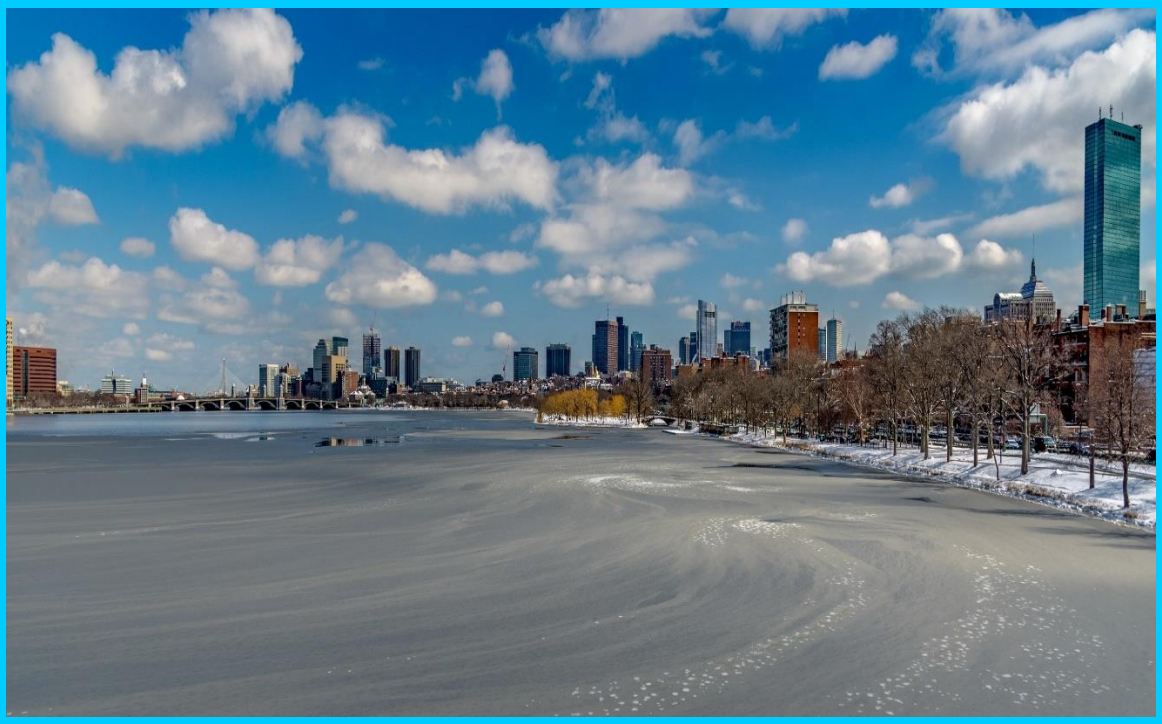
Boston Water & Sewer Commission 2021-2023 Capital Improvement Program



BOSTON WATER AND SEWER COMMISSION CAPITAL IMPROVEMENT PROGRAM 2021-2023

Henry F. Vitale
Executive Director
November 2020

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Prepared by the Finance Division

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EXECUTIVE SUMMARY

The Boston Water and Sewer Commission ("the Commission" or "BWSC") is a body politic and corporate and political subdivision of the Commonwealth created by Chapter 436 of the Acts of 1977 ("Enabling Act"). The Enabling Act abolished the water and sewer divisions within the City of Boston Public Works Department and transferred the ownership, operation and control of the water, sewer and storm drain systems to the Commission. As a public instrumentality, the Commission performs an essential public function in providing water and sewer services to the residents of the City of Boston. The Act authorizes the Commission to construct and make improvements to the water and sewer systems, establish and collect rates and charges for its services and finance its operations and improvements through revenue collections and the sale of bonds and notes payable solely from the Commission's revenues. The Act further provides that any revenue surpluses earned by the Commission in any Fiscal Year shall be credited to the next year's rates or returned to the City of Boston. Since its inception, the Commission has generated a surplus in each year of its operations and has credited the surplus to the reduction of the next year's rates.

The Enabling Act and the Commission's General Revenue Bond Resolution adopted December 6, 1984 ("the Resolution") require the Commission, on an annual basis, to develop a three-year Capital Improvement Program ("CIP"). Information generated by the Commission's ongoing monitoring programs for the Systems and from various engineering data files, together with information concerning the development needs of the City, is used to compile a list of pipes, conduits, transmission mains and other System components to be either renewed, replaced, relocated or added to the Systems each year. The CIP outlines the schedule and implementation of the capital projects necessary to maintain and improve the water and sewer systems for the ensuing three-year period.

The Commission in compliance with the requirements of the Enabling Act and the Resolution, project costs of the Commission's Capital Improvement Program from Fiscal Years 2021 through 2023 total approximately, $201.1 million.

Since the Commission's inception in 1977, the Commission has set forth its Capital Improvement Plan to provide for long-term capital improvements to its water distribution and sewer collection systems, governed by a core commitment to prudent fiscal management. Comprehensive and well-planned water distribution system maintenance and planning has sustained superior water service for our customers and resulted in a low incidence of system failures. The Commission has also led the industry in implementing effective water conservation measures, including dedication to deploying the most efficient technologies and practices enabling the Commission to maximize cost savings.

The Commission utilizes effective conservation measures through continued efforts to eliminate leaks across the system through advanced leak detection technology and proactive maintenance of the system's water mains.

DISCUSSION OF MANAGEMENT OBJECTIVES AND ACCOMPLISHMENTS

The Commission was created to maintain and improve the long-term quality and reliability of water and sewer services for all users in the City and to assure adequate funding for operation and maintenance of the systems. For the purposes of this document, "Systems" include the water distribution system (including potable water and fire suppression facilities) and sewer system (including separate sanitary sewers, separate stormwater drains and combined sewers) and the related appurtenances and fixtures. The Commission is committed to four primary goals:

- To maintain and improve the water distribution and wastewater collection systems. The Commission is committed to various improvements to the Water Distribution and Sewer Systems, including following an aggressive renewal and replacement program, reducing unaccounted for water, encouraging conservation and improving the environment. The Commission is also committed to meeting and exceeding the requirements of all federal and state water and wastewater laws, regulations and technical standards.

- To establish and administer a billing and collections system that is fair and efficient. The Commission has worked to establish a rate structure that fully and fairly reflects its costs, properly distributes the financial obligation concerning its customer base and encourages water conservation. The metering, billing and collection process is a central focus of the Commission's full management team and the Commission is committed to maintaining its strong record in that area.

- To maintain a strong financial structure. The Commission has consistently employed conservative financial projections and budgeting assumptions, maintains adequate reserves and struck a reasonable balance between debt funding and rate funding of capital expenses.

- To sustain the effectiveness of investments / compliance of regulations. The Commission is committed to complying with all its regulatory obligations under federal and state laws, including the Safe Drinking Water Act ("SDWA") and Clean Water Act ("CWA") with its National Pollutant Discharge Elimination System ("NPDES") permitting obligations for both its stormwater systems and combined sewer systems. Compliance obligations also extend to meeting and exceeding the goals and requirements of the Boston Harbor Decree and the Consent Decree executed in 2012 with the Environmental Protection Agency ("EPA") related to stormwater discharges.

In planning its CIP, the Commission balances the recognized need for ongoing renewal and replacement and preservation of its Systems with the desirability of specific improvements to accommodate development or redevelopment plans for the City. Wherever feasible, capital improvements are scheduled in cooperation with the street rebuilding and reconstruction activities of the City's Department of Public Works, the Boston Planning and Development Agency and the Commonwealth of Massachusetts Highway Department.

OBJECTIVES

The overall objectives of the Commission 2021-2023 CIP are to ensure the delivery of high-quality potable water for consumption and fire protection, as well as the efficient collection of sewage for transport and delivery to a treatment facility or for approved discharge. In addition, the CIP includes projects to improve overall efficiency of the Commission and to enhance the Commission's ability to provide services to its customers.

The Stormwater category was created in 2017 that focuses on Stormwater management. The primary purpose of the Stormwater Category in the 2021-2023 Capital Improvement Program is to participate in the Boston Harbor pollution abatement projects and implement green infrastructure to improve the water quality of discharges to the local receiving waters. The goal is also to study existing conditions and make recommendations for placement of new best management practices designed to promote improved water quality, ensure compliance with state and federal regulations, minimize flooding and strategically manage Stormwater throughout the City of Boston.

CIP expenditures are divided into four categories: Water Distribution System projects, Sewer System projects, Support projects and Stormwater projects. Water Distribution System projects account for $87.2 million, or 43.4% of the 2021-2023 CIP. Sewer System projects comprise $84.3 million, or 41.9%, Support projects total $20.4 million, or 10.1% of the expenditures outlined in the program, and Stormwater projects account for $9.2 million, or 4.6% of the 2021-2023 CIP.

Total capital expenditures of $72.0 million are outlined for 2021. Water Distribution projects comprise $25.9 million or 36.2%, Sewer System projects account for $34.5 million or 47.8%, Support projects account for $7.0 million, or 9.7% of the 2021 amount. Stormwater projects totaling $4.6 million consist of the remaining 6.3% of the 2021 amount.

Tables 1 and 2 represent the cash flow expenditures and funding sources for the Commission's 2021-2023 CIP.

Table 1 - 2021-2023 CIP Cash Flows

Program	2021	2022	2023	2021-2023
Water	25,972,000	31,207,000	30,009,000	87,188,000
Sewer	34,470,000	27,290,000	22,573,000	84,333,000
Support	7,001,000	10,511,000	2,883,000	20,395,000
Stormwater	4,559,000	2,881,000	1,720,000	9,160,000
Total	72,002,000	71,889,000	57,185,000	201,076,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

Table 2 - 2021-2023 CIP Funding Souces

Program	2021	2022	2023	2021-2023
BWSC Bonds	43,511,000	42,379,000	27,683,000	113,573,000
Rate Revenue	18,690,000	18,573,000	17,834,000	55,097,000
MWRA Water Assistance	1,662,000	7,927,000	8,549,000	$18,138,000
MWRA I/I Assistance	8,139,000	3,010,000	3,119,000	$14,268,000
Total	72,002,000	71,889,000	57,185,000	$201,076,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

PROJECT HIGHLIGHTS

The Commission's CIP includes projects to improve the overall efficiency and to enhance the Commission's ability to provide services to its customers. The projects included in this CIP are intended to accomplish these objectives in the most efficient and cost-effective manner. The Commission intends to enhance Boston's water and sewer infrastructure with several targeted projects included in the 2021-2023 Capital Improvement Program. Some of the major projects are listed below:

- ✓ Water Main Replacement Program
- ✓ Sewer and Drain Replacement Program
- ✓ Sewer Separation and System Improvements in South Boston
- ✓ Sewer Separation in Roxbury
- ✓ Sewer Separation in East Boston
- ✓ City-wide Illegal Connections Investigations
- ✓ Upgrades to Union Park Pumping Station & Satellite Stations
- ✓ Projects affiliated with the Consent Decree; includes cleaning and televising ninety miles of sewer and drains
- ✓ Implement Stormwater/Green Infrastructure Program designed to improve water quality, the environment and manage stormwater resources
- ✓ Improvements of Information Technology

WATER DISTRIBUTION SYSTEM

Since its creation the Boston Water and Sewer Commission has provided the City of Boston with reliable, quality water. A program, which began as an aggressive 17 miles of water pipe replaced or rehabilitated yearly based on age and the City's construction schedule, has transformed into a successful asset management approach. When combined with an aggressive leak detection and flushing program the results have been undeniable. The Commission has averaged just over 35 water pipe failures per year and has witnessed its unbilled water drop from 48% to 15%. The Commission utilizes effective conservation measures through continued efforts to eliminate leaks across the system through advanced leak detection technology and proactive maintenance of the system's water mains.

In 2011, the Commission completed a Water Distribution Study, which provided a thorough understanding of the water system and how to best manage it. The study gave all stakeholders a better sense of the history of Boston's water infrastructure and provided key insights into current conditions. The study has been responsible for the development of best management practices in value maintenance, main flushing and more effective methodology of selecting pipe to be replaced under the Capital Improvement Plan. Not only do these tools assist current Commission employees with an understanding of the system, but they also provide future employees with a roadmap for optimal system maintenance.

The three-year study was divided into two phases. The first phase was to have both Commission staff and a hired contractor collect 93 pipe samples (coupons). The samples were taken from every neighborhood and varied in size and pipe material. The age of the water pipes ranged from 18 years old to 147 years old and included cast iron, ductile iron and a mix of cement lined and unlined. The pipes and soil sample, which were also taken from the locations, were analyzed. The analysis consisted of physical observations and measurements, microscopic examination, mechanical properties test, and chemical composition analysis. The soil sample obtained at each location was also analyzed to determine its corrosiveness. The results of the tests performed were matched with locations on Commission maps, and corrosion rates were correlated with fill areas, electrified rail locations and groundwater levels.

The second phase was to create a sustainable distribution system by developing a risk-based measure for selecting pipe to be included in the annual CIP budget. This phase employed sophisticated models that levered all the data collected in phase one, data the Commission collects in its GIS, Citiworks, and hydraulic model to determine the appropriate level of pipe rehabilitation and replacement needed to achieve the Commission's goals. The pipe selected is based on a risk-based assessment. The framework is derived from asset management principles, which consider the highest risk of pipe to be the probability of a failure, and what the consequences of an event occurring could be (hospital flooding or critical customers without water).

In addition to the samples taken during the three-year study, the Commission obtains 8 pipe samples every year. Once the results of the analysis are received the information is uploaded into the Commission's database to continue selecting the most vulnerable pipe.

Water distribution system improvements made since 1978 include the replacement of 365.9 miles of older water mains, the cleaning and lining of 274.8 miles of water mains, hydrant replacements and valve upgrades and replacements.

Over the three years of the CIP, the Commission is projected to expend $87.2 million on improvements to the Water Distribution System. Most of these expenditures will occur in the replacement of water mains.

The projects scheduled for initiation in 2021 will result in the replacement of 8.6 miles of water mains.

Table 3 presents a summary of the 2021-2023 capital expenditures for the Water Distribution System.

Table 3 - Water Distribution System Expenditures by Program Category

Program	2021	2022	2023	2021-2023
Water Replacement	17,506,000	24,865,000	23,889,000	66,260,000
Water Special	8,466,000	6,342,000	6,120,000	20,928,000
Total	25,972,000	31,207,000	30,009,000	87,188,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

SEWER SYSTEM

The CIP for the Sewer System includes a total of $84.3 million for various types of system improvements. These include in-kind replacement and rehabilitation of sewer pipes, installation or replacement of sewers and storm drains that increase the overall capacity of the system, separation of combined sewers, identification and reduction of infiltration and inflow and compliance with permit requirements in the areas of combined sewer overflows and stormwater discharges.

Major sewer system improvements have resulted in increased system capacity and the virtual elimination of dry weather overflows from combined sewers into Boston Harbor and the Neponset, Charles and Mystic Rivers. These improvements have also increased water quality and improved accessibility to all waterways.

Projects associated with the Plan in the Sewer System CIP include the rehabilitation or replacement of approximately 21.0 miles of deteriorated or collapsed sanitary sewers and storm drains and the television inspection of approximately 90 miles of sewer pipe within the next three years. Also included are drainage improvements and the replacement of faulty tide-gates.

The CIP continues funding for the separation of combined sewers and for the reduction of infiltration and inflow into the sanitary system. Infiltration and inflow (I/I) are extraneous quantities of water, which enters the sanitary sewers and reduces the capacity of the system to transport sanitary sewage. Reduction of I/I also decreases the quantity of water transported to the Massachusetts Water Resource Authority ("MWRA") wastewater treatment facilities, thereby reducing overall transportation costs, treatment costs and BWSC's sewer assessments.

Table 4 presents a summary of the 2021-2023 capital expenditures for the Sewer System.

Table 4 - Sewer System Expenditures by Program Category

Program	2021	2022	2023	2021-2023
Sewer R & R	19,987,000	19,629,000	16,513,000	56,129,000
Increased Capacity	480,000	820,000	300,000	1,600,000
Separation	10,919,000	4,086,000	3,816,000	$18,821,000
Sewer Special	3,084,000	2,755,000	1,944,000	7,783,000
Total	34,470,000	27,290,000	22,573,000	84,333,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

CONSENT DECREE

On August 23, 2012, the Commission entered in a Consent Decree with the Environmental Protection Agency and Conservation Law Foundation. Under the terms of the Consent Decree the Commission implemented a Capacity, Maintenance, Operations and Management ("CMOM") self-assessment study in 2012 that analyzed all aspects of the Commission's sanitary sewer and storm drainage facility operations and maintenance. The Commission finalized a CMOM Corrective Action Plan in July 2013 and developed a CMOM Program Document in May 2014. The CMOM Program synchronizes infrastructure maintenance and operations goals with long-term CIP planning to achieve ("CWA") compliance with the Commission's NPDES permit and ultimately improve water quality.

As part of the CMOM Corrective Action Plan filed with the EPA, the Commission increased its inspection and assessment of its sewer and drainage systems. The program represents progressive increases in the quantity of pipes cleaned and televised with an end goal of completing approximately 10% of the system annually.

The Commission has embraced the Consent Decree requirements from senior management through all divisions and departments. The Commission views the requirements as an opportunity to enhance its current practices and procedures in operating and maintaining the sewer system. Staffing leadership changes have been implemented; for example, a CMOM director and an SSO manager were hired in 2013 to ensure compliance with the requirements enforced by the Consent Decree.

The Consent Decree offers an unprecedented opportunity for the Commission to increase its role as an environmental steward for Boston's waterways. The Commission is committed to meeting and surpassing the benchmarks outlined in the Consent Decree. To fulfill this commitment, the Commission has begun implementing both short-term and long-term measures that are designed to improve water quality, increase public awareness, and protect the environment.

The City of Boston, the Commission and its ratepayers have helped clean up Boston Harbor and Boston's waterways to a level where they are accessible for the public use 90.22% of the time. South Boston's beaches are recognized as the cleanest urban beaches in the U.S. and the Charles River has been recognized by the EPA and internationally as

one of the cleanest urban rivers in America. The Commission's illicit discharge detection protocol and sampling program have been cited as an example and standard by EPA. These achievements are a direct result of the Commission's investment in improved sewer and stormwater infrastructure, implementation of best management practices and working with other stakeholders in the City of Boston. The Commission will continue a tenable, sustainable path to improve water quality and maintain outstanding access to the City's waterways.

PROJECTS ASSOCIATED WITH THE CONSENT DECREE & WATER QUALITY IMPROVEMENTS

There are several projects that the Commission is performing and planning to undertake to fulfill and exceed recommendations of the Environmental Protection Agency and Conservation Law Foundation ("EPA" and "CLF") under the Consent Decree. The following projects will support the Commission's goal of compliance with the Consent Decree and improved water quality discharges and the environment:

Consent Decree	Water Quality Improvements
Sewer R & R	***Separation***
Cleaning and Inspections of Sewers and Storm Drains (CMOM-Capacity Management Operations and Maintenance)	Separation of Sewer House Laterals (Contract 20-309-015)
Separation	Owner Correction of Illegal Connections
Citywide Illegal Connection Investigation Program Phase V	***Stormwater***
Sewer Special	Design of Stormwater Retention- Arnold Arboretum
Customization of SCREAM & CMOM	Construction of Stormwater Retention- Arnold Arboretum
CCTV of Sewers and Storm Drains (Contamination Investigation) IDDE	Constructed Wetland in Stormwater Tributary Area
Stormwater	Sampling & Metering for Storm Drain Model Validation
Construct BMPs & Green Infrastructure at City Hall Plaza	Design Services for the Construction of Green Infrastructure / Stormwater Retention Structures for Low Lying Areas

NOTE: *Full description and forecasted budgets of individual projects are available in the Sewer R & R, Sewer Separation, Sewer Special & Stormwater sections.*

Table 5 presents a summary of the 2021-2023 projected capital expenditures associated with the Consent Decree.

Table 5 – Consent Decree Expenditures by Contract

Contract	Description	Budget
21-309-009	CCTV of Sewer & Storm Drains/CMOM	$1,000,000
21-309-010	CCTV of Sewers & Storm Drains/CMOM	$1,000,000
Future Contracts	CCTV of Sewer & Storm Drains/CMOM	$4,000,000
20-206-007	Citywide Illegal Connections PH V	$2,226,000
18-309-005	Lateral Testing & CCTV OF Sewer & Drains IDDE	$33,000
NA	Lateral Testing & CCTV OF Sewer & Drains IDDE	$500,000
N/A	Construct BMPs & GI at City Hall Plaza	$1,500,000

DEDICATED INFILTRATION INFLOW 4:1 PROJECTS

In 2004, the Massachusetts Department of Environmental Protection ("DEP"), in conjunction with the MWRA and its member communities implemented a program to help remove stormwater infiltration and inflow: I/I from the sewer system. Private developments may add substantial flows to the sewer collection system, requiring additional MWRA treatment.

To offset the effect of these additions, the Massachusetts DEP previously recommended to the Massachusetts Environmental Policy Act Office and the Executive Office of Environmental Affairs that new developments with a sewerage flow estimated at greater than 15,000 GPD be required to remove I/I at a 4:1 ratio from the sanitary sewer system, as part of the requirements by the Secretary of Environmental Affairs.

The Commission conducts investigations to identify sources of I/I to the Commission's system. These projects identify both public and private sector sources of I/I. Commission staff initially planned on developing a database with locations of I/I sources, which would be provided to a developer. The developer would correct sources from that list to fulfill their I/I removal requirement.

However, the Commission staff believed that this process would be unwieldy and unmanageable. Subsequently, at the July 28, 2005 Commission meeting, the Commission approved the establishment of a Dedicated Infiltration/Inflow ("DEDII") account into which developers assessed a 4:1 I/I reduction requirement by the DEP would contribute funds to fulfill their requirements. These funds will be used by the Commission to fund I/I identification and reduction projects.

During private project design, Engineering Customer Services receives and reviews a Site Plan for conformance with the Commission's Engineering Design and Construction standards. The Commission will confirm if the project is subject to the 4:1 compliance requirement as required by the new regulations.

The Engineering Customer Service department will coordinate with the Planning Department on the most current estimated wastewater flow that has been submitted by the developer. The developer will coordinate with the

Commission how to comply with the proposed assessment. The developer can either remove sources of I/I or make a requisite monetary contribution to the Commission.

In April 2014, the DEP promulgated new regulations. These regulations require the Commission to mitigate the impacts of development of all new sewer connections exceeding 15,000 gpd by removing four gallons of I/I for each new gallon of wastewater flow. For example, if a proposed project's calculated new daily wastewater flow is 100,000 gallons per day (gpd), the developer must remove 400,000 gpd of I/I from the sewer system.

To date, the Commission has implemented twelve contracts, which are funded by the 4:1 I/I Infiltration Inflow Reduction Mitigation Account. Contracts 09-309-008, 10-206-005, 10-309-004, 15-206-001, 17-206-004 and Inflow SSES project (Roslindale & West Roxbury) contract 18-206-004 are complete. Contracts 14-206-002, the Infiltration and Inflow SSES project (Allston/Brighton) contract 19-206-009, the Infiltration and Inflow SSES project (Mattapan) contract 20-206-008 and as well as South Boston Sewer Separation are ongoing. The South Boston Separation includes both design costs under contract 16-206-003 and construction costs under contracts 20-309-012, & 21-309-012. All costs identified as "DEDII" and are 100% reimbursable; therefore, are not included in the 2021-2023 cashflow. Only separation costs affiliated with the South Boston Separation are funded by DEDII.

Table 6 lists DEDII funded projects.

Table 6 – Dedicated I/I Expenditures and Status by Contract

Contract	Description	Cost	Status
09-309-008	Dorchester Brook Regulator Relocation	$6,924,672.92	Complete
10-206-005	Roxbury Separation Design Contract	$1,732,975.60	Complete
10-309-004	East Boston Separation	$504,381.30	Complete
15-206-001	Infiltration and Inflow Analysis	$1,998,970.00	Complete
17-206-004	Infiltration and Inflow Analysis	$994,470.00	Complete
18-206-004	I/I SSES (Roslindale & West Rox)	$1,301,793.00	Complete
19-206-009	I/I SSES (Allston/Brighton)	$1,415,720.00	Active
20-206-008	I/I SSES (Mattapan)	$1,500,000.00	Active
14-206-002	Roxbury Separation Design Contract	$1,049,954.00	Active
16-206-003	South Boston Separation	$5,380,000.00	Active
20-309-012	South Boston Separation	$5,820,000.00	Active
20-309-12P	South Boston Separation	$1,723,000.00	Active
21-309-012	South Boston Separation	$2,868,000.00	Active
20-206-002	South Boston Separation	$3,250,000.00	Active

WASTEWATER AND STORM DRAINAGE FACILITIES PLAN

The Commission completed its **Wastewater and Storm Drainage System Facilities Plan** in 2015. A major objective of the plan was to develop facility plans for the operation of the Commission's sewer and storm drains that are aligned with the Commission's primary service goals and supported by effective operations, maintenance, and engineering practices. This plan has reviewed all aspects of the Commission Sewer System, including the Commission's design standards, assets, mapping, maintenance and operational practices and future impacts of climate change on the Commission's facilities.

Critical elements of this Plan include:

- ✓ **Assessment of the Commission's Service Goals and other factors affecting long-term planning including** changing regulatory requirements, climate change and financial conditions
- ✓ **Systematic use of Risk-based tools** to govern prioritization of investments in condition assessments, repairs and replacements
- ✓ **Integration of Business Processes** needed to sustain effective **C**apacity, **M**anagement, **O**peration and **M**aintenance (CMOM) Programs for sanitary sewer collections systems and engineering programs
- ✓ **Training and Education** to embrace the use of new tools and business processes and to sustain knowledge of the system and its operations

In addition to establishing a sustainable framework for planning and management, the plan includes a broad spectrum of data collection, engineering evaluation and tool development activities.

SUPPORT PROJECT EXPENDITURES

The capital projects included in the Support category contribute to the overall efficient operation of the Commission and improve the Commission's ability to manage/administer projects and collect revenues. Monies allocated for Support projects in the 2021-2023 CIP total $20.4 million.

Monies budgeted in this section of the CIP are included expenditures for Advanced Meter Infrastructure, Information Technology, and various Administrative Equipment.

Table 7 presents a summary of the 2021-2023 capital expenditures for the Support projects.

Table 7 - Support Expenditures by Project Category

Program	2021	2022	2023	2021-2023
Metering	1,015,000	1,615,000	815,000	3,445,000
IT	3,075,000	2,215,000	1,510,000	6,800,000
Admin Equip	2,911,000	6,681,000	558,000	10,150,000
Total	7,001,000	10,511,000	2,883,000	20,395,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

STORMWATER PROJECT EXPENDITURES

The primary purpose of the Stormwater Program is to encourage participation in the Boston Harbor pollution abatement projects and implement green infrastructure to improve the water quality of discharges to the local receiving waters. The goal is also to study existing conditions and make recommendations for placement of new best management practices designed to promote improved water quality, ensure compliance with state and federal regulations, minimize flooding and manage stormwater throughout the City of Boston. Monies allocated for Stormwater projects in the 2021-2023 CIP total $9.2 million.

Table 8 presents a summary of the 2021-2023 capital expenditures for the Stormwater projects.

Table 8 - Stormwater Expenditures by Project Category

Program	2021	2022	2023	2021-2023
Stormwater	4,559,000	2,881,000	1,720,000	9,160,000
Total	4,559,000	2,881,000	1,720,000	9,160,000

NOTE: *Although expenditures decrease from periods 2022 to 2023, it is anticipated that funding for 2023 will be equal to or greater than funding presented in 2022. The decrease in 2023 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.*

MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)

The Commission obtains its water supply and wastewater treatment services from MWRA. MWRA provides water services to 52 cities, towns and special purpose entities ("Local Bodies") including the Commission and wastewater treatment to nearly half of the State's population in 43 cities, towns and special purpose entities located throughout central and eastern Massachusetts.

MWRA Background

In December 1984, MWRA was created by Chapter 372 of the Acts of 1984 ("the Act"). In accordance with the provisions of the Act effective July 1, 1985 the ownership, possession and control of all property comprising the Metropolitan District Commission ("MDC") water and sewer systems was transferred to MWRA. The Act authorizes MWRA to repair, replace, rehabilitate, modernize and extend the water delivery system and the sewage collection, disposal and treatment systems on a self-sustaining basis. The Act also allows for the issuance of bonds and notes to finance any of its corporate activities.

On January 31, 1985, a suit commonly referred to as the Boston Harbor case, was brought against the MDC, the Commonwealth, MWRA (as successor to the MDC) and the Commission alleging water pollution of and alleged illegal discharges into Boston Harbor in violation of the Clean Water Act. As the successor to the MDC, MWRA assumed responsibility for taking the Court-ordered actions to achieve and maintain compliance with the CWA. Such large-scale projects are financed through the issuance of revenue bonds, proceeds of federal and state grants and operating revenues.

MWRA Rates and Charges

Under the Act, MWRA was empowered to establish charges for its services and commodities. One of the basic goals achieved by the MWRA Act was the substitution of assessments, or user fees, to the member communities for the prior tax-based system of charges.

The Commission is the largest single customer for MWRA. For MWRA fiscal year 2021, the Commission will be assessed 36.6% of the water system charges and 29.0% of the sewer system charges. On a combined basis, the Commission will pay 32.0% of the total MWRA assessments.

Assessments for water services are calculated by MWRA based on the metered water use in the calendar year immediately preceding the MWRA fiscal year. The Commission's water charges for the MWRA fiscal year 2021 total $98.0 million based on the Commission's calendar year 2019 metered water use.

As of fiscal year, 1995, sewer assessments were calculated by a formula using, among other things, population and population equivalents. In accordance with legislation enacted in 1993, the MWRA developed a new sewer rate methodology for calculating assessments beginning in fiscal year 1996. The new methodology allocates operating and maintenance costs based on total metered annual flow and total annual average strength, septage contributions and high strength flow loads. Septage contributions are allocated based on volume, total suspended solids ("TSS") and biochemical oxygen demand ("BOD") loadings. High-strength flow loads are generated by those permitted entities whose flows exceed 25,000 gallons per day and whose TSS and/or BOD concentrations exceed 400 milligrams per liter.

Capital or debt service costs are allocated as follows: two-eighths based on maximum month metered flow and total annual average strength, septage and high strength flow loads; three-eighths based upon contributing (sewer) population; and three-eighths based population. Metered wastewater flow from the immediately preceding calendar year is used in calculating assessments. The Commission's sewer assessment for the MWRA fiscal year 2021 based on calendar year 2019 data, totals $146.0 million. Total assessments for water and sewer charges for MWRA fiscal year 2021 are $244.0 million.

As the largest of MWRA's customers, BWSC represents 36.1 percent of the current demand on the MWRA water supply. BWSC's water comes from the Quabbin Reservoir and the Wachusett Reservoir, located about 65 miles and 35 miles west of Boston. The two reservoirs combined supplied an average of 194.4 mgd (millions of gallon per day) to consumers in 2019. The safe yield of the reservoir system is 300 mgd.

Water distributed to the Boston metropolitan area is conveyed from the reservoirs through the Cosgrove or Wachusett Aqueducts and treated at the MWRA's John J. Carroll Water Treatment Plant at Walnut Hill in Marlborough. Treatment includes ozone disinfection, pH adjustment with sodium bicarbonate and the addition of chloramines and fluoride. Water leaves the plant through the Metrowest Water Supply Tunnel and is stored in covered storage tanks, such as Norumbega Reservoir and the Loring Road Tanks, where it is held for delivery to BWSC's service networks. MWRA mains distribute water to the BWSC system at 29 metered delivery points.

Today, Boston is one of 52 customers that purchases water wholesale from MWRA. BWSC's water distribution system currently provides service to approximately 90,000 active accounts throughout the City. Boston's resident population of nearly 646,000 almost doubles each day by commuting workers and students, shoppers, tourists, conventioneers, hospital patients and visitors.

MWRA has completed construction of major transmission and treatment facilities to service the Greater Boston area including the Metro West Tunnel. These improvements will ensure that Boston receives a reliable source of clean water.

FUNDING SOURCES AND FINANCIAL IMPACT

Funding for the Commission's CIP is provided through four sources: Commission general revenue bonds, rate revenues and two grant/loan programs provided by MWRA.

The primary funding source for the three-year capital program is the sale of Commission general revenue bonds. Over the three-year plan, general revenue bonds will comprise $113.6 million, or 56.5% of the total funding requirement. In 2021, bonds will make up approximately $43.5 million, or 60.4% of the funding required for that year.

As in past CIP's, the 2021-2023 program funds renewal and replacement ("R&R") work from current rate revenues. Renewal and replacement projects include water main relining, water main replacement (only replacement with the same size pipe), sewer pipe rehabilitation. The 2021-2023 CIP outlines R&R expenditures of $55.1 million, or 27.4% of total expenditures over the three years of the program. In 2021, approximately $18.7 million, or 26.0% will be expended out of current rate revenues for CIP projects.

Each year the Commission participates in the MWRA's I/I program for Infiltration/Inflow and Separation projects. Since 1993, the Commission has received $94.1 million in MWRA funding for various Infiltration/Inflow and Separation projects. The Commission plans to continue to take advantage of MWRA funding over the 2021-2023 period. $14.3 million in funding is anticipated to be used for projects that are ongoing along with new projects for the three years 2021-2023.

Table 9 lists projects funded by MWRA's I/I program for Infiltration/Inflow and Separation

Contract	Description
20-309-012	South Boston Separation Contract 1
20-309-011P	South Boston Separation Contract 1 Paving
21-309-012	South Boston Separation Contract 2
17-308-002	Sewer R & R in Dorchester & Roxbury
17-309-005	Sewer Separation in East Boston Phase II
17-309-011	Sewer Separation Roxbury Contract 3
16-309-005	Sewer Separation East Boston
16-309-011	Sewer Separation Roxbury Contract 2

In 2010, the MWRA Board voted to authorize the development of an interest free loan program to assist its member communities in the performance of water system improvement projects. The program is the MWRA Local Water System Assistance Program (LWSAP). The program offers interest-free loans payable over a ten-year period and is designed to improve water quality in local distribution systems. The amount of funds available in the program is $34.3 million dollars per year with Boston receiving a share of approximately $5.3 million dollars per year. The loans will be repaid to the MWRA over a ten-year period. Loan funds are approved for distribution from fiscal year 2011 through fiscal year 2021. The Commission has applied for loan funding for certain water main replacement projects awarded through the remainder of this program. Project costs incurred since January 1, 2010 have been considered for eligibility in applications under the LWSAP. From 2010-2021 the Commission has received $52.6 million in LWSAP funding.

It is anticipated in the 2021-2023 Capital Improvement Program $18.1 million will be funded using the LWSAP Program.

