

**DRAFT**

# CITY OF ST. HELENS, OR STORMWATER MASTER PLAN

SEPTEMBER 2021

PROJECT NO. 220060-001

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## SECTION 1 - EXECUTIVE SUMMARY

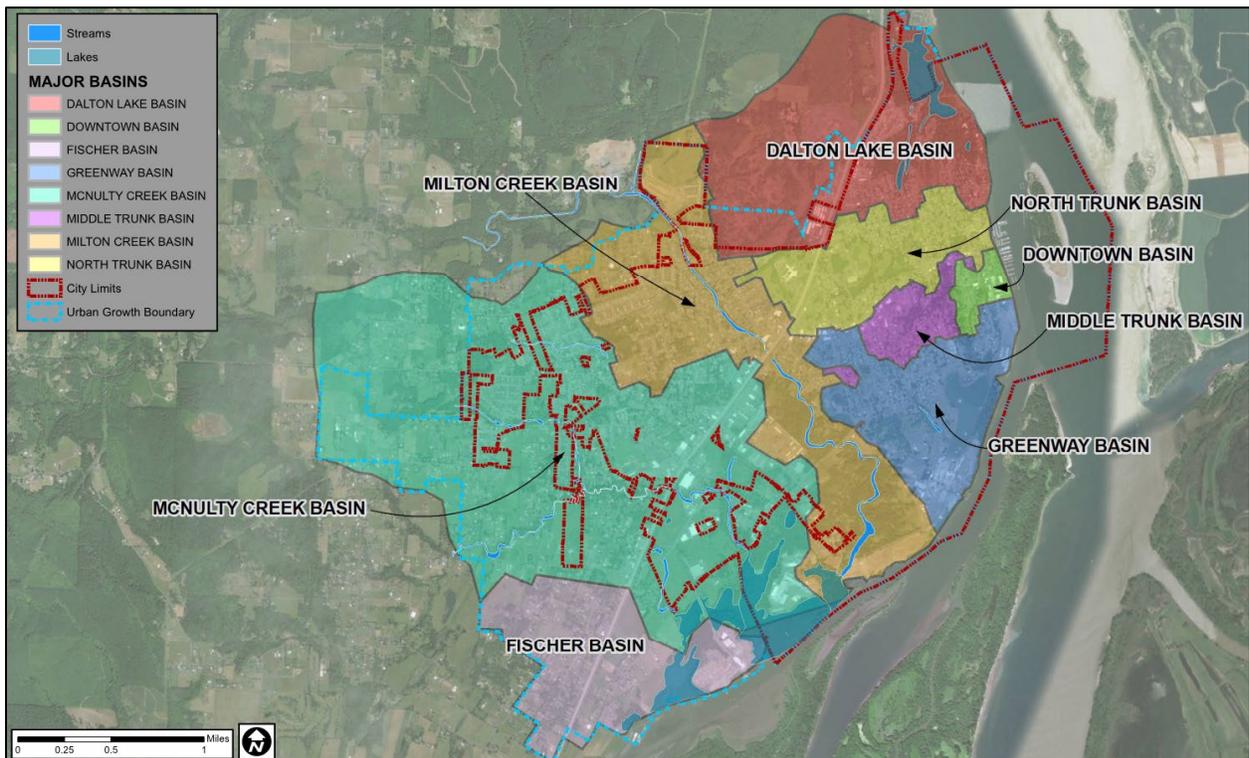
The City of St. Helens contracted with Keller Associates, Inc. to complete a stormwater master plan for the City’s municipal stormwater system. This report was commissioned by the City in an effort to assess the current state of the stormwater system and plan for future needs. This section includes a summary of the stormwater planning criteria, existing system capacities, recommended improvements, and a capital improvement plan.

### 1.1 STUDY AREA

The study area within St. Helens is comprised of the areas within the City limits, the Urban Growth Boundary (UGB), and additional area outside of these two boundaries where stormwater runoff collects before it drains into the City’s stormwater system. The City’s UGB is made up of approximately 5,300 acres of land; approximately 600 acres of which is part of the Columbia River. Adding outside drainage area brings the total study area to approximately 6,000 acres and a total drainage area (excluding the Columbia River) of approximately 5,400 acres.

Stormwater from the study area drains into eight major drainage basins: Dalton Lake, North Trunk, Middle Trunk, Downtown, Greenway, Milton Creek, McNulty Creek, and Fischer Basin. The water collected from these major basins eventually drains into the Columbia River. The watersheds that drain across land within the UGB, as shown in Figure 1-1, are the focus in this study area.

