Longfellow Natural Drainage Systems / Seattle Public Utilities

Concept Review for the Seattle Design Commission

11/1/2018

Venema Natural Drainage System

BRIEFING OBJECTIVES:

Overview of Natural Drainage Systems Partnership Program in Context

Concept Design for Longfellow Natural Drainage Systems Project

Highland Park Community Center
Depave & Raingarden Project

CONTEXT // Why we lead with green

- Best management practice & in some areas, the only cost effective approach
- Higher value per rate payer dollar
- People-centered

Venema Natural Drainage System

NEARBY NATURE = HUMAN HEALTH*

*Improvements to support a healthy environment for all can exacerbate displacement risk in communities of color and low income communities. This must be addressed with cohesive Citywide strategy.

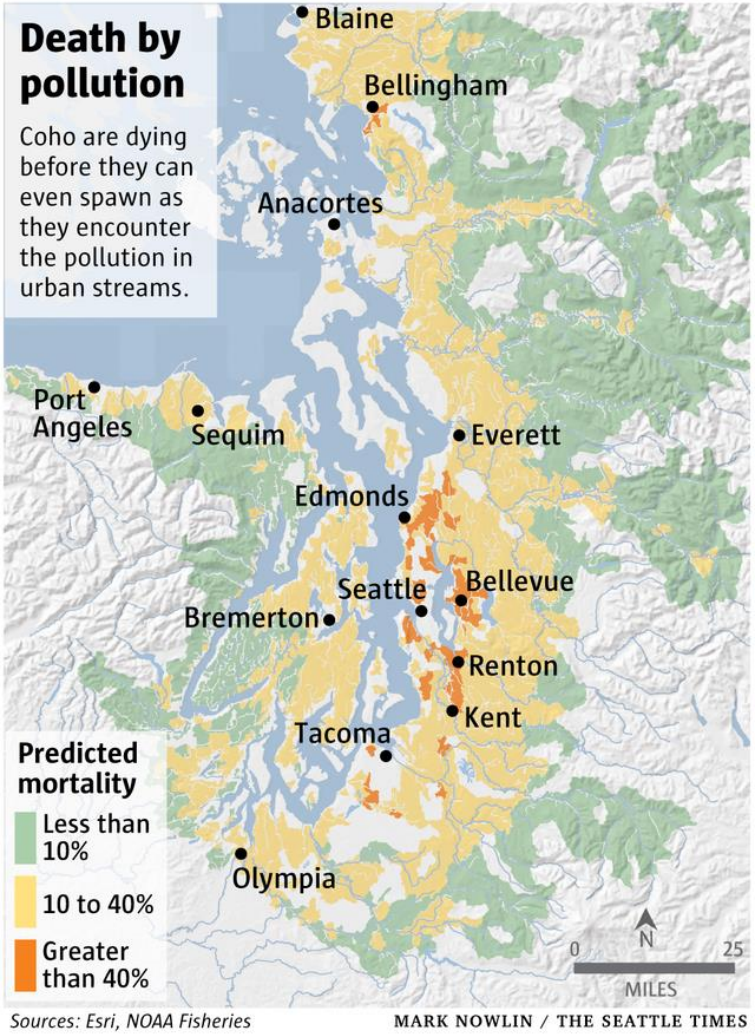
CONTEXT // Stormwater Pollution Is An Urgent Challenge

Environment | Local News | Northwest | Puget Sound

Stormwater pollution in Puget Sound streams killing coho before they can spawn

Originally published October 18, 2017 at 7:00 am | *Updated October 18, 2017 at 12:27 pm*

1 of 2 *Coho salmon, including females full of eggs, are dying before they can spawn in Puget Sound streams polluted with stormwater runoff. (NOAA Fisheries)*



Sources: Esri, NOAA Fisheries MARK NOWLIN / THE SEATTLE TIMES

TOOLS ON PRIVATE LAND

RESIDENTIAL SCALE

COMMERCIAL SCALE

CISTERNS


RainWise cisterns


Greenfire, Ballard

GREEN ROOFS


Garage roof


Gates Foundation

PERVIOUS PAVING


Pervious Driveway


Pervious Parking Lot

RAIN GARDENS/ BIORETENTION


RainWise raingarden

TOOLS ON PUBLIC LAND

total drainage area
129 ACRES


Highpoint

total drainage area:
435 ACRES

multi-benefit use of the right-of-way

primary project purpose:
FLOOD PREVENTION


Madison Valley

primary project purpose:
FLOOD PREVENTION


Meadowbrook Pond

multi-benefit use of parcels

GSI Program Manuals

Seattle Public Utilities | King County Department of Natural Resources and Parks Wastewater Treatment Division

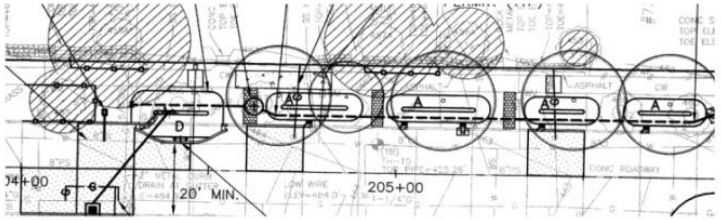
Green Stormwater Infrastructure in Seattle

www.700MillionGallons.org

Working Together to Protect our Waterways

Green Stormwater Infrastructure Manual

Volume III: Design Phase



June 2015

Seattle Public Utilities | King County

Green Stormwater Infrastructure

Working Together to Protect our Waterways

Green Stormwater Infrastructure Project Manual

Volume II: GSI Options Analysis/Problem Definition

2/21/2014

Green Stormwater Infrastructure Program History

2000

Creek protection and salmon recovery

SEA Street; 110th St. Cascade;
Pinehurst and Broadview Green Grids;

HighPoint Redevelopment

2008

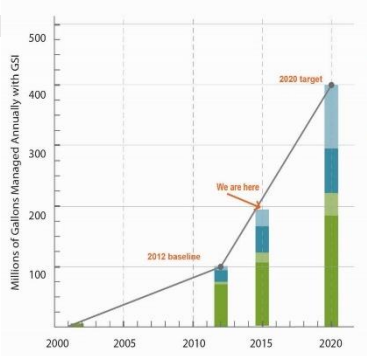
Early CSO compliance and Stormwater Code

RainWise program development

GSI required in Stormwater Code

2013

Citywide policy & code updates and Integrated (CSO/SW) Plan



Citywide commitment and target

$35M Natural Drainage System Partnering Program

2017

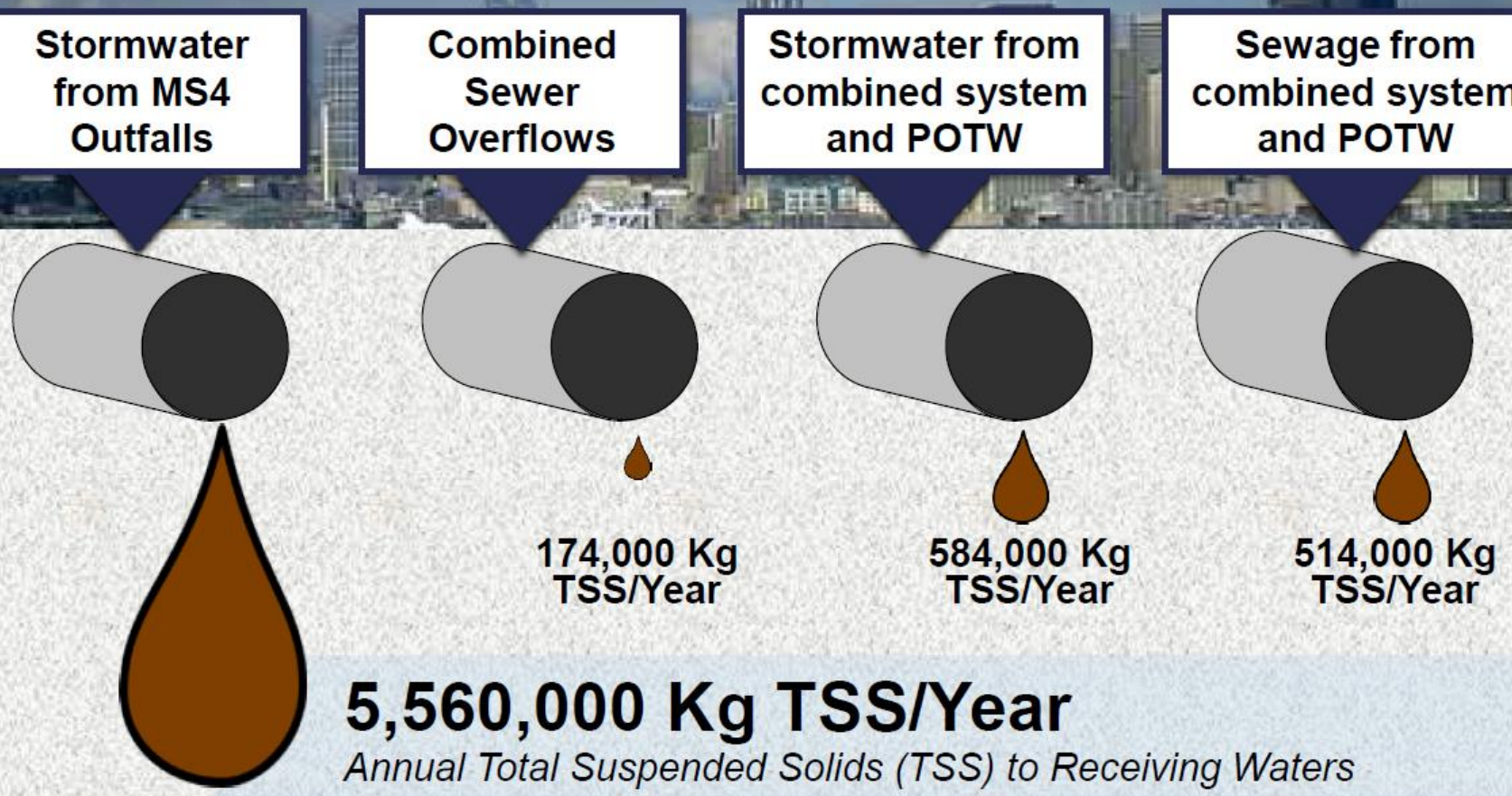
Investments integrated with open space, transportation, and development

$35M Urban Village Program

North Transfer Station; Fremont Building

Examples

Stormwater is major source of pollutant loading to local water bodies



5,560,000 Kg TSS/Year

Annual Total Suspended Solids (TSS) to Receiving Waters

Puget Sound, Duwamish Waterway, Lake Washington, Lake Union, Ship Canal, creeks

INTEGRATED PLAN // STORMWATER PROJECT ALTERNATIVES

- Street Sweeping Arterials – Expansion of existing program
- South Park Water Quality Facility – Stormwater treatments prior to discharge to the Duwamish River
- **NDS Partnering Program – Natural Drainage Systems and community benefits (mobility, traffic calming)**

GOALS // Natural Drainage System Partnering Program

Improve Water Quality

WHAT: Prevent 14,275 TONS of total suspended solids (TSS) and associated pollutants from entering Seattle's three major creek watersheds each year.

HOW: Construct natural drainage systems within city rights-of-way along approximately four miles (66 short blocks) by 2025, treating runoff from 44 acres of effective impervious area (including a minimum of 24 acres from the ROW).

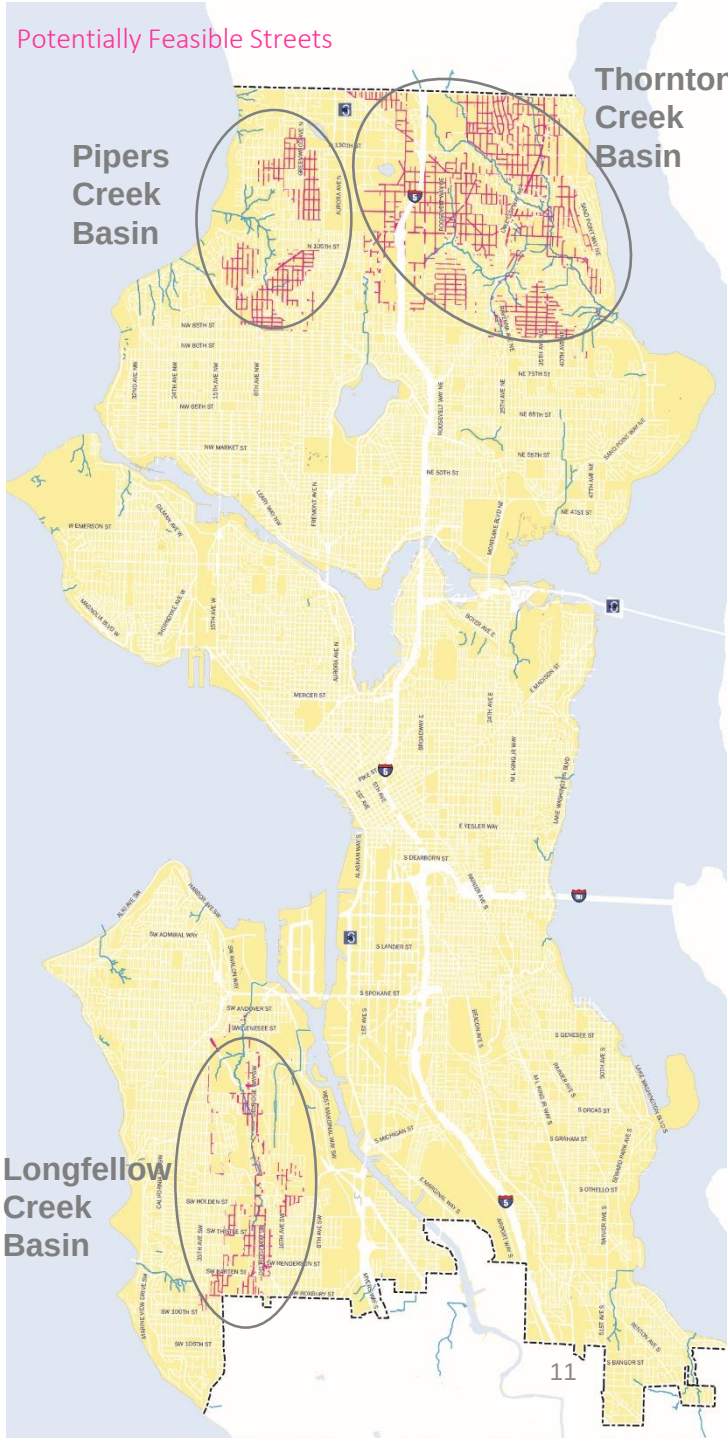
Deliver Community Co-Benefits through Partnerships

