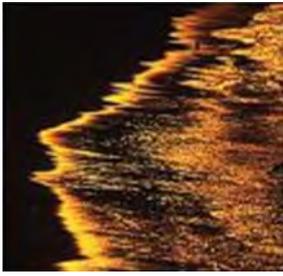


Introduction

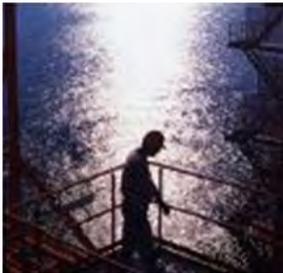


Introduction

HRSD is an independent political subdivision of the Commonwealth of Virginia (the Commonwealth) created by referendum on November 5, 1940. HRSD was established to abate water pollution in the Hampton Roads area by providing a system of interceptor mains and wastewater treatment plants.



Approximately 1.7 million individuals, more than one-fifth of Virginia's population, reside in HRSD's service area, which is located in the southeastern corner of the Commonwealth. HRSD's territory of approximately 3,100 square miles encompasses nine cities, nine counties and several large military facilities. HRSD is required by its enabling act to meet its obligations by charging user fees for its wastewater treatment services; no taxing authority is authorized by the enabling act. Currently, HRSD provides service and bills to approximately 470,000 service connections.



A board of eight commissioners (the Commission), appointed by the Governor of Virginia, governs HRSD. Commission members, who serve four-year terms, can be reappointed without limitation by the Governor. The Commission appoints a General Manager, who appoints the senior staff.

HRSD owns and operates 16 wastewater treatment plants. The nine major plants in Hampton Roads have design capacities ranging in size from 15 to 54 million gallons per day (MGD). Five of the major plants are located south of the James River and four are north of the James River. The combined capacity of these nine plants is approximately 249 MGD. HRSD's six small rural treatment plants, which are located on Virginia's Middle Peninsula and in Surry, have a combined capacity of almost one MGD.



HRSD maintains 620 miles of pipelines ranging from six inches to 66 inches in diameter. Interceptor pipelines, along with 88 pump stations in Hampton Roads, interconnect and form independent systems, one south of the James River and one north of the James River. The system is designed to provide some diversion capability to allow for maintenance or emergency work. HRSD owns and maintains 39 pump stations on the Middle Peninsula and Surry in addition to the collection and interceptor sewers.



Mission and Vision

HRSD's Mission is to protect public health and the waters of Hampton Roads by treating wastewater effectively. HRSD's Vision is future generations will inherit clean waterways and be able to keep them clean.

Guiding Principals

HRSD's Capital Improvement Program is the result of significant work by all of the departments in evaluating and recommending capital projects that ensures regulatory compliance, provides for adequate infrastructure reinvestment and meets the future growth needs of Hamptons Roads. The following principals are used in developing the Capital Improvement Program:

- The size and scope of HRSD's Capital Improvement Program are guided in part by federal and state regulatory requirements and by HRSD's [Financial Policy](#) document approved by its Board of Commissioners.
- Departments update existing capital projects based on the most recent information.
- Newly identified capital projects are evaluated to ensure the best alternative is selected.
- Each project is reviewed for inclusion in the CIP by HRSD's Commissioners and management.
- Once a project is justified for funding, the project schedule is determined by regulatory deadlines, an internal prioritization score relative to other projects and available capital funds.
- The final CIP must ensure good financial stewardship by balancing available capital funds as defined in the financial plan and ongoing capital infrastructure needs.
- HRSD's CIP is a planning document, not an appropriation of funds. HRSD's Commission must approve and fund Professional Services Agreements, Construction Contracts or other activities for each project.
- An Interceptor Sewer Replacement Planning Model is also used to ensure that the interceptor projects included in the 10 year program are being budgeted at a replacement rate equal to or above the simulated minimum reinvestment rate from the model.

Capital Project Prioritization

Given financial constraints, a challenging regulatory environment, and the need to renew and replace aging infrastructure, HRSD created an enhanced framework for prioritizing candidate projects for its Capital Improvement Program (CIP). Since 2007, HRSD has successfully used a comprehensive, systematic method for prioritizing its capital projects. The prioritization process is based on a decision-science based methodology that provides greater precision for weighting organizational value based criteria and measuring the contribution of candidate projects to HRSD's goals using performance scales.

