Chapter 10 - Capital Improvement Plan

Chapter 10

CAPITAL IMPROVEMENT PLAN

This chapter presents the recommended CIP for the potable water, recycled water, wastewater, and stormwater systems. The proposed CIP presents improvement projects based on the potable water, recycled water, wastewater, and stormwater system evaluations described in Chapters 6, 7, 8 and 9 of this One Water 2050 Plan. The planning horizon of this master plan is year 2050. The CIP is divided into three phases; near-term, mid-term, long-term. The near-term CIP includes projects phased in the years FY2022/FY2023 through FY2029/FY2030, the mid-term CIP includes projects phased in the years FY2030/FY2031 through FY2039/FY2040, and the long-term CIP includes project that are phased in the years FY2040/FY2041 through FY2049/FY2050.

This chapter starts with a summary of the cost-estimating assumptions. Subsequently, the potable water, wastewater, and stormwater CIPs are presented with a summary of recommendations on project prioritization. This chapter is concluded with a combined CIP that presents the total estimated cost of all three systems. A recycled water system was considered as part of Chapter 7; however, it is determined not to be cost effective and thus there is no recycled water CIP.

10.1 Cost Estimating Assumptions

The cost estimates presented in this One Water 2050 Plan are opinions developed from bid tabulations, cost curves, information obtained from previous studies, and Carollo's experience on other similar projects. The costs are based on an *Engineering News Record* Construction Cost Index (ENR CCI) 13212 (Greater LA Index, September 2021). All costs are in 2021 dollars and do not include escalation due to inflation. In 2021, costs have increased significantly due to various social and economic conditions; appropriate adjustments for current conditions will be needed when budgeting for projects.

The construction costs are representative of system facilities under normal construction conditions and schedules. Costs have been estimated for public works construction.

10.1.1 Cost Estimating Accuracy

The cost estimates presented in the CIP have been prepared for general master-planning purposes and for guidance in project evaluation and implementation. Final costs of a project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors such as preliminary alignment generation, investigation of alternative routings, and detailed utility and topography surveys.

The Association for the Advancement of Cost Engineering (AACE) defines an Order-of-Magnitude Estimate, deemed appropriate for master plan studies, as an approximate estimate made without detailed engineering data. It is normally expected that an estimate of this type would be accurate within plus 50 percent to minus 30 percent. This section presents the assumptions used in developing order-of-magnitude cost estimates for the recommended

facilities. As projects proceed into the preliminary design and design stages, estimates are refined when conditions become known.

10.1.2 Capital Cost Development

Capital costs developed for this One Water 2050 Plan are estimated by multiplying the estimated construction cost with various markups. The various cost components used in the development of capital cost estimates are described below.

The cost estimates presented in the CIP have been prepared for general master-planning purposes.

10.1.2.1 Baseline Construction Cost

This is the total estimated construction cost, in dollars, of the proposed improvement projects. Baseline construction costs are calculated by multiplying the estimated number of units by the unit cost, such as length of pipeline times the average cost per lineal foot of pipeline. The majority of unit construction costs used for this One Water 2050 Plan are presented in Section 10.1.3. This category includes both material and labor, and includes typical contractor markups such as insurance, overhead and profit.

10.1.2.2 Estimated Construction Cost

Contingency costs must be reviewed on a case-by-case basis because they will vary considerably with each project. Consequently, it is appropriate to allow for uncertainties associated with the preliminary layout of a project. Such factors as unexpected construction conditions, the need for unforeseen mechanical items, and variations in final quantities are a few of the items that can increase project costs for which it is wise to make allowances in preliminary estimates. To assist the City in making financial decisions for these future construction projects, contingency costs will be added to the planning budget as percentages of the total construction cost, divided into two categories: Estimated Construction Cost and Capital Improvement Cost.

Since knowledge about site-specific conditions of each proposed project is limited at the master-planning stage, a 30-percent contingency is applied to the Baseline Construction Cost to account for unforeseen events and unknown conditions. This contingency accounts for unknown site conditions such as poor soil, unforeseen conditions, environmental mitigations, and other unknowns and is typical for master planning projects. The Estimated Construction Cost for the proposed potable, wastewater, and stormwater system improvements consists of the Baseline Construction Cost plus the 30-percent construction contingency.

10.1.2.3 Capital Improvement Cost

Other project costs include costs associated with engineering, construction-phase professional services, and project administration. Engineering services associated with new facilities include preliminary investigations and reports, right-of-way (ROW) acquisition, foundation explorations, preparation of drawings and specifications during construction, surveying and staking, sampling of testing material, and start-up services. Construction-phase professional services cover such items as construction management, engineering services, materials testing, and inspection during construction. Finally, there are project administration costs, which cover such items as legal fees, environmental/California Environmental Quality Act (CEQA) compliance requirements, financing expenses, City administrative costs, and interest during construction. This category does not include land acquisition.

The cost of these items can vary, but, for the purpose of this study, it is assumed that the other project costs will equal approximately 27.5 percent of the Estimated Construction Cost.

As shown in the following sample calculation of the capital improvement cost, the total cost of all project construction contingencies (construction, engineering services, construction management, and project administration) is 65.8 percent of the baseline construction cost. Calculation of the 65.8 percent is the overall markup on the baseline construction cost to arrive at the capital improvement cost. It is not an additional contingency.

Example:

Baseline Construction Cost	**$1,000,000**
Construction Contingency (30%)	$300,000
Estimated Construction Cost	**$1,300,000**
Engineering Cost (10%)	130,000
Construction Management (10%)	130,000
Project Administration (7.5%)	$97,500
Capital Improvement Cost	**$1,657,500**

10.1.3 Unit Construction Cost

Due to the large number of types of projects presented in this One Water 2050 Plan, there are many unit construction costs utilized. The following unit construction costs are presented below:

- Pipeline Cost (see Table 10.1).
- Pump Station Cost (see Table 10.2).
- Pressure-Reducing Stations (see Table 10.3).
- Reservoir Cost (see Table 10.4).
- Wells (see Table 10.5).
- Backup Power (see Table 10.6).
- Studies & Reports (see Table 10.7).

It should be noted that these unit costs, along with some project-specific unit costs, are listed in the detailed summary CIP tables presented at the end of this chapter. A summary of miscellaneous unit cost assumptions is presented in Table 10.7. Consistent with typical master-planning cost estimating, pipeline materials are not specified at this time. Although pipeline materials are not specified in the One Water 2050 Plan, the City currently utilizes ductile iron pipe (DIP) for the potable and recycled water systems and extra strength vitrified clay pipe (VCP) for the sewer system. Storage reservoirs are assumed to be concrete reservoirs unless otherwise noted. Pump stations costs are based on total horsepower. For conservative planning purposes, no differentiation is made between new pump stations or pump station upgrades, as the condition of existing pump stations that can require upgrades can vary greatly.

Table 10.1 Unit Construction Costs - Pipelines

Pipe Size (inches)	Unit Construction Cost [1] ($/LF)
Potable Water Mains[2]	
4 inches	$130
6 inches	$195
8 inches	$210
10 inches	$260
12 inches	$270
14 inches	$360
16 inches	$360
18 inches	$405
20 inches	$450
24 inches	$515
27 inches	$540
30 inches	$540
36 inches	$645
42 inches	$775
48 inches	$850
Sewer Main Open Cut[3]	
6 inches	$295
8 inches	$295
10 inches	$305
12 inches	$365
15 inches	$460
18 inches	$460
Sewer Lining	
6 inches	$60
8 inches	$80
10 inches	$100
12 inches	$120
15 inches	$140
18 inches	$180
Sewer Main Point Repair	
6 inches	$10,000
8 inches	$10,000
10 inches	$15,000
12 inches	$15,000
15 inches	$20,000
18 inches	$20,000

Notes:
(1) ENR CCI 13212 (Los Angeles, September 2021).
(2) The unit costs may be reduced in locations with fewer utility conflicts and unpaved roads. This will be determined at the preliminary design level of the project.

Table 10.2 Unit Construction Costs – Booster Pump Stations

Station Size (HP)	Unit Construction Cost[1] ($/HP)
100 hp and smaller	$5,000
150 to 300 hp	$4,000
350 to 650 hp	$3,000
700 and larger	$2,000

Note:
(1) ENR CCI 13212 (Los Angeles, September 2021).

Table 10.3 Unit Construction Costs - Valves

Type	Unit Construction Cost[1] ($/Site)
Small PRS (1-2 PRVs <8 inches)	$100,000
Medium PRS (2-3 PRVs 8 inches and up)	$200,000
Large PRS (3-4 Valves 12 inches and up)	$300,000
PRV Rehabilitation and Repair	$75,000
New Installation of Isolation Valve	$5,000

Notes:
(1) ENR CCI 13212 (Los Angeles, September 2021).
(2) A pressure reducing station (PRS) is the vault that houses the pressure reducing valves (PRVs)

Table 10.4 Unit Construction Costs – Concrete Reservoir Storage

Type (MG)	Unit Construction Cost[1] ($/gallon)
<1	$5.25
1 to 3	$4.00
3 to 5	$3.25
5 to 10	$2.75

Note:
(1) ENR CCI 13212 (Los Angeles, September 2021).

Table 10.5 Unit Construction Costs – Wells

Type	Unit Construction Cost [1] ($)
New well motor	$100,000
New well pump	$150,000
Well pump and motor	$250,000
Well rehabilitation	$150,000

Note:
(1) Based on estimates from previous planning and construction projects.

Table 10.6 Unit Construction Costs – Backup Power

Type	Unit Construction Cost[1] ($/each)
Backup power hookup [transfer switch] (per PS)	$50,000
Backup power generator only (per PS)	$200,000
Backup power generator & transfer switch (per PS)	$250,000

Note:
(1) Based on estimates from previous planning and construction projects.

Table 10.7 Unit Costs – Studies & Reports

Type	Unit Construction Cost[1] ($/each)
Surge & VFD Study	$100,000
Pipeline Condition Assessment Report	$50,000
One Water Plan Update	$500,000
CCTV Inspection	$100,000
Sewer System Management Plan Update	$25,000

Note:
(1) Based on estimates from previous planning projects.

Table 10.8 Unit Construction Costs - Miscellaneous Items

Type	Unit Construction Cost[1] ($/each)
Installation of water quality monitoring site	$50,000
Retrofit existing pump with variable frequency drive (VFD)	$75,000

Note:
(1) Based on estimates from previous planning and construction projects.

10.1.4 CIP Phasing

The proposed capital improvements are prioritized based on their urgency to mitigate existing deficiencies, condition issues, and providing service for future growth. As previously mentioned, there are three implementation phases within the planning horizon of the One Water 2050 Plan. The near-term phase extends from FY2022/FY2023 through FY2029/FY2030, the mid-term phase extends from FY2030/FY2031 through FY2039/FY2040, and the long-term phase extends from FY2040/FY2041 through FY2049/FY2050.

It should be noted that several projects have been phased in the mid-term planning period (FY2022/FY2023 through FY2029/FY2030) and long-term phase (FY2040/FY2041 through FY2049/FY2050) due to funding constraints as the current water rates will make it difficult to fund all the projects initially recommended for the near-term planning period. Therefore, the CIP will need to be revised periodically to evaluate the appropriate project timing based on system needs and available funding. Some projects may need to be postponed until later years than indicated in this One Water 2050 Plan at the discretion of City staff. However, delaying projects may lead to increased pipe breaks and system failures, and increased operations and maintenance costs. Future rate increases to raise capital funds, additional contributions from developers, and grant funding can potentially accelerate projects to earlier planning phases.

10.2 Potable Water System CIP

The improvement projects included in the potable water CIP are a compilation of the recommendations made in Chapter 9 of this One Water 2050 Plan. The water system CIP includes the following project categories:

- Fire Flow Improvements:
  - Distribution System.
  - Control Valves.
- Capacity and Reliability Improvements:
  - Transmission Mains.
  - Wells.
  - Control Valves.
- Repair and Rehabilitation (R&R) Improvements:
  - Distribution System.
  - Storage Reservoirs.
  - Booster Pump Stations.
  - Wells.
  - Backup Power.
  - Site Improvements.
- Other Projects:
  - Studies.

A detailed list of potable water CIP projects with project descriptions, sizing, and cost estimating information is provided at the end of this chapter in Table 10.14 and project locations are shown on Figure 10.10. The key project phasing assumptions and cost summarizes are presented in Section 10.2.1.

10.2.1 Potable Water CIP by Phase

The potable water system CIP is summarized by improvement category and phase in Table 10.9, while phasing is graphically shown on Figure 10.1. The subsequent sections of this report provide a detailed phasing each individual CIP project.

Table 10.9 Summary of Potable Water Improvement Costs by Project Category

Project Category	Near-term FY22/23-FY29/30 ($ Million)	Mid-term FY30/31-FY39/40 ($ Million)	Long-term FY40/41-FY49/50 ($ Million)	Total ($ Million)
Fire Flow Improvements	$3.6	$8.5	$0	$12.1
Capacity & Reliability	$1.0	$6.8	$0	$7.8
R&R Improvements	$46.8	$48.8	$76.5	$172.2
Other	$0.1	$0.6	$0.6	$1.2
Grand Total	$51.6	$64.7	$77.1	$193.3
Number of Years	7	10	10	N/A
Total Annual Cost ($/year)	$7.4	$6.5	$7.7	N/A
Anticipated Developer Funding	$0	$6.8	$0	$6.8
City Funded CIP	$51.6	$57.9	$77.1	$186.5
City Annual Cost ($/year)	$7.4	$5.8	$7.7	N/A

Note:
(1) Numbers may vary slightly due to rounding. Costs are in 2021 dollars.

As listed in Table 10.9 and shown on Figure 10.1, the potable water CIP through the year 2050 is estimated to cost $193.3 million, which is approximately 77 percent of the total CIP (or $248.6 million) through long-term. The near-term projects account for about $51.6 million, which equates to roughly $7.4 million per year through FY29/30. The mid-term projects account for about $64.7 million, which equates to roughly $6.5 million per year through FY39/40. However, it is anticipated that developers will be responsible for funding approximately $6.8 million. This would bring the City's total cost down to $57.9 million, which equates to roughly $5.8 million per year through FY39/40. The long-term projects account for about $77.1 million, which equates to roughly $7.7 million per year through FY49/50. The average estimated capital cost for the 27-year planning horizon of this One Water 2050 Plan is $6.9 million per year.

As shown on Figure 10.2, the majority of the proposed improvements consist of pipeline R&R projects, which equate to approximately 75.5 percent of the total CIP cost. Facilities R&R improvements account for approximately 13.6 percent of the total CIP cost. Pipeline capacity improvements account for 2.6 percent of the total CIP cost, fire flow improvements account for 6.3 percent of the total CIP cost. Facility capacity improvements account for 1.5 percent of the total CIP cost and other projects account for approximately 0.6 percent of the total CIP cost.

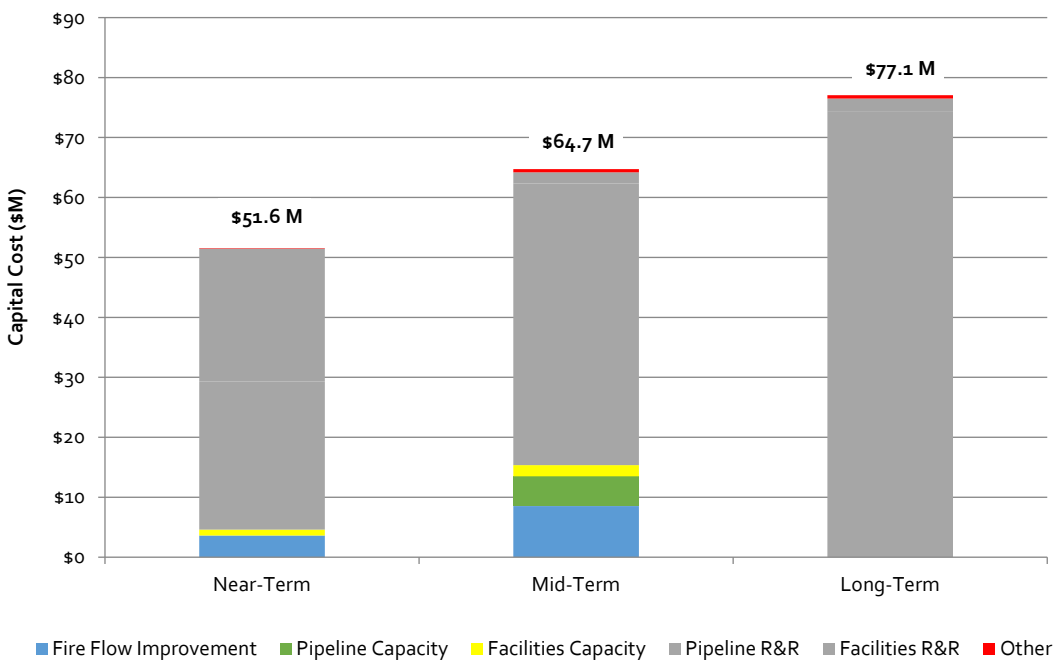

Figure 10.1 Potable Water CIP by Improvement Category and Phase

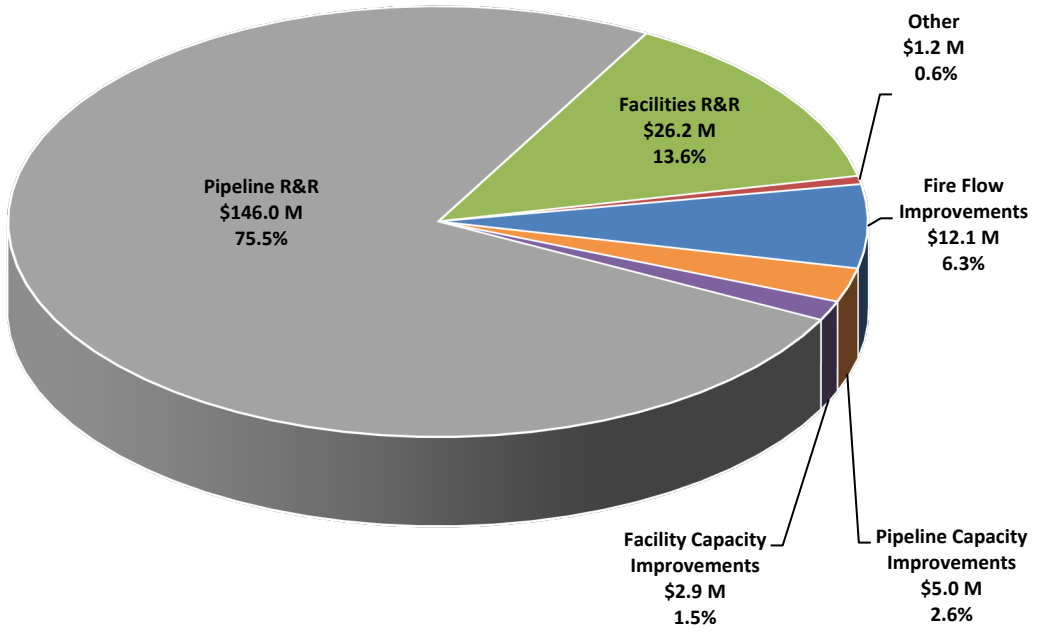

Figure 10.2 Potable Water CIP by Project Type

10.2.1.1 Near-term Potable Water CIP Projects

As summarized in Table 10.9 and shown on Figure 10.1, the cost for the near-term projects (Fiscal Year 2022/2023-Fiscal Year 2029/2030) are approximately $51.6 million, which includes $3.6 million for fire flow improvements, $1.0 million for capacity and reliability projects, $46.8 million for R&R projects, and $0.1 million for other projects. Individual project details and costs for each of these projects are listed in Table 10.14.

The vast majority (or 91 percent) of the projects within the near-term are to rehabilitate aging pipeline and facility infrastructure throughout the City's potable water system. These R&R projects include the small diameter pipeline replacements and the facilities R&R. Specific fire flow projects account for 7 percent or $3.6 million of the near-term projects. Facility and pipeline capacity projects account for 1.9 percent or $1.0 million of the near-term CIP. Other projects account for 0.6 percent or $0.1 million of the near-term CIP.

