

2017 CURRENT EXPENSE BUDGET



Boston Water and Sewer Commission



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Prepared by the Finance Division



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January 1, 2016

Executive Director

The Government Finance Officers Association of the United States and Canada (GFOA) presented a Distinguished Budget Presentation Award to the Boston Water & Sewer Commission, Massachusetts for its annual budget for the fiscal year beginning January 1, 2016.

In order to receive this award, a government unit must publish a budget document that meets program criteria as a policy document, as an operations guide, as a financial plan, and as a communicative device.

This award is valid for a period of one year only. We believe our current budget continues to conform to program requirements, and we are submitting it to GFOA to determine its eligibility for another award.

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2017 Budget Message from the Executive Director

The Boston Water and Sewer Commission (“the Commission” or “BWSC”) is a public instrumentality, a body politic and corporate and a political subdivision of the Commonwealth, separate and apart from the City. It was created by the passage by the Massachusetts Legislature of the Act in July, 1977 in response to a “home rule” petition of the City. In August, 1977, the ownership, operation and control of the City’s Systems were transferred to the Commission. The Act authorizes the Commission to operate, maintain and construct all necessary improvements to the Systems, establish and collect rates and charges for its services (which rates and charges are not subject to regulation by any other governmental body), 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 Act may be amended only by means of further “home rule” petitions of the City enacted by the Massachusetts Legislature, or by means of state legislation affecting generally all water and sewer districts within the Commonwealth.

In 2016, the Commission was recognized locally for its continued excellence in maintaining a safe and quality water and sewer service to the rate payers of the City of Boston.

The following are some of the awards presented to the Commission:

The Commission received The Regional Recognition Award for outstanding performance and achievements in 2015. The Massachusetts Department of Environmental Protection (MassDEP) recognized the Commission as a model public water agency that puts forth exemplary efforts in every area of water treatment and distribution including the Lead Service Replacement Program.

The Commission received the Citation for Consistent Performance for continued excellence in delivering safe drinking water in 2015. The Commission was proud to accept this first time award by MassDEP to celebrate the consistent success in providing safe drinking water to the City of Boston.

The Commission was presented with the Commonwealth of Massachusetts Governor’s Citation in recognition of dedicated service to maintaining a safe and abundant supply of clean water and commitment to protecting the environment. This award gives formal recognition by the Commonwealth to those who provide meaningful contributions, which distinguish them from their peers. These special awards focus attention on consistent, positive achievements by both individuals and teams of state employees, and recognize those who demonstrate: innovation and dedication to their work, concern for the public trust and commitment to excellence.

Boston Water and Sewer Commission was awarded the Best Stormwater Idea Award in 2015 by the New England Water Works Association. The Award given for “leveraging school system master planning for green infrastructure implementation” is the first of its kind.

Budget Message

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 34 water pipe failures per year, and has witnessed its unbilled water drop from 48% to 14%.

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, they 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 location 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 20 pipe and soil 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.

Budget Message

In cooperation with the MWRA, the Commission has completed six sewer separation projects in the City that were included in the MWRA's CSO Facilities Plan ("MWRA/BWSC CSO PLAN"). Combined, these projects involved the installation of approximately 43 miles of new storm drains to provide sewer separation. These projects were funded by the MWRA under a United States Environmental Protection Agency ("EPA") court ordered mandate to reduce or eliminate CSOs from the Charles River and area beaches. This work had the dual positive effect of reducing CSOs and inflow into the sewer system, resulting in substantial cost savings to the Commission.

On August 23, 2012, the Commission entered in a Consent Decree with the Environmental Protection Agency. 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 Clean Water Act 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 must increase its inspection and assessment of its sewer and drainage systems. The program represents progressive increases in the amount of pipes cleaned and televised with an end goal of completing approximately 10% of the system annually.

The 2017–2019 Capital Improvement Program saw the introduction of a Stormwater Management category. 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 strategically manage stormwater throughout the City of Boston.

The Commission's CIP includes projects to improve the overall efficiency of the Commission 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 2017-2019 Capital Improvement Program. Some of the major projects are listed below:

- Water Main Replacement Program
- Inspection and Rehabilitation of Steel Water Mains
- Sewer and Drain Replacement Program

Budget Message

- Sewer & Drain Rehabilitation & Replacement in the North End
- Sewer Separation and System Improvements in South Boston
- Sewer Separation in Roxbury
- City-wide Illegal Connections Investigations
- Upgrades to Union Park Pumping Station & Satellite Stations
- Upgrade of Automatic Metering Infrastructure (AMI)
- Projects affiliated with the Consent Decree; includes cleaning and televising ninety miles of sewer and drains
- Improvements to Information Technology

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 instance 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 98% 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 on a tenable, sustainable path to improve water quality and maintain outstanding access to the City's waterways.

Effective January 1, 2017 the Commission increased its water and sewer rates by an average of 2.4%. The 2017 Current Expense Budget ("CEB"), as outlined in the following pages, details \$361.3 million in anticipated revenues and expenses. This represents a 5.3% increase over the 2016 budget.

Budget Message

The Commission's fiscal priorities for 2017: management objectives; mitigate the effects of the Massachusetts Water Resources Authority ("MWRA") five-year projected wholesale rate increases. Successful achievement of these priorities will allow us to accomplish our main goal: providing Boston with the highest quality water and sewer service at the lowest possible price.

Management Objectives

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 the Systems. The Commission is committed to these primary goals:

To maintain and improve the Water Distribution and Sewer Systems. The Commission is committed to a number of improvements to the Water Distribution and Sewer Systems, including following an aggressive renewal and replacement program, reducing unaccounted-for water, encouraging conservation and participating in the Boston Harbor pollution abatement project. The Commission is also committed to meeting or 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 reflects its costs, fairly distributes the burden and encourages water conservation by consumers. 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 projection and budgeting assumptions, maintained adequate reserves and achieved a reasonable balance between debt funding and rate funding of capital expenses.

A continuing issue facing municipalities this year is the Other Post-Employment Benefits (OPEB) Liability as stated in GASB statement number 43 and GASB statement Number 45. The Commission is accounting for this liability by funding the 2016 Current Expense Budget with \$2.6 million. The Commission will continue to work with the City of Boston to fully fund the Commission's portion of the liability since the Commission is part of the City of Boston's retirement system.

MWRA Five-Year Rate Forecast

The MWRA regularly updates its estimates of anticipated revenues and expenses over a multi-year planning horizon. These planning estimates provide a context for budget discussions and a planning tool for the MWRA and those affected by its rate revenue requirements. Increasing debt service to finance the capital improvement program is the most important factor driving estimates of future budget increases. New water system improvements and the impact of recent financing strategies will increase capital financing costs over the next several years.

Budget Message

The payment of the cost of such MWRA programs will be included in the MWRA's assessments to its Member Communities for the supply of water and sewer services. Because the Commission is approximately one-third of the MWRA's rate revenue requirement, it is expected that these programs will have a significant financial impact on the Commission, inevitably leading to increased water and sewer rates for our customers.

In developing future rate projections, the Commission must utilize the most current rate and projections, which have been issued by the MWRA. The MWRA Assessment is based on an actual 3.0% for 2017, a projected 3.8% for 2018 to 2021. These anticipated rate increases are based on the MWRA fiscal year, which began on July 1, 2016.

The 2017 budgeted assessment of \$219.1 million is anticipated to escalate to \$254.4 million by the year 2021. This forecast amount represents approximately 60.6% of the total expenses of the Commission for that year. Consequently, the current rate increase to Boston's ratepayers for 2017 is 2.4%, with forecasted increases of 3.8% each year from 2018 through 2021.

The Commission will aggressively pursue all available state relief funding, grant and low interest loans, and continue to control total expenses, in an effort to offset these rate increases. Based on the projected rate increases for 2017-2021, household charges for the typical BWSC customer are forecast into an average dollar cost increase from \$1,052 in 2017 to \$1,221 in the year 2021.

The 2017 Current Expense Budget enables the Boston Water and Sewer Commission to fulfill its commitment to our ratepayers. That commitment is to operate the water and sewer systems in a modern and efficient manner; provide the highest quality and most cost effective water distribution and wastewater collection services; while improving the water quality in Boston Harbor, its beaches and tributary rivers.



Henry F. Vitale,
Executive Director

The Financial Planning Process

The Commission's annual financial planning process adheres to established procedures in completing each vital planning phase in the implementation of the Commission's overall financial plan. The phases, described below in chronological order, are the Goal Setting Process, the Capital Improvement Program ("CIP") Budget Process, Direct Expense and CEB Development and the Rate Setting Process. Together, these phases outline the level of expenses for which the Commission must secure necessary financial resources, the revenue requirement to meet these expenses and the sources of the funds to implement these spending plans. The primary source for funding the current expenses for each fiscal year is customer water and sewer charges.

Program Based Budgeting

In 1989 the Commission implemented the "Program Based Budgeting" methodology. Under this methodology each operating unit within the Commission identifies areas of concern on an annual basis and declares new goals and objectives, which outline the mission and the duties of each operating unit. Program goals and objectives when successfully completed result in reduced costs, increased operating efficiencies and elevated levels of service being provided to our customers.

The Goal Setting Process

The Goal Setting Process commences in June each year. Division Chiefs and Department Managers submit preliminary goals and objectives to the Budget and Financial Planning Department staff ("Budget staff") for review. The goals are categorized as Monthly Management Report Goals, Goals included in the Commission-wide Report Status Update, Tactical Goals and Strategic Goals. Monthly Management Report Goals are those, which carry out the core duties and responsibilities of an operating unit within the Commission for delivery of basic water and sewer services. Goals included in the Commission-wide Report Status Update are reports submitted by staff for internal distribution or as required by law or permit to be completed and submitted to any external agency. Tactical Goals are one-time improvements and/or enhancements to a technical or service-oriented process. Strategic Goals outline the long-range plans and direction of each division and department in the Commission. In each case, the Division Chiefs and Department Managers must declare goals and objectives which meet at least one of the following criteria: cost control, revenue enhancement, service improvement or environmental protection. Each division and department must explain how the progress of the objective is to be measured - the measurement criteria. After review by Budget staff, proposed goals are forwarded to the Chief Financial Officer ("CFO") for review and comment. The final goals for the ensuing year are then reviewed and approved by the Executive Director.

The Capital Improvement Program Budget Development

The Commission is required under its Enabling Act and the General Bond Resolution, adopted on December 6, 1984, and supplemental resolutions ("the Resolution") to annually publish a CIP for the succeeding three years. The ultimate goal of the CIP is to ensure the uninterrupted delivery of high quality water and wastewater services while minimizing water loss and the

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pollution of Boston Harbor and its tributary waters. The CIP process, which also begins in June each year, outlines the improvements, which are necessary to maintain and enhance the infrastructure. The overall objectives of the CIP are to ensure the adequate delivery of high quality potable water for consumption and fire protection and the efficient and environmentally sound collection of wastewater for transport and delivery to a treatment facility or for approved discharge. The projects included in the CIP are divided into three categories: water distribution system projects, sewer system projects and support projects. Commission staff establishes a time line for the design and construction phases of each project along with projected cash flow requirements based on engineering information and a priority ranking system. As part of the CIP development process the Commission solicits input from private and public entities regarding planned capital projects and any potential impact on the Commission's systems and/or CIP. Project information is then submitted to Budget staff for review and compilation into the annual CIP. The proposed CIP is then forwarded to the CFO for review and comment, after which it is forwarded to the Executive Director for review and approval. In accordance with the Enabling Act the proposed CIP must be delivered to the Mayor of the City of Boston on or before November 1, annually. Prior to adoption of the CIP, the Enabling Act requires that the Commission hold a public hearing on its proposed CIP for the purpose of allowing interested parties the opportunity to review and comment. After the public hearing, the Commission maintains a fifteen-day open comment period for the public to present views or arguments on the proposed CIP. The Commission responds to these public comments and the final CIP is presented to the Board of Commissioners for adoption in December each year.

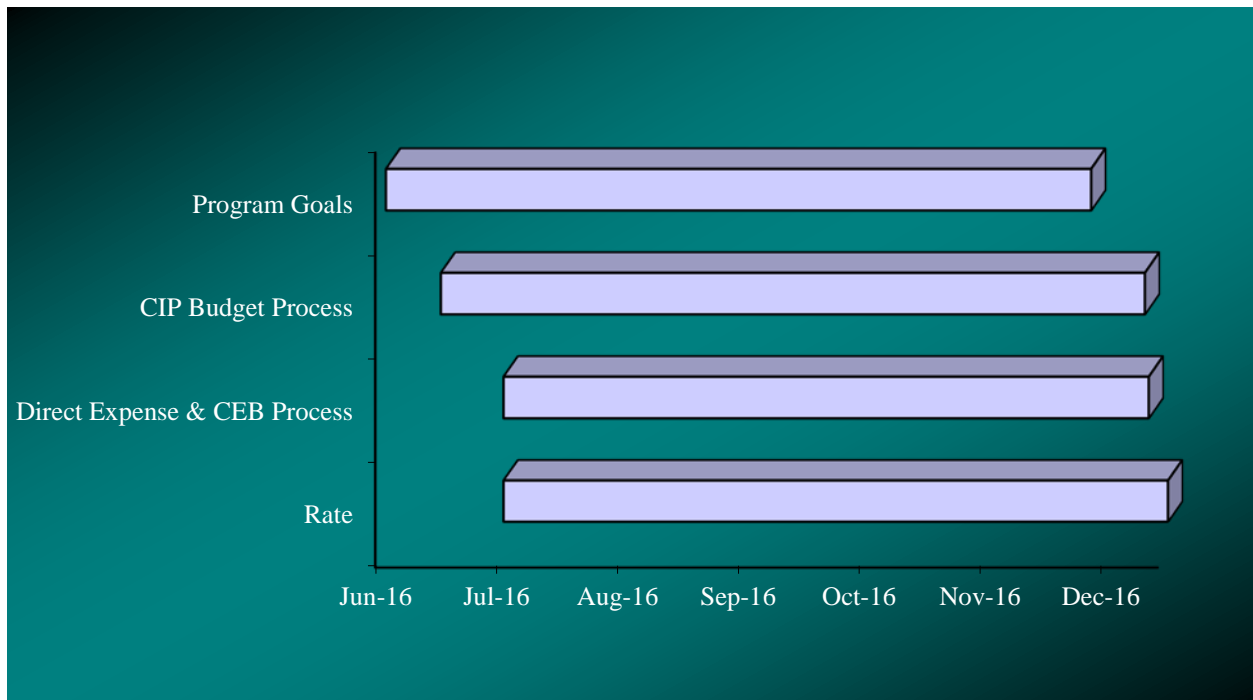
Direct Expense and Current Expense Budget Development

In July, the process for the Direct Expense Budget and CEB Development begins. Initially, Division Chiefs and Department Managers submit their requests for the funding necessary to fulfill the duties, responsibilities and new goals for the following fiscal year. Budget staff evaluates these requests in light of the current level of spending, historical spending patterns, availability of resources and the tactical and strategic goals declared by each department. Based on this analysis, the Budget staff determines a recommended level of funding. This recommendation is then submitted to the CFO for review and modification before finalizing the Direct Expense Budget at the Executive Director's Planning Meeting with Senior Management. The Commission then determines the total level of expenditures, which will be required to operate and maintain the systems, provide basic services and fulfill all financial obligations for the next fiscal year. Staff considers all financial obligations such as the wholesale costs of water and sewer services paid to the MWRA, the Direct Expenses as determined above, rate revenue funded costs of renewal and replacement of the water and sewer systems as included in the CIP, the Safe Drinking Water Act ("SDWA") Assessment, payment of State Revolving Loan Fund ("SRF") debt service, principal payments on MWRA loans, total debt service expense on outstanding general revenue bonds of the Commission and required deposits to various reserve funds which are stipulated by the Resolution ("Contractual Funding Obligations"). Once the level of these expenses is determined for the following year, the Commission must determine the level of revenue required to meet these expenses and to meet the debt service coverage test, which is covenanted in the Resolution.

The Rate Setting Process

The Rate Setting Process completes the final phase of the annual financial planning process by evaluating all the financial obligations of the Commission and determining the rate revenue requirement for the ensuing fiscal year. In accordance with legislative and policy mandates, the Commission adheres to an annual process in developing and setting the level of water and sewer rates for a given year. The Commission's Rate Setting Methodology incorporates the following four phases: Legislative/Policy Analysis; Water Demand Analysis; Financial Analysis; and the Water and Sewer Rate Calculation. Legislative/Policy Analysis is undertaken annually to ensure that the Rate Setting Process is conducted in compliance with all generally accepted rate making practices and that it adheres to all existing legal and policy directives mandated by the Enabling Act and the Resolution. The Water Demand Analysis considers factors, which have an impact on the level of consumption from year to year. Analysis of changes in the composition of the Commission's customer base, the occurrence of extreme weather conditions and its effects, the impact of increasing rates and economic activity and the extent to which system-wide water conservation efforts may alter usage patterns are considered. The third component of the Rate Setting Methodology is the Financial Analysis phase, which considers the past, present, and future financial position of the Commission in determining a projection of revenues, adjustments to revenues and expenses for a given year. The result of this phase is the total projected level of expenses for the ensuing year, which is used to determine the rate revenue requirement for that year. The Commission next estimates the level of non-rate revenue, which is derived from Special service fees, investment income, late payment charges, fire pipe charges, prior year net operating income, if any, and other miscellaneous income. The amount of non-rate revenue is applied to the level of expenses plus the level of adjustments to revenue and the resulting shortfall is the rate revenue requirement for the year. The final phase of this process is Water and Sewer Rate Calculation. The rate revenue requirement is allocated between water and sewer costs to derive a water revenue requirement and a sewer revenue requirement. The percent change in rates is determined by dividing the water and sewer rate revenue requirement by the estimated revenue from current water and sewer rates. The estimated percent changes are then applied to current water and sewer rates resulting in the calculation of new water and sewer rates. The Commission implemented a rate increase of 2.4% to be effective January 1, 2017. Also in 2005, the Commission completed a rate structure study in which it was determined that the rate structure should be reduced to six blocks. The 2017 Rate Schedule calculates charges based on a six-block inclining rate structure. From 1986 to 2005, the Commission used a ten-block inclining rate structure in order to promote water conservation. The inclining block rate structure charges a higher per-unit price as a customer's average daily consumption increases. It is a pricing structure widely used by water and sewer utilities throughout the country, and has contributed to the desired decline of water consumption in Boston over the past twenty years.

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2017 BUDGET PROCESS SCHEDULE

The above chart illustrates the process, which took place in 2016 in preparation for the 2017 financial year. At the beginning of June, the Program Goals and Objectives process was initiated, followed by the start of the CIP process in mid-June. During the first week of July, development of the direct and current expense budgets commenced, along with the development of the rates required to support all planned program spending.

Financial Policies

The Commission has established specific Financial Policies, which set the parameters within which decisions of a financial or budgetary nature are made. Many of the policies establish guidelines for operation in accordance with the requirements of the Enabling Act and the Resolution. Along with the broad-reaching policies described below, departmental level policies and procedures have been designed and instituted to ensure compliance with generally accepted accounting principles (“GAAP”) and applicable laws and statutes. Under the Enabling Act, the Commission is required to maintain its books and records in accordance with GAAP and to have an annual audit performed by an independent certified public accountant or firm of certified public accountants. The Commission has complied with this requirement and has received an unqualified opinion each year since inception.

The Commission follows the accounting standards set forth in Governmental Accounting Standards Board Statement No. 62, (“GASB 62”). Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements. GASB 62 allows certain (a) revenues provided for future allowable costs to be deferred until the costs are actually incurred (deferred credits) and (b) costs incurred to be capitalized if future recovery is reasonably assured (deferred charges). These changes allow a more meaningful presentation of the results of operations in that the financial statements prepared under GAAP more closely reflect the Commission’s rate setting policies.

Policy for the Investment of Boston Water and Sewer Commission Funds

This policy sets forth the principles, which the Commission shall follow in investing all of its cash assets, with the exception of the Pension Fund. Investment of Commission funds is governed by federal and state law and is restricted to Permitted Investments as defined by the Commission’s General Revenue Bond Resolution and Supplemental Resolutions. Revenues generated from the investment of Commission funds reduce the amount the Commission must charge its customers, while any investment losses would negatively affect the Commission’s general rates and charges. Consequently, the Commission shall at all times maintain a fully invested, diversified portfolio with the objective of achieving the highest yield that is attainable in conjunction with preservation of capital.

The basic criteria that will be used in making investment decisions include the evaluation of risk/reward tradeoffs, historical price spreads between different securities, the slope of the yield curve and the anticipated cash flows of the different investment accounts of the Commission. In addition, the prudent investor rule will be applied to all investment decisions.

Commercial Banking Policy Statement

This policy statement sets forth the principles governing the Commission’s commercial bank relationships. Commercial banks serve the Commission in two primary capacities. First, they provide a range of financial services including custody, trustee, check clearing, cash management and accounting. Second, commercial bank deposit accounts, including checking accounts, non-collateralized certificates of deposit and similar general obligations of the bank,

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are forms of investment securities. Banking relationships will be evaluated from both perspectives. Bank service relationships will be evaluated based on the quality of service provided and the full cost of service relative to similar service offered by other institutions. Bank deposit accounts in excess of amounts insured by the Federal Depositary Insurance Corporation (“FDIC”) will be analyzed relative to their compliance with the Resolution and their overall investment risk and return. Every attempt will be made to minimize the investment risks associated with bank deposit accounts by maintaining deposits below the level insured by the FDIC whenever possible or by requiring that bank deposits be fully-collateralized. Non-collateralized deposit accounts in excess of FDIC-insured levels will be placed to the fullest extent practicable with banks that have high credit ratings consistent with the general credit levels established by the Resolution for Permitted Investments.

Banking Policy

This policy was adopted in 1991 when operating losses, downgrades and failures spread throughout the banking industry in New England, in order to ensure the safety of the Commission’s bank deposits. This policy was designed to further restrict the list of Permitted Investments as defined in the Commission’s Resolution. The Banking Policy dictates that any funds maintained with the Trustee or any other bank would have to be invested, collateralized or otherwise secured so as to provide the Commission with the security equivalent to at least an A rating. The Resolution requires that bank deposits in excess of FDIC limits can only be maintained in banks with combined capital and surplus of more than \$50 million. This policy imposes the stricter requirement that unsecured deposits in excess of FDIC limits be maintained only in banks with commercial paper ratings of A-1/P-1 or credit ratings of A or better.

Policy on the Funding and Utilization of Reserve Funds

This policy sets forth the purposes of the contractual requirements and additional funding guidelines of the Commission’s reserve funds. At a minimum the Commission will maintain each reserve fund at the amount required by the Resolution adopted December 6, 1984 and Supplemental Resolutions. It is the intention of the Commission to augment, withdraw from, pledge or otherwise utilize its reserve funds in accordance with the Resolution and this policy in order to provide a high level of security to its bondholders and to potentially moderate future rate increases.

The Commission is self-supporting entity that provides water and sewer services to the City of Boston. The Commission has established a fund structure that ensures necessary funds are made available to meet its various responsibilities in the relative order of priority. The fund structure is prescribed in the General Resolution under which bonds are issued to fund its infrastructure needs.

The funds established under the General Resolution include the Project Fund, the Redemption Fund, the Revenue Fund, The Operating and Maintenance Fund, the Debt Service Funds, the Debt Service Reserve Funds, the Stabilization Fund, the Operating Reserve Fund, the Insurance Reserve Fund, the Renewal Replacement Fund, and the General Fund (as well as some inactive Funds not presented here).

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The funding structure requires all bond proceeds to be deposited in the Project Fund and thus, to be available for the purpose for which the bonds were issued.

The funding structure also requires revenues of the Commission to be deposited in the Revenue Fund and thereafter to be dispersed in the order stipulated in the General Resolution. The order ensures that funds are first available to meet operation and maintenance requirements of the Commission, and then to meet the debt service requirements of the Commission, and finally to maintain the reserves of the Commission. Thereafter, remaining revenues are deposited in the General Fund for use by the Commission as it sees fit.

Operating Reserve Fund

The basic purpose of the Operating Reserve Fund is to provide funds if at any time the amount on deposit in the Operating and Maintenance Fund is insufficient to pay operating expenses due, or if there are insufficient funds in the MWRA Assessment Fund to pay the MWRA charges. The Commission's Resolution requires that the Operating Reserve Fund be maintained in an amount that is equivalent to one-sixth of the Commission's operating and maintenance expenses, plus one-sixth of the MWRA water and wastewater charges assessed to the Commission.

Insurance Reserve

The purpose of the Insurance Reserve Fund is to provide funds for the payment of awards due to personal injury or property damage in excess of \$10,000 up to the amount reimbursable from available commercial insurance coverage. In accordance with the Resolution, the Commission maintains its Insurance Reserve Fund in an amount, which is determined and certified annually via an audit conducted by an insurance consultant or an engineer consultant.

Renewal and Replacement Reserve

The basic purpose of the Renewal and Replacement Reserve Fund is to provide additional funds for Renewal & Replacement projects if there are insufficient funds in the Renewal and Replacement Account to pay for these projects. The Commission's Resolution requires that the Renewal and Replacement Reserve Fund must be maintained at an amount equal to or above 25% of the current fiscal year's budgeted Renewal and Replacement expenditures.

Stabilization Reserve

The purpose of the Stabilization Reserve Fund is to provide additional security to bondholders and to moderate the impact on the Commission's ratepayers of any substantial increases in expenses or reductions in revenues. In particular, the Stabilization Reserve Fund can be utilized to offset any sharp increase in the Commission's variable rate interest obligations or large increases in wholesale water and sewer charges due from the Commission to the MWRA. The Stabilization Fund required balance, as defined in the Resolution, is 4% of the aggregate principal amount of any variable rate bonds outstanding. In the event additional variable rate bonds containing provisions for interest rate changes on an annual or more frequent basis are

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issued by the Commission, the Stabilization Fund required balance shall include an additional amount equal to 4% of such bonds.

Under guidelines pertaining to reserve funds, adopted by the Commission in October, 1990 and revised April, 1994, additional deposits may be made to the Stabilization Fund from projected audited year end surpluses realized by the Commission, in amounts equal to 50% of any savings on budgeted relative to actual MWRA charges unless otherwise approved by the Commissioners.

In December, 2000, this policy was amended to read as follows: The amount on deposit in the Stabilization Fund shall equal the greater of the Stabilization Fund Requirement or 10% of the previous fiscal year's net billed charges. If, at the start of the fiscal year, the balance of the Stabilization Fund is projected to exceed such requirement, then the Commission, on the last business day of the current fiscal year, may transfer to the Revenue Fund an amount up to the greater of 20% of such excess or \$20 million, but in either case, an amount not to exceed \$20 million in any one fiscal year.

The Commission has established supplemental guidelines for reserve fund contributions and withdrawals. In addition to the reserve fund requirements specified in the Resolution, the Commission shall manage its reserves in order to:

1. Provide additional security to bondholders where feasible and cost effective.
2. Ensure that sufficient funds are available to pay all operating and capital costs; meet, and to the extent cost-effective, exceed the net revenue requirements of the Resolution.
3. Moderate rate increases.
4. Or otherwise reduce the cost of maintaining and operating the water and sewer systems.

As part of the annual budgeting and rate setting processes the Commission shall review the funding levels of its debt service, operating, renewal and replacement, stabilization and insurance reserve funds. Withdrawals from or additional contributions to these funds shall be proposed in accordance with the Resolution and the objectives listed above.

Policy for Departmental Program Plans and Budgets

Through the 1990s the Commission has faced, and will continue to face, in the new millenium, increasing demands on its resources. At the same time the Commission must continue to improve and expand, where necessary, its services to maintain public support. In order to provide essential services and priorities, promote greater accountability and match scarce resources with critical program objectives, the Commission will annually undertake a program planning and budgeting process which defines departmental missions, sets objectives, establishes measurement criteria and projects promised levels of services which form the basis of the operating and capital budgets. The budgets, primarily the operating budget, thus reflect key performance objectives and allocate the resources needed to achieve these results.

Policy for the Development, Monitoring and Amendment of the Current Expense Budget

The CEB of the Commission should provide for the Commission's essential services and current priorities promote greater accountability by division and match scarce resources with critical program objectives. The CEB is developed in conjunction with departmental program plans and performance objectives. It therefore serves as both a planning document and a management tool for monitoring financial and operational performance. The Commission will utilize the CEB development and monitoring process to minimize its total costs of operation, consistent with its responsibilities to operate reliable and efficient water and sewer systems, conserve water and protect the natural resources available to the City.

The CEB is intended to be a balanced budget. The Commission believes a balanced budget is one where all available resources equals or exceeds budgeted expenditures. Available resources must include the use of the prior year's surplus and may include a transfer from the Stabilization Fund with the intent of mitigating the impact of projected rate increases. With each budget, the Commission expects at the end of that fiscal year to produce a small revenue surplus, typically less than \$1,000,000, which would be carried forward as available funds for next fiscal year.

Policy for the Development, Monitoring and Amendment of the Capital Improvement Program

The Commission's CIP is a comprehensive plan for the enhancement of the basic infrastructure and support facilities necessary to provide water distribution, wastewater collection and storm drainage services throughout the City. The primary goals of the CIP are to protect public health and the environment, improve the reliability of water, wastewater and storm drainage systems and minimize the long-term costs of operating these systems.

As part of the Commission's annual budgeting and rate-setting process, departments shall prepare capital project requests and submit them to the Finance Division for review and analysis. The Finance Division will estimate the financial feasibility of the proposed projects and will develop a draft CIP based on prioritized criteria. These criteria are intended to present a framework for project selection and elimination, are not all-inclusive and are subject to modification as part of the annual capital budget process.

Policy for the Establishment of Water and Sewer Rates, Fees and Other Charges

The Commission shall set its rates and charges in accordance with generally accepted accounting principles, generally accepted rate-setting practices of the utility industry and applicable federal and state law. The Commission has established the following rate-setting objectives in addition to the above requirements:

1. To establish fees, rates and charges on just and equitable standards such that all consumers pay their fair share of the costs of these services.

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2. To minimize the financial burden on its customers, consistent with the Commission's statutory responsibilities to operate the water and sewer systems in an efficient and financially self-sustaining manner.
3. To ensure that cash receipts and net revenues are at least sufficient to meet the fund transfers, debt service coverage ratios and reserve provisions required by the Commission's Resolution and the CEB.
4. To design its rates in order to promote the conservation, protection and improvement of increasingly scarce water sources.
5. To establish fees, rates and charges that will protect and preserve, to the extent possible, the natural resources available to the people of the City.

Other Commission Policies

In addition to the Financial Policies detailed above the Commission has established other Commission-wide policies and procedures. The purpose of the following policies and procedures is to set forth guidelines and principles, which the Commission shall follow.

1. Continue to comply with applicable laws and policies in obtaining needed professional services to ensure fair and full public competition in the solicitation and award of contracts.
2. Provide a safe and healthy work environment through in-house safety programs such as defensive driving, back injury prevention, confined space entry, right-to-know law, cardiopulmonary resuscitation and first aid and cultural diversity sensitivity training.
3. Maintain a 25% minority employment rate on all construction contracts employing a crew of four or more.
4. Maintain a 50% Boston resident employment rate on all construction contracts employing a crew of six or more.
5. Encourage all employees to enhance their knowledge and skills through education, to maintain and improve their capabilities in their position and to foster employee commitment. The Commission offers a Tuition Assistance Program and will also reimburse an employee for authorized attendance and travel related expenses at conferences, seminars and other training, educational or professional meetings.
6. Provide an Employee Assistance Program, which will help employees, and all members of their household, cope with various professional, personal or family problems.
7. Continue to comply with applicable laws, safety and health articles by promoting a safe and healthy work environment by reducing the health risk associated with the exposure to burning tobacco smoke. The Commission has adopted a Clean Air Policy to inform all employees that smoking in non-designated smoking areas will not be tolerated.

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8. Continue to disseminate current employment information to various minority agencies and local newspapers, to allow all residents of the City of Boston the equal opportunity to apply for employment with the Commission. City of Boston residency is required for all employees hired after January 1, 1991.
9. Maintain a Drug-Free Workplace policy, which prohibits the use of alcohol and/or drugs by employees during their work shift.
10. Encourage and provide the greatest possible participation of Minority Business Enterprises (MBEs) and Women Business Enterprises (WBEs) in the awarding of all contracts including contracts for supplies and equipment, services, design selection and consultants.
11. To ensure Commission employees the ability to provide efficient, high quality water and sewer services, so they will be entrusted with the public's confidence.
12. The Commission has adopted a Code of Conduct, which addresses conflict of interest, appropriate conduct, attitude and demeanor, as well as providing for a discrimination free and sexual harassment free work place.
13. To provide for the safety of Commission employees in emergency situations, with a comprehensive emergency evacuation plan that has been designed to execute the timely and orderly evacuation from Commission facilities in the event of an emergency.

Current Expense and Capital Improvement Plan Budget Process

The Commission has developed an integrated financial plan which encompasses all of its current expenses and capital improvement needs, provides for the efficient and financially self-sustaining operation of the water and sewer systems and allocates costs to all consumers in a just and equitable manner.

Current Expense Budget Process

The CEB provides for the Commission's essential services and current priorities, promotes greater accountability by departments and matches scarce resources with critical program objectives. The CEB is developed in conjunction with departmental program plans and performance objectives. The Commission's CEB is developed utilizing the full accrual method in which revenues are recognized when earned and expenses recognized when incurred, as opposed to when cash is received or spent.

The Commission's Enabling Act requires that the Commission recover its full costs of operation through fees, rates, rents, assessments and special charges. The CEB defines the operational activities and other costs that must be funded from these revenue sources during the fiscal year. The budget includes the costs of operations, maintenance and repair programs, MWRA charges for water supply and wastewater treatment, the SDWA assessment, R & R projects funded from current revenues, insurance, debt service and additions to reserves.

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The CEB is based on program priorities and objectives developed by each department. The budget process has two distinct, but interrelated aspects. The Finance Division works with each department of the Commission to develop a mission statement, a list of divisional programs and a set of specific measurable objectives for the upcoming year.

Based on the stated program performance objectives, Department Managers prepare and submit their budget requests to the Finance Division. Subsequently, the Finance Division compiles and analyzes the budget requests and allocates recommended resources according to the program priorities of each cost center. The proposed CEB is reviewed with Division Chiefs before submission to the Executive Director and the Commissioners for their final approval.

Budget Allocations

The Finance Division allocates the approved budget, by month, object code and department. Monthly allocations for MWRA Assessments, debt service and additions to reserves are determined by the Finance Division in accordance with the approved budget and the Commission's bond resolution. They also develop forecasts of monthly-billed water and sewer charges and revenue adjustments, as well as special charges and investment income. The monthly distribution serves as the basis for planned revenues, expenditures and accruals for each of the twelve months of the year, which will be compared to actual revenues, and expenses as reported in the Commission's monthly variance reports. The Finance Division produces the Budget Variance Reports and distributes to all cost center managers.

Budget Variance Monitoring and Analysis

At the close of a monthly accounting period the budget staff of the Finance Division prepares the monthly Budget Variance Reports. These reports set forth a comparison of planned expenses by object code and department for the month and year to date. Budget staff then distributes the Budget Variance Report to each Division Chief and Department Manager.

- (A) *Variance Analyses:* Division Chiefs are responsible for monitoring variance reports and for explaining variances between planned and actual expenditures and accruals by department when those variances exceed either plus or minus 10% and \$5,000. Budget staff then prepares a Budget Variance Analysis Report by department and by subsidiary account based on the written explanations given by the Division Chiefs. The Budget Variance Analysis Report is distributed to senior management, the Executive Director and the Commissioners on a monthly basis.
- (B) *Budget Reallocation and Amendments:* The Commission's CEB sets forth planned expenditures in certain categories for various areas of responsibility of the Commission and for the Commission as a whole. In addition, Divisions allocate planned expenditures by month for all departments and object codes. Changes during the year in BWSC priorities or in conditions upon which expenditure plans are predicated may require the reallocation of resources. This section delineates the authority and procedures for making reallocations of approved expenditures. It is intended to provide flexibility and discretion to Commission management and to respond to actual circumstances as they arise.

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Reallocations of the expenditure plan may occur at the end of the first, second or third fiscal quarters, as part of the Budget Variance Analysis process. All budget reallocations are documented on CEB Reallocation forms. Budget staff will consolidate these requests and prepare a forecast of the year-end expenditures by division and by subsidiary account. The quarterly year-end forecast will accompany the Budget Variance Analysis Report for distribution.

Division Chiefs may make any reallocations within their Department's budget provided that the reallocation does not change a division object code budget by either the greater of more than plus or minus \$10,000 or 5%. The Executive Director has full authority to approve budget reallocations, over the amount and percentage stated above.

The Executive Director or a Division Chief may initiate proposed budget reallocations using the CEB Budget Reallocation form. All reallocations within the authority of a Division Chief must be filed with budget staff before they are deemed to be in effect. All reallocations, which require approval by the Executive Director, must be submitted to budget staff for analysis and recommendation before approval.

Budget Staff is responsible for notifying Division Chiefs and the Accounting Department of any approved or disallowed budget reallocations. The Finance Division will also prepare a quarterly report for the Commissioners detailing all approved budget reallocations.

(C) *Budget Amendment:* An amendment to a Commission CEB shall be defined as follows:

- a.* Any increase in total Commission current expenses; or
- b.* An increase of 5% or more in total expenses for any division of the Commission; or
- c.* An addition or deletion of a specific new program or initiative, the cost of which is greater than 1% of total current expenses, less the MWRA assessment for that fiscal year.

The Executive Director must submit all proposed budget amendments to the Commissioners for their approval prior to the amendment going into effect.

Capital Improvement Program Process

The Commission's CIP is a comprehensive plan for the enhancement of the basic infrastructure and support facilities necessary to provide water distribution, wastewater collection and storm drainage services throughout the City of Boston. The primary goals of the CIP are to protect public health and the environment, improve the reliability of water, wastewater and storm drainage systems and minimize the long-term costs of operating these systems.

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The Commission is required by the Enabling Act and the Resolution to annually update a CIP for the three succeeding fiscal years. The proposed CIP must be submitted to the Mayor of the City of Boston on or by November 1st. In addition the Commission must hold a public hearing relating to the proposed CIP, prior to adoption of the CIP by the Board of Commissioners. Three types of capital projects are considered for inclusion in the annual CIP:

1. Projects involving expansion and improvement to the water distribution and wastewater collection systems including studies, planning, etc.
2. Projects involving the renewal and rehabilitation of the existing system (in-kind replacement).
3. Improvements to other facilities and equipment owned or leased by the BWSC.

Capital expenditures are considered for inclusion in the CIP if the estimated cost of the resulting tangible asset is \$10,000 or more and have a useful life of five years or more. In addition, projects involving improvements to the water distribution system or wastewater collection system are required to have a minimum useful life of ten years. Facility improvements should have a minimum useful life of seven years and equipment five years. For non-tangible assets (studies, improvement plans, etc.) the cost must be \$50,000 or more and have an expected benefit period of five years or more. Normal maintenance costs, emergency repair costs and recurring annual expenditures for system maintenance are generally not capitalized.

Development of the Capital Improvement Program

As part of the Commission's annual budgeting and rate-setting process, departments will prepare capital project requests and submit them to the Finance Division for review and analysis. The Finance Division will estimate the financial feasibility of the proposed projects and will develop a draft CIP based upon the following criteria:

Priority One: This priority should be assigned to the most critical projects. Projects that are included in this category must meet urgent Commission needs as defined by the following criteria:

- i. The project is required by a statutory or regulatory requirement, court order or consent decree; or
- ii. The project is necessary to correct an immediate threat to public health and safety; or
- iii. The project is necessary to correct an immediate threat to worker health and safety; or
- iv. The project is necessary to prevent imminent failure of the water or wastewater systems.

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Priority Two: This category includes projects that are essential to maintain current service levels, which protect the environment, or that directly reduce costs and/or increase revenues. Projects that are included in this category must meet one or more of the following criteria:

- i. The project is necessary for environmental protection; or
- ii. The project is part of the Wastewater Facilities Plan, Water Distribution Plan, Water Conservation Plan, or other, similar Commission endorsed improvement plan; or
- iii. The project corrects a chronic water discoloration problem; or
- iv. The project directly results in a net decrease in Commission operating and/or capital costs.

Priority Three: The projects in this category are necessary to provide improved service that meets the following criteria:

- i. The project will insure proper long-term operation of the distribution and collection systems.

These criteria are intended to present a framework for project selection and elimination. They are not all-inclusive and are subject to modification as part of the annual capital budget process. Any modification of the priority framework, however, will be reviewed with the Commissioners.

Capital Project Funding

Capital projects are funded through several mechanisms: Commission general revenue bonds, current year rate revenues, traditional grant reimbursements, subsidized loans through the SRF, and funding programs provided by the MWRA. In general, BWSC bond proceeds are used to fund projects that expand or improve the water distribution and wastewater collection system. Current rate revenues are used to fund projects resulting in renewal and rehabilitation of the existing system. Intergovernmental grants and loans and MWRA funding are generally available for projects, which provide specific benefits. Grant and loan funding has been and will continue to be aggressively sought.

Capitalized costs paid for through contributed capital (grant funds) are not charged to system users through rates. Yearly debt service on outstanding BWSC revenue bonds is included in the annual calculation of rates. The Commission amortizes costs over a period not to exceed that of the estimated useful life of the obtained asset. In the case of non-tangible assets, costs are amortized over a period not longer than ten years. The Commission may elect to amortize capital costs over a shorter period than that indicated on original depreciation schedules.

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Capital Budget Amendments

All amendments to the current CIP require the approval of the Commissioners. Amendments are defined as the following:

1. Any deletion, in total, of a capital project or program specifically budgeted in the current CIP or any addition of a previously un-budgeted capital project to the current CIP; or
2. Any increase in the budget for a particular project currently contained in the CIP where the increase has a dollar value greater than 10% of the current year budget for that project; or
3. Any increase in the total three-year budget of the current CIP.

In addition to the CIP amendments, as defined above, Commission approval will be required on all change orders which increase contract bid amounts as described in the Commission's Change Order Policy. Any other changes to the CIP are deemed as reallocations.

Capital Budget Reallocations

Reallocations are changes to the current CIP, which do not require the approval of the Commission. Reallocations are defined as any change in the budget for a particular project or program, not specified as Capital Budget Amendments.

Reallocations will be governed by the following procedure. The department managing the project will notify the Finance Division, in writing, of the proposed reallocation. The notification will include the following:

1. A description of the proposed project change.
2. An explanation of why the change is necessary.
3. An indication of the monetary impact the change will have on the capital budget.
4. An indication of the impact on the project schedule.

The notification must take place as soon as the managing department is aware that a project revision is necessary. The Finance Division will review the proposed project change for its impact on cash flow and will respond with relevant recommendations within five working days. Approval of the Executive Director is required for all reallocations. A quarterly report must be submitted to the Commissioners detailing all capital budget reallocations.

Capital Program Monitoring and Reporting

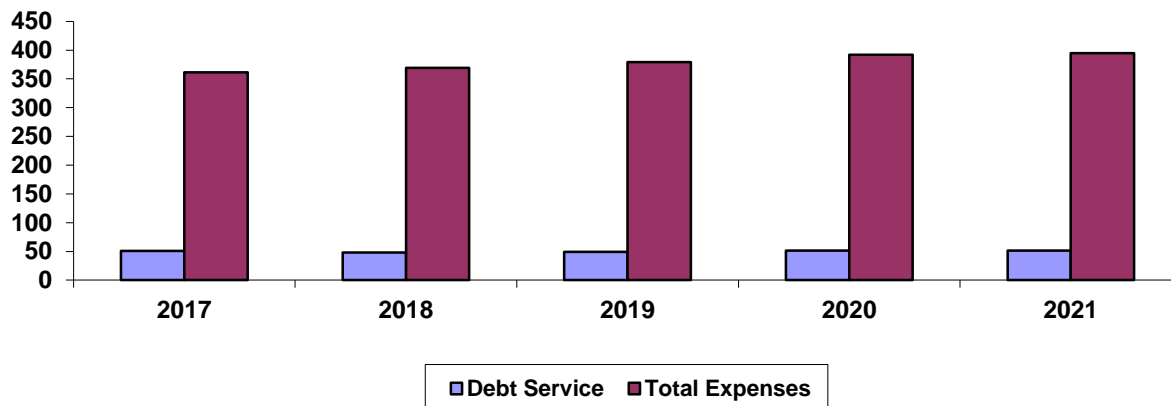
As part of the development of the CIP, Division Chiefs will develop schedules and quarterly expenditure forecasts for all capital projects. On a monthly basis actual schedule data for all capital projects are compared with the original project schedules. Capital Budget Variance Reports are produced utilizing data for actual project expenditures. These reports include an analysis of all project expenditure and schedule variances. The Commissioners receive a summary of all capital program-monitoring reports.

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Debt Plan

The Commission is empowered by the Enabling Act and the Resolution to issue bonds and notes payable solely constituted on the general obligation of the Commission. The Commission has no legal restrictions concerning the amount of debt, which it may have outstanding, subject to the coverage requirements described below.

The Commission issues General Revenue Bonds to finance portions of its CIP. The Commission's 2017-2019 CIP, which totals \$206.4 million, anticipates that projects totaling \$147.3 million or 71.4% will be funded from bond proceeds. The 2017 budget for debt service is \$51.1 million, or approximately 14.1% of the overall expenses. For the average single-family household paying \$1,052 for water and sewer services, approximately \$148 of these charges is related to debt service.



Five-year projections of debt service cost per household and five-year projections of debt service vs. total expenses are illustrated.

Year	Average Annual Cost-Single Family Home	Debt Service Cost
2017	\$1,052	\$148
2018	\$1,092	\$141
2019	\$1,133	\$147
2020	\$1,176	\$154
2021	\$1,221	\$155

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The Commission currently has eight series of General Revenue Bonds outstanding at the end of 2016:

\$21.2	Million	1993 Series A
\$18.6	Million	1994 Series A
\$13.0	Million	2009 Series A
\$24.9	Million	2009 Series B
\$6.3	Million	2010 Series A
\$105.0	Million	2012 Series A
\$100.0	Million	2014 Series A
\$72.8	Million	2015 Series A
\$60.2	Million	2016 Series A
\$85.0	Million	2016 Series B

The Commission issued approximately \$145.1 million in General Revenue and Refunding Bonds, the Commission was able to realize a net present value of savings of \$11.1 million. The Commission refunded portions of the 2009 and 2010 Series A bonds.

The Commission implemented a Commercial Paper Program in December of 2006 with an initial draw of \$25.0 million. The Commercial Paper Program was implemented to:

1. Provide very efficient and cost effective access to the capital markets as needed.
2. Fund the bond-funded portion of the capital improvements implemented by the Commission prior to issuing permanent debt.
3. Act as a portion of the variable rate debt the Commission will have outstanding.
4. Ensure the timely expenditure of tax-exempt note proceeds in accordance with the Internal Revenue code.
5. Provide some relief to the upward pressure on rates by deferring a principal payment on the bonds to be issued (to retire the commercial paper) for one year.

Debt Service Coverage Requirements

The Commission's bond covenant requires that rates and charges be at least sufficient to provide revenues (i) to pay all current expenses of the Commission, (ii) to pay the principal of, premium if any, and interest on all bonds issued by the Commission as they become due and payable, (iii) to create and maintain such reasonable reserves as may be reasonably required by any trust agreement or resolution securing bonds, (iv) to provide funds for paying the cost of all necessary repairs, replacements and renewal of the systems and (v) to pay or provide for any and all amounts which the Commission may be obligated to pay or provide for by law or contract. The Commission is also required to establish and maintain rates and charges at levels sufficient so that total net revenues in each year during which bonds are outstanding will equal at least 125% of (1) the bond debt service requirement during such year less (2) the amount, if

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any, of bond proceeds available to pay interest becoming due in such year on bonds outstanding as of the first day of such year. The Commission has exceeded the 125% debt service coverage requirement of the Resolution in each year since its inception in 1977. The table below presents the projected 2017-2021 debt service coverage.

Debt Service Coverage Calculation (000)

	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Cash Receipts	\$361,331	\$369,246	\$379,373	\$391,885	\$404,613
Operating Transfers	(297,852)	(305,728)	(314,514)	(326,293)	(337,458)
Net Revenues	63,479	63,518	64,859	65,592	67,155
Senior Debt Service	43,242	43,221	45,449	48,181	48,188
Total Debt Service	43,242	43,221	45,449	48,181	48,188
Debt Service Coverage Ratio	147%	147%	143%	136%	139%

Pursuant to the Resolution, these amounts do not include principal or interest, which are expected to be paid from amounts in available escrow funds. These amounts also exclude debt service on SRF loans and loans from the MWRA.

Five-Year Debt Service Requirements

Total Debt Service (000)	
2017	\$43,242
2018	\$43,221
2019	\$45,449
2020	\$48,181
2021	\$48,188

Additional Bonds and Refunding Bonds

The Resolution permits the issuance of additional bonds for paying the cost of any project, making deposits in various funds established under the Resolution, paying Costs of Issuance, paying the principal, premium and interest on any notes issued in anticipation of additional bonds, or any combination of the above.

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Additional bonds may only be issued by the Commission upon receipt by the Trustee of:

1. A certificate of the Commission setting forth the amount of net revenues (as defined in the Resolution) for the last full fiscal year prior to the year in which bonds are to be issued, showing that the net revenues were equal to at least 125% of the bond debt service requirement and the amount, if any, of bond proceeds available to pay principal and interest coming due in such fiscal year on bonds outstanding as of the first day of the fiscal year.
2. A certificate of a consulting engineer setting forth the estimated annual net revenues for each of the five full fiscal years following the issuance of additional bonds, showing that in each of those fiscal years the estimated net revenues, together with reserved revenues, will be at least equal to 125% of the aggregate of the Senior Debt Service Reserve Fund Requirement and the Subordinated Debt Service Fund Requirement calculated as of the first day the fiscal year, less the amount, if any, of bond proceeds available or projected to be available to pay principal and interest coming due that fiscal year on bonds outstanding or projected to be outstanding as of the first day of the fiscal year.

Refunding bonds may also be issued by the Commission only upon certifying that the aggregate debt service in each fiscal year in which Refunding Bonds are outstanding will not be increased as a result of the issuance of the Refunding Bonds; provided that, in lieu of such certification, the Commission may deliver to the Trustee certificates satisfying the conditions described above for the issuance of additional bonds.

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Initial Par Issue		\$100,505,000		\$40,000,000	
		General Revenue Bonds		General Revenue Bonds	
		(Senior Series)		(Senior Series)	
		1993 Series A		1994 Series A (1)	
Dated		9/1/1993		10/20/1994	
<u>Principle Due</u>		November 1		November 1	
<u>Year</u>	<u>Amount</u>		<u>Rate</u>	<u>Amount</u>	<u>Rate</u>
2017	7,790,000		5.250%	1,800,000	
2018	8,205,000		5.250%	2,000,000	
2019	5,155,000		5.250%	2,100,000	
2020			5.250%	2,200,000	
2021				2,400,000	
2022				2,500,000	
2023				2,700,000	
2024				2,900,000	
Total Issue		\$21,150,000		\$18,600,000	
Outstanding					
Call Provisions		Bonds maturing on or before 11/01/2003 and maturing on 11/01/2019 are not subject to optional redemption prior to maturity. All other maturities callable as a whole or in part at any payment. 11/1/03@102.0% 11/1/04@101.0%		Callable as a whole or in part on any Effective Rate Date	
<u>Ratings</u>					
(Moody's/S&P/Fitch)		Aa1/AA+/AA+		VMIG 1/A-1+F-1+(LOC)	

(1) Issued in a weekly Variable Rate mode.

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Initial Par Issue		\$81,320,000		\$67,335,000	
		General Revenue Bonds (Senior Series) 2009 Series A 3/26/2009		General Revenue Bonds (Senior Series) 2009 Series B 3/26/2009	
Dated		November 1		November 1	
<u>Principle Due</u>					
<u>Year</u>	<u>Amount</u>		<u>Amount</u>		<u>Rate</u>
2017	3,565,000	4.177%	4,415,000	5.000%	
2018	4,380,000	4.700%	4,635,000	5.000%	
2019	4,400,000	4.497%	8,340,000	5.000%	
2020	685,000	4.502%			
2020	1,035,000	5.000%	3,660,000	5.000%	
2021	1,085,000	4.000%			
2021	700,000	5.000%	3,840,000	4.000%	
2022	6,820,000	4.000%			
2023	6,965,000	5.000%			
2024	7,120,000	5.000%			
2025	11,550,000	5.000%			
2026	7,400,000	5.000%			
2027	7,600,000	4.500%			
2028	6,400,000	5.000%			

Total Issue
Outstanding

\$13,030,000

\$24,890,000

Call Provisions

Bonds maturing after May 1, 2019 are subject to redemption at the option of the Commission, on or after Mat 1, 2019, as a whole or in part at anytime, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.

Bonds maturing after May 1, 2019 are subject to redemption at the option of the Commission, on or after Mat 1, 2019, as a whole or in part at anytime, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.

Ratings
(Moody's/S&P/Fitch)

Aa1/AA+/AA+

Aa1/AA+/AA+

Refunded by 2015 Bond Series A
Refunded by 2016 Bond Series A

Plans, Policies and Procedures

Initial Par Issue	\$92,860,000			\$107,970,000		
	General Revenue Bonds (Senior Series) 2010 Series A 1/20/2010			General Revenue Bonds (Senior Series) 2012 Series A 5/9/2012		
Dated						
Principle Due	November 1			November 1		
Year	Amount		Rate	Amount		Rate
2017	705,000		4.000%	2,720,000		5.000%
2018				2,795,000		4.000%
2019	165,000		4.000%	2,970,000		5.000%
2020	5,400,000		4.630%	3,790,000		4.000%
2020				6,000,000		5.000%
2021	5,665,000		5.000%	5,000,000		4.000%
2021				5,190,000		5.000%
2022	6,010,000		5.000%	7,585,000		4.250%
2023	6,440,000		5.000%	7,875,000		5.000%
2024	6,550,000		4.912%	8,245,000		5.000%
2024	410,000		3.500%			
2025	6,550,000		4.912%			
2025	265,000		4.000%	6,955,000		4.000%
2026	7,405,000		5.000%	3,015,000		5.000%
2027	7,945,000		5.000%	3,170,000		4.000%
2028	9,885,000		5.000%	3,295,000		4.000%
2029	8,350,000		5.000%	3,425,000		5.000%
2030	8,770,000		5.000%	3,600,000		5.000%
2031	1,790,000		4.000%			
2031	7,420,000		5.000%	3,775,000		3.250%
2032				3,900,000		3.375%
2033				4,030,000		3.500%
2034				4,175,000		3.500%
2035				4,320,000		3.750%
2036				4,480,000		3.750%
2037				4,630,000		3.750%
Total Issue						
Outstanding	\$6,270,000			\$104,960,000		
Call Provisions	Bonds maturing after November 1, 2019 are subject to redemption at the option of the Commission, on or after November 1, 2019, as a whole or in part, at any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.			Bonds maturing after November 1, 2023 are subject to redemption at the option of the Commission, on or after November 1, 2022, as a whole or in part, at any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.		
Ratings						
(Moody's/S&P/Fitch)	Aa1/AA+/AA+			Aa1/AA+/AA+		
	Refunded by 2015 Bond Series A					
	Refunded by 2016 Bond Series A					

Plans, Policies and Procedures

Initial Par Issue			\$100,000,000			\$72,760,000		
			General Revenue Bonds			General Revenue Bonds		
			(Senior Series)			(Senior Series)		
			2014 Series A			2015 Series A		
Dated			7/22/2014			7/23/2015		
<u>Principle Due</u>			November 1			November 1		
<u>Year</u>	<u>Amount</u>			<u>Rate</u>		<u>Amount</u>		<u>Rate</u>
2017	100,000			5.000%				
2018	100,000			5.000%				
2019	100,000			5.000%				
2020	500,000			5.000%				
2021	500,000			5.000%				
2022	700,000			4.000%				
2023	1,000,000			5.000%	13,010,000			5.000%
2024	1,000,000			5.000%	13,255,000			5.000%
2025	1,000,000			5.000%	18,870,000			5.000%
2026	5,000,000			4.000%	14,345,000			5.000%
2027	5,000,000			4.000%	7,460,000			4.000%
2028	5,000,000			4.000%	5,820,000			3.250%
2029	5,000,000			3.500%				
2030	5,000,000			3.500%				
2031	5,000,000			3.500%				
2032	5,000,000			3.500%				
2033	5,000,000			3.750%				
2034	5,000,000			3.750%				
2035	5,000,000			3.750%				
2036	5,000,000			3.500%				
2037	5,000,000			3.500%				
2038	5,000,000			3.500%				
2039	5,000,000			3.500%				
2040	5,000,000			3.500%				
2041	5,000,000			3.500%				
2042	5,000,000			3.625%				
2043	5,000,000			3.625%				
2044	5,000,000			3.625%				
Total Issue			\$100,000,000			\$72,760,000		
Outstanding								
Call Provisions			Bonds maturing after November 1, 2024 are subject to redemption at the option of the Commission, on or after November 1, 2024, as a whole or in part, any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.			Bonds maturing after November 1, 2025 are subject to redemption at the option of the Commission, on or after November 1, 2025, as a whole or in part, any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.		
<u>Ratings</u>								
(Moody's/S&P/Fitch)			Aa1/AA+/AA+			Aa1/AA+/AA+		

Plans, Policies and Procedures

Initial Par Issue	\$60,155,000	\$84,960,000
	General Revenue Bonds	General Revenue Bonds
	(Senior Series)	(Senior Series)
	2016 Series A	2016 Series B
	8/17/2016	8/17/2016
Dated	November 1	November 1
Principle Due		
<u>Year</u>	<u>Amount</u>	<u>Rate</u>
2017		500,000 4.000%
2018		500,000 5.000%
2019		500,000 5.000%
2020	475,000	500,000 5.000%
2021	6,860,000	500,000 5.000%
2022	12,220,000	500,000 5.000%
2023		500,000 5.000%
2024		500,000 5.000%
2025		500,000 5.000%
2026		1,000,000 5.000%
2027	7,005,000	1,000,000 5.000%
2028	9,295,000	1,000,000 5.000%
2029	7,730,000	2,000,000 5.000%
2030	8,120,000	2,000,000 5.000%
2031	8,450,000	2,000,000 5.000%
2032		4,765,000 5.000%
2033		4,765,000 5.000%
2034		4,765,000 5.000%
2035		4,765,000 5.000%
2036		4,765,000 \$37,325,000 5.000%
2037		4,765,000 3.000%
2038		4,765,000 3.000%
2039		4,765,000 3.000%
2040		4,765,000 3.000%
2041*		4,765,000 \$23,825,000 3.000%
2042		4,765,000 3.000%
2043		4,765,000 3.000%
2044		4,760,000 3.000%
2045		4,760,000 3.000%
2046*		4,760,000 \$23,810,000 3.000%
Total Issue		
Outstanding	\$60,155,000	\$84,960,000
Call Provisions	Bonds maturing after November 1, 2026 are subject to redemption at the option of the Commission, on or after November 1, 2026, as a whole or in part, any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.	Bonds maturing after November 1, 2026 are subject to redemption at the option of the Commission, on or after November 1, 2026, as a whole or in part, any time, from maturities selected by the Commission at a redemption price equal to 100% of the principle amount to be redeemed, plus accrued interest to the date of redemption.
Sinking Fd Remption		Bonds maturing November 1, 2041 & November 1, 2046 are subject to redemption from sinking fund installments at their principal amounts, without premium, plus accrued interest to the redemption date on November 1 of each of the years.
*Stated Maturity		
<u>Ratings</u> (Moody's/S&P)	Aa1/AA+	Aa1/AA+

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2016 Revenues and Expenses

OVERVIEW

The 2016 year-end financial position for the Boston Water and Sewer Commission (“the Commission”) resulted in an unaudited surplus of \$0.7 million. Total Revenues equaled \$356.3 million. Expenses totaled \$355.6 million, resulting in the \$0.7 million surplus for FY16. The year-end financial position was mainly a result of more than anticipated Total Revenues and savings realized for Indirect Operating Expenses.

REVENUES

Total Revenues for FY16 were more than originally anticipated. The total revenues equaled \$356.3 million; the budgeted amount was \$343.2 million resulting in \$13.2 million, or 3.8% more than anticipated.

Water and Sewer Revenues (excluding adjustments) represented 97.8% of revenues and equaled \$348.5 million, which was \$12.8 million, or 3.8% more than the budgeted amount of \$335.7 million. Water revenues totaled \$150.3 million, the budget amount equaled \$144.7 million, and resulted in \$5.6 million or 3.9% more than budget. Sewer revenues totaled \$198.2 million, the budgeted amount equaled \$191.0 million resulting in \$7.2 million, or 3.8% more than anticipated.

Miscellaneous Revenues totaled \$16.7 million. This amount realized in 2016 was \$0.4 million, or 2.6% less than the budget amount of \$17.2 million. Late Charges equaled \$1.3 million for the year, and resulted in an unfavorable variance of 2.2% from the budgeted amount of \$1.3 million. Investment Income totaled \$3.7 million and was \$0.6 million or 18.4% more than the budgeted amount of \$3.1 million. Fire Pipe Income totaled \$4.6 million and was \$0.1 million more than the budgeted amount of \$4.5 million. The amount realized for Miscellaneous Other Income totaled \$7.1 million, and was \$1.1 million, or 13.4% less than the budgeted amount of \$8.2 million.

EXPENSES

The year-end surplus was also due to more than anticipated Direct Operating Expenses. Direct Operating Expenses in 2016 totaled \$80.6 million, which were above the budgeted amount of \$65.3 million by \$15.3 million or 23.5%. Indirect Expenses also contributed to the surplus realized in 2016. Indirect Expenses totaled \$275.0 million. The budget for the year equaled \$277.9 million resulting in a favorable variance of \$2.9 million or 1.0%. The favorable variance for Indirect Expenses was mainly due to less than anticipated expenses for Capital Improvement and the MWRA Assessment. The following page illustrates the 2016 budget versus unaudited revenues and expenses.

2016 Revenues and Expenses

	2016		VARIANCE	
	UNAUDITED	BUDGET	\$	%
Water Revenues	\$ 150,341,757	\$ 144,693,082	\$ 5,648,675	3.9%
Sewer Revenues	\$ 198,150,742	\$ 190,967,265	\$ 7,183,477	3.8%
Total	\$ 348,492,499	\$ 335,660,347	\$ 12,832,152	3.8%
Less:				
Adjustments	\$ 8,048,609	\$ 8,391,509	\$ (342,900)	-4.1%
Discounts	\$ 1,278,421	\$ 1,446,931	\$ (168,510)	-11.6%
Bad Debt	\$ 72,757	\$ 335,660	\$ (262,903)	-78.3%
Subtotal	\$ 9,399,787	\$ 10,174,100	\$ (774,313)	-7.6%
Net Billed Charges	\$ 339,092,712	\$ 325,486,247	\$ 13,606,465	4.2%
Prior Year Surplus	\$ 521,428	\$ 506,272	\$ 15,156	3.0%
Miscellaneous Revenues				
Late Charges	\$ 1,313,671	\$ 1,342,641	\$ (28,970)	-2.2%
Investment Income	\$ 4,590,020	\$ 4,475,856	\$ 114,164	2.6%
Fire Pipe	\$ 3,680,401	\$ 3,107,490	\$ 572,911	18.4%
Other Income	\$ 7,142,679	\$ 8,247,438	\$ (1,104,759)	-13.4%
Subtotal	\$ 16,726,771	\$ 17,173,425	\$ (446,654)	-2.6%
TOTAL REVENUES	\$ 356,340,911	\$ 343,165,944	\$ 13,174,967	3.8%
Direct Expenses				
Wages and Salaries	\$ 53,940,242	\$ 36,770,018	\$ (17,170,224)	-46.7%
Overtime	\$ 680,938	\$ 692,344	\$ 11,406	1.6%
Fringe Benefits	\$ 8,363,403	\$ 8,477,638	\$ 114,235	1.3%
Supplies and Materials	\$ 2,452,530	\$ 2,960,091	\$ 507,561	17.1%
Repair and Maintenance	\$ 7,766,940	\$ 8,146,340	\$ 379,400	4.7%
Utilities	\$ 1,553,000	\$ 1,585,468	\$ 32,468	2.0%
Professional Services	\$ 3,241,838	\$ 3,672,420	\$ 430,582	11.7%
Space & Equipment Rentals	\$ 280,300	\$ 282,500	\$ 2,200	0.8%
Other Services	\$ 1,689,096	\$ 1,843,292	\$ 154,196	8.4%
Insurance	\$ 509,121	\$ 544,664	\$ 35,543	6.5%
Inventory	\$ 23,000	\$ 23,000	\$ -	0.0%
Capital Outlay	\$ 60,000	\$ 70,000	\$ 10,000	14.3%
Travel/Training/Seminar	\$ 64,110	\$ 80,000	\$ 15,890	19.9%
Damage Claims	\$ 15,000	\$ 150,000	\$ 135,000	90.0%
Total Direct Expenses	\$ 80,639,518	\$ 65,297,775	\$ (15,341,743)	-23.5%
Indirect Expenses				
MWRA Assessment	\$ 212,475,077	\$ 213,780,214	\$ 1,305,137	0.6%
Capital Improvements	\$ 11,888,463	\$ 15,003,000	\$ 3,114,537	20.8%
Debt Service	\$ 48,133,298	\$ 48,251,190	\$ 117,892	0.2%
Contractual Funding	\$ 2,313,000	\$ 635,437	\$ (1,677,563)	-264.0%
SDWA Assessment	\$ 198,328	\$ 198,328	\$ -	0.0%
Total Indirect Expenses	\$ 275,008,166	\$ 277,868,170	\$ 2,860,004	1.0%
TOTAL EXPENSES	\$ 355,647,684	\$ 343,165,945	\$ (12,481,739)	-3.6%
	\$ 693,227	SURPLUS		

Requirements and Future Impact

The Commission is required by the Enabling Act to:

1. Establish fees, rates, rents, assessments and other charges to provide revenues at least sufficient to pay the current expenses of the Commission.
2. Pay the principal, premium, if any, and interest on all bonds issued by the Commission.
3. Maintain its reserve funds as stipulated by its General Bond Resolution.
4. Provide funds for paying the costs of all necessary repair, replacements, and renewals of the water and wastewater systems.
5. Pay all other amounts which the Commission by law or contract is obligated to pay.

The Commission's rates must comply with all applicable laws and statutes, and the rates must be set in a manner to ensure the eligibility for any federal and state funding.

The Proposed CEB and corresponding rate impact was presented to the Board of Commissioners for its review and comment. In accordance with the Commission's Rules of Procedure, the Commission is required to conduct a public hearing for the purpose of promulgating proposed water and sewer rate increases prior to implementation of new rates. The public hearing allows interested parties the opportunity to present data, views and arguments on the proposed schedule of fees, rates and other charges to be implemented.

Due to the financial condition of the Commission at year-end 2016, the 2017 Water and Sewer rates will increase by 2.4%.

Budgeting and Accounting Basis

The Commission is autonomous and self-sustaining, separate and apart from the City. As an enterprise fund, the Commission provides goods and services to the public, which it funds primarily through revenues it collects from user charges. Periodically, the Commission will examine revenues earned, expenses incurred and net income to determine how best to deal with issues such as capital maintenance, public policy, management control, accountability and other issues. The Commission follows Generally Accepted Accounting Principles (GAAP) and Governmental Accounting Standards Board Statement 62 (GASB 62).

The Commission's Current Expense Budget is developed using a full accrual method, a method of accounting in which revenues are recognized when earned and expenses recognized when incurred, as opposed to when cash is received or spent. Monthly deposits to all appropriate funds are made in an amount sufficient to equal the total projected level of accrued expenditures for each line item and to enable the Commission to have sufficient funds available to meet scheduled payments of all financial obligations.

The CEB includes the following:

- Anticipated operating and maintenance expenses
- Costs of wholesale water supply and wastewater treatment services provided by the MWRA
- Capital projects are funded from current rate revenues
 - ➔ renewal and replacement program
- Debt service
 - ➔ repayment of principal and interest
 - ➔ insurance
 - ➔ contractual funding obligations
 - ➔ working capital requirements

The Commission's CEB does not include (nor are its rates intended to provide for)

- Depreciation expenses
- Amortization of debt issuance costs
- Inventory expenses

2017 Budget Summary

The 2017 CEB totals \$361.3 million in Revenues, which is offset by an equal amount of Expenses. The amount budgeted for FY17 is a 5.3% increase from FY16.

In the illustration below, components of Revenues and Expenses are compared from 2017 to 2016 with variances in dollars and as a percentage changed. Dollar amounts are rounded and expressed in thousands of dollars (columns may not add up correctly due to rounding).