WHAT: Street trees; Traffic calming; Improved pedestrian experience/streetscape; Sidewalks

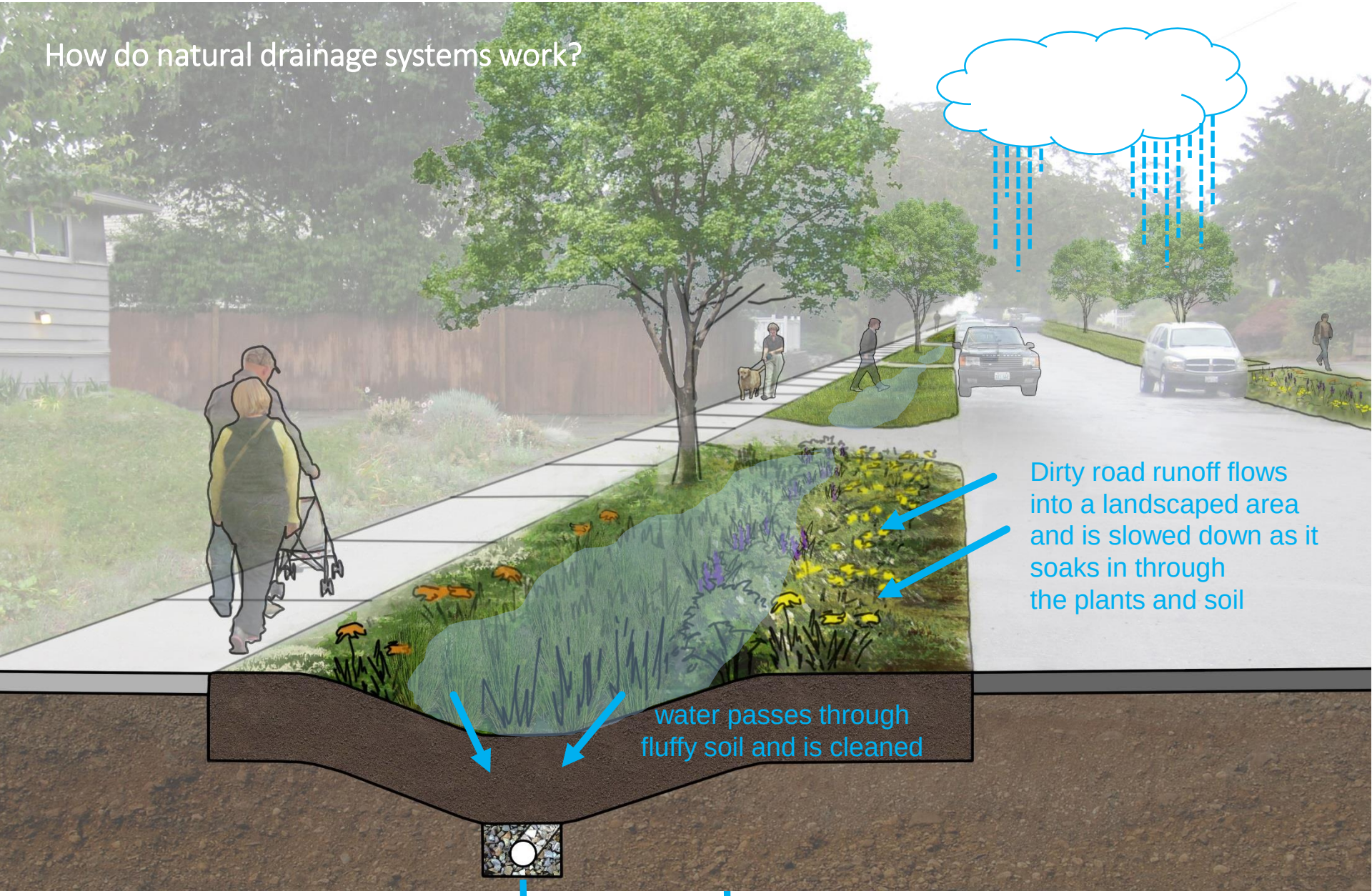
GUIDING PRINCIPLE

Greater Value

Provide better outcomes at lower costs via collaboration with sister agencies, neighborhood residents, and private sector developers.

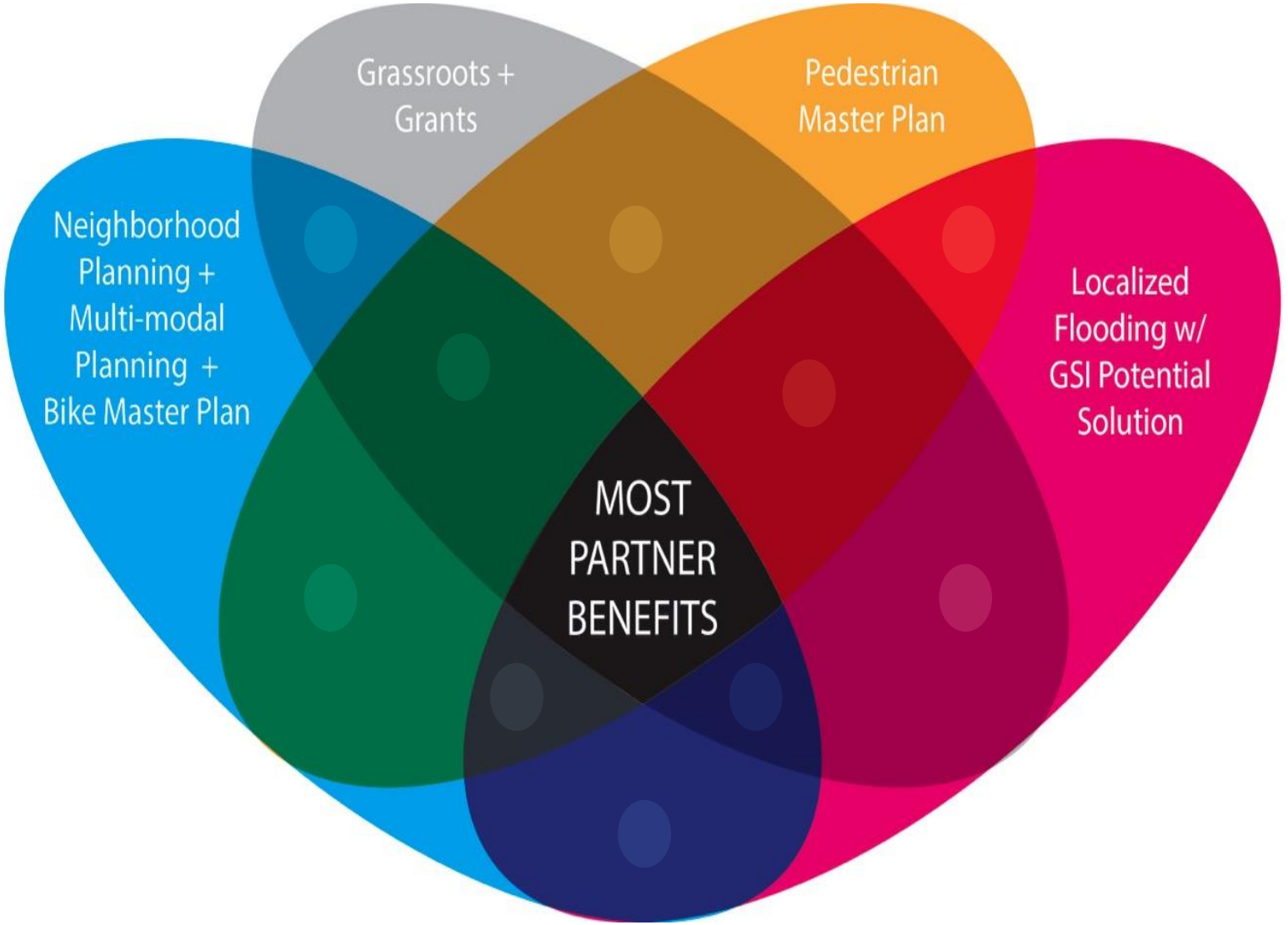


How do natural drainage systems work?



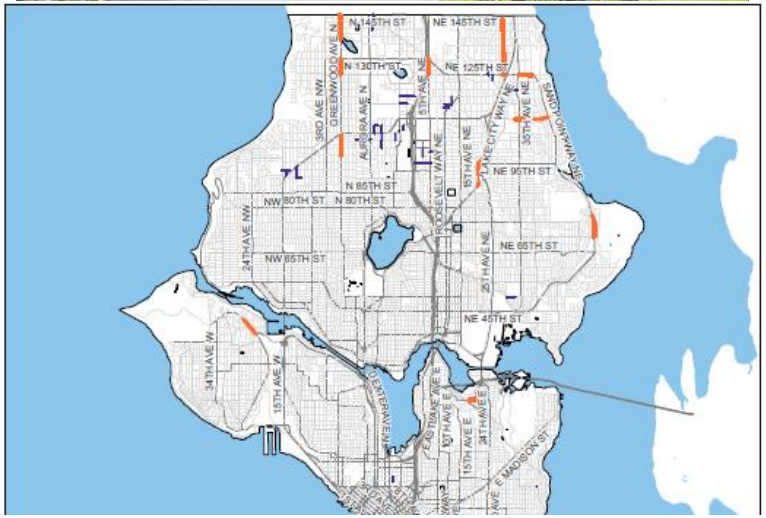
Neighborhood Co-benefits: Water pollution prevention +…

PARTNERING TO STRETCH INVESTMENT DOLLAR



EVALUATED OPPORTUNITIES WITH FLOODING PROGRAM

COORDINATED WITH EXTERNAL PUBLIC PARTNERS - SDOT



Safe Routes to School

Neighborhood Greenways

IDENTIFY OPPORTUNITIES WITH PRIVATE PARTNERS

RCW Barrier – restrictions on giving public funds to private partners made this partnership unattractive or infeasible to partners

WHAT MAKES A BLOCK 'POTENTIALLY TECHNICALLY FEASIBLE'?

There is enough room and it's not too steep

Few Driveways and Wide Planting Strip Area

Wide Shoulder

Flat (<5% Slope)

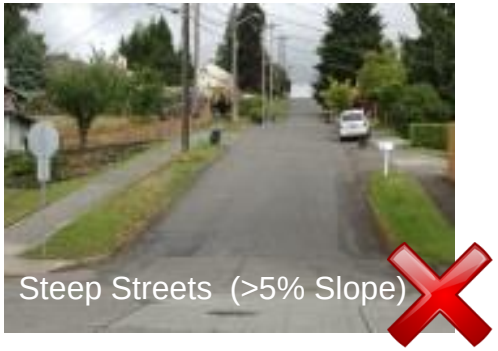
Other opportunities to improve the street

Informal Drainage

Few Street Trees

WHAT DISQUALIFIES A BLOCK, TECHNICALLY?