Pipeline Rehabilitation and Replacement ($24.7 million)

- **SDR-4a** – High priority small diameter replacements ($24.7 million).

The small diameter pipeline replacements involve replacing and upsizing the pipelines less than 4-inch in diameter where they serve a fire hydrant, providing for replacement of undersized pipelines and increased fire protection citywide. The small diameter replacement projects are broken into two categories in the CIP: SDR-4a and SDR-4b. The SDR-4a projects are pipelines less than 4-inch in diameter which when upsized to 8-inch diameter provide both increased citywide fire protection and are older pipes that should be replaced in the near-term. The SDR-4b projects are pipelines less than 4-inch in diameter which provide increased citywide fire protection when upsized to 8-inch diameter but are not old enough to replace in the near-term. The SDR-4a projects consist of approximately 13.5 miles of pipeline upsizing which will cost approximately $24.7 million and are included in the near-term CIP. The SDR-4b projects consist of approximately 0.8 miles of pipeline upsizing which will cost approximately $1.5 million and are included in the mid-term CIP. The SDR-4b projects contribute to fire protection and should be included in the near-term CIP, but since these pipes have not exceeded their useful life, they are deferred to the mid-term CIP per the City's request.

Facilities Rehabilitation and Replacement ($22.1 million)

- **WRS-2** – Surge and VFD Study for decommission of Bilicke Elevated Tank. Decommission of Bilicke Elevated Tank. Addition of surge tank at Bilicke or Westside Site. ($0.4 million).
- **WRS-3** – Westside Reservoir replacement ($13.8 million).
- **WRPS-1** – Westside Pump Station replacement ($3.4 million).
- **WRPS-2** – Indiana Pump Station replacement ($2.2 million).
- **BP-1 through BP-5** – Provide backup power at facilities ($1.4 million).
- **WRSI-NT-1 through WRSI-NT-8** – Near-term facility site improvements ($1.0 million).

The decommissioning of Bilicke Elevated Tank (WRS-2) is identified in the facility condition assessment. The existing elevated tank is in poor condition and rather than replacing it with a new elevated tank, the hydraulic model was used to determine that the City's distribution system can function without the tank. However, decommissioning of the tank will create a closed pressure zone in the Bilicke Pressure Zone which can put the pressure zone at risk of

surge. The hydraulic analysis preformed in this report did not include any surge analysis and thus a separate specialized surge analysis will need to be performed. Although the sizes are not currently known it is assumed that VFDs will be needed at the Westside and Indiana Pumps; and a surge tank will be needed at the Bilicke and/or Westside sites. The cost of the surge and VFD study, the decommissioning of Bilicke Elevated Tank, and a surge tanks at the Bilicke Site is calculated to be $0.4 million. The cost of the VFDs at Westside and Indiana Pumps are not included in this project as they are included in the replacements of their respective pump stations which are their own projects in the near-term CIP. This project is identified as a near-term project in the facility condition assessment.

The Westside Reservoir Replacement (WRS-3) involves demolishing the existing reservoir and constructing a new 2.0 MG reservoir. The cost of this project includes a $0.1 million study for the pre-design or the reservoir, a demolition cost of $0.5 million, and a construction cost of $13.2 million. The total project is estimated to cost $13.8 million and phased in the Near-term CIP. The Westside Reservoir was inspected by Carollo's engineer and was originally determined to be a mid-term project. However, due to the seismic concerns and the City's existing plans to build the reservoir, this project is included in the near-term CIP.

The Westside Pump Station replacement project (WRPS-1) consists of replacing the two existing 1,500 gpm pumps and adding a third 1,500 gpm pump. The replacement of the pumps is a recommendation which resulted from the facility condition analysis. The addition of a third pump came from the existing pumping analysis. Additionally, VFDs will need to be added to each of the pumps as a result of the decommissioning of the Bilicke Tank. The decommissioning of the Bilicke Tank is scheduled for the mid-term CIP, however, the VFDs should be installed with the new pumps and the new pumps should be installed at the same time as or directly after the replacement of the Westside Reservoir which is in the near-term CIP. The cost of replacing the Westside Pump Station with three new 1,500 gpm pumps equipped with VFDs is approximately $3.4 million.

The Indiana Pump Station replacement project (WRPS-2) consists of replacing the two existing 1,500 gpm pumps. The replacement of the pumps is a recommendation which resulted from the facility condition analysis. Additionally, VFDs will need to be added to each of the pumps because of the decommissioning of the Bilicke Tank. The decommissioning of the Bilicke Tank is scheduled for the mid-term CIP, however, the VFDs should be installed with the new pumps and the new pumps should be installed before the replacement of the Westside Reservoir which is in the near-term CIP. This project should occur before the westside reservoir replacement to ensure pumping reliability into the Bilicke Zone while the Westside Reservoir and Pump Station is offline. The cost of two new 1,500 gpm pumps equipped with VFDs is approximately $2.2 million.

CIP projects BP-1, BP-2, BP-3, BP-4, and BP-5 involve providing backup power at Indiana, Grand, Garfield, Wilson, and Graves, respectively. Indiana Pump Station only needs the transfer switch or hookups for backup power, so the City's existing mobile backup power generator can be used to connect to the proposed transfer switch. For the projects BP-2 through BP-5, each site already has transfer switches and only need a dedicated backup power generator on site. The recommendation for projects BP-1 through BP-5 came from existing pumping analysis and facilities condition assessment. These projects should be constructed in the near-term and cost $1.4 million.

As part of the facility condition assessment, Carollo visited all the City's water facilities and assessed their condition. Recommendations and costs for each individual improvement that are needed at each facility are grouped into near-term, mid-term, and long-term projects and are listed in Appendix H. The near-term site improvements are grouped for each site. The near-term site improvements and their CIP project IDs are as follows:WRSI-NT-1 (Garfield Site), WRSI-NT-2 (Raymond Site), WRSI-NT-3 (Grand Site), WRSI-NT-4 (Kolle Site), WRSI-NT-5 (Westside Site), WRSI-NT-6 (Bilicke Site), WRSI-NT-7 (Indiana Site), WRSI-NT-8 (Wilson Site). The total cost of near-term site improvements is approximately $1.0 million.

Facility Capacity Improvements ($1.0 million)

- **WCW-1** – Wilson Well 2 pump and motor installation ($0.8 million).
- **WCV-5** – LADWP Emergency Interconnection ($0.1 million).

The Wilson Well 2 pump and motor installation project (WCW-1) consists of installing a new pump and motor on the existing Wilson Well 2. This project also includes cost associated with installing the electrical and I&C. The well is currently capped off and bringing the well back online is a recommendation of the existing supply analysis. By bring this well back online the City can supply existing MDD with the MWD connection out of service and one other well offline. This project is listed in the near-term CIP is expected to cost $0.8 million.

A second Emergency Interconnect in the Central Pressure Zone (WCV-5) was recommended to be installed in the near-term. The connection requires a valve vault with a PRV and a flow control valve in between LADWP's pipe and the City's pipe. This project is estimated to cost $166,000.

Fire Flow Improvements ($3.6 million)

- **FF-1 through FF-4** – Fire flow enhancements ($3.5 million).
- **FFCV-1** – Fire flow check valve ($0.1 million).

There are a total of twenty three (23) specific fire flow improvement projects consisting of over 6.3 miles, which are recommended as a result of the fire flow analysis in Chapter 6. All the fire flow improvements are a high priority and should be constructed as soon as possible. The specific fire flow projects total 6.3 miles and the small diameter replacements (SDR-4a, described earlier) total 14.2 miles, equaling to a replacement of 20.5 miles of pipe. Due to the extensive length of pipe replacements needed in the near-term, the specific fire flow projects are prioritized into near-term and mid-term projects based on priority. The small diameter replacement projects are all phased into the near-term as the provided a greater citywide benefit. The priority of each specific fire flows projects is shown on Table 6.17 and are determined based on their proximity to critical facilities such as schools, hospitals, and public facilities. Fire flow projects FF-1 through FF-4 are included in the near-term CIP and cost $3.5 million.

Other Improvements ($0.1 million)

- **WS-3** – Rate Study ($0.1 million).

A rate study (WS-3) should be conducted following the One Water 2050 Plan and is estimated to cost $0.1 million.

10.2.1.2 Mid-term Potable Water CIP Projects

As summarized in Table 10.9 and shown on Figure 10.1, the cost for the mid-term projects (Fiscal Year 2030/2031-Fiscal Year 2039/2040) are approximately $64.7 million, which includes $8.5 million for fire flow improvements, $6.8 million for capacity projects, $48.8 million for R&R projects, and $0.6 million for other CIP projects. Individual project details and costs for each of these projects are listed in Table 10.14.

The vast majority $49.8 million or 75.4 percent of the projects within the mid-term are to rehabilitate aging pipeline and facility infrastructure throughout the City's potable water system. These R&R projects include the small diameter pipeline replacements, future pipeline R&R, and the facilities R&R. Specific fire flow projects account for 13.2 percent or $8.5 million of the mid-term projects. Facility and pipeline capacity projects account for 10.5. percent or $6.8 million of the mid-term CIP. Other miscellaneous projects account for $0.6 million or less than 1 percent of the mid-term CIP.

Pipeline Rehabilitation and Replacement ($47.0 million)

- **SDR-4b** –Small diameter replacements ($1.5 million).
- **RR-1** – Mid-term pipeline replacements ($45.5 million).

The small diameter pipeline replacements (SDR-4b) involve replacing and upsizing the pipelines less than 4-inch in diameter. These pipeline replacements provide increased fire protection citywide. The SDR-4b projects are pipelines less than 4-inch in diameter which when upsized to 8-inch diameter provide increased citywide fire protection. The SDR-4b projects consist of approximately 0.8 miles of pipeline upsizing which will cost approximately $1.5 million and are included in the mid-term CIP. The SDR-4b projects contribute to fire protection and should be included in the near-term CIP, but since these pipes have not exceeded their useful life, they are deferred to the mid-term CIP per the City's request. See discussion regarding SDR-4a in the near-term section of this report.

As part of the pipeline replacement analysis in Section 6.3.9 of this report, 56.6 miles of pipeline needs to be replaced by 2050. Of the 56.6 miles, 27.9 miles are overdue for replacement and are past their useful life in 2021 at the writing of this plan. Another 13.1 miles of pipeline should be replaced this decade (2020s) which equates to 41.0 miles of pipeline to be replace in the near-term CIP. 6.1 miles of pipeline need to be replaced in the mid-term CIP, and the remaining 9.4 miles of pipeline need to be replaced in the long-term CIP. However, the City indicated that funding for 41.0 miles of pipeline replacements in the near-term would not be feasible and that the highest priority pipeline replacement should be prioritized in the near-term. The highest priority pipeline replacements are prioritized and are the small diameter replacement project and the individual fire flow projects which are accounted for separately than the 56.6 miles of pipeline replacement needed. Therefore the 56.6 miles of pipeline replacement are separated into mid-term pipeline replacements (RR-1) consisting of 21.0 miles of pipeline replacements and long-term pipeline replacements (RR-2) consisting of 35.6 miles of pipeline replacements. The mid-term pipeline replacements cost $45.5 million.

Facilities Rehabilitation and Replacement ($1.8 million)

- **WRS-1** – Surge and VFD Study for removal of Raymond Elevated Tank. Removal of Raymond Elevated Tank. Addition of VFDs to pumps at Garfield and Grand. Addition of surge tank at Raymond Tank Site. ($1.3 million).
- **WRSI-MT-1 through WRSI-MT-8** – Mid-term facility site improvements ($0.6 million).

The removal of Raymond Elevated Tank (WRS-1) is identified in the facility condition assessment. The existing elevated tank is in poor condition and rather than replacing it with a new elevated tank, the hydraulic model was used to determine that the City's distribution system can function without the tank. However, removal of the tank will create a closed pressure zone in the Raymond Pressure Zone which can put the pressure zone at greater risk of surge and requires pressure control. The hydraulic analysis performed in this report did not include any surge analysis and thus a separate specialized surge analysis will need to be performed. Although the sizes are not currently known, it is assumed that VFDs will be needed at the Garfield and Grand Pumps; and a surge tank will be need at the Raymond Site. The cost of the surge and VFD study, the removal of Raymond Elevated Tank, VFDs at the Garfield and Grand Pumps, and a surge tanks at the Raymond Site is calculated to be $1.3 million. This project is identified as a near-term project in the facility condition assessment; however, the replacement of the Westside Reservoir was prioritized and this project moved to the mid-term.

As part of the facility condition assessment, Carollo visited all the City's water facilities and assessed their condition. Recommendations and costs for each individual improvement that are needed at each facility are grouped into near-term, mid-term, and long-term projects and are listed in Appendix H. The mid-term site improvements are grouped for each site. The mid-term site improvements and their CIP project IDs are as follows: WRSI-MT-1 (Garfield Site), WRSI-MT-2 (Raymond Site), WRSI-MT-3 (Grand Site), WRSI-MT-4 (Kolle Site), WRSI-MT-5 (Westside Site), WRSI-MT-6 (Bilicke Site), WRSI-MT-7 (Indiana Site), WRSI-MT-8 (Wilson Site). The total cost of mid-term site improvements is approximately $0.6 million.

Pipeline Capacity Improvements ($5.0 million)

- **WC-1 through WC-7** – Pipelines for rezoning the Magnolia Pressure Zone ($5.0 million).

Low pressures are identified in the north end of the Central Pressure Zone as part of the existing system analysis. Most of the City's growth is anticipated to occur in this area which will further increase the demand, ultimately reducing the pressures even lower. Therefore, it is recommended to extend the Magnolia Pressure Zone further south into the Central Pressure Zone and improve the lower pressures in the north part of the central zone. As part of extending the Magnolia Pressure Zone, two miles of pipeline ranging in diameter from 8-inch to 12-inch will needed (WC-1 through WC-7). These pipes will convey water from the Raymond Pressure Zone past the expanded Magnolia Pressure Zone into the Central Pressure Zone. Additionally, these pipes are used to route the flow from the Raymond and the Bilicke Pressure Zones through the proposed PRVs (See projects WCV-1 through WCV-4) and into the expanded Magnolia Pressure Zone. Since the growth in the city is expected before the end of the mid-term, these pipeline projects are phased into the mid-term CIP and will cost $5.0 million. Since the growth in the City is causing the deficiencies, it expected that the developers will be charged and assessment fee and would be responsible for funding the $5.0 million for this project.

Facility Capacity Improvements ($1.9 million)

- **WCV-1 through WCV-4** – Pressure reducing valves and isolation valves for rezoning the Magnolia Pressure Zone ($1.9 million).

The rezoning of the Magnolia Pressure Zone requires three pressure reducing stations to be constructed as well as seven new isolation valves to be installed these projects make up CIP projects WCV-1 through WCV-4. These projects are estimated to cost $1.9 million and phased to be constructed in the mid-term. These projects are to be installed with projects WC-1 through WC-7 which are described in the previous paragraph. Similar to pipeline capacity project, the $1.9 million cost of these facility capacity improvement projects are expected to be funded by developers.

Fire Flow Improvements ($8.5 million)

- **FF-5 through FF-23** – Fire flow enhancements ($8.5 million).

As previously stated in the near-term section for fire flow improvements: There are a total of twenty-three (23) specific fire flow improvement projects consisting of over 6.3 miles, which are recommended as a result of the fire flow analysis in Chapter 6. All the fire flow improvements are a high priority and should be constructed as soon as possible. Due to the extensive length of pipe replacements need in the near-term the specific fire flow projects are prioritized into near-term and mid-term projects based on priority. The priority of each specific fire flows projects is shown on Table 6.17 and is determined based on their proximity to critical facilities such as schools, hospitals, and public facilities. Fire flow projects FF-1 through FF-4 are determined to be in the near-term CIP. The remaining fire flow projects FF-5 through FF-23 total to 4.5 miles costing nearly $8.5 million. These fire flow improvements should be constructed early in the mid-term CIP.

Other Projects ($0.6 million)

- **WS-1** – Pipeline condition assessment update (< $0.1 million).
- **WS-2** – One Water 2050 Plan Update ($0.5 million).

A recommendation from the pipeline replacement analysis is to perform another pipeline condition analysis study in 2030 and again in 2040 to identify which specific pipes need replacement during that decade. As part of the One Water 2050 Plan, the lengths and timing of pipeline replacements are determined (RR-1 and RR-2), however, due to limited scope this plan did not identify which specific pipes need to be replaced. The pipeline condition analysis study WS-1 will determine which pipelines from the mid-term RR-1 project should be replaced and is expected to cost approximately $50 thousand.

The One Water 2050 Plan should be updated every 10 years to track the progress of the City's water facilities as well as to identify any new projects that may come up. It is recommended that the City updated their One Water 2050 plan in the mid-term (WS-2) which is anticipated to cost $0.5 million)

10.2.1.3 Long-term Potable Water CIP Projects

As summarized in Table 10.9 and shown on Figure 10.1, the cost for the long-term projects (Fiscal Year 2040/2041-Fiscal Year 2049/2050) are approximately $77.1 million, which includes $76.5 million for R&R projects and $0.6 million for other CIP projects. Individual project details and costs for each of these projects are listed in Table 10.14.

The vast majority $76.5 million or 99.3 percent of the projects within the long-term are to rehabilitate aging pipeline and facility infrastructure throughout the City's potable water system. These R&R projects include future pipeline R&R, and the facilities R&R. Other miscellaneous projects account for $0.6 million or less than 1 percent of the long-term CIP.

Pipeline Rehabilitation and Replacement ($74.3 million)

- **RR-2** – Mid-term pipeline replacements ($74.3 million).

As part of the pipeline replacement analysis in Section 6.3.9 of this report, 56.6 miles of pipeline need to be replaced by 2050. Of the 56.6 miles, 27.9 miles are overdue for replacement and are past their useful life in 2021 at the writing of this plan. Another 13.1 miles of pipeline should be replaced this decade (2020s) which equates to 41.0 miles of pipeline to be replace in the near-term CIP. 6.1 miles of pipeline need to be replaced in the mid-term CIP, and an additional 9.4 miles of pipeline need to be replaced in the long-term CIP. However, the City indicated that funding for 41.0 miles of pipeline replacements in the near-term would not be feasible and that the highest priority pipeline replacement should be prioritized in the near-term. The highest priority pipeline replacements are prioritized and are the small diameter replacement project and the individual fire flow projects which are accounted for separately than the 56.6 miles of pipeline replacement needed. Therefore the 56.6 miles of pipeline replacement are separated into mid-term pipeline replacements (RR-1) consisting of 21.0 miles of pipeline replacements and long-term pipeline replacements (RR-2) consisting of 35.6 miles of pipeline replacements. The long-term pipeline replacements cost $74.3 million.

Facilities Rehabilitation and Replacement ($2.2 million)

- **WRW-1** – Wilson Well 3 motor replacement ($0.2 million).
- **WRW-2** – Wilson Well 3 pump replacement ($0.2 million).
- **WRW-3** – Graves Well 2 pump and motor replacement ($0.4 million).
- **WRW-4** – Wilson Well 4 pump and motor replacement ($0.4 million).
- **WRSI-LT-1 through WRSI-LT-8** – Long-term facility site improvements ($1.0 million).

The Wilson Well 3 motor replacement (WRW-1) is recommended as part of the facility condition assessment and is identified as a long-term replacement. The cost to replace the Wilson Well 3 motor is $0.02 million.

The Wilson Well 3 pump (WRW-2) is recommended as part of the future supply analysis. Well pumps and motors typically need to be replaced every 15 -25 years. Therefore, it is recommended to repair and replace the well motors and pumps approximately every 20 years, including well casing inspection and relining as needed. The replacement of the well pump will need to occur sometime before 2050 and therefore is phased in the long-term CIP and will cost $0.2 million.

