

## Chapter 6

### Streetscape Design Guidelines

#### 6.1 Street Design Concept Plans

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##### 6.1.1 Overview

Streetscape features, such as street lights, trees and landscaping, and street furniture can contribute to the unique character of a block or entire neighborhood. This chapter describes the process for developing a Street Design Concept Plan (Concept Plan) and the process for getting such a plan approved by the Seattle Department of Transportation (SDOT) and Department of Planning and Development (DPD). Refer to [Figure 6-1: Street Design Concept Plan Process](#) [  322 kb ].

Seattle has a growing number of areas where community groups, developers or property owners are interested in developing a design concept for a street or series of streets. Concept Plans solidify a vision for the street or streets included and can tie that vision back to other planning and design documents that the neighborhood or City may have developed. Concept Plans are also useful as a vehicle for discussion between the proponent and the City about appropriate streetscape elements given the adjacent land use and the street's operational characteristics. Refer to [Figure 6-2: Street Design Concept Plan Template-Plan](#) [  4 MB ] for a sample plan and to [Figure 6-3: Street Design Concept Plan Template-Context](#) [  4 MB ] for a sample plan within context..

Concept Plans are proposed by a project proponent, typically a property owner or developer seeking to do an enhanced streetscape treatment for their project. The proponent may also be a community group that is interested in enhancing or preserving certain street features that are unique to their neighborhood. The proponent will then work in consultation with SDOT and DPD to develop the Concept Plan.

Typically, the Concept Plan provisions are implemented over time by multiple property owners as parcels on the block re-develop. In order to make the submittal process as straightforward as possible for the proponent, and expedite the City review process, this chapter also includes a template for a Concept Plan submittal that can be adapted to suit the specific proposal.

##### 6.1.2 Proposal Must Meet City Street Design Standards

Any project that is constructed in an area that has an adopted Concept Plan must still meet the currently adopted minimum requirements for the streetscape and roadway outlined in the Land Use Code, the design criteria in [Chapter 4 Design Criteria of the Right-of-Way Improvements Manual](#), and any applicable City of Seattle Standard Plans and Specifications.

##### 6.1.3 Implementation is Voluntary

The provisions in a Concept Plan are voluntary. However, property owners are encouraged to follow

them in order to achieve their intent. Street Use Permit submittals that follow the provisions of the Concept Plan can be assured that the major design elements contained in their plans meet and exceed the requirements described in this Manual. The City strongly encourages that the Concept Plan be followed especially any proposals for curb alignment grade and utility locations.

#### 6.1.4 Templates for Street Design Concept Plan Submittals

In order to simplify the process of preparing a Concept Plan for both the proponent and the City, the following template shall be used for submittals. Items in bold are required for all submittals:

##### 6.1.4a Context

The context information should include the following:

- **Vision statement:** one or two paragraphs that describe the vision the proponent is trying to achieve through the Concept Plan. This should be supplemented with photos of existing conditions and illustrative sketches of the proposal.
- **Locational map:** the purpose of this map is to locate the project and define its geographic scope.
- **Existing street section:** develop a scaled (1 inch=20 feet) is suggested), dimensioned street section that defines the existing street (e.g., number, width and typical purpose of travel lanes, location and width of sidewalks and planting strips).

Refer to [Figure 6-3: Street Design Concept Plan Template-Context](#) [  4 MB ].

##### 6.1.4b Dimensioned Street Section of Proposal

Develop a scaled (1 inch=10 feet is suggested), dimensioned street section that defines the proposed street elements. This section should be accompanied by a short description of the features that are proposed to change if the Concept Plan is approved and implemented. Refer to [Figure 6-4: Street Design Concept Plan Template: Dimensioned Street Section](#) [  2 MB ] for an example. A plan section may be necessary to present the full concept. Scale for both the existing and proposal may change depending on the geographic size of the proposal.

##### 6.1.4c Detailed Evaluation of Traffic Operations

Describe the proposed operations of the street(s) for traffic. Include, at a minimum, the following:

- One way or two way operations;
- Presence and configuration of parking;
- Sidewalk location and width;
- Presence of signals, regulatory signs or other roadway markings;
- Presence of traffic calming devices;
- Analysis of existing capacity, volumes and level of service on arterials and impact of proposal on future traffic operations along the street and adjacent arterial system;
- Impacts on non-motorized modes of travel (pedestrian, bicycle, people with mobility impairments); and
- Evaluation of freight mobility and local service deliveries.

##### 6.1.4d Dimensioned, Plan View Sketch of Proposal

Develop a plan view sketch of the proposed street right-of-way features. The Concept Plan should define or illustrate all of the streetscape features proposed, as well as basic information about traffic operations and typical travel behaviors on the street or streets. Include, at a minimum, the following

street right-of-way features:

### Roadway

- Curblines (including curb bulbs if proposed) or roadway edge;
- Special curb space zones (e.g., loading zones, bus layover zones);
- Parking, on-street location and configuration;
- Traffic operations (as defined above);
- Transit routes (bus, light rail, monorail or streetcar);
- Service access and delivery needs; and
- Street classifications within a quarter mile of the proposed site (refer to [Section 4.2 Street Classifications and Types](#)).

### Streetscape

- Sidewalks, walkways or other pedestrian space (location and dimensions);
- Bicycle parking;
- Paving material design;
- Trees and landscaping design, location and specimen type;
- Street furniture (e.g., benches, planters, waste receptacles), description and location;
- Weather protection (e.g., awnings);
- Signage, especially any non-standard or special signs;
- Public art or other unique features; and
- Transit stops or stations.

### Utilities

- Lighting (roadway, pedestrian scaled or other);
- Utilities, type and location of water, power and drainage both above and below grade;
- Natural drainage proposals; and
- Private utility locations (refer to Chapter 5 Construction and Maintenance, [Section 5.3 Coordination Activities](#)).

#### 6.1.4e Other Considerations or Unique Features Proposed

Include a description of streetscape features that are considered unique (e.g., special paving treatments or landscaping, special street and/or pedestrian lighting, non-standard stormwater or natural drainage treatments).

#### 6.1.5 Approval Process

Concept Plans can be formally approved through a DPD/SDOT Joint Director's Rule. The Proponent develops a [Street Design Concept Plan using the guidance provided in Section 6.1.4](#).

##### 6.1.5a Proposal of Preliminary Concept Plan

The Proponent proposes the preliminary concept to City.

##### 6.1.5b Pre-Application Conference

Proponent attends a pre-application conference with staff from SDOT, DPD and DON (if appropriate) to describe the vision for the Concept Plan and get input as to whether the proposal is feasible. In some cases, staff from other departments may need to be involved in making the final decision as to whether the concept proposed is feasible. In these instances, a final determination of whether the applicant should develop the Concept Plan will be made in writing within 30 days of the pre-application

conference.