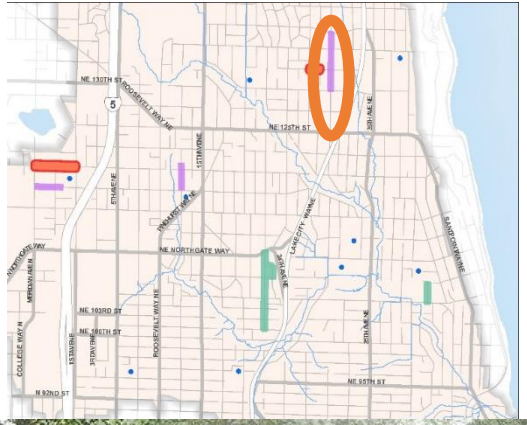
It is not safe to infiltrate the water



Other factors that can limit space

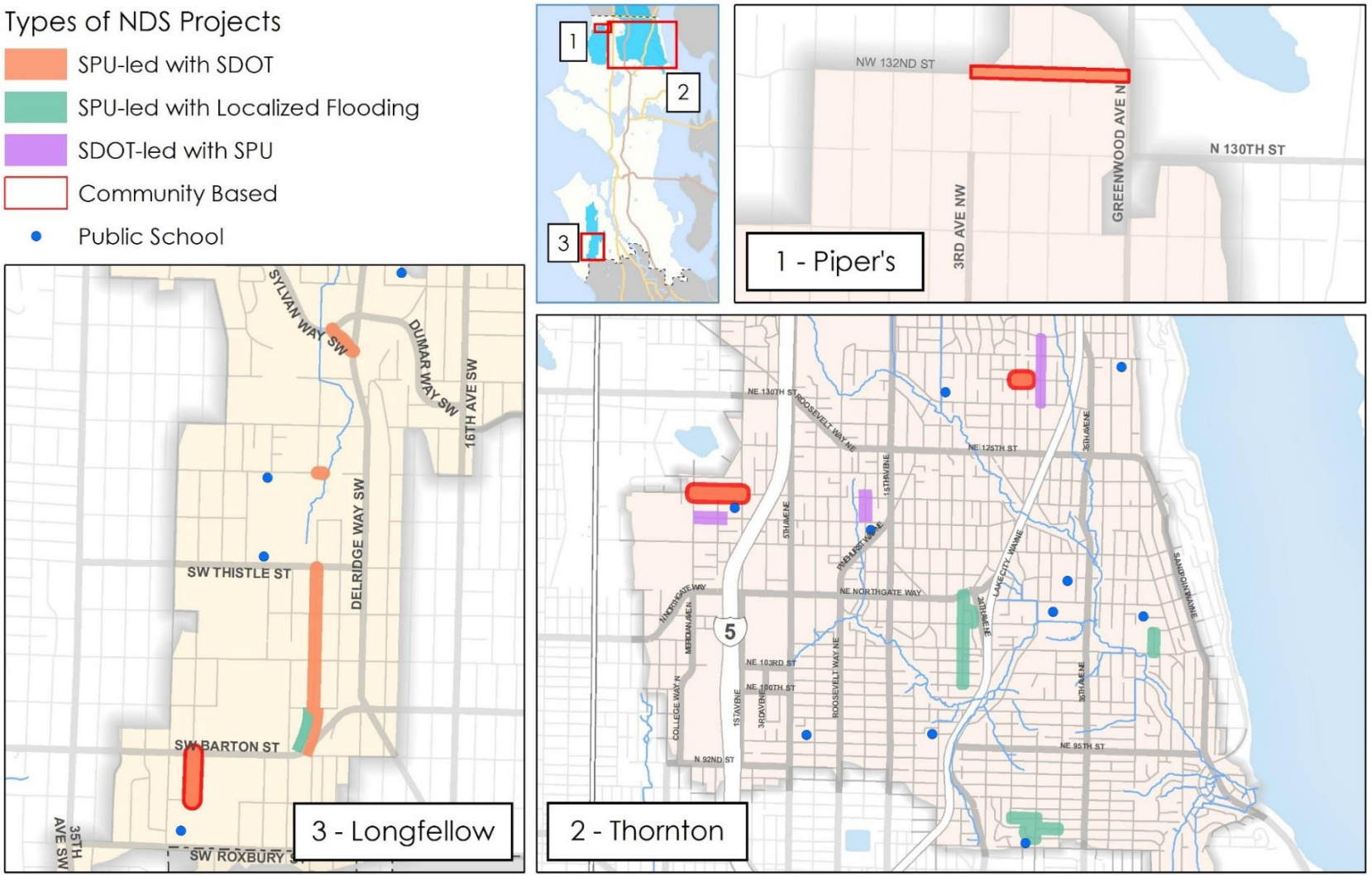
30TH AVE NE SIDEWALK + NDS PROJECT

First joint project under NDS Partnering Program



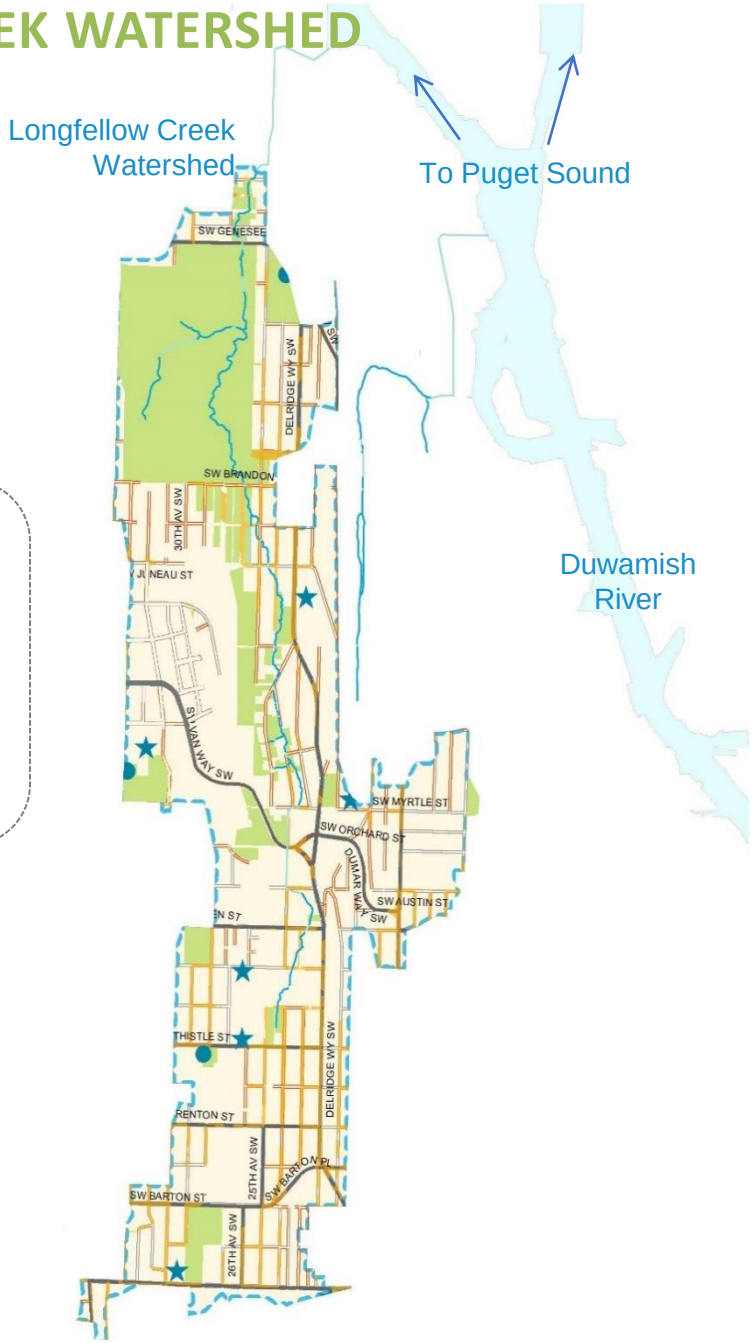
NDS provides a conveyance system where there is none, in addition to treating arterial water

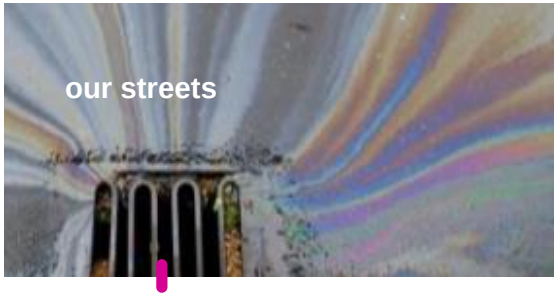
NDS PARTNERING PROGRAM:
PLANNED PROJECTS FOR 2019/2020 CONSTRUCTION

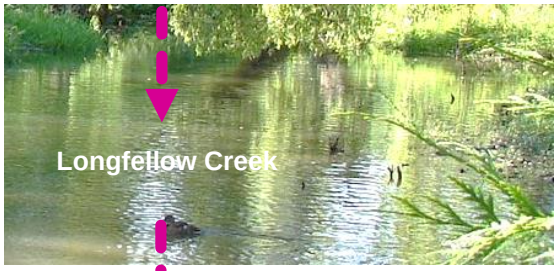


LONGFELLOW CREEK WATERSHED

The rain that falls in this area of Seattle drains to Longfellow Creek, then to the Duwamish Waterway, then to Puget Sound.







LONGFELLOW NDS PROJECT GOALS

- Water quality treatment of stormwater runoff
- Partnerships to increase investment value + lower construction disruption
- Reduce flooding + Improve stormwater conveyance
- Provide additional community benefits beyond water quality treatment

SITE SELECTION PROCESS

Choosing sites was an iterative process

Citywide Integrated Plan
Watersheds prioritized to improve water quality in local creeks and Puget Sound by cleaning the stormwater flowing into them.

Local Community Action

Technical Assessment
Identified blocks that could include natural drainage systems.

Partnering
Determined opportunities to provide extra community benefits by partnering with other City departments or community groups.

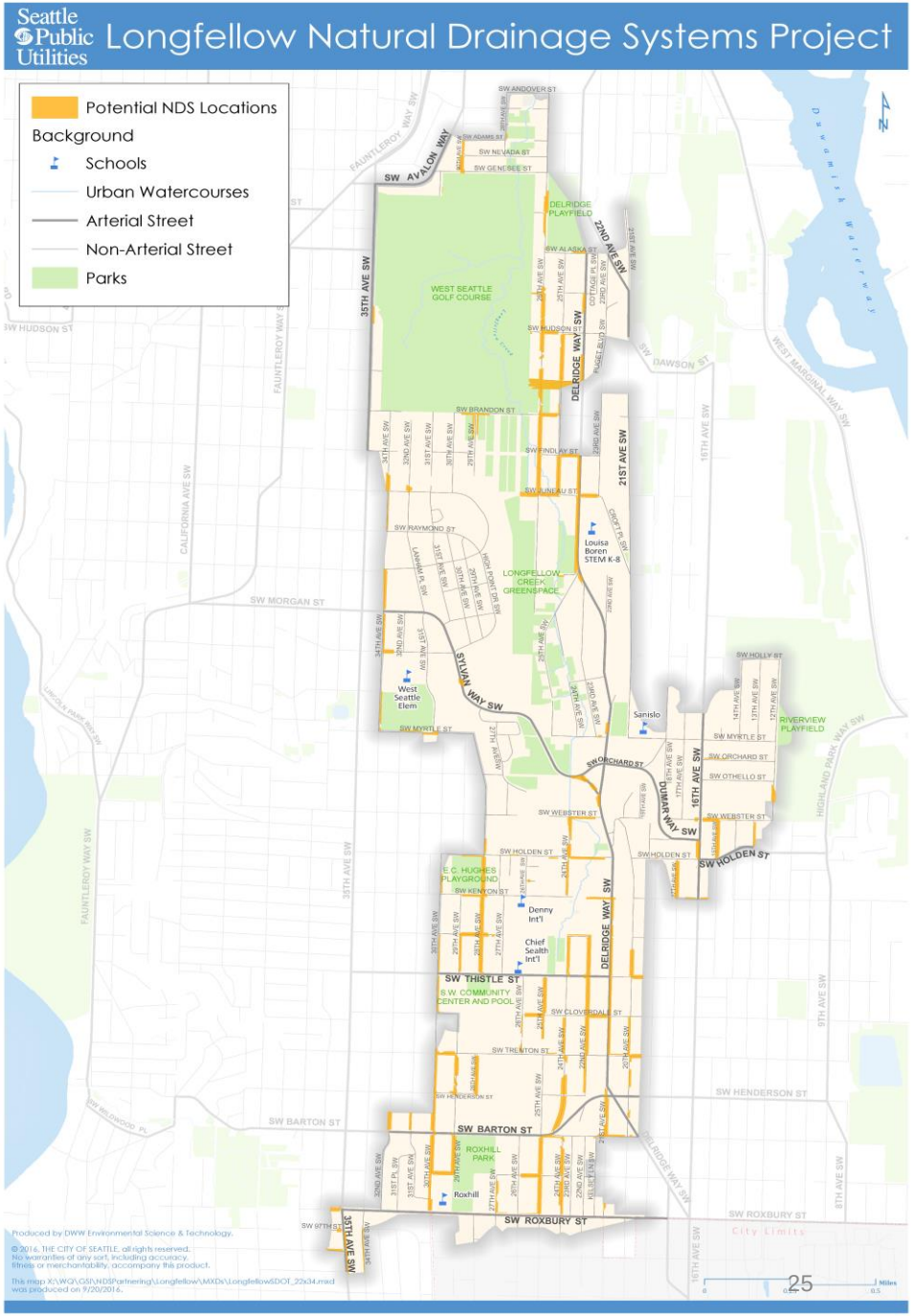
Equity Lens
Prioritized outreach efforts in the southern portion of the Longfellow Creek watershed.

Resident Survey
Asked a large pool of residents about interest in these projects.

Final Site Selection
Selected project sites based on ability to clean water, additional benefits and partnerships, and support from the community.

