partner in the Community Sustainability Partnership Program (CSPP) at USF. The development of a plan to address sea level rise was chosen as a number one priority topic for the program. Through the partnership, a website and print materials were developed for City residents as well as best practices for communication regarding climate change.

City of Gulfport

- A private lateral maintenance program is planned for 2018.

City of Largo

- There are long standing outreach programs for the City of Largo residents and commercial businesses. Two of these programs target the disposal of trash, fats, oil, and grease.
- *It's a Toilet Not a Trash Can* Campaign – A campaign that included wrapped vehicles (Figure 7-2) and flyers that can be handed out at public events, and social media vignettes emphasizing items that are not to be disposed of in the toilet. Brochures and YouTube videos highlight that these items collect in laterals and sewer lines and will cause sewer backups.



Figure 7-2. Wrapped vehicle promoting the "It's a Toilet Not a Trash Can" Campaign.

- *F.O.G. Monsters "Fight F.O.G. Keep Fats, Oils, and Grease from clogging the wastewater pipes"* Campaign – This campaign was coordinated by Goldstreet Design Agency and the City has purchased brochures aimed at residential and commercial sewer users. There is currently one wrapped vehicle, with plans to wrap additional vehicles. Additional youth orientated collateral materials are available to hand out at public events. The goal of the

materials is to emphasize keeping backups to a minimum by cooling, canning, and trashing fats, oils, and grease.

City of Oldsmar

- Ongoing social media efforts as well as Nextdoor and Utility Bill inserts.
- An annual public information class which includes a presentation by Public Works. Information is shared with the residents on private laterals, I/I, and impacts of grease in the sanitary sewer system.

City of Pinellas Park

- The City utilizes truck wraps and booths at city events with fliers for residents.

City of St. Pete Beach

- Project updates are posted to the City website.

City of St. Petersburg

- Ongoing information dissemination through the City website as well as media alerts and social media efforts such as Nextdoor, Twitter, and a YouTube channel.

City of Tarpon Springs

- An Environmental Management homepage (<https://www.ctsfl.us/environmental.htm>) was developed on the City's website (Figure 7-3). The site contains brochures related to fat, oils, and grease (F.O.G.) and Protecting Our Sewer System.

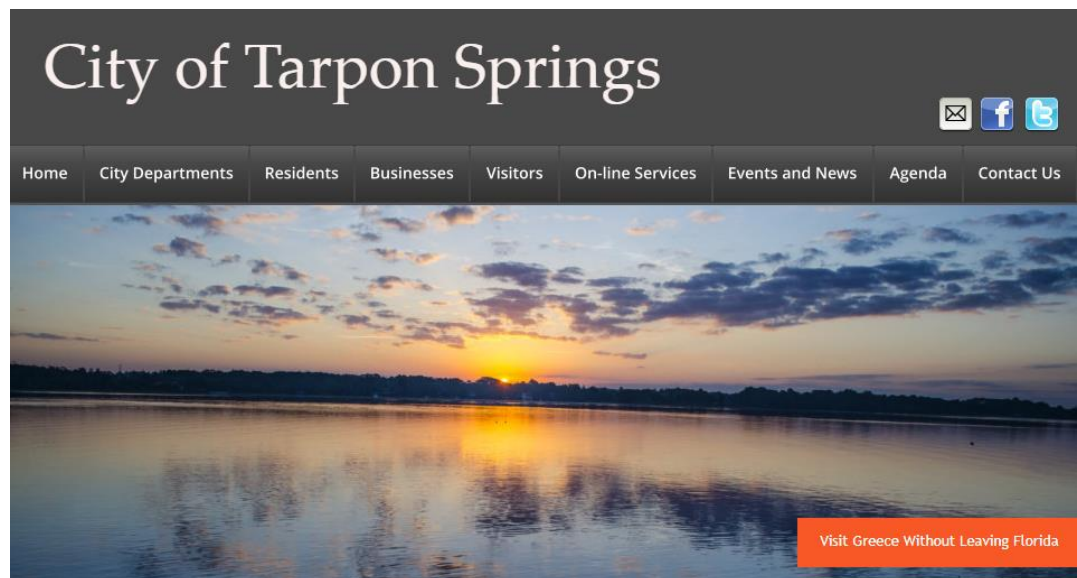


Figure 7-3. Environmental Management homepage for the City of Tarpon Springs. Homepage includes quick links to brochures for public education.

- The City is active in educating the public at events including Touch-a-Truck, Citizens Academy, Great American Teach In, and St. Pete Science Fair events.

Pinellas County

- Pinellas County Utilities (PCU) and the Wastewater/Stormwater Task Force shared an exhibit space at the 2018 Eco Fun Festival that delivered educational messages regarding wastewater and stormwater. Staff were available at the event to communicate with residents, as well as an interactive sewer pipe demo (Figure 7-4) for children to see what is commonly found within sewer pipes.



Figure 7-4. Photos from the 2018 Eco Fun Festival.

- South Cross Bayou (SCB) Education Program has been proposed for the FY19 budget to show how water can infiltrate aging pipes.

- The Tampa Bay Estuary Program (TBEP), with funding from the Wastewater/Stormwater Task Force, is helping to coordinate a regional social marketing campaign focused on reducing sanitary sewer overflows that are attributed to poor disposal practices. The education and outreach effort includes social surveys to assess knowledge and behaviors, the development of educational messaging and graphics, testing, implementation, and monitoring. To assist with this effort, the TBEP has applied for a 319(h) Education Grant through the Florida Department of Environmental Protection (FDEP).

The Education Grant program through FDEP is an opportunity for funding of projects that provide education and outreach about nonpoint source (NPS) pollution. NPS include stormwater runoff from urban surfaces areas, failing septic tanks, and erosion. NPS is the leading cause of water pollution in Florida today. By managing the NPS solution at the source is critical to restoring our environment.

8. Legislation, Regulations, and Local Ordinances

Implementation of legislation, regulations and local ordinances will provide a structured means for the County members to follow. County or State adoption of legislation, regulations, or local ordinances allowing for inspection and enforcement of private laterals, sewer systems, and lift stations; industrial pretreatment and control of fats, oils, and greases would also benefit county-wide utilities.

City of Clearwater

- Monitors the legislation that is related to utility operations. Input is provided through the City management and the Florida Water Environment Federation Utility Council.

City of Largo

- Proposed stormwater and wastewater bills are being monitored during the 2018 Legislative Session including:
 - SB 244 and HB 837 provide incentives for wastewater utilities to follow industry best practices, improve infrastructure, and prevent SSOs and unauthorized discharge of pathogens.
 - HB 7063 revises the current state law provisions addressing the Florida Forever Program funding allocations and policies and adds new requirements for public water supply, public wastewater treatment facilities, and Department of Transportation responsibilities related to stormwater.
- The FDEP amended the City of Largo's Consent Order (CO) which requires significant reduction of SSOs. The compliance deadline has been extended to January 31, 2019, which allows the City to operate and test the three completed CO projects throughout the 2018 tropical storm season.
- There is a proposed overhaul of the current ordinance to better clarify acceptable levels of I/I and to strengthen the City's ability to cause the privately-owned collection and transmission system (POCTS) owner to take corrective action as needed. Final revisions, legal review, City management approval, and a Commission/Public hearing are still required.

City of Oldsmar

- A Private Lift Station Permit and Inspection Program was initiated in 2017 and requires annual inspections by Public Works staff of privately owned lift stations to assure safe and reliable operation.

City of Pinellas Park

- Pinellas Park Ordinance Section 12-109 outlines the owner's responsibility to maintain all private infrastructure including utilities.

City of St. Petersburg

- The City does extensive work with Public Works administration and City of St. Petersburg Legal Department on research and best practices for I/I, rules, etc.

City of Tarpon Springs

- Ordinances are in place for F.O.G. and private/lift station ordinances.

