

Section 7

Financial Capability and Affordability Assessment

This report section summarizes the financial capability assessment (FCA) and affordability assessment that was completed for Capital Region Water (CRW) related to the development of the *City Beautiful H₂O Program Plan* (Program Plan), other water quality enhancement programs, and system rehabilitation programs required under Section V-E of the Consent Decree between CRW, the City of Harrisburg, United States Environmental Protection Agency (US-EPA) and Pennsylvania Department of Environmental Protection (PA-DEP)¹. The goal was to assess the current and projected future financial capability and customer affordability to implement the proposed Program Plan. The FCA and affordability assessment is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the policy and related guidance documents under an assumed implementation schedule, thereby informing the development of alternatives to address CSO, SSO, MS4, TMDL, system renewal, and other regulatory requirements.

As described in this section of the Program Plan, the assessment evaluated financial capability and affordability from a broad perspective, including the assessment outlined in the 1997 US-EPA guidance document Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development.² The US-EPA Financial Capability Assessment methodology aims to assess the overall financial capability of the utility and its customers to pay for a Long-Term Control Plan (LTCP). This report section also documents other information to provide a more complete assessment of financial capability and affordability, including providing current socioeconomic conditions within the service area and a year-by-year wastewater rate impact analysis.

7.1 Overview of the Financial Capability and Affordability Assessment

The FCA and affordability assessment is presented in this section of the Program Plan in the following order:

1. Current Socioeconomic Conditions – Summarizes important economic and social characteristics of CRW's service area, such as population, labor force, unemployment, median household income (MHI), and income distributions that provide an indication of the current socioeconomic conditions.
2. Financial Capability Assessment – Provides the results of the FCA, which was completed in accordance with the US-EPA FCA guidance document.

¹ U.S. District Court for the Middle District of Pennsylvania, Civil Action No. 1:15-cv-00921-WWC.

² EPA 832-B-97-004.

3. Year-By-Year Wastewater Financial and Rate Impact Analysis – Provides the results of a wastewater financial and rate impact analysis. This analysis included forecasts of various financial metrics, including year-by-year costs for wastewater services, debt burden, and cash flows, comparisons of customer costs to income levels, and an assessment of how a customer's annual wastewater utility service bill will change over time.

Overall, the FCA and Affordability Assessment demonstrates that the City of Harrisburg has experienced significant financial distress for several years, and there is a significant prevalence of economic hardship among the customers within the City. The City poverty rate was nearly 34 percent in 2016 and the MHI was \$33,289 (in 2015), which was more than \$20,000 lower than national, state, and local (Dauphin County) MHI's in the same year. While the MHIs of some of the suburban municipalities served by CRW are significantly higher than that of the City, CRW provides only treatment, and in some cases conveyance, services to several suburban municipalities. Since the suburban municipalities own, operate, and manage their own wastewater collection systems, CRW is unable to pass on a large portion of its Program Plan-related costs to these municipalities.

The FCA analysis using the EPA approach indicated that a capital program of approximately \$185 million in 2017 dollars was the maximum amount capital spend that could be incurred by CRW while keeping the Residential Indicator at the threshold of "High" financial impact. CRW has identified approximately \$120 million in capital costs (in 2017 dollars) needed to be spent to address aging infrastructure issues over the next 10 years. This leaves a capacity of only approximately \$65 million for Program Plan-related costs until the Residential Indicator reaches 2.0 corresponding to "High" financial impact.

Affordability was further evaluated by developing a comprehensive year-by-year, long-term financial plan and affordability model. This model was developed to assess the impact of capital program alternatives on customer bills and CRW's financial position. This model indicated that CRW can only include a total of \$315 million (escalated), or \$253 million (in 2017 dollars) in capital expenditures over a long-term 20-year period, while keeping the annual combined residential wastewater and stormwater cost as a percentage of MHI for City customers at or below the 2.0 percent threshold, while also satisfying its cash and debt service coverage requirements, and in keeping its debt burden at manageable levels. Of the \$315 million, approximately \$214 million is anticipated to be needed to address aging infrastructure issues over the 20-year period.

While the capital plan included in the long-term financial plan and affordability model was designed to keep total annual City residential customer cost for wastewater and stormwater service at or below 2.0 percent of MHI, it is anticipated that there will be significant and severe affordability issues for some customers within the City, with some customers experiencing wastewater and stormwater costs as a percentage of income exceeding 3.0 percent.

Given these considerations, it was concluded that CRW should receive the maximum schedule relief possible for implementing its City Beautiful H₂O program. The implementation schedule of 20-years or more, which is presented in this report, is a reasonable timeline to consider

affordability considerations, concerns in the more vulnerable areas of the CRW's service area, and for CRW to maintain a secure financial position over the term of the program.

7.2 Jurisdictional Scope of the Analysis

CRW provides wastewater service, consisting of collection, conveyance, and treatment service to the City of Harrisburg (City), and bills the City customers directly for this service. It also provides wholesale wastewater service, consisting of conveyance (through CRW interceptor sewers) and treatment service (at the CRW treatment plant), but not wastewater collection service (through municipal sewer systems), to several suburban wholesale customers comprised of Penbrook Borough, Paxtang Borough, Swatara Township, Lower Paxton Township, Susquehanna Township, and Steelton Borough. CRW only provides wholesale wastewater treatment service to a portion of Swatara Township and Steelton Borough as these municipalities convey wastewater to CRW through their own collection and conveyance infrastructure. A map of the jurisdictional boundary of the CRW service area, showing each of these customer municipalities, is provided on Figure 3-1.

The FCA and affordability assessment was prepared pursuant to paragraph V-E (18) of the Consent Decree, which requires the FCA to address the Harrisburg Sewer System as defined in paragraph IV-8(w). Therefore, this assessment was focused on the customers located within the City of Harrisburg. This is a reasonable approach because the City is the only jurisdiction within CRW's service area that receives wastewater collection, conveyance, and treatment service from CRW. Furthermore, the majority of the water quality related capital expenditures, and related future operation and maintenance (O&M) costs, pertain to infrastructure serving the City of Harrisburg.

7.3 Methodology

7.3.1 US-EPA Financial Capability Assessment

The FCA was completed in accordance with the method outlined in the US-EPA guidance document that specifies a two-phase process for assessing financial capability. Phase I of the analysis focuses on customer financial capability as measured by the Residential Indicator. The Residential Indicator is calculated by dividing the total projected residential cost by the MHI. If the costs are at or above 1.0 percent of the MHI, a Phase II analysis is completed. The Phase II analysis assesses community financial capacity (i.e., financial strength and financing capacity), including an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two phases are combined into a financial capability matrix to determine the financial burden placed on residential customers and the permittee by the existing and projected future costs of the wastewater system.

Phase I of the US-EPA FCA method calls for the use of a simplistic "snap shot" model, which aggregates future capital expenditures and current and incremental future operating expenses, and compares these costs to current income levels. This method can overstate the financial capability of long-term programs since income growth has generally not kept pace with increases in water and wastewater utility costs. For example, the national cost of typical household wastewater services increased at an annualized rate of approximately 4.8 percent from 1999

through 2013³, and the national Consumer Price Index increased at an annualized rate of approximately 2.4 percent⁴, whereas the national MHI only increased at an annualized rate of 1.6 percent over the same period.⁵ A financial capability assessment that does not account for the continuing divergence between wastewater utility costs and income growth over a long-term implementation schedule will overstate the financial capability of customers of the system. Therefore, due to the limitations of this method, additional financial capability and affordability information was provided in this Section of the Program Plan, including a year-by-year residential customer bill impact analysis.

Phase II of the US-EPA FCA method includes analyzing community financial capacity measures. However, three of the six community financial capability measures (overall net debt as a percentage of full market property value, property tax revenues as a percentage of full market property values, and the property tax collection rate) focus on General Fund government bond rating criteria and have little relevance to wastewater utilities, such as CRW, that are authorities and separate from the general city government. As a special purpose governmental enterprise, established pursuant to the Pennsylvania Municipal Authorities Act, CRW has no legal authority to establish or levy property tax assessments, and as such, cannot issue General Obligation bonds. Therefore, while presented, less emphasis has been placed on these factors in the Phase 2 FCA.

7.3.2 Enhancements to the US-EPA Process

The US-EPA encourages inclusion of any additional information related to the unique financial conditions of the permittee.⁶ Thus, this report section includes a summary of important socioeconomic trends and indicators, such as employment rates, poverty rates, income distribution, and other economic factors that can help to provide a more complete picture of a community's financial capability. Also provided in this section of the Program Plan is a year-by-year financial projection and rate impact analysis, and a discussion of the current economic conditions within the service area and associated challenges, all of which are relevant to the financial capability and the recommended compliance schedule.

7.4 Overview of the Wastewater Utility

7.4.1 System Description

CRW is a municipal authority that owns and operates a wastewater system that includes an Advanced Wastewater Treatment Facility (AWTF), a conveyance system, and wastewater and stormwater collection systems within the limits of the City of Harrisburg. Overall, the wastewater system includes approximately 36 miles of sanitary sewers, 40 miles of stormwater sewers, and 101 miles of combined sanitary and stormwater sewers. Customers located within the City utilize CRW's treatment, conveyance, and collection systems, while customers located within the

³ NACWA 2013 Cost of Clean Water Index.

⁴ U.S. Bureau of Labor Statistics

⁵ U.S. Census Bureau

⁶ E.G. Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development (EPA 832-B-97-04) page 7 and the November 24, 2014 memorandum to Regional Administrators: *Financial Capability Assessment Framework for Municipal Clean Water Act Requirements*.

suburban communities outside the City operate their own collection systems and primarily utilize CRW's treatment and conveyance facilities. However, the Borough of Steelton operates its own collection system and maintains its own conveyance system, and discharges wastewater directly to CRW's AWTF. Therefore, its wholesale rate is different than the other suburban communities, as it reflects only its proportionate share of the costs associated with the use of CRW's treatment facilities. Currently, CRW recovers the cost of managing the wastewater and stormwater system with wastewater user charges, since there is not currently a separate funding source to recover stormwater-related costs. However, CRW plans to implement a separate stormwater fee, possibly as early as 2019.

The wastewater system was originally managed, owned, and operated by the City. In 1990, the Harrisburg Authority (which has since been renamed Capital Region Water) was created to purchase the wastewater system from the City and at the same time enter into a 1990 Management Agreement with the City for continued management and operation of the wastewater system. In 2011, the City was placed under Commonwealth of Pennsylvania Receivership due to severe financial distress. As a result, the Commonwealth's Office of the Receiver, the City, and CRW agreed to terminate the 1990 Management Agreement with the City on November 4, 2013. With the termination of this Agreement, CRW has taken back operational and management control of the wastewater system.

In addition to providing wastewater collection and treatment services, CRW also provides drinking water services. CRW operates as one entity; however, CRW separately tracks and records the provision of services associated with each of the utilities it manages and operates.

7.4.2 Customer Base

CRW maintains approximately 17,000 active connections within the City of Harrisburg. Over 15,000, or approximately 88 percent, of the active connections are comprised of residential customers. Suburban communities are billed on a wholesale basis; therefore, individual account data for customers located in these communities is not available. Some suburban customers are billed for wastewater treatment and conveyance services based on metered water consumption, while others are billed based on the estimated number of equivalent dwelling units within their customer base. During fiscal year (FY) 2016, City and Suburban customers were billed for approximately 3.8 billion gallons of flow, as detailed in **Table 7-1**.