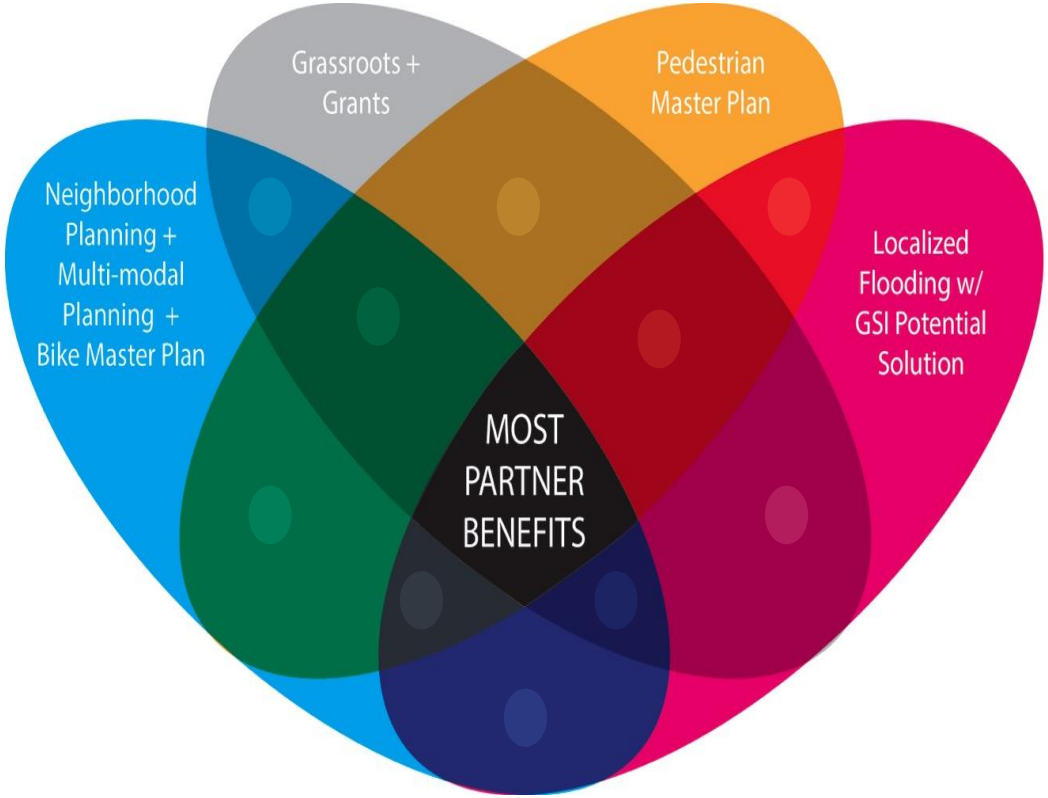
IDENTIFY WHERE NDS IS NOT FEASIBLE

- Not adjacent to steep slopes
- No landslides
- No seeps
- No landfills, underground storage tanks, contamination
- Wide enough ROW
- No existing NDS
- Road grade is not too steep
- Groundwater not too high



PARTNERING OPPORTUNITIES INVESTIGATED

- SDOT
  - Pedestrian Master Plan
  - Safe Routes to School
  - Neighborhood Greenway
  - Delridge Rapid Ride
- SPU
  - Localized Flooding problems
- DON
  - Neighborhood Matching Fund
- OPCD
  - North Delridge Action Plan
- Community groups
  - Neighborhood Parks & Street Fund
  - Community driven projects
- Developers



EQUITY

SPU Equity Planning Toolkit Memo

Task Description	Intended Benefits of Described Task
Traditionally underserved and diverse communities are taken into account when choosing project sites.	Communities that may not have received nor requested the multiple benefits of GSI will have the opportunity to receive the benefits of this service.
Emphasis outreach for projects will be conducted with an eye towards involving underserved populations who may not traditionally engage with standard outreach and siting processes.	Culturally aware and non-traditional outreach methods may result in greater participation from underserved ratepayers.
Provide rating criteria that allows for weighting for RSJ issues when selecting projects.	Increases odds of siting feasible projects in underserved and minority blocks.

2017/2018 ELEMENTARY SCHOOL ATTENDANCE STATS

- Low Income
- Limited English
- Percentage non-white

- West Seattle
- Sanislo
- Highland Park
- Roxhill

COMMUNITY OUTREACH

- Surveys
- Door-to-door follow-up
- Drop-in Sessions for Partnering blocks
- Drop-in Sessions for final potential blocks (post survey results)

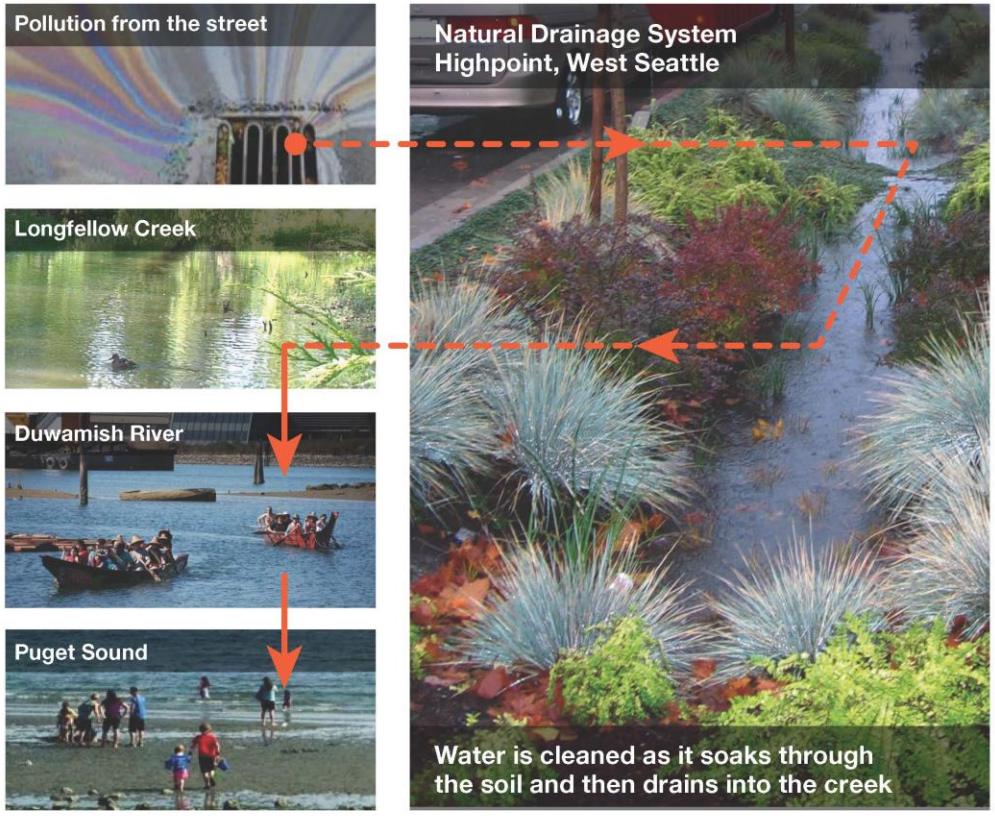
Improving Our Communities with Natural Drainage Systems

What Are They and Why Do We Need Them?

When it rains in this part of West Seattle, pollution from our streets runs into Longfellow Creek untreated. This is not healthy for the creek or for people. **The good news is: there is something we can do.**

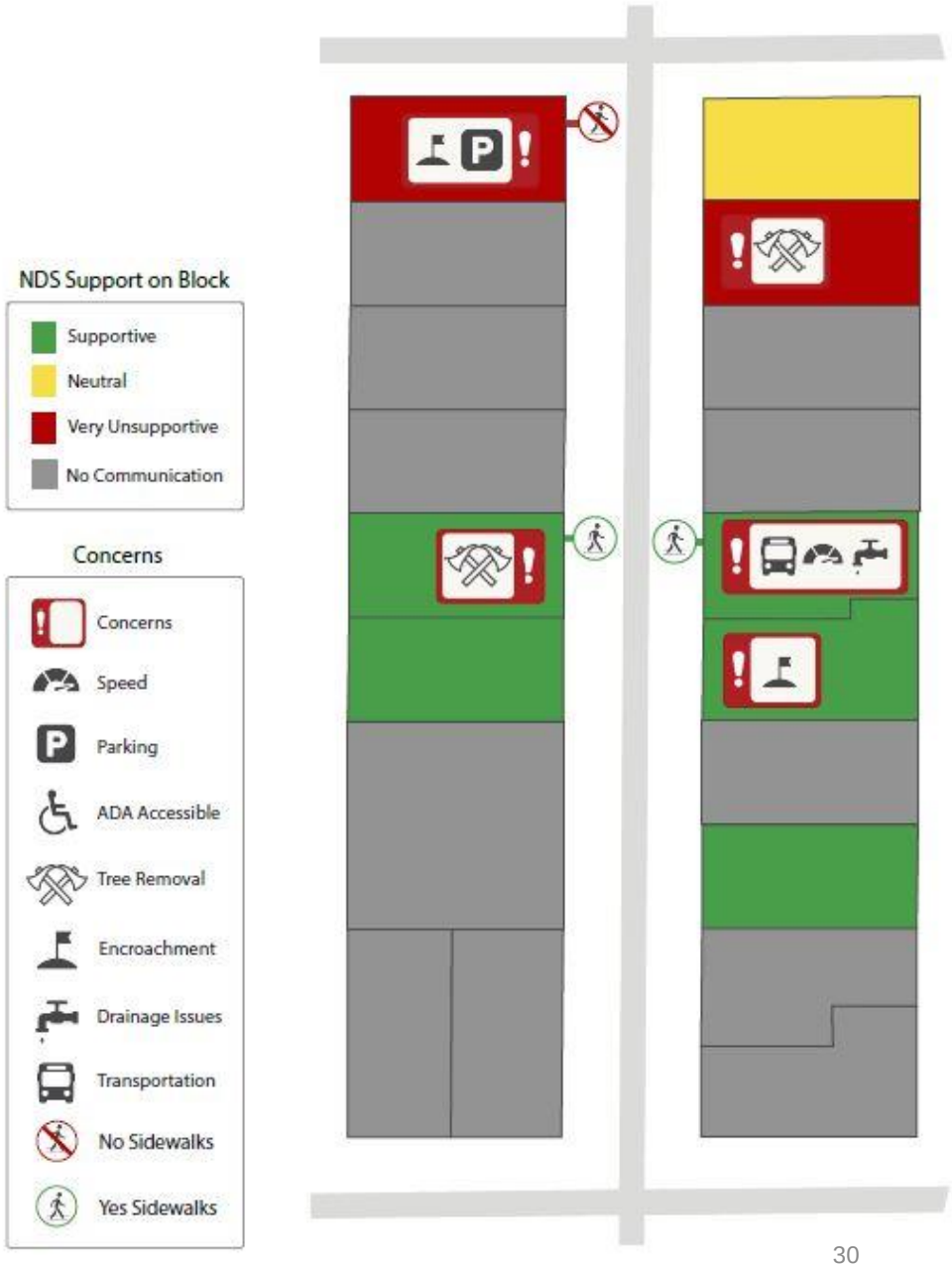
Natural drainage systems capture and clean pollutants before they can reach the creek. Seattle Public Utilities (SPU) is planning to build natural drainage systems in your neighborhood in 2019.

These systems are built in the public right-of-way between the street and property line. They capture, clean, and slow down stormwater.



OUTREACH RESULTS

- 1057 surveys mailed: 10% response rate
- Followed up with door-to-door for non-responders: additional 26% = Total 33% response rate
- Support on your block – 77%
- Support in front of house – 69%
- Need for language assistance – Somali, Spanish, Vietnamese
- Drop-in results: mostly interest in project, concerns over current flooding, parking post-project, safety, fate of items in right-of-way

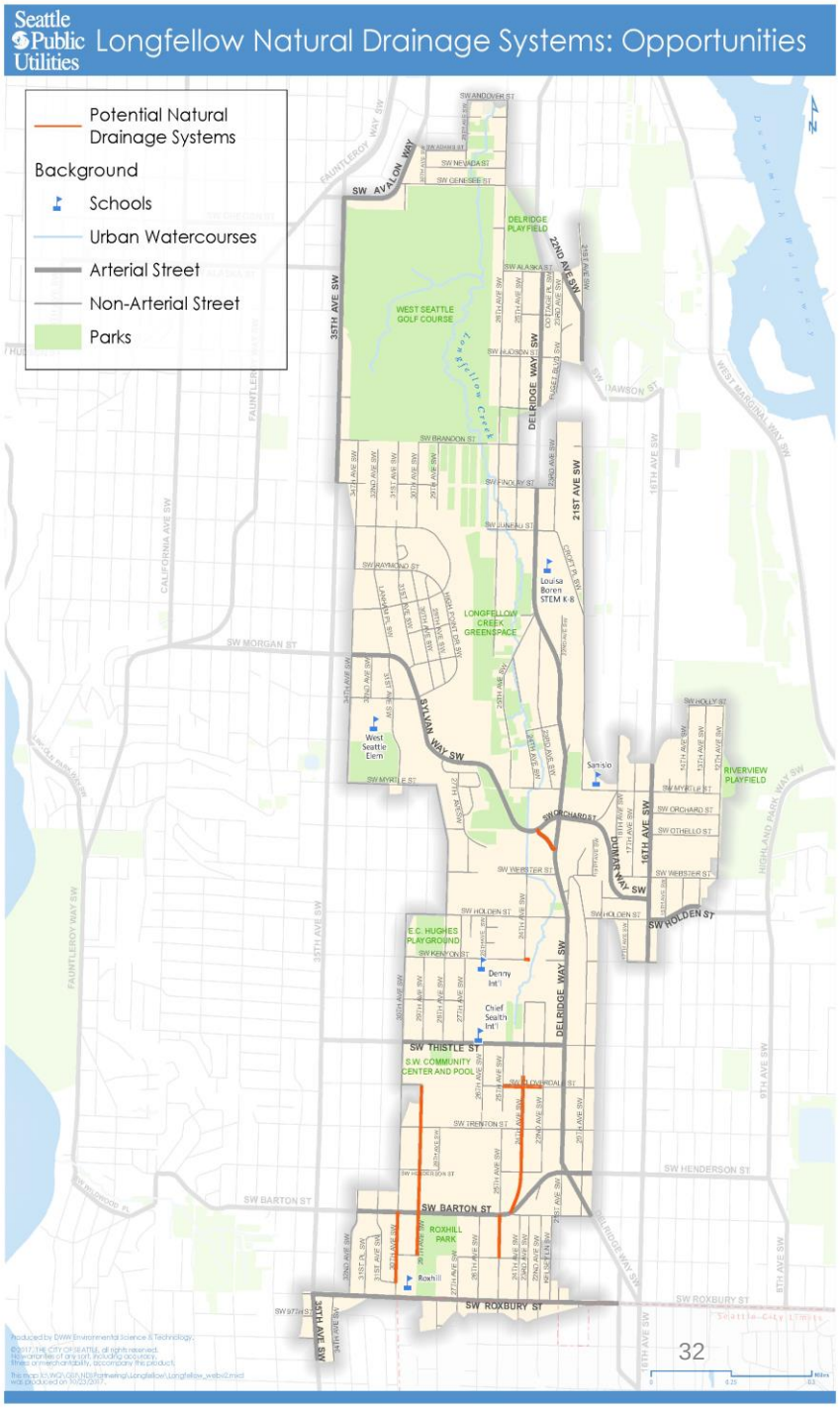


HOW OUTREACH INFLUENCES SITE SELECTION/DESIGN

- Confirm partnership blocks have mostly supporting residents
- Confirm that a block is technically feasible from a drainage perspective given on-the-ground resident feedback
- Identify blocks that have the most support + are likely most technically feasible for final block selection
- Identify any concerns that we can try to address in design
- Identify opportunities for creative outreach efforts given who we meet