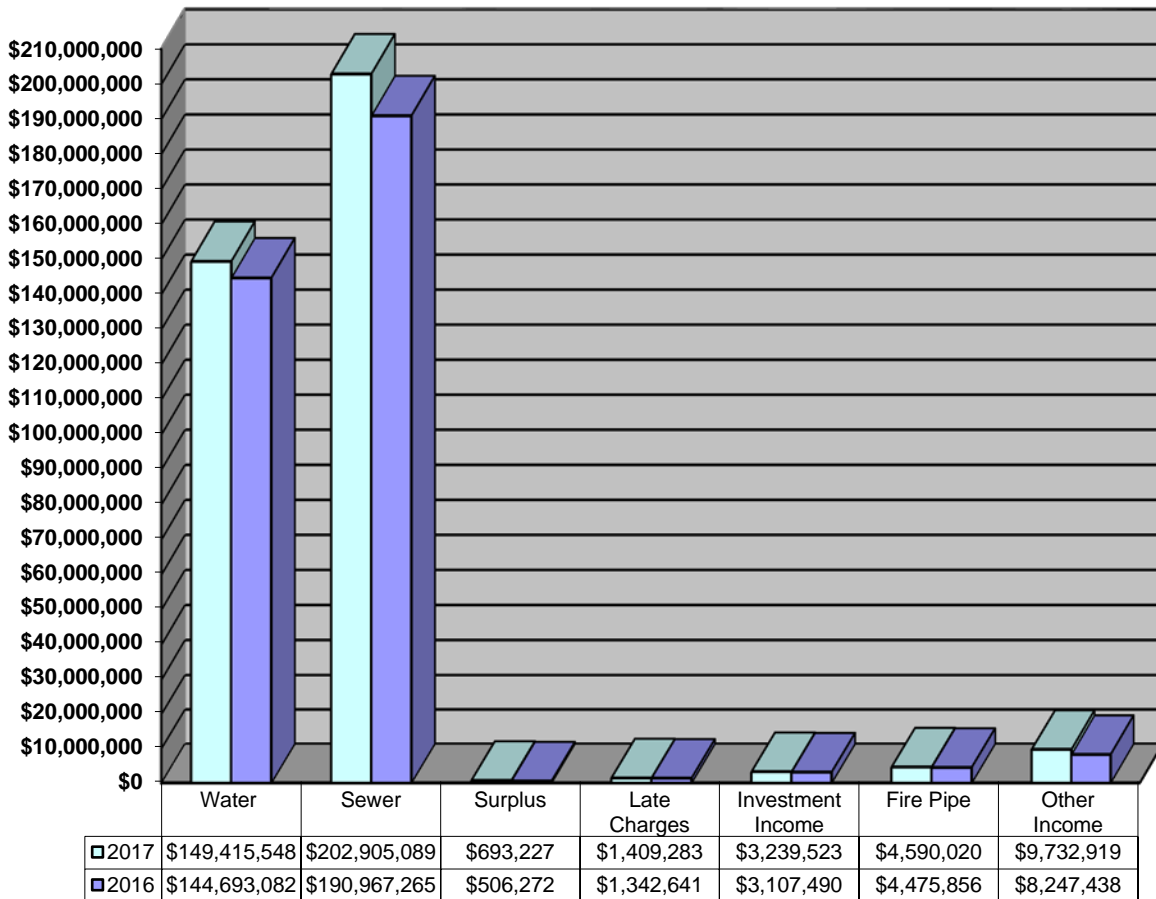
	BUDGET 2017	BUDGET 2016	VARIANCE	%
<u>Revenues</u>				
Water & Sewer Rate Revenue	\$ 352,320,637	\$ 335,660,347	\$ 16,660,290	5.0%
Less: Adjustments	\$ (8,808,016)	\$ (8,391,509)	\$ (416,507)	5.0%
Discounts	\$ (1,494,155)	\$ (1,446,931)	\$ (47,224)	3.3%
Bad Debt	\$ (352,321)	\$ (335,660)	\$ (16,661)	5.0%
Net Operating Revenues	\$ 341,666,145	\$ 325,486,247	\$ 16,179,898	5.0%
<u>Other Income</u>				
Prior Year Surplus	\$ 693,227	\$ 506,272	\$ 186,955	36.9%
Miscellaneous Income	\$ 15,732,222	\$ 14,065,936	\$ 1,666,286	11.8%
Investment Income	\$ 3,239,523	\$ 3,107,490	\$ 132,033	4.2%
Total Revenues	\$ 361,331,117	\$ 343,165,945	\$ 18,165,172	5.3%
<u>Expenses</u>				
Direct Expenses	\$ 69,609,154	\$ 65,297,775	\$ 4,311,379	6.6%
MWRA Assessment	\$ 219,125,991	\$ 213,780,214	\$ 5,345,777	2.5%
Capital Improvement	\$ 15,877,000	\$ 15,003,000	\$ 874,000	5.8%
Debt Service	\$ 51,095,966	\$ 48,251,190	\$ 2,844,776	5.9%
Contractual Funding Obligations	\$ 5,420,347	\$ 635,437	\$ 4,784,910	753.0%
SDWA Assessment	\$ 202,659	\$ 198,328	\$ 4,331	2.2%
Total Current Expenses	\$ 361,331,117	\$ 343,165,945	\$ 18,165,172	5.3%

Financial Analysis

	ACTUAL 2012	ACTUAL 2013	ACTUAL 2014	ACTUAL 2015	UNAUDITED 2016	BUDGET 2017
Revenues:						
Water Revenue	\$ 130,192,168	\$ 135,062,312	\$ 139,922,776	\$ 149,355,846	\$ 150,341,757	\$ 149,415,548
Sewer Revenue	\$ 163,206,107	\$ 171,115,529	\$ 175,943,859	\$ 187,450,059	\$ 198,150,742	\$ 202,905,089
Subtotal	\$ 293,398,275	\$ 306,177,841	\$ 315,866,635	\$ 336,805,905	\$ 348,492,499	\$ 352,320,637
Less:						
Adjustments	\$ (7,666,138)	\$ (8,342,424)	\$ (7,349,075)	\$ (8,366,706)	\$ (8,048,609)	\$ (8,808,016)
Discounts	\$ (915,322)	\$ (908,846)	\$ (912,695)	\$ (1,238,639)	\$ (1,278,421)	\$ (1,494,155)
Bad Debt	\$ (85,777)	\$ (58,617)	\$ (484,363)	\$ (223,168)	\$ (72,757)	\$ (352,321)
Subtotal	\$ (8,667,237)	\$ (9,309,887)	\$ (8,746,133)	\$ (9,828,513)	\$ (9,399,787)	\$ (10,654,492)
Net Billed Charges	\$ 284,731,038	\$ 296,867,954	\$ 307,120,502	\$ 326,977,392	\$ 339,092,712	\$ 341,666,145
Prior Year Surplus	\$ 83,871	\$ 183,611	\$ 211,384	\$ 389,063	\$ 521,428	\$ 693,227
Miscellaneous Revenues:						
Late Charges Revenue	\$ 1,272,253	\$ 1,266,534	\$ 1,357,316	\$ 1,414,957	\$ 1,313,671	\$ 1,409,283
Investment Income	\$ 3,873,877	\$ 2,993,410	\$ 2,820,493	\$ 2,824,294	\$ 3,680,401	\$ 3,239,523
Fire Pipe Revenue	\$ 4,107,752	\$ 4,185,692	\$ 4,330,652	\$ 4,486,066	\$ 4,590,020	\$ 4,590,020
Other Income	\$ 5,556,810	\$ 5,426,141	\$ 5,666,579	\$ 6,294,690	\$ 7,142,679	\$ 9,732,919
Total Revenues	\$ 299,625,601	\$ 310,923,342	\$ 321,506,926	\$ 342,386,462	\$ 356,340,911	\$ 361,331,117
Direct Operating Expenses						
Salaries and Wages	\$ 32,324,690	\$ 34,379,928	\$ 35,778,748	\$ 46,923,242	\$ 53,940,242	\$ 38,975,572
Overtime	\$ 710,291	\$ 815,128	\$ 778,642	\$ 789,500	\$ 680,938	\$ 740,809
Fringe Benefits	\$ 7,260,028	\$ 7,077,635	\$ 7,261,123	\$ 7,710,203	\$ 8,363,403	\$ 8,945,134
Supplies and Materials	\$ 2,413,099	\$ 2,286,065	\$ 2,526,486	\$ 2,295,723	\$ 2,452,530	\$ 2,975,143
Repairs and Maintenance	\$ 5,441,001	\$ 5,157,692	\$ 6,203,654	\$ 6,686,471	\$ 7,766,940	\$ 8,734,640
Utilities	\$ 974,913	\$ 1,207,108	\$ 1,207,616	\$ 1,093,997	\$ 1,553,000	\$ 1,612,853
Professional Services	\$ 2,769,362	\$ 2,649,969	\$ 3,348,408	\$ 2,724,914	\$ 3,241,838	\$ 4,535,270
Space and Equipment Rentals	\$ 37,985	\$ 663,354	\$ 235,693	\$ 251,778	\$ 280,300	\$ 295,784
Other Services	\$ 1,233,922	\$ 1,294,110	\$ 1,506,245	\$ 1,560,244	\$ 1,689,096	\$ 1,944,540
Insurance	\$ 756,934	\$ 764,915	\$ 629,990	\$ 533,935	\$ 509,121	\$ 528,409
Inventory	\$ 22,235	\$ 15,207	\$ 16,759	\$ 10,778	\$ 23,000	\$ 23,000
Capital Outlay	\$ 70,624	\$ 64,941	\$ 57,684	\$ 76,327	\$ 60,000	\$ 70,000
Travel/Training/Seminar	\$ 18,622	\$ 30,082	\$ 50,864	\$ 73,004	\$ 64,110	\$ 78,000
Damage Claims	\$ 113,681	\$ 180,699	\$ 66,283	\$ 61,729	\$ 15,000	\$ 150,000
Total Direct Operating Expenses	\$ 54,147,387	\$ 56,586,833	\$ 59,668,195	\$ 70,791,845	\$ 80,639,518	\$ 69,609,154
Indirect Operating Expenses:						
MWRA Assessment	\$ 184,878,521	\$ 191,786,231	\$ 199,673,027	\$ 206,839,502	\$ 212,475,077	\$ 219,125,991
Capital Improvement	\$ 16,056,935	\$ 11,110,952	\$ 8,057,958	\$ 8,939,628	\$ 11,888,463	\$ 15,877,000
Debt Service	\$ 43,814,254	\$ 45,815,575	\$ 46,875,435	\$ 48,105,732	\$ 48,133,298	\$ 51,095,966
Contractual Funding Obligations	\$ 340,000	\$ 5,211,606	\$ 6,643,000	\$ 6,990,000	\$ 2,313,000	\$ 5,420,347
SDWA Assessment	\$ 204,893	\$ 200,761	\$ 200,249	\$ 198,327	\$ 198,328	\$ 202,659
Total Indirect Operating Expenses	\$ 245,294,603	\$ 254,125,125	\$ 261,449,669	\$ 271,073,189	\$ 275,008,166	\$ 291,721,963
Total Current Expenses	\$ 299,441,990	\$ 310,711,958	\$ 321,117,864	\$ 341,865,034	\$ 355,647,684	\$ 361,331,117
Current Year Rate Surplus	\$ 183,611	\$ 211,384	\$ 389,062	\$ 521,428	\$ 693,227	\$ -

Revenue Sources

The 2017 CEB includes anticipated fees for Miscellaneous Revenues, Late Charges Revenue, Fire Pipe Revenue, and Investment Income (on certain operating and reserve fund balances Other Income, and Prior Year Surplus. The CEB also includes Adjustments to Revenue such as Bad Debt provisions, Discounts, and Billing Adjustments. The graph below compares the Commission's budgeted revenue sources in 2017 versus 2016.



Revenue Sources

The following pages analyze each of the revenue sources in greater detail. The revenue analysis provides a brief description of each source, a five-year historical perspective and the assumptions used in preparing the 2017 budget. This information is supplemented by the utilization of various graphical displays to facilitate a better understanding of each revenue source.

The Commission's total revenues in FY17 are projected at \$361.3 million, an increase of \$18.2 million or 5.3% from FY16. The table below shows a breakdown of the revenue sources and adjustments to rate revenue. Variances from the 2017 budget to the 2016 budget are discussed on the following pages.

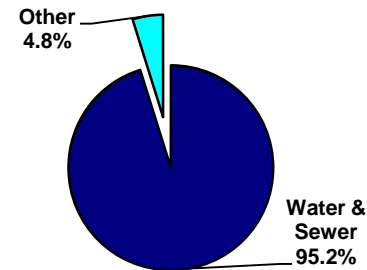
		BUDGET 2017	BUDGET 2016	VARIANCE	%
REVENUES					
Water	\$	149,415,548	\$ 144,693,082	\$ 4,722,466	3.3%
Sewer	\$	202,905,089	\$ 190,967,265	\$ 11,937,824	6.3%
SUBTOTAL	\$	352,320,637	\$ 335,660,347	\$ 16,660,290	5.0%
LESS:					
Adjustments	\$	(8,808,016)	\$ (8,391,509)	\$ (416,507)	5.0%
Discounts	\$	(1,494,155)	\$ (1,446,931)	\$ (47,224)	3.3%
Bad Debt	\$	(352,321)	\$ (335,660)	\$ (16,661)	5.0%
SUBTOTAL	\$	(10,654,492)	\$ (10,174,100)	\$ (480,392)	4.7%
NET BILLED CHARGES	\$	341,666,145	\$ 325,486,247	\$ 16,179,898	5.0%
PRIOR YEAR SURPLUS	\$	693,227	\$ 506,272	\$ 186,955	36.9%
MISCELLANEOUS REVENUES:					
Late Charges	\$	1,409,283	\$ 1,342,642	\$ 66,642	5.0%
Investment Income	\$	3,239,523	\$ 3,107,490	\$ 132,032	4.2%
Fire Pipe	\$	4,590,020	\$ 4,475,856	\$ 114,164	2.6%
Other Income	\$	9,732,919	\$ 8,247,438	\$ 1,485,481	18.0%
SUBTOTAL	\$	18,971,745	\$ 17,173,426	\$ 1,798,319	10.5%
TOTAL REVENUE	\$	361,331,117	\$ 343,165,945	\$ 18,165,172	5.3%

Rate Revenue

The primary source of the Commission's revenue is from billing for water and sewer services from various consumers. The Commission method for calculating water and sewer sales is to use last year's projected consumption and reduce it by 1.0%, then apply the rate increase (if any). Below annual amounts and the percentage of revenues are illustrated.

YEAR	TOTAL	% CHANGE	
2012	\$ 293,398,275	6.4%	ACTUAL
2013	\$ 306,177,529	4.4%	
2014	\$ 315,866,635	3.2%	
2015	\$ 336,805,905	6.6%	
2016	\$ 348,492,499	3.5%	
2016	\$ 335,660,347		BUDGET
2017	\$ 352,320,637	5.0%	

% of Revenues As of 2016



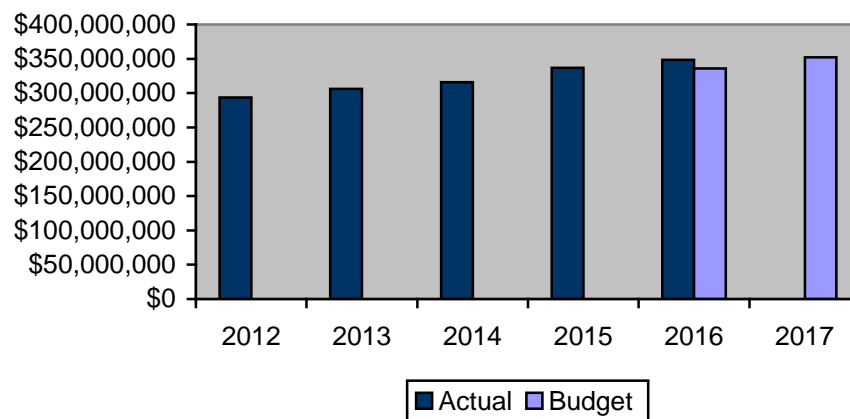
Historical Viewpoint

Due to decreasing revenues, the Commission was required to raise rates. There were rate increases in 2012, 2013, 2014, 2015, and 2016. Because of these past increases, Rate Revenues increased from \$293.4 million in 2012 to \$348.5 million in 2016 an increase of \$55.1 million, or 18.8%.

Funding

The Commission has increased rates in 2012, 2013, 2014, 2015, 2016 and plans a 2.4% increase for 2017. The Commission anticipates Water and Sewer Revenues to total \$352.3 million in 2017.

Rate Revenue



Adjustments to Rate Revenue

Adjustments to rate revenue are divided into three categories:

- I. Billing adjustments represent modifications to customer accounts, which can be attributed to a variety of factors such as inaccurate usage estimates, erroneous meter readings, sewer abatements and transfers of property ownership.
- II. Discounts are a requirement of the Commission's Enabling Act to elderly (65 years of age or older) or disabled homeowners living in structures with one to four dwelling units. These homeowners are entitled to a 30% discount on the water portion of their bills.
- III. Bad debt is the provision made for the uncollectible amount of adjusted billed revenue.

ADJUSTMENTS			
YEAR	TOTAL	% CHANGE	
2012	\$ 7,666,138	14.9%	ACTUAL
2013	\$ 8,342,424	8.8%	
2014	\$ 7,349,075	-11.9%	
2015	\$ 8,366,706	13.8%	
2016	\$ 8,048,609	-3.8%	
			Unaudited
2016	\$ 8,391,509		BUDGET
2017	\$ 8,808,016	5.0%	

DISCOUNTS			
YEAR	TOTAL	% CHANGE	
2012	\$ 915,322	2.7%	ACTUAL
2013	\$ 908,846	-0.7%	
2014	\$ 912,695	0.4%	
2015	\$ 1,238,639	35.7%	
2016	\$ 1,278,421	3.2%	
			Unaudited
2016	\$ 1,446,931		BUDGET
2017	\$ 1,494,155	3.3%	

BAD DEBT			
YEAR	TOTAL	% CHANGE	
2012	\$ 85,777	18.4%	ACTUAL
2013	\$ 58,617	-31.7%	
2014	\$ 484,363	726.3%	
2015	\$ 223,168	-53.9%	
2016	\$ 72,757	-67.4%	
			Unaudited
2016	\$ 335,660		BUDGET
2017	\$ 352,321	5.0%	

Adjustments to Rate Revenue

Historical Viewpoint

Adjustments to Rate Revenue include Adjustments, Discounts, and Bad Debt. Adjustments have totaled \$7.7 million in 2012, \$8.3 million in 2013, \$7.3 million in 2014, \$8.4 million in 2015 and \$8.0 million in 2016.

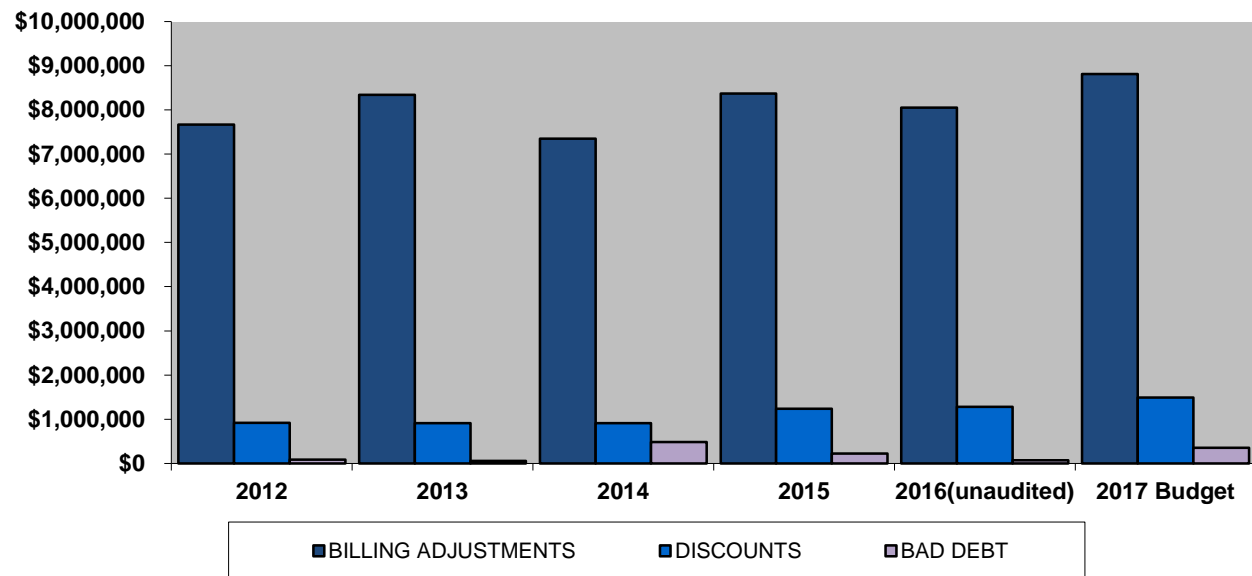
Discounts have totaled \$915,322 in 2012, \$908,846 in 2013, \$912,965 in 2014, \$1,238,639 in 2015 and \$1,278,421 in 2016.

Bad Debt has totaled \$85,777 in 2012, \$58,617 in 2013, \$484,363 in 2014, \$223,168 in 2015 and \$72,757 in 2016.

Funding

The funding for Adjustments to Rate Revenue is based on a percentage of water and sewer revenues. Adjustments have been budgeted at 2.5% of revenues, Discounts 1.0% (of water only), and Bad Debt at 0.1%, respectively. The amounts budgeted for these items in 2017 are Adjustments \$8.8 million, Discounts \$1.5 million, and Bad Debt \$0.4 million, respectively.

Adjustments to Rate Revenue



Prior Year Net Operating Surplus

As required by the Enabling Act, the Commission must use any net operating surplus generated in any year to reduce the revenue requirement in the following year, or transfer that operating surplus to the City of Boston. In a given year, the prior year net operating surplus is determined by subtracting the previous year's actual expenses from the actual revenues. In other words, the prior year net operating surplus of the 2017 budget reflects the actual (unaudited) surplus realized in 2016. Data and Graphs are shown below for additional information.

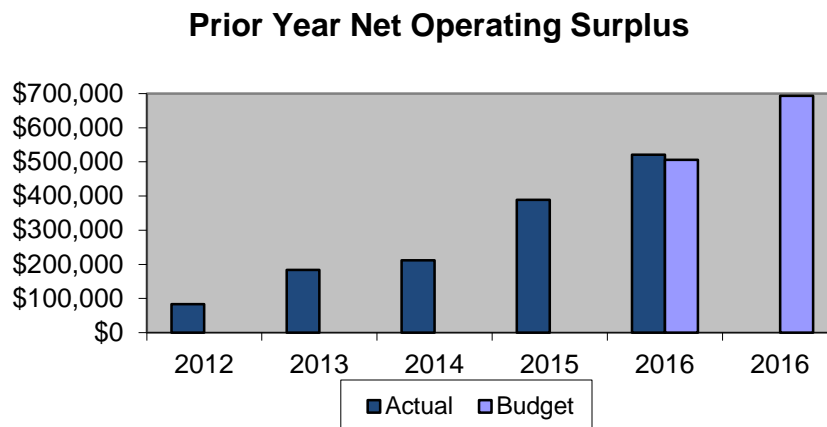
YEAR	TOTAL	% CHANGE	
2012	\$ 83,871	44.9%	ACTUAL
2013	\$ 183,611	118.9%	
2014	\$ 211,384	15.1%	
2015	\$ 389,063	84.1%	
2016	\$ 521,428	34.0%	
			Unaudited
2016	\$ 506,272		BUDGET
2017	\$ 693,227	36.9%	

Historical Viewpoint

The Commission has experienced a prior year net operating surplus in each of the past five years presented here. In 2012, the Commission recognized \$0.1 million in prior year net operating surplus, \$0.2 million in 2013, \$0.2 million in 2014, \$0.4 million in 2015, and a prior year surplus of \$0.5 million in 2016.

Funding

The 2017 budget will utilize the 2016 surplus of \$0.7 million to offset anticipated expenditures. The Commission anticipates a similar surplus in the future.



Miscellaneous Revenue – Late Charge Fees

It is the policy of the Commission to impose a late payment charge with each billing on all amounts past due over 45 days. The imposition of late charges encourages the prompt payment of bills to prevent subsidies to customers who do not pay their bills on time. The late payment charge is 14% per annum or 0.03836% per diem.

YEAR	TOTAL	% CHANGE	
2012	\$ 1,272,253	3.6%	ACTUAL
2013	\$ 1,266,534	-0.4%	
2014	\$ 1,357,316	7.2%	
2015	\$ 1,414,957	4.2%	
2016	\$ 1,313,671	-7.2%	
			Unaudited
2016	\$ 1,342,641		BUDGET
2017	\$ 1,409,283	5.0%	

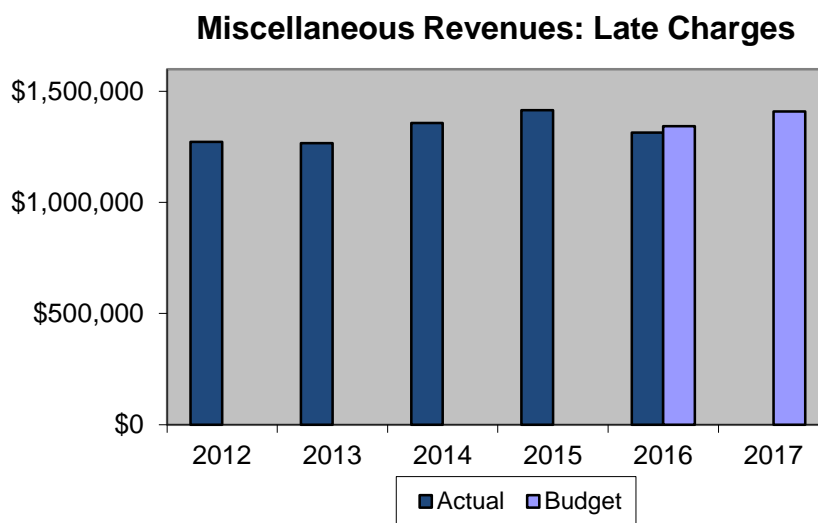
Unaudited

Historical Viewpoint

Late Charges have remained steady annually, which is a result of the Commission's efforts to collect outstanding balances. In 2012, the Commission observed \$1.3 million in Late Charges, \$1.3 million in 2013, \$1.4 million in 2014 and \$1.4 million in 2015. In 2016, the Commission anticipates Late Charges to equal \$1.3 million.

Funding

In the 2017 budget, Late Charges are estimated at 0.4% of billed Water and Sewer charges. Thus, the 2017 budget accounts for \$1.4 million in Late Charges, which is \$66,642 or 5.0% more than the budgeted amount in 2016.



Miscellaneous Revenue – Investment Income

Large expenditures such as the MWRA Assessment and principal and interest payments on outstanding debt are paid in periodic installments. The funds accumulated to pay these expenses earn Investment Income for the Commission. In addition, according to Commission policy, certain fund balances are available for investment purposes.

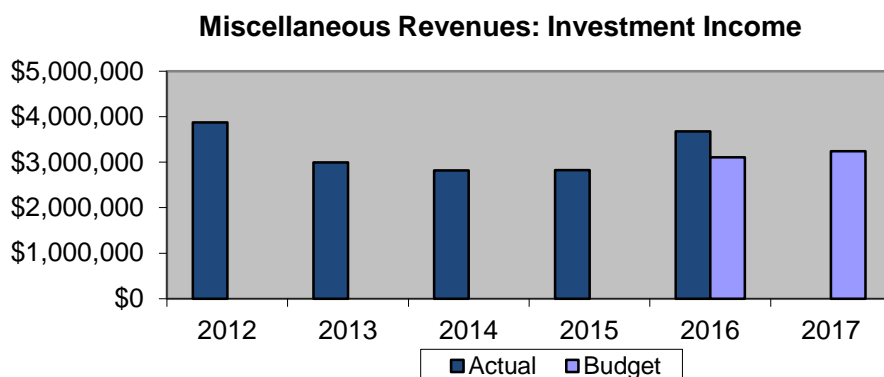
YEAR	TOTAL	% CHANGE	
2012	\$ 3,873,877	-4.0%	ACTUAL
2013	\$ 2,993,410	-22.7%	
2014	\$ 2,820,493	-5.8%	
2015	\$ 2,824,294	0.1%	
2016	\$ 3,680,401	30.3%	
			Unaudited
2016	\$ 3,107,490		BUDGET
2017	\$ 3,239,523	4.2%	

Historical Viewpoint

Investment Income has started to return increased yields over the last couple of years after experiencing consecutive decreases in the years prior. Investment Income totaled \$3.9 million in 2012, \$3.0 million in 2013, \$2.8 million in 2014, \$2.8 million in 2015, and \$3.7 million in 2016. The amount of assets available for investing purposes had decreased in previous years due to declines in operating surpluses experienced during this time period. However, these amounts have increased and the Commission has remained cautious and defensive in the present market by keeping short term investments in three-month and six-month callable agencies. This strategy has been effective and thus investment income has seen a positive trend in recent years.

Funding

Investment Income in 2017 is budgeted for \$3.2 million, which is \$0.1 million or 4.2% more than budgeted in 2016. The Commission has experienced more favorable returns on investments relating to the stock market, bonds acquired, and other investment options the Commission has explored. Monies invested have returned slightly higher returns, due to higher interest rate yields and a cautious strategy during in the past couple of years.



Miscellaneous Revenue – Fire Pipe Fees

Fire Pipe connections are billed separately by the Commission. Fire Pipe connections are used to service internal sprinkler systems and stand pipes which are utilized for fire protection in buildings. Generally accepted rate making practices recommend the imposition of special service fees for private fire protection.

YEAR	TOTAL	% CHANGE	
2012	\$ 4,107,752	2.9%	ACTUAL
2013	\$ 4,185,692	1.9%	
2014	\$ 4,330,652	3.5%	
2015	\$ 4,486,066	3.6%	
2016	\$ 4,590,020	2.3%	
			Unaudited
2016	\$ 4,475,856		BUDGET
2017	\$ 4,590,020	2.6%	

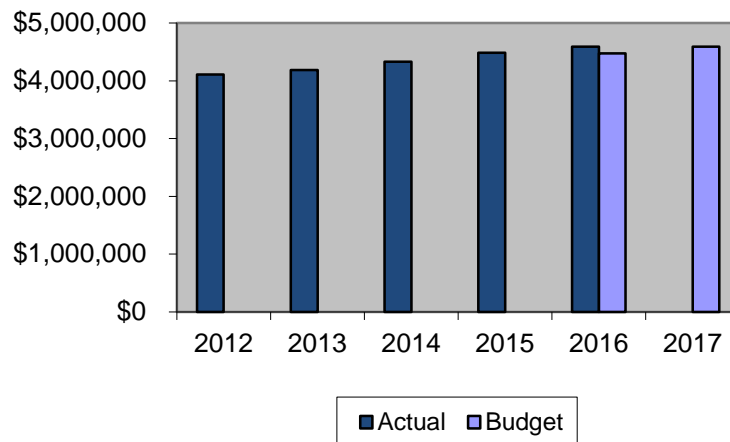
Historical Viewpoint

Fire Pipe Revenue has gradually increased since 2012. Increase in Fire Pipe Revenues can be attributed to new construction in the Boston area and the requirement for fire pipes in the city. The amount realized in 2016 was \$4.6 million, the largest amount in the five-year period.

Funding

The amount budgeted for Fire Pipe Revenue in the 2017 budget is \$4.6 million, which is \$0.1 million or 2.6% than the 2016 budget.

Miscellaneous Revenues: Fire Pipe Fees



Miscellaneous Revenue – Other Income

The Commission provides special services to some customers, the costs of which are not imposed upon the general ratepayer. These services come under the title “Special Service Fees.” Special services include cross connection inspections, general service applications, water and sewer lien certificates, water and sewer pipe inspections, and special meter tests. Another component of Other Income is Deferred Revenues, which are revenues that have been deferred for the primary purpose of being recognized later.

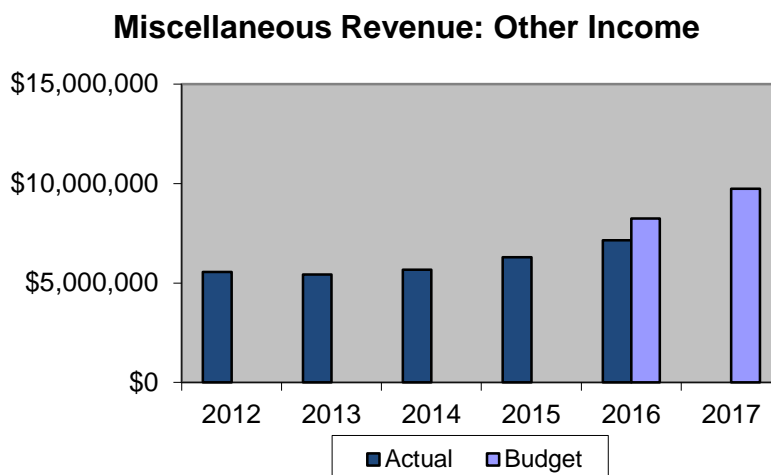
YEAR	TOTAL	% CHANGE	
2012	\$ 5,556,810	-45.9%	ACTUAL
2013	\$ 5,426,141	-2.4%	
2014	\$ 5,666,579	4.4%	
2015	\$ 6,294,690	11.1%	
2016	\$ 7,142,679	13.5%	
			Unaudited
2016	\$ 8,247,438		BUDGET
2017	\$ 9,732,919	18.0%	

Historical Viewpoint

Other Income increased 13.5% in 2016 totaling \$7.1 million. Amounts for Other Income have seen a steady increase since 2013 over the five-year span beginning in 2012. Other Income totaled \$5.6 million in 2012, \$5.4 million in 2013, \$5.7 million in 2014, \$6.3 million in 2015, and \$7.1 million in 2016. The increases realized in recent years are mostly a result of increased revenues from General Service Applications and Cross Connection Fees.

Funding

Monies budgeted for Other Income in 2017 equal \$9.7 million, an increase of \$1.5 million or 18.0% more than the 2016 budget.

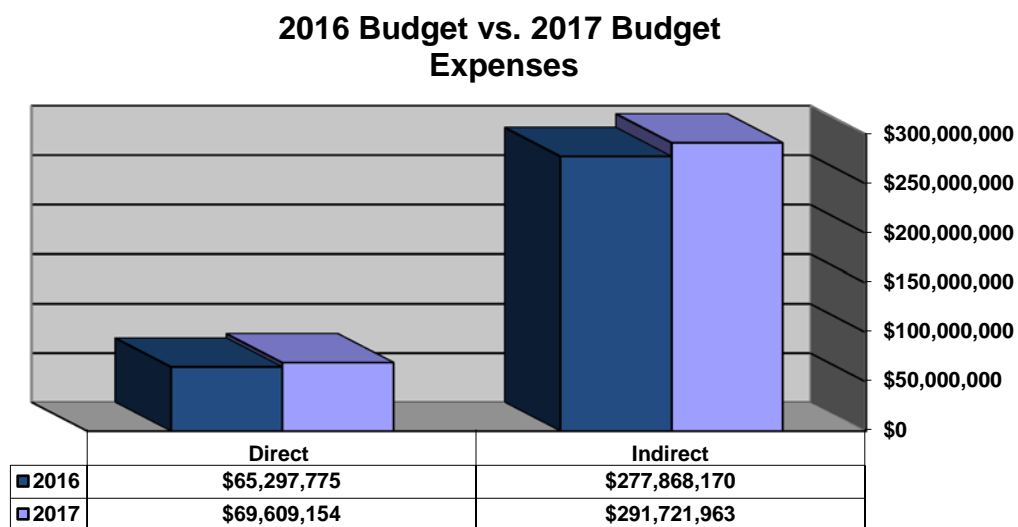


Total Expenses

The 2017 Current Expense Budget includes \$361.3 million in total expenses.

The budget includes:

- ➔ Direct Expenses - \$69.6 million
- ➔ Indirect Expenses - \$291.7 million
 - MWRA Assessment - \$219.1 million
 - Debt Service - \$51.1 million
 - Capital Improvements - \$15.9 million
 - Contractual Funding Obligations - \$5.4 million
 - SDWA Assessment - \$0.2 million



Direct Expense Budget Comparison

Direct Expenses are those expenses directly associated with a division, department, or operating unit's daily activity. The Direct Expense budget for 2017 totals \$69.6 million which reflects an increase of \$4.3 million or 6.6% from the 2016 budget. The Commission is dedicated to reducing the required level of future rate increases by controlling expenses wherever possible through strong financial management and policy controls. The chart below displays the 2017 Direct Expense budget by line item versus the 2016 budget along with the percentage change from year to year.

		2017 Budget	2016 Budget	Variance %
Wages and Salaries	\$	38,975,572	\$ 36,770,018	6.0%
Overtime	\$	740,809	\$ 692,344	7.0%
Fringe Benefits	\$	8,945,134	\$ 8,477,638	5.5%
Supplies & Materials	\$	2,975,143	\$ 2,960,091	0.5%
Repair & Maintenance	\$	8,734,640	\$ 8,146,340	7.2%
Utilities	\$	1,612,853	\$ 1,585,468	1.7%
Professional Services	\$	4,535,270	\$ 3,672,420	23.5%
Space & Equipment Rentals	\$	295,784	\$ 282,500	4.7%
Other Services	\$	1,944,540	\$ 1,843,292	5.5%
Insurance	\$	528,409	\$ 544,664	-3.0%
Inventory	\$	23,000	\$ 23,000	0.0%
Capital Outlay	\$	70,000	\$ 70,000	0.0%
Training/Seminar/Travel	\$	78,000	\$ 80,000	-2.5%
Damage Claims	\$	150,000	\$ 150,000	0.0%
TOTAL	\$	69,609,154	\$ 65,297,775	6.6%

Direct Expense Budget

The Commission's Direct Expenses are divided into two distinct categories, Labor Costs and Other Costs. These two categories are subsequently divided into fourteen line items with three line items attributed to Labor Costs and eleven attributed to Other Costs. Listed below are the line items and categories that are contained within them.

LABOR COSTS

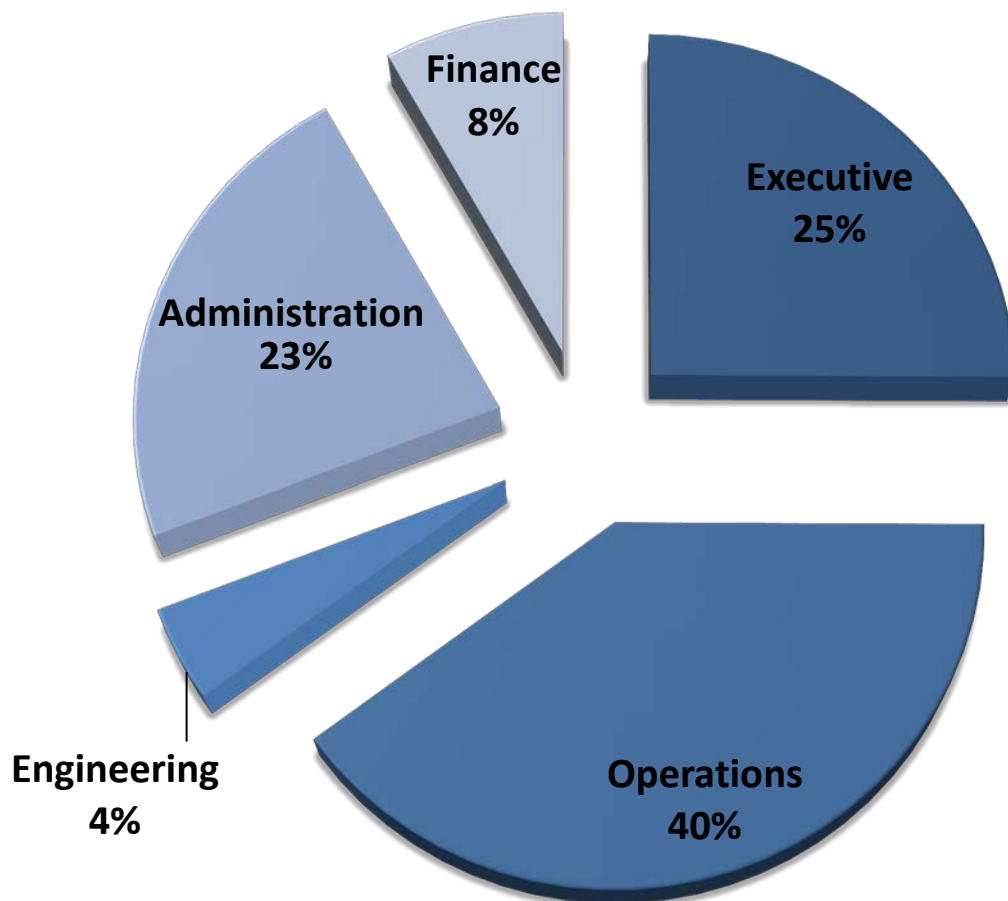
- **Wages and Salaries** – Medicare, Contract Allowances, Other Post Employee Benefits Liability, Mass Hospital Tax, and Pension
- **Overtime**
- **Fringe Benefits** – Health, Life, Dental, Workers' Compensation and Unemployment Insurance, Long Term Disability, Tuition Reimbursement

OTHER COSTS

- **Supplies and Materials** – Office, Program and Health/Safety Supplies, Work Clothes, and Vehicle Fuel
- **Repair and Maintenance** – Contract Repairs, Sewer Lateral, Television Inspections
- **Utilities** – Heating Oil, Gas, Electricity
- **Professional Services** – Audit Services, Trustee Services, Risk Management, Engineering Services, and Legal Services
- **Space & Equipment Rentals** – Space and Copier Leases, and Other Rentals
- **Other Services** – Printing and Duplication, Advertising, Police Details
- **Insurance** – Excess Liabilities, Fiduciary Liability, Property/Casualty Insurance, Vehicle Insurance, Crime Insurance, and Permit/Bonding
- **Inventory** – Water and Sewer related items
- **Capital Outlay** – Office and Field Equipment
- **Training/Seminar/Travel** – Local and Out-Of-State Training/Seminar, Local Meeting/Conference, Out-Of-State Conference
- **Damage Claims**

2017 Direct Expense Budget by Division

	Executive	Operations	Engineering	Administration	Finance	Total
Wages and Salaries	\$ 6,724,229	\$ 16,036,497	\$ 2,222,862	\$ 9,865,482	\$ 4,126,502	\$ 38,975,572
Overtime	\$ -	\$ 423,451	\$ 216,366	\$ 98,557	\$ 2,435	\$ 740,809
Labor Related Costs/Benefits	\$ 8,368,635	\$ 152,343	\$ 195,645	\$ 108,519	\$ 119,993	\$ 8,945,134
Total Labor Costs	\$ 15,092,864	\$ 16,612,291	\$ 2,634,873	\$ 10,072,558	\$ 4,248,930	\$ 48,661,515
Supplies and Materials	\$ 20,600	\$ 1,760,150	\$ 76,230	\$ 488,000	\$ 630,163	\$ 2,975,143
Repair and Maintenance	\$ 34,500	\$ 7,020,500	\$ 19,700	\$ 1,493,940	\$ 166,000	\$ 8,734,640
Utilities	\$ -	\$ -	\$ -	\$ 1,612,853	\$ -	\$ 1,612,853
Professional Services	\$ 1,485,800	\$ 1,482,500	\$ 226,120	\$ 806,250	\$ 534,600	\$ 4,535,270
Space and Equipment Rentals	\$ -	\$ 7,500	\$ -	\$ 288,284	\$ -	\$ 295,784
Other Services	\$ 131,250	\$ 708,280	\$ 11,000	\$ 982,060	\$ 111,950	\$ 1,944,540
Insurance	\$ 528,409	\$ -	\$ -	\$ -	\$ -	\$ 528,409
Inventory	\$ -	\$ 23,000	\$ -	\$ -	\$ -	\$ 23,000
Capital Outlay	\$ -	\$ 50,000	\$ -	\$ 20,000	\$ -	\$ 70,000
Training/Travel/Seminar	\$ 13,500	\$ 13,000	\$ 24,500	\$ 22,000	\$ 5,000	\$ 78,000
Damage Claims	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ 150,000
Total Other Costs	\$ 2,364,059	\$ 11,064,930	\$ 357,550	\$ 5,713,387	\$ 1,447,713	\$ 20,947,639
Total Direct Expenses	\$ 17,456,923	\$ 27,677,221	\$ 2,992,423	\$ 15,785,945	\$ 5,696,643	\$ 69,609,154

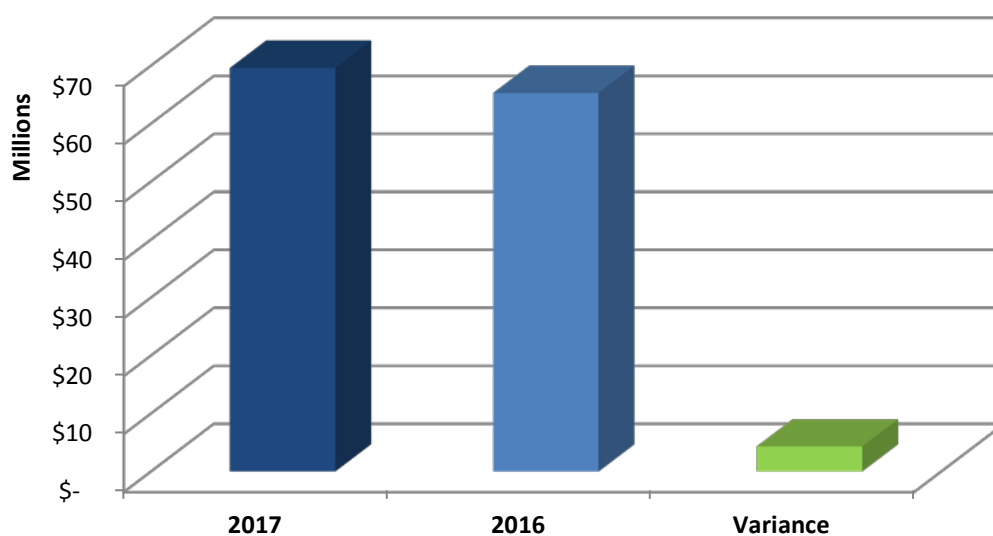


Budget Comparison by Line Item: 2017 vs. 2016

The following illustration shows the line items for Direct Expenses. The amounts from 2017 are compared to 2016, which includes the dollar and percentage variance from year to year.

Line Item	2017 Budget	2016 Budget	Variance \$	Variance %
Wages & Salaries	\$ 38,975,572	\$ 36,770,018	\$ 2,205,554	6.0%
Overtime	\$ 740,809	\$ 692,344	\$ 48,465	7.0%
Labor Related Costs/Benefits	\$ 8,945,134	\$ 8,477,638	\$ 467,496	5.5%
Total Labor Costs	\$ 48,661,515	\$ 45,940,000	\$ 2,721,515	5.9%
Supplies and Materials	\$ 2,975,143	\$ 2,960,091	\$ 15,052	0.5%
Repairs and Maintenance	\$ 8,734,640	\$ 8,146,340	\$ 588,300	7.2%
Utilities	\$ 1,612,853	\$ 1,585,468	\$ 27,385	1.7%
Professional Services	\$ 4,535,270	\$ 3,672,420	\$ 862,850	23.5%
Space and Equipment Rentals	\$ 295,784	\$ 282,500	\$ 13,284	4.7%
Other Services	\$ 1,944,540	\$ 1,843,292	\$ 101,248	5.5%
Insurance	\$ 528,409	\$ 544,664	\$ (16,255)	-3.0%
Inventory	\$ 23,000	\$ 23,000	\$ -	0.0%
Capital Outlay	\$ 70,000	\$ 70,000	\$ -	0.0%
Travel/Training/Seminar	\$ 78,000	\$ 80,000	\$ (2,000)	-2.5%
Damage Claims	\$ 150,000	\$ 150,000	\$ -	0.0%
Total Other Cost	\$ 20,947,639	\$ 19,357,775	\$ 1,589,864	8.2%
Total Direct Expenses	\$ 69,609,154	\$ 65,297,775	\$ 4,311,379	6.6%

**Direct Expenses
2017 Budget vs. 2016 Budget**

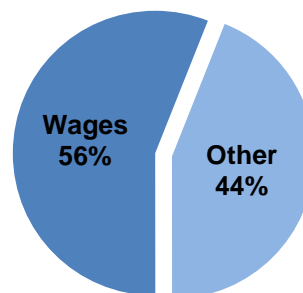


Wages and Salaries

The Wages and Salaries line item provides funding for compensation paid to Commission employees. Along with full time equivalent employees, this line reflects costs of part-time employees, interns, co-op students, and the summer youth program.

YEAR	TOTAL	% CHANGE	
2012	\$ 32,324,690	1.3%	ACTUAL
2013	\$ 34,379,928	6.4%	
2014	\$ 35,778,748	4.1%	
2015	\$ 46,923,242	31.1%	
2016	\$ 53,940,242	15.0%	
			Unaudited
2016	\$ 36,770,018		BUDGET
2017	\$ 38,975,572	6.0%	

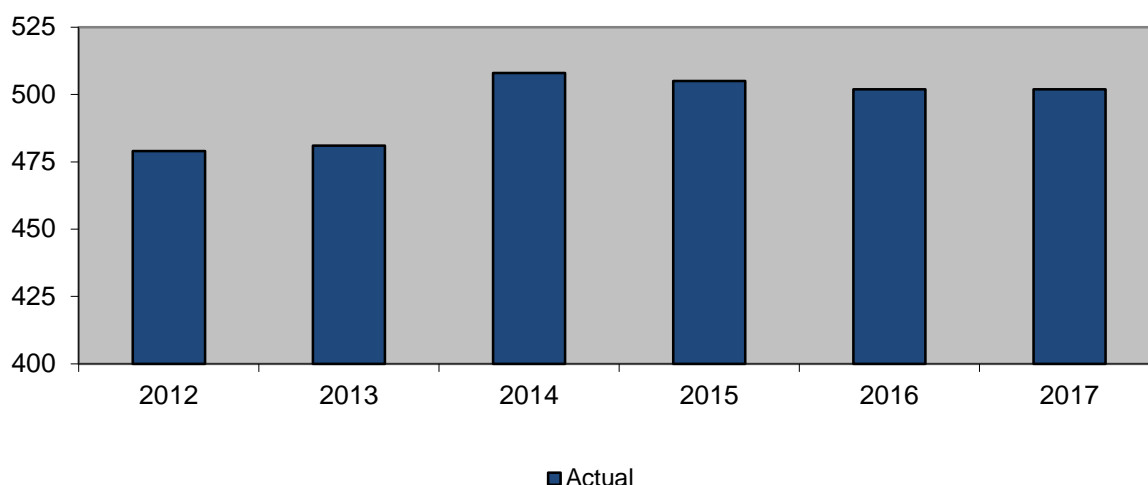
2017 Budget
Wages vs. Other Direct Expenses



Historical Viewpoint

Wages and Salaries have remained relatively stable within the past five-years. Increases seen over the last two years are based on contract settlements and performance reviews for various employees and unions within the Commission. The Commission's diverse workforce is comprised of executive employees and four collective bargaining units. The Commission will maintain the head count for 2017 at 502 positions, unchanged from the 2016 head count.

Budgeted Number of Employees at BWSC

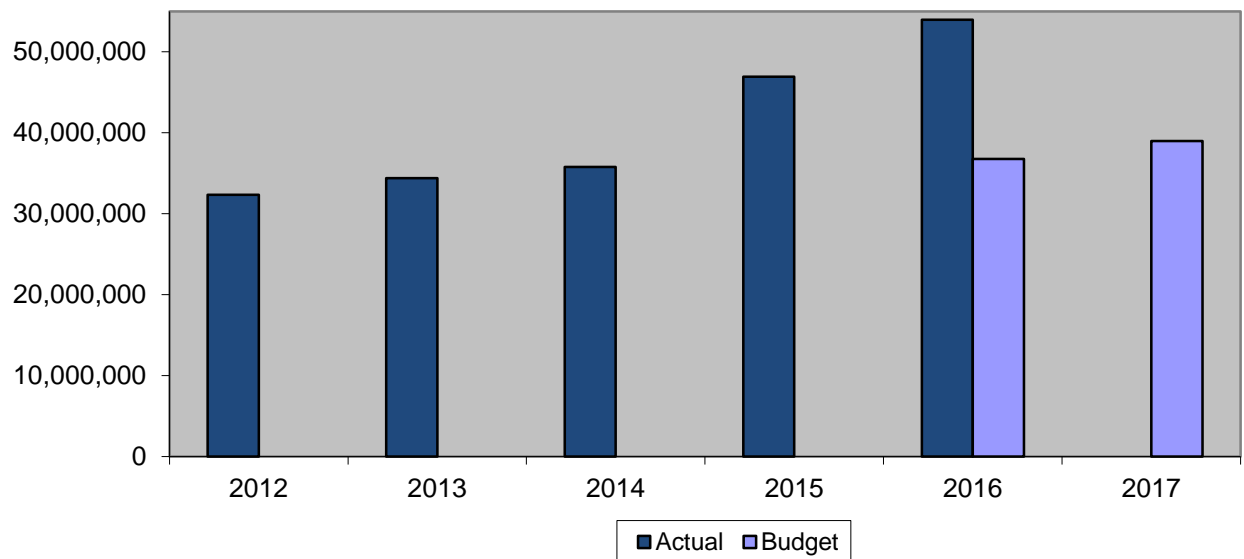


Wages and Salaries

Funding

The 2017 budget for Wages and Salaries is \$39.0 million, which is an increase of \$2.2 million or 6.0% from the 2016 budget. The increase is the result of contract settlements and performance reviews for various employees and unions within the Commission.

Historical Amounts for Wages and Salaries



Overtime

The Commission establishes a budget for Overtime in order to respond to services related to emergencies requiring attention outside the normal hours of operation.

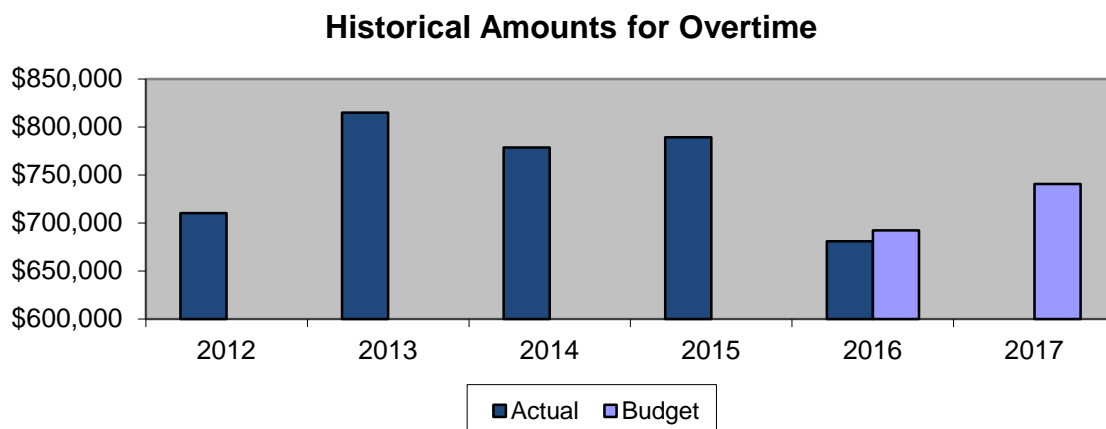
YEAR	TOTAL	% CHANGE	
2012	\$ 710,291	-3.7%	ACTUAL
2013	\$ 815,128	14.8%	
2014	\$ 778,642	-4.5%	
2015	\$ 789,500	1.4%	
2016	\$ 680,938	-13.8%	
			Unaudited
2016	\$ 692,344		BUDGET
2017	\$ 740,809	7.0%	

Historical Viewpoint

Overtime spending has stayed within the range of \$650,000 - \$850,000 over the past five years. Fluctuations in overtime spending are primarily due to varying numbers of unanticipated situations requiring overtime from year to year. Expenditures for Overtime have equaled \$710,291 in 2012, \$815,128 in 2013, \$778,642 in 2014, \$789,500 in 2015, and \$680,938 in 2016.

Funding

The amount allocated for 2017 Overtime is budgeted at \$740,809, which is \$48,465 or 7.0% more than the 2016 budget.



Labor Related Costs/Benefits

Labor Related Costs/Benefits provides funding for Health, Life, Dental, and Unemployment Insurance, Workers' Compensation, Tuition Reimbursement, and Sick, Compensatory, and Vacation Time Buy Back.

YEAR	TOTAL	% CHANGE	
2012	\$ 7,260,028	-6.5%	ACTUAL
2013	\$ 7,077,635	-2.5%	
2014	\$ 7,261,123	2.6%	
2015	\$ 7,710,203	6.2%	
2016	\$ 8,363,403	8.5%	
			Unaudited
2016	\$ 8,477,638		BUDGET
2017	\$ 8,945,134	5.5%	

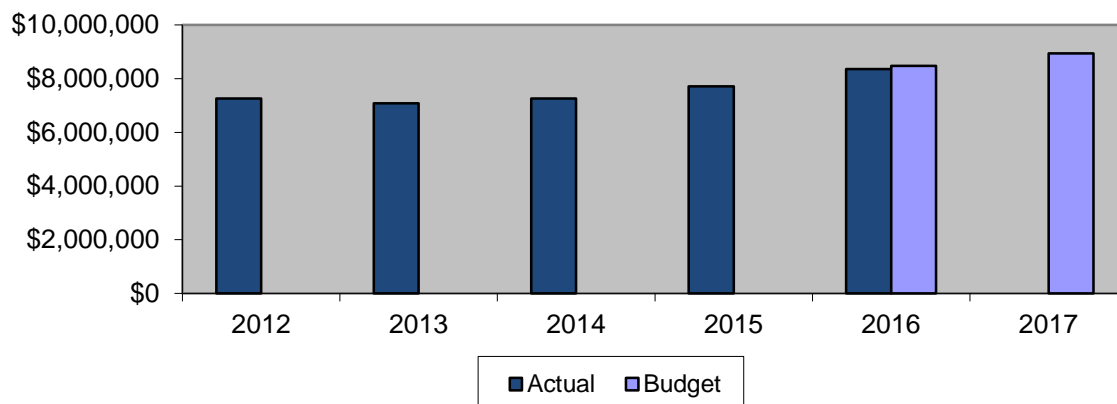
Historical Viewpoint

Increases in annual expenses have been caused by increasing premiums for health, dental, long-term disability, and unemployment insurance throughout the state of Massachusetts. The health care industry and premiums to employees continue to increase annually.

Funding

The 2017 budget equals \$8.9 million, which is an increase of \$0.5 million or 5.5% from 2016 Budget.

Labor Related Costs/Benefits



Supplies and Materials

Supplies and Materials include funding for office supplies, work clothes, health/safety supplies, program supplies, postage and delivery services, vehicle fuel, and all other materials not classified as inventory items.

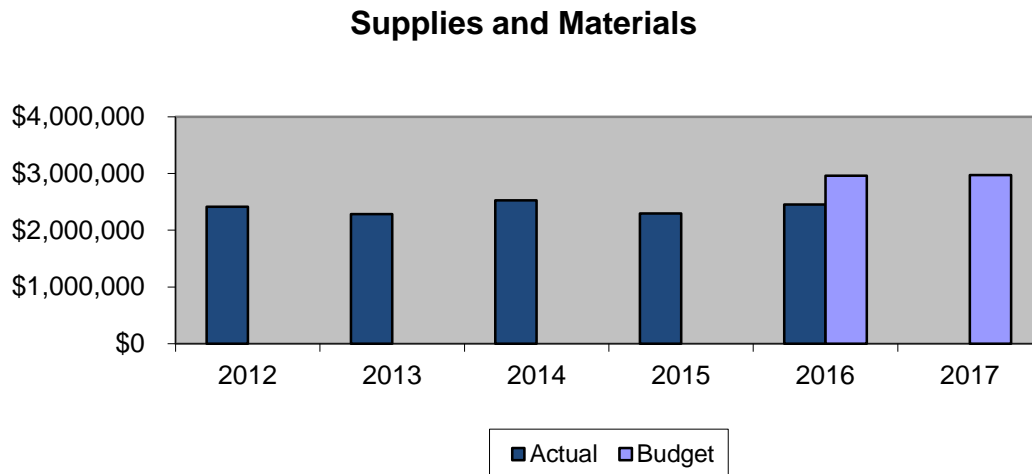
YEAR	TOTAL	% CHANGE	
2012	\$ 2,413,099	-0.4%	ACTUAL
2013	\$ 2,286,065	-5.3%	
2014	\$ 2,526,486	10.5%	
2015	\$ 2,295,723	-9.1%	
2016	\$ 2,452,530	6.8%	
			Unaudited
2016	\$ 2,960,091		BUDGET
2017	\$ 2,975,143	0.5%	

Historical Viewpoint

The Commission has focused on centralization for the purchasing of supplies and materials by management. Spending for supplies and materials totaled \$2.4 million in 2012, \$2.3 million in 2013, \$2.5 million in 2014, \$2.3 million in 2015, and \$2.5 million in 2016.

Funding

Supplies and Materials are budgeted for \$3.0 million in 2017, which reflects a \$15,052 or 0.5% increase from the 2016 budget.



Repair and Maintenance

The Repair and Maintenance line item includes: Materials, Service and Maintenance, Contractual Repairs to the Water System and the Sewer System, Television Inspections, Sewer Laterals, Solid Fill Disposals, and Other Repair and Maintenance.

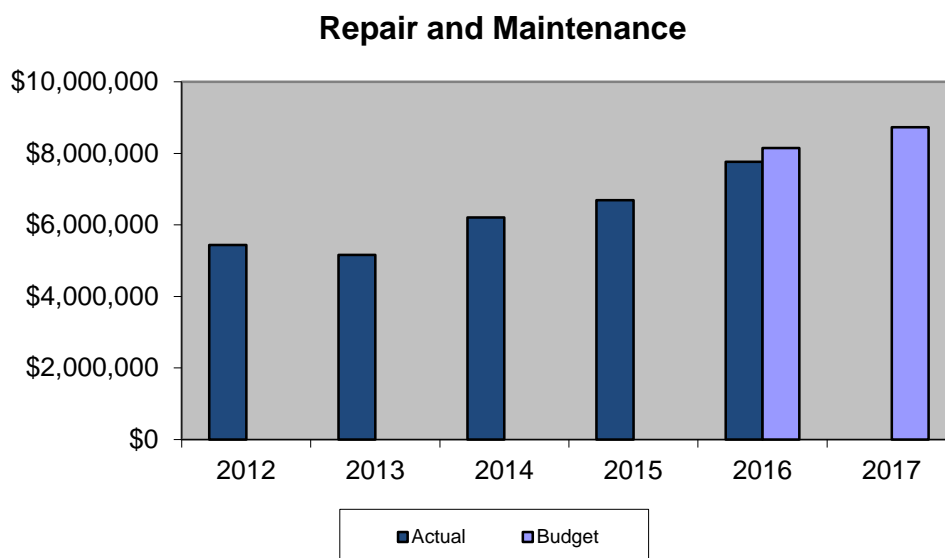
YEAR	TOTAL	% CHANGE	
2012	\$ 5,441,001	5.3%	ACTUAL
2013	\$ 5,157,692	-5.2%	
2014	\$ 6,203,654	20.3%	
2015	\$ 6,686,471	7.8%	
2016	\$ 7,766,940	16.2%	
			Unaudited
2016	\$ 8,146,340		BUDGET
2017	\$ 8,734,640	7.2%	

Historical Viewpoint

Costs associated with Repair and Maintenance equaled \$5.4 million in 2012, \$5.2 million in 2013, \$6.2 million in 2014, \$6.7 million in 2015, and \$7.8 million in 2016.

Funding

Repair and Maintenance is budgeted for \$8.7 million in 2017. This amount is \$0.6 million or 7.2% more than the 2016 budget amount.



Utilities

This line item includes funding for natural gas, electricity, water/sewer, and telephone expenses (long distance and cellular).

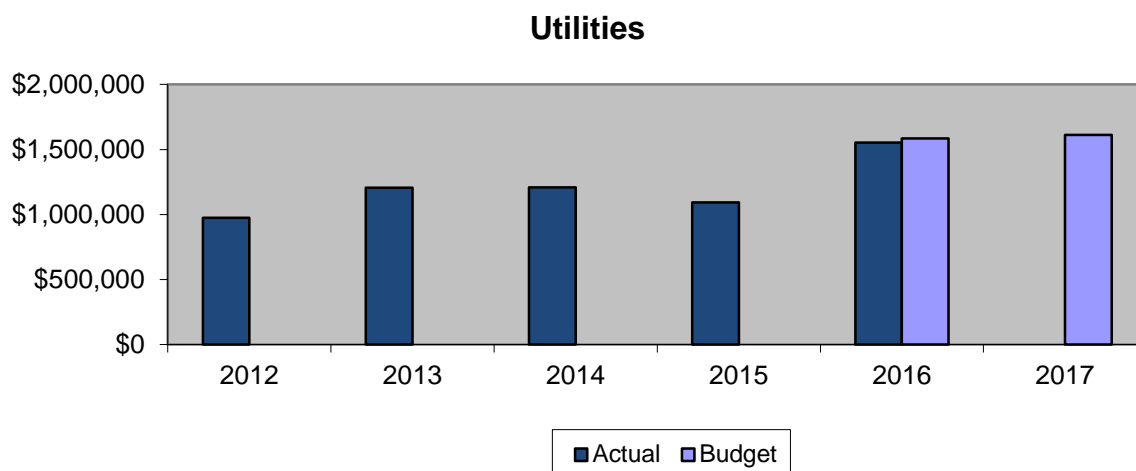
YEAR	TOTAL	% CHANGE	
2012	\$ 974,913	-18.0%	ACTUAL
2013	\$ 1,207,108	23.8%	
2014	\$ 1,207,616	0.0%	
2015	\$ 1,093,997	-9.4%	
2016	\$ 1,553,000	42.0%	
			Unaudited
2016	\$ 1,585,468		BUDGET
2017	\$ 1,612,853	1.7%	

Historical Viewpoint

The cost of Utilities has been rising over the past several years due to the higher cost of energy. Expenses increased by 42.0% in 2016.

Funding

Utilities in 2017 are budgeted for \$1.6 million. The amount is a \$27,385 or 1.7% increase from the 2016 budget.



Professional Services

The Professional Services line item includes funding for Audit Services, Trustee Services, Financial Consultants, Risk Management, Bond Remarketing, Rating Agencies, Letter of Credit, Miscellaneous Financial, Legal, Liens and Taking, Engineering, Personnel, and Other Professional Services.

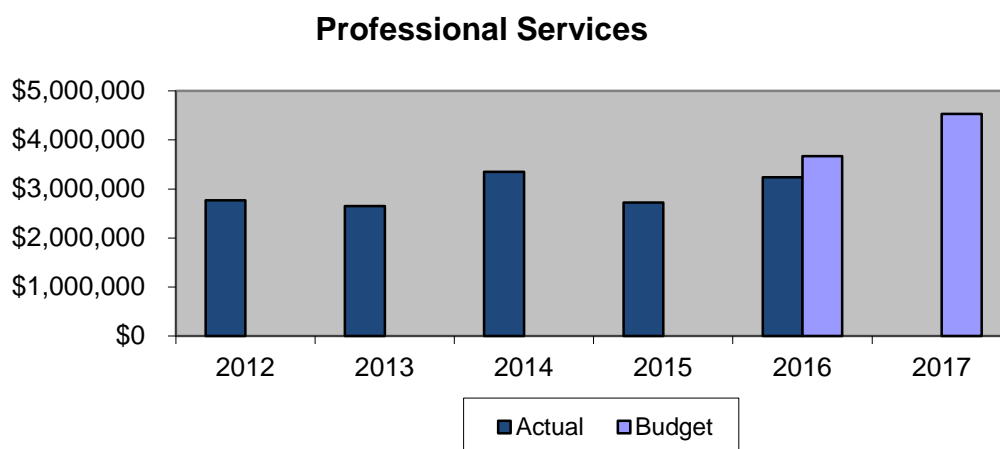
YEAR	TOTAL	% CHANGE	
2012	\$ 2,769,362	4.1%	ACTUAL
2013	\$ 2,649,969	-4.3%	
2014	\$ 3,348,408	26.4%	
2015	\$ 2,724,914	-18.6%	
2016	\$ 3,241,838	19.0%	
			Unaudited
			BUDGET
2016	\$ 3,672,420		
2017	\$ 4,535,270	23.5%	

Historical Viewpoint

In the year 2000, the Commission awarded a contract to service the pumping stations throughout the City of Boston. These services have been very effective in reducing flooding in various areas of Boston. These services have continued into the present and account for most of the Commission's annual expenses for Professional Services.

Funding

Professional Services are budgeted for \$4.5 million in 2017, which is \$0.9 million or 23.5% more than the 2016 budget.



Space and Equipment Rentals

The Space and Equipment Rentals line item includes funding for Space/Lease Rentals, Copier Leases, and Other Rentals. The funds allocated for this line item are also used for miscellaneous and emergency equipment rental costs.

YEAR	TOTAL	% CHANGE	
2012	\$ 37,985	-21.0%	ACTUAL
2013	\$ 663,354	1646.4%	
2014	\$ 235,693	-64.5%	
2015	\$ 251,778	6.8%	
2016	\$ 280,300	11.3%	
			Unaudited
2016	\$ 282,500		BUDGET
2017	\$ 295,784	4.7%	

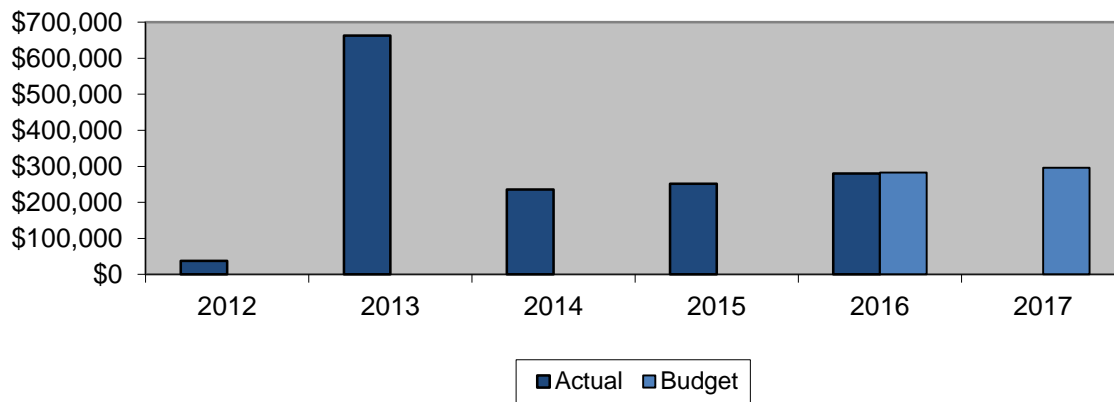
Historical Viewpoint

The Commission has seen fluctuations in Space and Equipment Rental spending over the last five years due to changing rental needs, but the Commission's rental needs have become more consistent over the last three years and spending has followed that trend. Expenses for 2016 totaled \$280,300.

Funding

Space and Equipment Rentals are budgeted for \$295,784 in 2017. This amount for the 2017 budget is \$13,284 or 4.7% more than the 2016 budget due to the addition of copier and printer leases.

Space and Equipment Rentals



Other Services

The Other Services line item includes all non-professional services, such as Printing and Duplication, Memberships/Dues, Subscriptions, Advertising (Public Information, Recruitment, Procurement), Police Details, Facilities Security, Billing, and Miscellaneous Other Services. Private police details are services that are required by law for work performed on the streets of Boston.

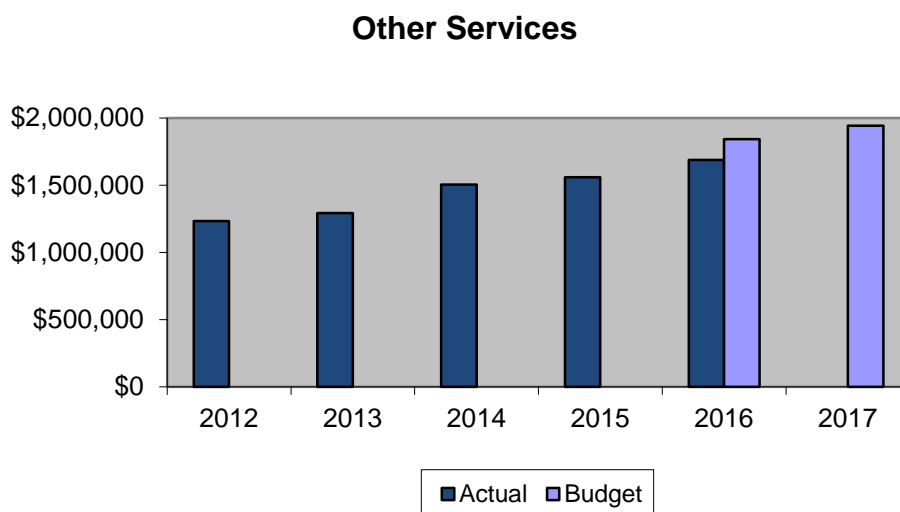
YEAR	TOTAL	% CHANGE	
2012	\$ 1,233,922	8.0%	ACTUAL
2013	\$ 1,294,110	4.9%	
2014	\$ 1,506,245	16.4%	
2015	\$ 1,560,224	3.6%	
2016	\$ 1,689,096	8.3%	
			Unaudited
2016	\$ 1,843,292		BUDGET
2017	\$ 1,944,540	5.5%	

Historical Viewpoint

Expenses for Other Services have gradually increased over the last five years. Expenses equaled \$1.2 million in 2012, \$1.3 million in 2013, \$1.5 million in 2014, \$1.6 million in 2015, and \$1.7 million in 2016. Printing and Duplication, Police Details, Advertising, Facilities Security, and Miscellaneous Other Services are the main components of the annual expenses made by the Commission for Other Services.

Funding

The Commission has allocated \$1.9 million in funds for Others Services in the 2017 budget, which is \$0.1 million or 5.5% more than the 2016 amount.



Insurance

The Insurance line item includes funding for Excess Liabilities, Fiduciary Liability, Property/Casualty, Vehicle Insurance, Crime Insurance, and Permit/Bonding.

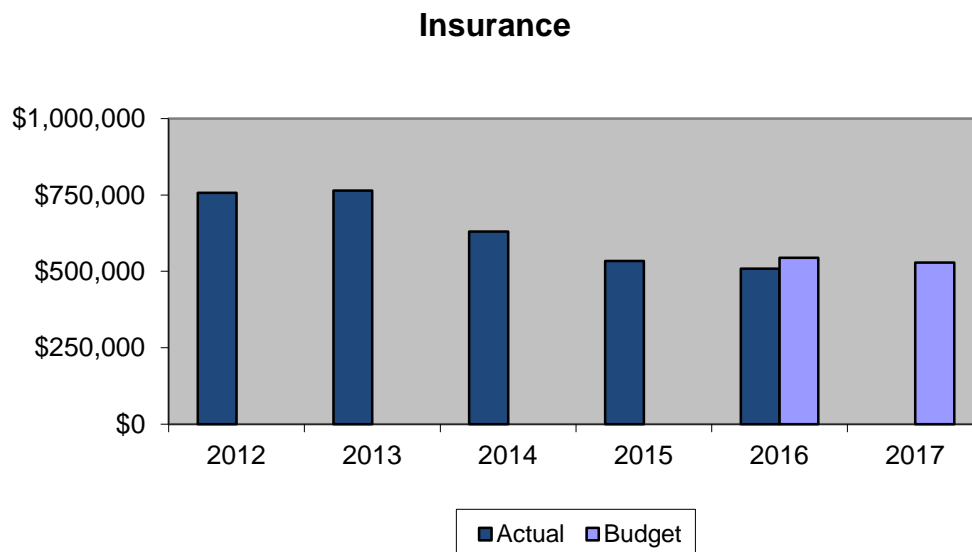
YEAR	TOTAL	% CHANGE		Types of Insurance Coverage	% of Budget
2012	\$ 756,934	-0.6%	ACTUAL	Excess Liabilities	40.7%
2013	\$ 764,915	1.1%		Fiduciary Liability	3.7%
2014	\$ 629,990	-17.6%		Property/Casualty	13.5%
2015	\$ 533,935	-15.2%		Vehicle	40.0%
2016	\$ 509,121	-4.6%		Crime	2.1%
			BUDGET	Permit/Bonding	0.0%
2016	\$ 544,664				100.0%
2017	\$ 528,409	-3.0%			

Historical Viewpoint

For Insurance over the last five years, the Commission has expensed \$756,934 in 2012, \$764,915 in 2013, \$629,990 in 2014, \$533,935 in 2015, and \$509,121 in 2016. Future costs are intended to decrease as premiums continue to fluctuate in the market.

Funding

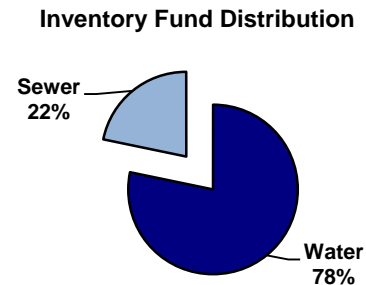
The Insurance line item is budgeted at \$528,409 in 2017. The amount budgeted is \$16,255 or 3.0% less than the previous year. The amount budgeted incorporates rates for five months of actual expenses and seven months of estimated renewals, which begin in June for the next fiscal year thus creating overlapping fiscal years.



