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What is Green Infrastructure?



What is Green Infrastructure ?

Infrastructure is defined as “the substructure or underlying foundation, especially the basic installations and facilities on which the continuance and growth of a community depends”. *Green infrastructure* can be defined as:

A community or region's natural life support system – an interconnected network of land and water that maintains natural ecological processes, sustains air and water resources, supports native species, and contributes to the health and quality of life for individuals and the larger community.

In the City of Shoreline, green infrastructure can be thought of as:

A network of parks, natural vistas, shorelines, civic spaces, sidewalks, trails, shorelines, creeks, natural drainage features and urban forests that connect neighborhoods, individuals, landscapes, flora and fauna to one another.

Green infrastructure can also include elements such as:

- Native landscaping,
- Sustainable transportation systems,
- Low impact development,
- Constructed natural drainage systems,
- Restored wetlands and streams,
- Managed urban forests, and
- Other attempts to enhance and mimic nature for the benefit of both humans and the larger ecology.

The Healthy Systems Approach

By identifying and mapping components of our physical environment we can identify gaps in the green infrastructure system and opportunities to improve it. By improving these elements as a system, rather than as separate urban amenities or natural resources, we can make the benefits of the sum much greater than the individual parts.

Why should Green Infrastructure be a component of our sustainability strategy ?

- Humans are part of the environment and viable ecosystems serve as the foundation for society by providing the natural resources we need to support our human systems and built environment.
- *Green Infrastructure* helps us enhance, not destroy, the natural processes we rely on for our very existence.
- *Green infrastructure* seeks to integrate functioning ecosystems with the built environment and to mimic natural systems and leverage their benefits, flexibility, and resiliency to improve both ecological and human conditions.
- *Green infrastructure* proponents seek to protect natural systems from the adverse impacts of urban development, develop more sustainable urban transportation systems, and to “design with nature” by planning land use and infrastructure based on land suitability.

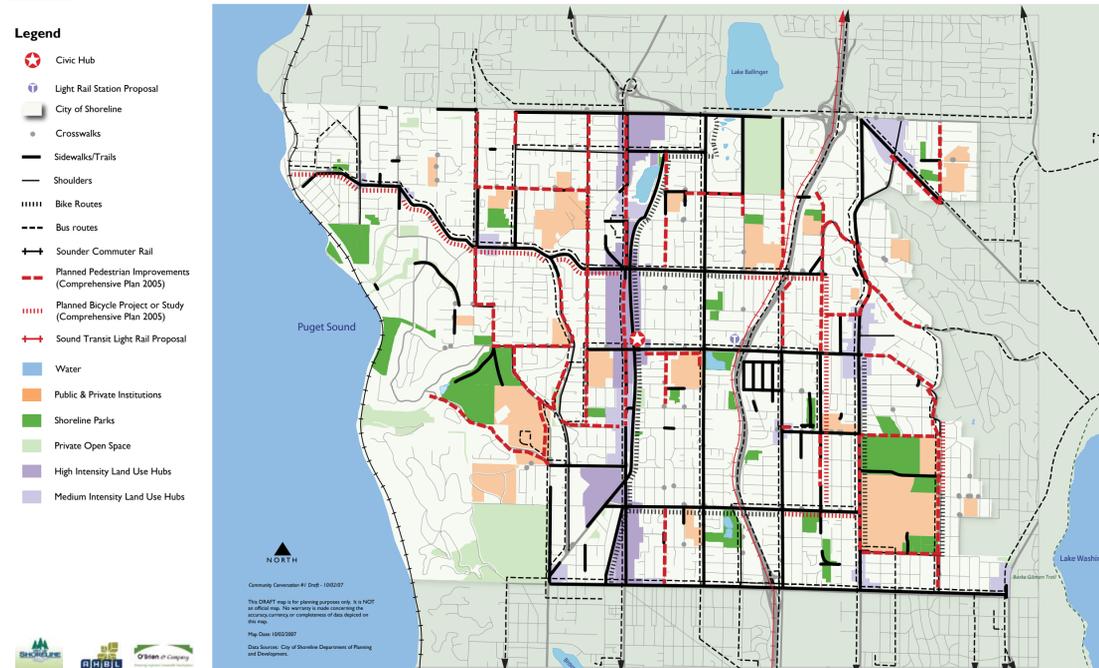
What future goals related to Green Infrastructure should we consider?