FURTHER ANALYSIS

- Geotechnical explorations
- Field technical assessments
- Drop-in sessions at site locations
- Apply ranking criteria



FINAL SITE SELECTION

Ranking Results

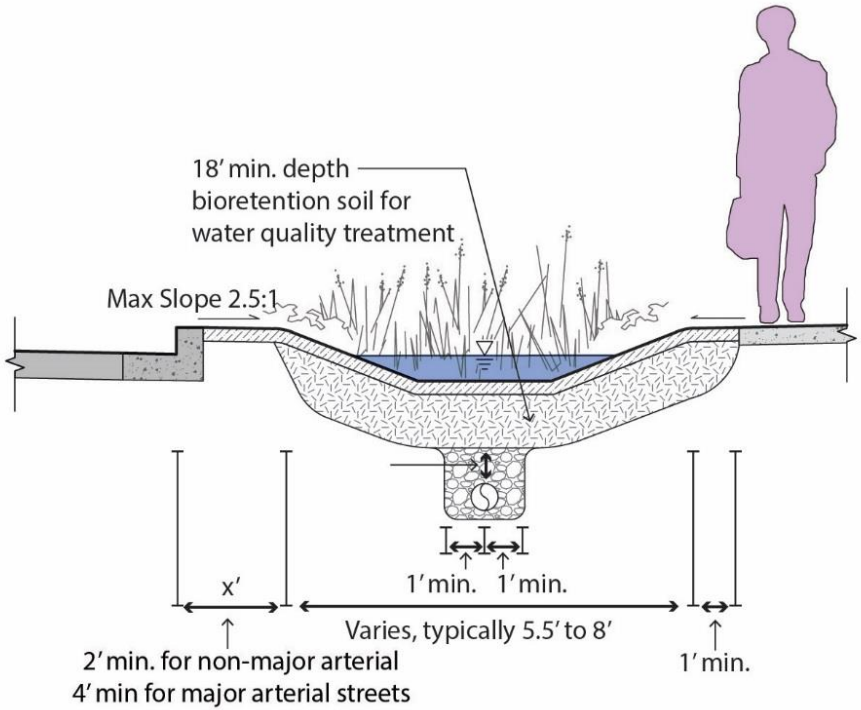
- Top 4 sites:
  - 24th Ave SW corridor – Barton to Thistle
  - Sylvan triangle
  - Kenyon dead end at 24th Ave SW
  - 29th Ave SW south of Barton

- Higher scores in:
  - Flooding problems (for one site)
  - Volume of polluted water that can be treated
  - Helps solve a problem to reduce maintenance
  - Service equity
  - Opportunity to reduce costs
  - Multiple benefits
  - Support of on-block residents

DESIGN ELEMENTS IN THE PUBLIC REALM

- Natural Drainage Systems with side slopes
- Conveyance systems for road runoff stormwater + road edge treatments
- New sidewalks or pathways
- New pedestrian trail bridge
- Potential additional lighting in one site
- Improved intersections (formalized overly wide intersections)
- ADA ramps
- New trees
- Reduced road widths (traffic calming)
- Art

NATURAL DRAINAGE SYSTEM WITH SIDE SLOPES



Bioretention with Sloped Sides with Underdrain
(Infiltrating or Non-Infiltrating)

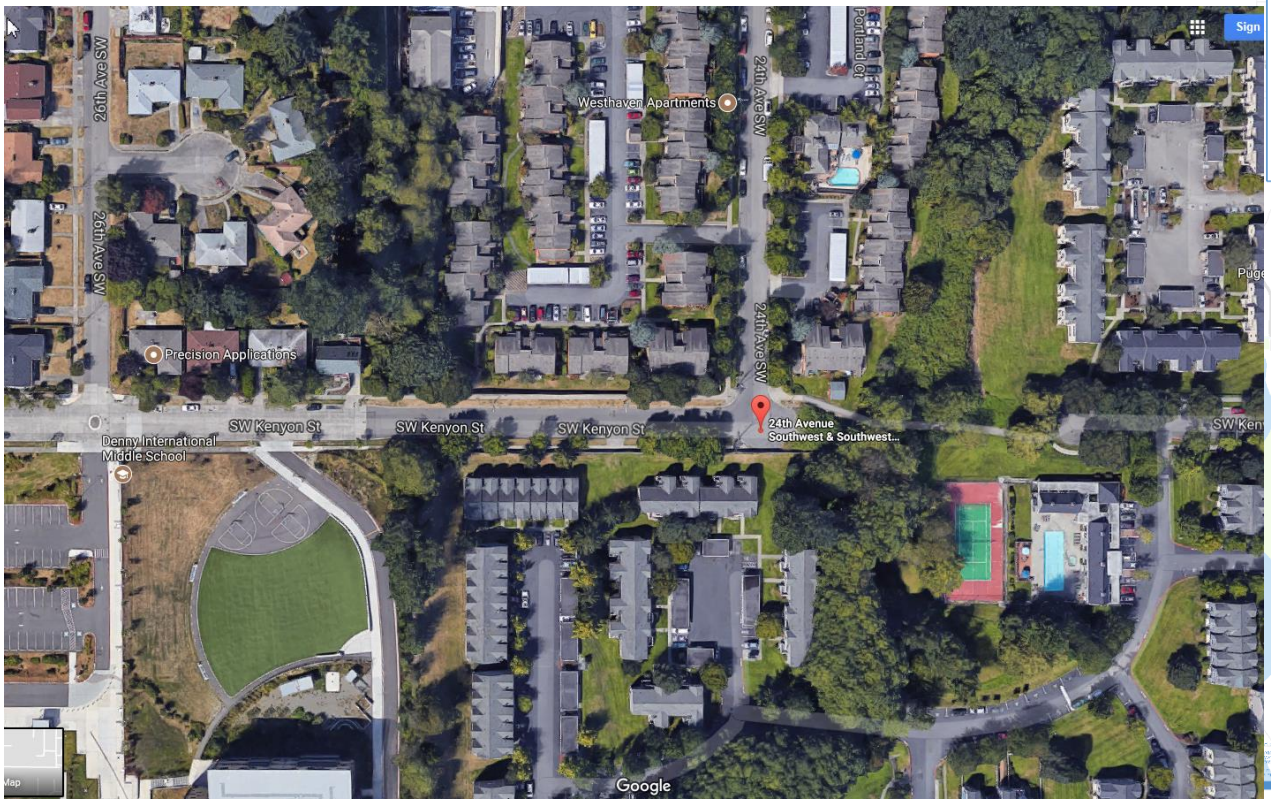
CONVEYANCE SYSTEMS + INFORMAL AREAS ROAD EDGE TREATMENTS

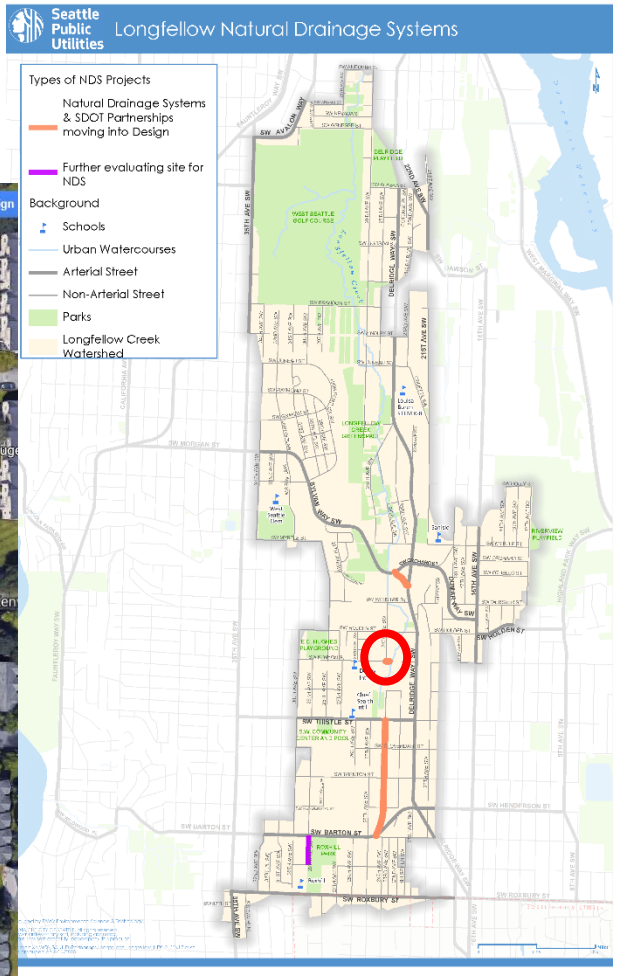
Figure Number 9. 24th Ave SW between SW Trenton St and SW Henderson St
Looking North from SW Henderson ST - possible Bioretention Area Eastside (Photo Taken November 14, 2016)

POTENTIAL IMPACTS IN THE PUBLIC REALM

- Formalization or changes to public right-of-way parking
- Removal of encroachments when in conflict with sidewalks or natural drainage systems
- Removal of smaller or diseased trees if can not be designed around
- Additional low walls and few steps to meet grade between public right-of-way and private property when necessary

SW KENYON ST & 24TH AVE SW





ADDED DESIGN ELEMENTS

- Natural Drainage Systems
- Replace pedestrian bridge
- Improve pathway
- Improve stormwater outfall
- Trees/plants
- Art

CHANGED ELEMENTS

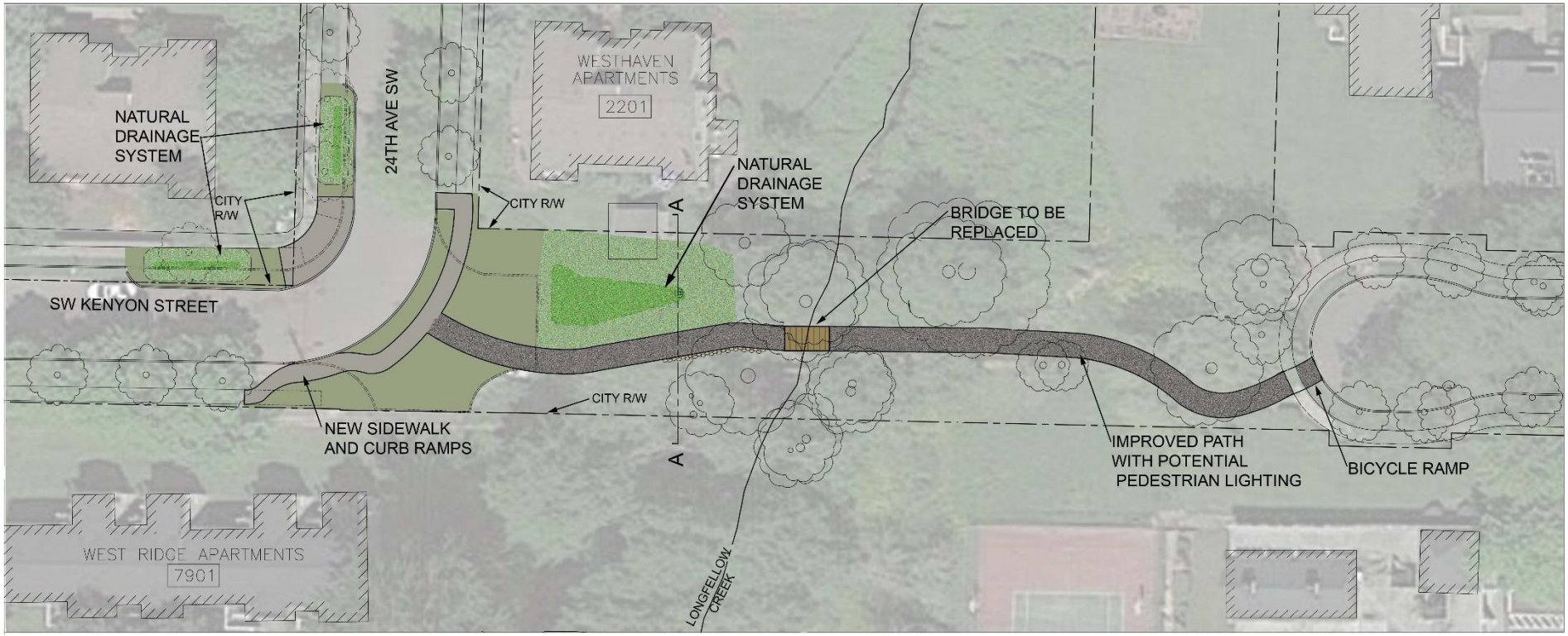
- Encroached shed
- Remove a few parking spaces at the dead end