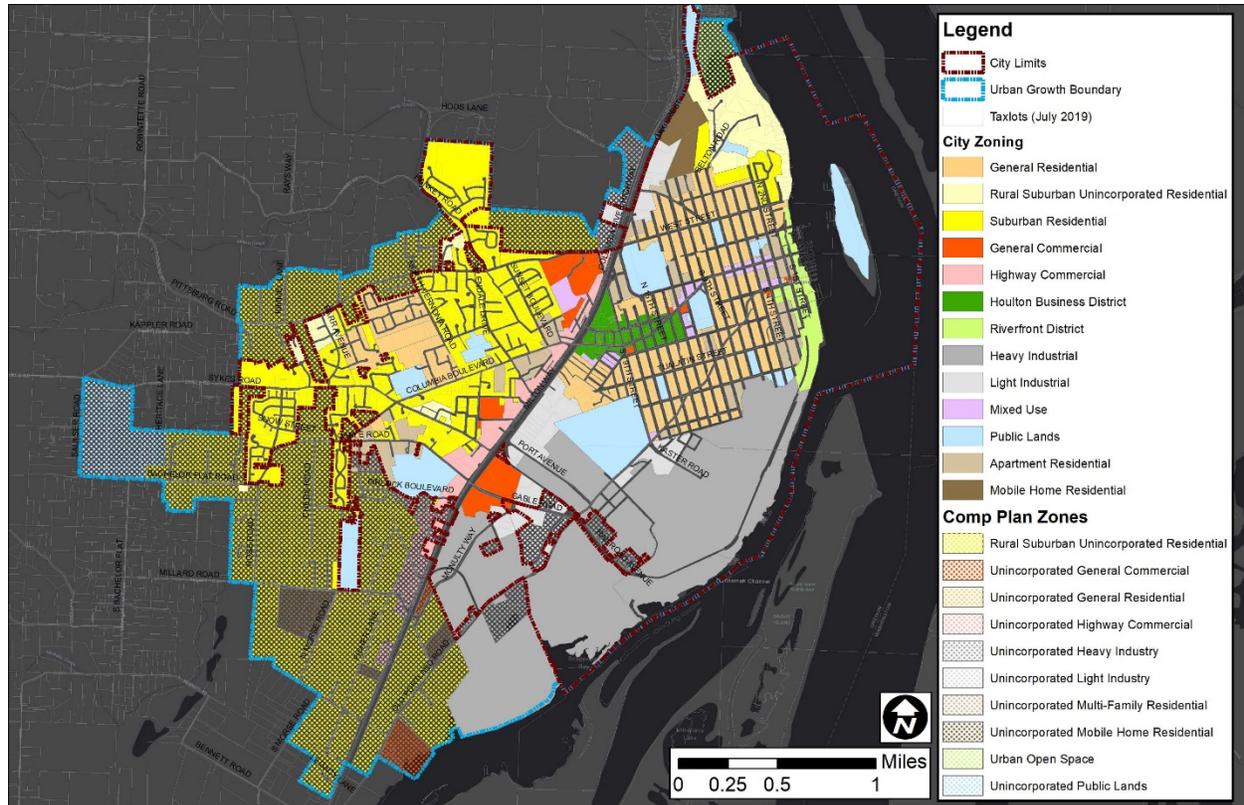
FIGURE 1-1: STUDY AREA AND MAJOR DRAINAGE BASINS



The City’s zoning areas include residential, commercial, industrial, and public zoning within City Limits. Approximately half of the zoning within City Limits is residential due in part to an ordinance adopted in 2017 that re-mapped suburban and moderate residential density housing into a general residential zone. Heavy and light industrial zones are concentrated in the southern portion of the City, and most

commercial areas surround US Highway 30 or are located in the Houlton Business District or Riverfront District. A zoning map for the study area is shown in Figure 1-2.

FIGURE 1-2: STUDY AREA AND ZONING



## 1.2 PLANNING CRITERIA

Certain planning criteria were established with input incorporated from City staff. It is recommended that stormwater conveyance components be capable of passing runoff from the 25-year storm event (equal to 3.5 inches within 24-hours) without flooding or surcharging to within 0.5 feet of the rim elevation of any structure. It is also recommended that detention ponds be designed so the post-development peak release rates equal the pre-development release rates for their matching design storm event up to the 10-year design storm. The 25-year storm event peak release rate should not exceed the 10-year pre-development peak release rate.

Review and evaluation of water quality standards were not included in the scope of this study; however, water quality standards should be a consideration in any new stormwater facility. St. Helens is required to comply with the Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) in the Willamette Basin and any future requirements set forth by the Oregon Department of Environmental Quality (DEQ). The City was recently named a designated management agency (DMA) for the Revised Willamette Basin Mercury TMDL and WQMP (2019). In conjunction with this stormwater master plan, the City is also developing an implementation plan to meet the revised TMDL requirements. Additionally, while the City of St. Helens is not currently regulated under a municipal separate storm sewer system (MS4) permit by the DEQ, the City will likely fall under an MS4 permit in the future. The city of St Helens would be regulated under a MS4 Phase II General Permit which covers cities with a population of less than 100,000 people.