The Graves Well 2 pump and motor (WRW-3) is recommended as part of the future supply analysis. Well pumps and motors typically need to be replaced every 15 -25 years. Therefore, it is recommended to repair and replace the well motors and pumps approximately every 20 years, including well casing inspection and relining as needed/The replacement of the well pump and motor will need to occur sometime before 2050 and therefore is phased in the long-term CIP and will cost $0.4 million.

The Wilson Well 4 pump and motor (WRW-4) is recommended as part of the future supply analysis. Well pumps and motors typically need to be replaced every 15 -25 years. Therefore, it is recommended to repair and replace the well motors and pumps approximately every 20 years, including well casing inspection and relining as needed. The replacement of the well pump and motor will need to occur sometime before 2050 and therefore is phased in the long-term CIP and will cost $0.4 million.

As part of the facility condition assessment Carollo visited all the City's water facilities and assessed their condition. Recommendations and costs for each individual improvement that are needed at each facility are grouped into near-term, mid-term, and long-term projects and are listed in Appendix H. The long-term site improvements are grouped for each site. The mid-term site improvements and their CIP project IDs are as follows: WRSI-LT-1 (Garfield Site), WRSI-LT-2 (Raymond Site), WRSI-LT-3 (Grand Site), WRSI-LT-4 (Kolle Site), WRSI-LT-5 (Westside Site), WRSI-LT-6 (Bilicke Site), WRSI-LT-7 (Indiana Site), WRSI-LT-8 (Wilson Site). The total cost of long-term site improvements is approximately $1.0 million.

Other Projects ($0.6 million)

- **WS-1** – Pipeline condition assessment update (< $0.1 million).
- **WS-2** – One Water 2050 Plan Update ($0.5 million).

A recommendation from the pipeline replacement analysis is to perform another pipeline condition analysis study in 2030 and again in 2040 to identify which specific pipes need replacement during that decade. As part of the One Water 2050 plan the lengths and timing of pipeline replacements are determined (RR-1 and RR-2), however due to limited scope this plan did not identify which specific pipes need to be replaced. The pipeline condition analysis study WS-1 will determine which pipelines from the long-term RR-2 project should be replaced and is expected to cost approximately $50 thousand.

The One Water 2050 Plan should be updated every 10 years to track the progress of the City's water facilities as well as to identify any new projects that may come up. It is recommended that the City updated their One Water 2050 plan in the long-term (WS-2) which is anticipated to cost $0.5 million

10.3 Recycled Water System CIP

Based on the Recycled water analysis in Chapter 7, alignment Option 3 would be the most cost effective and efficient recycled water alternative. This alignment has a capital cost of $3.47 million. However, the key constraint for implementing Option 3 is the uncertainty associated with the recycled water system implementation by the City of Pasadena. Both the uncertainty around timing and point of connection makes it difficult for South Pasadena to plan to implement a recycled water system. Therefore, no money is allocated for recycled water in the CIP.

10.4 Wastewater System CIP

The improvement projects included in the wastewater CIP are a compilation of the recommendations made in Chapter 7 of this One Water 2050 Plan. The wastewater system CIP includes the following project categories:

- Near-Term Repair and Rehabilitation Improvements:
  - Gravity Mains:
    - Linings.
    - Replacements.
    - Point Repairs.
- Future Repair and Rehabilitation Improvements:
  - Gravity Mains.
- Other Projects:
  - Sewer System Management Plan Updates.
  - CCTV Inspections.

A detailed list of wastewater CIP projects with project descriptions, sizing, and cost estimating information is provided at the end of this chapter in Table 10.11. and project locations are shown on Figure 10.11. The key project phasing assumptions and cost summarizes are presented below.

10.4.1 Wastewater CIP by Phase

The wastewater system CIP is summarized by improvement category and phase in Table 10.10, while phasing is graphically shown on Figure 10.3. The subsequent sections of this report provide a detailed phasing each individual CIP project.

Table 10.10 Summary of Wastewater Improvement Costs by Project Category

Project Category	Near-term FY22/23-FY29/30 ($ Million)	Mid-term FY30/31-FY39/40 ($ Million)	Long-term FY40/41-FY49/50 ($ Million)(2)	Total ($ Million)
Sewer Lining	$0.9	$0	$0	$0.9
Sewer Replacement	$3.2	$0	$0	$3.2
Sewer Point Repair	$0.1	$0	$0	$0.1
Future Repairs	$0	$5.0	$5.0	$10.0
Other	$0.2	$0.2	$0.2	$0.5
Grand Total	**$4.4**	**$5.2**	**$5.2**	**$14.7**
Number of Years	7	10	10	N/A
Total Annual Cost ($/year)	**$0.6**	**$0.5**	**$0.5**	**N/A**
Anticipated Developer Funding	0	0	0	0
City Funded CIP	$4.4	$5.2	$5.2	$14.7
City Annual Cost ($/year)	**$0.6**	**$0.5**	**$0.5**	**N/A**

Note:
(1) Numbers may vary slightly due to rounding. Costs are in 2021 dollars.

As listed in Table 10.10 and shown on Figure 10.3, the wastewater CIP through the year 2050 is estimated to cost $14.7 million, which is approximately 6 percent of the total CIP (or $248.6 million) through long-term. The near-term projects account for about $4.4 million, which equates to roughly $0.6 million per year through year 2030. The mid-term projects account for about $5.2 million, which equates to roughly $0.5 million per year from 2030 through 2040. The long-term projects account for about $5.2 million, which equates to roughly $0.5 million per year from 2040 through 2050. The average estimated capital cost for the 23-year planning horizon of this One Water 2050 Plan is $0.7 million per year.

As shown on Figure 10.4, the proposed improvements (lining, replacement, and point repair) and the budget for mid-term and long-term improvements each account for approximately one third of the wastewater CIP.

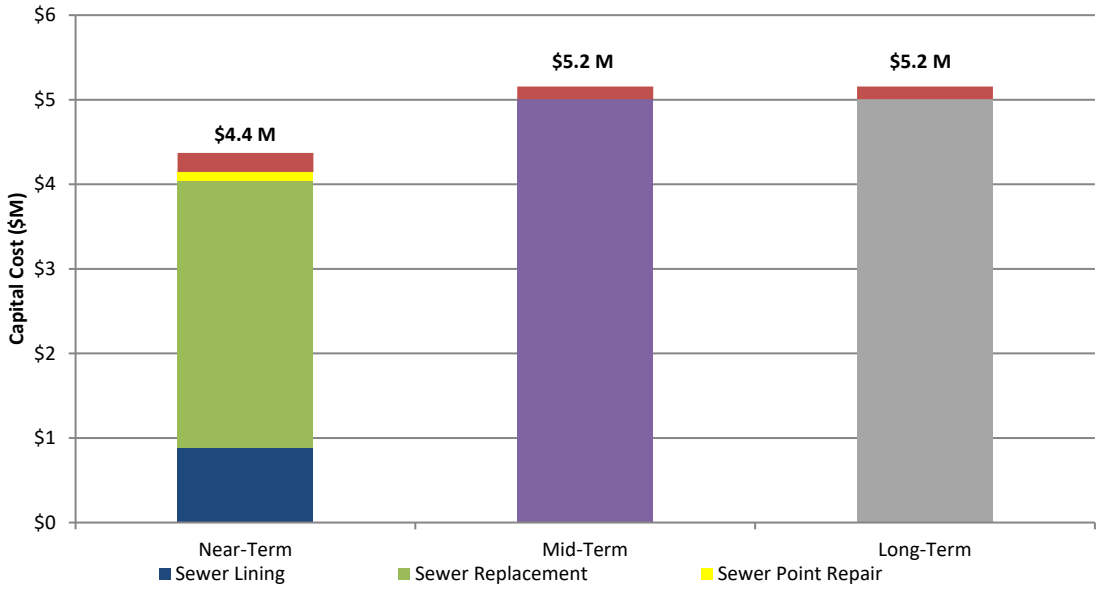

Figure 10.3 Wastewater CIP by Improvement Category and Phase

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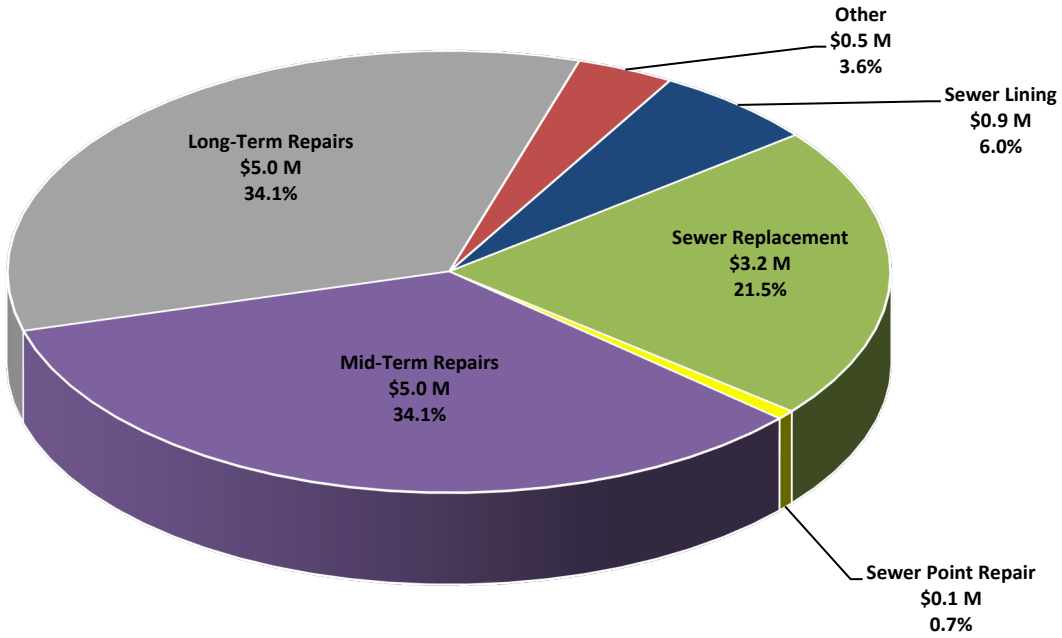

Figure 10.4 Wastewater CIP by Project Type

10.4.1.2 Near-term Wastewater CIP Projects

As summarized in Table 10.10 and shown on Figure 10.3, the cost for the near-term projects (Fiscal Year 2022/2023-Fiscal Year 2029/2030) are approximately $4.4 million, which includes $0.9 million sewer lining projects, $3.2 million for sewer replacement projects, $0.1 million for sewer point repair projects, and $225,000 for other CIP projects. Individual project details and costs for each of these projects are listed in Table 10.15.

The vast majority (or 72 percent) of the projects within the near-term are related to sewer replacement improvements. Sewer lining projects account for 20 percent of the CIP, sewer point repair projects make up 2 percent of the CIP and the remaining 5 percent of projects are categorized as other projects. The sewer replacement, lining, and point repair project categories each can be further broken down into identified projects and budgeted projects. For the identified projects, specific locations for the project have been identified. For the budgeted projects, the locations of the project are not currently known but replacements are anticipated and thus a budget has been accounted for in the CIP.

Sewer Replacement Projects ($3.2 million)

- **SR-1 through SR-9** – Specific sewer replacement projects for pipes in poor or very poor condition ($1.1 million).
- **NTSR** – Sewer replacement budget for pipes in mediocre condition ($2.0 million).

In Chapter 8 of this report all of the sewer CCTV for pipes with a structural rating score of poor and very poor were reviewed. Nearly 1 mile of poor to very poor sewer pipes were reviewed to determine the most cost-effective repair/replacement method. The repair/replacement methods that were considered for these pipelines are: replacement, pipe lining, and point repair. Of the 1 mile of poor and very poor sewer pipe reviewed 45 percent are to be replaced 45 percent are to be lined and 10 percent are to point repaired. Approximately 0.4 miles of 8-inch diameter pipes are identified as needing to be replaced (SR-1 through SR-9). The replacement method consists of digging out the entire length of pipe between manholes and installing a new pipe. Due to the poor condition of these pipes these replacements are prioritized in the near-term CIP and are estimated to cost $1.1 million.

The sewer pipes with a structural score of mediocre totaled to 17 miles and were not fully reviewed for this plan. A sample set of the 17 miles was reviewed and it is determined that approximately 1.7 miles or 10 percent will require replacement. The repair types for the 1.7 miles of mediocre pipes are divided into repair categories based on the distribution between categories seen in the review of the poor and very poor pipes (45 percent replacement, 45 percent line, and 10 percent point repair). Approximately 0.8 miles of mediocre sewer pipe is expected to be replaced in the near-term CIP (NTSR). The Sewer replacement budget for pipes in mediocre condition is $2.0 million. As CCTV is recommended for the system every 10 years, another set of CCTV should be performed prior to replacement of these pipelines.

Sewer Lining Projects ($0.9 million)

- **SL-1 through SL-7** – Specific sewer lining projects for pipes in poor or very poor condition ($0.3 million).
- **NTSL** – Sewer lining budget for pipes in mediocre condition ($0.6 million).

In Chapter 8 of this report, all of the sewer CCTV for pipes with a structural rating score of poor and very poor were reviewed. Nearly 1 mile of poor to very poor sewer pipes were reviewed to determine the most cost-effective repair/replacement method. The repair/replacement methods that were considered for these pipelines are: replacement, pipe lining, and point repair. Of the 1 mile of poor and very poor sewer pipe reviewed 45 percent are to be replaced 45 percent are to be lined and 10 percent are to point repaired. Approximately 0.4 miles of 8-inch diameter pipes are identified as needing to be lined (SL-1 through SL-7). The lining method consists of installing a synthetic lining on the inner diameter of the pipe, between manholes. Due to the poor condition of these pipes these linings are prioritized in the near-term CIP and are estimated to cost $0.3 million.

Approximately 0.8 miles of mediocre sewer pipe is expected to be lined in the near-term CIP (NTSL). The Sewer lining budget for pipes in mediocre condition is $0.6 million.

Sewer Point Repair Projects ($0.1 million)

- **SPR-1 and SPR-2** – Specific sewer point repair projects for pipes in poor or very poor condition ($34,000).
- **NTSPR** – Sewer point repair budget for pipes in mediocre condition ($66,000).

In Chapter 8 of this report all of the sewer CCTV for pipes with a structural rating score of poor and very poor were reviewed. Nearly 1 mile of poor to very poor sewer pipes were reviewed to determine the most cost-effective repair/replacement method. The repair/replacement methods that were considered for these pipelines are: replacement, pipe lining, and point repair. Of the 1 mile of poor and very poor sewer pipe reviewed 45 percent are to be replaced 45 percent are to be lined and 10 percent are to point repaired. Approximately two (2) 8-inch diameter pipes are identified as needing to be point repaired (SPR-1 and SPR-2). The lining method consists of digging up a small section of pipe and removing and replacing and only that section. Due to the poor condition of these pipes these point repairs are prioritized in the near-term CIP and are estimated to cost $34,000.

Approximately four (4) mediocre sewer pipes are expected need point repairs near-term CIP (NTSPR). The Sewer point repair budget for pipes in mediocre condition is $66,000.

Other Projects ($0.2 million)

- **CALIBRATION** – Perform a flow monitoring study and a Sewer Model Calibration ($0.1 million)
- **CCTV 2030** – Sewer CCTV inspection ($0.1 million).
- **SSMP** – Sewer System Management Plan update ($25,000).

As part of this One Water 2050 Plan the sewer model was developed and used to analyze the flows, this model was not calibrated. A flow monitoring study and calibration of the sewer model is recommended to be conducted in the near-term (CALIBRATION) and is projected to cost $0.1 million.

It is recommended to conduct sewer system CCTV inspections every 10 years. The CCTV inspections should be reviewed to determine which specific pipes need replacement, lining, or point repairs and thus should provide structural and maintenance scores. The CCTV inspections will provide the City with specific projects to spend the budgeted for replacement, lining, or point repairs. A CCTV inspection should be performed in 2030 (CCTV 2030) and thus one is scheduled in the near-term CIP and is expected to cost $0.1 million.

The sewer system management plan should be updated every 5 years (SSMP) and there will need to be one update in the near-term which is expected to cost $25,000.

10.4.1.3 Mid-term Wastewater CIP Projects

As summarized in Table 10.10 and shown on Figure 10.3, the cost for the mid-term projects (Fiscal Year 2030/2031-Fiscal Year 2039/2040) are approximately $5.2 million, which includes a budget of $5.0 million for sewer repair, lining, and point repair, as well as $150,000 for other CIP projects. Costs for each of these projects are listed in Table 10.15.

The vast majority (or 73 percent) of the projects within the mid-term are related to sewer replacement improvements. Sewer lining projects account for 20 percent of the CIP, Sewer Point repair projects make up 2 percent of the CIP and the remaining 5 percent of projects are categorized as other projects. The locations of the project in the mid-term CIP are not currently known but replacements are anticipated and thus a budget has been created in the CIP.

Mid-Term Sewer Repair Projects ($5.0 million)

- **MTSR** – Mid-term sewer replacement budget for future pipes ($3.8 million).
- MTSL – Mid-term sewer lining budget for future pipes ($1.1 million).

MTPR – Mid-term sewer point repair budget for future pipes ($0.1 million). The near-term CIP for sewer repair, lining, and point repairs are calculated to cost approximately $0.5 million per year. It is assumed that the City's sewer system will continue to need repairs at a similar rate in the future and thus a future budget is needed to repair the future sewer system as the pipes degrade. The mid-term CIP spans 10 years and therefore is estimated that approximately $5 million will be need for sewer repairs, linings, and point repairs. Using the same breakdown of 45 percent for replacements, 45 percent for linings, and 45 percent for point repair it is estimated that approximately 1.4 miles of sewer pipe will need to be replaced in the mid-term CIP which will cost nearly $3.8 million (MTSR);approximately 1.4 miles of sewer pipe will need to be lined in the mid-term CIP which will cost nearly $1.1 million (MTSL); and approximately 8 sewer point repair projects in the mid-term CIP which will cost nearly $0.1 million (MTPR). These repairs are not specificality identified projects and are budgetary place holders. Specific projects will come from future CCTV inspections.

Other Projects ($0.2 million)

- **CCTV 2040 –** Sewer CCTV inspection ($0.1 million).
- **SSMP** – Sewer System Management Plan update ($50,000).

It is recommended to conduct sewer system CCTV inspections every 10 years. The CCTV inspections should be reviewed to determine which specific pipes need replacement, lining, or point repairs and thus should provide structural and maintenance scores. The CCTV inspections will provide the City with specific projects to spend the budgeted for replacement, lining, or point repairs. A CCTV inspection should be performed in 2040 (CCTV 2040) and thus one is scheduled in the mid-term CIP and is expected to cost $0.1 million.

The sewer system management plan should be updated every 5 years (SSMP) and there will need to be two updates in the mid-term which is expected to cost $50,000.

10.4.1.4 Long-term Wastewater CIP Projects

As summarized in Table 10.10 and shown on Figure 10.3, the cost for the long-term projects (Fiscal Year 2040/2041-Fiscal Year 2049/2050) are approximately $5.2 million, which includes $1.1 million sewer lining projects, $3.8 million for sewer replacement projects, $0.1 million for sewer point repair projects, and $150,000 for other CIP projects. Individual project details and costs for each of these projects are listed in Table 10.15.

Long-Term Sewer Repair Projects ($3.8 million)

- **LTSR** – Long-term sewer replacement budget for future pipes ($3.8 million).
- **LTSL** – Long-term sewer lining budget for future pipes ($1.1 million).
- **LTPR** – Long-term sewer point repair budget for future pipes ($0.1 million).