ZONING

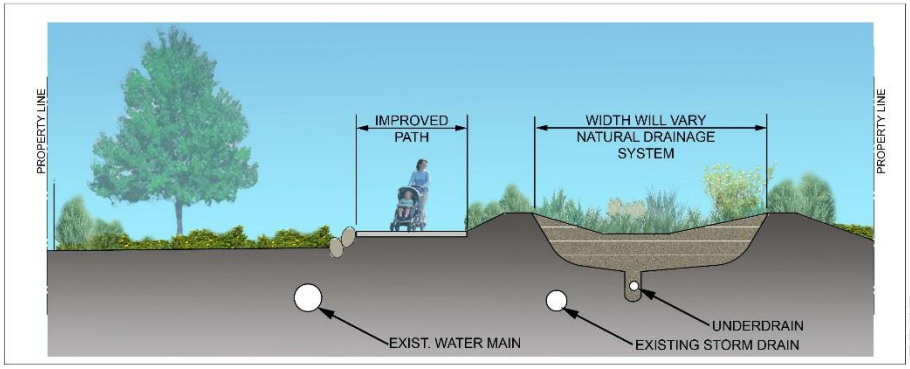
Low-rise multifamily

KENYON – EXISTING CONDITIONS

SW KENYON ST & 24TH AVE SW – PROPOSED CONCEPT



SW Kenyon Street and 24th Ave SW



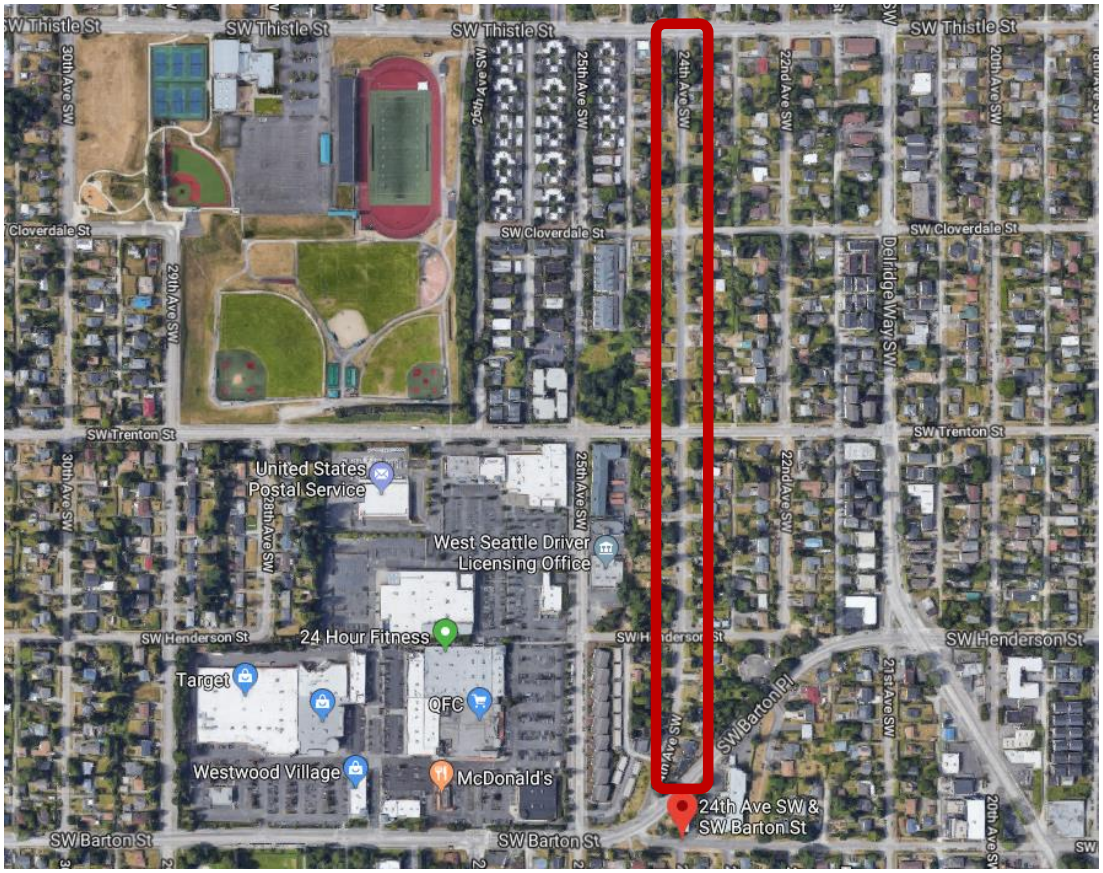
NOTE:
PLANTING AND NEW TREES TO BE DETERMINED

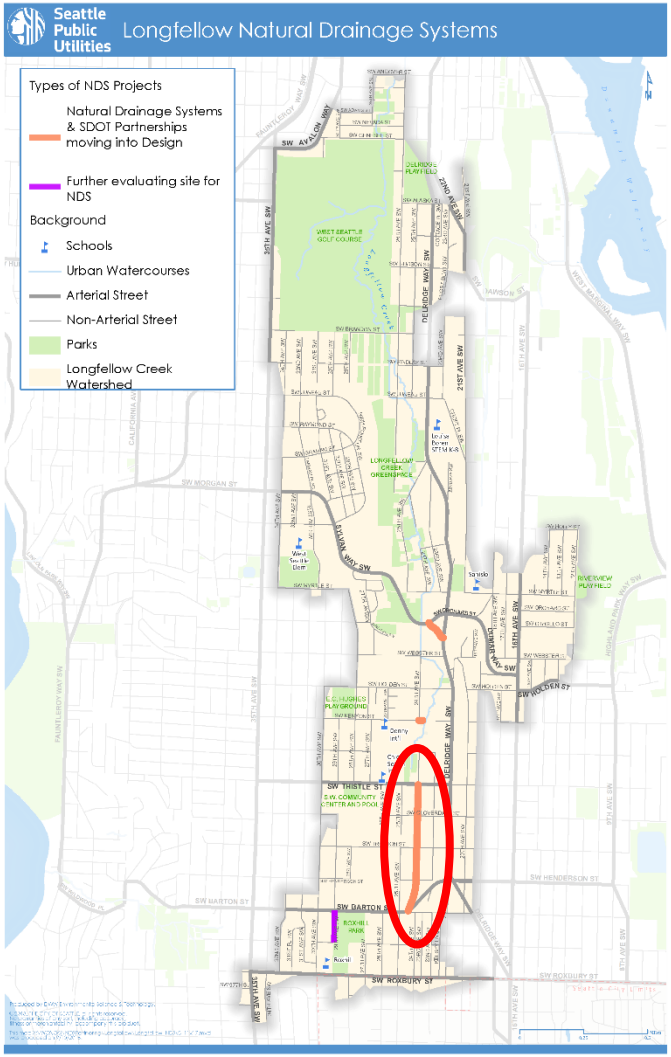
SECTION A-A

1% FOR ART

- Kenyon site
- $112K, Total artwork budget
- Artists invited from ARTS Established Roster
- Seeking site-specific and site integrated permanent artworks within the right-of-way – connecting people to the flow of water and the urban environment
- 29 artists applied
- Panel dates in late Nov. and Dec.
- Artist on board – late Jan/early Feb·

24TH AVE SW





ADDED DESIGN ELEMENTS

- Natural Drainage Systems
- Stormwater conveyance
- Sidewalk + ADA ramps
- Possible railings
- Trees/plants
- Short walls + steps

CHANGED ELEMENTS

- Encroachments/fences
- Formalize parking along curb or asphalt-thickened edge
- New driveway aprons
- Trees?
- Road alignment

ZONING

Single family residential
Urban Village

24TH AVE SW SITE – LOCALIZED FLOODING

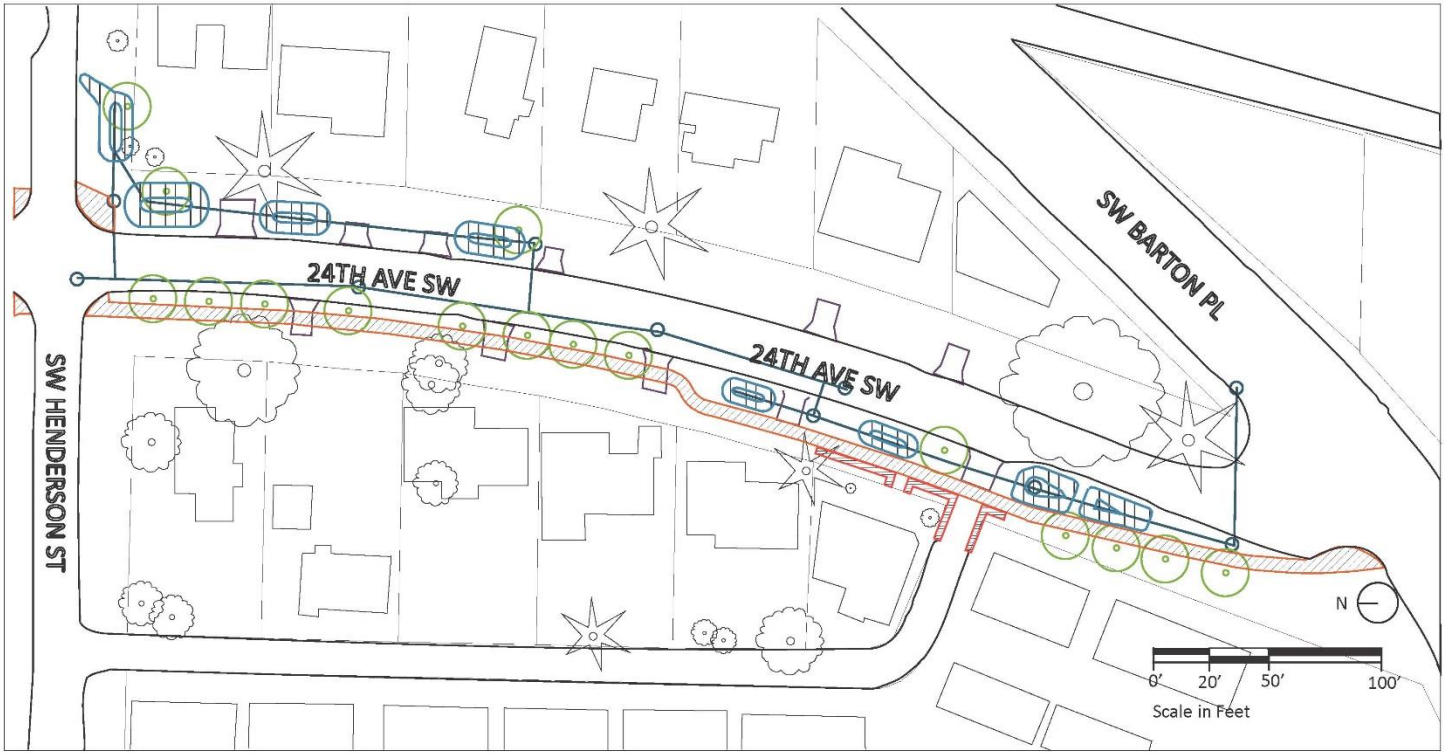
24TH AVE SW BTW SW BARTON PL & SW HENDERSON ST

LEGEND

- BIORETENTION CELL
- CURB RAMP IMPROVEMENTS/ NEW SIDEWALK
- NEW STREET TREES
- WALL/ROCKERY WITH RAILING (STEPS AT ACCESS)
- NEW DRAINAGE PIPE
- NEW DRIVEWAY APRONS

24th Ave SW
SW Henderson St to
SW Barton Pl
Block Overview

Seattle Public Utilities



24TH AVE SW BTW SW HENDERSON ST & SW TRENTON ST

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24th Ave SW
SW Henderson St to
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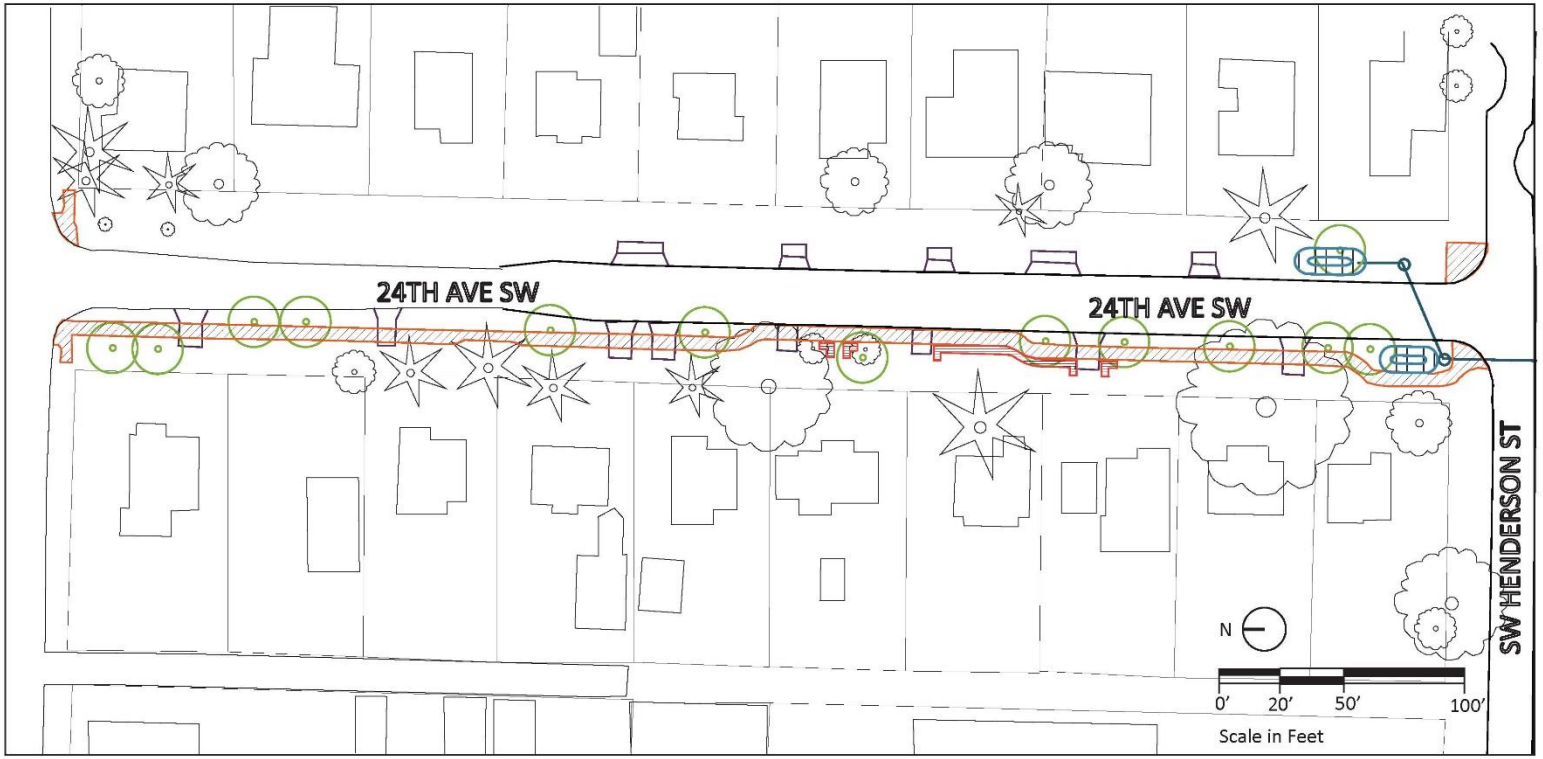