Pinellas County

- The County has several local ordinances in place for prohibited runoff connections, prohibited discharges, penalty for violations, inspection warrants, replacement of sewer laterals, and prohibition of infiltration, inflow, and other discharges to sewers.

9. Maintenance Program for Private Laterals, Sewer Systems, and Lift Stations

A key component of private sanitary sewers are the individual residential pipes. The Task Force is working together to propose repair and inspection programs to protect the integrity of private lines, which has immense benefits to the County by reducing or eliminating a large infiltration and inflow source. Private property owners are responsible for maintenance of their building plumbing and private laterals, which typically extend from the building's plumbing to the property line (Figure 9-1). A key component of private sanitary sewer is individual residential pipe. The Task Force is working together to propose repair and inspection programs to protect the integrity of this line. This has immense benefits to the County since these lines are linked to contribute a large component of the wet weather infiltration and inflow source. The amount of I/I from these private laterals depend on location, age, and condition. In addition to causing excessive flows into public sewer systems, inflow and infiltration in private laterals can also cause sewer backups into buildings resulting in property damage, health risks, and environmental degradation. While some cities have ordinances in place that allow inspections of private systems, there is no standard ordinance across the County. However, the Pinellas County Environmental Enforcement Act provides enforcement against sewage releases to surface waters or the stormwater system from private laterals, septic tanks, and lift stations and the issuance of fines up to \$10,000 per violation per day. Other challenges include enforcement of local sewer use ordinances or regulations, restrictions on spending public monies on private property, the high cost to repair private laterals (approximately \$2,000 to \$5,000 per property), and lack of a comprehensive inventory of all private sewers and lift stations in Pinellas County. Costs will depend on age of infrastructure, location, and elevation.

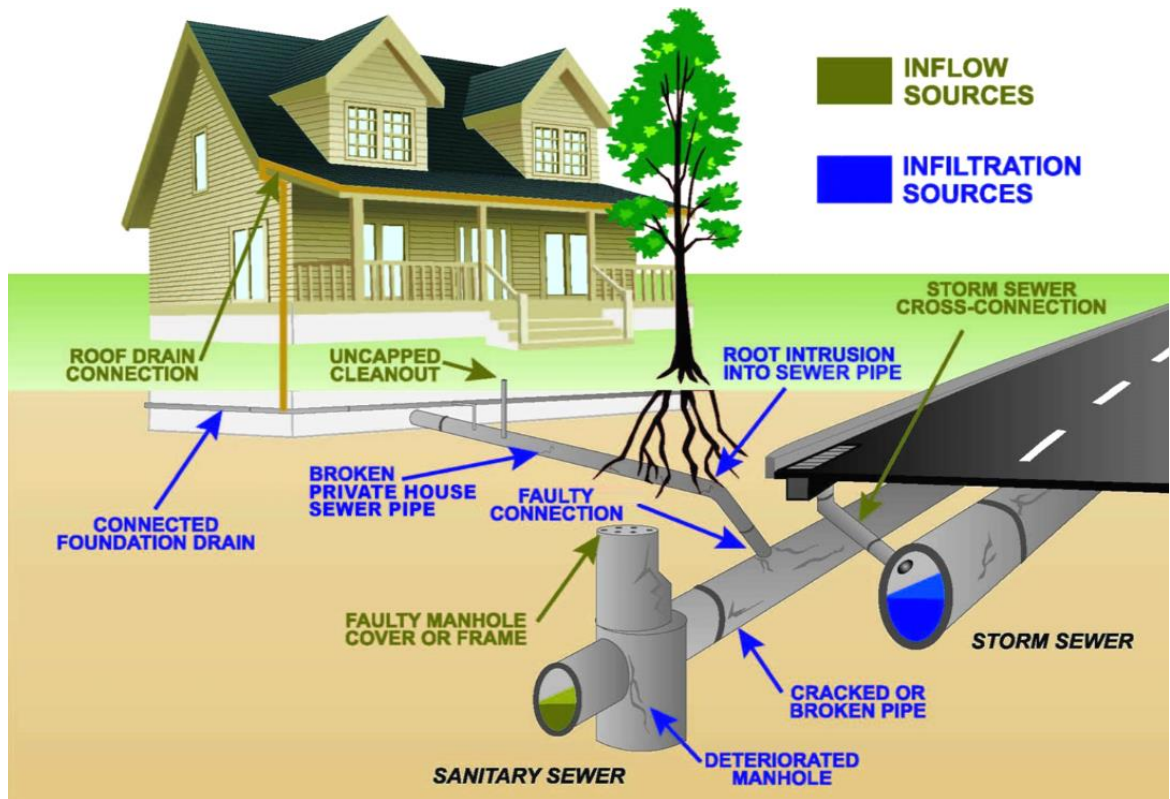


Figure 9-1. Inflow and Infiltration sources in private sewer laterals.

Because private sewer laterals, systems, and lift stations contribute flows to public systems and potentially contribute to the failure of the public systems, a compelling argument may exist for the use of public funds to prevent private systems from causing failure to public systems. A consistent, county-wide approach is needed to assist public sewer utilities in encouraging private entities to maintain their laterals, sewer systems, or lift stations.

This situation could be remedied by a statewide adoption of statutes and programs that regulate the inspection and enforcement of private laterals, sewer systems and lift stations connected to public sewer utilities. State funding alternatives for private laterals, including grants, loans, incentive programs, or rebates, would also help. One model program that could be used as a template for a statewide initiative is the My Safe Florida Home of 2006-2008. In lieu of a statewide initiative, a common county-wide approach for inspection and enforcement of private laterals, sewer systems, and lift stations could be pursued that would provide consistency across the county. Common local funding alternatives for private laterals could include grants, loans, incentive programs, or rebates. These types of programs are typically funded by the Utility and typically require an increase in customer utility rates of \$2 to \$3 per month.

Federal funding programs such as Community Development Block Grants can also be utilized for low to moderate income homeowners. In addition, insurance programs can be provided to

homeowners by a private insurer directly or managed by the utility, typically covering 80% to 100% of repairs up to \$5,000 to \$7,800 although some programs limit coverage to lateral failures and do not cover leaking laterals.

Finally, point of sale inspection and certification programs can ensure good condition of private laterals at the time of sale.

10. Conclusion

An Initial Action Plan (Pinellas County Wastewater/Stormwater Technical Working Group, 2017) was developed by the Technical Working Group which provided a framework for plans of action to improve countywide management of stormwater and wastewater in the sanitary sewer system, especially during heavy rain events.

Each of the group members throughout Pinellas County has made progress on the seven action items (Figure 10-1). Additional details and discussion on progress to date by the Wastewater/Stormwater Technical Working Group members can be found in the accompanying Appendix A. Through further collaboration, communication, and mutual support, this action plan will continue to improve countywide management of stormwater and wastewater in the sanitary sewer systems.