- Initiate one or more green infrastructure opportunities identified through this project: e.g. the City will pursue a Green Street pilot project.
- The *Green Infrastructure* system could be the backbone, framework and example for sustainable development in Shoreline.
- Manage public land as an integrated urban ecosystem that provides a wealth of benefits: open space, mobility, recreation, habitat, aesthetic beauty, cleaner stormwater, removal of CO2 and mitigation of the urban heat island effect, just to name a few.
- Private property and development that employs sustainable land use development and construction principles could provide still greater environmental benefits.
- Enhancement of the City's *Green Infrastructure* System would allow individuals and the community as a whole to shrink our ecological footprint.

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Community Connections & Ecological Systems

1 Shoreline Sustainability Strategy: DRAFT Community Connections Map



Map 1

Map 1 depicts Community Connections that relate strongly to our Draft sustainability guiding principles and framework goals. These include existing non-motorized facilities and transit which link neighborhoods to areas of higher land use intensity, schools, public and private institutions, and parks and open space. In addition to existing features, Map 1 also shows City planned improvements:

Planned Pedestrian Improvement



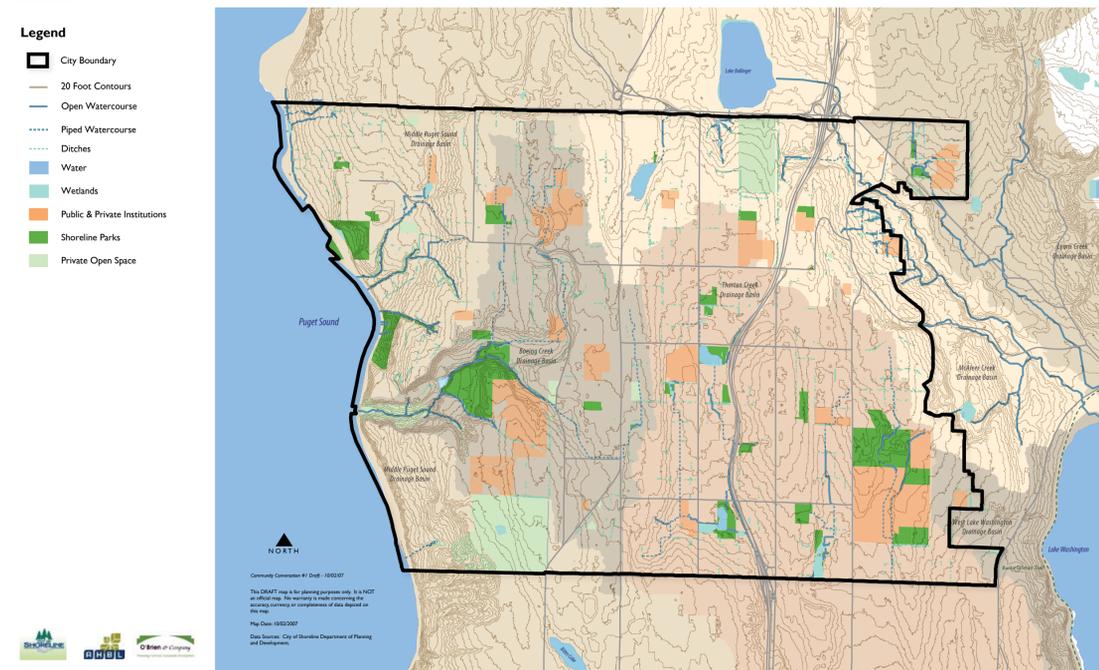
This symbol depicts the specific location where a planned new pedestrian facility improvement will help connect human elements of the community. Examples include sidewalks and off street paths near schools, parks and commercial centers. These were taken from the City's map of priority sidewalk improvements.

