CHAPTER 9 UTILITIES OPERATIONS

This chapter discusses the Utilities Department's current operations and maintenance of the storm and surface water system. It includes descriptions of the Utilities Department's organizational structure, communications tools, system protection and maintenance, supporting programs and tools,communication tools, and preparedness and response.

The Utilities Department maintains and operates the storm and surface water system to control damage from storms, protect surface water quality, support fish and wildlife habitat, and protect the environment.

Organizational Structure

The Utilities Department manages the storm and surface water system in accordance with the Bellevue City Code, specifically the Storm and Surface Water Utility Code (Chapter 24.06) and the Civil Violations Code (Chapter 1.18.075), the Storm and Surface Water Maintenance Standards (February 2010), a Clean Water Act permit (the National Pollutant Discharge Elimination System [NPDES] Phase II Municipal Stormwater Permit), and several other federal and state laws and regulations. The Utilities Department has responsibility for the ongoing operations and maintenance of the storm and surface water system in the city of Bellevue in conjunction with other City departments, government agencies, and private landowners. Responsibilities for drainage maintenance and operation are detailed in Chapter 3 Community Vision and Regulatory Framework, and Chapter 5 Storm and Surface Water Management Roles, Responsibilities, and Communications.

The Utilities Department is managed by the Director and Deputy Director. The Director's Office is the primary point of contact for the City Manager, City Council, and the Environmental Services Commission (ESC). The ESC is a citizen advisory committee that advises the City Council on planning, budget and rates, Capital Investment Program (CIP) Plan financing, contracts and policies related to water, wastewater, storm and surface water, and garbage programs. The Director's Office also leads intergovernmental and interagency efforts and coordinates the NPDES Municipal Stormwater Permit city-wide. Storm and surface water functions are implemented by three major divisions of the Utilities Department: Engineering, Operations and Maintenance (O&M), and Resource Management and Customer Service (RMCS). The functional organization of the Utilities Department is shown in Figure 9-1. The RMCS Division is responsible for customer service, outreach, financial management, and automation planning and implementation. The Engineering Division is responsible for development review and inspection; system analysis and comprehensive planning; asset management; systems mapping, design, and construction of the Utilities Department's capital program; and stream system management. The O&M Division is responsible for operations and maintenance of the storm and surface water and stormwater facilities associated with transportation systems including system repair and installation, emergency response, private system inspection programs, and illicit discharge response. A number of interdepartmental teams meet on a regular basis or are formed as needed to make policy recommendations and technical decisions regarding the operations and maintenance of the storm and surface water system.