#### 6.1.5c Develop Concept Plan

The Proponent develops [Street Design Concept Plan using the guidance provided in Section 6.1.4](#).

#### 6.1.5d City Review of Concept Plan

SDOT, in consultation with DPD, reviews the Concept Plan and describes the modifications or conditions that need to be met for City approval.

#### 6.1.5e Proponent Revises Concept Plan as Requested by City

The Proponent modifies Concept Plan and re-submits to SDOT for final review and approval. SDOT will consult with DPD before a decision is made.

#### 6.1.5f Approval by DPD/SDOT Joint Director's Rule

SDOT and DPD approve the Concept Plan by Joint Director's Rule. The Joint Director's Rule process has requirements for completion including listing the Rule in the Daily Journal of Commerce (DJC) and providing a 14 day appeal period prior to approval. The Rule must also be approved by the DPD and SDOT Directors. Once approved, the Concept Plan is appended to this Manual and listed in [Section 6.1.8: List of Approved Street Design Concept Plans](#).

#### 6.1.6 Summary of Approval Conditions

If a Concept Plan is approved by the City through a Joint DPD/SDOT Director's Rule, then the following applies:

- SDOT has agreed that the proposals described are appropriate for the street or streets defined.
- SDOT and DPD have determined the vision for the streetscape and features described in the Concept Plan are consistent with a recognized community or city sponsored plan for the area.
- The Concept Plan has had an appropriate level of review by SDOT and DPD and by other interested stakeholders.
- Once approved, the Concept Plan will be appended to this Manual and made available through this website. These actions will maintain a record of the proposed improvements, so that as new development proposals come forward within an area covered by a Concept Plan, the City can strongly encourage that the plan be followed.
- Improvements on streets that have an adopted Concept Plan may be implemented at one time, or over a longer period of time by multiple development or street right-of-way improvement projects.
- Preparation of a Concept Plan is encouraged for projects that are located on a designated Green Street or Neighborhood Green Street (refer to [Chapter 6.2 Green Streets](#)).
- Maintenance of any street right-of-way improvements that are beyond City standards is the responsibility of the property owners unless otherwise negotiated with SDOT. View more information about maintenance agreements related to streetscape improvements in [6.2.6f Maintenance](#).

#### 6.1.7 Key SDOT Considerations In Review of Street Design Concept Plans

Enhancements to the streetscape such as special paving treatments and street furnishings can contribute to the experience for pedestrians and help define neighborhood character. Well-designed streetscapes can support activities in neighborhood business districts, and make walking an attractive choice for getting around the city. SDOT recognizes and supports the range of benefits a well-designed streetscape provides for all pedestrians, including people with disabilities. For these reasons, SDOT reviews streetscape design elements very carefully to ensure that all of the materials, dimensions and design elements meet safety and accessibility requirements.

In addition to the aesthetic and practical benefits of a well-designed streetscape, SDOT must meet state and national safety and access standards for streetscape design. It should be possible to carry out the creative intent of a design proposal and meet the safety and accessibility requirements. SDOT and the Department of Planning & Development (DPD) are working together to better coordinate SDOT's early involvement and guidance with the design review process. The information below describes the key issues that SDOT street use permit reviewers and engineers must consider when reviewing streetscape designs:

### 6.1.7a Use of Materials

Pavement materials that result in a slippery or uneven pavement surface will not comply with standards established by the [Americans with Disabilities Act \(ADA\)](#) and therefore should be avoided.

### 6.1.7b Minimum Sidewalk Width, Areas Free of Obstructions

ADA requires a minimum of five feet of clear sidewalk space for two wheel chair users to pass on another. SDOT prefers six feet of unobstructed, linear sidewalk space that is free of street furniture, street trees, planters, and other vertical elements. These minimum widths are required to provide access to people with mobility impairments.

### 6.1.7c Curbside Management

Curbside space to accommodate bike lanes, parking, loading zones, transit zones, and other street elements is in very high demand in Seattle neighborhoods. While wide sidewalks and planting strips may meet many City and neighborhood goals, on-street parking spaces in business districts may also meet multiple policies and goals. Trade-offs are often necessary among the numerous uses competing for limited amounts of curbside space. Removing parking to add other street elements is possible in many locations and always requires careful consideration of business and neighborhood parking needs. Transit system needs, including bus zones, must be accommodated to support quick and reliable transit service throughout the city. Get more information about [curbside space uses](#). And, refer to the [City of Seattle's Comprehensive Plan priorities for curbside space uses](#).

### 6.1.8 List of Approved Street Design Concept Plans

Title	Streets Included	Special Designation	Reference Number
<a href="#">The Street Element of the Ballard Municipal Center Plan</a>	20th and 22nd Avenues NW NW Market Street NW 56 th-58 th Streets	None	<a href="#">SDOT DR 2002-04</a> <a href="#">DPD DR 15-2002</a>
<a href="#">Terry Avenue N. Street Design Guidelines</a>	Terry Avenue North between Denny Way and Mercer Street	None	Pending

## 6.2 Green Streets

[6.2.1 Background](#)

[6.2.2 Green Street Types](#)

[6.2.3 Green Street Locations](#)

[6.2.4 Basic Design Principles](#)

[6.2.5 Designating New Green Street and Neighborhood Green Streets](#)

[6.2.6 Green Street Design, Permit and Construction Process](#)

### 6.2.1 Background

A Green Street is a street right-of-way that, through a variety of design and operational treatments, gives priority to pedestrian circulation and open space over other transportation uses. The treatments may

include sidewalk widening, landscaping, [traffic calming](#), and other pedestrian-oriented features. The purpose of a Green Streets is to enhance and expand public open space, and to reinforce desired land use and transportation patterns on appropriate City street rights-of-way.

The original designation and mapping of Green Streets is in the City of Seattle 1985 Land Use and Transportation Plan for Downtown Seattle. Additional Green Streets were designated in the Northgate Area Comprehensive Plan (City of Seattle, 1993) and in a number of Neighborhood Plans affecting areas throughout Seattle.

Today, the Seattle Comprehensive Plan and the Seattle Department of Transportation (SDOT) provide the policy guidance for green streets. These two plans define a number of Street Types (refer to Chapter 4 Design Criteria, [Section 4.2 Street Classifications and Street Types](#)) including Green Streets and Neighborhood Green Streets. The information in this Manual provides guidance to an applicant who wishes to develop their project along a Green Street or Neighborhood Green Street, including the planning and design process, the City approval process for Green Street and Neighborhood Green Street designs, and some information on construction and maintenance of street features. For the types of street features that are appropriate to include on both Green Street types, refer to Chapter 4 Design Criteria, [Section 4.2 Street Classifications and Street Types](#). For information on the bonus floor area for amenity features allowed in the Seattle Municipal Code, [refer to SMC 23.49.013](#).