The following criteria are used in prioritizing capital projects (in order of importance):

1. Safety - Improve safety of employees or the community
2. Regulatory Compliance
3. Reliability/Operational Flexibility - Criticality, risk reduction, aging infrastructure
4. Capacity - Meet growth and development needs
5. Community Impacts/Regional Cooperation - Meeting specific city or community needs
6. O&M Efficiency/Opportunities for Cost Savings - Revenue generation/optimization
7. Public Acceptability/Customer Service - Odor, nuisance, conditions, traffic
8. Coordination with Other Projects - Project sequencing, internal and external
9. Sustainability - Energy efficiency, reuse, clean, "green"
10. Implementability - How easily/efficiently projects can be delivered

The prioritization scoring system is an effective tool in programming projects. Although there are a number of factors in programming projects, the scores provide an objective means to effectively and efficiently develop financially feasible cash flow projections. Other factors which affect project programming include risk factors, coordination with other projects, regulatory deadlines and the availability of funds within each fiscal year.

Summary of Major Regulatory Programs

Inflow & Infiltration (I&I) Abatement

HRSD is engaged in a multi-year effort to reduce Sanitary Sewer Overflows (SSOs) in the Hampton Roads area. These overflows occur when the system is overloaded with excess storm water or groundwater that enters the system during rain events, or when pipes or pumps fail due to unexpected mechanical problems or pipe breaks. HRSD is in the process of satisfying the requirements of a Federal Consent Decree regarding SSOs with the United States Environmental Protection Agency (EPA). HRSD has been working cooperatively with fourteen of the Hampton Roads localities, the EPA and the Department of Environmental Quality (DEQ) to develop a plan of action to study the regional sewer system and identify improvements that can be made to reduce the frequency and severity of SSOs.

Interim System Improvements

As part of the EPA Consent Decree, HRSD agreed to complete 51 capital improvement projects and satisfied this requirement as of February 2018.

Rehabilitation Plan Improvements

As part of the Consent Decree, HRSD performed a condition assessment of its conveyance system. Using the results of the condition assessment, a Rehabilitation Plan was developed to address assets within the HRSD system that present a material risk of failure. Rehabilitation is considered the repair or replacement of existing sanitary sewer assets to restore or improve the performance of the HRSD sanitary sewer system. The final Rehabilitation Plan was approved by the EPA in May 2015 and three phases with corresponding deadlines were established to complete the plan within ten years.

Regional Wet Weather Management Plan (RWWMP) Improvements

HRSD and the localities worked together over the past few years to develop a Regional Wet Weather Management Plan (RWWMP) to increase the wet weather capacity of the regional wastewater system to a specified level-of-service. The RWWMP was submitted to the EPA prior to the October 1, 2017 deadline.

Nutrient Reduction - Chesapeake Bay Total Maximum Daily Load (TMDL)

On December 29, 2010, the EPA established the Chesapeake Bay Nitrogen, Phosphorous and Sediment Total Maximum Daily Load (TMDL), which sets the nutrient load allocations for each watershed segment of the Chesapeake Bay. Each state was required to submit a Watershed Implementation Plan to EPA for approval that defines how each state proposes to meet the nutrient allocations for the watershed segments within its borders by the required deadlines. The EPA approved Virginia's plan on December 29, 2010, which included significant changes to the nutrient allocations for HRSD beyond 2011.



HRSD has twelve treatment plants that discharge into three river watershed segments within the Chesapeake Bay: Lower James River, York River, and Rappahannock River. To meet the nutrient load allocations by January 2011, a strategy was developed using treatment plant capital improvement projects and the purchase of nutrient credits from the Virginia Nutrient Credit Exchange Association.

HRSD invested \$143 million to successfully meet the 2011 nutrient load allocations. In addition, HRSD implemented two major treatment plant nutrient upgrades to meet the 2017 deadline. The \$123 million Army Base Treatment Plant Improvements includes an Enhanced Nutrient Removal (ENR) facility capable of reducing over 450,000 pounds per year of Total Nitrogen from the Lower James River Basin. The \$153 million VIP Treatment Plant Improvements was designed to remove an estimated 400,000 pounds per year of Total Nitrogen from the Lower James River Basin.

