

CHAPTER 8

CAPITAL IMPROVEMENT PLAN

INTRODUCTION

This chapter presents the proposed schedule for the City's 6-year Capital Improvement Plan (CIP) in accordance with the requirements of WAC 246-290. Water system capital improvements are scheduled and prioritized on the basis of water quality concerns, growth, regulatory requirements, component reliability, system benefit, and financial priority. For the proposed projects identified in this chapter, individual project descriptions and preliminary project cost estimates for the 6-year CIP are provided in Appendix Q. Additional projects for the 20-year planning period have also been identified. When the Water System Plan is updated after 6 years, the projects presented for the 20-year planning period should be reevaluated and scheduled for the subsequent 6-year planning period, if necessary. A water system basemap indicating proposed improvement projects is included as Figure 8-1.

In the future, other projects may arise that are not identified as part of the City's CIP. Such projects may be deemed necessary for ensuring water quality, preserving emergency water supply, accommodating transportation improvements proposed by other agencies, or addressing unforeseen problems within the City's water system. Due to budgetary constraints, the completion of these projects may require that the proposed completion date for projects in the CIP be rescheduled. The City retains the authority to reschedule proposed projects and to expand or reduce the scope of proposed projects, as best determined by the City Council. As the proposed completion date for the project approaches, each capital improvement project should be reevaluated to consider the most recent planning efforts

The CIP is categorized into six categories:

- Water Supply Projects (WS)
- Storage Projects (ST)
- Booster Station Projects (BS)
- Pressure Zone Modification Projects (PZ)
- Distribution System Projects (D), and
- Miscellaneous Projects (M)

Each category is further divided into a detailed list of projects presented chronologically over the 6-year and 20-year planning periods. Projects after the 6-year planning period are described along with a cost estimate, but are not scheduled for a specific year. Figure 8-1 identifies the locations of all capital improvement projects.

WATER SUPPLY PROJECTS

WS-1: Corridor Wells Iron and Manganese Treatment (2010)

Estimated Project Cost: \$655,000

The Corridor Wells have elevated levels of iron and manganese which exceed maximum contaminant levels (MCL) of 0.3 mg/L and 0.05 mg/L respectively. At the time of construction, it was unknown if iron and manganese treatment was necessary, so the well facility was plumbed for installation a treatment system. The treatment system will include filtration and continued use of existing chemical addition.

WS-2: Phase 1 Additional Source: Exploratory Drilling and Land Acquisition (Beyond 2015)

Estimated Project Cost: \$1,255,000

It is anticipated that the City's demand will soon exceed the source capacity from their existing wells. In June 2008, Robinson, Noble, Saltbush, Inc performed a water source and hydrogeologic analysis, which is included in Appendix R. Fifteen potential new wells sites were identified in this report. The City will conduct test drilling at the top three or four sites identified to determine on which site to develop a permanent source and shall purchase that land.

WS-3: Phase 2 Additional Source: Equipping (Beyond 2015)

Estimated Project Cost: \$885,000

Once a site has been acquired, the City shall begin development of an additional water supply source. Project costs include design and engineering and equipping of a new well and well building.

STORAGE PROJECTS

ST-1: 15th Avenue Reservoir Painting (2011)

Estimated Project Cost: \$190,000

The City has indicated that the 15th Avenue Reservoir is in need of new interior coating. The 0.35 MG reservoir was last recoated in the 1980s. The reservoir needs a new vent, several gaskets, and holes patched.

BOOSTER STATION PROJECTS

BS-1: Lloyd's Development Booster Station (2010)

Estimated Project Cost: Developer Funded

The City is currently working with the developer of the assisted living facility along 5th Avenue to design and install a new pump station to serve the facility. This pump station will create a new closed pressure zone along 5th Avenue north to South 376th Street. Since it is currently still in the design phase, the booster station was not considered when examining existing conditions using the hydraulic model. Depending on the required fire flow for the development, which has not yet been finalized, other projects may be required elsewhere in the system to support these flows.