The population of CRW's service area has remained relatively flat since 2010 as described later in this section, and future customer growth is anticipated to be minimal in both the City and several of the suburban areas that are served by CRW.⁷

⁷Tri-County Regional Planning Commission, 2010-2040 projections, tcrpc-pa.org.

Table 7-1: Wastewater Billed Flow by Municipality

Municipality	Billed Flow (1,000 gal.)
City of Harrisburg	1,650,641
Lower Paxton Township	766,398
Susquehanna Township	681,088
Swatara Township	468,118
Steelton Borough	130,264
Penbrook Borough	71,482
Paxtang Borough	36,136
Total	3,804,127

7.4.3 Historical and Current Costs

7.4.3.1 Operating Expenses

CRW's wastewater O&M expenses have increased significantly from FY 2013 to FY 2014 in response to acquiring the City's collection system. Increases in other years were the result of significant reinvestment into the system and efforts to meet wastewater regulatory requirements. Historical actual annual O&M expenses for FY 2013 through FY 2016, and budgeted O&M expenses for FY 2017 and FY 2018 are shown in **Table 7-2**. CRW's fiscal year begins on January 1st and ends on December 31th of each year.

Table 7-2: Historical and Budgeted O&M Expenses

Fiscal Year	O&M Expenses	Percent Change from Prior Year
2013	\$2,011,025	
2014	\$8,641,477	330%
2015	\$9,019,697	4.4%
2016	\$11,249,506	24.7%
2017 Budget	\$12,023,653	6.9%
2018 Budget	\$12,311,253	2.4%

Note: O&M expenses exclude depreciation are shown on an accrual basis, except 2017 and 2018 budget figures, which are shown on a budget basis.

7.4.3.2 Capital Improvement Program

CRW's wastewater capital improvement program (CIP) takes into consideration projects required as part of the utility's Program Plan and ongoing repair and replacement of existing

infrastructure. Annual capital project expenditures projected for FY 2018 through FY 2022, consisting largely of projects related to asset repair and rehabilitation, are shown in **Table 7-3**, with expenditures shown in 2017 dollars. The projected CIP over a 20-year planning period is provided later in this section of the Program Plan.

Table 7-3: Wastewater Capital Project Expenditures

Fiscal Year	Amount
2018	\$30,120,000
2019	\$31,175,000
2020	\$19,143,000
2021	\$15,964,000
2022	\$17,869,000

7.4.3.3 Debt Service Obligations

As of December 31, 2017, CRW had approximately \$69.5 million in outstanding long-term debt, and in FY 2018, CRW will be obligated to pay a total of \$4.9 million in annual principal and interest payments on the outstanding debt, which will comprise approximately 23.2 percent of CRW's expenses for that year. A listing of CRW's currently outstanding debt by issue is provided in **Table 7-4**.

Table 7-4: Outstanding Debt of the Wastewater System (As of December 31, 2017)

Debt	Final Maturity (Year)	Remaining Principal
2009 PENNVEST Loan	2029	\$1,167,000
2014 PENNVEST Loan	2025	\$19,538,000
2017 PENNVEST Loan	2037	\$4,895,000
Series 2017 Revenue Bonds	2047	\$43,915,000
Total		\$69,515,000

7.4.3.4 Historical Financial Results

CRW's historical annual financial results from FY 2013 through FY 2016 are summarized in **Table 7-5**.

Table 7-5: Historical Wastewater Utility Operating Results

Description	FY 2013	FY 2014	FY 2015	FY 2016
Total Operating Revenues	\$2,588,677	\$18,252,196	\$16,605,674	\$17,127,865
Total Operating Expenses	\$1,949,230	\$11,143,343	\$11,057,270	\$13,269,589
Revenues Over Expenses	\$639,447	\$7,108,853	\$5,548,404	\$3,858,276

Note: The amounts shown for Total Operating Expenses do not include annual principal payments on outstanding debt or the cash-funded portion of capital project expenditures. While not typically recognized as Operating Expenses, including these amounts would result in annual Revenues Over Expenditures that would be less than those shown in the table.

7.4.4 Wastewater Rates and Customer Bill Comparison

CRW's wastewater rates charged to retail City customers and suburban wholesale customers consist of uniform volumetric rates. A summary of the existing retail and wholesale wastewater rates for FY 2018 is provided in **Table 7-6**.

Table 7-6: Existing Wastewater Rates (FY 2018)

Municipality	Wastewater Rate (\$/1,000 gal.)
City of Harrisburg	\$6.99
Suburban Wholesale (Except Steelton)	\$4.33
Suburban Wholesale (Steelton)	\$2.89

As shown in the table, the wastewater rates for suburban customers are lower than the rates charged to City customers. This is because the rates for suburban customers (except Steelton) exclude CRW's collection system costs, while the rate for Steelton excludes CRW's collection and conveyance system costs. The existing inter-municipal agreement with the suburban municipalities, does not allow CRW to pass on collection-related costs to suburban wholesale customers, and does not allow CRW to pass on collection or conveyance-related costs to Steelton Borough.

7.5 Socioeconomic Conditions

7.5.1 Local Economy

CRW's entire service area is in Dauphin County, which is in the south-central portion of Pennsylvania. Dauphin County has a total area of 525 square miles and is bordered on the north by Northumberland County, on the east by Schuylkill and Lebanon Counties, on the south by Lancaster County, and on the west by the Susquehanna River and York, Cumberland, and Perry Counties. Most of the development in the County is in the southern portion of the County in the Harrisburg/Hershey area that is traversed by Interstates 81 and 83, which connect to the Pennsylvania Turnpike (Interstate 76). The Harrisburg/Hershey area contains a significant presence of companies from the food, hotel, insurance, casino, entertainment, and museum

sectors. However, the City of Harrisburg has struggled to find sound financial footing, which has preventing it from delivering a full range of high quality city services.

The City of Harrisburg has experienced significant financial distress for several years, entering state-mandated receivership in 2011. In 2012, the City's debt per capita was among the highest of any city in the United States (U.S.). Although the City has since left formal receivership, it continues to be under state oversight through the State of Pennsylvania's Municipalities Financial Recovery Act (No. 47) and concerns remain regarding future economic growth within the area. Further complicating the City's financial picture, the City cannot collect taxes on nearly half of its assessed property value because many properties are tax-exempt. State properties, including the State Capitol Complex, comprise approximately 42 percent of the City's land area.⁸

7.5.2 Populations and Households

According to the American Community Survey (ACS) five-year estimates for the municipalities within the service area, the population of the City of Harrisburg has declined since 2011, whereas the population within CRW's entire service area (including the suburban communities) has shown only an overall slight upward trend. As shown in **Table 7-7**, the City of Harrisburg, Penbrook Borough, Paxtang Borough, and Steelton Borough have each experienced population declines since 2011, whereas other municipalities, such as Swatara, Lower Paxton, and Susquehanna Townships have shown very modest growth. It should be noted that, of the four areas with population declines, three have at least 25 percent of residents living below the poverty level.

Table 7-7: Historic Population Trends

Area	2011	2012	2013	2014	2015	2016	CAGR
City of Harrisburg	49,499	49,401	49,395	49,297	49,232	49,160	-0.11%
Penbrook Borough	3,020	3,001	3,002	2,997	2,983	2,982	-0.21%
Paxtang Borough	1,546	1,505	1,462	1,450	1,519	1,493	-0.58%
Swatara Township	23,279	23,459	23,703	23,934	24,199	24,411	0.79%
Lower Paxton Township	47,092	47,312	47,532	47,705	47,950	48,175	0.38%
Susquehanna Township	23,804	24,062	24,227	24,332	24,478	24,591	0.54%
Steelton Borough	5,992	5,982	5,976	5,959	5,956	5,938	-0.15%

CAGR = Compound annual growth rate

The various types of households within CRW's service area are shown in **Figure 7-1**. As shown in the figure, families made up 60.5 percent of the households, which consisted of 38.3 percent Married-Couple Families and 22.2 percent Other Families. Of the Other Families, 11.7 percent are female householder families with no husband and with children under the age of 18 years. Non-Family households make up the remaining 39.5 percent of households in the service area, most of

⁸ Pennlive. Finding Revenue: Can Cities like Harrisburg Survive? March 10th, 2017. Pennlive.com

which are comprised of people living alone, but some are comprised of people living in households in which no one was related to the householder.

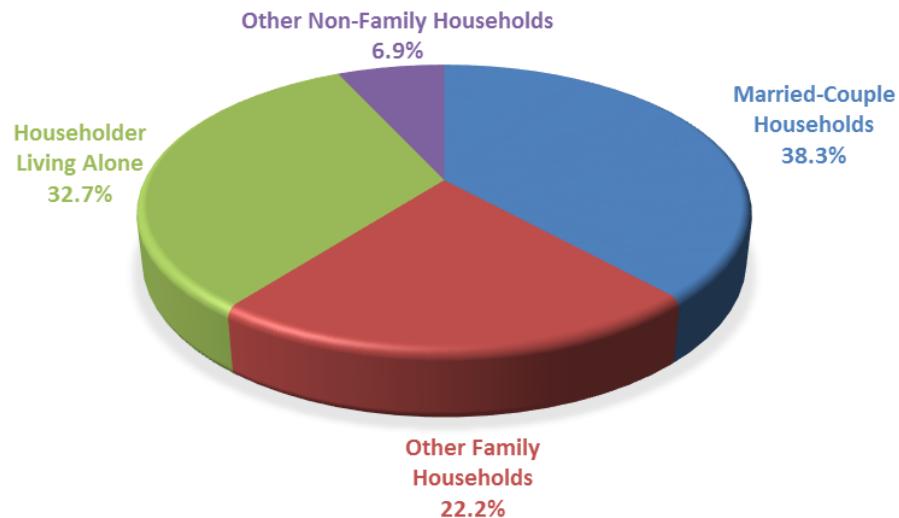


Figure 7-1: Types of Households

The proportion of married-couple households within CRW's service area (38.3 percent) was approximately 10 percent lower than the level of these households nationally and at the state level. For example, across the county and within the Commonwealth of Pennsylvania, married-couple households each comprised approximately 48 percent of all households. This is of note because poverty rates are known to be higher for families without a full-time, year-around worker, which is often the case in single-parent households, especially those with a female head of household.⁹

7.5.3 Labor Force and Unemployment

The historical unemployment rates from 2009 to 2016 for the City of Harrisburg, Dauphin County, the Commonwealth of Pennsylvania, and the U.S. are shown in **Figure 7-2**. As shown in the figure, the unemployment rate in the City of Harrisburg has consistently been significantly higher than national, state and local rates. The unemployment rate within the City of Harrisburg was 14.3 percent in 2016, and had exceeded 15 percent in each of the three years prior, which was more than twice the national, state, and local levels.

⁹ Income and poverty in the United States, P60-259, September 12, 2017.