### 1.3 MODEL DEVELOPMENT

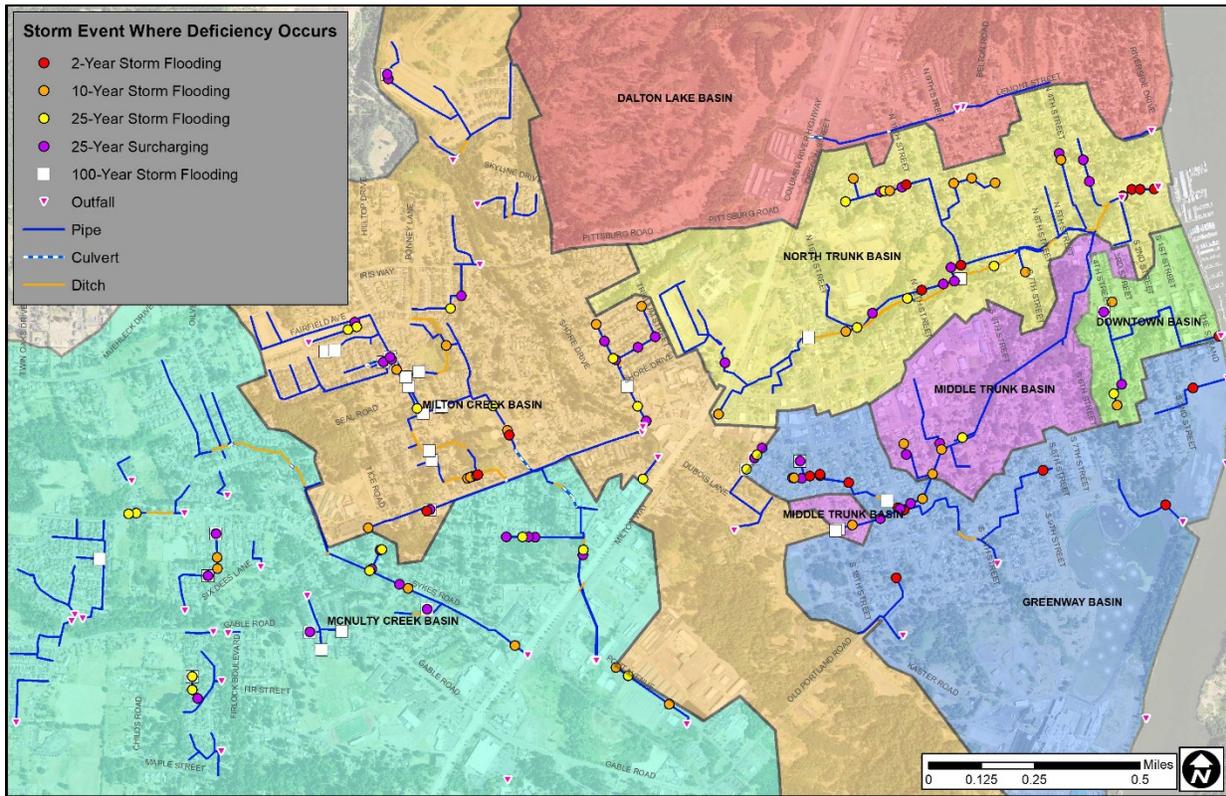
The stormwater modeling software InfoSWMM (Suite 14.7, Update #2) was used to assess stormwater runoff from the study area using the Natural Resources Conservation Service (NRCS) Unitless Hydrograph Method. Moreover, InfoSWMM was used to dynamically route the hydrologic model runoff through a hydraulic model representing the existing stormwater network of major trunklines (generally 12-inch and larger in diameter) and connected open channels and detention facilities. Gaps in the City's GIS data were filled by surveying key stormwater structures throughout the system to develop a representative hydraulic model. The survey resulted in locating approximately 200 stormwater structures and 2,500 LF of open channel ditches, which are included in the model. The computer model was calibrated using flow monitor data collected in January 2021.

### 1.4 EXISTING SYSTEM EVALUATION

St. Helens' existing stormwater system includes approximately 45 miles of closed-conduit pipe ranging in diameter from 2-inches to 66-inches and approximately 6.5 miles of open channel within the study area. The system also includes about 800 manholes and 1,500 catch basins. The pipelines were evaluated based on both existing condition and capacity to convey the design storm event. Multiple pipe segments were identified as greater than 50 years old and it is recommended that these pipes be inspected and either replaced or upsized. Additional pipes were found to be aligned underneath existing building structures based on the GIS data. If the pipes are running underneath existing structures, these areas should need to be field verified and re-aligned.