## 6.2.2 Green Street Types

There are two types of Green Streets:

1. Green Streets located in Downtown Seattle and defined and mapped in the Land Use Code; and
2. Neighborhood Green Streets that are designated through neighborhood plans or other City adoption process (e.g., City Council Ordinance or Director’s Rule).

The City’s original Green Streets policy offered a developer bonus in exchange for construction of an approved Green Street streetscape, and the bonus was limited to Downtown Seattle, consisting of the Belltown, Denny Triangle, Urban Core, Denny Triangle, Pioneer Square, and International District neighborhoods (refer to [Figure 6-5 Green Street Locations](#) [  1 MB ] ). Subsequently, the City has allowed Green Streets to be designated in Neighborhood Plans outside of Downtown Seattle, where no funding incentive exists. These are referred to as Neighborhood Green Streets. A more complete description of each the policy intent and purpose for each green street type follows:

### Green Street Definition and Purpose

#### Definition

As defined in the [City of Seattle Comprehensive Plan Transportation Element](#), “Green Streets are designated on a number of non-arterial streets within Downtown Seattle. Landscaping, historic character elements, traffic calming, and other unique features distinguish Green Streets from other Street Types. Green Streets are designed to emphasize pedestrian amenities and landscaping in areas that have dense, residential land uses. Each Green Street has its own unique character and design. The street right-of-way dimensions can vary significantly from street to street and from segment to segment.”

#### Purpose

- Enhance pedestrian circulation and create open space opportunities in medium to high density residential areas lacking adequate public open space.
- Create a vibrant pedestrian environment in the street right-of-way that attracts pedestrians.
- Strengthen connections between residential enclaves and other

	<p>Downtown amenities by improving the streetscape for pedestrians, bicycles and transit patrons.</p> <ul style="list-style-type: none"> <li>• Support economic activity in Downtown neighborhoods by creating an attractive and welcoming “front door” for pedestrians.</li> <li>• Maximize opportunities for trees and other landscaping to create a high quality open space.</li> </ul>
<b>Location</b>	Designated streets in Downtown Seattle (refer to <a href="#">Figure 6-5 Green Street Locations</a> [  1 MB ] ).
<b>Typical Adjacent Land Use</b>	Residential or mixed use.
<b>Street Classification</b>	Non-arterial.
<b>Authority</b>	Designated by City Council Ordinance and adopted and mapped in the Land Use Code (SMC 23.49).
<b>Implementation</b>	The design and construction of Green Street improvements is funded by developers in exchange for increased floor-area-ratio (FAR) or other land use code departures, as specified in <a href="#">Seattle's Land Use Code (SMC 23.49.013)</a> .

**Neighborhood Green Streets**

<b>Definition</b>	As defined in the <a href="#">City of Seattle Comprehensive Plan Transportation Element</a> , Neighborhood Green Streets may be on any non-arterial street outside of Downtown Seattle. Similar to Green Streets, Neighborhood Green Streets emphasize pedestrian amenities, landscaping, historic character elements, traffic calming, and other unique features. Neighborhood Green Streets were designated in Seattle’s neighborhood plans.
<b>Purpose</b>	<ul style="list-style-type: none"> <li>• Reflect a local community’s desire to target specific streetscapes for a pedestrian or open space enhancement.</li> <li>• Enhance the pedestrian environment and attract pedestrians.</li> <li>• Create open space opportunities in residential neighborhoods.</li> <li>• Retain unique street features (e.g., brick paving, mature landscaping that is adjacent to the roadway, curbless streets).</li> </ul>
<b>Location</b>	Designated streets in neighborhoods outside of Downtown Seattle (refer to <a href="#">Figure 6-6: Neighborhood Green Street Locations in North Seattle</a> [  521 kb ] and <a href="#">Figure 6-7: Neighborhood Green Street Locations in South Seattle</a> [  521 kb ] ).
<b>Typical Adjacent Land Use</b>	Residential or mixed use that includes residential uses.
<b>Street Classification</b>	Non-arterial.
<b>Authority</b>	Various. Neighborhood Green Streets are typically recommended in Neighborhood Plans or other transportation plans, and may subsequently be adopted into the Land Use Code through City Council Ordinance, designated by joint DPD/SDOT Director’s Rule, or included in a city recognized subarea

transportation plan.

#### Implementation

Neighborhood Green Streets do not have a dedicated funding mechanism in most cases. Funding to design and build Neighborhood Green Streets may come from a Local Improvement District, [Neighborhood Matching Funds](#), partnerships with other agencies (e.g., transit agencies), through private development or as part of a Seattle Public Utilities [Natural Drainage Systems Project](#).

### 6.2.3 Green Street Locations

There are 17 adopted Green Streets in Downtown Seattle (refer to [Figure 6-5: Green Street Locations](#) [  1 MB ] ). With the exception of Harbor Steps (University St. between 1st Ave. and Western Avenue) all of the Green Streets allow motorized vehicular traffic.

There are 15 adopted Neighborhood Green Streets (refer to [Figure 6-6: Neighborhood Green Street Locations in North Seattle](#) [  521 kb ] and [Figure 6-7: Neighborhood Green Street Locations in South Seattle](#) [  521 kb ] ). Another 41 Neighborhood Green Streets have been recommended in neighborhood plans in various neighborhoods, but have not yet been formally adopted and are indicated as either “neighborhood plan recommended” or “tentative” in the figures.

- **Neighborhood plan recommended:** defined in one of Seattle’s 37 adopted neighborhood plans as a Green Street improvement.
- **Tentative:** described in an [adopted neighborhood plan](#) as a street that should have some kind of pedestrian or open space improvement, but were not formally called Green Streets.

### 6.2.4 Basic Design Principles

The following design principles apply to both Green Streets and Neighborhood Green Streets:

- **Emphasize pedestrians and open space over other street functions.** Green Streets serve both as pedestrian gathering places, and as pedestrian corridors connecting activity areas. They are designed to provide an inviting, attractive, and safe streetscape for pedestrians, bicyclists, and transit patrons. In certain cases, green streets may be designed to reduce vehicular travel speeds to the point where it becomes reasonable for pedestrians and vehicles to “share” space in the street right-of-way. In Seattle, a well-known example of this type of “shared street” is Pike Place.
- **Design should complement and enhance adjacent land uses.** Buildings in much of Downtown Seattle are required to have pedestrian friendly features at the ground floor (e.g., transparency, weather protection, prominent entrances). Green street design should complement these features with improvements in the street right-of-way that encourage pedestrian activity.
- **Keep traffic speeds and volumes low.** Green streets are designated on non-arterial streets and are expected to have lower traffic volumes and speeds than other streets in the City. One of the key factors to making a street safe and inviting for pedestrian is maintaining slow vehicle speeds and relatively low vehicle volumes. This is why green streets are designated on non-arterial streets that do not, or are not anticipated to, contribute significantly to vehicle capacity in the area. Often, green streets are designated on non-through streets or streets that are not a key part of the street grid (e.g., dead ends and short segments of street created by the collision of street grids) Design features that tend to reduce vehicular travel speeds are good choices for green street designs ([Chapter 4 Design Criteria, Section 4.2 Street Classifications and Street Types](#)). If a Green Street or Neighborhood Green Street was designated on an arterial street, traffic speeds and volumes would need to support arterial operations and the mobility needs of all users and pedestrian “priority” would not be appropriate.

