CHAPTER 1 INTRODUCTION

Plan Purpose

This Storm and Surface Water System Plan (Plan) is intended for Bellevue residents and business owners, City of Bellevue (City) staff, developers, and other interested parties. This Plan describes the storm and surface water system, management and operations of the system, and system needs and recommendations. It also includes five strategic initiatives to help guide stormwater management in Bellevue for the 10-year planning horizon this planning document covers. However, this Plan does not include a comprehensive list of potential capital projects. Capital projects are prioritized and funded separately in the City's 7-year Capital Investment Plan, which is updated every 2 years by City Council.

This Storm and Surface Water System Plan is an update of the 1994 Comprehensive Drainage Plan. In the early days of the Storm and Surface Water Utility, Bellevue City Code required that the comprehensive drainage plan be updated every 5 years. In 1996, the code was changed to require it be revised as needed (Storm and Surface Water Utility Code 24.06.045). This update schedule was again modified in 2015 to be updated every ten years which is coincident with issuance of every other City Municipal NPDES permit.

This update highlights changes to the manner in which the storm and surface water system has been managed since 1994, describes the current state of the storm and surface water system, and recommends future actions to adapt to changing conditions and regulations. Major changes since 1994 are summarized below.

- Stormwater management regulatory requirements have become more rigorous since the Washington State Department of Ecology (Ecology) issued a Phase II municipal stormwater discharge permit (National Pollutant Discharge Elimination System [NPDES]) to the City in 2007.
- The City participated in regional efforts, such as salmon recovery, due to Chinook salmon being listed under the Endangered Species Act in 1999.
- Climate forecasts indicate changing climatic conditions that are still uncertain, but planning is needed to ensure the City can continue to operate a storm and surface water system that protects public health and safety, protects the environment, and remains affordable.
- New City programs, such as the Environmental Stewardship Initiative and updates to the City's Comprehensive Plan, emphasize some aspects of storm and surface water management, such as low impact development.

The framework for the management of the storm and surface water system and changes since 1994 are described in more detail in Chapter 3 Community Vision and Regulatory Framework.

Guidelines for Current Plan Update

This Plan is an update of (and supersedes) the 1994 Comprehensive Drainage Plan. The objectives for this update include:

- Refine the Community Vision for Storm and Surface Water Management, published most recently in the Utilities Strategic Plan (Bellevue Utilities 2011) for clarity of purpose.
- Review and update operating system policies to ensure consistency and cohesiveness with
    - City Comprehensive Plan policies;
    - Relevant City regulations, including the Critical Areas Ordinance; and
    - Bellevue initiatives such as the Environmental Stewardship and Green Infrastructure initiatives.

  - Other utility operations and management;

- Review the regulatory requirements, including but not limited to the City's NPDES Municipal Stormwater Permit, the Clean Water Act, and the Endangered Species Act.
- Identify water flow, water quality, and habitat management data gaps and develop tactics to address them.
- Develop a set of plan recommendations that guide operations, system, and outreach/education improvements.
- Define Strategic initiatives for Utilities Property Management, Primary Stormwater Infrastructure, Improving Water Quality, Open Streams Assessment, and Watershed Management Plan Assessment.

How this Plan was Completed

This Plan is intended to provide strategic direction for effectively managing stormwater facilities, streams, and lakes into the future. The following planning principles, developed by staff while scoping the project, guided this update:

- Promote a healthy environment, public safety, and a strong economy, which are essential to maintaining the City's and region's quality of life;
- Steward the City's stormwater system to protect water quality and provide sustainable urban habitat;
- Strive to minimize flooding and reduce damage from storms;
- Align with federal, state, and regional regulations;
- Align with authority granted to the Utilities Department by the Bellevue City Code;
- Ensure consistency with the City's Comprehensive Plan;
- Integrate stormwater management efforts with city-wide initiatives, such as the Environmental Stewardship Initiative and the Bel-Red Corridor Plan; and
- Ensure reasonable and prudent fiscal policies on behalf of ratepayers.

General stormwater policies were developed or revised by experts in the policy subject matter. Prior to adoption by the City Council, policies were reviewed by Utilities Department's managers, directors, and other City departments including the City's Legal Department. The Environmental Services Commission (ESC) then reviewed proposed policies over several months, inviting public comments at each of their meetings. Plan chapters were drafted by subject experts, then reviewed by the Utilities Department's managers, directors, and other City departments. As the Plan developed, major elements, such as the evaluation criteria, plan recommendations, and strategic initiatives were submitted to the ESC prior to preparing the draft document. The ESC reviewed the entire Plan and made a recommendation to the City Council for adoption of the Plan.