Table 10 lists projects funded by LWSAP

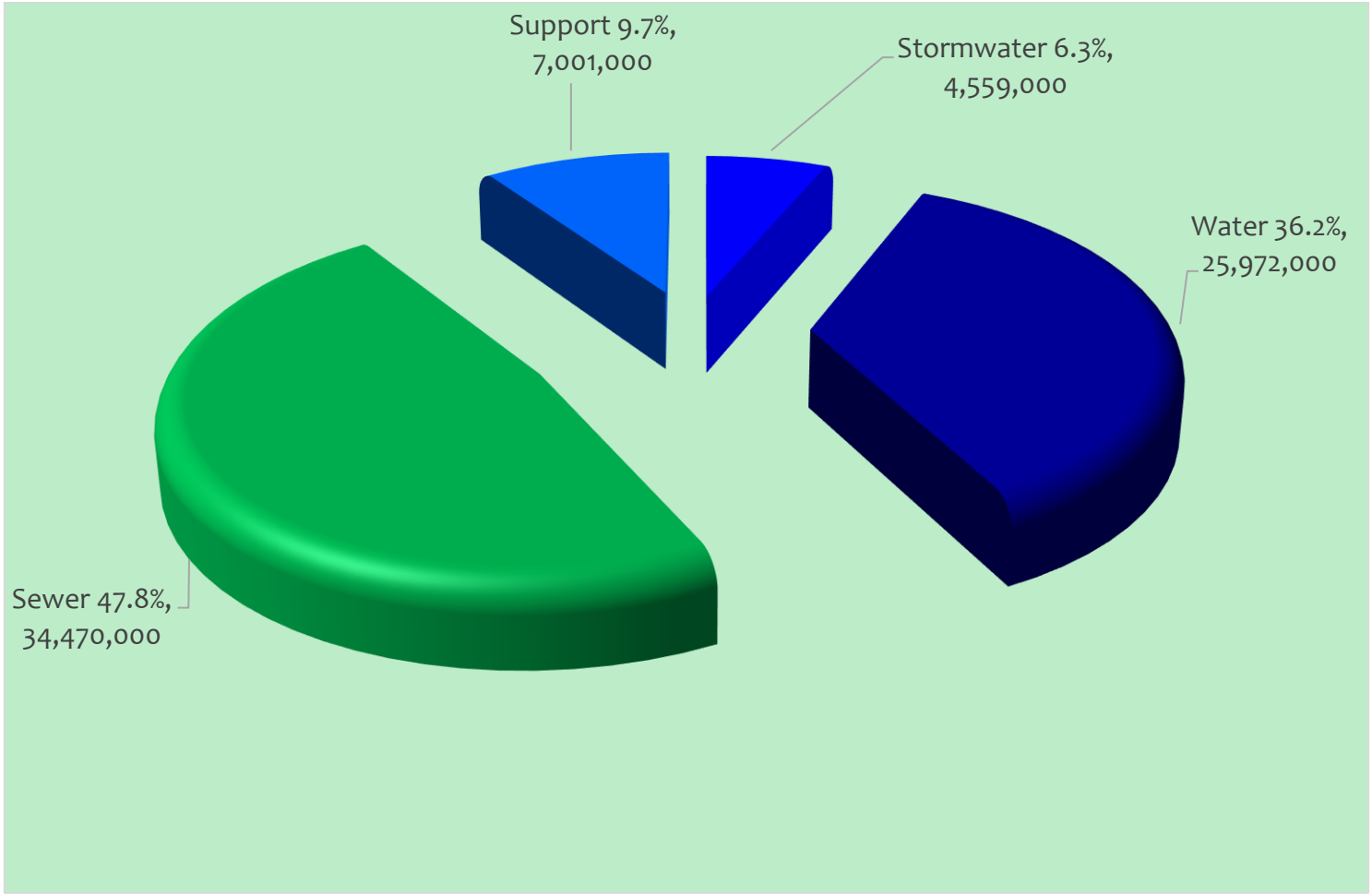
Contract	Description
20-309-012	South Boston Separation Contract 1
20-309-11P	South Boston Separation Contract 1 Paving
21-309-012	South Boston Separation Contract 2
22-309-012	South Boston Separation Contract 3
20-308-001	Water Main Replacement on Harrison Ave, South End
19-308-001	South End Water Pipe Improvements Phase I
18-308-001	Water Main Replacement in City Proper
17-308-002	Water Main Replacement in Dorchester and Roxbury
17-308-003	Water Main Replacement in Jamaica Plain and Mattapan
17-308-005	Water Main Replacement in the South End

Table 11 on page 17 represents the cash flow expenditures by category and funding source for the Commission's 2021-2023 CIP.

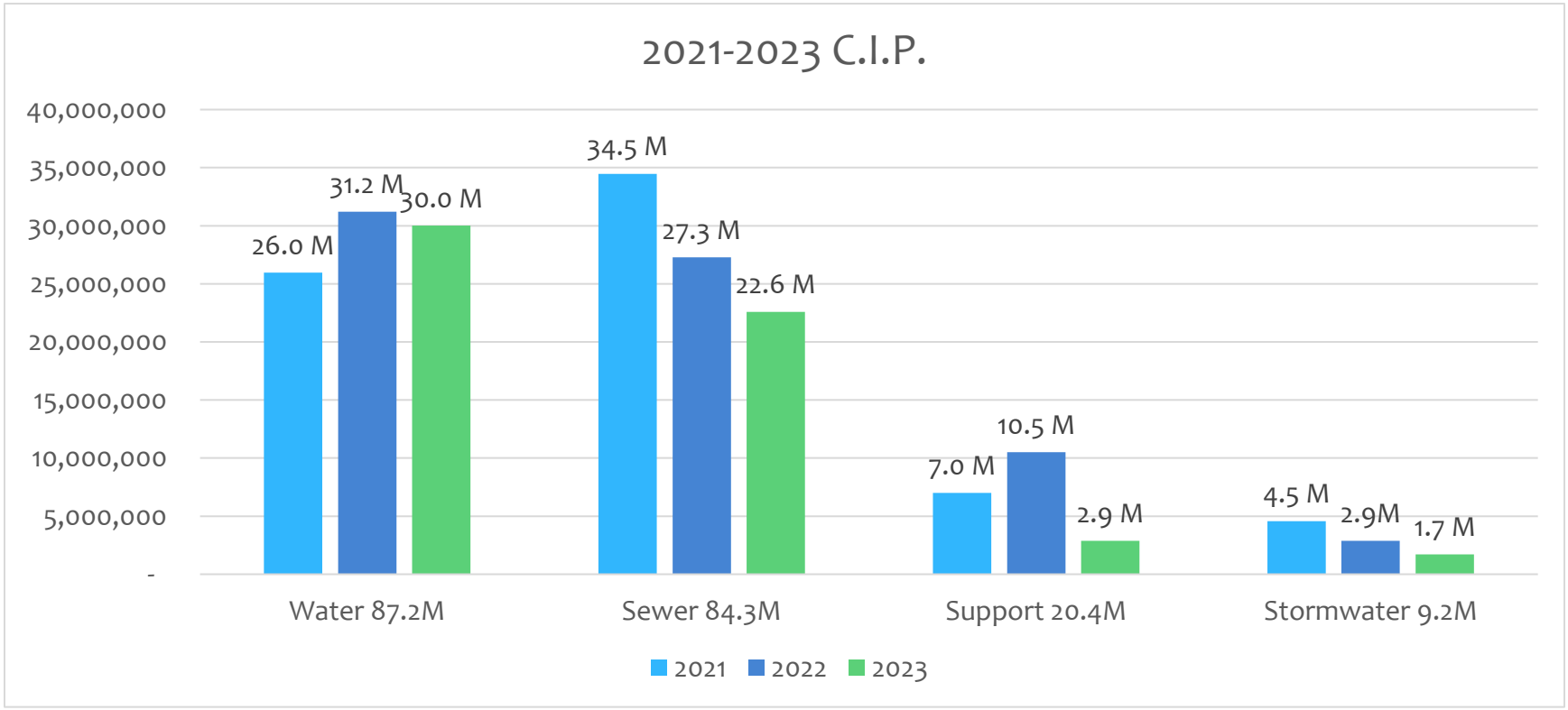
Capital Improvement Program
2021 - 2023
Totals by Category and Funding Source

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
Water Total	$ 548,000	$ 221,000	$ 404,000	$ 1,524,000	$ 2,778,000	$ 3,000,000	$ 2,487,000	$ 3,153,000	$ 3,385,000	$ 2,820,000	$ 3,001,000	$ 2,651,000	$ 25,972,000	$ 31,207,000	$ 30,009,000	$ 87,188,000
Bonds	368,000	164,000	117,000	778,000	1,821,000	2,197,000	1,935,000	2,570,000	2,629,000	2,288,000	2,503,000	2,170,000	19,540,000	17,697,000	15,289,000	52,526,000
Rate	114,000	57,000	287,000	496,000	653,000	498,000	500,000	473,000	425,000	423,000	437,000	407,000	4,770,000	5,583,000	6,171,000	16,524,000
LWSAP	66,000	-	-	250,000	304,000	305,000	52,000	110,000	331,000	109,000	61,000	74,000	1,662,000	7,927,000	8,549,000	18,138,000
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sewer Total	$ 2,594,000	$ 2,768,000	$ 2,872,000	$ 3,488,000	$ 3,349,000	$ 4,072,000	$ 2,939,000	$ 3,327,000	$ 2,419,000	$ 2,456,000	$ 1,988,000	$ 2,198,000	$ 34,470,000	$ 27,290,000	$ 22,573,000	$ 84,333,000
Bonds	598,000	986,000	1,003,000	1,342,000	1,089,000	1,628,000	1,109,000	1,092,000	918,000	789,000	736,000	1,121,000	12,411,000	11,290,000	7,791,000	31,492,000
Rate	1,353,000	700,000	671,000	780,000	1,430,000	1,748,000	1,178,000	1,648,000	1,159,000	1,229,000	1,114,000	910,000	13,920,000	12,990,000	11,663,000	38,573,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	643,000	1,082,000	1,198,000	1,366,000	830,000	696,000	652,000	587,000	342,000	438,000	138,000	167,000	8,139,000	3,010,000	3,119,000	14,268,000
Support Total	$ 290,000	$ 275,000	$ 808,000	$ 300,000	$ 325,000	$ 533,000	$ 170,000	$ 455,000	$ 1,722,000	$ 530,000	$ 530,000	$ 1,063,000	$ 7,001,000	$ 10,511,000	$ 2,883,000	$ 20,395,000
Bonds	290,000	275,000	808,000	300,000	325,000	533,000	170,000	455,000	1,722,000	530,000	530,000	1,063,000	7,001,000	10,511,000	2,883,000	20,395,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stormwater Total	$ 297,000	$ 292,000	$ 293,000	$ 402,000	$ 422,000	$ 424,000	$ 418,000	$ 418,000	$ 409,000	$ 408,000	$ 388,000	$ 388,000	$ 4,559,000	$ 2,881,000	$ 1,720,000	$ 9,160,000
Bonds	297,000	292,000	$ 293,000	$ 402,000	$ 422,000	$ 424,000	$ 418,000	$ 418,000	$ 409,000	$ 408,000	$ 388,000	$ 388,000	$ 4,559,000	$ 2,881,000	$ 1,720,000	$ 9,160,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**$ 3,729,000**	**$ 3,556,000**	**$ 4,377,000**	**$ 5,714,000**	**$ 6,874,000**	**$ 8,029,000**	**$ 6,014,000**	**$ 7,353,000**	**$ 7,935,000**	**$ 6,214,000**	**$ 5,907,000**	**$ 6,300,000**	**$ 72,002,000**	**$ 71,889,000**	**$ 57,185,000**	**$ 201,076,000**
Bonds	1,553,000	1,717,000	2,221,000	2,822,000	3,657,000	4,782,000	3,632,000	4,535,000	5,678,000	4,015,000	4,157,000	4,742,000	43,511,000	42,379,000	27,683,000	113,573,000
Rate	1,467,000	757,000	958,000	1,276,000	2,083,000	2,246,000	1,678,000	2,121,000	1,584,000	1,652,000	1,551,000	1,317,000	18,690,000	18,573,000	17,834,000	55,097,000
LWSAP	66,000	-	-	250,000	304,000	305,000	52,000	110,000	331,000	109,000	61,000	74,000	1,662,000	7,927,000	8,549,000	18,138,000
I/I	643,000	1,082,000	1,198,000	1,366,000	830,000	696,000	652,000	587,000	342,000	438,000	138,000	167,000	8,139,000	3,010,000	3,119,000	14,268,000
Total	**$ 3,729,000**	**$ 3,556,000**	**$ 4,377,000**	**$ 5,714,000**	**$ 6,874,000**	**$ 8,029,000**	**$ 6,014,000**	**$ 7,353,000**	**$ 7,935,000**	**$ 6,214,000**	**$ 5,907,000**	**$ 6,300,000**	**$ 72,002,000**	**$ 71,889,000**	**$ 57,185,000**	**$ 201,076,000**

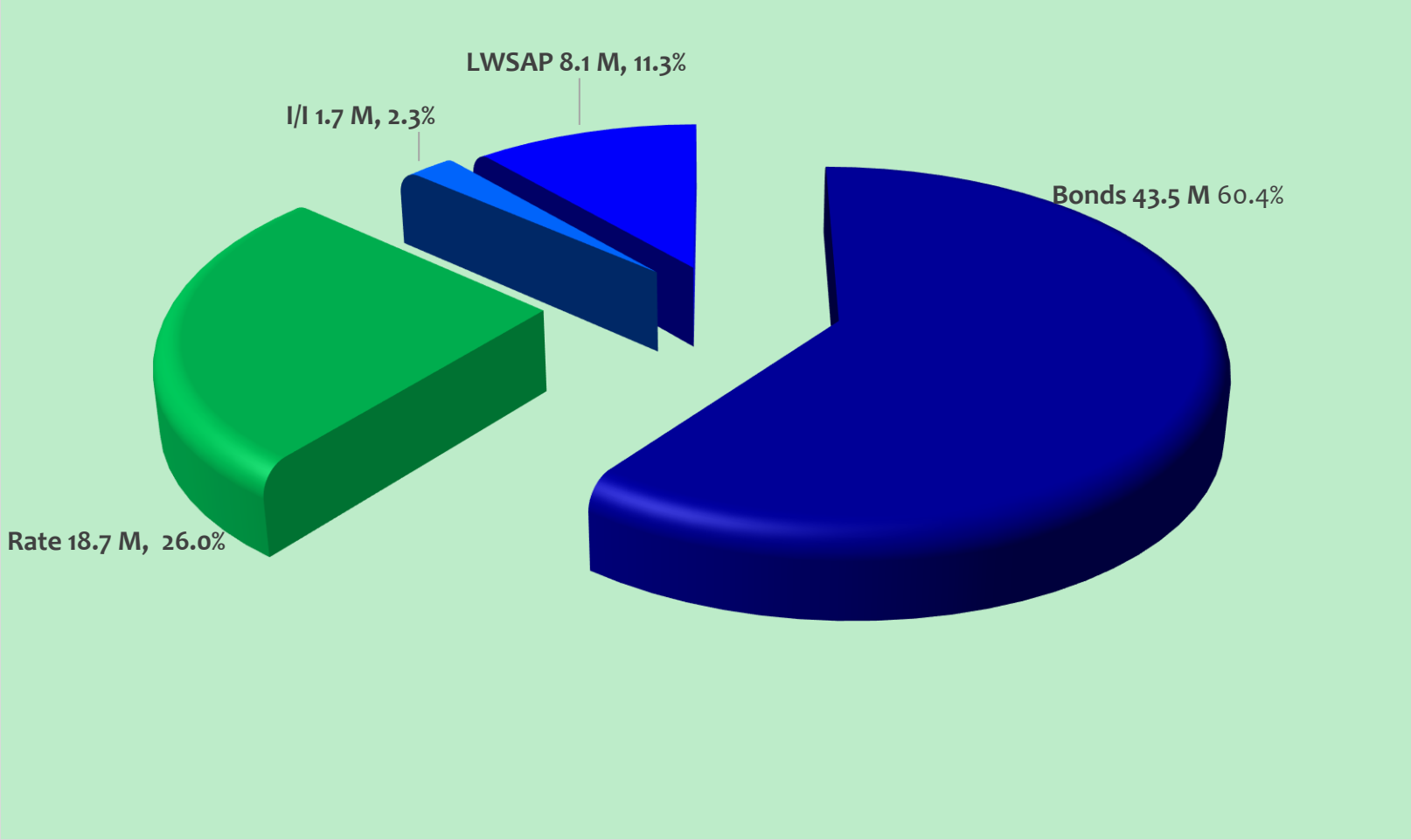
Graph 1 - 2021 CIP Total Expenditures $72.0 Million



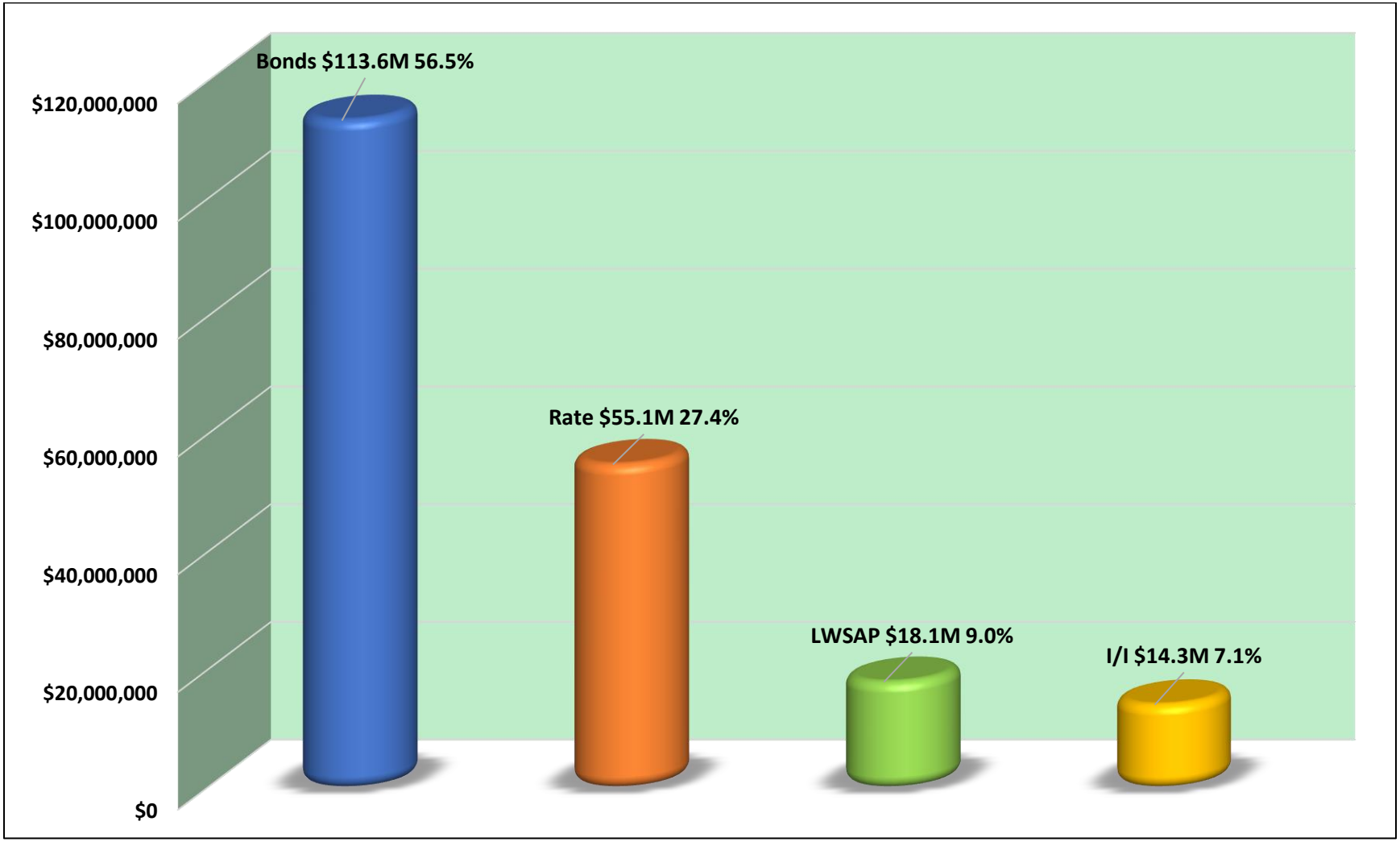
Graph 2 – 2021-2023 CIP Total Expenditures $201.1 Million



Graph 3 – 2021 CIP Total Expenditures by Funding $72.0 Million



Graph 4 – 2021 - 2023 Total Expenditures by Funding Source $201.1 Million



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WATER DISTRIBUTION SYSTEM

The system serves approximately 90,000 accounts through five major service networks: Southern Low Service, which serves City Proper, South Boston and parts of Roxbury; Northern Low Service which serves Allston/Brighton, Charlestown and East Boston; Southern High Service, which serves City Proper, Allston/Brighton, Dorchester, Hyde Park, Roslindale, and parts of Jamaica Plain, Roxbury and West Roxbury; and Southern Extra-High Service which serves portions of Jamaica Plain, West Roxbury and Hyde Park. In addition, a relatively small area in the Orient Heights section of East Boston is served by a single connection to the MWRA Northern High Service System.

Approximately 90% of the water consumed in the city is delivered through the Southern Low Service and Southern High Service, with most of the remainder delivered through the Northern Low Service. These service networks are supplied with potable water purchased from MWRA at 29 metered delivery points. This water is drawn from the Quabbin and Wachusett Reservoirs located in western and central Massachusetts. Supply is conveyed via aqueducts from these reservoirs to the Loring Road Tanks and Norumbega Reservoirs, where it is held for delivery to the Commission's service networks.

The Commission's current water distribution system consists of the following:

APPURTENANCES		WATER MAIN CITY WIDE		PRESSURE ZONE	
Hydrants	12,724	Total Linear Feet	5,323,872	High Pressure Fire System	15 Miles
		Total Linear Miles	1,007	Northern High	4 Miles
				Northern Low	89 Miles
		Pumping Stations	1		
Gate Valves *	17,635			Southern Extra High	80 Miles
				Southern High	560 Miles
				Southern Low	259 Miles

** Includes only facilities owned by BWSC*

OBJECTIVES

Primary Objectives of the 2021-2023 Water Distribution System are:

- To ensure a continued adequate supply of high quality, potable water at adequate pressure for consumption by Commission's customers and for fire protection
- To reduce the amount of non-revenue producing water and to reduce the long-term maintenance costs of the system
- To improve the operability of valves and appurtenances to advance the efficient operation of the water system
- To reduce public inconvenience by coordinating the scheduling of system improvements with related projects of other public agencies

To ensure the above stated objectives are attained, the Commission has implemented projects of the rehabilitation and replacement water mains, the replacement of valves and hydrants and the installation or replacement of water mains associated with bridge reconstruction projects.

2021-2023 WATER PROJECTS

Water Pipe Replacement Projects	• Replacement of Unlined Cast-Iron Water Mains
Water Special	• System Planning as well as Other Studies and Professional Services with the Rehabilitation and Operation of the Water System

Over the last ten years, the Commission has completed a total of $363.5 million in water distribution system improvements. These improvements have resulted in the replacement of 106.2 miles of water mains, and cement lining of 8.0 miles of water mains.

2021-2023 WATER DISTRIBUTION SYSTEM CAPITAL PROGRAM

The Commission's 2021-2023 CIP for the Water Distribution System continues the investments necessary to maintain and improve the water distribution infrastructure. Projects are planned in the following areas: the rehabilitation or replacement of water mains, including the replacement of water pipes and the upgrade of valves and hydrants. Also included are water mains that are replaced as part of the Commission's sewer separation work. Together, these planned program activities will result in significant improvements to the water distribution system.

Table 12 and Graph 5 present the 2021-2023 capital expenditures for the Water Distribution System. Graph 6 depicts the funding source application of the 2021-2023 capital expenditures. Graph 7 illustrates the spending by the program for 2021. Three-year expenditures are projected to be $87.2 million, of which $26.0 million is anticipated to occur in 2021. The three-year amounts are distributed in the Water Program as follows: Replacement $66.3 million or 76.0% and Special $20.9 million or 24.0%.

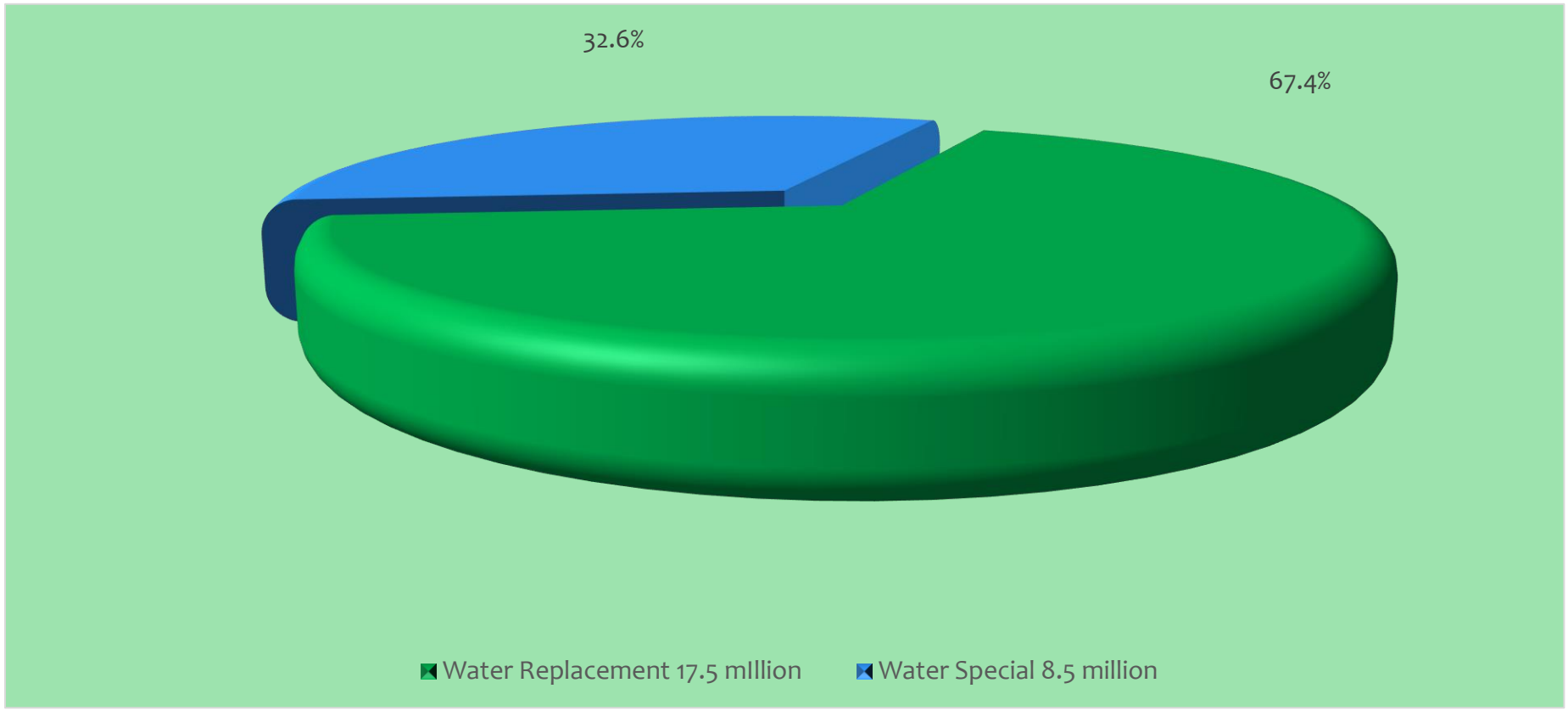
Water Main Replacement on Bowdoin St in City Proper

Table 12 - Water Distribution System by Category

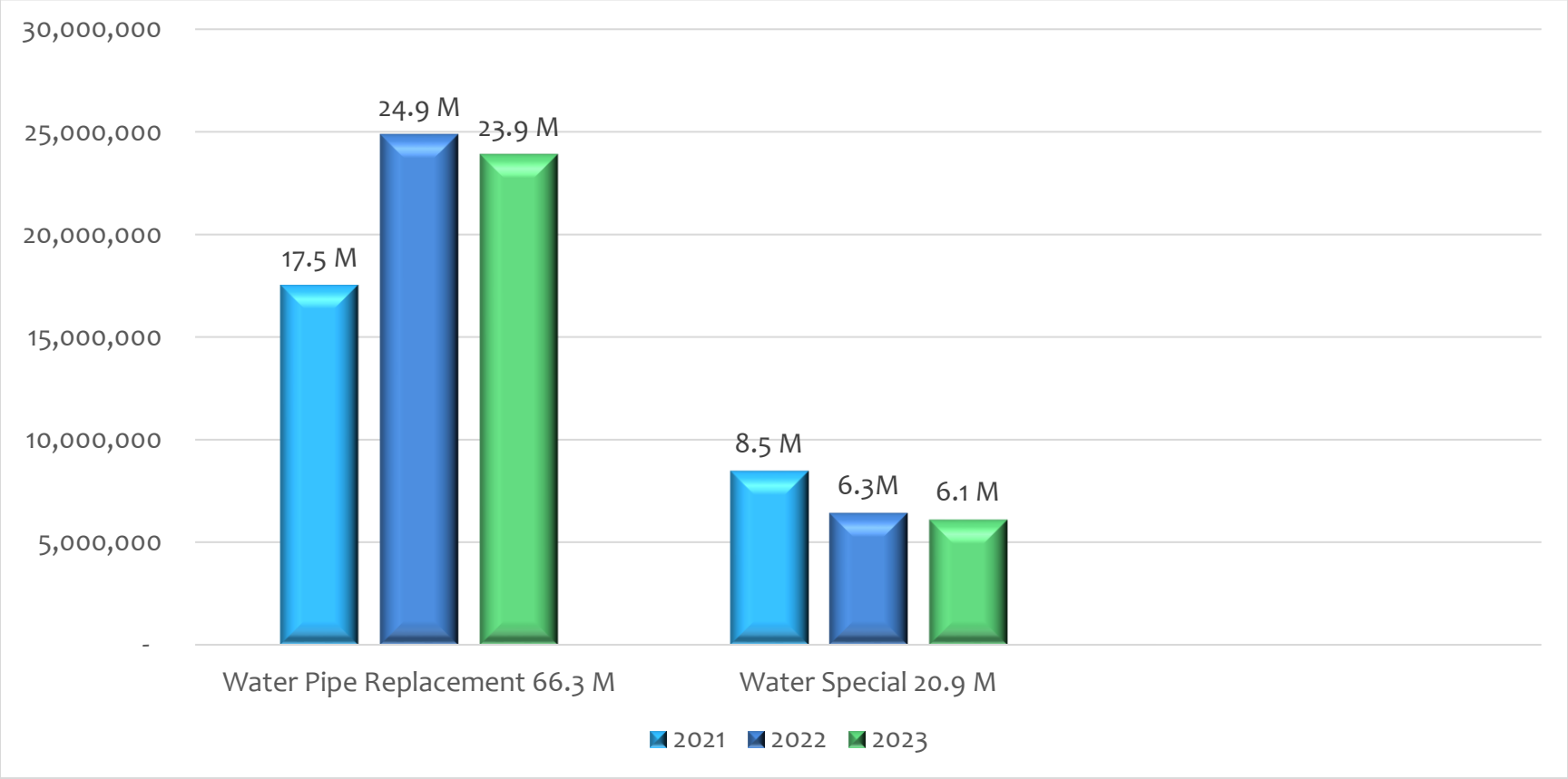
Capital Improvement Program
2021 - 2023
Water Total

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
Water Replacement																
Bonds	99,000	13,000	38,000	387,000	1,352,000	1,688,000	1,426,000	1,718,000	1,777,000	1,437,000	1,651,000	1,367,000	12,953,000	10,112,000	9,761,000	32,826,000
Rate	57,000	-	230,000	209,000	98,000	124,000	125,000	442,000	393,000	391,000	405,000	417,000	2,891,000	6,826,000	5,579,000	15,296,000
LWSAP	66,000	-	-	250,000	304,000	305,000	52,000	110,000	331,000	109,000	61,000	74,000	1,662,000	7,927,000	8,549,000	18,138,000
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relay Total	$ 222,000	$ 13,000	$ 268,000	$ 846,000	$ 1,754,000	$ 2,117,000	$ 1,603,000	$ 2,270,000	$ 2,501,000	$ 1,937,000	$ 2,117,000	$ 1,858,000	$ 17,506,000	$ 24,865,000	$ 23,889,000	$ 66,260,000
Water Special																
Bonds	269,000	151,000	79,000	391,000	469,000	509,000	509,000	509,000	509,000	509,000	509,000	460,000	4,873,000	4,672,000	4,500,000	14,045,000
Rate	57,000	57,000	57,000	287,000	555,000	374,000	375,000	374,000	375,000	374,000	375,000	333,000	3,593,000	1,670,000	1,620,000	6,883,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Special Total	$ 326,000	$ 208,000	$ 136,000	$ 678,000	$ 1,024,000	$ 883,000	$ 884,000	$ 883,000	$ 884,000	$ 883,000	$ 884,000	$ 793,000	$ 8,466,000	$ 6,342,000	$ 6,120,000	$ 20,928,000
Water Total	$ 548,000	$ 221,000	$ 404,000	$ 1,524,000	$ 2,778,000	$ 3,000,000	$ 2,487,000	$ 3,153,000	$ 3,385,000	$ 2,820,000	$ 3,001,000	$ 2,651,000	$ 25,972,000	$ 31,207,000	$ 30,009,000	$ 87,188,000
Bonds	368,000	164,000	117,000	778,000	1,821,000	2,197,000	1,935,000	2,227,000	2,286,000	1,946,000	2,160,000	1,827,000	17,826,000	14,784,000	14,261,000	46,871,000
Rate	114,000	57,000	287,000	496,000	653,000	498,000	500,000	816,000	768,000	765,000	780,000	750,000	6,484,000	8,496,000	7,199,000	22,179,000
LWSAP	66,000	-	-	250,000	304,000	305,000	52,000	110,000	331,000	109,000	61,000	74,000	1,662,000	7,927,000	8,549,000	18,138,000
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$ 548,000	$ 221,000	$ 404,000	$ 1,524,000	$ 2,778,000	$ 3,000,000	$ 2,487,000	$ 3,153,000	$ 3,385,000	$ 2,820,000	$ 3,001,000	$ 2,651,000	$ 25,972,000	$ 31,207,000	$ 30,009,000	$ 87,188,000

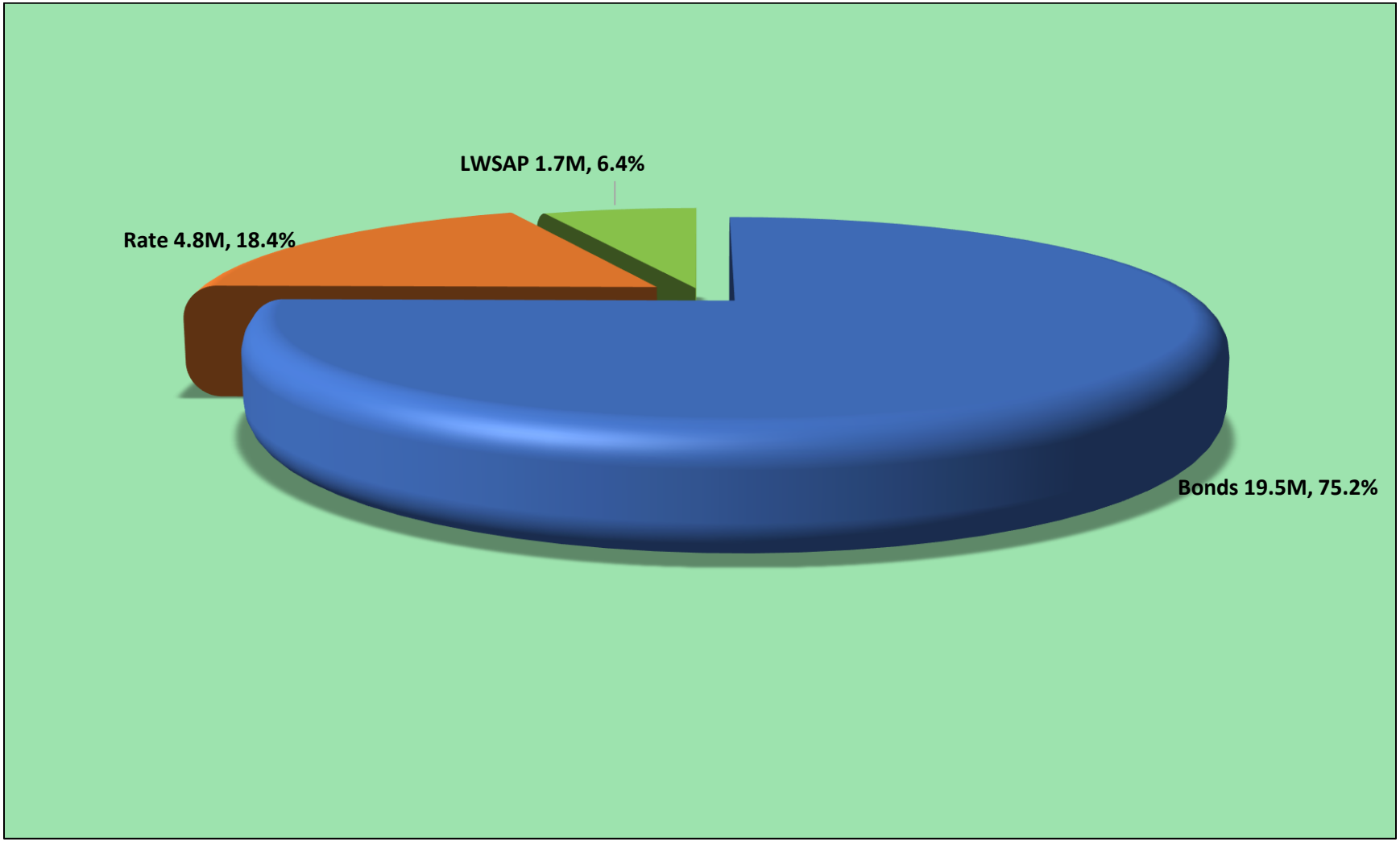
Graph 5 - 2021 Total Water Expenditures by Program 26.0 Million



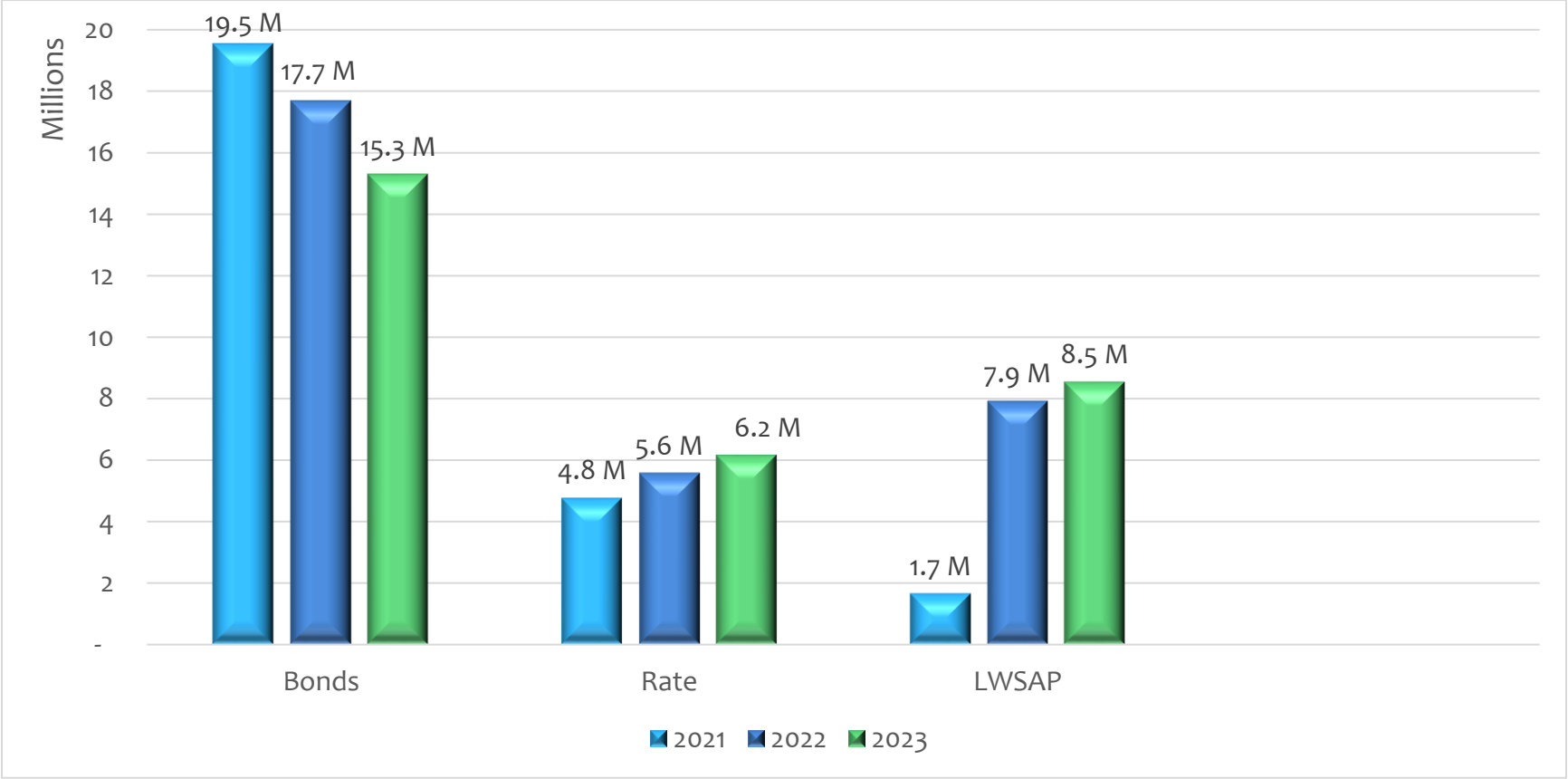
Graph 6 – 2021 - 2023 Total Water Expenditures by Program 87.2 Million



Graph 7 – 2021 Total Water Expenditures by Funding Source
26.0 Million



Graph 8 - 2021-2023 Total Water Expenditures by Funding Source 87.2 million



WATER MAIN REPLACEMENT PROGRAM

DESCRIPTION AND JUSTIFICATION

Funding is provided in the 2021-2023 CIP for the continuation of the Commission's Water Main Rehabilitation Program. The program consists of the replacement of unlined cast-iron water mains and water mains that have reached the end of their useful life.