Planned Bike Improvement



This symbol depicts additional locations where a new or enhanced bike system improvement would connect key destinations in the community. These locations are identified in the 2005 Comprehensive Plan.

2 Shoreline Sustainability Strategy: DRAFT Ecological Systems Map



Map 2

Map 2 depicts the Ecological Systems, including open space, parks, streams, wetlands, drainage basins, topographic features, shorelines and the connections between them. As the project continues, we will add habitat features, particularly forest areas and conditions, as this information becomes available from the City through its work with Seattle Urban Nature Project. We also intend to add Priority Habitats and Species Data from the Washington Department of Fish and Wildlife so key areas of habitat diversity, quality, concerns and opportunity can be better understood.

Future Green Infrastructure System Map

Shoreline Sustainability Strategy: DRAFT Future Green Infrastructure System Map

Legend

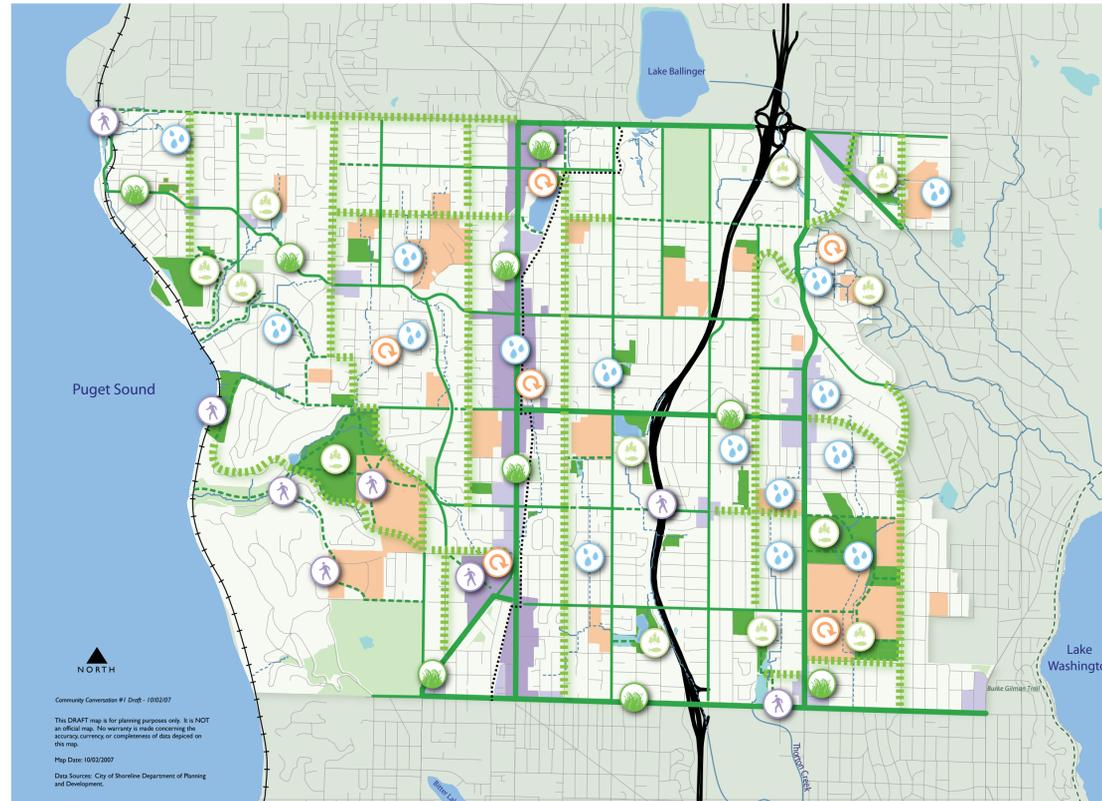
Opportunities

- Natural Landscaping
- Public Access
- Natural Drainage
- Habitat Enhancement
- Low Impact Development & Green Building