Sustainable Water Initiative for Tomorrow (SWIFT)

On September 28, 2017, HRSD submitted the Integrated Plan/ Regional Wet Weather Management Plan (IP/RWWMP) to the EPA. The IP/RWWMP outlines how HRSD plans to comply with the Consent Decree. In the IP/RWWMP, HRSD outlined an “integrated approach” to realize the significant environmental benefits provided by SWIFT and comply with the requirements of the Consent Decree. The integrated approach proposes constructing full scale SWIFT facilities by 2030 and delaying the implementation of some SSO reduction work until after SWIFT is implemented. SWIFT is an innovative initiative in eastern Virginia designed to ensure a sustainable source of groundwater while addressing environmental challenges such as Chesapeake Bay restoration, regulatory uncertainty, sea level rise and saltwater intrusion. The multi-year initiative will take already highly treated wastewater that would otherwise be discharged into the Elizabeth, James or York Rivers and purify it through additional advanced water treatment to produce SWIFT water that meets drinking quality standards. The SWIFT water will then be treated to match the existing groundwater chemistry and added to the Potomac Aquifer.

Funding the Capital Improvement Program

HRSD's CIP is primarily funded by revenue bonds and cash. The debt/cash capital funding ratio is based on HRSD's [Financial Policy](#) and financial planning model.

What is a CIP?

HRSD prepares a Capital Improvement Program (CIP) each year for the capital projects currently underway or proposed to be undertaken in the future. The CIP is a project and financial planning tool; it identifies individual projects currently underway or proposed to be undertaken over the next ten (10) years. The CIP also summarizes individual projects providing the name, description, justification, cost estimate, funding and schedule.

A draft CIP is submitted to the Commission for review and the final CIP is submitted to the Commission for approval. The CIP document is not a commitment by HRSD to undertake or provide specific improvements by specific dates. Projects may be deleted, delayed or otherwise modified significantly from that indicated in the CIP document. New projects not included in the CIP document may be proposed and authorized at any time.

The CIP is not an approval or appropriation of funds for individual projects. The Commission must appropriate the estimated total project cost before a capital project can begin.

A capital project by definition involves expenditures to acquire or add assets of a relatively permanent nature such as property, plant and equipment. The CIP is typically for capital projects, new facilities, expansions and improvements requiring engineering and/or construction services such as:

- Studies preceding or likely to result in new facilities
- New administrative facilities, expansions, major improvements and major renovations
- New pump stations and major improvements
- New pipelines, replacements and major rehabilitations
- New treatment plants, expansions and major improvements
- Capital projects, infrastructure or other large purchases with a value greater than \$100,000
- Studies or projects which will take multiple years to complete

The CIP document is submitted as part of the overall budget package to the Commission each year for review at the end of March or early April, preliminary action in April, and final action in May. Departments may propose new projects at any time throughout the year by submitting a Project Request to the HRSD management team. New projects are usually evaluated for their need and priority only when preparing the CIP. However, the General Manager may decide at any time to initiate an existing not yet started project or a new project due to an emergency or other condition justifying immediate action.

How is the CIP Organized?

The CIP is primarily organized by the treatment plant service area with separate sections for Administrative, General and Future Improvement Projects.

Each project included in the CIP is assigned a CIP number to provide a simplified way to reference projects. The first two letters represent the treatment plant system where the project is assigned and the number is assigned starting with 0100. If a project has distinct scopes of work that are undertaken at different times; the project may be split, in which case there will be another alphanumeric character that follows the standard CIP number. The following table provides a description of the treatment plant service areas used to assign CIP projects.

Symbol	System Descriptions
AD	Administration
AB	Army Base Wastewater Treatment Plant
AT	Atlantic Wastewater Treatment Plant
BH	Boat Harbor Wastewater Treatment Plant
CE	Chesapeake-Elizabeth Wastewater Treatment Plant
JR	James River Wastewater Treatment Plant
MP	Middle Peninsula (multiple smaller plants)
NP	Nansemond Wastewater Treatment Plant
SU	Surry Town and County System
VP	Virginia Initiative Plant Wastewater Treatment Plant
WB	Williamsburg Wastewater Treatment Plant
YR	York River Wastewater Treatment Plant
GN	General Infrastructure that spans multiple systems
IP	Future Infrastructure Improvements

Project Type Descriptions

Biosolids – Related to biosolids handling and disposal infrastructure

Electrical – Involves generators, switchgear and other electrical components

Facilities and Buildings – Includes administrative office buildings at the main offices and treatment plants

Locality – Projects to be constructed within the Locality system

Nutrient Reduction – Wastewater treatment enhancements specifically to remove nutrients

Pipelines – Includes pressurized and gravity interceptor pipelines

Pump Stations – Includes wet well pump stations and pressure reducing stations

Offline Storage – Related to peak wet weather storage facilities and may include a pump station