The long-term CIP for sewer repair, lining, and point repairs are calculated to cost approximately $0.5 million per year. It is assumed that the City's sewer system will continue to need repairs at a similar rate in the future and thus a future budget is needed to repair the future sewer system as the pipes degrade. The long-term CIP spans 10 years and therefore is estimated that approximately $5 million will be need for sewer repairs, linings, and point repairs. Using the same breakdown of 45 percent for replacements, 45 percent for linings, and 45 percent for point repair it is estimated that approximately 1.4 miles of sewer pipe will need to be replaced in the long-term CIP which will cost nearly $3.8 million (LTSR);approximately 1.4 miles of sewer pipe will need to be lined in the long-term CIP which will cost nearly $1.1 million (LTSL); and approximately 8 sewer point repair projects in the long-term CIP which will cost nearly $0.1 million (LTPR). These repairs are not specificality identified projects and are budgetary place holders. Specific projects will come from future CCTV inspections.

Other Projects ($0.2 million)

- **CCTV 2040** – Sewer CCTV inspection ($0.1 million).
- **SSMP** – Sewer System Management Plan update ($50,000).

It is recommended to conduct sewer system CCTV inspections every 10 years. The CCTV inspections should be reviewed to determine which specific pipes need replacement, lining, or point repairs and thus should provide structural and maintenance scores. The CCTV inspections will provide the City with specific projects to spend the budgeted for replacement, lining, or point repairs. A CCTV inspection should be performed in 2040 (CCTV 2040) and thus one is scheduled in the long-term CIP and is expected to cost $0.1 million.

The sewer system management plan should be updated every 5 years (SSMP) and there will need to be two updates in the long-term which is expected to cost $50,000.

10.5 Stormwater CIP

The improvement projects included in the stormwater CIP are a compilation of the recommendations made in Chapter 9 of this One Water 2050 Plan. The stormwater system CIP includes the following project categories:

- Green Street.
- Ongoing Regional Projects.
- Potential Future Projects.

A detailed list of stormwater CIP projects with project descriptions, sizing, and cost estimating information is provided at the end of this chapter in Table 10.16. and project locations are shown on Figure 10.12. The key project phasing assumptions and cost summarizes are presented below.

10.5.1 Stormwater CIP by Phase

The stormwater system CIP is summarized by project type and phase in Table 10.11, while phasing is graphically shown on Figure 10.5. The key project phasing assumptions and cost summaries and funding sources are presented below.

Table 10.11 Summary of Stormwater Improvement Costs by Project Type

Project Type	Near-term FY22/23-FY29/30 ($ Million)	Mid-term FY30/31-FY39/40 ($ Million)	Long-term FY40/41-FY49/50 ($ Million)(2)	Total ($ Million)
Green Streets	$5.5	$0	$0	$5.5
Ongoing Regional Projects	$33.7	$0	$0	$33.7
Potential Future Projects	$0	$0	$2.7	$2.7
Grand Total	**$39.2**	**$0**	**$2.7**	**$41.9**
Number of Years	7	10	10	N/A
Total Annual Cost ($/year)	**$5.6**	**$0**	**$0.3**	**N/A**
Identified Grant Funding[2]	$8.8	$0	$0	$8.8
Unfunded[2]	$30.4	$0	$2.7	$33.1
Yearly Funding Needed ($/year)[2]	**$4.3**	**$0**	**$0.3**	**N/A**

Notes:
(1) Numbers may vary slightly due to rounding. Costs are in 2021 dollars.
(2) For some of the projects, funding is identified by the City, but is not secured. If funding is not secured the project is listed as unfunded.

As listed in Table 10.11 and on Figure 10.5, the stormwater CIP through the year 2050 is estimated to be $41.9 million, which is approximately 17 percent of the total CIP (or $248.6 million) through long-term. The near-term projects account for about $39.2 million, which equates to roughly $5.6 million per year through year 2030. There are no mid-term stormwater projects identified. The long-term projects account for about $2.7 million, which equates to roughly $0.3 million per year from 2040 through 2050. The average estimated capital cost for the 27-year planning horizon of this One Water 2050 Plan is $5.6 million per year, which excludes the long-term improvement projects that equate to approximately $2.7 million. Since the timing of the long-term projects is unknown, the costs are not included in the average annual expenditures.

As shown in Figure 10.6 approximately $8.8 million in grant funding is identified for the near-term projects. The grant funding equates to approximately 22 percent of the near-term CIP. The City will need to secure funding for the stormwater projects to proceed. The City still needs to secure funding for $30.4 million in stormwater projects. There are no projects identified in the mid-term phase CIP. Several potential future projects have been identified, the City hasn't begun to secure funding for these projects or phases them. Therefore, the timing of the potential future projects is shown in the long-term CIP.

As shown on Figure 10.6, the majority of the proposed improvements consist ongoing regional projects, which equate to approximately 80.4 percent of the total CIP cost. Green streets account for 13.1 percent, and Potential Future Projects account for approximately 6.4 percent of the total CIP cost.

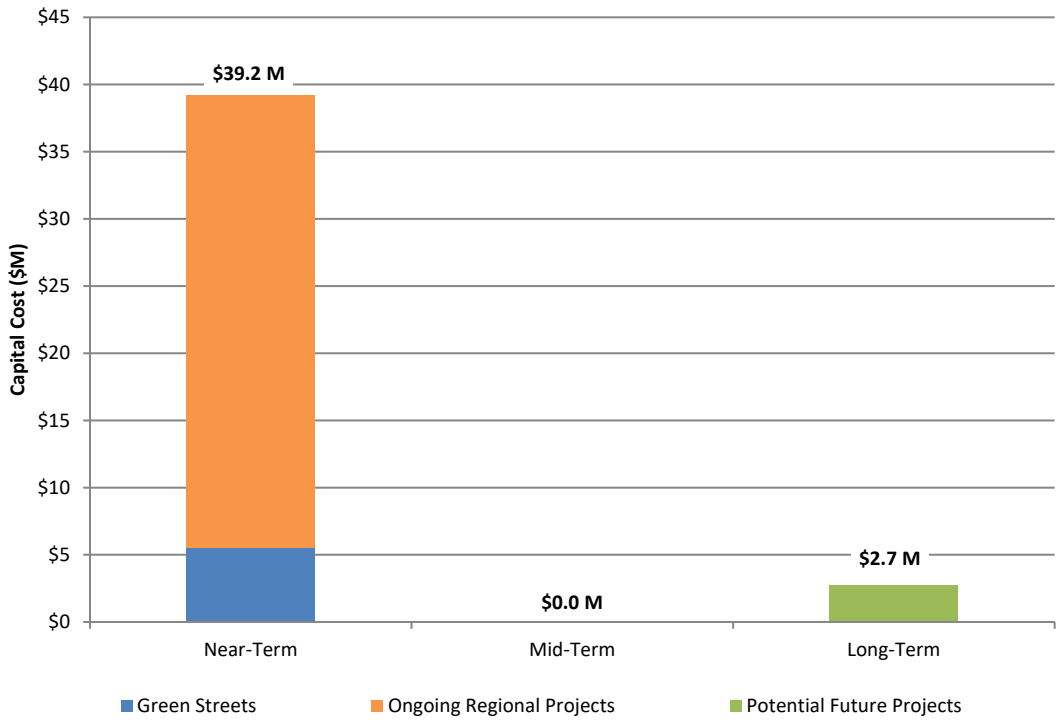

Figure 10.5 Stormwater CIP by Project Type and Phase

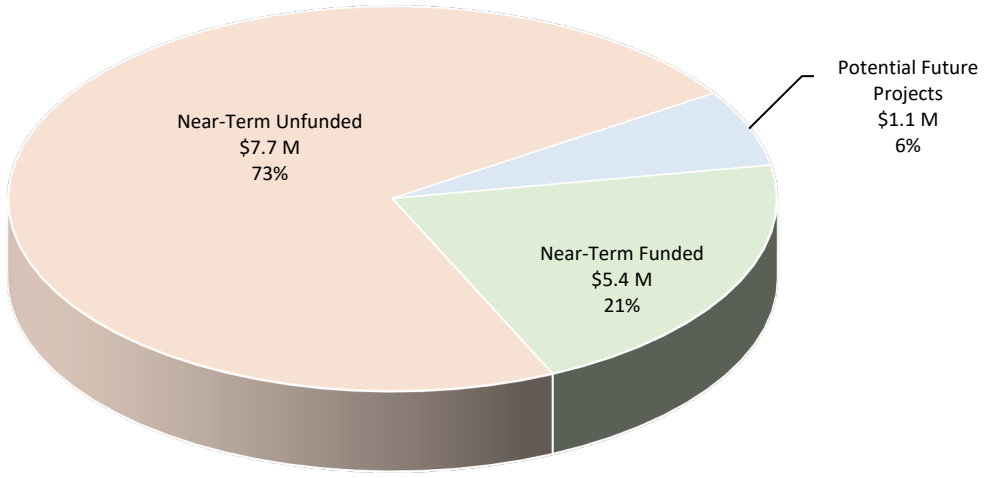

Figure 10.6 Stormwater CIP by Funding

10.5.1.1 Near-term Stormwater CIP Projects

As summarized in Table 10.11 and shown on Figure 10.4, the cost for the near-term projects (Fiscal Year 2022/2023-Fiscal Year 2029/2030) are approximately $39.2 million, which includes $5.5 million for green streets and $33.7 million for ongoing regional projects. The vast majority (or 86 percent) of the projects within the near-term are ongoing regional projects the remaining 14 percent of projects are green streets. The detail for each of these projects is listed in Table 10.15.

The City has obtained Measure W Regional Grant Funds for the green streets and 6 of 7 of the ongoing regional projects. The total funding obtained from "Measure W" is $8.8 million. Which reduces the City's cost from $39.2 million down to $30.4 million. The City has identified other potential grant funding for their near-term projects; however, the funding has not been obtained and therefore is not considered under identified grant funding and is classified as unfunded in the near-term CIP

Green Street Projects ($5.5 million)

- **GS1** – Huntington Drive ($5.5 million).

The Huntington Drive Green Street (GS1) was identified by the City in their near-term CIP and is expected to cost $5.5 million. The City has secured $0.3 million in Measure W Regional Grant Funds and additional funding will be required for the remaining $5.2 million for the project to be completed.

Ongoing Regional Projects ($33.7 million)

- **SWP-1** – Arroyo Seco San Rafael and San Pascual Treatment/Infiltration Project ($8.3 million).
- **SWP-2** – Arroyo Seco Lower Arroyo Park Infiltration Basin Facility ($10.8 million).
- **SWP-3** – Arroyo Seco Golf Corse Wetland Facility ($7.4 million).
- **SWP-4** – Arroyo Seco Golf Corse Driving Range Wetland Facility ($5.3 million).
- **SWP-5** – Rio Hondo Load Reduction Strategy ($49 thousand).
- **SWP-6** – Camino Verde Stormwater Treatment/Infiltration Project ($1.8 million).

The Arroyo Seco San Rafael and San Pascual Treatment/Infiltration Project (SWP-1) was identified by the City in their near-term CIP and is expected to cost $8.3 million. The City has secured $4.8 million in Measure W Regional Grant Funds and $3.5 million in Urban Counties Per Capita Grant grogram (Prop 68). The project is fully funded, and the city will not need to fund any money for this project in the near-term CIP.

The Arroyo Seco Lower Arroyo Park Infiltration Basin Facility (SWP-2) was identified by the City in their near-term CIP and is expected to cost $10.8 million. The City has secured $50,000 in Measure W Regional Grant Funds and will require funding for the remaining $10.8 million for the project to be completed.

The Arroyo Seco Golf Corse Wetland Facility (SWP-3) was identified by the City in their near-term CIP and is expected to cost $7.4 million. The City has secured $50,000 in Measure W Regional Grant Funds and will require funding for the remaining $7.4 million for the project to be completed.

The Arroyo Seco Golf Corse Driving Range Wetland Facility (SWP-4) was identified by the City in their near-term CIP and is expected to cost $5.3 million. The City has secured $50,000 in Measure W Regional Grant Funds and will require funding for the remaining $5.2 million for the project to be completed.

The Rio Hondo Load Reduction Strategy (SWP-5) was identified by the City in their near-term CIP and the City's cost for the program is expected to cost $49,000 The City has secured $49,000 in Measure W Regional Grant Funds. The project is fully funded, and the city will not need to fund any money for this project in the near-term CIP.

The Camino Verde Stormwater Treatment/Infiltration Project (SWP-6) was identified by the City in their near-term CIP and is expected to cost $1.8 million. The City will require funding of $1.8 million for the project to be completed.

10.5.1.2 Mid-term Stormwater CIP Projects

There a no mid-term Stormwater CIP projects.

10.5.1.3 Long-term Stormwater CIP Projects

As summarized in Table 10.11 and shown on Figure 10.4, the cost for the long-term phase is approximately $2.7 million. The projects identified within the long-term phase are potential future projects and will only move forward if the City identifies funding sources for them.

10.6 Integrated Systems CIP

The integrated systems CIP for the City's water, recycled water, wastewater, and stormwater systems is summarized in Table 10.12 and graphically depicted on Figure 10.7. As shown in Table 10.12, the combined CIP costs for all three systems through planning year 2050 is estimated to be about $345.4 million, respectively.

Table 10.12 Integrated CIP by System and Phase

Project Type	Near-term FY22/23-FY29/30 ($ Million)	Mid-term FY30/31-FY39/40 ($ Million)	Long-term FY40/41-FY49/50 ($ Million)(1)	Total ($ Million)
Potable Water System(2)	$51.6	$64.7	$77.1	$193.3
Recycled Water System	$0	$0	$0	$0
Wastewater System(3)	$4.4	$5.2	$5.2	$14.7
Stormwater System(4)	$39.2	$0	$2.7	$41.9
Grand Total	**$95.1**	**$69.9**	**$84.9**	**$249.9**
Number of Years	7	10	10	N/A
Total Annual Cost ($/year)	**$13.6**	**$7.0**	**$8.5**	**N/A**
Anticipated Developer Funding	$0	$6.8	$0	$6.8
Identified Grant Funding	$8.8	$0	$0	$8.8
Required Additional Funding	$30.4	$0	$2.7	$33.1
City Funded CIP	$55.9	$63.1	$82.2	$201.2
City Annual Cost ($/year)	**$8.0**	**$6.3**	**$8.2**	**N/A**

Notes:
(1) Numbers may vary slightly due to rounding. Costs are in 2021 dollars.
(2) Potable Water CIP shown on Table 10.13.
(3) Wastewater CIP shown on Table 10.14.
(4) Stormwater CIP shown on Table 10.15.

The phasing of the integrated CIP by system is depicted on Figure 10.7. As shown on this figure, about $95.1 million of project costs are included in the near-term phase and $69.9 million are scheduled for the mid-term phase. The long-term CIP costs are $84.9 million. These costs include the costs anticipated to be funded by developers, grants, and the City. A breakdown of costs by funding sources is presented on Figure 10.8.

As shown on Figure 10.8, 80 percent of the City's CIP will need to be funded by the City. The other 20 percent of the recommended CIP projects are anticipated to be funded by developers or grants. 3 percent of the CIP are anticipated to be developer funded. The stormwater projects should be funded by grants if they are to be constructed. Currently $8.8 million in grant funding has been obtained, however an additional 33.1 million is needed to move forward with all the stormwater projects. The portion of the CIP that is to be City funded totals $201.2 million and is broken by phase in Figure 10.9

The City needs to fund the majority of the Potable Water CIP projects with the exception of the $8.8 million that anticipated to be funded by developers in the mid-term. The City will need to fund all of the Wastewater CIP projects because no projects were identified as developer or grant funded. The Stormwater CIP projects should be funded by entirely by grants. As shown on Figure 10.9, the City is only responsible for funding the potable water and wastewater CIP projects. The near-term City funded CIP totals $55.9 million of which 92 percent or $51.6 million are potable water projects and 8 percent of $4.4 million are wastewater projects. The mid-term City funded CIP totals $63.1 million of which 92 percent or $57.9 million are potable water projects and 8 percent of $5.2 million are wastewater projects. The long-term City funded CIP totals $82.2 million of which 94 percent or $77.1 million are potable water projects and6 percent of $5.2 million are wastewater projects.

The potable water system CIP comprises the largest portion of cost with $186.5 million (93 percent) of the total combined CIP. The wastewater system accounts for the remaining 6 percent of the CIP which totals to $14.7 million. The City will need to spend $8.0 million per year in the near-term, $6.3 million per year in the mid-term, and $8.2 million per year in the long-term; which averages to an annual cost for the CIP of $7.4 million per year.

The current water rates will make it difficult to fund all the projects recommended within the near-term planning phase. Therefore, the CIP will need to be revised periodically to adjust the project phasing based on system needs and available funding. The phasing of other select projects may also be adjusted at the discretion of City staff. Future rate increases to raise capital funds, additional contributions from developers, and grant funding can potentially accelerate projects to the near-term planning phase.