The primary purpose of the Water Main Replacement Program is to ensure the quality and quantity of water provided by the Commission to its customers. Over long periods of time the internal and external surfaces of water mains are subject to corrosion and deterioration. Internal corrosion of water mains can affect water quality, particularly taste, odor and color as well as reduce the hydraulic capacity of the pipe. Internal and external corrosion can also reduce the structural integrity of pipe, causing potential leakage and main breaks.

The largest component of the Water Distribution System CIP is the program to replace water mains. The replacement program replaces aged, undersized or structurally deteriorated pipe. The program also includes rehabilitation of pipe by structural lining.

The 2021-2023 CIP for the Water Distribution System continues programs for the replacement of water mains, the replacement of older or defective hydrants as necessary on all replacement projects, the replacement of water mains on new or reconstructed bridges and various design services, permits and paving fees associated with the capital funded projects.

THE WATER MAIN REPLACEMENT PROGRAM ACCOMPLISHES THE FOLLOWING:

- Reduces the occurrence of main breaks, public inconvenience, loss of water and associated costs
- Decreases water leakage
- Increases the capacity of water mains
- Reduces discolored water conditions associated with water main tuberculation
- Reduces long-term maintenance costs
- Contributes to the control of biofilm in complying with the requirements of the Safe Drinking Water Act

In 2011, the Commission completed a Water Distribution Study, which analyzed the effectiveness and stability of the water system. Incorporating a progressive approach to understanding system needs, the new study outlines a detailed maintenance and improvement plan.

This study provided a multi-faceted methodology for strategic investments over the next twenty years. As part of the Water Distribution Study all pipes in the BWSC system were placed in a ranking system through specialized software utilizing several factors including pipe age, material, soil conditions, break history and consequence of

failure. The study recommended replacing 11 miles of pipe per year. This ranking system was updated in 2016 resulting in a recommendation to replace and rehabilitate 8 miles of pipe per year.

This system is used in the selection of pipes for replacement under the Capital Improvement Program. Pipes with the higher ranking are considered for replacement. Pipes are also selected within proximity to other selected pipe to create geographic based contracts. All streets are coordinated with City and State Paving Programs.

Using the latest technology solutions, we are identifying new areas where BWSC can make sustainable improvement to the quality of our environment and services.

WATER MAIN REPLACEMENT PROGRAM 2021 SUMMARY

The projects scheduled for initiation in 2021 will result in the replacement of approximately 8.0 miles of water mains.

Prior to construction, the Commission inspects sewer and drainpipes in streets where water pipes are scheduled to be replaced. All sewer and drain replacement and rehabilitation work is then performed along with the water pipe replacement. This coordination avoids disruption of the streets and saves project costs. Funding for the sewer and drain work is included in the sewer section of the CIP.

METHODOLOGY FOR SELECTING WATER MAINS FOR REHABILITATION

The Commission conducts an annual evaluation of its water distribution system to determine and prioritize water main rehabilitation needs. Based on this annual evaluation staff prepares a priority list of pipes to be replaced.

Candidates are based on information and recommendations from the 2016 update of the pipe ranking system as well as water main breaks, customer complaints concerning water quality or pressure deficiency, BWSC maintenance records, pressure and fire-flow tests and construction work planned by other agencies.

To the highest extent possible, the Commission coordinates the replacement and lining of water mains with roadway and highway construction, urban development, housing development and mass transit work planned by state or local government entities.

For example, if the City of Boston PWD is planning to resurface a roadway within the next few years, the Commission would make every effort to replace the older water main in that street before it is resurfaced.

The coordination of the Commission's capital programs with other infrastructure improvements minimizes temporary construction related impacts to Boston's residential neighborhoods and commercial centers.

WATER REPLACEMENT

The following pages contain brief summaries of each on-going and new water replacement projects included in the 2021-2023 CIP.

NEW PROJECTS

Water Main Rehabilitation in City Proper – Contract No. 21-308-001: The project includes the replacement of 12,500 Ft of water mains in City Proper. Construction is projected to commence September 2021 and be completed by November 2024. The total three-year budget for this project is $4,554,000.

ONGOING PROJECTS

Water Main Replacement in Harrison Ave, South End – Contract No. 20-308-001: This project includes the replacement of older cast iron water mains that have reached their useful life in Harrison Ave, South End. Construction is projected to commence April 2022 and be completed by November 2024. The total three-year budget for this project is $3,387,000.

Water Main Replacement in Charlestown – Contract No. 20-308-003: This project includes the replacement of older cast iron water mains that have reached their useful life in Charlestown. Construction is projected to commence July 2021 and be completed by June 2023. The total three-year budget for this project is $5,655,000.

Water Main Replacement in City Proper / Charlestown – Contract No. 20-308-004: This project includes the replacement of older cast iron water mains that have reached their useful life in City proper / Charlestown. Construction is projected to commence July 2022 and be completed by June 2024. The total three-year budget for this project is $2,630,000.

Final Paving - South Boston Sewer Separation Contract No. 20-309-011P Contract 1: This project includes the final Paving for South Boston Sewer Separation Phase I. This project is one of two (2) planned contracts to install final pavement where new storm drains have been constructed in Phase 1 and 2 to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. New paving will also be installed where upgrades of the sanitary sewer and water main systems impact the roadway surface. Construction is scheduled to commence in September 2021 and is projected to be completed by November 2025. The three-year budget is $845,000.

Water Main Replacement in Charlestown – Contract No. 20-309-002: This project includes the replacement of older cast iron water mains that have reached their useful life in Charlestown. Construction is projected to commence December 2023 and be completed by August 2025. The total three-year budget for this project is $0.

Water Main Replacement in South End Phase I – Contract No. 19-308-001: This project includes the replacement of 6,450 feet of 12-inch and 16-inch water mains on East Berkeley Street and Washington Street in the South End. Construction is projected to commence in May 2022 and be completed by December 2024. The total three-year budget for this project is $3,100,000.

***Water Main Replacement Main Replacement in Charlestown – Contract No. 19-308-002*:** This project will replace 8,800 feet of 8- and 12-inch water mains on Bunker Hill Street, Chelsea Street, School Street, Vine Street, and Bartlett Street in Charlestown. This contract is being programmed as a response to a request by the Operations Division for Water Relay on Chelsea Street, in conjunction with break history (School Street), and pipe age / risk scoring on 1880's PCI mains in Bunker Hill and Vine Streets. Construction is projected to commence in April 2022 and completed by November 2024. The three-year budget is $2,870,000.

Water Main Replacement in Citywide – Contract No. 19-308-003: This project will replace 5,155 feet of 8-inch, 12-inch & 16-inch water mains on Tide St., Edgerly Rd. Columbus Ave (rear), Playstead Rd. and Savin Hill Ave. Construction is projected to commence in April 2022 and completed November 2024. The three-year budget is $2,492,000.

Water Main Replacement in City Proper – Contract No. 19-308-004: This contract will replace 6,050 feet of water mains in the Cambridge Street and Mass General Hospital area of City Proper. The project will continue a water main replacement program in Beacon Hill programmed under previous Capital Plans by relaying new mains in Cambridge Street from New Chardon Street to Charles Street. This contract will also replace a water main on Charles Street as requested by the Operations Division. In addition, water mains on West Cedar Street and Phillips Street will be replaced due to break history and pipe ages more than 100 years. Construction is projected to commence in June 2022 and completed September 2024. The three-year budget is $4,470,000.

Water Main Replacement associated with East Boston Sewer Separation – Contract No. 19-309-002: This project is the third phase in a multi-year plan to separate East Boston combined sewers and associated water main replacement. Construction is projected to commence in June 2023 and completed in June 2025. The total three-year budget is $661,000.

Water Main Replacement associated with South Boston Separation – Contract No. 20-309-012 (Contract 1): Construction Contract No. 1 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction is projected to commence in April 2021 and completed in February 2023. The three-year budget is $2,368,000.

Water Main Replacement associated with South Boston Separation – Contract No. 21-309-012 (Contract 2): Construction Contract No. 2 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction is projected to commence in April 2022 and completed in November 2023. The three-year budget is $230,000.

Water Main Replacement in City Proper – Contract No. 18-308-001: This project includes the replacement of older cast iron water mains that have reached their useful life in City Proper. Construction is projected to commence April 2022 and completed by November 2025. The total three-year budget for this project is $8,700,000.

Water Main Replacement in City Proper and Back Bay – Contract No. 18-308-002: This project involves rehabilitation by trenchless methods of large diameter steel mains. This work was recommended in the 2011 Water Distribution Study and is part of a larger plan to ensure the structural integrity of the Commission's 11 miles of large diameter steel water mains. Also included is the dewatering and inspection of a 42-inch water pipe which lies beneath Copley Place Development to determine its condition. This project is projected to commence In April 2021 and completed in May 2022. The total three-year budget is $6,450,000.

Water Main Replacement in Dorchester – Contract No. 18-308-003: This project includes the replacement of older cast iron water mains that have reached their useful life in Dorchester. Construction is projected to commence April 2021 and completed by April 2022. The total three-year budget for this project is $973,000.

Water Main Replacement in Fenway – Contract No. 18-309-001: This project includes the replacement of older cast iron water mains that have reached their useful life in Fenway. Construction is projected to commence April 2022 and completed by November 2023. The total three-year budget for this project is $4,680,000.

Water Main Replacement in Roslindale, Hyde Park and Mattapan – Contract No. 18-309-003: This project includes the replacement of older cast iron water mains that have reached their useful life in Roslindale, Hyde Park & Mattapan. Construction is projected to commence in August 2022 and completed by May 2024. The total three-year budget for this project is $2,659,000.

Water Main Replacement in East Boston – Contract No. 17-308-001: This project includes the replacement of older cast iron water mains that have reached the end of their useful life in East Boston. Construction commenced in September 2019 and will be completed by September 2021. The total three-year budget for this project is $202,000.

Water Main Replacement in Dorchester, Fenway/Kenmore, Mattapan & Roxbury – Contract No. 17-308-002: This project includes the replacement of older cast iron water mains that have reached the end of their useful life in Dorchester, Fenway/Kenmore, Mattapan & Roxbury. Construction commenced June 2020 and will be completed by October 2021. The total three-year budget for this project is $1,047,000.

Water Main Replacement in Roslindale, Jamaica Plain, Roxbury and Hyde Park– Contract No. 17-308-003: This project includes the replacement of older cast iron water mains that have reached their useful life in Roslindale, Jamaica Plain, Roxbury and Hyde Park. Construction commenced July 2020 and is projected to be completed by April 2021. The total three-year budget for this project is $117,000.

Water Main Replacement in the South End – Contract No. 17-308-005: This project includes the replacement of older cast iron water mains that have reached their useful life in the South End. Construction commenced in September 2018 and will be completed by December 2020. A small budget of $66,000 will be established in 2021 for closings costs of this contract.

Water Main Replacement in Back Bay/Beacon Hill and City Proper – Contract No. 17-308-006: This project includes the replacement of older cast iron water mains that have reached their useful life in the Back Bay/Beacon Hill and City proper. Construction commenced in May 2019 and is projected to be completed by September 2021. The total three-year budget for this project is $2,039,000.

Water Main Replacement in City Proper – Contract No. 17-308-007: This project includes the replacement of older cast iron water mains that have reached their useful life in City proper. Construction is projected to commence December 2020 and completed by December 2021. The total three-year budget for this project is $3,634,000.

Water Main Replacement in Dorchester, Hyde Park, South Boston & West Roxbury – Contract No. 17-309-001: This project includes the replacement of older cast iron water mains that have reached the end of their useful life in Dorchester, Hyde Park, South Boston & West Roxbury. Construction will commence in April 2021 and is expected to be completed by October 2022. The total three-year budget for this project is $1,339.000.

Water Main Replacement Citywide – Contract No. 17-309-014: This project includes the replacement of older cast iron water mains that have reached their useful life Citywide. Construction commenced in May 2019 and is expected to be completed by July 2021. The total three-year budget for this project is $200,000.

Water Main Replacement Associated with Sewer Separation in Roxbury – Contract No. 17-309-011: This project includes the replacement of older cast iron water mains that have reached their useful life in Upper Roxbury associated with sewer separation work. Construction is projected to commence April 2023 and is expected to be completed by November 2025. The total three-year budget for this project is $75,000.

Water Main Replacement in Fenway/Kenmore, Jamaica Plain &Roxbury Contract No. 16-308-002: This project includes the replacement of older cast iron water pipes in Roxbury. Construction commenced in June 2019 and is expected to be completed by June 2021. The total three-year budget for this project is $149,000.

Water Portion of Sewer Separation in East Boston Contract No. 16-309-005: This project includes the replacement of older cast iron water mains that have reached their useful life in East Boston associated with sewer separation work. Construction commenced September 2018 and was completed in August 2020. A budget will be established in 2021 in the amount of $140,000 to cover close-out costs.

Water Main Replacement in the North End Contract Phase IV No. 16-309-006: This project includes the replacement of older cast iron water mains that have reached their useful life in the North End. Construction commenced in April 2020 and is expected to be completed by August 2021. The total three-year budget is $404,000.

Water Main Replacement in the South End, Roxbury and City Proper Contract No. 15-308-004: This project includes the replacement of older cast iron water mains that have reached their useful life in the South End, Roxbury and City Proper. Construction commenced July 2017 with a completion date of April 2021. A budget of $124,000 will be established in 2021 to cover the closing costs of this contract.

PROJECT CASH FLOW

Table 13 on page 38 presents cash flow expenditures for Water Replacement Projects for the period from 2021-2023. The total expenditures for the three-year period are $66,260,000. The expenditures for 2021 are anticipated to be $17,506,000.

Table 13 - Water Replacement

Capital Improvement Program
2021 - 2023
Water Pipe Replacement

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
Water Main Rehabilitation in City Proper	-	-	-	-	-	-	-	-	-	-	-	217,000	217,000	2,169,000	2,168,000	4,554,000
Ongoing Projects																
Water Main Replacement on Harrison Ave, South End	-	-	-	-	-	-	-	-	-	-	-	-	-	1,694,000	1,693,000	3,387,000
Water Main Replacement in Charlestown & Brighton	-	-	-	-	-	-	-	343,000	343,000	342,000	343,000	343,000	1,714,000	2,913,000	1,028,000	5,655,000
Water Main Replacement in Charlestown & Back Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	1,052,000	1,578,000	2,630,000
Final Paving South Boston Separation Phase 1	-	-	-	-	-	-	-	-	-	-	25,000	50,000	75,000	385,000	385,000	845,000
South End Water Pipe Improvements Phase I	-	-	-	-	-	-	-	-	-	-	-	-	-	1,447,000	1,653,000	3,100,000
Water Pipe Improvements in Charlestown	-	-	-	-	-	-	-	-	-	-	-	-	-	1,435,000	1,435,000	2,870,000
Water Pipe Improvements Citywide	-	-	-	-	-	-	-	-	-	-	-	-	-	1,108,000	1,384,000	2,492,000
City Proper Water Pipe Improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	2,235,000	2,235,000	4,470,000
Water Pipe Improvements in East Boston	-	-	-	-	-	-	-	-	-	-	-	-	-	-	661,000	661,000
South Boston Separation Contract 1	-	-	-	-	99,000	99,000	99,000	99,000	99,000	99,000	98,000	98,000	790,000	789,000	789,000	2,368,000
South Boston Separation Contract 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230,000	230,000
Water Main Replacement in City Proper	-	-	-	-	-	-	-	-	-	-	-	-	-	4,200,000	4,500,000	8,700,000
Water Main Replacement in City Proper, Back Bay & Roxbury	-	-	-	-	500,000	500,000	500,000	750,000	750,000	750,000	750,000	500,000	5,000,000	1,450,000	-	6,450,000
Water Main Replacement in Dorchester	-		-	-	-	200,000	100,000	100,000	200,000	150,000	119,000	50,000	919,000	54,000	-	973,000
Water Main Replacement in Fenway	-	-	-	-	-	-	-	-	-	-	-	-	-	2,340,000	2,340,000	4,680,000
Water Main Replacement in Hyde Park, Mattapan & Roslindale	-	-	-	-	-	-	-	-	-	-	-	-	-	886,000	1,773,000	2,659,000
Water Main Replacement in East Boston	-	-	-	-	-	161,000	-	41,000	-	-	-	-	202,000	-	-	202,000
Water Main Replacement in Dorchester and Roxbury	-	-	-	250,000	250,000	250,000	-	-	238,000	59,000	-	-	1,047,000	-	-	1,047,000
Water Main Replacement in Jamaica Plain and Mattapan	-	-	-	-	5,000	5,000	3,000	60,000	44,000	-	-	-	117,000	-	-	117,000
Water Main Replacement in the South End	66,000	-	-	-	-	-	-	-	-	-	-	-	66,000	-	-	66,000
Water Main Replacement in Bowdoin St. & Lincoln St.	-	-	-	289,000	289,000	289,000	289,000	289,000	289,000	-	244,000	61,000	2,039,000	-	-	2,039,000
Water Main Replacement in City Proper	-	-	-	-	454,000	454,000	454,000	454,000	454,000	454,000	454,000	456,000	3,634,000	-	-	3,634,000
Water Main Replacement Citywide	-	-	-	-	84,000	84,000	83,000	84,000	84,000	83,000	84,000	83,000	669,000	670,000	-	1,339,000
Water Main Replacement City Wide	-	-	-	-	-	75,000	75,000	50,000	-	-	-	-	200,000	-	-	200,000
Water Main Replacement in Upper Roxbury Phase III	-	-	-	-	-	-	-	-	-	-	-	-	-	38,000	37,000	75,000
Water Main Replacement in Roxbury	99,000	-	25,000	-	25,000	-	-	-	-	-	-	-	149,000	-	-	149,000
Wat Port Sew Sep in East Boston	57,000	-	67,000	16,000	-	-	-	-	-	-	-	-	140,000	-	-	140,000
Water Pipe Replacement in the North End	-	-	163,000	193,000	48,000	-	-	-	-	-	-	-	404,000	-	-	404,000
Water Main Replacement in the South End	-	13,000	13,000	98,000	-	-	-	-	-	-	-	-	124,000	-	-	124,000
Totals	$222,000	$13,000	$268,000	$846,000	$1,754,000	$2,117,000	$1,603,000	$2,270,000	$2,501,000	$1,937,000	$2,117,000	$1,858,000	$17,506,000	$24,865,000	$23,889,000	$66,260,000
Bonds	99,000	13,000	38,000	387,000	1,352,000	1,688,000	1,426,000	1,718,000	1,777,000	1,437,000	1,651,000	1,367,000	12,953,000	10,112,000	9,761,000	32,826,000
Rate	57,000	-	230,000	209,000	98,000	124,000	125,000	442,000	393,000	391,000	405,000	417,000	2,891,000	6,826,000	5,579,000	15,296,000
Grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	66,000	-	-	250,000	304,000	305,000	52,000	110,000	331,000	109,000	61,000	74,000	1,662,000	7,927,000	8,549,000	18,138,000
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$222,000	$13,000	$268,000	$846,000	$1,754,000	$2,117,000	$1,603,000	$2,270,000	$2,501,000	$1,937,000	$2,117,000	$1,858,000	$17,506,000	$24,865,000	$23,889,000	$66,260,000

WATER DISTRIBUTION SYSTEM SPECIAL PROJECTS

DESCRIPTION AND JUSTIFICATION

Special Projects includes funding for a variety of system planning and other studies, professional services associated with the rehabilitation and operation of the water system, and for the engineering design and construction of the installation or replacement of water mains associated with bridge improvement projects undertaken by other agencies. Also included are the associated design and engineering services required for the implementation of capital projects and the permanent paving fees for ongoing and future capital improvements.

Overall, the objectives of the Water Distribution System Special Projects are to extend the useful life of water mains, reduce long-term maintenance and repair costs, reduce the occurrence of main breaks and the resulting impacts, conserve drinking water and coordinate improvements with other agencies to minimize disruptions.

NEW PROJECTS

Water Main Valve Replacement Contract No. 20-308-006: This project consists of the replacement of water main valves in critical condition citywide. These improvements are based on the findings of the Special Structures group, which identified faulty valves when surveyed and exercised. Work is projected to commence in April 2021 and will be completed in November 2021. The total three-year budget is $1,900.000.

ONGOING PROJECTS

Traffic Management Services Contract No 19-206-006: In support of the capital plan, on occasion it is necessary to develop traffic management plans for construction phasing of water, sewer, and drain replacement projects. This project allows the Commission to utilize transportation engineers to develop these plans in accordance with BTD regulations. If the construction will occur on state agency roadways, the traffic plans can be produced to meet state agency requirements. Work commenced in January 2020 and completed December 2022. The three-year budget is $138,000.

Water Pipe Testing Services Contract No. 19-06-004: This professional services contract provides metallurgical testing of pipes. The information provided by the testing is to be used in conjunction with water main breaks to forecast future CIP work. The services began in January 2020 and completed December 2022. The three-year budget is $191,000.

Water Main Flushing Program Contract No. 19-203-001: This project involves the maintenance of a water main flushing program for the Commission's water distribution system by a qualified engineering firm. Since 1997, the Commission has maintained a system-wide water main flushing program to ensure water quality throughout its entire water distribution system. The flushing program was initiated as part of the Commission's Biofilm Corrective Action Plan developed in response to a 1996 violation of the Total Coliform Rule, a national primary drinking water regulation. Since implementation of the water main flushing program, the Commission has had no Coliform bacteria violations.

The Commission's unidirectional water main flushing program is designed to flush all pitometer sections individually and includes water main pipes less than 16-inches in diameter. Unidirectional water main flushing is achieved by closing valves to isolate water mains from the actual pipe being flushed. After isolating the desired pipe and creating one (1) intake main, hydrant(s) are flowed downstream from a dead-end valve. Water main flushing is intended to bring stronger chlorine residuals into areas where it is low and scour pipe walls of biofilm and tuberculation. Annually, the Commission flushes approximately 200 miles of water main with the intended goal of flushing 800 miles of water main over a 4-year cycle. The flushing program is conducted during the construction season (March-November) in the late evening/early morning hours to minimize disturbance to customers.

The Commission has engaged the services of a professional engineering consulting firm (Weston & Sampson) to implement and maintain the system-wide water main flushing program. Weston & Sampson has reviewed the Commission's current water main flushing program and made recommendations for improvements including updating the flushing database utilizing the Commission's recently restructured water distribution system model; developing methodologies to achieve greater flushing velocities for low flow areas; and evaluating the overall program effectiveness by way of a water quality sampling program.

This project commenced in April 2019 with services continuing to December 2022. The total three-year budget for this project is $750,000.

Subsurface Investigation Services: There are locations where the information of conditions below the surface is inadequate. This on-call service contract is for using vacuum excavation and electronic tracking systems to locate utilities and other buried object to aid design. The services commenced in January 2020 and completed December 2022. The three-year budget is $210,000.

Hydrant Replacement: Replacement of defective and inoperative hydrants is essential to maintain public safety and reduce unaccounted-for-water resulting from hydrant leaks. Older fire hydrants, many of which are impossible to repair due to unavailability of replacement parts, must be replaced to ensure Public Safety. Standardization of hydrants also reduces the number and styles of hydrant repair parts needed to be stored in inventory. Large quantity purchases significantly reduce unit costs and assure cost over a three-year period. Construction commenced in January 2021 with a completion date of December 2023. New Hydrants will be installed through the Annual Area Emergency Contracts, Construction Projects and by Operations personnel. Custodian-equipped hydrants discourage illegally opened hydrants and reduce unaccounted-for-water loss by preventing water theft. The total three-year budget for this project is $1,095,000.

City of Boston Street Opening Permit Fees: The Boston Water & Sewer Commission is required by the City of Boston's regulations to obtain street opening permits for any construction activity that will require This project involves obtaining street opening permits from the City of Boston for excavation activities performed by the Commission's crews and contractors in the public way. The City of Boston Public Works Department issues the street opening permits for which the Commission reimburses the City. This project is renewed annually. The three-year budget totals $6,000,000.

City of Boston Paving Restoration: The Boston Water and Sewer Commission is responsible for the permanent restoration of streets and sidewalks excavated during construction activities. On an annual basis, the Commission publicly advertises and awards contracts to private contractors for permanent restoration work. In addition, the Commission is required to reimburse City of Boston contractors for the repairs and/or replacement of the Commission's castings through the permanent restoration of the streets under the City contracts. The three-year budget totals $10,644,000.

Streets	2021	2022	2023	2021-2023 Total
Permits	$1,000,000	$1,000,000	$1,000,000	$3,000,000
Paving	$3,644,000	$3,500,000	$3,500,000	$10,644,000
Total	$4,644,000	$4,500,000	$4,500,000	$13,644,000

PROJECT CASH FLOW

Table 14 on page 42 illustrates the cash flow information for the Water Special Program for 2021-2023. Three-year expenditures for this program total $20,928,000, of which $8,466,000 will be spent in 2021.

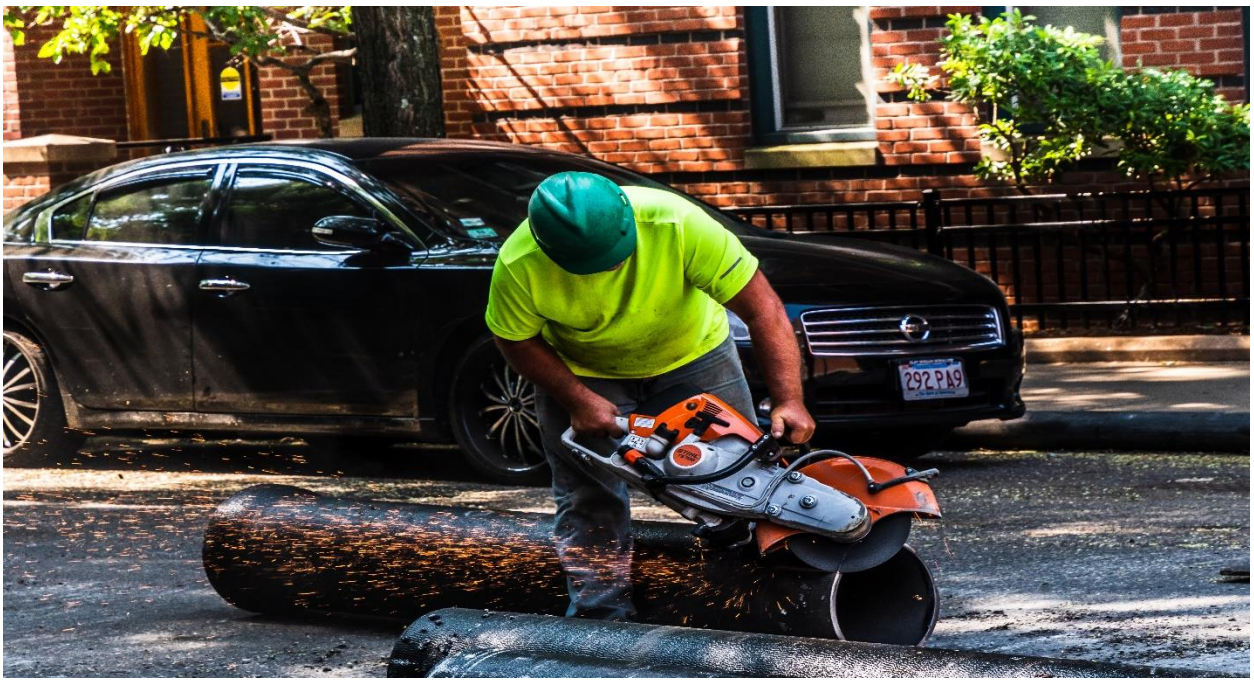


Table 14 - Water Special

Capital Improvement Program
2021 - 2023
Water Special

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
Water Main Valve Replacement	-	-	-	-	238,000	237,000	238,000	237,000	238,000	237,000	238,000	237,000	1,900,000			1,900,000
Ongoing Projects																
Traffic Management Services	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	6,000	83,000	55,000	-	138,000
Water Pipe Testing Services	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	10,000	109,000	82,000	-	191,000
Water Main Flushing Program	-	-	-	-	30,000	30,000	30,000	30,000	30,000	30,000	30,000	40,000	250,000	250,000	250,000	750,000
Subsurface Investigation	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000	90,000	-	210,000
Hydrant Replacement	-	-	-	180,000	180,000	-	-	-	-	-	-	-	360,000	365,000	370,000	1,095,000
Operations Permits	50,000	50,000	50,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	50,000	1,000,000	1,000,000	1,000,000	3,000,000
Operations Permits	50,000	50,000	50,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	50,000	1,000,000	1,000,000	1,000,000	3,000,000
Paving	200,000	82,000	10,000	272,000	350,000	390,000	390,000	390,000	390,000	390,000	390,000	390,000	3,644,000	3,500,000	3,500,000	10,644,000
Totals	**$326,000**	**$208,000**	**$136,000**	**$678,000**	**$1,024,000**	**$883,000**	**$884,000**	**$883,000**	**$884,000**	**$883,000**	**$884,000**	**$793,000**	**$8,466,000**	**$6,342,000**	**$6,120,000**	**$20,928,000**
Bonds	269,000	151,000	79,000	391,000	469,000	509,000	509,000	509,000	509,000	509,000	509,000	460,000	4,873,000	4,672,000	4,500,000	14,045,000
Rate	57,000	57,000	57,000	287,000	555,000	374,000	375,000	374,000	375,000	374,000	375,000	333,000	3,593,000	1,670,000	1,620,000	6,883,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**$326,000**	**$208,000**	**$136,000**	**$678,000**	**$1,024,000**	**$883,000**	**$884,000**	**$883,000**	**$884,000**	**$883,000**	**$884,000**	**$793,000**	**$8,466,000**	**$6,342,000**	**$6,120,000**	**$20,928,000**

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THE SEWER SYSTEM

The Commission owns and operates a system for the collection and transport of wastewater in the City of Boston.

The original backbone of the sewer system was the Boston Main Drainage System ("BMDS"). The BMDS was constructed from 1877 to 1884 under the direction of a special committee established by the City of Boston for that specific purpose. The original system consisted of five combined interceptors, the Calf Pasture pumping station and the Dorchester Bay Tunnel. Neither the pumping station, nor the tunnel is in use today. The BMDS interceptors were initially designed to carry a peak dry weather sanitary flow together with an allowance for stormwater.

In 1988, construction of the New Boston Main Interceptor and the New East Side Interceptor were completed, replacing portions of the original system. The interceptors serve the sewer needs of downtown Boston, the South End, Roxbury, Dorchester, and South Boston. These improvements have increased capacity, eliminated dry weather overflows, and lowered the volume of wet weather overflows.

Other collection facilities provide sewer services to different parts of the City. Charlestown is served by a separated system, except for one small area. East Boston, City Proper, South Boston and Roxbury are served mainly by combined systems; however, major portions of each area have been or are in the process of being separated. The South End has been partially separated under a program initiated by the City's urban renewal program and continued by the Commission where feasible and cost effective. Allston/Brighton, Roslindale, West Roxbury, Hyde Park, Mattapan and portions of Dorchester and Jamaica Plain, all of which are in the southern part of the City, are served by separate systems.