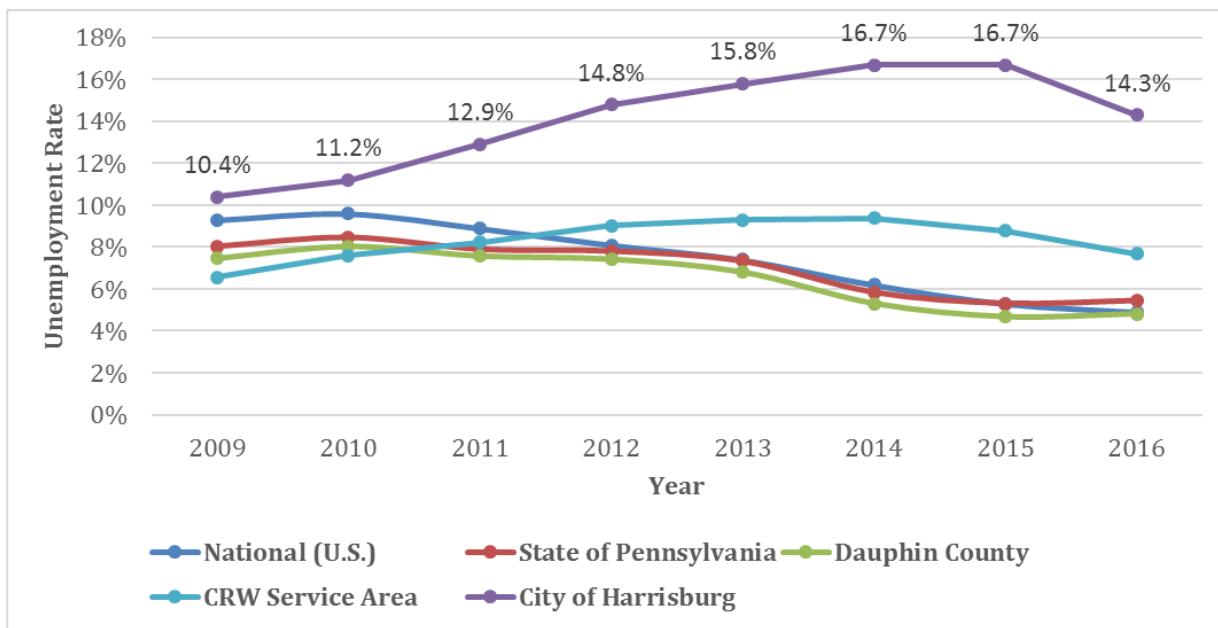


Figure 7-2: Trends in Unemployment Rates

7.5.4 Poverty Rates

The poverty rate measures the number of households reporting earnings lower than the national poverty thresholds, which vary by size of household. The national poverty thresholds for 2016 are shown in **Table 7-8**.

If the disposable income for households is reduced due to higher wastewater bills, this will place an additional financial burden on all households, but especially those that are below the poverty level, and as a result, could impact public health because reducing disposable income for these households would further reduce their ability to pay for necessities such as food, heat, and medical care. As shown in **Table 7-9**, from 2012 to 2016, the poverty rate for the City of Harrisburg has remained between 31 percent and 34 percent.

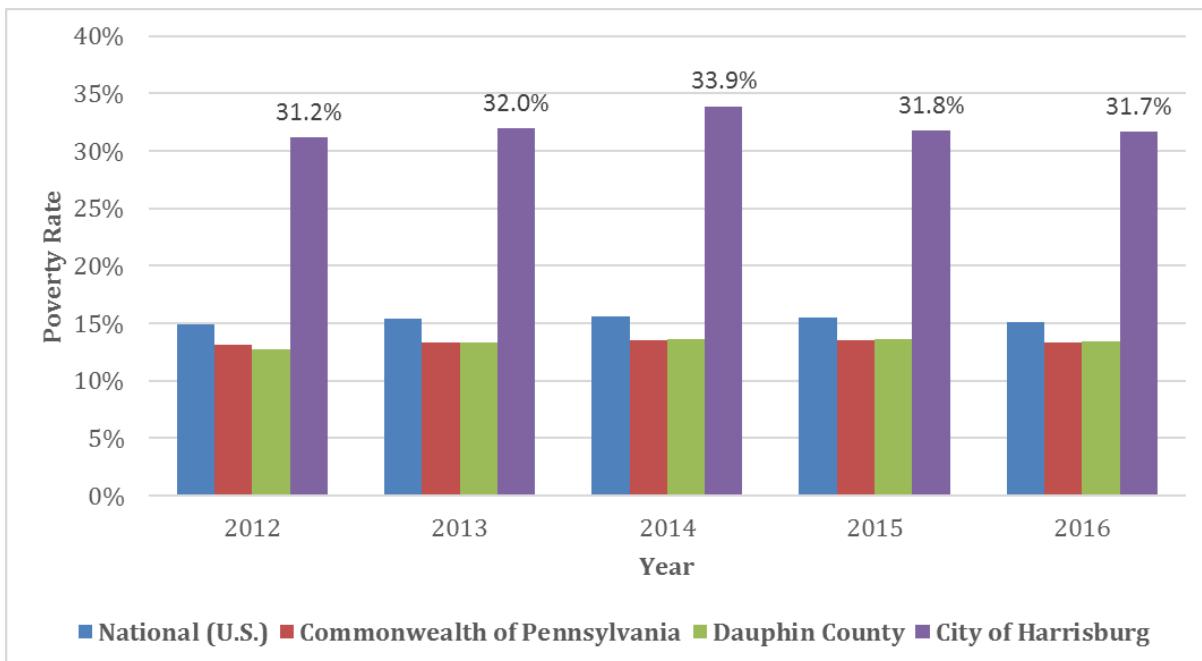
The historical poverty rates, from 2012 to 2016, for the City of Harrisburg, Dauphin County, the State of Pennsylvania, and the U.S. are shown in **Figure 7-3**. As shown in the figure, the City of Harrisburg has experienced a poverty level that is more than double the national, state, and local levels over this same period, indicating that there is significant economic hardship within the City.

Table 7-8: National Poverty Thresholds (2016)¹⁰ Trend¹¹

Household Size	Poverty Threshold
1	\$12,486
2	\$16,072
3	\$18,774
4	\$25,160
5	\$29,854
6	\$34,337
7	\$39,509
8	\$44,188

Table 7-9: City of Harrisburg Poverty Rate

Year	Poverty Rate
2012	31.2%
2013	32.0%
2014	33.9%
2015	31.8%
2016	31.7%

**Figure 7-3: Trends in Poverty Rates**

In 2016, the percentage of people with a Bachelor's degree or higher in the City of Harrisburg was 40 percent less than the percentage in Dauphin County, the Commonwealth of Pennsylvania and the U.S. This may be one factor contributing to the City of Harrisburg's high poverty rate, as in general, areas with higher educational attainment have lower levels of poverty. The percentage of

¹⁰ US Census Bureau. <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html>

¹¹ US Census Bureau. <https://www.census.gov/library/visualizations/time-series/demo/census-poverty-tool.html>

people with a Bachelor's degree or higher at the national, state, and local levels, as compared to the City of Harrisburg, is shown in **Table 7-10**.

Table 7-10: Percentage of Population with a Bachelor's Degree or Higher

Area	Population % with Bachelor's Degree or Higher
National (U.S.)	31.3%
Commonwealth of Pennsylvania	30.8%
Dauphin County	32.5%
City of Harrisburg	18.2%

7.5.5 Income Distribution

Median household income is one measure of a community's financial capability. However, relying solely on the MHI as an indicator of a community's ability to pay for higher wastewater utility bills may be misleading. Some of the limitations of using MHI in this manner are as follows:

- MHI can mask poverty or other measures of economic need within a community, as MHI is only able to represent the "middle" income within a given area. Therefore, there are many households whose annual incomes are substantially lower than this amount.
- MHI does not capture impacts across diverse populations, as there are sub-regions in each area with MHI's that are substantially lower than the overall area's MHI.
- MHI escalation generally lags increases in water and wastewater costs, as well as consumer price increases; therefore, water and wastewater bills can be expected to become a larger burden on customers over time.
- MHI does not reflect the income needed to adequately support larger household sizes. For example, a certain level of income may adequately support a two or three-person household, but this same income level may not adequately support a household of five or six persons. This was illustrated in Table 7-8, which showed different income thresholds for poverty based on household size.
- MHI provides a "snapshot" that does not account for the historical and future trends of a community's economic, demographic, and/or social conditions. This is particularly relevant in areas that may be experiencing economic declines or population losses.

Furthermore, in many communities served by CRW, incomes are less centered on the median compared to incomes included in the national average. Therefore, in addition to the MHI, an analysis of alternative income metrics should be considered to adequately measure a community's financial capability.

7.5.5.1 Median Household Income

The MHI for the City of Harrisburg is provided in **Table 7-11** for 2011, 2013 and 2015 with a comparison to the national, state, and local MHI's in these years. In addition, the MHI of CRW's

service area is also shown. The MHI of each municipality within the CRW service area was weighted based on its population relative to the total population within CRW's service area. As noted in Section 7.2, the jurisdictional scope of this analysis is limited to the City of Harrisburg pursuant to paragraph V-E (18) of the Consent Decree.

Table 7-11: Median Household Income (adjusted to 2015 dollars)

Area	2011 MHI	2013 MHI	2015 MHI	% Change
National (U.S.)	\$52,931	\$53,029	\$55,775	5.4%
State of Pennsylvania	\$54,135	\$53,332	\$53,599	-1.0%
Dauphin County	\$56,357	\$54,872	\$53,754	-4.6%
CRW Service Area	\$55,117	\$53,972	\$52,732	-4.3%
City of Harrisburg	\$34,260	\$34,726	\$33,289	-2.8%

As shown in the table, the inflation-adjusted MHI for the City of Harrisburg has declined since 2011, while the inflation-adjusted national income level increased. Also, the inflation-adjusted MHI for the City has consistently been more than \$20,000 lower than MHI levels for the U.S., Commonwealth of Pennsylvania, and Dauphin County.

The historical MHI trend (adjusted to 2015 dollars) from 2011 to 2015 is shown in **Figure 7-4**. As shown in the figure, the inflation adjusted MHI for the City of Harrisburg has been much lower than the inflation adjusted MHI for CRW's service area. For example, in 2015 the City of Harrisburg's MHI was \$33,289; however, the MHI of CRW's service area was \$52,732, which is approximately 58.4 percent higher than in the City. This demonstrates that there is a significant disparity in income levels within CRW's service area, with several suburban communities having significantly higher MHI's than the City of Harrisburg. However, since CRW provides only treatment, and in some cases conveyance, services to the suburban communities, and since the suburban municipalities own, operate, and manage their own wastewater collection systems, CRW is unable to pass on a large portion of its Program Plan-related costs to these communities with higher income levels than the City. Moreover, CRW is required to allocate costs between the municipalities proportionately to the causes of cost pursuant to its inter-municipal service agreements, the Pennsylvania Municipality Authorities Act and federal regulations. In addition, the MHI for the City of Harrisburg is only slightly (approximately \$8,000) higher than the poverty threshold for a family of four, further demonstrating that income levels are depressed within the City.

7.5.5.2 Income Quintiles

The income distribution within the City of Harrisburg and the other municipalities served by CRW provides additional information on the disparity of income levels within CRW's service area. The upper limits of household income quintiles for the City were compared to those of the U.S., the Commonwealth of Pennsylvania, Dauphin County, and CRW's service area in **Table 7-12**.

As shown in the table, the City has much lower income levels than Dauphin County, the Commonwealth of Pennsylvania, and the U.S.

- The lowest quintile (20 percent) of households in the City of Harrisburg earn less than \$12,989 per year, which is 41 percent lower than the lowest quintile of households in the Commonwealth of Pennsylvania and in the U.S.

