8 Sustainability & Natural Environment



What You Will Find in this Chapter

- Information about ecosystems, critical areas, and stormwater systems.
- A description of the City's plan for environmental protection, stormwater management, and climate change.
- Goals and policies that promote sustainability and a quality natural environment.

Our Sustainability Vision

Tree canopy, natural areas, biodiversity, watersheds, and green infrastructure are protected and enhanced over time. Negative environmental impacts such as exposure to sea level rise, flooding, air and noise pollution, and urban heat effects are mitigated.

Introduction

Burien residents enjoy five miles of Puget Sound shoreline, steeply wooded slopes, salmon-bearing streams, and wetlands. These provide ecosystem benefits. Burien also contains hazardous area prone to landslides and flooding. Development is managed with policies and regulations to avoid or mitigate impacts to regulated critical areas.

Stormwater management addresses water quality and pollution and drainage problem areas. State agencies have found that polluted stormwater is the primary toxic threat to Puget Sound and local bodies of water, threatening wildlife, fisheries, and open space areas. The City implements stormwater management regulations to minimize such impacts to the natural environment. As redevelopment occurs, better-integrated stormwater management practices that also enhance the environment could address degradation of water quality.

Conditions and Trends

Today's Conditions

Ecosystems

Natural ecological environment **assets in Burien** include surface water and groundwater; green spaces including urban forests; critical areas such as wetlands, streams, and steep slopes; and fish and wildlife.

- **Puget Sound:** Burien is situated along the Puget Sound, a large and ecologically diverse estuary, supporting a wide range of marine life, including salmon, orcas, seals, and various seabird species.

- **Shoreline Habitats:** Burien has several miles of shoreline along the Puget Sound, providing habitats for various species of shorebirds, marine invertebrates, and coastal plants. These habitats include sandy beaches, rocky shores, and intertidal zones.
- **Forests and Parks:** Burien is home to more than 365 acres of parks and open space, including Ed Munro Seahurst Park, each with their own unique and diverse ecology. Forested areas support a diversity of plant and animal species, including migratory birds, small mammals, and native plants.
- **Urban Green Spaces:** Burien incorporates urban green spaces throughout the city, including neighborhood parks, community gardens, street trees, and trees on private property. These areas contribute to the overall ecological health of the city, improve air quality, clean stormwater, cool the city, and provide habitat for urban wildlife.
- **Water Bodies and Riparian Corridors:** Lake Burien, Arbor Lake, and several creeks and streams, such as Miller Creek and Salmon Creek, provide ecological functions such as habitat for fish, amphibians, and waterfowl, hold flood waters, and recharge groundwater.
- **Wetlands:** Wetlands are important ecological assets that help purify water, mitigate flooding, and provide habitat for numerous plant and animal species. Burien has wetland areas that support diverse wetland-dependent species.
- **Wildlife Corridors:** The region surrounding Burien features natural and semi-natural areas that serve as wildlife corridors, allowing for the movement of species between larger habitat patches. These corridors contribute to biodiversity conservation and facilitate gene flow between populations.

Critical Areas

Critical areas provide a variety of valuable and beneficial biological and physical functions that benefit the city and its residents, and/or may pose a threat to human safety or to public and private property. Critical areas include fish and wildlife habitat conservation areas, wetlands, critical aquifer recharge areas, flood hazard areas, and geologically hazardous areas. See a map of critical areas mapped in the city. See **Exhibit 8-1**.

The beneficial functions and values of critical areas include, but are not limited to, water quality protection and enhancement, fish and wildlife habitat, food chain support, flood storage, conveyance and attenuation of storm runoff, groundwater recharge and discharge, wave attenuation, aesthetic value protection, and recreation. Hazards include coastal and stream flooding, landslides, and excessive erosion.

Critical area regulations apply if a property is located within a critical area or its buffer. A critical area study prepared by a professional in the field of wetland or stream biology, engineering, or geology, depending on the type of critical area, is required.