- **Respond to site specific conditions.** Generally, Green Streets are conceived around a unified design concept--one that reflects or embellishes the unique character of the site. Ideally, such a design concept would be applied to every block of the Green Street. Green streets offer the opportunity to reinforce unique conditions or respond to site specific opportunities (e.g., solar access, historic buildings or street features, topography, stormwater mitigation, views).

### 6.2.5 Designating New Green Street and Neighborhood Green Streets

It is possible to designate new locations for Green Streets and Neighborhood Green Streets. A proposal for a new designation can be made by private development proponents, community organizations. A designation request may come through SDOT, DPD, or the [Department of Neighborhoods \(DON\)](#).

The City will assess the eligibility of the proposed Green Street or Neighborhood Green Street based on the criteria defined below in Section 6.2.5a Criteria for Designating New Green Streets and 6.2.5b Criteria for Designating New Neighborhood Green Streets.

#### 6.2.5a Criteria for Designating New Green Streets

Designating a Green Street is a land use action that must be approved by the City through an Ordinance process. The Land Use Code (SMC reference) defines criteria for each type of land use and zoning designation to ensure that any change to land use or zoning is made according to a set of consistent criteria. The locational criteria for Green Streets are as follows:

1. Streets in medium and high-density areas where residents generally do not have access to private yards, existing open space is very limited, and land is not available for future open space development.
2. Streets within or providing connections to pedestrian-oriented neighborhood commercial areas where Green Street improvements could reinforce commercial and mixed use activity, and enhance the quality of the pedestrian environment without conflicting with the desired traffic circulation.
3. Streets at critical locations in redeveloping areas that could serve as a focus for new development and provide direction for desirable changes in land use patterns. Examples might include streets that, as Green Streets, could strengthen the residential character of areas where efforts are being made to promote residential development or stabilize an existing neighborhood.
4. Streets and street ends which provide safe pedestrian and bicycle connections with neighborhood attractions, such as schools, shopping areas, public facilities, institutions and public open spaces, or streets integrated with the City's urban trail network.
5. Streets that have a special character that is of interest to pedestrians, including streets providing shoreline access, streets with special views, and streets located in areas of unique historic or architectural interest.
6. Undeveloped streets within designated open spaces where it is desirable to retain the undeveloped conditions of the surroundings.

#### 6.2.5b Criteria for Designating New Neighborhood Green Streets

There are no official criteria for neighborhood green streets in the Seattle Municipal Code. This chapter identifies the following as appropriate criteria for Neighborhood Green Streets.

1. Neighborhood Green Streets shall support multiple functions in the street right-of-way, especially pedestrian access and landscaping. Streets that are good candidates for traffic calming are also appropriate as streets with slower traffic enhance conditions for pedestrians and support the Neighborhood Green Street concept.
2. Streets that are direct links to major transit facilities and light rail stations.

3. Streets and street ends which provide safe pedestrian and bicycle connections with neighborhood attractions, such as schools, shopping areas, public facilities, institutions and public open spaces, or streets integrated with the City's Urban Trails Network.
4. Streets that have a special character that is of interest to pedestrians, including streets providing shoreline access, streets with special views, and streets located in areas of unique historic or architectural interest.
5. Undeveloped streets or streets that are not fully improved (e.g., sidewalk, curb and gutter) where it is desirable to retain the undeveloped conditions of the surroundings. In some cases, property access on undeveloped streets may necessitate that a minimum level of improvements be completed, but not required at the full standard.

### 6.2.6 Green Street Design, Permit and Construction Process

Design and permit activities on designated Green Streets and Neighborhood Green Streets shall follow the following process, defined below and charted in [Figure 6-8: Green Street Design, Permit and Construction Process](#) [  377 kb ].

#### 6.2.6a Initial Contact

The proponent (developer or community group representative) can start the Green Street design, permit and construction process by contacting either the [Seattle Department of Transportation \(SDOT\)](#) or [Department of Planning and Development Department \(DPD\)](#).

#### 6.2.6b Prepare a Street Design Concept Plan

To assist in approval of a Green Street or Neighborhood Green Street it is necessary to prepare a Concept Plan according to the guidelines and templates in [Section 6.1 Street Design Concept Plans](#). For Downtown Green Street projects seeking an increase in FAR (Floor Area Ratio) provide FAR calculations per [Seattle Municipal Code Section 23.49.013](#).

At this point, the project proponent can decide to have the Concept Plan adopted by Joint DPD/SDOT Director's Rule or prepare the Concept Plan at a level of detail suitable for Street Improvement Permit Review. Refer to [Chapter 2.4.1 Street Improvement Permits](#).

#### 6.2.6c Existing Street Design Concept Plan Review

If an approved Concept Plan exists for the Green Street or Neighborhood Green Street, it is the responsibility of the applicant to determine if the design concept is still viable given conditions in the area or the design standards that may have changed since the approval of the original Concept Plan.

#### 6.2.6d Permit Review and Issuance

After incorporating comments from the City review for the Concept Plan, the Green Street proponent refines the Concept Plan to an adequate level of design to commence a [Master Use Permit \(MUP\)](#) and/or [Building Construction Permit](#) process, or if the proposal impacts the street right-of-way and not private property, the proponent will want to initiate a Street Improvement Permit process. For information about how to prepare a Street Improvement Permit, including early design guidance, plan requirements, and City of Seattle CAD standards, refer to [Section 2.4.1 Street Improvement Permits](#), in particular SDOT [Client Assistance Memo \(CAM\) #461](#) and SDOT [CAM #462](#).

#### 6.2.6e Green Street and Neighborhood Green Street Construction

Construction of the Green Street that is part of a MUP or Building Construction Permit can commence once the DPD and SDOT reviews for the Street Improvement Permit and the MUP or Construction Permit are issued. The project is concluded by a final inspection and, where relevant, issuance of a Certificate of Occupancy.