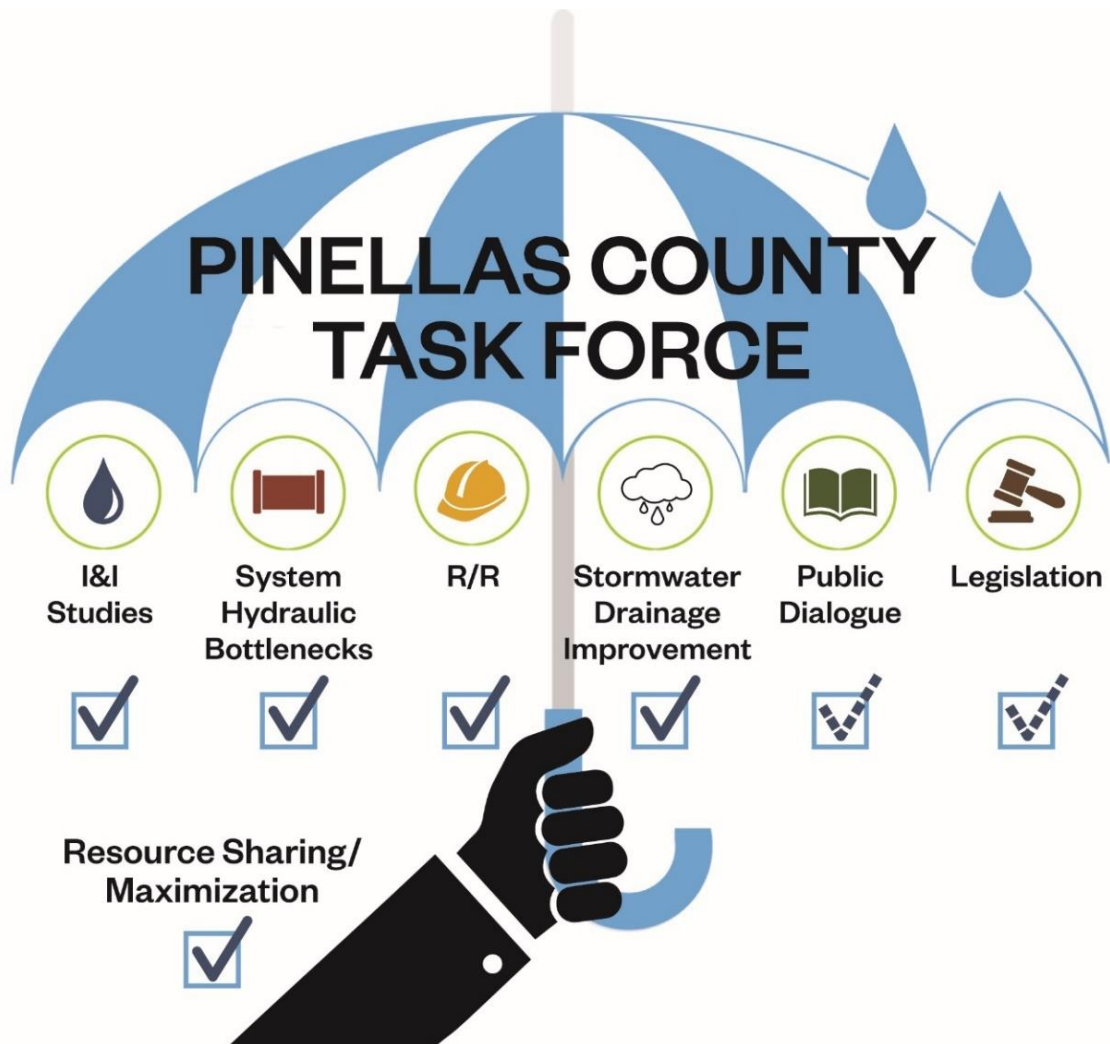


Figure 10-1. Continuing efforts of the seven action items will ensure success within the Pinellas County Task Force.

11. References

1. Webpage for the Wastewater/Stormwater Task Force
<http://www.pinellascounty.org/taskforce/default.htm>
2. Reference for – City of Gulfport SSES Phase 1 Study
3. Reference for - States with successful programs include California, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Missouri, Nevada, New Jersey, New York, Pennsylvania, Tennessee, Utah, Virginia and West Virginia (info pulled from tasf force draft report)

Table 11-1. Links to Municipality Capital Improvement Plans and Budgets

City of Clearwater	http://www.myclearwater.com/home/showdocument?id=4828
City of Dunedin	https://www.dunedingov.com/home/showdocument?id=10735
City of Gulfport	https://mygulfport.us/wp-content/uploads/2017/09/Final-Budget-FY-17-18-09.19.2017.pdf
City of Largo	https://www.largo.com/1510759586_74406.pdf
City of Oldsmar	https://www.myoldsmar.com/DocumentCenter/View/4970/2018-Final-Budget-Document
City of Pinellas Park	https://www.pinellas-park.com/ArchiveCenter/ViewFile/Item/112
City of Safety Harbor	https://www.cityofsafetyharbor.com/DocumentCenter/View/11131/FY18-Budget-Book-
City of Tarpon Springs	http://www.ctsfl.us/index.htm files/Fy%202018%20Budget-City%20of%20Tarpon%20Springs.pdf
City of St. Pete Beach	http://www.stpetebeach.org/images/stories/finance/FY2018/FY%202018%20Adopted%20Budget.pdf
City of St. Petersburg	https://www.stpete.org/economic_development/redevelopment/docs/FY2018%20Recommended%20Budget.pdf
City of South Pasadena	http://www.ci.south-pasadena.ca.us/modules/showdocument.aspx?documentid=13958
Pinellas County	http://www.pinellascounty.org/budget/18budget/CIP/FY2018_FY2027_CIPDocument.pdf

Appendix A - Summary of Action Items – Progress through January 2018

Table A-1: Summary of Action Items Progress through January 2018

Municipality	Inflow and Infiltration Initiatives	Address System Hydraulic Bottlenecks	Rehabilitation/Replacement of Aging Infrastructure	Stormwater Drainage Improvements to Benefit Wastewater System	Resource Sharing/ Maximization	Public Dialogue Program	Legislation. Regs, Local Ordinances
City of Clearwater	- Manhole Inspections - Sewer Relining - Point Repair	Corona Avenue Interceptor Sewer Bottleneck Project	- Funded CIP Program - Collection System Master Plan - Wastewater Treatment Master Plan - Reclaimed Water and Water Supply and Treatment System Master Plan	- Hillcrest Avenue Bypass Culvert - East Gateway	Active Task Force Members	Active Members in the Task Force RFP Process, Speakers at local events	Monitors legislation related to utility operations
City of Dunedin			- Manhole Lining - Pipe Lining - Manhole Repairs - Lift Station Replacement/ Refurbishment	Stormwater Master Plan Update		Community Sustainability Partnership Program (CSPP)	
City of Gulfport	Two Phase I/I Study and Repairs		- Ongoing repairs based on flow data - SSES PH I Final Report	22 nd Avenue South Drainage Improvement Project		Private Lateral Maintenance Program to be offered later in 2018	
City of Largo	Lift Station Sanitary Sewer Basins - LS 15 Basin Area - LS 2 Basin Area - LS 12 Basin Area - LS 20 Basin Area	Hurricane Hermine Engineering Evaluation	Assessment of wastewater force mains and reclaimed pressure pipe in the planning phase	- Wrens Way Flood Mitigation Project - 101 st Street SE Channel Bank Stabilization Project - Venetian Gardens Stormwater Outfall Replacement - Church Creek Drainage Improvement Project Phase II and III	Monitors resource requests through EOC using the Pinellas County WebEOC website	- It's a Toilet Not a trash Can Campaign - F.O.G. Monsters "Fight F.O.G. Keep Fats Oils and Grease from clogging the pipes" Campaign	Stormwater and wastewater proposed bills are being monitored in the 2018 Legislative Session
City of Oldsmar	Sanitary Sewer Pipe Assessment (2019-2024)	Filter Capacity Increase (Completion 2021)	- Gravity Sewer Lining (2018-2024) - Sewer Camera Purchase (2020) - Lift Station Rehabilitation (2018-2024) - Lift Station Radio Upgrade (2020)	- Watershed Management Plan updates - Watershed Management Plan Improvement Projects (2019-2023) - Harbor Palms Infrastructure Improvements – Drainage System (In Design Phase, Construction 2019-2021)	Mutual aid and piggybacking of contracts	- Social Media - Citizens Academy - Annual public information class	Private Lift Station Permit and Inspection Program initiated in 2017
City of Pinellas Park	- Annual ongoing CIPP - In house smoke testing - Cleaning and inspection program	Provided Pinellas County information to aid in the design of the Belcher Road 42" Interceptor Bottleneck	- Annual CIPP - Annual Manhole Rehabilitation - Rebuild Lift Station Program	- Continuous cleaning and inspection and point repairs - In-house Culvert Replacement Program - Stormwater CIP Projects	- Contracts competitively bid - Project information available upon request	- Truck wraps - Booth at city events - Fliers	Ordinance Section 12-109 outlining the owner's responsibility to maintain all private infrastructure
City of Safety Harbor	Citywide wastewater lining project with \$1M underway		Funds are budgeted for current and future years	Two runs of stormwater piping are out for bid			