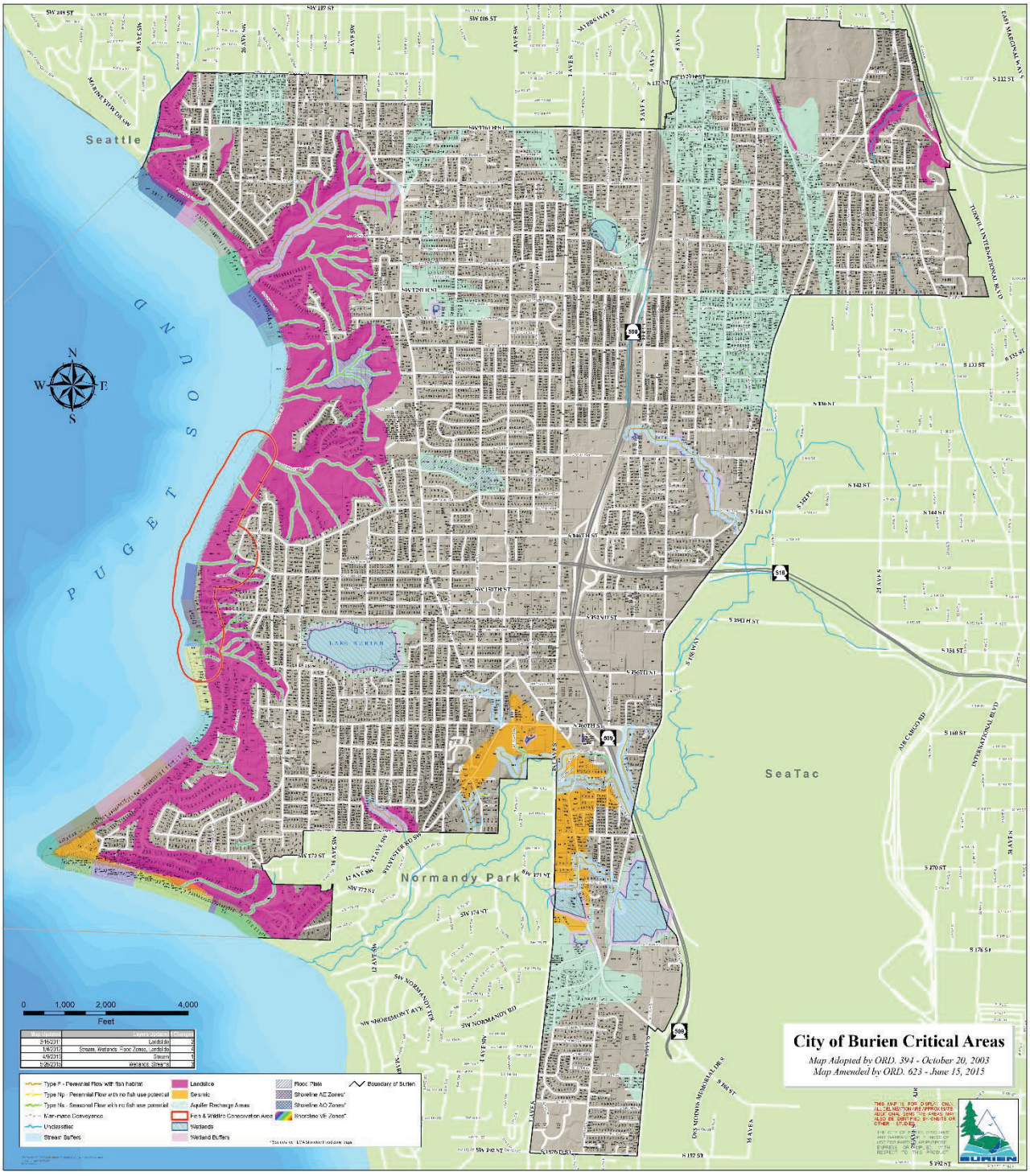
Landslides

Landslides are a prevalent critical area hazard in Burien. Landslides are capable of moving massive amounts of land, trees, and other material potentially causing death, injury, or property damage. Burien's landslide risk areas include the Puget Sound coastal properties, large ravines, and steep slopes along the western edge of the Green/Duwamish River valley. Landslides would typically be caused by unusually heavy seasonal rains or seismic events.

Potential landslides along the Puget Sound coastal properties within Burien are a significant risk as earth movement is documented in some areas. Past slides have threatened or damaged homes. However, most of the potential landslide areas within ravines are undeveloped and pose little risk.

Landslides could cause damage to existing structures if they were not constructed using adequate soils analysis. New building construction must be permitted based on certified geotechnical analysis and be able to withstand or avoid damage from earth movement. (City of Burien, Annex to the King County Regional Hazard Mitigation Plan, 2020)

Exhibit 8-1. Critical Areas



Source: City of Burien, 2015.

Shorelines

Shorelines of the state include lakes over 20 acres like Lake Burien and all marine shorelines including along Burien's Puget Sound coast. Streams over 20 cubic feet per second are also shorelines of the state though none are in Burien. The Shoreline Management Act generally applies to land within 200 feet of the ordinary high water mark of the shorelines as well as the aquatic portion of the shorelines. Shoreline Master Programs (SMPs) required by the Shoreline Management Act (SMA) set forth goals and regulations for the shorelines to allow for preferred shoreline uses, public access, and environmental protection.

Through its SMP, Burien has designated shorelands as shoreline residential along lakeside and marine residential lands, and urban conservancy along public parklands along the marine shoreline. Waters are designated "aquatic." See **Exhibit 8-2**.

The City last updated its SMP in 2019, and it is codified in BMC Title 20. The SMP periodic update timelines are regulated by RCW 90.58 and WAC 173-26.

The goals and policies of the SMA are part of GMA goals in RCW 36.70A.020. The goals and policies of a local shoreline master program are considered an element of a jurisdiction's comprehensive plan. All other portions of the SMP are considered a part of the jurisdiction's development regulations. (RCW 36.70A.480)

Within shoreline jurisdiction, the SMP applies as an overlay in addition to zoning and other development regulations established by the City.

Exhibit 8-2. Shoreline Designations



Source: City of Burien, 2013.

Stormwater

The City's stormwater program services approximately ten square miles with over 10,000 catchments, 14,000 feet of ditch, and 859,000 feet of pipe. A complete inventory of existing stormwater infrastructure (as of September 2019) is listed in **Exhibit 8-3** and depicted in **Exhibit 8-4**. The City has made significant investments in assets since 2020 and has an online interactive map where the data is updated as needed.[9]

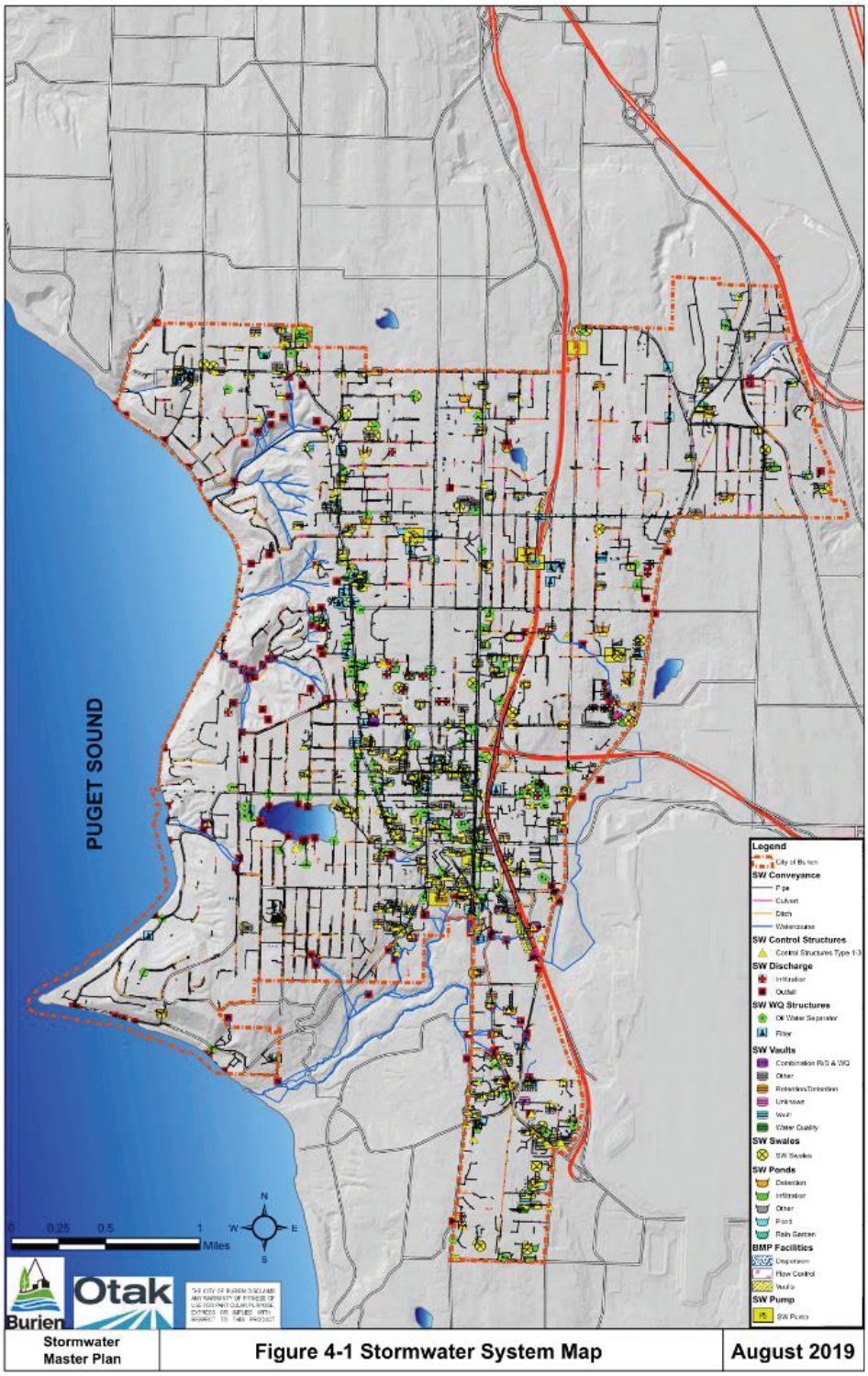
Exhibit 8-3. Existing Stormwater Inventory Summary