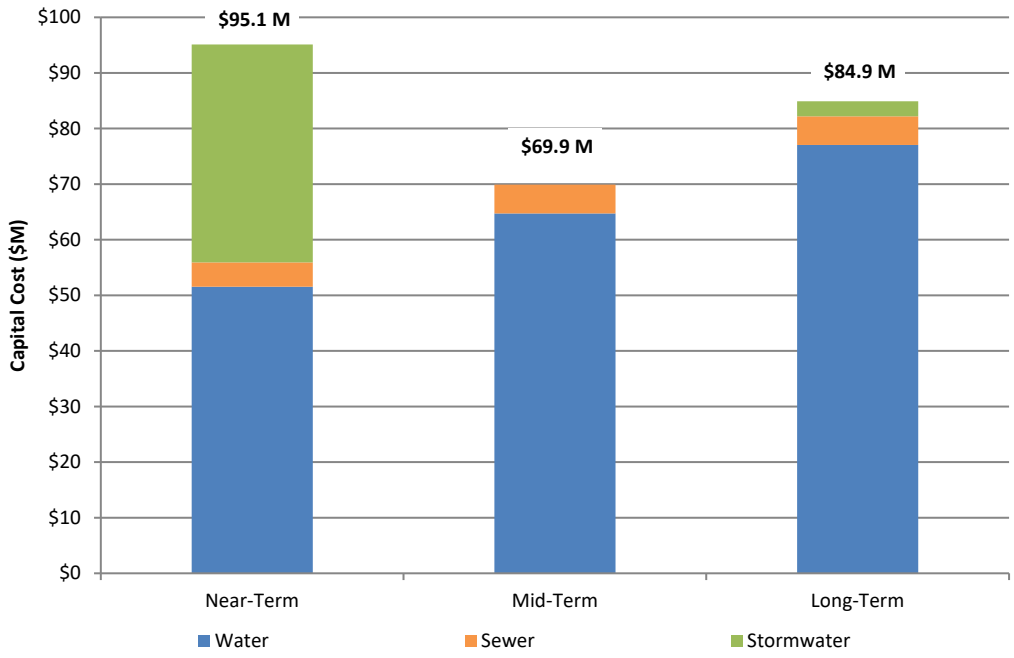

Figure 10.7 Integrated Systems CIP by Phase

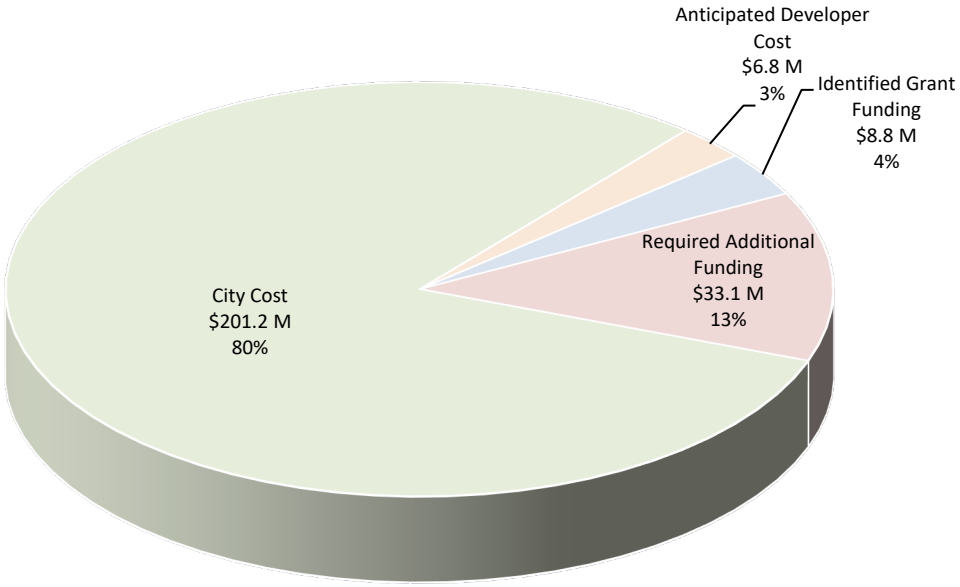

Figure 10.8 Integrated Systems CIP by Funding Sources

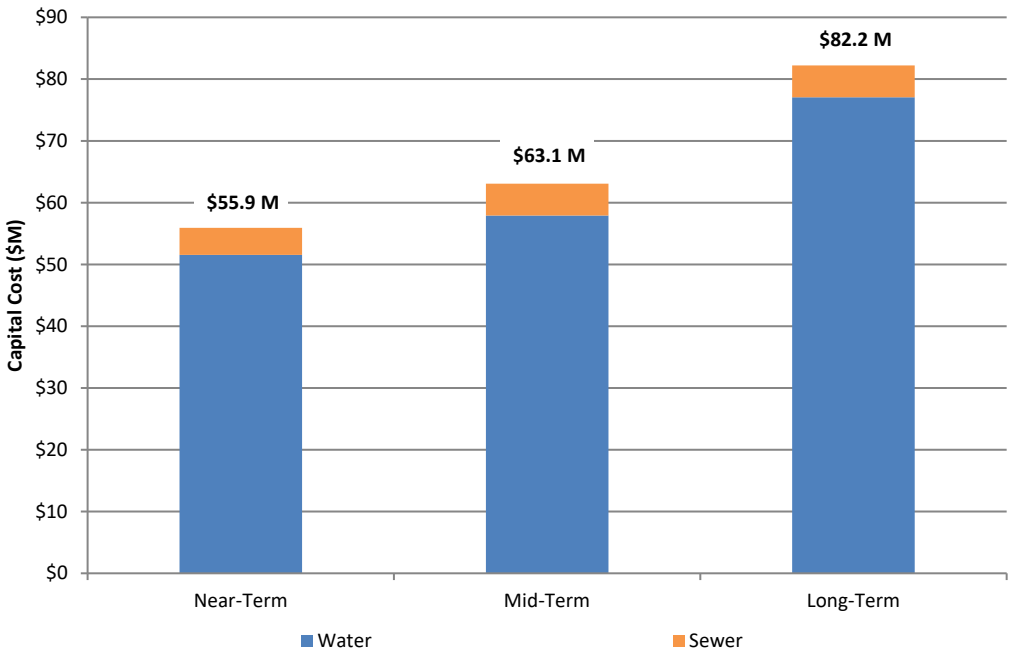

Figure 10.9 Integrated Systems CIP – City Funded by Phase

10.7 Financial Plan

Since the projects recommended in the CIP will require financial investments above and beyond the City's typical budget, the City will need to plan for additional sources of funds in order to implement these projects. This section contains an overview of several options that the City may which to pursue in order to finance CIP projects.

There are two types of costs associated with the recommended CIP projects: capital costs required to plan, design, and build the facilities and infrastructure elements; and operational costs required to maintain, operate, and repair those facilities and infrastructure elements. Capital costs are funded through a variety of sources that range from traditional funding options such as rates, connection fees, and bond financing, to non-traditional funding sources such as grants and loans. The sections that follow outline the mechanisms available to recover both capital and O&M costs.

The main instruments available for funding the capital costs include:

- **Rates and Pay-as-you-go (PAYGO) Financing** — upfront collection of project costs from existing and new users for future capital improvement projects from rates or reserve funds. It is common for utilities to fund major capital expansions through other methods, particularly bond financing, to avoid the burden that PAYGO's high upfront cash requirement places on rate or reserve funds.
- **Development and Connection Fees** – charges on new customers that can fund the maintenance and expansion of the existing system

- **Debt Financing** — acquisition of funds through borrowing mechanisms such as general obligation bonds, revenue bonds, and certificates of participation.
- **Grants and Loans** — alternate sources of funds from public agencies at no or minimal interest cost. Examples include federal, state, and local programs that provide funding at zero interest for projects that meet select criteria. Typically grant and low-interest loan programs do not pay for operation and maintenance costs.

Operating revenues remaining after operating expenses and debt service obligations have been met can be a significant source of funding for capital expenses today or can be placed in reserves for future projects. Financing methods such as grants and loans can be combined with rate and reserve funding to develop a complete funding plan. Most agencies fully fund operational costs through user rates and other recurring annual sources of revenue, and not funded through debt.

10.7.1 Rates and Pay-as-you-go (PAYGO)

The City uses rates paid by water and sewer customers to operate and maintain the water and sewer systems. The City's three-tiered water rate structure includes a fixed fee based on meter size and includes a volume charge and water efficiency fee based on water use to promote water conservation. Most sewer fees are fixed; however, commercial properties are charged based on flow. The City last updated water and sewer rates in 2017 using a rate schedule set to expire in 2022. The existing rate structure allows for increases due to increased wholesale costs from MWD and to account for inflation. Given that the current rate schedule will expire at the end of 2022 and the significant costs associated with projects identified in the CIP, the City should undertake a rate study to update customer water and sewer rates to continue to fund the cost of water and sewer service.

Pay-as-you-go (or PAYGO) financing involves periodic collection of capital charges or assessments from customers within the utility's jurisdiction for funding future capital improvements. The financing could come from either rates or tax assessment. These revenues are accumulated in a capital reserve fund and are used for capital projects in future years. PAYGO financing could be used to finance all or part of a given project.

Overall, total costs are substantially lower when employing a PAYGO financing approach due to the avoidance of interest payments incurred from bond funding, along with the associated transaction costs (e.g., legal fees, underwriters' discounts, etc.). However, it is often challenging to employ this funding approach for large new or replacement projects, due to the high amount of capital that is needed on-hand in reserves, or from rate-based cash flow. If the program is reserve funded, the agency must already have sufficient cash-on-hand designated for such a project. If the program is rate funded, it could significantly increase the agency's rates and fees if the program represents a sizeable increase in capital needs.

10.7.2 Development and Connection Fees

Connection fees are a method by which local agencies can impose charges to offset the costs of new customers connecting to their water, wastewater, or other utility or infrastructure systems. Connection fees are governed by California Government Code §66000, which provides a legal framework for the applicability, assessment, and imposition of connection fees. There are various methods to calculate connection fees; the most appropriate method for any system is dictated by the system's specific characteristics. The results of connection fee calculations typically represent the maximum fees that a utility can impose on new or upgraded connections.

While utilities do hold a degree of latitude in selecting the methodology to calculate and impose connection fees, it is important to provide a strong and reasonable nexus between the connection fees paid by any new customer, the service provided to that customer, and the facilities required to provide that service. If the City wishes to adopt water connection fees in the future, it is recommended that a more refined analysis be performed.

10.7.2.1 Connection Fee Methodologies

Connection fees can be evaluated using three common calculation methods. They are the Buy-In approach, the Incremental Approach, and the Hybrid Approach.

Buy-In Approach:

Connection fees calculated using the Buy-In approach are intended to recover the costs that have already been incurred by a utility in order to serve future growth. In this approach, asset values are calculated based on the current replacement value of the existing system and all other current assets held by each utility. Next, net assets are calculated by subtracting all liabilities from the total asset value. The net asset value is then divided by the existing customer base to calculate the capacity fee.

For water connection fees, the value of net assets is divided by the total number of meter equivalent units (MEUs) that are currently served in order to calculate the capacity fee per MEU.

$$\boldsymbol{Buy\ In\ Capacity\ Fee} = \frac{\boldsymbol{Existing\ System\ Value}}{\boldsymbol{Current\ Customer\ Base}}$$

Incremental Approach:

The second approach, the incremental cost method, recovers costs of planned investments that the utility will undertake to add or maintain capacity necessary to serve future development. In this approach, the current value of planned capital improvements that will serve future users is divided by the expected number of new connections through build-out.

$$\boldsymbol{Incremental\ Capacity\ Fee} = \frac{\boldsymbol{Applicable\ CIP}}{\boldsymbol{Expected\ Future\ Customers}}$$

Hybrid Connection Fee Approach:

The Hybrid (Combined) Approach combines the Buy-In and Incremental Approaches. Current system value is added to capacity related capital projects and divided by the current customer base plus expected future customers.

$$\boldsymbol{Hybrid\ Capacity\ Fee} = \frac{\boldsymbol{Existing\ System\ Value + Applicable\ CIP}}{\boldsymbol{Current\ Customer\ Base + Expected\ Future\ Customers}}$$

10.7.2.2 Value of the Existing System

Both the Buy-In Approach and Hybrid Approach require that new users buy into the Water or Sewer system. Ratepayer equity is comprised of two components: Net Capital Asset Equity and Reserves.

Net Capital Asset Equity

Net capital asset equity represents the current value of the physical water or wastewater system funded by existing ratepayers, less accumulated depreciation and outstanding debt principal. This approach accounts for the fact that system assets have been in service and no longer have the full useful life. The terms related to the calculation of net capital asset equity are defined as:

- **Replacement Cost New**– Current value of the existing water or wastewater system assets.
- **Capital Costs Not Funded by Existing Ratepayers** – These include developer-funded assets and are excluded from the ratepayers' equity calculation.
- **Construction Work-In-Progress** – Capital projects currently under construction.
- **Depreciation** – Represents the loss in value of the system as the useful life of that asset is exhausted.
- **Outstanding Debt Principal** – Outstanding debt principal represents amortized capital project costs not yet funded by existing ratepayers. Asset equity is reduced by this amount. As debt is retired, through the use of either user rates or capacity charge revenues, the retired debt principal becomes part of the asset equity.

Reserves

Reserves and funds contributed by existing ratepayers are also included when calculating ratepayer equity. The reserve funds included in connection fee calculations may include the debt service reserve and unrestricted cash reserves.

Total Ratepayer Equity

The total ratepayer equity is the value of the existing system that has been contributed by existing ratepayers. It is the sum of net capital asset equity (adjusted value) and the reserve fund balance.

10.7.2.3 Value of the Future System

The value of capital investments that will add capacity to serve future users or maintain existing capacity available for future users, serves as the basis for Incremental connection fees, and is also included in the calculation of Hybrid connection fees. The value of the future system is calculated based on the CIP values presented earlier in this chapter.

Many of the capital projects included in the calculation of the connection fees provide benefits to both existing and future users, and the majority is driven by the need for repair and replacement. Though these projects will not be undertaken specifically to serve growth, it is appropriate that a portion of the costs is borne by future users as the projects will maintain the existing capacity within the system that will be allocated to those future users.

10.7.2.4 Customer Base

Water connection fees are typically assessed to customers based on MEUs, which are calculated based on water meter size. Larger meters have higher instantaneous flow rates and therefore have an increased potential capacity. The current customer base can be calculated through the number and size of existing meters. The future customer base can be estimated by applying the growth assumptions documented in this One Water Plan to the City's current customer base.

10.7.2.5 Considerations for the City

The preferred connection fee approach for any utility is dictated by the specific characteristics of the utility, as well as the policy goals that the utility hopes to achieve through the implementation of connection fees. Typically, factors such as the level of system build-out and the type of development expected, the presence of excess capacity or need for additional capacity, and the amount of CIP expenditures anticipated are considered when choosing a connection fee approach.

Though limited in scope, this overview provides a starting point for the City in the consideration of water connection fees. If the City elects to pursue connection fees for the water or wastewater systems, a more in-depth study should be completed to reach a more refined result.

10.7.3 Debt Financing

Debt financing is the acquisition of funds through borrowing mechanisms such as general obligation bonds, revenue bonds, and certificates of participation.

10.7.3.1 General Obligation Bonds

General Obligation (G.O.) bonds are backed by the full faith and credit of the issuer. As such they also carry the pledge of the issuer to use its taxing authority to guarantee payment of interest and principal. The issuer's general obligation pledge is usually regarded by both investors and ratings agencies as the highest form of security for bond issues. As a result, G.O. bonds generally have the lowest long-term costs of the debt financing options.

Because G.O. bonds are viewed as being more secure than other types of bonds, they are usually issued at lower interest rates, have fewer costs for marketing and issuance, and do not require the restrictive covenants, special reserves, and higher debt service coverages typical of other types of bond issues.

The ultimate security for G.O. bonds is the pledge to impose a property tax to pay for debt service. Use of property taxes, assessed on the value of property, may not fairly distribute the cost burden in line with the benefits received by the City's customers. While the ability to use the taxing authority exists, the City could choose to fund the debt service from other sources of revenues, such as water rates or connection/development fees.

In California, any new debt issue that could affect property taxes must be approved by the electorate by a two-thirds majority. This requirement still applies even if the intent of the issuer is to use revenue sources other than property taxes to pay debt service since the taxing authority is still in place. Consequently, few G.O. bonds are approved. While not an impossible task, the cost, time, and resources required to educate the public and gain approval for G.O. bonds are likely to be substantial.

G.O. bonds are attractive due to lower interest rates, fewer restrictions, greater market acceptance, and lower issue costs. However, the difficulties in securing a two-thirds majority make them less attractive than other alternatives, such as revenue bonds.

10.7.3.2 Revenue Bonds

Revenue bonds are long term debt obligations for which the revenue stream of the issuer is pledged for payment of principal and interest. Because revenue bonds are not secured by the full credit or taxing authority of the issuing agency, they are not perceived as being as secure as G.O. bonds. Since revenue bonds are perceived to have less security and are therefore considered riskier, they are typically sold at slightly higher interest rates than would be the case for G.O. bonds. The security pledged is that the system will be operated in such a way that sufficient revenues will be generated to meet debt service obligations.

Typically, issuers provide the necessary assurances to bondholders that funds will be available to meet debt service requirements through two mechanisms. The first is provision of a debt reserve fund. The debt reserve fund is usually established from the proceeds of the bond issue. The amount held in reserve in most cases is based on either the maximum debt service due in any one year during the term of the bonds or the average annual debt service over the term. The funds are deposited with a trustee to be available in the event the issuer is otherwise incapable of meeting its debt service obligations in any year. The issuer pledges that any funds withdrawn from the reserve will be replenished within a short period, usually within a year.

The second assurance made by the borrower is a pledge to maintain a specified minimum coverage ratio (sometimes referred to a "times coverage") on its outstanding revenue bond debt. The coverage ratio is determined by dividing the net revenues of the borrower by the annual revenue bond debt service for the year, where net revenues are defined as gross revenues less operation and maintenance expenses. Minimum coverage ratios must be comfortably above 1. If the ratio falls below 1, the borrower revenues are less than what is needed to pay back bondholders. To the extent that the borrower can demonstrate achievement of coverage ratios higher than required, the marketability and interest rates on new issues may be more favorable.

Specific authority to issue a specified amount in revenue bonds requires approval by a majority of voters casting ballots. To limit costs (and risks) associated with seeking approval through elections, authorization is typically sought for the maximum amount of bonds that will be needed over the planning period. Upon receiving authorization, the agency actually issues bonds as needed, up to the authorized amount.

Use of revenue bonds provides a viable option for providing the needed financing for the City. The City will need to consider, in conjunction with its financial advisers, the feasibility of issuing the bonds as tax-exempt versus taxable bonds. Since the costs of issuing bonds is usually a subject to economies of scale (i.e., the larger the bond issue, the less the percentage of the bond issue that must be devoted to bond issue costs), having one larger bond issue is more economical than several smaller bond issues. For example, a bond issue of $50 million will have lower issue costs than two separate issues of $25 million. The City and its financial advisor would need to determine appropriate issue size(s).

10.7.3.3 Certificates of Participation

Certificates of participation provide long-term financing through a lease agreement that does not require voter approval. The legislative body of the issuing agency is required to approve the lease arrangement by a resolution. The lessee (the City) would be required to make payments typically from revenues derived from the operation of the facilities. The amount financed may include reserves and capitalized interest for the period that facilities will be under construction. Within California, most municipal utility bonds are issued in the form of certificates of participation rather than traditional revenue bonds.

10.7.4 Grants and Loans

In addition to rates, fees, and bonds, there are potential federal and state low interest loan and grant funding program mechanisms available to recover the capital costs associated with the planning, design, and construction of CIP projects.

With an overall increased interest in grants and low interest loan programs, and in light of COVID-19 related revenue impacts, sources of low interest loan financing and grant funding are more limited and/or more competitive to secure. The larger funding programs (e.g., Water Innovation Finance and Innovation Act [WIFIA] and State of California Clean Water State Revolving Fund [CWSRF]) provide some of the best opportunities to obtain larger sources of low interest loan funding. While programs such as the Department of Water Resources (DWR) or Bureau of Reclamation (Reclamation) programs provide relatively large sources of grant funding. Smaller grants and loans can also be pursued as they are helpful in building relationships with funding agencies and reducing the financial burden on the City. In addition, grant and low interest loan funding helps to demonstrate that the City is doing their fiduciary responsibility to ratepayers by seeking alternative sources of funding.

There are numerous factors that should be considered in the pursuit of grant and low interest loan funding, including:

- **Funding Program Focus/Priorities.** Most low interest loan and grant programs target a specific type of project or purpose/priority. In order for a project to be competitive, it needs to meet the intent of the program and support program priorities.
- **Established Application Timelines.** Application timing is critical for most low interest loan and grant programs. While some funding agencies accept applications on a rolling basis, most have prescribed submission dates. Typically, programs release funding announcements once a year, while some vary year to year pending appropriations.
- **Project Readiness.** An assessment of project document readiness compared to funding program requirements is important to ensure the appropriate level of documentation (e.g., engineering, environmental, and financial) is available to support the grant application.
- **Funding Restrictions.** Very few programs allow for the retroactive funding of design and construction work, and some programs will only fund activities that are conducted post selection for award and/or agreement prior to starting work activities.

- **Application Timing.** In general, if pursuing low interest loan programs, agencies should plan on submitting a loan application 6 to 12 months in advance of when funding is needed for construction. For most grant programs, a grant package is typically due within 45 to 60 days of the release of a funding announcement, with awards announced approximately 3 months after submission and contracting another 3 to 6 months pending the program.
- **Does not cover the full cost of the project.** Most grant programs do not cover the full cost of the project, requiring the sponsoring agency to provide a minimum cost share ranging from 25 to 75 percent. Often there is also a minimum funding requirement. Some agencies secure low interest loan financing for the entire project and in parallel pursue appropriate grants where the entity will be competitive.
- **Reimbursement for incurred costs, requiring agency to initially pay for project.** Most low interest loan and grant programs are reimbursements of cost incurred and not cash up front. This requires that a source of funding be available for the construction of the project.
- **Staffing is required to pursue and manage the grants.** Most Federal and State loans and grants have significant requirements for documentation to submit applications and to manage programs. These require significant staff time, and the City will need additional staff to be able to manage the grants. For some smaller grants, the cost of staff time to administer the program may be high compared to the amount received.

Both Federal and State low interest loans and grant programs are competitive, and the application process can be time-consuming and require an investment to pursue funding. More so, as grant funds are limited and highly competitive, require a challenging qualification process, are not typically a long-term funding solution, and may expire after a specified time, an assessment of the appropriateness of pursuing a specific grant should be conducted to verify the investment is worthwhile. The City must have adequate staffing support in order to pursue and administer grant or loan funds.

Table 10.13 summarizes some potential grant and loan programs that the City may wish to pursue to fund the recommended CIP projects. More investigation is required to determine which projects may be eligible for each funding source. Note that this table is not exhaustive and there may be other funding opportunities available for specific CIP projects.

10.7.5 Financial Plan Recommendations

Given the urgent need for additional funding to finance the projects recommended in the CIP, the following measures are recommended:

- Undertake a rate study to update water and wastewater rates and connection fees.
- Secure additional staffing support to execute projects recommended in the CIP and to manage the grants needed to fund CIP projects.
- Further investigate grant and loan opportunities for specific projects.