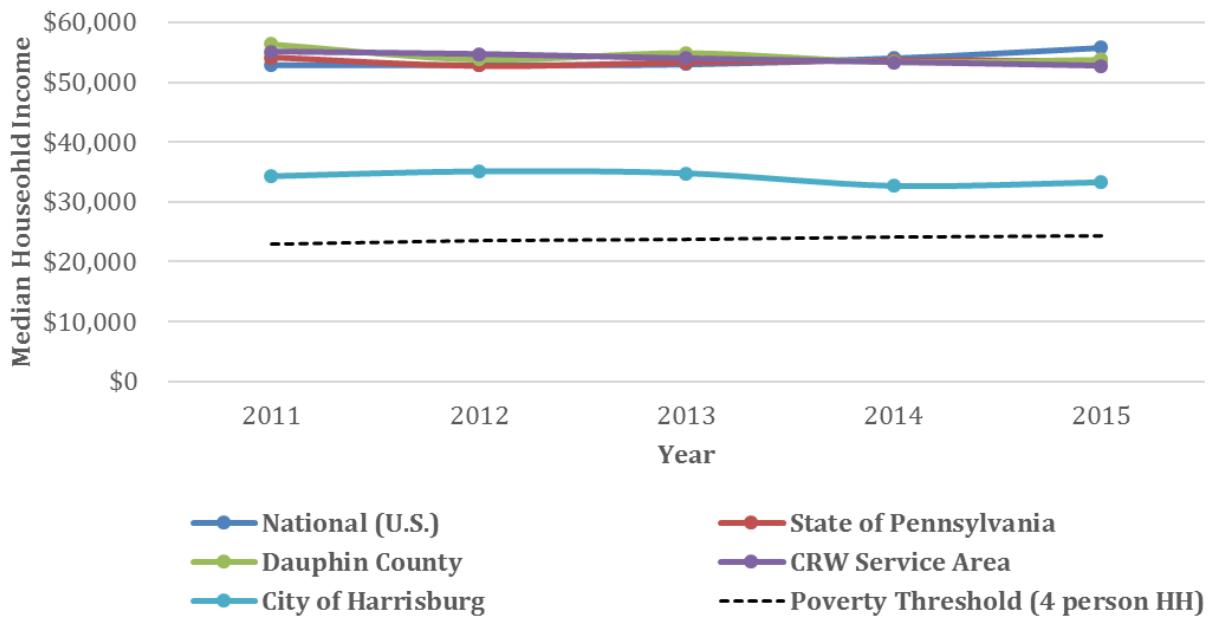


Figure 7-4: Trends in Median Household Income (Adjusted to 2015 Dollars)

Table 7-12: Income Quintiles of the U.S., Pennsylvania, Dauphin County, CRW's Service Area, and the City of Harrisburg

	Lowest Quintile	Second Quintile	Third Quintile	Fourth Quintile
National (U.S.)	\$22,001	\$42,125	\$67,814	\$108,994
Commonwealth of PA	\$22,116	\$42,084	\$66,977	\$105,848
Dauphin County	\$24,986	\$44,695	\$67,823	\$103,207
CRW Service Area	\$24,906	\$42,759	\$63,900	\$95,707
City of Harrisburg	\$12,989	\$25,811	\$40,957	\$66,422
% Below US Quintile	-41.0%	-38.7%	-39.6%	-39.1%
% Below PA Quintile	-41.3%	-38.7%	-38.8%	-37.2%
% Below County Quintile	-48.0%	-42.3%	-39.6%	-35.6%
% Below Service Area Quintile	-47.8%	-39.6%	-35.9%	-30.6%

- The second lowest quintile (40 percent) of households in the City earn less than \$25,811 per year, which is 39 percent lower than the second lowest quintile of households in the Commonwealth of Pennsylvania and in the U.S.
- The upper incomes of residents in the City on average earn less than those in Dauphin County, the Commonwealth of Pennsylvania, and the U.S. The City's top income quintile earned 37 percent less than the top quintiles in the Commonwealth and the U.S.

This shows that in general, the City of Harrisburg has fewer high earners, as compared to the Commonwealth of Pennsylvania and the U.S.

7.5.5.3 Household Income Distribution

The household income distribution within the City of Harrisburg and the entire CRW service area was compared to the household income distribution within the Commonwealth of Pennsylvania and the U.S. in **Figure 7-5**. As shown in the figure, there is a much larger proportion of households within the City of Harrisburg at low income levels and a much smaller proportion of households at higher income levels as compared to the state and national level.

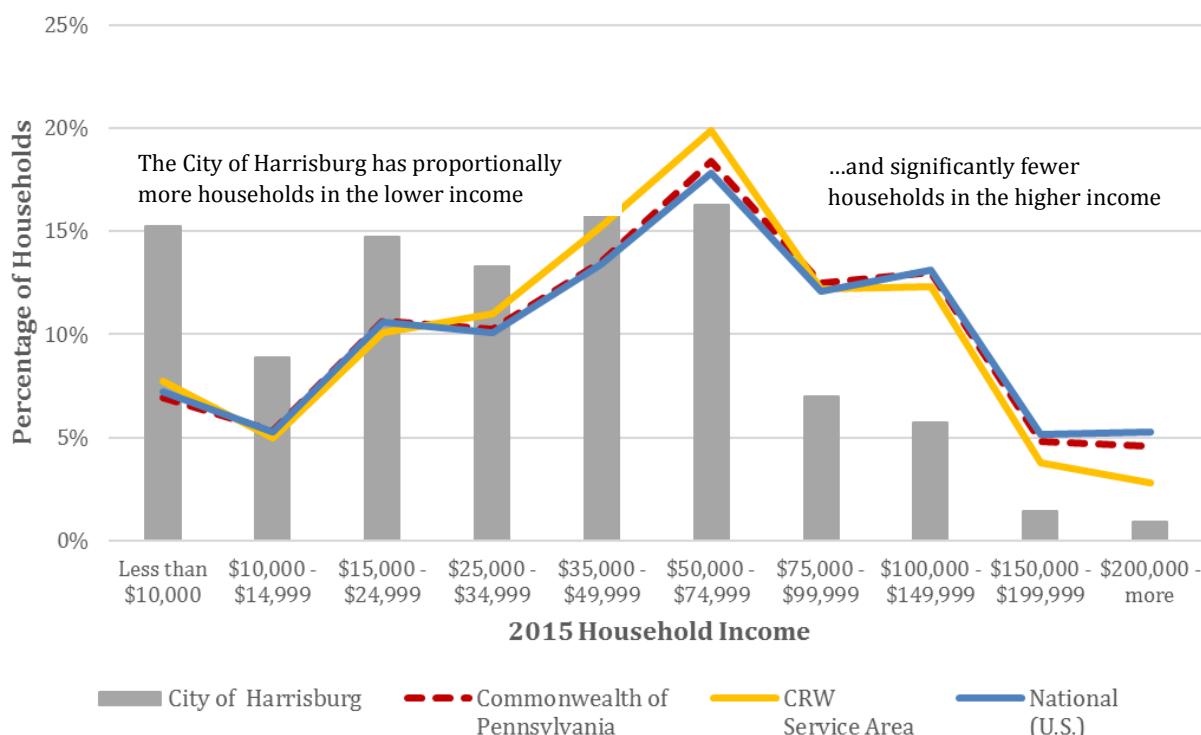


Figure 7-5: Income Distribution for the City of Harrisburg, CRW's Service Area, Pennsylvania, and the U.S.

Furthermore, a map of the MHI levels by census block group for the City of Harrisburg is provided in **Figure 7-6**. The map provides a detailed geographical representation of the income disparity within the City.

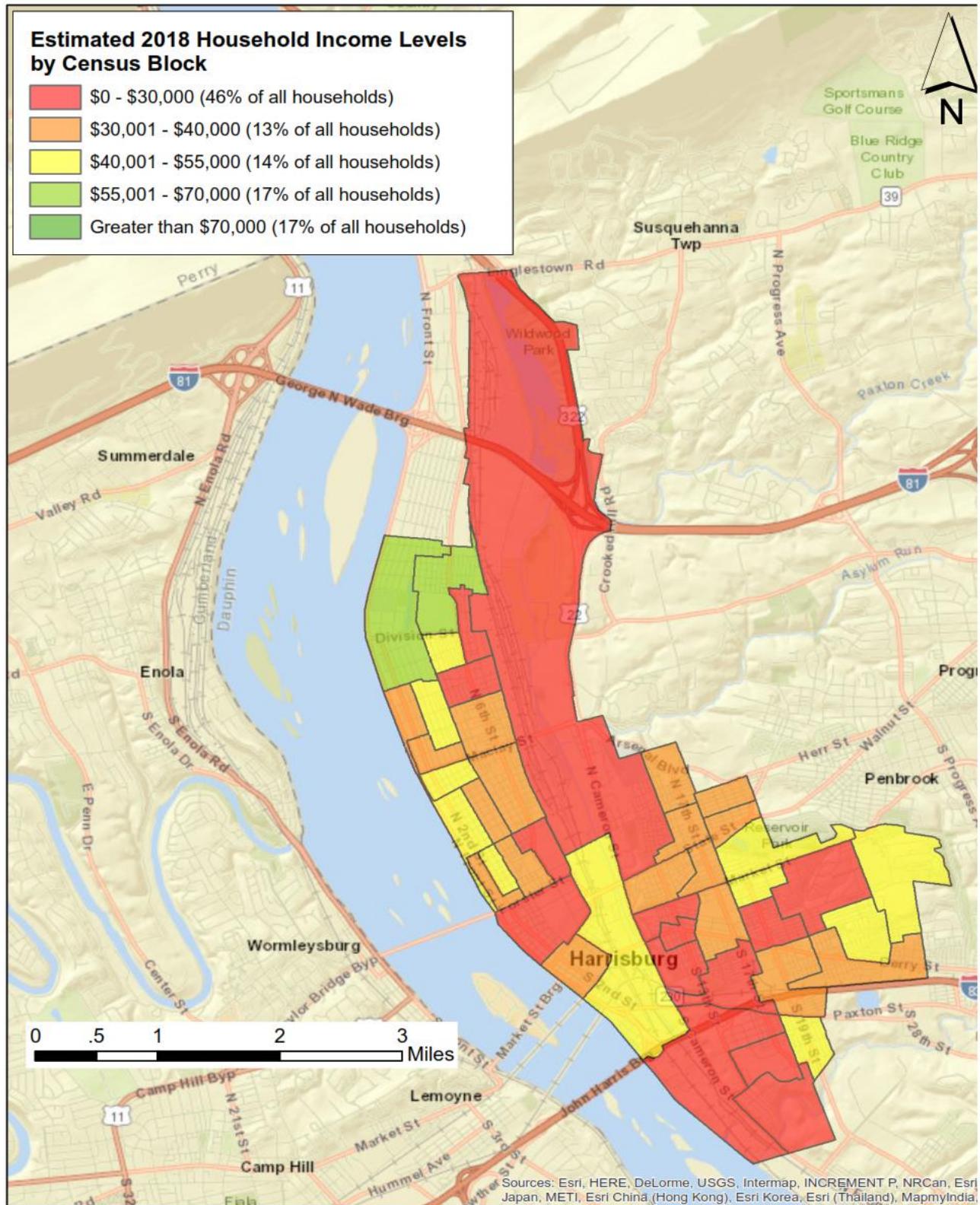


Figure 7-6: Estimated 2018 Income Levels by Census Block for the City of Harrisburg

7.5.5.4 Renter and Owner-Occupied Household

The proportion of renter and owner-occupied housing units for the City of Harrisburg and the Commonwealth of Pennsylvania are shown in **Figure 7-7**. As shown in the figure, there are significantly more renter-occupied households within the City on a percentage basis (62%), as compared to the Commonwealth of Pennsylvania (31%). The evaluation of income distributions across renter- and owner-occupied households show that renter-occupied households tend to have lower incomes. The weighted MHI in 2015 was estimated to be \$33,202 for renter-occupied households within the City of Harrisburg and \$58,626, or approximately 76.6 percent higher, for owner-occupied households.