Type	Right-Of-Way	Parks	City Owned Property	Private Property	Total in City
Stormwater Ponds	0	2	13	47	62
Control Structures	71	4	12	256	343
Water Quality Structures	25	1	4	151	181
Vaults	32	1	4	187	224
Pump Stations	2	0	1	10	13
Catchments (catch basins, yard drains, manholes etc.)	6,176	155	155	4,176	10,662
Discharge Points (Outfalls, Infiltration)	41	27	30	107	205
Culvert (ft)	35,188	448	515	3,113	39,263
Ditch (ft)	115,026	2,005	2,337	21,459	14,082
Pipe (ft)	502,135	14,007	17,117	226,413	859,673
Swale (ft)	331	85	444	2,241	3,101
Other (ft)	4,469	979	1,083	10,370	17,502

Source: 2020 Burien Stormwater Master Plan Update

[9] Note: See the City's stormwater map online for current information: https://ogtx.burienwa.gov/ExternalViewer/index.html?viewer=Stormwater.

Exhibit 8-4. Burien Stormwater System Map



Source: 2020 Burien Stormwater Master Plan Update

A total of seven drainage basins lie within city limits including Miller Creek, Lower Puget Sound - South, Duwamish River, Salmon Creek, Lower Puget Sound - North, Seola Creek, and Des Moines Creek drainage basins (listed in order from largest to smallest). A significant amount of flow from these basins originates outside city limits and drains into city limits.

Tomorrow's Projections

Climate change stands to have profound effects on individuals and their communities. Warmer temperatures and changes in patterns of precipitation, among other climate change impacts, will affect human health, the natural and built environment, recreation, and other facets of society. Landslide hazard areas, flood hazard, and drainage problem areas could worsen and the City may need to account for stormwater system size and design. Critical area buffers may require alternative planting standards.

Challenges & Opportunities

Stormwater

A majority of the stormwater infrastructure the City acquired from King County has reached or exceeded its design life of 50-100 years and requires replacement. The City has an Infrastructure Replacement Fund in place to upgrade and replace aging infrastructure associated with roadway improvement projects (2020 Storm Drainage Master Plan Update).

There are 16 stormwater deficient areas identified in the 2020 Storm Drainage Master Plan – all capital improvement projects, studies, and small works projects are listed in **Exhibit 8-5** and depicted in **Exhibit 8-6**. These projects address flooding, infrastructure concerns, and water quality concerns (2020 Storm Drainage Master Plan Update).

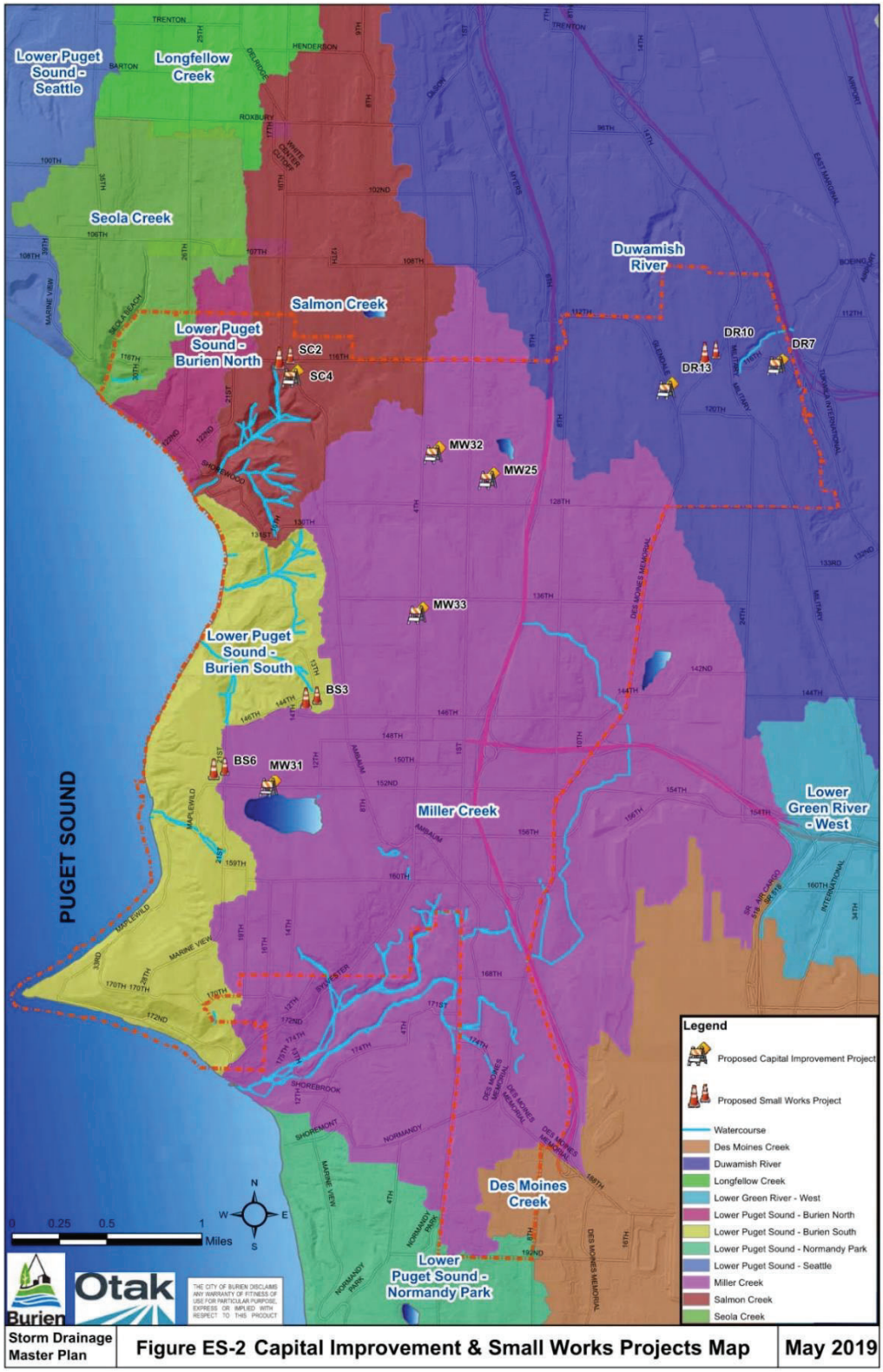
Exhibit 8-5. Stormwater CIP Projects, Studies, and Small Works Projects