Capacity related deficiencies were identified both by City staff's historical observations and by the stormwater model. Deficiencies in the model were identified for the 2-, 10-, 25-, and 100-year storm events and were used to prioritize improvements, which are included in the capital improvement plan. Flooding and surcharging were identified in each of the major drainage basins excluding the Dalton Lake Basin and Fischer Basin. A summary of the modeled flooding and surcharging within 0.5 feet of rim elevation for each storm event is shown in Figure 1-3.

FIGURE 1-3: EXISTING SYSTEM FLOODING AND SURCHARGING



### 1.5 STAFFING EVALUATION

A high-level evaluation of existing stormwater staffing levels, deficiencies in existing staffing levels, and staffing recommendations was completed as part of this study. The City Public Works (PW) Operations staff, who are responsible for the operations and maintenance (O&M) of the stormwater system, were interviewed to collect information on existing staffing levels, annual O&M activities, and level of service (LOS) goals for the City stormwater infrastructure. In general, St. Helens’ public works staff provide support for many City activities that are not directly related to public utility O&M (i.e. building maintenance, building remodels, City events, etc.), which reduces time and O&M activities they can spend on utility infrastructure. It is recommended that either additional full-time equivalent (FTE) be budgeted for the PW staff to complete the existing workload requested, or the responsibilities of the PW staff be reduced to focus solely on utility O&M. Additionally, it is advised that staffing needs be re-evaluated every two to three years.

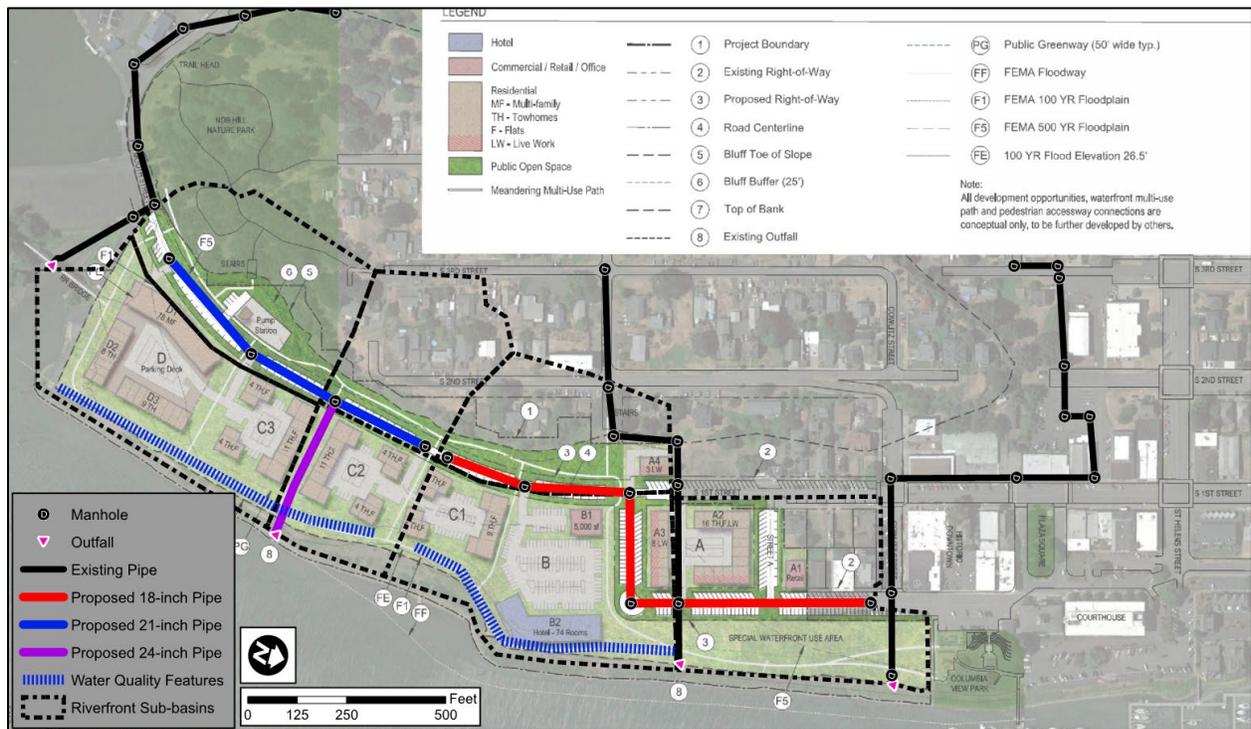
### 1.6 ALTERNATIVES ANALYSIS

Multiple alternatives were evaluated to address the deficiencies identified in the existing stormwater system. Some of the alternatives included rerouting flows, detaining flows, and upsizing existing pipes. The natural topography of the City was utilized where available to develop alternatives which would provide detention storage, reduce peak flows, and allow opportunities for water quality facilities. Pipes were recommended to be upsized where detention storage was not a viable option. The pros and cons of each alternative were evaluated, and a recommended alternative project was presented to the City to be included in the CIP.