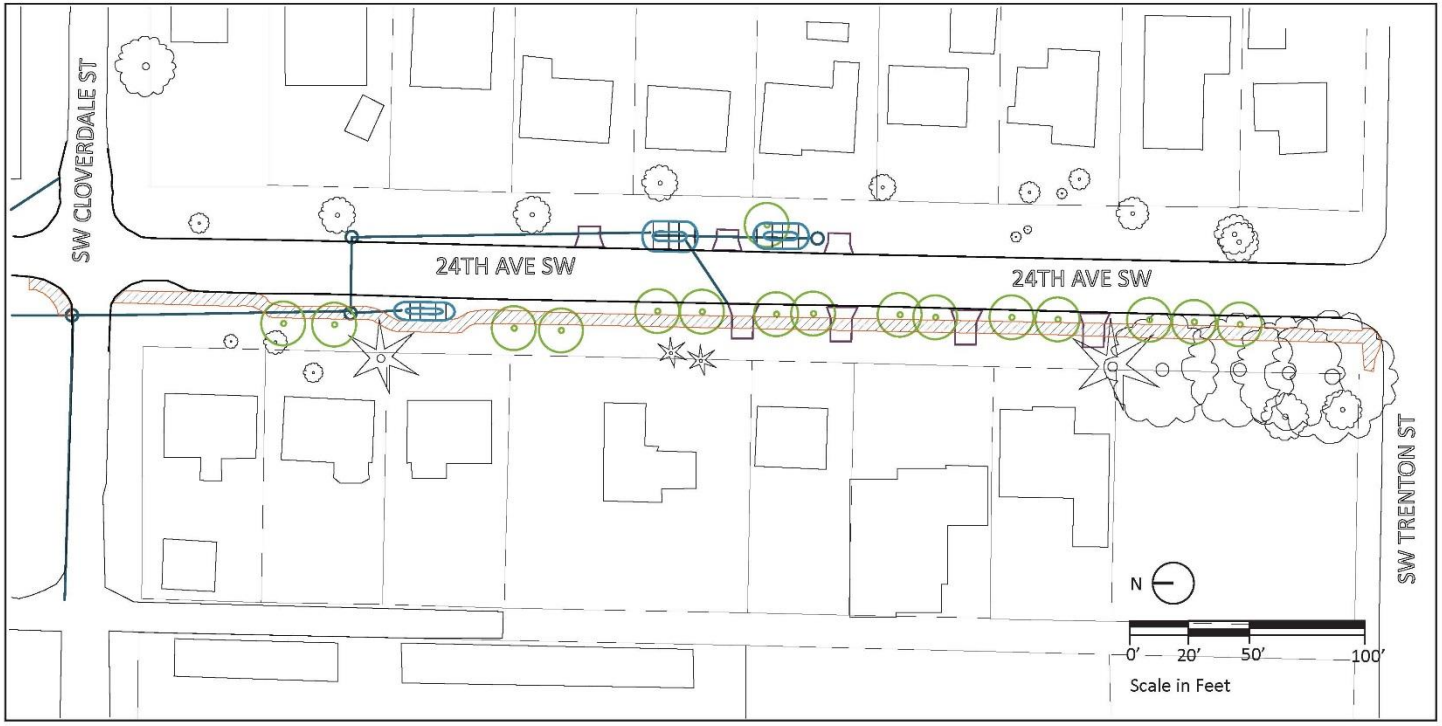
24TH AVE SW BTW SW TRENTON ST & SW CLOVERDALE ST

LEGEND

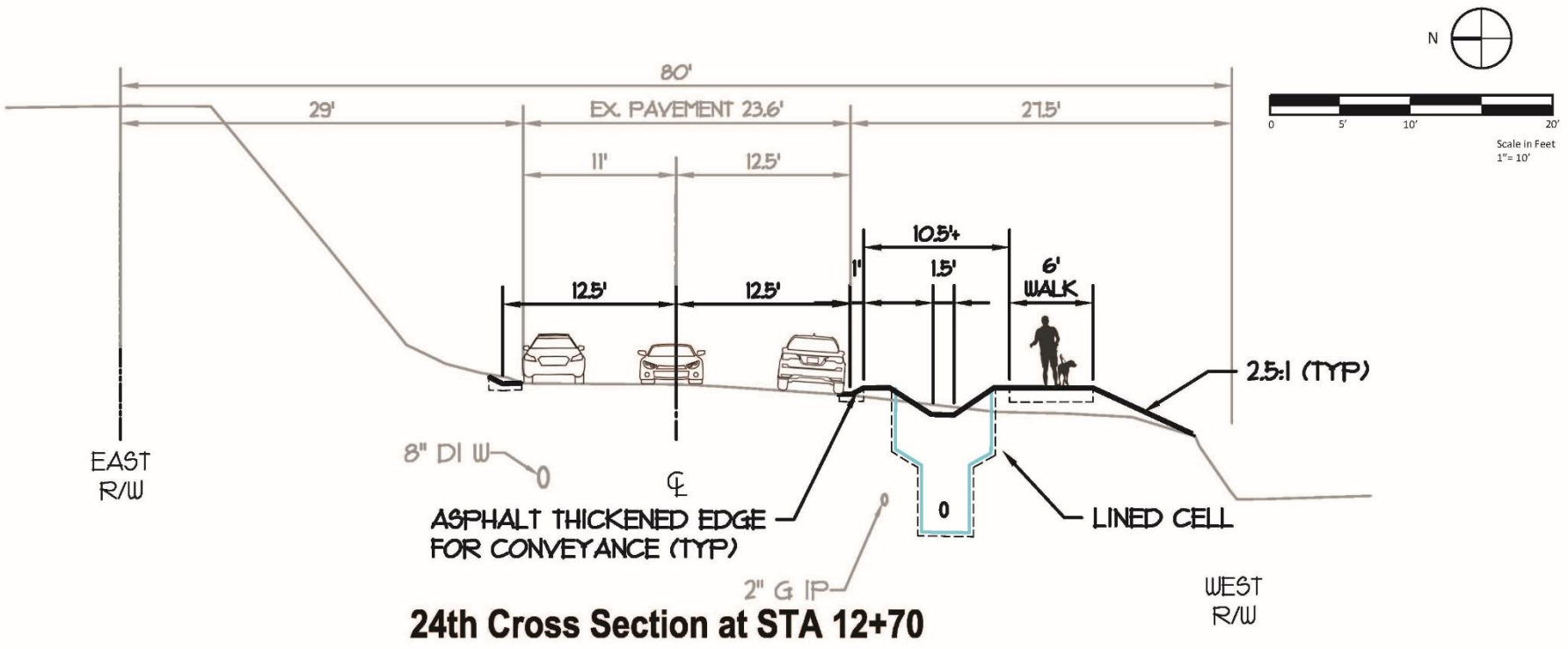
- BIORETENTION CELL
- CURB RAMP IMPROVEMENTS/ NEW SIDEWALK
- NEW STREET TREES
- NEW DRAINAGE PIPE
- NEW DRIVEWAY APRON

24th Ave SW
SW Trenton St to
SW Cloverdale St
Block Overview

Seattle Public Utilities



SECTION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0
5'
10'
20'
Scale in Feet
1"= 10'
80'
29'
EX. PAVEMENT 23.6'
27.5'
11'
12.5'
10.5'
1'
1.5'
6'
WALK
12.5'
12.5'
2.5:1 (TYP)
EAST
R/W
8" DI W
℄
ASPHALT THICKENED EDGE
FOR CONVEYANCE (TYP)
LINED CELL
2" G IP
WEST
R/W
24th Cross Section at STA 12+70

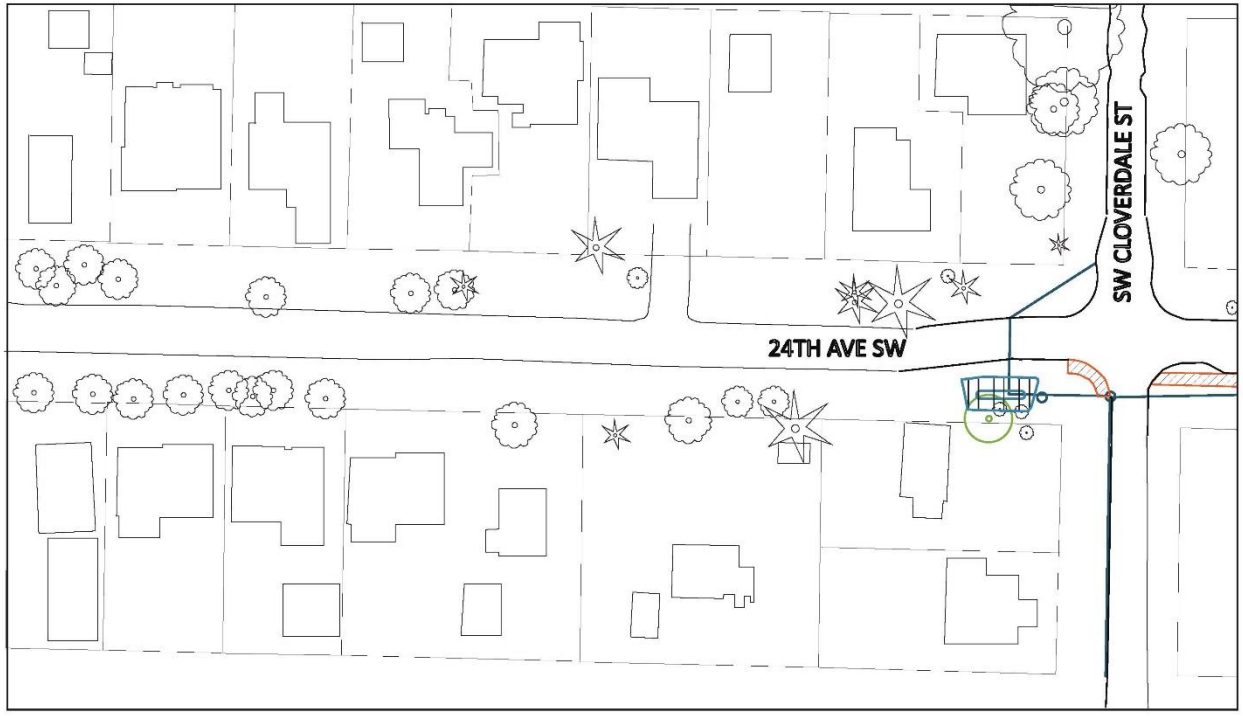
24TH AVE SW BTW SW CLOVERDALE ST & SW THISTLE ST

LEGEND

- BIORETENTION CELL
- CURB RAMP IMPROVEMENTS/ NEW SIDEWALK
- NEW STREET TREES
- NEW DRAINAGE PIPE

24th Ave SW
SW Henderson St to
SW Barton Pl
Block Overview

Seattle Public Utilities

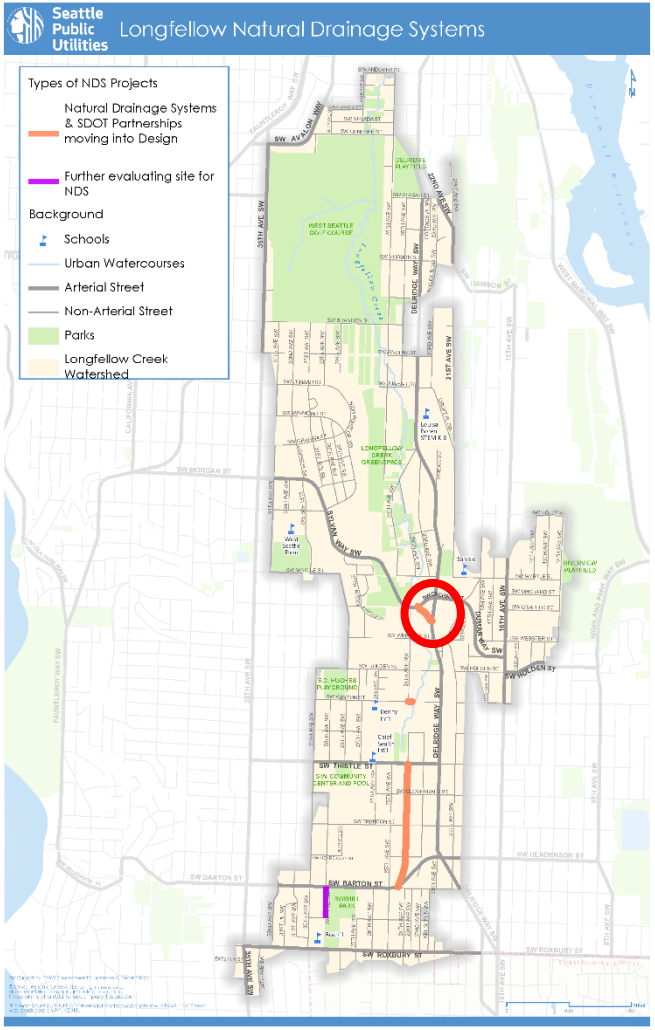


N

0' 20' 50' 100'

Scale in Feet

SYLVAN WAY SW & SW ORCHARD ST



ADDED DESIGN ELEMENTS

- Natural Drainage System
- Sidewalk
- Curb & gutter
- Formalize intersection
- Trees/plants

CHANGED ELEMENTS

- Trees?