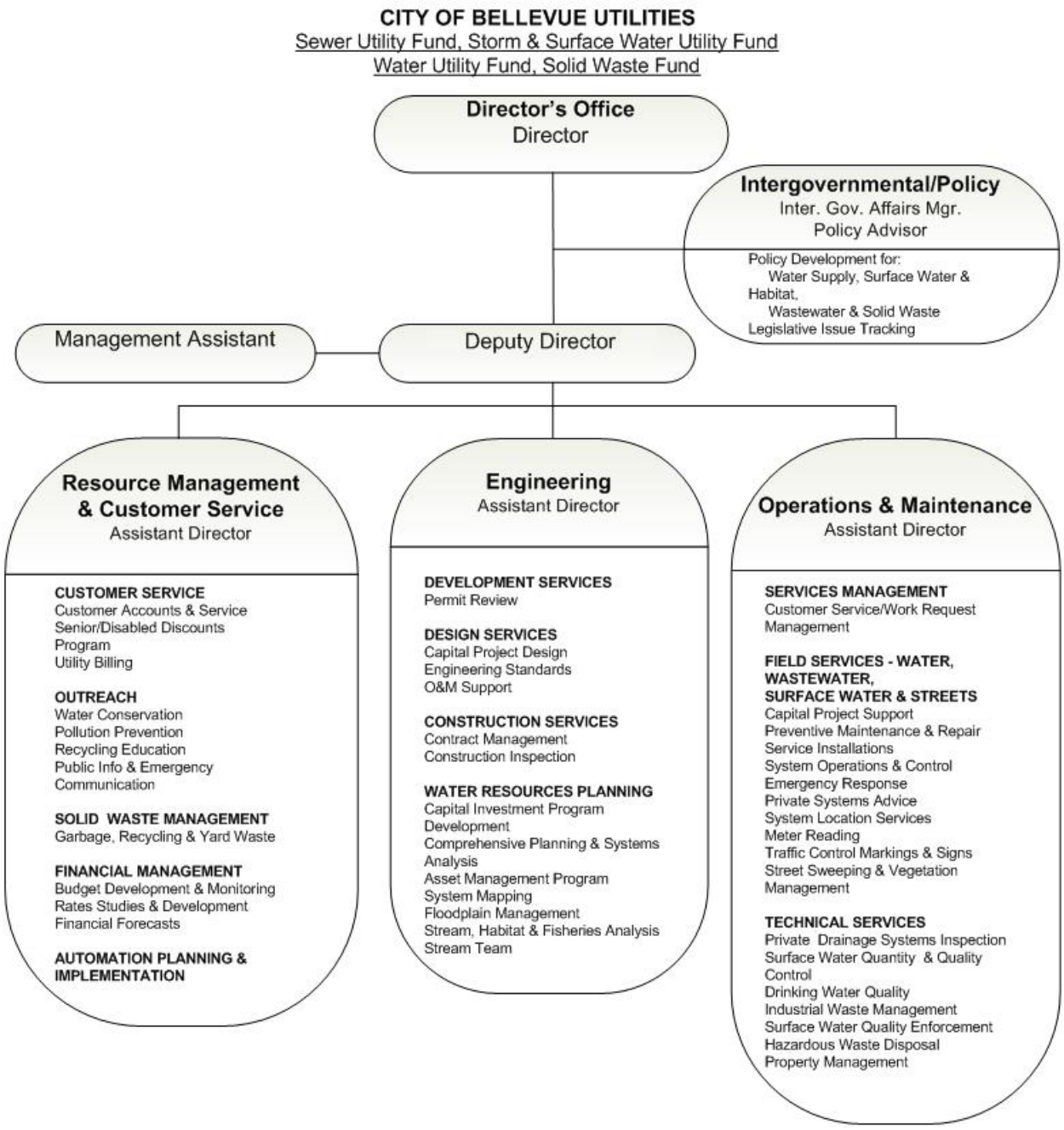

Figure 9-1. Bellevue Utilities Department organizational chart showing division and section responsibilities and functions (updated 7/23/2010).

System Protection and Maintenance

System Components

The storm and surface water system includes structural and natural drainage components located within Bellevue's 26 drainage basins, all of which ultimately discharge either to Lake Washington or Lake Sammamish. The structural components, both public and private, include over 35,000 catch basins and manhole structures and approximately 1,400 flow control and water quality facilities (including vaults, tanks, ponds, oil/water separators, and other structures). The natural elements include over 79 miles of streams and three small lakes. The City owns and operates 11 large regional detention facilities, almost

400 miles of underground drainage pipe, 86 miles of open ditch, approximately 21,000 storm drains and manholes, and approximately 350 water quality and/or detention facilities. Over 15 miles of streams and 864 acres of protected wetlands are on public property. A significant proportion of the system is under private ownership, including approximately 1,500 private drainage systems with over 17,000 individual flow control, water quality, and conveyance structures.

New facilities are added to the system each year. For example, 3 new miles of underground pipe, 27 flow control and water quality facilities, and 795 new catch basins, inlets, and manholes were installed in 2009 and 2010.

Preventative Maintenance

The final discharge locations for all drainage in Bellevue are streams and lakes. The NPDES Permit requires system maintenance to reduce the flow of sediment and pollutants into surface waters. For the constructed drainage system to function as designed and provide adequate flood control and water quality treatment, it must be kept free of excessive debris and sediment. Debris and sediment buildup in pipes, vaults, and other storage areas reduces storage capacity and can cause blockages during heavy rains leading to flooding, property damage claims, and environmental degradation. Sediment and associated pollutants are harmful to fish and other aquatic organisms. The drainage system contains a variety of water quality facilities that trap oils and other pollutants from roadways and allow for their removal during maintenance.

Preventive maintenance services are performed by the O&M Division. These include inspecting and cleaning the components of the drainage system under City responsibility according to the City's maintenance standards and schedules, which comply with the NPDES Permit, as well as performing many operations and maintenance activities necessary for optimal performance of the City's surface water system.

System inspection and cleaning operations involve measuring the amount of sediment in structures or regional ponds, then scheduling and completing cleaning based on inspection results. Cleaning of structures is typically conducted using a high-powered vacuum (eductor) truck that removes sediment from the system and transports it to an approved disposal facility. Regional ponds are generally excavated using large equipment.

Stream inspections are typically performed when a flooding, erosion, or water quality problem has been identified. Because streams in Bellevue flow through both public and privately owned properties, maintenance activities are generally limited to sections of streams on public properties or locations where a dedicated easement exists. Stream inspections and stream channel maintenance is closely coordinated with the Utilities Department water quality staff and Development Services Department staff to ensure compliance with critical areas regulations. Maintenance work includes relocating large logs, managing beaver ponds, adding rocks or erosion control fabric to stream banks, or clearing debris jams that can cause flooding.