### 1.7 FUTURE SYSTEM

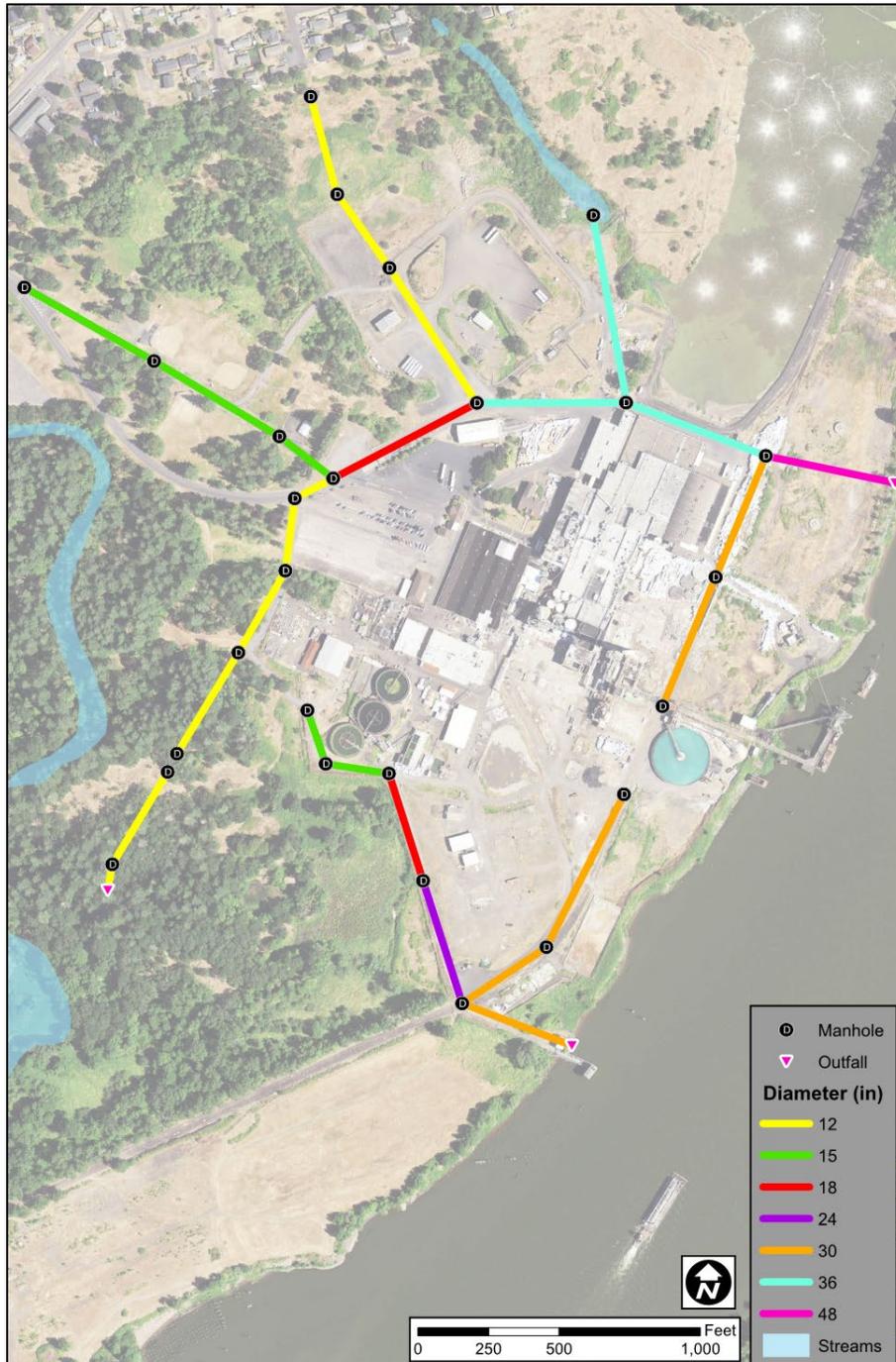
Development driven stormwater infrastructure was evaluated at a high level and drainage sub-basins for the 20-year development areas were delineated. A number of the proposed developments will likely drain to the existing stormwater network while others may drain to a new outfall location at one of the bodies of water within the study area. Stormwater conveyance infrastructure was evaluated in more detail for the City’s Riverfront Development and Industrial Business Park. Stormwater piping alignment and sizes were recommended for the Riverfront Development as shown in Figure 1-4.