Inventory

The Commission's Inventory budget includes funding for water and sewer related items, such as, copper, tubing, gate valves, fittings, and couplings. Also included in this line item are replacement parts for hydrants.

YEAR	TOTAL	% CHANGE	
2012	\$ 22,235	11.5%	ACTUAL
2013	\$ 15,207	-31.6%	
2014	\$ 16,759	10.2%	
2015	\$ 10,778	-35.7%	
2016	\$ 23,000	113.4%	
			Unaudited
2016	\$ 23,000		BUDGET
2017	\$ 23,000	0.0%	

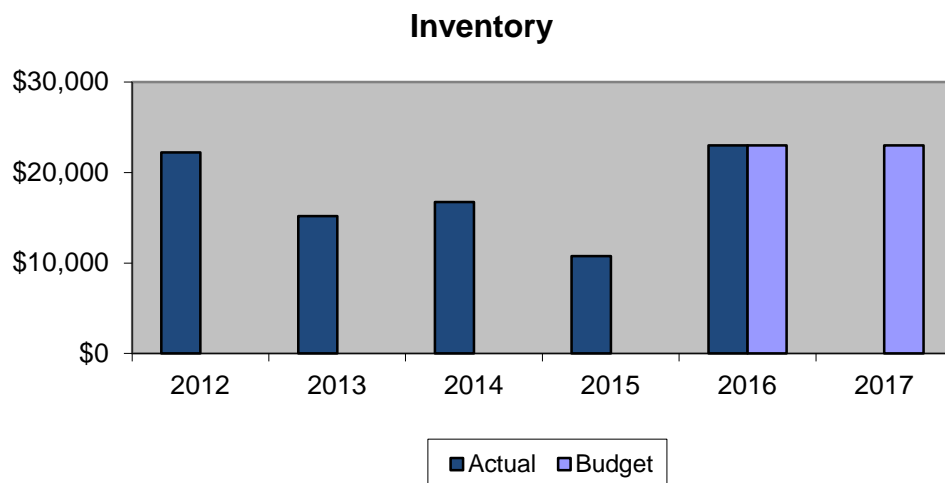


Historical Viewpoint

The Commission reclassified materials that were previously considered inventory into program supplies. Annual expenses for inventory totaled \$22,235 in 2012, \$15,207 in 2013, \$16,759 in 2014, \$10,778 in 2015, and \$23,000 in 2016. The increase in spending for 2016 can be attributed to restocking all supplies.

Funding

Funding for inventory in the 2017 budget is \$23,000, which is level funded with 2016.



Capital Outlay

The Capital Outlay line item includes funding for Office Equipment and Field Equipment.

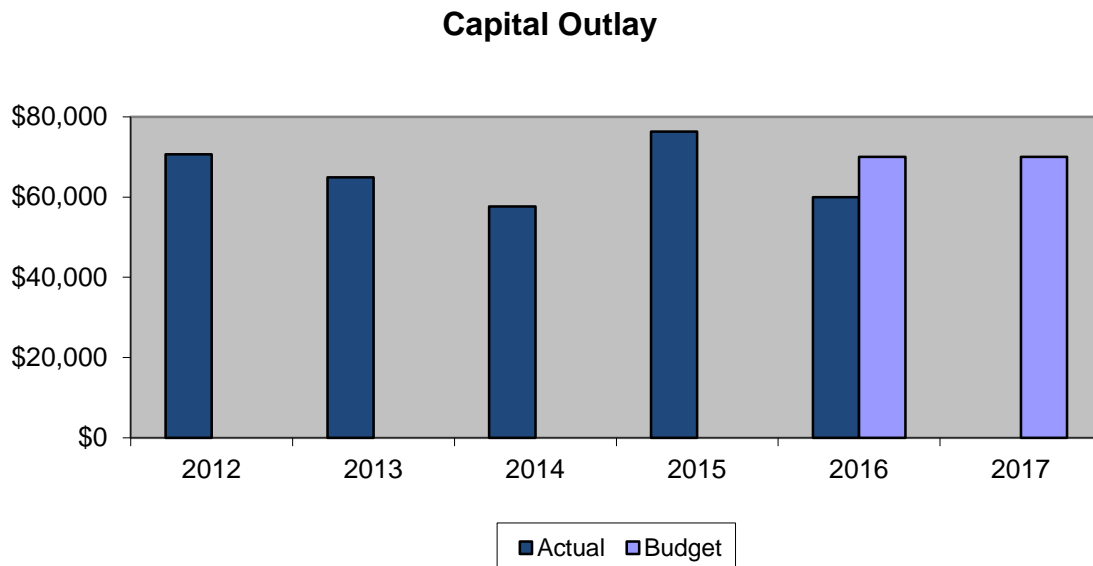
YEAR	TOTAL	% CHANGE	
2012	\$ 70,624	-25.0%	ACTUAL
2013	\$ 64,941	-8.0%	
2014	\$ 57,684	-11.2%	
2015	\$ 76,327	32.3%	
2016	\$ 60,000	-21.4%	
			Unaudited
2016	\$ 70,000		BUDGET
2017	\$ 70,000	0.0%	

Historical Viewpoint

In prior years, the Commission purchased replacement furniture and office equipment. Annual expenses for Capital Outlay totaled \$70,624 in 2012, \$64,941 in 2013, \$57,684 in 2014, \$76,327 in 2015, and \$60,000 in 2016.

Funding

Funding for Capital Outlay in the 2017 budget is \$70,000, which is level funded with the 2016 budget.



Travel/Training/Seminar

Travel/Training/Seminar is funded in order to provide Commission employees the opportunity to enhance professional development and stay current with the trends in their fields of expertise by attending job-related seminars or training sessions.

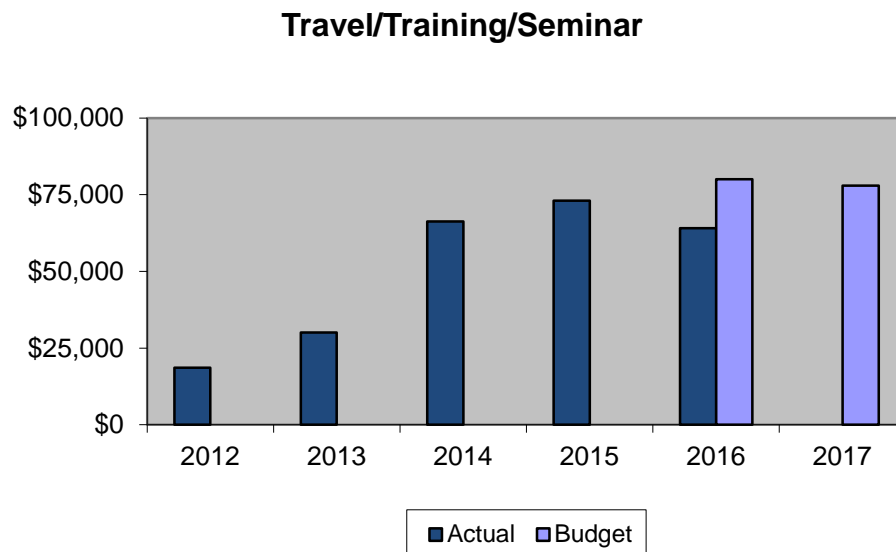
YEAR	TOTAL	% CHANGE	
2012	\$ 18,622	-2.3%	ACTUAL
2013	\$ 30,082	61.5%	
2014	\$ 66,283	120.3%	
2015	\$ 73,004	10.1%	
2016	\$ 64,110	-12.2%	
			Unaudited
2016	\$ 80,000		BUDGET
2017	\$ 78,000	-2.5%	

Historical Viewpoint

Travel/Training/Seminar expenditures totaled \$18,622 in 2012, \$30,082 in 2013, \$66,283 in 2014, \$73,004 in 2015, and \$64,110 in 2016.

Funding

Travel/Training/Seminar is funded at \$78,000 for 2017, which is \$2,000 or 2.5% less than the previous year. Monies for Travel/Training/Seminar are distributed amongst the following line items: Local Training/Seminar (\$32,000), Out-of-State Training/Seminar (\$5,000), Local Meeting/Conference (\$16,000), and Out-of-State Conference (\$25,000).



Damage Claims

The Damage Claims line item is budgeted to pay claims sustained against the Commission for personal injury, property damage, or employee liability damages. The Commission's current policy calls for a self-insured retention limit of \$1.0 million per occurrence and \$2.5 million in annual aggregate retention. In addition, damages relating to employee liability are subject to a \$100,000 self-insured retention limit. Claims exceeding \$10,000 are paid from the Insurance Reserve Account.

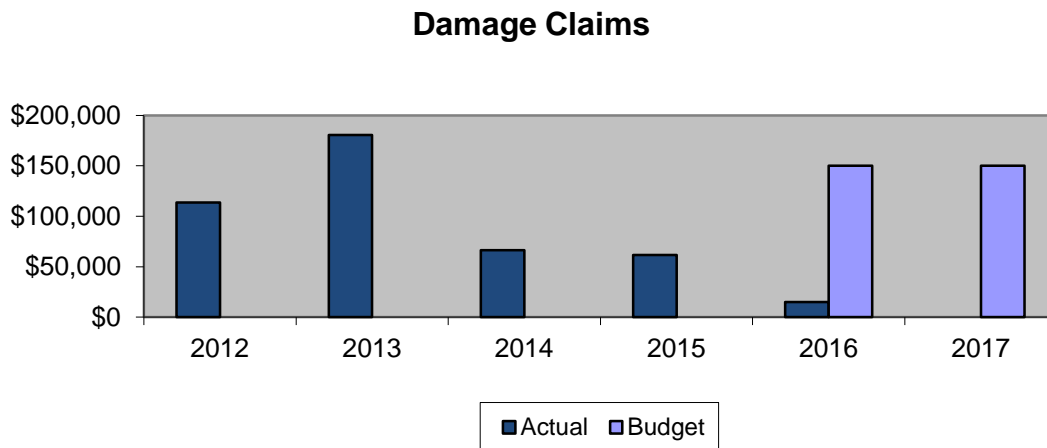
YEAR	TOTAL	% CHANGE	
2012	\$ 113,681	-48.9%	ACTUAL
2013	\$ 180,699	59.0%	
2014	\$ 66,283	-63.3%	
2015	\$ 61,729	-6.9%	
2016	\$ 15,000	-75.7%	
			Unaudited
2016	\$ 150,000		BUDGET
2017	\$ 150,000	0.0%	

Historical Viewpoint

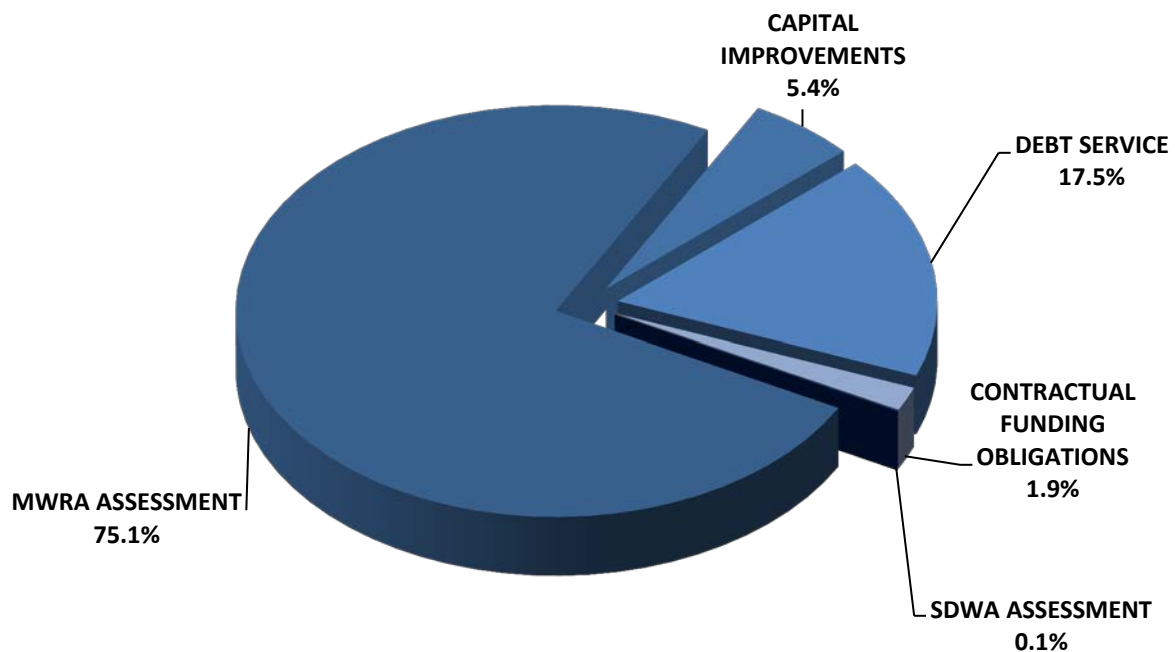
Damage Claims in a given year depend on how many claims are brought against the Commission. The decreases in expenditures over the past few years can be attributed to less damages claims being filed against the Commission. Expenses for Damage Claims totaled \$113,681 in 2012, \$180,699 in 2013, \$66,283 in 2014, \$61,729 in 2015, and \$15,000 in 2016.

Funding

Funding for Damage Claims in the 2017 budget is \$150,000, which is level funded with 2016.



INDIRECT EXPENSES FOR 2017 BUDGET



MWRA Assessment	\$	219,125,991
Capital Improvements	\$	15,877,000
Debt Service	\$	51,095,966
Contractual Funding	\$	5,420,347
SDWA Assessment	\$	202,659
Total Indirect Expenses for FY 2017		\$ 291,721,963

Indirect Expenses: 2017 vs. 2016

The table below displays the breakdown of Indirect Expenses. Variances from the 2017 to the 2016 budget are discussed in the following sections.

	2017 Budget		2016 Budget		Variance %
MWRA Assessment	\$	219,125,991	\$	213,780,214	2.5%
Capital Improvements	\$	15,877,000	\$	15,003,000	5.8%
Debt Service	\$	51,095,966	\$	48,251,190	5.9%
Contractual Funding	\$	5,420,347	\$	635,437	753.0%
SDWA Assessment	\$	202,659	\$	198,328	2.2%
TOTAL	\$	291,721,963	\$	277,868,170	5.0%

Indirect Expenses – MWRA Assessment

The Commission obtains its water supply and sewer treatment services from the MWRA. The MWRA provides wholesale water and sewer services to 2.5 million people and more than 5,500 large industrial users in 61 metropolitan Boston communities.

Background

On December 19, 1984, Chapter 372 of the Acts of 1984, known as the MWRA Act, was passed by the legislature, creating the MWRA. The MWRA was formed as a body politic and corporate and public instrumentality of the Commonwealth of Massachusetts (“the Commonwealth”). Effective July 1, 1985 the ownership, possession, and control of all personal property comprising the Metropolitan District Commission (“MDC”) water and sewer systems were transferred to the MWRA. It was recognized at that time that the MDC was unable to effectively manage the collection, treatment, and disposal of sewage in the Boston metropolitan area. The MWRA Act made the MWRA responsible for the repair, replacement, rehabilitation, modernization, and extension of the water delivery system and of 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.

Rates and Charges

The MWRA was empowered to establish charges for its services and commodities without supervision by other agencies or governmental bodies. 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 continues to be the single largest customer of the MWRA. For the MWRA fiscal year 2017, the Commission will be assessed \$82.8 million or 35.3% of MWRA total water system charges and \$132.3 million or 28.7% of the MWRA sewer system charges. On a combined basis, the Commission will pay \$215.0 million or 30.9% of the total MWRA combined assessments.

Assessments for water services are calculated by the MWRA based on the metered water use in the calendar year immediately preceding the MWRA fiscal year. The Commission’s water charges for MWRA Fiscal year 2017 total \$82,771,709 based on the Commission’s 2015 calendar year metered water use.

Sewer Assessments allocate 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.

Indirect Expenses – MWRA Assessment

The 2017 CEB includes funding for the MWRA Assessments totaling \$219.1 million. Since the MWRA fiscal year begins July 1 each year, the Commission's budgeted amount is based on MWRA rates for two fiscal years.

YEAR	TOTAL	% CHANGE	
2012	\$ 184,878,521	3.0%	ACTUAL
2013	\$ 191,786,231	3.7%	
2014	\$ 199,673,027	4.1%	
2015	\$ 206,839,502	3.6%	
2016	\$ 212,475,077	2.7%	
			Unaudited
2016	\$ 213,780,214		BUDGET
2017	\$ 219,125,991	2.5%	

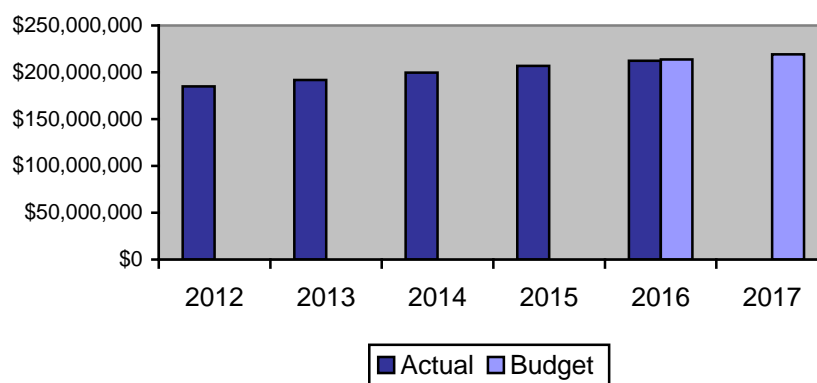
Historical Viewpoint

Expenses for MWRA Assessments have gradually increased in the past five years. Rate increases imposed by the MWRA have contributed to the rising expenditures. Amounts for MWRA Assessments totaled \$184.9 million in 2012, \$191.8 million 2013, \$199.7 million in 2014, and \$206.8 million in 2015, and \$212.5 million in 2016.

Funding

The 2017 Budget for the MWRA Assessment is \$219.1 million, an increase of \$5.3 million or 2.5% from the 2016 Budget. The MWRA and Commission have different fiscal years, thus, the budget for 2017 is based on an increase of 2.4% in MWRA FY17, and a projected 3.8% increase in MWRA FY18.

MWRA Assessment



Indirect Expenses – Capital Improvements

The Commission has an aggressive annual Capital Improvement Program in place to ensure the proper long-term integrity of its water distribution and wastewater collection systems. Capital Improvement expenses represent the costs associated with rate revenue funded projects undertaken in the CIP. In 2012, the Commission began to implement the recommendations made in the Water Distribution System Study. This study recommended that the Commission rehabilitate 11 miles of water mains per year through 2030. The Water Infrastructure Program, which is a grant loan provided by the MWRA, assists the Commission to pay for related projects.

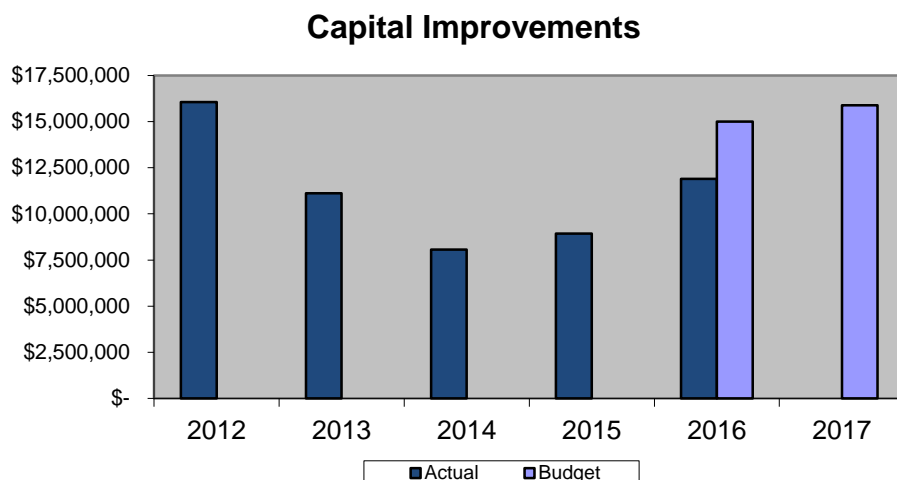
YEAR	TOTAL	% CHANGE	
2012	\$ 16,056,935	54.0%	ACTUAL
2013	\$ 11,110,952	-30.8%	
2014	\$ 8,057,958	-27.5%	
2015	\$ 8,939,628	10.9%	
2016	\$ 11,888,463	33.0%	
			Unaudited
2016	\$ 15,003,000		BUDGET
2017	\$ 15,877,000	5.8%	

Historical Viewpoint

Costs associated with Capital Improvements have fluctuated during the last five years, but increases have occurred in the previous two years. Expenses have totaled \$16.1 million in 2012, \$11.1 million in 2013, \$8.1 million in 2014, \$8.9 million in 2015, and \$11.9 million in 2016.

Funding

The amount budgeted in 2017 equals \$15.9 million, which is \$0.9 million or 5.8% more than 2016. The amount budgeted annually is based on project detail of new and ongoing water and sewer main rehabilitation projects outlined in the 2016-2018 Capital Improvement Program.



Indirect Expenses – Debt Service

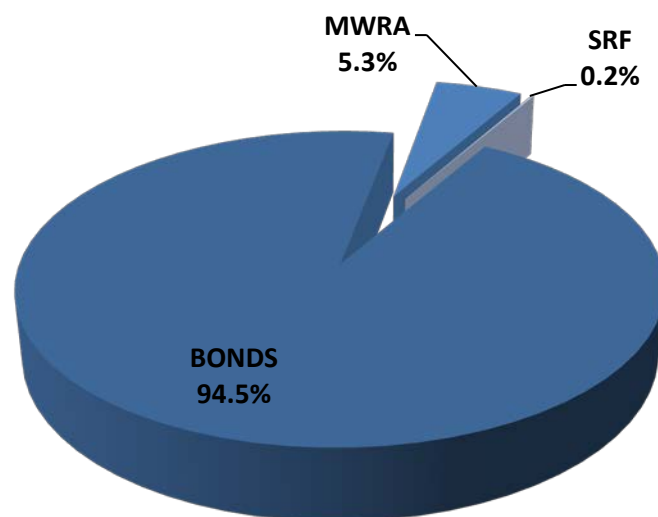
The Commission issues General Revenue Bonds to finance a portion of its Capital Improvement Program. The Commission has \$506.8 million of General Revenue Bonds outstanding with different maturity dates on which there will be required principal and interest payments in 2017. In addition to its debt service obligations associated with General Revenue Bonds, the Commission must pay debt service relating to the MWRA and Massachusetts Abatement Trust Loan and Grant Programs.

YEAR	TOTAL	% CHANGE	
2012	\$ 43,814,254	2.0%	ACTUAL
2013	\$ 45,815,575	4.6%	
2014	\$ 46,875,435	2.3%	
2015	\$ 48,105,732	2.6%	
2016	\$ 48,133,298	0.1%	
			Unaudited
2016	\$ 48,251,190		BUDGET
2017	\$ 51,095,966	5.9%	

Historical Viewpoint

In 2012, the Commission advance refunded the callable portion of the 2004 Series A Bonds, generating a \$5.7 million present value savings. In 2015, the Commission issued \$72.8 million in general revenue bonds and a partial refunding of the 2009 and 2010 Series A Bonds, to realize a net present value savings of \$5.4 million. In 2016, the Commission issued \$145.1 million in general revenue bonds and a partial refunding of the 2009 and 2010 Series A Bonds, to realize a net present value savings of \$9.1 million.

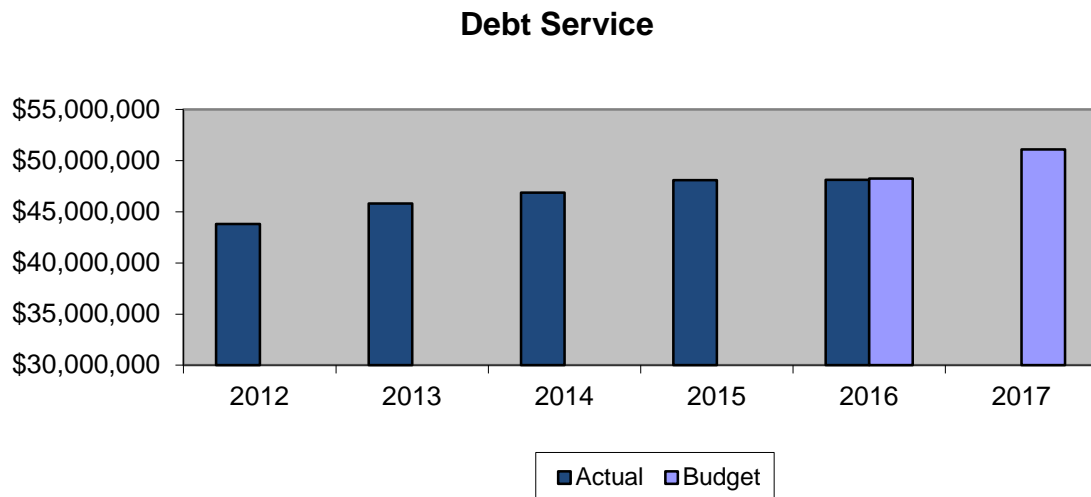
Outstanding Debt



Indirect Expenses – Debt Service

Funding

Funding for Debt Service is set at \$51.1 million for 2017, which is \$2.8 million or 5.9% more than 2016. The budget anticipates variable rate debt at 4.0%. The amount budgeted incorporates principal and interest payments on \$536.2 million, which consists of \$506.8 million Senior Debt, \$28.6 million MWRA loans, and \$0.8 million Massachusetts Water Pollution Abatement Trust.



Indirect Expenses – Debt Service

Current outstanding debt includes the following General Revenue Bonds:

1993 Series A = \$21.2 million	2012 Series A = \$105.0 million
1994 Series A = \$18.6 million	2014 Series A = \$100.0 million
2009 Series A = \$13.0 million	2015 Series A = \$72.8 million
2009 Series B = \$24.9 million	2016 Series A = \$60.2 million
2010 Series A = \$6.3 million	2016 Series B = \$85.0 million

2017 Debt Service				
	INTEREST		PRINCIPAL	TOTAL
1993 Series A (Senior)	\$ 1,110,375	\$	7,790,000	\$ 8,900,375
1994 Series A (Senior)	\$ 738,000	\$	1,800,000	\$ 2,538,000
2009 Series A (Senior)	\$ 578,344	\$	3,565,000	\$ 4,143,344
2009 Series B (Senior)	\$ 1,206,100	\$	4,415,000	\$ 5,621,100
2010 Series A (Senior)	\$ 284,800	\$	705,000	\$ 989,800
2012 Series A (Senior)	\$ 4,520,424	\$	2,720,000	\$ 7,240,424
2014 Series A (Senior)	\$ 3,699,250	\$	100,000	\$ 3,799,250
2015 Series A (Senior)	\$ 3,461,550	\$	-	\$ 3,461,550
2016 Series A (Senior)	\$ 2,757,550	\$	-	\$ 2,757,550
2016 Series B (Senior)	\$ 3,290,300	\$	500,000	\$ 3,790,300
Total of Senior Bonds	\$ 21,646,694	\$	21,595,000	\$ 43,241,694
SRF Debt Service	\$ -	\$	549,745	\$ 549,745
MWRA I/I	\$ -	\$	2,744,607	\$ 2,744,607
MWRA PAP	\$ -	\$	1,847,140	\$ 1,847,140
MWRA SAP	\$ -	\$	2,712,780	\$ 2,712,780
	\$ -	\$	7,854,272	\$ 7,854,272
Total Debt Service	\$ 21,646,694	\$	29,449,272	\$ 51,095,966

Indirect Expenses – Debt Service

MWRA PAP is the Water Pipeline Assistance Program, an interest free loan implemented in September 1999.

- SRF includes one pool

	INTEREST	PRINCIPAL	TOTAL
POOL 3	\$ -	\$ 549,745	\$ 549,745
	\$ -	\$ 549,745	\$ 549,745

- MWRA I/I includes three phases

	INTEREST	PRINCIPAL	TOTAL
PHASE 6	\$ -	\$ 460,339	\$ 460,339
PHASE 7	\$ -	\$ 1,246,520	\$ 1,246,520
PHASE 8	\$ -	\$ 1,037,748	\$ 1,037,748
	\$ -	\$ 2,744,607	\$ 2,744,607

- MWRA includes SAP and PAP

	INTEREST	PRINCIPAL	TOTAL
SAP	\$ -	\$ 2,712,780	\$ 2,712,780
PAP	\$ -	\$ 1,847,140	\$ 1,847,140
	\$ -	\$ 4,559,920	\$ 4,559,920

Indirect Expenses – Contractual Funding Obligations

The Commission, as required by its Bond Resolution, maintains an Operating Reserve Fund, a Renewal and Replacement Reserve Fund, an Insurance Reserve Fund, and Stabilization Fund. The Contractual Funding Obligation line item represents mandated funding of all of these funds. The Commission is annually required to maintain a balance in the Operating Reserve Fund an amount equal to one-sixth of the Commission's operating and maintenance expenses and the accrued MWRA Assessments for that year.

YEAR	TOTAL	% CHANGE	
2012	\$ 340,000	-43.2%	ACTUAL
2013	\$ 5,211,606	1432.8%	
2014	\$ 6,643,000	27.5%	
2015	\$ 6,990,000	5.2%	
2016	\$ 2,313,000	-66.9%	
2016	\$ 635,437		BUDGET
2017	\$ 5,420,347	753.0%	

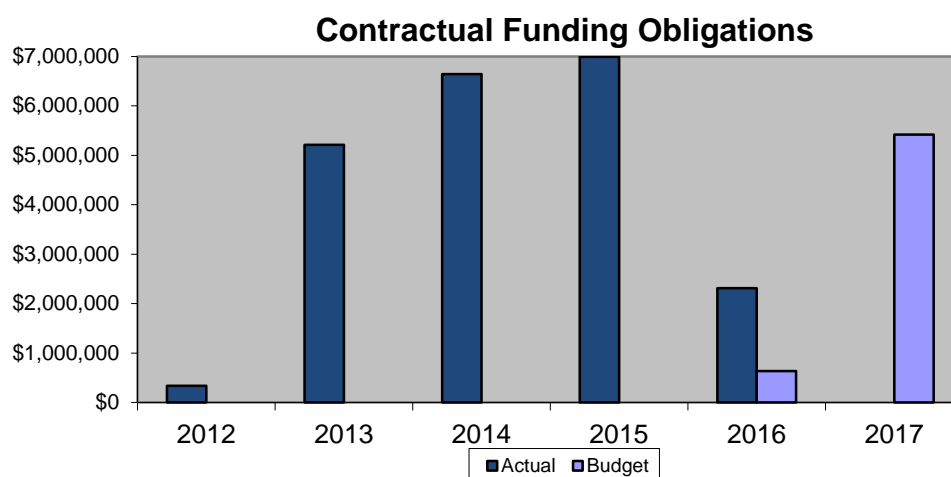
Unaudited

Historical Viewpoint

Contractual Funding Obligations have totaled \$0.3 million in 2012, \$5.2 million in 2013, \$6.6 million in 2014, \$7.0 million in 2015, and \$2.3 million in 2016. Changes in spending can be attributed to different monthly deposit amount requirements by year per the Bond Resolution.

Funding

The amount funded for Contractual Funding Obligations in the 2017 budget is \$5.4 million, which is an increase of \$4.8 million or 753.0% from the 2016 budget. Changes in spending can be attributed to different monthly deposit amount requirements by year per the Bond Resolution.



Indirect Expenses – Safe Drinking Water Act Assessment

The Safe Drinking Water Act (“SDWA”) Assessment line item was established as a result of a federal mandate. Massachusetts has opted to oversee the implementation of the SDWA throughout the Commonwealth (“Primacy”). A funding mechanism for Primacy was approved by the Legislature in 1993 that entails an assessment to all water suppliers.

YEAR	TOTAL	% CHANGE	
2012	\$ 204,893	-0.6%	ACTUAL
2013	\$ 200,761	-2.0%	
2014	\$ 200,249	-0.3%	
2015	\$ 198,327	-1.0%	
2016	\$ 198,328	0.0%	
			Unaudited
2016	\$ 198,328		BUDGET
2017	\$ 202,659	2.2%	

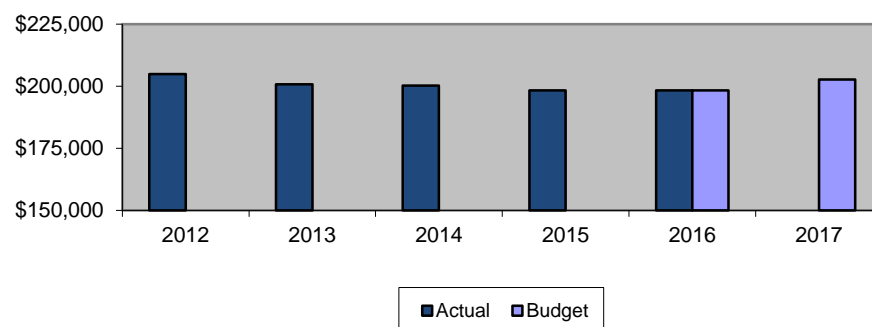
Historical Viewpoint

The SDWA Assessment is based upon the volume of water purchased during the previous calendar year. Declining water purchases have caused the SDWA Assessment to diminish over the last five years realizing amounts of \$204,893 in 2012, \$200,761 in 2013, \$200,249 in 2014, \$198,327 in 2015, and \$198,328 in 2016.

Funding

The 2017 budget for the Safe Drinking Water Act Assessment is \$202,659, which is an increase of 2.2% from the 2016 budget. Massachusetts opted to oversee the implementation of the SDWA throughout the Commonwealth; the Legislature approved a funding mechanism that entails an assessment to all water suppliers. This assessment is calculated at \$0.0085 per thousand gallons of water purchased to offset expenses incurred by the Department of Environmental Protection, which includes monitoring, inspection, and enforcement of activities.

SDWA Assessment



Fund Balances

The statements of net assets provide the information on the assets and liabilities of the Commission, with net assets (deficits) reported as the difference between assets and liabilities. Condensed financial information for the three most recent fiscal years is presented below.

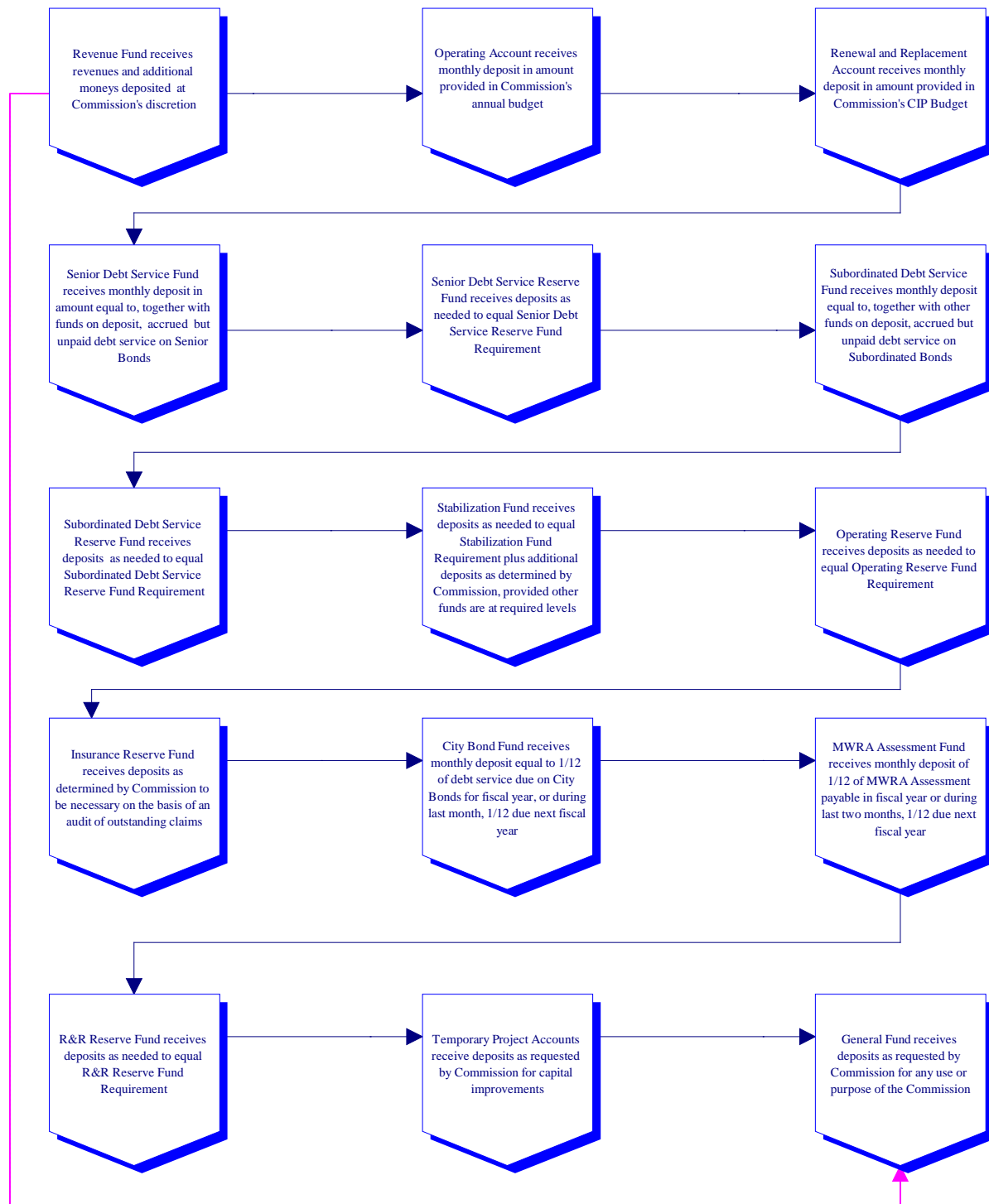
	2013	2014	2015
Current Assets	58,906,425	58,200,951	57,638,267
Capital Net Assets	1,207,956,772	1,256,782,012	1,302,177,235
Other Assets	213,520,877	237,848,686	229,384,295
Total Assets	1,480,384,074	1,552,831,649	1,589,199,797
Current Liabilities	96,138,906	60,148,576	93,965,789
Noncurrent Liabilities	448,247,213	529,401,854	520,902,941
Total Liabilities	544,386,119	589,550,430	614,868,730
Net Assets			
Invested in Capital Assets	800,137,309	785,722,222	764,282,627
Restricted Net Assets	93,154,087	96,275,938	100,160,909
Unrestricted Net Deficits	(517,415,068)	(509,209,599)	(473,792,441)
Total Net Assets	375,876,328	372,788,561	390,651,095

The Commission's Resolution required the establishment of the following funds and accounts shown below in the table presented. The table below illustrates historic and projected year-end balances for these funds. Further details on each individual fund follow.

Fund	Actual 2012	Actual 2013	Actual 2014	Actual 2015	Unaudited 2016	Projected 2017
Revenue	\$ 983,166	\$ 2,343,419	\$ 2,152,517	\$ 10,596,116	\$ 5,243,027	\$ 743,027
Operating & Maintenance	\$ 5,585,414	\$ 6,283,782	\$ 4,125,992	\$ 6,691,893	\$ 7,540,407	\$ 7,540,407
Sr. Debt Service	\$ 5,785,112	\$ 6,206,141	\$ 6,204,802	\$ 6,674,279	\$ 7,147,627	\$ 7,279,016
Sr. Debt Service Reserve	\$ 37,837,705	\$ 37,898,563	\$ 41,486,024	\$ 41,667,576	\$ 44,213,737	\$ 44,213,737
Operating Reserve	\$ 41,488,344	\$ 41,854,970	\$ 43,909,711	\$ 46,550,354	\$ 47,005,939	\$ 48,615,939
Insurance Reserve	\$ 5,931,028	\$ 3,535,121	\$ 1,757,906	\$ 1,559,564	\$ 1,211,674	\$ 1,211,674
MWRA	\$ 16,413,754	\$ 16,206,845	\$ 16,811,964	\$ 18,519,213	\$ 18,840,880	\$ 18,875,150
R & R Reserve	\$ 3,508,534	\$ 3,362,444	\$ 3,863,999	\$ 3,312,223	\$ 3,805,716	\$ 4,024,716
General	\$ 1,674,501	\$ 1,656,384	\$ 1,711,470	\$ 2,309,163	\$ 2,370,616	\$ 1,861,769
Stabilization	\$ 50,763,028	\$ 54,975,935	\$ 59,130,129	\$ 64,956,984	\$ 66,766,960	\$ 67,359,281
Total	\$ 169,970,586	\$ 174,323,604	\$ 181,154,514	\$ 202,837,364	\$ 204,146,583	\$ 201,724,716

➔ NOTE: None of the Commission Funds are subject to appropriation

Flow of Funds



Revenue Fund

The Commission's Bond Resolution establishes funds dedicated to the payment of certain obligations of the Commission. In accordance with the Commission's Bond Resolution, all reserves (except certain sale, insurance and condemnation proceeds and certain investment earnings) are deposited in the Revenue Fund, which is held by the Commission's trustee. The Bond Resolution provides that the Trustee make monthly transfers from the Revenue Fund to the other funds and accounts as directed and required.

The Commission projects that in 2017, \$361.3 million will be deposited and \$365.8 million will be withdrawn from the Revenue Fund. The net of these transactions will produce a year-end balance of \$0.7 million. The transactions are summarized in the table below.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 1,655,571	\$ 295,978,595	\$ (296,651,000)	\$ 983,166
2013	\$ 983,166	\$ 313,317,253	\$ (311,957,000)	\$ 2,343,419
2014	\$ 2,343,419	\$ 321,348,099	\$ (321,539,001)	\$ 2,152,517
2015	\$ 2,152,517	\$ 345,971,599	\$ (337,528,000)	\$ 10,596,116
2016	\$ 10,596,116	\$ 358,025,911	\$ (363,379,000)	\$ 5,243,027
2017	\$ 5,243,027	\$ 361,331,117	\$ (365,831,117)	\$ 743,027

2016 Figures are Unaudited
2017 Figures are Projected

➔ Deposits include:

- Water and Sewer Receipts
- Interest income earned from Revenue Fund
- Liens
- Write-off recovery
- Fees collected for special services
- Interest income transferred from other funds

➔ Withdrawals include transfers to other funds

Operating and Maintenance Fund

Deposits are made into the Operating and Maintenance Fund at the end of each month for the following month as provided for in the annual budget. The monies deposited into this fund are used to pay for the Commission's day-to-day expenditures such as wages and salaries and payments to vendors for goods and services received. Department heads are required on a monthly basis to inform the Treasury Services Department of any unforeseen expenditures so that the Operating Account deposit can be modified based on the revised expenditure plan.

As illustrated below, the Commission projects that in 2017, \$165.0 million will be deposited and \$165.0 million will be withdrawn, resulting in an ending balance of \$7.5 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 4,814,452	\$ 147,829,278	\$ (147,058,316)	\$ 5,585,414
2013	\$ 5,585,414	\$ 158,938,036	\$ (158,239,668)	\$ 6,283,782
2014	\$ 6,283,782	\$ 165,427,531	\$ (167,585,321)	\$ 4,125,992
2015	\$ 4,125,992	\$ 171,111,659	\$ (168,545,758)	\$ 6,691,893
2016	\$ 6,691,893	\$ 188,441,781	\$ (187,593,267)	\$ 7,540,407
2017	\$ 7,540,407	\$ 165,013,681	\$ (165,013,681)	\$ 7,540,407

2016 Figures are Unaudited
2017 Figures are Projected

Senior Debt Service Fund

The Senior Debt Service Fund provides for the payment of debt service on senior bonds. Deposits are made monthly in equal amounts, together with funds already on deposit, which are sufficient to meet scheduled debt service payments for a given year.

The Commission projects a beginning balance of \$7.1 million in 2017. Deposits made in 2017 are projected to be \$43.4 million and amounts withdrawn are projected to total \$43.2 million, resulting in a projected ending balance of \$7.3 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 5,625,587	\$ 34,985,799	\$ (34,826,274)	\$ 5,785,112
2013	\$ 5,785,112	\$ 35,842,140	\$ (35,421,111)	\$ 6,206,141
2014	\$ 6,206,141	\$ 36,442,349	\$ (36,443,688)	\$ 6,204,802
2015	\$ 6,204,802	\$ 39,437,017	\$ (38,967,540)	\$ 6,674,279
2016	\$ 6,674,279	\$ 39,716,473	\$ (39,243,125)	\$ 7,147,627
2017	\$ 7,147,627	\$ 43,373,083	\$ (43,241,694)	\$ 7,279,016

2016 Figures are Unaudited

2017 Figures are Projected

➔ Deposits represent:

- Transfers from the Revenue Fund
- Amounts escrowed to pay debt service
- Interest income received on the Senior Debt Service Fund
- Interest earned is not transferred to Revenue Fund

➔ Withdrawals represent actual senior debt service payments

Senior Debt Service Reserve Funds

The Senior Debt Service Reserve Funds are maintained at a level sufficient to meet the respective requirements as outlined in the Bond Resolution. These funds are to be used in the event there are insufficient funds in the respective debt service funds. The requirement for each account is equal to the total maximum aggregate amount of principal and interest becoming due in any fiscal year for fixed rate bonds plus the maximum aggregate amount of principal and interest becoming due in any fiscal for variable rate bonds.

The 2017 beginning balance is projected at \$44.2 million. The projected deposit for 2017 is \$7.7 million, and the projected withdrawal is \$7.7 million, resulting in an ending balance of \$44.2 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 35,568,592	\$ 2,919,113	\$ (650,000)	\$ 37,837,705
2013	\$ 37,837,705	\$ 1,260,858	\$ (1,200,000)	\$ 37,898,563
2014	\$ 37,898,563	\$ 4,662,461	\$ (1,075,000)	\$ 41,486,024
2015	\$ 41,486,024	\$ 1,206,551	\$ (1,025,800)	\$ 41,667,575
2016	\$ 41,667,575	\$ 3,981,162	\$ (1,435,000)	\$ 44,213,737
2017	\$ 44,213,737	\$ 7,730,740	\$ (7,730,740)	\$ 44,213,737

2016 Figures are Unaudited

2017 Figures are Projected

- ➔ Deposits to the Senior Debt Service Reserve represents:
 - Interest Income received on the fund
 - Additional monthly accruals deposited
- ➔ Any excess reserve gets transferred to the Revenue Fund
- ➔ Reserve Requirement is equal to \$43,749,894
- ➔ In the Reserve Fund is \$44,213,737 cash and \$7,168,001 in a surety policy
- ➔ Assets valued at amortized cost

Operating Reserve Fund

The Operating Reserve Fund receives deposits as needed to meet the requirements outlined in the Bond Resolution. The purpose of the Operating Reserve Fund is to provide funds if at any time the amount on deposit in the Operating Account is insufficient to meet operating expenses that are payable, or if there are insufficient funds in the MWRA Assessment Fund to pay the MWRA charges due. The Operating Reserve Fund requirement is equal to one-sixth, or two months of the Commission's projected annual operating expenses and MWRA charges.

The Commission's beginning balance in 2017 is projected to be \$47.0 million. The Commission projects deposits to equal \$2.4 million and withdrawals to equal \$0.8 million resulting in a year end balance projection of \$48.6 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 40,548,752	\$ 1,399,592	\$ (460,000)	\$ 41,488,344
2013	\$ 41,488,344	\$ 816,626	\$ (450,000)	\$ 41,854,970
2014	\$ 41,854,970	\$ 2,054,741	\$ -	\$ 43,909,711
2015	\$ 43,909,711	\$ 2,640,643	\$ -	\$ 46,550,354
2016	\$ 46,550,354	\$ 1,155,585	\$ (700,000)	\$ 47,005,939
2017	\$ 47,005,939	\$ 2,432,604	\$ (822,604)	\$ 48,615,939

2016 Figures are Unaudited

2017 Figures are Projected

- ➔ Withdrawals represent transfers of earned interest to the Revenue Fund
 - Withdrawals equals any excess reserves

- ➔ 2017 Requirement equals one-sixth of the MWRA Assessment plus one-sixth of the Direct Expenses

Insurance Reserve Fund

The Insurance Reserve Fund receives deposits as required to maintain the balance at a level sufficient to cover the costs of pending claims against the Commission, as certified annually by the Commission's insurance consultant.

Currently, the Commission utilizes the Insurance Reserve Fund to pay all damage claims in excess of \$10,000. Deposits in 2017 are projected for \$1,818 and the withdrawal amount is projected for \$1,818, resulting in a projected ending balance of \$1.2 million for 2017.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 5,894,113	\$ 36,915	\$ -	\$ 5,931,028
2013	\$ 5,931,028	\$ 4,093	\$ (2,400,000)	\$ 3,535,121
2014	\$ 3,535,121	\$ 2,785	\$ (1,780,000)	\$ 1,757,906
2015	\$ 1,757,906	\$ 1,658	\$ (200,000)	\$ 1,559,564
2016	\$ 1,559,564	\$ 2,110	\$ (350,000)	\$ 1,211,674
2017	\$ 1,211,674	\$ 1,818	\$ (1,818)	\$ 1,211,674

2016 Figures are Unaudited

2017 Figures are Projected

➔ Deposits reflect interest income received on Insurance Reserve Fund

➔ Withdrawals represent interest income transferred to the Revenue Fund

MWRA Assessment Fund

The MWRA Assessment Fund receives monthly deposits of one-twelfth of the MWRA Assessment payable in a given fiscal year. Scheduled payments are made monthly in ten equal monthly payments (excluding January and July) to satisfy the MWRA's wholesale water and sewer charges.

The ending balance in 2016 equals \$18.8 million. The ending balance in 2016 is the beginning balance projected in 2017. Deposits in 2017 are projected for \$219.2 million and the withdrawal amount is projected for \$219.1 million, resulting in an ending balance of \$18.9 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 16,399,770	\$ 184,892,505	\$ (184,878,521)	\$ 16,413,754
2013	\$ 16,413,754	\$ 191,579,322	\$ (191,786,231)	\$ 16,206,845
2014	\$ 16,206,845	\$ 200,278,145	\$ (199,673,026)	\$ 16,811,964
2015	\$ 16,811,964	\$ 208,546,751	\$ (206,839,502)	\$ 18,519,213
2016	\$ 18,519,213	\$ 212,796,744	\$ (212,475,077)	\$ 18,840,880
2017	\$ 18,840,880	\$ 219,160,261	\$ (219,125,991)	\$ 18,875,150

2016 Figures are Unaudited

2017 Figures are Projected

➔ Deposits represent

- Transfers from the Revenue Fund
- Interest income

➔ Withdrawals reflect

- Payments to the MWRA
- Transfers of Interest Income to the Revenue Fund

Renewal and Replacement Reserve Fund

The Renewal and Replacement (“R & R”) Reserve Fund is intended to provide additional funds for R & R projects if there are insufficient funds in the Renewal and Replacement Account to pay for these projects. In addition, this fund may also be used to pay debt service if certain other funds are insufficient to meet this purpose. The requirement for this fund is 25% of the budgeted R & R expenditures for the year.

The Commission projects \$3.8 million for its beginning balance in 2017. Deposits for 2017 are projected at \$0.3 million and withdrawals at \$0.1 million resulting in an ending balance of \$4.0 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 3,198,507	\$ 310,027	\$ -	\$ 3,508,534
2013	\$ 3,508,534	\$ 28,910	\$ (175,000)	\$ 3,362,444
2014	\$ 3,362,444	\$ 501,555	\$ -	\$ 3,863,999
2015	\$ 3,863,999	\$ 148,224	\$ (700,000)	\$ 3,312,223
2016	\$ 3,312,223	\$ 493,493	\$ -	\$ 3,805,716
2017	\$ 3,805,716	\$ 285,600	\$ (66,600)	\$ 4,024,716

2016 Figures are Unaudited

2017 Figures are Projected

- ➔ Deposits represent interest earned
- ➔ Withdrawals reflect interest transfers to the Revenue Fund
- ➔ Fully funded at the beginning of year

General Fund

Deposits to the General Fund must occur on the last business day of the year and may be held and applied by the Commission for any use or purpose. The Commission is currently using the General Fund as a repository for the funds, which are required to satisfy the Commission's obligation to the Massachusetts Pollution Abatement Trust.

As illustrated below, the December 2016 year-end balance equals \$2.4 million, which represents the projected 2017 beginning balance. The amount projected to be deposited in 2017 equals \$41,486 and the amount withdrawn is projected to equal \$0.6 million, resulting in a projected ending balance of \$1.9 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 1,605,989	\$ 1,516,952	\$ (1,448,440)	\$ 1,674,501
2013	\$ 1,674,501	\$ 1,536,228	\$ (1,554,345)	\$ 1,656,384
2014	\$ 1,656,384	\$ 1,117,259	\$ (1,062,173)	\$ 1,711,470
2015	\$ 1,711,470	\$ 1,674,325	\$ (1,076,632)	\$ 2,309,163
2016	\$ 2,309,163	\$ 605,485	\$ (544,032)	\$ 2,370,616
2017	\$ 2,370,616	\$ 41,486	\$ (550,333)	\$ 1,861,769

2016 Figures are Unaudited
2017 Figures are Projected

- ➔ Deposits reflect
 - Transfers from Revenue Fund
 - Interest Income

- ➔ Deposits into General Fund incorporate any expenses for SRF loans in the following year

- ➔ Withdrawals represent
 - Principal and Interest payments on loans to Massachusetts Pollution Abatement Trust

Stabilization Fund

The Rate Stabilization Fund, as established in the Bond Resolution, is to be used to minimize the rate impact of extraordinary cost increases, such as large increases in the MWRA Assessments to the Commission; or significant increases in interest rates on the Commission's variable rate debt. The Stabilization Fund Requirement is defined in the Resolution as an amount equal to 4% of the aggregate principal amount of Outstanding Variable Rate Bonds (referred to as the "Stabilization Fund Resolution Requirement"). The Resolution also provides discretion to the Commission to make additional deposits to the Stabilization Fund and to withdraw amounts as needed to fund Commission expenses.

Currently, the Commission policy, which was amended in December 2000, further states that the amount on deposit in the Stabilization Fund shall equal the greater of the Rate Stabilization Fund Resolution Requirement or 10% of the previous fiscal year's net-billed charges. If at the start of the fiscal year the balance of the Rate Stabilization Fund is projected to exceed such requirements then the Commission on the last business day of the current fiscal year may transfer to the Revenue Fund an amount up to the greater of 20% of such excess or \$20 million, but in either case, an amount not to exceed \$20 million in any one fiscal year.

The Commission has been very aggressive in managing the funding and utilization of the Rate Stabilization Fund to have the greatest impact of future rate mitigation. The recent amendment to the policy ensures that funds withdrawn at a sensible pace that mitigates sharp ratepayer increases and permits the availability of the surplus balance for future fiscal years.

The Commission projects the 2017 year-end balance to equal \$67.4 million.

	Begin Balance	Deposits	Withdrawals	Ending Balance
2012	\$ 50,919,326	\$ 1,050,702	\$ (1,207,000)	\$ 50,763,028
2013	\$ 50,763,028	\$ 5,212,907	\$ (1,000,000)	\$ 54,975,935
2014	\$ 54,975,935	\$ 5,804,194	\$ (850,000)	\$ 59,930,129
2015	\$ 59,930,129	\$ 5,776,855	\$ (750,000)	\$ 64,956,984
2016	\$ 64,956,984	\$ 2,779,976	\$ (970,000)	\$ 66,766,960
2017	\$ 66,766,960	\$ 4,761,881	\$ (4,169,560)	\$ 67,359,281

2016 Figures are Unaudited
2017 Figures are Projected

- ➔ Deposits represent transfers from the Revenue Fund plus Interest Income
- ➔ Withdrawals reflect transfers to other Commission funds
- ➔ Commission has solicited the Board of Commissioners to modify the policy on Rate Stabilization so that future anticipated increases might be gradually implemented

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The Commission

Commission Organization

The Boston Water and Sewer Commission is overseen by a three member Board of Commissioners appointed by the Mayor of Boston, subject to approval by the City Council. The primary responsibility of the Board is to ensure the sound economical and efficient operation and maintenance of the systems to ensure the highest quality services to the City of Boston. The Board of Commissioners is also responsible for setting clear financial and operational policy directives.

The Commission consists of five divisions: Executive, Operations, Engineering, Administration and Finance.

The Executive Division provides executive management, including policy formation and strategic planning, to the entire Commission. The Executive Division also represents the Commission in all legislative lobbying efforts pertaining to securing continued federal and state funded rate relief. This Division is also responsible for implementing and monitoring the Commission's affirmative action plans and ensuring the participation of women and minority owned businesses in obtaining goods, services contracts and safety management to the entire Commission. Additionally, the Executive Division represents the Commission in all litigation. The Human Resources Department is now part of the Executive Division and provides its employees with proactive personnel services.

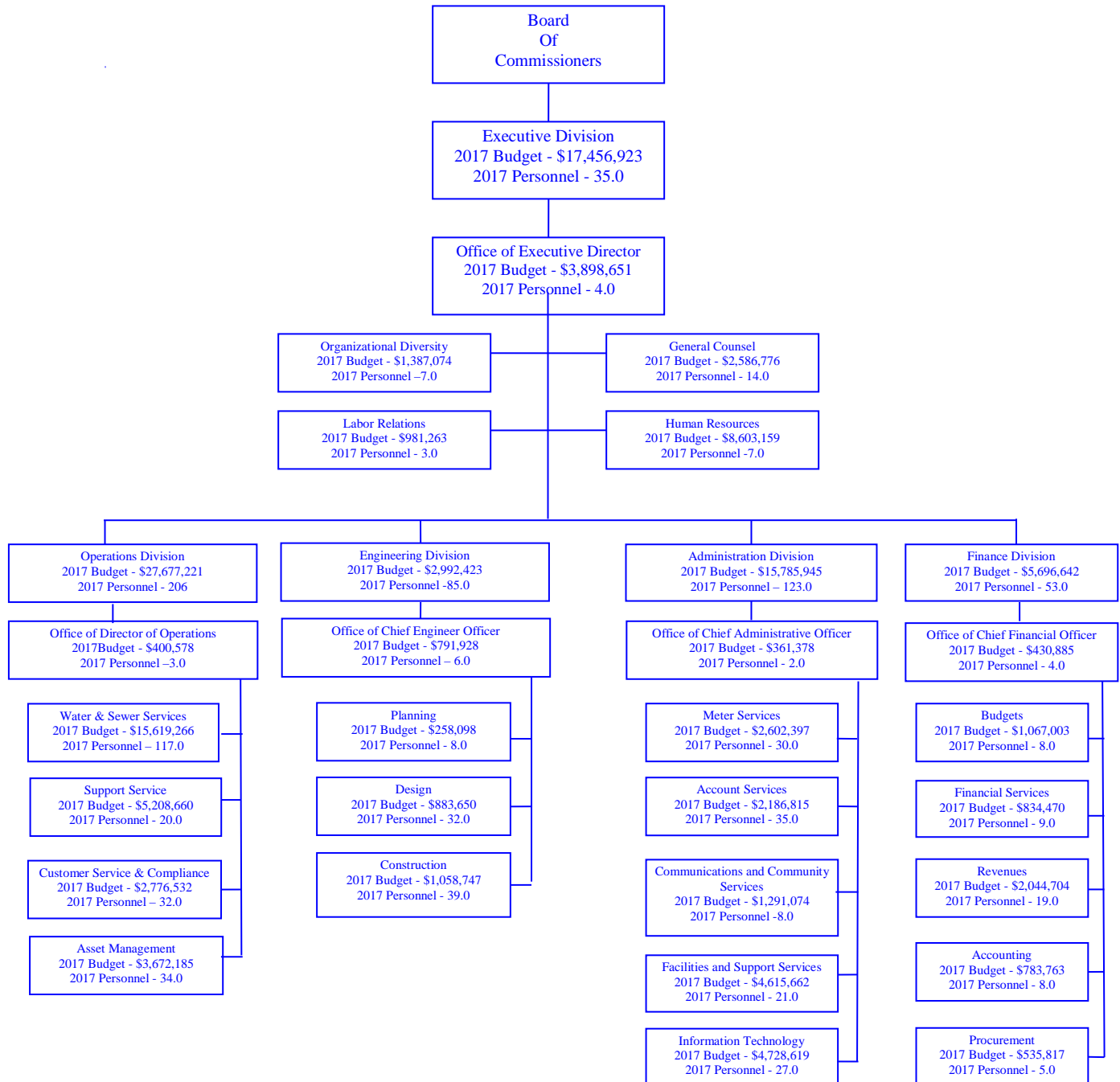
The Operations Division ensures the ongoing maintenance and emergency repairs to the Commission's water and sewer mains, service connections, hydrants and drains. The Division is also responsible for inventory control, management and maintenance of the Commission's automotive fleet for the entire Commission.

The Engineering Division is responsible for high quality, reliable water, sewer and drainage services. These services are achieved by effectively planning, designing, managing and providing contract compliance for the construction of the Commission's Capital Improvement Projects.

The Administration Division provides the Commission and the Commission's customers with administrative support services. The Administration Division provides its employees with proactive personnel services. This Division is responsible for representing the Commission at various public and community meetings, maintaining collections, customer services and the installation and repair of meters and the provision of facilities and support services. The Information Technology ("IT") Department is now part of the Administration Division and is responsible for the preservation of the Commission's technical infrastructure.

The Finance Division provides effective management of the Commission's revenues and all its resources. The Finance Division accomplishes this through its financial budgeting, rate setting, accounting and cash management, billing and adjustments. This Division is also responsible for debt financing, investment management, providing procurement, investigate, document and resolve meter problems and erratic consumption.

Commission-Wide Organizational Chart

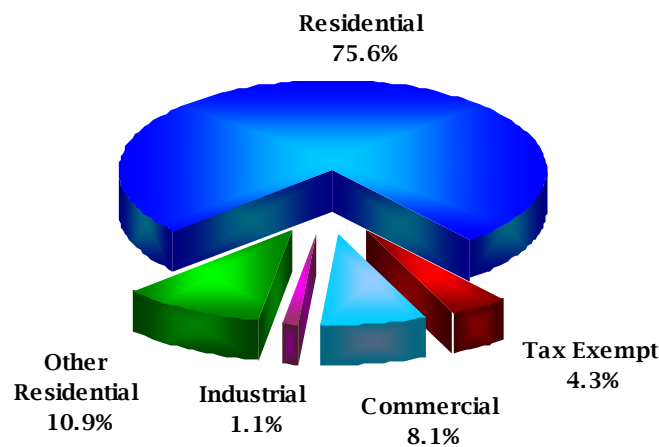


The Commission

Customer Base

The Commission provides water and sewer services to residential, commercial, industrial, public, private and non-profit institutional properties throughout the city. The distribution of the Commission's 88,079 accounts in 2016 was as follows: 75.6% were one to three family dwellings; other residential dwellings accounted for 10.9%. Commercial customers represented 8.1%; Tax-exempt customers accounted for an additional 4.3%; the remaining 1.1% of the customer base is made of the industrial customers. It should be noted that the Boston Housing Authority, which is tax exempt and is the Commission's largest customer, falls into the classification "other residential."

2016 Distribution of Customers by Account



Account Type by Land Code	Number of Accounts	% of Total Accounts
Residential	66,562	75.6%
Other Residential	9,564	10.9%
Commercial	7,182	8.1%
Tax Exempt	3,840	4.3%
Industrial	931	1.1%
Total by Land Code	88,079	100.0%

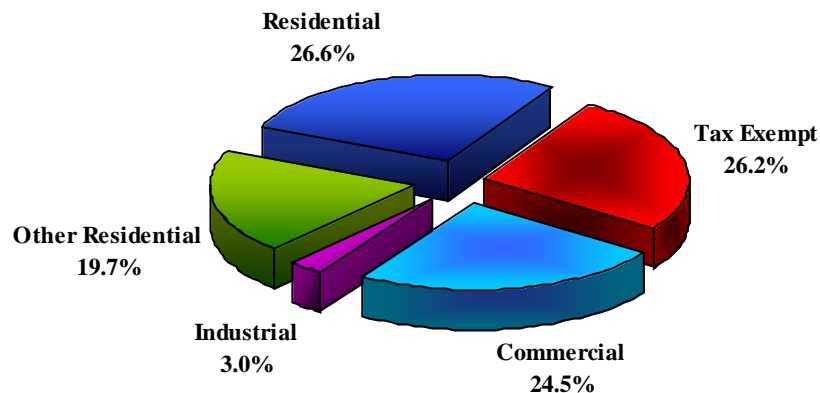
In the above table and graph, one to three family dwellings have accounted for 75.6% of the total accounts. The actual consumption for residential accounts is much lower, using only 26.6%. Other residential customers accounted for an additional 19.7%. Tax Exempt organizations, which include hospitals, universities, religious institutions and government agencies, accounted for 26.2%. The commercial and industrial customers consumed 27.5% with 24.5% and 3.0% used, respectively.

The Commission

While the graph on the previous page highlights the distribution of the Commission's customer base by account type, the graph below illustrates the distribution of customers by consumption. The non-residential segment of the customer base (commercial, industrial and tax-exempt), although representing only 13.5% of customer accounts generated 86.5% of retail water sales. These accounts are financially strong entities for which water and sewer charges typically represent a relatively small portion of their operating budget. The high percentage of annual consumption consumed by a relatively small number of accounts has had a positive financial impact on the Commission. These accounts, which include hospitals, universities, commercial and industrial businesses, provide the necessary stability and diversity to the customer base, while providing a steady stream of revenue on a monthly basis. The composition of the Commission's customer base is highly regarded by credit rating agencies as a major financial strength. Together with the Commission's proven record of financial management, we have achieved excellent credit ratings. The Commission has received the following ratings from credit agencies:

- "AA+" -- Standard and Poor's
- "Aa1" -- Moody's Investor Services

2016 Distribution of Customers by Consumption



Account Type by Consumption	Sales in Cubic Feet (000)	% of Total Accounts
Residential	723,390	26.6%
Other Residential	534,653	19.7%
Commercial	665,760	24.5%
Tax Exempt	714,296	26.2%
Industrial	82,454	3.0%
Total by Consumption	2,720,553	100.0%

2016 Commission Results

The Commission established 78 tactical and strategic goals and core program functions for 2016, which are highlighted in the “Program Goals and Budgets” section. The Commission has received numerous industry awards for excellence and achievements in the financial, engineering and environmental fields unrelated to any specific 2016 program goal but deserving of recognition. These achievements include:

2016 Massachusetts Department of Environmental Protection’s Regional Recognition Award

In 2016, the Commission received The Regional Recognition Award for outstanding performance and achievements in 2015. The Massachusetts Department of Environmental Protection recognized the Commission as a model public water agency that puts forth exemplary efforts in every area of water treatment and distribution including the Lead Service Replacement Program.

2016 Massachusetts Department of Environmental Protection’s Citation for Consistent Performance

In 2016, the Commission received the Citation for Consistent Performance for continued excellence in delivering safe drinking water in 2015. The Commission was proud to accept this first time award by MassDEP to celebrate the consistent success in providing safe drinking water to the City of Boston.

2016 Governor’s Citation

BWSC was presented with the Commonwealth of Massachusetts Governor’s Citation in recognition of dedicated service to maintaining a safe and abundant supply of clean water and commitment to protecting the environment. This award gives formal recognition by the Commonwealth to those who provide meaningful contributions, which distinguish them from their peers. These special awards focus attention on consistent, positive achievements by both individuals and teams of employees, and recognize those who demonstrate: innovation and dedication to their work, concern for the public trust and a commitment to excellence.

2016 New England Water Works Best Stormwater Idea Award

Boston Water and Sewer Commission was awarded the 2015 Best Stormwater Idea Award by the New England Water Works Association. The Award given for “leveraging school system master planning for green infrastructure implementation” is the first of its kind.

2016 Distinguished Budget Presentation Award

For 25 consecutive years, BWSC has received the Government Finance Officers Associations (“GFOA”) Distinguished Budget Presentation Award. This is the highest form of recognition in governmental budgeting. This award recognized that the Commission’s Current Expense Budget met the GFOA program criteria as a policy document, an operation guide, a financial plan and a communications device.

2015 COMPREHENSIVE ANNUAL FINANCIAL REPORT AWARD (CAFR)

The Commission’s 2014 Comprehensive Annual Financial Report (“CAFR”) received the GFOA’s Certificate of Achievement for Excellence in Financial Reporting. The CAFR was judged based on its conformity to Generally Accepted Accounting Principles (“GAAP”) and its compliance with other

The Commission

finance related legal and contractual provisions. The Certificate of Achievement is the highest form of recognition in governmental accounting and financial reporting and its attainment represents a significant accomplishment for any municipality or governmental agency.

Commission Budget Summary

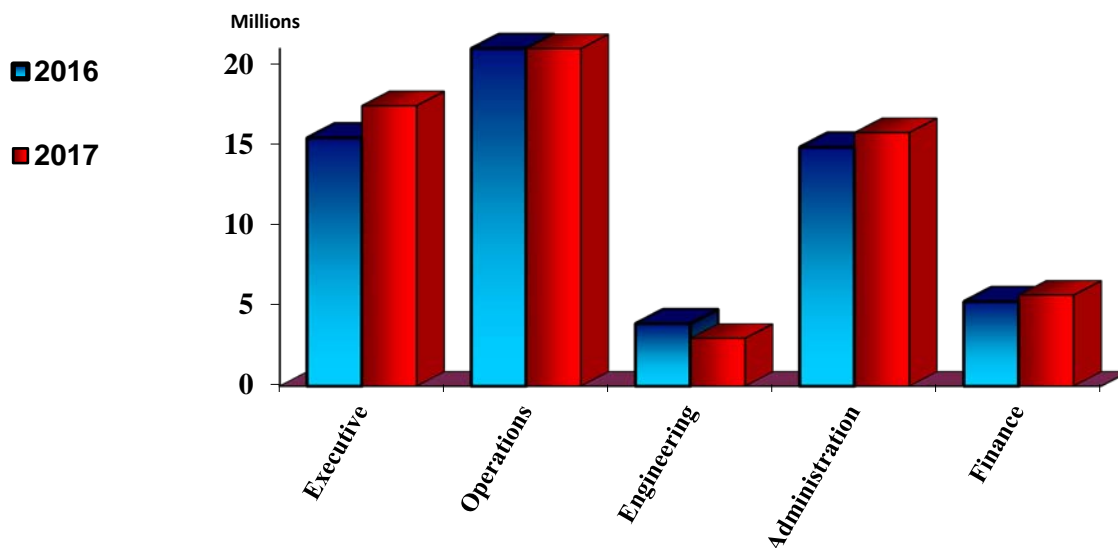
Division	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Executive	\$18,137,234	\$15,457,600	\$17,456,923	\$1,999,323	12.9%
Operations	\$25,029,192	\$25,761,115	\$27,677,221	\$1,916,106	7.4%
Engineering	\$8,059,512	\$3,908,806	\$2,992,423	(\$916,383)	-23.4%
Administration	\$4,077,190	\$14,878,446	\$15,785,945	\$907,499	6.1%
Finance	\$5,288,477	\$5,291,808	\$5,696,642	\$404,834	7.7%
Total Direct Expenses	\$60,591,605	\$65,297,775	\$69,609,154	\$4,311,379	6.6%

Explanation of Major Variances

The Commission consists of five divisions: Executive, Operations, Engineering, Administration and Finance.

The Commission's current expense budget for 2017 is \$69,609,154 an increase of \$4,311,379 or 6.6% increase from the 2016 budget.

2016 versus 2017 Budget



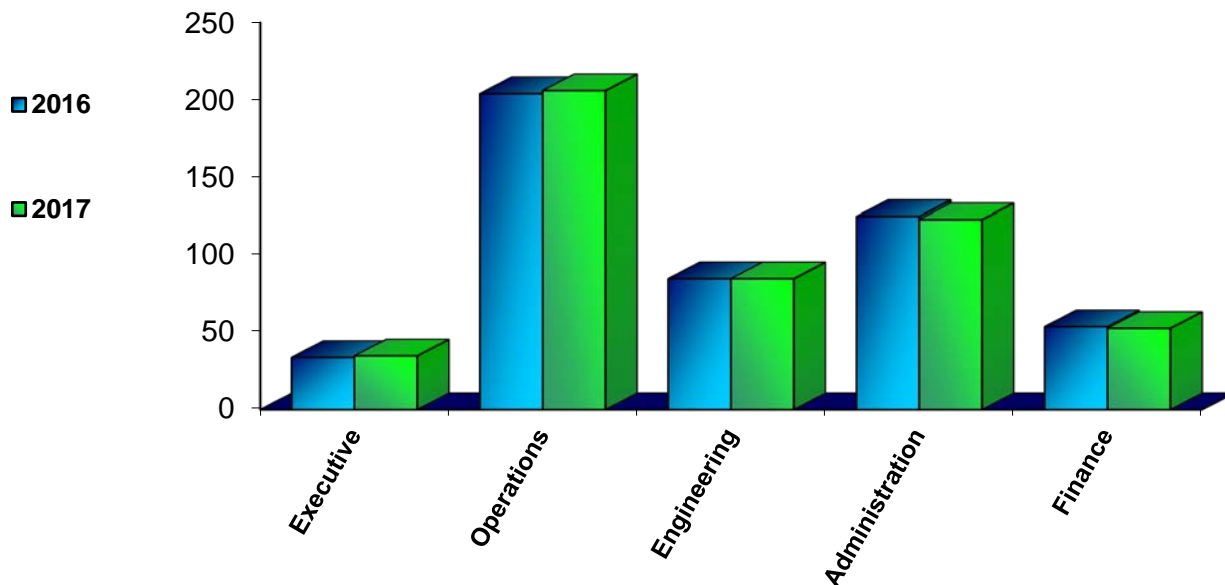
Commission Personnel Summary

Division	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Executive	32.0	34.0	35.0	1.0
Operations	209.0	204.0	206.0	2.0
Engineering	83.0	85.0	85.0	0.0
Administration	128.0	125.0	123.0	(2.0)
Finance	53.0	54.0	53.0	(1.0)
Total Budgeted Positions	505.0	502.0	502.0	0.0

Explanation of Personnel Changes

The Commission's 2017 position count is 502.0 FTE, there was no change from the 2016 approved position count. Other minor personnel changes are explained in the following pages with the breakdowns of each department.