Beaver pond management is a unique maintenance challenge for Bellevue because they yield benefits to the open stream channels provided that they do not cause flooding or block fish migration. In a benign manner, beaver ponds trap sediment, provide valuable storage of flood waters, recharge aquifers, and generally improve riparian zone habitat. However, they are also known to be barriers to fish migration and can often cause upstream flooding problems. Maintenance staff periodically dismantle beaver dams when they threaten fish passage or cause flooding. Therefore, it is recommended that the City inventory beaver problems and evaluate opportunities for beaver management that would reduce cost while maintaining the benefits offered by beaver ponds.

Infrastructure Condition Assessment

Storm and surface water infrastructure condition is assessed by capturing digital video images usingclosed-circuit television technology (CCTV) of the inside of drainage pipes to find deficiencies that may lead to system failures. "Critical pipes" (e.g., large diameter pipe, pipes under main arterials) and older pipes that are more likely to fail are inspected as part of this program. In addition, the Utilities Department works closely with the Transportation Department to prioritize video-inspection of pipes under streets where resurfacing is scheduled so that necessary repairs can be completed prior to paving. It is more cost-effective to repair defects before repaving than to incur costly grind and overlay expenses to repair failures that occur after roadway resurfacing. Most condition assessment work is completed by an outside contractor. A small portion of this work is done by in-house staff to investigate unanticipated, localized problems.

As the contractor performs a video-inspection review of the pipes, defects are scored in each pipe segment. In 2009, the contractor inspected 53,800 linear feet (10.2 miles out of a total of 395 miles) of underground drainage pipe and found 148 significant defects. These defects are then assessed by City staff, rated according to severity, and, if appropriate, scheduled for repair. Many of the repairs are completed by O&M Division staff, but larger, more complex repairs are referred to the Engineering Division for correction by an outside contractor as part of the CIP Plan.

System Repair and Installation

Repairs and installations to public storm and surface water system components are necessary to ensure that the municipal storm drainage system functions as designed to protect life, property, and the environment, and to reduce pollution entering streams and lakes. Drainage facilities are examined for cracks, loose joints, broken or missing parts, and other deficiencies during routine preventative maintenance inspections. Deficiencies found during inspections or reported to the City are scheduled for repairs or follow-up, as needed, to maintain the designed function of the system.

On average, the O&M Division repairs 172 storm structures and 502 feet of City-owned storm pipe each year; in addition, the City spends 2,650 labor hours annually repairing water quality facilities and streams. In addition, new drainage structures are installed in response to public drainage and/or flooding problems when necessary, such as catch basins and pipes. On average, 6 new structures and 430 feet of new pipe are installed annually. These installations reduce the likelihood that homes, businesses, and streets will flood.

Private Drainage Inspection

The Private Drainage Inspection (PDI) Program provides inspection and maintenance compliance of privately owned drainage systems to protect streams, ponds, and lakes from pollutants and minimize flooding threats to property. The list of drainage assets inspected by PDI includes assets owned by other City departments that are not part of the Utilities Department-owned assets. This program, an integral part of Bellevue's stormwater system management since 1984, was recently mandated by the NPDES Municipal Stormwater Permit. It provides regulatory oversight of private drainage systems to ensure protection of public health and the environment, as well as protection for the public infrastructure system to which it is connected. Private drainage structures are an integral component of the drainage system.

The PDI Program implements federal and state requirements, primarily through inspection and certification services to verify proper function and maintenance. PDI activities include customer notification of inspection visits and results, facilities inspection, enforcement, database management, and regulatory compliance reporting. Specifically, the Utilities Department's staff conduct periodic field inspections of over 1,500 privately owned storm drainage systems for compliance with required maintenance standards. Private system owners are responsible for repairs and maintenance based on

inspection results. These systems are connected to the public system and represent over 17,000 individual flow control, water quality treatment, and conveyance drainage structures, which account for about half of the total constructed drainage system in Bellevue. Source control inspections that target commercial properteries (inspecting outdoor storage of potential pollution sources such as bags of fertilizer) are also conducted.

Stormwater Pollution Prevention Plans at Public Facilities

The NPDES Permit requires development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for City facilities, which provide heavy equipment maintenance or storage and/or material storage facilities. In 2009, a cross-departmental team (Utilities, Civic Services, and Parks) worked with a consultant to develop and implement the SWPPPs for six City facilities that triggered this requirement. The six City facilities are: Eastgate Yard, Bellevue Service Center, Lower Bellevue Service Center Parking Lot, Resource Management Center, Bellevue Golf Course Maintenance Facility, and Bellefields Yard.