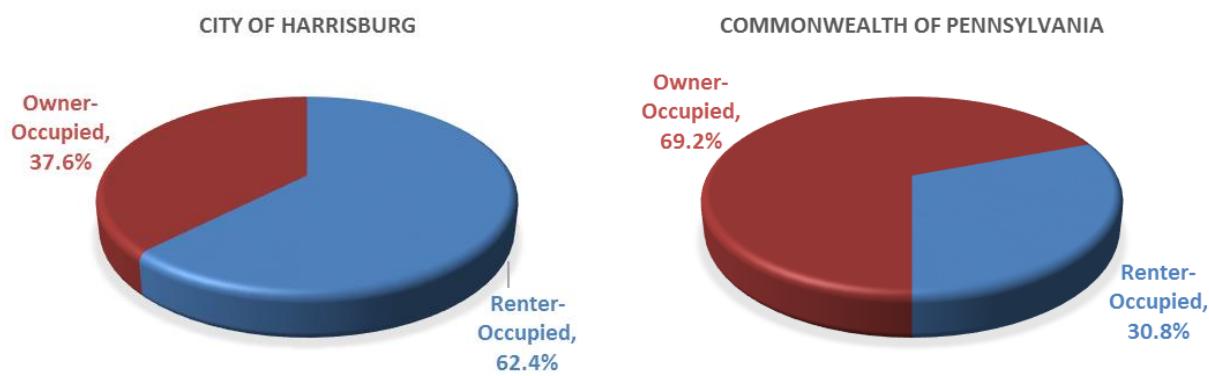


Figure 7-7: Proportion of Renter and Owner-Occupied Housing in the City of Harrisburg and Commonwealth of Pennsylvania

7.5.6 Housing Burden

The housing burden is defined as housing cost as a percentage of household income, and is another factor to consider when assessing financial capability and affordability because it reflects non-discretionary household spending. In other words, households with high housing costs as a percentage of income have fewer funds to spend on other necessary expenses. Typically, households with lower incomes are more likely to be burdened with high housing costs relative to their income level.

The housing burden for the City of Harrisburg for owner- and renter-occupied households with incomes less than \$35,000 per year is shown in **Figures 7-8** and **7-9**, respectively. As shown in Figure 7-8, approximately 69 percent of owner-occupied housing units earning less than \$35,000 per year have a housing burden at or above 30 percent of their annual household income. These housing units comprise approximately one-third of all owner-occupied housing units within the City. As shown in Figure 7-9, 78 percent of all renter-occupied housing units with household incomes less than \$35,000 per year have a housing burden at or above 30 percent of their annual household income. These housing units represent approximately 62 percent of all renter-occupied housing units within the City. The results further demonstrate that low income customers within the City have very limited resources to pay for essential services, such as water and wastewater services.

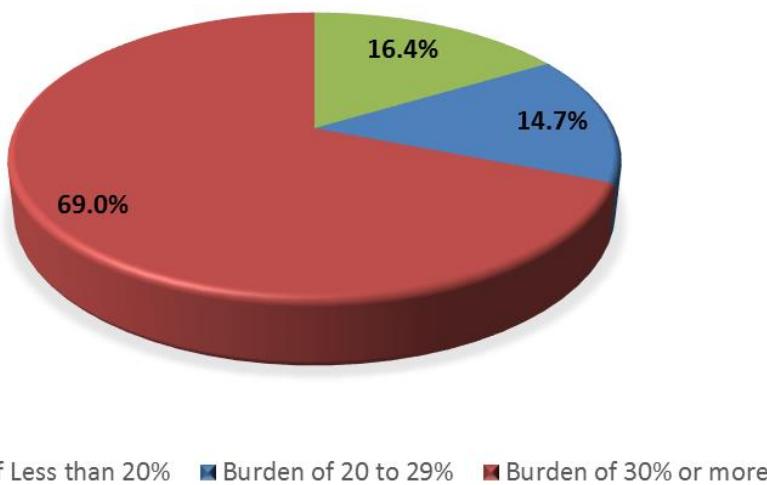


Figure 7-8: Housing Burden for Owner-Occupied Households in the City of Harrisburg (Incomes Less than \$35,000 per Year)

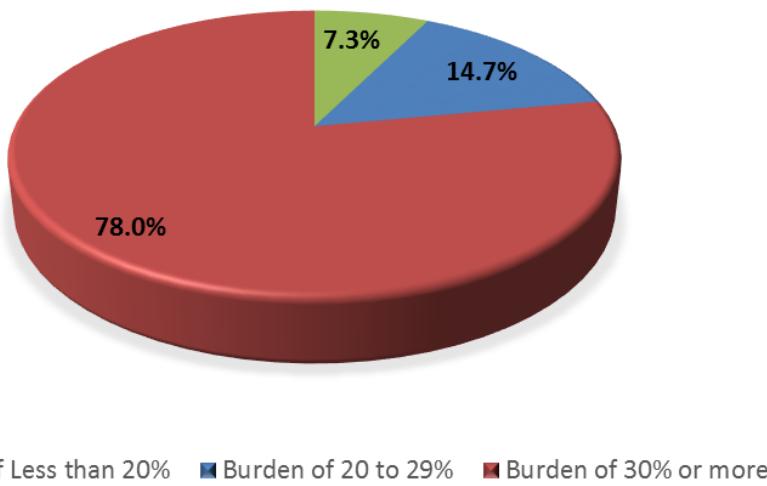


Figure 7-9: Housing Burden for Renter-Occupied Households in the City of Harrisburg (Incomes Less than \$35,000 per Year)

7.5.7 Other Economic Indicators

The combined cost of utility services, including both water and wastewater service, is important to consider when assessing financial capability and affordability because both represent non-discretionary household expenses. Therefore, the annual water and wastewater bills for a typical residential customer within the City were compared to the City's MHI. This comparison was also made for various income categories and federal poverty level income thresholds. The current estimated annual water and wastewater bill (FY 2018) assuming 4,000 gallons of billed consumption per month, and a 5/8-inch residential meter is \$544 per year for water and \$336 per year for wastewater.

7.5.7.1 Typical Bill as a Percentage of Federal Poverty Threshold Incomes

Reviewing the typical utility bills as a percentage of poverty level income also provides insight into the number of people currently facing unaffordable water and wastewater bills. As discussed earlier in this chapter, poverty thresholds vary by size of the household. Therefore, to complete this analysis, water consumption per person was assumed to be approximately 80 gallons per day, which corresponds to an average consumption of 22,727 gallons per year for the average customer with a one-person household, and up to 181,818 gallons per year for the average customer with 8 people per household.

As shown in **Table 7-13**, the wastewater bill as a percentage of poverty level income for various household sizes ranges from 0.8 percent to 2.7 percent. Similarly, the combined bill for water and wastewater as a percentage of poverty level income for various household sizes ranges from 2.0 percent to 7.0 percent. These results indicate that for those customers that are at or below the poverty threshold, a significant portion of household income is required to pay for water and wastewater service.

Table 7-13: Water and Wastewater Bill as a Percentage of Federal Poverty Threshold Incomes

Household Size	Poverty Threshold	Assumed Annual Usage	Wastewater Bill as a Percentage of Income	Combined Bill as a Percentage of Income
1	\$12,486	22,727	2.7%	7.0%
2	\$16,072	45,455	2.1%	5.5%
3	\$18,774	68,182	1.8%	4.7%
4	\$25,160	90,909	1.3%	3.5%
5	\$29,854	113,636	1.1%	2.9%
6	\$34,337	136,364	1.0%	2.6%
7	\$39,509	159,091	0.9%	2.2%
8	\$44,188	181,818	0.8%	2.0%

7.6 US-EPA Financial Capability Assessment

A financial capability assessment was completed in accordance with the February 1997 US-EPA guidance document – “CSO Guidance for Financial Capability Assessment and Schedule Development”. In this section, the methodology and results of the financial capability assessment for CRW’s wastewater CIP and Program Plan are presented for customers located within the City of Harrisburg. The analysis was completed to assess the residential cost as a percentage of income when capital costs that are needed to address known aging infrastructure issues are implemented, and to assess the remaining amount of capital expenditures that could be included in the Program Plan that would allow the Residential Indicator to remain at or just below 2.0 percent, or the US-EPA’s defined criteria for its “High” financial impact range.

7.6.1 Financial Capability Assessment

7.6.1.1 Residential Indicator (City)

The Residential Indicator (residential cost as a percentage of MHI) was calculated by first determining the total cost of wastewater treatment (WWT) for customers located within the City of Harrisburg. The portion of wastewater treatment and conveyance costs recoverable from CRW's suburban wholesale customers was deducted from the total WWT cost to arrive at the City's portion. A portion of the total City cost was then allocated to residential customers based on the percentage of total flow generated from these customers. Finally, the total residential cost was allocated among the total number of households in the community to determine the wastewater treatment cost per household (CPH), including Program Plan costs. Once the CPH was estimated, the Residential Indicator was calculated by dividing the CPH by the MHI of the City. The calculated Residential Indicator was then compared to the US-EPA defined criteria for classifying the financial impacts as "Low," "Mid-range" or "High" as shown in **Table 7-14**.

Table 7-14: US-EPA Residential Indicator Financial Impacts

Financial Impact	Residential Indicator (Cost as a Percent of MHI)
Low	Less than 1.0 percent
Mid-Range	1.0 percent to 2.0 percent
High	Greater than 2.0 percent

7.6.1.1.1 Worksheet 1: Cost Per Household

Worksheet 1 develops the cost per residential household served by the City. The US-EPA defines current wastewater treatment costs as the current annual O&M expenses (excluding depreciation) plus current annual debt service payments (principal and interest). These costs are intended to represent the cash expenditures of current wastewater treatment, conveyance, and collection system operations. Lines 100 and 101 show the current FY 2018 O&M and debt service cost for CRW. These amounts were then prorated to subtract the portion of the costs that are currently allocated to suburban wholesale customers.

Line 103 shows the amount of total future capital costs that could be incurred by CRW to address aging infrastructure and for implementation of the City Beautiful H₂O plan while keeping the Residential Indicator from exceeding 2.0 percent. The projected costs include the portion of the costs that are anticipated to be allocated to suburban wholesale customers. However, as noted above, due to limited nature of the wholesale wastewater service provided to the suburban customers, CRW is not able to pass on a large portion of its Program Plan-related costs to these communities. The City's residential share of the total current and projected costs was then estimated based on an analysis of billed volume and CRW's cost of service and rate-setting policies. The cost per household was then calculated by dividing the City customer's residential share of the costs by the number households within the City. A summary of this calculation is provided in **Table 7-15**.

Table 7-15: Worksheet 1: Cost Per Household

Description		Amount	EPA Line No.
Current WWT Costs:			
Annual Operations and Maintenance Expenses		\$12,311,253	100
Annual Debt Service (Principal and Interest)		<u>\$4,819,817</u>	101
Total Current WWT Costs		\$17,131,069	102
Total Current WWTP Costs (City Share)	58.3%	\$9,989,082	
Projected WWT and CSO Costs:			
Estimated Annual Operating and Maintenance Expenses		\$1,998,704	103
Projected Capital Cost (Amount needed to reach high burden)	\$184,800,000		
Annual Debt Service (Principal and Interest)		<u>\$13,983,371</u>	104
Total Projected WWT and CSO Costs		\$15,982,075	105
Total Projected WWT and CSO Costs (City Share)	74.5%	\$11,903,819	
Total Current and Projected WWT and CSO Costs (City Share)		\$21,892,901	106
Residential Share of WWT and CSO Costs	48.1%	\$10,533,412	107
Total Number of City Households		15,218	108
Cost per Household		\$692	109

7.6.1.1.2 Worksheet 2: Residential Indicator (City)

The Residential Indicator for the City was calculated by dividing the cost per household by the MHI. Multiple statistical sources were evaluated for MHI data for the City. The MHI was adjusted to 2018 dollars and the Residential Indicator was then calculated by dividing the Cost Per Household by the adjusted MHI for the City. A summary of these calculations is provided in **Table 7-16**.