Software & Technology – Any new software and/or hardware that meets the criteria for inclusion in the CIP

Strategic Planning – Involves a study or evaluation that may lead to multiple capital projects

SWIFT – The sub-program of projects needed to implement the SWIFT initiative

Wastewater Treatment – Includes any treatment plant infrastructure project needed to process wastewater

Water Reuse – Related to projects that beneficially reuse wastewater effluent

Project Driver Descriptions

The Project Drivers categorize projects based on their primary purpose. The two primary drivers are Regulatory and Non-Regulatory Capital Improvement. Regulatory projects are required by an existing federal, state or local mandate. Non-Regulatory Capital Improvement projects are required to maintain HRSD's existing infrastructure and improve operational performance.

Regulatory

- **I&I Abatement** – Required to comply with the EPA Consent Decree regarding Sanitary Sewer Overflows.
 - **Interim System Improvements** – These projects were identified in Appendix 5 of the 2010 EPA Consent Decree and 2013 Consent Decree Modification.
 - **Rehabilitation Plan** – These projects are the result of condition assessment activities and are listed in the 2014 Rehabilitation Plan.
 - **Integrated Plan/Regional Wet Weather Management Plan (IP/RWWMP)** – SWIFT and the upgrades identified to meet wet weather capacity at a specified level of service.
- **NPDES Compliance** – Required to comply with wastewater effluent discharge permit requirements.
- **Nutrient Reduction** – Required to comply with the Chesapeake Bay Total Maximum Daily Load (TMDL).
- **Clean Air Act** – Required to comply with the Clean Air Act.
- **Safety Compliance** – Required to ensure employee safety.

Non-Regulatory Capital Improvement

- **Aging Infrastructure** – Needed to rehabilitate or replace aging infrastructure.
- **Relocation** – Needed to move existing infrastructure to avoid a conflict with another project.
- **Capacity Improvements** – New or larger infrastructure needed to increase the wet weather or growth-related system capacity, not specifically identified in the EPA Consent Decree or the IP/RWWMP.
- **Performance Upgrades** – Needed to improve the operational performance of the existing system beyond the status quo.

Individual Project Summary Definitions

Contingency – Each project is assigned an individual project contingency based on project complexity and/or project status.

Cost Estimate – The cost estimate details estimated costs for each phase in the project.

Funding Type – Each project may be funded by different sources such as revenue bonds, cash, federal or state grants or other reimbursements.

Program Cash Flow Projection – This is the planned cash expenditures for each fiscal year based on the project schedule. This cash flow projection does not include individual project contingencies.

Program Cost – This is the sum of the estimated costs for each project phase and does not include an individual project contingency.

Project Status – This is the project status as of July 1, 2018.

Project Cost – This the sum of the estimated costs for each project phase plus an individual project contingency.

Proposed Schedule – The schedule in the CIP book is updated annually in the spring of each year.

Estimate Class – This communicates the level of Cost Estimate and Schedule Estimate maturity.

Estimate Class	Maturity Level of Project Definition	Project Stage	Expected Accuracy Range
Class 5	0% - 5%	Concept	-50% to +100%
Class 4	5% - 15%	Preliminary Engineering	-30% to +50%
Class 3	15% - 60%	60% Design	-20% to +30%
Class 2	60% - 95%	100% Design	-15% to +20%
Class 1	95% - 100%	Awarded	-10% to +15%

Program Contingency

In the FY2019 to FY2028 CIP, HRSD uses an overall program contingency for each fiscal year. Project contingencies are shown on the Individual Project Sheets but they are not aggregated as part of the program funding for each fiscal year. The purpose for this methodology is to more accurately estimate future CIP spending projections. In addition, program contingencies can globally account for inflation, variations in the bidding environment, emergency infrastructure efforts, unplanned relocations and other unforeseen factors.