Municipality	Inflow and Infiltration Initiatives	Address System Hydraulic Bottlenecks	Rehabilitation/Replacement of Aging Infrastructure	Stormwater Drainage Improvements to Benefit Wastewater System	Resource Sharing/ Maximization	Public Dialogue Program	Legislation. Regs, Local Ordinances
City of Tarpon Springs	<p>Since July 2016, the Collection crew has completed</p> <ul style="list-style-type: none"> - CCTV/Inspecting 114,742 LF of sewer pipe - Cleaned 158,868 LF of sewer pipe - Inspected 720 manholes 	<ul style="list-style-type: none"> - Repaired Seminole Lift Station's main line to resolve groundwater infiltration and hydraulic bottleneck - Continually monitor the collection system for operating water levels 	<ul style="list-style-type: none"> - Replaced 40 LF of a deteriorated 8" sewer line that was allowing infiltration into the River Village LS - Replaced manhole on Division St that was seeping groundwater - Repaired lateral at Cottage Grove Rd - Placing rain trays into manholes - Identified 8 pipe lining areas and 10 manhole repairs for the 2018 fiscal year. Scopes sent to Procurement Department in January 2018 	<p>CCTVed Martin Luther King Dr to look for cross connections. None found.</p>	<ul style="list-style-type: none"> - Plans to partner with Pinellas County Working Group on stormwater mapping/GIS and coordinate sewer system improvement - Upgrading Linkos Database to efficiently track grease hauler activities and share data with Pinellas County 	<ul style="list-style-type: none"> - Environmental Management homepage on City website - Educating public at Touch-a-Truck, Citizens academy, Great American Teach In, St Pere Science Fair 	<p>F.O.G. and Private Collection/Lift Station Ordinances in place</p>
City of St. Pete Beach	<ul style="list-style-type: none"> - Committed \$2.3M in FY17 and \$1.3M in FY18 to reduce I/I - 96 pipe sections have been lined - Multiple point repairs - 356 Manhole rehabilitations completed 		<ul style="list-style-type: none"> - Force Main Assessment – Engineering Study in progress - New Force Main Capacity – Engineering Design in progress, construction to be completed 2022 	<ul style="list-style-type: none"> - Boca Ciega Isle Drainage Basin – stormwater flooding reduction; design in progress - Local Stormwater Flooding – 12 locations identified, 6 in design for corrective action 	<p>Using Continuing Engineering Services Task Orders for design and a Task Order Contract for construction</p>	<p>Updates posted to City website</p>	
City of St. Petersburg	<p>Wet Weather Overflow Mitigation Program Phase I (Dec 2015 to April 2016) and Phases II (June 2016 to June 2018)</p>	<ul style="list-style-type: none"> - Interim Capacity Improvements (May 2017 to Dec 2017) - Late Track Capacity Improvements (January 2017 to September 2019) 	<p>Cured-In Place Lining for sewer mains (November 2016 – ongoing)</p>	<p>Stormwater Master Plan</p>		<p>City Website, social media</p>	<p>Extensive work to research and develop best-practices with regard to I/I legislation</p>
City of South Pasadena	<ul style="list-style-type: none"> - Two flow meters installed. MH 20A and MH 1 - 374 I/I Visual Inspections completed, and four cleanouts repaired. 		<p>2, 200 LF of sewer main line slipped</p>	<ul style="list-style-type: none"> - \$325,000 alley improvement/drainage project in between Grevilla Ave and Hibiscus completed September 2017 - Three fallouts cleaned 			
Pinellas County	<p>Flow Monitoring Project for the South County sewer system</p> <ul style="list-style-type: none"> - I/I analysis for 16 South County Sewer Zones - In 2017, 67 sub-sewer sheds were evaluated in eight study zones 	<ul style="list-style-type: none"> - Predictive curves of what storm event will cause the gravity system to fail were developed based on flow data - Six projects initiated to evaluate specific known historic SSO locations. The projects identified and isolated areas where SSOs may be mitigated with hydraulic capacity improvements. 	<p>Ongoing pipe rehabilitation efforts.</p> <ul style="list-style-type: none"> - Five projects for Large Diameter Sewer Interceptor Rehabilitation Projects - Two projects for Smaller Diameter Sewer Rehabilitation Projects 	<p>Project to address drainage and stormwater issues and identify stormwater best management practices (BMPs) across the County to reduce stormwater inflows into the wastewater system</p>	<ul style="list-style-type: none"> - Pumping and Tankering Services contract has been awarded for services to include all management, supervision, labor and equipment to pump and transport domestic wastewater. Regional municipalities have the ability to utilize this contract cooperatively. - RFP for a Private Sewer Lateral Warranty Program has been drafted and ready for review. Pinellas County has partnered with the cities of Clearwater, Dunedin, St. Petersburg, St. Pete Beach and Tarpon Springs. 	<ul style="list-style-type: none"> - Pinellas County Utilities (PCU) and the Wastewater/ Stormwater Task Force are sharing an exhibit space at the 2018 Eco Fun Fest - South Cross Bayou (SCB) Education program proposed for the FY19 budget 	<p>Local ordinances in place</p>

Appendix B - Project Location Map

The numbers on the project location map correspond to individual projects listed in Appendices C, D, E and F.