Public Input

In 2009, the Bellevue City Council established the ESC as the public review body for the Storm and Surface Water System Plan update process. Staff provided introductory information to the ESC, with opportunity for public input, in July and October 2010. Beginning in December 2010, as items of substance were introduced, specific public announcements were released before each ESC meeting where the Plan update issues were discussed. On March 1, 2012, staff hosted an open house inviting the public's comments on the Plan. The Washington State Environmental Policy Act (SEPA) process provided an additional opportunity for the public to comment on the Plan. To coordinate with other surface water issues under City review, City Council did not adopt the Storm System Plan until late 2015.

A second public open house was held in August 2015 prior to submittal to the City Council. Further opportunities for public comment were available during the City Council's review and adoption of the Plan.

Stormwater Management Guide

In association with the Storm and Surface Water System Plan, a separate 54-page pamphlet, the Stormwater Management Guide (Storm Guide) was prepared to help explain the complexities of manageing stormwater to a layperson audience (Appendix D). The purpose of the Storm Guide is to provide a brief overview of stormwater management, describe the role private property owners have in stormwater management, and to provide the public with a resource guide to obtain more information. As contrasted against the Storm and Surface Water System Plan, the Storm Guide provides greater detail on a few select subjects that warrant further explanation given the target audience. The Storm Guide can also be located on the Utilities Department web page (search Stormwater Management Guide at www.bellevuewa.gov).

Bellevue Storm and Surface Water System, General Information

The City of Bellevue is located in King County, Western Washington, and is part of the Puget Sound lowlands. Bellevue is in the Lake Washington/Cedar River Watershed, and all storm and surface water originating in Bellevue eventually drains to Puget Sound via Lake Washington, the Lake Washington Ship Canal, Lake Union, and the Hiram M. Chittenden Locks (Ballard Locks). City drainage areas have been divided into 26 small drainage basins (Figure 1-1). Seventeen of these basins drain into Lake Washington, and nine drain towards Lake Sammamish. Some of the basins are only partially contained within city limits. The storm and surface water system is described in more detail in Chapter 6 Current Conditions—State of the Storm and Surface Water System.

The City of Bellevue's population in 2010 was 122,363 according to the U.S. Census. As of April 2015, there were 32,973 storm and surface water accounts.

The Utilities Department may be contacted as follows:

City of Bellevue

Utilities Department

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Bellevue, WA 98009-9012

(425) 452-6800 (general information)

(425) 452-7840 (24-hour emergency number for reporting problems)

http://www.bellevuewa.gov/utilities.htm

Bellevue Storm and Surface Water History

The City of Bellevue was incorporated in 1953. Citizens of Bellevue have a long history of keen interest in their streams, wetlands, and open spaces. Concerns about the impact of increasing urbanization on city water resources led to the formation of the Citizen's Advisory Committee on Stream Resources in 1970. With the aid of a consultant, this group prepared a set of recommendations dealing with streamside development and requirements for surface water drainage related to streams (Hall & Corwin Associate. 1976).

Prior to 1970, the City had relied on the traditional approach to stormwater management typical in the Puget Sound region. This approach was to treat storm runoff as a nuisance to be eliminated as quickly as possible. Public roads and private property were drained to the nearest watercourse, which often had to be dredged, armored against erosion, and lined or piped to mitigate impacts of increased flows. Those impacts often included flooding, erosion, and other forms of property damage, as well as a deterioration of water quality. Consequently, natural streams, wetlands, and open spaces were permanently lost to human use and enjoyment. Fisheries and wildlife habitats were also destroyed. Drainage planning was rarely coordinated between or within government agencies.

Figure 1-1. Location of the City of Bellevue and the 26 storm drainage basins.
Note that some basins are located partially outside city limits.

By 1970 the problems associated with urbanization had already become apparent in Bellevue. A series of studies on Kelsey Creek stream ecology, started in 1971 by the University of Washington, showed that while the system was generally in "good" condition, profound changes were beginning to occur (Comis et al. 1971). The study concluded that "…the present management mentality for engineering the fastest storm runoff collection and discharge from the point of interception is in error." It was determined that costs for solving these problems would be high, and that a funding source committed to stormwater management would be needed. It was also apparent that an agency was needed to take responsibility for all aspects of stormwater management within the City.