Table 7-16: Worksheet 2: Residential Indicator

Description	Amount	EPA Line No.
MHI Census Year	2015	201
MHI Adjustment Factor	1.040	202
Adjusted MHI	\$34,604	203
Annual WWT and CSO Control Cost per Household	\$692	204
Residential Indicator:		
Cost per Household as a Percentage of Household Income	2.0%	205

The Residential Indicator was compared to the US-EPA financial impact ranges shown in Table 7-14 provided in the US-EPA guidance document to assess the financial impact that wastewater treatment and Program Plan costs may have on the community's residential customers. Based on the results of the analysis, a capital program of approximately \$185 million in 2017 dollars was determined to be the maximum amount capital spend that could be incorporated into the analysis, while keeping the Residential Indicator at or below the "High" financial impact threshold of 2.0 percent.

The projected capital costs included in Worksheet 1 (Table 7-15) totaling approximately \$185 million includes both direct Program Plan costs, and other capital needs of the wastewater system to address aging infrastructure and asset replacement needs. These other non-Program Plan related capital costs to address aging infrastructure total approximately \$120 million (in 2017 dollars) and are planned to be implemented over the next 10 years. Additional capital expenditures to address aging infrastructure are anticipated to be needed beyond the 10-year period. Therefore, even without the Program Plan-related costs, the Residential Indicator is expected to increase to 1.67 due to implementing capital projects to address aging infrastructure, leaving a capacity of only approximately \$65 million (in 2017 dollars) for Program Plan-related costs until the Residential Indicator reaches 2.0 corresponding to "High" financial impact.

7.6.1.2 Community Financial Capability Indicators (City)

The second phase of the US-EPA FCA is intended to assess the financial capability of the community. There are three general categories of measures used to assess the community financial capability: (1) debt indicators, (2) socioeconomic indicators, and (3) financial management indicators. However, three of the six community financial capability measures (overall net debt as a percentage of full market property value, property tax revenues as a percentage of full market property values, and the property tax collection rate) focus on General Fund government bond rating criteria and have little relevance to CRW, as it is a Municipal Authority separate from the City government and has no legal authority to establish or levy property tax assessments, and also cannot issue General Obligation bonds. While presented below for the City of Harrisburg, these factors, which all reflect weak scores, have less relevance to CRW.

The US-EPA has established guidelines for interpreting these indicators and their associated impact on the overall financial capability, and these guidelines are provided below.

7.6.1.2.1 Debt Indicators

Debt indicators assess the current debt burden of the community and its ability to issue additional debt to finance the planned future wastewater treatment and Program Plan projects. The indicators include bond rating and the overall net debt as a percentage of full market property value.

Worksheet 3: Bond Rating

Bond credit ratings measure a community's credit worthiness, and are assessed by one or more of the three major rating agencies. CRW received a rating on its Series 2017 Sewer System Revenue Bonds, dated May 18, 2017 from Standard & Poor's of "A+". CRW's credit rating of A+ from Standard & Poor's places it in the "Strong" category of US-EPA's indicator ranges.

Worksheet 4: Net Debt as a Percentage of Full Market Value of Taxable Property

Net debt as a percentage of the full market value of taxable property compares the level of debt with the full market value of the real property used to support that debt. The US-EPA defines overall net debt as debt repaid by property taxes. It includes the debt issued directly by the municipality as well as debt of overlapping entities, such as school districts. It excludes debt that is repaid by special user fees (e.g., revenue debt). This measure considers the debt burden on residents within the service area and the ability of the municipality to issue additional debt. Financial information for the City was used for this section of the analysis, since CRW does not have taxing authority. A summary of this measure is provided in **Table 7-17**.

Table 7-17: Worksheet 4: Overall Net Debt as a Percentage of Full Market Property Value

Description	Amount
Overall Net Debt	\$294,905,302
Market Value of Property	\$1,586,229,000
Ratio	18.6%

As shown in the table, the City's overall net debt as a percentage of the full market value of property is extremely high at 18.6 percent. This results in the City being in the "Weak" category, based on US-EPA indicator ranges shown in **Table 7-18**.

Table 7-18: US-EPA Indicator Ranges for Overall Net Debt as a Percentage of Full Market Property Value

Rating	Ratio
Weak	Above 5 percent
Mid-Range	2 percent to 5 percent
Strong	Below 2 percent

7.6.1.2.2 Socioeconomic Indicators

Socioeconomic indicators are indicators of the economic well-being of residential customers. They offer additional insight into the economic conditions within the City. According to the US-EPA guidance document, two socioeconomic indicators to be considered are the (1) unemployment rate and (2) MHI. A more extensive discussion of the socioeconomic conditions of CRW's service area and its customers was provided previously.

Worksheet 5: Unemployment Rates

Unemployment rate (percent of service area residents who are on the unemployment rolls) for the City was compared to the national average unemployment rate, as shown in **Table 7-19**. The unemployment rate statistics show that the City's unemployment rate is high and currently well above the national average. A comparison of the City's unemployment rate with the national average places the City in the "Weak" range for this measure based on the US-EPA indicator ranges shown in **Table 7-20**.

Table 7-19: Worksheet 5: Unemployment Rates (2016)

Description	Percentage
City	14.3%
National (U.S.)	4.9%
Difference	9.4%

Table 7-20: US-EPA Indicator Ranges for the Unemployment Rate

Rating	Ratio
Weak	More than 1 percent above National Average
Mid-Range	+/- 1 percent of National Average
Strong	More than 1 percent below National Average

Worksheet 6: Median Household Income

The MHI for the City as compared to the national average MHI is shown in **Table 7-21**.

Table 7-21: Worksheet 6: Median Household Income

Description	MHI (2015)	Adjusted MHI (2018)
City of Harrisburg	\$33,289	\$34,604
National MHI (2015)	\$55,775	\$57,979
Percentage Below Adjusted National Average		-40.3%

The US-EPA has established indicator ranges for variation between national and permittee MHI in the financial capability assessment. Based on these ranges, which are shown in **Table 7-22**, the City of Harrisburg's adjusted 2018 MHI of \$34,604, as compared to the adjusted 2018 national MHI of \$57,979, places the City in the "Weak" range, well below the threshold for this rating category.

Table 7-22: US-EPA Indicator Ranges for MHI

Rating	Ratio
Weak	More than 25 percent below National Average
Mid-Range	Within 25 percent of National Average
Strong	More than 25 percent above National Average

7.6.1.2.3 Financial Management Indicators (City)

The financial management indicators included in the US-EPA FCA are: (1) property tax revenues as a percent of full market property value and (2) property tax revenue collection rate. These financial management indicators are presented for the City of Harrisburg since CRW does not collect property taxes.

Worksheet 7: Property Tax Revenues as a Percent of Full Market Property Value

This indicator is referred to as the “property tax burden” since it indicates the funding capacity available to support debt based on the wealth of the service area. Property tax revenues as a percent of full market property value measures the capacity of the community to support additional debt. In other words, this figure estimates the ability of the local government to levy increased property taxes to fund additional borrowings. Financial information from the City was used for this measure since CRW does not have taxing authority. Also, the value for the full market value of real property excludes the value of tax-exempt properties within the City, and property tax revenues include revenues from overlapping entities (County and School District property taxes).

Table 7-23: Worksheet 7: Property Tax Revenues as a Percentage of Full Market Property Value

Description	Amount
Full Market Value of Real Property	\$1,586,229,000
Property Tax Revenues	\$73,271,394
Ratio	4.6%

As shown in the table, the City’s property tax revenues comprise 4.6 percent of its taxable full market property value. The US-EPA has established the following indicator ranges for property tax revenues as a percentage of full market property value in the financial capability assessment. According to **Table 7-24**, the City falls in the “Weak” category for this measure.

Table 7-24: Property Tax Revenues as a Percentage of Full Market Property Value

Rating	Ratio
Weak	Above 4 percent
Mid-Range	2 percent to 4 percent
Strong	Below 2 percent

Worksheet 8: Property Tax Revenue Collection Rate

The property tax revenue collection rate reveals inefficiencies in the tax collection system by reporting the difference between the levied tax amount and the collected tax amount. The collected tax revenue for the City in FY 2016, excluding overlapping tax revenue, are shown in **Table 7-25**.

Table 7-25: Worksheet 8: Property Tax Revenue Collection Rate

Description	Amount
Property Tax Revenue Collected	\$15,375,462
Property Tax Levied	\$17,515,445
Property Tax Collection Rate	87.8%

As shown in the table, the City's property tax collection rate is 87.8 percent. The US-EPA has established the following indicator ranges for the property tax revenue collection rate in the financial capability assessment. According to **Table 7-26**, the City falls in the "Weak" category for this measure.

Table 7-26: Property Tax Revenue Collection Rate Benchmarks

Rating	Ratio
Weak	Below 94%
Mid-Range	94% to 98%
Strong	Greater than 98%

7.6.1.2.4 Worksheet 9: Summary of Results of System Financial Capability Indicators (City)

Based on this analysis, an overall Financial Capability Indicator score of 1.3 was calculated, which corresponds to a "Weak" Financial Capability Indicator rating based on the US-EPA methodology. The following table summarizes the financial indicators, the rating associated with each indicator and the City's score for each indicator. The average score for all indicators is used to determine the overall indicator score.

Table 7-27: Worksheet 9: Financial Capability Indicator Score

Indicator	Actual Value	Rating	Score
Bond Rating (CRW)	A+	Strong	3
*Overall Net Debt as a Percentage of Full Market Value	18.6%	Weak	1
Unemployment Rate	14.3%	Weak	1
Adjusted Median Household Income	\$34,604	Weak	1
*Property Tax Revenues as a Percentage of Full Market Property Value	4.6%	Weak	1
*Property Tax Revenue Collection Rate	87.8%	Weak	1
Overall Financial Capability Indicator Score			1.3

* Indicators that are less relevant to a municipal authority, such as CRW, which does not have taxing authority.

7.6.1.3 Worksheet 10: The Financial Capability Matrix (City)

Using the US-EPA methodology, the results of the Residential Indicator and the Financial Capability Indicator assessments were combined into a Financial Capability Matrix to evaluate the level of financial burden that WWT and Program Plan costs would impose on CRW and the City of Harrisburg. According to in the 1997 CSO Guidance Document, the stated purpose of the matrix was to assist the utility and regulatory agencies in establishing a Program Plan implementation schedule. The Financial Capability is shown in **Table 7-28**.

Table 7-28: Worksheet 10: Financial Capability Matrix Score

Financial Capability Indicators Score	Residential Indicator (Cost per Household as a Percent of MHI)		
	Low – Less than 1.0%	Mid-Range – 1.0% to 2.0%	High – Greater than 2.0%
Weak – Below 1.5	Medium Burden	High Burden	High Burden
Mid-Range (1.5 to 2.5)	Low Burden	Medium Burden	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

Based on a “High” financial impact Residential Indicator of 2.0 percent and a “High” Financial Capability Indicator score of 1.3, the financial capability matrix score for CRW and the City was classified as “High Burden”.

