SECTION 7
CAPITAL IMPROVEMENTS PROGRAM

General

This section describes recommended improvement projects to correct deficiencies identified earlier in the report. Additional recommendations for assisting future stormwater planning efforts are also provided. Finally, a capital improvements program (CIP) is presented which prioritizes and assigns suggested planning level budgets to individual improvement projects.

Recommended Improvements

General

Presented below are recommended storm drainage system improvements to include preliminary project descriptions, costs and prioritizations. The recommended facility sizes and locations designated in this master plan are preliminary only. During final design of facilities, it will be necessary to confirm design flows, pipe sizes, required inverts and routing schemes based upon the current land use plan, proposed development, soil surveys, soil investigations, physical constraints and other relevant field conditions.

The recommended pipe replacement material is generally corrugated High-Density Polyethylene (HDPE) pipe due to its relatively low cost, ease of installation and durable nature. However, concrete pipe is recommended when a higher strength pipe is required in cases where the pipe has minimal cover or other situations.

Implementation Time Frame and Prioritization Criteria

The projects have been grouped into four priority levels with associated implementation time frames. Short range projects are those anticipated in the next five years. Mid-range projects are those anticipated for a period from five to ten years hence. Long range projects are those anticipated from 10 years hence to full build-out conditions. Where an improvement project is dependent on the timing of development in the affected areas, the time frame is described as developer-driven. The priority levels are summarized in Table 7-1.

Estimates of Project Cost

An estimate of project cost for each identified improvement project was developed in conjunction with this study. In accordance with OAR Chapter 660, Division 11 (Facilities Planning), the cost estimates are planning-level estimates that are to be used for the following purposes:

- Use as a tool to review the City's mechanisms for funding stormwater improvements, including user fees and system development charges (SDCs).
- Develop budgets for project implementation purposes.

- Estimate fiscal requirements to support land use designations in the comprehensive plan.

The project cost estimates are listed with the summarized project table presented in the following section. The estimates have an accuracy of no more than plus or minus approximately 25 percent. Project costs also include an allowance of 40 percent for administration, engineering and contingencies in addition to estimated basic construction costs. A description of the methodology used for project cost estimating the improvement projects is presented in Appendix D.

Table 7-1
Prioritization Criteria for Recommended Improvements

Implementation Time Frame	Priority Description
Short Range	• Deficiency addressed is identified by City staff and hydraulic model • Flooding occurs within developed area
Mid-Range	• Deficiency addressed is identified by City staff and hydraulic model • Flooding occurs at the edge of developed area or in an undeveloped area
Long Range	• Deficiency addressed is identified by hydraulic model only
Developer Driven	• Deficiency occurs in an area that is currently undeveloped • Deficiency should be addressed as the area and/or areas upstream are developed

Recommended Storm Drainage Improvement Projects

A total of nine storm drainage improvement projects have been identified to address the deficiencies identified by City staff and the stormwater system analysis. The projects are described below. Project locations are shown in Figure 7-1.

1. Project CH-1

Drainage Basin:	Cherry Hill Road Basin
Project Description:	Construct regional detention system for future expansion areas.
Project Benefits:	Minimize downstream impacts in Cherry Hill Road drainage ditch due to increased impervious area upstream
Time Frame:	Developer-driven
Notes:	Project scope and size will be based on overall development potential of upstream areas within current UGB.

2. Project EL-1

Drainage Basin:	Elm Street Basin
Project Description:	Construct with storm drainage system to route excess runoff downstream, bypassing existing system from Center Street to Yamhill Street.
Deficiencies:	EL-X-1, EL-X-2, EL-X-3
Project Features:	2,600 LF of 36-inch storm drain piping
Project Benefits:	The project will reduce excess flows into existing storm drain system, reducing incidents of flooding. Flows will be conveyed in new storm drain piping to existing underground system where capacity is available. Provides storm drainage service to future expansion areas. Improves under-capacity system in Yamhill Street.
Time Frame:	Short-term
Notes:	Permitting requirements need to be addressed. Consider obtaining drainage easements from existing property owners.

3. Project OL-1

Drainage Basin:	Elm Street Basin
Project Description:	Construct bypass storm drain system at Canyon Creek inlet to route excess runoff from Olive Street Basin to Viola Street basin.
Project Features:	750 LF of 36-inch storm drain piping
Deficiencies:	OL-X-1, OL-X-2
Project Benefits:	The project will remove excess flows from storm system inlet north of Blair Street, alleviating existing flooding potential throughout drainage basin.
Time Frame:	Short-term
Notes:	Project V-1 required to convey additional flows south in Viola Street Basin.

4. Project V-1

Drainage Basin: Viola Street Basin
Project Description: Construct parallel storm drain in Viola Street right-of-way, from north end of Viola Street Basin to Sherman Street.
Project Features: 900 LF of 36-inch storm drain piping
Deficiencies: V-X-1
Project Benefits: The project will provide additional storm drain capacity required for current and future development conditions.
Time Frame: Short-term
Notes: Size storm drain to convey additional flows from Olive Street Basin.