The backbone of the Commission's sewer is several major interceptors, which convey flows from the Commission's system to the MWRA's interceptors. The New East Side Interceptor, the Main Interceptor completed in 1988 and the New Albany St. Interceptor completed in 1990, serve Downtown, South Boston, the South End and Dorchester. The other interceptors and the neighborhoods they serve are:

The sewer system is comprised of the following:

APPURTENANCES		SEWER PIPES CITY WIDE		TYPE OR DESIGNATION	
Catch Basins	30,321	Total Linear Feet	8,112,171	Combined Sewer	144 Miles
Manholes	50,605	Total Linear Miles	1,536	Combined Sewer Overflow	12 Miles
Outfalls	273	Pumping Stations	18	Sanitary Sewer	710 Miles
Regulators	148			Storm Drain	670 Miles
Tide gates	201				

OBJECTIVES

Primary Objectives of the 2021-2023 Sewer Collection System are:

- Implement and manage contracts affiliated with the Consent Decree
- Implement Green Infrastructure Projects
- Comply with the requirements of the Commission's National Pollutant Discharge Elimination System (“NPDES”) and Municipal permits
- Minimize infiltration and inflow into the sanitary system, which will increase system capacity and decrease treatment costs
- Reduce combined sewer overflows by reducing wet weather discharges and minimizing sea water intrusions
- Provide sufficient hydraulic capacity for current and projected flows
- Protect the structural integrity of the wastewater collection and storm drainage systems
- Coordinate sewer system improvements with the related projects of other public agencies

OBJECTIVES

The primary objectives of the Sewer System Capital Improvement Program for 2021-2023 are to provide uninterrupted wastewater transport and storm drainage services to the residents, businesses and visitors of Boston and to improve water quality in Boston Harbor and its tributary waters. The 2021-2023 CIP has five major programs for the Sewer System: the sewer renewal and replacement program, the increased capacity program, the sewer separation, the Infiltration/Inflow program, and sewer special program.

The Commission's CMOM Program utilizes closed circuit TV camera inspection equipment and software to assess the structural and maintenance condition of pipes and identify areas of excessive infiltration and inflow. The SCREAM software system is utilized to prioritize these inspection results for repair and replacement by Commission crews and under its Capital Improvement Program. The CMOM Program includes the cleaning and inspection of approximately 80 miles of sewer pipe in 2021. This along with TV inspection under other programs will result in the inspection of 80 miles of pipe in 2021 with a goal of completing the entire system over a ten-year period.

Projects included in the Sewer System CIP include repair or replacement of approximately 7 miles of deteriorated or failing sanitary sewers and storm drains each year. Work is included under contracts 21-309-009, 21-309-010, 21-309-001, 21-309-002, 21-309-014, 21-309-014, and CMOM for future contracts (TBD – to be determined). Also included in the Sewer System CIP are South Boston Separation contracts 20-309-11P, 20-309-012 & 21-309-012.

The sewer system objectives will be carried out through the continuation of the following program activities renewal and replacement of sewer pipes, rehabilitation of sewers and drains, separation of combined sewers, improvements that will result in an increase in system capacity, an infiltration/inflow reduction program including the disconnection of downspouts and a number of special projects necessary to improve the efficiency and effectiveness of the sewer system.

In addition, all sewers and drains on streets where water mains are to be replaced will be inspected prior to replacement. All defective pipes will then be replaced or rehabilitated in the water main replacement contract under the 2021-2023 Sewer System Capital Program.

WASTEWATER PROJECTS HIGHLIGHTS

- South Boston Separation (Contracts 1, 2 & 3)
- Replacement and Rehabilitation of Sewer and Drains Citywide
- CCTV of Sewers and Storm Drains/CMOM Program
- North End Replacement and Rehabilitation Phase II & III
- Replacement of Tidegates
- Sewer Separation in Roxbury (Contracts 1, 2 & 3)
- Infiltration/Inflow Analysis
- Downspout Disconnection Program

PROJECT CASH FLOW

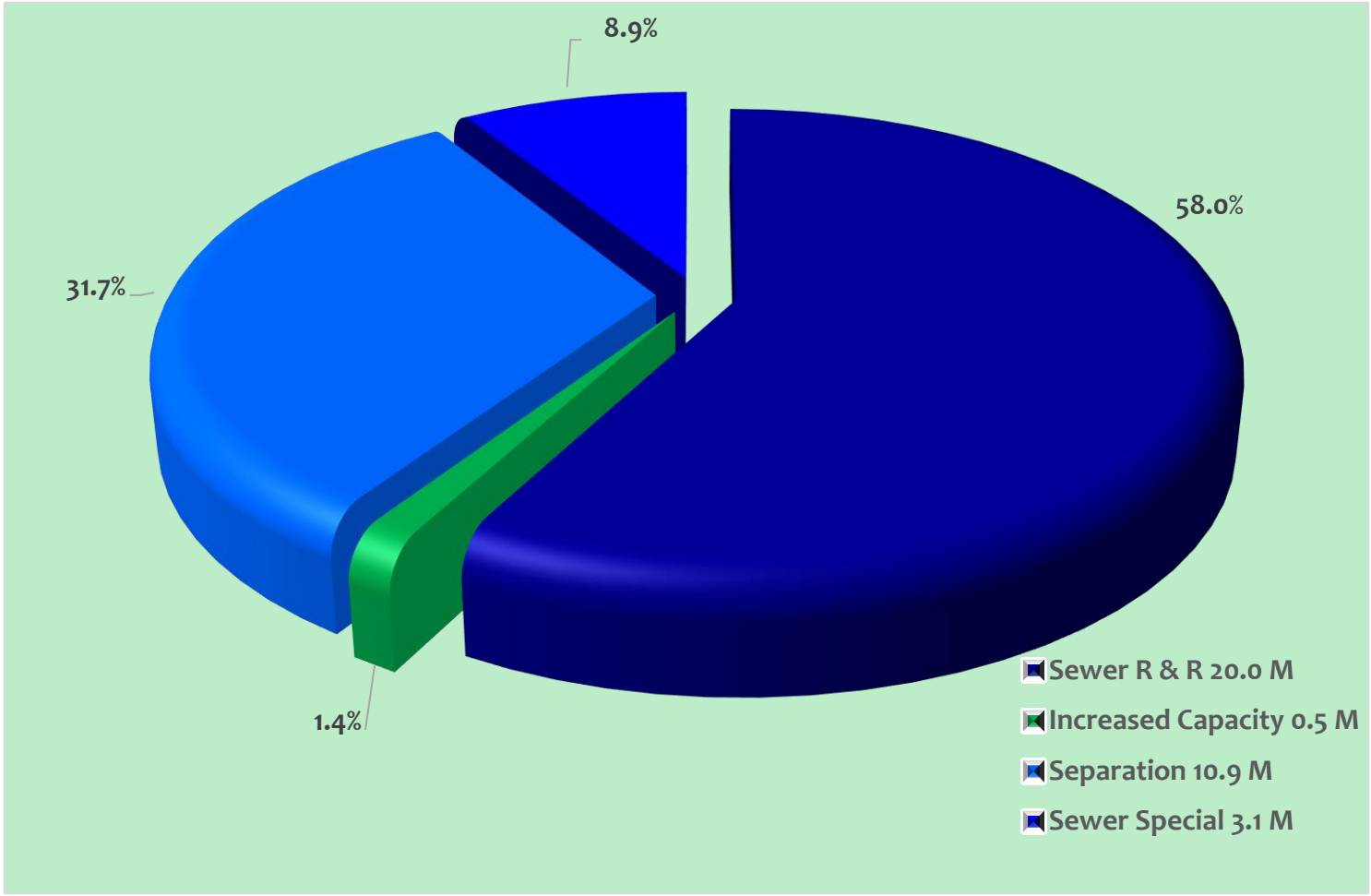
Table 15 on page 47 illustrates Sewer Distribution System by Category. Graph 8 on page 48 illustrates the capital expenditures by program of the Total Sewer Program for 2021-2023. Three-year total expenditures are $84.3 million, of which $34.4 million is anticipated to be spent in 2021. Graph 9 on page 49 illustrates by the Funding Source for 2021-2023. Graph 10 on page 50 illustrates the Sewer Distribution by Program for 2021.

Table 15 - Sewer Distribution System by Category

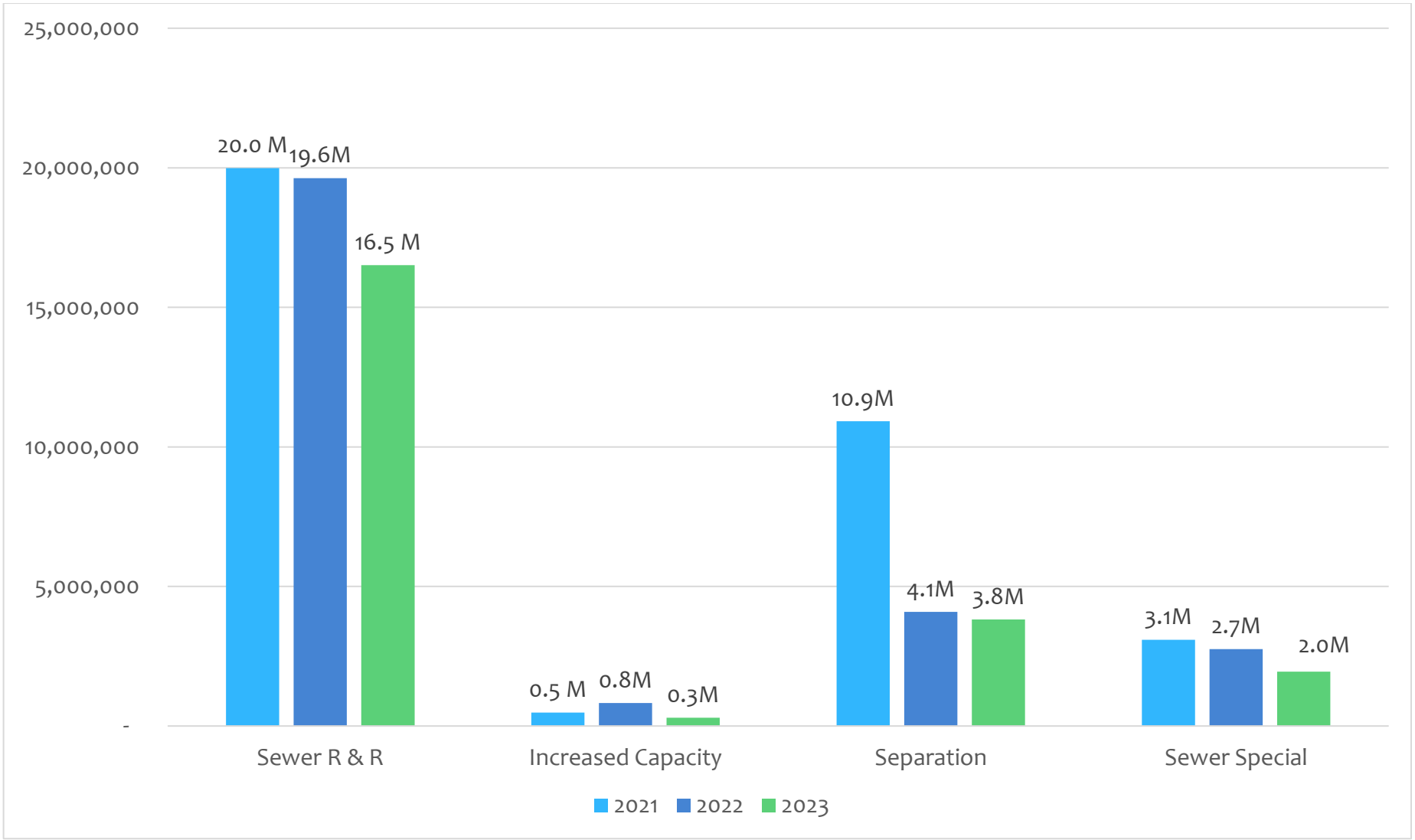
Capital Improvement Program
2021-2023
Sewer Total

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
Sewer R&R																
Bonds	274,000	452,000	477,000	578,000	551,000	786,000	675,000	646,000	476,000	364,000	365,000	521,000	6,165,000	6,490,000	4,322,000	16,977,000
Rate	1,215,000	562,000	553,000	663,000	1,312,000	1,610,000	1,040,000	1,511,000	1,031,000	1,081,000	986,000	782,000	12,346,000	11,417,000	10,359,000	34,122,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	111,000	109,000	175,000	124,000	108,000	109,000	109,000	109,000	108,000	109,000	138,000	167,000	1,476,000	1,722,000	1,832,000	5,030,000
Totals	1,600,000	1,123,000	1,205,000	1,365,000	1,971,000	2,505,000	1,824,000	2,266,000	1,615,000	1,554,000	1,489,000	1,470,000	$ 19,987,000	$ 19,629,000	$ 16,513,000	$ 56,129,000
Increased Capacity																
Bonds	-	-	-	-	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	480,000	820,000	300,000	1,600,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$ -	$ -	$ -	$ -	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000	$ 480,000	820,000	300,000	$ 1,600,000
Separation																
Bonds	123,000	316,000	316,000	415,000	309,000	463,000	213,000	175,000	131,000	124,000	116,000	181,000	2,882,000	1,425,000	1,425,000	5,732,000
Rate	118,000	118,000	118,000	117,000	118,000	118,000	118,000	117,000	108,000	108,000	108,000	108,000	1,374,000	1,373,000	1,104,000	3,851,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	532,000	973,000	1,023,000	1,242,000	722,000	587,000	543,000	478,000	234,000	329,000	-	-	6,663,000	1,288,000	1,287,000	9,238,000
Totals	$ 773,000	$ 1,407,000	$ 1,457,000	$ 1,774,000	$ 1,149,000	$ 1,168,000	$ 874,000	$ 770,000	$ 473,000	$ 561,000	$ 224,000	$ 289,000	$ 10,919,000	$ 4,086,000	$ 3,816,000	$ 18,821,000
Sewer Special																
Bonds	201,000	218,000	210,000	349,000	169,000	319,000	161,000	211,000	251,000	241,000	195,000	359,000	2,884,000	2,555,000	1,744,000	7,183,000
Rate	20,000	20,000	-	-	-	20,000	20,000	20,000	20,000	40,000	20,000	20,000	200,000	200,000	200,000	600,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$ 221,000	$ 238,000	$ 210,000	$ 349,000	$ 169,000	$ 339,000	$ 181,000	$ 231,000	$ 271,000	$ 281,000	$ 215,000	$ 379,000	$ 3,084,000	$ 2,755,000	$ 1,944,000	$ 7,783,000
Sewer Total	**$ 2,594,000**	**$ 2,768,000**	**$ 2,872,000**	**$ 3,488,000**	**$ 3,349,000**	**$ 4,072,000**	**$ 2,939,000**	**$ 3,327,000**	**$ 2,419,000**	**$ 2,456,000**	**$ 1,988,000**	**$ 2,198,000**	**$ 34,470,000**	**$ 27,290,000**	**$ 22,573,000**	**$ 84,333,000**
Bonds	598,000	986,000	1,003,000	1,342,000	1,089,000	1,628,000	1,109,000	1,092,000	918,000	789,000	736,000	1,121,000	12,411,000	11,290,000	7,791,000	31,492,000
Rate	1,353,000	700,000	671,000	780,000	1,430,000	1,748,000	1,178,000	1,648,000	1,159,000	1,229,000	1,114,000	910,000	13,920,000	12,990,000	11,663,000	38,573,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	643,000	1,082,000	1,198,000	1,366,000	830,000	696,000	652,000	587,000	342,000	438,000	138,000	167,000	8,139,000	3,010,000	3,119,000	14,268,000
Totals	**$ 2,594,000**	**$ 2,768,000**	**$ 2,872,000**	**$ 3,488,000**	**$ 3,349,000**	**$ 4,072,000**	**$ 2,939,000**	**$ 3,327,000**	**$ 2,419,000**	**$ 2,456,000**	**$ 1,988,000**	**$ 2,198,000**	**$ 34,470,000**	**$ 27,290,000**	**$ 22,573,000**	**$ 84,333,000**

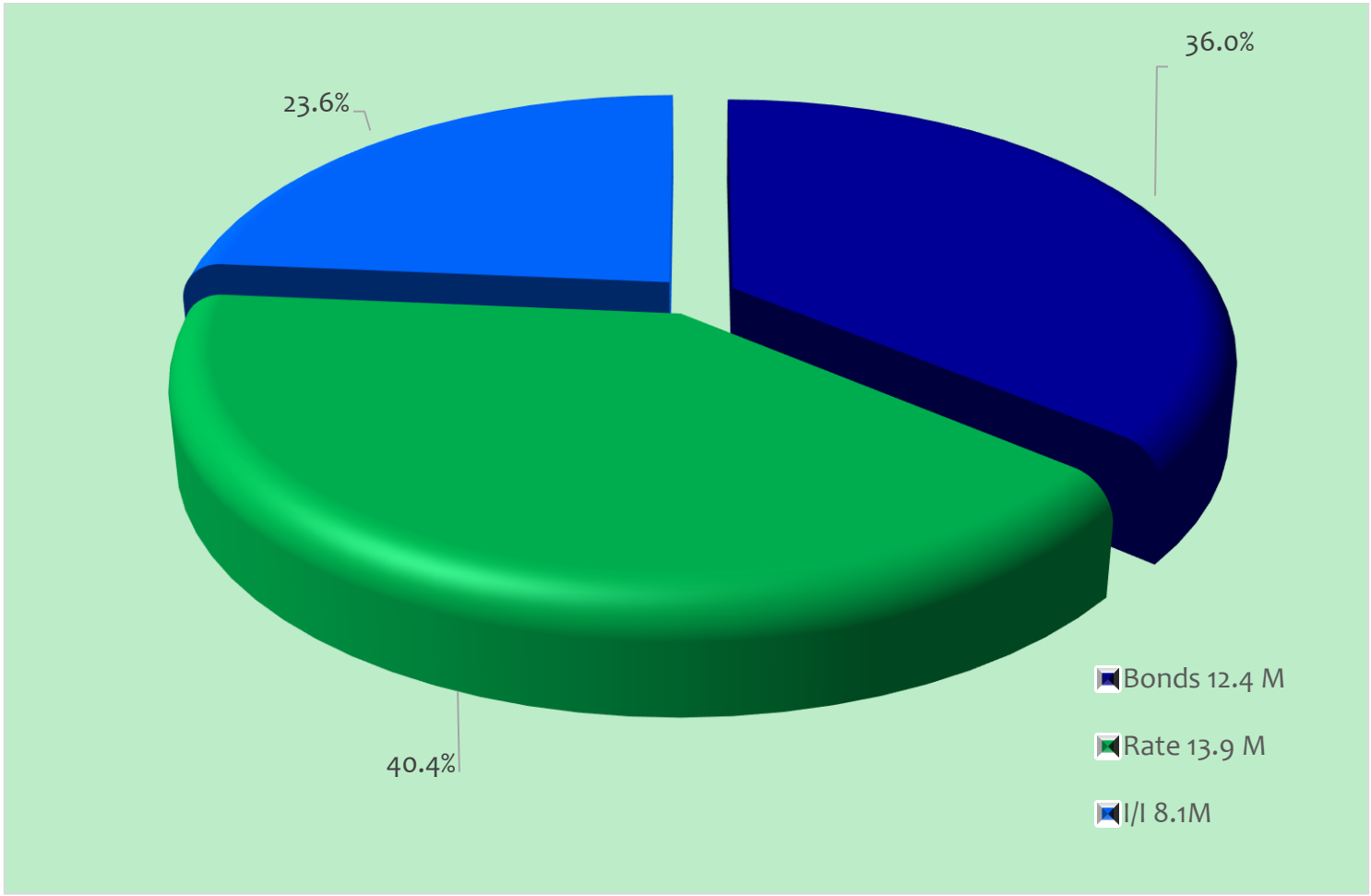
Graph 5 – 2021 Total Sewer Expenditures by Program $34.5 Million



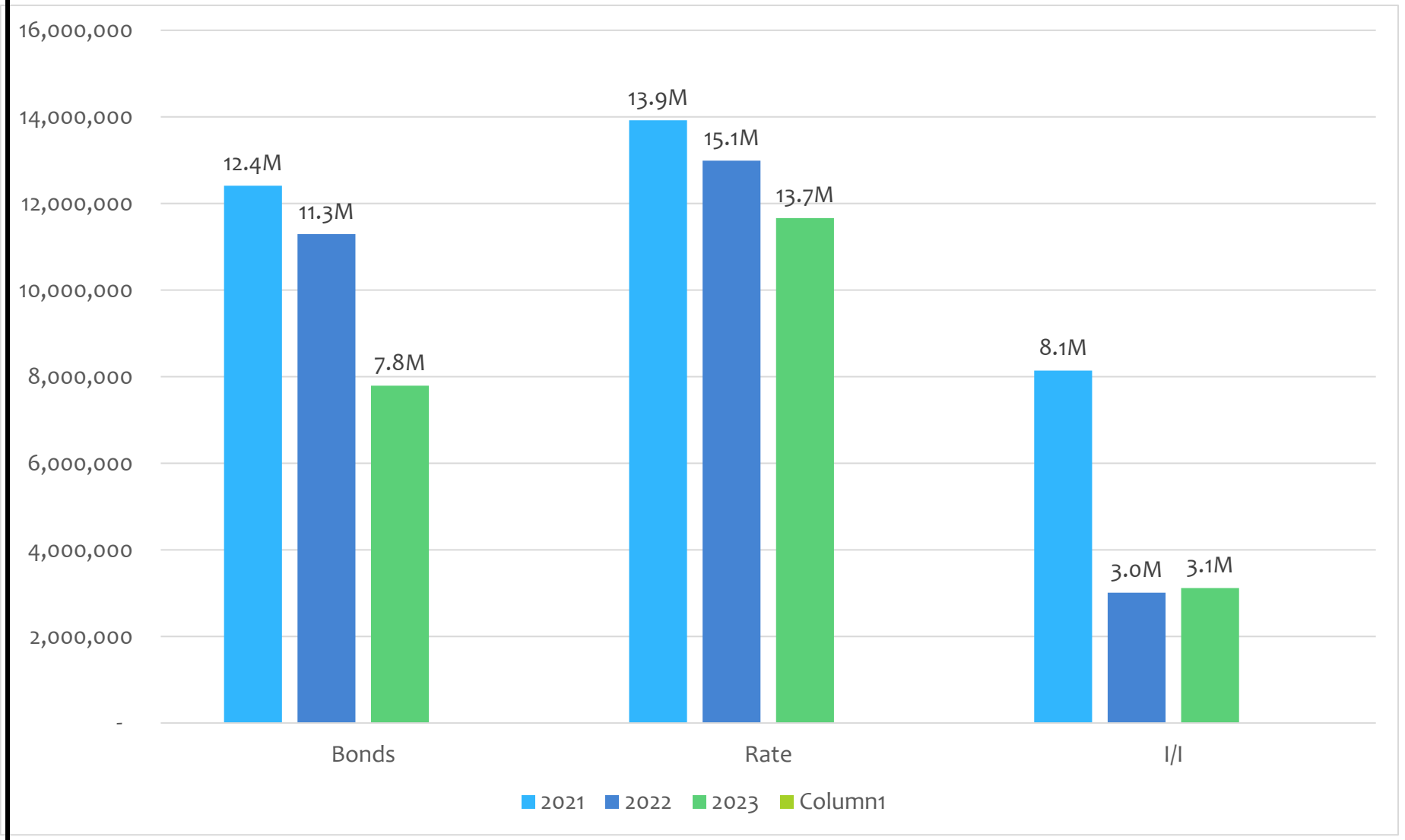
Graph 6 – 2021 - 2023 Total Sewer Expenditures by Program $84.3 Million



2021 Total Sewer Expenditure by Funding Source $34.4 Million



2021 - 2023 SEWER EXPENDITURE BY FUNDING SOURCE $84.3 MILLION



SEWER RENEWAL AND REPLACEMENT

DESCRIPTION AND JUSTIFICATION

Renewal and replacement projects involve the trenchless rehabilitation or replacement of sewers and storm drains in response to persistent malfunction, structural deterioration, excessive emergency repairs and other operation and maintenance problems.

The Commission identifies sewer and drain lines that require renewal or replacement through television inspections, sewer system evaluation surveys and routine maintenance activities. Renewal and replacement projects are coordinated with the Boston DPW's Roadway Reconstruction Program to ensure that the Commission avoids excavating newly resurfaced street, unless under emergency circumstances.

The objectives of the renewal and replacement program are to: ensure the operability of sewers and storm drains, protect the structural integrity of the sewer system, reduce long-term capital and maintenance costs and minimize disruptions of service caused by sewerage back-ups or other related problems.

NEW PROJECTS

CCTV OF Sewers and Storm Drains/CMOM - Contract No. 21-309-009: This project includes the inspection of sanitary sewers and drain pipes using closed circuit TV cameras utilizing the SCREAM coding system to assess the structural condition of the pipes. Approximately thirty (30) miles of various pipes will be cleaned and inspected, with a goal of completing the entire system over a 10-year period. Construction is projected to commence in March 2021 and is expected to be completed by March 2022. The three-year budget is $1,000,000.

CCTV OF Sewers and Storm Drains/CMOM - Contract No. 21-309-010: This project includes the inspection of sanitary sewers and drain pipes using closed circuit TV cameras utilizing the SCREAM coding system to assess the structural condition of the pipes. Approximately thirty (30) miles of various pipes will be cleaned and inspected, with a goal of completing the entire system over a 10-year period. Construction is projected to commence in March 2021 and is expected to be completed by March 2022. The three-year budget is $1,000,000.

Future CCTV of Sewers & Storm Drains/CMOM Contracts 22-309-009, 22-309-010, 23-309-009 & 23-309-010: These projects include the inspection of sanitary sewer and drain pipes using closed circuit TV cameras utilizing the SCREAM coding system to assess the structural condition of the pipes. Approximately ninety (90) miles of various pipes will be cleaned and inspected, with a goal of completing

the entire system over a 10- year period. Construction is projected to commence in March 2022 and is expected to be completed by December 2023. The three-year budget is $4,000,000.

Sewer Renewal & Rehabilitation in Readville – Contract 21-309-001: This project includes rehabilitation and replacement of heavily damaged sewers and drain pipes in Readville as identified by CMOM and BWSC Operations. Construction is projected to commence in April 2023 and is expected to be completed by June 2024. The three-year budget is $1,200,000.

Sewer Renewal & Rehabilitation in South Boston – Contract 21-308-001: This project includes rehabilitation and replacement of heavily damaged sewers and drain pipes in South Boston as identified by CMOM and BWSC Operations. Construction is projected to commence in December 2021 and is expected to be completed by May 2025. The three-year budget is $2,249,000.

Rehabilitation of NBMI – Contract No. 20-309-005: This project includes rehabilitation of the 102" New Boston Main Interceptor (NBMI) between approximately the crossing at the Dorchester Brook Sewer to the Columbus Park Headworks, both siphon chambers at Andrew Square, and other associated manhole/chambers. This project is expected to commence in January 2024 and be completed in February 2025. No actual cost is expected to be recognized until 2024.

ONGOING PROJECTS

***Engineering Design Services for Sewer and Drain Renewal & Rehabilitation- Contract No. 20-206-001*:** This project includes the professional services design of replacement and rehabilitation of sanitary sewer and drains Citywide. Design commenced in February 2020 and is expected to be completed by June 2021. The three-year budget is $300,000.

Emergency Sewer & Storm Drain Replacement 2020 - Contract No. 20-309-014: This project includes the replacement of sewers and storm drains in critical condition, citywide. These improvements are based on the findings of the CMOM group which identified sewer and drain defects, with associated water relay. Construction is projected to commence in July 2021 and is expected to be completed by June 2022. The three-year budget is $2,200,000.

Emergency Sewer & Storm Drain Replacement 2021-2022 Contract No. 21-309-014: Replacement of sewers and storm drains in critical condition, citywide. These improvements are based on the findings of the CMOM group which identified sewer and drain defects, with associated water relay. Construction is projected to commence in 2022 and is expected to be completed in 2023. The three-year budget is $4,700,000.

Sewer Renewal & Rehabilitation in South End - Contract No. 20-308-001: This project includes sewer replacement & rehabilitation and storm drain relay/rehab on Harrison Ave. in the South End. Construction is projected to commence in April 2022 and be completed in November 2024. The three-year budget is $666,000.

Sewer Renewal & Rehabilitation in Charlestown - Contract No. 20-308-003: This project includes sewer replacement & rehabilitation and storm drain relay/rehab on Rutherford Ave in Charlestown. Construction is projected to commence in July 2021 and be completed in June 2023. The three-year budget is $1,680,000.

South Boston Sewer Separation - Contract 1 Paving in South Boston - Contract No. 20-309-011P: This project includes the paving for Contract 1 of the South Boston Sewer Separation contract in the area along the Dorchester Ave corridor in South Boston. Construction is projected to commence in September 2021 and be completed in November 2026. The three-year budget is $981,000.

Sewer and Storm Drain Improvements associated with South Boston Sewer Separation - Contract 1 - Contract No. 20-309-012: This project includes sewer replacement & rehabilitation on rehabilitation along the Dorchester Ave. corridor in South Boston. Construction commenced in November 2020 and be completed in February 2026. The three-year budget is $3,801,000.

Sewer and Storm Drain Improvements associated with South Boston Sewer Separation - Contract 2 - Contract No. 21-309-012: This project includes sewer replacement & rehabilitation along the Dorchester Ave. corridor in South Boston. Construction is projected to commence in August 2023 and be completed in November 2026. The three-year budget is $110,000.

Sewer & Storm Drain Improvements Ass. with East Boston Sewer Separation Phase III- Contract No. 19-309-002: This project includes the Sewer Renewal & Rehabilitation in East Boston. This is the third phase in a multi-year plan to separate East Boston combined sewers. Construction is projected to commence in June 2023 and be completed by June 2025. The three-year budget is $628,000.

Storm Drain Improvements in Brighton - Contract No. 19-309-004: This project will replace a granite block and field stone culvert on Lake Street in Brighton with a new 54-inch RCP pipe and replace a failed 12-inch outfall on Lakeshore Rd. Construction is projected to commence in April 2021 and be completed by June 2021. The three-year budget is $338,000.

South End Sewer Renewal & Rehabilitation Phase I - Contract No. 19-308-001: This project includes sewer replacement & rehabilitation of 6,480 feet and 6,220 feet of storm drain relay/rehab on Washington St. and East Berkeley St. in the South End. Construction is projected to commence in May 2022 and be completed in December 2024. The three-year budget is $188,000.

Sewer Renewal & Rehabilitation in Charlestown - Contract No. 19-308-002: This project includes sewer replacement & rehabilitation of 4,329 feet and 1,909 feet of storm drain relay/rehab on Bunker Hill Ave, Vine St., Chelsea St., School St., and Bartlett St. in Charlestown. Construction is projected to commence in April 2022 and be completed in November 2024. The three-year budget is $2,230,000.

Sewer Renewal & Rehabilitation Citywide - Contract No. 19-308-003: This project includes sewer replacement & rehabilitation on Tide St, Edgerly Rd, Columbus Ave (rear), Playstead Rd & Savin Hill Ave. Construction is projected to commence in April 2022 and be completed in November 2023. The three-year budget is $2,047,000.

City Proper Sewer Renewal & Rehabilitation Improvements - Contract No. 19-308-004: This project includes sewer renewal & rehabilitation on Cambridge St, Charles St, Harvard St, Msg. Shea Rd, West Cedar Rd & Phillips St. in Beacon Hill/West End. Construction is projected to commence in June 2022 and be completed by September 2024. The three-year budget is $150,000.

Emergency Sewer Replacement 2019 - Contract No. 19-309-014: This project includes the Replacement of sewers and storm drains in critical condition, citywide. These improvements are based on the findings of the CMOM group which identified sewer and drain defects, with associated water relay. Construction commenced in July 2020 and will be completed by April 2021. The three-year budget is $367,000.

Sewer & Drain Replacement and Rehabilitation in Fenway- Contract No. 18-309-001: This project includes the replacement and rehabilitation of sanitary sewer; storm drain and combined sewer pipes in Fenway. The pipes in this contract have been inspected and reviewed and are found to be in poor condition. Construction is projected to commence in April 2022 and be completed in November 2023. The three-year budget is $4,101,000.

Sewer & Drain Replacement and Rehabilitation in Roslindale, Hyde Park & Mattapan- Contract No. 18-309-003: This project includes replacement of sanitary sewer and drain pipes in Roslindale, Hyde Park & Mattapan. The pipes in this contract have been inspected and reviewed and are found to be in poor condition. Contraction is projected to commence in August 2022 and be completed by August 2024. The three-year budget is $3,222,000.

Sewer & Drain Replacement and Rehabilitation in Roslindale, Hyde Park and Mattapan- Contract No. 18-309-004: This project includes trenchless rehabilitation of sanitary sewer & drain pipes in Roslindale, Hyde Park & Mattapan. The pipes in this contract have been inspected and reviewed and are found to be in poor condition. This contract will rehabilitate 18,350 feet of sewers and drains from 8 inches to 18 inches in diameter with liners. Construction will commence in December 2020 and be completed in November 2022. The three-year budget is $2,236,000.

Sewer Renewal & Rehabilitation in City Proper- Contract No. 18-308-001: This project includes the replacement & rehabilitation of sanitary sewer and drain pipes in City Proper. Also, associated sewers and drains that are in disrepair in these streets will be replaced or rehabilitated under this contract. Construction is projecting to commence in April 2022 and be complete by November 2025. The three-year budget is $300,000.

Sewer Renewal & Rehabilitation in Dorchester- Contract No. 18-308-003: This project includes the replacement & rehabilitation of sanitary sewer and drain pipes in Dorchester. Sewers serving the area were found heavily damaged and undersized. The work in this contract also includes the replacement of 670 feet of 8" clay pipe with new 10" sewer pipe. Construction is projected to commence in May 2021 and will be completed by May 2022. The three-year budget is $787,000.

Sewer & Drain Replacement & Rehabilitation in Dorchester, Hyde Park, South Boston & West Roxbury- Contract No. 17-309-001: This project includes the replacement & rehabilitation of sanitary sewer and drain pipes in Dorchester, Hyde Park, South Boston & West Roxbury. Construction is projected to commence in January 2021 and be completed by October 2022. The three-year budget is $6,524,000.

Sewer & Drain Replacement & Rehabilitation City Wide- Contract No. 17-309-014: This project includes replacement & rehabilitation of sanitary sewer & drain pipes City Wide. Construction commenced in May 2019 and be completed by July 2021. The three-year budget is $2,553,000.

Rehabilitation of Large Sewer and Drain Conduits on the Waterfront & South Boston - Contract No. 17-309-015: This project includes trenchless rehabilitation of large sewer and drain conduits in the Waterfront / South Boston. Recent CCTV inspection of sewer and drain in these areas have shown signs of hydrogen sulfide chemical. Pipes in this contract have been found defective and in need of repair as determined by CCTV inspection under contract 17-309-006. Construction is projected to commence in June 2021 and be completed in August 2022. The three-year budget is $2,591,000.

Sewer & Drain Replacement & Rehabilitation in East Boston- Contract No. 17-308-001: This project includes replacement & rehabilitation of sanitary sewer and drain pipes in East Boston. Construction commenced in September 2019 and will be complete by November 2021. The three-year budget is $450,000.

Sewer & Drain Replacement & Rehabilitation in Dorchester, Fenway/Kenmore, Mattapan and Roxbury- Contract No. 17-308-002: This project includes replacement & rehabilitation of sanitary sewer and drain pipes in Dorchester, Fenway/Kenmore, Mattapan & Roxbury. Construction commenced in June 2020 and be completed by October 2021. The three-year budget is $409,000.

Sewer & Drain Replacement & Rehabilitation in Roslindale, Jamaica Plain, Mattapan, Hyde Park & West Roxbury Contract No. 17-308-003: This project includes the installation of sanitary sewer & drains in the Roslindale, Jamaica Plain, Mattapan, Hyde Park and West Roxbury. Construction commenced July 2020 and be completed by April 2021. The total three-year budget for this project is $1,574,000.

Sewer & Drain Replacement and Rehabilitation in Back Bay, Beacon Hill & City Proper- Contract No. 17-308-006: This project includes sanitary sewer & drain replacement and rehabilitation in Back Bay/Beacon Hill and City Proper. Construction commenced in September 2019 and will be completed by September2021. The three-year budget is $666,000.