7.7 Long-Term Financial Projections and Rate Impacts

The US-EPA 1997 Guidance provides a “snapshot” of financial capability for a utility, but this method is limited in its ability to account for the impact that the program costs will have on overall affordability. Further, the US-EPA financial capability assessment guidance document allows consideration of unique circumstances and conditions. To present a more comprehensive picture of the City’s financial capability and customer affordability, a comprehensive long-term financial planning and affordability model was prepared that is based on the model that CRW uses to evaluate budgets and set wastewater rates. Based on this analysis, projections of the average annual residential wastewater and stormwater bills for City retail customers were calculated in each year of the program.

The following discussion provides a summary of the methodology, key assumptions, and inputs used to develop the long-term financial planning and affordability model, followed by the resulting forecast for CRW’s recommended capital plan.

7.7.1 Key Assumptions

The following key assumptions were incorporated into the financial projection. It should be noted that any changes in these assumptions could have a material effect on the findings included as part of this section of the Program Plan.

7.7.1.1 Wastewater and Stormwater Revenues

The revenues from wastewater user charges comprise the majority of revenue used to recover the costs of CRW's wastewater operations. Annual growth in the volume of billed flows applicable to the retail wastewater volumetric rate was assumed to be 0.1 percent per year in future years, based on a review of historical changes in retail customer accounts and water consumption per account. Annual growth in the volume of billed flows from suburban wholesale customers was assumed to remain flat in future years, based on a review of historical annual flow volumes from these customers.

Other miscellaneous revenues, such as interest income and miscellaneous fees provide a small portion of the total revenue. As of the date of this report, CRW has not implemented a separate stormwater fee to recover a portion of costs related to stormwater management. However, based on discussions with CRW, it intends to implement a stormwater fee separate from wastewater user charges as early as 2019. Therefore, revenues from implementing a stormwater fee have been included in this analysis and approximately \$5.0 million of annual costs have been assumed to be recovered with stormwater fee revenues, instead of wastewater user charge revenues.

The levels of future revenues from wastewater operations and a new stormwater fee were projected based on the anticipated wastewater and stormwater revenue requirements (described below) and based on meeting CRW's established fiscal management policies. These policies included maintaining unrestricted cash reserves not less than 180 days of O&M expenses, and a debt service coverage ratio of not less than 1.35 times. These policies will help CRW borrow money for capital projects at favorable interest rates and help CRW maintain a relatively strong fiscal condition. CRW's wastewater Trust Indenture requires net revenues (operating revenues minus operating expenses) to be at least 120 percent of the annual debt service attributable to all outstanding senior lien debt. In addition, the covenant requires a minimum debt service coverage requirement of 100 percent on all outstanding subordinate lien debt.

7.7.1.2 Wastewater and Stormwater Revenue Requirements

The wastewater and stormwater rate revenue requirements consist of the revenues required to operate and maintain both the wastewater and stormwater systems, consisting of the amounts needed to cover O&M expenses and capital expenditures, including debt service payments. CRW's wastewater and stormwater systems O&M expenses are comprised of salaries and wages, benefits, insurance, electricity, chemicals, legal costs, and other expenses. The projection of these expenses over the forecast period were based on their FY 2018 budgeted amounts and certain cost escalation assumptions which were developed in part with discussions with CRW management. The escalation assumptions are shown in **Table 7-29**.

It is anticipated that additional, or incremental, O&M expenses would be incurred in future years as a result of implementing the City Beautiful H₂O program. The financial forecast includes incremental O&M expenses equal to 2.0 percent of the cost of planned green infrastructure projects. Furthermore, additional incremental O&M expenses were incorporated into the forecast to reflect the addition of an environmental compliance coordinator, collection and interceptor system inspection and cleaning, and neighborhood plan and concept development, which totaled approximately \$900,000 per year.

Table 7-29: Expense Category Cost Escalation Rates

Expense Category	2018-2022	2023-2032	2033-2047
Salaries and Wages	3.5%	3.5%	3.5%
Benefits	6.0%	4.0%	4.0%
Insurance	3.0%	3.0%	3.0%
Electricity	3.1%	3.1%	3.1%
Chemicals	4.0%	3.0%	3.0%
Water	5.1%	4.1%	4.1%
Other Expenses	2.8%	3.0%	3.0%

The annual capital expenditures associated with City Beautiful H₂O and other wastewater and stormwater capital needs were included in the affordability model at a level that would keep the annual combined residential wastewater and stormwater bill for City residents at or below 2.0 percent of the projected MHI for the City. CRW anticipates paying for the planned capital expenditures with a combination of long-term debt and current revenues from wastewater user charges. Approximately 50 percent of the total capital project costs over the long-term forecast period was assumed to be funded with long-term debt, and the remaining was assumed to be funded with current revenues on a pay-as-you-go basis. This level of cash funding of the capital program was required for CRW to meet its debt service coverage ratio targets and to keep CRW's debt burden at manageable levels. Further, CRW anticipates utilizing the state revolving loan fund program, administered through PENNVEST, to the maximum extent possible. However, to reflect the likelihood that CRW will not be able to fund all eligible projects through PENNVEST loans, blended debt financing assumptions were used in the long-term financial forecast. Debt service was calculated on future debt issues assuming the following financing terms:

- Interest Rate: 5.5 percent per year
- Term: 25 years
- Debt Issuance Cost: 1.5 percent of the amount of borrowed funds

The long-term forecast includes debt service payments on existing debt in addition to new debt service that would result from financing future capital projects.

7.7.2 Capital Expenditures and Rate Impacts

The long-term financial projection and affordability model results are presented in Table 7-31 for the 20-year period from 2018 to 2037. As shown in the table, it is anticipated that CRW can potentially include a total of \$315 million (escalated), or \$253 million (in 2017 dollars) in capital expenditures in its long-term 20-year financial plan, while keeping the annual combined residential wastewater and stormwater cost as a percentage of MHI for City customers at or below the 2.0 percent threshold, while also satisfying its cash and debt service coverage

requirements, and keeping its debt burden at manageable levels. Of the \$315 million, approximately \$214 million is anticipated to be needed to address aging infrastructure issues. Therefore no more than approximately \$101 million for direct Program Plan-related projects will be available over the period.

Furthermore, as shown in the summary in **Table 7-30** and in **Table 7-31**, the amount of capital expenditures projected within the first ten years of the plan (totaling \$225 million) is much more significant than in the remaining ten years (totaling \$90 million) of the 20-year period. As a result, the financial plan indicates that significant wastewater rate increases will be needed over the first ten years of the plan. For example, including the 7.1 percent rate increase that was adopted by CRW in 2017 for 2018, cumulative increases in retail wastewater rates of 106.7 percent were forecasted to be required from 2018 to 2027, while cumulative retail rate increases of only 43.7 percent were forecasted to be required from 2028 to 2037. It should be noted that after 2027, the residential bill as a percentage of MHI approaches 2.0 percent and remains at this level throughout the remaining portion of the 20-year forecast period (2028 to 2037).

Table 7-30: Summary of Projected R&R and Program Plan Capital Expenditures (escalated)

Projected Type	Years 1-10	Years 11-20	Total
Rehabilitation & Replacement	\$164,700,000	\$49,200,000	\$213,900,000
Wet Weather Control	\$60,200,000	\$41,100,000	\$101,300,000
Total	\$224,900,000	\$90,300,000	\$315,200,000

Note: Amounts escalated to future dollars.

While the capital costs included in the long-term financial plan and affordability model were structured and scheduled to allow for the total annual wastewater and stormwater bill for a typical residential customer to be maintained at or below the 2.0 percent threshold, it is anticipated that the annual bill amount for these services will far exceed 2.0 percent for some City customers in future years. For example, the typical annual residential wastewater and stormwater bill as a percentage of average census block income projected for FY 2027 is shown at the census block group level in **Figure 7-10**.

The projected annual wastewater and stormwater bills in this year reflect the annual rate adjustments shown in Table 7-31. As shown in Figure 7-10, the annual bill as a percentage of income for some census blocks within the City were anticipated to exceed 2.0 in many areas, with several areas being expected to exceed 3.0 percent. This indicates that the increases in retail wastewater and stormwater bills from implementing capital investments in the system would result in significant economic hardship for certain residential customers within the City.

Table 7-31: Long Term Financial Plan and Affordability Projection

Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	2034	2035	2036	2037	
Capital Project Funding (in Future \$s)	\$18	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037					
Annual Wastewater (WW) CIP (\$millions)	\$34	\$19	\$15	\$18	\$21	\$17	\$23	\$25	\$16	\$7	\$5	\$5	\$5	\$5	\$4	\$4	\$4	\$4	\$4	\$4	\$4	\$4	\$4	\$4	
Cumulative WW CIP (\$ millions)	\$34	\$53	\$68	\$86	\$107	\$123	\$146	\$171	\$188	\$194	\$200	\$205	\$211	\$216	\$220	\$224	\$228	\$231	\$235	\$239					
Annual Stormwater (SW) CIP (\$millions)	\$0	\$3	\$3	\$3	\$3	\$3	\$3	\$3	\$4	\$4	\$4	\$4	\$4	\$4	\$4	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5	
Cumulative SW CIP (\$millions)	\$0	\$3	\$6	\$9	\$13	\$16	\$20	\$23	\$27	\$31	\$35	\$39	\$43	\$47	\$52	\$56	\$61	\$66	\$71	\$76					
Total Cumulative WW and SW CIP (\$millions)	\$34	\$56	\$74	\$95	\$119	\$139	\$165	\$194	\$214	\$225	\$234	\$244	\$253	\$263	\$272	\$280	\$288	\$297	\$306	\$315					
Capital Financing - WW																									
Debt (\$ millions)	\$5	\$12	\$7	\$10	\$13	\$9	\$15	\$17	\$17	\$18	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19	\$19
Cash (\$ millions)	\$26	\$7	\$7	\$7	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8
Grants (\$ millions)	\$2	\$1	\$1	\$1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Debt Service (DS) Coverage (All-in)	1.59	2.05	2.02	1.89	2.03	1.90	1.64	1.55	1.38	1.37	1.49	1.48	1.38	1.36	1.36	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.45	1.45
Cash Reserves (Days of Op&M)	633	655	613	549	545	531	451	373	255	184	205	229	193	181	181	180	182	182	181	183	182				
Total WW Annual Budget (\$ millions)	\$24	\$24	\$25	\$27	\$28	\$30	\$32	\$34	\$36	\$35	\$33	\$34	\$36	\$35	\$35	\$35	\$35	\$36	\$37	\$38	\$38	\$38	\$38	\$38	\$38
Debt Service (DS) (\$ millions)	\$5	\$6	\$6	\$7	\$8	\$9	\$10	\$11	\$11	\$11	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12	\$12
DS as % of Total Budget	20.4%	24.2%	25.0%	26.6%	28.7%	29.7%	31.4%	33.3%	33.6%	34.6%	34.6%	36.4%	34.1%	34.8%	34.7%	34.0%	33.4%	33.2%	29.5%	28.8%					
Rate Increase - Wastewater (WW) City	7.1%	10.0%	10.0%	10.0%	10.0%	8.0%	7.0%	6.0%	5.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Cumulative Rate Increase SW City	7.1%	17.1%	28.1%	40.2%	53.5%	65.2%	76.3%	86.4%	97.2%	106.7%	110.7%	114.8%	118.9%	123.1%	127.5%	131.9%	136.4%	141.0%	145.6%	150.4%					
Annual City Residential WW Bill (\$0.000/gal/mo)	\$326	\$469	\$406	\$447	\$491	\$521	\$568	\$602	\$638	\$670	\$683	\$697	\$711	\$725	\$739	\$754	\$769	\$785	\$800	\$816					
Rate Increase - Stormwater (SW) City	0.0%	3.0%	3.0%	9.1%	12.3%	15.6%	18.9%	22.4%	26.0%	29.7%	33.5%	37.4%	41.4%	45.6%	49.9%	54.3%	58.3%	63.5%	68.3%						
Cumulative Rate Increase SW City	0.0%	3.0%	6.0%	9.1%	12.3%	15.6%	18.9%	22.4%	26.0%	29.7%	33.5%	37.4%	41.4%	45.6%	49.9%	54.3%	58.3%	63.5%	68.3%						
Annual City Residential SW Bill	\$0	\$93	\$95	\$98	\$101	\$104	\$107	\$111	\$114	\$117	\$121	\$124	\$128	\$132	\$136	\$140	\$144	\$149	\$153	\$158					
Total WW and SW City Residential Bill	\$336	\$462	\$501	\$592	\$635	\$675	\$712	\$752	\$787	\$804	\$821	\$839	\$857	\$875	\$894	\$914	\$933	\$953	\$974						
Median Household Income (MHI) City	\$34,604	\$35,054	\$35,510	\$35,971	\$36,439	\$37,077	\$37,726	\$38,386	\$39,058	\$39,741	\$40,536	\$41,347	\$42,173	\$43,017	\$43,877	\$44,755	\$45,650	\$46,553	\$47,494	\$48,444					
Lowest Quintile (LQ) Household Income (Hi) City	\$13,207	\$13,379	\$13,553	\$13,729	\$14,151	\$14,907	\$14,398	\$14,650	\$14,907	\$15,167	\$15,471	\$15,780	\$16,096	\$16,418	\$16,746	\$17,081	\$17,423	\$17,771	\$18,127	\$18,489					
Annual WW & SW Bill as % of MHI (City)	1.0%	1.3%	1.4%	1.5%	1.6%	1.7%	1.8%	1.9%	1.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%					
Annual WW & SW Bill as % of LQ HI (City)	2.5%	3.5%	3.7%	4.0%	4.3%	4.5%	4.7%	4.9%	5.0%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.3%	5.3%					