BS-2: 15th Avenue Booster Station (2011)

Estimated Project Cost: \$220,000

The City's 15th Avenue Booster Station currently must be run at full capacity during peak times and sometimes cannot provide enough flow to maintain reservoir levels. A third pump shall be installed to meet maximum day demands and provide redundancy for average day demands.

BS-3: 1-MG Reservoir Booster Station (2012)

Estimated Project Cost: \$400,000

In order to meet fire flows and redundancy requirements for booster stations pumping to a closed zone, an additional 1,400-gpm pump shall be installed at the 1-MG Reservoir Booster Station. A back-up generator will also be installed on site. The existing booster station is plumbed with 10-inch pipe to allow installation of a third pump.

PRESSURE ZONE MODIFICATION PROJECTS

PZ-1: Goat Hill Pressure Zone Change (2015)

Estimated Project Cost: \$105,000

In response to customer complaints of low pressures in the Goat Hill area, the boundary between the 434 and 520 Pressure Zones will be shifted to include the Goat Hill neighborhood and schools in the 520 Zone. This will include installing a PRV along Oak Street between 16th Avenue and 17th Avenue and creating zone breaks at the following locations:

- In the 4-inch cast iron branch at 16th Avenue and Maine Street.
- In the 6-inch A.C. branch at Taylor Street and 17th Avenue.
- In the 8-inch D.I. branch at Taylor Street and 18th Avenue.
- In the 6-inch PVC branch at Taylor Street and 19th Avenue Court.

- In the 8-inch C.I. branch at Taylor Street just east of 19th Avenue Court.
- Valve modifications to cluster at Milton Way and 20th Avenue.

Zone breaks could be accomplished at these locations by either closing existing branch valves, removing a section of pipe, or closing existing branch valves and installing 3/4-inch bypass. The estimated project cost is based on closing existing valves. The detailed cost estimate in Appendix Q also shows the added cost for the other options.

A stand-alone low pressure study was completed in 2005 by Gray & Osborne Inc. A copy of this study is included in Appendix S.

DISTRIBUTION SYSTEM PROJECTS

Sections of the City's distribution system need to be replaced to ensure reliability of the water supply. These projects are noted on Figure 8-1, which is a base map of proposed improvements within the water system. The preliminary cost estimates are included in Appendix Q. These projects fall under several categories:

- (1) Fire flow improvements prompted by pressure limitations,
- (2) Fire flow improvements prompted by velocity limitations,
- (3) Replacement of aging or undersized water main.

The cost of projects with similar distances of pipe may vary due to the number of service connections and connections to the existing distribution system that are required. All project costs contain a 25-percent contingency and a 25-percent engineering and administration cost. The following projects are included for the planning horizon:

Project D-1: Meridian Avenue East (2010)

Estimated Project Cost: Dept. of Transportation partially funded, City portion \$80,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 3,500 lineal feet of 4-inch pipe with 12-inch pipe along Meridian Avenue East from 18th Street Court East to north of 24th Street East. Future development is currently unknown for this area; however, it is zoned for large commercial use which could require high flows. Installing 12-inch pipe will currently help address flow deficiencies at the south end of the pipe and will allow for a greater range of future development.

Project D-2: Birch Street Crossing (2013-2014)

Estimated Project Cost: \$650,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,400 lineal feet of 4-inch and 6-inch pipe with 12-inch pipe along Birch Street from 5th Avenue West to the existing 10-inch pipe on the west side of I-5. The City would like to increase transmission to the Pacific Highway corridor and rely less on the emergency intertie with Lakehaven. Of the three I-5 pipe crossings, this site is suspected to be the easiest place to make improvements. The existing pipe is also cast iron and is near the end of its useful life.

Project D-3: Porter Way (Beyond 2015)

Estimated Project Cost: \$250,000

Primary Reason: pressure and velocity limitations.