2016 versus 2017 Personnel

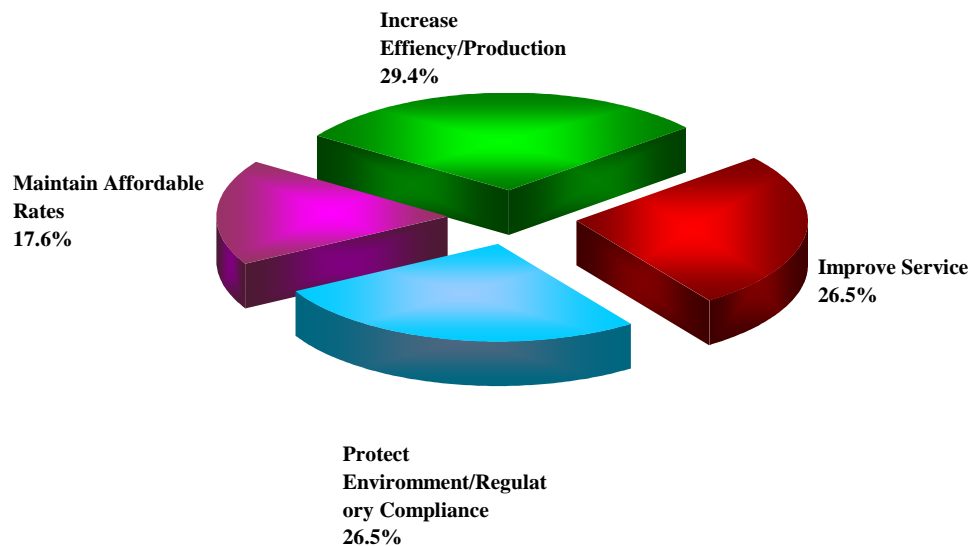


The 2017 Commission Goals

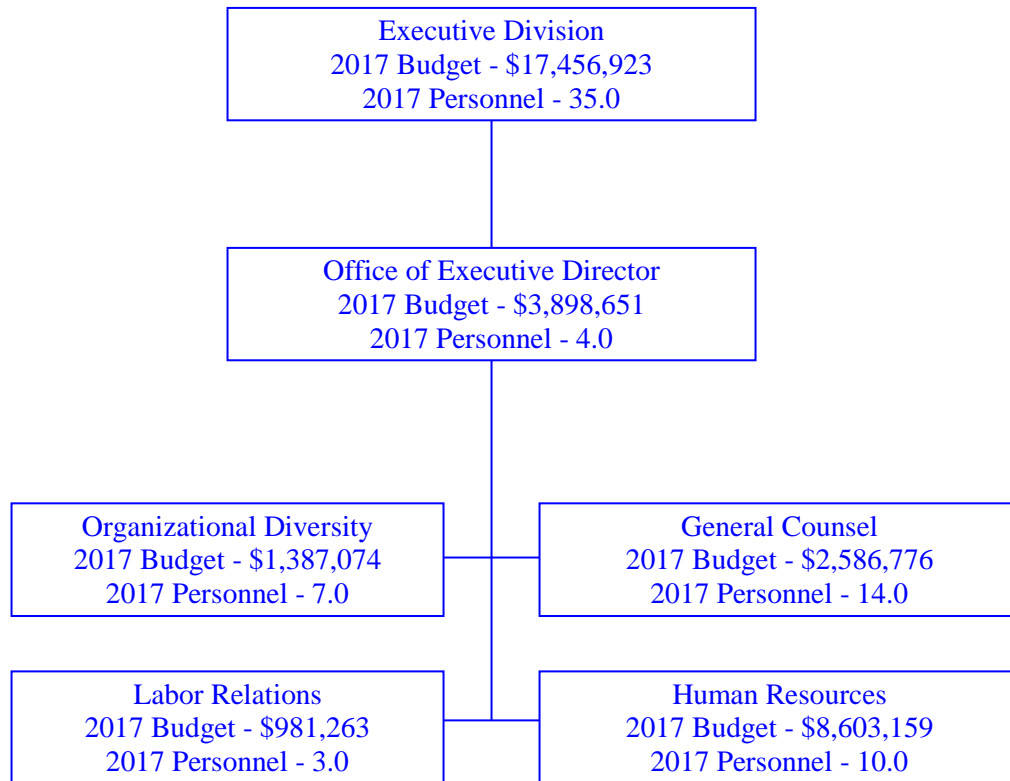
Boston had the first public water supply in the colonies and one of the first water distribution systems providing water to every home. When originally built, Boston's water distribution and wastewater collections systems were state of the art. In light of evolving technologies and today's stringent environmental and public health standards, the original systems no longer suffice. The Commission is continually dedicating resources to efforts such as improving operations and services to its ratepayers and controlling pollution to keep Boston's harbor, beaches and rivers clean. The Commission fights aggressively to maintain equitable and affordable rates.

The Commission has established 88 strategic and tactical goals to accomplish in 2017. Upon successful completion, each goal will continue the Commission's mission to provide the highest quality services at the lowest possible rates while ensuring the protection of the environment. The chart below depicts the breakdown of the 2017 goals by mission.

2017 Commission Goals by Mission



EXECUTIVE DIVISION



Executive Division

Executive Division Organization

The Executive Division consists of the Office of Executive Director and four other departments:

- **Organizational Diversity**
- **General Counsel**
- **Labor Relations**
- **Human Resources**

Division Mission

The Executive Division is responsible for providing policy formation and strategic planning to the entire Commission. The Executive Division provides overall executive management in the critical areas of organizational development, long-term strategic planning, law and labor relations. The Human Resource Department now in the Executive Division provides its employees with proactive personnel services.

Division Budget Summary

Department	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Office of Executive Director	\$6,038,503	\$3,246,679	\$3,898,651	\$651,972	20.1%
Organizational Diversity	\$945,164	\$1,016,237	\$1,387,074	\$370,837	36.5%
General Counsel	\$2,291,999	\$2,285,032	\$2,586,776	\$301,744	13.2%
Labor Relations	\$1,175,147	\$1,049,138	\$981,263	(\$67,875)	-6.5%
Human Resources	\$7,592,743	\$7,860,514	\$8,603,159	\$742,645	9.4%
Total Direct Expenses	\$18,043,556	\$15,457,600	\$17,456,923	\$1,999,323	12.9%

Explanation of Major Variances

The 2017 budget for the Executive Division is \$17,456,923, an increase of \$1,999,323 or 12.9% from 2016. The increase in the variance is due to the Office of the Executive Director, Organizational Diversity, General Counsel and Human Resources line items.

Division Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Executive Director	3.0	4.0	4.0	0.0
Organizational Diversity	6.0	7.0	7.0	0.0
General Counsel	12.0	13.0	14.0	1.0
Labor Relations	4.0	3.0	3.0	0.0
Human Resources	7.0	7.0	7.0	0.0
Total Personnel	32.0	34.0	35.0	1.0

Explanation of Personnel Changes**Office of Executive Director**

There was no change to the position count.

Organizational Diversity

There was no change to the position count.

General Counsel

One position was added to the position count.

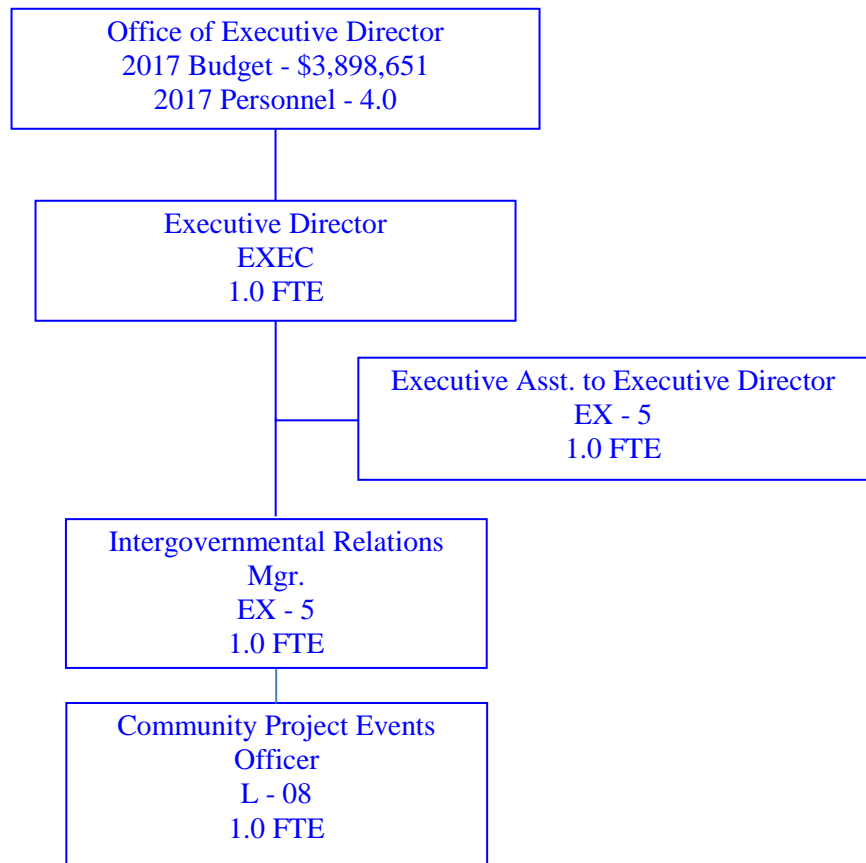
Labor Relations

There was no change to the position count.

Human Resources

There was no change to the position count.

Office of the Executive Director



Executive Division

Office of Executive Director

Program Activities

- Provide policy formation and strategic planning
- Represent the Commission in legislative lobbying efforts to secure rate relief funding

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$5,837,949	\$3,023,977	\$3,484,044	\$460,067	15.2%
Labor Related Costs/Benefits	\$35,703	\$31,180	\$30,107	(\$1,073)	-3.4%
Supplies and Materials	\$2,374	\$4,500	\$4,500	\$0	0.0%
Professional Services	\$57,938	\$85,000	\$265,000	\$180,000	211.8%
Other Services	\$103,506	\$97,022	\$110,000	\$12,978	13.4%
Training/Seminar/Travel	\$1,033	\$5,000	\$5,000	\$0	0.0%
Total Direct Expenses	\$6,038,503	\$3,246,679	\$3,898,651	\$651,972	20.1%

Explanation of Major Variances

The 2017 budget for the Office of the Executive Director is \$3,898,651 an increase of \$651,972 or 20.1% from the budgeted amount for 2016. The variance is due to Wages and Salaries, Professional Services and Other Services line items.

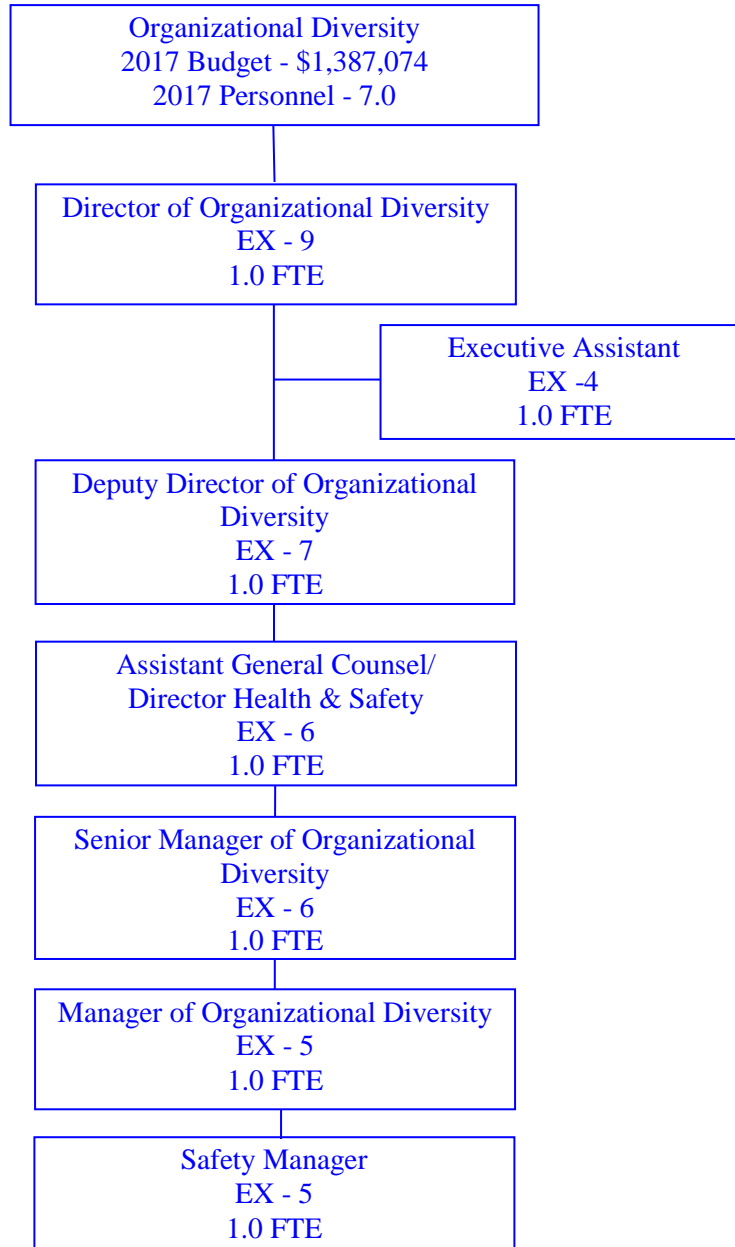
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of the Executive Director	3.0	4.0	4.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

Organizational Diversity



Organizational Diversity

Program Activities

- Assist the Commission in establishing, conducting and maintaining a recruitment program to assure Equal Employment Opportunity for all persons. Assist in the development and implementation of programs to maximize equal employment and promotional opportunity for minorities, woman and Vietnam-era veterans
- The Commission will use its best effort to ensure that Minority and Women Business Enterprise (“MBE/WBE”) participate in construction contracts to the extent that such firms are qualified and represented in the marketplace
- Ensure that the Commission implements all federal, state and local policies and provisions relative to contract compliance regarding construction contracts, professional service, procurement and work force compliance
- Direct the Commissions overall training needs, administers the terms of the Apprentice Program, administers the Tuition Reimbursement Program, administers the License Reimbursement Program and administers other contractual training initiatives

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$727,610	\$701,937	\$727,662	\$25,725	3.7%
Labor Related Costs/Benefits	\$13,248	\$60,200	\$82,212	\$22,012	36.6%
Supplies and Materials	\$8,638	\$14,700	\$10,200	(\$4,500)	-30.6%
Repair and Maintenance	\$15,106	\$30,000	\$34,500	\$4,500	15.0%
Professional Services	\$177,441	\$206,900	\$530,000	\$323,100	156.2%
Training/Seminar/Travel	\$3,123	\$2,500	\$2,500	\$0	0.0%
Total Direct Expenses	\$945,166	\$1,016,237	\$1,387,074	\$370,837	36.5%

Explanation of Major Variances

The 2017 budget for Organizational Diversity is \$1,387,074, an increase of \$370,837, or 36.5% from the budgeted amount for 2016. The variance is due to Wages and Salaries, Labor Related Cost/Benefits, Repair and Maintenance and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Organizational Diversity	6.0	7.0	7.0	0.0

Explanation of Personnel Change

There was no change to the position count.

2016 Program Goal Results

The Organizational Diversity goals established for employment and retention remains at 28% for minorities and at 25% for women. For the year 2016, the department achieved employment goals of 37% for minorities and 25% for women, respectively. For Professional Service Contracts in 2016, the Women's Business Enterprise ("WBE") achieved 13% of contract expenditures working towards and exceeding the goal of 6%. Additionally, The Board of Commissioners authorized BWSC to utilize both the Massachusetts State Wide Contract PRF61 to provide management consultancy service in order to enhance Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) opportunities, as well as Next Street Financial LLC (Next Street) to assist with workforce development. Next Street commenced data collection followed by several working sessions with small group discussions that aided the consultants' understanding of all the goals, regulations, programs and procedures for procurement and supplier diversity as well as work force diversity. The Succession Planning Committee, comprised of representatives from each department and chaired by the Director of Organizational Diversity, held its initial meeting during June 2016. The Committee began classifying key positions that, either presently or in the near future, will be vacated, and subsequently identifying potential in-house successors to these positions from diverse groups.

2017 Program Goals and Objectives

Goal: Review, implement and administer the Commission's Affirmative Action Program so that equal employment opportunity is provided to all in hiring, training and promotion of minorities, women, disabled persons and Vietnam era veterans. Maintain throughout the City of Boston and its environs contact with appropriate persons and groups to recruit members of protected groups.

Objective: The objective of this goal is to create a work environment that is free from all discrimination and harassment concerning race, sex, religion, national origin and qualified veteran status.

Mission: Comply with Local, State and Federal Regulations

Goal: Implement the recommendation of the consultancy work that was performed by Next Street that covers the enhancement of MBE/WBE utilization as well as workforce development.

Objective: To increase the participation of MBE/WBE in Commission's construction and professional service contracts.

Mission: Comply with Local, State and Federal Regulations

Goal: Carry out the implementation of the Succession Planning Committee's recommendations that will encompass the identification and development of employees who have the potential to assume key leadership positions. The goal is to enable the Commission to strategically plan its future personnel needs.

Executive Division

Objective: Identify and develop employees who have the potential to assume key leadership positions when occupants of those positions retire.

Mission: Provide Staff Training

Goal: Increase the capacity of the Commission to design, develop and implement in-house trainings that will meet the requirement of the Commission to train its employees effectively.

Objective: Increase the number of desired courses that will be designed and developed in house as opposed to using outside vendors.

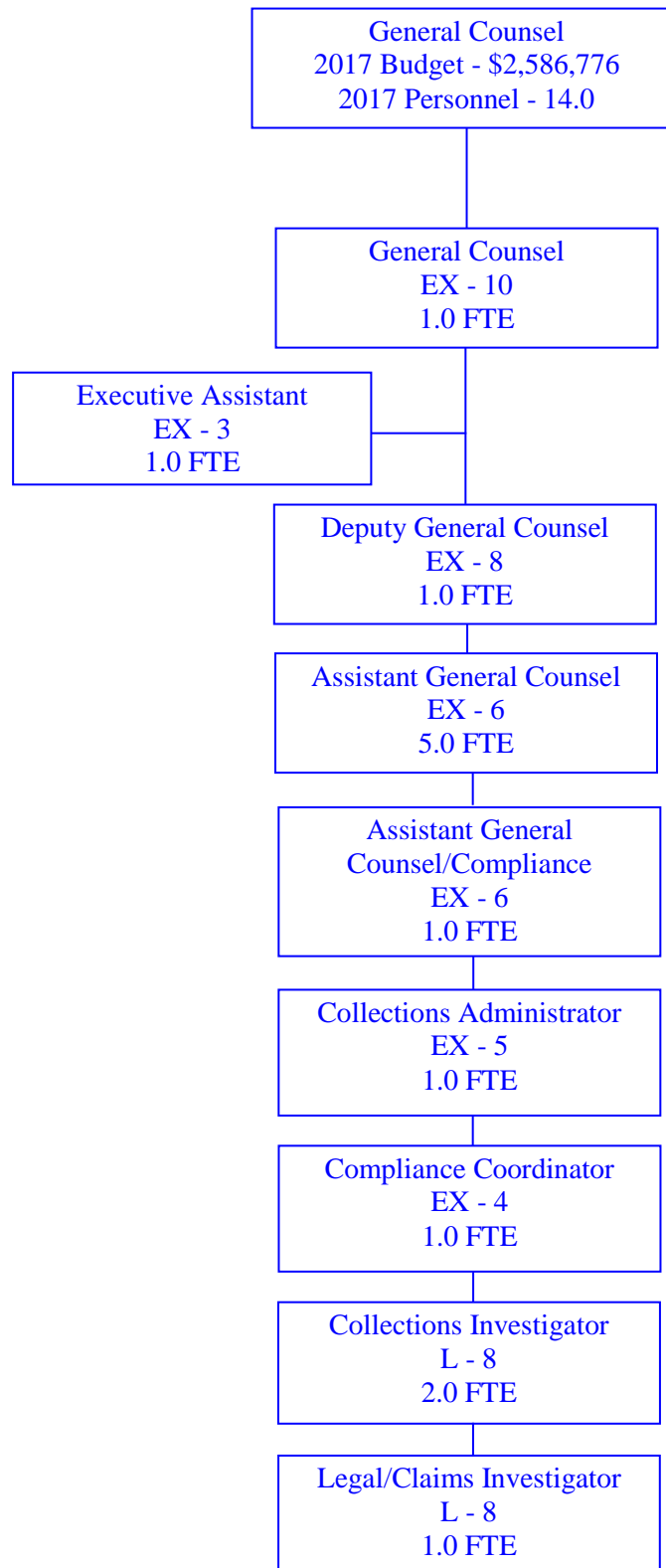
Mission: Provide Staff Training

Goal: Provide leadership training for the managers and supervisors in order to develop their skills and prepare them to assume increasing responsibilities as well as enhance their effectiveness to the organization.

Objective: Provide manager and supervisor training to enhance the skills of the Commission leadership.

Mission: Provide Staff Training

General Counsel



Executive Division

General Counsel

Program Activities

- Represent the Commission in all litigation matters before the courts of the Commonwealth and of the United States and before all administrative bodies
- Defend the Commission against all claims for personal injury and property damage
- Drafting and reviewing contracts, contract amendments and change orders
- Preparing and reviewing easements and licenses
- Drafting, reviewing and enforcing regulations governing the conduct and operation of the Commission adopted by the Board of Commissioners
- Drafting, analyzing, proposing, supporting or opposing legislation affecting the Commission
- Ensuring compliance with environmental regulations applicable to the Commission
- Provide legal analysis of issues before the Commission on a daily basis

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,298,158	\$1,163,021	\$1,397,341	\$234,320	20.1%
Labor Related Costs/Benefits	\$13,767	\$7,347	\$16,026	\$8,679	118.1%
Professional Services	\$372,822	\$400,000	\$480,000	\$80,000	20.0%
Other Services	\$8,209	\$15,000	\$10,000	(\$5,000)	-33.3%
Insurance	\$533,935	\$544,664	\$528,409	(\$16,255)	-3.0%
Training/Seminar/Travel	\$3,379	\$5,000	\$5,000	\$0	0.0%
Damage Claims	\$61,729	\$150,000	\$150,000	\$0	0.0%
Total Direct Expenses	\$2,291,999	\$2,285,032	\$2,586,776	\$301,744	13.2%

Explanation of Major Variances

The 2017 budget for General Counsel is \$2,586,776, an increase of \$301,744 or 13.2% from the budgeted amount for 2016. The variance is due to an increase in Wages and Salaries, Labor Related Costs/Benefits and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
General Counsel	12.0	13.0	14.0	1.0

Explanation of Personnel Changes

One position was added to the position count.

2016 Program Goal Results

During 2016, staff updated the fine schedule for violations of the Commission's Water and Sewer Use Regulations. Staff also prepared a contractor checklist for inclusion in all Commission bid documents to ensure that all bidders sign and submit the necessary forms, bonds and other information required in the invitation for bids or RFP's. Staff continues to prepare a weekly report of all activity pertaining to easements, licenses and rights in land requested by or from the Commission and proofs of claim in bankruptcy matters filed and the corresponding monetary value of bankruptcy collections. Additionally, staff also prepared a monthly report for dispositive motions such as summary judgement and motions to dismiss filed the name of the Case, a brief statement of the basis of the motion and the decision of the court, when received. General Counsel Staff assessed the Commission's record retention procedures and developed up-to-date processes in accordance with recent amendments to the statutory regulations. Staff assessed the insurance requirements for all Commission contracts in an effort to develop guidelines for each type of contract. Furthermore, Staff reviewed the Commission's accident reporting procedures and subsequently developed a more refined, accessible format to ensure the reports are filled out properly.

2017 Program Goals and Objectives

Goal: Develop an environmental regulation checklist for the items, including but not limited to, those listed below:

NPDES CSO Permit and NPDES Stormwater Permit.

980 Harrison Avenue Facility:

- Auto-maintenance facility
- Auto Fleet
- Fueling Facility (including above & underground (if applicable) storage tanks)
- Emergency Response/Reporting -- Mass Contingency Plan/21E (MCP)
- Hazardous Waste Transportation/Management -- MCP
- Air Quality
- Water Use/Management (if applicable)
- Right-to-Know (with respect to chemicals & products used at facility)

Union Park Pumping Station:

- Air Quality (permitting)
- Water Resources Commission (if applicable)
- NPDES (as applicable)
- Fuel use & storage (MCP, storage facilities)
- Other Pumping Stations (if applicable) -- air quality, fuel spill (in case of temporary generator use)
- Materials Handling Facility

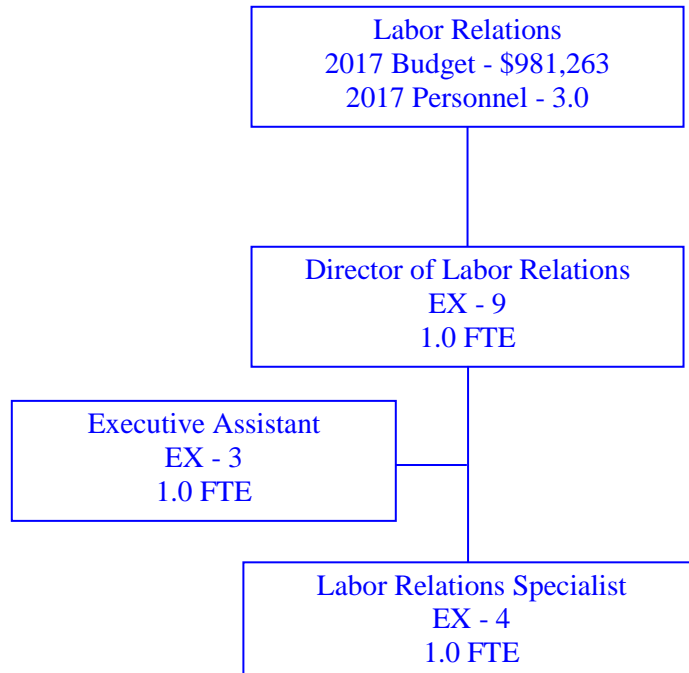
Objective: The objective of this goal is to ensure compliance with all environmental regulations.

Mission: Comply with Local, State and Federal Regulations

Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
Small Claims Cases	2,145	2,191	2,174	At Least 175/Month
Schedule Hearings	5	10	10	Settled Before the Hearing Process

Labor Relations



Executive Division

Labor Relations

Program Activities

- Assist in the analysis, negotiation and enforcement of four different collective bargaining agreements with each of the four unions serving as the exclusive bargaining agent for certain Commission employees
- Represent the Commission in the grievance and arbitration process
- Assist in the development, revision, implementation and enforcement of Commission policies, rules and regulations
- Conduct investigations of alleged work rule violations as well as internal complaints alleging violation of federal and state labor and employment laws
- Manage the overall defense of employment related claims
- Provide technical assistance and legal advice on a wide range of employment related matters

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2015 Variance
Wages and Salaries	\$318,150	\$266,557	\$292,345	\$25,788	9.7%
Labor Related Costs/Benefits	\$767,037	\$687,081	\$595,918	(\$91,163)	-13.3%
Supplies and Materials	\$1,860	\$2,500	\$2,000	(\$500)	-20.0%
Professional Services	\$87,524	\$90,000	\$90,000	\$0	0.0%
Training/Seminar/Travel	\$576	\$3,000	\$1,000	(\$2,000)	-66.7%
Total Direct Expenses	\$1,175,147	\$1,049,138	\$981,263	(\$67,875)	-6.5%

Explanation of Major Variances

The 2017 budget for Labor Relations is \$981,263, a decrease of \$67,875 or 6.5% from the budgeted amount for 2016. The variance is due to a decrease in Labor Related Costs/Benefits and Training/Seminar/Travel line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Labor Relations	4.0	3.0	3.0	0.0

Explanation of Personnel Changes

There is no change to the position count.

2016 Program Goal Results

Labor Relations continued to defend and represent the Commission at all internal and external forums, including hearings, arbitrations, and various litigations, Staff also conducted meetings to discuss and resolve employment matters as well as responded to various inquiries and requests made by management personnel and union representatives. Staff worked closely with medical providers, claims personnel, legal counsel, and investigators on pending cases, entering and updating all claims information in the PeopleSoft System. Furthermore, staff made significant progress in negotiating and executing successor agreements to three collective bargaining agreements for Council 93, Lodge 100 and Local 6, respectively, which expired on December 31, 2015. Ultimately, successor contracts were reached for each of the expiring collective bargaining agreements. Staff held discussions with claims personnel from the third party provider, USI/Future Comp to aid the Commission in providing periodic updates on injury trends to the Health and Safety Department based on worker's compensation loss/run data. In response to the aforementioned data collected for 2016, staff recommended re-training for employees on rodding equipment. Staff held two training sessions on site for impacted employees.

2017 Program Goals and Objectives

Goal: Defend and represent the Commission at all internal and external forums, including but not limited to: hearings, arbitrations and various litigations at the federal and state levels.

Objective: To conduct internal investigations, document findings and defend the Commission on employment matters; and to ensure consistency in the application and enforcement of employment policies and procedures; and to enforce the terms of the collective bargaining agreements.

Mission: Limit Commission Liability/Increase Safety

Goal: Direct and administer the self-insured Workers Compensation Program. Ensure compliance with applicable statutes and enforce the provisions of the collective bargaining agreements and all policies and procedures related to the workers compensation process.

Objectives: Administer the self-insured Worker's Compensation Program in conjunction with the third party administrator and counsel by investigating and processing claims; issuing indemnity payments; and authorizing and approving payment for allocated loss expenses.

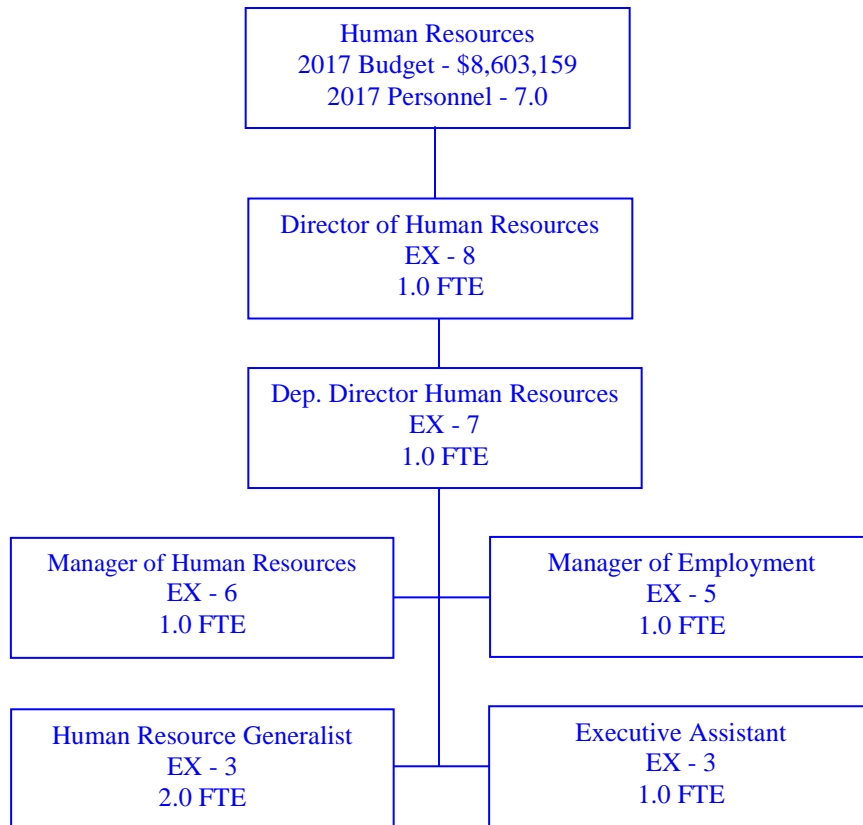
Mission: Limit Commission Liability/Increase Safety

Goal To negotiate and execute successor agreement to the collective bargaining agreement with the Service Employees International Union ("SEIU"), Local 888 which will expire on June 30, 2017.

Objectives: Update contract language relative to the Commission's goals and develop a fair economic package for the Commission and the union membership.

Mission: Improved Customer/Employee/Investor

Human Resources



Executive Division

Human Resources

Program Activities

- Establish and monitor personnel policies and procedures
- Manage hiring activities
- Maintain staff knowledge on related issues
- Assist in research to develop collective bargaining strategies
- Manage employee benefits
- Oversee the performance appraisal process

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,171,902	\$633,724	\$822,837	\$189,113	29.8%
Labor Related Costs/Benefits	\$6,317,794	\$7,160,140	\$7,644,372	\$484,232	6.8%
Supplies and Materials	\$3,267	\$600	\$3,900	\$3,300	550.0%
Professional Services	\$94,126	\$54,800	\$120,800	\$66,000	120.4%
Other Services	\$5,648	\$11,250	\$11,250	\$0	0.0%
Total Direct Expenses	\$7,592,737	\$7,860,514	\$8,603,159	\$742,645	9.4%

Explanation of Major Variances

The 2017 budget for Human Resources is \$8,603,159, an increase of \$742,645 or 9.4% from the budgeted amount for 2016. The variance is due to increases to the Wages and Salaries, Labor Related Cost/Benefits, Supplies and Materials and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Human Resources	7.0	7.0	7.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

During 2016, the first of three electronic bulletin boards went live. Staff transmits job postings and Human Resources related content weekly to ensure that employees are kept informed of relevant employment information and open enrollment deadlines. - The Employee Handbook was updated to reflect minor changes in Commission Policies and was distributed to all employees as well as new hires. A new employee orientation program was created to provide new employees with a more complete understanding of the Commission's pertinent policies and more detailed benefit information. Staff established a new exit interview format for Co-op students when they leave the Commission. To date, Human Resources has conducted 18 interviews providing valuable feedback on their experience while at the Commission.

2017 Program Goals and Objectives

Goal: In conjunction with the State-Boston Retirement Board, investigate the feasibility of developing a process to verify the accuracy of employees' creditable service in an effort to minimize difficulties encountered during the retirement process.

Objective: The objective of this goal is to implement a process to enable the Commission to verify that the retirement board has accurate employee service information that will be utilized by the board when they are calculating retirement benefits. Successful completion of this goal will ensure that employee data is correct thereby helping to ensure an uncomplicated retirement application

Mission: Improved Customer/Employee/Investor Relations

Goal: Develop content encompassing a wide variety of topics pertaining to human resources matters, such as employment, benefits, policies and procedures. Provide content to be disseminated via the electronic bulletin boards throughout the Commission.

Objective: Develop content encompassing a wide variety of topics pertaining to human resources matters, such as employment, benefits, policies and procedures. Provide content to be disseminated via the electronic bulletin boards throughout the Commission.

Mission: Improved Customer/Employee/Investor Relations

Goal: Implement a training program for new managers and supervisors encompassing topics such as effective completion of performance appraisals, interpreting and enforcing Commission policies, how and when to use discipline, how to conduct an interview and other required skills.

Objective: In order to accomplish this goal, Human Resources staff will informally survey managers to determine relevant topics to be included in the supervisory training. A comprehensive outline of training content will be produced and approved by senior management. Training modules will be developed and training will be implemented.

Mission: Improve Customer /Employee/Investor Relations

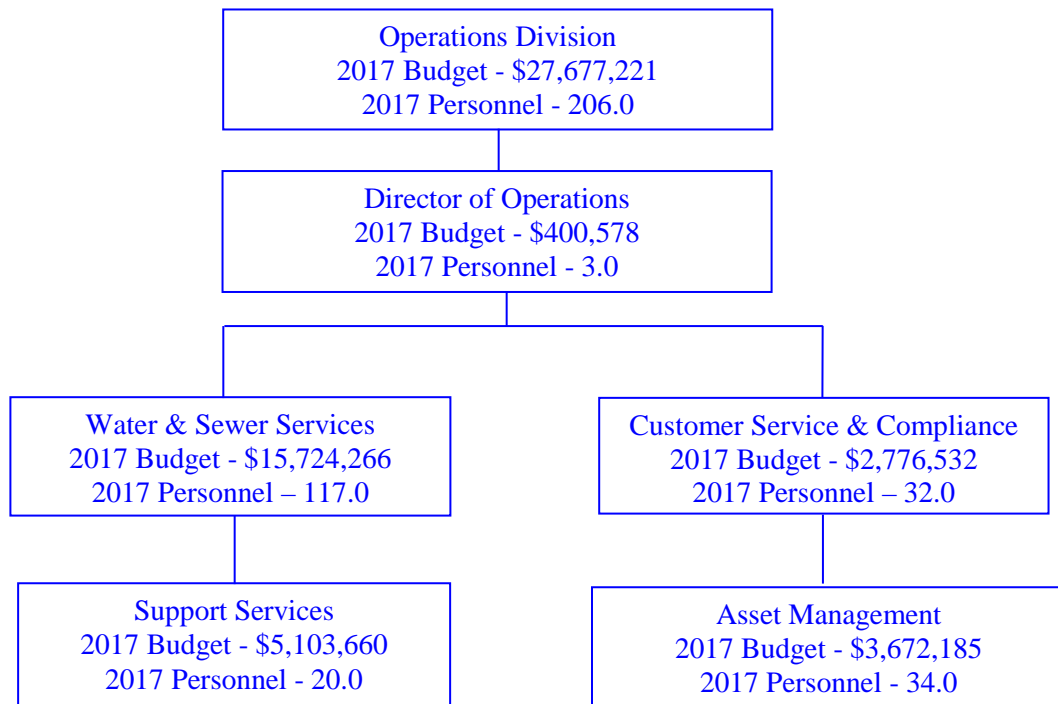
Executive Division

Goal: Conduct a public bidding process for selected employee benefit insurance plans.

Objective: To identify those benefit plans that would be best served by a public bidding process and to advertise the selected insurance line items. Conduct a comprehensive review of all proposals and select the most cost efficient, qualified vendor(s). Receive Commission approval, execute contracts and conduct employee meetings to facilitate enrollment into the newly selected plan(s).

Mission: Improve Customer /Employee/Investor Relations

OPERATIONS DIVISION



Operations Division

Operations Division Organization

The Operations Division includes the Office of the Director of Operations Services and four other departments:

- **Water & Sewer Services**
- **Support Services**
- **Customer Service & Compliance**
- **Asset Management**

Division Mission

The Operations Division is primarily responsible for ensuring the ongoing maintenance and operability of the Commission's buildings and water, sewerage and drainage infrastructures

Division Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Director of Operations Services	\$403,069	\$378,481	\$400,578	\$22,097	5.8%
Water & Sewer Services	\$14,006,768	\$14,391,373	\$15,724,266	\$1,332,893	9.3%
Support Services	\$4,206,336	\$4,953,095	\$5,103,660	\$150,565	3.0%
Customer Service & Compliance	\$2,937,188	\$2,656,506	\$2,776,532	\$120,026	4.5%
Asset Management	\$3,475,831	\$3,381,660	\$3,672,185	\$290,525	8.6%
Total Direct Expenses	\$25,029,192	\$25,761,115	\$27,677,221	\$1,916,106	7.4%

Explanation of Major Variances

The 2017 budget for the Operations Division is \$27,677,221, an increase of \$1,916,106 or 7.4% from the budgeted amount for 2016. The variance is attributed to the Director of Operation Services, Water & Sewer Services, Customer Service & Compliance and Asset Management line items.

Operations Division

Division Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Operations Services	4.0	4.0	3.0	(1.0)
Water & Sewer Services	117.0	114.0	117.0	3.0
Support Services	20.0	19.0	20.0	1.0
Customer Service & Compliance	33.0	33.0	32.0	(1.0)
Asset Management	35.0	34.0	34.0	0.0
Total Personnel	209.0	204.0	206.0	2.0

Explanation of Personnel Changes

Director of Operations

One position transferred to Water & Sewer Services.

Water & Sewer Services

One position transferred from Operation Services.

One position transferred from Customer Service & Compliance.

One position transferred from Facilities & Support.

Support Services

One position transferred from IT.

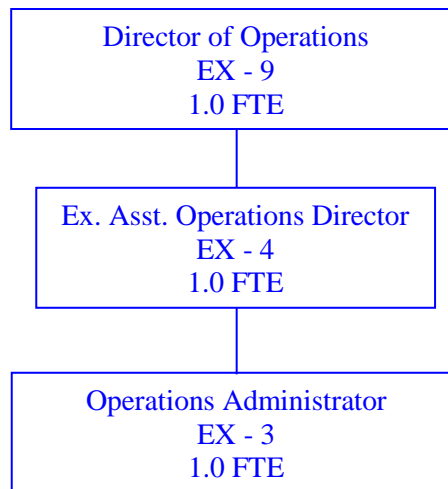
Customer Service & Compliance

One position transferred to Water & Sewer Services.

Asset Management

There was no change to the position count.

Office of Operations Services



Operations Division

Office of Operations Director

Program Activities

- Oversee all activities engaged in by Water and Sewer Services, Day and Night Operations, Support Services, Customer Service and Compliance and Asset Management/CMOM Departments

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$389,416	\$347,232	\$371,191	\$23,959	6.9%
Labor Related Costs/Benefits	\$8,287	\$8,249	\$6,387	(\$1,862)	-22.6%
Professional Services	\$0	\$10,000	\$10,000	\$0	0.0%
Training/Seminar/Travel	\$5,366	\$13,000	\$13,000	\$0	0.0%
Total Direct Expenses	\$403,069	\$378,481	\$400,578	\$22,097	5.8%

Explanation of Major Variances

The 2017 budget for the Office of Operations Director is \$400,578, an increase of \$22,097 or 5.8% from the budgeted amount for 2016. The increase in the variance is due to Wages and Salaries line items.

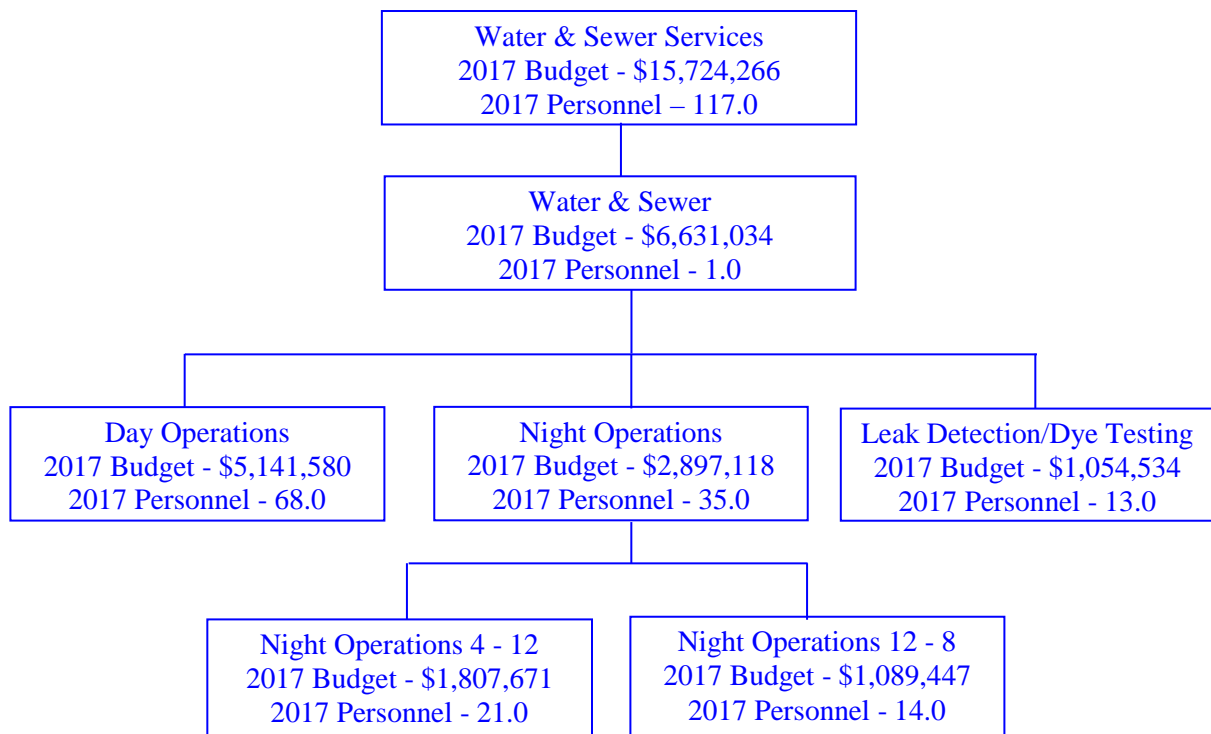
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Operations Director	4.0	4.0	3.0	(1.0)

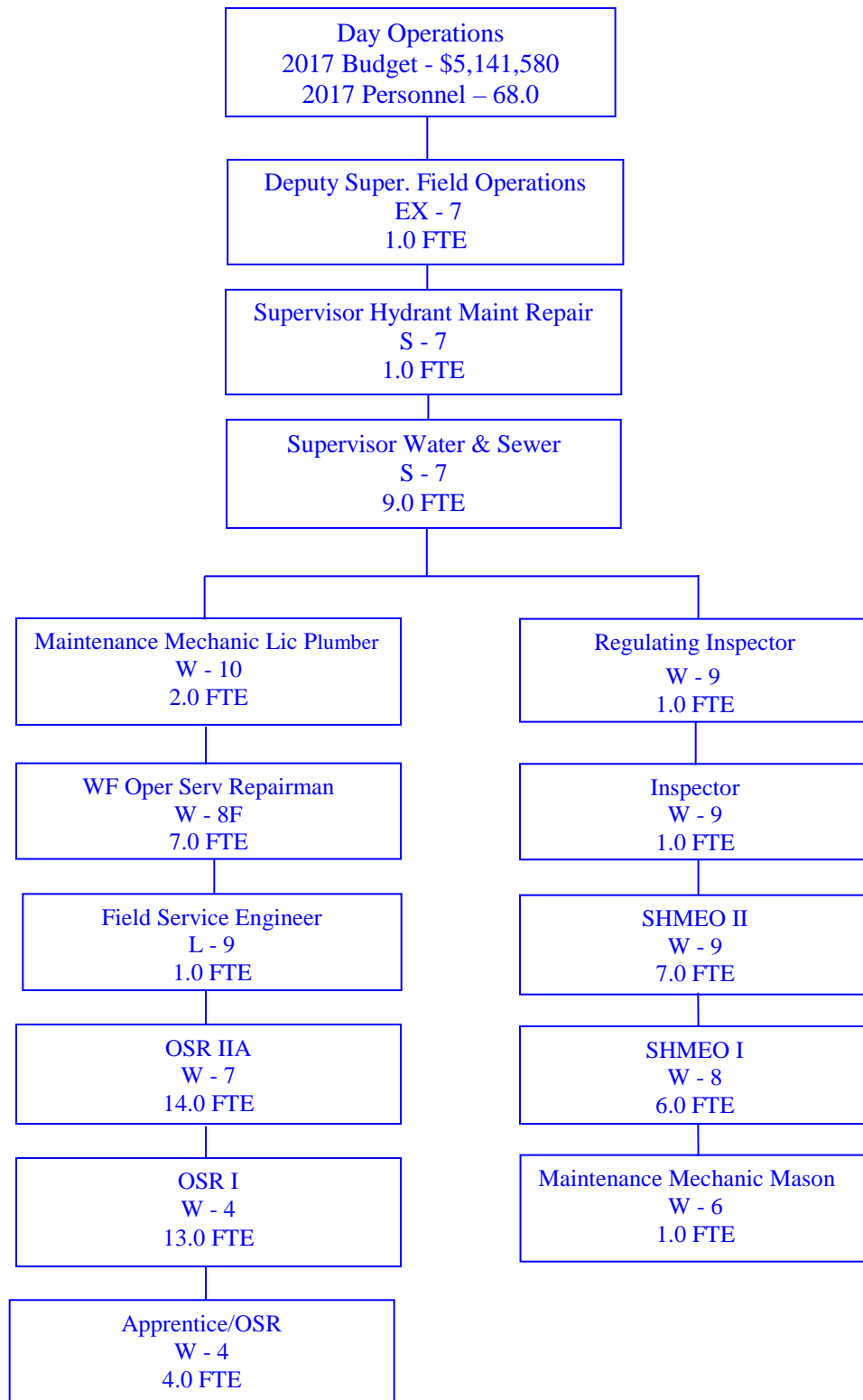
Explanation of Personnel Changes

One position transferred to Water & Sewer Services.

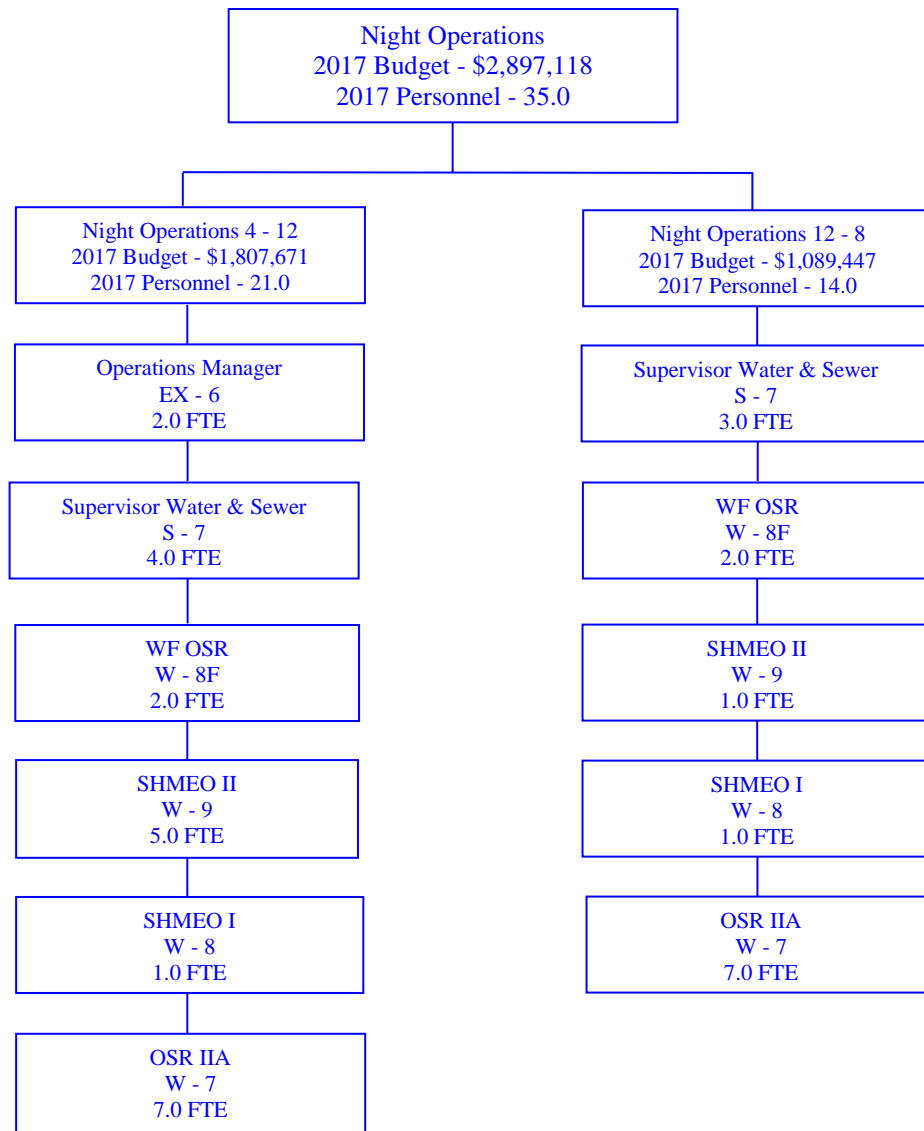
Water & Sewer Services



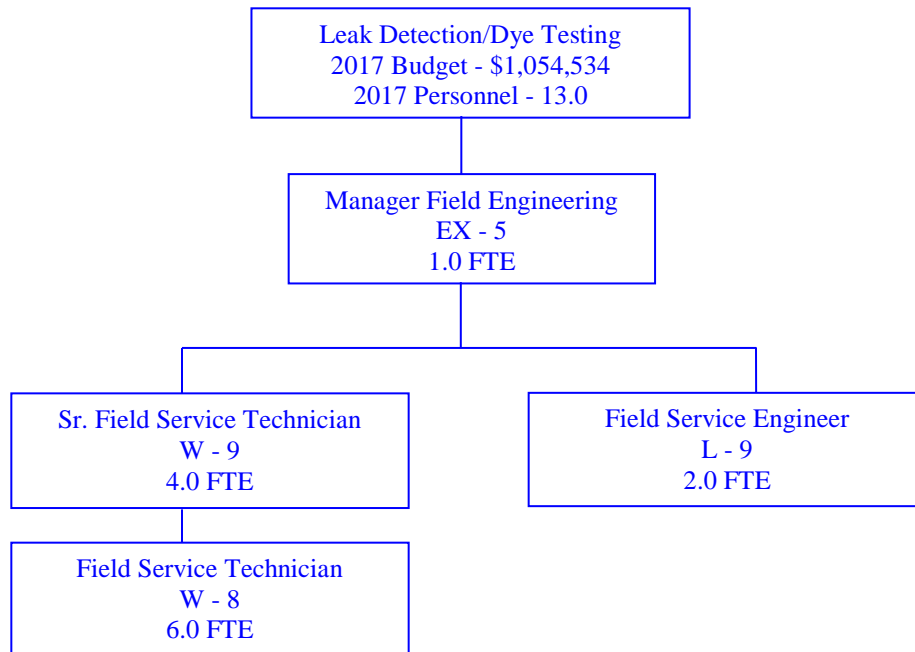
Day Operations



Night Operations



Leak Detection/Dye Testing



Operations Division

Water & Sewer Services

Program Activities

- Water & Sewer Services directs the operation and maintenance of the Commission's water, sewerage and drainage systems. The Department ensures the operability of the water and wastewater systems by efficiently maintaining and performing emergency repairs to water mains, service pipes, hydrants, gates, valves, catch basins, manholes and sewer and storm lines
- Increase water accountability by reducing the amount of water purchased from the MWRA through the continued implementation of the Commission's ongoing leak detection and MWRA Master Meter Monitoring programs
- Perform Fire Flow tests, Loss of Head tests, water pressure analysis and other diagnostic procedures as required
- Identify, through dye testing, improper sanitary connections to storm drains and identify sources of inflow and infiltration entering the sewer system
- Respond to hazardous material spills affecting the sewer system

Division Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$9,123,858	\$8,010,744	\$8,860,650	\$849,906	10.6%
Overtime	\$361,523	\$313,949	\$335,925	\$21,976	7.0%
Labor Related Costs/Benefits	\$88,278	\$113,680	\$48,411	(\$65,269)	-57.4%
Supplies and Materials	\$720,855	\$850,000	\$850,000	\$0	0.0%
Repair and Maintenance	\$3,450,926	\$4,350,000	\$4,860,000	\$510,000	11.7%
Other Services	\$610,334	\$680,000	\$696,280	\$16,280	2.4%
Inventory	\$10,778	\$23,000	\$23,000	\$0	0.0%
Training/Seminar/Travel	\$5,366	\$0	\$0	\$0	0.0%
Capital Outlay	\$37,918	\$50,000	\$50,000	\$0	0.0%
Total Direct Expenses	\$14,409,836	\$14,391,373	\$15,724,266	\$1,332,893	9.3%

Explanation of Major Variances

The for 2017 budget for the Water & Sewer Services Department is \$15,724,266, an increase of \$1,332,893 or 9.3% from the 2016 budget. The variance is due to Wage and Salaries, Overtime, Repair and Maintenance and Other Services line items.

Operations Division

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Water & Sewer Services	1.0	1.0	1.0	0.0
Day Operations	68.0	65.0	68.0	3.0
Night Operations	34.0	34.0	35.0	1.0
Leak Detection/Dye Testing	14.0	14.0	13.0	(1.0)
Total Personnel	117.0	114.0	117.0	3.0

Explanation of Personnel Changes

Water & Sewer Services

There was no change to the position count.

Day Operations

One position transferred from Operations Services.

One position transferred from Customer Service & Compliance.

One position transferred from Leak Detection/Dye Testing.

Night Operations

One position transferred from Facilities & Support Services.

Leak Detection/Dye Testing

One position transferred to Day Operations.

2016 Program Goal Results

The Water and Sewer Services Department assembled a demonstrative model of the Commission's infrastructure and subsequently conducted several presentations concerning the model. Personnel from Communications, Engineering Services and Operations all participated in the demonstrations. Additionally, Staff, in conjunction with the Legal Department, formally established new protocol mandating that other utility companies that inadvertently cause damage to Commission structures are fiscally liable for the repairs for the aforementioned structures. The Commission is responsible for inspecting 53,900 manholes on a ten year rotation in compliance with the Consent Decree, equaling a desired average of 5,390 inspections for each of the ten years. During 2016, a total of 6,273 manholes were inspected.

2017 Program Goals and Objectives

Goal: The Commission has a number of service pipes that are labeled unknown in our records. By means of non-destructive excavation using Commission personnel and equipment, this service pipe material can be identified.

Objectives: To reduce the number of unknown service pipe material in our records.

Mission: Comply with Local, State and Federal Regulations

Goal: Operations crews will perform repairs to sewers and drains when practical.

Objectives: Currently the Operation's Emergency Sewer Repair Contractor performs the majority of the repairs to sewer/drains. By utilizing the Operation's Dig Crews to perform some of the repairs the Commission can save funds. The Operations Department crews have the equipment and expertise to perform some of the sewer/drain repairs.

Mission: Increased Fiscal Controls

Goal: The Operations Department will continue the effort to identify and remove privately owned lead services in the City of Boston.

Objectives: Through record research and physical inspection Operations will identify privately owned lead services. When interested owners agree to the terms of the Lead Replacement Incentive Program, these services will be replaced by Operation crews or by Operation's contractor.

Mission: Comply with Local, State and Federal Regulations

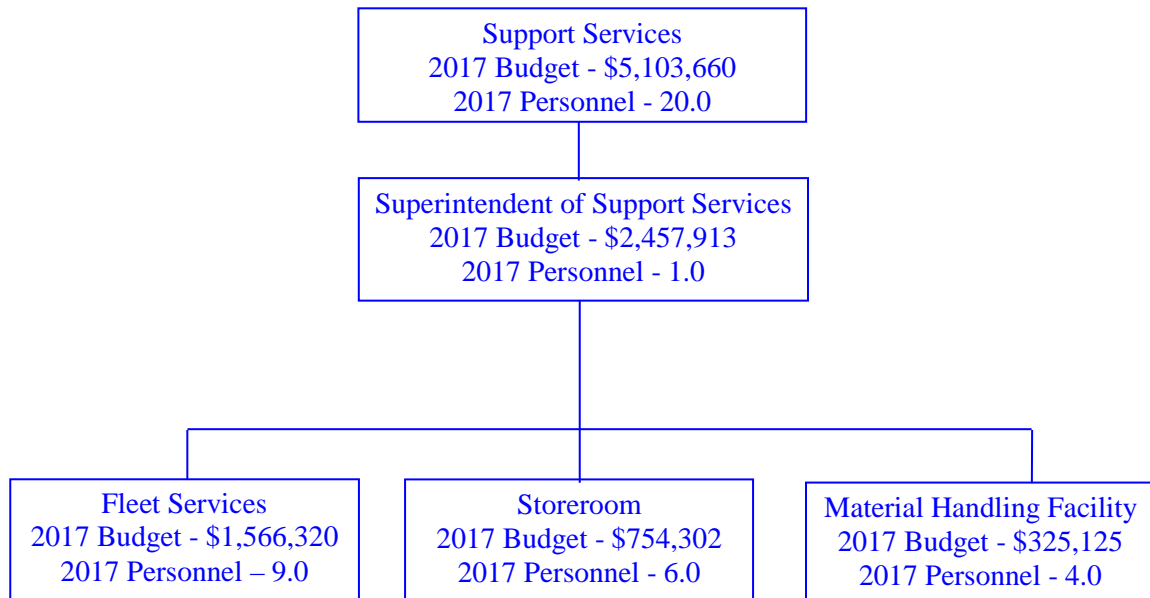
Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
<u>Investigations:</u>				
Sewer Lateral	165	165	320	216
Hydrant	1,913	2,079	2,221	2,071
Leak	1,046	957	857	953
Service Pipe	261	207	195	221
Frozen Pipe	121	171	140	144
Water Entering	192	185	276	218
Lead	56	49	596	234
Rusty Water	303	245	222	183
Leak Up To Owner (LUTO)	75	74	111	87
Catch Basin	921	637	815	791
Sewer/Drain	5,672	4,215	3,819	457
CSO Regulator	965	1,067	993	949
Tide Gate	711	881	843	814
Backflow Device	21,013	21,748	22,436	21,732
Hazardous & Oil Spill	20	11	4	12
Illegal Connection	2	13	10	8
SSO's Reported to DEP	192	113	131	145
Hydrant Illegal Opening	32	29	29	30
<u>Water & Sewer Main Breaks/Repair:</u>				
Water Mains	48	34	24	35
Sewer Mains	47	45	54	49
Hydrant Replacement	58	51	35	48
Hydrant Repair	316	312	238	289
<u>Permits:</u>				
Engineering Permits	737	543	401	560
Operations Permits	877	526	580	661
General Services	1,109	1,095	1,193	1,132
<u>Preventative Maintenance:</u>				
Vactored Meter Box	3	4	13	7
Vactored Gate Box	0	1	70	24
Cement Sidewalks	483	560	526	523
Valve Repack	9	15	23	16
LUTO Repair	72	75	99	82
Plate Handling	24	36	13	24
Waste Sediment Disposed/Recycled (ton)	4,724	4,821	4,788	4,774
Gallons Pumped Union Park (million)	39	19	35	31

Operations Division

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
<u>Preventive Maintenance:</u>				
Main Pipe Flush (miles)	257	200	224	227
Hydrants Painted	2,125	1,344	2,084	1,851
Frame Reset (Water)	90	77	74	80
Frame Reset (Sewer)	647	410	347	468
Control Located	85	86	116	96
Control Reset	65	80	90	103
Mark Outs of Water and Sewer Infrastructure (Emergencies)	3,201	3,153	3,439	3,264
Excavation	752	863	839	1,066
Exercising of System Gates (Survey)	663	361	278	434
Hydrant Flush	262	175	175	117
Sewer Lines Jetted/Vactored (ft.)	424,871	424,248	447,467	304,862
Sewer Lines Rodded (ft.)	2,966	2,147	1,379	2,174
Bacteria Treatment	1,089	961	220	757
Service Pipe Repair	119	94	100	104
Service Pipe Relay	60	99	54	71

Support Services



Operations Division

Support Services

Program Activities

- Manage the Operations and Maintenance Contract for the Commission's nine pumping stations

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,383,620	\$1,350,473	\$1,581,954	\$231,481	17.1%
Overtime	\$37,320	\$20,570	\$22,011	\$1,441	7.0%
Labor Related Costs/Benefits	\$10,191	\$22,327	\$7,545	(\$14,782)	-66.2%
Supplies and Materials	\$647,008	\$944,475	\$899,150	(\$45,325)	-4.8%
Repair and Maintenance	\$903,735	\$1,211,000	\$1,126,000	(\$85,000)	-7.0%
Professional Services	\$1,218,013	\$1,387,500	\$1,447,500	\$60,000	4.3%
Space and Equipment Rental	\$2,701	\$7,500	\$7,500	\$0	0.0%
Other Services	\$3,746	\$9,250	\$12,000	\$2,750	29.7%
Total Direct Expenses	\$4,206,334	\$4,953,095	\$5,103,660	\$150,565	3.0%

Explanation of Major Variances

The 2017 budget for the Support Services Department is \$5,103,660, an increase of \$150,565 or 3.0% from 2016. The variance is due to Wages and Salaries, Overtime, Professional Services and Other Services line items.

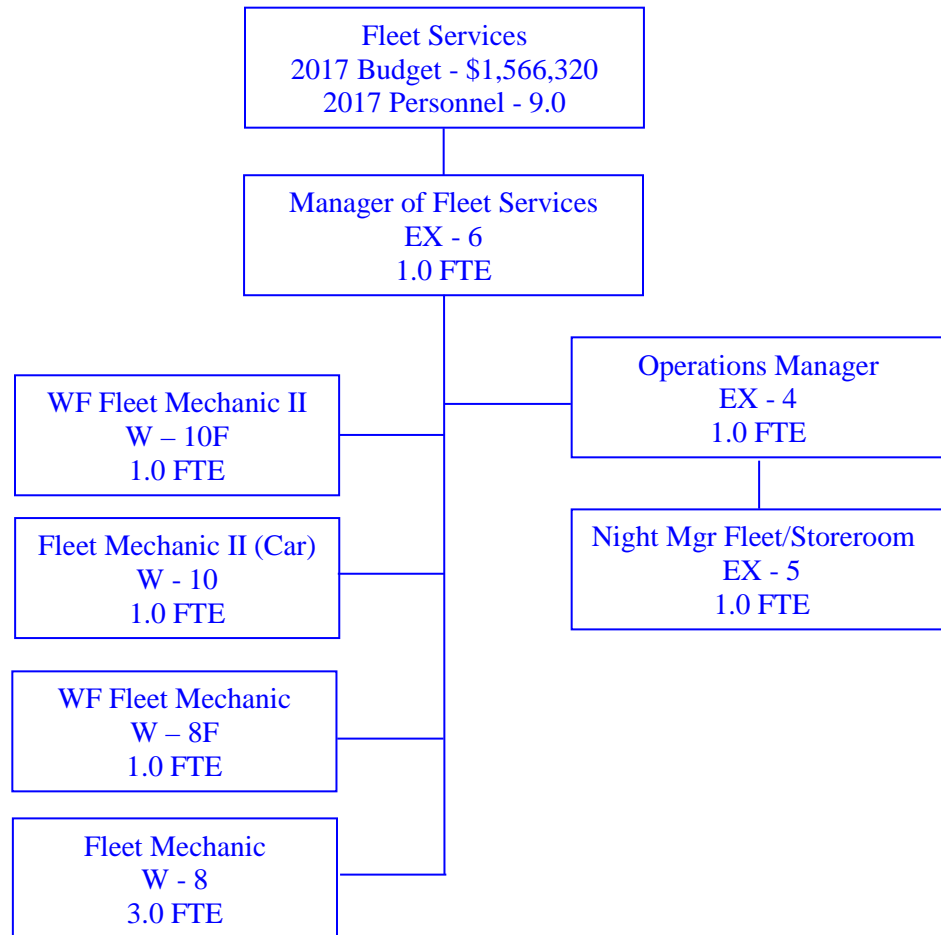
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Support Services	20.0	19.0	20.0	1.0

Explanation of Personnel Changes

One position transferred from IT.

Fleet Services



Operations Division

Fleet Services

Program Activities

- Fleet manages and coordinates all activities required for the efficient operation and maintenance of the Commission's fleet of over 200 vehicles including heavy equipment

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$525,942	\$535,681	\$739,761	\$204,080	38.1%
Overtime	\$25,867	\$8,923	\$9,548	\$625	7.0%
Labor Related Costs/Benefits	\$5,250	\$0	\$2,111	\$2,111	0.0%
Supplies and Materials	\$281,333	\$484,475	\$414,400	(\$70,075)	-14.5%
Repair and Maintenance	\$248,800	\$361,000	\$381,000	\$20,000	5.5%
Space and Equipment Rental	\$2,701	\$7,500	\$7,500	\$0	0.0%
Other Services	\$3,746	\$9,250	\$12,000	\$2,750	29.7%
Total Direct Expenses	\$1,093,639	\$1,406,829	\$1,566,320	\$159,491	11.3%

Explanation of Major Variances

The 2017 budget for the Fleet Services Department is \$1,566,320, an increase of \$159,491 or 11.3% from 2016. The variance is due to Wages and Salaries, Overtime, Repair and Maintenance and Other Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Fleet Services	7.0	7.0	9.0	2.0

Explanation of Personnel Changes

One position transferred from the Storeroom.

One position transferred from Work Order/Customer Service.

2016 Program Goal Results

Implementing Mercury Associates “Fleet Utilization Study” as a benchmark, staff developed a continuance standard for the future purchase of Fleet vehicles. Throughout 2016, various vehicles, including a new super vactor vehicle, were purchased in accordance with the Utilization Study. Staff was tasked with employing a new AVL (Automatic Vehicle Location) program for Fleet vehicles in an effort to enhance the ability of tracking vehicles during emergency response situations. Subsequently, staff installed new two-way radios in approximately 99% of the vehicle pool as well as the installation and distribution of corresponding desk top and handheld two-way radios respectively.

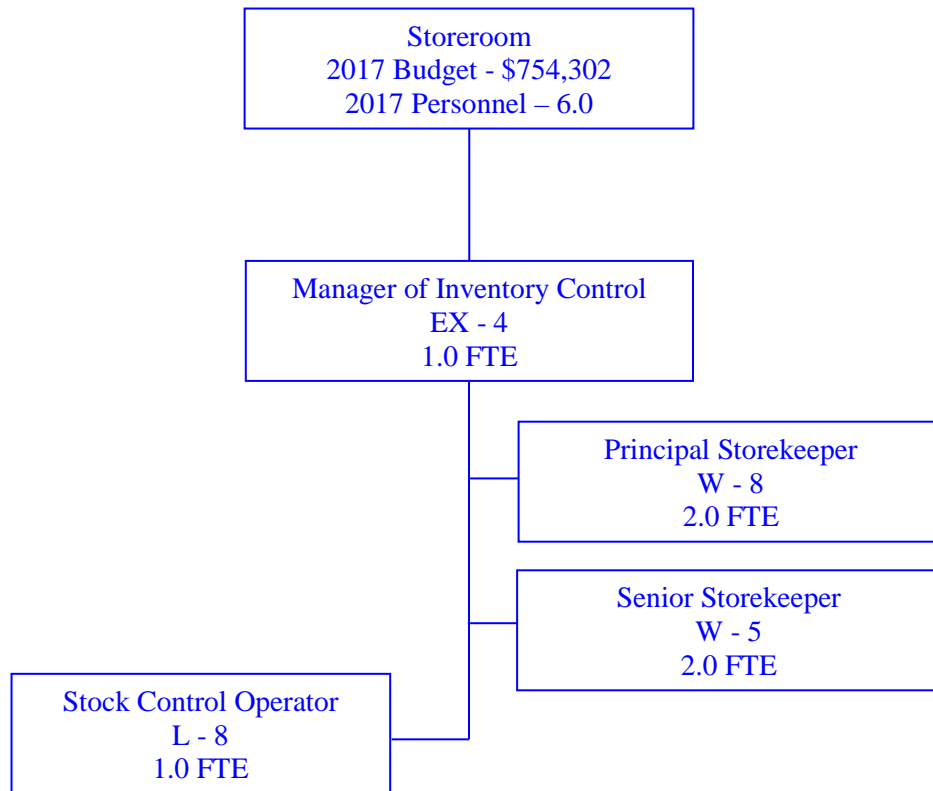
2017 Program Goals and Objectives

Goal: Manage the Design/Build for Pump Station Improvement Contract –Phase II. This work includes pump replacement and upgrades to the controls, electrical and mechanical functions of the Commission owned pump stations.

Objectives: This contract will improve the operability and reliability of the Commission’s Pump Stations.

Mission: Enhanced Repair and Maintenance of Water or Wastewater System

Storeroom



Operations Division

Storeroom

Program Activities

- The Storeroom maintains an inventory of materials, supplies, equipment and tools necessary for the ongoing maintenance and repair activities of the Division

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$435,014	\$430,887	\$416,348	(\$14,539)	-3.4%
Overtime	\$2,138	\$2,994	\$3,204	\$210	7.0%
Supplies and Materials	\$264,485	\$310,000	\$334,750	\$24,750	8.0%
Total Direct Expenses	\$701,637	\$743,881	\$754,302	\$10,421	1.4%

Explanation of Major Variances

The 2017 budget for the Storeroom Department is \$754,302 an increase of \$10,421 or 1.4% from 2016. The variance is due to the Overtime and Supplies and Materials line items.