ZONING

C1-40 (commercial)

SYLVAN WAY SW & SW ORCHARD ST – EXISTING CONDITIONS

Figure Number 21. Sylvan Way SW between SW Orchard St and Delridge Way SW

Looking east from SW Orchard Street toward Intersection at SW Sylvan St – Potential Bioretention Area (Photo taken November 14, 2016)

Figure Number 22. Sylvan Way SW between SW Orchard St and Delridge Way SW

Looking SE from SW Orchard Street – Low Point, 2 gas valves and light pole (Photo taken November 14, 2016)

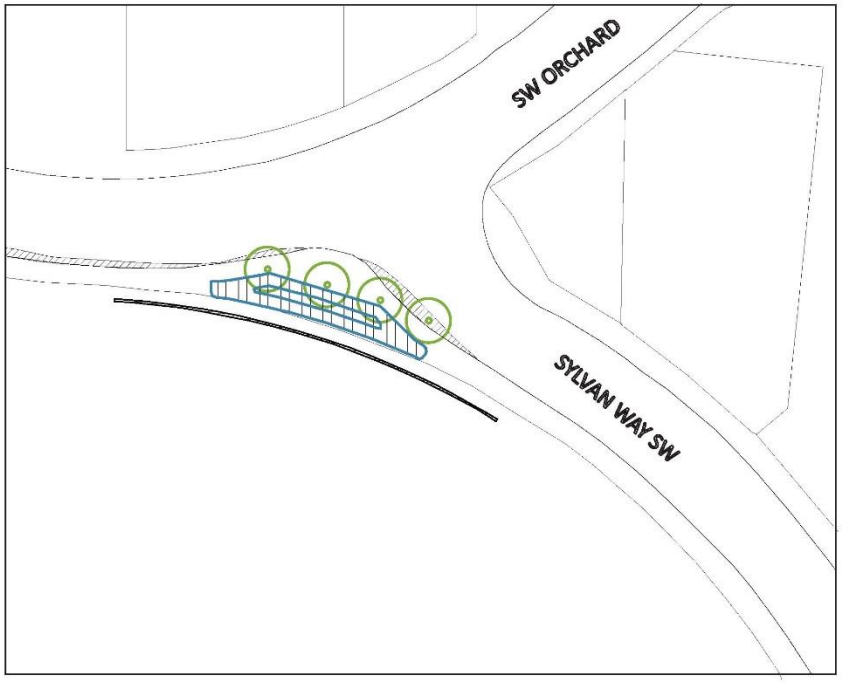
Figure Number 23. SW Orchard St between SW Delridge Way and Sylvan Way SW

Looking NE to SW Orchard Street – Grades lower on north side of the road (Photo taken November 14,2016)

SYLVAN WAY SW & SW ORCHARD ST – PROPOSED CONCEPT

LEGEND

- BIORETENTION CELL
- NEW STREET TREES
- EXISTING RETAINING WALL
- EXISTING CURB

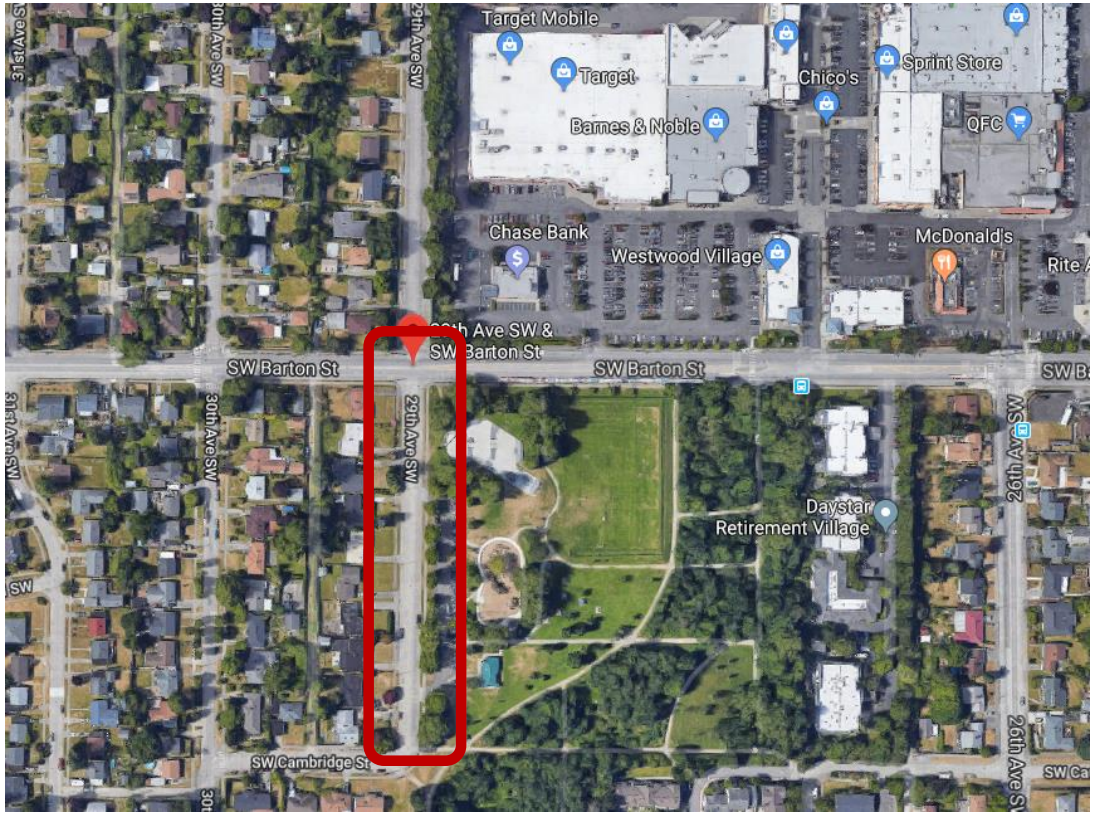


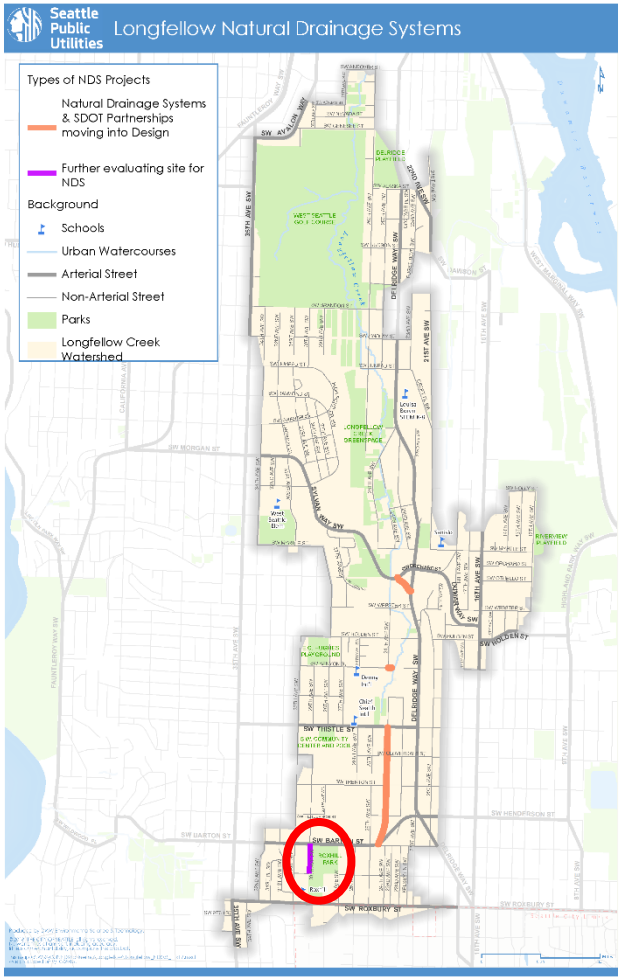
N

0′ 20′ 50′ 100′

Scale in Feet

29TH AVE SW BTW CAMBRIDGE & BARTON





ADDED DESIGN ELEMENTS

- Natural Drainage Systems
- Trees/plants

CHANGED ELEMENTS

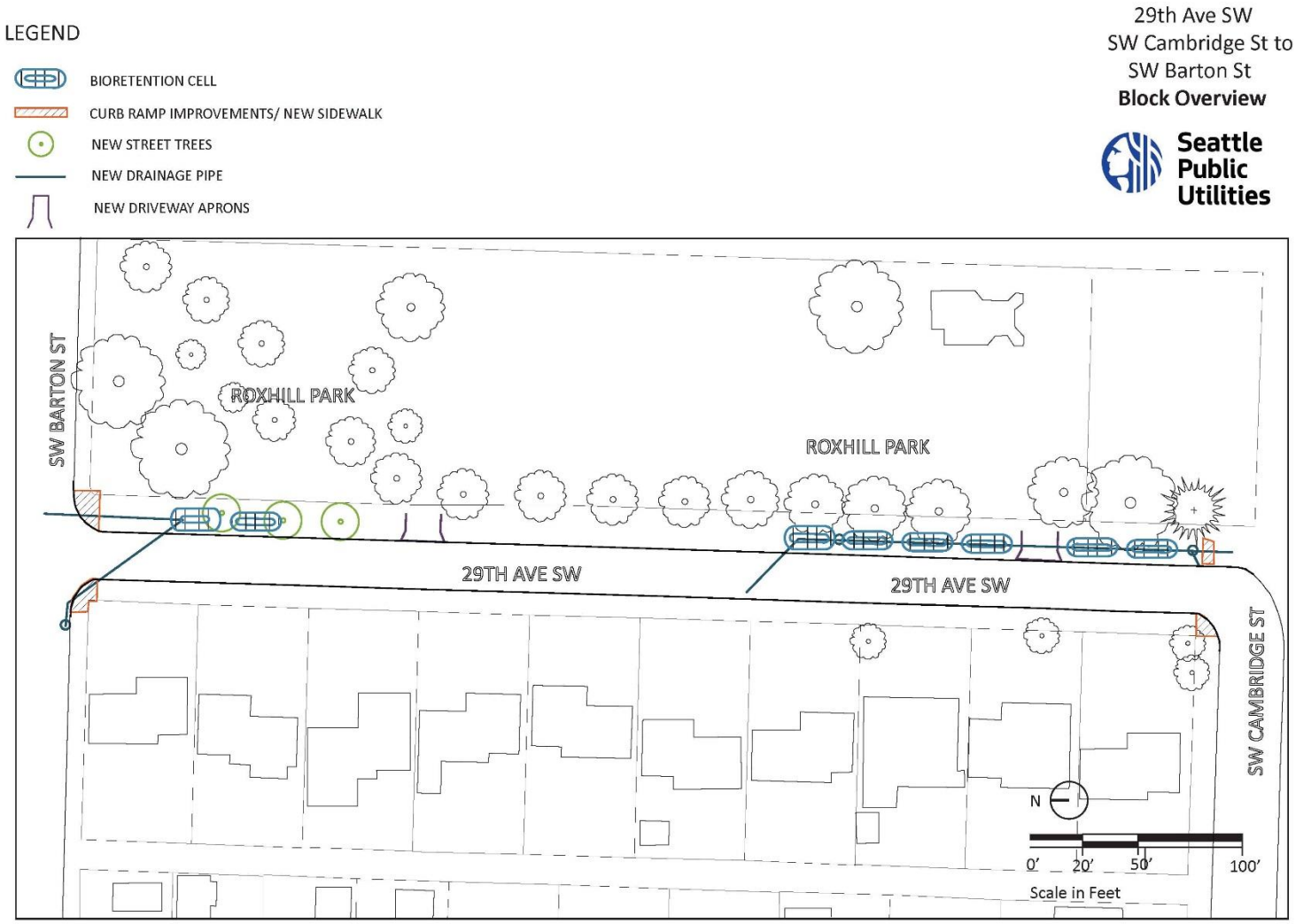
- De-pave wide road to 25’
- Parking shifted but not removed

ZONING

Single family residential

29TH AVE SW BTW CAMBRIDGE & BARTON – EXISTING CONDITIONS

29TH AVE SW BTW CAMBRIDGE & BARTON – PROPOSED CONCEPT



APPLYING LESSONS LEARNED

- Developing an efficient partnership approach between SPU and SDOT for one City, including the review and approval process by both departments

- Communicate clearly to the community and partner departments that the design changes as it moves through the design process

- Communicate clearly to residents how site will feel including depths – and that the site will change over time as the plants grow

QUESTIONS/COMMENTS?