Sewer & Drain Rehabilitation in City Proper- Contract No. 17-308-007: This contract will replace 2,980 feet of 8-inch to 12-inch water mains on Harvard Street, High Street, Lincoln Street, Monsignor Shea Road, and South Street in the Financial District, the Leather District, and Chinatown, along with associated sewer and storm drain relay/rehab. This work is in response to break history. Construction commenced in November 2020 and will be completed in December 2021. The three-year budget is $486,000.

Sewer R & R Portion of Separation East Boston I- Contract No. 16-309-005: This project includes the separation of combined sewers in a portion of East Boston. Construction commenced in September 2018 and completed by August 2020. A small budget of $138,000 will be created in 2021 to cover closings costs of this contract.

North End Sewer Phase IV - Contract No. 16-309-006: This project includes the replacement and rehabilitation of sanitary sewer, storm drains in the North End. This project is Phase 4 of a 4-Phase program. Construction commenced in June 2020 and will be completed in August 2021. The three-year budget is $65,000.

Sewer R & R in Roxbury Contract No. 16-308-002: This project includes the Renewal & Replacement of sanitary sewer and drain pipes in Roxbury. Construction commenced in June 2019 and will be completed by June 2021. The total three-year budget for this project is $149,000.

Sewer R & R in the South End, Roxbury and City Proper Contract No. 15-308-004: This project includes the replacement and rehabilitation of sanitary sewer and drain pipes in the South End, Roxbury and City Proper. Construction commenced July 2017 and was completed in 2020. A budget will be established in 2020 in the amount of $43,000 to cover closing costs of the contract.

PROJECT CASH FLOW

Table 16 on the page 58 presents the cash flow expenditures for the Sewer Renewal and Replacement Program. Total 2021-2023 expenditures are $56,129,000. Expenditures for 2021 are expected to be $19,987,000.

Table 16 - Sewer Renewal & Replacement

Capital Improvement Program
2021 - 2023
Sewer Renewal and Replacement

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
CCTV of Sewers & Storm Drains - CMOM	-	-	-	-	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	600,000	400,000	-	1,000,000
CCTV of Sewers & Storm Drains - CMOM	-	-	-	-	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	600,000	400,000	-	1,000,000
Future CCTV of Sewers & Storm Drains/CMOM	-	-	-	-	-	-	-	-	-	-	-	-	-	2,000,000	2,000,000	4,000,000
Sewer R & R in Readville	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,200,000	1,200,000
Sewer R & R in South Boston	-	-	-	-	-	-	-	-	-	-	-	107,000	107,000	1,071,000	1,071,000	2,249,000
Ongoing Projects																
Design Services for Sewer Renewal & Replacement	50,000	50,000	50,000	50,000	50,000	50,000	-	-	-	-	-	-	300,000	-	-	300,000
Emergency Sewer Replacement 2020	-	-	-	-	-	-	-	300,000	300,000	300,000	300,000	300,000	1,500,000	700,000	-	2,200,000
Emergency Sewer Replacement 2021 & 2022	-	-	-	-	-	-	-	-	-	-	-	-	-	2,300,000	2,400,000	4,700,000
Sewer R & R on Harrison Ave, South End	-	-	-	-	-	-	-	-	-	-	-	-	-	333,000	333,000	666,000
Sewer R & R in Charlestown	-	-	-	-	-	-	-	102,000	102,000	102,000	102,000	101,000	509,000	865,000	306,000	1,680,000
South Boston Separation Contract 1 Paving	-	-	-	-	-	-	-	-	-	-	29,000	58,000	87,000	447,000	447,000	981,000
South Boston Separation Contract 1	54,000	109,000	109,000	109,000	108,000	109,000	109,000	109,000	108,000	109,000	109,000	109,000	1,251,000	1,275,000	1,275,000	3,801,000
South Boston Separation Contract 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110,000	110,000
Sewer & Storm Drain Improvements in East Boston	-	-	-	-	-	-	-	-	-	-	-	-	-	-	628,000	628,000
Storm Drain Improvements in Brighton	-	-	-		113,000	112,000	113,000	-	-	-	-	-	338,000	-	-	338,000
South End Sewer R & R Improvements Ph I	-	-	-	-	-	-	-	-	-	-	-	-	-	94,000	94,000	188,000
Sewer R & R Improvements in Charlestown	-	-	-	-	-	-	-	-	-	-	-	-	-	1,115,000	1,115,000	2,230,000
Sewer R & R Improvements Citywide	-	-	-	-	-	-	-	-	-	-	-	-	-	910,000	1,137,000	2,047,000
City Proper Sewer R & R Improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	150,000	-	150,000
Emergency Sewer Replacement 2019	257,000	-	-	110,000	-	-	-	-	-	-	-	-	367,000	-	-	367,000
Sewer R & R in Fenway	-	-	-	-	-	-	-	-	-	-	-	-	-	2,050,000	2,051,000	4,101,000
Sewer R & R in Roslindale, Hyde Park & Mattapan	-	-	-	-	-	-	-	-	-	-	-	-	-	876,000	2,346,000	3,222,000
Sewer R & R Roslindale, Hyde Park & Mattapan	203,000	203,000	204,000	203,000	203,000	204,000	203,000	203,000	204,000	203,000	203,000		2,236,000	-	-	2,236,000
Sewer R & R in City Proper	-	-	-	-	-	-	-	-	-	-	-	-	-	300,000	-	300,000
Sewer R & R in Dorchester	-	-	-	-	-	260,000	200,000	170,000	-	-	-	50,000	680,000	107,000	-	787,000
Sewer R& R City Proper, Dor, Hyd Pk, SB & W. Rox	-	277,000	277,000	277,000	304,000	304,000	304,000	304,000	304,000	304,000	304,000	303,000	3,262,000	3,262,000	-	6,524,000
Sewer & Drain R & R Citywide	346,000	347,000	346,000	347,000	346,000	347,000	-	379,000	-	95,000	-	-	2,553,000	-	-	2,553,000
Rehab of Large Sewer & Drain Conduits	-	-	-	-	-	231,000	231,000	231,000	231,000	231,000	231,000	231,000	1,617,000	974,000	-	2,591,000
Sewer R & R in East Boston	125,000	125,000	125,000	75,000	-	-							450,000			450,000
Sewer R & R in Dorchester & Roxbury	409,000	-	-	-	-	-	-	-	-	-	-	-	409,000	-	-	409,000
Sewer R & R in Jamaica Plain and Mattapan	-	-	-	-	475,000	566,000	343,000	146,000	44,000	-	-	-	1,574,000	-	-	1,574,000
Sewer R & R in Beacon Hill	-	-	-	111,000	111,000	111,000	111,000	111,000	111,000	-	-	-	666,000	-	-	666,000
Sewer R & R in City Proper	-	-	-	-	61,000	61,000	60,000	61,000	61,000	60,000	61,000	61,000	486,000	-	-	486,000
Sewer R & R Port Sew Sep in East Boston	57,000	-	66,000	15,000	-	-	-	-	-	-	-	-	138,000	-	-	138,000
North End Phase III	-	-	-	65,000	-	-	-	-	-	-	-	-	65,000	-	-	65,000
Sewer R & R in Roxbury	99,000		25,000		25,000	-	-	-	-	-	-	-	149,000			149,000
Sewer R & R in the South End	-	12,000	3,000	3,000	25,000	-	-	-	-	-	-	-	43,000	-	-	43,000
Totals	**$1,600,000**	**$1,123,000**	**$1,205,000**	**$1,365,000**	**$1,971,000**	**$2,505,000**	**$1,824,000**	**$2,266,000**	**$1,615,000**	**$1,554,000**	**$1,489,000**	**$1,470,000**	**$19,987,000**	**$19,629,000**	**$16,513,000**	**$56,129,000**
Bonds	274,000	452,000	477,000	578,000	551,000	786,000	675,000	646,000	476,000	364,000	365,000	521,000	6,165,000	6,490,000	4,322,000	16,977,000
Rate	1,215,000	562,000	553,000	663,000	1,312,000	1,610,000	1,040,000	1,511,000	1,031,000	1,081,000	986,000	782,000	12,346,000	11,417,000	10,359,000	34,122,000
Grants	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	111,000	109,000	175,000	124,000	108,000	109,000	109,000	109,000	108,000	109,000	138,000	167,000	1,476,000	1,722,000	1,832,000	5,030,000
Totals	**$1,600,000**	**$1,123,000**	**$1,205,000**	**$1,365,000**	**$1,971,000**	**$2,505,000**	**$1,824,000**	**$2,266,000**	**$1,615,000**	**$1,554,000**	**$1,489,000**	**$1,470,000**	**$19,987,000**	**$19,629,000**	**$16,513,000**	**$56,129,000**

INCREASED CAPACITY PROJECTS

DESCRIPTION AND JUSTIFICATION

During the 1980s, the Commission completed the construction of several new major interceptors including the New Boston Main and New East Side Interceptors. They provided increased system capacity, which reduced wet weather combined sewer overflow discharges and virtually eliminated dry weather discharges to Boston Harbor and its tributary waters.

Since their completion, the Commission has continued to make capital investments to increase system capacity in some areas and maximize the existing capacity of the system in other areas. The Commission's efforts to increase system capacity are designed to ensure sufficient hydraulic flow in all areas of the city, reduce long-term maintenance costs, minimize the frequency and volume of CSO discharges and ensure the continued structural integrity of the wastewater collection system.

In 1994, the EPA issued a policy nationwide on CSOs that requires communities with CSOs to implement nine minimum controls to reduce the frequency and volume of CSO discharges. Maximizing the use of in-system storage, or system capacity, is one of the nine controls. The Commission continues its efforts to increase system capacity. The projects presented in the CIP Increased Capacity Program seek to fulfill that objective.

NEW PROJECTS

ONGOING PROJECTS

Installation of Tide-gates City-Wide- Contract No. 19-309-001: This contract will evaluate the need for and provide design for the installation of five tide gates on drainage systems of various sizes in Water Front/North End, South Boston (Seaport), and Dorchester. The Design Department is working with the planning department to identify outfalls which may not be protected from extreme tides to prevent street flooding from surcharged drainage systems. This project includes the installation of tide-gates in City Proper, South Boston, Charlestown and Dorchester. Construction is projected to commence in April 2021 and will be completed in November 2022. The three-year budget is $1,000,000.

Installation of Backflow Prevention Devices in North End, Charlestown, and East Boston: Installation of backflow prevention devices at storm drain outfalls to prevent the receiving water from entering the storm drain system and flooding inland areas during exceptionally high tide and river levels. This project also includes ongoing coordination with the City of Boston's effort to prevent inundation of coastal land by constructing barriers. In conjunction with the barriers, backflow prevention devices must be installed

on the storm drain system by the Commission to prevent water from by-passing the barriers. The Commission and the City of Boston are committed to protect the City from predicted rising sea levels and increase in the number and severity of storms brought by climate change. The intent of this project to identify areas and backflow prevention devices on storm drains near the outfall pipe to prevent the receiving water entry into the storm drain system. Construction is projected to commence in October 2022 and be completed in February 2023. The three-year budget is $600,000.

PROJECT CASH FLOW

Table 17 on page 61 illustrates the 2021-2023 cash flow projection for Increased Capacity projects. Total 2021-2023 expenditures are $1,600,000. Monies allocated for 2021 total $480,000.

Table 17 - Increased Capacity

Capital Improvement Program
2021 - 2023
Increased Capacity

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
Ongoing Projects																
Tidegate Installation Citywide	-	-	-	-	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	480,000	520,000	-	1,000,000
Installation of Backflow Prevention Devices	-	-	-	-	-	-	-	-	-	-	-	-	-	300,000	300,000	600,000
Totals	-	-	-	-	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	480,000	820,000	300,000	1,600,000
Bonds	-	-	-	-	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	480,000	820,000	300,000	1,600,000
Rate		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$0	$0	$0	$0	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$60,000	$480,000	$820,000	300,000.00	$1,600,000

SEWER SEPARATION

DESCRIPTION AND JUSTIFICATION

The Commission's separation program involves the replacement of combined sanitary and storm sewers with two separate systems, one for sanitary sewage and one for stormwater. The purpose of the separation program is to reduce the frequency and volume of wet weather CSO discharges and ensure the continued compliance with state and federal permits. Combined systems will be separated where it is appropriate and cost effective to do so. Sewer separation work most often involves converting the combined sewer to a separate sanitary sewer and constructing a new storm drain.

In addition to addressing CSO concerns, the Commission is identifying sanitary sewage that is being discharge into the storm drain system. Between 1986 and December 31, 2019, the Commission removed more than 1,800 illegal connections, eliminating the discharge of an estimated 840,000 gallons of wastewater per day to the storm drainage system and receiving waters. In 2019 alone, the Commission eliminated 64 illicit sanitary sewer connections to storm drains, removing an estimated 38,000 gallons per day of sewage from the drainage system and receiving waters.

Since 1996, the Commission has spent approximately $300 million on sewer separation projects. Projects were designed with the intent of eliminating combined sewer overflow ("CSO") discharge, improving water quality in Boston Harbor and its tributaries and diverting stormwater from environmentally sensitive areas. The Commission's ability to remove extraneous flow from its sewers will result in a reduction in its metered wastewater flow and wholesale sewer charges. Thus far, these projects have reduced annual discharge of CSO by 124.3 million gallons.

The Commission regularly inspects, cleans and maintains its catch basins citywide. Cleaning restores the effective capacity of catch basins, thereby allowing for greater solids removal from stormwater flows. Hoods and traps are replaced on catch basins as needed. The Commission's site plan review process has been upgraded and enhanced in recent years. The Commission now exercises greater control over non-stormwater discharges and ensures that construction sites and new development projects conform to its requirements, as well as state and federal requirements for stormwater management.

NEW PROJECTS

No New Projects

ONGOING PROJECTS

City-Wide Correction of Illicit Sanitary Building Connections Contract No. 20-309-015: This contract involves disconnection of sanitary sewer laterals from storm drains and reconnection of laterals to sanitary sewers. Sanitary sewer laterals connected to storm drains allow untreated sewage to discharge to storm drains and from there to rivers, streams, wetlands and Boston Harbor. Sanitary sewer laterals connected to storm drains are prohibited under the Commission's NPDES Stormwater Permit and the Consent Decree. This project commenced in October 2020 and will be completed by September 2023. The three-year budget is $1,625,000.

Construction Oversight of South Boston Sewer Separation Contract No. 20-206-002: This project includes the construction oversight of the South Boston Separation. Construction will commence in April 2021 and is projected to be completed by August 2027. The three-year budget is $4,185,000.

Sewer Separation in East Boston and West Roxbury Contract No. 17-309-005: This project will include the Separation of combined sewers in East Boston and West Roxbury. Work will also include replacement or rehabilitation of water and sewer pipes as necessary. Construction began in September 2019 and is projected to be completed by May 2021. The three-year budget is $1,444,000.

Sewer Separation Upper Roxbury Phase III- Contract No. 17-309-011: This project includes the installation of sewers and drains for sewer separation in Upper Roxbury. Construction is scheduled to commence in April 2023 and is projected to be completed by November 2025. The three-year budget is $2,575,000.

Sewer Separation East Boston I- Contract No. 16-309-005: This project includes the separation of combined sewers in a portion of East Boston. Construction commenced in September 2018 and was completed by August 2020. A small budget of $206,000 will be established in 2021 to cover closing costs of this contract.

Sewer Separation Upper Roxbury Phase II Contract No. 16-309-011: This project includes the installation of sewers and drains for sewer separation in Upper Roxbury. Construction commenced in April 2016 and is projected to be completed by October 2021. The three-year budget is $5,446,000.

***Sewer Separation Roxbury Phase 1 Contract No. 15-309-011*:** This project includes the installation of sewers and drains for sewer separation in Roxbury. Construction commenced in April 2016 and was delayed by gas main relocation work. A budget has been established for 2021 in the amount of $1,024,000 to cover work on Dudley St.

City-wide Illegal Connections Investigation Phase 5 Contract 20-206-007: This project is a continuation of the Commission's Citywide Illegal Connection Investigation Program under Phase 5. Under the Consent Decree with the EPA and NPDES Stormwater Permit the Commission is required to identify and eliminate

sanitary sewer connections to storm drains and annually screen all the Commission's outfalls. Under this program illicit sanitary sewer connections to storm drains are identified using manhole inspections and sandbagging, water quality sampling, and dye tests of buildings. This program also includes wet and dry weather outfall screening to prioritize drainage sub-catchments for investigation. This program began in August 2020 and is expected to conclude in August 2023. The total cost of the project is estimated at $2,226,000, with $800,000 expected to be spent in the 2021 budgeted period.

Owner Fix of Illegal Connections: Illicit connections in the public way are usually corrected by a Commission contractor. In a few instances, homeowners must alter internal plumbing by installing an ejector pump or redirecting piping to correct an illicit connection. In these instances, the Commission will reimburse owners up to $7,500 for the work. Illicit connections are a violation of Federal law and must be promptly corrected. This program was instituted and approved by the Commission to assist property owners with costly alterations required to correct illicit connections. The average need is four per year for a total of $30,000 per year. Capital reserved for reimbursements for the 2021-2023 period is $90,000.

PROJECT CASH FLOW

Table 18 on page 65 illustrates the cash flow for the Sewer Separation for 2021-2023. Total expenditures over the three-years of the program are expected to be $20,017,000, of which $10,919,000 is budgeted for expense in 2021.

Table 18 - Sewer Separation

Capital Improvement Program
2021 - 2023
Sewer Separation

Description	Proj	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																	
Ongoing Projects																	
Correction of Illicit Sanitary Building Connections	3323200305	48,000	48,000	48,000	47,000	48,000	48,000	48,000	47,000	48,000	48,000	48,000	48,000	574,000	573,000	478,000	1,625,000
Construction Oversight of South Boston Separation	3323200304	116,000	116,000	116,000	117,000	116,000	116,000	116,000	117,000	116,000	116,000	116,000	117,000	1,395,000	1,395,000	1,395,000	4,185,000
Sewer Separtion in East Boston Phase II	3323170302	-	-	-	210,000	210,000	210,000	210,000	136,000	35,000	-	-	-	1,011,000	-	-	1,011,000
Sewer Separtion in East Boston Phase II	3323170302	-	-	-	90,000	90,000	90,000	90,000	58,000	15,000	-	-	-	433,000	-	-	433,000
Roxbury Sewer Separation Contract 3	3323160301	-	-	-	-	-	-	-	-	-	-	-	-	-	1,288,000	1,287,000	2,575,000
East Boston Sewer Separation	3323160302	57,000	-	133,000	16,000	-	-	-	-	-	-	-	-	206,000	-	-	206,000
Roxbury Sewer Separation Contract 2	3323160303	475,000	973,000	890,000	1,016,000	512,000	377,000	333,000	342,000	199,000	329,000	-	-	5,446,000		-	5,446,000
RoxburySewer Separation Contract 1	3323160201	-	200,000	200,000	200,000	103,000	257,000	-	-	-	-	-	64,000	1,024,000	-	-	1,024,000
City-wide Illegal Connections Investigation PH V	3323020222	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	60,000	60,000	60,000	60,000	800,000	800,000	626,000	2,226,000
Owner Fix of Illegal Connections	3323020221	7,000	-	-	8,000	-	-	7,000	-	-	8,000	-	-	30,000	30,000	30,000	90,000
Totals		$773,000	$1,407,000	$1,457,000	$1,774,000	$1,149,000	$1,168,000	$874,000	$770,000	$473,000	$561,000	$224,000	$289,000	$10,919,000	$4,086,000	$3,816,000	$18,821,000
Bonds		123,000	316,000	316,000	415,000	309,000	463,000	213,000	175,000	131,000	124,000	116,000	181,000	2,882,000	1,425,000	1,425,000	5,732,000
Rate		118,000	118,000	118,000	117,000	118,000	118,000	118,000	117,000	108,000	108,000	108,000	108,000	1,374,000	1,373,000	1,104,000	3,851,000
LWSAP		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I		532,000	973,000	1,023,000	1,242,000	722,000	587,000	543,000	478,000	234,000	329,000	-	-	6,663,000	1,288,000	1,287,000	9,238,000
Totals		$773,000	$1,407,000	$1,457,000	$1,774,000	$1,149,000	$1,168,000	$874,000	$770,000	$473,000	$561,000	$224,000	$289,000	$10,919,000	$4,086,000	$3,816,000	$18,821,000

SEWER SYSTEM SPECIAL

DESCRIPTION AND JUSTIFICATION

The Sewer System Special Projects category provides funding for a variety of system planning and other studies and for professional services associated with the rehabilitation and operation of the sewer system.

Overall, the objectives of the Sewer System Special Projects are to extend the useful life of the Commission's wastewater facilities, comply with the requirements of the NPDES Permit regulations and plan for future sewer system projects.

NEW PROJECTS

Drain Sensor Deployment: The purpose of this project is to install sensors through the Commission's major sewer and drains and develop an application for real-time monitoring of the systems. The application will have a graphic component showing profiles of pipes and graphical representation of depth of flow. This project will commence in September 2021 and be completed by August 2024. The three-year budget is $970,000.

3D Depictions of Sewer Structures Phase II: The project will produce animated files that allow Commission staff to educate themselves on how regulating structures are configured and how they operate under varying weather conditions. The depictions will provide Commission employees with knowledge about what they will see in the field and how the structure operates and how the tributary pipes impact them. These animated three-dimensional (3D) renderings will help the Commission in its goal to provide knowledge transfer to Commission employees. This project will produce animated three-dimensional (3D) interactive renderings for up to 50 sewer regulators and other sewer structures. Planning commenced in July 2020 with a completion date of December 2021. The three-year budget is $250,000.

Materials Handling Facility Weight Scale Upgrade: The purpose of this project is to purchase a weight scale at the Materials handling Facilities. This project will commence in January 2021 and be completed by December 2023. The three-year budget is $95,000.

ONGOING PROJECTS

Lateral Testing & CCTV of Sewers & Drains (IDDE): Under the Consent Decree with EPA the Commission must adhere to strict deadlines for completing illicit discharge investigations. Testing of sewer laterals will verify whether the laterals leak sewage to the storm drain system. CCTV of sewers and drains will aid in identifying illicit sanitary discharges and structural deficiencies in the pipes. This funding will be used

to continue testing sewer laterals to determine whether they leak sewage into drains, and to CCTV inspect sewers and drains to aid in identifying illicit connections and structural deficiencies in pipes. This is expected to be a two-year contract. Planning is projected to commence in January 2021 with a completion date of January 2023. The three-year budget is $500,000.

Upgrades to Summer Street Pump Station: In 2016 a condition assessment of the Commission's pump stations was completed which recommended various repairs and improvements to be made to maintain service and reliability of the pump stations. This project includes the upgrade or replacement of essential equipment and components related to the Commission's Pump Station on Summer Street. The upgrades will commence in January 2021 and is projected to be completed by December 2023. The three-year budget is $250,000.

3D Depictions of Sewer Structures Contract No. 19-206-010: The purpose of this project is to produce animated three-dimensional interactive renderings for up to 50 sewer regulators and other sewer structures. This project will produce animated files that allow Commission staff to educate themselves on how regulating structures are configured and how they operate under varying weather conditions. The depictions will provide Commission employees with knowledge about what they see in the field, how the structure operates and how the tributary pipes impact them. These animated three-dimensional (3d) renderings will help the Commission in its goal to provide knowledge transfer to Commission employees. Planning commenced in April 2019 with a completion date of December 2020. A budget of $30,000 will be established in 2021 for closing costs of this contract.

Technical Assistance Sewer and Drain Models Contract No. 19-206-012: The purpose of this project is to acquire technical assistance in running Sewer and Drain Models. The program will also include provisions for training and manual development. The Commission has made a significant investment in both the Sewer Model and the Drain model. Engineering staff will benefit from the technical advice on how to more efficiently use the software. Planning commenced in December 2019 and completed in December 2022. The three-year budget is $225,000.

Lateral Testing and CCTV of Sewers and Storm Drains: IDDE Contract No. 18-309-005: Under the Consent Decree with EPA the Commission must adhere to strict deadlines for completing illicit discharge investigations. Testing of sewer laterals will verify whether the laterals leak sewage to the storm drain system. CCTV of sewers and drains will aid in identifying illicit connections and structural deficiencies in the pipes. This funding will be used to complete contract 18-309-005 which was established to test sewer laterals to determine whether they leak sewage into drains, and to CCTV inspect sewers and drains to aid in identifying illicit connections and structural deficiencies in pipes. This was a two-year contract. The project started in March 2018 and will be completed by December 2020. A small budget of $33,000 will be established in 2021 to cover closing costs of this contract.

Dorchester Interceptor Study Contract No. 18-206-003: The purpose of this project is to identify how the Dorchester Interceptor operates during wet weather. The Dorchester Interceptor is not able to convey flows during large storms. Several gates are in place along the interceptor to divert flows out of the interceptor. The project will identify what measures are necessary to eliminate the need for the gates. The project will meter and model flows over a three-year period. Flow meters will supplement existing

data. The Commission's model will attempt to simulate flows in real time. The modeling and metering efforts will help to determine if the interceptor is too small. The project commenced in September 2018 and is projected to be completed by September 2022. The three-year budget is $769,000.

Trilling Way Pump Station Improvements: In 2016 a condition assessment of the Commission's pump stations was completed which recommended various repairs and improvements to be made to maintain service and reliability of the pump stations. This project includes the upgrade or replacement of essential equipment and components related to the Commission's Pump Stations. The upgrades will commence in January 2021 and will be completed by December 2023. The three-year budget is $350,000.

Discharge Notification for CSOs Contract No. 19-206-008: The purpose of this is to comply with the anticipated new State Regulations and the Commission's CSO NPDES Permit, which requires the Commission to notify the public of discharges from its combined sewer system. Professional metering services will be used to determine when an overflow began and when it ended. A website will be maintained for the public to access the overflow information. The planning stage commenced in August 2019 and is estimated to be completed in December 2022. The three-year budget is $1,450,000.

Interactive Training Tool: This project includes the development of an interactive training tool that will support knowledge sharing specific to the operation of the Commission's sewer and drainage systems and relevant components of the MWRA's wastewater collection system. The Planning stage is scheduled to commence in September 2022 and is projected to be completed in December 2023. The three-year budget is $600,000.

BWSC Union Park Pump Station Improvements: In 2016 a condition assessment of the Commission's pump stations was completed which recommended various repairs and improvements to be made to maintain service and reliability of the pump stations. This project includes the upgrade or replacement of essential equipment and components related to the Commission's Pump Stations. The upgrades will commence in January 2021 and is projected to be completed by December 2023. The three-year budget is $930,000.

Diving Services NA: This project includes Professional Diving services to inspect and repair large conduits and other underwater facilities. This is a professional services contract. In many instances it is necessary to inspect and repair Commission facilities, which are underwater and thus inaccessible. This needs to be accomplished using professional qualified divers. The services commenced in February 2020 and are expected to conclude by February 2023. The three-year budget is $200,000.

Geotechnical Service Contract No. 19-206-002: This project includes professional geotechnical services related to Commission projects. Services include soil borings and engineering analysis to design pipe and soil support systems. This is a professional services contract. To install sewer and drain pipe in deep locations and in certain soils it is required to sample and analyze the soils to determine the correct method of support for the pipes and excavations. Services commenced in January 2020 and conclude in December 2022. The three-year budget is $200,000.

Land Survey Services Contract No. 19-206-003: This project includes surveys for Capital Improvement Projects after construction is completed. This is used to supplement Commission staff with their surveys

for busier roadways and difficult to access locations. These services are necessary to complete contracts for the Capital Improvement Program. Services commenced in August 2019 and conclude in July 2022. The three-year budget is $64,000.

Castings & Gratings: Payments to Boston Public Works Department for adjustment of BWSC Water and sewer castings during roadway reconstruction contracts. Services are projected to commence in January 2021 and expected to conclude in December 2021. The three-year budget is $600,000.

Survey Services for CIP Projects Contract 20-206-005: This project includes total station surveys for Capital Improvement Projects. This is used to augment Commission staff with their surveys. These services are necessary to complete contracts for the Capital Improvement Program. Services commenced in October 2020 and conclude in September 2023. The three-year budget is $267,000.

PROJECT CASH FLOW

Table 19 on page 70 illustrates the cash flow expenditures for Sewer Special Projects for the period 2021-2023. The total expenditures for the Sewer Special program are $7,783,000. The expenditures for 2021 are anticipated to be $3,084,000.

Table 19 - Sewer Special

Capital Improvement Program
2021 - 2023
Sewer Special

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
Drain Sensor Deployment	-	-	-	-	-	-	-	-	-	-	35,000.00	35,000.00	70,000	450,000	450,000	970,000
3D Depiction of Sewer Structures Phase II	10,000	10,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	220,000	30,000	-	250,000
Weight Scale Upgrade atg Materials Handling Facility	-	60,000	-	-	10,000	-	-	-	-	-	-	-	70,000	15,000	10,000	95,000
Ongoing Projects																
Lateral Testing & CCTV of Sewers & Drains (IDDE) 2021	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	20,000	20,000	250,000	250,000	-	500,000
Upgrades to Summer St. Pump Station	-	-	-	50,000	-	50,000	-	-	-	-	-	50,000	150,000	50,000	50,000	250,000
3D Depiction of Sewer Structures	20,000	10,000	-	-	-	-	-	-	-	-	-	-	30,000	-	-	30,000
Technical Assistance for Sewer & Drain Models	5,000	5,000	5,000	6,000	6,000	13,000	7,000	7,000	15,000	8,000	8,000	15,000	100,000	100,000	25,000	225,000
CCTV of Sewers and Storm Drains: IDDE	33,000	-	-	-	-	-	-	-	-	-	-	-	33,000	-	-	33,000
Dorchester Interceptor Study	37,000	38,000	37,000	38,000	37,000	38,000	37,000	38,000	37,000	38,000	37,000	38,000	450,000	319,000	-	769,000
Trilling Way Pump Station Improvements	-	-	-	50,000	-	50,000	-	50,000	-	-	-	25,000	175,000	100,000	75,000	350,000
Discharge Notification for CSOs	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000	600,000	250,000	1,450,000
Interactive Training Tool	-	-	-	-	-	-	-	-	-	-	-	-	-	100,000	500,000	600,000
Upgrades to UPPS & Satellite Stat	-	-	50,000	90,000	-	50,000	-	-	80,000	80,000	-	80,000	430,000	250,000	250,000	930,000
Diving Services	6,000	5,000	6,000	5,000	6,000	5,000	6,000	5,000	6,000	5,000	6,000	5,000	66,000	67,000	67,000	200,000
Geotechnical Services	8,000	8,000	8,000	8,000	8,000	9,000	9,000	9,000	9,000	8,000	8,000	8,000	100,000	100,000	-	200,000
Land Survey Services	3,000	3,000	4,000	3,000	3,000	4,000	3,000	3,000	4,000	3,000	3,000	4,000	40,000	24,000	-	64,000
Castings and Gratings	20,000	20,000	-	-	-	20,000	20,000	20,000	20,000	40,000	20,000	20,000	200,000	200,000	200,000	600,000
Survey Services for Asbuilts	8,000	8,000	9,000	8,000	8,000	9,000	8,000	8,000	9,000	8,000	8,000	9,000	100,000	100,000	67,000	267,000
Totals	$ 221,000	$ 238,000	$ 210,000	$ 349,000	$ 169,000	$ 339,000	$ 181,000	$ 231,000	$ 271,000	$ 281,000	$ 215,000	$ 379,000	$ 3,084,000	$ 2,755,000	$ 1,944,000	$ 7,783,000
Bonds	201,000	218,000	210,000	349,000	169,000	319,000	161,000	211,000	251,000	241,000	195,000	359,000	2,884,000	2,555,000	1,744,000	7,183,000
Rate	20,000	20,000	-	-	-	20,000	20,000	20,000	20,000	40,000	20,000	20,000	200,000	200,000	200,000	600,000
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$ 221,000	$ 238,000	$ 210,000	$ 349,000	$ 169,000	$ 339,000	$ 181,000	$ 231,000	$ 271,000	$ 281,000	$ 215,000	$ 379,000	$ 3,084,000	$ 2,755,000	$ 1,944,000	$ 7,783,000

DEDICATED INFILTRATION INFLOW 4:1 PROJECTS

To date, the Commission has implemented nine contracts, which are funded by the 4:1 I/I Infiltration Inflow Reduction Mitigation Account. Contracts 09-309-008, 10-206-005, 10-309-004, 15-206-001 and 17-206-004 are complete and Contracts 14-206-002, 16-206-003, 18-206-004, 19-206-009 and 20-206-008 are ongoing. All costs are funded by the ("DEDII") account and are 100% reimbursable; therefore, are not included in the 2021-2023 cashflow. The separation portion of the South Boston Separation contracts 20-309-012, 21-309-012, 22-309-012 and 20-206-002 are also funded by the ("DEDII") account and are 100% reimbursable; therefore, are not included in the 2021-2023 cashflow. Water and Sewer Renewal & Replacement portions of contracts 20-309-012, 21-309-012, 22-309-012 and 20-206-002 are included in the 2021-2023 cashflow.

In 2004, the Massachusetts Department of Environmental Protection (DEP), in conjunction with the MWRA and its member communities, implemented a program to help remove stormwater infiltration and inflow (I/I) from the sewer system. Large projects that are constructed can contribute substantial additional flows to the sewer collection system and subsequently require additional MWRA treatment. In the 2004 program, the Massachusetts DEP recommended to the Massachusetts Environmental Policy Act Office, through the Executive Office of Energy and Environmental Affairs, that new developments be required to remove I/I from the sanitary sewer system, as part of the requirements by the Secretary of Energy and Environmental Affairs. A ratio of 4:1 is used for I/I removed to new wastewater added. For example, if a proposed project's calculated new daily wastewater flow is 100,000 gallons per day (gpd), the developer must remove 400,000 gpd of I/I from the sewer system.

The Commission conducts investigations to identify sources of I/I to the Commission's system. These projects identify both public and private sector sources of I/I. Commission staff initially planned on developing a database with locations of I/I sources which would be provided to a developer. The developer would correct sources from that list to fulfill their I/I removal requirement. However, Commission staff believed that this process would be unwieldy and unmanageable. Subsequently, at the July 28, 2005 Commission meeting, the Commission approved the establishment of a dedicated account into which developers assessed a 4:1 Infiltration/Inflow reduction requirement by the DEP could pay money to fulfill their requirements. The funds would then be used by the Commission to fund I/I identification and reduction projects.

In April 2014, the DEP promulgated new regulations. The Commission has a National Pollutant Discharge Elimination System (NPDES) Permit for its combined sewer overflows and is subject to these new regulations [314 CMR 12.00, section 12.04(2)(d)]. This section requires all new sewer connections with design flows exceeding 15,000 gpd to mitigate the impacts of the development by removing four gallons of I/I for each new gallon of wastewater flow. In this regard, any new connection or expansion of an existing connection that exceeds 15,000 gallons per day of wastewater shall assist in the I/I reduction effort to ensure that the additional wastewater flows are offset by the removal of I/I. Projects constructed in multiple phases may contribute 4:1 reduction 90 days before each phase comes on-line. Phased construction may include flows under 15,000 gpd. Currently, a minimum ratio of 4:1 is used for I/I removal to new wastewater flow added.

Process of 4:1 Infiltration Inflow Payments

During private project design, Engineering Customer Services receives and reviews the Site Plan for conformance with the Commission's Engineering Design and Construction Standards. Engineering Customer Services will confirm if the project has been assessed a 4:1 compliance requirement by the DEP/MEPA.

Engineering Customer Service will notify the Planning Division of the most current estimated wastewater flow that has been submitted by the project developer. The developer shall coordinate with the Commission how to comply with the proposed assessment, either removing sources of I/I or making a requisite monetary contribution. The removal or contribution must be completed at least ninety days prior to the issuance of the Occupancy Permit by the Boston Inspectional Services Department. If the developer chooses to contribute monetarily to the Commission's I/I reduction program, the check is payable to the Commission. The check is submitted to the Finance Department for deposit into the Commission's dedicated I/I Reduction Account.

A. Commission Contributions Generated to Date

Between July 28, 2005 and March 2020, most projects fulfilled their contribution requirement by monetary means. The Commission has collected $33,086,742.13.