For Neighborhood Green Street projects that are not part of a MUP or Construction Permit, construction can commence when the Street Improvement Permit is issued. The process is concluded with the

approval of a final inspection of the work completed.

### 6.2.6f Maintenance

Sidewalks with special paving treatments (such as pavers or stamped, colored concrete) add a unique design element to the streetscape and can enhance the walking experience for pedestrians. It is important to design special paving so that it retains its integrity over time. This is becoming increasingly important as the number of utility cuts on sidewalks increases to respond to the demands of higher density development. Carefully selected colors can be mismatched as the original color fades and new sections are applied. A successful design solution will address safety, access, and aesthetics.

To assure that maintenance is considered when streetscape design features are being selected, SDOT requires a maintenance agreement for all streetscape treatments that go beyond City Standards. The following sections provide an overview of what is expected of the property owner and SDOT regarding maintenance of streetscape features:

**Responsibility:** With their consent, the abutting property owners shall be responsible for the maintenance of the completed Green Street section unless there is an agreement in writing, acceptable to SDOT, which provides for an alternative maintenance and repair program. Said agreement shall be a written condition on any street use permit for a Green Street project.

**Joint agreements:** Proponents may enter into an agreement with other property owners adjacent to their Green Street section for shared maintenance responsibility.

**Maintenance, repair and replacement:** Maintenance responsibilities for Green Streets shall include ongoing sweeping, debris removal, landscape maintenance, and responsibility for the repair and replacement of all auxiliary street design elements of the Green Street (i.e. fixture replacement, replacing tree grates, paver repair, replacement or repair of special amenities such as fountains, benches, and planters).

## 6.3 Station Area Plans

### 6.3.1 Overview

Station area planning (SAP) defined a vision and framework for future development around transit stations for Link Light Rail and the Seattle Monorail Project. The City of Seattle, in partnership with transit agencies and with significant input from the community completed station area planning for light rail stations on the initial segment of Link Light Rail and for the 19 proposed monorail stations of the Green Line. In general, station area planning efforts have focused on the areas within a quarter mile of the proposed transit station. The plans identify key public and private investments as well as City actions to achieve City and Community goals in the station areas.

Station area plans have significant input and review by the communities in or adjacent to the station area and may provide useful context for future development plans and projects in the areas they address.

### 6.3.2 Light Rail Station Area Plans

The [Link Light Rail Station Area Planning](#) web pages on the Seattle Department of Transportation (SDOT) website provides a comprehensive record of accomplishments resulting from the Station Area Planning Program, a three-year effort led by the City of Seattle Strategic Planning Office in partnership with Sound Transit. With support from Sound Transit, Station Area Planning engaged city departments, community representatives and partner agencies in planning and development work for the ¼ mile around proposed light rail stations.

The Station Area Planning Program refined the community's vision initially articulated in neighborhood plans, for each station area and has already begun to implement some of the actions necessary to make these visions a reality. Station area plans were completed for thirteen neighborhoods: Rainier Beach/S. Henderson St. Station, Othello/New Holly Station, Columbia City/S. Edmunds St. Station, Mt. Baker/S. McClellan St., Beacon Hill Station, International District/Chinatown Station, Pioneer Square Station, Westlake/Convention Place Station, and the First Hill, Capitol Hill, University District Station areas. Each plan includes a vision for the station area, an urban design concept plan and a number of strategies and actions recommended to accomplish the vision. Refer to the [SDOT website](#).

### 6.3.3 Monorail Station Area Plans

Station Area Planning for the Green Line monorail system is a complementary effort to the station and guideway design work undertaken by the Seattle Monorail Project (SMP). Monorail Station Area Planning will identify the opportunities and implications presented by the arrival of the Green Line including suggested actions to best integrate the station and transportation system into the surrounding built environment and future use patterns of community members. The dynamic relationships between transportation, land use, economics, and urban form within station areas will be examined through Station Area Planning. Get more information about Monorail station area planning on the City of Seattle [Integrating the Monorail](#) web pages.

## 6.4 Natural Drainage Systems

[6.4.1 Chapter Purpose](#)

[6.4.2 Definition of Natural Drainage Systems](#)

[6.4.3 Benefits of Natural Drainage Systems in Creek Watersheds](#)

[6.4.4 Where Natural Drainage Systems Work Best](#)

[6.4.5 Design Guidance](#)

[6.4.6 Approval and Permit Procedures](#)

[6.4.7 Maintenance Responsibilities](#)

### 6.4.1 Chapter Purpose

The purpose of this chapter is to provide guidance to applicants that are interested in considering Natural Drainage System (NDS) designs as part of their development project. NDS designs can improve community livability and creek health and be accomplished consistent with public safety, utility functions, transportation uses and other environmental priorities for Seattle's street rights-of-way.

### 6.4.2 Definition of Natural Drainage Systems

NDS design is an alternative approach to a typical curb and gutter street improvement with underground drainage and detention systems. An NDS uses swales, landscaping and permeable pavements to accomplish the following:

- reduce the amount of impermeable surface in the street right-of-way;
- filter pollutants from surface water through soil and plants; and,
- slows the flow of water to improve habitat for fish and other wildlife in Seattle's urban creeks.

### 6.4.3 Benefits of Natural Drainage Systems in Creek Watersheds

When you live in a creek watershed, the rain that falls in your neighborhood flows through pipes and ditches to the creek as stormwater. In Seattle, creeks are fragile ecosystems, home to salmon and other wildlife. At one time stormwater infiltrated the soils of meadows and wetlands, and collected on the surface of trees and vegetation. It was released slowly throughout the year to streams, lakes and estuaries.

With urban growth the trees and vegetation have been replaced with impermeable or disturbed surfaces

such as rooftops, roadways, and construction sites. Consequently stormwater flows across these surfaces collecting pollutants generated by our urban activities, such as landscaping, transportation, and business. Instead of reaching creeks slowly, the water flows quickly and in great volumes to Seattle's creeks. This causes erosion of stream banks, increased flooding, and degradation of water quality and aquatic habitat.

Seattle has implemented a pilot NDS Program as one tool to mitigate these impacts. The program includes City-funded capital projects that retrofit residential streets in creek watersheds to improve stormwater management and provide other neighborhood amenities such as landscaping. Get more information on the City's [Natural Drainage System Capital Program](#).

Based on the success of these capital projects, Seattle Department of Transportation and Seattle Public Utilities have compiled the design guidance in this chapter to assist developers with projects in creek watersheds that want to include NDS techniques as part of their projects.

#### 6.4.4 Where Natural Drainage Systems Work Best

**Residential access streets in creek watersheds:** The primary function of residential access streets is to provide access to neighborhood land uses and connections to higher level traffic streets, such as arterials. Residential access streets typically have lower traffic volumes, lower speeds and lower volumes of trucks and buses than arterial streets.