Table 10.13 Potential Grant and Loan Programs

Program	Agency	Type	Description	Notes
Federal Funding Programs				
Water Infrastructure Finance and Innovation Act (WIFIA)	EPA	Loan	Financing mechanism for water and wastewater infrastructure projects which provides low interest rate financing for large dollar-value water and wastewater projects. Projects must cost no less than $20 million or $5 million for small community projects (25,000 of fewer) (projects can be combined and submitted as a group of projects) with the maximum amount of the loan not exceeding 49 percent of the project costs. Maximum loan term is 35 years (including 5-year repayment deferment). Interest rate is equal to the US Treasury rate of a similar maturity. Funds can be used to cover planning/design (retroactive) and construction activities. Application fees apply with initial application fee of a $100,000 at time of Application submittal (total average fee is $200,000 - $400,000 pending reviews and legal negotiations). FY 2021 lending capacity is $6 billion. FY 2022 FOA (funding capacity of $5.5 B) will likely be released in April-June 2022. **Link:** https://www.epa.gov/wifia	Projects for the repair, rehabilitation, or replacement of a treatment works, community water system, or aging water distribution or waste collection facility are specified as eligible projects for the program.
State Funding Programs				
Drinking Water State Revolving Fund (DWSRF)	State Water Resources Control Board (SWRCB)	Loan	The State's DWSRF program provides low interest (the 2021 rate is 1.2%) loans for up to 30 years for the funding of water treatment works, transmission lines, distribution systems, water meters, and other projects. To be considered for funding, a complete (or as complete as possible) DWSRF Application package (including required technical, environmental and financial documentation) must be submitted. Funding is based on a first come first serve basis based on submission of a complete application package. Projects are required to comply with federal requirements (CEQA plus, A&E Procurement, AIS, Davis Bacon, DBE and other requirements). **Link:** https://www.waterboards.ca.gov/drinking_water/services/funding/SRF.html	DWSRF financing would cover all eligible costs and provide for low interest financing of CIP projects with no minimum project cost.
Clean Water State Revolving Fund (CWSRF)	SWRCB	Loan	The State's CWSRF program provides low interest (50% of the G.O. bond rate – the current interest rate is 0.9%) loans for up to 30 years for the funding of wastewater treatment works, transmission lines, distribution systems, recycled water, and other projects. To be considered for funding, a complete (or as complete as possible) CWSRF Application package (including required technical, environmental and financial documentation) must be submitted for evaluation by the SWRCB based on established scoring criteria. Projects meeting an established priority score will be placed on a fundable list for funding in the upcoming fiscal year. As funding for the program is from both Federal and State sources – federal requirements apply including CEQA plus, A&E Procurement, AIS, Davis Bacon, anti-lobbying, and other requirements. In addition, the Green Project Reserve (GPR) program provides loan principal forgiveness for projects that address water or energy efficiency or encourage sustainable project development. The maximum GPR project's loan forgiveness limit for recycled water projects is 50 percent for construction costs with a maximum $2.5 million cap. **Link:** https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/	Potential programs for wastewater treatment plant projects which hit program priorities/scoring. Funding is available for both planning and construction efforts. For construction projects, it is recommended that engineering documents are at least 50 percent complete, projects with score higher the more completeness they can demonstrate.
Proposition 1 IRWM Grant Program	Department of Water Resources (DWR)	Grant	The Prop 1 Grant Program authorized $510 million in IRWM funding to meet long term water needs in the state. IRWM projects target long-term water supply reliability, resiliency, water quality improvements, and protection of natural resources. Potential amendments to address climate change resiliency in future guidance. Project must be listed in the local region's IRWM plan in order to pursue funding. **Link:** https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs/Proposition-1	Final Proposal solicitations for Round2 funding is anticipated for release in late 2021 and will fully allocate available Prop 1 funding during this round. Projects that allow the City to use more local groundwater, capture and use stormwater, or implement recycled water rather than rely on imported water from MWD may be eligible.

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Table 10.13 Potential Grant and Loan Programs *(continued)*

Program	Agency	Type	Description	Notes
Urban Community and Multi-benefit Drought Relief Program	DWR	Grant	The Urban and Multi-benefit Drought Relief Program address drought impacts through the implementation of projects with multiple benefits for communities facing the loss or contamination of their water supplies due to drought and to address immediate drought impacts on human health and safety, and to protect fish and wildlife resources plus other public benefits. Types of projects include hauled water, temporary community water tanks, water vending machines, emergency water interties, new wells/rehab of existing wells, recycled water projects immediately reducing potable water demands construction/installation of permanent connections to water projects providing immediate relief to potable water and support immediate drought relief. DWR has allocated $100 million for Urban Communities and $200 million for Multi-benefit Drought Relief projects; DWR combined a portion of these allocations into a $200 million Drought and Multi-benefit Drought Relief Funding for FY 2021; with $100M for Multi-benefit Drought Funding for FY 2022. **Link:** https://water.ca.gov/Water-Basics/Drought/Urban-Multi-Benefit-Drought	Well-related projects and future recycled water projects may be eligible.
Local Funding Programs				
Safe Clean Water Program (SCW)	Los Angeles County	Grant	In response to water quality limitations, and to increase water supplies, voters passed a parcel tax in Los Angeles County in 2018 (Measure W) to implement the Safe, Clean Water (SCW) Program. The measure will raise an estimated $285 million annually for projects and programs throughout Los Angeles County, allocating funds to support municipal, regional, and district programs. Estimated annual revenue under the municipal program for the City is approximately $250,000 for project and programs at the local level. The SCW Regional Program provides funding for stormwater projects at the watershed level and is distributed among nine watershed areas. The objective of this program is to plan, build, and maintain watershed-based projects that incorporates multi-benefit components to its communities. **Link:** https://safecleanwaterla.org/	The City has already successfully applied for and been granted SCW funds and plans to continue to do so in order to fund stormwater projects.

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Table 10.14 Detailed CIP -Potable Water System

Table 10.14 Water System Capital Improvement Program
One Water 2050 Plan
City of South Pasadena

Improv. ID	Facility Type	Type of Improvement	Project Description	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Replace/ New	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[2],[3] ($)	Phasing: Phase 1 Near-Term FY22/23-FY29/30 ($)	Phase 2 Mid-Term FY30/31-FY39/40 ($)	Phase 3 Long-Term FY40/41-FY49/50 ($)	Developer Contribution (%)	Developer Cost ($)	Grant Funding (%)	Grant Funding ($)	Total City Cost ($)
Water System Fire Flow Improvements																		
Distribution System																		
FF-1	Pipe	Fire Flow	Fire Flow Enhancements - Priority 1	Hawthorne St, Doran St, Cawston Ave, Pasadena Ave	8"	New/Replace	1,580	$ 210	$ 332,000	$ 550,000	$ 550,000			0%	$ -	0%	$ -	$ 550,000
FF-1	Pipe	Fire Flow	Fire Flow Enhancements - Priority 1	Hawthorne St, Doran St, Cawston Ave, Pasadena Ave	12"	New/Replace	1,230	$ 270	$ 332,000	$ 550,000	$ 550,000			0%	$ -	0%	$ -	$ 550,000
FF-2	Pipe	Fire Flow	Fire Flow Enhancements - Priority 1	Fremont Ave, Diamond Ave, Rollin St, Lyndon St	8"	Replace	5,070	$ 210	$ 1,065,000	$ 1,765,000	$ 1,765,000			0%	$ -	0%	$ -	$ 1,765,000
FF-3	Pipe	Fire Flow	Fire Flow Enhancements - Priority 1	Straford Ave	8"	Replace	1,660	$ 210	$ 349,000	$ 578,000	$ 578,000			0%	$ -	0%	$ -	$ 578,000
FF-4	Pipe	Fire Flow	Fire Flow Enhancements - Priority 1	Meridian Avenue and Diamond Avenue	8"	New	20	$ 210	$ 4,000	$ 7,000	$ 7,000			0%	$ -	0%	$ -	$ 7,000
FF-5	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Indiana Ave, Alta Vista Ave, St. Albans Ave	12"	Replace	2,810	$ 270	$ 759,000	$ 1,258,000		$ 1,258,000		0%	$ -	0%	$ -	$ 1,258,000
FF-6	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Hanscom Dr, Peterson Ave, Hulbert Ave,	8"	Replace	4,720	$ 210	$ 991,000	$ 1,643,000		$ 1,643,000		0%	$ -	0%	$ -	$ 1,643,000
FF-7	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Mockingbird Ln, and Raymond Hill	8"	Replace	290	$ 210	$ 61,000	$ 101,000		$ 101,000		0%	$ -	0%	$ -	$ 101,000
FF-7	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Mockingbird Ln, and Raymond Hill	12"	New/Replace	290	$ 270	$ 78,000	$ 129,000		$ 129,000		0%	$ -	0%	$ -	$ 129,000
FF-8	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Arroyo Dr, Hawthorne St, Pasadena Ave	8"	Replace	1,020	$ 210	$ 214,000	$ 355,000		$ 355,000		0%	$ -	0%	$ -	$ 355,000
FF-8	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Arroyo Dr, Hawthorne St, Pasadena Ave	12"	Replace	880	$ 270	$ 238,000	$ 394,000		$ 394,000		0%	$ -	0%	$ -	$ 394,000
FF-9	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Orange Grove Ave, Monterey Rd	8"	New/Replace	2,140	$ 210	$ 449,000	$ 744,000		$ 744,000		0%	$ -	0%	$ -	$ 744,000
FF-10	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Pipe from Raymond	8"	New	100	$ 210	$ 21,000	$ 35,000		$ 35,000		0%	$ -	0%	$ -	$ 35,000
FF-11	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Garfield Ave, Montrose Ave	8"	Replace	1,510	$ 210	$ 317,000	$ 525,000		$ 525,000		0%	$ -	0%	$ -	$ 525,000
FF-12	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Mill Rd	8"	Replace	600	$ 210	$ 126,000	$ 209,000		$ 209,000		0%	$ -	0%	$ -	$ 209,000
FF-13	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Glendon Way, Lyndon St	6"	Replace	380	$ 195	$ 74,000	$ 123,000		$ 123,000		0%	$ -	0%	$ -	$ 123,000
FF-13	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Glendon Way, Lyndon St	8"	Replace	680	$ 210	$ 143,000	$ 237,000		$ 237,000		0%	$ -	0%	$ -	$ 237,000
FF-14	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Pipe from Bilicke	8"	New	100	$ 210	$ 21,000	$ 35,000		$ 35,000		0%	$ -	0%	$ -	$ 35,000
FF-15	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Mountain View Ave	8"	Replace	620	$ 210	$ 130,000	$ 215,000		$ 215,000		0%	$ -	0%	$ -	$ 215,000
FF-16	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Warwick Pl, South Ln	8"	Replace	680	$ 210	$ 143,000	$ 237,000		$ 237,000		0%	$ -	0%	$ -	$ 237,000
FF-17	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Winding Ln	6"	New	1,030	$ 195	$ 201,000	$ 333,000		$ 333,000		0%	$ -	0%	$ -	$ 333,000
FF-18	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Santa Teresa, Camino Del Cielo	8"	Replace	1,340	$ 210	$ 281,000	$ 466,000		$ 466,000		0%	$ -	0%	$ -	$ 466,000
FF-19	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Monterey Rd, Arroyo Verde	8"	Replace	2,010	$ 210	$ 422,000	$ 699,000		$ 699,000		0%	$ -	0%	$ -	$ 699,000
FF-20	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Oak Crest Ave	8"	Replace	570	$ 210	$ 120,000	$ 199,000		$ 199,000		0%	$ -	0%	$ -	$ 199,000
FF-21	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Diamond Ave	6"	Replace	380	$ 195	$ 74,000	$ 123,000		$ 123,000		0%	$ -	0%	$ -	$ 123,000
FF-21	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	Maycrest Ave	8"	Replace	610	$ 210	$ 128,000	$ 212,000		$ 212,000		0%	$ -	0%	$ -	$ 212,000
FF-23	Pipe	Fire Flow	Fire Flow Enhancements - Priority 2	La Fremontia	8"	Replace	740	$ 210	$ 155,000	$ 257,000		$ 257,000		0%	$ -	0%	$ -	$ 257,000
Subtotal							**33,060**		**$ 7,228,000**	**$ 11,979,000**	**$ 3,450,000**	**$ 8,529,000**	**$ -**		**$ -**		**$ -**	**$ 11,979,000**
Control Valves					**Quantity**		**Unit**	**$/unit**										
FFCV-1	Valve	Fire Flow	Fire Flow Valve	Install 8-inch diameter check valve and valve vault at the intersection of Raymond Hill and Cedarcrest Avenue	1	New		$ 100,000	$ 100,000	$ 166,000	$ 166,000			0%	$ -	0%	$ -	$ 166,000
Subtotal									**$ 100,000**	**$ 166,000**	**$ 166,000**	**$ -**	**$ -**	**0%**	**$ -**	**0%**	**$ -**	**$ 166,000**
Fire Flow Improvements Total									**$ 7,328,000**	**$ 12,145,000**	**$ 3,616,000**	**$ 8,529,000**	**$ -**	**0%**	**$ -**	**0%**	**$ -**	**$ 12,145,000**
Water System Capacity Improvements																		
Transmission Mains																		
WC-1	Pipe	Capacity	Magnolia Rezone	New pipeline near Fair Oaks Avenue and Hope Street	12"	New	650	varies	$ 173,000	$ 287,000		$ 287,000		100%	$ 287,000	0%	$ -	$ -
WC-2	Pipe	Capacity	Magnolia Rezone	New pipeline near Meridian Avenue and Hope Street	12"	New	100	varies	$ 28,000	$ 46,000		$ 46,000		100%	$ 46,000	0%	$ -	$ -
WC-3	Pipe	Capacity	Magnolia Rezone	New pipeline near Indiana Street and Monterey Road	12"	New	200	varies	$ 47,000	$ 78,000		$ 78,000		100%	$ 78,000	0%	$ -	$ -
WC-4	Pipe	Capacity	Magnolia Rezone	New pipeline near Monterey Road, Hawthorne Street, and Fair Oaks Avenue	12"	New/Replace	7,050	varies	$ 1,934,000	$ 3,206,000		$ 3,206,000		100%	$ 3,206,000	0%	$ -	$ -
WC-5	Pipe	Capacity	Magnolia Rezone	New pipeline near Hawthorne Street and Indiana Avenue	12"	New	300	$ 270	$ 81,000	$ 134,000		$ 134,000		100%	$ 134,000	0%	$ -	$ -
WC-6	Pipe	Capacity	Magnolia Rezone	New pipeline near El Centro Street, Cawston Avenue, and Indiana Avenue	12"	New	850	$ 270	$ 230,000	$ 381,000		$ 381,000		100%	$ 381,000	0%	$ -	$ -
WC-7	Pipe	Capacity	Magnolia Rezone	New pipeline on Grand Avenue between Mission Street and Charter Oak Street	12"	New	1,850	$ 270	$ 500,000	$ 829,000		$ 829,000		100%	$ 829,000	0%	$ -	$ -
Subtotal							**11,000**		**$ 2,993,000**	**$ 4,961,000**	**$ -**	**$ 4,961,000**	**$ -**		**$ 4,961,000**		**$ -**	**$ -**
Wells					**Quantity**		**Unit**	**$/unit**										
WCW-1	Well	Capacity	Supply Reliability	Install pump and motor on Wilson Well 2 along withlectrical, and I&C)		New			$ 500,000	$ 829,000	$ 829,000			0%	$ -	0%	$ -	$ 829,000
Subtotal									**$ 500,000**	**$ 829,000**	**$ 829,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 829,000**
Control Valves					**Quantity**		**Unit**	**$/unit**										
WCV-1	Pressure Reducing Station	Capacity	Magnolia Rezone	Install a 4-inch diameter PRV, a 10-inch diameter PRV and valve vault south of Hope Street and Brent Avenue	1	New		$ 200,000	$ 200,000	$ 332,000		$ 332,000		100%	$ 332,000	0%	$ -	$ -
WCV-2	Pressure Reducing Station	Capacity	Magnolia Rezone	Install a 4-inch diameter PRV, a 8-inch diameter PRV and valve vault southeast of the intersection of Median Avenue and Hope Street	1	New		$ 200,000	$ 200,000	$ 332,000		$ 332,000		100%	$ 332,000	0%	$ -	$ -
WCV-3	ssure Reducing Sta	Capacity	Magnolia Rezone	Install a 6-inch diameter PRV, a 12-inch diameter PRV and valve vault southwest of the intersection of Indiana Avenue and Monterey Road	1	New		$ 200,000	$ 200,000	$ 332,000		$ 332,000		100%	$ 332,000	0%	$ -	$ -
WCV-4	Isolation Valves	Capacity	Magnolia Rezone	Install 7 new isolation valves to rezone the Magnolia Pressure Zone. Locations vary see Table 6.13 for a description of locations.	7	New		$ 75,000	$ 525,000	$ 870,000		$ 870,000		100%	$ 870,000	0%	$ -	$ -
WCV-5	Pressure Reducing Station	Capacity	Emergency Interconnection	Install a new interconnection to LADWP. Construct a valve vault with an 8-inch diameter Pressure Reducing Vavle and a Flow Control Valve.	1	New		$ 100,000	$ 100,000	$ 166,000	$ 166,000			0%	$ -	0%	$ -	$ 166,000
Subtotal									**$ 1,225,000**	**$ 2,032,000**	**$ 166,000**	**$ 1,866,000**	**$ -**		**$ 1,866,000**		**$ -**	**$ 166,000**
Capacity Improvements Total									**$ 4,718,000**	**$ 7,822,000**	**$ 995,000**	**$ 6,827,000**	**$ -**	**0%**	**$ 6,827,000**	**0%**	**$ -**	**$ 995,000**

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Table 10.14 Water System Capital Improvement Program
One Water 2050 Plan
City of South Pasadena