Regional Endangered Species Act Roads Maintenance

The Endangered Species Act of 1973 (ESA) is a federal law designed to prevent endangered species from becoming extinct as a "consequence of economic growth and development untempered by adequate concern and conservation" (Section 2, ESA). The ESA Roads Maintenance Program established a set of roads maintenance best management practices (BMPs) designed to protect aquatic species listed as threatened under the ESA. This state-wide program was created regionally by the Washington State Department of Transportation (WSDOT) and 23 city and county jurisdictions; it was approved by the federal agency that administers the ESA for salmon (the National Marine Fisheries Service [now NOAA Fisheries Service]) in 2003. Participating agencies receive protection from liability for activities that have the potential to affect species listed under the ESA. The program involves implementing BMPs, training staff, and monitoring to prevent impacts to aquatic species listed under the ESA that rely on surface waters (Regional Road Maintenance Technical Working Group 2001). The Utilities Department and the Transportation Department signed a letter of program commitment for the National Marine Fisheries Service on November 6, 2001, and use the approved BMPs for all construction and maintenance activities.

Supporting Programs and Tools

Various monitoring programs and analysis and communications tools support the Utilities Department in managing the storm and surface water system. Monitoring programs involve collecting and analyzing information about stormwater system performance for efficient operations to quantify system capabilities and to identify system problems or deficiencies. Examples of ongoing monitoring programs include the collection and analysis of regional detention pond stages, rainfall information, and stream flows. Computer models of the storm and surface water system are developed, maintained, and used to map and predict flooding. The models allow accurate assessment of the system's ability to accommodate scenarios such as planned population growth or changed land uses; the data are then made available for basin or comprehensive planning. Physical, chemical (water quality), and biological information about streams are collected for analysis of fish use, environmental health, and beneficial uses of surface waters such as fishing and swimming. These data are used to evaluate how the storm and surface water system is performing relative to the Utilities Department's goals, as detailed in Chapter 6.

Physical System Monitoring

Computer models and trend analyses rely on up-to-date, accurate information. Data about facilities are provided by the O&M Division and analyzed by the Engineering Division staff. Physical information about streams collected by the Utilities Department includes continuous stream flow data at critical

locations, including the U.S. Geological Survey (USGS) gauges on Kelsey Creek, precipitation data, and water level data at Lake Sammamish and regional detention ponds.

Telemetry Systems

Telemetry and Supervisory Control and Data Acquisition (SCADA) equipment are automated systems used to remotely monitor surface water elements such as precipitation, flow rates, and water level elevations. These systems allow staff to operate and regulate the gate settings at the regional detention facilities for stormwater. Telemetry and SCADA equipment requires regular repair, replacement/upgrade, preventative maintenance, calibration, programming, and testing. Research and development are ongoing to stay current with technological advances, and to maintain effective and reliable telemetry/SCADA systems.

Telemetry and SCADA equipment warns in real time when systems are operating outside normal parameters, alerting staff so they can make manual adjustments. Currently, 12 stormwater structures and 11 rain gauges are monitored remotely using telemetry equipment. The communications and control system consists of an infrastructure of remote telemetry units at each site, fiber optics, and a leased line and network that provides data and control to and from all remote sites, Bellevue City Hall, and the Bellevue Service Center.

Water Quality and Illicit Discharge Detection and Elimination

The City performs water quality monitoring to detect and eliminate pollutant sources to the municipal stormwater system, to investigate water quality issues and reports of pollutant spills, to determine long-term water quality trends in a few water bodies, and, as needed, to inform management actions. The Illicit Discharge Detection and Elimination (IDDE) Program involves field assessment activities that include 1) outfall prioritization, screening, reconnaissance, discharge characterization, and sampling; 2) investigation, containment, and cleanup of illicit discharges and connections; and 3) regulatory enforcement, reporting, and program effectiveness evaluation. The IDDE Program also includes locating and mapping drainage outfalls, documentation, and City-wide support for illicit discharge training and response. The protocol for working with those responsible for illicit discharges ranges from education to fines.

The Utilities Department has conducted and/or participated in numerous storm and surface water quality monitoring studies, including comprehensive characterization studies of urban stormwater quality, monitoring studies of water bodies, and studies to assess the effectiveness of BMPs. Water quality studies are expensive. The Utilities Department uses studies strategically to identify options to address specific water quality issues and inform management actions to adaptively manage programs over time, resulting in better water quality protection, and reduced pollutant discharge to the storm and surface water system.