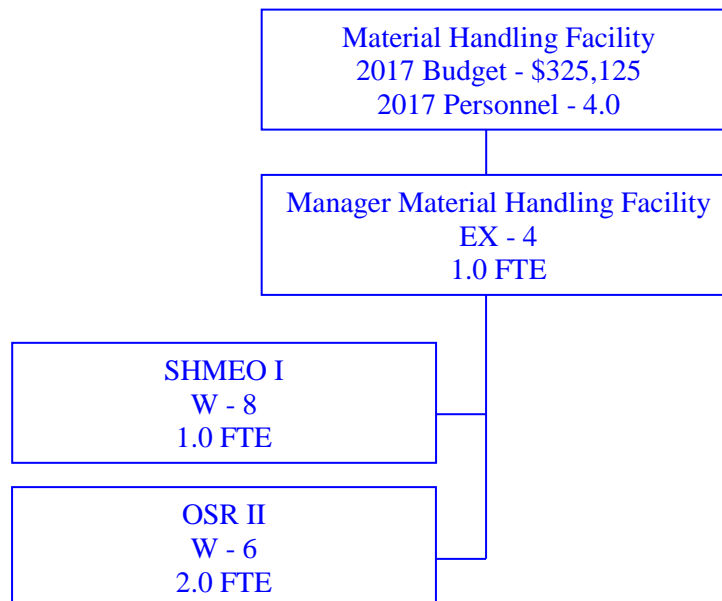
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Storeroom	8.0	7.0	6.0	(1.0)

Explanation of Personnel Changes

One position transferred to Fleet Services.

Material Handling Facility



Operations Division

Material Handling Facility

Program Activities

- Manage the collection and removal of sewer, drain, catch basin and trench waste generated from the BWSC's infrastructure

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$302,941	\$278,727	\$314,450	\$35,723	12.8%
Overtime	\$9,315	\$8,653	\$9,259	\$606	7.0%
Labor Related Cost/Benefits	\$1,288	\$825	\$1,416	\$591	71.6%
Total Direct Expenses	\$313,544	\$288,205	\$325,125	\$35,723	12.4%

Explanation of Major Variances

The 2017 budget for the Material Handling Department is \$325,125, an increase of \$35,723 or 12.4% from 2016. The variance is due to Wages and Salaries, Overtime and Labor Related Cost/Benefits line item.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Material Handling Facility	4.0	4.0	4.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

During 2016, the Cardinal scale software was upgraded to the latest version. The scale system is calibrated on the quarterly basis to ensure accurate material weight recordings. The information is utilized and referenced by staff for monthly contractor estimates and record keeping.

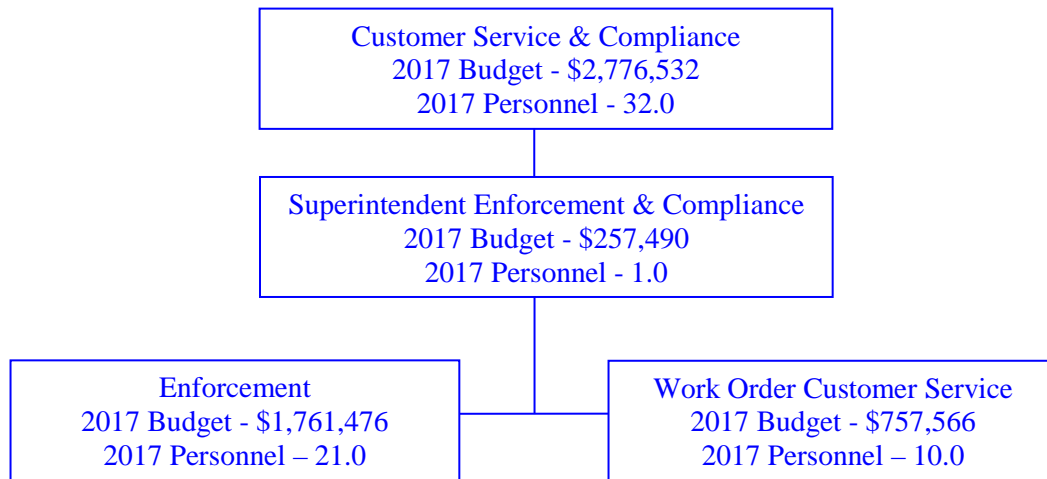
2017 Program Goal Results

Goal: Develop a protocol for the dewatering of sewer and catch basin cleanings at the Alford Street Facility.

Objectives: To ensure that best practices are used during the decanting and dumping of sewer and catch basin cleanings to prevent blockages and potential SSO's at the Alford Street Facility.

Mission: Increased Production or Efficiency Improvements

Customer Service & Compliance



Operations Division

Customer Service & Compliance

Program Activities

- Customer Service & Compliance maintains the Commission's work order management system (CityWorks) and provides assistance to the Commission's customers with telephone inquiries

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,760,228	\$2,486,172	\$2,606,437	\$120,265	4.8%
Overtime	\$32,632	\$26,202	\$28,037	\$1,835	7.0%
Labor Related Cost/Benefits	\$24,726	\$18,632	\$16,558	(\$2,074)	-11.1%
Supplies and Materials	\$10,894	\$11,000	\$11,000	\$0	0.0%
Repair and Maintenance	\$105,788	\$109,500	\$109,500	\$0	0.0%
Professional Services	\$2,920	\$5,000	\$5,000	\$0	0.0%
Total Direct Expenses	\$2,937,188	\$2,656,506	\$2,776,532	\$120,026	4.5%

Explanation of Major Variances

The 2017 budget for the Customer Service & Compliance Department is \$2,776,532, an increase of \$120,025 or 4.5% from 2016. The variance is due to Wages and Salaries and Overtime line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Customer Service & Compliance	33.0	33.0	32.0	(1.0)

Explanation of Personnel Changes

One position transferred to Day Operations.

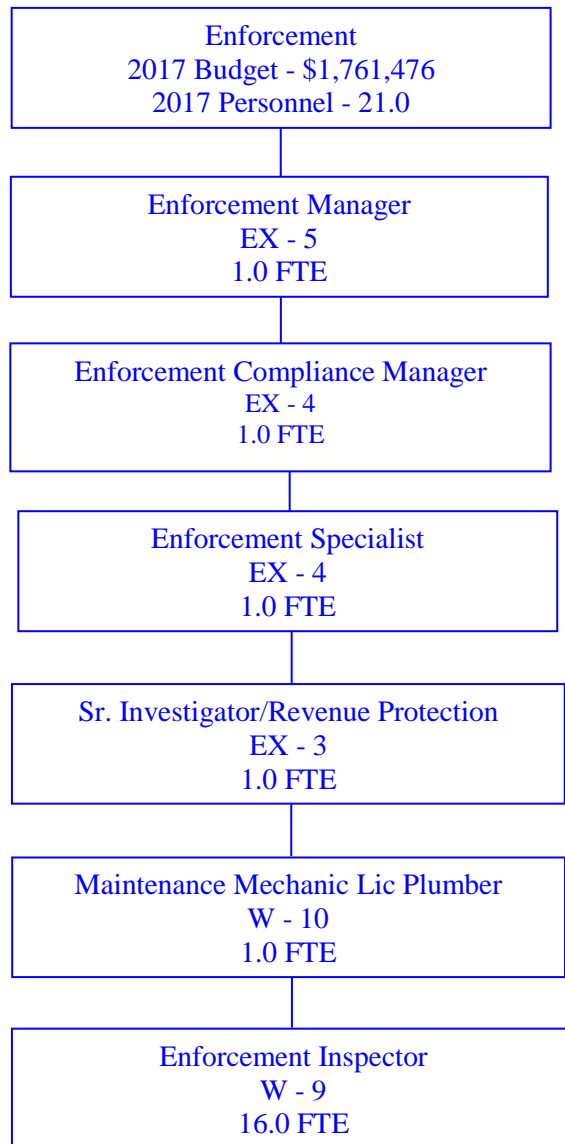
2017 Program Goals and Objectives

Goal: Develop a procedure to follow-up on the approximate 300 survey violations in BESS and Checkmate to confirm if the violations have been rectified. Implement a follow-up procedure for all future violations.

Objectives: The objective of the goal is to insure that the public water supply is protected from cross connections. Any violations in Checkmate that has not been resolved will be reinvestigated for compliance.

Mission: Improve/Develop Policy/Procedure

Enforcement



Operations Division

Enforcement

Program Activities

- Protect the public water systems distribution and water quality from contamination and/or pollution due to unprotected or improperly protected Cross Connection
- Provide water sampling as required by State and Federal Regulatory Agencies
- Provide weekly chlorine and bacteriological samplings to the MWRA and report results to the Boston Public Health Commission
- Administrate the BWSC Sewer Abatement Program
- Conduct field inspection of authorized Backwater Valve installations

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,801,724	\$1,628,184	\$1,747,100	\$118,916	7.3%
Overtime	\$784	\$2,593	\$2,775	\$182	7.0%
Labor Related Costs/Benefits	\$13,794	\$13,425	\$11,601	(\$1,824)	-13.6%
Total Direct Expenses	\$1,816,302	\$1,644,202	\$1,761,476	\$117,274	7.1%

Explanation of Major Variances

The 2017 budget for Enforcement Department is \$1,761,476, an increase of \$117,274 or 7.1% from 2016. The variance is due to Wages and Salaries and Overtime line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Enforcement	21.0	21.0	21.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

Enforcement surveys Fast Spin Echoes (FSE's), both scheduled and reactionary due to Sanitary Sewer Overflows (SSO's), a prevalent issue as the majority of SSO's are caused by grease. Therefore, The Enforcement Department is currently developing a matrix for assessing grease trap inspection criteria and fees. Currently there is an annual charge of \$200.00 per facility that has a grease trap that discharges into the Commission's sewer system. During 2016, Enforcement surveyed 58 facilities related to SSO's, performed 511 open inspections, 57 initial inspections, and identified 206 violations. In December, a \$200.00 charge was applied to 1,994 accounts that have grease traps, totaling \$398,800.00. Staff will continue to review and revise inspection criteria's and protocol's regarding the regulation of inspection fees.

2017 Program Goals and Objectives

Goal: The Commission has developed and implemented an Industrial Facility Stormwater Pollution Prevention Program (IFSPPP). In 2017 the Enforcement Department will complete the program's first year of the two-year cycle schedule.

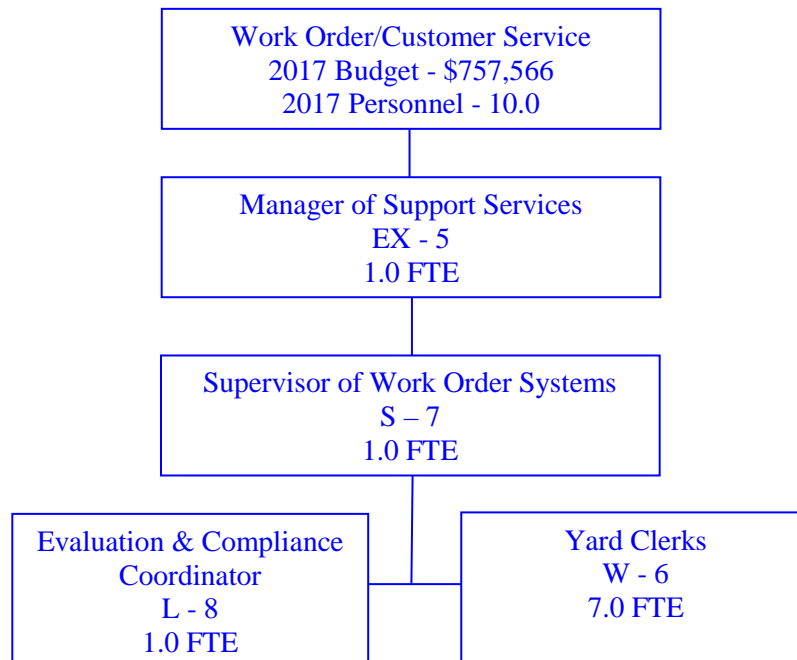
Objectives: Under the Clean Water Act, operators of Stormwater discharges associated with certain industrial activities are required to obtain NPDES Stormwater Permits from EPA. These facilities include hazardous waste treatment, storage, disposal and recovery facilities; facilities subject to EPCRA Title III, Section 313; facilities involved in manufacturing electronic, electrical and photographic goods; processing or raw material storage facilities; automobile salvage sites; recycling facilities; and transportation related facilities.

Mission: Protect Environment

Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
Sewer Abatements:				
Sewer Requests	52	38	39	50
Sewer Inspections	49	57	56	50
Sewer Approvals	51	57	56	50
Inspections of Backflow Device Installations:				
Semi-annual	10,550	13,114	13,507	13,507
Annual	6,315	7,672	7,911	7,911
Initial Inspections of Backflow Devices	839	631	619	500
Conducting Cross Connection Surveys of Industrial, Institutional and Commercial Properties	936	1,572	1,238	960

Work Order/Customer Service



Operations Division

Work Order/Customer Service

Program Activities

- Work Order/Customer Service maintains the Commission's work order management system (CityWorks) and provides assistance to the Commission's customers with telephone inquiries

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$825,676	\$740,697	\$729,588	(\$11,109)	-1.5%
Overtime	\$31,848	\$23,609	\$25,262	\$1,653	7.0%
Labor Related Cost/ Benefits	\$8,895	\$3,032	\$2,716	(\$316)	-10.4%
Total Direct Expenses	\$866,419	\$767,338	\$757,566	(\$9,772)	-1.3%

Explanation of Major Variances

The 2017 budget for the Work Order/Customer Service Department is \$757,566, a decrease of \$9,772 or 1.3% from 2016. The variance is due to Wages and Salaries and Labor Related Cost/Benefits line items.

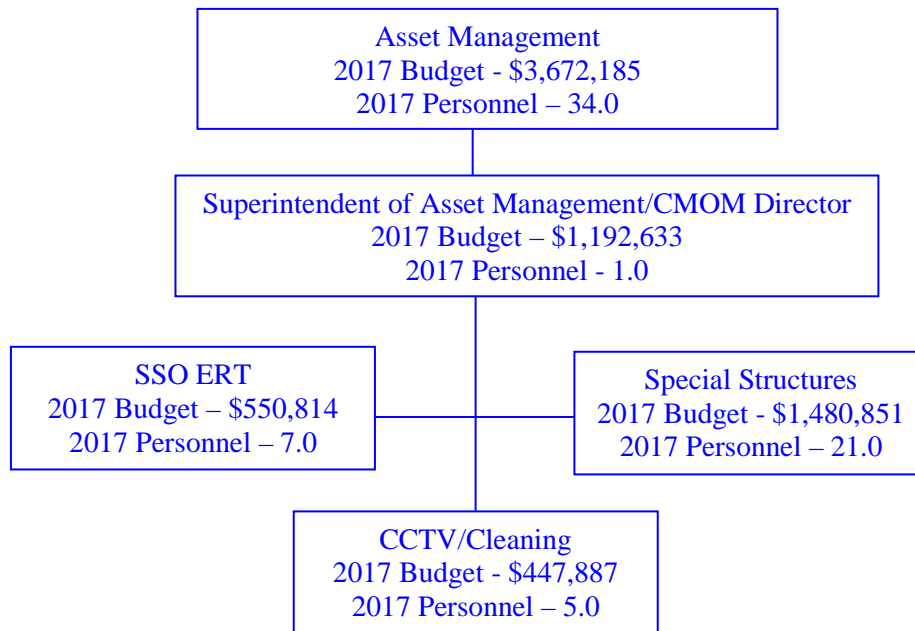
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Work Order/Customer Service	11.0	11.0	10.0	(1.0)

Explanation of Personnel Changes

One position transferred to Fleet Services.

Asset Management/CMOM



Operations Division

Asset Management/CMOM

Program Activities

- Inspect and maintain the combined sewer overflow system in accordance with the Commission's National Pollutant Discharge Elimination System (NPDES) permit
- Inspect sewers and building connections within low groundwater areas to ensure that they are not causing the drawdown
- Inspect and ensure the operability of all large diameter water valves, division gates, and appurtenances.
- Inspect manholes, siphon chambers and tide gates for defects and recommend repair and/or replacement

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,591,766	\$2,447,416	\$2,616,265	\$168,849	6.9%
Overtime	\$33,536	\$35,026	\$37,478	\$2,452	7.0%
Labor Related Costs/Benefits	\$38,036	\$62,718	\$73,442	\$10,724	17.1%
Repair and Maintenance	\$783,412	\$825,000	\$925,000	\$100,000	12.1%
Professional Services	\$29,082	\$11,500	\$20,000	\$8,500	73.9%
Total Direct Expenses	\$3,475,832	\$3,381,660	\$3,672,185	\$290,525	8.6%

Explanation of Major Variances

The 2017 budget for Asset Management/CMOM Department is \$3,672,185, an increase of \$290,525 or 8.6% from 2016. The variance is due to the Wages and Salaries, Overtime, Labor Related Costs/Benefits, Repair and Maintenance and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Asset Management/CMOM	1.0	1.0	1.0	0.0
SSO ERT	8.0	7.0	7.0	0.0
Special Structures	21.0	21.0	21.0	0.0
CCTV/Cleaning	4.0	5.0	5.0	0.0
Total	34.0	34.0	34.0	0.0

Operations Division

Explanation of Personnel Changes

Asset Management/CMOM

There was no change to the position count.

SSO ERT

There was no change to the position count.

Special Structures

There was no change to the position count.

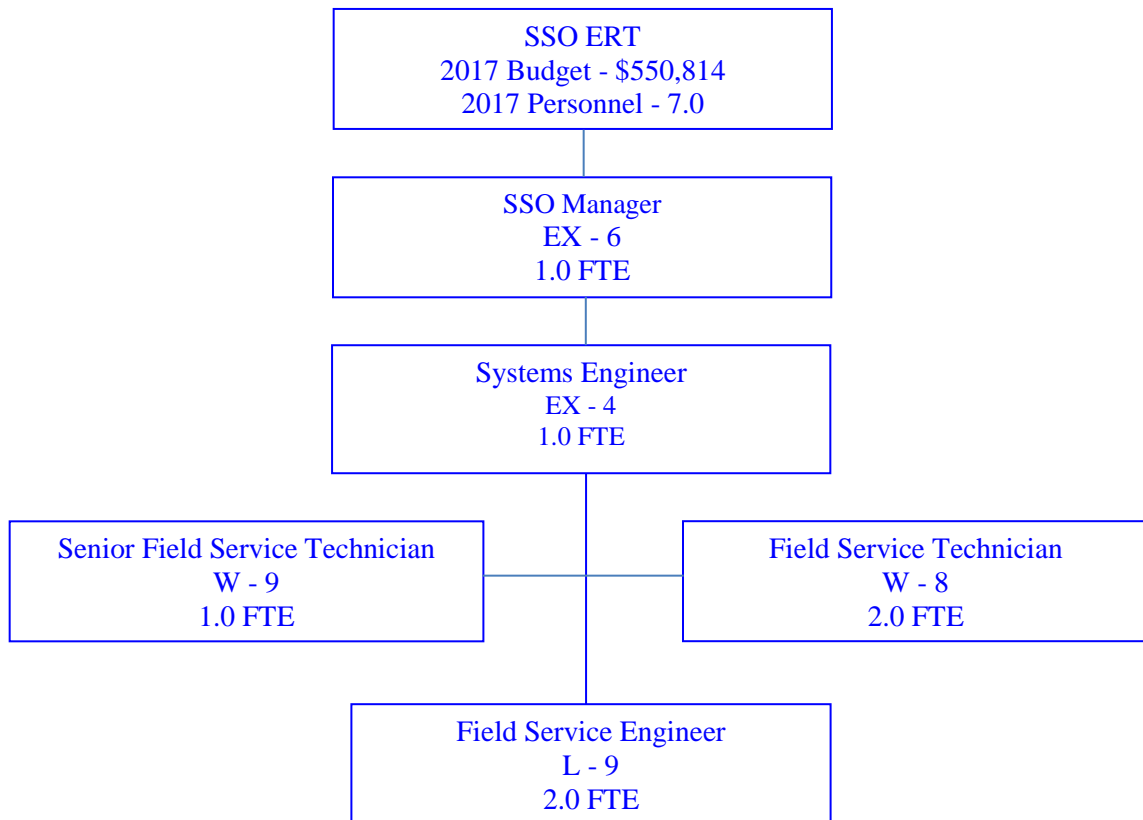
CCTV/Cleaning

There was no change to the position count.

Department Maintenance Goals

Activity	2015 Actual	2016 Actual	2017 Goal
<u>Capacity, Management, Operations and Maintenance (CMOM) :</u>			
Catch Basin Cleaning	21,945	21,804	20,00
Catch Basin Inspections	4,656	10,665	10,000
Clean and Inspect Sewers and Drains	72.45 miles	96.77 miles	90 miles
Manhole Inspections	8,835	6,273	5,000
Siphon Chamber Inspections	109	102	121
Inspect CSO Regulator	1,073	993	984
Inspect CSO Tide Gate	885	843	720

SSO ERT



Operations Division

SSO ERT

Program Activities

- Ensure timely response, reporting, tracking and mitigation of SSOs in accordance with the Commission's 2012 Consent Decree with EPA
- Manage the Commission's SSO Emergency Response Plan. Conduct training in the standard operating procedures for responding to and reporting of SSOs
- Maintain the computerized record keeping system for SSO reporting to assure data validity and consistency
- Analyze SSO events and recommend/implement recommendations for future mitigation or elimination

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$597,236	\$505,123	\$545,303	\$40,180	8.0%
Overtime	\$4,788	\$2,402	\$2,570	\$168	7.0%
Labor Related Costs/Benefits	\$3,673	\$2,819	\$2,941	\$122	4.3%
Total Direct Expenses	\$605,697	\$510,344	\$550,814	\$40,470	7.9%

Explanation of Major Variances

The 2017 budget for the SSO ERT Department is \$550,814, an increase of \$40,470 or 7.9% from 2016. The variance is due to Wages and Salaries, Overtime and Labor Related Costs/Benefits line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
SSO ERT	8.0	7.0	7.0	0.0

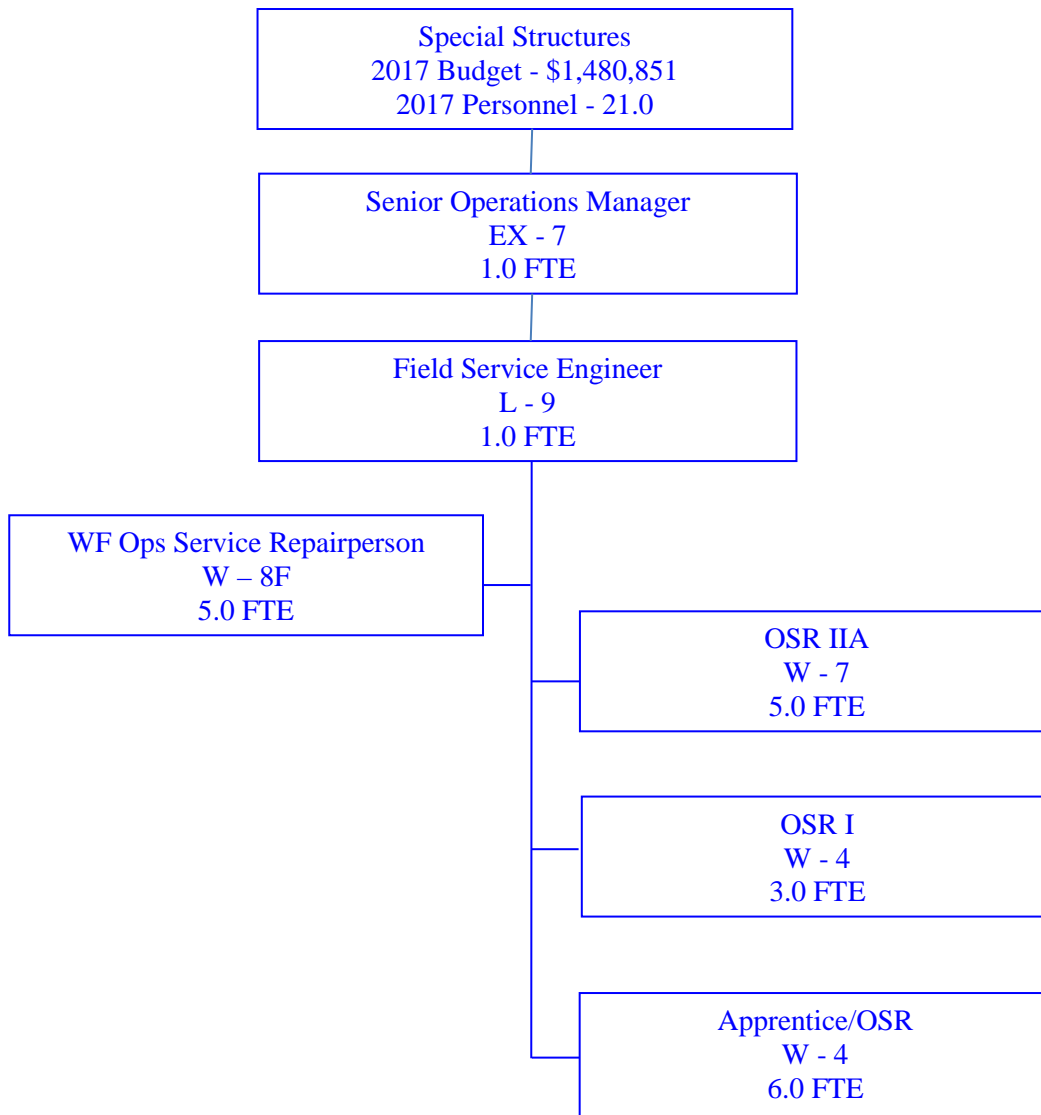
Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

Staff developed a standardized cloud based catch basin data collection and management system. The system verifies and submits GIS correction reports for catch basins missing or containing incorrect asset attribute information, which is identified during the annual cleaning program. This new system provides for direct comparison of cleaning and inspection records collected with mobile computing devices to existing GIS data. Significant discrepancies were noted. Therefore, inspections were scheduled to verify location and attribute information, and appropriate corrections reports were forwarded to GIS to update existing data. The paper record submissions from the Division's catch basin cleaning contractor were also cross referenced with the Commission's current GIS system map and database. The basins that were either not included in GIS or had location discrepancies were forwarded to GIS and subsequently the system map and corresponding data were updated. During 2016, over 100 catch basins have been removed from the storm drainage system by staff, and an additional 150 catch basins were identified as either private or non-BWSC. Twenty four catch basins that were previously unable to be located by the Contractor were ultimately discovered. Utilizing the same cloud based system originally conceived for the missing catch basins data; staff completed 2,762 manhole inspections, for the purpose of increasing productivity and also achieving established Capacity, Management, Operations and Maintenance (CMOM) program goals.

SPECIAL STRUCTURES



Operations Division

Special Structures

Program Activities

- Inspect and maintain the combined sewer overflow system in accordance with the Commission's National Pollutant Discharge Elimination System (NPDES) permit
- Inspect sewers and building connections within low groundwater areas to ensure that they are not causing the drawdown
- Inspect and ensure the operability of all large diameter water valves, division gates, and appurtenances
- Inspect manholes, siphon chambers, and tide gates for defects and recommend repair and/or replacement

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$433,161	\$1,307,648	\$1,394,614	\$86,966	6.7%
Overtime	\$0	\$32,624	\$34,908	\$2,284	7.0%
Labor Related Costs/Benefits	\$6,173	\$44,045	\$51,329	\$7,284	16.5%
Total Direct Expenses	\$439,334	\$1,384,317	\$1,480,851	\$96,534	7.0%

Explanation of Major Variances

The 2017 budget for Special Structure Department is \$1,480,851, an increase of \$96,534 or 7.0% from the 2016 budget. The variance is due to Wages and Salaries and Labor Related Costs/Benefits line items.

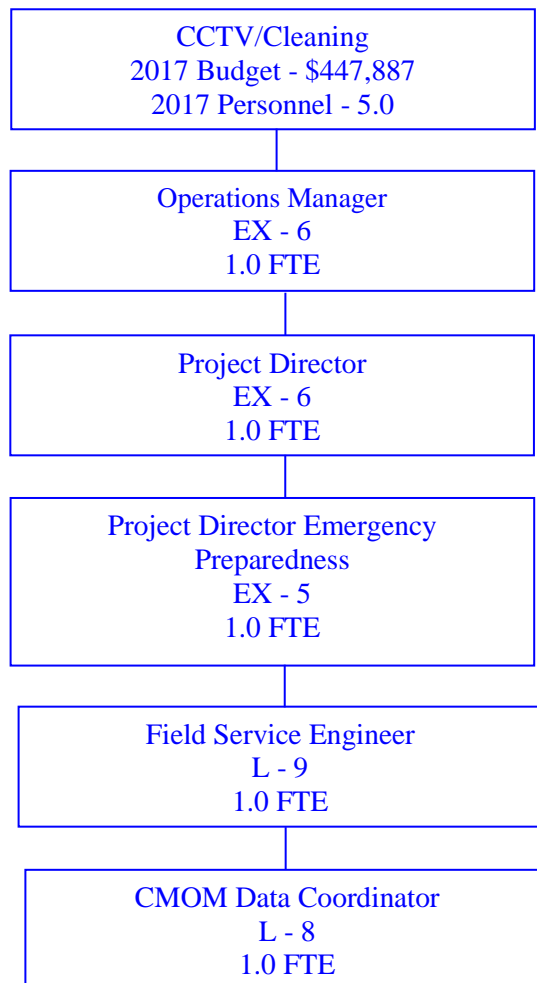
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Special Structures	21.0	21.0	21.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

CCTV/Cleaning



Operations Division

CCTV, Pipe Cleaning and Catch Basins

Program Activities

- Clean and inspect approximately ten percent (10%) of the Commission's sewer system annually using a risk based approach. Analyze inspection data and make recommendations for repair and improvements
- Centralize all Closed Circuit Television (CCTV) data for reporting and scoring purposes
- Inspect all of the Commission's catch basins on an annual basis and clean as necessary. The current program is anticipated to clean approximately 20,000 catch basins annually
- Utilize catch basin inspection data to schedule cleaning, other maintenance and repairs of defects found

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$84,891	\$394,543	\$430,876	\$36,333	9.2%
Labor Related Cost/Benefits	\$15,345	\$13,756	\$17,011	\$3,255	23.7%
Total Direct Expenses	\$100,236	\$408,299	\$447,887	\$39,588	9.7%

Explanation of Major Variances

The 2017 budget for CCTV/CB Cleaning is \$447,887, an increase of \$39,588 or 9.7% from 2016. The variance is due to Wage and Salaries and Labor Related Cost/Benefits line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
CCTV/CB Cleaning	4.0	5.0	5.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

Staff, in conjunction with IT, developed a Sanitary Sewer Overflow (SSO) Metrics Report to track and analyze various statistics as related to SSO events, root cause and remediation for use in assessing the performance of the wastewater collection system. The finalized system is a versatile tool that allows Commission staff to analyze SSO metrics over a user defined date range, assisting staff in efforts to reduce SSO's through preventative and predictive maintenance.

2017 Program Goals and Objectives

Goal: Develop a pre-cleaning catch basin inspection program to identify basins that require cleaning prior to the catch basin cleaning contractor entering the area.

Objectives: The objective of this goal is to develop a work queue for the catch basin cleaning contractors prior to mobilizing in an area or neighborhood such that only basins identified by the Commission are cleaned. This will help to maximize the efficiency of the contractor and ensure difficult catch basins are not skipped or ignored.

Mission: Increased Production or Efficiency Improvements

Goal: Evaluate the feasibility of automatically updating GIS attributes from the newly acquired Closed Circuit Television (CCTV) pipeline inspection system to improve data quality. Test and implement a system if found to be feasible.

Objectives: The objective of this goal is to eliminate the need for manual GIS correction to be submitted to the GIS department in order to increase the productivity of inspection video reviews and improve GIS data quality.

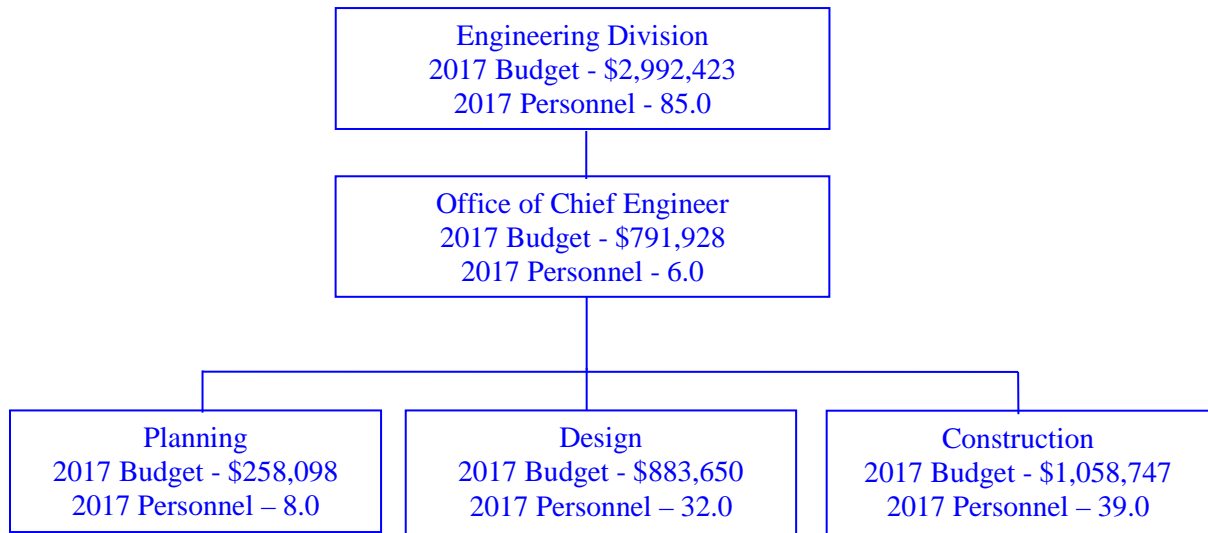
Mission: Increased Production or Efficiency Improvements

Goal: Pilot the use of mobile functionality of the Commission's newly implemented work order management system, City Works, to perform manhole inspections to comply with the Commission's Capacity, Management, Operations and Maintenance (CMOM) goals.

Objectives: The objective of this goal is to pilot-test the functionality of the Commission's work order management system's mobile capabilities to improve the efficiencies of field inspections

Mission: Increased Production or Efficiency Improvements

ENGINEERING DIVISION



Engineering Division

Engineering Division Organization

The Engineering Division is comprised of the Office of the Chief Engineer and three other departments:

- **Planning**
- **Design**
- **Construction**

Division Mission

The Engineering Division ensures the provision of high quality, reliable water, sewer and drainage services while protecting the environment. The Engineering Division accomplishes this through pursuing an aggressive Renewal and Replacement program, supporting the Boston Harbor pollution abatement effort and meeting all federal and state water and wastewater laws.

Division Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Office of the Chief Engineer	\$530,392	\$735,598	\$791,928	\$56,330	7.7%
Planning	\$833,994	\$373,346	\$258,098	(\$115,248)	-30.9%
Design	\$2,749,351	\$1,231,401	\$883,650	(\$347,751)	-28.2%
Construction	\$3,949,169	\$1,568,461	\$1,058,747	(\$509,714)	-32.5%
Total Direct Expenses	\$8,062,906	\$3,908,806	\$2,992,423	(\$916,383)	-23.4%

Explanation of Major Variances

The 2017 budget for the Engineering Division is \$2,992,423, a decrease of \$916,383, or 23.4% from the 2016 budget. The variance is due to decrease in Planning, Design and Construction Departments line items.

Engineering Division

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Chief Engineering Officer	5.0	5.0	6.0	1.0
Planning	7.0	8.0	8.0	0.0
Design	32.0	32.0	32.0	0.0
Construction	39.0	40.0	39.0	(1.0)
Total Personnel	83.0	85.0	85.0	0.0

Explanation of Personnel Changes

Office of the Chief Engineer

One position was added to the position count.

Planning

There was no change to the position count.

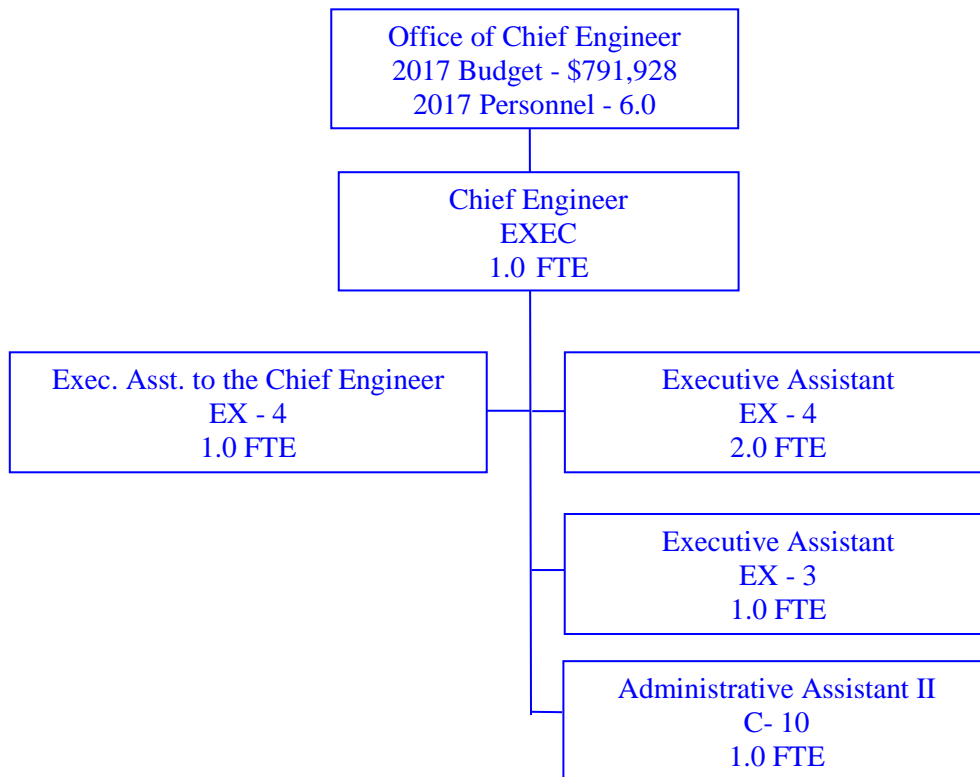
Design

There was no change to the position count.

Construction

One position transferred to Water & Sewer Services.

Office of the Chief Engineer



Engineering Division

Office of Chief Engineer

Program Activities

- Provide overall management and coordination of all engineering program development to ensure the provision of high quality, reliable water, sewer and drainage services
- Manage and coordinate all Commission activities with the MWRA
- Manage and coordinate all Commission activities regarding Central Artery/Tunnel Projects

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$419,605	\$403,831	\$555,227	\$151,396	37.5%
Overtime	\$726	\$529	\$566	\$37	7.0%
Labor Related Costs/Benefits	\$19,088	\$19,918	\$20,515	\$597	3.0%
Professional Services	\$50,827	\$286,820	\$191,120	(\$95,700)	-33.4%
Training/Seminar/Travel	\$40,146	\$24,500	\$24,500	\$0	0.0%
Total Direct Expenses	\$530,392	\$735,598	\$791,928	\$56,330	7.7%

Explanation of Major Variances

The 2017 budget for the Office of Chief Engineer is \$791,928, an increase of \$56,330 or 7.7% from 2016. The variance is due to increases in Wages and Salaries, Overtime, and Labor Related Costs/Benefits line items.

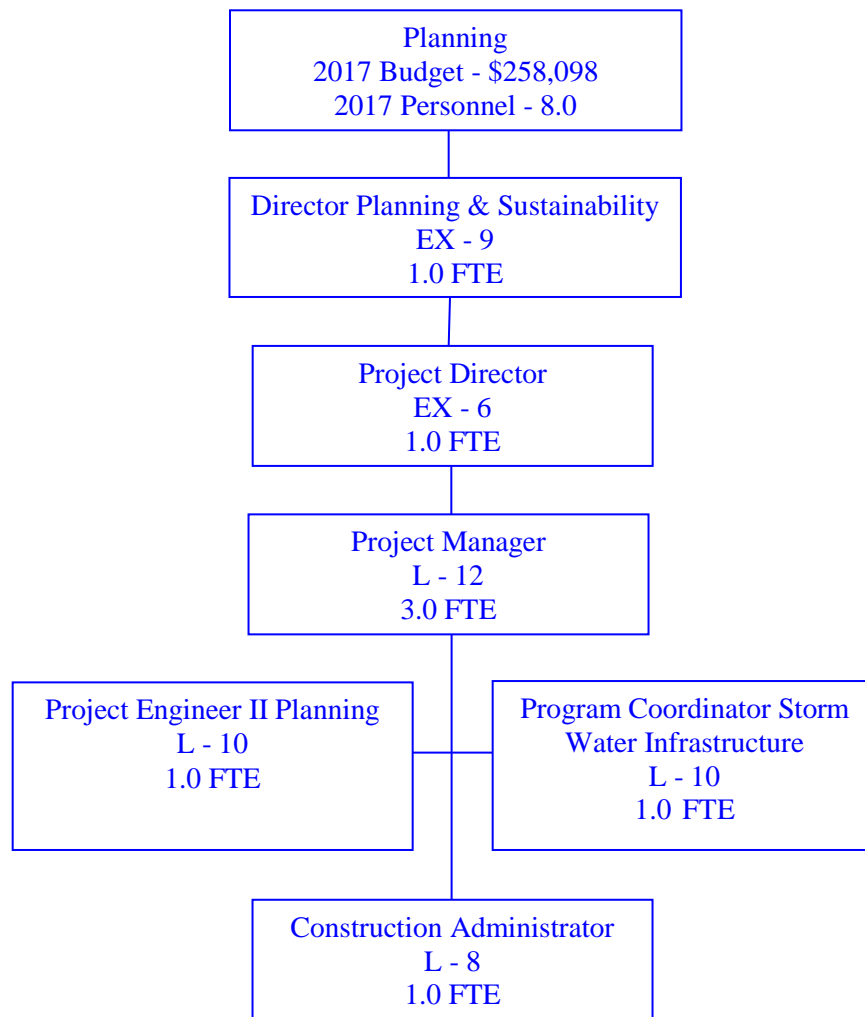
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Chief Engineer	5.0	5.0	6.0	1.0

Explanation of Personnel Changes

There was one position added to the position count.

Planning



Engineering Division

Planning

Program Activities

- Conduct system-wide, area specific investigations and project planning
- Determine planning projects for three year Capital Improvement Program
- Develop and coordinate Commission regulatory compliance activities
- Analyze and disseminate demographic, engineering and regulatory information
- Devise and manage consultant contracts
- Develop model capabilities
- Evaluate the impacts on Commission facilities of proposed public and private projects
- Participate in the review of MWRA projects and implementation of those assigned to BWSC

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$813,611	\$336,037	\$210,554	(\$125,483)	-37.3%
Labor Related Costs/Benefits	\$18,984	\$20,809	\$19,044	(\$1,765)	-8.5%
Supplies and Materials	\$1,400	\$8,500	\$8,500	\$0	0.0%
Professional Services	\$0	\$8,000	\$20,000	\$12,000	150.0%
Total Direct Expenses	\$833,995	\$373,346	\$258,098	(\$115,248)	-30.9%

Explanation of Major Variances

The 2017 budget for the Planning Department is \$258,098 a decrease of \$115,248 or 30.9% from 2016. The decrease in variance is due to Wages and Salaries, Labor Related Costs/Benefits line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Planning	7.0	8.0	8.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

Planning Department staff facilitated collaboration between the Commission, Boston Public Schools (BPS) and Horsley Witten Group, The Commission's consultant. Tasco Construction, Inc. continued construction on the Washington Irving School. Construction is now approximately 75% complete and will be finished in the spring of 2017. The designs for the Rafael Hernandez School are 95% complete, and the project is scheduled to be bid in early 2017. The Green Infrastructure designs are 75% completed for the David A Ellis School, the Horace Mann School and the Kennedy Health Careers Academy and designs will be finalized in early 2017. Final conceptual designs for a Subsurface Gravel Filter under the playing field and a perimeter bioswale around the Daisy Field parking lot were submitted to and reviewed by the Commission.

2017 Program Goals and Objectives

Goal: Update the Commission's Stormwater Management Program Plan (SWMP).

Objective: A first draft of the SWMP will be completed in January of 2017. The SWMP will describe Best Management Practices (BMPs) the Commission will implement over a five year period to reduce the discharge of pollutants from the Commission's municipal separate stormwater system (MS4). The SWMP will identify specific goals aimed at advancing and measuring progress, and provide strategies for achieving the goals. The SWMP will be prepared by the Planning Department based on interviews with in-house staff from the Engineering, Operations, Legal and Communications Departments.

Mission: Comply with Local, State and Federal Regulations

Goal: Complete a program to evaluate the quality of stormwater runoff and discharges from the Commissions stormwater system.

Objective: Monitor and track the consultant's progress to ensure the project is completed in accordance with the terms of the executed contract. Under the project, collect wet and dry weather water quality samples to be analyzed for a variety of parameters, including fecal indicator bacteria, phosphorus, pharmaceuticals, personal care products and DNA.

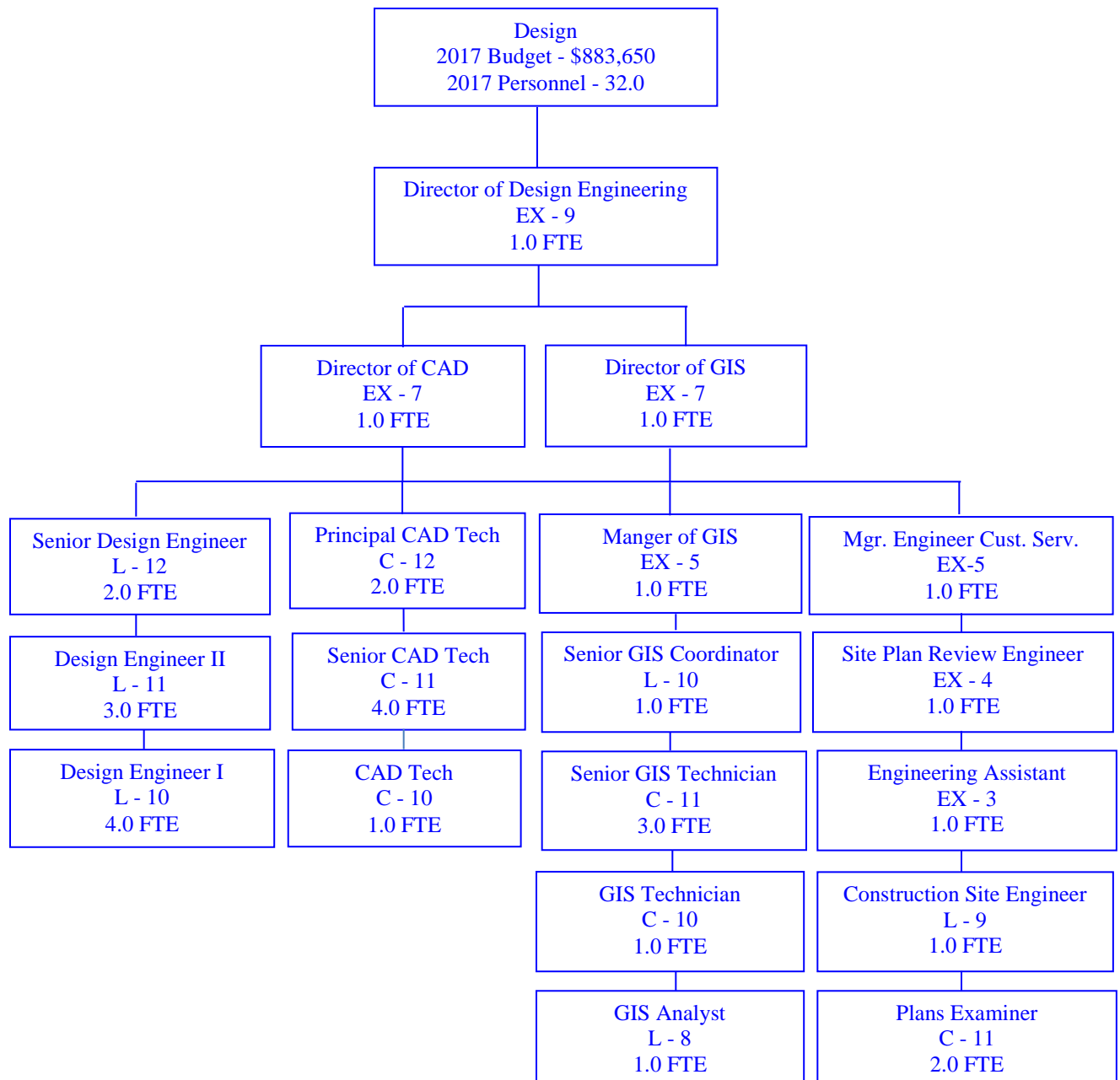
Mission: Protect Environment

Goal: Develop methods to evaluate catch basins in combined areas that, according to the Wastewater Facilities Study, are in an area identified as potentially prone to inundation according to the Climate Change Scenarios.

Objective: The Wastewater and Storm Drainage System Facilities Study identified areas in Boston that may be prone to inundation under future climate change scenarios. Staff will examine these areas and identify those that have combined sewer systems in them. Staff will then identify the catch basins that may be tributary to the combined system and develop an inspection program that will ascertain if the catch basins are connected to the combined system.

Mission: Enhanced Repair and Maintenance of Water or Wastewater System

Design



Engineering Division

Design

Program Activities

- Provide the Commission with professional engineering services for the design of water and wastewater construction projects
- Provide engineering review of outside projects that affect Commission facilities ensuring that those projects protect or enhance the Commission facilities
- Service BWSC's customers and in-house personnel by providing GIS information, research data, facility prints, water and sewer service location cards, As-Built and other relevant Street Log, Webpage, and Arcview information concerning the Commission's systems
- Schedule new water, sewer, drain installations and repair inspections and provide GIS with as built and inspector's reports for GIS input

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,617,343	\$1,135,516	\$662,998	(\$472,518)	-41.6%
Overtime	\$10,247	\$8,278	\$8,857	\$579	7.0%
Labor Related Costs/Benefits	\$89,717	\$35,407	\$108,895	\$73,488	207.6%
Supplies and Materials	\$17,160	\$12,700	\$57,400	\$44,700	352.0%
Repair and Maintenance	\$10,916	\$15,000	\$19,500	\$4,500	30.0%
Professional Services	\$1,938	\$15,000	\$15,000	\$0	0.0%
Other Services	\$2,030	\$9,500	\$11,000	\$1,500	15.8%
Total Direct Expenses	\$2,749,351	\$1,231,401	\$883,650	(\$347,751)	-28.2%

Explanation of Major Variances

The 2017 budget for the Design Department is \$883,650 a decrease of \$347,751 or 28.2% from 2016. The decrease in variance is due to the Wages and Salaries line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Design	32.0	32.0	32.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

The Commission's Storm Drainage Design Manual has been revised and a new design manual, NOAA Atlas 14, has been established. Design staff composed an As-Built information manual in order to assist current and new CAD technicians with the creation of as-built plans. The Commission's site plan requirements have been reviewed and subsequently modified as recommended by the 2015 Wastewater Facilities Final Report. Additionally, Design staff continued working on the Manhole Annotation Project, generating a process to identify where annotation was missing but inverts exist and completing 172 tiles.

2017 Program Goals and Objectives

Goal: This is the third year of a three year project which began in 2015. Continue with the Manhole Annotation project and complete the quality control and correction of the remaining 77 BWSC tiles. There are 277 total tiles to review and with the achievement of this goal the project will be complete.

Objective: Improve data integrity by focusing on correcting specific issues with the data. Over the next 12 months GIS will identify BWSC storm and drain pipes whose inverts exist in the attributes but do not display with annotation. This goal is to complete 28% of the city or 77 tiles by 6/15/17.

Mission: Increased Production or Efficiency Improvements

Goal: To aid in reducing the risk of failure for the Commission's water distribution system the GIS Department will work to identify BWSC owned water mains that exist within or above MBTA subway tunnels. The GIS Department will work closely with contacts at the MBTA to acquire both record plan images and geographic data.

Objective: The objective of this goal is to clearly identify the Commission's water mains which exist in or above MBTA Tunnels. The GIS Department will collect, catalog, and link any relevant record plans or documents and alter the data schema to designate the water main features as unique. There is also potential to find new facilities that may not currently exist in our geodatabase.

Mission: Enhanced Repair and Maintenance of Water or Wastewater System

Goal: To update and revise the Commission's Site Plan requirements as recommended by the Wastewater and Storm Drainage Facilities Project-2015 plan.

Objective: To ensure that the Commission's Site Plan Requirements meet all current requirements for stormwater manage and clarify inconsistencies.

Mission: Comply with Local, State and Federal Regulations

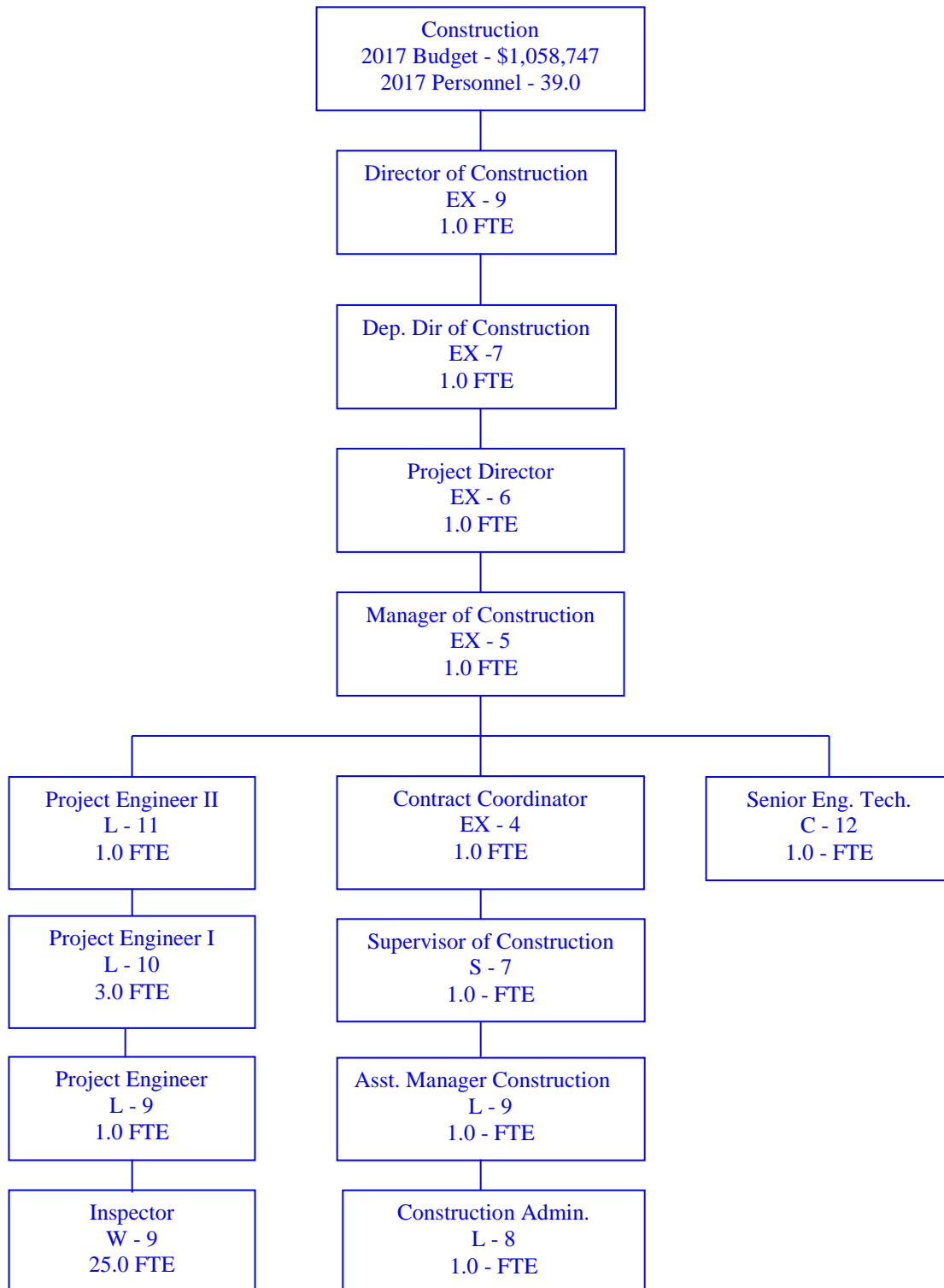
Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
Design contracts to replace or rehabilitate water mains.	12.87 miles	11 miles	11 miles	11 miles
Design contracts to replace or rehabilitate sewer pipes.	5,233 feet	12,400 feet	21,120 feet	47,520 feet

Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
Drain Layers Licenses	413	499	383	390
Water and Sewer Prints	292	148	89	100
Repairs:				
Fire pipe	26	50	34	40
Sanitary	213	293	251	260
Storm Drains	7	11	5	10
Site Plans:				
Submitted	389	478	604	625
Approved	427	530	635	40
Dye Tests	599	620	525	550
Customer Service Visits	4,828	5,373	5,932	6,000

Construction



Engineering Division

Construction

Program Activities

- Provide construction management services for all the Commission's CIP projects and other major projects, which are undertaken by private developers or other agencies or utilities that impact our infrastructure

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2017-2016 Variance
Wages and Salaries	\$3,674,764	\$1,324,197	\$794,083	(\$530,114)	-40.0%
Overtime	\$210,648	\$193,405	\$206,943	\$13,538	7.0%
Labor Related Costs/Benefits	\$56,582	\$40,709	\$47,191	\$6,482	15.9%
Supplies and Materials	\$7,175	\$9,950	\$10,330	\$380	3.8%
Repair and Maintenance	\$0	\$200	\$200	\$0	0.0%
Total Direct Expenses	\$3,949,169	\$1,568,461	\$1,058,747	(\$509,714)	-32.5%

Explanation of Major Variances

The 2017 budget for the Construction Department is \$1,058,747, a decrease of \$509,714 or 32.5% from 2016. The variance is due to the Wages and Salaries and Repair and Labor Related Costs/Benefits line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2015 Variance
Construction	39.0	40.0	39.0	(1.0)

Explanation of Personnel Changes

One position transferred to Water & Sewer Services.

2016 Program Goal Results

The Project Engineers develop reports on contract overruns and underruns and process Change Orders. The annual report will include a summary of all contracts. The monthly report for December will be provided to each engineer to review their projects. To date over 30 contracts have been closed. This goal will continue into 2017. Recently the sewer on Beacon Street was found to be offset from the location shown on the plan and the depth of the sewer was deeper. This information was provided to the design section. The first project is complete. Coordination occurred for the permanent restoration of Hampden Street and the detour implemented on Dudley Street. The traffic modifications on Eustis Street were returned to their original conditions. Notices of the detour were hand delivered to the impacted streets. Coordination with Boston Public Schools and the MBTA occurred for bus routes. Ongoing customer service coordination continues.

2017 Program Goals and Objectives

Goal: Assist the Planning Division with field investigations of catch basins designated within the inundation sewer area. The field work will be within a pilot program to determine how long it takes to inspect the catch basins

Objective: To reduce the number of preventable change orders and to align estimated quantities with actual quantities.

Mission: Protect Environment

Goal: Assist in the development of mentoring programs and training sessions for succession planning.

Objective: To ensure that key positions within the Commission can be filled in the future with qualified individuals.

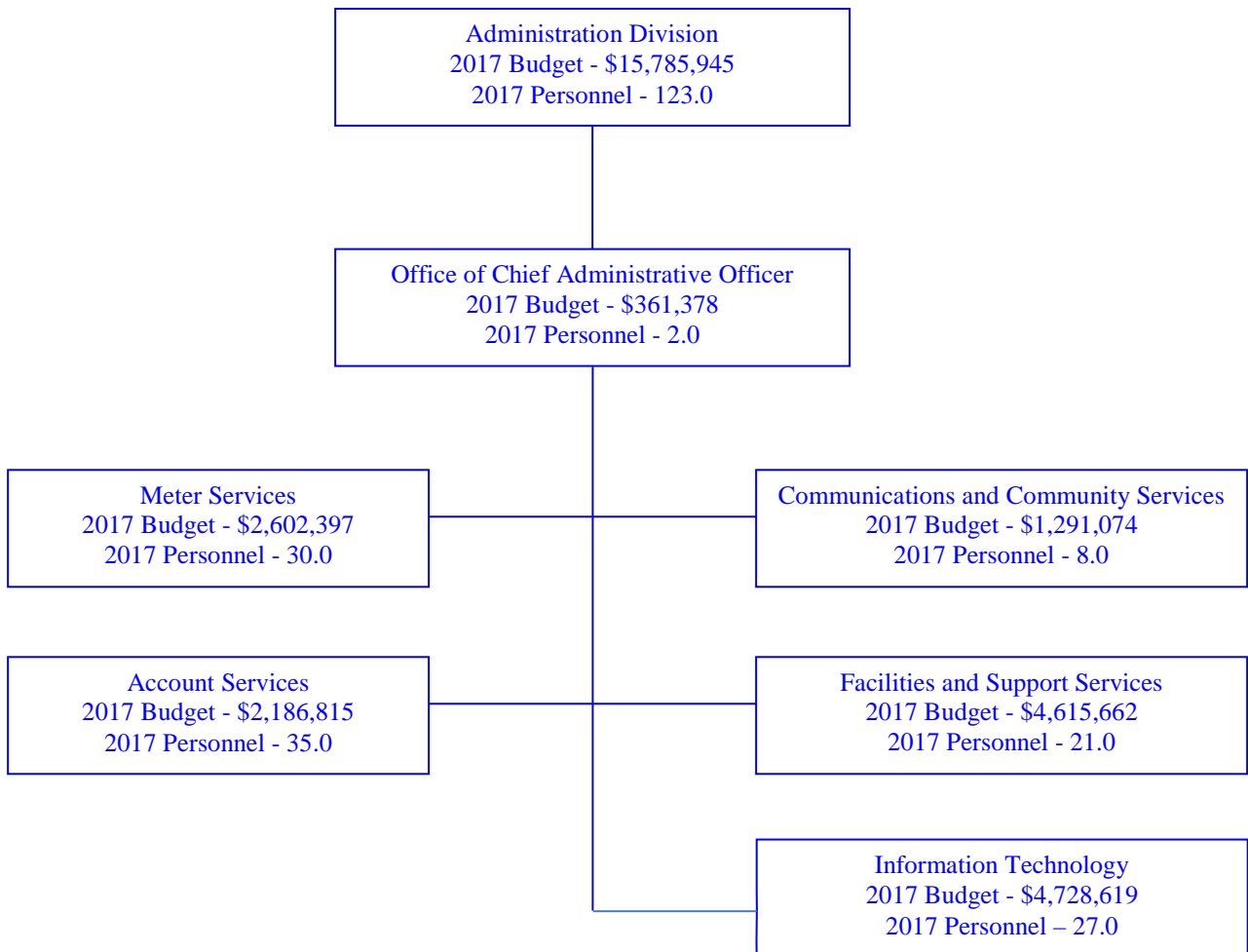
Mission: Increased Production or Efficiency Improvements

Goal: Work with BPWD and BTM on creating a better mechanism for permits. Create a protocol for confirming and appealing paving and permit charges.

Objective: To reduce the time to obtain permits and to contest permit fees applied incorrectly.

Mission: Increased Fiscal Goals

Administration Division



Administration Division

Administration Division

The Administration Division consists of the Office of Chief Administrative Officer and five other departments:

- **Meter Services**
- **Account Services**
- **Communications and Community Services**
- **Facilities and Support Services**
- **Information Technology**

Division Mission

The Administration Division performs support functions for the Commission by promoting proactive personnel services; providing prompt, efficient and knowledgeable service to our customers; providing timely and accurate reading of meters and installation of new meters; representing the Commission at various public and community meetings and coordinating all aspects of the Commission's buildings and properties including maintenance, repairs, security, mail distribution, office supplies and furniture, records archiving, office equipment leasing and food services.

Division Budget Summary

Department	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Office of Chief Administrator Officer	\$349,032	\$347,378	\$361,378	\$14,000	4.0%
Meter Services	\$2,711,799	\$2,581,336	\$2,602,397	\$21,061	0.8%
Account Services	\$2,356,924	\$2,084,849	\$2,186,815	\$101,966	4.9%
Communications and Community Srvs	\$896,222	\$1,138,077	\$1,291,074	\$152,997	13.4%
Facilities and Support Services	\$4,130,005	\$4,509,099	\$4,615,662	\$106,563	2.4%
Information Technology	\$3,833,450	\$4,217,707	\$4,728,619	\$510,912	12.1%
Total Direct Expenses	\$14,277,432	\$14,878,446	\$15,785,945	\$907,499	6.1%

Explanation of Major Variances

The 2017 budget for the Administration Division is \$15,785,945, an increase of \$907,499 or 6.1% from 2016. The variance is due to the Office of Chief Administrator, Meter Services, Account Services, Communication and Community Services, Facilities and Support Services and Information Technology departments.

Administration Division

Division Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Chief Administrator Officer	2.0	2.0	2.0	0.0
Meter Services	30.0	30.0	30.0	0.0
Account Services	36.0	35.0	35.0	0.0
Communications and Community Service	8.0	7.0	8.0	1.0
Facilities and Support Services	22.0	22.0	21.0	(1.0)
Information Technology	30.0	29.0	27.0	(2.0)
Total	128.0	125.0	123.0	(2.0)

Explanation of Personnel Changes

Office of Chief Administrator Officer

There was no change to the position count.

Meter Services

There was no change to the position count.

Account Services

There was no change to the position count.

Communications and Community Services

One position transferred from Finance.

Facilities and Support Services

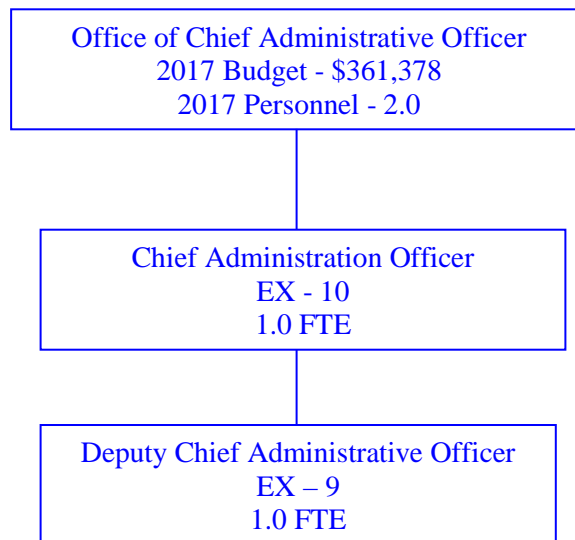
One position transferred to Night Operations.

Information Technology

One position transferred to Support Services.

One position transferred to Facilities and Support Services.

Office of Chief Administrative Officer



Administration Division

Office of Chief Administrative Officer

Program Activities

- Oversee efforts to provide outstanding service to all Commission employees and customers

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$316,138	\$277,300	\$290,758	\$13,458	4.9%
Labor Related Costs/Benefits	\$16,927	\$18,078	\$18,620	\$542	3.0%
Professional Services	\$0	\$30,000	\$30,000	\$0	0.0%
Training/Seminar/Travel	\$15,967	\$22,000	\$22,000	\$0	0.0%
Total Direct Expenses	\$349,032	\$347,378	\$361,378	\$14,000	4.0%

Explanation of Major Variances

The 2017 budget for the Office of the Chief Administrative Officer is set at \$361,378, an increase of \$14,000 or 4.0% from 2016. The variance is due to an increase in Wage and Salaries, Labor Related Costs/Benefits line items.

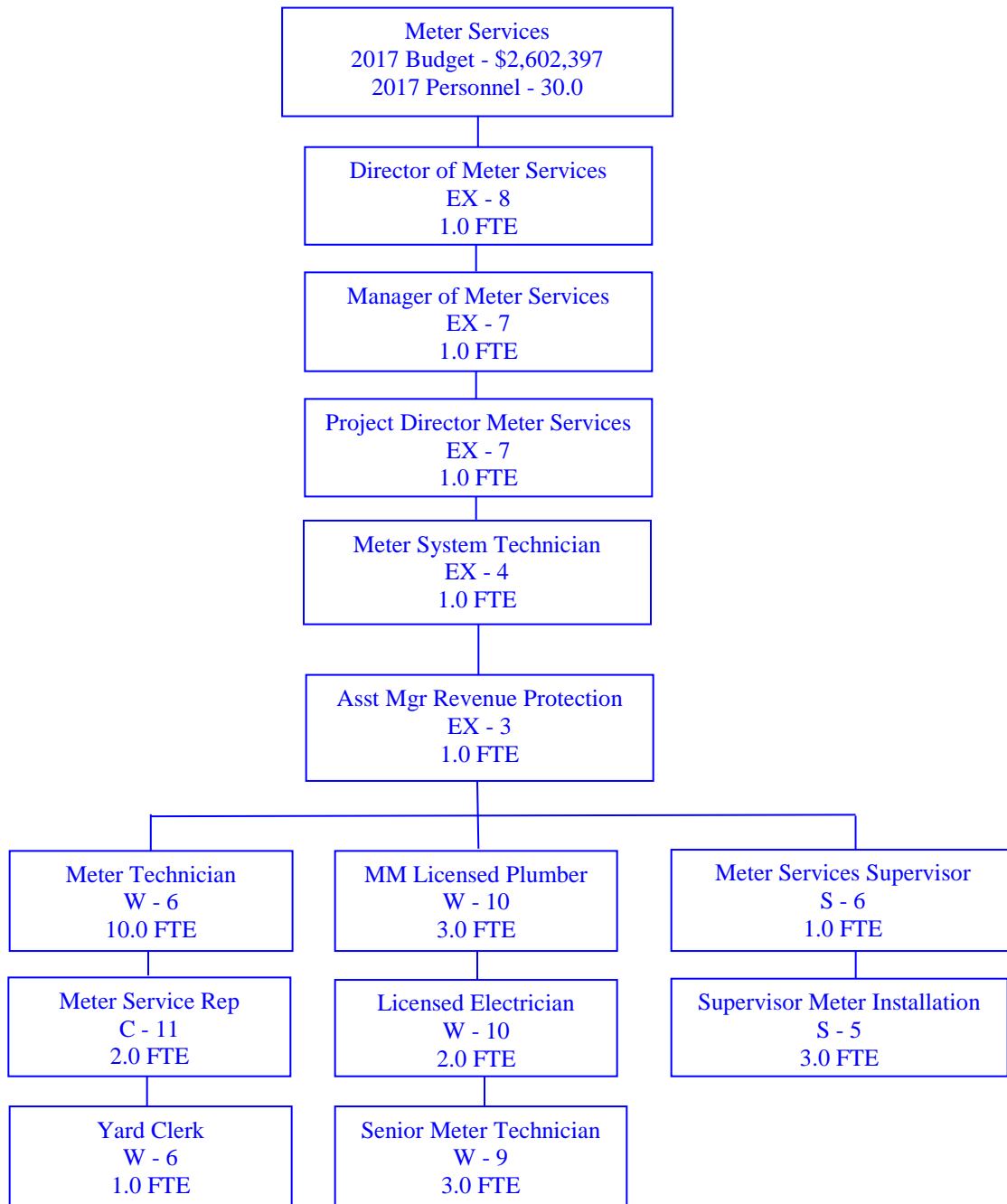
Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Chief Administrator Officer	2.0	2.0	2.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

Meter Services



Administration Division

Meter Services

Program Activities

- Maintain the efficient operation of approximately 89,000 water meters and associated automatic meter reading devices in the system thus assuring accurate registration of consumption, including the tracking and evaluation of accounts with irregularities that may be the result of defective registration and/ or meter tampering
- Provide mechanical and technical support services by way of skilled personnel as requested

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,588,627	\$2,423,073	\$2,465,257	\$42,184	1.7%
Overtime	\$65,107	\$70,144	\$75,054	\$4,910	7.0%
Labor Related Costs/Benefits	\$15,402	\$10,359	\$14,326	\$3,967	38.3%
Supplies and Materials	\$22,503	\$24,500	\$24,500	\$0	0.0%
Repair and Maintenance	\$20,161	\$21,000	\$21,000	\$0	0.0%
Professional Services	\$0	\$30,000	\$0	(\$30,000)	100.0%
Other Services	\$0	\$2,260	\$2,260	\$0	0.0%
Total Direct Expenses	\$2,711,800	\$2,581,336	\$2,602,397	\$21,061	0.8%

Explanation of Major Variances

The 2017 budget for Meter Services is \$2,602,397, an increase of \$21,061 or 0.8% from 2016. The variance is due to Wages and Salaries, Overtime, Labor Related Costs/Benefits and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Meter Services	30.0	30.0	30.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

The Meter division tested 3,483 meters in 2016. Meter Services will continue to test large meters in accordance with the AWWA recommended test schedule as well as all working meters that are replaced as well as meters that customers request to be tested. The Meter Division performed due diligence checks on Barletta Engineering Corporation and their subcontractor Utility Metering Solutions regarding their potential selection as BWSC's new MTU installation contractor, and submitted a transmittal in January 2016 to authorize the award of the contract. By the conclusion of 2016, installations in 19 of the 22 wards were completed. Regarding the solicitation of bids for the purchase and installation of a lift for the large meter test bench in the Meter Shop, American Crane and Hoist Corporation was awarded the bid, and the installation of the fully operational lift complied with Boston Water and Sewer Commission's specifications.