Project Title	Project Problem Area
Stormwater Infrastructure Improvement at S 116th Way	CIP DR7
Stormwater Infrastructure Improvement at Glendale Way S	CIP DR13
Stormwater Infrastructure Improvement at 2nd Ave S between S 124th St and S 128th St	CIP MW25
Stormwater Infrastructure Improvement at 11704 Ambaum Blvd SW	CIP SC4
Stormwater Infrastructure Improvement on SW 152nd St and 16th Ave SW	CIP MW31
Stormwater Infrastructure Improvement at 2nd Ave SW and SW 124th St	CIP MW32

Project Title	Project Problem Area
Stormwater Infrastructure Improvement on 4th Ave SW and SW 137th St and SW 139th St	CIP MW33
142nd Street Depression Improvement	Study 1
Chelsea Park Neighborhood Bioretention Siting (total cost assumes four facilities)	Study 2
Large-scale ditch retrofit project (converting into bioretention, bioswales, infiltration trenches, etc.) (total cost assumes ten facilities)	Study 3
Pretreatment or WQ retrofits on untreated outfalls City-wide (total cost assumes ten outfalls)	Study 4
Public-Private partnership for large-scale stormwater retrofits	Study 5
Stormwater Infrastructure Improvement at SW 144th Pl	Small Works Project BS3
Stormwater Infrastructure Improvement at 1598 SW 116th St	Small Works Project SC2
Stormwater Infrastructure Improvement at 14945 21st Ave SW	Small Works Project BS6
Stormwater Infrastructure Improvement at 11424 20th Ave S	Small Works Project DR10

WQ = water quality
Source: 2020 Burien Stormwater Master Plan Update

Exhibit 8-6. Burien Stormwater Deficiency Map



Source: 2020 Burien Stormwater Master Plan Update

This element updates key stormwater concepts including the stormwater master plan, low-impact development (LID) and green stormwater infrastructure(GSI) policies and codes, stormwater incorporation, transportation element, general language, and water quality and fish.

- **LID/GSI Policies and Codes: Prioritize** LID/GSI approaches/facility types first before traditional or grey infrastructure types are used. Strategies include:
- Adopt the Puget Sound LID Manual by reference to the City stormwater code.
- Requiring CIP projects to implement LID/GSI with a certain target percentage project flow.
- Cost evaluations for considering LID/GSI BMPs shall include a life cycle cost analysis component.
- Stormwater Incorporation into other plan and code elements:
- Include stormwater facilities as a consideration for street sections or planter strips.
- Incorporate requirements into area specific plans and standards (such as the Urban Center Plan, landscaping codes, etc.).
- **Transportation and Stormwater:** Update City roadway design standards (such as updated/new street sections) to reflect space allocation for and preferred implementation of GSI facilities (landscape buffers and landscape strips).

Floodplain Regulations and Habitat Assessment

Based on a federal biological opinion, the City would need to apply a habitat assessment for development in the 100-year floodplain. The City could document its process with policies and code.

Our Sustainability and Environment Plan

Burien has a multifaceted strategy to promote sustainability and environmental protection and enhancement. The City has adopted the following into the Comprehensive Plan or municipal code:

- **Burien Climate Action Plan:** Some tree related and environmental goals. Adopted in the Comprehensive Plan.
- **Critical Areas Regulations:** Through Chapter 19.40 BMC, the City regulates critical areas to protect them with avoidance of impacts, buffers, plantings, and others. The regulations are reviewed for consistency with Best Available Science with periodic updates of the Comprehensive Plan.
- **Green Burien Partnership Urban Forest Stewardship Plan:** Contains a canopy cover goal (40% equitably distributed) and more specific objectives for tree and vegetation maintenance. Adopted in the Comprehensive Plan
- **Shoreline Master Program (SMP):** This protects shoreline ecological functions, promotes shoreline public access, and allowance for preferred uses. The SMP is considered an element of

a comprehensive plan and regulations are part of the City's development regulations. See Chapter 20 BMC which contains goals and policies that are incorporated by reference as an element of the Comprehensive Plan.

- **Surface Water Manuals:** Stormwater is regulated through 13.10 BMC and surface water manuals.

Goals and Policies

Goal 8.1 Preserve and enhance critical areas in order to protect public health, safety, and welfare, and to maintain the integrity of the natural environment.

Policy 8.1-1 Use Burien's Critical Areas Map as a reference for identifying critical areas. Other unmapped critical areas do exist throughout the city. Any site containing critical areas are subject to the special development regulations and conditions found in the City's Critical Areas Ordinance.

Policy 8.1-2 Direct development toward areas where their adverse impacts on critical areas can be minimized.

Policy 8.1-3 Avoid impacts to critical areas where feasible, before considering minimizing impacts or providing mitigation.