5. Project R-1

Drainage Basin: Richard Street Basin
Deficiencies: R-X-1
Project Description: Construct underground storm drain system storm drain in Richard Street right-of-way, from City limits to new South Yamhill River outfall.
Project Features: 2,100 LF of 36-inch storm drain piping
Project Benefits: The project will remove excess surface runoff from basin, alleviate existing flooding problems, and provide storm drain capacity required for future development conditions.
Time Frame: Short-term
Notes: Alternately, to avoid construction at river, can discharge to outlet of 48-inch culverts at Western Street and West Main Street.

6. Project R-2

Drainage Basin: Richard Street Basin
Project Description: Construct improved storm drain system between railroad tracks and new storm drain in Richard Street right-of-way (Project R-1)
Project Features: 600 LF of 24-inch storm drain piping
Project Benefits: The project will alleviate overland flooding problems at low area in Richard Street, and serve future expansion areas.
Time Frame: Medium-term
Notes: Requires additional capacity improvements to river, such as Project R-1.

7. Project O-1

Drainage Basin:	Orchard Street Basin
Project Description:	Construct new storm drain system in Orchard Street between north City limits and existing Orchard Street river outfall.
Project Features:	1,500 LF of 30-inch storm drain piping
Deficiencies:	none
Project Benefits:	The project will provide storm drainage service to undeveloped area within City limits, capture and discharge to river excess overland flows which currently flow east into Richard Street Basin.
Time Frame:	Medium-term

8. Project I-1

Drainage Basin:	Industrial Basin
Project Description:	Construct new storm drain system to serve industrial zone and future expansion areas, discharging to existing 36-inch diameter Industrial Basin outfall.
Project Features:	3,000 LF of 36-inch storm drain piping
Deficiencies:	none
Project Benefits:	The project will provide storm drainage service for future development, capture and discharge to river excess overland flows which currently flow east into Orchard and Richard Street Basins.
Time Frame:	Developer-driven

9. Project S-1

Drainage Basin:	South Basin
Project Description:	Construct sedimentation basin at head of storm drainage ditch in commercially zoned area.
Deficiencies:	S-O-1
Project Benefits:	The sedimentation basin will be a City-maintained facility constructed to promote maximum settling of sediment carried from upstream areas. This will help minimize sediment build-up in the drainage channel downstream, thereby preserving system capacity, with easier maintenance access.
Time Frame:	Short-term

Summary of Recommended Storm Drainage Improvement Projects

Recommended improvement projects are summarized in Table 7-2. The table also includes estimated project cost and implementation time frame for each project.

Table 7-2
Summary of Recommended Storm Drainage Improvement Projects

Project	Project Description	Improvement	Project Cost
Developer Driven			
CH-1	Regional detention system	Detention ponds	$100,000
I-1	Construct new storm drain system	3,000 LF of 36-inch pipe	$1,870,000
Short-Term			
EL-1	Construct bypass storm drain system	2,600 LF of 36-inch pipe	$1,620,000
R-1	Construct storm drain system	2,100 LF of 36-inch pipe	$1,300,000
V-1	Construct parallel storm drain system	900 LF of 36-inch pipe	$560,000
OL-1	Construct bypass storm drain system	750 LF of 36-inch pipe	$410,000
S-1	Construct sedimentation pond	500-cubic yard pond	$80,000
Medium-Term			
O-1	Construct storm drain system	1,500 LF of 30-inch pipe	$740,000
R-2	Construct storm drain system	600 LF of 24-inch pipe	$240,000
Estimated Cost of Storm Drainage Improvement Projects			**$6,920,000**

Note: Project cost estimates include an aggregate 45-percent allowance over the estimated construction cost to provide for contingencies, engineering, legal, permitting and administrative costs.

Additional Recommendations

Additional Studies Recommended

The following deficiencies were identified during the hydraulic modeling portion of the study. The modeling results showed there is some potential that a capacity deficiency may exist, but the effect was determined to be minor surcharging only, and therefore did not warrant improvements at this time. Further detailed study is recommended before undertaking improvements or allowing further development upstream of these deficiency areas. Field surveying of the system should be performed at a minimum, with hydraulic calculations based on the field survey data and City stormwater design standards.

<u>*Potential Deficiencies needing further study:*</u> CH-X-1
CH-X-2
EV-X-1
EV-X -2
EV-X -3

Local Improvement Fund

It is anticipated that relatively small, local drainage problems will need to be addressed by City crews on an annual basis. Based on City staff input, an annual budget of approximately $40,000 is suggested to address such problems.

Storm Drainage Master Plan Update

This storm drainage master plan should be updated approximately every seven to 10 years after adoption in accordance with the periodic review provisions of OAR Chapter 660, Section 25. A cost of $60,000 to update the Storm Drainage Master Plan is recommended for inclusion in the CIP. This is based on a portion of the fee required to produce this study, plus an adjustment for inflation over seven years (a five percent yearly inflation factor is applied).

As-built Survey Program and Record Keeping

Data gaps in the City's stormwater system records were identified during the development of this master plan. This information is helpful to accurately define the existing system and develop future storm drainage improvements. An annual cost of $5,000 over five years (assuming five percent yearly annual inflation) is recommended for inclusion in the CIP to develop a systematic as-built survey program that can be used to enhance the existing stormwater system maps.

In addition to an as-built surveying program, the City should require developers to submit as-built drawings after new projects are completed. Data from these drawings should be added to the City's stormwater system maps.