2017 Program Goals and Objectives

Goal: In conjunction with BWSC's IT Department and CIS Vendor, assist with the implementation and testing of the new CIS system.

Objective: Work directly with the new CIS vendor assisting with the development of business processes and work flows as well as a possible alternative business process relating to the functionality of the new CIS system. Make certain that the implementation of the new CIS system runs successfully and efficiently while adhering to all BWSC regulations and guidelines.

Mission: Increased Fiscal Controls

Goal: In conjunction with other stake holding departments, participate in the management of the contract and oversee the installation of 30,000 MTU II's.

Objective: Finalize the installation of 30,000 MTU II's on the Commissions account with the oldest MTU's. In conjunction with various departments manage and oversee the day to day functions of the installation contractor including notification process, work order system, scheduling, monitoring of successful installations and payment method.

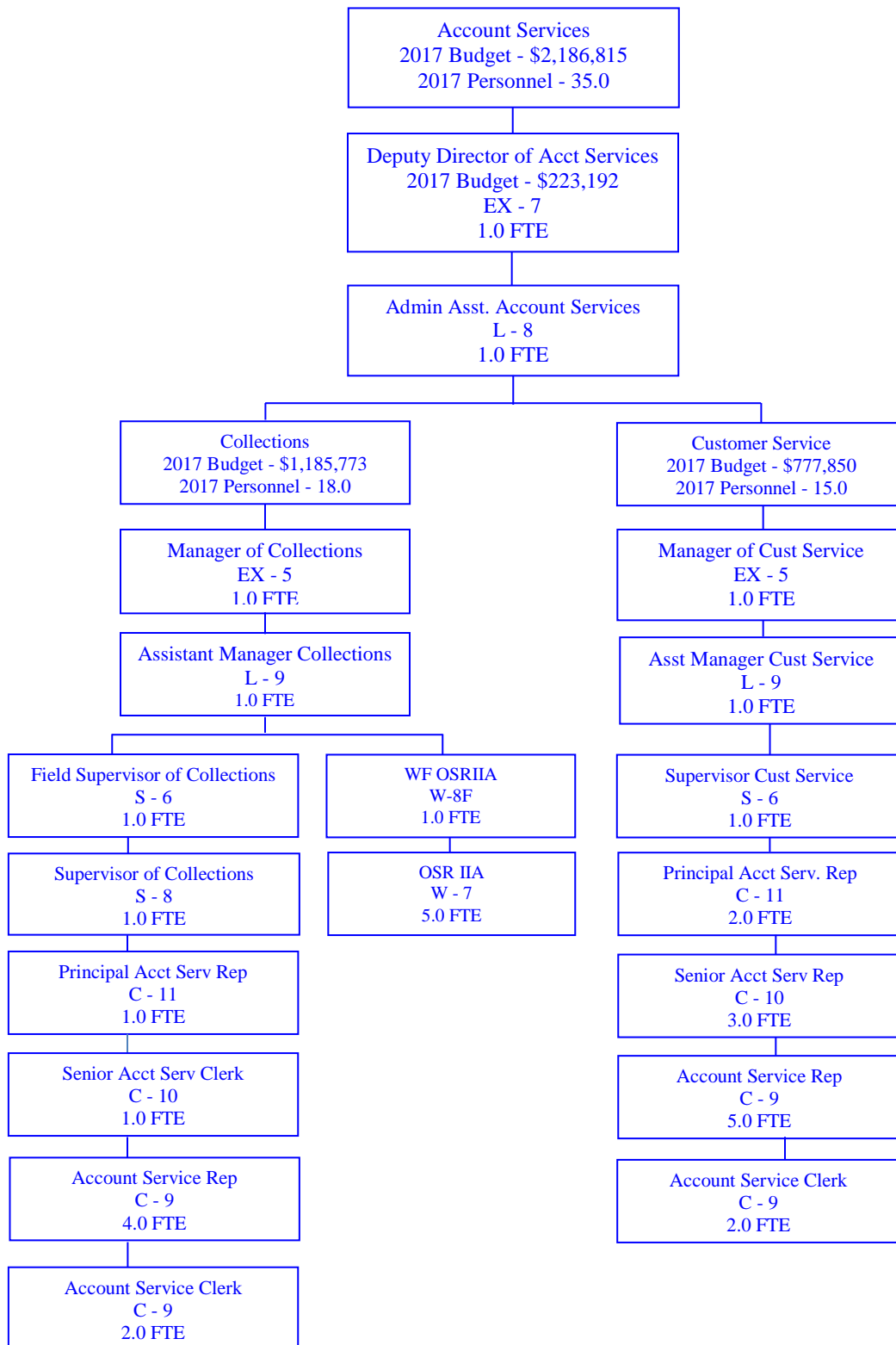
Mission: Improved Customer/Employee/Investor Relations

Goal: In Conjunction with IT, Account Services, and Finance develop a Request for Information on current meter reading technology, conduct vendor demonstrations and evaluate the feasibility of a pilot for approximately 1500 accounts.

Objective: Solicit AMR vendors to demonstrate the most current meter reading technology and select a vendor to pilot 1500 accounts. Monitor the system to evaluate how it performs in Boston and the pros and cons of the system compared to the current AMR System.

Mission: Improved Production or Efficiency Improvements

Account Services



Administration Division

Accounts Services

Program Activities

- Respond quickly to customer inquiries and expeditiously resolve all disputes regarding customer account balances
- Reduce outstanding dollars on delinquent accounts
- Manage the automated calling system to increase the number of outgoing and follow-up calls on delinquent accounts
- Manage the Automated Dunning System and the Commission's integrated collection activities

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,285,442	\$2,018,025	\$2,129,251	\$111,226	5.5%
Overtime	\$6,615	\$5,071	\$5,426	\$355	7.0%
Labor Related Costs/Benefits	\$36,780	\$11,458	\$19,638	\$8,180	71.4%
Supplies and Materials	\$28,087	\$34,015	\$32,500	(\$1,515)	-4.5%
Total Direct Expenses	\$2,356,924	\$2,068,569	\$2,186,815	\$118,246	5.7%

Explanation of Major Variances

The 2017 budget for Account Services is \$2,186,815, an increase of \$118,246, or 5.7% from 2016. The variance is due to Wages and Salaries, Overtime and Labor Related Costs/Benefits line items.

Administration Division

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Account Services	3.0	2.0	2.0	0.0
Collections	18.0	18.0	18.0	0.0
Customer Service	15.0	15.0	15.0	0.0
Total	36.0	35.0	35.0	0.0

Explanation of Personnel Changes

Account Services

There was no change in the position count.

Collections

There was no change in the position count.

Customer Services

There was no change in the position count.

2016 Program Goal Results

A report was developed by the Account Services Department that identifies accounts with delinquent balances between \$1000.00 and \$1,500.00, which averages 800 accounts each month. The report is distributed to Account Service Representatives to contact customers regarding the outstanding balance. To date, over 6,800 customer contacts were attempted. Consequently, during 2016, Account Services completed and subsequently implemented a draft of the Collection Agreement Guidelines which serves to provide apt procedure for dealing with delinquent accounts to maintain consistency and ensure customers meet the required criteria for the terms of the collection agreement. Account Services continued taking an active role in supporting and working directly with BWSC's new MTU installation contractor, Barletta Engineering Corporation. The Account Services Division coordinated and scheduled the mailing of notices and posting of properties for the AMR Shut-Off for Refusal of Access.

2017 Program Goals and Objectives

Goal: In conjunction with BWSC's IT Department and CIS Vendor, assist with the development of business processes and work flows for the new CIS system.

Objectives: Work directly with the new CIS vendor assisting with the development of business processes and work flows and as well as possible alternative business process relating to the functionality of the new CIS system. To make certain that the implementation of the new CIS system runs successfully and efficiently while adhering to all BWSC regulations and guidelines.

Mission: Increased Production or Efficiency Improvements

Goal: In conjunction with BWSC's IT Department and CIS vendor, assist with the testing of the functionality of business processes and requirements of the new CIS system.

Objective: Assign key personnel to work with the CIS vendor testing all Account Service related business processes and in turn, will then become the designated SME's for the new CIS system. Train staff members on current work processes to assist with backfilling positions of the SME's assigned to work with the CIS vendor. To ensure all work processes function accurately prior to go live on the new system and provide coverage for SME's assigned to test the new CIS system.

Mission: Increased Production or Efficiency Improvements

Goal: In response to the revised eligibility for water discounts for properties held in a trust, manage the inclusion of the additional discount applications.

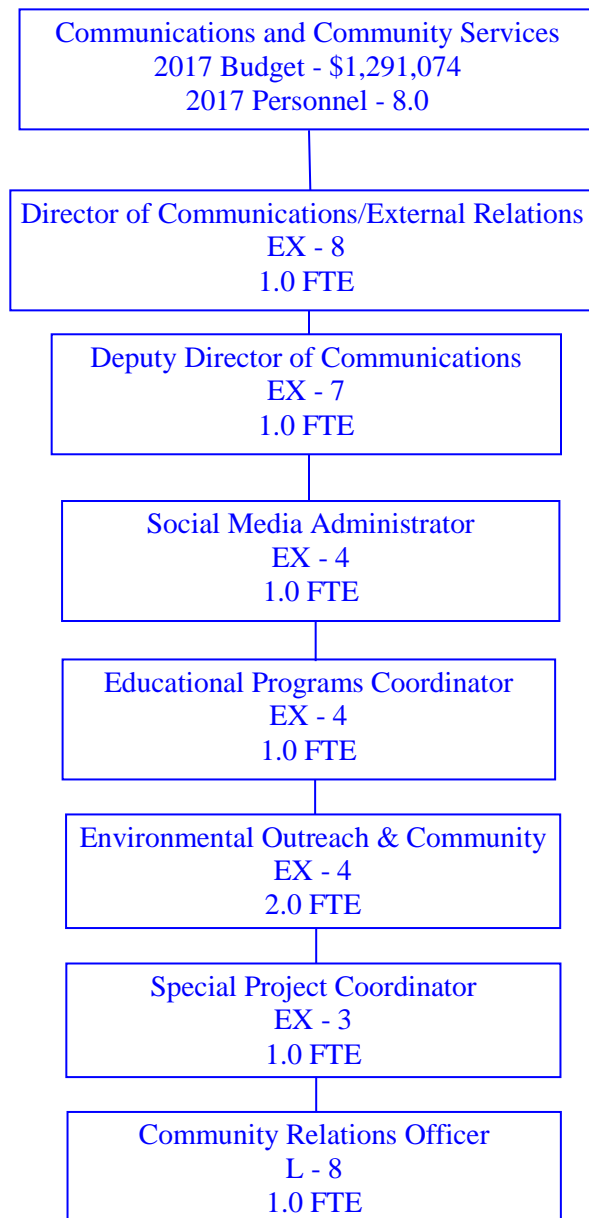
Objective: Train key personnel to review and approve recorded trust instruments for qualifying homeowners where the real property is held in a real estate trust.

Mission: Provide Staff Training

Department Maintenance Goals

Activity	2014 Actual	2015 Actual	2016 Actual	2017 Goal
Reduce Customer Service & Collections calls abandoned	1.18%	1.49%	1.41%	Less than 2.25% per month
Customer Visits	7,684	7,481	7,380	7,515
Dunning Letters mailed	44,862	44,969	45,292	45,041
Payment received	8,009	8,267	8,263	8,180

Communications and Community Services



Administration Division

Communications and Community Services

Program Activities

- Produce the Commission's external communications such as informational and educational brochures, customer newsletters and text messages for the Commission's website
- Represent the Commission at various public and community meetings and at all remote customer service sites located in Boston's neighborhoods to resolve customer concerns
- Projecting a positive, responsive and proactive public image to the media, customers, businesses, communities and elected officials
- Coordinate and promote a variety of employee participation programs such as the annual Blood Drive, Walk for Hunger and Walk for Breast Cancer
- Assist other Commission departments in developing material, making contacts, and facilitating meetings

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$590,564	\$568,539	\$762,898	\$194,359	34.2%
Labor Related Costs/Benefits	\$3,957	\$50,538	\$2,876	(\$47,662)	-94.3%
Supplies and Materials	\$6,521	\$45,000	\$52,000	\$7,000	15.6%
Professional Services	\$82,554	\$137,500	\$141,500	\$4,000	2.9%
Other Services	\$212,626	\$336,500	\$331,800	(\$4,700)	-1.4%
Total Direct Expenses	\$896,222	\$1,138,077	\$1,291,074	\$152,997	13.4%

Explanation of Major Variances

The 2017 budget for Communications and Community Services is \$1,291,074, an increase of \$152,997 or 13.4% from 2016. The variance is due to the Wages and Salaries, Supplies and Materials and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Communications and Community Services	8.0	7.0	8.0	1.0

Explanation of Personnel Changes

One position transferred from IT.

2016 Program Goal Results

Seeking to expand outreach to renters, multi-unit property owners, and businesses, Community Relations participated in several community events centered on sharing the Commission's environmental-focus message, particularly the FOG (Fats, Oils and Greases) emphasis. In addition to highlighting the Commission's material on FOG and how they pertain to the water system on the Commission's website, the department purchased ads for the FOG campaign on Facebook and Twitter, resulting in enhanced engagement and more followers. Along with the aforementioned purchasing of ads on social media sights, the Department strove to develop an overarching social media strategy to extend the Commission's environmental message to more platforms, including forming a comprehensive calendar year which outlines planned events with Environmental Partners. Staff distributed over 1900 grease-can lids at the local Stop and Shop. The Commission also collaborated with partners such as the New England Aquarium, the Live Blue Program and the Emerald Necklace Conservancy. Staff continued expanding outreach to youth as well, presenting to 45 Greater Boston Area Schools and nearly 3,000 students in grades ranging from kindergarten students through seniors. Staff also restructured other environmental content on the Commission website, including simplifying the public outreach message, updating outmoded content and adding in photos and videos of the various presentations administered at local schools. Staff collaborated with IT staff to coordinate the launch of the Digital Display Board, including revising pertinent Community Relations info of the board.

2017 Program Goals and Objectives

Goal: Expand public outreach to renters, multi-unit private property owners and businesses.

Objective: Outreach will include presentations, exhibits, special mailings and participation at events including storm drain stenciling, getting environmental groups to help educate local business owners about storm water matters. Target audience includes residents in elderly and family BHA housing developments through the REACH program, private rental property residents and management companies, and shoppers. Non-traditional locations include Stop & Shop at Thanksgiving, events with H2Go Trailer and events coordinated with Environmental Partners. Schedule FOG presentations for residents and facilities management staff

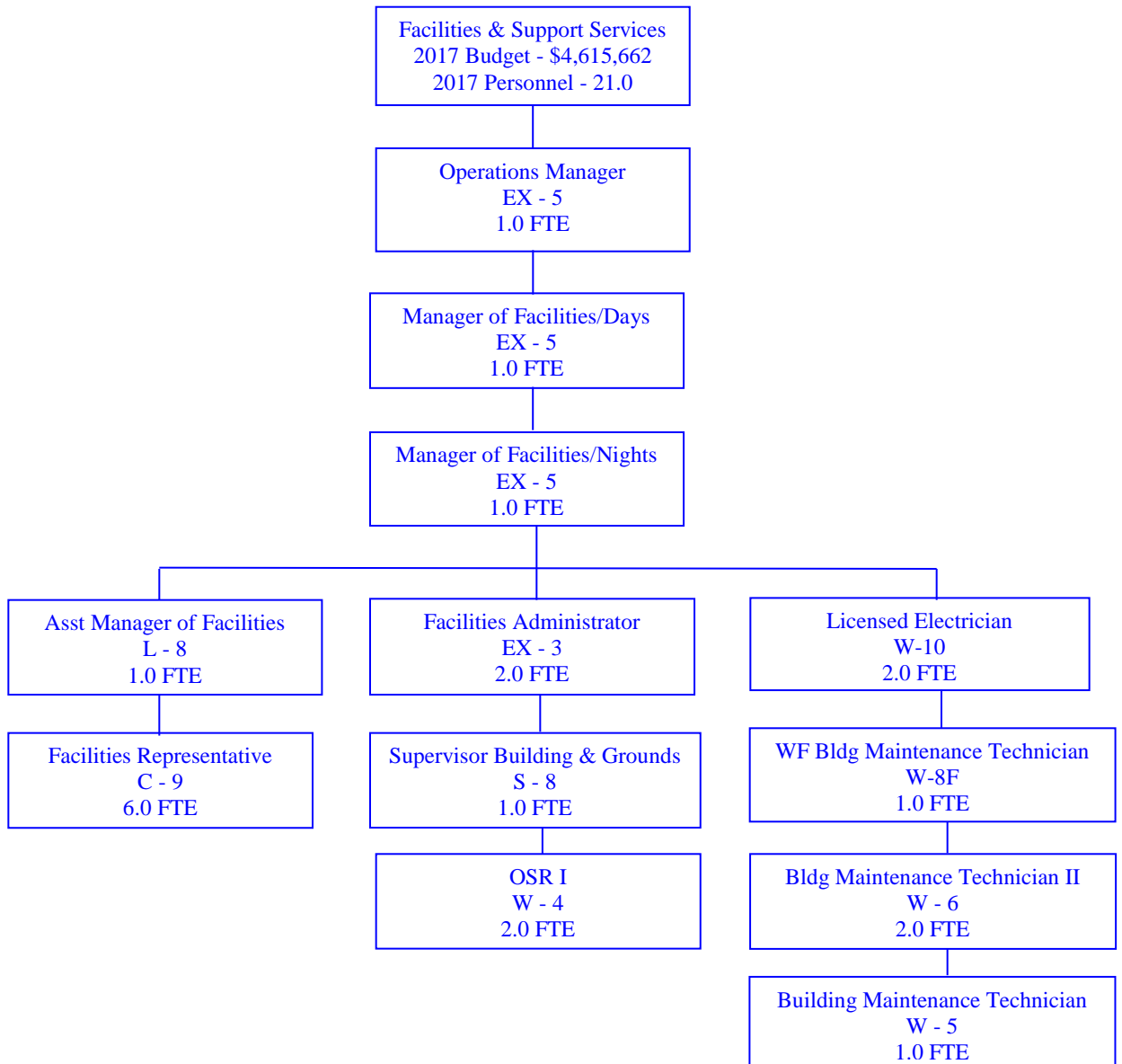
Mission: Improved Customer/Employee/Investor Relations

Goal: Continue and Expand Educational Outreach Program to Youth.

Objective: Manage the K-12 environmental educational curriculum and events for continued working relationships with schools, camps, and community centers. Build upon educational programs targeting youth focusing on water, wastewater system, stormwater, and how to prevent pollution. Engage youth in storm water markings programs and other related activities. Continue the expansion of environmental presentation to colleges, universities, and other related organizations.

Mission: Improved Customer/Employee/Investor Relations

Facilities & Support Services



Administration Division

Facilities & Support Services

Program Activities

- The Facilities Department is responsible for coordinating all aspects of the Commission's buildings and properties including maintenance, repair, security, mail distribution, office supplies and furniture, records archiving, office equipment leasing and food services
- Facilities is also responsible for directing and monitoring the Commission's Safety Program including accident/injury reporting, safe work practices and alcohol/drug testing

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,497,963	\$1,402,240	\$1,394,335	(\$7,905)	-0.6%
Overtime	\$21,663	\$16,894	\$18,077	\$1,183	7.0%
Labor Related Costs/Benefits	\$15,972	\$10,965	\$9,966	(\$999)	-9.1%
Supplies and Materials	\$306,822	\$320,000	\$330,000	\$10,000	3.1%
Repair and Maintenance	\$794,542	\$772,000	\$782,000	\$10,000	1.3%
Utilities	\$792,199	\$1,273,000	\$1,220,000	(\$53,000)	-4.2%
Professional Services	\$74,569	\$75,000	\$135,000	\$60,000	80.0%
Space and Equipment	\$50,579	\$56,000	\$58,284	\$2,284	4.1%
Other Services	\$537,289	\$563,000	\$648,000	\$85,000	15.1%
Capital Outlay	\$38,409	\$20,000	\$20,000	\$0	0.0%
Total Direct Expenses	\$4,130,007	\$4,509,099	\$4,615,662	\$106,563	2.4%

Explanation of Major Variances

The 2017 budget for Facilities & Support Services Department is \$4,615,662, an increase of \$106,563 or 2.4% from 2016. The variance is due to Overtime, Supplies and Materials, Repair and Maintenance, Professional Services, Space and Equipment and Other Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Facilities & Support Services	22.0	22.0	21.0	(1.0)

Explanation of Personnel Changes

One position transferred to Day Operations

2016 Program Goal Results

In an effort to improve system operating efficiencies and reduce equipment failures, staff performed research of various electrical testing procedures and ultimately procured the services of Electrical Engineering and Services Co. Inc. to conduct an infrared thermographic survey of the electrical equipment at the Commission's Headquarters Building. The survey, conducted on all electrical panels at the building, revealed no problems with any of the electrical equipment. Seeking to procure system upgrades to the Commission's Vehicle Wash Building in order to improve building functionality, staff researched the upgrade or potential replacement of the system and determined that due to the nature of the work involving building construction activities, the project would have to be publically advertised and bid in accordance with M.G.L. Chapter 149. Staff developed a draft Request for Proposals for professional engineering services to develop technical specification for the project and received one proposal in response to the RFP from west and Sampson Engineers, Inc. of Peabody, Massachusetts. The RFP Committee awarded the RFP to Weston & Sampson.

2017 Program Goals and Objectives

Goal: Coordinate the development of plans, procedures and programming to comply with the Boston Water and Sewer Commission's Industrial Stormwater Pollution Prevention Program and the Environmental Protection Agency's Multi-Sector General Permit.

Objectives: The objective of this goal is to ensure the Commission's compliance with local, state and federal industrial stormwater discharge regulatory requirements. Staff will procure the services of a professional environmental engineering firm to provide the technical environmental expertise to develop plans, procedures and programming for the compliance with industrial stormwater regulatory requirements. A coordinated work effort by various Commission Departments (Engineering, Operations, and Facilities) will be required for successful completion of this goal.

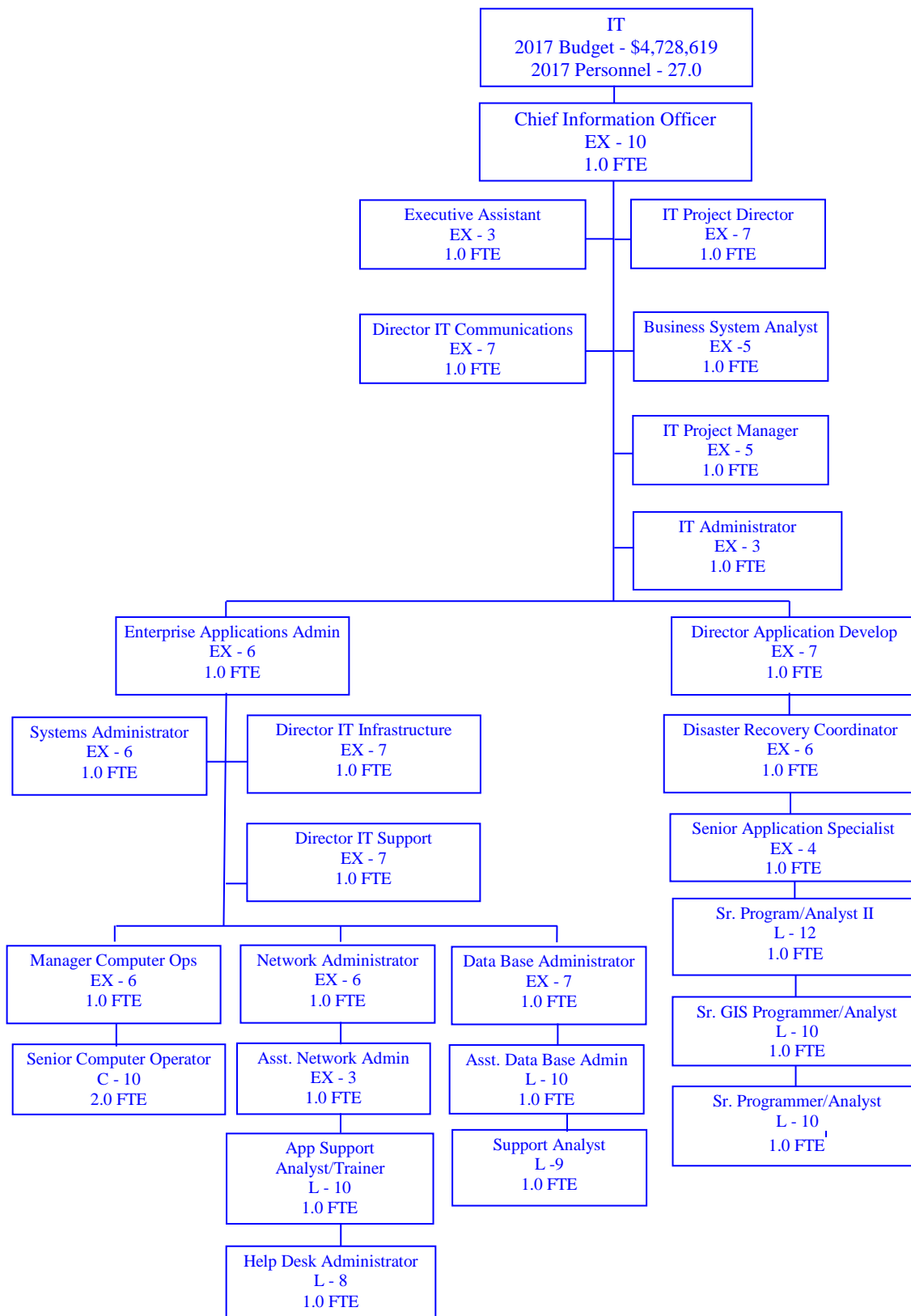
Mission: Comply with Local, State and Federal Regulations

Goal: Develop, implement and monitor new work procedures for Facilities Staff to utilize Cityworks for department work activities in order to improve workflow processes

Objectives: Improve procedures for tracking work activities performed by Facilities and Support Services. Staff will be trained to utilize Cityworks, the Commission's work order management system. New procedures will be developed for administrative staff to create and close-out work orders for department work activities. In addition, QA/QC procedures will need to be put in place to monitor the department's work activities recorded in Cityworks.

Mission: Increased Production or Efficiency Improvements

Information Technology (IT)



Administration Division

Information Technology (IT)

Program Activities

The mission of Information Technology (IT) is to provide support to all end users of computing resources throughout the Commission in a manner that maximizes the effectiveness of their duties while minimizing the expense to the Commission. Support is provided for the following activities:

- Billing functions
- Customer Service support
- Financial Management System support
- Human Resources System support
- Geographic Information System support
- Work order processing for Engineering and Operations
- Fleet Management System support
- Word Processing for all departments
- PC training and support
- Applications Development
- Miscellaneous computer support

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$2,674,280	\$2,608,940	\$2,822,983	\$214,043	8.2%
Labor Related Costs/Benefits	\$64,806	\$35,959	\$43,093	\$7,134	19.8%
Supplies and Materials	\$34,889	\$41,700	\$49,000	\$7,300	17.5%
Repair and Maintenance	\$491,590	\$646,640	\$690,940	\$44,300	6.9%
Utilities	\$301,798	\$312,468	\$392,853	\$80,385	25.7%
Professional Services	\$67,589	\$353,000	\$499,750	\$146,750	41.6%
Space and Equipment	\$198,498	\$219,000	\$230,000	\$11,000	5.0%
Total Direct Expenses	\$3,833,450	\$4,217,707	\$4,728,619	\$510,912	12.1%

Explanation of Major Variances

The 2017 budget for the IT Department is \$4,728,619, an increase of \$510,912 or 12.1% from 2016. The variance is due to the Wages and Salaries, Labor Related Costs/Benefits, Supplies and Materials, Repair and Maintenance, Utilities, Professional Services and Space and Equipment line items.

Administration Division

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
IT	30.0	29.0	27.0	(2.0)

Explanation of Personnel Changes

One position transferred to Support Services.

One position transferred to Communications and Community Services.

2016 Program Goal Results

During 2016, new CCTV software was purchased and subsequently integrated with SCREAM. In the 1st quarter of 2017 the software will be incorporated with CityWorks. The GISViewer's legacy functions are being programmed in CityWorks in order to take the GISViewer offline, and these updates will also coincide with a new release of CityWorks by the end of the 1st quarter in 2017. The Selection Committee chose Itineris as the winning proposal to replace BESS with a new Customer Information & Billing System (CIS). Additionally, database replication was successfully tested using Oracle's Data Guard software, and deployment of database hardware to BWSC's Disaster Recovery site will take place after tax updates to PeopleSoft are completed in the 1st quarter of 2017.

2017 Program Goals and Objectives

Goal: Replace the Commission's current Automatic Vehicle Locator (AVL) system.

Objective: To track the locations of vehicles in real time towards better dispatching, planning and improved customer service. Improve safety, emergency response, and incident management. Improve handling of complaints and disputes among the public and Commission staff. Automate the maintenance of vehicles through the electronic transfer of engine diagnostic data through the AVL system.

Mission: Increased Production or Efficiency improvements

Goal: Implement an IT Training Program.

Objective: To increase employee awareness about IT security issues and employee knowledge about Commission business process workflows. To provide a platform for increasing internal promotion through knowledge

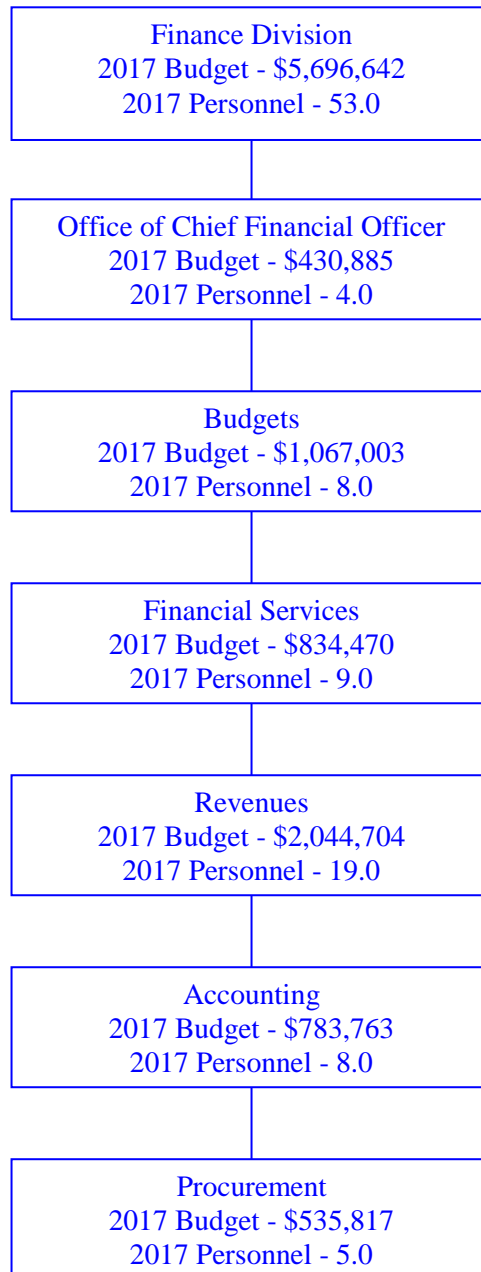
Mission: Provide Staff Training

Goal: Replace bulletin boards throughout the Commission with Digital Signage.

Objective: Utilize enhanced technology efficiently to increase employee awareness of Commission programs and objectives

Mission: Increased Production or Efficiency Improvements

Finance Division



Finance Division

Finance Division Organization

Program Activities

The Finance Division is comprised of the Office of Chief Financial Officer and the following five departments:

- **Budgets**
- **Financial Services**
- **Revenues**
- **Accounting**
- **Procurement**

Division Mission

The Finance staff is responsible for the establishment of policies to provide maintenance of a strong financial structure designed to provide the lowest possible cost of water, wastewater and storm drainage services; establish a billing methodology that is fair and equitable to all rate payers; advance security for the Commission's bondholders; design and implement an internal control structure intended to provide reasonable security for the safeguard of Commission assets. The Finance staff carries out its mission through the activities of its five Departments: Budgets, Financial Services, Revenues, Accounting, and Procurement.

Division Budget Summary

Department	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Office of Chief Financial Officer	\$426,651	\$405,024	\$430,885	\$25,861	6.4%
Budgets	\$944,254	\$994,782	\$1,067,003	\$72,221	7.3%
Financial Services	\$767,019	\$788,101	\$834,470	\$46,369	5.9%
Revenues	\$1,932,360	\$1,984,875	\$2,044,704	\$59,829	3.0%
Accounting	\$757,661	\$679,064	\$783,763	\$104,699	15.4%
Procurement	\$460,534	\$439,962	\$535,817	\$95,855	21.8%
Total Direct Expenses	\$5,288,479	\$5,291,808	\$5,696,642	\$404,834	7.7%

Explanation of Major Variances

The 2017 budget for the Finance Division is \$5,696,642, an increase of \$404,834, or 7.7% from 2016. The variance is attributed to increases Office of Chief Financial Officer, Budgets, Financial Services, Revenues Accounting and Procurement line items.

Division Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Chief Financial Officer	5.0	4.0	4.0	0.0
Budgets	7.0	8.0	8.0	0.0
Financial Services	9.0	9.0	9.0	0.0
Revenues	19.0	20.0	19.0	(1.0)
Accounting	8.0	8.0	8.0	0.0
Procurement	5.0	5.0	5.0	0.0
Total	53.0	54.0	53.0	(1.0)

Explanation of Personnel Changes

Office of Chief Financial Officer

There was no change to the position count.

Budgets

There was no change to the position count.

Financial Services

There was no change to the position count.

Revenues

One position was attrited.

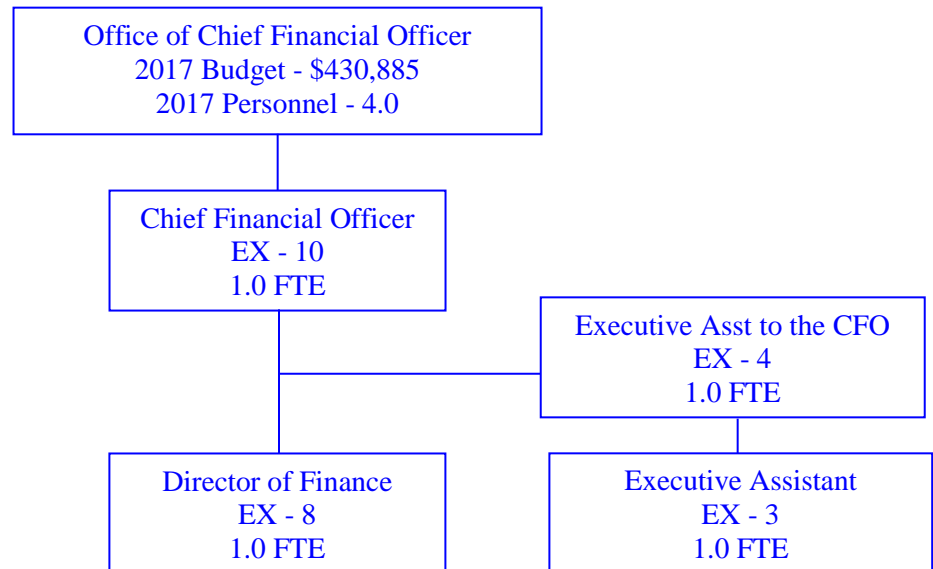
Accounting

There was no change to the position count.

Procurement

There was no change to the position count.

Office of Chief Financial Officer



Finance Division

Office of Chief Financial Officer

Program Activities

- Oversee the integration of all financial and analytical activities enabling the Commission to improve overall operational effectiveness and control expenses
- Ensure the adequacy of resources to implement near and long range initiatives

Department Budget Summary

Department	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$412,148	\$393,779	\$416,464	\$22,685	5.8%
Labor Related Costs/Benefits	\$11,084	\$6,245	\$9,421	\$3,176	50.9%
Training/Seminar/Travel	\$3,419	\$5,000	\$5,000	\$0	0.0%
Total Direct Expenses	\$426,651	\$405,024	\$430,885	\$25,861	6.4%

Explanation of Major Variances

The 2017 budget for the Office of Chief Financial Officer is \$430,885 for an increase of \$25,861 or 6.4% from 2016. The variance is due to the Wages and Salaries and Labor Related Costs/Benefits line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Office of Chief Financial Officer	5.0	4.0	4.0	0.0

Explanation of Personnel Changes

There was no change to the position count.

2016 Program Goal Results

In conjunction with the IT Department and a majority of the Finance Division, the Office of the Chief Financial Officer determined that a new billing system was required. Multiple meetings and presentations with the EMA consultants were conducted regarding the selection and implementation of a new system. More specifically, these meetings and presentations included the analysis of current policies, an examination of how the current billing system, BESS, is utilized within the various departments and potential capabilities of a new billing system. Ultimately, these meetings provided a framework for selecting the vendor most suitable to provide the optimal billing system for the Commission. The Commission received 12 completed bids for the committee to review, and after deliberation amongst the various departments, Itineris NV was selected as the new Customer Information/Billing system software solution vendor. The Office of the Chief Financial Officer reached out to various municipalities across the United States to gain information in what investments can be made with their reserve funds, as the selected municipalities have similar strategic investments to the Commission. The Finance Division also reviewed and assisted in the actuarial valuation study for the Pension and Other Post-Employee Benefit (OPEB) Trust Funds, having received final copies of the valuation during 2016.

2017 Program Goals and Objectives

Goal: Establish a FEMA Committee within the Commission by January 2017.

Objective: Select members for a Committee tasked with compiling the information necessary to receive reimbursements from FEMA for expenses incurred during a state of emergency.

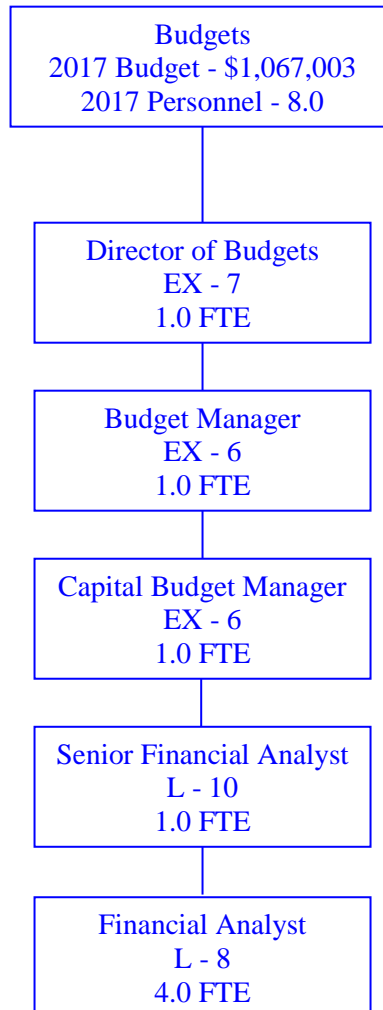
Mission: Improve/Develop Policy/Procedure

Goal: Review the Investment Policy for the Reserve Funds.

Objective: Seek alternative investments to maximize the yield in the Commission's portfolio.

Mission: Increased Fiscal Controls

Budgets



Finance Division

Budgets

Program Activities

Budgeting and Financial Planning

- Coordinate the development and review of program plans and resource requirements for all Commission operations and activities including capital improvement projects
- Analyze actual expenditures against authorized budgets
- Staff relating to Treasury functions, to monitor, coordinate and enhance the Commission's revenue stream in order to maximize yields and minimize cost

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$634,491	\$597,335	\$649,682	\$52,347	8.8%
Labor Related Costs/Benefits	\$3,030	\$7,097	\$8,771	\$1,674	23.6%
Supplies and Materials	\$3,547	\$3,950	\$3,950	\$0	0.0%
Professional Services	\$0	\$386,400	\$404,600	\$18,200	4.7%
Total Direct Expenses	\$641,068	\$994,782	\$1,067,003	\$72,221	7.3%

Explanation of Major Variances

The 2017 budget for the Budgets Department is \$1,067,003, an increase of \$72,221 or 7.3% from 2016. The variance is due to Wages and Salaries and Labor Related Costs/Benefits and Professional line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Budgets	1.0	1.0	1.0	0.0
Budget and Financial Planning	6.0	7.0	7.0	0.0
Total	7.0	8.0	8.0	0.0

Explanation of Personnel Changes

Director of Budgets

There was no change to the position count.

Budget and Financial Planning

There was no change to the position count.

2016 Program Goal Results

The Budget and Financial Planning Department continued to provide financial analysis and managerial support to all Commission Departments, including assisting cost center managers with reviewing and managing both the operating and capital improvement budgets, as well as answering any pertinent budgetary questions. In addition to numerous forms of financial analysis for an assortment of departments, staff assisted in preparing, reviewing and updating the primary Commission fiscal books including the Current Expense Budget (CEB), the Capital Improvement Program (CIP), the various monthly transmittals, and the Rate Document. Additionally, staff worked diligently on updating and revising the Commission's General Revenue and Refunding Bonds 2016 Series-A Document, and participated in the reformation of the Unaccounted-For Water Committee.

2017 Program Goals and Objectives

Goal: Modify the presentation of the CIP/Rate Hearings to include a power point presentation.

Objective: Currently, the CIP/Rate Hearings primarily consist of the reading of each document. In an effort to make the hearings more engaging and effective, the communication of pertinent information by the speaker will be aided by a power point presentation.

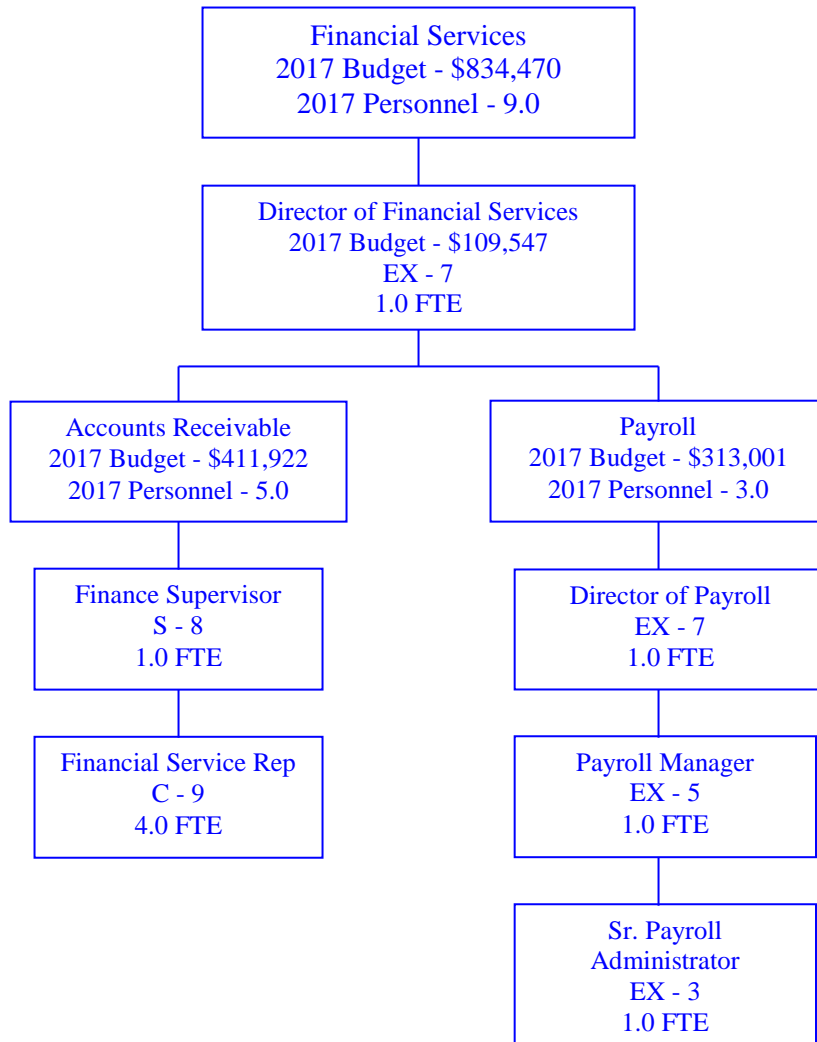
Mission: Improve/Develop Policy/Procedure

Goal: Continue to provide financial analysis and managerial support to all Commission Departments.

Objective: To assist all Commission Departments in managing the operating and capital improvements budgets.

Mission: Increased Production or Efficiency Improvements

Financial Services



Finance Division

Financial Services

Financial Services

- Accounts Receivable staff, receives and posts, in a timely manner, all cash receipts and accurately maintains a record of the Commission's investments, while generating monthly detailed reports of investment activities
- Payroll is responsible for generating and distributing accurate paychecks to employees on a weekly basis
- Payroll also enforces policies and procedures as stipulated by contracts, policies and state and federal payroll laws

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$634,871	\$598,362	\$646,207	\$47,845	8.0%
Overtime	\$1,141	\$0	\$0	\$0	0.0%
Labor Related Costs/Benefits	\$14,967	\$11,354	\$11,038	(\$316)	-2.8%
Supplies and Materials	\$5,747	\$11,085	\$9,925	(\$1,160)	-10.5%
Repair and Maintenance	\$110,294	\$166,000	\$166,000	\$0	0.0%
Other Services	\$0	\$1,300	\$1,300	\$0	0.0%
Total Direct Expenses	\$767,020	\$788,101	\$834,470	\$46,369	5.9%

Explanation of Major Variances

The 2017 budget for the Financial Services Department is \$834,470, an increase of \$46,369 or 5.9% from 2016. The variance is due to the Wages and Salaries line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Financial Services	1.0	1.0	1.0	0.0
Accounts Receivable	5.0	5.0	5.0	0.0
Payroll	3.0	3.0	3.0	0.0
Total	9.0	9.0	9.0	0.0

Explanation of Personnel Changes

Director of Financial Services

There was no change to the position count.

Accounts Receivable

There was no change to the position count.

Payroll

There was no change to the position count.

2016 Program Goals Results

The Payroll Department, assisted by IT staff, implemented accrual and usage for the new MA Sick Time Law on the portal software as well as on employee pay statements. In mid-2016, BWSC were made aware that final regulations were published that excluded government employers from the Law. Therefore, staff continued to track and grant sick accruals according to the Law until December 2016 when the Human Resources Department notified staff that effective January 2017, BWSC was exempt from the Law. Subsequently, staff updated the Manager Portal to remove tracking. Additionally, during 2016, staff transferred payroll records, including timesheets, overtime sheets and all employee Calendars, from paper to digital up through the conclusion of 2015.

2017 Program Goals and Objectives

Goal: In 2016 the goal was to implement accrual and usage for 7/1/2015 MA Sick Time Law. HR informed Payroll that BWSC is exempt from the MA Sick Time Law effective 1/1/2017.

Objective: In 2017 we will track and ensure all accruals and usage reverts back to the implementation in 2016.

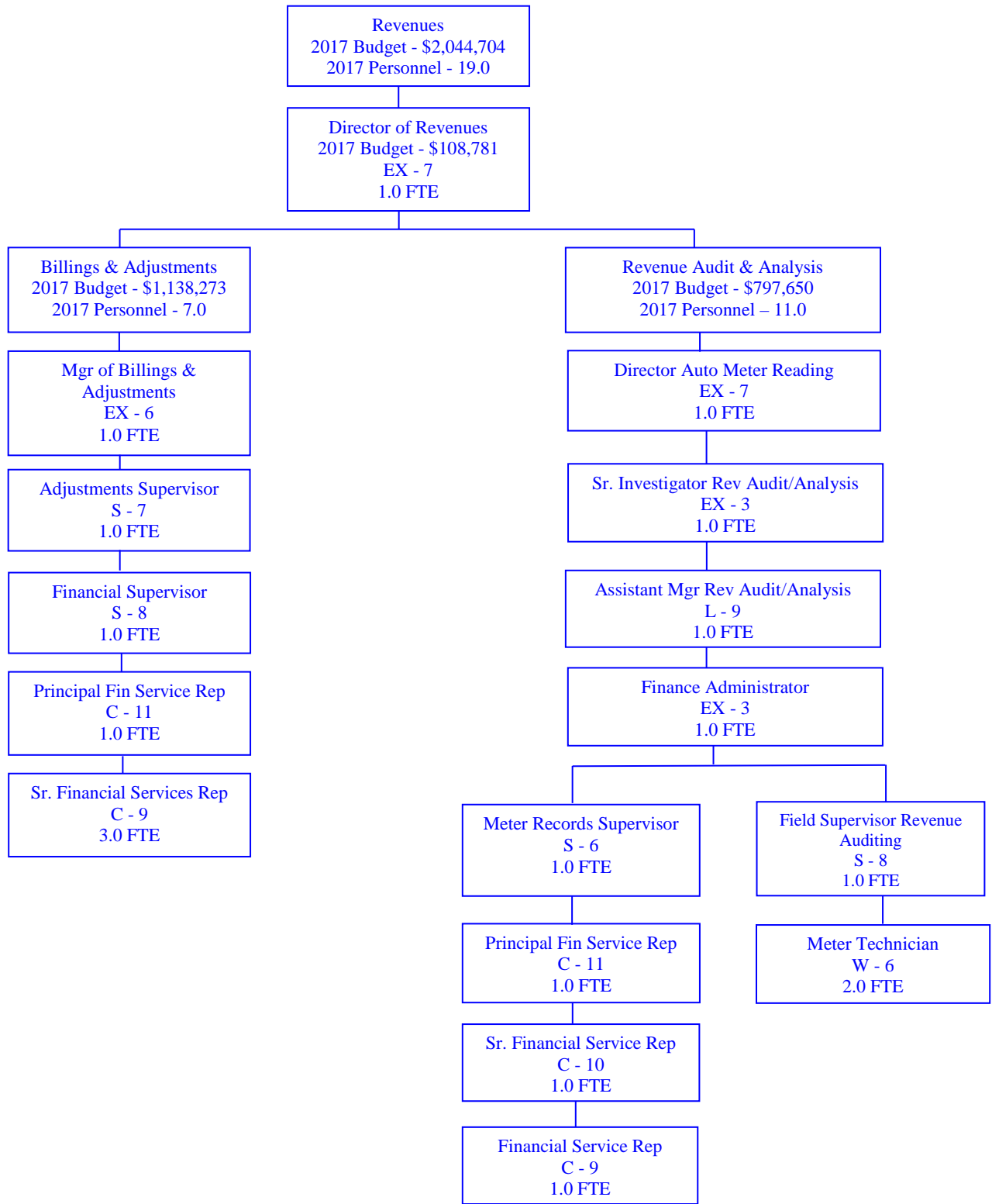
Mission: Comply with Local, State and Federal Regulations

Goal: To have better estimated accruals and a cutoff date by working with staff members from the Engineering, Operations and MIS Divisions.

Objective: To book into the general ledger year-end accruals in a timely and more accurate manner.

Mission: Improve/Develop Policy/Procedure

Revenues



Finance Division

Revenues

Program Activities

Billings & Adjustments

- Staff provides timely and accurate billings in conjunction with processing adjustments to appropriate customers' accounts

Revenue Audit and Analysis

- Investigate, document and resolve all reports of erratic reads, low usage, no usage, meter tampering and illegal connections, including communicating with BWSC departments and customers during follow-up
- Maintain integrity of Hexagram and BESS records of meters and MTUs by reviewing and verifying information on replacement/repair/reprogram work orders before entering data/closing out, and by running and reviewing numerous queries/reports to identify problems and correct such problems by updating/editing or correcting BESS and/or Hexagram records as needed
- Monitor Hexagram and/or BESS processes such as processing MTU programmer files into BESS work orders, transfer of readings from Hexagram to BESS, DCU status, report problems and follow-up with appropriate staff to resolve

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$1,418,760	\$1,319,284	\$1,374,810	\$55,526	4.2%
Overtime	\$8,338	\$2,276	\$2,435	\$159	7.0%
Labor Related Costs/Benefits	\$18,729	\$10,369	\$15,196	\$4,827	46.6%
Supplies and Materials	\$463,444	\$614,141	\$600,513	(\$13,628)	-2.2%
Professional Services	\$0	\$0	\$9,000	\$9,000	100.0%
Other Services	\$23,090	\$38,805	\$42,750	\$3,945	10.2%
Total Direct Expenses	\$1,932,361	\$1,984,875	\$2,044,704	\$59,829	3.0%

Explanation of Major Variances

The 2017 budget for the Revenues Department is set at \$2,044,704, an increase of \$59,829 or 3.0% from 2016. The variance is due to Wages and Salaries, Overtime, Labor Related Costs/Benefits Professional Services and Other Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Revenues	1.0	1.0	1.0	0.0
Billings & Adjustments	7.0	7.0	7.0	0.0
Rates & Revenues	1.0	1.0	0.0	(1.0)
Revenue Audit & Analysis	10.0	11.0	11.0	0.0
Total	19.0	20.0	19.0	(1.0)

Explanation of Personnel Changes**Director of Revenues**

There was no change to the position count.

Billings & Adjustments

There was no change to the position count.

Rates & Revenues

One position transferred to Budgets and Planning.

Revenue Audit & Analysis

There was no change to the position count.

2016 Program Goals Results

The contract process between BWSC and new MTU installation contractor, Barletta Engineering Corporation, was completed and the necessary System Acceptance Testing (SAT) was completed during May. Subsequently, MTU replacements began at the beginning of June. To date, approximately 23,575 MTU's have been replaced.

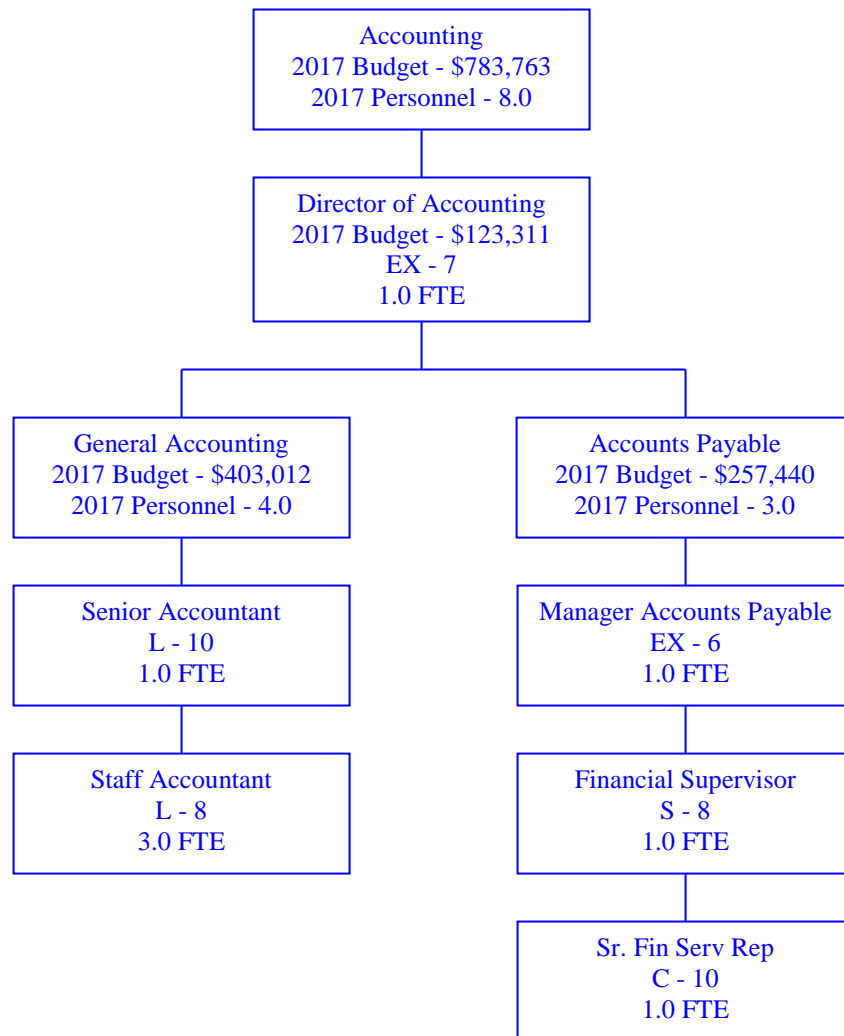
2017 Program Goals and Objectives

Goal: In conjunction with Meter Services Department, continue to assist in management of on-going Automatic Meter Reading system equipment upgrades and the new MTU II's.

Objective: Assist in management of on-going Automatic Meter Reading system equipment upgrades and the new MTU II's.

Mission: Increased Production or Efficiency Improvements.

Accounting



Finance Division

Accounting

Program Activities

General Accounting

- Produce monthly financial management reports and annual interim financial statements

Accounts Payable

- Efficiently handles and process all accounts payable functions

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$632,090	\$558,594	\$634,105	\$75,511	13.5%
Labor Related Costs/Benefits	\$14,997	\$15,320	\$14,508	(\$812)	-5.3%
Supplies and Materials	\$2,296	\$4,400	\$4,400	\$0	0.0%
Professional Services	\$108,278	\$100,000	\$130,000	\$30,000	30.0%
Other Services	\$0	\$750	\$750	\$0	0.0%
Total Direct Expenses	\$757,661	\$679,064	\$783,763	\$104,699	15.4%

Explanation of Major Variances

The 2017 budget for the Accounting Department is \$783,763, an increase of \$104,699 or 15.4% from 2016. The variance is due to Wages and Salaries, and Professional Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Accounting	1.0	1.0	1.0	0.0
General Accounting	4.0	4.0	4.0	0.0
Accounts Payable	3.0	3.0	3.0	0.0
Total	8.0	8.0	8.0	0.0

Explanation of Personnel Changes

Director of Accounting

There was no change to the position count.

General Accounting

There was no change to the position count.

Accounts Payable

There was no change to the position count.

2016 Program Goal Results

GASB No. 68 Accounting and Financial Reporting for Pensions require an entity participating in a multi-employer pension system to record its proportionate share of the net pension liability and to restate prior period balances accordingly. In consultation with the auditors, the Commission follows the accounting standards set forth in GASB No. 62 and provides for recovery of these pension liability costs as a deferred outflow of resources to be collected over the life of the liability. As a result, the statement of net position as of December 31, 2014 was restated with increases in Deferred Outflow of Resources, Other Long-Term Liabilities and Deferred Inflow of Resources. GASB No. 71 Pension for Contributions Made Subsequent to the Measurement Date has been reviewed by the Commission during 2015 Audit and was found to have no applicable effect to the Commission book at this time.

2017 Program Goals and Objectives

Goal: To have better estimated accruals and a cutoff date by working with staff members from the Engineering, Operations and IT Department.

Objective: Record into the general ledger year-end accruals in a timely and more accurate manner

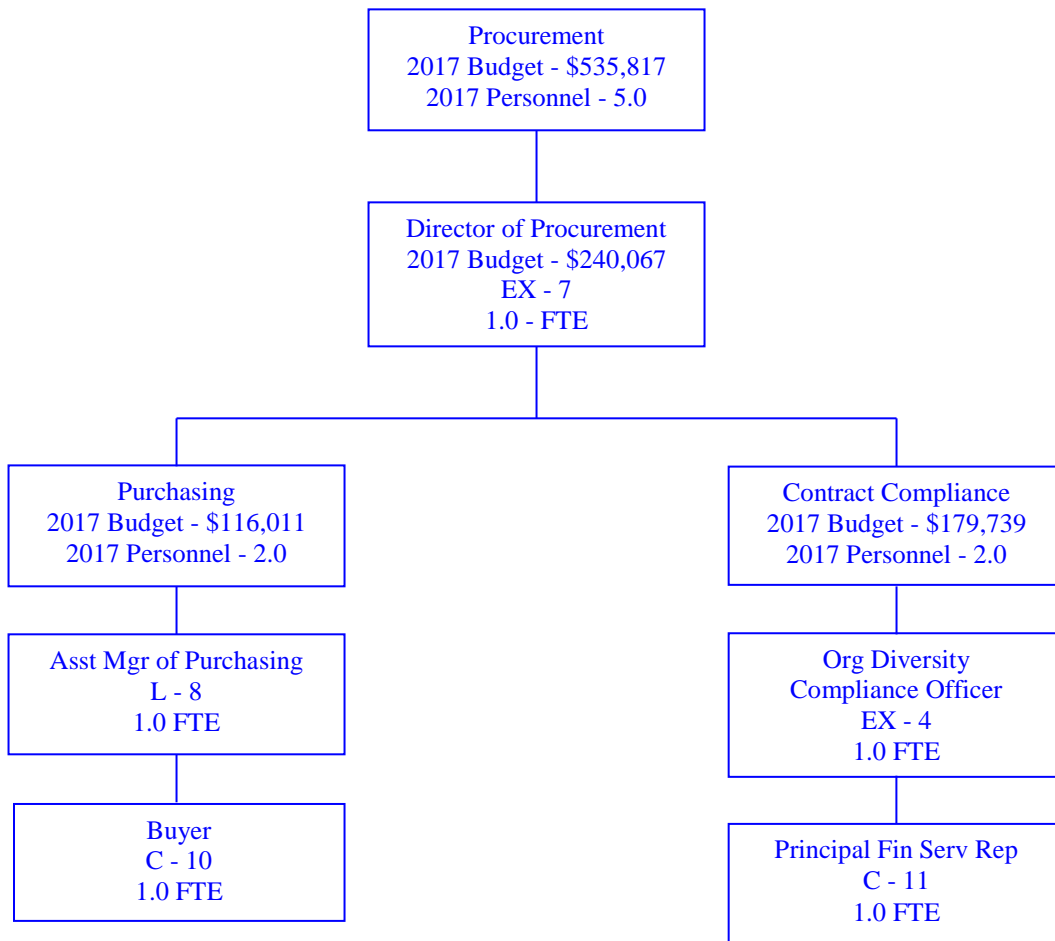
Mission: Improve/Develop Policy/Procedure

Goal: To work closely with Capital Budget Manager prior to assigning asset category to IT and Automotive related purchases.

Goal Objective: Categorize assets correctly with the appropriate useful life.

Mission: Improve/Develop Policy/Procedure

Procurement



Finance Division

Procurement

Program Activities

Purchasing

- Provide purchase and contract support services in a cost-effective manner
- Ensure fair and equitable treatment of all persons who offer to provide supplies or services
- Provide safeguards for the maintenance of the procurement system of quality and integrity and to maximize, to the fullest extent practicable, the purchasing value of public funds

Contract Compliance

- The Contract Compliance Officer monitors: minority/residency/women participation goals, payment of prevailing wage rates, MBE/WBE contract goals, OSHA training requirements and responds to all “Freedom of Information” requests relating to construction contractual information

Department Budget Summary

Expense Line Item	2015 Actual	2016 Budget	2017 Budget	Dollar Variance	2016-2017 Variance
Wages and Salaries	\$405,306	\$373,713	\$405,234	\$31,521	8.4%
Labor Related Costs/Benefits	\$400	\$1,499	\$61,058	\$59,559	3973.2%
Supplies and Materials	\$1,061	\$2,375	\$2,375	\$0	0.0%
Other Services	\$53,767	\$62,375	\$67,150	\$4,775	7.7%
Total Direct Expenses	\$460,534	\$439,962	\$535,817	\$95,855	21.8%

Explanation of Major Variances

The 2017 budget for the Procurement Department is \$535,817, an increase of \$95,855 or 21.8% from 2016. The variance is due to the Wages and Salaries, Labor Related Costs/Benefits and Other Services line items.

Department Personnel Summary

Department	2015 Actual	2016 Approved	2017 Budget	2016-2017 Variance
Director of Procurement	1.0	1.0	1.0	0.0
Purchasing	2.0	2.0	2.0	0.0
Contract Compliance Officer	2.0	2.0	2.0	0.0
Total	5.0	5.0	5.0	0.0

Explanation of Personnel Changes

Director of Procurement

There was no change to the position count.

Purchasing

There was no change to the position count.

Contract Compliance

There was no change to the position count.

2016 Program Goal Results

During 2016, staff developed a written justification process for change orders for Good & Services. Additionally, staff, with assistance from the Legal Department, developed a final draft contract boiler plate for facilities maintenance and repair contracts. In conjunction with the Policy Committee, a group tasked with recommending potential modifications and subsequently updating the Commission's Policies, staff revised and updated multiple Operating Policies including: The Policy against Harassment and Discrimination, the Policy on Tuition Reimbursement, the Policy on Conferences, Training and Travel, the Policy on Petty Cash, the Policy on Mobile Devices and Agreement and the Policy on Electronic Mail and Internet Use. The Committee will continue to review the Operating Policies and make recommendations for amendment.

2017 Program Goals and Objectives

Goal: Improve strategic supplier diversity strategy.

Objective: Assess and analyze internal data to develop an understanding of what has worked and identify where the Commission has faced challenges.

Mission: Increased Production or Efficiency Improvements

Goal: In conjunction with the Engineering Department develop digital copies of contract plans and specifications.

Objective: To develop a pilot program for paperless distribution of the construction contract documents, plans and specifications.

Mission: Increased Production or Efficiency Improvements

Goal: Implement the internal procurement initiatives set up by the supplier diversity project.

Objective: Implementation of key initiatives prioritized under the new supplier diversity project.

Mission: Increased Production or Efficiency Improvements

2017 – 2019 Capital Improvement Program

Boston Water and Sewer Commission (“the Commission” or “BWSC”) is a body politic and corporate a political subdivision of the Commonwealth created by Chapter 436 of the Acts of 1977 (“The 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 Enabling 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 Enabling Act further provides that any revenue surplus realized by the Commission in any fiscal year shall be used to offset future rate increases.

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 storm water 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 a number of 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.
- 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 reflects its costs, fairly 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 this area.
- To maintain a strong financial structure. The Commission consistently employs conservative financial projections and budgeting assumptions, maintains adequate reserves and strikes a balance between debt funding and rate funding of capital expenses.

2017 – 2019 Capital Improvement Program

- Sustaining 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”), Clean Water Act (“CWA”) and its National Pollutant Discharge Elimination System (“NPDES”) permitting obligations for both its stormwater system and combined sewer system. 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.

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.

Complying with the requirements of the Enabling Act and the Resolution, the Commission projected cost of the Commission’s Capital Improvement Program from Fiscal Years 2017 through 2019 totals approximately, \$206.4 million.

On August 23, 2012, the Commission entered in a Consent Decree with the EPA and others in settlement of a CWA suit in the U.S. District Court. As a result, the Commission is undertaking remedial measures designed to improve the Commission’s practices, compliance and MS4 water quality discharges. These remedial measures include a Capacity, Maintenance, Operations and Management (“CMOM”) self-assessment study to analyze all aspects of the Commission’s sanitary sewer and storm drainage facility operations and maintenance; tracking and mitigating sanitary sewer overflows (SSO’s); prioritizing sub-catchment areas for investigation and elimination of illicit discharges to the drainage system; improved its mapping capabilities; tracking industrial facility and construction site discharges; development of a comprehensive storm water model, implementation of structural Best Management Practices (BMPs) including green infrastructure and low impact development (GI/LID) and other activities. The Commission’s goal is to meet and exceed all of its compliance obligations and improve water quality and the environment for the City of Boston’s residents and visitors.

As part of the CMOM Corrective Action Plan filed with the EPA, the Commission must increase its inspection and assessment of its sewer and drainage systems. The program represents progressive (“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

2017 – 2019 Capital Improvement Program

mains and other System components to be either renewed, replaced, relocated or added to the Systems each year.

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.

The overall objectives of the Commission 2017-2019 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 CMOM Department oversees the response and reporting of Sanitary Sewer Overflows (SSO), preventative maintenance, catch basin cleaning program and inspection and maintenance of the combined overflow system, in accordance with the Commission's National Pollutant Discharge Elimination (NPDES) Permit.

The Asset Management/CMOM team reports and conducts a root cause analysis of all SSOs as well as conducts sewer flow metering and dye testing.

Since the implementation of the CMOM program in 2014, the Commission has televised and cleaned annually since the onset of the program, as well as the projected amount of pipe to be televised and cleaned in the 2017-2019 CIP.

✓ 2014	37.27 miles
✓ 2015	72.45 miles
✓ 2016	60.46 miles
✓ 2017 – 2019	261.00 miles

The Citywide Illicit Identification Program seeks to identify, through dye testing, improper sanitary lateral connections to storm drains and sources of inflow and infiltration entering the sewer system. Corrective actions will be taken to eliminate illicit connections and identify the sources of inflow and infiltration. This program also includes the inspection of sewer and building connections within low groundwater areas to ensure that they do not cause drawdown groundwater through infiltration.

The Commission added the Stormwater Category in the 2017-2019 Capital Improvement Program. 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

2017 – 2019 Capital Improvement Program

designed to promote improved water quality, ensure compliance with state and federal regulations, minimize flooding and manage stormwater throughout the City of Boston.

Funding for the 2017-2019 Capital Improvement Program totals \$206.4 million. The CIP is comprised of Water, Sewer, Support, and Stormwater Programs.

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 \$84.6 million, or 41.0% of the 2017-2019 CIP. Sewer System projects comprise \$93.2 million, or 45.2%, Support projects total \$18.5 million, or 9.0% of the expenditures outlined in the program, and Stormwater projects account for \$10.1 million, or 4.8% of the 2017-2019 CIP.

Total capital expenditures of \$89.5 million are outlined for 2017. Water Distribution projects comprise \$42.1 million, or 47.1%. Sewer System projects account for \$34.8 million, or 38.8%, Support projects account for \$7.7 million, or 8.6% of the 2017 amount. Stormwater projects totaling \$4.9 million consist of the remaining 5.5% of the 2017 amount.

2017 – 2019 Capital Improvement Program

2017-2019 Capital Improvement Program Cash Flows

<i>Program Source*</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>Water</i>	\$42,112,000	\$30,116,000	\$12,354,000	\$84,582,000
<i>Sewer</i>	\$34,758,000	\$38,549,000	\$19,941,000	\$93,248,000
<i>Support</i>	\$7,700,000	\$5,280,000	\$5,550,000	\$18,53,000
<i>Stormwater</i>	\$4,938,000	\$3,241,000	\$1,870,000	\$10,049,000
<i>TOTAL</i>	\$89,508,000	\$77,186,000	\$39,715,000	\$206,409,000

NOTE: Although expenditures decrease from periods 2018 to 2019, it is anticipated that funding for 2019 will be equal or greater than funding presented in 2018. The decrease in 2019 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.

2017-2019 Capital Improvement Program Funding Sources

<i>Funding Source*</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>BWSC Bonds</i>	\$69,594,000	\$55,681,000	\$22,037,000	\$147,312,000
<i>Rate Revenue</i>	\$15,877,000	\$19,366,000	\$15,051,000	\$50,294,000
<i>MWRA Water Assistance</i>	\$3,162,000	\$1,556,000	\$2,627,000	\$7,345,000
<i>MWRA I/I Assistance</i>	\$875,000	\$583,000	\$	\$1,458,000
<i>TOTAL</i>	\$89,508,000	\$77,186,000	\$39,715,000	\$206,409,000

NOTE: Although expenditures decrease from periods 2018 to 2019, it is anticipated that funding for 2019 will be equal or greater than funding presented in 2018. The decrease in 2018 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 of the Commission 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 2017 – 2019 Capital Improvement Program. Some of the major projects are listed below:

- ✓ Water Main Replacement Program
- ✓ Inspection and Rehabilitation of Steel Water Mains
- ✓ Sewer and Drain Replacement Program
- ✓ Sewer & Drain Rehabilitation & Replacement in the North End
- ✓ Sewer Separation and System Improvements in South Boston
- ✓ Sewer Separation in Roxbury
- ✓ City-wide Illegal Connections Investigations
- ✓ Upgrades to Union Park Pumping Station & Satellite Stations
- ✓ Upgrade of Automatic Metering Infrastructure (AMI)
- ✓ Projects affiliated with the Consent Decree; includes cleaning and televising ninety miles of sewer and drains
- ✓ Improvements to Information Technology

The Commission completed its Wastewater and Storm Drainage System Facilities Plan in 2015. The 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. Critical elements of this project 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 Process needed to sustain effective Capacity, Management, Operation and Maintenance (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, Plan projects include a broad spectrum of data collection, engineering evaluation and tool development activities.

2017 – 2019 Capital Improvement Program

PROJECTS ASSOCIATED WITH THE CONSENT DECREE & WATER QUALITY IMPROVEMENTS

There are projects that the Commission is currently performing and planning to undertake to fulfill and exceed recommendations of the Environmental Protection Agency (“EPA”) 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
CCTV of Sewers and Storm Drains (Contamination Investigation)	Fort Point Channel Water Quality Assessment
Cleaning and Inspections of Sewers and Storm Drains (CMOM-Capacity)	Fort Point Channel Implementation of Recommendations
Management Operations and Maintenance	Separation of Sewer House Laterals (Contracts 14-309-007& 17-309-013)
Construct Best Management Practices & Green Infrastructure Central Square in East Boston	Urban Runoff Water Quality Evaluation
Construct BMPs & Green Infrastructure at City Hall Plaza.	Constructive Wetland in Stormwater Tributary Area.
Construct BMPs & Green Infrastructure at Audubon Circle	Green Infrastructure Low Impact Development Area (North Beacon Street)
Industrial Facility Stormwater Prevention Program	Green Infrastructure Low Impact Development Area (Stony Brook)
Citywide Illegal Connection Investigation Phase IV (Contract 16-206-001)	Green Infrastructure Low Impact Development Area III (Canterbury Brook)
Augment Drain Model to Characterize Water Quality	Stormwater Utility Evaluation
	Model Improvements
	Interactive Training Tool
	Wastewater/Drainage Facilities Plan
	Owner Correction of Illegal Connections
	Design of Constructed Wetland in Stormwater Tributary Area (Daisy Field)
	Design of Constructed Rain Gardens
	Constructed Rain Gardens

2017 – 2019 Capital Improvement Program

Projects associated with the Plan in the Sewer System CIP include the rehabilitation or replacement of approximately 9.0 miles of deteriorated or collapsed sanitary sewers and storm drains and the television inspection of approximately 90 miles of sewer pipe. 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 is 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.