Replacement of 830 lineal feet of 8-inch pipe with 12-inch pipe along Porter Way from Kent Street to the intersection of 5th Avenue and Porter Way. This section of pipe connects to 12-inch pipe to the north and 10-inch and 16-inch pipe to the south. Upgrading this portion will fire flow availability to the north end of 5th Avenue and the Pacific Highway corridor. This project may be required to help provide adequate fire flow to the Lloyd's development at the north end of 5th Avenue if high flows are required.

Project D-4: School Property – South Connection and Looping (Beyond 2015)

Estimated Project Cost: \$220,000

Primary Reason: pressure and velocity limitations.

Installation of 800 lineal feet of 12-inch pipe on the site of Endeavor Elementary School and Discovery Primary School from the hydrant off of Oak Street to the 10-inch dead end pipe on the east side of the school, then to the existing 10-inch pipe on 19th Street. In combination with Project PZ-1, this project increases fire flow availability by eliminating a dead end pipe, increasing flow pressures and decreasing velocities.

Project D-5: Porter Way Crossing (Beyond 2015)

Estimated Project Cost: \$670,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,600 lineal feet of 6-inch pipe with 12-inch pipe along Porter Way from 5th Avenue West to the existing 12-inch pipe to the west of I-5. The City would like to increase transmission to the Pacific Highway corridor and rely less on the emergency intertie with Lakehaven. Of the three I-5 pipe crossings, this site will not likely be the easiest location to make improvements. However, there are several large commercial and industrial facilities in this area which require high fire flows, which cannot currently be provided. This project will increase fire flow to these facilities and to the Pacific Hwy

corridor by eliminating pressure and velocity constraints and remove old cast iron and asbestos cement pipe from the system.

Project D-6: 2-MG Reservoir Booster Station to Northwood Elementary (Beyond 2015)

Estimated Project Cost: \$205,000

Primary Reason: pressure and velocity limitations.

Replacement of 740 lineal feet of existing 8-inch pipe with 12-inch pipe from 2-MG Reservoir pump station to Northwood Elementary School. This project increases fire flow availability by eliminating pressure deficiencies and velocity limitations.

Project D-7: 11th Avenue from Juniper Street to Fir Street (Beyond 2015)

Estimated Project Cost: \$160,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 350 lineal feet of 4-inch pipe with 8-inch pipe along 11th Avenue from Gary Street to Fir Street and reconnection of all intersecting pipes and services along 11th Avenue from Juniper Street to Gary Street from the 4-inch pipe to the existing 8-inch pipe on the east side of the street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-8: Hemlock Street (Beyond 2015)

Estimated Project Cost: \$210,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 800 lineal feet of 6-inch pipe with 8-inch pipe along Hemlock Street east from 11th Avenue. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-9: Porter Way from Taylor Street to Milton Way (Beyond 2015)

Estimated Project Cost: \$160,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 560 lineal feet of 4-inch pipe with 8-inch pipe along Porter Way from Taylor Street to southeast of Milton Way, and installation of about 50 lineal feet of new 8-inch pipe to connect to the existing 8-inch pipe along the south side of Taylor Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-10: Reconnection of Services Along 15th Avenue (Beyond 2015)

Estimated Project Cost: \$20,000

Primary Reason: pressure limitations, aging and undersized water mains.

Installation 50 lineal feet of 8-inch pipe at the intersection of 15th Avenue and Oak Street to connect the 8-inch pipe along 15th Street to the 4-inch pipe along the south side of Oak Street. The City wants to abandon much of the aging and undersized pipe in the area by transferring services and connections over to parallel pipes where possible.

Project D-11: 12th Avenue (Beyond 2015)

Estimated Project Cost: \$335,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,300 lineal feet of 4-inch pipe 8-inch pipe along 12th Avenue from Taylor Street to Oak Street and connection of the new pipe to the existing 8-inch pipe on along the south side of Taylor Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-12: 13th Avenue North of Taylor Street (Beyond 2015)

Estimated Project Cost: \$335,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,300 lineal feet of 4-inch pipe 8-inch pipe along 13th Avenue from Taylor Street to Oak Street and connection of the new pipe to the existing 8-inch pipe on along the south side of Taylor Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-13: 19th Avenue (Beyond 2015)

Estimated Project Cost: \$295,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,300 lineal feet of existing 4-inch pipe with 8-inch pipe along 19th Avenue from Milton Way to Emerald Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-14: 15th Avenue (Beyond 2015)

Estimated Project Cost: \$340,000

Primary Reason: pressure limitations, aging and undersized water mains.