**Locations with existing informal drainage:** [Seattle's creek watersheds](#) [  500 kb ] are largely served by informal drainage (e.g., ditch and culvert systems, or no formal system at all) and NDS improvements provide an opportunity to enhance the existing informal system. Refer to [Figure 6-9: City of Seattle Creek Basin](#) [  500 kb ].

**Areas with existing ditches** The Natural Drainage System (NDS) guidance in this chapter may be used to implement street improvements in locations that have a ditch and culvert system. Since the City does not permit the filling of a ditch if that ditch functions as part of the City's informal drainage system in the street right-of-way and is located within a creek watershed, NDS options are encouraged as an alternative to ditch filling. Exceptions to the ditch filling moratorium policy include culvert installations that are necessary to implement driveway permits, required street improvements, City-approved street improvements, or City capital improvements.

The SDOT Director may approve a requested exception per the Street Use Code (15.04.112) if the Director determines that the modification is likely to be equally protective of public health, safety and welfare, the environment, or public and private property. If the proposed modification is not equally protective, the Director may approve a requested exception if substantial reasons are documented such as:

- an emergency situation necessitates approval of the exception;
- a reasonable use of the adjacent property is not possible unless the exception is approved; or
- harm or threat of harm to public health, safety and welfare, the environment, or public and private property is at risk unless the exception is approved.

#### 6.4.5 Design Guidance

The design guidance in this chapter typically applies to street improvements using Natural Drainage System (NDS) elements, and may need to be modified to address local conditions.

The design guidance presented below should be considered once the applicant and the City have jointly determined that a NDS approach is appropriate for the project. Keep in mind that NDS projects need to

be designed in a manner which ensures protection of the public's safety and addresses the mobility needs of the traveling public. If an NDS approach is being considered, the applicant is encouraged to participate in an [early design guidance meeting](#) with City staff to discuss possible site constraints, transportation needs, soil conditions, design and accessibility issues, and maintenance responsibilities.

Note: minimum requirements defined in the [Land Use Code](#), the design criteria in [Chapter 4 Design Criteria](#) of this Manual, and any applicable [City of Seattle Standard Plans and Specifications](#) apply to NDS improvements in the street right-of-way. Deviations from the design criteria presented in this Manual may be allowed in some cases, where minimum requirements can not be achieved due to site constraints.

### 6.4.5a Principles

There are a few guiding principles to consider when designing a Natural Drainage System (NDS) project in the street right-of-way:

**Minimize impermeable surfaces** Avoid paving or compacting soils where it is not necessary. This could mean a narrower driveway, a smaller parking area, or use of alternative materials which reintroduce water back into the soil.

**Gentle slopes to slow the flow:** When stormwater moves slowly through a system more pollutants are filtered and more water infiltrates or evaporates. A pipe is designed to move water at top velocities. Re-grading a ditch with gentler side slopes and a moderately sloping, broad channel allows water to percolate into the soil. Channel bottoms can be made gentler by adding “steps.”

#### Amend soil and add vegetation to reduce stormwater quantity:

- **Amend soils** Adding organic compost or mulch to soil improves its ability to support plants and absorb stormwater. Healthy soil is the backbone of natural drainage systems. Refer to [Standard Specification 7-21](#) for more information.
- **Add vegetation:** Trees and vegetation catch rainfall before it reaches the ground reducing the amount of stormwater runoff. Native shrubs, perennials and small trees planted in natural drainage systems slow the movement of stormwater, encourage infiltration and provide bio-remediation of pollutants.

NDS may be accomplished as a street improvement or in conjunction with a construction permit. Not all NDS options are appropriate for all project types. [Figure 6-10: Natural Drainage System Menu of Options](#) [  535 kb ] identifies appropriate NDS options based on the permit type.

### 6.4.5b Natural Drainage System Options

#### 1. Swales

Swales replace traditional planting strips with linear rain gardens. Swales can vary in depth from six inches to 24 inches and can be planted with grass, perennials, shrubs and small trees. Consider the following guidance for swale design:

Swale Design Category	Design Guidance
Swale Grade	Side slopes: 3 horizontal minimum to 1 vertical on the roadside of the swale. Variance of up to 2 horizontal to 1 vertical slope on non-street side may be approved by the City Traffic Engineer.
Depth	Where no ditch currently exists, swale depth should be 6 inches minimum. Swale

	depth should not exceed 3.9 feet maximum below the roadway.
Longitudinal Slope	Grade elevation through the length of the swale should be gradual and match adjacent elevations.
Top Width	7-12 feet depending on site conditions.
Bottom Width	2 foot minimum (1 foot may be approved by City Traffic Engineer in consultation with SPU).
Shoulder Grade	<ul style="list-style-type: none"> <li>• Grade shoulder adjacent to roadway with 2% slope toward swale.</li> <li>• Shoulder should withstand vehicular traffic loads.</li> <li>• Grade a 2-foot shoulder on the private property side of the swale with 2% slope toward the swale.</li> <li>• Railing or fences may be necessary to protect the public safety adjacent to swale embankments.</li> </ul>
Clearances	<ul style="list-style-type: none"> <li>• Must be at least 30 inches over top of water service and gas line.</li> <li>• Grade a 3 foot flat area around all power poles or fire hydrants.</li> <li>• If filling around a power pole more than 10 inches, notify City Light for wood surface treatment.</li> </ul>
Soil Amendments and Depth	<ul style="list-style-type: none"> <li>• Amend existing substrate by incorporating 3 inches of compost or decomposed mulch to a depth of 6-8 inches.</li> <li>• If longitudinal slope is greater than 6% or existing ditch is lined with asphalt, provide appropriate soil erosion protection such as a 3 inch depth of 1-3 inch clean rock.</li> </ul>
Plantings	<ul style="list-style-type: none"> <li>• Plantings of a variety growing taller than 30 inches should be placed at least 10 feet from the pavement edge and 1 foot from sidewalk corridor.</li> <li>• Long term maintenance of plantings needs to be considered.</li> </ul>

## 2. Soils and Planting

The success of a natural drainage system has much to do with building healthy soils that can readily absorb surface water, and selecting appropriate plants. Consider the following guidance for soil and plant selection:

Planting Component	Design Guidance
Materials	Plantings should consist of primarily native shrubs, perennials, and groundcovers that can thrive in wet and dry soil moistures. Refer to an <a href="#">NDS planting list</a> for more information.
Sight distances	Locations for materials larger than 30 feet in height at maturity should be placed at least 10 feet from the pavement edge and 1 foot from the sidewalk corridor and not block sight distance of driveways, alleys and streets.
Sizing	Trees and other plant materials shall be sized for compatibility with sloped planting conditions and may be smaller than typical street design standards.
Soil amendments	Amend existing substrate by incorporating 3 inches of compost or decomposed mulch to a depth of 6-8 inches.