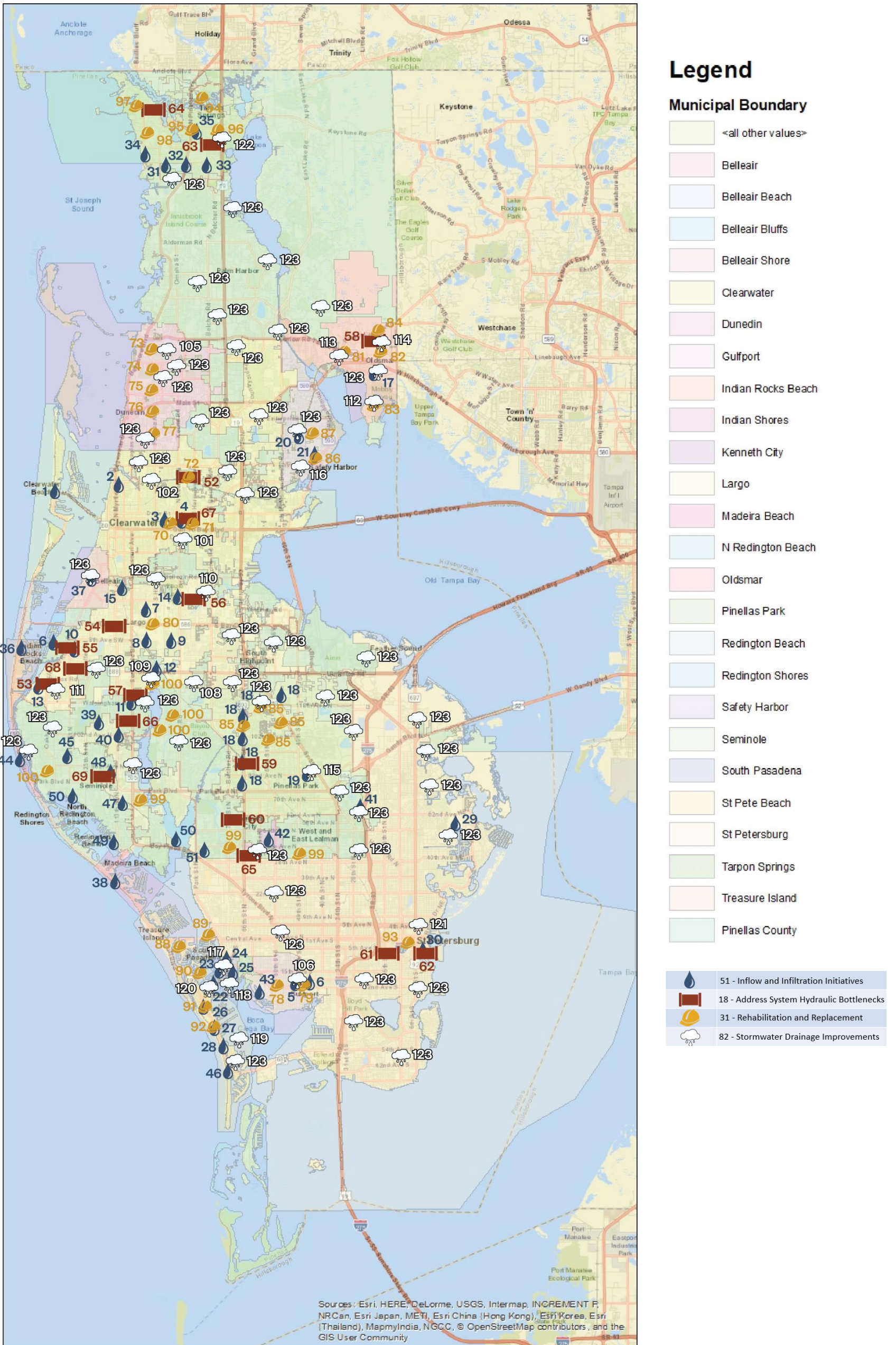


Figure B-1. Combined efforts of Inflow and Infiltration, System Hydraulic Bottlenecks, Rehab and Replacement, and Stormwater Drainage Improvements across Pinellas County.

Appendix C - Inflow and Infiltration Initiatives Projects

Municipality	No.	Project Title	Description	Cost	Timeline
Clearwater	1	Manhole Inspections and Nightflow Isolation Project	Clearwater Beach service area Multi-phase Identifying manhole repairs required and I/I sources Repair of the defects found		Ongoing for an indefinite period
Clearwater	2	Permanent Sewer Collection System Flow Monitoring Project	East WRF and Marshall Street WRF Service Areas; Beginning a similar project for the Northeast WRF Service Area Provide sub-system flow data which assists in targeting I/I efforts to maximize reductions in I/I entering the system		
Clearwater	3	Sewer Relining Project	Reline sewers that are identified as having defects that allow I/I flows to enter the system		Multi-year
Clearwater	4	Sewer Line Point Repair	Rapidly address sewer line defects that cannot be repaired by lining but must be repaired by traditional excavation and replace methods		Annual Contract
Gulfport	5	Flow Monitoring Study Phase 1	The flow monitoring study consisted of nineteen (19) meter sites at key locations throughout the City's collection system. Gravity sewer flows were monitored at these sites from July 18, 2014 to September 22, 2014. Approximately 84,050 LF or 38% of the City's sanitary sewer pipes were cleaned and inspected by CCTV. These were then ranked from 1 (highest priority) to 3 (lower priority) for repair and maintenance. During the CCTV work a total of 37 point repairs were completed throughout the City, which included replacing pipe sections with traditional open cut construction methods at 35 locations. The remaining two locations included pipe segments that were rehabilitated with CIPP liners.		
Gulfport	6	Flow Monitoring Study Phase 2	Remainder of gravity sewers to be CCTVed, reviewed and prioritized. Repairs of the priority 1 defects from PH 1 being repaired. 30-month program started in May 2017. Open cut contract and Trenchless contract NTPs issued Nov. 2017		Ongoing

Municipality	No.	Project Title	Description	Cost	Timeline
Largo		Lift Station Sanitary Sewer Basins	These projects evaluate the City's wastewater collection system lift station basins to identify the sources of inflow and infiltration (I/I) using investigative resources such as flow monitoring, smoke testing and closed-circuit television (CCTV) inspection. Once identified, source mitigation can be completed utilizing a variety of repair techniques.		
Largo	6		Lift Station 15 Basin Area - Smoke Testing and manhole inspection completed. CCTV of identified areas scheduled, flow monitoring ongoing	\$199,540	2017-2018
Largo	7		Lift Station 2 Basin Area - Wet season flow monitoring and I/I Abatement Phase I in progress. Smoke testing will commence during March 2018, I/I Abatement Phase II to commence during 2019.	\$22,500	2017 through 2021
Largo	7		Lift Station 2 Sanitary Sewer Basin I/I Abatement Phase I	\$182,700	FY17
Largo	7		Lift Station 2 Sanitary Sewer Basin I/I Abatement Phase 2	\$199,900	FY19
Largo	7		Lift Station 2 Sanitary Sewer Basin I/I Abatement Phase 3	\$199,900	FY20
Largo	8		Lift Station 12 Basin Area - Smoke testing in progress. Flow monitoring to follow.		2018
Largo	9		Lift Station 20 Basin Area - Scheduled for smoke testing		2018
Largo	10		Hermine SSO Prevention Projects Engineering Eval Sites 1-4	\$1,147,029	FY17
Largo	11		Hermine SSO Prevention Projects Engineering Eval Site 5	\$273,830	FY17
Largo	12		I/I Design, Construction and Repair Project	\$8,750,000	FY18
Largo	12		I/I Design, Construction and Repair Project	\$5,600,000	FY19
Largo	12		I/I Design, Construction and Repair Project	\$5,700,000	FY20
Largo	12		I/I Design, Construction and Repair Project	\$5,500,000	FY21
Largo	12		I/I Design, Construction and Repair Project	\$4,900,000	FY22
Largo	12		I/I Design, Construction and Repair Project	\$3,400,000	FY23
Largo	12		I/I Design, Construction and Repair Project	\$4,000,000	FY24
Largo	13		Lift Station 19 & 2 Phase 4 Sanitary Sewer Basin I/I Abatement	\$199,900	FY21
Largo	14		Lift Station 10 Sanitary Sewer Basin I/I Abatement	\$199,900	FY22
Largo	15		Lift Stations 3 (and 6) Sanitary Sewer Basin I/I Abatement	\$199,900	FY23
Oldsmar	17	Sanitary Sewer Pipe Assessment	Assessment of 8-in and larger sanitary sewer lines using robotic cameras to identify needed repairs. This work is a proactive approach to maintaining the sanitary sewer system by identifying damaged piping before failure. Preventing sewer spills are necessary for public safety, the environment, and regulatory compliance.		2019-2024

Municipality	No.	Project Title	Description	Cost	Timeline
Pinellas Park	18	Inflow and Infiltration Prevention Plan	Provide for purchase of equipment and training to perform monitoring of various sub-basins that compromise the overall sewer system	\$125,000	FY17-18
Pinellas Park	19	Manhole Rehabilitation	Purchase and install Manhole Inflow Protectors. Looking at Smart Cover System to monitor flows from private customers and to monitor the low-lying Lift Station Basins		
Safety Harbor	20	Citywide Wastewater Lining Project		\$1,000,000	Currently Underway
Safety Harbor	21	Inflow and Infiltration Study	A complete citywide wastewater inspection, inventory, and flow monitoring		Plans to release RFQ
South Pasadena	22	Flow Meters Installed	Two flow meters installed by the City of St. Pete in 2016. MH 20A located at 1075 Pasadena Ave. S and MH 1 located at 6940 Hibiscus Ave. S		
South Pasadena	23	Manhole Improvements	Inflow protectors (rain trays) installed in 122 of 155 sanitary manholes.		
South Pasadena	24	Manhole Improvements	Two sanitary manholes repaired to stop inflow (MH 69 at 1471 Island Dr. and MH 19A at 1075 Pasadena Ave S)		Completed August 2017
South Pasadena	25	I/I Visual Inspections	374 visual inspections completed. Four cleanouts were repaired on December 7, 2017. (1426 Pasadena Ave S, 1290 Pasadena Ave. S, 1609 Pasadena Ave. S, 1475 Pasadena Ave. S)		
St. Pete Beach	26	Pipe Lining	96 pipe sections have been lined		\$2.3M in FY17 and \$1.3M in FY18 committed to reduce I/I
St. Pete Beach	27	Point Repairs	Multiple locations repaired		
St. Pete Beach	28	Manhole Rehabilitation	356 manhole rehabilitations completed		