Note: Annual WW & SW bills as a % of MHI (City) equaling the high-burden threshold of 2.0 percent have been highlighted in Red.

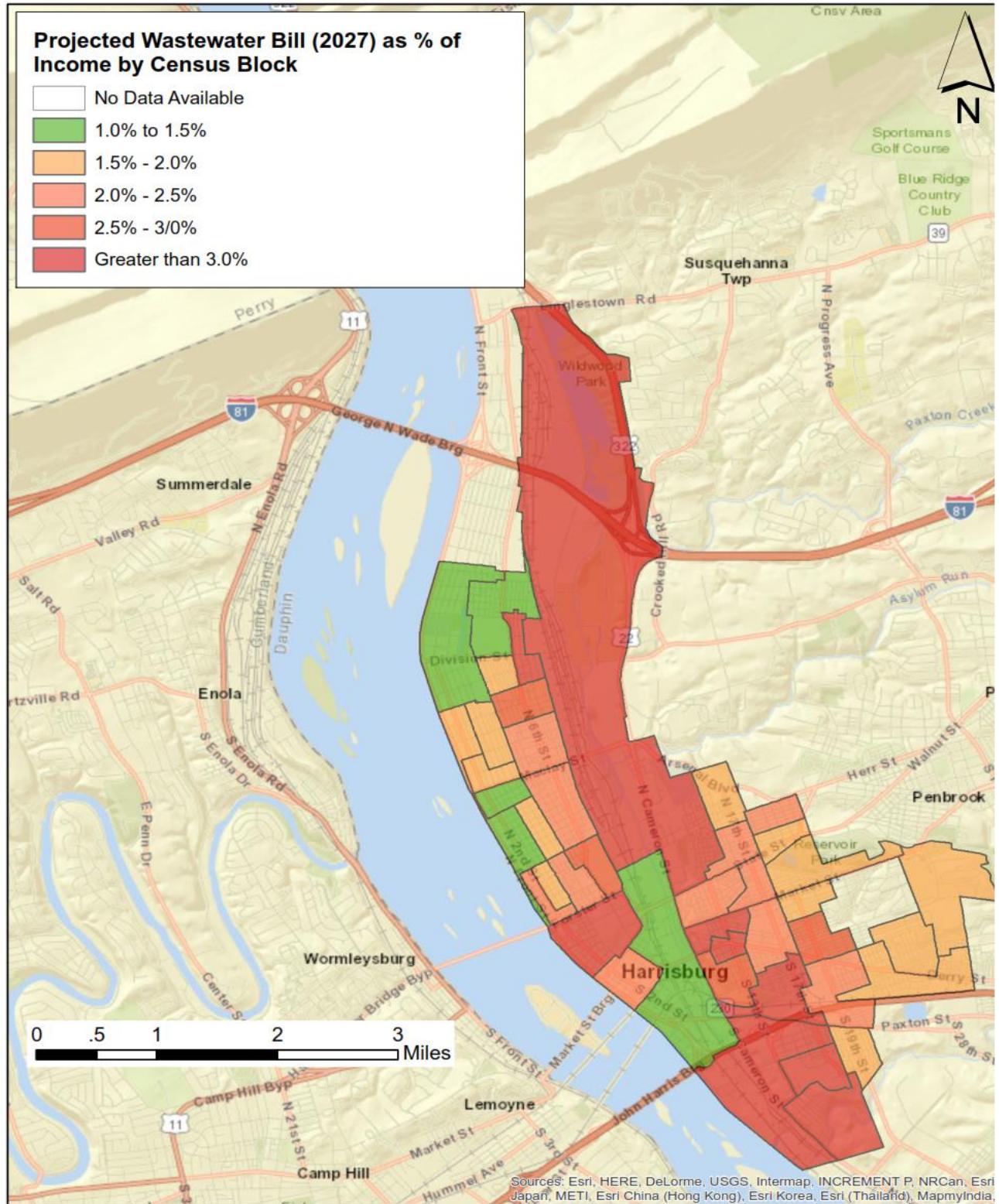


Figure 7-10: Distribution of Future Residential Wastewater and Stormwater Bill as Percentage of MHI (2027)

7.8 Conclusions

The following are the conclusions of the Financial Capability and Affordability Assessment:

- The City of Harrisburg has experienced significant financial distress for several years, entering state-mandated receivership in 2011. In 2012, the City's debt per capita was among the highest of any city in the U.S. Although the City has since left formal receivership, it continues to be under state oversight through the State of Pennsylvania's Municipalities Financial Recovery Act (No. 47) and concerns remain regarding future economic growth within the area.
- The poverty rate in the City of Harrisburg has ranged between 31.2 and 33.9 percent over the last five years, from 2012 to 2016, with these rates being at least twice the national, state, and county (Dauphin County) poverty levels. Some reasons for the high poverty rates in the City include fewer married-couple households, lower educational attainment, and a high unemployment rate. This level of poverty within the City demonstrates the presence of significant economic hardship.
- The MHI within the City of Harrisburg is significantly lower than national, state, and local MHI levels. For example, in 2015, the MHI in the City was \$33,289, which was more than \$20,000 less than the national, state, and local (Dauphin County) MHI's in the same year. Furthermore, the MHI of CRW's service area was \$52,732 in 2015, which is approximately 58.4 percent higher than in the City of Harrisburg. This demonstrates that there is a significant disparity in income levels within CRW's service area, with many communities having higher, or in some cases, significantly higher MHI's than the City of Harrisburg.
- To compound the City's already low MHI, households with lower incomes are more likely to be burdened with high housing costs relative to their income level. These households spend a significant proportion of their incomes on housing, and thus have fewer funds to spend on other necessary expenses, such as water and wastewater services. Within the City, 69 percent of owner-occupied housing units earning less than \$35,000 per year have a housing burden at or above 30 percent of their annual household income, with this comprising approximately one-third of all owner-occupied housing units within the City. In addition, 78 percent of all renter-occupied housing units with household incomes less than \$35,000 per year have a housing burden at or above 30 percent of their annual household income, with this comprising approximately 62 percent of all renter-occupied housing units within the City.
- Approximately 25 percent of households within the City currently have annual wastewater bills that exceed 2.0 percent of their income, and approximately 30 percent have combined water and wastewater bills that exceed 4.5 percent of their income. By 2027, it is projected that about half of all households will have annual wastewater bills that exceed 2.0 percent of their incomes, while approximately 45 percent of all households will have annual combined water and wastewater bills that exceed 4.5 percent of their incomes. In addition, roughly 15 percent of all households within the City have annual wastewater bills that are at least 3.4 percent of their household income and combined annual water and wastewater bills that are at least 8.8 percent of their income.

- The FCA analysis using the EPA approach indicated that a capital program of approximately \$185 million in 2017 dollars was the maximum amount capital spend that could be incurred by CRW while keeping the Residential Indicator at the threshold of "High" financial impact. CRW has identified approximately \$120 million in capital costs (in 2017 dollars) needed to be spent to address aging infrastructure issues over the next 10 years. This leaves a capacity of only approximately \$65 million for Program Plan-related costs until the Residential Indicator reaches 2.0 corresponding to "High" financial impact.
- A comprehensive year-by-year, long-term financial plan and affordability model was developed to assess the impact of capital program alternatives on customer bills and CRW's financial position. This model indicates that CRW can only include a total of \$315 million (escalated), or \$253 million (in 2017 dollars) in capital expenditures in its long-term 20-year financial plan, while keeping the annual combined residential wastewater and stormwater cost as a percentage of MHI for City customers at or below the 2.0 percent threshold, while also satisfying its cash and debt service coverage requirements, and keeping its debt burden at manageable levels. Of the \$315 million, approximately \$214 million is anticipated to be needed to address aging infrastructure issues over the 20-year period.
- No more than approximately \$101 million for direct Program Plan-related projects will be available over this period. This limitation on capital expenditures will continue for at least 30 years until current and near-term debt necessitated by the near-term capital improvements is paid off.
- While the capital plan included in the long-term financial plan and affordability model was designed to keep total annual City residential customer cost for wastewater and stormwater service at or below 2.0 percent of MHI, it is anticipated that there will be significant and severe affordability issues for some customers within the City, with some customers experiencing wastewater and stormwater costs as a percentage of income exceeding 3.0 percent.
- The jurisdictional scope of this FCA and affordability assessment is pursuant to paragraph V-E (18) of the Consent Decree, which addresses the Harrisburg Sewer System as defined in paragraph IV-8(w). Moreover, CRW is required to allocate costs between the municipalities proportionately to the causes of cost pursuant to its inter-municipal service agreements, the Pennsylvania Municipality Authorities Act and federal regulations. More specifically, since CRW provides only treatment, and in some cases conveyance, services to the suburban communities, and since the suburban municipalities own, operate, and manage their own wastewater collection systems, CRW is unable to pass on a large portion of its Program Plan-related costs to these suburban municipalities. The affordability and financial capability assessment presented above reflects a proportionate allocation of future capital costs between the CRW municipalities.

Given these considerations, CRW should receive the maximum schedule relief possible for implementing its City Beautiful H₂O program. The implementation schedule presented in this report is a reasonable timeline, taking into consideration affordability, concerns in the more vulnerable areas of the CRW's service area, and CRW's maintenance of a secure financial position over the term of the program.

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