C. Allocations, Expenditures and Money Remaining in Bank from Dedicated 4:1 I/I Reduction Mitigation Account

Eleven contracts to date are funded by the dedicated account:

*South Boston Separation

1. Roxbury Separation Design, Contract 10-206-005
2. East Boston Separation, Contract 10-309-004
3. Dorchester Brook Regulator Relocation, Contract 09-309-008
4. Upper Roxbury Separation Design, Contract 14-206-002
5. Inflow and Infiltration Analysis of Wastewater Collection System, Contract 15-206-001
6. South Boston Sewer Separation Planning & Design, Contract 16-206-003*
7. SSES Dorchester, Contract 17-206-004
8. SSES Roslindale, Contract 18-206-004
9. South Boston Separation, Contract (1) 20-309-012*
10. South Boston Separation, Contract (2) 21-309-012*
11. South Boston Separation, Contract (3) 22-309-012*
12. Construction Oversight of South Boston Separation, Contract 20-206-002*
13. East Boston Sewer Separation Phase III- Contract No. 19-309-002
14. East Boston Sewer Separation – Phase 4

The allocations, expenditures to date and the money remaining for each contract are as follows:

Contract No.	Allocations	Expenditures	Money Remaining
10-206-005	$ 1,773,000.00	$1,752,541.96	$ 20,458.04
10-309-004	$ 498,494.59	$498,494.59	$ 0.00
09-309-008	$ 2,548,118.17	$2,548,118.17	$ 0.00
14-206-002	$ 1,050,000.00	$906,717.43	$ 143,282.57
15-206-001	$ 1,998,970.00	$1,718,424.95	$ 280,545.05
16-206-003	$ 5,240,000.00	$ 3,397,117.63	$1,842,882.37
17-206-004	$994,470.00	$878,897.72	$ 115,572.28
18-206-004	$ 1,301,793.00	$1,289,449.83	$12,343.17
20-309-012	$5,820,000.00	$0.00	$5,820,000.00
21-309-012	$2,868,000.00	$0.00	$2,868,000.00
20-309-012	$964,000.00	$0.00	$964,000.00
19-206-009	$1,900,000.00	$0.00	$1,900,000.00
Contracts Subtotal	$26,781,845.76	$9,666,096.53	$17,115,749.23
Unallocated Subtotal	$6,304,896.37		
Collected Total	$33,086,742.13		

D. Projected Expenditures from Dedicated 4:1 I/I Reduction Mitigation Account

The following proposed contracts are projected to draw from the $6,304,896.37 unallocated portion of the dedicated account:

- Mattapan SSES (Contact No. 20-206-008), approximately $1,500,000,
- Jamaica Plain SSES (Contract TBD), approximately $1,500,000,
- Dorchester Inflow Removal (Contract No. TBD), approximately $1,000,000
- Downspout Disconnection (Contract No. TBD), approximately $1,000,000.

E. Deposits Versus Expenditures by Area

The deposits to the dedicated account and the expenditures by area are as follows:

Area	Deposits	Expenditures
Allston-Brighton	$2,687,644.53	$159,805.05
Boston Proper	$13,481,619.18	$123,893.63
Charlestown	$498,676.80	$49,726.44
Dorchester	$9,070,308.99	$5,123,787.11
East Boston	$1,527,313.40	$669,134.42
Roxbury/South End	$3,124,158.67	$2,837,409.23
West Roxbury	$2,697,020.56	$702,340.65

Open Contracts

Charlestown SSES: The Massachusetts Department of Environmental Protection (MassDEP) developed regulations requiring sewer system operators to conduct an infiltration and inflow (I/I) analysis of their wastewater collection system and implement a long term plan to identify and remove extraneous flows. The I/I analysis was completed and the final report was delivered to the Commission in May of 2017. The report's long term plan divided the wastewater collection system into 11 regions and recommended that the BWSC conduct a sewer system evaluation survey (SSES) in one region each year. This project is initiated to identify sources of extraneous flows in the Charlestown region of the wastewater collection system. This project will entail an Infiltration and Inflow Sewer System Evaluation Survey (SSES) to identify sources of extraneous flow in the Commission's wastewater collection system. The SSES will include flow monitoring, manhole inspection, smoke testing, dye testing, and television inspection of sewer pipes. Findings will be provided to the Commission in a report with recommendations for capital improvements to eliminate sources of extraneous flows. This project will entail an Infiltration and Inflow Sewer System Evaluation Survey (SSES) to identify sources of extraneous flow in the Commission's wastewater collection system. The SSES will include flow monitoring, manhole inspection, smoke testing, dye testing, and television inspection of sewer pipes. Findings will be provided to the Commission in a report with recommendations for capital improvements to eliminate sources of extraneous flows. The planning stage will commence in April 2022. The completion date for this contract is September 2024. The three-year budget is $1,000,000.

Jamaica Plain SSES: The Massachusetts Department of Environmental Protection (DEP) developed regulations requiring sewer system operators to create and implement a long term infiltration and inflow (I/I) reduction plan to remove extraneous flows from the wastewater collection system. The I/I reduction plan was completed in May of 2017. The I/I reduction plan recommends that the Commission conduct sewer system evaluation surveys in sections of the wastewater collection system exhibiting excessive flows. This project is intended to identify sources of extraneous flows in the wastewater collection system serving Jamaica Plain. This project entails an, infiltration and inflow, sewer system evaluation survey (SSES) to identify sources of extraneous flow in Jamaica Plain. The SSES may include flow monitoring, manhole inspections, smoke testing, dyed water testing, and television inspection of sewer pipes. The finding will be provided to the Commission in a report with recommendation for capital improvements to eliminate the sources of extraneous flows. The planning stage will commence in June 2021. The completion date for this contract is January 2023. The three-year budget is $2,000,000.

East Boston Separation

East Boston Sewer Separation – Phase IV Design Services Contract 21-206-001: This project includes design services to augment in house capability and manage MOM increased work. Design is projected to commence in June 2022 and is projected to be completed by December 2025. The three-year budget is $1,700,000.

East Boston Sewer Separation Phase III- Contract No. 19-309-002: This project is the third phase of a multi -year plan to separate East Boston Combined sewers. Construction is projected to commence in June 2023 and be completed in June 2025. The three-year budget is $1,195,000.

South Boston Separation

South Boston Sewer Separation - Contract 1:

Contract 20-309-012: This project includes the construction of new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction Contract No. 1 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. Construction is scheduled to start in April 2021 and is projected to be completed by August 2023. The three-year budget is $4,020,000.

South Boston Sewer Separation – Final Paving Contract 1:

Construction of new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Final Paving Contract No. 1 is one of two (2) planned contracts to install final pavement where new storm drains have been constructed in contracts 1 and 2 to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. New paving will also be installed where upgrades of the sanitary sewer and water main systems impact the roadway surface. Construction is projected to commence in April 2021 and is projected to be completed by November 2024. The three-year budget is $969,000.

South Boston Sewer Separation - Contract 2:

Contract 21-309-012: This project includes the construction of new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction Contract No. 1 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. Construction is projected to commence in August 2023 and is projected to be completed by November 2025. The three-year budget is $103,000.

South Boston Sewer Separation - Contract 3:

Contract 22-309-012: This project includes the construction of new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction Contract No. 3 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. This contract is currently scheduled to commence in April 2024.

South Boston Sewer Separation - Contract 4:

Contract 23-309-012: This project includes the construction of new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. The project also includes upgrades of the sanitary sewer and water main systems to continue providing the highest level of service to the community and to support the BPDA's initiative to foster future development along Dorchester Avenue. Construction Contract No. 4 is one of five (5) planned contracts to construct new storm drains to separate approximately 400 acres in South Boston along the Dorchester Avenue Corridor. This contract is currently delayed.

Construction Oversight of South Boston Sewer Separation Contract No. 20-206-002: This project includes the construction oversight of the South Boston Separation. This project commenced in November 2020 and is projected to be completed by February 2027. The three-year budget is $1,395,000.

Infiltration and Inflow Analysis SSES (Mattapan) Contract 20-206-008: The Massachusetts Department of Environmental Protection (DEP) developed regulations requiring sewer system operators to conduct infiltration and inflow (I/I) analysis of their wastewater collection system and implement a long term plan to identify and remove extraneous flows. The I/I reduction plan was completed and delivered to the Commission in May of 2017. The report's long term plan divided the wastewater collection system into 11 regions and recommended that the BWSC conduct a sewer system evaluation survey (SSES) in one region each year. This project is initiated to identify sources of extraneous flows in the wastewater collection system serving Mattapan. The SSES will include flow monitoring, manhole inspections, smoke testing, dyed water testing and television inspection of sewer pipes. Findings will be provided to the Commission in a report with recommendation for capital improvements to eliminate the sources of extraneous flows**.** The planning phase of this project commenced in April 2020 and is estimated to be completed in September 2022. The three-year budget is $1,500,000.

Infiltration and Inflow Analysis SSES (Allston/Brighton) Contract No. 19-206-009: The Massachusetts Department of Environmental Protection (DEP) developed regulations requiring sewer system operators to create and implement a long term infiltration and inflow (I/I) reduction plan to remove extraneous flows from the wastewater collection system. The I/I reduction plan was completed in May of 2017. The I/I reduction plan recommends that the Commission conduct sewer system evaluations surveys in sections of the wastewater collections system exhibiting excessive flows. This project is intended to identify sources of extraneous in the wastewater collection system serving Allston/Brighton. This project entails to identify sources of extraneous flows in the Allston/Brighton. The SSES will include flow monitoring, manhole inspections, smoke testing, dyed water testing and television inspection of sewer pipes. Findings will be provided to the Commission in a report with recommendation for capital improvements to eliminate the sources of extraneous flows**.** The planning phase of this project commenced in November 2019 and is estimated to be completed in April 2021. The three-year budget is $615,000.

Roxbury Sewer Separation Design Contract No. 14-206-002: This project includes the final design and subsequent construction for sewer separation in the Dudley Square of Roxbury. Sewer Separation removes gross inflow from the sewer system and is the most direct and efficient form of I/I reduction. Sewer Separation decreases the Commission's sewer payments to MWRA and decreases CSO activity. Work includes construction of new sewer and drains. The design phase of this project began in July 2014 and will completed in December 2021. A small budget of $128,000 will be established in 2020 to cover closing cost of this contract.

South Boston Sewer Separation - Contract 1:

Streets

STREETS	LIMITS
A ST	West Broadway to Dorchester Av
ATHENS ST	S Boston Bypass to C St
B ST	West Second St to Dorchester Av
BOLTON ST	S Boston Bypass to B St
C ST	West Second St to West Broadway
COSTELLO CIR	
CROWLEY ROGERS WY	Delessio Ct to D St
DALESSIO CT	
DORCHESTER AV	
FLAHERTY WY	B St to D St
GOLD ST	A St to B St
JOYCE HAYES WY	Orton Marota Wy to West Seventh St
LINSKY-BARRY CT	
OFF B ST	Orton Field
ORTON MAROTTA WY	B St to D St
PRIVATE RD	
SILVER ST	Dorchester Av to B St
WEST BROADWAY	S Boston Bypass to C St
WEST FIFTH ST	Dorchester Av to B St
WEST FOURTH ST	Dorchester Av to B St
WEST SEVENTH ST	Dorchester Av to D St
WEST SIXTH ST	S Boston Bypass to B St
WEST THIRD ST	B St to C St

South Boston Sewer Separation - Contract 2

STREETS	LIMITS
ALGER ST	
BAXTER ST	C St to E St
BELL CT	
C ST	West Seventh St to Old Colony Av
COTTAGE ST	
D ST	West Seventh St to Dorchester Av
DAMRELL ST	Old Colony Av to Dorchester Av
E ST	West Seventh St to Old Colony Av
EARL ST	West Ninth St to Old Colony Av
EWER ST	West Ninth St to Damrell St
FREDERICK ST	
GLOVER CT	End to Woodward St
GUSTIN ST	End to Old Colony Av
LARK ST	#23 to Old Colony Av
MIDDLE ST	Dorchester Av to Dorchester St
MITCHELL ST	at Old Colony Av
OLD COLONY AV	Dorchester Av to Dorchester St
PRIVATE RD	
SAYWARD PL	End to Woodward St
TUCKERMAN ST	Middle St to Dorchester St
WEST EIGHTH ST	#88 to E St
WEST NINTH ST	D St to E St
WOODWARD ST	Dorchester Av to Dorchester St

South Boston Sewer Separation - Contract 3

STREETS	LIMITS
BOWEN ST	D St to Dorchester St
D ST	#215 to West Seventh St
E ST	West Broadway to West Seventh St
F ST	Silver St to Bowen St and #58 to West Seventh St
GOLD ST	D St to Dorchester St
LILLY ST	
LOVIS ST	
SILVER ST	D St to Dorchester St
TUDOR ST	D St to #156 and F St to Dorchester St
WEST FIFTH ST	D St to Dorchester St
WEST FOURTH ST	D St to Dorchester St
WEST SEVENTH ST	D St to Dorchester St
WEST SIXTH ST	D St to Dorchester St

PROJECT CASH FLOW

Table 20 on page 80 illustrates the cash flow expenditures for DEDII Projects for the period 2020-2022. The total expenditures for the DEDII program are $14,631,000. The expenditures for 2020 are anticipated to be $3,850,000.

Table 20 - DEDII

Capital Improvement Program

2021-2023

Dedicated Infiltration Inflow 4:1 Projects

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New																
Infiltration/Inflow SSES (Charlestown)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,000,000	1,000,000
Infiltration/Inflow SSES (Jamaica Plain)	-	-	-	-	-	-	-	30,000	50,000	50,000	50,000	50,000	230,000	1,670,000	100,000	2,000,000
East Boston Sewer Separation Phase 4 Design Services	-	-	-	-	-	-	-	-	-	-	-	-	-	600,000	1,100,000	1,700,000
Ongoing																
East Boston Sewer Separation PH III	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,195,000	1,195,000
South Boston Separation Contract 1	57,000	115,000	115,000	115,000	116,000	115,000	115,000	115,000	116,000	115,000	115,000	116,000	1,325,000	1,350,000	1,351,000	4,026,000
South Boston Separation (Contract 1 Paving)	-	-	-	-	-	-	-	-	-	-	29,000	58,000	87,000	441,000	441,000	969,000
South Boston Separation Contract 2		-	-	-	-	-	-	-	-	-	-	-	-	-	103,000	103,000
Construction Oversight of South Boston Separation	39,000	39,000	39,000	38,000	39,000	39,000	39,000	38,000	39,000	39,000	39,000	38,000	465,000	465,000	465,000	1,395,000
Infiltration/Inflow SSES (Mattapan)	50,000	50,000	50,000	50,000	100,000	100,000	150,000	150,000	100,000	100,000	50,000	50,000	1,000,000	500,000	-	1,500,000
Infiltration/Inflow SSES (Allston/Brighton)	130,000	130,000	120,000	100,000	98,000	37,000	-	-	-	-	-	-	615,000	-	-	615,000
Roxbury Separation (Design Contract)	-	-	-	-	-	-	-	-	-	40,000	40,000	48,000	128,000	-	-	128,000
Totals	**276,000**	**334,000**	**324,000**	**303,000**	**353,000**	**291,000**	**304,000**	**333,000**	**305,000**	**344,000**	**323,000**	**360,000**	**3,850,000**	**5,026,000**	**5,755,000**	**14,631,000**
DEDII	276,000	334,000	324,000	303,000	353,000	291,000	304,000	333,000	305,000	344,000	323,000	360,000	3,850,000	5,026,000	5,755,000	14,631,000
Totals	**276,000**	**334,000**	**324,000**	**303,000**	**353,000**	**291,000**	**304,000**	**333,000**	**305,000**	**344,000**	**323,000**	**360,000**	**3,850,000**	**5,026,000**	**5,755,000**	**14,631,000**

SUPPORT PROJECTS

Various Support Projects are included in the 2021-2023 CIP, which the Commission firmly believes will improve the overall efficiency of Commission's functions and enhance its ability to collect revenues and track information. Funds are also allocated for software licenses and upgrades, hardware and peripheral equipment, metering, and vehicles.

OBJECTIVES

Primary Objectives of the 2021-2023 Support Category are as follows:

- Upgrade of Automatic Meter Reading System Data Collectors
- Upgrade Work Order Management System
- Replace Customer Information & Billing System
- Replacement of Commission Vehicles

Support Projects are divided into three sections. These sections are:

- Metering
- Information Technology
- Administrative Equipment

Table 21 on page 82 illustrates the Support Projects in the 2021-2023 Capital Improvement Program total $20.3 million. Monies allocated for 2021 total $7.0 million. Graph 11 on page 101 illustrates the Total Support expenditures for 2021-2023. Graph 12 on page 102 illustrates Support Distributions Spending by category for 2021.

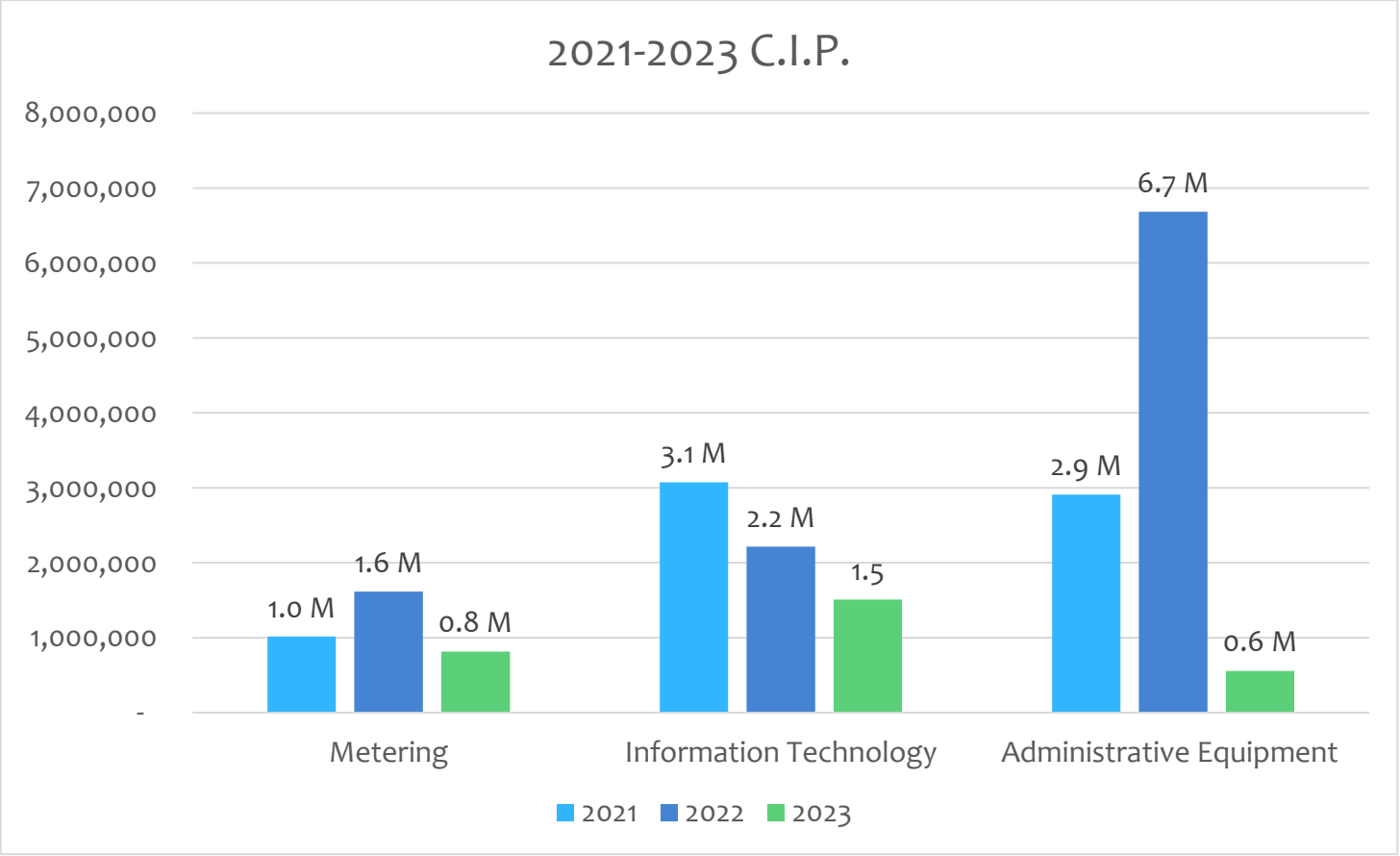
Table 21 - Support Category

Capital Improvement Program
2021-2023
Support Total

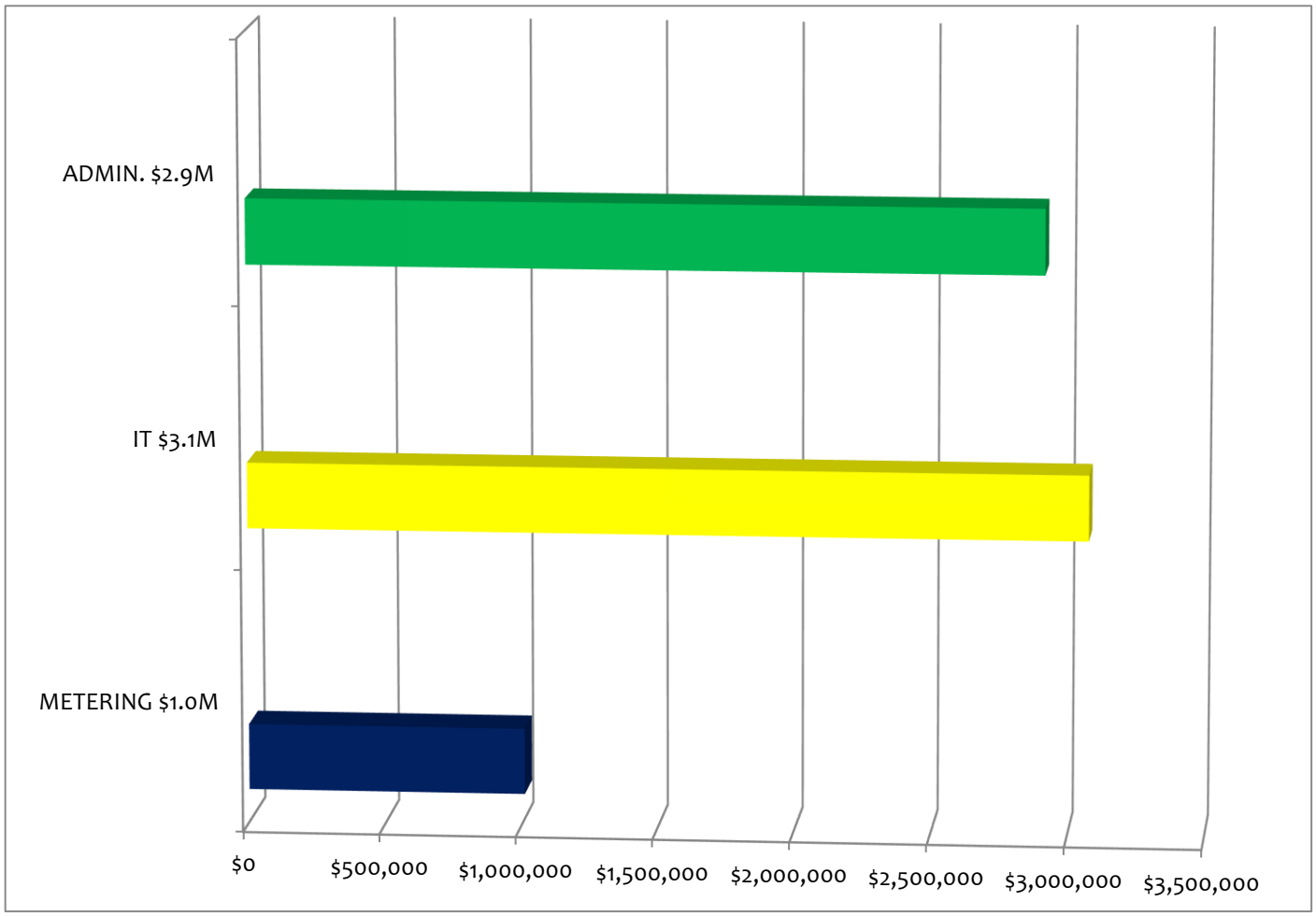
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
Metering																
Bonds	-	-	-	-	-	-	-	-	1,015,000	-	-	-	1,015,000	1,615,000	815,000	3,445,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$0	$0	$ -	$0	$0	$ -	$0	$0	$ 1,015,000	$0	0	$ -	$ 1,015,000	$ 1,615,000	$ 815,000	$ 3,445,000
Information Technology																
Bonds	290,000	230,000	280,000	300,000	325,000	305,000	170,000	200,000	230,000	230,000	230,000	285,000	3,075,000	2,215,000	1,510,000	6,800,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$ 290,000	$ 230,000	$ 280,000	$ 300,000	$ 325,000	$ 305,000	$ 170,000	$ 200,000	$ 230,000	$ 230,000	$ 230,000	$ 285,000	$ 3,075,000	$ 2,215,000	$ 1,510,000	$ 6,800,000
Administrative Equipment																
Bonds	-	45,000	528,000	-	-	228,000	-	255,000	477,000	300,000	300,000	778,000	2,911,000	6,681,000	558,000	10,150,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	$0	$45,000	$528,000	$ -	0	$ 228,000	0	$255,000	$477,000	$300,000	$300,000	$778,000	$ 2,911,000	6,681,000	558,000	$ 10,150,000
Support Total	**$ 290,000**	**$ 275,000**	**$ 808,000**	**$ 300,000**	**$ 325,000**	**$ 533,000**	**$ 170,000**	**$ 455,000**	**$ 1,722,000**	**$ 530,000**	**$ 530,000**	**$ 1,063,000**	**$ 7,001,000**	**$ 10,511,000**	**$ 2,883,000**	**$ 20,395,000**
Bonds	290,000	275,000	808,000	300,000	325,000	533,000	170,000	455,000	1,722,000	530,000	530,000	1,063,000	7,001,000	10,511,000	2,883,000	20,395,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**$ 290,000**	**$ 275,000**	**$ 808,000**	**$ 300,000**	**$ 325,000**	**$ 533,000**	**$ 170,000.00**	**$ 455,000**	**$ 1,722,000**	**$ 530,000**	**$ 530,000**	**$ 1,063,000**	**$ 7,001,000**	**$ 10,511,000**	**$ 2,883,000**	**$ 20,395,000**

GRAPH 11 -2021-2023 TOTAL SUPPORT EXPENDITURES
$20.4 MILLION

Spending by Category



GRAPH 12 -2021 SUPPORT DISTRIBUTION SPENDING
$7.0 MILLION



METERING

DESCRIPTION AND JUSTIFICATION

Metering programs include meter downsizing, which involves the replacement of large meters with smaller meters, where hydraulically feasible. On an annual basis, the Meter Services Department repairs, replaces, tests and installs water meters and automatic reading devices and maintains all field components of the Commission's Automatic Meter Reading system. All meters that are removed are tested on a fully equipped test bench, which was purchased in 2009. Meters 3" and larger are field tested, based on size, at intervals of: every year (6" to 10", every other year (4") and every three years (3"), in accordance with American Water Works Association standards. In addition, usage is evaluated utilizing the AMR system and recommendations are made to downsize identified meters to more accurately account for low flow.

NEW PROJECTS

In 2021 the Commission will evaluate upgrading the current Aclara Network Control Software to Aclara One Head End and evaluating the purchase of their Meter Data Management System("MDM") to better serve our customers with more analytic tools.

ONGOING PROJECTS

MTU and DCU Maintenance/Repair/Replacements and Upgrades: Having completed the upgrade of its AMR infrastructure in 2018, efforts will focus on quickly addressing any system issues with the intent of preserving the elimination of estimated bills which the system has achieved. The three-year budget is $1,600,000.

Large Meter Work (Water): The Commission closely follows AWWA recommendations and tests all large meters in accordance with AWWA parameters. In the course of its large meters work, the Commission prioritizes the repair/replacement of any malfunctioning parts and/or replaces large meters, as necessary. Wherever feasible, the Commission downsizes large meters to improve accuracy of registration. The three- year budget for this project is $945,000.

Residential Metering (Water): The residential metering program is an ongoing project to replace approximately 4,000 residential meters sizes 5/8" through 2" annually**.** The three- year budget for this project is $900,000.

PROJECT CASH FLOW

Table 22 on page 86 illustrates cash flow for Metering projects for 2021-2023 CIP totals $3,445,000. Metering expenditures allocated for 2021 total 1,015,000.

Table 22 - Metering Category

Capital Improvement Program
2021 - 2023
Metering

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																
No New Projects																
Ongoing Projects																
MTUs and Data Collection Units	-	-	-	-	-	-	-	-	400,000	-	-	-	400,000	1,000,000	200,000	1,600,000
Large Meters	-	-	-	-	-	-	-	-	315,000	-	-	-	315,000	315,000	315,000	945,000
Residential Meters	-	-	-	-	-	-	-	-	300,000	-	-	-	300,000	300,000	300,000	900,000
Totals	-	-	-	-	-	-	-	-	1,015,000	-	-	-	$ 1,015,000	$ 1,615,000	$ 815,000	$ 3,445,000
Bonds	-	-	-	-	-	-	-	-	1,015,000	-	-	-	1,015,000	1,615,000	815,000	3,445,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	-	-	-	-	-	-	-	-	1,015,000	-	-	-	1,015,000	1,615,000	815,000	$3,445,000

INFORMATION TECHNOLOGY

Effective use of the right technologies enables BWSC to provide more efficient and high-quality water and sewer services to the City of Boston. Strategic planning, careful selection of technological tools, and effective use of such tools has enabled BWSC to continue to improve the level of service associated with emergency responses, preventative maintenance, infrastructure improvements, and most importantly, quality customer service. Providing staff with appropriate training and utilizing the right mix of hardware and software is something BWSC continues to assess and act upon as new technologies continue to evolve.

Several mission critical software applications are utilized to support BWSC's daily operations and provide for emergency response services 24 hours a day, 7 days a week.

In 2019 BWSC completed the upgrade of the following systems: Customer Information and Billing System, BWSC Website and Mobile Computing Platform.

BWSC is currently in the process of replacing its Building Access Control and CCTV Security Systems and Construction Management Systems.

BWSC also completed a Cyber Security Risk Assessment on March 31, 2020. America's Water Infrastructure Act of 2018, S.3021, requires water system utilities which serve a population of at least 100,000 people complete a risk and resilience assessment of their electronic, computer or other automated systems (including the security of such systems).

In September 2019, BWSC completed the upgrade to a new Customer Information and Billing System. The new system is based on Microsoft technology which is tightly integrated with BWSC's other critical applications. The new system provides a mobile computing platform for BWSC field employees which creates a more prolific operational awareness of field operations. Our customers will now have options for eBilling, autopay and real-time notifications all controlled through our new Customer Self Service Portal.

NEW PROJECTS

No New Projects included in Software and Hardware line items are included in the tables below.

ONGOING PROJECTS

Server / Network Hardware & Peripheral Equipment: New Server/Network Hardware is used to upgrade and add to the Commission's Computing Infrastructure, which provides sufficient capacity and performance to support computing activities including: billing, HRIS, payroll, financials, work order system and GIS. The total three-year budget for this project is $955,000. Monies are budgeted for the following items:

- Backup disk/tape
- Communications/Networking
- Server Upgrades
- B&W Network Printers
- Disaster Recovery Hardware
- Replace/Upgrade PC's
- Tablets/Ipads/Phones
- Laptops
- Peripherals (cables, adapters, cases etc.)

Server/Network Software Licenses and Upgrades: Funding is included for software upgrades and additions to the Commission's Computer Infrastructure. Software and related upgrades to support Commission computing activities include: Billing, HRIS, Payroll, Financials, Work Order system, GIS, Document Management and Construction Management System. The total three-year budget for this project is $5,845,000. Software and upgrades consist of the following:

- Workorder Mgt. System (Cityworks)
- CIS
- Upgrade Engineering VB Apps
- IT Ticketing System
- Database Software
- Application Development
- Construction Management Software
- Website
- Document Management System
- GIS Software/Upgrade
- Management Portal
- Information Security
- Disaster Recovery Software & Services
- AutoCAD & Design Software/upgrades

PROJECT CASH FLOW

Table 23 on page 89 illustrates cash flow expenditures for IT projects for 2021-2023. Total three-year budget is $6,800,000. Expenditures for 2021 total $3,075,000.

Table 23 - Information Technology Category

Capital Improvement Program
2021 - 2023
Infomatrion Technology

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New																
No New Projects																
Ongoing																
Server/Network Hardware	40,000	20,000	30,000	50,000	75,000	70,000	20,000	-	20,000	30,000	30,000	35,000	420,000	270,000	265,000	955,000
Server/Network Software	250,000	210,000	250,000	250,000	250,000	235,000	150,000	200,000	210,000	200,000	200,000	250,000	2,655,000	1,945,000	1,245,000	5,845,000
Totals	**290,000**	**230,000**	**280,000**	**300,000**	**325,000**	**305,000**	**170,000**	**200,000**	**230,000**	**230,000**	**230,000**	**285,000**	**3,075,000**	**2,215,000**	**1,510,000**	**6,800,000**
Bonds	290,000	230,000	280,000	300,000	325,000	305,000	170,000	200,000	230,000	230,000	230,000	285,000	3,075,000	2,215,000	1,510,000	6,800,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**290,000**	**230,000**	**280,000**	**300,000**	**325,000**	**305,000**	**170,000**	**200,000**	**230,000**	**230,000**	**230,000**	**285,000**	**3,075,000**	**2,215,000**	**1,510,000**	**6,800,000**

ADMINISTRATIVE EQUIPMENT

DESCRIPTION AND JUSTIFICATION

The projects contained in the administrative equipment category provide funding for improvements to administrative facilities and equipment. The Fleet department manages and coordinates all activities required for the efficient operation and maintenance of the Commission's fleet of vehicles including heavy equipment. To minimize fleet total cost of ownership (operating and capital cost) and ensure the ability to provide required customer services using reliable transportation and equipment, vehicles should be replaced at regular intervals, derived from optimal replacement cycle analyses. Vehicle replacement cycles provide the basis for long-term replacement plans for year-to-year replacement earmarking and budgeting. A recent study of the Commission's fleet by a professional management consulting firm has determined that optimum replacement cycles for all classes of vehicles range from 7 to 12 years with a weighted average replacement cycle of 8.8 years for all vehicle.

NEW PROJECTS

Security Kiosks: The Commission will install security kiosks throughout the headquarters. Upon completion of the security system upgrade, there is a projected need to redesign the areas in the headquarters facility that host the monitoring stations carrying the new camera views. Construction will commence in July 2021 and be completed in August 2021. The total cost of this project is $300,000.

Exterior Work – 980 Harrison Avenue: A summary review of building conditions undertaken in late 2017 noted several areas on the exterior of 980 Harrison Avenue that would require work over the near term. These included work on the buildings skin (limestone, composite and metal panels) and replacement of perimeter sealant. Twenty years of urban grime has left several exposed building exterior sections unsightly and in need of cleaning. Time has also had a negative effect on the sealant around building panels and at windows. The deterioration of sealant has allowed for leaks to occur when there is a driving rain. Certain building maintenance initiatives have dented some of the metal panels and additionally degraded associated seals around them. Construction will commence in the summer 2022 and be completed in the summer 2023. The total cost of this project is $240,000.

Gasket Replacement in 2nd Floor Garage: The gasketing material at the expansion joint at the second floor garage has deteriorated and heaved out of its setting. The absence of the material does not allow the expansion joint to function as designed and presents a trip hazard to all traveling to and from vehicles parked at this level. Construction will commence in the spring of 2022 and be completed in the fall 2022. The total cost of this project is $175,000.

Owner's Project Manager (OPM): There are pressing needs to undertake major repairs at Commission facilities. MGL Ch 149, requires that all building projects with a cost in excess of $1.5 million have an OPM assigned to the project. Several of the projects required at Commission facilities trigger this threshold. Additionally, staff in the Facilities Department has a proven track record of capabilities in the maintenance of facilities. Construction of facilities is a separate skill set and existing Staff has little capacity to independently undertake large scale construction projects. The Commission has engaged an OPM to provide staff with expert advice for undertaking facilities construction projects toward the restoration of Commission physical plant. The projects commenced in the summer of 2020 and will be ongoing through the entire length of this capital plan and beyond. The total cost of OPM services through 2023 are projected to be $385,000.