- Green Streets
- Complete Streets
- Pedestrian Paths

Current features

- City Boundary
- I-5
- Street
- Interurban Trail
- Railroad
- Open Watercourse
- Piped Watercourse
- Water
- Wetlands
- High Intensity Land Use Hub
- Medium Intensity Land Use Hub
- Public & Private Institutions
- Shoreline Parks
- Private Open Space



Complete Streets

- Emphasis is on traditional non-motorized improvements and landscaping
- Locations, such as N 155th Street, 5th Ave. NE, Meridian Ave. N, and N 185th Street, which currently have sidewalks and landscaping, where goal center on enhancing pedestrian and bike safety and landscaping
- Arterials with limited or no pedestrian and bicycle facilities (such as Dayton Ave. N and 25th Ave., NE) where improvements are planned
- Arterials that currently have substandard sidewalks (such as Richmond Beach Road, N 145th Street, 15th Ave. NE, and N 175th Street), where additional improvements and landscaping are needed
- Other collector & local streets that provide key connections
- Please see Community Connections Map for more info about existing and proposed improvements

Pedestrian Path

- Emphasis in on providing and enhancing footpaths in those areas where vehicular access is not provided or is discontinuous
- Better designation and directional signage on existing paths, including those in Hamlin and Shoreview Parks
- Public access and wayfinding on trails in the Innis Arden and Highlands neighborhoods
- East-west connections thru Fircrest site and North 205th Street alignment



Natural Drainage Connection or Feature

- While applicable citywide, site specific examples include re-establishing and enhancing surface water connections in the upper Thornton Creek, Boeing Creek and McAleer Creek Watersheds through enhanced open channel conveyance systems along City streets.
- Notably, the City's recent and planned improvements along Aurora Ave. include a substantial natural drainage component.



Low Impact Development (LID) and Green Building

- Redevelopment of sensitive areas, such as the north and west sides of Echo Lake and tributary areas of McAleer Creek
- Redevelopment of large properties, such as the Fircrest Campus
- Targeting the upper reaches of basins with known flooding problems
- Future Shoreline City Hall Complex
- State owned facilities, such as school district properties, where state law requires green building
- New private residential construction under the Built Green program



Public Access

- Pedestrian bridge over the railroad and viewing platform to connect the City's Innis Arden Reserve to the shoreline
- Public access and safe pedestrian connection from Richmond Beach Drive NW to shoreline
- Connection from 145th Street into Paramount Open Space
- Formal, legal and controlled public access to the Boeing Creek Reserve
- Pedestrian bridge over I-5 extending from N 165th Street.



Natural Landscaping

- Particularly applicable as a "quick win" in auto oriented commercial centers developed under outdated standards (e.g. Aurora Square), in addition to citywide opportunities
- Key arterials that currently have sidewalk facilities (but no or very limited landscaping), such as 145th Street and 175th Street
- Continued enhancement of the I-5 freeway corridor and City gateways
- Existing and planned improvements to the Aurora Corridor and Interurban Trail



Habitat Enhancement

- Urban forest management in Hamlin Park and other City Parks
- Restoration of high quality wetlands near Storm Creek - Richmond Beach
- Enhancement of wetlands in City owned parks
- Protection and enhancement of McAleer Creek near Lake Forest Park
- Habitat enhancement is also applicable citywide, and enhancement of private yards (e.g. Washington Department of Fish and Wildlife "Backyard Wildlife Sanctuary") is a key opportunity.
- Extensive habitat enhancement has occurred along Boeing Creek and at Paramount Park.