FIGURE 1-4: RIVERFRONT DEVELOPMENT PROPOSED STORMWATER INFRASTRUCTURE



Recommended pipe alignments and sizing for the City's Industrial Business Park are shown in Figure 1-5. The pipe alignments were based on the City's parcellation plan and pipes were aligned within the proposed right-of-way.

FIGURE 1-5: INDUSTRIAL BUSINESS PARK PROPOSED STORMWATER INFRASTRUCTURE



### 1.8 ENGINEERING DESIGN STANDARDS, CODE, & COMPREHENSIVE PLAN REVIEW

The City’s existing development code (Title 17), engineering design standards (Title 18), and comprehensive plan (Title 19) were reviewed as they pertain to stormwater conveyance and treatment for new development to identify potential deficiencies and provide recommendations for updates. The primary recommendations for review, updates, and additions include the following:

- ▶ Clear triggers and requirements for water quality
- ▶ Promote best management practices (BMPs) and low impact development (LID)
- ▶ Specifics of required drainage report elements and City engineering process for review and approval of plans
- ▶ Detention facility requirements
- ▶ Hydrologic analysis requirements

The City should review and assess these recommended changes to these sections to City code, standards, and comprehensive plans to match current best practices in the industry. The City should then initiate the process of proposing changes to associated City documents to maintain consistency.

### 1.9 CAPITAL IMPROVEMENT PLAN (CIP)

Improvements were suggested to alleviate the flooding and surcharging identified in the existing system evaluation. The capital improvement plan (CIP) was categorized into three priorities. The criteria for each priority are shown in Table 1-1.

TABLE 1-1: CAPITAL IMPROVEMENT PLAN PRIORITIZATION CRITERIA

Priority	Criteria	Implementation Timeline
1	Alleviate historically known flooding identified by the City and some 2-year flooding.	0-5 Years
2	Alleviate additional 2-year flooding identified in the model or age identified replacement.	5-10 Years
3	Alleviate deficiencies identified in 10-year and 25-year storm events.	10-20 Years

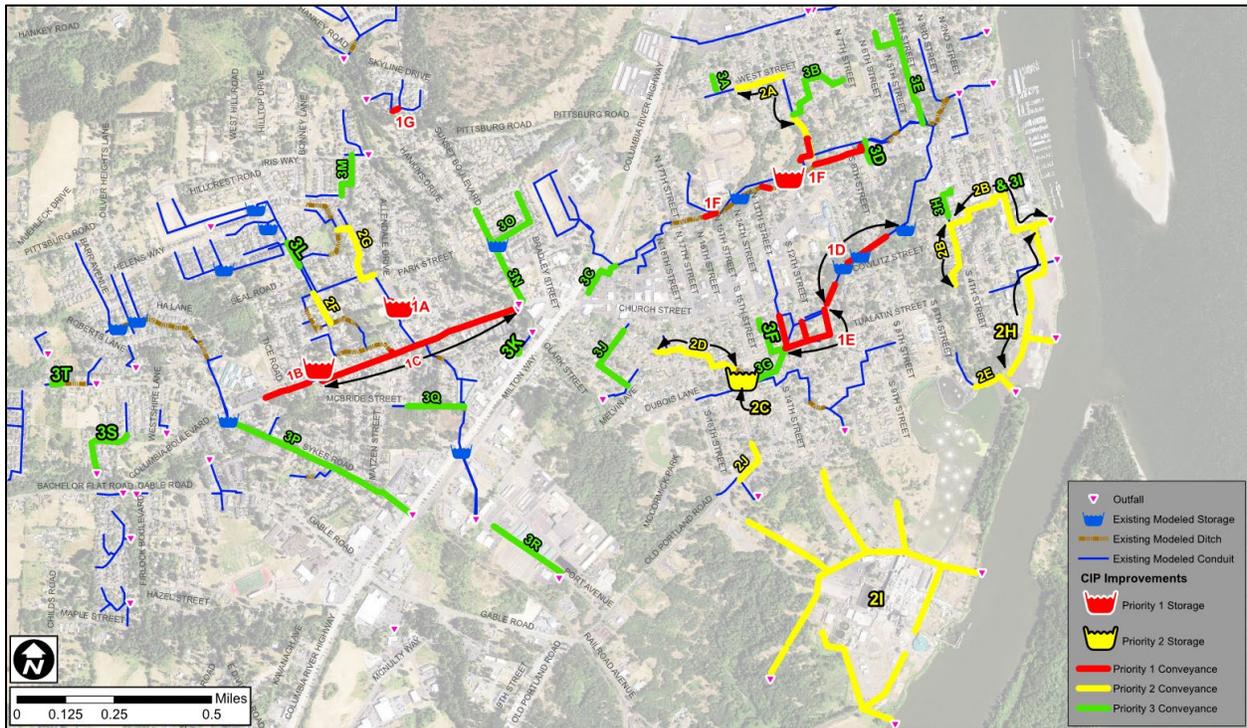
System development charge (SDC) eligibility was evaluated for each of the improvement projects recommended. The SDC improvement amount is based on the percentage of future development area within the capital improvement’s contributing drainage basin. The SDC eligibility for each project is summarized in Table 1-2.