Policy 8.1-4 Maintain a system of development regulations and a permitting system to prevent the destruction of critial areas. Development regulations should at a minimum address wetland protection, aquifer recharge areas important for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. (Pol. EV 1.4, Amended)

Policy 8.1-5 Require permit review approval before any activity or construction is allowed to occur in, adjacent to, or impact a critical area.

Policy 8.1-6 If no feasible alternative exists, allow a limited amount of development on wetlands and floodplains. Ensure development does not result in a net loss of associated natural functions and values of those systems. In these instances, a broad range of site planning techniques should be explored to minimize impacts on these critical areas.

Policy 8.1-7 Allow clustering of housing units on lots that contain steep slopes and are located adjacent to an urban environment.

Policy 8.1-8 Locate development in a manner that minimizes impacts to natural features. Promote the use of innovative environmentally sensitive development practices, including design, materials, construction, and ongoing maintenance.

Policy 8.1-9 Develop land use regulations to buffer critical areas from the impacts of adjacent land uses.

Policy 8.1-10 Require the use of Best Available Science for protecting critical areas within the community pursuant to the Growth Management Act [RCW 36.70A.172(1)].

Policy 8.1-11 Encourage minimizing the amount of impervious surfaces in new development through the use of appropriate low-impact development techniques and removing paved areas or using retrofit options in existing developments, where applicable, to minimize runoff.

Policy 8.1-12 Integrate information from local watershed planning processes, salmon recovery plans, climate change mitigation and resilience plans, ecosystem recovery plans, and relevant tribal plans to identify important habitats and species of local and tribal importance.

Policy 8.1-13 Explore the opportunities to preserve and enhance the quality of the Miller Creek corridor. The City should develop a strategy that would enhance the habitat quality of the stream corridor for salmonid and other wildlife, and provide for passive enjoyment of the creek through the development of a regional trail system.

Goal 8.2 Maintain and promote a safe and healthy environment and preserve the quality of life in Burien.

Policy 8.2-1 Ensure that uses and development in shoreline areas are compatible with the shoreline environments designated in the Shoreline Master Program. Adherence to these designations will ensure that sensitive habitat, ecological systems, and other shoreline resources are protected.

Policy 8.2-2 Maintain or restore stream banks and stream channels to their natural condition wherever such conditions or opportunities exist.

Policy 8.2-3 Manage or clear Himilayan Blackberry, English Ivy, and other weeds in vegetation understory.

Policy 8.2-4 Ensure the capacity of natural drainage courses are diminished by development or other activities.

Policy 8.2-5 Consider the impacts of new development on water quality as part of its environmental review process and require, where appropriate, low impact design, and any other mitigation measures.

Policy 8.2-6 Consider the impacts of new development on air quality as part of the SEPA environmental review process and require mitigating measures as may be appropriate.

Policy 8.2-7 Consider the impacts of new development on the quality of land, wildlife, and vegetative resources as part of its environmental review process and require any

appropriate mitigating measures. Such mitigation may involve the retention of significant habitats.

Policy 8.2-8 Identify existing and potential wildlife habitat corridors and work to enhance their ecological function and connectivity to other habitat areas.

Policy 8.2-9 Encourage an increase in quantity and quality of tree canopies through the addition and the preservation of existing vegetation and use of landscaping as an integral part of development plans.

Policy 8.2-10 Promote incentives and standards to preserve trees of historical significance.

Policy 8.2-11 Require storage and disposal of any hazardous material in strict compliance with applicable city, state, and federal law.

Policy 8.2-12 Consider the impacts of new development on the risk of hazardous materials as a part of the environmental review process and require any appropriate mitigating measures.

Policy 8.2-13 Educate the public on water quality issues and impacts of stormwater flow. Make educational materials available in the most commonly spoken languages in Burien.

Policy 8.2-14 Educate individuals and households about different ways to reduce pollution. Make educational materials available in the most commonly spoken languages in Burien.

Policy 8.2-15 Support efforts to create and improve urban habitat areas. Habitat creation and enhancement efforts include backyards and/or other forms of urban habitat areas.

Goal 8.3 Promote soil stability to protect against the loss of both public and private property in areas with steep slopes.

Policy 8.3-1 As slope increases, development intensity, site coverage, and vegetation removal should decrease and thereby minimize the potential for drainage problems, soil erosion, siltation, and landslides. Slopes of 40 percent or greater should be retained with relatively intact native vegetation, free of structures and other land surface modifications.

1. Single family homes and detached single-family garages on existing legally established lots are exempted from this restriction, provided that:

    a. The application of this restriction would deny any appropriate use of this property;

    b. There is no other appropriate economic use with less impact;

    c. The proposed development does not pose a threat to public health, safety, or welfare on or off the development site;

    d. Any alterations permitted to the critical area shall be the minimum necessary to allow for economic use of the property;

e. An analysis of soils, footings and foundations, and drainage is to be prepared by qualified professionals, certifying that the proposed activity is safe and will not adversely affect the steep slope hazard area or buffer;

f. There are adequate plans, as determined by the City, for stormwater and vegetation management.

2. Short plats or other divisions of an existing legal lot shall only be approved if all resulting lots are buildable under this restriction.

3. It is the applicant's responsibility to show that these provisions are met through a mechanism, such as, or similar to, the SEPA process.

Policy 8.3-2 Prohibit development on areas prone to erosion and landslide hazards. Further, the City should restrict development on potentially unstable land to ensure public safety and conformity with existing natural constraints, unless the risks and adverse impacts associated with such development can be appropriately mitigated.

Policy 8.3-3 Require development proposals to include non-structural measures to stabilize soils, hillsides, bluffs, and ravine sidewalls and to promote wildlife habitat by retaining or restoring native vegetation.

Policy 8.3-4 Design land uses on steep slopes to prevent property damage and environmental degradation, and to enhance open space and wildlife habitat.

Policy 8.3-5 Where there is a high probability of erosion, ensure grading is kept to a minimum and disturbed vegetation is restored as soon as feasible. In all cases, require appropriate site design and construction measures to control erosion and sedimentation.

Policy 8.3-6 Encourage voluntary enhancement in steep slope and landslide hazard areas where feasible.

Goal 8.4 Conserve fish and wildlife resources and maintain biodiversity.

Policy 8.4-1 Maintain and enhance existing species and habitat diversity including fish and wildlife habitat that supports the greatest diversity of native species.

Policy 8.4-2 Locate, design, construct, and manage all development activity to avoid disturbance of adverse impacts to fish and wildlife resources, including spawning, nesting, rearing and habitat areas and migratory routes.