Green Streets

- Green streets combine non-motorized improvements, natural drainage and landscaping in innovative ways and connect parks and neighborhoods
- Arterial collectors and neighborhood collectors, such as Ashworth Ave., 25th Ave. NE and 10th Ave. NE are priority locations for green streets
- Select portions of minor arterials where existing physical characteristics allow room for modified improvements (e.g. Dayton Ave. N)
- Limited portions of local streets that provide important connections
- The City's Transportation Master Plan recognizes that design standards for green streets should vary based on street classification and site
- The use of the public right of way as a tool for promoting sustainability will be a key strategy

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Green Infrastructure Opportunities



Natural Drainage Connection or Feature

While applicable citywide, this icon depicts the general location where the construction or enhancement of natural surface drainage systems would provide water quality and quantity improvements and help restore natural processes. The tool is particularly applicable in areas with open ditches, historic stream channels, and vulnerable drainage basins.



Low Impact Development (LID) and Green Building

While applicable citywide, this symbol depicts locations where LID techniques and standards would protect vulnerable ecological conditions or address ongoing impacts to the environment. It also indicates public properties where Green Building projects could be initiated.



Habitat Enhancement

Locations where important remaining elements of the natural environment should be conserved, restored or otherwise actively managed. Projects include removal of invasive species, planting of native vegetation, stream channel enhancement, wetlands restoration and "backyard" habitat improvements.



Public Access

Locations where public access enhancements, pedestrian connections, open space acquisition or protection of a key viewpoint would reconnect the community to the natural environment. Of particular emphasis is promoting stronger connections to the Puget Sound shoreline, where very limited legal public access is currently provided.



Natural Landscaping

While applicable throughout the City, this icon depicts the location where the addition of native and/or drought tolerant plantings would provide a "quick win" to help enhance community appearance, promote connections to the environment, mitigate the urban heat island effect and generally improve ecological function.



Green Streets

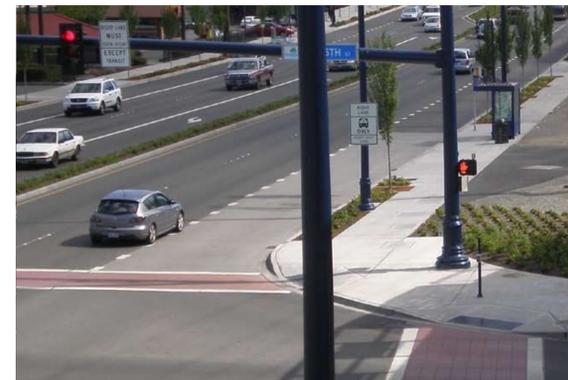
Potential locations where an innovative combination of natural landscaping, surface drainage systems, non-motorized improvements and other amenities would link neighborhoods, parks and natural environments, provide additional recreation amenities, sustainable transportation alternatives and form the core of the green infrastructure system.

Complete Streets

This symbol represents the a potential future network of complete streets. Complete streets are designed and operated to enable safe access for all users, including pedestrians, bikes, motorists, and buses. Arterial and collector streets, particularly near schools, should be high priority locations for street improvements such as sidewalks, landscaping and other amenities, enhanced pedestrian crossings, and bike lanes.

Pedestrian Paths

This symbol represents a potential future network of pedestrian trails and paths. Mapped features include existing paths (where improvements such as better designation and way finding could be made) and potential new paths that would help complement the potential system of complete streets and green streets to form a sustainable transportation network.