Improv. ID	Facility Type	Type of Improvement	Project Description	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Replace/ New	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[2],[3] ($)	Phasing: Phase 1 Near-Term FY22/23-FY29/30 ($)	Phase 2 Mid-Term FY30/31-FY39/40 ($)	Phase 3 Long-Term FY40/41-FY49/50 ($)	Developer Contribution (%)	Developer Cost ($)	Grant Funding (%)	Grant Funding ($)	Total City Cost ($)
Repair and Rehabilitation Projects																		
Distribution System																		
SDR-4a	Pipe	R&R	Small Diameter Pipeline Replacements (4")	Upsize 4" diameter pipelines to 8" (13.5 mi) - city wide for FF improvements & at end of useful life	8"	Replace	71,016	$ 210	$ 14,913,000	$ 24,718,000	$ 24,718,000			0%	$ -	0%	$ -	$ 24,718,000
SDR-4b	Pipe	R&R	Small Diameter Pipeline Replacements (4")	Upsize 4" diameter pipelines to 8" (0.8 mi) - city wide for FF improvements	8"	Replace	4,193	$ 210	$ 881,000	$ 1,460,000		$ 1,460,000		0%	$ -	0%	$ -	$ 1,460,000
RR-1	Pipe	R&R	Mid-Term Pipeline Replacements	Replace 21.0 miles of pipelines that are at the end of their useful life.	varies	Replace	113,000	varies	$ 27,464,589	$ 45,523,000		$ 45,523,000		0%	$ -	0%	$ -	$ 45,523,000
RR-2	Pipe	R&R	Long-Term Pipeline Replacements	Replace 35.6 miles of pipelines that are at the end of their useful life.	varies	Replace	185,000	varies	$ 44,810,645	$ 74,274,000			$ 74,274,000	0%	$ -	0%	$ -	$ 74,274,000
Subtotal							**373,210**		**$ 88,069,234**	**$ 145,975,000**	**$ 24,718,000**	**$ 46,983,000**	**$ 74,274,000**		**$ -**		**$ -**	**$ 145,975,000**
Storage/Reservoir					**Quantity (MG)**		**Unit**	**$/unit**										
WRS-1	Storage	R&R	Condition Assessment	Surge & VFD Study for removal of Raymond Elevated Tank, Removal of Raymond Tank, Add VFDs to pumps at Garfield and Grand, Add surge tank at Raymond Tank Site.					$ 775,000	$ 1,285,000		$ 1,285,000		**0%**	$ -	**0%**	$ -	$ 1,285,000
WRS-2	Storage	R&R	Condition Assessment	Surge & VFD Study for decommission of Bilicke Elevated Tank, Decommission of Bilicke Tank, Add surge tank at Bilicke or Westside Site.					$ 225,000	$ 373,000	$ 373,000			0%	$ -	0%	$ -	$ 373,000
WRS-3	Storage	R&R	Condition Assessment	Replacement of Westside Reservoir					$ 8,300,000	$ 13,757,000	$ 13,757,000			0%	$ -	0%	$ -	$ 13,757,000
Subtotal									**$ 9,300,000**	**$ 15,415,000**	**$ 14,130,000**	**$ 1,285,000**	**$ -**		**$ -**		**$ -**	**$ 15,415,000**
Booster Pump Stations					**Quantity**		**Unit**	**$/unit**										
WRPS-1	PS	R&R	Condition Assessment	Westside Pump Station replacement with additional Pump and VFDs	3 Pumps				$ 2,025,000	$ 3,356,000	$ 3,356,000			0%	$ -	0%	$ -	$ 3,356,000
WRPS-2	PS	R&R	Condition Assessment	Indiana Pump Station replacement with VFDs	2 Pumps				$ 1,350,000	$ 2,238,000	$ 2,238,000			0%	$ -	0%	$ -	$ 2,238,000
Subtotal									**$ 3,375,000**	**$ 5,594,000**	**$ 5,594,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 5,594,000**
Wells					**Quantity**		**Unit**	**$/unit**										
WRW-1	Well	R&R	Ongoing R&R Projects for Wells	Replace motor on Wilson Well 3		Rehab			$ 100,000	$ 166,000			$ 166,000	0%	$ -	0%	$ -	$ 166,000
WRW-2	Well	R&R	Ongoing R&R Projects for Wells	Replace pump on Wilsons Well 3		Rehab			$ 150,000	$ 249,000			$ 249,000	0%	$ -	0%	$ -	$ 249,000
WRW-3	Well	R&R	Ongoing R&R Projects for Wells	Replace pump and motor on Graves Well 2		Rehab			$ 250,000	$ 414,000			$ 414,000	0%	$ -	0%	$ -	$ 414,000
WRW-4	Well	R&R	Ongoing R&R Projects for Wells	Replace pump and motor on Wilson Well 4		Rehab			$ 250,000	$ 414,000			$ 414,000	0%	$ -	0%	$ -	$ 414,000
Subtotal									**$ 750,000**	**$ 1,243,000**	**$ -**	**$ -**	**$ 1,243,000**		**$ -**		**$ -**	**$ 1,243,000**
Backup Power					**Quantity**		**Unit**	**$/unit**										
BP-1	Valve	R&R	Backup Power	Install Transfer Switch at Indiana Site (Hookup Only)	1	New		$ 50,000	$ 50,000	$ 83,000	$ 83,000			0%	$ -	0%	$ -	$ 83,000
BP-2	Valve	R&R	Backup Power	Install backup power at Grand Site (Generator Only)	1	New		$ 200,000	$ 200,000	$ 332,000	$ 332,000			0%	$ -	0%	$ -	$ 332,000
BP-3	Valve	R&R	Backup Power	Install backup power at Garfield (Generator Only)	1	New		$ 200,000	$ 200,000	$ 332,000	$ 332,000			0%	$ -	0%	$ -	$ 332,000
BP-4	Valve	R&R	Backup Power	Install backup power at Wilson Site (Generator Only)	1	New		$ 200,000	$ 200,000	$ 332,000	$ 332,000			0%	$ -	0%	$ -	$ 332,000
BP-5	Valve	R&R	Backup Power	Install backup power at Graves (Generator Only)	1	New		$ 200,000	$ 200,000	$ 332,000	$ 332,000			0%	$ -	0%	$ -	$ 332,000
Subtotal									**$ 850,000**	**$ 1,411,000**	**$ 1,411,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 1,411,000**
Site Improvements					**Quantity**		**Unit**	**$/unit**										
WRSI-NT-1	Site	R&R	Near-Term Site Improvements	Garfield	1			$ 18,000	$ 18,000	$ 30,000	$ 30,000			0%	$ -	0%	$ -	$ 30,000
WRSI-NT-2	Site	R&R	Near-Term Site Improvements	Raymond	1			$ 60,000	$ 60,000	$ 99,000	$ 99,000			0%	$ -	0%	$ -	$ 99,000
WRSI-NT-3	Site	R&R	Near-Term Site Improvements	Grand	1			$ 45,000	$ 45,000	$ 75,000	$ 75,000			0%	$ -	0%	$ -	$ 75,000
WRSI-NT-4	Site	R&R	Near-Term Site Improvements	Kolle (MWD Connection)	1			$ 164,000	$ 164,000	$ 272,000	$ 272,000			0%	$ -	0%	$ -	$ 272,000
WRSI-NT-5	Site	R&R	Near-Term Site Improvements	Westside	1			$ 172,000	$ 172,000	$ 285,000	$ 285,000			0%	$ -	0%	$ -	$ 285,000
WRSI-NT-6	Site	R&R	Near-Term Site Improvements	Bilicke	1			$ 38,000	$ 38,000	$ 63,000	$ 63,000			0%	$ -	0%	$ -	$ 63,000
WRSI-NT-7	Site	R&R	Near-Term Site Improvements	Indiana	1			$ 75,000	$ 75,000	$ 124,000	$ 124,000			0%	$ -	0%	$ -	$ 124,000
WRSI-NT-8	Site	R&R	Near-Term Site Improvements	Wilson	1			$ 28,000	$ 28,000	$ 46,000	$ 46,000			0%	$ -	0%	$ -	$ 46,000
WRSI-MT-1	Site	R&R	Mid-Term Site Improvements	Garfield	1			$ -	$ -	$ -		$ -		0%	$ -	0%	$ -	$ -
WRSI-MT-2	Site	R&R	Mid-Term Site Improvements	Raymond	1			$ -	$ -	$ -		$ -		0%	$ -	0%	$ -	$ -
WRSI-MT-3	Site	R&R	Mid-Term Site Improvements	Grand	1			$ 70,000	$ 70,000	$ 116,000		$ 116,000		0%	$ -	0%	$ -	$ 116,000
WRSI-MT-4	Site	R&R	Mid-Term Site Improvements	Kolle (MWD Connection)	1			$ 17,000	$ 17,000	$ 28,000		$ 28,000		0%	$ -	0%	$ -	$ 28,000
WRSI-MT-5	Site	R&R	Mid-Term Site Improvements	Westside	1			$ 200,000	$ 200,000	$ 332,000		$ 332,000		0%	$ -	0%	$ -	$ 332,000
WRSI-MT-6	Site	R&R	Mid-Term Site Improvements	Bilicke	1			$ -	$ -	$ -		$ -		0%	$ -	0%	$ -	$ -
WRSI-MT-7	Site	R&R	Mid-Term Site Improvements	Indiana	1			$ 23,000	$ 23,000	$ 38,000		$ 38,000		0%	$ -	0%	$ -	$ 38,000
WRSI-MT-8	Site	R&R	Mid-Term Site Improvements	Wilson	1			$ 30,000	$ 30,000	$ 50,000		$ 50,000		0%	$ -	0%	$ -	$ 50,000
WRSI-LT-1	Site	R&R	Long-Term Site Improvement	Garfield	1			$ 350,000	$ 350,000	$ 580,000			$ 580,000	0%	$ -	0%	$ -	$ 580,000
WRSI-LT-2	Site	R&R	Long-Term Site Improvement	Raymond	1			$ 2,000	$ 2,000	$ 3,000			$ 3,000	0%	$ -	0%	$ -	$ 3,000
WRSI-LT-3	Site	R&R	Long-Term Site Improvement	Grand	1			$ 62,000	$ 62,000	$ 103,000			$ 103,000	0%	$ -	0%	$ -	$ 103,000
WRSI-LT-4	Site	R&R	Long-Term Site Improvement	Kolle (MWD Connection)	1			$ -	$ -	$ -			$ -	0%	$ -	0%	$ -	$ -
WRSI-LT-5	Site	R&R	Long-Term Site Improvement	Westside	1			$ -	$ -	$ -			$ -	0%	$ -	0%	$ -	$ -
WRSI-LT-6	Site	R&R	Long-Term Site Improvement	Bilicke	1			$ 180,000	$ 180,000	$ 298,000			$ 298,000	0%	$ -	0%	$ -	$ 298,000
WRSI-LT-7	Site	R&R	Long-Term Site Improvement	Indiana	1			$ -	$ -	$ -			$ -	0%	$ -	0%	$ -	$ -
WRSI-LT-8	Site	R&R	Long-Term Site Improvement	Wilson	1			$ -	$ -	$ -			$ -	0%	$ -	0%	$ -	$ -
Subtotal									**$ 1,534,000**	**$ 2,542,000**	**$ 994,000**	**$ 564,000**	**$ 984,000**		**$ -**		**$ -**	**$ 2,542,000**
R & R Total									**$ 103,878,234**	**$ 172,180,000**	**$ 46,847,000**	**$ 48,832,000**	**$ 76,501,000**		**$ -**		**$ -**	**$ 172,180,000**
Other Projects																		
Studies					**Quantity**		**Unit**	**$/unit**										
WS-1	Other	Study	Pipeline Condition Assessment	Pipeline Condition Assessment Update (2030, 2040)	2		Study	$ 50,000	$ 100,000	$ 100,000		$ 50,000	$ 50,000	0%	$ -	0%	$ -	$ 100,000
WS-2	Other	Study	One Water Plan Updates	Master Plan Update Years (2030, 2040)	2		Study	$ 500,000	$ 1,000,000	$ 1,000,000		$ 500,000	$ 500,000	0%	$ -	0%	$ -	$ 1,000,000
WS-3	Other	Study	Rate Study	Conduct a rate study (2022)	1		Study	$ 100,000	$ 100,000	$ 100,000	$ 100,000			0%	$ -	0%	$ -	$ 100,000
Subtotal									**$ 1,200,000**	**$ 1,200,000**	**$ 100,000**	**$ 550,000**	**$ 550,000**					**$ 1,200,000**
Other Projects Total									**$ 1,200,000**	**$ 1,200,000**	**$ 100,000**	**$ 550,000**	**$ 550,000**		**$ -**		**$ -**	**$ 1,200,000**
Grand Total CIP									**$ 117,124,234**	**$ 193,347,000**	**$ 51,558,000**	**$ 64,738,000**	**$ 77,051,000**	**$ -**	**$ 6,827,000**	**$ -**	**$ -**	**$ 186,520,000**

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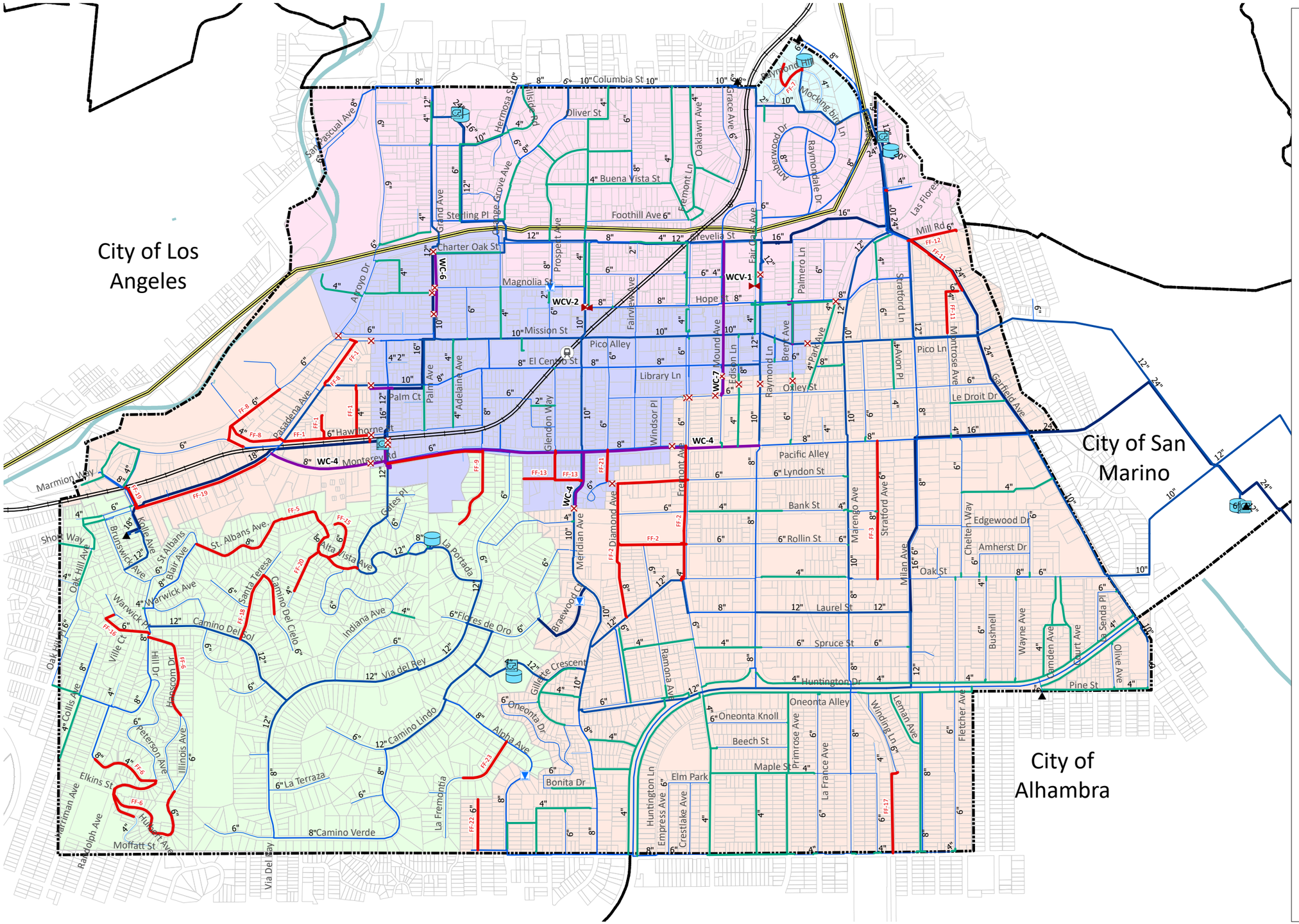

Legend

- Valves to be Closed
- Proposed PRVs
- Fire Flow Projects
- Rezone CIP Pipes
- Pipelines 4-inch diameter and smaller to be upsized
- Interconnections
- Existing Tank
- Existing Pump
- Existing PRV

Existing Potable Water Pipeline

- ≤4"
- 6"
- 8"
- 12"
- ≤24"
- City Boundaries
- Mission Street Gold Line Station
- Metro Gold Line
- Highways
- Arroyo Seco Channel
- Parcel

Pressure Zones

- Magnolia
- Bilikie
- Main
- Pasadena
- Raymond

Miles
0 0.15 0.3

Data Sources: LA County GIS, ESRI, City of South Pasadena

Disclaimer: Features shown in this figure are for planning purposes and represent approximate locations. Engineering and/or survey accuracy is not implied.

Figure 10.10 Potable Water CIP Map

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Table 10.15 Detailed CIP - Wastewater System

Table 10.15 Sewer System Capital Improvement Program
One Water 2050 Plan
City of South Pasadena