TABLE 1-2: CAPITAL IMPROVEMENT PLAN SUMMARY

Priority	Project Description	Estimated Cost	SDC Eligibility	SDC Improvement Amount	City Amount
<b>Priority 1 Improvements</b>					
1A	Campbell Park Detention Pond (Milton Creek)	\$300,000	0%	\$0	\$300,000
1B	Columbia Boulevard Detention Pond (Milton Creek)	\$1,100,000	66%	\$727,000	\$373,000
1C	Columbia Boulevard Upsize (Milton Creek)	\$2,800,000	14%	\$392,000	\$2,408,000
1D	Middle Trunk Detention Ponds and Piping	\$2,000,000	5%	\$103,000	\$1,897,000
1E	Upsize and Realign Tualatin Street (Middle Trunk)	\$5,000,000	14%	\$677,000	\$4,323,000
1F	Detention Pond and Piping Between N 12th and N 7th Street (North Trunk)	\$1,600,000	17%	\$269,000	\$1,331,000
1G	Steinke Drive Pipe Installation	\$60,000	0%	\$0	\$60,000
<b>Total Priority 1 Improvement Costs</b>		<b>\$12,900,000</b>	<b>-</b>	<b>\$2,200,000</b>	<b>\$10,700,000</b>
<b>Priority 2 Improvements</b>					
2A	Upsize Pipes along West Street and N 10th Street (North Trunk)	\$1,400,000	0%	\$0	\$1,400,000
2B	S 4th Street to Outfall CCTV Inspection (Downtown)	\$20,000	0%	\$0	\$20,000
2C	Heinie Huemann Park Detention Pond (Greenway)	\$200,000	26%	\$52,000	\$148,000
2D	Upsize from S 20th Street to Heinie Huemann Park (Greenway)	\$1,100,000	29%	\$318,000	\$782,000
2E	Nob Hill Park CIP lining (Greenway)	\$400,000	0%	\$0	\$400,000
2F	Franz Street (Milton Creek)	\$400,000	0%	\$0	\$400,000
2G	Mayfair Drive CIP lining and Upsize (Milton Creek)	\$400,000	0%	\$0	\$400,000
2H	Riverfront Development Stormwater Infrastructure	\$3,300,000	100%	\$3,300,000	\$0
2I	Industrial Business Park Stormwater Infrastructure	\$8,600,000	100%	\$8,600,000	\$0
2J	S 16th Street to Old Portland Road Upsize (Greenway)	\$500,000	0%	\$0	\$500,000
2K	Stormwater Master Plan Update	\$200,000	0%	\$0	\$0
<b>Total Priority 2 Improvement Costs</b>		<b>\$16,500,000</b>	<b>-</b>	<b>\$12,300,000</b>	<b>\$4,100,000</b>
<b>Priority 3 Improvements</b>					
3A	Upsize N 13th Street to West Street (North Trunk)	\$200,000	0%	\$0	\$200,000
3B	Upsize from 6th Street Ball Park to N 10th Street (North Trunk)	\$900,000	0%	\$0	\$900,000
3C	Upsize Milton Way at Street Helens Street (North Trunk)	\$600,000	75%	\$450,000	\$150,000
3D	Upsize N 7th Street from Columbia Boulevard to Trunkline (North Trunk)	\$400,000	0%	\$0	\$400,000
3E	Upsize N 4th Street south of West Street (North Trunk)	\$1,400,000	0%	\$0	\$1,400,000
3F	Upsize and Regrade along S 14th Street (Middle Trunk)	\$600,000	50%	\$298,000	\$302,000
3G	Upsize existing pipes from Heinie Huemann to Tualatin Street (Middle Trunk)	\$400,000	0%	\$0	\$400,000
3H	Street Helens Street to South 4th Street Upsizing (Downtown)	\$500,000	0%	\$0	\$500,000
3I	S 4th Street to Outfall Pipe Upsizing (Downtown)	\$2,400,000	0%	\$0	\$2,400,000
3J	Crouse Way Upsize (Milton Creek)	\$1,000,000	14%	\$137,000	\$863,000
3K	Eilertson Street (Milton Creek)	\$100,000	0%	\$0	\$100,000
3L	N Vermonia Road from Oakwood to Ava Court (Milton Creek)	\$400,000	0%	\$0	\$400,000
3M	Ethan Lane Upsizing (Milton Creek)	\$600,000	0%	\$0	\$600,000
3N	Sunset Boulevard to Outfall Upsize (Milton Creek)	\$800,000	0%	\$0	\$800,000
3O	Sunset Boulevard, Trillium Street and Salmon Street upsize (Milton Creek)	\$1,100,000	0%	\$0	\$1,100,000
3P	Sykes Road Upsize from Columbia Boulevard to Outfall (McNulty Creek)	\$2,700,000	0%	\$0	\$2,700,000
3Q	McBride Street Upsize (McNulty Creek)	\$600,000	0%	\$0	\$600,000
3R	Port Avenue Upsize (McNulty Creek)	\$900,000	0%	\$0	\$900,000
3S	Whitetail Avenue Upsize (McNulty Creek)	\$800,000	0%	\$0	\$800,000
3T	Sykes Road Cuvert near Mountain View Drive Upsize (McNulty Creek)	\$80,000	0%	\$0	\$80,000
<b>Total Priority 3 Improvement Costs</b>		<b>\$16,500,000</b>	<b>-</b>	<b>\$900,000</b>	<b>\$15,600,000</b>
<b>Total Capital Improvement Costs</b>		<b>\$45,900,000</b>	<b>-</b>	<b>\$15,400,000</b>	<b>\$30,400,000</b>