Municipality	No.	Project Title	Description	Cost	Timeline
St. Petersburg	29	Wet Weather Overflow Mitigation Program - Phase I	Used existing available data to develop preliminary recommendations and budgetary costs to mitigate infiltration and inflow (I/I), provide wastewater collection system relief, upgrade wastewater treatment capacity at the City's Water Reclamation Facilities (WRFs), and/or upgrade disposal capacity at the WRFs. The existing collection system hydraulic model was assessed, and it was determined improvements were desirable. Estimated and compared the cost to mitigate future overflows through I/I mitigation versus the cost of improvements to the WRFs to treat flows from a rainfall event similar to that which occurred in August 2015, based on existing available data. This analysis found that improvements to the WRFs were the most cost-effective solution to mitigate potential future overflows. Upgrades to the WRFs, obtaining collection system flow data, and updating the calibration of the collection system hydraulic model to cost effectively target and reduce I/I was recommended.		December 2015 through April 2016
St. Petersburg	30	Wet Weather Overflow Mitigation Program - Phase II	Performed wastewater collection system flow, rainfall, and groundwater monitoring to characterize infiltration and inflow (I/I) in the wastewater collection system, updating and calibrating the wastewater collection system hydraulic model, and performing a stress test/ capacity analysis using the hydraulic model. Seventy-seven flow meters, 8 rain gauges, and 20 groundwater monitor wells were installed, and data was collected for approximately 6-months during 2016. Thirty-five flow meters and 8 rain gauges were installed, and data was collected for approximately 4-months during 2017 due to lack of qualifying rain events during the 2016 flow monitoring period. Compiling a report that documents the findings of the flow metering and hydraulic model calibration, including a prioritization of collection system basins based on rainfall derived I/I, and identification of collection system capacity deficiencies as predicted by calibrated hydraulic model based on multiple design storm scenarios.		June 2016 through June 2018
Tarpon Springs	31	CCTV/Inspecting	114,742 LF of sewer pipe and stormwater pipe		
Tarpon Springs	32	Sewer Pipe Cleaning	158,868 LF of sewer pipe cleaned		
Tarpon Springs	33	Manhole Inspections	720 manholes inspected		
Tarpon Springs	34	Cromwell Dr Mainline	Cromwell Dr Mainline (10" VCP) repair, 18.3' deep. This will repair the road and eliminate infiltration.	\$140,000	
Tarpon Springs	35	CIPP Lining	Have a bid to CIPP (line) nine areas throughout the City. The total length is 2,400 LF.	\$60,000	

Municipality	No.	Project Title	Description	Cost	Timeline
Pinellas County	36	003202C - Zone 1 - Indian Rocks Beach	Pinellas County has initiated a Flow Monitoring Project for the South County sewer system. The project consists of Inflow & Infiltration analysis for sixteen (16) South County sewer zones. The total study period is three (3) years. The study is identifying the areas of the South County sewer system that experience the most amounts of inflow and infiltration so that mitigation strategies can be developed. Complete Data Collected from May 2017 to Nov 2017		Data Analysis in Progress. Results summary for individual studies complete Jan '18 Results summary combined all studies complete Feb '18
Pinellas County	37	003202D - Zone 5 – Bellaire			
Pinellas County	38	003202E - Zone 6 – Madeira/Red. Shores/N. Red.			
Pinellas County	39	003202F - Zone 8 – North West Lake Seminole Basin			
Pinellas County	40	003202G - Zone 9A – N. 113 th Ave. Area			
Pinellas County	41	003202H - Zone 14 – Lealman Area			
Pinellas County	42	003202I - Zone 15B – Kenneth city Area			
Pinellas County	43	003202J -Zone 16 – Unincorporated Gulfport Area			
Pinellas County	44	003202K - Zone 2A – Indian Shores	Pinellas County has initiated a Flow Monitoring Project for the South County sewer system. The project consists of inflow and infiltration analysis for sixteen (16) South County sewer zones. The total study period is three (3) years. The study is identifying the areas of the South County sewer system that experience the most amounts of inflow and infiltration so that mitigation strategies can be developed.	Funded FY18 and FY19	Consultants hired. Preparing meeting locations.
Pinellas County	45	003202L - Zone 2B – Oakhurst			
Pinellas County	46	003202N - Zone 7A – City of Seminole Basin			
Pinellas County	47	003202M - Zone 7B – Boca Ciega Area			
Pinellas County	48	003202O - Zone 9B – Mid-Seminole Blvd			
Pinellas County	49	003202P - Zone 9C – South Seminole Blvd			
Pinellas County	50	003202R - Zone 13- Long Bayou Area			
Pinellas County	51	003202Q - Zone 15A – West South Cross Gravity Basin			

Appendix D - Address System Hydraulic Bottleneck Projects

Municipality	No.	Project Title	Description	Cost	Timeline
Clearwater	52	Corona Avenue Interceptor Sewer Bottleneck	Completed design, bid and awarded a construction contract and started work. Located the source of the bottleneck associated with one of the interceptor sewers that transport sewage from the southern portion of the East WRF service area to the East WRF. Able to modify the configuration and operation of the East WRF Master Pumping Station to alleviate the bottleneck.		Complete July 2018
Largo		Hurricane Hermine Engineering Evaluation	Implement a program that involves identification of stormwater inflow and groundwater infiltration (I/I) sources, provides recommendations for I/I abatement, identifies hydraulic limitations within the existing system, assists in I/I abatement, documents I/I flow reduction, provides updates to the City's Capital Improvement Plan and performs design and construction services to implement the selected improvements. This program will identify the underlying cause of the past SSOs and minimize risk of future SSOs from occurring		
Largo	53		Wilcox Road/Indian Rocks Road Area - Study/Evaluation Phase	\$1,500,000	Analysis/Design - 2017 Construction - 2018
Largo	54		Pinecrest Brookdale - Study/Evaluation Phase	\$2,500,000	Analysis/Design - 2017 Construction - 2018
Largo	55		Crescent Drive - Study/Evaluation Phase	\$2,500,000	Analysis/Design - 2017-2018 Construction - 2019
Largo	56		Saint Paul's Drive - Study/Evaluation Phase	\$2,000,000	Analysis/Design - 2017-2018 Construction - 2019
Largo	57		Private Lift Station #28 - Seminole Blvd - Study/Evaluation Phase		Analysis/Design - 2017-2018 Construction - 2019
Oldsmar	58	Filter Capacity at the WRF	Three filter bays at the WRF were completed and put into service in 2012. The fourth filter bay structure was constructed for future capacity with no piping, underdrain, valving, or media. The project will include the installation of these components and connection to the existing electrical panel. The additional bay provides increased treatment capacity that would allow processing of peak flows associated with storm events. This would allow the facility permitted capacity to increase by more than 30%.		2021
Pinellas Park	59	Belcher Road 42" Interceptor Bottleneck	Provided Pinellas County information to aide in the design		
Pinellas Park	60	Lift Station #31 Pump Controls Replacement Project	Replace pump, motor controls, and related appurtenances	\$650,000	On Hold