2017 – 2019 Capital Improvement Program

BACKGROUND

The Commission was established pursuant to the Boston Water and Sewer Reorganization Act of 1977, Chapter 436 of the Acts of 1977 (“the Enabling Act”) and is governed by a three-member Board of Commissioners. Since the Commission’s inception in 1977, the Commission has set forth its Capital Improvement Plan to provide for long-term sustained capital improvements to its water distribution and sewer collection system, 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 failure. 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.

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 the waterways.

In addition, the Commission completed construction of a new Materials Handling Facility in 2010 to effectively dispose of catch basin debris and sewer cleaning materials. This facility will also reduce the Commission’s costs for transportation and disposal of catch basin debris by dewatering the materials.

In 2011, the Commission completed a comprehensive water distribution study that reviewed all aspects of the Commission’s distribution system, including a prioritization of every water pipe in the system. The Commission utilizes the study’s results to prioritize capital improvements and invest in the most cost-effective maintenance projects. A subsequent update to the prioritization models was completed in 2016.

Water distribution system improvements made since 1978 include the replacement of 338.2 miles of older water mains, the cleaning and lining of 274.8 miles of water mains, hydrant replacements and valve upgrades and replacements.

The Commission has also recently completed a comprehensive review of the sewer and storm drainage facilities. This project 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. This review completed in 2015. The final plan has provided a detailed and efficient sewer program for the next twenty five years.

Since 1978, 83.3 miles of deteriorated or collapsed sanitary sewers and drains have been replaced, 58.7 miles of sewers and drains have been rehabilitated, 664 miles of sewer pipe have been television inspected, 45.6 miles of large sewers and drains have been cleaned and approximately 159 miles of new storm drains have been installed for separation purposes.

2017 – 2019 Capital Improvement Program

WATER DISTRIBUTION SYSTEM EXPENDITURES

Over the three-years of the CIP, the Commission will expend \$84.6 million on improvements to the Water Distribution System. The majority of these expenditures will occur in the replacement of water mains.

The projects scheduled for initiation in 2017 will result in the replacement of 8 miles of water mains.

The table below presents a summary of the 2017-2019 capital expenditures for the Water Distribution System.

Water Distribution System Expenditures by Program Category

<i>Program Source</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>Water Replacement</i>	\$32,714,000	\$23,201,000	\$9,034,000	\$64,949,000
<i>Water Reline</i>	\$160,000	\$	\$	\$160,000
<i>Water Special</i>	\$9,238,000	\$6,915,000	\$3,320,000	\$19,473,000
<i>TOTAL</i>	<i>\$42,112,000</i>	<i>\$30,116,000</i>	<i>\$12,354,000</i>	<i>\$84,582,000</i>

NOTE: Although expenditures decrease for 2019, it is anticipated that funding for 2018 will be equal or greater than funding presented in 2019. The decrease in 2018 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.

SEWER SYSTEM EXPENDITURES

The CIP for the Sewer System includes a total of \$93.2 million for various types of system improvements. These include in-kind replacement and rehabilitation of sewer pipe, installation or replacement of sewers and storm drains that increase the overall capacity of the system, separation of combined systems, identification and reduction of infiltration and inflow and compliance with permit requirements in the areas of combined sewer overflows and storm water discharges.

2017 – 2019 Capital Improvement Program

The table below presents a summary of the 2017-2019 capital expenditures for the Sewer System.

Sewer System Expenditures by Program Category

<i>Program Source</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>Sewer R&R</i>	\$20,482,000	\$24,670,000	\$9,795,000	\$54,947,000
<i>Increased Capacity</i>	\$1,711,000	\$828,000	\$3,000,000	\$5,539,000
<i>Separation</i>	\$7,470,000	\$9,015,000	\$3,232,000	\$19,717,000
<i>Infiltration/Inflow</i>	\$100,000	\$200,000	\$800,000	\$1,100,000
<i>Sewer Special</i>	\$4,995,000	\$3,836,000	\$3,114,000	\$11,945,000
<i>TOTAL</i>	<i>\$34,758,000</i>	<i>\$38,549,000</i>	<i>\$19,941,000</i>	<i>\$93,248,000</i>

NOTE: Although expenditures decrease for 2019, it is anticipated that funding for 2019 will be equal or greater than funding presented in 2018. The decrease in 2019 is primarily due to the CIP being a one-year cash flow, over a three-year budget period.

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 2017-2019 CIP total \$18.5 million.

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

Support Expenditures by Project Category

<i>Program Source</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>Metering</i>	\$2,115,000	\$1,615,000	\$1,615,000	\$5,345,000
<i>IT</i>	\$3,180,000	\$2,610,000	\$3,105,000	\$8,895,000
<i>Admin. Equipment</i>	\$2,405,000	\$1,055,000	\$830,000	\$4,290,000
<i>TOTAL</i>	<i>\$7,700,000</i>	<i>\$5,280,000</i>	<i>\$5,550,000</i>	<i>\$18,530,000</i>

2017 – 2019 Capital Improvement Program

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 2017-2019 CIP total \$10.1 million.

<i>Program Source</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>TOTAL</i>
<i>Stormwater</i>	<i>\$4,938,000</i>	<i>\$3,241,000</i>	<i>\$1,870,000</i>	<i>\$10,049,000</i>
<i>Total</i>	<i>\$4,938,000</i>	<i>\$3,241,000</i>	<i>\$1,870,000</i>	<i>\$10,049,000</i>

MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)

The Commission obtains its water supply and sewer treatment services from the MWRA. The MWRA provides water services to 51 cities, towns and special purpose entities including the Commission (45 in greater Boston and the Metro west areas; 3 in Central Massachusetts; and a back-up water supply in 3 other communities) 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

On December 19, 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 personal property comprising the Metropolitan District Commission ("MDC") water and sewer systems were 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 a 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 Clean Water Act. 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.

2017 – 2019 Capital Improvement Program

The Commission is the largest single customer for MWRA. For MWRA fiscal year 2017, the Commission will be assessed 35.3% of the water system charges and 28.7% of the sewer system charges. On a combined basis, the Commission will pay 30.9% of the total MWRA assessments.

Assessments for water services are calculated by MWRA based on the metered water use in the calendar year immediately proceeding the MWRA fiscal year. The Commission's water charges for the MWRA fiscal year of 2017 total \$82.2 million based on the Commission's calendar year 2015 metered water use.

Through 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 Advisory Board 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 on census population. Metered wastewater flow from the immediately preceding calendar year is used in calculating assessments. The Commission's sewer assessment for fiscal year 2017 based on calendar year 2015 data, totals \$132.3 million. Total assessments for water and sewer charges for MWRA fiscal year 2017 are \$215.1 million.

As the largest of MWRA's water community members, 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 203.7 mgd (millions of gallon a day) to consumers in 2014. 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 Metro-West 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 51 member communities that purchases its water (fluoridated and disinfected by ozone with chlorine residual added) wholesale from the MWRA and represents approximately 36.1 percent of the current demand on the MWRA water supply. 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, conventioners, hospital patients and visitors.

2017 – 2019 Capital Improvement Program

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 CIP is provided through for sources; Commission general revenue bonds, current year rate revenues, and two grant/loan programs provided by the 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 \$147.3 million, or 71.4% of the total funding requirement. In 2017, bonds will make up \$69.6 million, or 77.8% of the funding required for that year.

As in past CIP's, the 2017-2019 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), and sewer pipe rehabilitation. The 2017-2019 CIP outlines R&R expenditures of \$50.3 million, or 24.4% of total expenditures over the three years of the program. In 2017, approximately \$15.9 million or 17.7% will be expended out of current rate revenues for CIP projects.

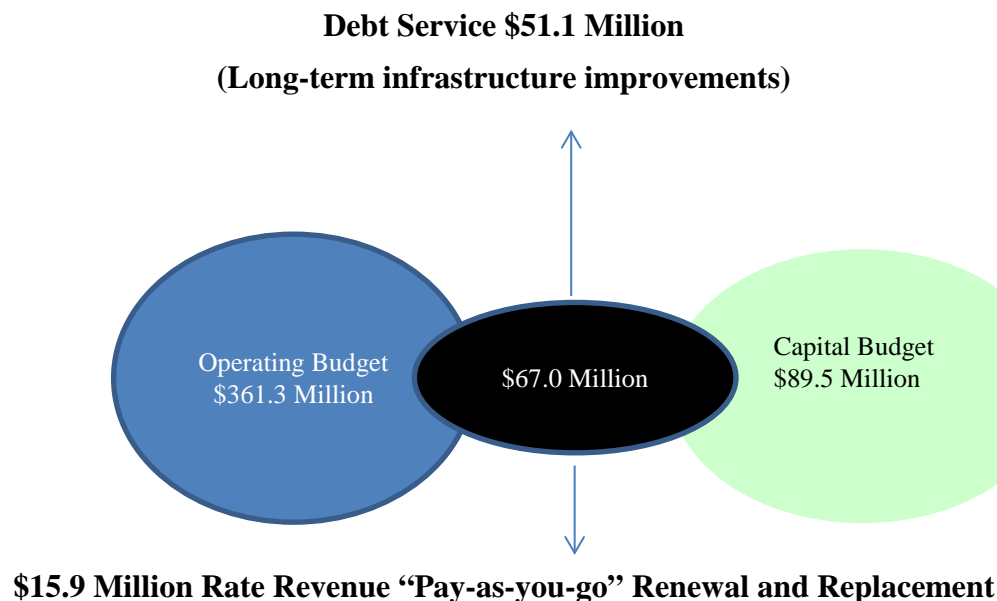
Each year the Commission participates in the MWRA's Infiltration/Inflow program for Infiltration/Inflow and Separation projects. Since 1993, the Commission has received \$83.7 million in MWRA funding for various Infiltration/Inflow and Separation projects. The Commission plans to continue to take advantage of MWRA funding over the 2017-2019 period. \$1.5 million in funding is anticipated to be used for projects that are ongoing along with new projects for the three years 2017-2019.

In 2010, the MWRA Board voted to authorize the development of a 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 \$29.2 million dollars per year with Boston receiving a share of approximately \$3.9 million dollars. The loans will be repaid to the MWRA over a 10-year period. Loan funds are approved for distribution from fiscal year 2011 through fiscal year 2020. 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 2010-2016 the Commission has received \$27.1 million in LWSAP funding.

It is anticipated in 2017-2019, Capital Improvement Program \$7.3 million will be funded using the LWSAP Program

2017 – 2019 Capital Improvement Program

Impact of CIP on Current Expense Budget 2017



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 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	12,616	Total Linear Feet	5,330,364	High Pressure Fire System	16 Miles
		Total Linear Miles	1,010	Northern High	5 Miles
Gate Valves*	17,409	Pumping Stations	1	Northern Low	89 Miles
				Southern Extra High	80 Miles
				Southern High	561 Miles
				Southern Low	258 Miles

*Includes only facilities owned by BWSC

2017 – 2019 Capital Improvement Program

OBJECTIVES

The primary objectives of the 2017-2019 Water Distribution System CIP are:

- ✓ To ensure a continued adequate supply of high quality, potable water at adequate pressure, for consumption by the 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 so as to advance the efficient operation of the water system
- ✓ To coordinate 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.

Over the last ten years, the Commission has completed a total of \$260.0 million in water distribution improvements. These improvements have resulted in the replacement of 104.2 miles of water mains, and cement lining of 34.9 miles of water mains.

2017-2019 WATER DISTRIBUTION SYSTEM CAPITAL PROGRAM

The Commission's 2017-2019 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 which 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.

Three-year expenditures are projected to be \$84.6 million, of which \$42.1 million is anticipated to occur in 2017. The three-year amounts are distributed in the Water Program as follows: Replacement \$64.9 million or 76.8%, Reline \$0.2 million or 0.2% and Special \$19.5 million or 23.0%.

WATER MAIN REPLACEMENT PROGRAM

DESCRIPTION AND JUSTIFICATION

Funding is provided in the 2017-2019 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

2017 – 2019 Capital Improvement Program

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 Internal 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 2017-2019 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 in the control of bio-film 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 mile 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 improvements to the quality of our environment and services.

WATER MAIN REPLACEMENT PROGRAM 2017 SUMMARY

The projects scheduled for initiation in 2017 will result in the replacement of approximately 8 miles of water mains.

Prior to construction the Commission inspects sewer and drain pipes 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 avoids disruption of the streets and saves projects 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 recommendation 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 and 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 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 SYSTEM

WATER REPLACEMENT

The following pages contain a brief summary of each on-going and new water replacement project included in the 2017-2019 CIP.

NEW PROJECTS

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 as well as associated sewers and drains that are in disrepair. Construction is projected to commence by July 2018 and be completed by October 2019. The total three-year budget for this project is \$3,753,000.

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Water Main Replacement in Dorchester and 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 and Roxbury. Associated sewers and drains that are in disrepair will also be replaced or rehabilitated. Construction is projected to commence in May 2018 and be completed by May 2019. The total three-year budget for this project is \$2,343,000.

Water Main Replacement in Jamaica Plain and Mattapan – Contract No. 17-308-003: This project includes the replacement of older cast iron water mains that have reached their useful life in Jamaica Plain and Mattapan as well as associated sewers and drains that are in disrepair. Construction is projected to commence May 2018 and be completed by May 2019. The total three-year budget for this project is \$2,110,000.

Water Main Replacement in City Proper – Contract No. 17-308-004: This project includes the replacement of older cast iron water mains that have reached their useful life in City Proper as well as associated sewers and drains that are in disrepair. Construction is projected to commence May 2018 and be completed by July 2019. The total three-year budget for this project is \$4,206,000.

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 as well as associated sewers and drains that are in disrepair. Construction is projected to commence April 2018 and be completed by July 2019. The total three-year budget for this project is \$3,390,000.

Curlew St. Betterment Water Pipe Replacement: This project includes the replacement of a water pipe that has reached its useful life on Curlew St. Construction is projected to commence June 2017 and be completed by October 2017. The total budget for this project is \$117,000.

ONGOING PROJECTS

Water Portion of Sewer Separation Contract No. 15-309-011: This project includes the replacement of water mains as part of the sewer separation in Roxbury Contract 1. Construction commenced in October 2016 and be completed by November 2017. The total three-year budget for this project is \$749,000.

Cambridge St.: This project includes the replacement 2,000 linear feet of water main on Cambridge St. The Mass Highway Department is planning to reconstruct a portion of Cambridge St. in Allston/Brighton. The Commission owns an older water main in this street that requires replacement. It is recommended to have the pipe replaced as part of the roadway project. This will result in a cost savings for paving work and police details. Construction is projected to commence May 2018 and be completed by June 2019. The total three-year budget for this project is \$500,000.

Water Portion of Sewer Separation in East Boston Contract 16-309-005: This project includes the separation of combined sewers in a portion of East Boston as well as the replacement of older iron water mains and the rehabilitation or replacement of sewer pipes if

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found to be in poor conditions. Construction is projected to commence May 2017 and a completion date of June 2018. The total three-year budget for this project is \$625,000.

East Boston Contract No. 16-308-001: This project includes the replacement of 6,320 linear feet older cast iron water pipes in East Boston. Construction is projected to commence in April 2017 with an estimated completion date of August 2018. The three-year budget for this project is \$2,314,000.

Roxbury Contract No. 16-308-002: This project includes the replacement of approximately 6,000 linear feet of older cast iron water pipes in Roxbury. Construction is projected to commence in April 2018 and be completed by May 2019. The total three-year budget for this project is \$1,670,000.

Mattapan, Hyde Park, Jamaica Plain & West Roxbury Contract No. 16-308-003: This project includes the replacement 6,290 of older iron water pipes in Mattapan, Hyde Park, Roslindale and West Roxbury. Construction is projected to commence in September 2017 and be completed by September 2018. The total three-year budget for this project is \$1,573,000.

Fenway & Kenmore Sq. Contract No. 16-308-004: This project includes the replacement of 7,535 linear feet older iron water pipes in Fenway and Kenmore. Construction is projected to commence in April 2017 and be completed by October 2017. The total three-year budget for this project is \$2,802,000.

Dorchester, Roxbury & South Boston Contract No. 16-308-005: This project includes the replacement of 6,320 feet older iron water pipes in Dorchester, Roxbury and South Boston. Construction is projected to commence in April 2017 and is projected to be completed in May 2018. The total three-year budget for this project is \$2,434,000.

Allston/Brighton, Back Bay, and Beacon Hill & City Proper Contract No 16-308-006: This project includes replacement of 4,625 feet older iron water pipes in Allston/Brighton, Back Bay and City Proper. Construction is projected to commence in *August* of 2017 with an end date projection of August 2018. The total three-year budget for this project is \$1,813,000.

Boston Common Contract No 16-308-007: This project includes the rehabilitation by trenchless methods of large diameter steel main in the City Proper. Also included is the dewatering and inspection of a 42-inch steel water pipe which lies beneath the Copley Place Development to determine its condition. Construction is projected to commence in April 2017 and be completed by October 2017. The total three-year budget for this project is \$1,670,000.

Water Main Replacement in the North End – Contract No. 15-309-007 (Water Portion): This project includes water main replacement within the North End limits of work, and two water main replacements in Private Ways near Downtown Crossing. Construction commenced October 2016 and be completed by July 2018. The total three-year budget for this project is \$2,281,000.

Fenway & City Proper Contract No. 15-308-001: This project includes the replacement of approximately 3,360 linear feet of water pipes in Fenway/Kenmore and City Proper.

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Construction is scheduled to commence in April 2017 and is projected to be completed by October 2017. The total three-year budget for this project is \$3,793,000.

Mattapan & Hyde Park Contract No. 15-308-003: This project includes the replacement of approximately 6,400 linear feet of water pipes in Mattapan and Hyde Park. Construction commenced in July 2016 and is projected to be completed by October 2017. The total three-year budget for this project is \$1,437,000.

South End & Roxbury Contract No. 15-308-004: Work includes the replacement of approximately 9,865 linear feet of existing 6, 8 and 12 inch water mains in the South End and Roxbury. Construction is projected to commence April 2017 with a completion date of June 2018. The total three-year budget for this project is \$2,600,000.

Dorchester, Hyde Park, & Roxbury Contract No. 15-308-005: This project includes the replacement of approximately 8,800 linear feet of water pipes in Dorchester and Hyde Park. Construction is projected to commence April 2017 with a completion date of July 2018. The total three-year budget for this project is \$2,500,000 for water only.

Allston/Brighton & Charlestown Contract No. 15-308-006: This project includes the replacement of approximately 11,160 linear feet of water pipes in Allston/Brighton and Charlestown. Construction is scheduled to commence in April 2017 and be completed by July 2018. The total three-year budget for this project is \$3,357,000.

Roslindale, Hyde Park, & West Roxbury Contract No. 15-308-007: This project includes the replacement of approximately 8,145 linear feet of water pipes in Roslindale, Hyde Park, and West Roxbury. This Project is projected to commence in April 2017 with a completion date of September 2018. The total three-year budget for this project is \$4,045,000.

City Proper, Charlestown Contract No. 14-308-001: This project includes the replacement of approximately 4,015 linear feet of water pipes in City Proper and Charlestown. Construction commenced in June 2016 and is projected to be completed by April 2018. The total three-year budget for this project is \$923,000.

Roxbury Contract No. 14-308-002: This project includes the replacement of approximately 7,705 linear feet of water pipes in Roxbury and South End. Construction commenced in June 2015 and was completed by June 2016. A small budget will be established in 2017 to cover closing costs of this contract. The total three-year budget for this project is \$50,000.

West Roxbury Contract No. 14-308-003: This project includes the replacement of approximately 15,655 linear feet of water pipes in West Roxbury. Construction is projected to commence in April 2017 and be completed by September 2019. The total three-year budget for this project is \$4,384,000.

Fenway/Kenmore, Jamaica Plain, & Roxbury Contract No. 14-308-004: This project includes the replacement of approximately 6,300 linear feet of water pipes in Fenway/Kenmore, Jamaica Plain, and Roxbury. Construction commenced in September 2016 and is projected to be completed by September 2018. The total three-year budget for this project is \$2,286,000.

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South Boston, East Boston & Hyde Park Contract No. 14-308-005: This project includes the replacement of approximately 9,000 linear feet of water pipes in East Boston, South Boston and Hyde Park. Construction commenced in August 2016 and be completed by November 2017. The total three-year budget for this project is \$2,128,000.

Allston/Brighton, Dorchester Contract No. 14-308-006: This project includes the replacement of approximately 6,200 linear feet of water pipes in Allston/Brighton and Dorchester. Construction is projected to commence in May 2017 and be completed by June 2018. The total three-year budget for this project is \$1,673,000.

Allston/Brighton, Hyde Park & West Roxbury Contract No. 13-308-002: This project includes the replacement of approximately 8,255 linear feet of water pipes in Allston/Brighton, Hyde Park and West Roxbury. Construction commenced in June 2015 and was completed in June 2016. A small budget of \$70,000 will be established in 2017 to cover closing costs of this contract.

Mattapan Contract No. 13-308-004: This project includes the replacement of approximately 7,450 linear feet of water pipes in Mattapan and Roslindale. Construction commenced in June 2016 and is expected to be completed by June 2017. A budget of \$718,000 will be established in 2017.

Jamaica Plain, Roslindale, Roxbury & South Boston Contract No. 13-308-005: This project includes the replacement of approximately 7,040 linear feet of water pipes in Jamaica Plain, Roslindale, Roxbury, and South Boston. Construction commenced in May 2016 and was substantially completed in December 2016. A budget of \$260,000 will be established in 2017 to cover the closing costs of this contract.

Back Bay, Beacon Hill & City Proper Contract No. 12-308-008: This project included the replacement of approximately 2,735 linear feet of water pipes in Back Bay, Beacon Hill, and City Proper. Construction commenced in March 2015 and was completed in June 2016. A budget of \$300,000 will be established in 2017 to cover the closing costs of this contract.

City Proper Contract No. 11-308-010: This project included the replacement of approximately 5,150 linear feet of water pipes in City Proper. Construction commenced in July 2013 and was completed in November 2014. A budget of \$75,000 will be established in 2017 to cover the closing costs of this contract.

WATER RELINE PROJECTS

The following pages contain a brief summary of each on-going and new water reline project in the 2017-2019 CIP.

NEW PROJECTS

No new projects

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ONGOING PROJECTS

Contract No. 15-308-002: This project includes the rehabilitation of approximately 7,150 linear feet of unlined water pipes under DCR roadways in Jamaica Plain and Roxbury. Construction commences in April 2016 and is projected to be completed by May 2017. A small budget of \$160,000 will be established in 2017 to cover closing costs of this contract.

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

No new projects

ONGOING PROJECTS

Roadway Resurfacing Contract No. 15-309-003: This project involves the permanent paving of trenches from BWSC CIP Projects. Construction commenced in April 2016 and was substantially completed by December 2016. A budget worth \$442,000 will be created in 2017 to cover closing costs of this project.

Reconstruction of Large Mains (Public Gardens) Contract No. 14-308-008: This project involves the replacement and reconstruction of 48-inch pipes and connections in Charles Street adjacent to the Public Garden and replacement of large valves on transmission mains. Replacement of valves on large transmission mains is required since they have reached the end of their useful life. These valves were designated for replacement by the Commission's Operations Department. Construction commences in June 2015 and was completed in April 2016. A small budget of \$40,000 will be established in 2017 to cover closing costs of this contract.

Engineering Design Services Contract No 14-206-003: This project provides design services for Capital Improvement Projects to augment the Commission's Design Staff. The contract will be on an as-needed basis for a three-year period. When the design staff is shorthanded or when additional projects become necessary, this contract will provide professional design services.

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Services commenced in September 2014 and are expected to be completed by September 2017. The total three-year budget for this project is \$450,000.

Traffic Management Services Contract No. 15-206-008: This project involves professional services to design traffic management plans for Commission construction contracts for main streets and DCR roadways. The Boston Transportation Department and DCR require traffic plans for main streets for all construction projects. The total three-year budget for this project is \$200,000.

(CWS)Leak Detection – Large Mains: This project will be a pilot program to test the installation of a permanent leak detection system on large diameter transmission water mains. By monitoring these mains, unnoticeable leaks can be detected early and repaired before catastrophic failure of the pipe occurs and sensors can be installed to monitor for indicators of possible drinking water contamination. Construction for this project is projected to commence in July 2017 with a completion date of December 2019. The total three-year budget for this project is \$300,000.

Water Pipe Testing Services Contract No. 15-206-010: This program was a recommendation of the 2011 Water Distribution Study. The Water Distribution Study recommended that the Commission collect and analyze samples of water pipe each year in order to continue the program initiated under the study. Each year sixteen samples representing various ages and materials will be collected and analyzed under this contract. The total three-year budget for this project is \$150,000.

Water Main Flushing Program Contract No. 14-203-001: This project involves the implementation and maintenance of a water main flushing program for the Commission's water distribution system by a qualified professional engineering consulting 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 unidirectional water main flushing program is designed to flush all pito-meter 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 main 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 chloramines 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 four year cycle. The flushing is conducted during the construction season (March-November) in the late evening/early morning to minimize disturbance to customers.

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The Commission has engaged the services of a professional engineering consulting firm to evaluate the overall effectiveness of the flushing program recommend improvements and continue the implementation of the system-wide water main flushing program.

The firm has reviewed the Commission's current water flushing program and made recommendations for improvements including updating the flushing database utilizing the Commission's recently restructured water distribution system model. The form also developed methodologies to achieve greater flushing velocities for low flow areas and evaluate the overall program effectiveness. The firm deploys its own work crews to conduct the water main flushing program.

The project is expected to cost \$250,000 annually over a four year period totaling \$1,000,000. This contract commenced in April 2015 and be completed in December 2018. The budget for the remaining three-years of this program is \$750,000.

Subsurface Investigation Services Contract No. 14-206-004: During the construction of capital projects it is often necessary to install Commission facilities in areas with a great deal of utilities. This project includes services for non-destructive excavation with electronic detection to locate subsurface utilities during the design phase in streets included in the Capital Improvement Program. Knowledge of the locations of other underground utilities helps to alleviate change orders during construction. This is a three-year professional services contract. The total three-year budget for this project is \$375,000.

Hydrant Replacement Contract 13-103-004: 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 (3) year period. Construction is projected to commence in January 2017 with a completion date of December 2019. 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 \$975,000.

City of Boston Street Opening Permit Fees: The Boston Water and Sewer Commission is required by the City of Boston's regulations to obtain street opening permits for any construction activity that will require the removal of existing street and/or sidewalk material in the public way. This project involves obtaining street opening permits from the City of Boston for excavation activities performed by the Commission forces 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 are responsible for the permanent restoration of streets and sidewalks excavated during construction activities. On an annual basis, the Commission publicly advertises and awards to private contractors permanent restoration work. In addition, the Commission is required to reimburse City of

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Boston's contractors for the repairs and/or replacement of the Commission's castings as a result of the permanent restoration of the streets under the City contracts. The three-year budget totals \$9,791,000.

Note* The Paving line item in the Capital Improvement Program encompasses several contracts performing a variety of tasks relative to the paving of city streets. Listed below are the specific contracts incorporated into the Paving line item.

<i>Streets</i>	<i>2017</i>	<i>2018</i>	<i>2019Paving</i>	<i>2017-2019</i>
<i>Permits</i>	\$2,000,000	\$2,000,000	\$2,000,000	\$6,000,000
<i>Paving</i>	\$5,391,000	\$400,000		\$9,791,000
<i>Total</i>	\$7,391,000	\$2,400,000		\$15,791,000

SEWER SYSTEM

The Commission owns and operates a system for the collection and transport of wastewater and storm drainage 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 storm water.

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. The work has increased capacity, eliminated dry weather overflows, and the volume of wet weather overflows has been reduced as well.

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, 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 located in the southern part of the City, are essentially served by separate systems.

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

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Interceptor

Boston Main Interceptor
 Dorchester Interceptor
 East Side Interceptor
 Faneuil Street Trunk Sewer
 Roslindale Interceptor
 South Boston Interceptors
 Southwest Corridor Interceptor
 Stony Brook Interceptor
 Stoney Valley Sewer
 West Side Interceptor
 Talbot Avenue High Level Sewer
 Hyde Park Trunk Sewer
 East Boston Low Level Sewer
 Dorchester High Level Sewer

Neighborhood Served

South End, Roxbury and North Dorchester
 Dorchester and Neponset
 Downtown and North End
 Allston/Brighton
 Roslindale and West Roxbury
 South Boston
 Roxbury and Jamaica Plain
 Roxbury
 Roxbury and Jamaica Plain
 Back Bay, Beacon Hill and West End
 Dorchester, Mattapan and Roslindale
 Hyde Park
 East Boston
 Mattapan and Hyde Park

The sewer system is comprised of the following:

APPURTENANCES		SEWER PIPES CITY WIDE		TYPE OR DESIGNATION	
Catch Basins	30,000	Total Linear Feet	8,087,767	Combined Sewer	165 Miles
Manholes	48,623	Total Linear Mile:	1,532	Combined Sewer Overflow	4 Miles
Outfalls	252	Pumping Stations	9	Sanitary Sewer	700 Miles
Regulators	148			Storm Drain	662 Miles
Tide Gates	186				

All wastewater collected by Commission facilities are conveyed to the MWRA's Deer Island Treatment Plant.

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 storm-water infiltration and inflow ("I/I") from the sewer system. Private developments may add substantial flows to the sewer collection, requiring additional MWRA treatment.

In order to offset the effect of these additions, the Massachusetts DEP recommends to the Massachusetts Environmental Policy Act Office and the Executive Office of Environmental

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Affairs that new developments be required to remove I/I 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 in order 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 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.

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.

The Engineering Customer Service department will coordinate with the Planning Department of 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 date, the Commission has implemented five contracts, which are funded by the 4:1 Infiltration / Inflow Reduction Mitigation Account. Contracts 09-309-008, 10-206-005, 10-309-004 are complete and Contracts 14-206-002 and 15-206-001 are ongoing. All costs reflected in the DEDII account and are 100% reimbursable; therefore are not included in the 2017-2019 cash flow.

OPEN CONTRACTS

Roxbury Separation Design Contract 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. It avoids the need for expensive I/I studies and flow monitoring. Sewer Separation decreases the Commission's sewer payments to MWRA and decreases CSO activity. Work includes construction of new drains and where necessary new sewer and water pipes. The design phase of this project began in July 2014 and is expected to be completed in June 2018. The three-year budget for the project is \$150,000.

Infiltration and Inflow Analysis Contract 15-206-001: This project includes an Infiltration and Inflow analysis to identify sources of extraneous flow in the Commission's sewer system. The

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I/I analysis project will include a review of prior I/I investigations, flow metering, groundwater level monitoring, manhole inspections, and analysis of data collected. The finding will be provided to the Commission in a report with recommendations, a schedule and a plan for conducting a Sanitary Sewer Evaluation Study (“SSES”) in sections of the sewer system that exhibit excessive I/I. The planning phase of this project commenced in May 2015 and is estimated to be completed in January 2017. The three-year budget is \$160,000.

Infiltration and Inflow SSES: This project includes an Infiltration and Inflow analysis to identify sources of extraneous flow in the Commission’s sewer system. The Department of Environmental Protection (DEP) developed regulations requiring sewer system operators to create and implement a plan to remove extraneous flows from the wastewater collection system. The plan is expected to be completed in early 2017. The plan implementation will require the Commission to conduct sewer system evaluation surveys in sections of the wastewater collection system exhibiting excessive flows. This project is designed to identify sources of extraneous flows in accordance with DEP requirements. This project will entail an Infiltration and Inflow survey to identify sources of extraneous flow in the Commission’s wastewater collection system. The I/I survey 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 recommendations for capital improvements to eliminate the sources of extraneous flows. The planning phase of this project is expected to commence in February 2017 and is estimated to be completed in December 2018. The three-year budget is \$1,500,000.

<i>Contract</i>	<i>Description</i>	<i>Cost</i>	<i>Status</i>
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
14-206-002	Roxbury-Separation-Design-Contract	\$1,049,954.30	Active
15-206-001	Infiltration-and-Inflow-Analysis	\$1,998,970.00	Active
N/A	Infiltration and Inflow SSES	\$1,500,000.00	Active

OBJECTIVES

The primary objectives of the Sewer System Capital Improvement Program for 2017-2019 is designed 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 2017-2019 CIP has five major programs for the Sewer System: the sewer renewal and replacement program; the increased capacity program; the sewer separation and storm drainage program; the Infiltration/Inflow program; and special program.

Projects included in the Sewer System CIP include the repair or replacement of approximately 9 miles of deteriorated or collapsed sanitary sewers and storm drains. Work is included under contracts 17-309-001, 17-309-002, 17-309-006, 17-309-009, 17-309-010 and CMOM for future contracts (TBD – to be determined).

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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.

The primary objectives of the 2017-2019 Sewer CIP are:

- ✓ Implement and manage contracts affiliated with the Consent Decree
- ✓ Implement Green Infrastructure
- ✓ 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

2017-2019 SEWER SYSTEM CAPITAL PROGRAM

The sewer system objectives will be carried out through the continuation of the following program activities: renewal and replacement of sewer pipes, rehabilitation of sewer and drains, separation of combined sewers into sewer and storm drains, 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.

WASTEWATER PROJECTS HIGHLIGHTS

- ✓ 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 (Contract 1, 2, & 3)
- ✓ Infiltration/Inflow Analysis
- ✓ Downspout Disconnection Program

Three year total expenditures are \$93.2 million, of which \$34.8 million is anticipated to be spent in 2017.

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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: insure 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

Sewer & Drain Rehabilitation Citywide 17-309-001: This project includes the replacement and rehabilitation of sanitary sewer, storm drain and combined sewer pipes in need of structural repair as identified by various Commission inspection programs. Pipes in this contract have been found defective and in need of repair or replacement as determined by cleaning and CCTV inspection under various programs including SSO investigations, CMOM contracts, and illegal connection inspection. The project is scheduled to commence in May 2018 and is projected to be completed by July 2019. The budgeted amount is \$3,100,000.

Sewer & Drain Rehabilitation Citywide 17-309-002: This project includes the replacement and rehabilitation of sanitary sewer, storm drain and combined sewer pipes in need of structural repair as identified by various Commission inspection programs. Pipes in this contract have been found defective and in need of repair or replacement as determined by cleaning and CCTV inspection under various programs including SSO investigations, CMOM contracts, and illegal connection inspection. The project is scheduled to commence in May 2018 and is projected to be completed by October 2019. The budgeted amount is \$7,655,000.

Rehab of Large Sewer & Drain Conduits 17-309-006: This project includes the trenchless structural rehabilitation of large conduits found to be in disrepair during recent inspections. The project is scheduled to commence March 2018 and is projected to be completed in May 2018. The three-year budget for the project is \$2,358,000.

Sewer & Drain Inspection for 2017 17-309-007: This project includes the inspection of sewer and drain pipes due for future replacement using closed circuit television cameras. The project is scheduled to commence in December 2017 and is projected to be completed by September 2018. The budget for the project is \$550,000.

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CMOM Program 17-309-009: This project entails the inspection of sewers and drains through the use of closed circuit TV cameras utilizing the SCREAM coding system in order to assess the structural condition of the pipes. Approximately thirty (30) miles of various sized pipes will be cleaned and inspected. Construction is scheduled to commence in April 2017 and is estimated to be completed by March 2018. The three-year budget for the project is \$1,100,000.

CMOM Program 17-309-010: This project entails the inspection of sewers and drains through the use of closed circuit TV cameras utilizing the SCREAM coding system in order to assess the structural condition of the pipes. Approximately thirty (30) miles of various sized pipes will be cleaned and inspected. Construction is scheduled to commence in April 2017 and is estimated to be completed in March 2018. The three-year budget for the project is \$1,100,000.

TBD CMOM –Future Contracts: This project includes the inspection of sewers and drains through the use of closed circuit TV cameras utilizing the SCREAM coding system in order to assess the structural condition of the pipes. Approximately one hundred twenty (120) miles of various pipes will be cleaned and inspected with a goal of completing the entire system over a 10 year period. Construction is scheduled to commence in 2018 and is projected to be completed in 2019. The three-year budget is \$4,400,000.

Replacement of a Private Sewer in Alley 521 17-309-012: This project includes the replacement of a private sewer in Alley 521. The project is expected to commence in March 2018 and is projected to be completed by July 2018. The three-year budget for the project is \$450,000.

Replacement of Wood Overflow Conduits 17-309-013: This project includes the replacement of two wood constructed overflows with new pipe. The project is expected to commence in October 2018 and is projected to be completed by February 2019. The three-year budget for the project is \$325,000.

ONGOING PROJECTS

Design Services for S & D Reconstruction Projects Contract N/A: This project includes professional design services for Sewer Replacement and Rehabilitation Citywide. The project is scheduled to commence April 2017 and is projected to be completed in November 2018. The three-year budget is \$700,000.

Sewer & Drain Rehabilitation Citywide Contract 16-309-001: This project includes the trenchless rehabilitation of sewer and drain pipes. Each of the pipes in this contract was inspected and found to be in poor condition, but are able to be rehabilitated through trenchless methods. The pipes selected for inspection were found to be defective through CMOM and other inspection programs as well as those in the areas of chronic maintenance problems. Construction is scheduled to start April 2017 and projected to be completed October 2017. The three-year budget is \$1,057,000.

Contract 16-309-007: This project includes inspection of sewer and drain pipes using closed circuit television cameras. The streets in this contract are those containing water pipes due for future replacement. Construction commenced in December 2016 and is projected to be completed by August 2017. The three-year budget is \$550,000.

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CCTV of Sewers and Storm Drains/CMOM Contract 16-309-009: This project includes the inspection of sewers and drains through the use of closed circuit TV cameras utilizing the SCREAM coding system in order to assess the structural condition of the pipes. Approximately thirty (30) miles of various pipes will be cleaned and inspected. Construction commenced in January 2016 and is projected to be completed by March 2017. The three-year budget \$250,000.

CCTV of Sewers and Storm Drains/CMOM Contract 16-309-010: This project includes the inspection of sewers and drains through the use of closed circuit TV cameras utilizing the SCREAM coding system in order to assess the structural condition of the pipes. Approximately thirty (30) miles of various pipes will be cleaned and inspected. Construction commenced in January 2016 and is projected to be completed by March 2017. The three-year budget \$250,000.

Sewer R & R Portion of Roxbury Separation Contract 1 Contract 15-309-011: This project includes the replacement and rehabilitation of sanitary sewer affiliated with sewer separation in Roxbury. Construction commenced in August 2016 and is projected to be completed by November 2017. The three-year budget is \$1,663,000.

Sewer and Drain Pipe Replacement and Rehabilitation Contract 16-309-002: This project includes the replacement and rehabilitation of sanitary sewer, storm drain and combined sewer pipes throughout the City of Boston. Pipes in this contract have been found defective and in need of repair or replacement as determined by cleaning and CCTV inspection under various programs including SSO investigations, CMOM contracts, and illegal connection inspection. Construction is scheduled to commence in April 2017 and is projected to be completed by November 2018. The three-year budget is \$7,200,000.

Sewer and Drain Replacement and Rehabilitation in the North End Contract:16-309-006: This project includes phase-three of a three-phase program to replace or rehabilitate sewers and drain in the North End. Construction is scheduled to commence in April 2018 and is projected to be completed by June 2019. The three-year budget is \$1,650,000.

Sewer and Drain Replacement and Rehabilitation Contract 15-309-001: This project includes the replacement and rehabilitation of sewer and drain pipes citywide that have been found through inspection to be defective. The streets in this contract are those containing water pipes due for future replacement. Construction is scheduled to commence in April 2017 and is projected to be completed by September 2018. The three-year budget is \$5,040,000.

Sewer and Drain Inspection for 2015 Contract 15-309-002: This project includes the inspection of sewer and drain pipes using closed circuit television cameras. The streets in this contract are those containing water pipes due for future replacement. Construction commenced in February 2016 and was completed in August 2016. A small budget worth \$2,000 will be established in 2017 to cover closing costs of this contract.

North End Phase II Contract 15-309-007: This project includes the replacement and rehabilitation of sewer and drain pipes in the North End. This is Phase two of a three phase plan. Construction commenced in October 2016 and is projected to be completed July 2018. The three-year budget is \$3,379,000.

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Sewer and Drain Renewal & Replacement for 2014 Contract 14-309-001: This project includes the replacement of 4,200 linear feet of sewer pipe and rehabilitation of 6,070 linear feet of sewer and drain pipes, along with spot repairs and illicit connection correction. All pipes in this contract have been inspected using closed circuit TV and have found to be defective where possible trenchless methods of rehabilitation will be used, otherwise damaged pipes will be replaced. Several Neighborhoods are affected by this work. Construction is scheduled to commence in April 2017 and be completed by May 2018. The three-year budget is \$4,305,000.

Sewer & Drain Replace & Rehab Citywide Contract 13-309-001: This project includes the replacement or trenchless lining of sewer and drain pipes found to be in need of repair. Construction commenced in September 2014 and was substantially completed by May 2016. A small budget worth \$367,000 will be established in 2017 to cover closing costs of this contract.

Sewer & Drain Replace & Rehab in the North End Contract 13-309-008: This project includes the replacement and/or trenchless rehabilitation of defective sewer, drain and combined system pipes within the North End neighborhood. This project is phase one of a three-year capital improvement program. Work will include approximately 1,585 linear feet of combined sewer relay, 5,900 linear feet of combined sewer structural lining, and approximately 160 linear feet of excavated spot repairs. Construction commenced in November 2014 and was completed in February 2016. A small budget worth \$77,000 was created in 2017 to cover closing costs of the contract.

S & D Reconstruction in Charlestown & East Boston Contract 10-309-001: This project includes the replacement or rehabilitation of existing sewer and drain pipes that are in disrepair or are allowing infiltration into the sewer system. The locations have been determined through closed circuit television inspections. The pipes included in this contract were determined to be in need of replacement or rehabilitation. The neighborhoods affected by this work are City Proper, East Boston and Roslindale. Construction commenced in June 2011 and was completed in September 2012. A small budget of \$19,000 will be established in 2017 to cover closing costs of this contract.

S & D Replacement Associated with Water Mains: On streets scheduled for water pipe replacement, the Commission will inspect the condition of the sewer and drain pipes. If they need to be repaired or replaced the Commission will add the work to the water main replacement contract. This work is intended to upgrade all Commission facilities in the street at the same time thus avoiding multiple contracts which disrupt the public. It is also less expensive to combine work into a single contract. The three-year budget is \$7,400,000.

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.

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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

Installation and Replacement of Tidegates, Increased Capacity 17-309-004: This project will include installation of new tidegates for drainage systems not currently protected by a tidegate. This is part of a long range plan for protection of the Commission's drainage system from tidal inflow from high tides and storm surges for predicted higher tides. Construction is projected to commence December 2017 and be completed by April 2018. The two-year budget is \$250,000.

Curlew St. Betterment Sewer Pipe Replacement: This project includes the replacement of a sewer pipe that has reached its useful life. Construction is projected to commence June 2017 and be completed by October 2017. The total budget for this project is \$123,000.

ONGOING PROJECTS

Inspection and Cleaning of Sewer Siphons Contract 16-309-003: This project will include the cleaning of three sewer siphons and chambers plus inspection of four other siphons to determine sediment depths. This project will cover the Roxbury, Roslindale, Dorchester, Back Bay and South Boston neighborhoods. Construction scheduled to commence in March 2017 and is projected to be completed by November 2017. The three-year budget is \$255,000.

Installation of New Tidegates Contract 16-309-004: This project includes the installation of new tidegates for drainage systems not currently protected by a tidegate. This is part of a long range plan for protection of the Commission's drainage system from tidal inflow from high tides and storm surges for predicted higher tides. Construction is projected to commence in May 2017 with an anticipated completion date in August 2017. The three-year budget for this project is \$1,076,000.

Lining the West Side Interceptor Contract 15-309-005: This project includes the installation of a cured-in-place lining system to for the West Side Interceptor. The interceptor was recently cleaned and inspected. Although it was found to be in good condition, its age dictates that it be lined to maintain its structural integrity. Construction commenced in June 2016 and was substantially completed in August 2016. A small budget worth \$110,000 will be created in 2017 to cover closing costs of this contract.

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OUTFALL 065

Cleaning and Rehabilitation of CSO Outfall 065 Contract 10-309-007: This project includes the cleaning and rehabilitation of overflow conduit 065 to the Fort Point Channel. Inspection shows a need for cleaning and structural repairs. This conduit is located beneath railroad tracks at South Station and US Postal Service. Construction is scheduled to commence in May 2018 and is projected to be completed by November 2018. The three-year budget is \$3,500,000.

Design for Cleaning and Rehabilitation of CSO Outfall 065 Contract 09-206-003: This project includes engineering services for cleaning and rehabilitation of overflow Conduit 065 to the Fort Point Channel. Inspection shows a need for cleaning and structural damage. This conduit is located beneath railroad tracks at South Station. Construction is scheduled to commence in May 2017 and is projected to be completed by November 2017. The three-year budget is \$225,000.

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 storm water. 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 discharged into the storm drain system. Between 1986 and September 28, 2016, the Commission removed more than 682 illegal connections, eliminating the discharge of an estimated 774,938 gallons of wastewater per day to the storm drainage system and receiving waters.

NEW PROJECTS

Correction of Illicit Sanitary Building Connections, Sewer Separation 17-309-003: Correction of sanitary building connections that are found connected to storm drains. The Commission conducts investigation to locate building connections that are incorrectly connected to storm drains. This contract will involve reconnection of these laterals to sanitary sewers. Construction scheduled to commence in September 2017 and is projected to be completed by August 2020. The three-year budget is \$936,000.

Sewer Separation in East Boston Phase II Contract 17-309-005: This project will include the Separation of combined sewers in East Boston. This is phase 2 of a 3-phased program. Work will also include replacement or rehabilitation of water and sewer pipes as necessary. Construction scheduled to commence in May 2018 and is projected to be completed by November 2018. The three-year budget is \$1,120,000.

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ONGOING PROJECTS

Sewer Separation Roxbury Contract 3 Contract 17-309-011: This project includes the installation of sewers and drains for sewer separation in Roxbury. Construction is scheduled to commence in April 2018 and is projected to be completed by October 2019. The three-year budget is \$5,150,000.

Sewer Separation East Boston Contract 16-309-005: This project includes the separation of combined sewers in a portion of East Boston. Work may also include replacement of older water mains and replacement or rehabilitation of sewer pipes if found to be in poor condition. Construction is scheduled to commence in May 2017 and is projected to be completed by June 2018. The three-year budget is \$1,458,000.

Sewer Separation Roxbury Contract 2 Contract 16-309-011: This project includes the installation of sewers and drains for sewer separation in Roxbury. Construction is scheduled to commence April 2017 and is projected to be completed by October 2018. The three-year budget is \$7,050,000.

Sewer Separation Roxbury Contract 1 Contract 15-309-011: This project includes the installation of sewers and drains for sewer separation in Roxbury. Construction commenced in August 2016 and is projected to be completed by November 2017. The three-year budget is \$1,858,000.

Separation of Sanitary House Lateral Connections to Storm Drains Contract 14-309-007: This project includes the separation of house laterals connected to storm drains citywide. Construction commenced in October 2014 and is projected to be completed by September 2017. The three-year budget is \$455,000.

Sewer Separation in Roxbury (Hampden St.) Contract 13-309-006: This project includes the sewer separation on Hampden St. Area in Roxbury. This project includes the installation of storm drain, sanitary sewers and water mains. Construction commenced in April 2014 and was completed in June 2016. A small budget worth \$100,000 will be created in 2017 to cover closing costs.

City-wide Illegal Connections Investigation Contract 16-206-001: This project is a continuation of the Commission's Citywide Illegal Connection Investigation Program. Under this program illicit sanitary sewer connection 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. Though the project duration is four years, the three year budget) is 1,500,000.

Owner Fix of Illegal Connections: Illegal connections are usually corrected by a Commission contractor on public property. There are a few instances where the homeowner must alter the internal plumbing to correct the problem. In these instances, the Commission will reimburse the homeowner for the work and avoid having Commission contractors working on private property. Illegal connections are a violation of Federal Law and must be promptly corrected. This

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program was instituted and approved by the Commission to assist homeowners with costly repairs to correct these violations. The Commission reimbursed each homeowner up to \$7,500. The average need is four per year for \$30,000. Capital reserved for this project totals \$90,000 for three years.

INFILTRATION AND INFLOW

DESCRIPTION AND JUSTIFICATION

Infiltration and Inflow (I/I) are extraneous quantities of water, which enter the sanitary sewer system and reduce the capacity of the system to transport sanitary sewage to a treatment plant. Infiltration is groundwater that leaks into the sanitary sewerage system through pipe joints and defects. Inflow refers to storm water that enters sewers through catch basins, sump pumps, downspouts, basement drains and defective manholes. Inflow can also enter the sewer system through defective tide gates that are subject to tidal inflow.

All sewer systems are subject to some level of I/I. The Commission has performed sewer system evaluation surveys (“SSES”) to determine the quantity of excessive I/I and the cost-effectiveness of removing the excessive I/I from the collection system. The purpose of a SSES is to identify and quantify specific I/I sources and recommend the structural improvements necessary to eliminate them. The Commission has completed several SSESs. The recommendations from the SSESs have been incorporated into annual renewal and replacement and other system rehabilitation construction contracts.

The Commission’s I/I reduction program is funded using the MWRA I/I Local Financial Assistance Program. For all eligible I/I projects, the Commission will perform an analysis of the costs and benefits associated with undertaking the project using each of these funding sources.

NEW PROJECTS

No new projects

ONGOING PROJECTS

Downspout Disconnection: This project includes the disconnection of downspouts connected to the sanitary sewer system or the combined sewer system. Downspouts connected to the sanitary sewer system or the combined sewer system contributes unnecessary flow to the MWRA treatment works. The Commission pays MWRA for each gallon sent to the treatment works. Downspout flows to the sanitary sewer and the combined sewer also contribute to SSOs and CSOs. Eliminating downspout flows to these two systems solves these two problems. Construction is scheduled to commence in April 2019 and is expected to be completed by December 2019. The three-year budget for this project is \$1,100,000.

SEWER SYSTEM SPECIAL PROJECTS

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

CCTV of Sewers and Storm Drains: IDDE: The purpose of this project is to continue testing sewer laterals to determine whether they leak sewage into drains and to inspect sewers and drains using CCTV to evaluate their condition and aid in locating illicit connections. The project is scheduled to commence in June 2017 and is projected to be completed by May 2019. The three-year budget is \$520,000.

Orient Heights Redevelopment: This project includes the replacement and rehabilitation of sewer and drain pipes as part of the Orient Heights Redevelopment. Construction is scheduled to commence in July 2018 and is projected to be completed by July 2019. The three-year budget is \$450,000.

ONGOING PROJECTS

Sampling and Metering for Drain Model Calibration: The purpose of this project is to acquire information about phosphorus levels in three major storm drains, all of which discharge into the Charles River. These three drains convey a significant amount of phosphorus according to the 2012 Drain Model Report. The proposed project will acquire data to be used to calibrate the Drain Model in the future. The proposed program will run over a three year period. The Planning stage is scheduled to commence in March 2017 with a projected completion date of February 2020. The three-year budget is \$174,000.

Metering Flows Tributary to Columbus Park Headworks: This program has two goals: (1) to acquire data from the Commission's interceptors that convey flows into the MWRA's Columbus Park Headworks and (2) to test whether the flow data will be appropriate for the Commission's future Operations Center. The Operations Center will be used by the Operations Department to monitor conditions in the collection system during large storms. It has been thought that actions taken by MWRA effect conditions upstream in the Commissions interceptors. The metering devices will be able to detect the influence of conditions downstream at the MWRA headworks. The Planning stage will commence November 2017 and is projected to be completed by November 2020. The three-year budget is \$144,000.

Discharge Notification for CSO's Contract 16-206-002: The proposed project will be an extension of an earlier project, CSO Public Notification which was a pilot program. During the

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pilot program, it became apparent that identifying overflows could be done more effectively by eliminating locations that did not overflow during the pilot. The proposed program will run over a three year period and replace the two year pilot program. The purpose of this project is to comply with 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 web site will be maintained for the public to access the overflow information. The planning stage of the proposed project commenced in July 2016 and is estimated to be completed in June 2019. The three-year budget is \$246,000.

System Operations Monitoring Center: This project involves the development and implementation of a real-time supervisory control and data acquisition (SCADA) monitoring of critical BWSC and MWRA systems. Construction scheduled to commence in August 2017 and is projected to be completed in December 2017. The three-year budget is \$400,000.

Urban Runoff Water Quality Evaluation Contract 15-206-011: This project includes evaluating the quality of urban runoff in Boston and its impact on stormwater discharges from the Commission's drainage system and on receiving waters. Wet weather water quality samples will be collected from various locations, such as roads (gutters), catch basins, parking lots, roof-tops, city parks, open spaces, and swales. The sample results will be compared with wet and dry weather samples collected from storm drain manholes, outfalls, receiving waters and wetlands. Samples will be analyzed for bacteria, metals and nutrients, as well as other parameters. Alternative methods for determining whether bacteria in the environment and storm drains are from human versus non-human sources will be explored. Numerous studies by the Commission in the past have evaluated bacterial concentrations in wet and dry weather discharges and in receiving waters. The bacteria were generally assumed to be from human sources, i.e. due to illicit connections or combined sewer overflows. Recent outfall and storm drain sampling has indicated that although those sources have largely been eliminated, elevated concentrations of bacteria were present in the flow. Studies by experts in the storm water field have suggested that non-human sources may contribute significant concentrations of bacteria to dry weather flows and urban wet weather discharges. EPA has asked the Commission to explore methods for determining whether some of the elevated levels of bacteria in its storm drains could be due to non-human sources. The planning stage commenced in November 2015 and is estimated to be completed in July 2018. The three-year budget is \$382,000.

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 the first quarter of 2017 and is projected to be completed in December 2017. The three-year budget is \$600,000.

Fort Point Channel Implementation of Recommendations Contract 16-206-004: Despite numerous sewer separation projects in the combined sewer systems tributary to the Fort Point Channel in the last decade, water quality in the Channel continues to be impaired. In 2014, the Commission completed a water quality assessment of the Fort Point Channel and its tributaries and developed recommendations for further investigations aimed water quality improvements. This project will implement the recommendations developed under the 2014 water quality

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assessment project. The Planning stage commenced in February 2016 and is projected to be completed in June 2017. The three-year budget is \$625,000.

CCTV of Sewers and Drains IDDE Sewer Contract 16-309-012: This project entails testing sewer laterals to determine whether they leak sewage into drains and CCTV inspection of sewers and drains evaluate their condition and aid in locating illicit connections. 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. The Planning stage is scheduled to commence in January 2017 and is projected to be completed in May 2017. The three-year budget is \$197,000.

Model Improvements Contract 13-206-010: This project will improve the sewer model developed in 2006 and maintain the Drain model. The improvements will include the delineation of tributary areas in select locations along with recalibration. The goal of this project is to improve the sewer model with data collected from other projects. It is anticipated that the improvements will also improve the confidence of those using the model, which was developed before a number of important separation projects were completed. The Planning stage of this project began in January 2015 and is estimated to be completed in December 2017. This is a three-year project with a projected budget of \$334,000.

Construct Best Management Practices (BMPs) & Green Infrastructure in Central Square East Boston Contract BWPD 13-24: The purpose of this project is to install stormwater BMPs and Green Infrastructure components in the Central Square area of East Boston. This project is being undertaken as part of the consent decree requirement. The purpose of this project is to serve as a demonstration project for BMP and Green Infrastructure installations. The project will have monitoring devices installed to determine the effectiveness of stormwater retention and addressing pollutant discharges. Construction commenced in September 2015 and is projected to be completed in September 2017. A small budget worth 47,000 will be established in 2017 to cover closing costs of this contract.

Additional Sewer & Drain Work, Sewer Special: This project covers the costs associated with the addition of new water and sewers pipe to the Capital Improvement Program in order to expedite the replacement or rehabilitation of pipe that cannot wait for future programs. The three-year budget is \$750,000.

Upgrades to UPPS & Satellites 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 2017 and is projected to be completed by December 2019. The three-year budget is \$2,925,000.

Diving Services: 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 through the use of professional qualified divers. The three-year budget is \$200,000.

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Sediment Analysis Services: This project includes professional services to analyze the composition of sediments to be removed from sewers and drains scheduled for cleaning. This contract also includes recommendations for disposal options. In order to legally dispose of sediments from sewers and drains it is required to collect and analyze sediment samples. The project is scheduled to commence in January 2017 and is projected to be completed by December 2019. This is a professional services contract for three-years. The three-year budget is \$150,000.

Geotechnical Service Contract 15-206-002: 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. In order to install sewer and drain pipe in deep locations and in certain soils it is required to sample and analyze the soils in order to determine the correct method of support for the pipes and excavations. The three-year budget is \$300,000.

Land Survey Services Contract 13-206-008: This project includes professional survey services for easements and other special surveys. These are professional service contracts. It is necessary for the establishment of new easements, property line surveys and other services requiring professional surveys. The three year budget is \$300,000.

Castings & Gratings: Payments to Boston Public Works Department for adjustment of BWSC Water and sewer castings during roadway reconstruction contracts. Construction is projected to commence in January 2017 and a completion date of December 2019. The three-year budget is \$2,850,000.

Police Details/Professional Services: Payment for police details necessary for field work associated with professional contracts. Police details are utilized in conjunction with professional service contracts for field work associated with professional service contracts. The three-year budget is \$51,000.

Survey Services for CIP Projects Contract 15-206-009: 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. The three-year budget is \$300,000.

SUPPORT PROJECTS

Various Support Projects are included in the 2017-2019 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.

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OBJECTIVES

The primary objectives of the Support category for 2017-2019 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 Systems
- ✓ Administrative Equipment

Support Projects for 2017-2019 CIP total \$18.5 million. Monies allocated for 2017 total \$7.7 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 Service 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 and 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.

Since 2012, the Commission has been working with Aclara Technologies to upgrade the current AMR system, originally installed in 2002, with a second generation system with greater functionality.

In 2013, a new infrastructure of Data Collection Units ("DCUs") was installed that provides:

- ✓ Backwards capability allowing the new DCUs to obtain reads from old and new Meter Transmitter Units ("MTUs")
- ✓ The transmission of additional data to a new Network Control Computer ("NCC") for analysis and reporting, using enhanced software, and,
- ✓ Potential two-way communication with newer MTUs

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In October of 2013, the Commission began deployment of MTUs II, which transmit 5 times more data than previous units and provide the ability for programming at read intervals as short as 15 minutes. As of November 2016, the Commission has installed over 63,000 new MTU II's.

In June of 2016, the Commission awarded an installation contract to replace 30,000 older MTUs with MTU II's. As of November 2016, over 13,000 of these units have been installed. Working in tandem with the contractor, Commission forces will complete the upgrade during 2017.

NEW PROJECTS

No new projects

ONGOING PROJECTS

Meter Transmission: The MTU Program is an on-going project to replace or repair the Meter Transmission Units (MTU). Meter Transmission Units (MTU) utilizes patented, sole source technology that service over 90,000 BWSC accounts. This program funds the replenishing of MTUs for replacing older devices as well as devices for new accounts. The three-year anticipated spending is \$3,500,000.

Large Meter Replacement (Water): This project provides funding for the yearly repair and replacement of all large (3" and over) meter. The large meter replacement program will increase the number of actual readings, thereby reducing the number of estimated bills, resulting in greater water accountability and improved customer satisfaction. This program will also help maintain maximum cash flow by ensuring the accuracy of large meters. The three-year budget is \$945,000.

Residential Metering (Water): This project funds the purchase of small/residential meters (5/8"-2"). The installation of new meters helps to increase water accountability. The three-year budget is \$900,000.

Information Technology Systems

Effective use of the right technologies enables the Commission to provide more efficient and high quality water and sewer services to the people of Boston. Strategic planning, careful selection of technological tools, and effective use of such tools has enabled the Commission to continue to improve the level of service associated with emergency response, preventive 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 the Commission continues to assess and act upon as new technologies continue to evolve.

2017 – 2019 Capital Improvement Program

The Commission utilizes a 5 Year Strategic Information Technology Plan as a roadmap for maintaining technical infrastructure and implementing new technologies. Based on technology trends, it is necessary to periodically reevaluate the Commission's computing infrastructure and the technologies currently in use. In 2012, the Commission contracted with a professional services firm to provide assistance in revising its 5 Year Strategic Information Technology Plan. The new plan was finalized in late 2013.

Mission critical software applications are utilized to support the Commission's daily operations and provide for emergency response services 24 hours a day, 7 days a week. They include PeopleSoft Human Resources & Financial Management Systems, AutoCAD, ESRI Geographic Information System, Acara Automatic Meter Reading, Radio Satellite Integrators Automatic Vehicle Location,

Since 2012, the Commission has been working with Acara Technologies to upgrade the current AMR system, originally installed in 2002, with a second generation system with greater functionality. In 2013 a new infrastructure of Data Collection Units ("DCUs") was installed that provides:

- ✓ Backwards compatibility allowing the new DCUs to obtain reads from old and new Transmitter Units ("MTUs")
- ✓ The transmission of additional data to a new Network Control Computer ("NCC") for analysis and reporting, using enhanced software
- ✓ Potential two-way communication with newer MTUs

The 2013 IT Strategic Plan identified the upgrade of the Commission's Work Order Management System as a top priority. This project began in 2014 and was completed by the end of 2015. The upgraded system City works includes a mobile component, which will allow for the paperless collection of work done by field crews. The upgraded system also includes a geographical component which will enable mobile access to interactive Geological Information Systems.

The 2013 IT Strategic Plan also identified the upgrade of the Commission's Customer Information/Billing System as a top priority. In 2015 the Commission advertised an RFP and selected EMA Inc. to assist in the requirements assessment, evaluation, acquisition and implementation management of a new Customer Information/Billing System. Currently the Commission is in the process of selecting a software vendor for the project.

In 2015 the IT department completed the upgrade of the Commission's phone system. This involved replacing the phone switch and desktop phones. The new system is a unified communications solution which offers both digital and IP based voice support.

The Commission is currently in the process of implementing a Disaster Recovery plan. The Commission has leased rack space at a third party Data Center and has connected the Commission's headquarters to the Data Center. During 2015 the IT department created a replica of the Commission's environment at the Data Center and began backups to the remote sight.

2017 – 2019 Capital Improvement Program

NEW PROJECTS

New Projects included in Software and Hardware line items are listed 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 \$340,000. Monies are budgeted for the following items:

- VMS Server Upgrades
- SCSI Disk/Tape drives & Controllers
- Communications/Networking
- Windows Server Upgrades
- B&W Network Printers
- Color Network Printers
- ACAD/GIS Plotters
- Disaster Recovery Hardware

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 Management System, GIS, Document Management and Construction Management System. The total three-year budget for this project is \$7,505,000. Software and upgrades consist of the following:

- Work-order Mgt. System
- BESS Replacement
- Oracle Database Software
- Application Development Tools
- Windows Server Software
- Construction Management Software
- Portal / SharePoint Software
- Firewall Software
- GIS Software
- PeopleSoft Upgrades
- Information Security
- Disaster Recovery Software & Services
- AVL Replacement

Personal Computer Client Desktops: This line item includes upgrades and additions to the Commission's personal computers inventory. Mobile and truck mounted PCs are included in this category. This initiative will provide users with PCs with sufficient capacity and performance. The total three-year budget for this project is \$275,000.

2017 – 2019 Capital Improvement Program

Replace/Upgrade PCs (150/25/25)

Tablets/IPads (25/25/25)

Personal Computer Application Software: This line item includes upgrades and additions to the Commissions Personal Computer Software. The total three-year budget for this project is \$775,000. Funding is included for the following software:

PC OS Software/Upgrades

Microsoft licensing

AutoCAD & Design Software/upgrades

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. In order 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 year with a weighted average replacement cycle of 8.8 years for all vehicle. The 2017-2019 CIP has allocated a total of \$4,290,000, which is for vehicles and other administrative equipment. Funds allocated for Administrative Equipment expenditures in 2017 total \$2,405,000.

NEW PROJECTS

No new projects

ONGOING PROJECTS

Commission Headquarters – Office Renovations: This project includes the renovation and reconfiguration of offices and work areas at the Commission Headquarters Building to accommodate re-organization and improve work flows. The project is projected to begin in October 2017 and be completed in June 2018. Total cost of the projected is projected to be \$500,000.

Energy – Lighting Conservation: This project includes the installation of a new state-of-the-art, energy efficient electrical lighting and related components at the Commission's Headquarters Building, 980 Harrison Avenue, as recommended by energy audit. The project is projected to begin June 2017 with a completion date of August 2017. The cost of this project is estimated at \$100,000.

2017 – 2019 Capital Improvement Program

Purchasing of New Radio Equipment: This project includes the replacement of the Commission's radio equipment. The planning phase will commence in January 2016 with a projected completion date of December 2016. The estimated cost to this project is \$110,000.

Commission Vehicle Wash Building Upgrades: This project includes the installation of system upgrades for the Commission's Vehicle Wash Building to improve building functionality and ensure long-term reliability. The project is scheduled to commence in February 2017 and is projected to be completed in June 2017. The estimated cost is \$200,000.

Upgrade of the Fuel Dispensing Management System: Upgrade of the fuel dispensing/management system. Construction will commence in January 2017 with a projected completion date of December 2017. The estimated cost of this project is \$30,000.

Upgrade to Video Surveillance and Door Access Control System: This project includes the replacement and modernization of the Commission's video surveillance and door access control systems. The project is scheduled to commence in February 2017 and is projected to be completed in June 2017. The estimated cost is \$250,000.

Upgrade to Building HVAC Equipment: This project includes the replacement and upgrade of the Commission's HVAC Equipment as well as the replacement of the rubber membrane (EPDM) lower roof as part of the project. The project is scheduled to commence in February 2017 and is projected to be completed in November 2017. The estimated cost is \$700,000.

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. Three-year monies budgeted for Vehicles total \$2,400,000.

STORMWATER/GREEN INFRASTRUCTURE/LOW IMPACT DEVELOPMENT PROJECTS

DESCRIPTION AND JUSTIFICATION

Funding is provided in the 2017-2019 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.

2017 – 2019 Capital Improvement Program

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 currently developing a Best Management Practice (“BMP”) Recommendations Report in compliance with the terms of the Consent Decree. The BMP Recommendations Report will provide 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 is intended to provide 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 land owners) in the City of Boston as they become available. This program will further the Commission’s goal of compliance with the Consent Decree.

NEW PROJECTS

Design Services for the Construction of GI at Five Boston Public Schools Contract 15-206-012: The stormwater report identified areas in Boston with high Phosphorus loadings. Boston Public Schools in areas with high Phosphorus loadings were identified. Five schools have been and selected for evaluation and construction of Green Infrastructure to treat stormwater runoff. This contract will provide design services. The planning phase of this project commenced in September 2015 and is expected to be completed in March 2017. The three-year budget for the project is \$90,000.

Green Infrastructure & Low Impact Development – Canterbury Brook Contract 15-206-015: 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 currently developing a Best Management Practice

2017 – 2019 Capital Improvement Program

(“BMP”) Recommendations Report in compliance with the terms of the Consent Decree. The BMP Recommendations Report will provide a scheduled plan for implementation of structural BMPs, GI, and Low Impact Development (“LID”) to reduce pollutant loadings discharged to the twenty-seven (27) sub-watersheds of the City of Boston. This project will assist the Commission in developing a more detailed implementation plan and schedule for the Canterbury Brook tributary area, which has been identified as contributing a high phosphorus load to its receiving water. The planning phase of this project commenced in May 2016 and is expected to be completed in October 2017. The three-year budget for the project is \$256,000.

Green Infrastructure & Low Impact Development North Beacon St. Contract 15-206-013:

The Commission is required to limit the amount of phosphorus discharged into the Charles River. Green Infrastructure contains a number of methods for reducing phosphorus but it usually requires more area than is usually available in the public right of way. As part of Consent Decree, the Commission developed a Stormwater BMP Implementation Plan. This plan developed goals for the Commission to comply with the limits in the TMDL. The North Beacon Street GI Project will identify potential sites and estimate. The planning phase of this project commenced in April 2016 and is expected to be completed in September 2017. The three-year budget for the project is \$260,000.

Design of Constructed Wetland in Stormwater Tributary Area: This project includes the design of a constructed a vegetated wetland to treat stormwater runoff in tributary area 18GSDO233. Final designs for a vegetated subsurface gravel filter and bio-retention feature to treat stormwater runoff in tributary area 18GSDO233, also known as Daisy Field, is impacting the Muddy River and eventually the Charles River. This constructed wetland will be designed and constructed to improve the quality of stormwater runoff. In addition, monitoring locations will be included to monitor the operation of the wetland. The stormwater runoff in tributary area 18GSDO233, also known as Daisy Field, is impacting the Muddy River and eventually the Charles River. Conceptual designs, completed by the UNH Stormwater Center, for a subsurface gravel filter and a parking lot perimeter bio -retention feature that will improve the quality of stormwater runoff from the tributary area will be moved to final design. In addition, monitoring locations will be included to monitor the operation of the wetland. The design stage is projected to commence in March 2017 and is estimated to be completed in December 2017. This three-year budget is \$50,000.

Stormwater Fee Feasibility Study Contract 15-207-003: This project is designed to study the possibility of implementing a city-wide stormwater fee or stormwater utility to capture costs associated with stormwater infrastructure expenses. The project began in November 2015 and is scheduled to be completed by December 2018. The three-budget is \$500,000.

BMPs & Green Infrastructure at Beacon St. Park St.: The purpose of this project is to install stormwater BMPs and Green Infrastructure components in the Audubon Circle area of Boston. The components will have monitoring devices installed to determine the effectiveness of Green Infrastructure. Construction is scheduled to commence in March 2017 and is projected to be completed by March 2018. The three-year budget is \$756,000.

2017 – 2019 Capital Improvement Program

Construction of Rain Gardens at Boston Public Schools: The stormwater report identified areas in Boston with high phosphorus loadings. Boston Public Schools in areas with high phosphorus loadings were identified. Five schools have been and selected for evaluation and construction of Green Infrastructure to treat stormwater runoff. This contract will provide the construction services necessary to construct Green Infrastructure features at these five Boston Public Schools to treat stormwater runoff. Construction commenced in August 2016 and is projected to be completed by June 2018. The three-year budget for the project is \$910,000.

Construction of Vegetated Subsurface Gravel Wetland in Stormwater Tributary Area 18GSDO233UI (Daisy Field): The purpose of this project is to construct a vegetated subsurface gravel wetland to treat stormwater runoff in tributary area 18GSDO233 (Daisy Field). Construction for this project is scheduled to commence in September 2017 and is projected to be completed by September 2019. The three-year budget is \$2,500,000.

Green Infrastructure & Low Impact Development – Lower Stony Brook Contract 15-206-014: The stormwater quality model was developed to identify pollutant loading from land areas that contribute to storm water runoff to the Commission's storm drain system. The Lower Stony Brook area is designated for a more in depth study, and implementation plan development for the highest pollution loading for GI/LID as for per the Consent Decree. As part of Consent Decree, the Commission was required to develop a Stormwater BMP Implementation Plan. This project will assist the Commission in developing a more detailed implementation and schedule for the Lower Stony Brook area in Boston that has been identified with high phosphorus loading contributing to its receiving water. The planning stage of this project commenced in April 2016 and is projected to be completed by October 2017. The three-year budget is \$257,000.

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 is scheduled to commence in March 2018 and is projected to be completed by December 2018. The three-year budget is \$900,000.

Design Services for the Construction of GI/Stormwater Retention Structures for Low Lying Areas: The Wastewater and Storm Drainage System Facilities Plan included an evaluation of climate change adaptation strategies for changing wet weather conditions. The Plan recommended that the Commission identify areas for temporary surface storage of stormwater and the utilization of BMPs to alleviate the hydraulic stress of potential rainfall volumes and peak intensities of storms that may be experienced in the future. This project will provide design services for the construction of Green Infrastructure/Stormwater Retention Structures in specific topographic areas identified for acting as temporary surface storage for stormwater. The planning stage of this project is scheduled to commence in November 2017 and is projected to be completed by December 2019. The three-year budget is \$500,000.

2017 – 2019 Capital Improvement Program

Green Infrastructure Signage: The purpose of this project is to provide funding for Green Infrastructure signage as needed for Green Infrastructure projects. Construction is scheduled to commence in October 2016 and is projected to be completed by December 2019. The three-year budget is \$70,000.

Green Infrastructure: The purpose of this project is to provide funding for Green Infrastructure projects as needed in collaboration with public improvements in the City of Boston. Construction is scheduled to commence in January 2017 and is projected to be completed by December 2019. The three-year budget is \$3,000,000.