As a guideline, individual project contingencies vary depending on the project status:

- Proposed or Pre-Design 25%
- Design 10%
- Bid Stage 5%
- Construction 3%

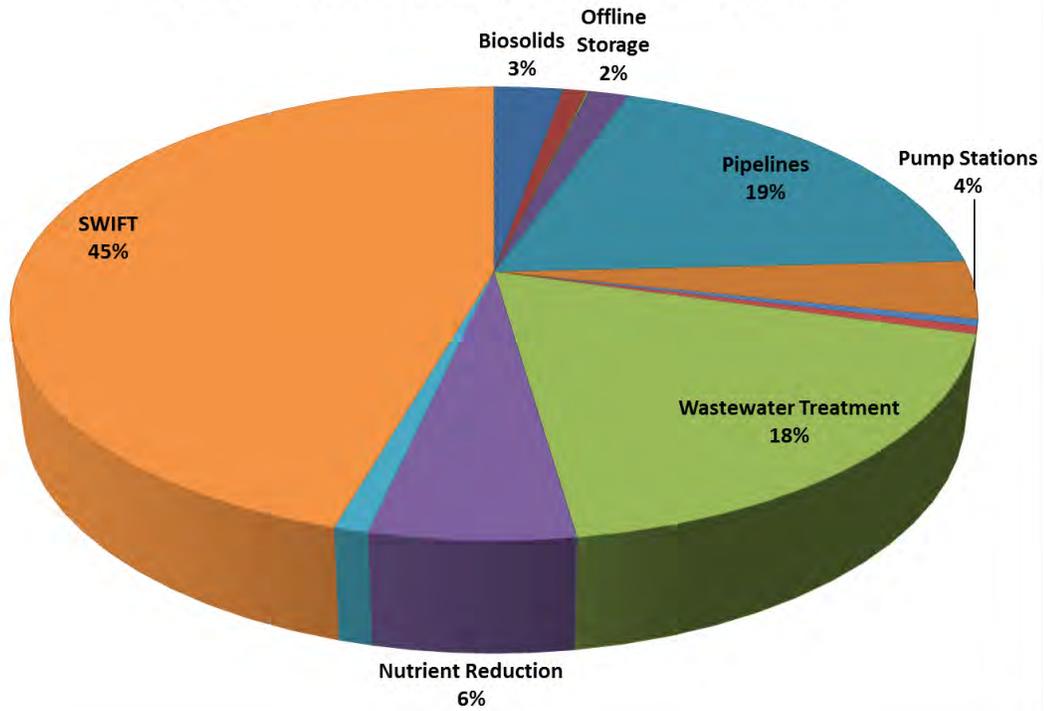
When aggregating the individual projects' cash flow projections into fiscal years, the near term fiscal years have a lower program contingency since many of the projects have begun. In the future years, the program contingency increases to reflect the uncertainty associated with proposed projects.

Program Summary

The following charts provide a breakdown of the projects by type and driver:

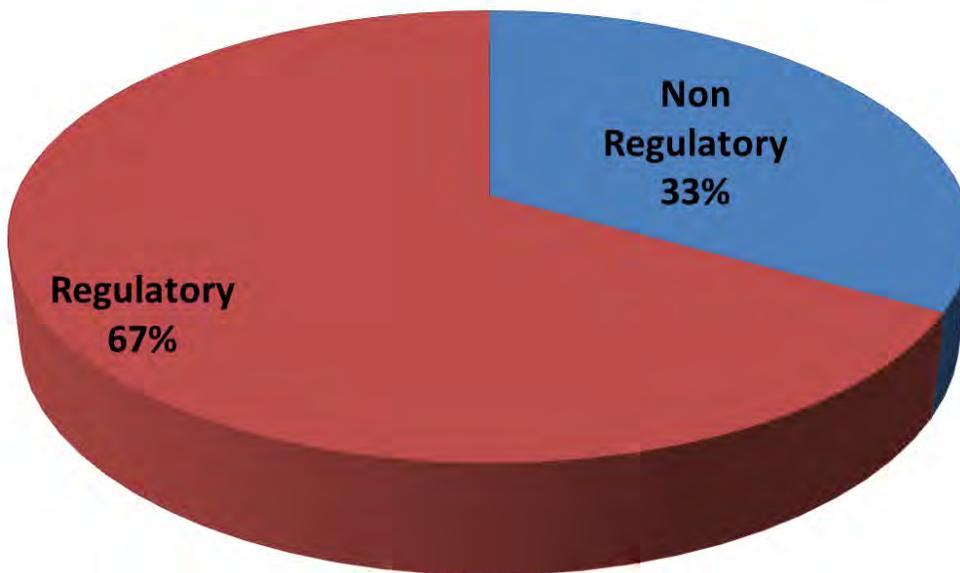
Sum of FY19-28

FY19 to FY28 Proposed Spending - Grouped by Project Type



Sum of FY19-28

FY19 to FY28 Proposed Spending - Grouped by Project Driver



Sum of FY19-28

FY19 to FY28 Proposed Spending - Grouped by Project Driver