In the next 5-year NPDES Phase II Municipal Stormwater Permit (2012 to 2017), the City anticipates the Washington State Department of Ecology (Ecology) will require Phase II municipalities, including Bellevue, to implement storm and surface water quality monitoring. These new monitoring requirements and implementation options are still being developed.

Aquatic Habitat and Biological Information

The Utilities Department plays a major role in maintaining and monitoring aquatic habitat (areas with the conditions to support aquatic life). The specific activities are detailed in Chapter 5 Storm and Surface Water Management Roles, Responsibilities, and Communications. The number and type of animals living in streams are a good indication of the relative condition of the streams. Biological information about streams collected by the Utilities Department includes surveys of spawning salmon in the fall; summer fish use of streams; annual sampling of benthic macroinvertebrates from streams; and

peamouth minnow spawning surveys each spring. Staff, professional consultants, and volunteers collect biological information that is used to assess the environmental health of Bellevue's open streams.

Fall salmon spawner surveys are generally conducted on Bellevue's primary salmon streams—Kelsey Creek, West Tributary, Richards Creek, and Coal Creek—with occasional surveys and spot checks by volunteers on other streams. The surveys are normally conducted from early September through late December, during the fall spawning runs for Chinook, coho, and sockeye salmon. Summer fish use of several reaches of stream is sampled every 2 to 3 years by electrofishing. This information is used to document resident fish species present, relative abundance and ages of fish, native and non-native populations, and to document trends over time. Peamouth spawning events are monitored by volunteers who check various sites, primarily along Kelsey Creek, from April through June.

Benthic macroinvertebrates, the "bugs" that live in the stream gravels and can be seen with the naked eye, are collected each summer from multiple sites along three to five streams. Samples are collected using regionally approved protocols. Each site is assigned a score based on sampling results that indicates the relative condition compared to other streams in the region. Scores can range from pristine to heavily impacted. This score is known as the Benthic Index of Biotic Integrity, or B-IBI.

Communications Tools

Communication within the Utilities Department and with other City departments is facilitated by automation systems and tools. These systems are described below; each work group is trained in how best to use the available tools to perform its mission. Standard operating procedures are developed and updated using an internal review process, and are centrally available to Utilities staff.

The Utilities Department uses IBM's Maximo work management database to manage daily operations and maintenance. For example, service requests are directed to managers who then schedule and assign work orders to staff. The database is also used for purchasing, work planning and scheduling, making payroll, conducting asset inventory and tracking, scheduling tools and equipment, stocking inventory, financial reporting, responding to customer requests, preparing regulatory reports, and dispatching during emergencies. The Development Services Department uses the CSDC System's Amanda database system for development permitting, tracking, and reporting. Amanda interfaces with Maximo for new service connections that originate in Development Services. A City-wide geographic information system (GIS) with a customized browser called Mapster shows Utilities infrastructure and structures on secured layers. Custom maps and geographic analyses can be created using GIS and other mapping programs, including ESRI's ArcGIS and AutoCAD. Centralized network drives and other software facilitates sharing of electronic files between the Utilities Department staff and other City departments. These automated communications applications are supported by the Information Technology Department, and Utilities staff within the RMCS Division.

Floodplain Management Program (FEMA's National Flood Insurance Program)

A floodplain is the land area adjacent to a stream or lake that temporarily stores excess water during heavy rain, providing natural storage and beneficial protection of downstream properties, groundwater reservoirs, water quality, and streams. More specifically, Bellevue City Code (LUC 25.20H175) defines the floodplain as "The land in the floodplain subject to the flood having a one percent chance or greater of being equaled or exceeded in any given year as determined by customary methods of statistical analysis defined in the Utility Code, Chapter 24.06 BCC." The National Flood Insurance Program (NFIP) is a federally backed insurance program that offers flood insurance to property owners who own property in participating communities. The federal government instituted the NFIP in 1968 to provide flood insurance coverage not generally available on the private market. Bellevue voluntarily joined the NFIP in 1974, providing citizens the opportunity to purchase flood insurance.

The NFIP requires participating communities to adopt land use regulations that minimize flooding risk to new and substantially improved developments. The degree to which these regulations minimize risk is rated by the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS). The CRS is a national program that recognizes and encourages community floodplain management activities that exceed minimum NFIP standards. Every 3 years, Bellevue's floodplain management program is evaluated against CRS standards that are based on a system of points awarded for floodplain management activities under the categories of Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness. Flood insurance premium rates for policyholders that live in Bellevue are dependent upon the CRS score. Bellevue's CRS score of Class 5 (last awarded in 2008) resulted in Bellevue citizens being eligible for up to a 25 percent discount on flood insurance premiums; this discount was due to floodplain management practices in Bellevue. Ongoing activities related to the CRS program include improving floodplain maps using FEMA protocols, regularly communicating with citizens regarding floodplains on their property and flood prevention activities, continuous stream flow gauging, and a suite of other activities.