Replacement of 1,340 lineal feet of 4-inch pipe with 8-inch pipe along 15th Avenue from Emerald Street to Juniper Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure constraints.

Project D-15: Yuma Street (Beyond 2015)

Estimated Project Cost: \$355,000

Primary Reason: pressure and velocity limitations, aging and undersized water mains.

Installation of 600 lineal feet of 8-inch pipe along Yuma Street from 10th Avenue to 8th Avenue, and replacement of 850 lineal feet of 4-inch pipe with 8-inch pipe along 8th Avenue to Vine Street. This project replaces aging and undersized pipe, increases fire flow availability by eliminating pressure and velocity constraints, and connects three dead end pipes by looping.

Project D-16: 13th Avenue South of Emerald Street (Beyond 2015)

Estimated Project Cost: \$130,000

Primary Reason: pressure and velocity limitations, aging and undersized water mains.

Replacement of 530 lineal feet of 4-inch and 6-inch pipe with 8-inch pipe along 13th Avenue south of Emerald Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure and velocity constraints.

Project D-17: Xavier Street (Beyond 2015)

Estimated Project Cost: \$70,000

Primary Reason: pressure and velocity limitations.

Installation of 350 lineal feet of 8-inch pipe within undeveloped right of way along Xavier Street from 15th Avenue to 16th Avenue to connect to existing 8-inch pipe on 16th Avenue. Replacement of 200 lineal feet of 6-inch pipe along 16th Avenue south of Vine Street to the hydrant near the intersection of 16th Avenue and Vine Street. This project increases fire flow availability by eliminating pressure and velocity constraints, and eliminates a dead end pipe.

Project D-18: 13th Avenue and Comet Street (Beyond 2015)

Estimated Project Cost: \$155,000

Primary Reason: pressure and velocity limitations, aging and undersized water mains.

Replacement of 600 lineal feet of 4-inch pipe with 8-inch pipe along 13th Avenue from Emerald Street to hydrant on Comet Street. This project replaces aging and undersized pipe and increases fire flow availability by eliminating velocity constraints.

Project D-19: Diamond Street (Beyond 2015)

Estimated Project Cost: \$95,000

Primary Reason: pressure and velocity limitations, aging and undersized water mains.

Replacement of 330 lineal feet of 6-inch pipe with 8-inch pipe along Diamond Street from 19th Avenue to 18th Avenue. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure velocity constraints.

Project D-20: 22nd Avenue Court to Alder Street (Beyond 2015)

Estimated Project Cost: \$75,000

Primary Reason: pressure and velocity limitations.

Installation 360 lineal feet of 8-inch pipe in an easement which must be obtained from the end of the cul-de-sac on 22nd Avenue Court to Alder Street. This project eliminates a dead end pipe on 22nd Avenue Court. This project should be completed prior to project PZ-1, the 520 Zone boundary change. Project PZ-1 creates some pressure deficiencies within the northern part of the 520 Zone which this project, D-4, solves.

Project D-21: Milton Way and 13th Avenue (Beyond 2015)

Estimated Project Cost: \$260,000

Primary Reason: pressure and velocity limitations, aging and undersized water mains.

Replacement of 1,150 lineal feet of 6-inch pipe with 8-inch pipe along Milton Way from 15th Avenue to 13th Avenue and along 13th Avenue north of Milton Way. This project replaces aging and undersized pipe and increases fire flow availability by eliminating pressure and velocity constraints.

Project D-22: 70th Avenue East (Beyond 2015)

Estimated Project Cost: \$135,000

Primary Reason: pressure and velocity limitations.