Improv. ID	Facility Type	Type of Improvement	Project Description	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Replace/ New	Length (ft)	Unit Cost ($)	Baseline Construction Cost ($)	Capital Improvement Cost[2],[3] ($)	Phasing: Phase 1 Near-Term FY22/23-FY29/30 ($)	Phase 2 Mid-Term FY30/31-FY39/40 ($)	Phase 3 Long-Term FY40/41-FY49/50 ($)	Developer Contribution (%)	Developer Cost ($)	Grant Funding (%)	Grant Funding ($)	Total City Cost ($)
Near-Term Sewer System Rehab and Rehabilitation																		
Sewer Lining Projects for Pipes in Poor or Very Poor Condition																		
SL-1	Pipe	R&R	Sewer Repair - Priority 1	Line 450 feet of pipe on Laurel street between manhole 49A and manhole 49B	8"	Replace	500	$ 80	$ 40,000	$ 66,000	$ 66,000			0%	$ -	0%	$ -	$ 66,000
SL-2	Pipe	R&R	Sewer Repair - Priority 1	Line 350 feet of pipe on Stratford Avenue between manhole 6D and manhole 6E	8"	Replace	330	$ 80	$ 26,000	$ 43,000	$ 43,000			0%	$ -	0%	$ -	$ 43,000
SL-3	Pipe	R&R	Sewer Repair - Priority 1	Line 250 feet of pipe on Brent Avenue between manhole 52A and manhole 52B	8"	Replace	240	$ 80	$ 19,000	$ 31,000	$ 31,000			0%	$ -	0%	$ -	$ 31,000
SL-4	Pipe	R&R	Sewer Repair - Priority 1	Line 425 feet of pipe on Fair Oaks Avenue between manhole 48D and manhole 48C	8"	Replace	410	$ 80	$ 33,000	$ 55,000	$ 55,000			0%	$ -	0%	$ -	$ 55,000
SL-5	Pipe	R&R	Sewer Repair - Priority 1	Line 275 feet of pipe on xxxx Donaldo Court between manhole 134F and manhole 13C	8"	Replace	280	$ 80	$ 22,000	$ 36,000	$ 36,000			0%	$ -	0%	$ -	$ 36,000
SL-6	Pipe	R&R	Sewer Repair - Priority 1	Line 425 feet of pipe on Marengo Avenue between manhole 32A and manhole 32B	10"	Replace	430	$ 100	$ 43,000	$ 71,000	$ 71,000			0%	$ -	0%	$ -	$ 71,000
SL-7	Pipe	R&R	Sewer Repair - Priority 1	Line 125 feet of pipe on Monterey Road between manhole 105E and manhole 105D	8"	Replace	110	$ 80	$ 9,000	$ 15,000	$ 15,000			0%	$ -	0%	$ -	$ 15,000
Subtotal							**2,300**		**$ 192,000**	**$ 317,000**	**$ 317,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 317,000**
Sewer Replacement Projects for Pipes in Poor or Very Poor Condition																		
SR-1	Pipe	R&R	Sewer Repair - Priority 1	Replace 440 feet of pipe on Edgewood Drive between manhole 17E and manhole 16C	8"	New	440	$ 295	$ 130,000	$ 215,000	$ 215,000			0%	$ -	0%	$ -	$ 215,000
SR-2	Pipe	R&R	Sewer Repair - Priority 1	Replace 200 feet of pipe on Brent Ave between manhole 52C and manhole 55B	8"	New	200	$ 295	$ 59,000	$ 98,000	$ 98,000			0%	$ -	0%	$ -	$ 98,000
SR-3	Pipe	R&R	Sewer Repair - Priority 1	Replace 220 feet of pipe on Fremont Ave between manhole 95E and manhole 39B	8"	New	220	$ 295	$ 65,000	$ 108,000	$ 108,000			0%	$ -	0%	$ -	$ 108,000
SR-4	Pipe	R&R	Sewer Repair - Priority 1	Replace 200 feet of pipe on Garfield Ave manhole 117K and manhole 117L	8"	New	200	$ 295	$ 59,000	$ 98,000	$ 98,000			0%	$ -	0%	$ -	$ 98,000
SR-5	Pipe	R&R	Sewer Repair - Priority 1	Replace 340 feet of pipe on Fair Oaks Ave between manhole 48B and manhole 48C	8"	New	340	$ 295	$ 100,000	$ 166,000	$ 166,000			0%	$ -	0%	$ -	$ 166,000
SR-6	Pipe	R&R	Sewer Repair - Priority 1	Replace 380 feet of pipe on Marengo Avenue between manhole 33E and manhole 33B	8"	New	380	$ 295	$ 112,000	$ 186,000	$ 186,000			0%	$ -	0%	$ -	$ 186,000
SR-7	Pipe	R&R	Sewer Repair - Priority 1	Replace 200 feet of pipe on Saint Albens Avenue between manhole 119A and manhole 119K	8"	Neww	200	$ 295	$ 59,000	$ 98,000	$ 98,000			0%	$ -	0%	$ -	$ 98,000
SR-8	Pipe	R&R	Sewer Repair - Priority 1	Replace 140 feet of pipe in easment east of Camino Del Sol between manhole 178E and manhole 178F	8"	New	140	$ 295	$ 41,000	$ 68,000	$ 68,000			0%	$ -	0%	$ -	$ 68,000
SR-9	Pipe	R&R	Sewer Repair - Priority 1	Replace 190 feet of pipe in easment between Collis Ave and Harriman Ave. Between manhole 142E and manhole 189E	8"	New	190	$ 295	$ 56,000	$ 93,000	$ 93,000			0%	$ -	0%	$ -	$ 93,000
Subtotal							**2,310**		**$ 681,000**	**$ 1,130,000**	**$ 1,130,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 1,130,000**
Sewer Point Repair for Pipes in Poor or Very Poor Condition					**Diameter**		**Qty**	**$/Qty**										
SPR-1	Pipe	R&R	Sewer Repair - Priority 1	Repair 100 feet of pipe on Chelten Way between manhole 19E and manhole 16D	8"	Replace	1	$ 10,000	$ 10,000	$ 17,000	$ 17,000			0%	$ -	0%	$ -	$ 17,000
SPR-2	Pipe	R&R	Sewer Repair - Priority 1	Repair 100 feet of pipe in easment south of Peterson Ave between manhole 194C and manhole 194B	8"	Replace	1	$ 10,000	$ 10,000	$ 17,000	$ 17,000			0%	$ -	0%	$ -	$ 17,000
Subtotal									**$ 20,000**	**$ 34,000**	**$ 34,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 34,000**
Sewer Lining Budget for Pipes in Mediocre Condition					**Diameter**		**Qty**	**$/Qty**										
NTSL	Pipe	R&R	Sewer Repair - Priority 2	Near-Term Sewer Lining		Replace	4,000	$ 86	$ 344,000	$ 570,000	$ 570,000			0%	$ -	0%	$ -	$ 570,000
Subtotal									**$ 344,000**	**$ 570,000**	**$ 570,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 570,000**
Sewer Replacement Budget for Pipes in Mediocre Condition					**Diameter**		**Qty**	**$/Qty**										
NTSR	Pipe	R&R	Sewer Repair - Priority 2	Near-Term Sewer Replacement		Replace	4,000	$ 306	$ 1,224,000	$ 2,029,000	$ 2,029,000			0%	$ -	0%	$ -	$ 2,029,000
Subtotal									**$ 1,224,000**	**$ 2,029,000**	**$ 2,029,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 2,029,000**
Sewer Point Repair Budget for Pipes in Mediocre Condition					**Diameter**		**Qty**	**$/Qty**										
NTSPR	Pipe	R&R	Sewer Repair - Priority 2	Near-Term Sewer Point Repair		Replace	4	$ 10,000	$ 40,000	$ 66,000	$ 66,000			0%	$ -	0%	$ -	$ 66,000
Subtotal									**$ 40,000**	**$ 66,000**	**$ 66,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 66,000**
Near-Term Sewer System Repair and Rehabilitation Total									**$ 2,501,000**	**$ 4,146,000**	**$ 4,146,000**	**$ -**	**$ -**		**$ -**		**$ -**	**$ 4,146,000**
Future Sewer System Repair and Rehabilitation																		
MTSL	Pipe	R&R	Sewer Repair - Priority 3	Mid-Term Sewer Lining		Replace	7,500	$ 86	$ 645,000	$ 1,069,000		$ 1,069,000		0%	$ -	0%	$ -	$ 1,069,000
MTSR	Pipe	R&R	Sewer Repair - Priority 3	Mid-Term Sewer Replacement		Replace	7,500	$ 306	$ 2,295,000	$ 3,804,000		$ 3,804,000		0%	$ -	0%	$ -	$ 3,804,000
MTSPR	Pipe	R&R	Sewer Repair - Priority 3	Mid-Term Sewer Point Repair		Replace	8	$ 10,000	$ 80,000	$ 133,000		$ 133,000		0%	$ -	0%	$ -	$ 133,000
LTSL	Pipe	R&R	Sewer Repair - Priority 4	Long-Term Sewer Lining		Replace	7,500	$ 86	$ 645,000	$ 1,069,000			$ 1,069,000	0%	$ -	0%	$ -	$ 1,069,000
LTSR	Pipe	R&R	Sewer Repair - Priority 4	Long-Term Sewer Replacement		Replace	7,500	$ 306	$ 2,295,000	$ 3,804,000			$ 3,804,000	0%	$ -	0%	$ -	$ 3,804,000
LTSPR	Pipe	R&R	Sewer Repair - Priority 4	Long-Term Sewer Point Repair		Replace	8	$ 10,000	$ 80,000	$ 133,000			$ 133,000	0%	$ -	0%	$ -	$ 133,000
Subtotal									**$ 6,040,000**	**$ 10,012,000**	**$ -**	**$ 5,006,000**	**$ 5,006,000**		**$ -**		**$ -**	**$ 10,012,000**
Future Sewer System Repair and Rehabilitation Total									**$ 6,040,000**	**$ 10,012,000**	**$ -**	**$ 5,006,000**	**$ 5,006,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 10,012,000**
Other Projects																		
Studies					**Quantity**		**Unit**	**$/unit**										
CCTV 2030	Pipe	Other	Perform CCTV Inspection in 2030	Perform a CCT Inspection on the Sewer System every 10 years	1		1	$ 100,000	$ 100,000	$ 100,000	$ 100,000			0%	$ -	0%	$ -	$ 100,000
CCTV 2040	Pipe	Other	Perform CCTV Inspection in 2040		1		1	$ 100,000	$ 100,000	$ 100,000		$ 100,000		0%	$ -	0%	$ -	$ 100,000
CCTV 2050	Pipe	Other	Perform CCTV Inspection in 2050		1		1	$ 100,000	$ 100,000	$ 100,000			$ 100,000	0%	$ -	0%	$ -	$ 100,000
CALIBRATION	System	Other	Sewer Model	Flow Monitoring Study and Sewer Model Calibration (2023)	1		1	$ 100,000	$ 100,000	$ 100,000	$ 100,000			0%	$ -	0%	$ -	$ 100,000
SSMP	System	Other	SSMP Update	Update the SSMP every 5 years	1		5	$ 25,000	$ 125,000	$ 125,000	$ 25,000	$ 50,000	$ 50,000	0%	$ -	0%	$ -	$ 125,000
Subtotal										**$ 525,000**	**$ 225,000**	**$ 150,000**	**$ 150,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 525,000**
Other Projects Total									**$ -**	**$ 525,000**	**$ 225,000**	**$ 150,000**	**$ 150,000**		**$ -**		**$ -**	**$ 525,000**
Grand Total CIP									**$ 8,541,000**	**$ 14,683,000**	**$ 4,371,000**	**$ 5,156,000**	**$ 5,156,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 14,683,000**

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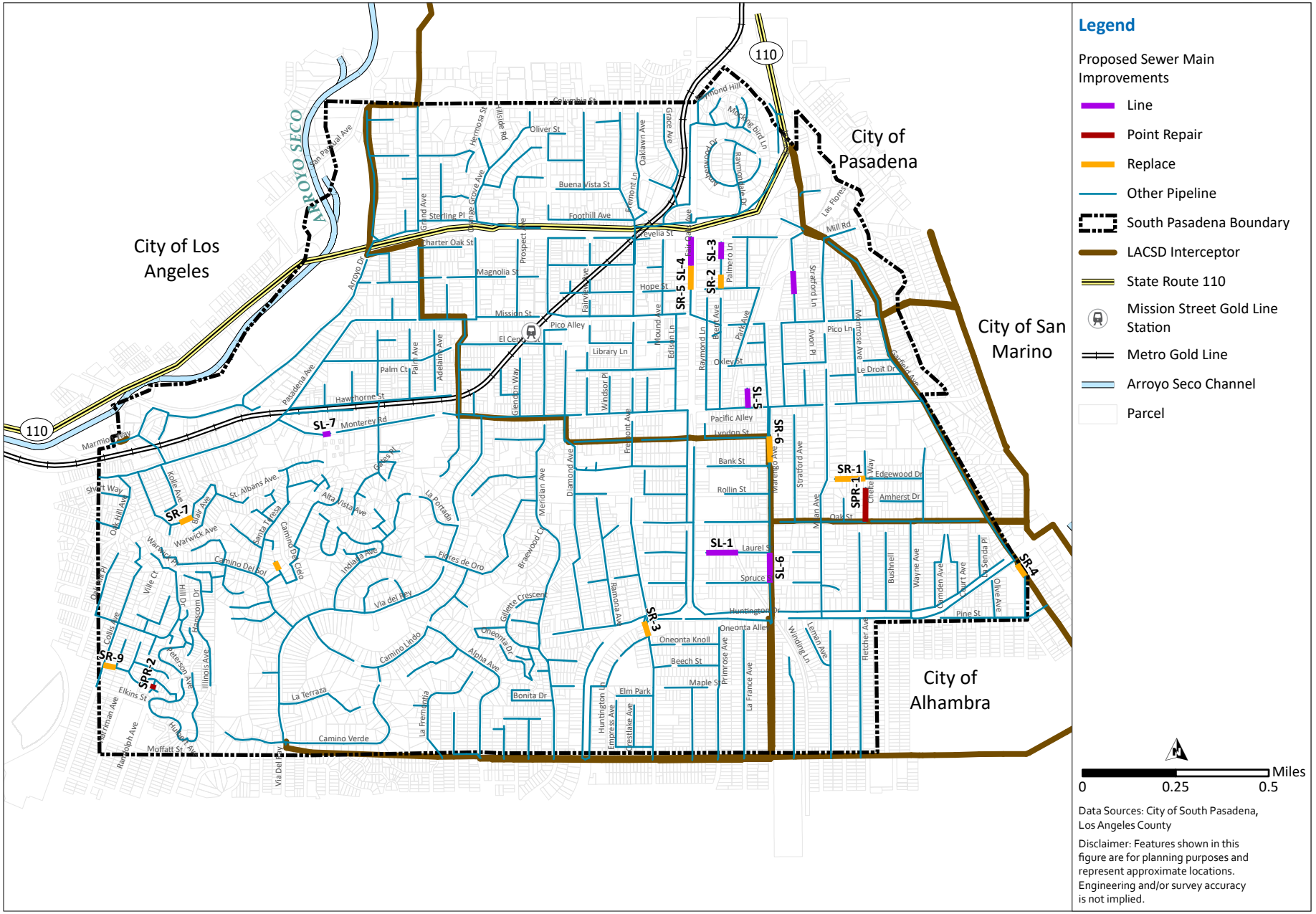

Figure 10.11 Wastewater CIP Map

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Table 10.16 Detailed CIP - Stormwater System

Table 10.16 Stormwater System Capital Improvement Program
One Water 2050 Plan
City of South Pasadena

Improv. ID	Facility Type	Type of Improvement	Project Description	Description/ Street	Project Length/Size and Cost: New Size/ Diam. (in)	Replace/ New	Length (ft)	Unit Cost ($)	Capital Improvement Cost[2],[3] ($)	Phasing: Phase 1 Near-Term FY22/23-FY29/30 ($)	Phase 2 Mid-Term FY30/31-FY39/40 ($)	Phase 3 Long-Term FY40/41-FY49/50 ($)	Developer Contribution (%)	Developer Cost ($)	Grant Funding (%)	Grant Funding ($)	Total City Cost ($)
Stormwater System Capacity Improvements																	
Green Streets					**acres**		**Qty**										
GS-1	Street	Capacity	Green Street Main Basin	Huntington Drive	0.77	New	8,500		$ 5,500,000	$ 5,500,000			0%	$ -	0%	$ 300,000	$ 5,200,000
Subtotal							**8,500**		**$ 5,500,000**	**$ 5,500,000**	**$ -**	**$ -**		**$ -**		**$ 300,000**	**$ 5,200,000**
Ongoing Regional Projects					**acres**												
SWP-1	Park	Capacity	Stormwater Capture in South Pasadena	Arroyo Seco San Rafael and San Pascuel Treatment/Infiltration Project		New			$ 8,271,000	$ 8,271,000			0%	$ -	0%	$ 8,271,000	$ -
SWP-2	Park	Capacity	Stormwater Capture in South Pasadena	Arroyo Seco Lower Arroyo Park Infiltration Basin Facility		New			$ 10,863,000	$ 10,863,000			0%	$ -	0%	$ 50,000	$ 10,813,000
SWP-3	Park	Capacity	Stormwater Capture in South Pasadena	Arroyo Seco Golf Corse Wetland Facility		New			$ 7,433,000	$ 7,433,000			0%	$ -	0%	$ 50,000	$ 7,383,000
SWP-4	Park	Capacity	Stormwater Capture in South Pasadena	Arroyo Seco Golf Corse Driving Range Wetland Facility		New			$ 5,263,000	$ 5,263,000			0%	$ -	0%	$ 50,000	$ 5,213,000
SWP-5	Park	Capacity	Outside South Pasadena	Rio Hondo Load Reduction Strategy		New			$ 49,000	$ 49,000			0%	$ -	0%	$ 49,000	$ -
SWP-6	Park	Capacity	Stormwater Capture in South Pasadena	Camino Verde Stormwater Treatment/Infiltration Project		New			$ 1,800,000	$ 1,800,000			0%	$ -	0%	$ -	$ 1,800,000
Subtotal									**$ 33,679,000**	**$ 33,679,000**	**$ -**	**$ -**		**$ -**		**$ 8,470,000**	**$ 25,209,000**
Potential Future Projects					**acres**		**Qty**										
FSCWP-1	Park	Capacity	Stormwater Capture in South Pasadena	Arroyo Park North (20 acres)	20	New	1		$ 1,000,000			$ 1,000,000	0%	$ -	0%	$ -	$ 1,000,000
FSCWP-2	Park	Capacity	Stormwater Capture in South Pasadena	Garfield Park (7 acres)	7	New	1		$ 500,000			$ 500,000	0%	$ -	0%	$ -	$ 500,000
FSCWP-3	Park	Capacity	Stormwater Capture in South Pasadena	Eddie Park (0.75 acres)	0.75	New	1		$ 250,000			$ 250,000	0%	$ -	0%	$ -	$ 250,000
FSCWP-4	Park	Capacity	Stormwater Capture in South Pasadena	Library Park (2.0 acres)	2	New	1		$ 300,000			$ 300,000	0%	$ -	0%	$ -	$ 300,000
FSCWP-5	Park	Capacity	Stormwater Capture in South Pasadena	War Mermorial Park (2.0 acres)	2	New	1		$ 300,000			$ 300,000	0%	$ -	0%	$ -	$ 300,000
FSCWP-6	Park	Capacity	Stormwater Capture in South Pasadena	Orange Grove Park (2.5 acres)	2.5	New	1		$ 350,000			$ 350,000	0%	$ -	0%	$ -	$ 350,000
Subtotal									**$ 2,700,000**	**$ -**	**$ -**	**$ 2,700,000**		**$ -**		**$ -**	**$ 2,700,000**
Capacity Improvements Total									**$ 41,879,000**	**$ 39,179,000**	**$ -**	**$ 2,700,000**	**0%**	**$ -**	**0%**	**$ 8,770,000**	**$ 33,109,000**
Grand Total CIP									**$ 41,879,000**	**$ 39,179,000**	**$ -**	**$ 2,700,000**	**$ -**	**$ -**	**$ -**	**$ 8,770,000**	**$ 33,109,000**

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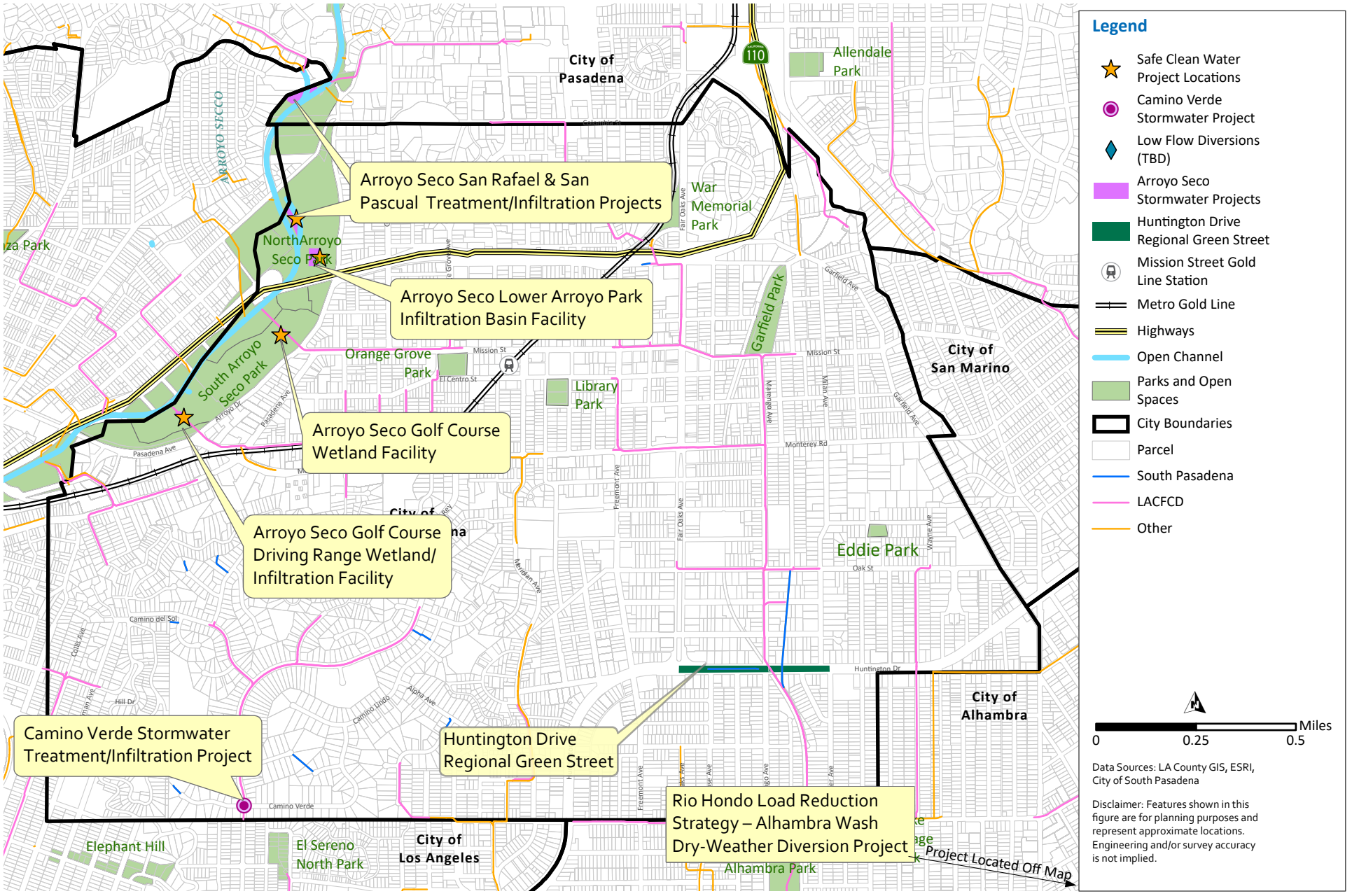

Figure 10.12 Stormwater CIP Map

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