### 3. Sidewalks

If sidewalks are required for your development permit, consider using alternative materials such as permeable pavement or unit pavers.

Sidewalk Component	Design Guidance
Width	5 feet in width, or sized to accommodate typical use (e.g., sidewalk may need to be wider near a school or transit stop).
Setbacks	Ensure 1-2 feet of unpaved flat shoulder between sidewalk and swale slope. Depending on the slope, railings may be needed.
Materials	<a href="#">Get more information on permeable pavement types.</a> <a href="#">Get more information on maintenance of permeable pavements.</a>

### 4. Driveways

The location and design of driveways has a significant influence on the success of an NDS. Consider the following design guidance for driveways located within the street right-of-way when a NDS is being used:

Driveway Component	Design Guidance
Width	12 feet within the street right-of-way. Narrower driveway openings may be considered based on site conditions.
Shoulder	Provide 2 foot compacted load bearing shoulder on both sides of new driveway before the swale or berm starts.
Slope	Driveway profile slope within the street ROW shall comply with <a href="#">Standard Plans 430 and 431</a> .
Materials	Minimize driveway pavement through the use of Hollywood drives (paving wheel tracks only) and permeable surfaces (such as structural grass, permeable asphalt, permeable concrete, unit-pavers, or gravel pave behind the sidewalk area. Refer to <a href="#">Figure 6-11: Permeable Pavement Comparison Guide</a> [  5 MB ] for more information.

### 5. Parking

The location and design of on-street parking has a significant influence on the success of a natural drainage system. Consider the following design guidance on parking space size, location and materials:

Parking Space Component	Design Guidance
Size	No larger than 8 x 20 feet within the street right-of-way.
Shoulder	Provide 1 foot compacted shoulder between parking pad and swale.
Materials	Minimize pavement through the use of Hollywood drives (paving wheel tracks only) behind the sidewalk only, and permeable surfaces (such as structural grass, permeable asphalt, permeable concrete, unit-pavers, or gravel pave. Refer to <a href="#">Figure 6-11:</a>

[Permeable Pavement Comparison Guide](#) [  5 MB ] for more information.

## 6. Roadway

The design of the adjacent roadway must meet minimum [City of Seattle design criteria](#). Consider the following design guidance for altering or adding roadways in creek watersheds:

Roadway Component	Design Guidance
Shoulder	Minimum 2-foot road shoulder on each side of the road, with 2% maximum slope toward swales. Acceptable road shoulder materials should comply with <a href="#">Standard Specification 2-06: Subgrade Preparation</a> and <a href="#">4-04: Ballasting and Crushed Surfacing</a> .
Cross slope	Cross slope range is between 2% and 4%. The roadway may drain to one side toward the curb and/or swale as long as no concentrated curb discharges occur. Where repaving or adding part of the roadway width, the cross slope should be a continuation of the existing slope or be sloped to drain the surface runoff from the pavement. The roadway cross slope shall not be greater than 4%.
Minimum roadway profile	Minimum roadway profile is 1%.
Minimum roadway width	The minimum roadway width is 20 feet with the following conditions. <ul style="list-style-type: none"> <li>• Pedestrian shoulder is adjacent to the roadway with on- street parking on one side of the street.</li> <li>• Sidewalk (if it exists) is separated from the roadway with parking on one side of the street.</li> <li>• Survey information including traffic volume, traffic speed and parking utilization may be required for review.</li> <li>• Depending on local conditions, SDOT may increase the required pavement width or remove parking.</li> </ul>

## 7. Permeable Paving

Permeable pavements are surfaces that allow water to pass through voids in the paving material and/or between paving units while providing a stable, load-bearing surface. Permeable pavements reduce impermeable surfaces and can be used to achieve City of Seattle water quality requirements and credit toward flow control requirements.

An important component to permeable pavements is the reservoir base course, which provides stability for load-bearing surfaces and underground storage for runoff. There are three main categories of permeable pavements that meet Seattle 's permeable pavement standards:

**Permeable concrete or permeable asphalt pavement:** Is similar to standard pavement, but the fine material (sand and finer) is reduced or eliminated in the mix. As a result, channels form between the aggregate in the pavement surface and allow water to infiltrate.

**Plastic grid systems** Come in rolls that are covered with soil and grass or gravel. The grid sections interlock and are pinned in place.

**Interlocking pavers:** Include cast-in-place or modular pre-cast blocks. The cast-in-place systems are reinforced concrete made with reusable forms. Pre-cast systems are either high-strength Portland cement concrete or plastic blocks. Both systems have wide joints or openings that can be filled with soil and grass or gravel.

Refer to [Figure 6-11: Permeable Pavement Comparison Guide](#) [  5 MB ] for more information on these materials.

**Permeable pavements—use within the street right-of-way**

At this time, permeable pavements are limited to non-street surfaces, such as sidewalks, driveways and parking pads. The following table outlines which materials are allowed for each street right-of-way component.

Component	Design Guidance—Approved Materials
Driveway, parking pad	Parking spaces and driveways may use the gravel-pave technique, permeable concrete or permeable asphalt provided the City’s loading requirements for driveways and long term maintenance considerations are met. Refer to <a href="#">Standard Plan 430</a> and <a href="#">Standard Plan 431</a> for more information.
Sidewalk	Permeable asphalt and permeable concrete may be used for sidewalks provided the City’s ADA requirements and long term maintenance considerations are met.
Pathway	Permeable asphalt, permeable concrete, unit pavers and gravel-pave may be used for informal pathways.
Roadway	Roadway pavement shall continue to use standard non-permeable materials.

**Permeable pavements—pathways only**

Component	Design Guidance
Setbacks	<ul style="list-style-type: none"> <li>• Permeable pavements should not be placed within 300 feet of any steep slope.</li> <li>• A minimum 5-foot setback shall be maintained between any part of an infiltration device and any structure or property line.</li> </ul>
Subbase	<ul style="list-style-type: none"> <li>• Permeable pavements shall be placed over a base material that is partially or completely below surrounding grade. Sub-base depth should be adequate to avoid a freeze-thaw impact.</li> </ul>
Limitations	<ul style="list-style-type: none"> <li>• Do not use at “high-use” sites, auto commercial services (gas stations, mini-marts, commercial fueling stations, auto body and auto repair shops, auto wash), commercial truck parking areas, areas with heavy industrial activity (as defined by US Environmental Protection Agency regulations), or areas with high pesticide use.</li> <li>• Do not use where seasonal high groundwater is at or near ground surface.</li> <li>• Do not use in areas subject to heavy, routine sanding for traction during snow and ice accumulation.</li> <li>• Do not use on slopes exceeding 10%.</li> <li>• No run-off from adjacent surfaces is preferred. If run-off comes from minor or incidental permeable areas, those areas must be fully stabilized. Sediment from adjacent areas onto the permeable surface must be minimized.</li> <li>• For projects that trigger City of Seattle Stormwater Code, supplemental design</li> </ul>

- requirements identified in the [Flow Control Manual](#) shall be followed.
- As with other paving surfaces, longevity varies by material. Refer to the [Figure 6-11: Permeable Pavement Comparison Guide](#) [  5 MB ] for more detail.
- Additional limitations are outlined in [City of Seattle Standard Specifications](#).