During this period, Bellevue's community leaders recognized that innovative planning and funding solutions would be needed to deal with the impacts of future urbanization. In 1967 the State Legislature had amended the state law (Cities RCW 35.67 and Counties RCW 36.94) to include storm drainage as a utility function along with such traditional areas as water supply and sanitary sewerage. This action was seen as a means to obtain a dedicated revenue source to accomplish the community's goals of preserving natural streams and water resources.

The Bellevue City Council formed the Storm and Surface Water Utility (Utility) in the spring of 1974 (Ordinance 2003). At that time, a consulting team was formed to investigate funding alternatives. They recommended a service charge to each property based on runoff rate. Funds received from this source would be used for maintenance and operation of the existing system and capital improvement projects needed to reduce flooding and erosion within the city. This approach was considered innovative at the time, and was looked upon as a model for other agencies across the nation seeking alternative financing sources for stormwater management.

Despite considerable effort to involve the citizens in formation of the Utility, the first service charge bills raised many questions. In response to a petition from area residents, a Storm Drainage Utility Task Force was set up to study past decisions and recommend future actions for the Utility. The primary recommendations from the Task Force were:

1. All actions taken by the Utility in the future should be based on a comprehensive system plan.
2. Maximum use should be made of the existing natural, open drainage system.
3. Surface water control requirements should be strengthened to protect those streams.
4. The Utility should consider alternative financing schemes for capital improvements and put these alternatives before the electorate in an advisory ballot.
5. The existing Utility service charge should be used to cover startup costs, maintenance, and operations but not long-term capital improvements.
6. The Utility should act to improve water quality as well as to control flooding and property damage.

In a study considered to be a departure from traditional drainage system master plans, the consulting team of Kramer, Chin & Mayo – Water Resources Engineers/Yoder, Trotter, Orlob & Associates (KCM-WRE/YTO) prepared the City's original Drainage Master Plan in order to mitigate impacts from past development (KCM-WRE/YTO 1976). This plan listed projects to construct, identified properties to be acquired for project construction, and provided preliminary budget estimates for the construction program. In addition to traditional drainage concerns, the consulting team considered alternative drainage control methods, aesthetics, water quality, and system reliability factors in evaluating alternative improvement schemes. The 1976 Drainage Master Plan recommended combining on-site stormwater controls with regional flood control facilities that maximized the use of existing open channel drainage systems (i.e., keep streams rather than building a pipe network for the streams). This

plan recommended 1) a capital improvement program to improve conveyance capacity such that the system could safely convey the existing (early 1970s) 10-year flow rate without causing damage, and 2) that increased flows due to future development would be addressed by regulations. The plan also identified a phased approach for constructing regional flood control detention ponds. The first phase was to obtain land for the regional flood control ponds, construct minor control structures, and conduct stream improvements so that the ponds could function properly. The second phase was a long-range plan to construct the regional flood control ponds and other pipe and channel improvements, and eventually enlarge the ponds to achieve the goals identified in the 1976 Drainage Master Plan.

Concurrent with the work involved with the 1976 Drainage Master Plan, the City established a council-appointed, citizen's Storm and Surface Water Advisory Commission charged with providing the following:

1. Short-term and long-range storm and surface water planning;
2. Annual storm and surface water management budget;
3. Storm and surface water rate structures;
4. Storm and surface water bond proposals;
5. Major property development proposals, and major land use changes directly related to storm and surface water management;
6. Storm and surface water management-related ordinances and resolutions; and
7. City of Bellevue policies related to storm and surface water control.

The City conducted an alternatives analysis of the Drainage Master Plan recommendations and updated the work done by the original consulting team. The City Council formally adopted the plan on December 14, 1979, provided that voters approved funding for project construction. The capital improvement program adopted with this plan continued the two-phased approach. Phase 1 was estimated to cost $8,395,000 and Phase 2, $22,030,000 in 1979 dollars.