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our professional opinion of accurate costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices, or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

FIGURE 1-6: CAPITAL IMPROVEMENT PLAN



### 1.10 PLANNING RECOMMENDATIONS

It is recommended that the City update their planning documents every five years because updates to the planning documents and models would allow the City to re-assess needs and properly allocate budgets to address system deficiencies. A Master Plan Update for the stormwater system has been included as a Priority 2 improvement in the CIP (Table 1-2).

### 1.11 OTHER ANNUAL COSTS

The stormwater conveyance system requires regular maintenance to ensure that pipelines, catch basins, and detention facilities flow freely during the storm events. Additional stormwater facilities continue to age and will eventually need to be rehabilitated or replaced.

The replacement program is based on the total amount of existing City stormwater infrastructure and its estimated useful life. The City facilities include approximately 45 miles of storm pipes, 800 manholes, and 1,500 catch basins. Assuming an average useful life of 75-years remaining life, the replacement program should target approximately 3,000 feet of pipe, 30 catch basins, and 16 manholes per year. Assuming an average pipe replacement cost of \$190 per foot, a catch basin cost of \$3,500 each, and a manhole cost of \$11,000, the City would need an annual replacement budget of approximately \$900,000. Table 1-3 summarizes the annual replacement program targets and associated costs.

TABLE 1-3: SUMMARY OF ANNUAL REPLACEMENT COSTS

Item	Lifespan	Total Quantity	Annual Cost <sup>1</sup> (rounded)
Lineal Feet of Storm Lines	75 Years	237,000	\$600,000
Number of Catch Basins	50 Years	1,500	\$110,000
Number of Manholes	50 Years	800	\$180,000
<b>Total (Rounded)</b>			<b>\$900,000</b>
<i>1) Storm pipes unit price equal to average unit price of 12" to 30". Manhole unit price equal to average of 48" and 60" manhole.</i>			

Additionally, as part of the City’s maintenance program, the locations indicated in the existing evaluation as being underneath a structure should be investigated and abandoned if it is determined the pipes are actually underneath existing structures.

Currently, additional projects and work the PW staff are requested to complete will significantly decrease the budgeted FTE that can be spent on stormwater O&M. It is estimated that approximately 4.25-4.5 FTE are needed to meet the current recommended level of O&M to meet the City’s LOS goals. It is recommended that either additional FTE be budgeted for the PW staff to complete the extra workload requested, or the responsibilities of the PW staff be reduced to focus solely on utility O&M. In addition, it is advised that staffing needs be reevaluated every two to three years.

**1.12 OTHER FINANCIAL CONSIDERATIONS**

The City should complete a full-rate study for the stormwater utility to evaluate the potential user rate and SDC impacts of the recommended CIP. Estimated SDC eligibility for each identified capital improvement is included in Table 1-2 for use in completing a full rate study. It is recommended the City actively pursue opportunities with funding sources for grant funds, low-interest loans, or principal forgiveness to mitigate user rate impacts. As the City begins to prepare and proceed on CIP projects, if outside funding is desired, it is recommended the City setup a one-stop meeting with Business Oregon to identify and assess the potential funding sources for stormwater projects.