Municipality	No.	Project Title	Description	Cost	Timeline
St. Petersburg	61	Interim Capacity Improvements - SWWRF	Project was designed and constructed to improve wet weather hydraulic treatment capacity limitations at SWWRF. Interim Capacity Improvements Fast Track projects completed in December 2017 provided wet weather related hydraulic improvements to achieve peak hydraulic capacity of 70 MGD.		May 2017 - December 2017
St. Petersburg	62	Late Track Capacity Improvements	Late Track Capacity improvements will provide resiliency and redundancy to the treatment capacity process and capacity up to 78 MGD. Design was completed in December 2017. Construction is estimated to be completed in September 2019.		January 2017 - September 2019
Tarpon Springs	63	Seminole Lift Station	Repaired Seminole Lift Station's main line to resolve groundwater infiltration and hydraulic bottleneck. The severely deteriorated line was also causing road issues. An 8" pipe was poorly connected to a 10" pipe, with the poured in place concrete joint partially filling the line. Corrected by installing a new 10" PVC pipe from collection manhole to lift station.		
Tarpon Springs	64	Collection System Monitoring	Continually monitor the collection system for operating water levels in the collection system. Unexpectedly high-water levels in an area investigated for potential bottleneck conditions.		
Pinellas County	65	003204 - Kenneth City 62nd St at 43rd Ave	Suspected undersized pipe 8" pipe causing SSOs		Study complete. Consultant performing data analysis.
Pinellas County	66	003204C - Seminole Blvd	Several historic SSOs. Study completed and found 7" sediment build up in 30" piping system is causing hydraulic capacity limitations. Planning maintenance efforts for aggressive pipe cleaning in Seminole Blvd pipe run (11,000 LF)		
Pinellas County	67	003204D - Ridgewood 82nd Ave at Ridgewood Dr	Historic SSOs. Study completed and found hydraulic constraint in 8" pipe (350 LF). Planning replacement of 8" pipe with 10" pipe.		Proposed FY19 CIP Construction
Pinellas County	68	003204F - - Bellaire Bluffs FM Avocado Dr. @ Indian Rocks Rd	Historic SSOs. Study completed and found hydraulic constraint in 8" pipe (350 LF). CIP Project to re-route FM out of gravity and extend to Pump Station.		Construction plans 90% complete. Planned FY19 Construction.

Municipality	No.	Project Title	Description	Cost	Timeline
Pinellas County	69	003202G - Florida MHP	Historic SSOs. Study complete and found hydraulic constraint in 30" pipe (5000 LF)		Planning stage. Evaluating alternatives to increase capacity or divert flows.

Appendix E - Rehabilitation and Replacement Projects

Municipality	No.	Project Title	Description	Cost	Timeline
Clearwater	70	CIP Program	Renew, replace, and/or upgrade existing facilities	Funded	Being implemented
Clearwater	71	Collection System Master Plan	Developing and negotiating a work order with a consulting engineer to complete an extensive collection system master plan that will include a CMOM update		
Clearwater	72	Master Plan Projects	Wastewater Treatment and Reclaimed Water System and Water Supply and Treatment System		Anticipated over the next two years
Dunedin	73	Monthly Study Reports for LS	Increased efforts to reduce I/I through on-going monthly study reports for each LF area and comparing rain data with run time/flows to better direct efforts. The City utilizes GIS, televising, and cleaning of main lines to identify areas that would benefit from sectional repairs and manhole repairs/flood dome installations.		
Dunedin	74	Sewer Pipe Lining	Sewer Pipe Lining	Annual Budget of \$400,000	
Dunedin	75	Manhole Lining	Manhole Lining	Annual Budget of \$100,000	
Dunedin	76	Lift Stations	Plans are to rebuild/relocate Lift Stations # 20 and # 32 including the addition of onsite, back up diesel pump. Preliminary survey work is taking place on both Lift Station (LS) # 20 and LS # 32 as part of the initial design. Once the initial design and projected costs are determined, it is anticipated that the LS # 20 and LS # 32 rebuilds/relocations will become part of the Capital Improvement Program (CIP).		
Dunedin	77	Emergency Backup pumps	Permanent emergency backup pumps for LS # 8 and LS # 15 are budgeted for fiscal year 2018. This CIP project is currently in the research and preliminary design phase. Additional lift stations will be evaluated for emergency pumps based on the operation and performance of the emergency pumps at LS #8 and LS #15	\$180,000	
Gulfport	78	Flow Monitoring Study Phase 1	The flow monitoring study consisted of nineteen (19) meter sites at key locations throughout the City's collection system. Gravity sewer flows were monitored at these sites from July 18, 2014 to September 22, 2014. Approximately 84,050 LF or 38% of the City's sanitary sewer pipes were cleaned and inspected by CCTV. These were then ranked from 1 (highest priority) to 3 (lower priority) for repair and maintenance. During the CCTV work a total of 37 point repairs were completed throughout the City, which included replacing pipe sections with traditional open cut construction methods at 35 locations. The remaining two locations included pipe segments that were rehabilitated with CIPP liners.		

Municipality	No.	Project Title	Description	Cost	Timeline
Gulfport	79	Flow Monitoring Study Phase 2	Remainder of gravity sewers to be CCTVed, reviewed and prioritized. Repairs of the priority 1 defects from PH 1 being repaired. 30-month program started in May 2017. Open cut contract and Trenchless contract NTPs issued Nov. 2017		Ongoing
Largo	80	Assessment of WW FM and Reclaimed Pressure Pipes	The City is venturing on a critical assessment of its wastewater force mains and reclaimed pressure pipes. This project will provide insight to the City on various pressure pipe assessment methods which can be used to identify locations within the existing force mains and reclaimed water pressure system where repairs are needed and to assist the City with developing a Capital Improvement Plan (CIP) with a prioritized schedule, allocating the necessary funds to perform the required repairs within the system. Current Status - Planning Phase		Estimated completion date - 2018
Oldsmar	81	Gravity Sewer Lining	Line the gravity sewer clay pipe using cure-in-place pipe to reduce groundwater infiltration and extend the life of the existing collection system.		2018-2024
Oldsmar	82	Sewer Camera Purchase	Used to inspect integrity of collection system piping and investigate obstructions which will help maintain regulatory compliance preventing sewage overflows or spills.		2020
Oldsmar	83	Lift Station Rehabilitation	As lift stations age, the various systems degrade or are not efficient for the current operating conditions. Some of the work will include assessing the lift stations capacity, evaluating the pumps, replacing rail systems, repairing wetwell concrete and coatings, replacing /repairing valves, adding isolation valves for ease of maintenance.		2018-2024
Oldsmar	84	Lift Station Radio Upgrade	The lift stations are connected remotely to the WRF and on-call devices to ensure rapid response to equipment failures, pump ragging, power loss, and water quality in the industrial areas. This is important in preventing sanitary sewer overflows and potential process impacts at the WRF which affect regulatory compliance.		2020

Municipality	No.	Project Title	Description	Cost	Timeline
Pinellas Park	85	Sewer Inspection, Cleaning, and Rehabilitation Program	Annual program for the rehabilitation of system-wide sanitary sewer	\$550,000	FY17-18
Safety Harbor	86	Citywide Wastewater Lining Project		\$1,000,000	Currently Underway
Safety Harbor	87	Pipe Bursting	300' of pipe bursting accomplished for a broken 8" main over 10' deep		
South Pasadena	88	Sewer Main Slipped	24,200 LF of sewer main slipped line		100% of sewer main completed in August 2016
South Pasadena	89	Sewer Main Cleaning	1900 LF		Completed in 2017
South Pasadena	90	Lateral Repair	Repaired on an as needed basis. Four have been repaired.		2011 to 2015
St. Pete Beach	91	Force Main Assessment			Engineering study currently in progress
St. Pete Beach	92	New Force Main Capacity			Engineering Design currently in progress Construction completion estimated for 2022
St. Petersburg	93	Cured-In Place Lining	Cured-in-place pipe lining for sewer mains in various parts of the city.		This started in November 2016 and is still on-going.
Tarpon Springs	94	River Village Lift Station	Replaced 40 LF of a deteriorated 8" sewer line that was allowing infiltration into the River Village Lift Station		
Tarpon Springs	95	Division Street Manhole	Replaced manhole that was deteriorated and seeping groundwater		
Tarpon Springs	96	Cottage Grove Road	Repaired lateral at Cottage Grove Rd. CCTV discovered excessive amount of groundwater infiltration. This line was under a stormwater pipe.		
Tarpon Springs	97	Manhole Improvements	Placing rain trays into manholes that would be of greatest benefit		
Tarpon Springs	98	Improvements	Identified 8 pipe lining areas (2,255 LF) and 10 manhole coating/bench repairs for the 2018 FY. Both scopes sent to Procurement Department in January 2018.		