ONGOING PROJECTS

Selection of "House Doctors" for Facilities Projects: Several of the major components of the Commission's headquarters building (roof, HVAC system, etc.) need replacement. The original components have been begun to deteriorate and must either be replaced or completely refurbished. House Doctor/design services are architectural/engineering services required for the design and development of plans and specifications to undertake upgrades to existing components of Commission's buildings and/or to build/renovate additional buildings on Commission owned property. The House Doctor will also be utilized to undertake an evaluation of flood protection systems for the Commission Headquarters, Materials Handling Facility and two above ground pump stations. In 2020, the Board approved $850,000.00 for these services. It is expected that all architectural/engineering work at Commission facilities will be undertaken by the House Dr. However, there may be circumstances where it makes more sense for the Commission to engage a "specialized" design contract for a unique circumstance. This project is expected to commence in the winter of 2021 and completed in the Winter of 2023. The total three-year budget is $850,000.

Upgrade to Building HVAC Equipment: The existing HVAC system is the system that came on-line with the Headquarters opening in 2001. As with most major building components, the system was installed well in advance of actual building opening. This project includes the replacement of existing heating/AC units throughout the Headquarters Facility. The project is scheduled to commence in the fall of 2021 and be completed in the spring of 2022. The estimated cost is $3,500,000.

Deflection Monitoring System: At the Headquarters facility, there was an expansion joint installed between the existing building (Stride Rite factory) and the addition installed when the headquarters campus was constructed. Over time, there has been movement at the location of the expansion joint which has caused cracks and floor heaves. In order to mitigate the situation and eliminate trip hazards, additional deflection monitoring will need to occur, as will the replacement of expansion joint covers which no longer adequately cover the locations where they were placed. This project includes the installation of a Deflection Monitoring System to ensure that the building is only moving within acceptable parameters and the movement does not exceed permissible tolerances. The installation of these devices was undertaken in the spring of 2020 and is expected to be completed in the second quarter of 2021. The estimated cost is $150,000.

Roof Upgrade Replacement: This project includes the upgrade and/or replacement of the Commission's Roof. The project is scheduled to commence in Summer 2022 and is projected to be completed in Fall 2022. The estimated cost is $4,000,000.

Vehicles/Equipment: The Fleet department manages and coordinates all activities required for the efficient operation and maintenance of the Commission's fleet of vehicles including heavy equipment. In order to, minimize fleet total cost of ownership (operating and capital costs) and sure the ability to provide required customer services using reliable transportation and equipment, vehicles should be replaced at regular intervals derived from optimal replacement cycle analyses. Vehicle replacement cycles provide the basis for long-term replacement plans for year-to-year replacement earmarking and budgeting. A recent study of the Commission's fleet by a professional fleet management consulting firm has determined that optimum replacement cycles for all classes of vehicles range from 7 to 12 years with a weighted average replacement cycle of 8.8 years for all vehicles. Funding is provided for the replacement of various vehicles for utility and operational purposes. The vehicles being replaced have reached their useful life. The total amount budgeted for Vehicles total $550,000.

PROJECT CASH FLOW

The 2021-2023 cash flow total $10,089,000 is presented in Table 24 on page 93. Monies allocated in 2021 for various vehicles total $2,908,000.

Table 24 - Administrative Equipment Category

Capital Improvement Program
2021 - 2023
Administrative Equipment

Description	Contract	Acct	Fund	Org	Prog	Class	Proj	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New Projects																							
Security Kiosks	NA	722300	200	000000	30400	CP06A	4331980399	-	-	300,000	-	-	-	-	-	-	-	-	-	300,000	-	-	300,000
Exterior Work - 980 Harrison Avenue	NA	722300	200	000000	30400	CP06A	4331980399	-	-	-	-	-	-	-	-	-	-	-	50,000	50,000	95,000	95,000	240,000
Gasket Replacement 2nd Floor Garage	NA	722300	200	000000	30400	CP06A	4331980399	-	-	-	-	-	-	-	-	-	-	-	50,000	50,000	125,000	-	175,000
Owner's Project Manager (OPM)	NA	722300	200	000000	30400	CP06A	4331980399	-	-	32,000	-	-	32,000	-	-	32,000	-	-	32,000	128,000	128,000	129,000	385,000
Ongoing																							
Atrium Door Improvements	NA	722300	200	000000	30400	BD18A	4331980399													-			-
Selection of House Doctors for Facilities Projects	NA	722300	200	000000	30400	BD18A	4331980399	-	-	71,000	-	-	71,000	-	-	70,000	-	-	71,000	283,000	283,000	284,000	850,000
Upgrade/Replacement of Building HVAC Equipment	NA	722300	200	000000	30400	BD18A	4331980399	-	-	-	-	-	-	-	-	-	300,000	300,000	400,000	1,000,000	2,500,000	-	3,500,000
Deflection Monitoring System	NA	722300	200	000000	30400	BD18A	4331980399	-	-	-	-	-	-	-	-	-	-	-	50,000	50,000	50,000	50,000	150,000
Rooftop Upgrade Replacement	NA	722300	200	000000	30400	BD18A	4331980399	-	-	125,000	-	-	125,000	-	-	125,000	-	-	125,000	500,000	3,500,000	-	4,000,000
Upgrade to Video Surveillance and Door Access Control System	NA	722300	200	000000	30400	BD16A	4331980399													-			-
Vehicles/Equipment	NA	722300	200	000000	30400	CP06A	2136980192	-	45,000	-	-	-	-	-	255,000	250,000	-	-	-	550,000	-	-	550,000
Totals								**-**	**45,000**	**528,000**	**-**	**-**	**228,000**	**-**	**255,000**	**477,000**	**300,000**	**300,000**	**778,000**	**2,911,000**	**6,681,000**	**558,000**	**10,150,000**
Bonds								-	45,000	528,000	-	-	228,000	-	255,000	477,000	300,000	300,000	778,000	2,911,000	6,681,000	558,000	10,150,000
Rate								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals								**-**	**45,000**	**528,000**	**-**	**-**	**228,000**	**-**	**255,000**	**477,000**	**300,000**	**300,000**	**778,000**	**2,911,000**	**6,681,000**	**558,000**	**10,150,000**

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STORMWATER/GREEN INFRASTRUCTURE/LOW IMPACT DEVELOPMENT PROJECTS

DESCRIPTION AND JUSTIFICATION

Funding is provided in the 2021-2023 CIP for the implementation of the Commission's Stormwater Program. This program consists of studies of existing and new drainage infrastructure, best management practices and implementation of programs designed to improve water quality, the environment and manage stormwater resources.

The primary purpose of the Stormwater Program is to participate in the Boston Harbor pollution abatement projects, implement green infrastructure/low impact development to improve the water quality of discharges to the local receiving waters and promote public awareness of stormwater quality issues. The goal is also to study existing conditions and make recommendations for placement of new best management practices designed to promote improved water quality, ensure compliance with state and federal regulations, minimize flooding and manage stormwater throughout the City of Boston.

The Green Infrastructure/Low Impact Development ("GI/LID") category provides funding for ("GI/LID") projects as needed in collaboration with public improvements in the City of Boston.

The Commission is under an obligation to meet the Phosphorus Total Maximum Daily Load ("TMDL") for the Lower Charles River Basin by reducing elevated levels of phosphorus discharged from its stormwater outfalls. The Commission was required by its Consent Decree with the U.S. EPA to develop a stormwater model to identify pollutant loadings (including phosphorus) from land areas that contribute stormwater runoff to the Commission's storm drain system. In addition, the Commission is developed a Best Management Practice ("BMP") Recommendations Report in compliance with the terms of the Consent Decree. The BMP Recommendations Report provides a scheduled plan for implementation of structural BMPs to reduce pollutant loadings discharged to the twenty-seven sub-watersheds of the City of Boston.

The BMP Recommendations Report provides a plan for the Commission's whole stormwater collection system. According to the interim findings, the cost to implement this plan could be substantial. The purpose of this program is to make available funding to implement GI/LID projects (in collaboration with other city departments and/or private landowners) in the City of Boston as they become available. This program will further the Commission's goal of compliance with the Consent Decree.

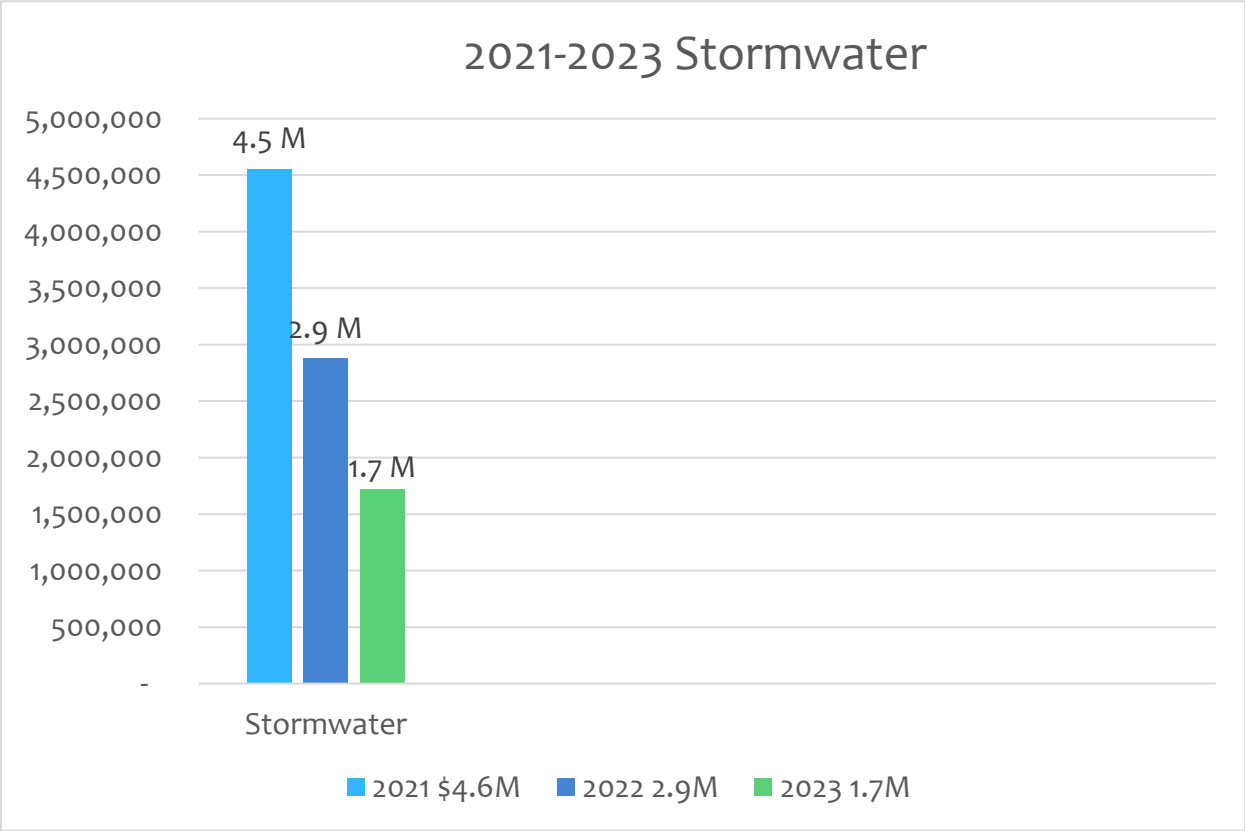
Table 25 on page 96 illustrates Stormwater by Category. Three-year total expenditures are $9.1 million, of which $4.6 million is anticipated to be spent in 2021.

Table 25 - Stormwater

Capital Improvement Program
2021 - 2023
Stormwater

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
Stormwater																
Bonds	297,000	292,000	293,000	402,000	422,000	424,000	418,000	418,000	409,000	408,000	388,000	388,000	4,559,000	2,881,000	1,720,000	9,160,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**297,000**	**292,000**	**293,000**	**402,000**	**422,000**	**424,000**	**418,000**	**418,000**	**409,000**	**408,000**	**388,000**	**388,000**	**4,559,000**	**2,881,000**	**1,720,000**	**9,160,000**
Stormwater Total	**297,000**	**292,000**	**293,000**	**402,000**	**422,000**	**424,000**	**418,000**	**418,000**	**409,000**	**408,000**	**388,000**	**388,000**	**4,559,000**	**2,881,000**	**1,720,000**	**9,160,000**
Bonds	297,000	292,000	293,000	402,000	422,000	424,000	418,000	418,000	409,000	408,000	388,000	388,000	4,559,000	2,881,000	1,720,000	9,160,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**297,000**	**292,000**	**293,000**	**402,000**	**422,000**	**424,000**	**418,000**	**418,000**	**409,000**	**408,000**	**388,000**	**388,000**	**4,559,000**	**2,881,000**	**1,720,000**	**9,160,000**

Graph 5 - 2021-2023 Total Stormwater Expenditures $9.1 Million



NEW PROJECTS

Construction Stormwater Retention - Arnold Arboretum: The purpose of this project is to make improvements to wetlands at the Arnold Arboretum to retain and treat stormwater. Construction will commence in July 2023 and to be completed in May 2024. The three-year budget for this project is $750,000.

Design Stormwater Retention – Facilities Phase II: The Wastewater and Storm Drainage System Facilities Plan included recommendations for temporary surface storage of stormwater to alleviate the hydraulic stress on the Commission's storm drain system from increased rainfall volumes and peak intensities that may be experienced during future storms. Under Contract 18-206-002, the Stormwater Detention Investigation, identified potential sites for stormwater storage. This planning and design project will advance the Commission's stormwater storage program. Engineering services for design of stormwater detention facilities at locations that will be determined based on future needs. The design project will include records research, site investigations, field survey, permitting and preparation of bid documents for the final design of facilities designed to detain stormwater and slowly release it into the storm drain system. Construction cost estimates for the new facilities will be developed as part of the design. The design phase of this project is estimated to commence in October 2023 and is projected to be completed in February 2024. The three-year budget for this project is $20,000.

ONGOING PROJECTS

Design of Stormwater Detention Facilities: The Wastewater and Storm Drainage System Facilities Plan included recommendations for temporary surface storage of stormwater to alleviate the hydraulic stress on the Commission's storm drain system from increased rainfall volumes and peak intensities that may be experienced during future storms. Under Contract 18-206-002, the Stormwater Detention Investigation, identified potential sites for stormwater storage. This planning and design project will advance the Commission's stormwater and storage program. The purpose of this project is to provide Engineering services for design of stormwater detention facilities in Roslindale and Jamaica Plain. This design project will include records research, site investigations, field survey, permitting and preparation of bid documents for the final design of facilities designed to detain stormwater and slowly release it into the storm drain system. Construction of stormwater detention facilities is expected to start in the spring of 2022. Construction cost estimates for the new facilities are will developed as part of the design. The planning phase of this project commenced in November 2020 and the design phase is projected to be completed in July 2022. The three-year budget for this project is $850,000.

Coastal Stormwater Impact Analysis: The purpose of this project to conduct an analysis of areas along the coast in Boston that will be unable to discharge stormwater due to potential higher tides and develop a strategy for addressing the impact. The project will review topographic changes and low-lying areas to identify areas where stormwater will gather if it is unable to discharge to receiving waters due to higher tides. The project will develop recommendations for addressing the potential inundation issues. The planning phase of this project commenced in November 2020 and is projected to be completed in December 2022. The three-year budget for this project is $1,100,000.

Design Stormwater Retention - Arnold Arboretum: The purpose of this project is the prepare a design to utilize the wetland at the Arnold Arboretum for stormwater retention and treatment. The design phase of this project commenced in November 2020 and is projected to be completed in January 2022. The three-year budget for this project is $850,000.

Inundation Modeling Contract 18-206-001: The purpose of this project is to utilize the Commission's model as a basis to identify areas of the City that may experience flooding during extreme weather events. The project commenced in July 2018 and projected to be completed in June 2021. A small budget of $50,000 will be established in 2021 to cover closing costs of this contract.

Sampling and Metering for Storm Drain Model Validation: The project will entail collection of flow metering and storm-water quality data to validate the Commission's Storm Water Model. The Commission's 2012 Stormwater Model Project (the 2012 Project) characterized the quality of discharges from over 200 storm drain outfalls. The Project monitored conditions at 20 locations over two 12-week periods in 2011 and 2012 to comply with conditions set forth in the Commission's Consent Decree with the EPA. The data collected for the 2012 Project reflected conditions at the time; however, since 2012, extensive improvements have been made in the stormwater system. For example, over 500 illicit sanitary discharges have been eliminated removing an estimated 176,000 gallons of sewage per day from the drain system. Also, over 1,500 infiltration devices have been installed by developers, thus reducing the concentrations of phosphorus in stormwater runoff. Inherently, these measures improve stormwater quality; however, having current stormwater quality data with which to compare this historic data will enable the Commission to demonstrate whether stormwater quality improvements have in fact occurred. This Project

proposes to continuously collect flow metering and water quality data over a multi-year period rather than the shorter period used in the past. The data will then be used to verify the Commission's Stormwater Model. Planning commenced in May 2020 and a completion date in November 2022. The budget is $1,440,000.

Constructed Wetland in Stormwater Tributary at Daisy Field: This project is to construct a vegetated subsurface gravel filter and bioretention feature to treat stormwater runoff in tributary area of Daisy Field. Construction of the gravel filter and bioretention feature to treat stormwater runoff will improve the stormwater quality entering the Charles and Muddy rivers. The construction phase is set to commence in September 2023 and is expected to be completed by November 2024. The three-year budget is $500,000.

Construct BMPs & Green Infrastructure at City Hall Plaza: This project is being undertaken as part of the Consent Decree requirements. The purpose of this project is to install stormwater BMPs and Green Infrastructure components in the City Hall Plaza area of Boston to serve as a demonstration project for such installations. The components will have monitoring devices installed to determine their effectiveness got stormwater retention and addressing pollutant discharges. Construction commenced in August 2020 and completed by November 2021. The three-year budget is $2,000,000.

Green Infrastructure: This line item is for funds for BWSC contributions to the construction of Green Infrastructure opportunities within BPWD projects. There are currently three projects, which have been designed by an On-Call consultant that are included in BPWD projects. These projects are New England Avenue, Codman Square as well as funding for potential GI opportunities with BPWD. Construction will commence in April 2021 and completed November 2023. The three-year budget is $1,600,000.

PROJECT CASH FLOW

Table 26 on page 100 illustrates Stormwater by Category. Three-year total expenditures are $9,160,000, of which $4,559,000 is anticipated to be spent in 2021.

Table 26 – Stormwater

Capital Improvement Program
2021 - 2023
STORMWATER/GREEN INFRASTRUCTURE/LOW IMPACT DEVELOPMENT

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021	2022	2023	Total 2021 - 2023
New																
Construction of Stormwater Retention - Arnold Arboretum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750,000	750,000
Design Stormwater Retention Facilities Phase II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20,000	20,000
Ongoing																
Design of Stormwater Detention Facilities	30,000	40,000	40,000	60,000	70,000	70,000	70,000	70,000	65,000	65,000	60,000	60,000	700,000	150,000	-	850,000
Coastal Stormwater Impact Analysis	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	540,000	560,000	-	1,100,000
Design Stormwater Retention - Arnold Arboretum	30,000	40,000	40,000	60,000	70,000	70,000	70,000	70,000	65,000	65,000	60,000	60,000	700,000	150,000	-	850,000
Inundation Model	29,000	4,000	4,000	4,000	4,000	5,000	-	-	-	-	-	-	50,000	-	-	50,000
Sampling & Metering for Storm Drain Model Validation	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	70,000	70,000	940,000	500,000	-	1,440,000
Constructed Vegetated Wetland in Stormwater Tributary-18GSDO233	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500,000	500,000
Construct BMPs & Green Infrastruct at City Hall Plaza	83,000	83,000	84,000	83,000	83,000	84,000	83,000	83,000	84,000	83,000	83,000	84,000	1,000,000	1,000,000	-	2,000,000
Green Infrastructure	-	-	-	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	69,000	629,000	521,000	450,000	1,600,000
Totals	**297,000**	**292,000**	**293,000**	**402,000**	**422,000**	**424,000**	**418,000**	**418,000**	**409,000**	**408,000**	**388,000**	**388,000**	**4,559,000**	**2,881,000**	**1,720,000**	**9,160,000**
Bonds	297,000	292,000	293,000	402,000	422,000	424,000	418,000	418,000	409,000	408,000	388,000	388,000	4,559,000	2,881,000	1,720,000	9,160,000
Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LWSAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I/I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**297,000**	**292,000**	**293,000**	**402,000**	**422,000**	**424,000**	**418,000**	**418,000**	**409,000**	**408,000**	**388,000**	**388,000**	**4,559,000**	**2,881,000**	**1,720,000**	**9,160,000**

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APPENDIX A - GLOSSARY

ARB: A trademark for Schlumberger remote meter reader interfaces. See also R.M.I.

Board of Commissioners: The three-member governing board of the Commission.

Bond: A written promise to pay a specific sum of money (called the face value or principal amount) at a specific date or dates in the future (called the maturity dates), together with periodic interest at a specific or variable rate.

Bond Resolution: A document that contains terms and conditions relating to the issuance and sale of bonds and sets forth the obligations to bondholders.

BWSC: The Boston Water and Sewer Commission.

Capital Improvement Program (CIP): A plan which identifies and estimates the nature, schedule, cost, priority, and financing of long-term assets that the Commission intends to build or acquire during a specific period.

Cleaning and Lining: A process to improve unlined but structurally sound, older cast iron mains. The mains are cleaned and lined with cement (while still in place) to improve hydraulic capacity and extend useful life.

Collection System: The pipes, conduits, pumping stations and appurtenances involved in the collection and transport of wastewater and storm-water.

Combined Sewer: A sewer designed to receive both sanitary sewage and storm-water runoff.

CSO (Combined Sewer Overflow): The discharge from combined sewers which collect both sanitary sewage and storm-water runoff for wastewater treatment under normal (dry) weather conditions. During rainstorms, the system becomes overloaded and the excess is discharged directly into neighboring waterways from CSO outlets. In the City of Boston area there are 37 permitted combined sewer overflow outlets.

Current Expense Budget (CEB): A financial plan which estimates the revenues and expenses associated with the Commission's operations for a fiscal year.

Debt Service: In a given fiscal year, the amount of money necessary to pay interest and principal on outstanding debt instruments.

DEP (Department of Environment Protection): The Massachusetts agency that regulates water pollution control, water supplies, drinking water quality and waterways and certifies projects for eligibility under the Water Pollution Abatement Trust Loan programs.

Department: A sub-unit of a division.

Division: A major organizational unit within the Commission, encompassing the activities and resources for providing a major service or function.

Drain: A pipe or conduit which conveys storm-water.

Enabling Act: Chapter 436 of the Acts of the Commonwealth of Massachusetts of 1977, the legislation which established the BWSC and defined its purpose and responsibilities as of August 5, 1977.

EPA (Environmental Protection Agency): The federal government agency responsible for environmental enforcement and investigation. The EPA enforces the provisions of the Safe Drinking Water Act and the Clean Water Act.

Expenditures: Actual payment within a specified period for goods and services received.

Fiscal Year: The 12-month financial period used by the Commission which begins January 1 and ends December 31 of the same calendar year.

General Revenue Bonds: Bonds which are general obligations of the issuer where the full faith and credit of the issuer is pledged to the payment of the principal and interest thereon utilizing the revenue to be generated through the sale of a particular commodity, service or toll.

Hydrant: A device connected to a public water main for the purpose of providing water for firefighting or other authorized purposes.

Illegal Connection: A sanitary sewer service which is connected to a storm drain system, thus contributing sewerage.

Infiltration/Inflow: Extraneous sources of water that enter the sanitary system and are transported unnecessarily to the treatment facility. Infiltration is groundwater that leaks into the sanitary sewerage system through pipe joints and defects. Inflow refers to water that enters sewers from improperly connected catch basins, sump pumps, downspouts, basement drains and defective manholes. Inflow also enters through defective harbor CSO tide-gates when the tide is high.

Interceptors: The large pipes or culverts that convey wastewater from the localized collection system to the treatment plant.

Meter: An instrument for measuring the flow of water.

Meter Pit: An underground vault enclosing a meter.

MWRA (Massachusetts Water Resources Authority): An agency created by the Massachusetts Legislature through the passage of Chapter 372 of the Acts of 1984, responsible for providing wholesale potable water and wastewater collection, transport, delivery and treatment services to user Communities in Eastern Massachusetts. The Communities provide retail services directly to their customers or end users.

NPDES (National Pollutant Discharge Elimination System): A permit issued by EPA in conjunction with DEP to govern discharges into waterways.

Potable Water: Water fit for human consumption in conformance with the regulations of the Environmental Protection Agency and the Massachusetts Department of Environmental Protection.

Program: An organized group of activities and the resources to carry them out, aimed at achieving related goals.

Public Water Main: The piping and associated valves, hydrants and appurtenances installed in a public way, Commission-owned easement, or private way open to public travel, for the purpose of supplying water to one or more customers or for public fire protection.

R.M.I: Remote Meter Interface. A device for reading water meters using a hand held computer which is plugged into an outside box wired to the meter.

Rate Revenue: Income received in a specified period from user charges for providing water and sewer services.

Rehabilitation: Any process which serves to extend the useful life of a pipe or structure which is in need of repair.

Residential Meter: A meter two inches in size or smaller used to measure the flow of water to predominantly residential properties.

Sanitary Sewage: Liquid and water-carried human and domestic wastes from buildings, exclusive of ground, storm and surface water.

Sanitary Sewers: In a separated system, pipes that carry only domestic or commercial sanitary sewage as opposed to rainwater runoff.

Sewer: A pipe or conduit that carries wastewater

Sewer System: The combined Wastewater System and Storm Drainage System.

Storm Drain: A pipe or conduit designed to carry storm-water or surface water runoff.

Storm Drainage System: Storm drains, tidegates, flow regulators, catch basins, storm-water pumping stations and appurtenant facilities.

Storm Sewers: Storm drains or storm drainage system.

Stormwater: Any water resulting from rainfall or other precipitation that runs off surfaces during or after a storm.

Unaccounted-for Water: The difference between the volume of water withdrawn from the source of supply and the volume of water billed to customers. Unaccounted for water is caused by system losses, fire protection and construction activities.

Valve: A device used in water systems to control the flow of water.

Wastewater: The spent water of a community, which may be a combination of the liquid and water-carried domestic or industrial wastes from buildings, together with any groundwater and stormwater that may be present.

Wastewater System: The totality of the devices, equipment or works used in transportation, pumping, storage, treatment, recycling, or reclamation of wastewater or in the disposal of the effluent.

Water Service Pipe: The connection, piping and associated valves and appurtenances that extend from a public water main to a building or property for the purpose of supplying water.

APPENDIX B - KEY ABBREVIATIONS

SIZE	DESCRIPTION
4 W/ 8	4" PIPE IS REPLACED WITH 8" PIPE
6 W/ 8	6" PIPE IS REPLACED WITH 8" PIPE
8 W/ 12	8" PIPE IS REPLACED WITH 12" PIPE

TYPE	TYPE OF SEWER PIPE
CS	COMBINED SEWER
SD	STORM DRAIN
SS	SANITARY SEWER

APPENDIX C – STREET LISTING

WATER REPLACEMENT

Contract 21-308-001

Street	Limits	Neighborhood	Length	Size
Dorchester Avenue	Von Hillern to Columbia Rd	Dorchester	1,700	12
Norwell St	Park to Carmen	Dorchester	2,300	12
Columbia Road	Mercer St to Farragut Rd	South Boston	7,200	16
Farragut Road	East Third St to Columbia Rd	South Boston	1,300	16
Total			**12,500**	

Contract 20-308-001

Street	Limits	Neighborhood	Length	Size
Harrison Ave	Mass Ave to Melnea Cass Blvd..	South End	1,500	16
Harrison Ave	Mass Ave to E. Canton St	South End	1,850	16
Harrison Ave	Randolph to Thayer St	South End	600	12
Harrison Ave	Wareham St to Paul Sullivan Wy	South End	1,525	12
Harrison Ave	Paul Sullivan Wy to Savoy St	South End	550	12
Union Park St	Washington St to Harrison Av	South End	500	8
Traveler St	Washington St to Harrison Av	South End	400	12
Washington St	Park St to Talbot Av	Dorchester	1,850	12
Total			**8,775**	

Contract 20-308-003

Street	Limits	Neighborho	Length	Size
Bennett St	Parsons St to Leicester St	Brighton	250	8
Soldiers Field Rd	N. Harvard St to 801 Soldiers Fld Rd	South End	900	12
New Rutherford Ave	Cambridge St to Austin St	Charlestown	3,800	16
New Rutherford Ave	Cambridge St to Dunstable St	Charlestown	2,800	8

New Rutherford Ave	W. School St to Front St	Charlestown	1,700	8 w 12
New Rutherford Ave	Cambridge St to Front St	Charlestown	2,400	8 w 12
Austin St	New Rutherford St. to Warren St	Charlestown	1,000	8
Caldwell St	29JV132 At Maffa	Charlestown	50	24
Total			**12,900**	

Contract 20-308-004

Street	Limits	Neighborhood	Length	Size
Monument St.	Bunker Hill Ave to Medford St	Charlestown	625	12
Tufts St.	Bunker Hill Ave to Medford St	Charlestown	725	8
Corey St.	Vine St to Medford St	Charlestown	825	12
Moulton St.	Vine St to end	Charlestown	100	8
David G Mugar Way	Beacon St to Back St	Back Bay	200	12
Berkeley St	Beacon St to Back St	Back Bay	200	12
Clarendon St	Beacon St to Back St	Back Bay	200	12
Dartmouth St	Beacon St to Back St	Back Bay	200	12
Exeter St	Beacon St to Back St	Back Bay	1	HYDRANT
Fairfield St	Beacon St to Back St	Back Bay	200	12
Gloucester St	Beacon St to Back St	Back Bay	200	12
Hereford St	Beacon St to Back St	Back Bay	200	12
Mass Ave	Beacon St to Back St	Back Bay	200	12
Charlesgate East	Beacon St to Back St	Back Bay	200	12
Charlesgate West	Beacon St to rear Baystate	Back Bay	200	12
Raleigh St	Baystate St to Back St	Back Bay	160	12
Silber Way	Baystate St to Back St	Back Bay	160	12
Granby Way	Baystate St to Back St	Back Bay	150	12
Total			**4,746**	

Contract 19-308-001

Street	Limits	Neighborhood	Length	Size
East Berkeley St.	Tremont St to Washington St (SH)	South End	1,105	12
East Berkeley St.	Washington St to Albany St (SH)	South End	940	16 w/12
Washington St.	East Berkeley St to Herald St.	South End	1,000	16 w/12
Washington St.	E. Berkeley St to Traveler (SH) (replace HDPE)	South End	300	8
Washington St.	E. Berkeley St to E Brookline St (North) (SL)	South End	1,500	12
Washington St.	E. Berkeley St to MSG Reynolds Way (South) (SL)	South End	1,805	12
Paul Place	Harald to Shawmut Ave	South End	255	10
East Brookline St.	Shawmut Ave to Washington St.	South End	175	12
Total			**7,080**	

Contract 19-308-002

Street	Limits	Neighborhood	Length	Size
Vine St.	Chelsea St. to Bunker Hill St.	Charlestown	600	8
Bunker Hill St.	Lowney Way to Allston St.	Charlestown	2,700	8
Chelsea St.	Constitution St. to Medford	Charlestown	2,300	12
School St.	Main St. to Bunker Hill St.	Charlestown	1,200	8
Bartlett St.	Monument SQ. to Pearl St.	Charlestown	2,000	8 SH/SL
Total			**8,800**	

Contract 19-308-003

Street	Limits	Neighborhood	Length	Size
Tide St.	FID Kennedy Ave-Dry Dock Ave	South Boston	800	12,16
Tide St.	FID Kennedy Ave-Dry Dock Ave	South Boston	627	12

Dry Dock Ave	Harbor Street to Design Center Place	South Boston	550	16
Dry Dock Ave	Harbor Street to Tide Street	South Boston	746	12,18
Edgerly Rd	Haviland to Westland	South End	2,000	8,12
Edgerly Rd	Haviland to Westland	South End	1,454	12,18
REAR 627-607 Columbus Ave	Camden to Northampton	South End	250	12
Savin Hill Ave	Hubbardston to Caspian	Dorchester	1,405	8,12
Savin Hill Ave	Hubbardston to Caspian	Dorchester	1,328	12-18
Playstead Rd	Savin Hill Ave to Springdale	Dorchester	400	12
Total			**9,560**	

Contract 19-308-004

Street	Limits	Neighborhood	Length	Size
Blossom St	Charles St to Blossom Ct	City Proper	450	16
Charles St.	Cambridge St to Blossom St	City Proper	1,100	16
West Cedar St.	Cambridge St to Phillips St	City Proper	250	10
Phillips St.	West Cedar St to Grove St	City Proper	400	10
Cambridge St.	Charles St to Joy St	City Proper	2,000	12
Boston Common	Charles St to Joy St	City Proper	1,200	48w30
Total			**5,400**	

Contract 19-309-002

Street	Limits	Neighborhood	Length	Size
Cottage St	East Boston	Maverick St to Sumner St	500	12
Orleans St	East Boston	Porter St to Gove St	700	12
Orleans St	East Boston	Gove St to Maverick St	650	8,12
Maverick St	East Boston	Orleans St to Cottage St	750	16
Sumner St	East Boston	Breman St to Clippership LN	650	12
Falcon St	East Boston	Border to Brooks	1,150	6,8

Everett St	East Boston	Orleans St to Lamson St	1,550	10
Total			**5,950**	

Contract 18-308-001

Street	Limits	Neighborhood	Length	Size
Belvidere St.	#55 Clearway St to Huntington	City Proper	670	12”
Clearway St.	#55 Clearway St to Dalton St	City Proper	45	12”
Dalton St.	Clearway St to Scotia St	City Proper	405	12”
Saint Germain St.	Mass Ave to Dalton St	City Proper	770	8”
North St.	Union St to Blackstone St	City Proper	45	12”
North St.	Union St to Blackstone St	City Proper	160	12”
Clinton St.	North St to Commercial St	City Proper	780	12”
Clinton St.	North St to Commercial St	City Proper	280	15”
Essex St.	Washington St to Kingston St	City Proper	1,820	12”
Essex St.	Lincoln St to South St	City Proper	145	12”
Chauncy St.	Ave De Lafayette to Summer St	City Proper	530	12”,10”
Chauncy St.	Ave De Lafayette to Summer St	City Proper	510	12”
Congress St.	Milk St to Purchase St	City Proper	1,350	12”
Pearl St.	Milk St to Purchase St	City Proper	1,020	15,18, 24
Boylston St.	CharlesGate East to Boylston St	City Proper	325	12”
Boylston St.	Boylston St to Haviland St	City Proper	370	12”
Hemenway St.	Boylston St to Haviland St	City Proper	175	12”
Hanover St.	Congress St to Blackstone St	City Proper	130	12”
Total			**9,530**	

Contract 18-308-002

Street	Limits	Neighborhood	Length	Size
Copley Place	St. Botolph St to Stuart St	City Proper	850	42
St. Botolph St.	Harcourt St to Gainsborough St	City Proper	2,650	42
Total		**3,500**		

Contract 18-308-003

Street	Limits	Neighborhood	Length	Size
Neponset Ave	#415 Neponset under (I-93) Expressway to Neponset (Route 3A) Bridge	Dorchester	475	12
Neponset Ave	Gallivan Blvd N/B to Taylor Street adj/under Neponset (Route 3A) Bridge	Dorchester	720	8
Neponset Ave	Taylor Street (adj. Neponset Bridge) to Morrissey Blvd N/B	Dorchester	310	8
Morrisey Blvd S/B	#12 Redfield Street to Neponset Ave	Dorchester	165	12
Gallivan Blvd S/B	Gallivan Blvd. to #415 Neponset Ave	Dorchester	60	12
Gallivan Blvd N/B	#815 Gallivan Blvd. to Neponset Ave	Dorchester	185	12
Neponset Ave	#415 Neponset under (I-93 Expressway) to #475 Neponset Ave	Dorchester	670	10
Neponset Ave	Minot Street to Chickatawbut Street	Dorchester	300	15
Total			2,885	