Future Green Infrastructure System - Community Conversation Map

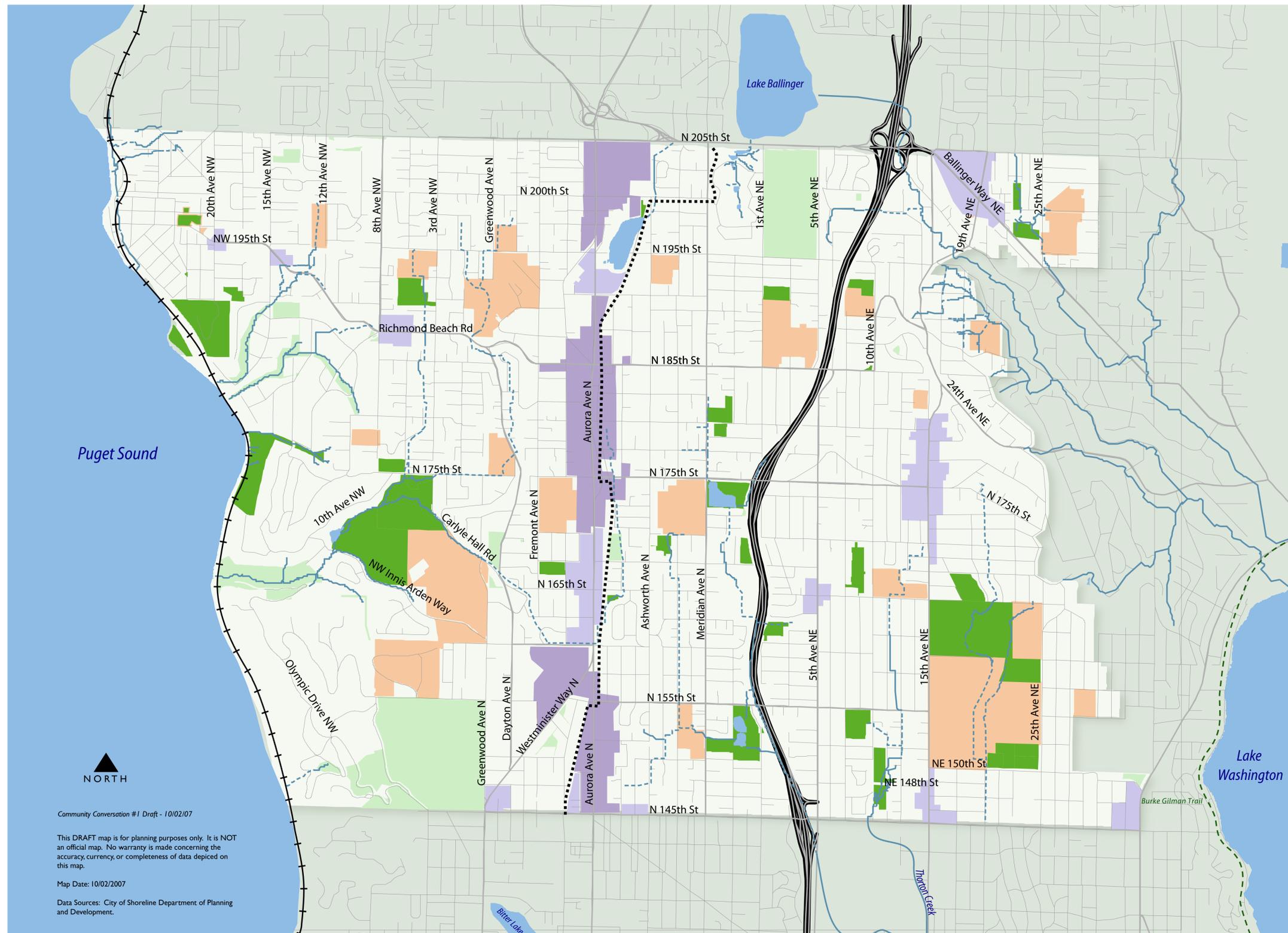
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Community Conversation #1 Draft - 10/02/07

This DRAFT map is for planning purposes only. It is NOT an official map. No warranty is made concerning the accuracy, currency, or completeness of data depicted on this map.

Map Date: 10/02/2007

Data Sources: City of Shoreline Department of Planning and Development.



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Shoreline Sustainability Strategy: Aerial Photo