Cost for the first phase was projected over the first 5 years at $10 million. The budget was approved with over 60 percent of the vote in 1980. The major portions of the plan were completed between 1981 and 1984. Approximately 70 acres of wetlands and riparian areas were acquired to construct projects. Eight regional flood control facilities and 13,000 linear feet of pipeline were constructed. In 1983, the Utility's Department capital projects were incorporated into the City's first overall Capital Improvement Program plan. A separate drainage basin plan was prepared for the Meydenbauer Creek basin in 1980, recommending direct discharge to Lake Washington in this intensely developed area; the 1976 Drainage Master Plan was subsequently amended. Some of the projects recommended in the 1976 Drainage Master Plan, including the second phase of the regional detention pond network, were not constructed due to improved conditions.

Between 1984 and 1987, over 50 public meetings were held between citizens and City officials concerning the City's Natural Determinants policies and regulations. The Natural Determinants policies and regulations were the City's first set of regulations that protected sensitive natural areas. On April 30, 1985, the City Council adopted an update to the Natural Determinants Element of the Comprehensive Plan (Resolution No. 4541). The stated goals of this amendment were to provide for the preservation and enhancement of water, earth, and vegetation resources. In April 1987, Natural Determinants regulations were adopted with the establishment of the Sensitive Area Overlay District (now called the Critical Areas Overlay District) Section 20.25H of the Land Use Code (Ordinance 3775) and amendments to the Clearing and Grading Code (Ordinance 3776). The City's Design and Development Department and the Storm and Surface Water Utility were initially given joint authority over the Sensitive Area regulations in the Land Use Code.

In 1985, the consulting firm of Brown and Caldwell was retained to update the 1976 Drainage Master Plan. The resulting 1988 Comprehensive Drainage Plan update included 14 new Utility operating policies, a new stormwater rate structure, and goals listed within the Natural Determinants Element of the City's Comprehensive Plan pertaining to protecting or improving water quality, system capacity, fish, aquatic and riparian habitat, and wetlands. This 1988 update also included potential capital projects with predesign reports, and a utility rate study (City of Bellevue 1988). The environmental impact statement and budget were prepared separately as part of the city-wide Capital Investment Program.

On January 18, 1986, an intense storm hit the central Puget Sound area. Over 4 inches of rain fell in 24 hours, causing damage of over $1 million in unanticipated costs to the Utility. As a result of this storm, the Apple Valley ravine stabilization and Bel-Red Road streambank stabilization projects were constructed on an emergency basis. The Newport Shores Berm project was accelerated to construction in 1987. In addition, ten projects were added to the capital project list.

In early 1988, following extensive work by the Storm and Surface Water Advisory Commission, Bellevue City Council and King County Metro adopted the Coal Creek Basin Plan and its attendant Interlocal Agreement. This landmark agreement called for strict erosion and stormwater controls on new development in the Coal Creek basin, outlined joint funding responsibilities for approximately $7 million worth of flood control and sedimentation control facilities, and prescribed means to enhance salmon spawning habitat in Coal Creek.

In January 1990, the City of Bellevue received 3.02 inches of rainfall in a 24-hour storm event. This amount of rainfall had a probability of occurring once in 15 years. However, due to very wet conditions prior to the rain, the runoff volumes approached a 100-year flow event. In contrast to the 1986 storm, very little damage occurred. The drainage improvements constructed following the previous storm were instrumental in preventing damage in 1990.

In June 1991, the City Council voted to create a new council-appointed citizen's advisory commission, the ESC, to replace the Storm and Surface Water Advisory Commission. The ESC assists the City Council in establishing City policy and rates regarding water, sewer and solid waste functions, as well as storm and surface water services.

In 1993, the Storm and Surface Water Utility was combined with other City department utilities into a comprehensive Utilities Department. With this City reorganization, most of the authority over the Critical Area regulations and clearing and grading development regulations were transferred to the City department responsible for Land Use and Development Approvals. The Utilities Department was assigned the responsibility of managing drinking water, wastewater, surface water, and solid waste. The storm and surface water functions of the Utilities Department included flood control, maintenance and enhancement of surface water quality, protection of critical areas, and public education.

The 1988 Comprehensive Drainage Plan was updated in 1994. The 1994 plan updated storm and surface water general policies and provided a list of potential capital projects. This 2012 Plan update supersedes the 1994 plan. Drivers for the 2012 update are detailed in Chapter 2 Stormwater Management Challenges and Opportunities, and Chapter 3 Community Vision and Regulatory Framework.