Installation of 500 lineal feet of 12-inch pipe along 70th Avenue East to connect the existing 10-inch dead end pipe at the south end of Pacific Highway to existing 8-inch pipe at 12th Street East. This project increases fire flow availability by eliminating a dead end pipe and pressure and velocity constraints.

Project D-23: Comet Street (Beyond 2015)

Estimated Project Cost: \$170,000

Primary Reason: velocity limitations, aging and undersized water mains.

Replacement of 680 lineal feet of 6-inch pipe with 8-inch pipe along Comet Street west of 5th Avenue. This project replaces aging and undersized pipe and increases fire flow availability by eliminating velocity constraints.

Project D-24: Millridge Village Apartments (Beyond 2015)

Estimated Project Cost: \$45,000

Primary Reason: velocity limitations.

Replacement of 130 lineal feet of 8-inch pipe with 12-inch pipe between the Millridge Village Apartments and 28th Avenue. This project increases fire flow availability by eliminating velocity constraints.

Project D-25: Diamond Loop (Beyond 2015)

Estimated Project Cost: \$50,000

Primary Reason: velocity limitations.

Replacement of 150 lineal feet of 8-inch pipe with 12-inch pipe along Diamond Loop west of 28th Avenue. This project increases fire flow availability by eliminating velocity constraints.

Project D-26: Dead-End Pipe Near Queens Way (Beyond 2015)

Estimated Project Cost: \$110,000

Primary Reason: velocity limitations.

Replacement of 410 lineal feet of 8-inch pipe with 12-inch pipe along the driveway down to Surprise Lake off of Queens Way. This project increases fire flow availability by eliminating velocity constraints on the dead-end pipe.

MISCELLANEOUS PROJECTS

The following projects will improve the operations and maintenance aspects of the water system.

Project M-1: Service Meter Replacement Program (2009-2012)

Estimated Project Cost: \$100,000 annually (total \$300,000)

As service meters need replacing within the City, the City will install new meters that are able to be read automatically either through a hand held transmitter or by way of radio frequency. The City hopes to have all meters replaced by the year 2012, which would require approximately 390 meters to be replaced each year until then.

Project M-2: Site Security (2010)

Estimated Project Cost: \$25,000

Due to heightened security concerns, site security will be installed at all three reservoirs and the buildings for Well Nos. 3, 5, 10, 15th Avenue Reservoir Booster Station, and 1-MG Reservoir Booster Station, none of which have adequate security currently. City staff has been pursuing grants for this project, but have not been successful at getting any yet.

Project M-3: Well No. 10 Building Upgrades/Retrofitting (beyond 2015)

Estimated Project Cost: \$470,000

The ground beneath the Well No. 10 building has settled significantly over the years. As a result, the building has required several modifications which were never meant to be permanent solutions. The City would like to retrofit or replace the building and some plumbing aspects to be less susceptible to the effects of settling.

SUMMARY OF RECOMMENDED IMPROVEMENTS

A prioritization schedule and cost summary for the recommended 6-year capital improvements are shown in Table 8-1. All costs shown are in 2009 dollars.

TABLE 8-1
6-Year Capital Improvement Plan

Project		2010	2011	2012	2013	2014	2015
WS-1	Corridor Wells Iron and Manganese Treatment	\$655,000					
ST-1	15th Avenue Reservoir Coating		\$190,000				
BS-1	Lloyd's Development Booster Station	Developer					
BS-2	15th Avenue Booster Station		\$220,000				
BS-3	1 MG Reservoir Booster Station			\$400,000			
PZ-1	Goat Hill Pressure Zone Change						\$105,000
D-1	Meridian Ave E	\$80,000					
D-2	Birch Street Crossing				\$325,000	\$325,000	
M-1	Service Meter Replacement Program	\$100,000	\$100,000	\$100,000			
M-2	Site Security	\$25,000					
Total		\$860,000	\$510,000	\$500,000	\$325,000	\$325,000	\$105,000

Note: All costs are shown in 2009 dollars and include sales tax, 20-percent contingency, and 25-percent engineering and administrative costs.