FEMA publishes floodplain maps to depict the extent of the 100-year floodplain (Federal Emergency Management Agency 1995). These maps, known as Flood Insurance Rate Maps (FIRMs), help insurance agents, lending institutions, and local governmental jurisdictions understand flooding risk. The City of Bellevue uses floodplain maps to promote wise land use activities on lands prone to flooding. City floodplain management code is written to preserve floodplains in an undeveloped state so they are available to store floodwaters without damaging private property. If natural flood storage areas were allowed to develop, flood waters would be pushed downstream, causing harm to others and putting investments into private property at risk.

Floodplains in Bellevue were originally mapped by FEMA in the late 1970s and are documented in the King County Flood Insurance Study (Federal Emergency Management Agency 1995). Updates to the original floodplain maps have primarily included changes in non-technical mapping information such as jurisdictional boundary lines and new roads (Figure 9-2). With the exception of Kelsey and Meydenbauer Creeks, the FIRMs for Bellevue do not reflect changes in flood flows or flooding elevations that may have occurred due to urbanization. The Meydenbauer Creek and Kelsey Creek floodplain maps, however, have each been updated with flow rates and 100-year flooding elevations as predicted with fully built-out land use conditions (FEMA case # 98-10-131P, 03-10-0399P and 07-10-0757P).

The City's need to map floodplains is different than the needs of the NFIP. The NFIP is primarily an insurance program, and its mapping efforts are limited to stream basins that met a minimum land area threshold. Because some stream basins in Bellevue are below this threshold, the FIRMs for Bellevue do not show all of the 100-year floodplains in the city. Bellevue, on the other hand, uses floodplain maps to implement land use policies, and the City's definition of floodplains applies to every open stream within city limits. Therefore, the City's need for floodplain maps is not limited to what was mapped by FEMA.

Flooding elevations depicted on floodplain maps are affected by stream flow volumes—increased stream flow volume results in larger floodplains—and because stream flows have changed since the original FEMA floodplain maps were produced in the late 1970s, they are likely incorrect and need to be updated. Two Bellevue drainage basins have recently been remapped with updated hydrology and flooding extents (Meydenbauer Creek and Kelsey Creek), as shown on Figure 9-2. It is recommended that the City complete a floodplain mapping needs assesment for the three basins not originally included in the FEMA Flood Insurance study (colored yellow) and for basins originally mapped by FEMA, but have not been updated since 1978. Many basins are not recommended for any floodplain mapping (shown in brown) because those basins do not meet the City's remapping criteria due to steep stream gradients, a poorly defined stream corridor, and/or a lack of anticipated redevelopment.