Policy 8.4-3 Protect, conserve, and enhance fish and wildlife habitat, including:

a. Habitats for species which have been identified as endangered, threatened, or sensitive by the state or federal government.

b. Washington Department of Fish and Wildlife Priority Habitats and Species list and mapping resources.

c. Shellfish areas

d. Kelp and eel-grass beds

e. Herring and smelt spawning areas.

f. Wildlife habitat networks designated by the City

Policy 8.4-4 Maintain fish and wildlife through conservation and enhancement of terrestrial, air and aquatic habitats.

Policy 8.4-5 Ensure the City is an active steward of public lands and should integrate restoration and enhancement of fish and wildlife habitats into capital improvement projects whenever feasible.

Policy 8.4-6 Coordinate with adjacent jurisdictions and state, federal, and tribal governments during land use review to identify and protect habitat networks that are adjacent to jurisdictional boundaries.

Policy 8.4-7 Ensure that habitat networks throughout Burien are designated and mapped. The network should be of sufficient width to protect habitat and dispersal zones for small mammals, amphibians, reptiles, and birds. These networks should be protected through incentives, regulations, and other appropriate mechanisms. Site planning should be coordinated during development review to ensure that connections are made or maintained amongst segments of the network.

Policy 8.4-8 Integrate native plant communities and wildlife habitats with other land uses where possible. Development shall protect wildlife habitat through site design and landscaping. Landscaping, screening, or vegetated buffers required during development review shall retain, salvage, or re-establish native vegetation whenever feasible. Development within or adjacent to wildlife habitat networks shall incorporate design techniques that protect and enhance wildlife habitat values.

Policy 8.4-9 Protect salmonid habitats by ensuring that land use and facility plans (transportation, water, sewer, power, gas) include riparian habitat conservation measures developed by the City, affected tribes, and/or state and federal agencies. Development within basins that contain fish enhancement facilities must consider impacts to those facilities. Prioritize fish passage improvements.

Policy 8.4-10 Protect fish and wildlife habitat conservation areas within Burien from exterior noise levels that exceed 55 dBA Ldn to the extent allowed by federal and state law.

Policy 8.4-11 Promote voluntary wildlife enhancement projects that buffer and expand existing wildlife habitat through educational and incentive programs for individuals and businesses. Information regarding these programs will be made available in the most commonly spoken languages in Burien.

Policy 8.4-12 Whenever possible, replace culverts with bridges wide enough to permit movement of terrestrial wildlife species to restore habitat connectivity.

Goal 8.5 Protect, improve, and sustain groundwater quality and quantity through sound and innovative environmental management.

Policy 8.5-1 Identify critical aquifer recharge areas in accordance with best available science and available maps.

Policy 8.5-2 Protect the quality and quantity of groundwater by:

(1) Developing a process by which the City will review, and implement, as appropriate, Wellhead Protection Programs in conjunction with adjacent jurisdictions and ground water purveyors, and adopting best management practices for new development. The goals of those practices should be to promote aquifer recharge quality and quantity; and

(2) Refining regulations as appropriate to protect critical aquifer recharge areas based on information derived through the preparation of Groundwater Management Plans and Wellhead Protection Programs.

Policy 8.5-3 Provide incentives for and promote groundwater recharge by allowing and encouraging the use of low-impact development techniques that infiltrate runoff where site conditions permit.

Policy 8.5-4 Protect groundwater sources from contamination by requiring pollution source controls and stormwater pretreatment.

Policy 8.5-5 Ensure Comprehensive Plan land use decisions consider impacts to quantity and quality of groundwater supply.

Policy 8.5-6 When considering new or modified groundwater policies evaluate costs of implementation.

Goal 8.6 Protect and enhance the functions and values of wetlands.

Policy 8.6-1 Protect the wetlands with an objective of no overall net-loss of functions and values.

Policy 8.6-2 Ensure all wetland functions are considered in evaluating wetland mitigation proposals, including fish and wildlife habitat, flood storage, water quality, recreation, educational opportunities, and aesthetics.

Policy 8.6-3 Protect wetlands by maximizing infiltration opportunities and promoting the conservation or restoration of forest cover and native vegetation.

Policy 8.6-4 Ensure mitigation for any adverse impacts on wetlands is provided in the same basin within which the impacts occur.

Goal 8.7 Promote tree canopy enhancement and protection on public and private lands.

Policy 8.7-1 Develop and periodically update a street tree guide for selecting appropriate tree species for landscaped and median strips, sidewalks, and other landscaped right-of-way areas. The street tree guide shall be updated based on best management practices and climate resilient tree species.

Policy 8.7-2 As an integral part of street construction or reconstruction, encourage the establishment of planting strips with adequate [width] soil volume for appropriate types of vegetation and street trees. Planting strips shall have adequate soil volume to support healthy and resilient trees while mitigating infrastructure conflicts using elements such as larger planters, structural soil cells, bump-out planters, planters with shared soil volume between trees, raised sidewalks, and other best management practices.

Policy 8.7-3 Incorporate street design guidelines elements in roadway design consistent with the Pedestrian and Bicycle Facilities Plan. These elements include collector lanes, wider sidewalks, separated sidewalks, planting strips, benches, curb line trees and pedestrian oriented streetlights.

Policy 8.7-4 Develop 1st Avenue South between 128th Avenue SW and approximately SW 164th Pl. as a boulevard by:

(1) Incorporating street trees, sidewalks, planting strips, and a planted median strip;

(2) Requiring the undergrounding of utilities where feasible in new development, when street improvements are made, or whenever opportunities arise; and

(3) Minimizing the number of access points to 1st Avenue South from adjacent uses by encouraging shared parking and driveways, where appropriate.

Policy 8.7-5 Work with the Washington State Department of Transportation (WSDOT) to encourage the use of native, drought tolerant plants, shrubs, and trees along the length of State Routes 509 and 518 corridors located within the City.

Policy 8.7-6 Replace all trees previously removed from the public right-of-way on a suitable public property site, and work towards increasing the number of healthy trees in the public right-of-way.

Policy 8.7-7 Monitor and maintain street trees in order to strengthen urban forest resilience.

Policy 8.7-8 Increase street tree diversity to increase urban forest resilience, striving for no more than 10 percent of an individual tree species, 20 percent of a genus, or 30 percent of a tree family.

Tree species diversity helps mitigate the impacts of pests and pathogens that can wipe out large portions of the urban canopy, such as Dutch elm disease. Increased tree diversity also increases the likelihood of planting trees that will do well in a rapidly changing climate.