Long Range Forecast

As part of the annual financial planning process, the Commission develops a five-year forecast of revenues, expenses and required rates. In assembling these projections, the Commission must estimate the level of expenditures required in each of the following years to operate and maintain the systems, provide basic services and meet all its financial obligations. In addition, estimates of water demand, based on recent actual trends, are made to calculate water and sewer rate revenue. Utilizing a computerized financial model, the Commission is able to develop various scenarios reflecting current and proposed program goals and objectives. Upon final review, the Commission decided to institute a 2.40% rate increase for 2017, and forecast 3.80% rate increase for the years 2018 - 2021.

Financial Modeling Results

MWRA Assessment

Since the MWRA Assessment is the largest single expense in the CEB, the annual increase in the assessment has a significant impact on the rate projections of the Commission. Federal mandates require the MWRA to invest heavily in water system improvements. These extensive capital projects along with the operation and maintenance of the regional water distribution and wastewater collection systems have caused the MWRA's funding requirements to increase significantly. Consequently, rate increases are expected to continue while these projects are in progress. Again, in developing future rate projections, the Commission must utilize the most current rate projections, which have been issued by the MWRA. The MWRA projections listed below are based on the MWRA fiscal year, which begins July 1, 2016.

The line chart on the following page shows historical results of the MWRA Assessment for the years 2012 through 2016 and the projections for 2017 through 2021. Based on the above forecast increases, the MWRA Assessment is projected to experience an average compounded annual increase of 3.5% from 2017 to the year 2021. The 2016 actual assessment of \$212.5 million is anticipated to escalate to \$254.4 million by the year 2021. This forecast amount would represent approximately 62.9% of the total expenses of the Commission for that year.

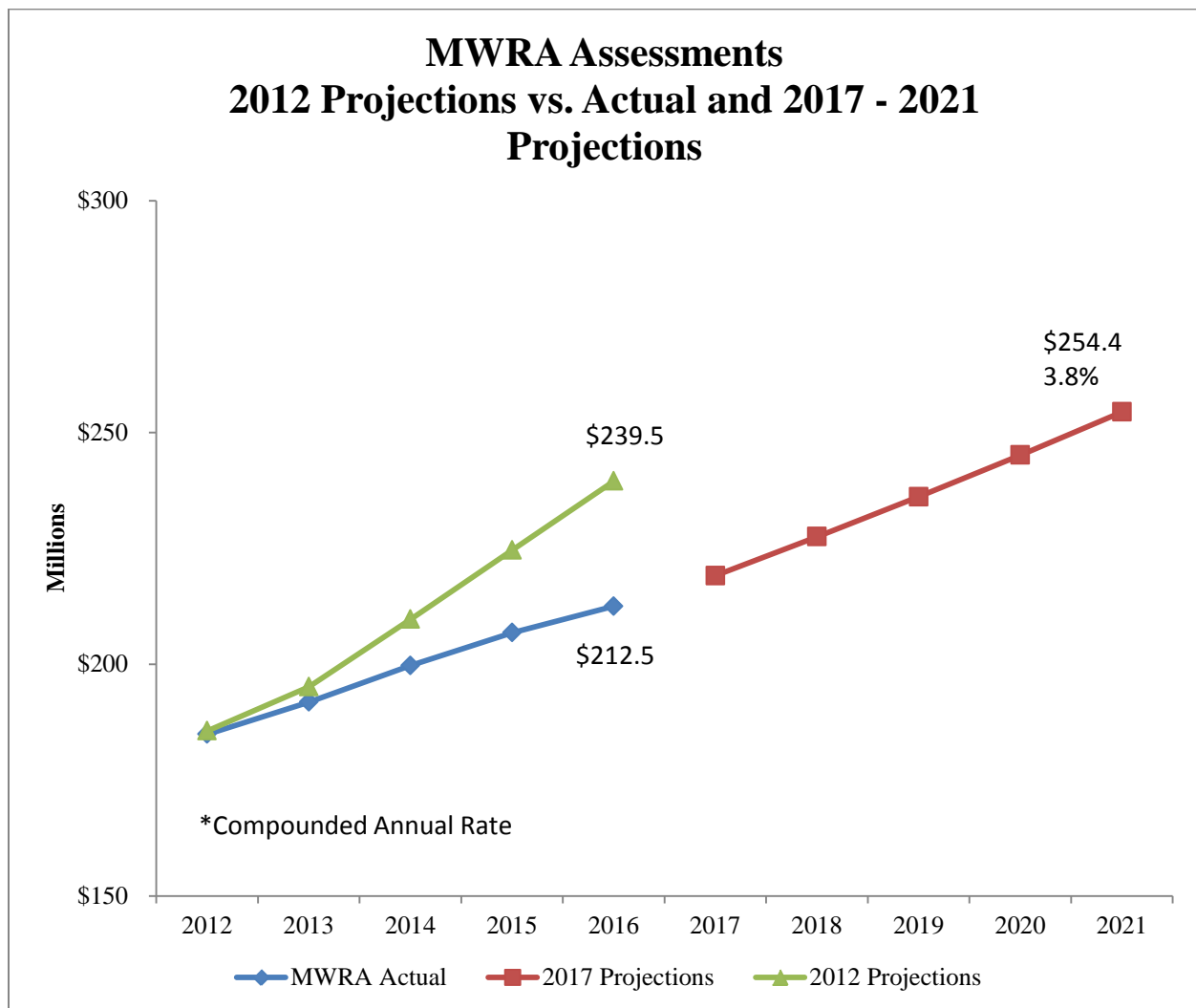
In an effort to minimize the impact of the MWRA Assessment increases, the Commission began an aggressive program to update and improve the water system in 1978. The program included replacing old, ineffective water mains and aggressive leak detection and repair. These efforts, which continue today, combined with the inclining rate structure, have had the net effect of reducing the overall level of water purchased by the Commission from 146.1 MGD in 1977 to 65.3 MGD in 2016. In addition to reducing the level of water purchases from the MWRA, the Commission continues to pursue increasing billable consumption through its ongoing meter replacement and meter downsizing programs. All of these efforts have combined to reduce the level of unbilled water from 48% in 1977 to 15.9% in 2016.

Long Range Forecast

The past success that the Commission has realized in reducing purchases, maximizing billings and reducing unaccounted-for-water, resulted in a reduced level of rate increases to be passed on to the customer.

Forecasted MWRA Rate Increases

2017	2018	2019	2020	2021
3.3%	3.8%	3.8%	3.8%	3.8%



Long Range Forecast

Forecast Assumptions

Revenue and expense forecast assumptions used in setting the 2017 CEB and rates are detailed below.

	2017	2018	2019	2020	2021
Fire Pipe Charges (% of Water)	3.00	3.00	3.00	3.00	3.00
Elderly Discount (% of Water)	1.00	1.00	1.00	1.00	1.00
Late Payment (% of Billed Chgs.)	0.40	0.40	0.40	0.40	0.40
Adjustments (% of Billed Chgs.)	2.50	2.50	2.50	2.50	2.50
Bad Debt (% of Billed Chgs.)	0.10	0.10	0.10	0.10	0.10
Interest on Fund Balances	1.75%	1.75%	1.75%	1.75%	1.75%
Increase in Direct Operating Expenses	3.00%	3.00%	3.00%	3.00%	3.00%
Increase in MWRA Rate Revenue Requirement – MWRA FY					
Water	3.5%	3.9%	4.2%	4.3%	4.0%
Sewer	3.3%	3.7%	3.6%	3.5%	3.6%
Estimated MWRA Rate Revenue Requirement – MWRA FY					
Water	234,263	243,461	253,705	264,741	275,401
Sewer	460,616	477,731	494,703	511,916	530,466
BWSC Share of MWRA Expense					
Water	35.3%	35.3%	35.3%	35.3%	35.3%
Sewer	28.7%	28.7%	28.7%	28.7%	28.7%
Annual MWRA Assessment to BWSC					
Water	84,397	87,831	91,591	95,424	99,513
Sewer	134,729	139,624	144,532	149,667	154,884
Total	219,126	227,455	236,123	245,091	254,297
Stabilization Fund					
Discretionary Deposits					
Discretionary Withdrawals	3,000	1,904	1,990	2,089	2,192

Long Range Forecast

Financial Projections

The table below illustrates the Commission's pro forma financial projections for the years 2016 to 2021. This table details the estimated revenues and expenses for the period and the corresponding rate increases required allowing the Commission to meet all its financial obligations.

Pro Forma Financial Projections (\$000)

	<i>Unaudited</i> 2016	2017	2018	2019	2020	2021
REVENUES						
Water	\$150,341	\$149,415	\$153,542	\$157,783	\$162,960	\$168,306
Sewer	198,150	202,905	208,509	214,268	221,298	228,559
LESS:						
Adjustments	(8,048)	(8,808)	(9,051)	(9,301)	(9,606)	(9,921)
Discounts	(1,278)	(1,494)	(1,535)	(1,578)	(1,630)	(1,683)
Bad Debt	(73)	(352)	(363)	(372)	(384)	(397)
NET BILLED CHARGES	339,092	341,666	351,102	360,800	372,638	384,864
Prior Year Surplus	521	693	0	0	0	0
Late Charges	1,314	1,409	1,448	1,488	1,537	1,588
Investment Income	3,680	3,240	3,250	3,218	3,375	3,342
Fire Pipe	4,590	4,590	4,607	4,733	4,889	5,049
Other Income	7,143	9,733	8,839	9,133	9,446	9,770
SUBTOTAL	17,248	19,665	18,144	18,572	19,247	19,749
TOTAL REVENUE	\$356,340	\$361,331	\$369,246	\$379,372	\$391,885	\$404,613
EXPENSES						
Operating	\$80,639	\$69,609	\$71,607	\$73,665	\$75,785	\$77,969
MWRA Assessment	212,475	219,126	227,455	236,123	245,093	254,396
Capital Improvement	11,889	15,877	19,366	15,051	16,765	17,603
Debt Service	48,133	51,096	47,963	49,263	51,543	51,163
Contractual Funding Obligations	2,313	5,420	2,653	5,067	2,496	3,279
SDWA Assessment	198	203	203	203	203	203
TOTAL OPERATING EXPENSES	\$355,647	\$361,331	\$369,246	\$379,372	\$391,885	\$404,613
NET INCOME	\$693	0	0	0	0	0
Average Combined Rate (\$/1000gal)	\$17.35	\$17.77	\$18.45	\$19.15	\$19.87	\$20.63
Annual Increase (%)	3.00%	2.40%	3.80%	3.80%	3.80%	3.80%
Typical Household Bill	\$1,027	\$1,052	\$1,092	\$1,133	\$1,176	\$1,221

Reserve Fund Levels

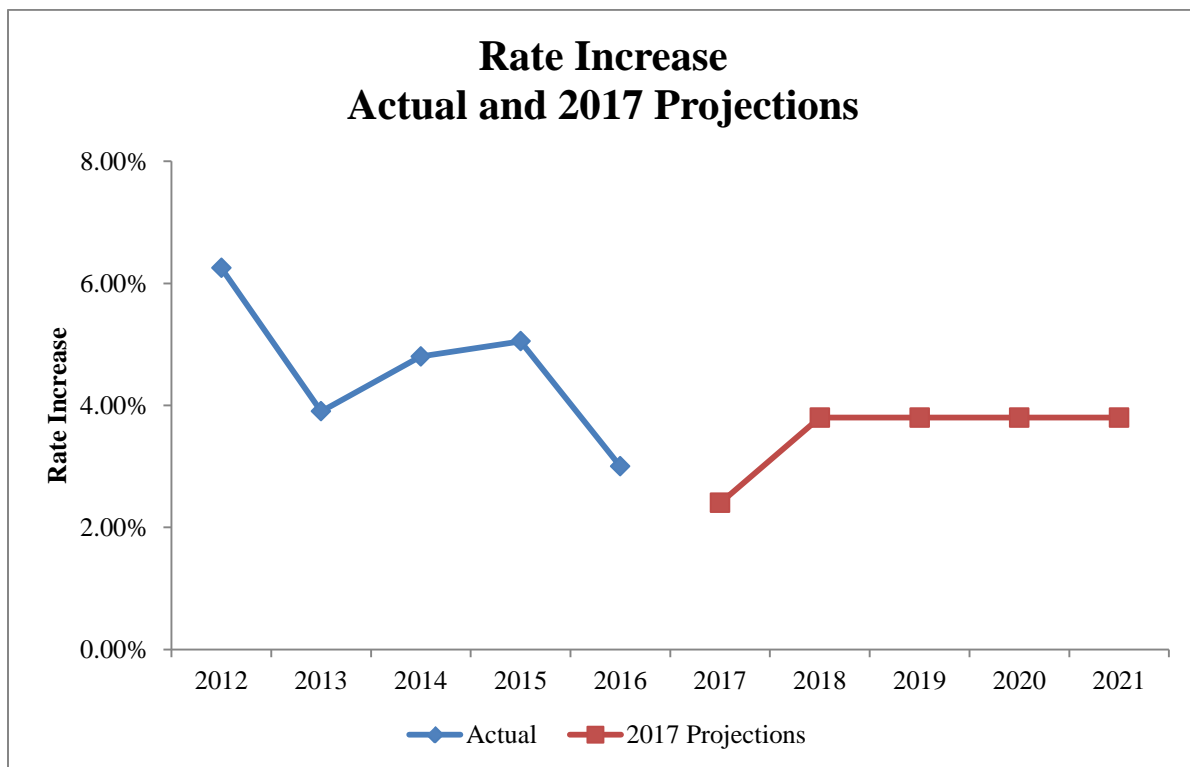
Withdrawals from the Stabilization Fund began in 2000, will continue in 2017, and will occur during 2018 to 2021. Deposits will be made to the reserve funds to comply with the Commission's Bond Resolution. A description of the Commission's Reserve Funds and current balances are shown in the Budget Overview section of this document. Boston Water and Sewer Commission rate projections for the year's 2017 - 2021 are outlined on the following page. These rate projections are based on the best data available during the 2017 Financial Planning Process.

BWSC Rate Increases

2017	2018	2019	2020	2021
2.40%	3.80%	3.80%	3.80%	3.80%

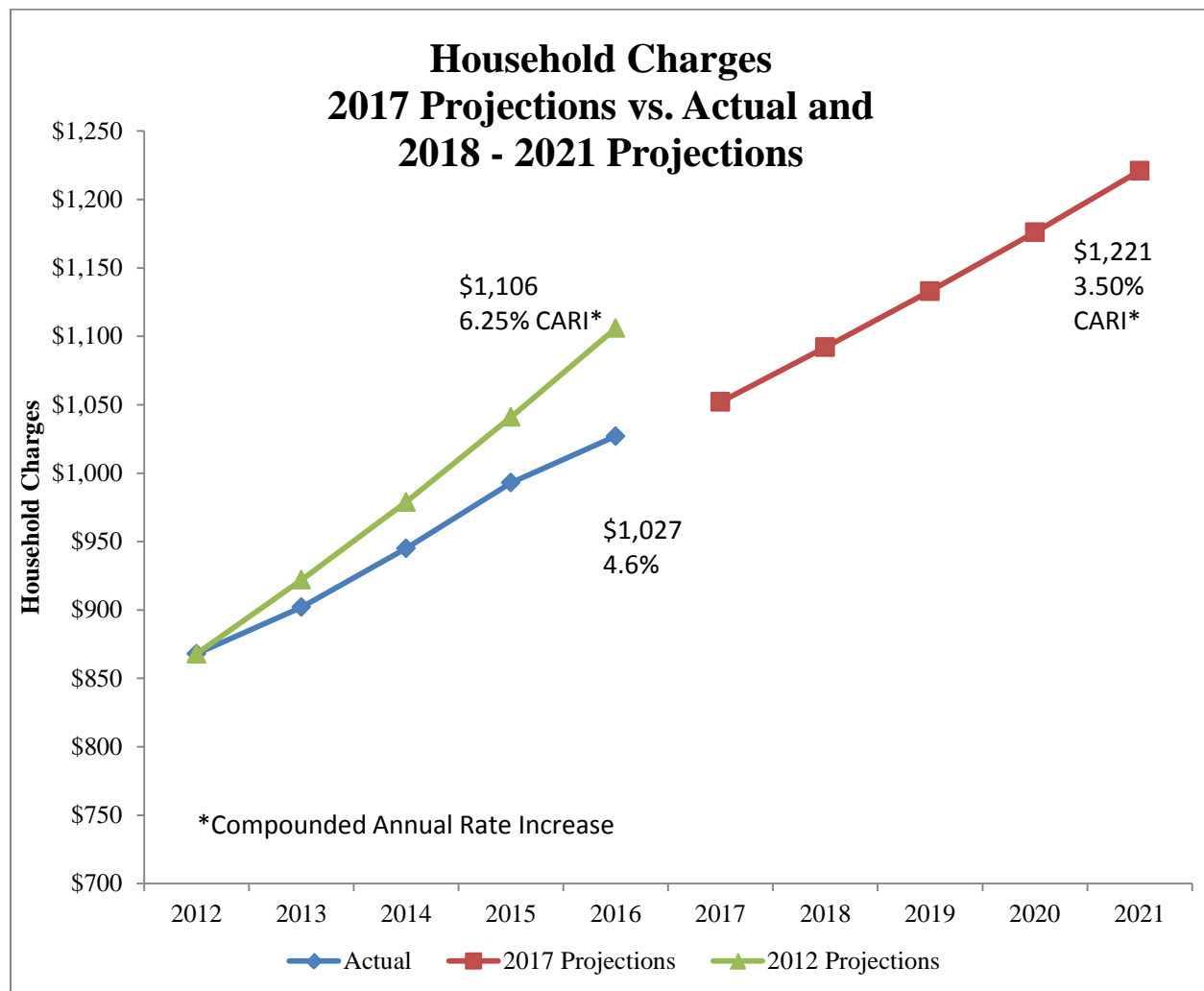
The current increase for 2017 is 2.40% and 3.80% increase for years 2018 - 2021. The graph below illustrates the actual rate increases occurring during the years 2012 through 2016. The Commission was able to do this by effectively controlling costs and utilizing the Stabilization Fund withdrawals.

These less-than-anticipated increases are the result of considerable reductions in the projected spending for Direct Expenses, Contractual Funding Obligations, and MWRA Assessment costs. The Commission continues to be aggressive in attempting to secure state rate relief funding, various grants and low interest loans and controlling direct expenses. These efforts will contribute to minimizing the level of required future rate increases as shown in the chart below.



Household Charges

The Commission approved a rate increase of 2.40% for 2017 and projects 3.80% increase for years 2018 - 2021. This rate increase translates into an average household dollar cost to increase from \$1,052 in 2017 to \$1,221 in the year 2021. This is depicted below in the graph, which also shows the actual household charges for the years 2012 - 2016 versus projections made during the same period. The variance between the actual and projected household charges is directly attributed to lower than anticipated wholesale water and sewer rate increases experienced between 2012 and 2016.



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City of Boston Overview

The first settler in what would become Boston was Reverend William Blackstone, an Anglican clergyman, who built a cottage on what is now Beacon Hill in 1625. He was drawn by the considerable accessibility of fresh water and vast open land. Subsequently, Governor John Winthrop of the Massachusetts Bay Company and a group of Puritan Englishmen who followed Reverend William, formally founded Boston in 1630.

The city is named for a port in Lincolnshire, England, which received its name in honor of a Benedictine monk called Botulph (“bot” meaning boat and “ulph” meaning “helper” in Old English). “Bot Ulphs” Town became Bottleston and ultimately Boston. As most of the Puritan settlers came from the Lincolnshire district of England, they honored their English hometown by transporting the name Boston to the New World.

The City of Boston is the economic heart of the Commonwealth of Massachusetts and the entire New England region, a hub for professional, business, governmental, financial, advanced educational, medical, transportation, communicative, technological, cultural and entertainment services. Additionally, research and development, bio-technology, manufacturing and wholesale distribution also significantly contribute to the economy of the City and the surrounding suburbs.

Boston’s population reached 617,594 according to the 2010 U.S Department of Commerce Bureau of the Census, registering a 4.8% gain since the Census of 2000, the third consecutive decade in which the city’s population has grown. The latest estimate of population is 650,281 as of 2015. Below is a simplistic version of a map of Boston.



Population

Neighborhood Population by Race – City Boston 2010

Neighborhood	White	Black	Hispanic/ Latino	Asian	Native American	Other Single Race	Multi- Racial	Total
Allston/Brighton	49,464	3,431	7,440	11,543	65	1,114	1,835	74,892
Back Bay/Beacon Hill	22,321	832	1,426	2,333	19	91	454	27,476
Central Boston	21,071	1,397	1,583	6,248	40	85	477	30,901
Charlestown	12,458	764	1,591	1,334	18	72	202	16,439
Dorchester, North	9,849	6,498	4,723	3,752	61	2,217	1,284	28,384
Dorchester, South	15,648	24,839	7,928	6,763	151	2,407	2,213	59,949
East Boston	15,051	1,283	21,419	1,410	69	658	618	40,508
Fenway/Kenmore	26,820	2,229	3,276	7,224	57	155	1,137	40,898
Harbor Island	N/A	N/A	N/A	N/A	N/A	N/A	N/A	640
Hyde Park	8,965	14,949	6,449	510	85	265	671	31,894
Jamacia Plain	21,402	5,368	8,764	3,138	86	194	945	39,897
Mattapan	1,259	26,008	5,664	355	97	388	845	34,616
Roslindale	15,814	6,536	8,015	1,080	84	223	756	32,508
Roxbury	3,913	33,266	17,842	719	259	1,895	1,896	59,790
South Boston	26,552	1,572	3,345	1,630	38	150	401	33,688
South End	17,153	5,938	5,745	4,830	67	207	729	34,669
West Roxbury	22,302	2,959	2,573	1,969	29	125	488	30,445
Total	290,042	137,869	107,783	54,838	1,225	10,246	14,951	617,594

Source: U.S. Census Bureau and B.R.A. Prepared by the Boston Redevelopment Authority.

Population growth within the City of Boston is projected to increase in the ensuing years. The table below displays the historical population and the increase for the year 2015.

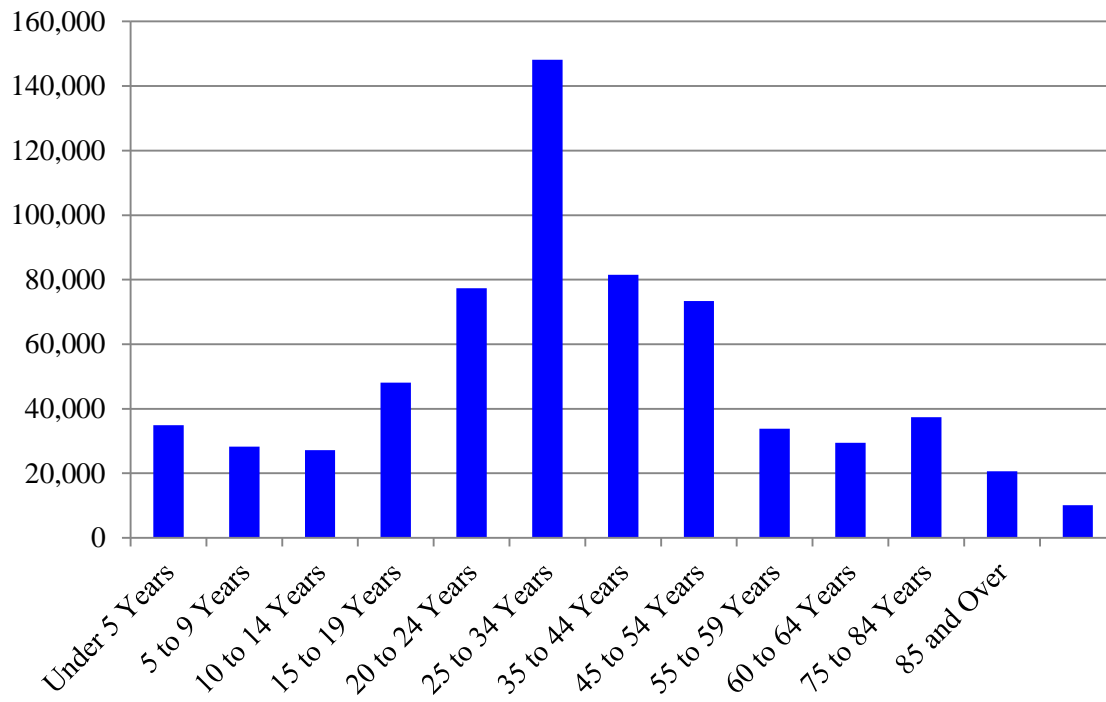
Population	1970	1980	1990	2000	2010	2015
Total	641,070	562,994	574,283	589,141	617,594	650,281
Growth Rate	N/A	-12.2%	2.0%	2.6%	4.8%	5.3%

Population Breakdown by Age in Boston

Age	Total	% of Total
Under 5 Years	34,943	5.44%
5 to 9 Years	28,240	5.72%
10 to 14 Years	27,132	5.53%
15 to 19 Years	48,099	7.41%
20 to 24 Years	77,392	11.9%
25 to 34 Years	148,153	21.18%
35 to 44 Years	81,554	14.67%
45 to 54 Years	73,407	10.79%
55 to 59 Years	33,786	3.86%
60 to 64 Years	29,418	3.1%
65 to 74 Years	37,420	5.8%
75 to 84 Years	20,648	3.68%
85 and Over	10,089	1.44%
Total	650,281	100.0%

*BRA Research Division, 2015.

Population Breakdown by Age



Employment

The World economy as well as the National Economy has had some drastic and fundamental Shifts in the last three decades. In the U.S. as a whole and Boston in particular the industrial and manufacturing sectors of the economy have drastically declined due to such forces as rising gains in worker productivity assisted by Information Technology and growing levels of automation and off-shoring of jobs to low wage nations.

But Greater Boston has with its unique concentration of institutions of higher education that has helped anchor the growing economic sectors of the innovative economy attracting research and venture capital funding, with multiplier effects across other sectors such as health care and financial services. From 2009 through 2010 the Metro Boston economy grew by 4.8% topping all U.S. large metros and since 2002, the Milken Institute has ranked Massachusetts #1 on its Science & Technology State Index, which is conducted every other year. The study also ranked the Boston Metro Area 3rd in the country in overall educational achievement during that same time period. Furthermore, economic growth in Metropolitan Boston is trending up. In 2014, there was a net gain in jobs of 2.3%.

The economy of Boston is more specialized in the financial, business, professional services, medical, and educational sectors than the suburban economy which is more specialized in high technology and the defense industry. According to a 2013 report by the BRA, Boston regained all but 1,000 of the jobs lost between 2008 and 2010. Shown in the table on the following page is the breakdown of Boston Employment by Industry for the years 2012, 2013 and 2014.

Five Largest Public & Private Companies in Massachusetts **Ranked by Revenue**

Public Company	Industry	2015 Revenue
The TJX Cos. Inc.	Retail	\$30,944,938,000
EMC Corp.	High Technology	\$24,704,000,000
Raytheon Co.	High Technology	\$23,246,999,552
Staples Inc.	Retail	\$21,059,000,320
Thermo Fisher Scientific Inc.	High Technology	\$10,314,852,352
Private Company	Products/Service	2015 Revenue
Massachusetts Mutual Life Insurance Co.	Financial Services/Insurance	\$29,500,000,000
Fidelity Investments	Financial Services	\$15,900,000,000
Demoulas Super Markets Inc.	Supermarket Operator	\$4,750,000,000
The Kraft Group	Sports Entertainment, Manufacturing	\$3,900,000,000
New Balance Athletics Inc.	Athletic Footwear/Apparel	\$3,720,000,000

*2017 Book of Lists, Boston Business Journal, Ranked by Revenue

City of Boston Employment by Industry for the Years 2012, 2013, 2014

Industry	2012	2013	2014	%Change '13-'14
Health Care and Social Assistance	127,055	131,004	133,658	2.03%
Professional and Technical Services	79,963	84,083	88,636	5.41%
Finance and Insurance	79,102	79,316	79,990	0.85%
Government	77,563	76,145	76,602	0.60%
Accommodation and Food Services	56,407	57,465	58,887	2.47%
Educational Services	54,272	54,902	56,357	2.65%
Administrative and Waste Services	33,946	33,814	35,338	4.51%
Retail Trade	31,381	32,186	33,087	2.80%
Other Services, excluding Public Admin.	30,941	31,666	32,985	4.17%
Real Estate, Rental and Leasing	23,280	23,608	24,881	5.39%
Transportation and Warehousing	20,015	20,298	21,641	6.62%
Construction	14,909	16,656	17,052	2.38%
Arts, Entertainment and Recreation	14,799	15,577	16,253	4.34%
Information	15,666	15,529	16,051	3.36%
Wholesale Trade	8,951	9,066	9,240	1.92%
Management of Companies and Enterprises	7,287	7,658	7,837	2.34%
Manufacturing	9,085	8,133	7,797	-4.13%
Utilities	1,486	1,519	1,871	23.17%
Natural Resources and Mining	315	250	336	34.40%
Total	686,423	698,875	718,499	2.81%

Sources: U.S. Bureau of Economic Analysis (BEA), Massachusetts Executive Office of Labor and Workforce Development (EOLWD), BRA Research Division Analysis

Unemployment

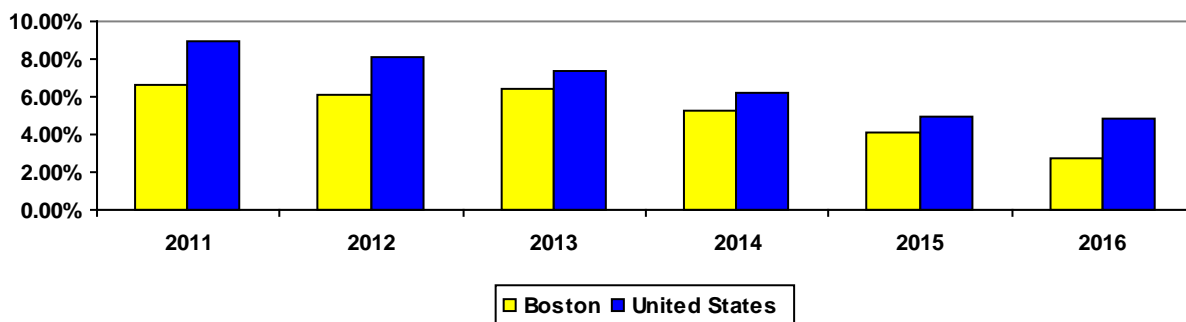
The unemployment rate for the Boston area in 2016 decreased to 2.7%, below that of Massachusetts at 2.8% as well as the national rate of 4.7%, indicating that the recession may be easing. The table and following bar graphs show the unemployment trends of Boston versus the United States, and Massachusetts.

Unemployment Rates

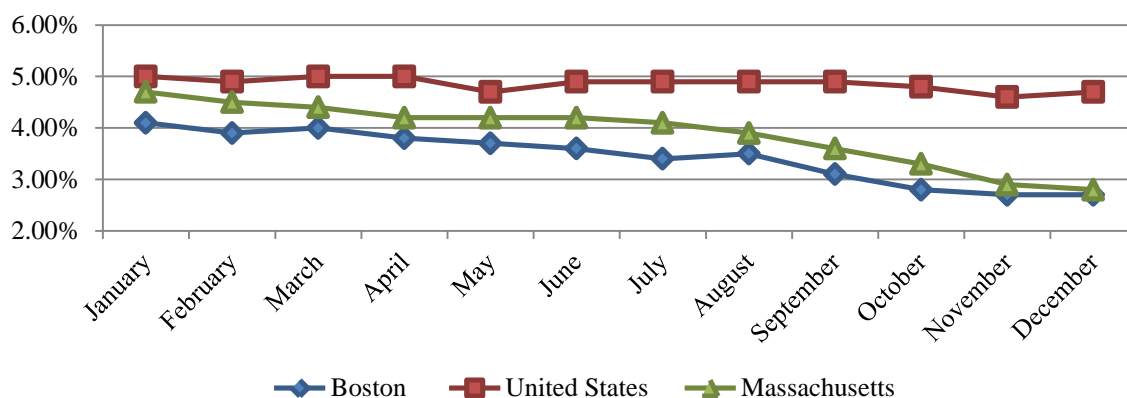
Unemployment	2011	2012	2013	2014	2015	2016
Boston	6.6%	6.1%	6.4%	5.3%	4.1%	2.7%
Massachusetts	7.3%	6.8%	7.1%	6.0%	4.7%	2.8%
United States	8.9%	8.1%	7.4%	6.2%	4.8%	4.7%

Source: Bureau of Labor Statistics for Boston, United States, and Massachusetts. Recent Unemployment Data is subject to revision.

Unemployment Rate for Boston and United States for the Years 2011 - 2016



Unemployment Rate for Boston & Massachusetts in Comparison to the United States 2016



Source: U.S. Bureau of Labor Statistics. *Latest available monthly data.
Most recent data is preliminary and subject to revision

Largest Employers in Boston
(With 1,000+ employees, listed alphabetically)

Allen & Gerritsen	John Hancock
American Cleaning Co	Liberty Mutual
American International Group	Massachusetts Eye and Ear Infirmary
ARAMARK	Massachusetts General Hospital
Berklee College of Music	MFS Investment Management
Beth Israel Deaconess Medical Center	New England Baptist Hospital
Blue Cross Blue Shield of Massachusetts	New England Financial/MetLife
BNY Mellon	Northeastern University
Boston College	NSTAR Electric
Boston Globe Media Partners	Partners HealthCare
Boston Medical Center	Pearson
Boston University	Pioneer Investment Management
Brigham and Women's Hospital	Putnam Investments
Brown Brothers Harriman & Co	Ropes & Gray
Cambridge Associates	Shaw's
CBS	Simmons College
Children's Hospital, Boston	St. Elizabeth's Medical Center
Christian Science Publishing Society	State Street Bank & Trust Co
Dana-Farber Cancer Institute	Massachusetts Eye and Ear Infirmary
Deloitte	Stop & Shop
Dunkin' Donuts	Suffolk University
Ernst & Young	Thomson Reuters
Faulkner Hospital	Tufts Medical Center
Fidelity	Tufts University Graduate Schools
Gillette	Verizon Massachusetts
Harvard University Graduate Schools	Wellington Management Co
Hebrew Rehabilitation Center	Stop & Shop

Source: BRA Research Division, 2013.

Years of School Completed for Boston Residents Age 25 and Over 1980, 1990, 2010

	1980	1990	2010
Less than High School	104,339	88,875	72,953
High School Graduate or GED	115,787	97,233	103,989
1-3 years of college	43,451	69,889	82,352
4 or more years of college	67,073	109,711	154,389
Total	330,650	365,708	413,683

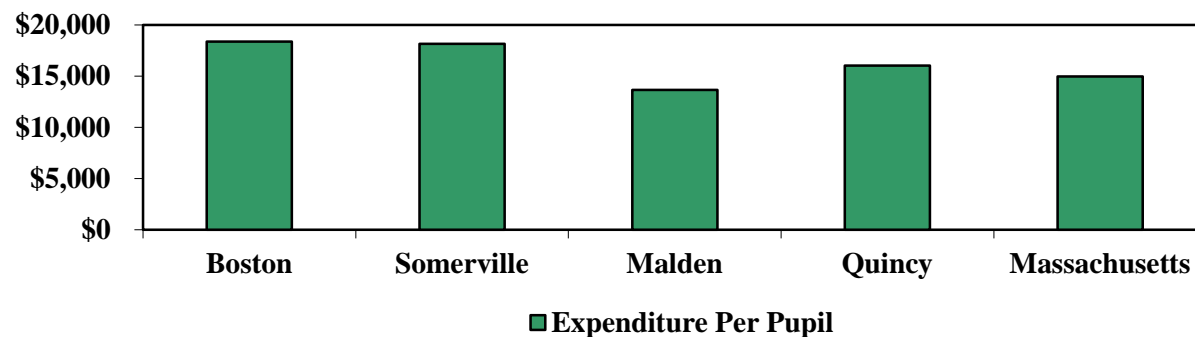
Source: U.S. Dept. of Commerce, Bureau of the Census: 1980, 1990 and 2010.

Expenditures Per Pupil 2015 School Year

Boston	\$18,372
Somerville	\$18,165
Malden	\$13,643
Quincy	\$16,023
Massachusetts	\$14,963

Source: Massachusetts Department of Education Website

Expenditures Per Pupil Boston vs. Somerville, Malden, Quincy & Massachusetts



Boston Consumer Price Index, 2012 - 2016

Category	2012	2013	2014	2015	2016
All Items	247.7	251.1	255.2	256.7	260.5
Food	245.0	248.1	250.9	255.5	258.0
Shelter	279.4	284.0	292.7	302.9	312.7
Fuel and Utilities	236.8	245.7	261.2	249.8	249.0
Transportation	205.4	207.4	206.2	186.7	183.1
Medical	571.5	586.6	589.2	607.0	633.7

Source: Federal Reserve Bank of Boston

Boston's consumer price index for the period of 2012 - 2016 can be compared to the United States consumer price index for the same goods and services. The table below provides data for such purpose.

U.S. Consumer Price Index, 2012 - 2016

Category	2012	2013	2014	2015	2016
All Items	229.6	233.1	234.8	236.5	239.2
Food	235.4	237.9	246.0	247.9	248.0
Shelter	259.3	265.9	273.6	282.4	288.1
Fuel and Utilities	218.5	224.4	231.2	223.5	239.2
Transportation	211.9	212.9	199.8	294.4	298.4
Medical	418.7	427.1	439.7	485.3	493.1

Source: United States Bureau of Labor Statistics.

Per Capita Personal Income Comparison, 1970, 1980, 1990, 2000, 2010, 2015

Year	United States	Massachusetts	Boston*
1970	\$4,196	\$4,575	\$4,794
1980	\$10,150	\$10,693	\$11,138
1990	\$19,584	\$23,074	\$24,669
2000	\$30,587	\$38,430	\$42,085
2010	\$40,144	\$51,487	\$55,548
2015	\$55,775	\$70,628	\$78,800

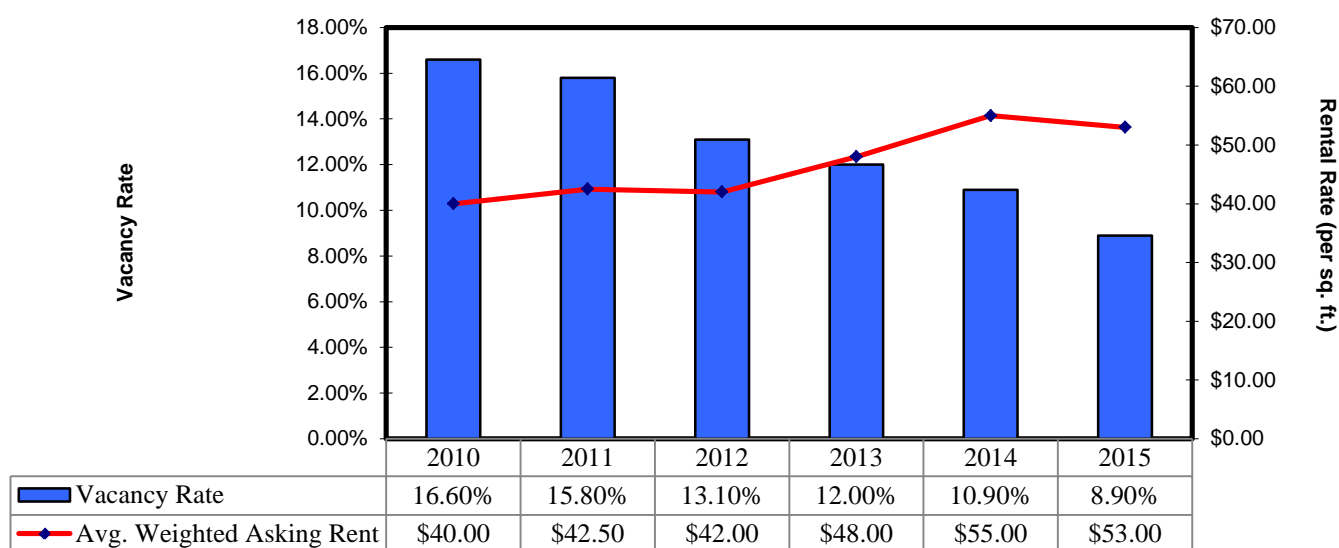
*Boston-Cambridge-Newton, MA-NH (Metropolitan Statistical Area)

Source: Bureau of Economic Analysis

Commercial Market

The Boston Office Market contains over 63.9 million square feet of office space in eight submarkets: The Financial District, Back Bay, Charlestown, Crosstown, Fenway/Kenmore, North Station, Seaport District and South Boston. In 2015 the Boston office space vacancy rate declined to approximately 8.90% from 10.90% in 2014. From 2011 - 2013 the Seaport District had significant leasing activity with two to three the rate relative to its market share. But in 2014, the Financial District regained its dominance in terms of market share. Furthermore, rents appear to be steadily rising, reflecting the declining vacancy rate, as this trend continued in 2015 as well.

Boston Vacancy Rate versus Rental Rate for the Period 2010 - 2015



Weighted asking rent is rent per square foot that factor in vacant sq. ft. of space in each building.
Source; Colliers International, 2014.

Boston's 2015 Highest Assessed Properties

Property	Owner	Tax Liability	Total Assessed Value
800 Boylston St.	BP PruCenter Acquisition LLC	\$26,157,967	\$886,110,000
200 Clarendon St	BP Hancock LLC	\$20,110,397	\$681,246,500
125 High St.	TST 125 High St. LLC	\$17,343,945	\$587,532,000
100 Huntington Ave.	UDIC of Mass. Inc.	\$13,962,960	\$473,000,000
100 Federal St.	BP Federal St. LPS	\$13,018,999	\$441,023,000

Source: Boston Assessing Department

Median Sales Price, Single-Family Homes-Boston **For the period 2012 - 2016**

Year	Median Sales Price	Percent Change
2012	\$345,850	0.9%
2013	\$369,850	6.9%
2014	\$389,800	5.4%
2015	\$403,900	3.6%
2016	\$421,100	4.3%

Federal Reserve. (Boston, Cambridge, Quincy Metro Area).

City of Boston Tax Rate 2015 - 2016

Fiscal Year	Assessed Value	Residential	Commercial
2015	\$110,736,862,222	\$12.11	\$29.52
2016	\$128,047,080,703	\$11.00	\$26.81

Note: Dollars per \$1,000 valuation.

Monthly Advertised Rent in Boston Neighborhoods for 2015 vs. 2016

Neighborhood	2015	2016
Allston/Brighton	\$2,233	\$2,566
Back Bay	\$3,667	\$3,261
Beacon Hill	\$3,100	\$3,261
Charlestown	\$3,767	\$2,920
Dorchester	\$2,000	\$2,383*
East Boston	\$2,200	\$2,438
Fenway/Kenmore	\$2,893	\$2,977
Jamaica Plain	\$2,400	\$3,216
Mattapan	\$2,159	\$1,995
Mission Hill	\$2,233	\$2,233
Roslindale	\$1,947	\$2,267
Roxbury	\$2,133	\$2,610
South Boston	\$2,800	\$3,271
South End	\$3,467	\$3,503
West Roxbury	\$2,393	\$1,896
Citywide	\$2,458	\$2,955

Jumpshell 2015, Rent Jungle, 2017

*2017 Dorchester rent calculated by average of North Dorchester and South Dorchester rent from Rent Jungle

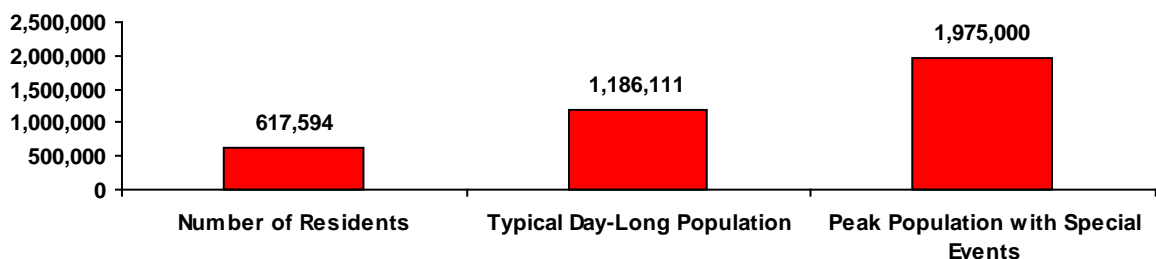
Boston continues to be a city that offers a variety of tourist attractions and is well known as an inviting destination for conventions, concerts, circuses, ice shows, theatrical performances, along with other entertainment and sporting events. In addition to being one of the few major cities that generates more jobs than it has residents, Boston attracts hundreds of thousands of additional visitors who come to shop and visit historic sites. On days when special events are held in Boston, like Sail Boston, or annual events like the Boston Marathon, Fourth of July Esplanade Celebration, or the Head of the Charles Regatta, the city's population can approach two million people. Regularly scheduled and special events can add from 50,000 to 800,000 visitors to Boston on a single day. Boston is also recognized as a great professional sports city and attendance is generally high for each of the three teams regardless of their record. Last season, the Boston Red Sox drew 2,880,694 fans to Fenway Park. At the Bank North Garden, the Boston Bruins drew 720,165 fans and Boston Celtics drew 742,400 fans for each of their seasons. Based upon the average attendance for all three teams and the total number of home dates, sporting events attract 27,108 people to Boston on game days. In 2015, Faneuil Hall Marketplace was ranked the seventh most-visited tourist attraction in the world with approximately eighteen million visitors per year.

Listed in the following table are the most frequent tourist attractions in Boston.

Tourist Attractions – City of Boston

Tourist Attraction	Description
Faneuil Hall Marketplace	Historic Marketplace with stores, restaurants and pubs
The Freedom Trail	Walking tour of Boston's historical sites
Museum of Science	Science education exhibits and exploration museum 2015 Attendance: 1,512,600
The New England Aquarium	Marine exhibition/research facility 2015 Attendance: 1,277,484
Museum of Fine Arts, Boston	New England's largest art museum 2015 Attendance: 1,183,085
Boston Duck Tours	Amphibious sightseeing tour
Old North Church	American history museum 2015 Attendance: 578,000
Boston Children's Museum	Children's museum 2015 Attendance: 492,105
Black Heritage Trail Afro-American History	Black history museum and tour

Boston Statistics and Reports



Most Popular Boston Restaurants*

Abe & Louie's	1	Menton	6
Aquitaine	2	Sorellina	7
Davio's Italian Steakhouse	3	Neptune Oyster	8
Mistral	4	Grill 23 & Bar	9
Giacomo's Ristorante	5	Mamma Maria	10

*Zagat Survey 2017

Largest Hotels in Boston 2016

<u>Company</u>	<u>Rooms</u>	<u>Room Rates</u>
Sheraton Boston Hotel	1,220	\$179 to \$699
Boston Marriott Copley Place	1,146	\$179 to \$799
Boston Park Plaza	1,060	\$139 to \$699
Westin Copley Place	803	\$199 to \$699
Westin Boston Waterfront	793	\$199 to \$599
Hilton Boston Logan Airport	599	\$159 to \$399
Boston Omni Parker House	551	\$169 to \$449
Hyatt Regency Boston	502	\$129 to \$699
Renaissance Boston Waterfront Hotel	471	\$179 to \$799
Seaport Boston Hotel	470	\$169 to \$3,000

*Boston Business Journal 2017

Commission Background

The Commission was created on July 18, 1977 pursuant to a “home rule” petition enacted by the Massachusetts Legislature as the Boston Water and Sewer Reorganization Act of 1977, Chapter 436 of the Acts of 1977 (“the Enabling Act”). The Enabling Act created the Commission as “...a public instrumentality, a body politic and corporate, a political subdivision of the Commonwealth, separate and apart from the City...” In August of that year ownership of and responsibility for the water distribution system and the wastewater collection and storm water drainage system (collectively known as the sewer system) was transferred to the Commission from the City of Boston’s Department of Public Works (“DPW”).

Water Distribution and Sewer Systems

The Commission's water distribution system serves approximately 90,000 active accounts throughout the City of Boston. Service is provided to the City's schools, hospitals, residential population, businesses, and industries and public and private institutions. In addition to the resident population of nearly 646,000, the daytime population of Boston is increased by approximately 375,590 commuting workers, 52,000 shoppers, 44,530 commuting students, 13,940 overnight guests in hotels and homes, 11,600 tourists, 67,480 combined for conventions, trade shows and sporting events, and 31,830 hospital patients and visits.

The Commission currently owns and operates a system for the distribution of potable water to customers throughout the City of Boston. The Commission purchases finished water (fluoridated and disinfected) from the MWRA. The MWRA is the wholesale provider of water to 51 communities in the metropolitan Boston area.

Boston’s early settlers relied on water from cisterns and underground wells, but the quality was poor and the supply inadequate. The first attempt to provide an alternative came from a private company. In 1796, the Aqueduct Corporation began delivering water from Jamaica Pond through a system of wooden pipes.

In 1848, the City of Boston obtained its first municipal water supply from Lake Cochituate via the Cochituate Aqueduct and the Brookline Reservoir. In order to meet the growing needs of Boston and the necessary system expansion, construction began in 1866 on the Chestnut Hill Reservoir and construction of reservoirs on the Sudbury River to feed the Chestnut Hill Reservoir through the Sudbury Aqueduct soon followed. The Metropolitan Water District was formed in 1895 and by 1908 the Wachusett Dam, Reservoir and Aqueduct were completed.

By the early 1900s, it was apparent that the Boston metropolitan area required additional water supplies and a more comprehensive plan to ensure its delivery. The MDC Water Supply Division was created in 1926 as a solution to this problem and was responsible for building many MDC facilities, among them Quabbin Reservoir, the Quabbin Aqueduct and the Hultman Aqueduct.

On July 1, 1985, legislation was effected which transferred the possession, control and operation of the MDC Water and Sewerage Divisions to the newly created MWRA. However, the MDC remains responsible for the operation and maintenance of the watershed at the Quabbin and Wachusett Reservoirs, the expenses of which are reimbursed to the MDC by the MWRA.

Commission Background

Currently, the MWRA is authorized to provide water supply services to 51 cities, towns, and special purpose entities located in central and eastern Massachusetts. The Commission is the MWRA's largest single customer for both water and sewer services, and MWRA charges represent the largest single component of the Commission's operating expenses. For the Commission's 2017 fiscal year beginning January 1, 2017, the MWRA assessment is projected to be approximately \$219.1 million, or 60.6% of total expenses projected to be approximately \$361.3 million.

The Commission's current water distribution system consists of approximately 1,010 miles of pipes with diameters ranging from 4 to 48 inches; 17,409 valves; 12,616 hydrants; and 16 miles of high-pressure fire pipe.

The system serves approximately 90,000 accounts through five major service networks: Southern Low Service which serves the City proper, South Boston and parts of Roxbury; Northern Low Service which serves Allston, Charlestown and East Boston; Southern High Service which serves Brighton, Dorchester, Hyde Park, Roslindale, parts of Jamaica Plain, parts of Roxbury and parts of 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 the 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 Weston and Norumbega Reservoirs, where it is held for delivery to the Commission's service networks.

A number of services in conjunction with the water distribution system are provided by the BWSC. These include mandatory cross connection inspections, meter installation, meter testing on demand, flow testing to determine adequate service line size, fire flow testing, grease trap inspections, water service shut offs and let ons. The Commission also provides assistance for customers in the form of providing construction plan drawings, providing hydrant meters for access to hydrant water, and also the licensing of individuals to ensure properly qualified contractors. A contestant schedule of water sample testing in conjunction with the MWRA is also maintained to ensure safe and desirable water.

The Commission owns and operates a system for the collection and transport of wastewater and storm drainage 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 now in use). The BMDS interceptors were initially designed to carry a peak dry weather sanitary flow together with an allowance for stormwater.

Commission Background

In 1988, construction of the New Boston Main Interceptor and the New East Side Interceptor was completed, replacing portions of the original system. These interceptors serve the sewer needs of downtown Boston, the South End, Roxbury, Dorchester and South Boston. They increase capacity and virtually eliminate dry weather overflows. The volume of wet weather overflows has been reduced as well.

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, 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 located in the southern part of the City, are served by separate systems.

The Commission's Sewer System collects wastewater and stormwater in the City. The Sewer System consists of approximately 1,532 miles of sewers, including 700 miles of sanitary sewers, 662 miles of storm drains and 165 miles of combined sewers. Sanitary sewers range in size from six-inch clay pipes to 20ft by 15 ½ft reinforced concrete interceptors. The overall sewer system includes 148 regulators and 186 tide-gates. Separate sanitary sewers and storm drains serve approximately 35 square miles, or 83 percent of the City. There are 252 stormwater outfalls. Other facilities include nine pumping stations and two gatehouses. All wastewater collected by the Commission facilities is conveyed to the MWRA's Deer Island Treatment plant.

Water Consumption Total 2012-2016 Consumption by Land Use Code (cubic ft.) – Boston Water and Sewer Commission

Codes	2012	2013	2014	2015	2016
A	265,941,304	263,639,848	277,530,230	282,128,865	286,895,622
AH	6,863,325	7,799,326	8,026,394	9,202,555	8,474,859
C	460,403,312	454,419,684	442,922,659	459,806,813	460,831,362
C3	18,898,255	19,269,118	18,864,831	19,414,776	19,616,958
CC	13,752,619	13,411,093	13,379,960	16,193,476	16,618,397
CD	8,925,107	9,139,814	8,732,110	8,782,901	7,891,599
CL	11,540,010	11,574,975	11,613,588	10,942,240	10,816,927
CM	172,525,335	169,741,647	168,529,752	168,689,230	169,601,956
E	667,268,110	672,368,186	655,149,134	689,652,187	676,761,195
EA	17,076,905	18,348,435	19,654,607	18,962,373	19,059,448
I	83,436,660	88,458,495	77,589,949	80,241,259	82,454,334
R1	226,701,351	221,105,033	220,520,285	223,759,002	223,353,485
R2	228,917,154	222,897,272	221,705,397	222,087,380	221,236,653
R3	288,899,186	282,749,088	279,787,883	281,297,362	278,799,456
R4	73,959,546	72,512,893	72,486,748	73,235,991	71,493,853
RC	140,486,129	138,269,877	139,732,786	148,615,348	154,071,707
RL	1,896,554	2,107,034	2,250,134	2,400,060	2,575,409
TOTAL	2,687,490,862	2,667,811,818	2,638,476,447	2,715,411,818	2,710,553,220

Legend for Codes

A = Apartment Building-7 Units or More	EA = Clause 121A Exempt
AH = Agricultural/Horticultural	I = Industrial
C = Commercial	R1 = One Family
C3 = Condo 3 Units	R2 = Two Family
CC = Commercial Condo	R3 = Three Family
CD = Condominium Unit	R4 = Four to Six Units
CL = Commercial Land	RC = Residential Commercial
CM = Condominium Master	RL = Residential Land
E = Exempt	

Water Consumption Percent by Category

	ACCTS	%ACCTS	CONS	%CONS
RESIDENTIAL	66,562	75.6%	723,389,594	26.8%
OTHER RES.	9,564	10.9%	534,653,549	19.7%
COMMERCIAL	7,182	8.2%	665,760,241	24.6%
TAX EXEMPT	3,840	4.4%	704,295,502	26.0%
INDUSTRIAL	931	1.1%	82,454,334	3.0%
<u>TOTAL</u>	88,079	100.0%	2,710,553,220	100.0%

Sources

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- Jumpshell.com
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- Rent Jungle
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- Massachusetts Office of Tourism

The Commission

Overview

Bargaining Unit	Code	Number of Grades	Number of Position Titles	Number of Budgeted Positions	Weekly Salary Ranges
Executive	EX	9	116	135	\$637.81 - \$2,761.20
Local 6	L	5	40	63	\$1,038.47 - \$2,307.70
Local 888	C	4	20	59	\$682.50 - \$1,478.59
Council 93	S	4	15	33	\$800.00 - \$2,083.20
Local Lodge 100	W	9	27	212	\$868.60 - \$1,659.47

Executive Detail

Grade	Position Title	Number of Positions	Weekly Minimum	Weekly Maximum
EX-3			\$765.37	\$1,337.26
	Assistant Manager Revenue Protection	1		
	Assistant Network Administrator	1		
	Executive Assistant	6		
	Facilities Administrator	2		
	Finance Administrator	1		
	Human Resource Generalist	2		
	IT Administrator	1		
	Operations Administrator	1		
	Senior Investigator Revenue Audit/Analysis	1		
	Special Project Coordinator	1		
	Senior Investigator/Revenue Protection	1		
EX-4			\$880.17	\$1,516.85
	Contract Coordinator	1		
	Compliance Coordinator	1		
	Educational Programs Coordinator	1		

The Commission

	Enforcement Compliance Manager	1		
	Enforcement Specialist	1		
	Environmental Outreach & Community Coordinator	2		
	Executive Assistant to the Chief Engineer & Operations Officer	1		
	Executive Assistant to the Director of Operations	1		
	Executive Assistant	3		
	Executive Assistant to the Chief Financial Officer	1		
	Labor Relations Specialist	1		
	Manager Materials & Handling	1		
	Meter System Technician	1		
	Manager Inventory Control	1		
	Operations Manager	1		
	Organizational Diversity Compliance Officer	1		
	Senior Application Specialist	1		
	Site Plan Review Engineer	1		
	Senior Payroll Administrator	1		
	Social Media Administrator	1		
	Systems Engineer	1		
EX-5			\$1,012.20	\$1,740.62
	Business System Analyst	1		
	Collections Administrator	1		
	Enforcement Manager	1		
	Executive Assistant to the Executive Director	1		
	Intergovernmental Relations Manager	1		
	IT Project Manager	1		
	Manager of Facilities/Nights	1		
	Manager of Support Services	1		
	Manager Collections	1		

The Commission

	Manager Construction	1		
	Manager Customer Service	1		
	Manager Employment	1		
	Manager Engineering Customer Service	1		
	Manager Facilities/Days	1		
	Manager Field Engineering	1		
	Manager of GIS	1		
	Night Manager Fleet/Storeroom	1		
	Manager Organizational Diversity	1		
	Operations Manager	1		
	Payroll Manager	1		
	Project Director Emergency Preparedness	1		
	Safety Manager	1		
EX-6			\$1,164.03	\$1,946.50
	Assistant General Counsel - Compliance	1		
	Assistant General Counsel	5		
	Assistant General Counsel/Director Health & Safety	1		
	Budget Manager	1		
	Capital Budget Manager	1		
	Disaster Recovery Coordinator	1		
	Enterprise Applications Admin	1		
	Manager Accounts Payable	1		
	Manager Billing & Adjustments	1		
	Manager Computer Operations	1		
	Manager Fleet	1		
	Operations Manager	3		
	Payroll Manager	1		
	Project Director	3		
	Senior Manager Organizational Diversity	1		

The Commission

	Systems Administrator	2		
	SSO Manager	1		
EX-7			\$1,338.64	\$2,152.08
	Data Base Administrator	1		
	Deputy Director Organizational Diversity	1		
	Deputy Director Account Services	1		
	Deputy Director Communications	1		
	Deputy Director Construction	1		
	Deputy Director Human Resources	1		
	Deputy Director Payroll	1		
	Deputy Superintendent Field Operations	1		
	Director Automatic Meter Reading	1		
	Director Accounting	1		
	Director Application Development	1		
	Director Budget	1		
	Director CAD	1		
	Director Financial Services	1		
	Director GIS	1		
	Director Procurement	1		
	Director IT Communications			
	Director IT Infrastructure	1		
	Director Revenues	1		
	Director IT Support	1		
	IT Project Director	1		
	Meter Services Manager	1		
	Senior Operations Manager	1		
EX-8			\$1,472.50	\$2,367.29
	Deputy General Counsel	1		
	Director Communications/External Relations	1		

The Commission

	Director Finance	1		
	Director Human Resources	1		
	Director Meter Services	1		
	Superintendent Support Services	1		
	Superintendent Water & Sewer	2		
	Superintendent Asset Management/CMOM Director	1		
	Superintendent Enforcement & Compliance	1		
EX-9			\$1,619.75	\$2,556.67
	Deputy Chief Administrative Officer	1		
	Director Construction	1		
	Director Labor Relations	1		
	Director Organizational Diversity	1		
	Director Planning & Sustainability	1		
	Director of Engineering	1		
	Director of Operations	1		
EX-10			\$1,781.72	\$2,761.20
	Chief Administrative Officer	1		
	Chief Information Officer	1		
	Chief Financial Officer & Treasurer	1		
	General Counsel	1		
EXC				
	Chief Engineer & Operations Officer	1		
	Executive Director	1		

The Commission

Local 6 Detail

Grade	Position Title	Number of Positions	Weekly Minimum	Weekly Maximum
L-8			\$1,038.47	\$1,584.19
	Administrative Assistant/Account Services	1		
	Assistant Manager Facilities	1		
	Assistant Manager Purchasing	1		
	Collections Investigator	2		
	CMOM Data Coordinator	1		
	Community Project Events Coordinator	1		
	Community Relations Officer	1		
	Construction Administrator	2		
	Evaluation & Compliance Coordinator	1		
	Financial Analyst	4		
	GIS Analyst	1		
	Help Desk Administrator	1		
	Legal/Claims Investigator	1		
	Staff Accountant	3		
	Stock Control Operator	1		
L-9			\$1,153.85	\$1,680.11
	Assistant Manager Collections	1		
	Assistant Manager Construction	1		
	Assistant Manager Customer Service	1		
	Assistant Manager Revenue Audit & Analysis	1		
	Construction Site Engineer	1		
	Field Service Engineer	7		
	Programmer/Analyst	1		
	Project Engineer	1		
	Support Analyst	1		

The Commission

L-10			\$1,346.16	\$1,798.61
	Application Support Analyst/Trainer	1		
	Assistant Data Base Administrator	1		
	Design Engineer I	4		
	Project Coordinator Stormwater Infrastructure	1		
	Project Engineer I	3		
	Project Engineer II Planning	1		
	Senior Financial Analyst	1		
	Senior GIS Coordinator	1		
	Senior GIS Programmer/Analyst	1		
	Senior Accountant	1		
	Senior Programmer/Analyst	1		
L-11			\$1,538.47	\$2,019.24
	Design Engineer II	3		
	Project Engineer II	1		
L-12			\$1,730.77	\$2,307.70
	Project Manger	3		
	Senior Design Engineer	2		
	Senior Programmer/Analyst II	1		

Local 888 Detail

Grade	Position Title	Number of Positions	Weekly Minimum	Weekly Maximum
C-9			\$682.50	\$1,165.48
	Account Services Clerk	4		
	Account Service Representative	10		
	Facilities Representative	6		
	Financial Service Representative	5		

The Commission

C-10			\$739.47	\$1,265.21
	Administrative Assistant II	1		
	Buyer	1		
	CAD Technician	2		
	GIS Technician	1		
	Senior Account Service Representative	1		
	Senior Account Service Clerk	1		
	Senior Computer Operator	2		
	Senior Financial Service Representative	5		
C-11			\$781.69	\$1,364.73
	Meter Service Representative	2		
	Plans Examiner	2		
	Principle Account Service Representative	4		
	Principle Financial Service Representative	3		
	Senior CAD Technician	3		
	Senior GIS Technician	3		
C-12			\$859.86	\$1,522.95
	Principal CAD Technician	2		
	Senior Engineer Technician	1		

Council 93 Detail

Grade	Position Title	Number of Positions	Weekly Minimum	Weekly Maximum
S-5			\$800.00	\$1,568.00
	Supervisor Water and Sewer	1		
S-6			\$840.00	\$1,646.40
	Meter Records Supervisor	1		

The Commission

	Supervisor Collections	1		
	Supervisor Customer Service	1		
	Supervisor Meter Installation	3		
S-7			\$924.00	\$1,811.20
	Supervisor Adjustments	1		
	Supervisor of Construction	1		
	Supervisor Hydrant Maintenance & Repair	1		
	Supervisor Water & Sewer	15		
	Work Order Systems Supervisor	1		
S-8			\$1,062.80	\$2,083.20
	Field Supervisor Revenue Auditing	1		
	Field Supervisor/Collections	1		
	Financial Supervisor	3		
	Meter Services Supervisor	1		
	Supervisor Buildings & Grounds	1		

Local Lodge 100 Detail

Grade	Position Title	Number of Positions	Weekly Minimum	Weekly Maximum
W-4			\$868.60	\$1,138.54
	Apprentice/Operations Service Repairperson	10		
	Operations Service Repairperson I	19		
W-5			\$905.30	\$1,184.98
	Building Maintenance Technician	1		
	Senior Storekeeper	2		
W-6	Building Maintenance Technician II	2	\$943.34	1,233.19
	Maintenance Mechanic Mason	1		

The Commission

	Meter Technician	13		
	Operations Service Repairperson II	2		
	Yard Clerk	9		
W-7			\$982.84	\$1,283.21
	Operations Service Repairperson IIA	36		
W-8			\$1,023.58	\$1,340.62
	Field Service Technician	8		
	Fleet Mechanic	3		
	Principal Storekeeper	2		
	Special Heavy Motor Operator I	9		
W-8F			\$1,071.64	\$1,388.36
	WF Building Maintenance Technician	1		
	WF Fleet Mechanic	1		
	WF Operations Service Repairperson	17		
W-9			\$1,120.42	\$1,468.36
	Enforcement Inspector	16		
	Inspector	26		
	Regulating Inspector	1		
	Special Heavy Motor Equipment Operator II	14		
	Senior Field Service Technician	5		
	Senior Meter Technician	3		
W-10			\$1,227.66	\$1,611.73
	Fleet Mechanic II (Car/Truck)	1		
	Licensed Electrician	3		
	Maintenance Mechanic Licensed Plumber	6		
W-10F			1,275.40	1,659.47
	WF Fleet Mechanic II	1		

Glossary of Financial and Operating Terms

Accrual Budgeting: An accrual method whereby monthly deposits to all appropriate funds are made in an amount sufficient to equal the total projected level of accrued expenditures for each fund thus enabling the Commission to have sufficient funds available to meet scheduled payments of all financial obligations when due.

Attrited: To lose (personnel) by attrition.

Average Household: A residential customer with average water consumption of 180 gallons per day.

Board of Commissioners: The three-member, non-salaried governing board of the Commission, appointed by the Mayor subject to the approval of the City Council. Commissioners serve for a term of four years.

Bond: A certificate of debt issued by a government or corporation guaranteeing periodic payments of interest and return of original investment on specified future dates.

Bond Resolution: A document that contains terms and conditions relating to the issuance and sale of Bonds and sets forth the Commission's legal obligations to bondholders.

Boston Harbor Cleanup Project: An extensive plan of activities, which the MWRA developed and is implementing in response to a federal court order to comply with the provisions of the U.S. Clean Water Act.

BESS (Business and Engineering Support System): The Commission has customized computer programs, which provide the Commission with billing, collection, and service information about its customers.

BWSC: The Boston Water and Sewer Commission.

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

CIP (Capital Improvement Program): A plan which identifies and estimates the nature, schedule, cost, priority and financing of long-term assets that the Commission intends to build, rehabilitate 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 transportation of wastewater and storm water.

Contractual Funding Obligations: The incremental deposits into the various reserve accounts so that the Commission may meet the minimum funding requirements of its General Bond Resolution.

Glossary

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

CMOM (Capacity, Maintenance, Operations, and Management): A Self-assessment study in 2012 that analyzed all aspects of the Commission's sanitary sewer and storm drainage facility operations and maintenance.

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

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

Debt Coverage Requirement: The Commission is required to set rates and charges at levels sufficient so that total net revenues equal at least 125% of the Bond Debt Service Requirement during such Fiscal Year with respect to all Bonds Outstanding as of the first day of such Fiscal Year.

DEP (Department of Environment Protection): The Massachusetts agency that regulates water pollution control, water supplies, and waterways and dispenses federal and state grant funds to support these activities.

Direct Expenses: Expenses directly associated with providing water and sewer services, or of a division, department or operating unit.

Division: A major organizational unit within the Commission, encompassing the activities and resources for providing a major service or function. A Division is further divided into departments, units, and programs.

Drain: A pipe or conduit, which conveys wastewater or storm water.

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

EPA (Environmental Protection Agency): The federal government agency responsible for promulgation and enforcement of environmental regulations and investigation and prosecution of infractions of non-compliance with regulations.

Expenditures: Actual payment for goods and services received.

Financial Statement: A set of summary documents which pertain to financial information that consist of the following: Balance Sheet, Statement of Operation, Statement of Equity, Statement of Cash Flows, Notes of Financial Statements and, in the Commission's case, Supplements, Schedules of Revenues and Expenses - Rate Basis.

Fiscal Year: A twelve-month period for which an organization plans the use of its resources. The Commission's fiscal year is January 1 through December 31.

Glossary

Fund: An account established under the Commissions General Bond Resolution into which deposits and withdrawals for specific purposes are made or held.

Full-Time Equivalent (FTE): Full-time Employee, who works 40 hours per week and is benefited, coded as 1.0 FTE.

General Revenue Bonds: Bonds, which are obligations of the issuer on which revenues received from operations, are pledged for the payment of the principal and interest thereon.

Goal: general statements of a desired state, condition, or situation to be achieved, which may be stated from a short or long term perspective.

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

Independent Auditor: External public accounting firm hired to audit the annual financial statements and express an opinion on those statements as to conformity with generally accepted accounting principles.

Indirect Expenses: Those costs including expenditures and accrued costs, which are not directly associated with providing services or performing activities.

Infiltration/Inflow: Infiltration is groundwater that leaks into the sewerage system through pipe joints and defects. Inflow refers to water that enters sewers from improperly connected catch basins, sump pumps, and land and basement drains and defective manholes. Inflow also enters through improperly closed or defective harbor CSO tidegates when the tide is high.

Interceptors: The large pipes or culverts that convey wastewater from the localized collection system to the treatment plant. The Commission's largest interceptors are 20 foot by 15-1/2 foot concrete box culverts.

Investment Income: Income derived by investing certain fund balances in interest-yielding securities in compliance with the provisions of the Commission's General Bond Resolution and Investment Policy.

Inventory: A product either purchased as a replacement part or as new equipment, costing more than \$100.00 and having a useful life greater than three years.

Labor Costs: Direct costs of employing permanent and temporary personnel, including wages, salaries, overtime pay, benefits, and workers' compensation insurance.

MBE/WBE: Minority Business Enterprise/Women Business Enterprise.

Meter: An instrument for measuring the flow of water.

Meter Pit: An underground vault enclosing a meter.

MGD: Million gallons per day.

Glossary

MH: Manholes.

Mission: A description of the fundamental purpose and major activities of a division, department, or other operational unit.

MWRA (Massachusetts Water Resources Authority): An agency created by the enactment of Chapter 372 of the Acts of 1984. The MWRA is responsible for providing potable water and wastewater collection, transport, delivery, and treatment services to 60 user communities in Eastern Massachusetts.

MWRA Assessment Fund: A fund which receives monthly deposits equal to one twelfth of the annual MWRA Assessment of the Commission which is used to pay the Commission's wholesale water and sewer liability.

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

Objective: (1) A statement defining the result-oriented activities necessary to achieve a stated goal, quantify work output or measure the quality of service; (2) a statement describing continuing targets, long and short term to achieve improvements in efficiency or productivity or establish long range plans.

OPEB: Other Post-Employment Benefits Liability (GASB 43 and GASB 45)

Operating Account: An account in the Operating and Maintenance Fund which is used as a depository for funds to meet the ensuing months operating liabilities.

Operating Reserve Fund: A fund established by the Commission's General Bond Resolution to provide a reserve for operating contingencies. The Operating Reserve Fund is required by the Commission's bond resolution to be funded at not less than one-sixth of its annual operating expenses including the assessments from the MWRA.

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: (1) A sub-unit of a department which is organized as a separate administrative or functional unit; (2) 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.

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

Glossary

Rate Revenue Requirement: The amount of revenue necessary to equal total expenses, plus revenue adjustments, less other revenues.

Reserves: Funds not appropriated for payment of expenditures or that are designated for specific use.

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, either sanitary sewage or storm or surface water runoff, or both.

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

SHEMO: Special Heavy Equipment Machine Operator.

Stabilization Fund: A fund established by the Commission's Bond Resolution to mitigate the impact of extraordinary costs. The Resolution requires minimum funding of the Stabilization Fund in an amount equal to 4% of the aggregate principal amount of the Commission's outstanding variable rate bonds.

State Revolving Fund (SRF): See Water Pollution Abatement Trust.

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.

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

Strategic Goal: The long range plans and direction of each division, department or program of the Commission.

Tactical Goal: A one-time improvement and/or enhancement to a technical or service oriented process.

Unaccounted for Water: Difference between amount of water purchased from the MWRA and the amount of water sold. The difference is caused by system losses, leakage, unbilled public usage, and water used during construction projects.

Glossary

Variance: The dollar and/or percentage difference between two sets of figures.

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 storm water 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 Demand: A projection of aggregate water usage for the City of Boston, which is expressed in million gallons per day.

Water Pollution Abatement Trust: A funding mechanism created to administer the Water Pollution Abatement Revolving Fund (State Revolving Fund) established by the Commonwealth of Massachusetts to provide funding for water pollution abatement projects in Massachusetts, incorporating federal and state loans to local governmental units.

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.

Weir: A dam built to raise, regulate, or divert water.

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