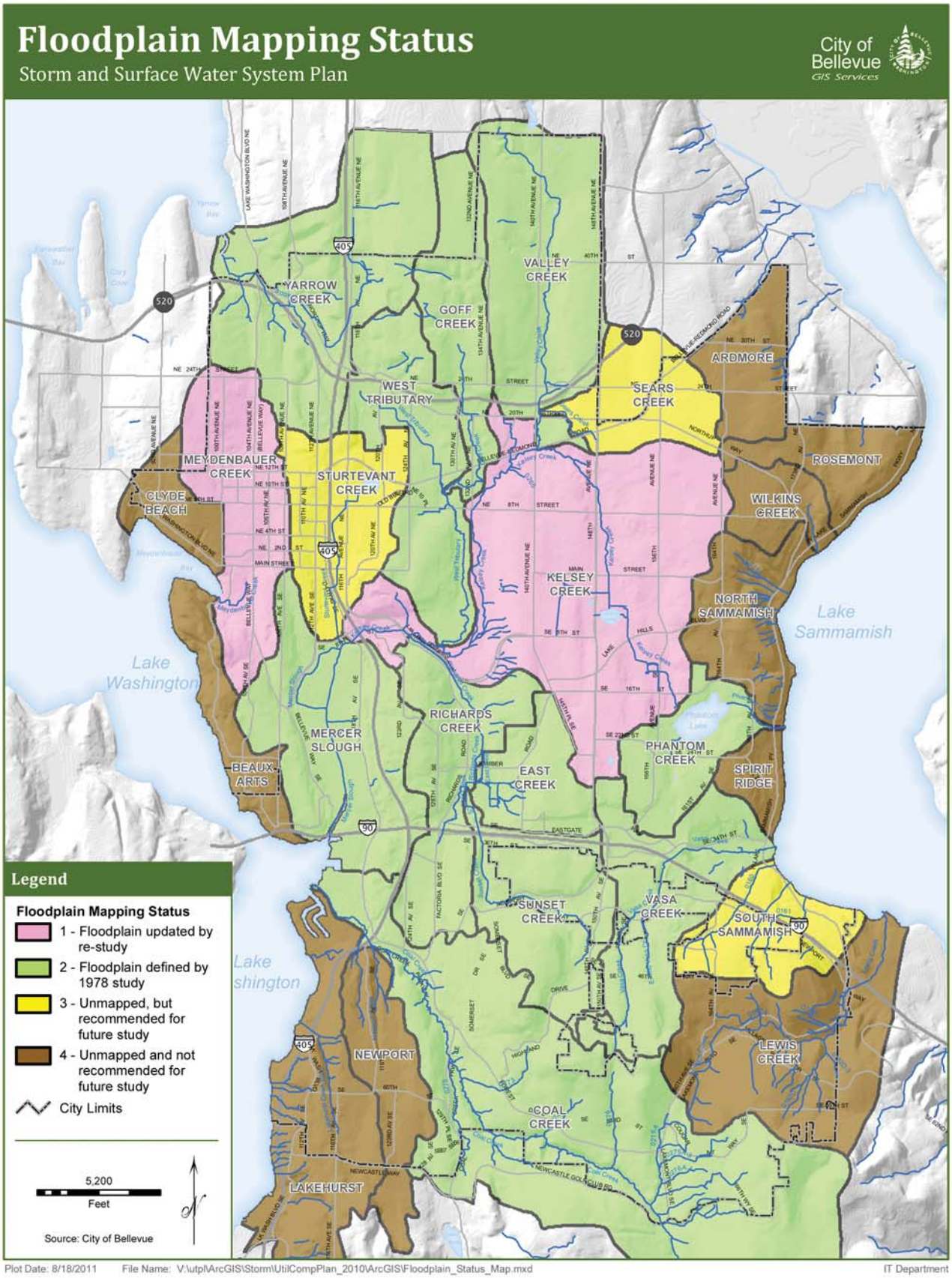

Figure 9-2. Status of floodplain mapping in each of Bellevue's drainage basins as of 2010.

Capital Investment Program

The Utilities Department's Storm and Surface Water CIP Plan is a 7-year spending plan, representing a significant investment of Utilities' resources intended to further the department's mission with regards to storm and surface water. The 2011 to 2017 CIP Plan budgets approximately $4.9 million/year for projects that:

- Protect property from flooding or other stream-related damage;
- Protect or improve water quality;
- Maintain or improve the reliability, effectiveness, and/or integrity of the utility's infrastructure;
- Promote fiscal stewardship through cost savings or reduced potential liability;
- Promote resource stewardship by improving fish and/or riparian wildlife habitat; and
- Respond to regulatory requirements, settlement or easement agreements, or court orders.

The CIP Plan is updated every 2 years, as part of the City's biennial budget adoption. Changes or additions to the CIP Plan are recommended based on comprehensive plans or studies, operations or maintenance experience, asset management program recommendations, and regulatory changes. Recommended changes are developed by a diverse, multi-interest team of stakeholders including staff from all Utilities divisions and other departments. They are submitted for extensive review by the ESC, with several opportunities for review and comment by the public, before being presented to the City Council for review and adoption.

The CIP Plan includes ongoing programs with annual funding for infrastructure repair and replacement; stream channel stability; fish passage improvements; and flood control. Projects within each of these programs are prioritized and constructed based on criteria specific to each program. The CIP Plan also includes one-time projects with specific objectives, such as construction of a pond for sediment removal on Coal Creek, retrofit of an existing stormwater pond to improve water quality, and replacement of a stormwater culvert that conveys a stream under a major arterial.

Managing the CIP Plan involves ongoing monitoring and quarterly reporting (internal and to the City Council) of CIP budget and project status. Performance monitoring includes assessment of the program's planned vs. actual accomplishments.

Implementation of the CIP Plan involves selection of the optimal design alternative based on a triple-bottom-line decision model that considers economic, social, and environmental impacts. Engineering drawings, specifications, and cost estimates are developed and required permits and property rights are secured. Quality control and quality assurance is provided throughout the design process, which uses a collaborative approach involving staff from O&M, Planning, and Design and Construction sections, as well as staff from other departments depending on the nature of the project. This process results in a design that ensures a long asset life with minimal maintenance costs.