Policy 8.7-9 Create and maintain a tree inventory that identifies tree location, species, size, and condition of trees in the improved public right-of-way.

Policy 8.7-10 Ensure all tree placement follows the "right tree for the right place" principles to ensure that the tree has adequate resources (e.g., water, soil, sun) while mitigating or avoiding conflicts with above- and below-ground infrastructure.

Policy 8.7-11 Use nature-based solutions, such as planting and maintaining trees, to mitigate and adapt to the impacts of climate change.

Policy 8.7-12 Strive to divert urban wood from the landfill, chipper, and firewood wherever possible and repurpose the wood for things such as furniture to sequester carbon.

Policy 8.7-13 Implement the recommendations included in the Green Burien Partnership Urban Forest Stewardship Plan.

Goal 8.8 Manage stormwater runoff in such a manner as to:

(1) protect steep slopes, streams, wetlands and shorelines from erosion and sedimentation to avoid the degradation of environmental quality, wildlife habitat, and natural system aesthetics;

(2) preserve, protect, and restore natural habitat critical for the conservation of salmonid species listed under the federal ESA;

(3) protect the quality of surface water and groundwater;

(4) provide recharge of groundwater where appropriate; and

(5) ensure natural control mechanisms are preferred, where appropriate.

Managing Stormwater (General)

Policy 8.8-2 Adopt a detailed Storm Drainage Master Plan as a system plan supporting the Comprehensive Plan in order to implement these stormwater policies based on this comprehensive plan. This plan shall:

(1) Provide a plan of drainage improvements and regulatory actions that will reduce or eliminate local erosion, landslide and flooding problems in Burien, thereby protecting existing and future development and property values;

(2) Provide protection from erosion, landslides and flooding in the Puget Sound basins where perennial and seasonal streams exist, and also protect these streams from the impacts of urban runoff;

(3) Provide for the long-term protection and restoration of Miller Creek Basin as a viable fish habitat and a natural amenity for the urban area. Require higher detention and

water quality standards for development within this basin because it supports a federally listed species.

(4) Provide long-term protection and restoration of Salmon Creek Basin, as a viable fish habitat and a natural amenity for the urban area. Require higher detention and water quality standards for development within this basin because it supports a federally listed species.

(5) Encourage developers to incorporate into site planning various environmentally sensitive approaches to stormwater management, including low-impact development techniques, and preservation and restoration of natural landforms.

Policy 8.8-3 Encourage regional approaches to managing stormwater to provide improved performance, maintenance and cost efficiency. Land should be acquired that is adequate for the development of regional detention and water quality facilities.

Policy 8.8-4 Wherever possible, consider stormwater facilities as a multi- functional community resource which provides other public benefits such as recreational, habitat, cultural, educational, open space and aesthetic opportunities. These facilities should be equitably distributed throughout Burien.

Policy 8.8-5 Allow stormwater retention/detention facilities to be used as partial fulfillment of open space requirements, where the facility provides significant recreation and open space amenities. In determining the degree to which this is allowed, consideration shall be given to the nature of the development. Where the development is non-residential, a greater percentage may be allowed for fulfillment. Commercial development shall make retention/detention facilities part of a more extensive landscaping. These facilities should be designed as an amenity, particularly in commercial developments, and to ensure the safety of its users.

Policy 8.8-6 Take a watershed approach to surface water management, with responsibility shared among the City and other contributing jurisdictions. This approach should emphasize:

(1) Prevention of water quality degradation through implementation of Best Management Practices and educational programs to reduce pollution entering surface waters;

(2) Reduction of volumes and duration of urban flows to prevent flooding and erosion;

(3) Cost sharing;

(4) Consistency with the City's risk management practices; and

(5) Maintenance and restoration of stream habitat for habitat preservation and enhancement.

(6) Coordinated, knowledge based management decisions.

Protecting Natural Drainage Systems

Policy 8.8-7 Require development to be designed and constructed to minimize disruption and/or degradation of natural drainage systems and the habitat they provide, both during and after construction. Development design that minimizes impervious surfaces through the use of appropriate low-impact development techniques, such as by limiting site coverage and maximizing the exposure of natural surfaces for the infiltration of water shall be required.

Policy 8.8-8 Require stormwater to be detained and infiltrated on-site where possible. If on-site detention and infiltration is not possible, stormwater shall be detained so that the release rate is equal to or less than predevelopment or natural conditions. Any release must be to an approved drainage system, either natural or constructed, as approved by the City.

Policy 8.8-9 As part of the City's review process, consider the impacts of stormwater runoff from new development on the City's natural drainage systems and require any appropriate mitigating measures. When redevelopment occurs, and the amount of impervious surface increases, the City shall require existing development to be retrofitted with stormwater management facilities. Criteria for implementing this policy should also be developed using a threshold approach patterned after SEPA requirements.

Policy 8.8-10 Require development to provide off-site improvements necessary to avoid adverse downstream impacts.

Protecting Water Quality

Policy 8.8-11 In the interest of the residents of Burien, the Puget Sound area and adjoining communities, protect the quality of surface water bodies that are located within drainage basins of the City.

Policy 8.8-12 Encourage all City residents and require businesses to implement Best Management Practices to prevent erosion and sedimentation from cccurring, and to prevent pollutants from entering ground or surface waters to maintain natural aquatic communities and beneficial uses.

Policy 8.8-13 Establish enforcement mechanisms that may be used to prevent or stop contamination to surface water quality, as well as to implement all City stormwater policies. Enforcement mechanisms should address surface water contamination, including surface water flows. Through intergovernmental coordination, the City will seek similar enforcement mechanisms for all waters through or into the City from up to five miles from its corporate limit.

Discussion: The City currently does not have an adopted water quality ordinance.

Policy 8.8-14 Incorporate facilities such as detention ponds, bioswales, wetlands, and other natural drainage facilities to improve the water quality of surface water runoff from existing and new roadway improvements.

Providing Groundwater Recharge

Policy 8.8-15 Where infiltration will not adversely affect down gradient properties, prefer infiltration of stormwater over surface discharge to a natural stream system. The return of precipitation to the soil at natural rates near where it falls should be encouraged through the use of infiltration mechanisms, including but not limited to, well-designed open drainage systems, infiltration ponds, detention ponds and grass lined swales.