Municipality	No.	Project Title	Description	Cost	Timeline
Pinellas County	99	Cured-In Place Piping	Under construction of Cured-In Place pipeline of aging sewer gravity mains 27" diameter and larger - 2.59 miles of pipe		FY 17/18
Pinellas County	100	Planned Rehabilitation	Planned rehabilitation of aging sewer gravity mains 8" - 30" diameter interceptor pipes - 2.9 miles of pipe		FY 18/19

Appendix F - Stormwater Drainage Improvements to Benefit Wastewater System Projects

Municipality	No.	Project Title	Description	Cost	Timeline
Clearwater	101	Hillcrest Avenue Bypass Culvert	Consists of installation of a box culvert under Browning St to the upstream end of Linn Lake at the Evergreen Ave footbridge to reduce structure flooding		Completed Design and will be bid for construction
Clearwater	102	East Gateway Stormwater and Sanitary Sewer project	Increase stormwater treatment in the Stevensons Creek Watershed through upgrades in the collection system to capture the mean annual storm and treat it through five nutrient separating baffle boxes, and remove and replace outdated potable water pipes on Hillcrest Avenue		Under Construction
Clearwater	103	Magnolia Drive Outfall Improvement Project	Includes upgrades to stormwater inlets, rehabilitation and pipe replacement, and installation of a nutrient separating baffle box		Completing Construction
Clearwater	104	Curlew Creek Watershed Management Plan Update	City of Clearwater is coordinating with Pinellas County and Dunedin		
Dunedin	105	Stormwater Master Plan Update	The City of Dunedin completed a Master Drainage Plan in 2003. Many of the stormwater improvements recommended in the existing Master Drainage Plan have been implemented by the City. Jones Edmunds & Associates, Inc. (JEA) has been selected to perform a Stormwater Master Plan Update for the City. JEA is being tasked with developing a watershed model in ICPR4, mapping the model results in GIS / ESRI with Floodplain Delineation, conducting a Vulnerability Assessment, addressing water quality and natural system assessments, as well as considering Community Rating System (CRS) requirements, developing a Downtown Regional Stormwater Plan, and providing the City with a Best Management Practices (BMP) Analysis Report.		
Gulfport	106	49th Street Outfall	In 2017 the City completed a project to divert the first flush of stormwater from the 49 th Street outfall into a nutrient removing baffle box to remove suspended solids then into two wet detention ponds in a series on vacant land adjacent to the Gulfport Marina. These recent improvements provide treatment for a 244-acre drainage basin for both commercial and residential, and it is estimated that over 7,500 pounds of pollution will be kept for Boca Ciega Bay annually.		
Gulfport	107	22nd Avenue South Drainage Improvement Project	A Pinellas County project but traverses through the center of the City of Gulfport on 22 nd Avenue between 51 st Street South and 55 th Street South. This project includes new storm structures and 1,800 LF of upgraded storm pipe.		

Municipality	No.	Project Title	Description	Cost	Timeline
Largo	108	Wrens Way Flood Mitigation Project	This project eliminated persistent nuisance flooding risk to four properties in the cul-de-sac at the end of Wrens Way. An easement was established with a local property owner for a new stormwater outfall to the owner's pond.		Construction Completed January 2017 - May 2017
Largo	109	101st Street SE Channel Bank Stabilization Project	Bank stabilization of approximately 205 linear feet within a section of the open channel		Construction Phase January 22 - May 22, 2018
Largo	110	Venetian Gardens Stormwater Outfall Replacement	This project replaces the failed stormwater outfall for the Venetian Gardens neighborhood		Design Phase October 2017 - September 2018 (Design and Construction)
Largo	111	Church Creek Drainage Improvement Project Phase II and III	The Church Creek drainage basin is located in Southwest Largo. The current drainage system is in poor condition and does not have the necessary capacity. Phase II will convey stormwater in a new box culvert along Twigg Terrace, discharging it into Church Creek. Phase III will convey excess flow during large storm events through upgraded stormwater infrastructure replacing corrugated metal pipe (CMP) discharging it further downstream from an outfall near 126 th Ave.		Survey and Design estimated completion - May 2019
Oldsmar	112	Watershed Management Plan	The Oldsmar Watershed Management Plan (Stormwater Master Plan) was last updated in 2002 and significant development has occurred since. Through the completion of updates to the Plan, the City will be able to better prioritize the use of capital improvement funds for projects that have the most benefit to water quality, increasing basin storage, and alleviating some localized flooding. Projects will be identified to meet existing goals for nitrogen limits in the upper Tampa Bay estuary.		Currently underway
Oldsmar	113	Watershed Management Plan Improvements Projects	Projects will address drainage issues that are identified by the completion of the Watershed Master Plan. Issues will include addressing undersized pipes, improving capacity and performance of the conveyance system, erosion and safety concerns and realigning ditches to improve conveyance. Purpose to reduce flooding, improve existing drainage infrastructure and increase the life expectancy of the drainage asset.		2019-2023
Oldsmar	114	Harbor Palms Infrastructure Improvements - Drainage System	This is part of an integrated project with Utilities to improve infrastructure in the Harbor Palms neighborhood. Stormwater infrastructure shall be removed and replaced in order to accommodate new curb and sidewalk. Existing corrugated metal pipe will be lined to extend service life as needed.		2019-2021
Pinellas Park	115	Storm Sewers - Maintenance	Cleaning and Inspection and point repairs, in-house culvert replacement program, stormwater CIP Projects	\$315,000	FY17-18

Municipality	No.	Project Title	Description	Cost	Timeline
Safety Harbor	116	Stormwater Pipe Lining			
South Pasadena	117	Alley Improvement/Drainage Project	Project located in between Grevilla Ave and Hibiscus on the west side	\$325,000	Completed September 2017
South Pasadena	118	Fall Outs Cleaned	Three fall outs cleaned (barnacles removed) (18") S-73 – 1893 Shore Drive S. (West end by Pasadena Isle Bridge) (29x45) S-129 – 1403 Corey Way (18") S-151A – Pasadena Isle Bridge (Southwest		2017
St. Pete Beach	119	Boca Ciega Isle Drainage Basin	Stormwater flooding reduction		Engineering design in progress
St. Pete Beach	120	Local Stormwater Flooding	12 locations identified, 6 currently in design for corrective action		
St. Petersburg	121	Cured-In Place Lining	Cured-in-place pipe lining for sewer mains in various parts of the city.		November 2016 - Ongoing
Tarpon Springs	122		Worked with stormwater crew to CCTV stormwater lines along Martin Luther King Dr. prior to the road being repaved. Did not reveal any cross connections.		
Pinellas County	123-182	Stormwater Drainage Improvements	Pinellas County Public Works Department retained Jones Edmunds and Associates (JEA) to identify opportunities to address drainage and stormwater issues that impact the wastewater system. The objective of this project is to identify stormwater best management practices (BMPs) across the County to reduce stormwater inflows into the wastewater system. This project included the collection of know flooding areas, stormwater and wastewater asset data from the County and the municipalities. Subsequently, JEA conducted an initial screening to identify where the wastewater assets are potentially impacted by stormwater inflow. For example, flood-prone areas that intersected parts of the wastewater network were flagged for closer analysis. Locations where stormwater lines coincide with wastewater lines were also identified.		The initial screening analysis will be completed in mid-2018.