Major CIP projects will often seek public input through meetings that range in size from neighborhood groups to larger basin-wide public meetings. Property owners affected by CIP projects receive letters during the design phase that provide information about the project, including the name and contact information of the project engineer. Once projects commence construction, property owners receive advance notice that includes anticipated impacts, duration of construction work, and contact information for the City inspector assigned to the project.

CIP projects are typically constructed by private contractors obtained through a public works bidding process. This process follows Washington State public works bid laws. As prescribed by state law, construction projects are awarded to the lowest qualified bidder.

CIP projects in construction are managed and inspected by the Utilities Inspection Services staff to ensure that bidding procedures are followed; that facilities are constructed in accordance with the

approved drawings and specifications; that all permit conditions are met; that construction impacts on residents and businesses are minimized; that the health and safety of the public is protected; and that costs are reviewed and accurately accounted to maintain budget integrity. O&M staff support CIP projects during construction, by attending pre-construction meetings, coordinating site access for contractors, and inspecting facilities before they are accepted for public ownership.

Preparedness and Response

The Utilities Department responds to environmental and other emergencies, including flooding, snow, ice, earthquakes, and spills and pollution discharges into the storm and surface water system. The department also participates in city-wide emergency preparedness and response activities. These activities are described below.

Environmental Response

The Utilities Department responds to disasters and major emergency events to maintain or return utility and street systems to service. Emergency events include extreme rain and flooding, snow, ice, earthquakes, as well as other unforeseen disasters such as spills or illicit discharges of pollutants. Events that have obvious or potential wildlife impacts are reported to Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries Service, as appropriate.

Water Quality Response

Response for surface water quality protection is conducted as required by the NPDES Permit, public health department, and/or water quality goals established for streams and lakes. O&M Division staff routinely respond to and investigate reported illicit discharges (pollutant spills). The responsible party is identified and required to perform cleanup, or is subject to enforcement, which may include cost recovery and fines. O&M and Engineering staff also respond to customer water quality concerns, help resolve crossed connections between surface water and wastewater pipes, provide city-wide technical expertise and support for water quality response issues, and oversee response planning activities for preventing and managing the West Nile virus. In 2009, Utilities staff responded to over 60 potential pollutant spills into lakes and streams and two sewage overflows that threatened Lake Washington beaches.

Emergencies

The City follows national Incident Command System protocols established under FEMA and Homeland Security. The Utilities Department participates in this City-wide emergency preparedness planning, coordination, and training. Activities undertaken to prepare the Utilities Department for emergency and disaster response include regular Emergency Management Plan updates, maintenance of mutual aid agreements, emergency response training, emergency management team meetings (department and city teams), disaster response exercises, and other research or activities contributing to emergency preparedness.

The Utilities Department has a key role in response to natural and human-caused disasters and major emergencies because of the critical importance of the drinking water, wastewater, and drainage systems to maintenance of public health and safety. Major wind storms may cause flooding and debris removal challenges. A strong earthquake would likely cause major damage to below-ground piped infrastructure and water detention structures. Utilities must be prepared to respond to a wide array of potential disasters, including paralyzing snowstorms, chemical spills, gas explosions, terrorist acts, volcanic activity, airplane crashes, and more. During emergency events, an Incident Command System (ICS) structure is implemented. ICS is a standardized, on-scene, all-hazards incident management approach that allows for integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. Following ICS protocols, resources are shared

among the field operating sections of the O&M Division. Response, however, is only one piece of a comprehensive emergency management program as defined by FEMA and the Utilities Department. The department's emergency planning has five aspects: mitigation, preparedness, response, recovery, and review.

The steps above are detailed in the Emergency Management Plan, which the Utilities Department maintains in two volumes. Volume 1 contains information on policies and instructions regarding reporting to work; emergency response roles and responsibilities; vehicle, equipment, and emergency supplies inventories; contact information for employees, emergency operations centers, and response partners; telephone and radio communications protocols; and critical infrastructure location lists and maps to guide damage assessments. A separate Volume 2 includes scenario-based response plans for many disaster scenarios such as snow and ice events, flooding, windstorm debris removal, drinking water contamination, and West Nile virus outbreak, etc.

In addition to regularly updating the plans described above, the Utilities Department emergency preparedness includes participating on City-wide preparedness teams, maintaining a departmental emergency management team, conducting ongoing emergency response training and exercises, developing emergency messages and warning systems, and preserving mutual aid agreements with other agencies for possible lending/borrowing of critical resources. The City-wide effort produces the City of Bellevue Emergency Operations Plan (EOP), continuity of operations/continuity of government protocols, and guidance to departments on disaster response priorities.