Policy 8.8-16 Use Geographic Information Systems (GIS) and other analysis tools to assist in determining appropriate locations for implementation of low impact development techniques that are complementary to their respective geographic context. The resulting analysis (document/map) should be made available to the public to increase education and awareness of best storm water management practices.

Goal 8.9 Ensure that standards used for the design and development of stormwater drainage systems reflect and support the character of adjacent development and the stormwater, land use, and environmental protection goals of the City.

Policy 8.9-1 Require that appropriate stormwater management practices be employed to prevent stormwater problems from urban runoff, which may include flooding, erosion, or stream channel scouring in natural drainage systems. These practices at a minimum should include the collection, control and treatment of storm water runoff at a rate and quantity that will prevent damage to both manmade and natural drainage systems. One or a combination of the following three approaches can be used to managed excessive storm water runoff:

(1) Collect, control, and treat stormwater runoff to a level that will prevent damage to the natural drainage system and restore the ability of the natural drainage system to function as a productive biosystem; and/or

(2) Remove excessive stormwater runoff from the natural drainage system by artificial means such as bypass systems in accordance with SEPA or other adopted plans, regulations or regional programs.

(3) Repair/retrofit private storm drainage lines that route City stormwater to prevent damage to both manmade and natural drainage systems.

Policy 8.9-2 Use the following guidelines to develop stormwater quantity and quality standards within the City:

(1) Residential Medium, Residential Low: The City shall require new development, as well as redevelopment projects involving external construction that may have drainage

implications, to comply with full urban stormwater drainage standards. Seek to implement stormwater management, including low-impact development standards, which require all development proposals to establish systems, preferably natural, for filtering the "first flush" (delivery of disproportionately large amounts of pollutants which occur during the early stages of the storm) of urban runoff near its source. The standards should also address maximum impervious lot coverage. Where appropriate, the Director of Public Works may modify these standards but only to the extent that runoff quantity and quality levels are maintained.

(2) Commercial, Commercial Mixed Use, and Industrial Areas: The City shall require new development, as well as redevelopment projects involving external construction that may have drainage implications, to comply with full urban stormwater drainage standards, as described above.

(3) Residential Low: The City shall allow low- impact development techniques that are appropriately designed to match the character of adjacent land uses, such as allowing well designed, open drainage systems which increase the amount of infiltration of rainfall as it occurs, as opposed to gutters and pipes which do not provide infiltration. (Facilities on arterials in these areas may require full urban stormwater drainage standards.)

(4) Residential Low located in landslide hazard areas, on steep slopes, or in erosion hazard areas (as defined in the City's Critical Areas Ordinance), or in areas with existing or potential drainage problems: The City shall require new development, as well as redevelopment projects involving external construction that may have adverse impacts on the stormwater drainage system, to comply with stormwater drainage standards that include on-site drainage controls. (Facilities on arterials in these areas may require full urban stormwater drainage standards.)

Policy 8.9-3 Develop and adopt regulations to supplement the adopted King County Surface Water Design Manual to ensure that any clearing, grading or the addition of impervious area in steep slopes or landslide hazard areas (or projects that drain or discharge into such areas) be reviewed for drainage implications and regulated accordingly.

Policy 8.9-4 Address rate of discharge, water quality, method and point of discharge, and method of storm drainage control in design and construction standards for development.

Policy 8.9-5 Require the use of temporary erosion and sedimentation control measures that minimize the transport of sediment to drainage facilities, water resources, and adjacent properties in design and construction standards for development.

Policy 8.9-6 Require stormwater conveyance systems for proposed projects be analyzed, designed and constructed to accommodate stormwater runoff originating off-site that are conveyed onto the project site, as well as runoff from the project itself. Encourage the use of semi-pervious or pervious surfaces, and other low-impact development techniques to ensure that stormwater discharge from the site occurs at the natural location.

Policy 8.9-7 Enact ordinances and review development and redevelopment proposals in a manner which controls the duration and discharge of storm water from new development. At a minimum, peak discharge shall not exceed the rate of the predevelopment or natural conditions.

Policy 8.9-8 Require maintenance of all drainage facilities constructed or modified by a proposed project be the responsibility of the property owner. The City of Burien may assume maintenance of all approved drainage facilities constructed for formal plat subdivisions, planned unit developments, and short plat subdivisions two years after construction approval and upon assurance that they are in working order.

Policy 8.9-9 Do not convert any pervious residential driveways to impervious surfaces following completion of a stormwater improvement or capital improvement project unless the residential driveway was impervious prior to the commencement of the project.

Policy 8.9-10 Increase the overall coverage of tree canopies and other vegetation in the City by encouraging new site development and retrofit plans to include provisions for the addition or preservation of trees and vegetation.

Policy 8.9-11 Implement public educational programs encouraging homeowners to use development modifications to reduce stormwater impacts. The program should distribute materials to the community or conduct outreach activities about the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff.

Policy 8.9-12 Involve the public in creating, implementing, and updating the storm/surface water management program. Municipalities should make efforts to reach out and engage all economic and ethnic groups.

Policy 8.9-13 Enforce a program to detect and eliminate illicit discharges into the city's stormwater system, including illegal dumping to the system.

Policy 8.9-14 Develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

Goal 8.10 Minimize the risk to property and residents from flooding hazards.

Policy 8.10-1 Allow flood prone properties outside of the floodway to be developed provided that such development can meet the standards set forth in the federal flood insurance program.

Discussion: The general location of areas within the 100-year floodplain is depicted on the City's critical areas map.

Policy 8.10-2 Require site plan review under SEPA for all development in the flood plain, including single family development, short plats and redevelopment. Appropriate mitigating measures shall be required whenever needed to reduce potential hazards.

Policy 8.10-3 Prohibit any development within the floodway, which would reduce the capacity of the floodway or create risks to property.

Implementation

Following in Exhibit 8-7 are measurable outcomes to support implementation and ongoing monitoring of this element.

Exhibit 8-7. Outcomes and Metrics: Sustainability and Natural Environment Element

Outcomes	Metrics
▶ Increase tree canopy and dense vegetation to promote clean air, water quality, habitat, and reduce greenhouse gas emissions	▶ Implement canopy cover goal (40%), and other goals per Green Burien Partnership Urban Forest Stewardship
▶ Healthy or improved ecosystems.	▶ Acres of habitat conservation and enhancement particularly improving climate resilience.
▶ Development is increasingly resilient to hazards (sea level rise, flood plains, extreme heat).	▶ Development retrofitted and managed retreat.