Contract 18-309-001

Street	Limits	Neighborhood	Length	Size
Kilmarnock St	Boylston St to Park Dr	Fenway	750	10,8
Jersey St	Boylston St to Park Dr	Fenway	1,000	12
Peterborough St	Park Dr to Park Dr	Fenway	2,000	12
Queensberry St	Park Dr to Park Dr	Fenway	1,800	8
Total			**5,550**	

Contract 18-309-003

Street	Limits	Neighborhood	Length	Size	Type
Destefano Rd	Hyde Park Ave to End	Roslindale	460	8	W
Harding Rd	Stella Rd to Hadwin HWY	Roslindale	400	10	W
Cummins Hwy	Harding Rd to American Legion HWY	Roslindale	345	16	W
Rowe St	Seymour St to Cummins Hwy	Roslindale	514	8	W
Huntington Ave	Collins St to Thatcher St	Hyde Park	1,486	8	W

Hawthorne Ter	Hawthorne St to End	Roslindale	163	8	W
Hawthorne St	Hawthorne Ter to Heathcote St	Roslindale	205	10	W
Hawthorne St	Sycamore St to Florence St	Roslindale	632	8	W
Brown Ave	Cummins Hwy to Allen St	Roslindale	310	12	W
Cummins Hwy	Sycamore St to Florence St	Roslindale	378	16	W
Wellington Hill St	Duke St to Hillsboro Rd	Mattapan	509	12	W
Morton St	Blue Hill Ave to Leston St	Mattapan	500	12	W
Wildwood St	Woolson St to Morton St	Mattapan	596	12	W
Verrill St	Woolson St to Morton St	Mattapan	529	12	W
Coronado Rd	Belnel Rd to End	Hyde Park	359	8	W
Total			**7,386**		

Contract 17-308-001

Street	Limits	Neighborhood	Length	Size
Walley St.	Leyden St. to Waldemar Ave	East Boston	700	12-10
Total			**700**	

Contract 17-308-002

Street	Limits	Neighborhood	Length	Size
Binney St	Longwood Ave to End	Roxbury	155	12
Blackfan Ct	Longwood Ave to End	Roxbury	645	12
8 Bower St	Walnut Ave to End	Roxbury	340	8
Devon St	Columbia Rd to Vaughan Ave	Roxbury	220	8
E. Cottage St	Dudley St to Robey St	Roxbury	1,025	12
Elm hill Ave	Crawford St. to Warren St	Roxbury	775	12
Intervale St	Blue Hill Ave to Normandy St	Roxbury	645	8
Cedar St	Sanford St. to Manchester St	Dorchester	295	8
Morrisey Blvd	Victory Rd to #725	Dorchester	435	8
Fox Point Rd	Morrisey Blvd to Savin Hill Ave	Dorchester	295	8
Westglow St	Adams St. to Garner Rd	Dorchester	425	8
Total		**Total**	**5,255**	

Contract 17-308-003

Street	Limits	Neighborhood	Length	Size
Bismark St.	Cummins Hwy. To End	Mattapan	295	
Bradshaw St.	Esmond St. to McLellan St.	Mattapan	420	
Harvard St.	Walkhill St. to End	Hyde Park	1,180	
West St.	Hyde Park Ave to Hilton St.	Hyde Park	390	
Jacqueline St.	Birchland Ave to Ansonia St	W. Roxbury	465	
Forest Hills St.	Williams St. to #199	Mattapan	750	
Morton Street	Forest Hill St. to Canterbury	Mattapan	3,600	
Total			**7,100**	

Contract 17-308-006

Street	Limits	Neighborhood	Length	Size
Bowdoin Street	Cambridge Street to Derne Street	Beacon Hill		
Total				

Contract 17-308-007

Street	Limits	Neighborhood	Length	Size	Type
Lincoln Street	Kneeland Street to Essex Street	City Proper	1,275	8	W
South Street	Kneeland Street to Beach Street	City Proper	275	8	W
South Street	Kneeland Street to Beach Street	City Proper	250	18	CS
Harvard Street	Tyler Street to Hudson Street	City Proper	235	12	W
Harvard Street	Harrison Ave to Monsignor Shea	City Proper	530	12	W
Harvard Street	Harrison Ave to Monsignor Shea	City Proper	40	8	W
Harvard Street	Harrison Ave to Monsignor Shea	City Proper	120	12	SS
Harvard Street	Harrison Ave to Monsignor Shea	City Proper	135	15	SD
Monsignor Shea	Harvard St to Kneeland St	City Proper	225	8	W
Monsignor Shea	Harvard St to Kneeland St	City Proper	255	12	W
Harold St	Holworthy St to Hollander St	Roxbury	220	15	SS

Harold St	Holworthy St to Hollander St	Roxbury	230	24	SD
Total			**3,790**		

Contract 17-309-001

Street	Limits	Neighborhood	Length	Size	Type
Buchanan Rd	President Rd to Wedgewood Rd	West Roxbury	400	8	W
Ledgedale Rd	Buchanan Rd to Weld St	West Roxbury	360	8	W
Port Norfolk St	Water St to Ericsson St	Dorchester	1,030	8	W
Running Brook Rd	Woodley Ave to Westmoor Rd	West Roxbury	760	8	W
Total			**2,550**		

SEWER RENEWAL & REPLACEMENT

Contract 21-309-001

Street	Limits	Neighborhood	Length	Size	Type
Sanford St	#15 Sanford to Vallaro Rd	Hyde Park	20	18	DREL
Ernest Ave	Marion St to Como Rd	Hyde Park	90	8	SLIN
Como Rd	#40 Como Rd to Reynolds Rd	Hyde Park	215	10	SLIN
Como Rd	Readville Ave to #20 Como Rd	Hyde Park	185	10	SREL
Readville Ave	Como Rd to Chesterfield St	Hyde Park	420	10	SLIN
Readville Ave	Chesterfield St to #108 Readville Ave	Hyde Park	225	10	SLIN
Danny Rd	#52 Danny Rd to #32 Danny Rd	Hyde Park	205	8	SLIN
Chesterfield St	Epson Rd to Manilla Ave	Hyde Park	300	10	SREL
Readville Ave	Albemarle St to #75 Readville Ave	Hyde Park	225	10	SLIN
Manilla Ave (Easement)	Norton St to Neponset Valley Pkwy	Hyde Park	195	18	SLIN
Manilla Ave (Easement)	Norton St to Neponset Valley Pkwy	Hyde Park	280	18	SLIN
Westinghouse Plaza	Readville Ave to parking lot #1 Westinghouse Pz	Hyde Park	275	20	SLIN
Hollander St	Harold St to #56 Hollander St	Roxbury	175	18	SREL
Hollander St	#56 Hollander St to Crawford St	Roxbury	170	18	SREL

Waumbeck St	#75 Waumbeck to #85 Waumbeck	Roxbury	215	12	DLIN
Waumbeck St	Harold St to #101 Waumbeck	Roxbury	125	12	DREL
Walnut Ave	Harrisof St to Holworthy St	Roxbury	245	12	SLIN
Walnut Ave	Harrisof St to Holworhty St	Roxbury	230	18	DLIN
Waumbeck St	Huboldt Ave to Wabeno St	Roxbury	360	10	SREL
Humboldt Ave	Waumbeck St to #135 Humboldt (Trotter School)	Roxbury	200	12	SREL
Humboldt Ave	Townsend St to Harrishof St	Roxbury	220	10	SREL
Humboldt Ave	Townsend St to Harrishof St	Roxbury	205	12	DLIN
Coniston Rd (easement)	#104 Walther St to Roslindale Wetlands	Roslindale	300	12	SLIN
Coniston Rd (easement)	Roslindale wetlands to #23 Coniston (rear)	Roslindale	250	15	SLIN
Coniston Rd (easement)	#23 Coniston Rd to Roslindale Wetlands	Roslindale	235	15	SLIN
Thwing St (easement)	#51 (rear) to 43 Beech Glen (rear) Thwing (easement)	Roxbury	165	8	SLIN
Thwing St (easement)	#55 (rear) to 51 Beech Glen Thwing (easement)	Roxbury	135	10	DLIN
Thwing St (easement)	#51 (rear) to 47 Beech Glen (rear) Thwing (easement)	Roxbury	105	10	SLIN
Thwing St (easement)	#47 (rear) to 43 Beech Glen (rear) Thwing (easement)	Roxbury	60	10	DLIN
Total			**6,030**		

Contract 19-309-002

Street	Limits	Neighborhood	Length	Size	Type
Cottage St	Maverick St to Everett St	East Boston	70	28x 42	SS
Cottage St	Maverick St to Everett St	East Boston	210	36x 36	SS
Cottage St	Maverick St to Everett St	East Boston	205	12x 16	SS
Maverick St	Bremen St to Orleans St	East Boston	115	12	SS
Maverick St	Frankfort St to Orleans St	East Boston	131	15	SS
Maverick St	McKay PL to Cottage St	East Boston	215	15	SS
Maverick St	McKay PL to Cottage St	East Boston	65	15	SS
Maverick St	McKay PL to Frankfort St	East Boston	120	15	SS
Maverick St	Cottage St to Geneva St	East Boston	40	12	SS
Sumner St	Seaver St to Lamson St	East Boston	160	12	SS

Webster St	Orleans St to #74 Webster St	East Boston	220	36	SS
Falcon St	Border St to Meridan St	East Boston	250	12	SS
Falcon St	Meridan St to Brooks St	East Boston	30	12	SS
Porter St	Chelsea St to Porter St	East Boston			
Total			**1,831**		

Contract 19-309-004

Street	Limits	Neighborhood	Length	Size	Type
Lake St	Lakeshore Rd to Glenmont Rd	Allston/Brighton	100	54	SD
Lakeside Rd	22CSDO385	Allston/Brighton	50	12	SD
Total			**150**		

Contract 18-309-001

Street	Limits	Neighborhood	Length	Size	Type
Jersey St	Queensberry St to Parkway Dr	Fenway	49	18	SS
Jersey St	Queensberry St to Parkway Dr	Fenway	161	18	SS
Jersey St	Peterborough St to Queensberry St	Fenway	165	18	SS
Jersey St	Peterborough St to Queensberry St	Fenway	109	18	SS
Jersey St	Peterborough St to Queensberry St	Fenway	13	18	SS
Jersey St	Peterborough St	Fenway	27	30x36	SS
Jersey St	Peterborough St to Queensborough St	Fenway	8	30x36	SS
Jersey St	Peterborough St to Boylston St	Fenway	16	18	SS
Jersey St	Peterborough St to Boylston St	Fenway	297	18	SS
Private Alley 930	Peterborough St to Queensberry St	Fenway	171	18x15	SS
Private Alley 930	Peterborough St to Queensberry St	Fenway	172	18x15	SS
Private Alley 930	Peterborough St to Queensberry St	Fenway	152	36x36	SD
Private Alley 930	Peterborough to Queensberry St	Fenway	152	36x36	SD
Private Alley 914	Jersey St to Queensberry St	Fenway	232	18	SD

Private Alley 914	Jersey St to Queensberry St	Fenway	232	12	SS
Private Alley 925	Kilmarnock St to Jersey St	Fenway	221	18x24	SD
Private Alley 925	Kilmarnock St to Jersey St	Fenway	224	15x18	SS
Private Alley 925	Park Dr to Jersey St	Fenway	28	18	SS
Queensberry St	Park Dr to Kilmarnock St	Fenway	100	15	SD
Queensberry St	Park Dr to Kilmarnock St	Fenway	181	15	SD
Queensberry St	Park Dr to Kilmarnock St	Fenway	67	15	SD
Queensberry St	Park Dr to Kilmarnock St	Fenway	110	15	Sd
Queensberry St	Park Dr to Kilmarnock St	Fenway	194	15	SD
Queensberry St	Kilmarnock St to Jersey St	Fenway	195	18	SD
Queensberry St	Kilmarnock St to Jersey	Fenway	86	18	SD
Queensberry St	Kilmarnock St to Jersey	Fenway	46	18	SD
Queensberry St	Jersey St to Park Dr	Fenway	198	15	SD
Queensberry St	Jersey St to Park Dr	Fenway	142	15	SD
Queensberry St	Jersey St to Park Dr	Fenway	153	15	SD
Queensberry St	Kilmarnock to Jersey St	Fenway	18	15	SD
Queensberry St	Kilmarnock St to Jersey St	Fenway	60	15	SD
Queensberry St	Park Dr to Jersey St	Fenway	234	30x36	SS
Peterborough St	Kilmarnock St to Jersey St	Fenway	251	30x36	SS
Peterborough St	Kilmarnock St to Jersey St	Fenway	248	30x36	SS
Peterborough St	Kilmarnock St to Jersey St	Fenway	120	30x36	SS
Peterborough St	Park Dr to Kilmarnock St	Fenway	63	12	SD
Peterborough St	Park Dr to Kilmarnock St	Fenway	43	12	SD
Peterborough St	Park Dr to Kilmarnock St	Fenway	184	12	SD
Peterborough St	Park Dr to Kilmarnock St	Fenway	196	12	SD
Peterborough St	Park Dr to Kilmarnock St	Fenway	182	12	SD
Peterborough St	Park Dr to Kilmarnock St	Fenway	146	15	SD
Peterborough St	Kilmarnock St to Jersey St	Fenway	184	15	SD
Peterborough St	Kilmarnock St to Jersey St	Fenway	29	15	SD
Queensberry St	Queensberry St to End	Fenway	54	30x30	SD
Queensberry St	Park Dr to Kilmarnock St	Fenway	141	15	SD
Queensberry St	Park Dr to Kilmarnock St	Fenway	21	15x18	SS
Private Alley 926	21HMH191 to Queensberry St	Fenway	125	15	SS
Private Alley 926	21HMH191 to Queensberry St	Fenway	172	15	SS
Kilmarnock St	Peterborough St to Boylston St	Fenway	171	15x22	SS
Kilmarnock St	Peterborough St to Boylston St	Fenway	164	15x22	SS
Kilmarnock St	Peterborough St to Boylston St	Fenway	168	15x22	SS

Kilmarnock St	Peterborough St to Boylston St	Fenway	153	15x22	SS
Boylston St	Park Dr to Jersey St	Fenway	197	18	SD
Boylston St	Park Dr to Jersey St	Fenway	206	18	SD
Boylston St	Park Dr to Jersey St	Fenway	207	18	SD
Boylston St	Park Dr to Jersey St	Fenway	114	18	SD
Boylston St	Park Dr to Jersey St	Fenway	34	18	SD
Boylston St	Park Dr to Queensberry St	Fenway	110	12	SD
Boylston St	Park Dr to Queensberry St	Fenway	204	15	SD
Boylston St	Park Dr to Jersey St	Fenway	28	15	SD
Boylston St	Park Dr to Jersey St	Fenway	79	32x42	SS
Boylston St	Park Dr to Jersey St	Fenway	178	24	SD
Boylston St	Park Dr to Jersey St	Fenway	32	24	SD
Total			**8,417**		

Contract 18-309-003

Street	Limits	Neighborhood	Length	Size	Type
Bradlee St/Navarre	End under American Legion Hwy	Hyde Park	360	18	SD
Clare Ave	Collins St to American Legion Hwy	Hyde Park	105	6	SD
Coronado Rd	Belnel Rd to End	Hyde Park	225	10	SD
Cummins HWY	Harding Rd to American Legion Hwy	Roslindale	175	8	SD
Cummins HWY	Sycamore St to Florence St	Roslindale	105	12	SD
Destefano Rd	Hyde Park Ave to End	Roslindale	330	10	SD
Harding Rd	Stella Rd to Hadwin Hwy	Roslindale	165	10	SD
Hawthorne Ter	Hathorne St to End	Roslindale	175	10	SD
Hawthorne St	Florence St to End	Roslindale	415	15,18	SD
Herbertson Rd	Eldridge Rd to Northnourne Rd	Roslindale	105	10	SD
Huntington Ave	Collins St to Thatcher St	Hyde Park	215	12	SD
Hyde Park Ave	#497 to #515 Hyde Park Ave	Roslindale	115	12	SD
Morton St	Blue Hill Ave to Leston St	Mattapan	340	12	SD
Neponset Ave	Charme Ave to Byrd Ave	Roslindale	650	10	SD
Philbrick St	Neponset Ave to Mount Hope St	Roslindale	205	10	SD
Rodman St	Wachusett St to Patten St	Roslindale	295	12	SD
Rowe CT	Seymour St to Cummins Hwy	Roslindale	255	12	SD
Sycamore St	Hawthorne St to Cummins Hwy	Roslindale	300	12	SD
Verrill St	Woolson St to Morton St	Mattapan	205	10	SD
Wachusett St	Rodman Rd to Patten St	Roslindale	315	10,12	SD

Wellington Hill St	Duke St to Hillsboro Rd	Mattapan	330	10	SD
Wildwood St	Woolson St to Morton St	Mattapan	725	12	SD
Wilkins Pl	Sycamore St to End	Roslindale	195	6	SD
Wyvern	Grover Ave to Florian St	Roslindale	430	10	SD
Total			**6,735**		

Contract 18-309-004

Street	Limits	Neighborhood	Length	Size	Type
Lining					
Hyde Park Ave	Northborne Rd to Patten St	Roslindale	210	15	SS
Hyde Park Ave	Northborne Rd to Patten St	Roslindale	175	15	SD
Hyde Park Ave	Northborne Rd to Patten St	Roslindale	300	15	SD
Eldridge Rd	Hyde Park Ave to Wachusett St	Roslindale	190	12	SS
Rodman St	Wachusett St to Patten St	Roslindale	120	12	SD
Rodman St	Wachusett St to Patten St	Roslindale	440	10	SD
Walk Hill St	Hyde Park Ave to Wachusett St	Roslindale	660	12	SS
Walk Hill St	Wachusett St to Bourne St	Roslindale	280	12	SS
Grover Ave	End to Wyvern	Roslindale	140	10	SS
Wyvern	Neponset Ave to Grover Ave	Roslindale	280	10	SS
Philbrick St	Neponset Ave to Mount Hope St	Roslindale	400	10	SS
Philbrick St	Neponset Ave to Mount Hope St	Roslindale	155	10	SD
Philbrick St	Neponset Ave to Mount Hope St	Roslindale	150	10	SD
Sammett Ave	Neponset Ave to Holly Rd	Roslindale	200	12	SS
Sammett Ave	Holly Rd to Mount Hope St	Roslindale	275	12	SS
Harding Rd	Stella Rd to Hadwin Wy	Roslindale	190	10	SS
Cummins Hwy	Harding Rd to American Legion Hwy	Roslindale	185	8	SS
Hyde Park Ave	Ramsdell Av to American Legion Hwy	Hyde Park	165	18	SD
Hyde Park Ave	Ramsdell Av to American Legion Hwy	Hyde Park	180	10	SS
Hyde Park Ave	Collins St to American Legion Hwy	Hyde Park	455	24	SS
Hyde Park Ave	Collins St to American Legion Hwy	Hyde Park	155	10	SS
Hyde Park Ave	Collins St to Willow Av	Hyde Park	320	12	SS
Hawthorne St	Heathcote St to School Parking Lot	Roslindale	970	48	SD
Hawthorne St	Sherman St to Sycamore	Roslindale	200	12	SD
Hawthorne St	Hawthorne Ter to Sycamore St	Roslindale	775	12	SS
Heathcote St	Poplar St to Hawthorne St	Roslindale	500	42	SD
Florence St	Poplar St to Hawthorne St	Roslindale	195	12	SS
Florence St	Hawthorne St to Cummins Hwy	Roslindale	190	15	SS
Private Driveway	Florence St to End	Roslindale	130	8	SS
Cummins Hwy	Brown Av to Sherwood St	Roslindale	225	12	SD
Cummins Hwy	Sherwood St to Sheldon St	Roslindale	165	12	SD
Westmore Rd	Hillsboro Rd to Gilmer St	Mattapan	255	10	SS
Westmore Rd	Gilmer St to Deering Road	Mattapan	1,050	8	SS
Deering Rd	Westmore Rd to Harvard St	Mattapan	330	8	SS

Deering Rd	Westmore Rd to Harvard St	Mattapan	170	12	SD
Walkhill St	Almont St to Mulvey St	Mattapan	155	12	SD
Walkhill St	Mulvey St to Fottler Rd	Mattapan	190	18	SD
Walkhill St	Mulvey St to Fottler Rd	Mattapan	595	12	SS
Hazelton St	Hillsboro Rd to Fottler Rd	Mattapan	430	12	SD
Ormond St	Hillsboro Rd to Outlook Rd	Mattapan	200	10	SS
Ormond St	Hillsboro Rd to Outlook Rd	Mattapan	110	12	SD
Goodale Rd	Wellington Hill St to Blue Hill Av	Mattapan	195	10	SS
Wildwood St	Woolson St to Morton St	Mattapan	180	10	SD
Edgewater Dr	Mattakeeset St to Monponset St	Hyde Park	235	8	SS
Edgewater Dr	Holmfield St to Monponset St	Hyde Park	235	12	SS
Edgewater Dr	Wachusett St to Massasoit St	Hyde Park	250	12	SS
Edgewater Dr	Oscelola St to Wachusett St	Hyde Park	255	12	SS
Rodman St	Wachusett St to Patten St	Roslindale	120	12	SS
Hyde Park Ave	Northborne Rd to Patten St	Roslindale	175	15	SD
Walk Hill St	Wachusett St to Bourne St	Roslindale	280	12	SS
Grover Ave	End to Wyvern	Roslindale	25	10	SS
Philbrick St	Neponset Ave to Mount Hope St	Roslindale	150	10	SD
Jewett St	Neponset Ave to Holly Rd	Roslindale	115	10	SD
Sammett Ave	Neponset Ave to Holly Rd	Roslindale	225	12	SS
Hyde Park Ave	Mount Hope to Destefano Rd	Roslindale	200	12	SS
Hyde Park Ave	Mount Hope to Destefano Rd	Roslindale	125	12	SS
Harding Rd	Stella Rd to Hadwin Wy	Roslindale	80	10	SS
Stella Rd	Harding Rd to American Legion Hwy	Roslindale	105	10	SS
Canterbury St	Poplar St to Pinedale Rd	Roslindale	145	18	SS
Hyde Park Ave	Ramsdell Av to American Legion Hwy	Hyde Park	180	10	SS
Hyde Park Ave	Ramsdell Av to American Legion Hwy	Hyde Park	130	18	SD
Hyde Park Ave	Ramsdell Av to American Legion Hwy	Hyde Park	155	10	SS
Huntington Ave	Collins St to Thatcher St	Hyde Park	210	10	SS
Hawthorne St	School Parking lot to Sherman St	Roslindale	130	12	SD
Wilkins Pl	Sycamore St to End	Roslindale	230	10	SD
Brown St	Cummins Hwy to Allen St	Roslindale	170	12	SS
Florence St	Hawthorne St to Cummins Hwy	Roslindale	170	15	SD
Florence St	Hawthorne St to Cummins Hwy	Roslindale	140	12	SD
Cummins Hwy	Sherwood St to Sheldon St	Roslindale	200	12	SS
Westmore Rd	Hillsboro Rd to Gilmer St	Mattapan	235	10	SD
Wellington Hill St	Duke St to Ormond St	Mattapan	530	12	SD

Ormond St	Hillsboro Rd to Outlook Rd	Mattapan	110	12	SD
Goodale Rd	Wellington Hill St to Blue Hill Av	Mattapan	175	10	SD
Walk Hill St	Borne St to Canterbury	Roslindale	1	10	SS
Harding Rd	Stella Rd to End	Roslindale			SD
Varney St	Wachusett St to Wenham	Roslindale	1	12	SS
Harding Rd	Stella Rd to End	Roslindale	110	10	SS
Total			**17,750**		

Contract 17-309-001

Street	Limits	Neighborhood	Length	Size	Type
Buchanan Rd	President Rd to Wedgewood Rd	West Roxbury	470	12,24	SDR
Courthouse Wy	Northern Ave to End	South Boston	570	10,12	SDR
Dale St	At Metropolitan Ave	Hyde Park	35	18	SDR
Ericsson St	Walnut St to Lawley St	Dorchester	410	12	SDR
Lawley St	Water St to Ericsson St	Dorchester	210	12	SDR
Ledgedale Road	Buchanan Rd to Weld St	West Roxbury	615	10	SDR
Port Norfolk St	Water St to Ericsson St	Dorchester	1,060	12	SDR
Running Brook Rd	Woodley Ave to Westmore Rd	West Roxbury	560	10	SDR
Taylor St	Water St to End	Dorchester	635	15	SDR
Walnut St	Ericsson St to Water St	Dorchester	1,075	10,12	SDR
Water St	Walnut St to Taylor St	Dorchester	260	12	SDR
Buchanan Rd	President Rd to Wedgewood Rd	West Roxbury	175	24	SDL
Chittick Rd	Truman Pkwy to End	Hyde Park	1,635	8,10	SDL
Easement	Keystone to Glenellen Rd	West Roxbury	410	10	SDL
Garfield Ave	Truman Pkwy to Blow St	Hyde Park	2,000	8,10,12	SDL
Loring Pl	Garfield Ave to End	Hyde Park	325	10	SDL
Northern Ave	Courthouse Way to Seaport Blvd	South Boston	750	15	SDL
Oakman St	Taylor St to Walnut St	Dorchester	320	12	SDL
Seaport Blvd	Northern Ave to D street	South Boston	1,230	15,18	SDL
Sherrin Woods (Easement)	Austin St to Dale St	Hyde Park	1,655	18	SDL
Taylor St	Rice St to Neponset Ave	Dorchester	540	12	SDL
Truman Pkwy	Easton Ave to Chittick Rd	Hyde Park	510	12,15	SDL
Total			**15,450**		

Contract 17-309-014

Street	Limits	Neighborhood	Length	Size	Type
Barnes Ave.	Saratoga St. to End		1,501	8-12	
Humboldt. St.	Townsend St. to Waumbeck St.		1,026	12	

Child St.	Cleveland St. to Winslow St.	520	10
Total		**3,047**	

Contract 17-309-015

Street	Limits	Neighborhood	Length	Size	Type
Anthony Rip Valenti Way	Canal St to Beverly St	Central	76	57	SS
Anthony Rip Valenti Way	Anthony Rip Valenti Way to New Chardon St	Central	275	66	SS
Blackstone St	North St to Hanover St	Central	127	15	SS
Blackstone St	North St Hanover St	Central	20	18	SS
Blackstone St	North St to Hanover St	Central	99	18	SS
Blackstone St	North St to Hanover St	Central	232	18	SS
Hanover St	Union St to Cross St	Central	165	30	SS
Hanover St	Union St to Cross St	Central	155	30	SS
Hanover St	Union St to Cross St	Central	8	30	SS
Hanover St	Union St to Cross St	Central	7	36	SS
JFF Surface Rd	Market St to Hanover St	Central	21	66	SS
JFF Surface Rd	Market St to Hanover St	Central	282	66	SS
JFF Surface Rd	Market St to Hanover St	Central	29	36	SS
JFF Surface Rd	Market St to Hanover St	Central	59	48	SS
Cross St	Cooper St to Fulton St	Central	95	48	CS
Cross St	Cooper St to Fulton St	Central	112	48	CS
Cross St	Cooper St to Fulton St	Central	115	66	CS
Cross St	Cooper St to Fulton St	Central	19	66	CS
Cross St	Cooper St to Fulton St	Central	13	66	CS
Cross St	Cooper St to Fulton St	Central	30	66	CS
Cross St	Cooper St to Fulton St	Central	77	66	CS
Cross St	Cooper St to Fulton St	Central	49	66	CS
Cross St	Cooper St to Fulton St	Central	135	66	CS
Cross St	Cooper St to Fulton St	Central	188	66	CS
Cross St	Cooper St to Fulton St	Central	23	66	CS
Cross St	Cooper St to Fulton St	Central	49	66	CS
Cross St	Cooper St to Fulton St	Central	114	66	CS
Cross St	Cooper St to Fulton St	Central	112	66	CS
Cross St	Cooper St to Fulton St	Central	68	66	CS
North St	Near Tunnel Entrance to Cross St	Central	122	66`	CS
North St	Near Tunnel Entrance to Cross St	Central	186	66	CS
North St	Near Tunnel Entrance to Cross St	Central	126	66	CS

North St	Near Tunnel Entrance to Cross St	Central	75	66	CS
Salt Lane	Union St to Blackstone St	Central	74	16	SS
Salt Lane	Union St to Blackstone St	Central	13	16	SS
Salt Lane	Union St to Blackstone St	Central	28	6	SS
Salt Lane	Union St to Blackstone St	Central	74	12	SS
Salt Lane	Union St to Blackstone St	Central	94	12	SS
Salt Lane	Union St to Blackstone St	Central	61	15	SS
Salt Lane	Union St to Blackstone St	Central	56	15	SS
Salt Lane	Union St to Blackstone St	Central	16	15	SS
Salt Lane	Union St to Blackstone St	Central	16	15	SS
Private Land	E St to Pappas Way	South Boston	92	60	CS
Private Land	E St to Pappas Way	South Boston	436	72	CS
Total			**4,223**		

Contract 16-309-006

Street	Limits	Neighborhood	Length	Size	Type
Lewis St.	Moon St. to North St.	North End	215	12	
Margaret St	Prince St. to Sheafe St.	North End	220	12	
Prince St.	Garden Ct. to 31 Prince St.	North End	120	20	
Tileston St	Salem St. to Hanover St.	North End	500	12	
Total			**955**		

INCREASED CAPACITY

19-309-001

Location	Limits	Neighborhood	Length	Size
Beverly St	Lovejoy Place to Causeway St	North End		
Neponset Ave	Gallivan Boulevard to Taylor St (Neponset Circle)	Dorchester		
Seaport Blvd	Seaport Blvd at Seaport Lane	Waterfront		
Seaport Blvd	Seaport Blvd at Sleeper St	Waterfront		
Seaport Blvd	Seaport Blvd at B St	South Boston		
Total				

SEPARATION

Contract 17-309-005

Location	Limits	Neighborhood	Length	Size
Bennington St.	Porter St. to Marion St.	East Boston	460	12
Decatur St.	Border St. to London St.	East Boston	925	24, 30
Liverpool St.	Decatur St. to Marion St.	East Boston	430	12
London St.	Maverick St. to Porter St.	East Boston	2,025	12, 15, 18
Saratoga St.	Meridian St. to Marion St.	East Boston	130	12
Sumner St.	Lamson St. to Jeffries St.	East Boston	1,855	12, 18
Webster St.	Lamson St. to Jeffries St.	East Boston	1,780	12, 24
Jeffries St.	At Sumner St.	East Boston	55	12
Lubec St.	Gove St. to Porter St.	East Boston	825	12, 15
Baker St.	Cutter St. to Dunwell St.	East Boston	855	12, 15
Total			**9,340**	

Contract 17-309-011

Location	Limits	Neighborhood	Length	Size
Alaska St.	Blue Hill Ave to #24	Roxbury	220	12
Blue Hill Ave.	Woodville St. to Maywood St.	Roxbury	2,050	18, 36
Brookford St.	Blue Hill Ave. to Rand St.	Roxbury	310	12
Clifford St.	At Blue Hill Ave.	Roxbury	70	12
Edgewood St.	Blue Hill Ave to #44	Roxbury	630	12
Irwin Ave.	At Blue Hill Ave.	Roxbury	50	
Julian St.	Blue Hill Ave. to Cottage Ct.	Roxbury	430	12
Maywood St.	Blue Hill Ave to #29	Roxbury	750	12
Rand St.	Brookford St. to Fairbury St.	Roxbury	250	12
Southwood St.	Blue Hill Ave to #21	Roxbury	460	
Waverly St.	Blue Hill Ave to #26	Roxbury	950	15
West Cottage St.	Blue Hill Ave #81	Roxbury	390	10
Woodbine St.	Blue Hill Ave to #30	Roxbury	560	12
Maywood St.	Blue Hill Ave to #29	Roxbury	680	8
Total			**7,800**	

Contract 16-309-005

Location	Limits	Neighborhood	Length	Size
Brooks St.	Falcon St. to Condor St.	East Boston	200	18
Brooks St.	Falcon St. to West eagle St.	East Boston	275	12
Meridian St.	Falcon St. to Condor St.	East Boston	200	18
White St.	Border St. to Brooks St.	East Boston	860	12
White St.	Border St. to Meridian St.	East Boston	250	18
Eutaw St.	Border St. to Meridian St.	East Boston	200	24
Eutaw St.	Meridian St. to Marion St.	East Boston	400	15
Eutaw St.	Marion St. St. to 61 Eutaw St.	East Boston	150	12
Meridian St.	Trenton St. to Monmouth St.	East Boston	540	18
Meridian St.	Trenton St. to #316 Meridian St.	East Boston	120	12
Monmouth St.	Meridian St. to Marion St.	East Boston	275	12
Trenton St.	Marion St. to Meridian St.	East Boston	510	15
Total			**3,980**	

Contract 16-309-011

Street	Limits	Neighborhood	Length	Size	Type
Blue Hill Ave.	Dudley St. to Maywood St.	Roxbury	600		SD
La Grange Pl.	Blue Hill Ave to End	Roxbury	230		SD
Total			**830**		

Contract 15-309-011

Street	Limits	Neighborhood	Length	Size	Type
Dudley St.	Mt. Pleasant St. to Dudley St.	Roxbury	1,680		SD
Total			**1,680**		

SOUTH BOSTON SEPARATION

20-309-012 CONTRACT I

		Combined Sewer	Sewer		Drain		Water
Street	Approximate Limits	Combined Sewer Conversion (lf)	New Sewer (lf)	Rehabilitation Sewer (lf)	New Drain (lf)	Rehabilitation Drain (lf)	Replacement Water (lf)
A ST	West Broadway to Dorchester Av	0	420	250	350	0	0
ATHENS ST	S Boston Bypass to C St	0	570	0	370	0	530
B ST	West Second St to Dorchester Av	1,270	1,500	0	190	640	690
BOLTON ST	S Boston Bypass to B St	0	0	0	0	0	0
C ST	West Second St to West Broadway	0	0	270	370	0	600
COSTELLO CIR		0	0	0	0	0	0
CROWLEY ROGERS W	Delessio Ct to D St	0	700	0	810	0	1,140
DALESSIO CT		0	0	0	0	0	0
DORCHESTER AV		0	0	0	0	0	0
FLAHERTY WY	B St to D St	0	1,060	0	1,060	0	0
GOLD ST	A St to B St	0	350	0	80	0	0
JOYCE HAYES WY	Orton Marota Wy to West Seventh St	0	0	0	280	0	0
LINSKY-BARRY CT		0	0	0	0	0	0
ORTON MAROTTA WY	B St to D St	0	30	0	440	0	0
SILVER ST	Dorchester Av to B St	0	620	70	470	0	600
ST CASIMIR ST		0	10	290	0	0	0
WEST BROADWAY	S Boston Bypass to C St	0	670	150	540	0	720
WEST FIFTH ST	Dorchester Av to B St	0	349	0	350	0	0
WEST FOURTH ST	Dorchester Av to B St	0	670	0	560	0	110
WEST SEVENTH ST	Dorchester Av to D St	1,110	1,050	0	0	0	1,200
WEST SIXTH ST	S Boston Bypass to B St	0	0	0	0	0	0
WEST THIRD ST	B St to C St	0	0	0	260	0	570
Totals		**2,380**	**7,999**	**1,030**	**6,130**	**640**	**6,160**

21-309-012 CONTRACT II

STREETS	LIMITS
CONTRACT 2	
ALGER ST	
BAXTER ST	C St to E St
BELL CT	
C ST	West Seventh St to Old Colony Av
COTTAGE ST	
D ST	West Seventh St to Dorchester Av
DAMRELL ST	Old Colony Av to Dorchester Av
E ST	West Seventh St to Old Colony Av
EARL ST	West Ninth St to Old Colony Av
EWER ST	West Ninth St to Damrell St
FREDERICK ST	
GLOVER CT	End to Woodward St
GUSTIN ST	End to Old Colony Av
LARK ST	#23 to Old Colony Av
MIDDLE ST	Dorchester Av to Dorchester St
MITCHELL ST	at Old Colony Av
OLD COLONY AV	Dorchester Av to Dorchester St
PRIVATE RD	
SAYWARD PL	End to Woodward St
TUCKERMAN ST	Middle St to Dorchester St
WEST EIGHTH ST	#88 to E St
WEST NINTH ST	D St to E St
WOODWARD ST	Dorchester Av to Dorchester St

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