#### 6.4.6 Approval and Permit Procedures

If you are interested in using NDS guidance for street improvements, the following steps may be required in addition to the [standard permit applications process](#):

- Apply for a permit at the [SDOT Street Use Counter](#).
- Site plan drawn to scale (1 inch=20 feet scale suggested) that must include the area in the street right-of-way between parcel boundaries and 3 feet beyond, and from the street right-of-way boundary to the centerline of the road.
- Site plan must show the following features:
  - Existing structures in the street right-of-way such as culvert invert elevations, edges of any pavement including roads and driveways, and locations of manholes, fire hydrants, light poles, water main and meters, significant trees, etc.
  - Locations of new plant material, rocks, hardscaping, or other materials.
  - Indicate flow direction in the swale.
  - Cross-section drawn to scale (1 inch=5 feet or 1 inch=10 feet scale suggested) that shows maximum side slopes and maximum swale depth (as measured from the edge of the road).
- SPU, SDOT Traffic Operations and Street Use sections will review the application, and conduct a site visit if necessary prior to approving the plan.
- If approved, the applicant must pay the permit fee and pick up the completed permit at the Street Use counter.
- Following the completion of construction, a final site inspection will be conducted by a City of Seattle inspector.

#### 6.4.7 Maintenance Responsibilities

As with other types of street improvements, adjacent property owners are responsible for maintaining sidewalks, driveways and parking pads as well as landscaping in the street right-of-way. The following sections provide general maintenance guidelines specific to natural drainage landscaping and permeable pavements.

##### 6.4.7a Soil and Plantings

Establishment of plantings takes approximately 3 years.

**Year 1:** Plants are working very hard below the ground to develop new roots. Appropriate soil moisture will make the difference between success and failure during the first year. Plants need watering, a minimum of once per week for shady areas and twice per week for sunny areas, throughout the first summer. Pruning should be limited to the removal of damaged limbs, since plants and trees need maximum foliage to generate energy to develop new roots.

**Year 2:** Plants will begin to put on new growth and continue to develop root systems. Soil moisture is less critical than during the first year, so watering can be done less frequently. Weeding will be necessary. Pruning is still discouraged, except to remove damaged or dead limbs.

**Year 3:** Successfully established plantings will flourish in the third year. Expect larger shrubs to require some pruning for clearance along the sidewalk. Pruning should be limited to encourage the natural growth habit of the plant.

**Natural lawn and garden care only:** Pesticide use is not allowed in the City's drainage system including natural drainage systems. Refer to the [City's Natural Lawn and Garden Care website](#) for tips regarding smart water and pesticide use.

**Plant replacement during establishment:** Adequate plant coverage is necessary to guard against soil erosion. Ideally the original planting will include a wide selection of species spaced to provide more than adequate coverage. If there is adequate coverage of the swale soils, not all plants that fail to thrive will need to be replaced. If patches of bare soil emerge, plantings should be replaced. If groups of plants are lost, a different species may need to be considered.

**Maintenance of the mulch layer:** is important for both moisture retention and weed control. Spring and Fall are excellent times to mulch and prune trees and shrubs where needed.

**Trimming, thinning and pruning:** Once plants are established and thriving, periodic trimming, thinning and pruning of plantings and trees may be necessary to ensure that the swale edge is not completely obscured. This is particularly important on narrow rights-of-way so that pedestrians, bicyclists and drivers are aware of the change in elevation between the roadway and the swale.

#### 6.4.7b. Maintenance for All Permeable Pavements

Permeable pavements and pavers require some additional maintenance to keep them functioning properly:

**Inspect for surface material that may clog the pavement:** Inspect the project upon completion to remove any fine material that has accumulated on the surface. Conduct periodic visual inspections to determine if surfaces are clogged with vegetation or fine soils. Clogged surfaces should be corrected immediately.

**Periodic vacuum sweeping or pressure washing:** Permeable concrete and permeable asphalt surfaces should be swept with a high-efficiency or vacuum sweeper twice per year, preferably, once in the autumn after leaf fall, and again in early spring. High pressure hosing could substitute for sweeping or supplement sweeping if material appears clogged. For gravel pave or unit pavers, replace gravel if clogging occurs.

**Surface sealing is NOT allowed:** Permeable paving or pavers will no longer function if the surface is sealed with a sealant application or other uncontrolled use.

**Utility cut repair:** Utility cuts should be backfilled with the same aggregate base used under the permeable paving to allow continued conveyance of stormwater through the base, and to prevent migration of fines from the standard base aggregate to the more open graded permeable base material. Small utility cuts can be repaired with conventional asphalt or concrete if small batches of permeable material are not available or are too expensive. Replace broken pavers or grid segments where three or more adjacent rings are broken or damaged.

**Replenish aggregate:** Replenish paver aggregate material in surface as needed.

**Maintain public safety:** With NDS systems that have highly technical designs, it is critical to identify responsibility for utility providers, SPU and property owners on how the pavement or area will be maintained and re-established to maintain public safety.

These maintenance responsibilities are critical to the successful functioning of an NDS and will be included as a project permit condition.

## 6.5 Traffic Calming

[6.5.1 Overview](#)

[6.5.2 Policy Guidance for SDOT's Neighborhood Traffic Control Program \(NTCP\)](#)

[6.5.3 Neighborhood Traffic Control Program Goals](#)

[6.5.4 Considerations for Traffic Calming on All Streets](#)

[6.5.5 Additional Considerations for Traffic Calming on Arterial Streets](#)

[6.5.6 Typical Traffic Calming Devices in Seattle](#)

[6.5.7 Process for Installing Traffic Calming](#)

[6.5.8 Point Criteria for Traffic Calming Project Ranking](#)

[6.5.9 Trials and Temporary Installations for Traffic Calming](#)

[6.5.10 Landscaping for Traffic Calming Devices](#)

### 6.5.1 Overview

Traffic calming is a way to design streets to improve safety, reduce the amount of cut-through traffic traveling on residential streets, and generally encourage people to drive more slowly. Along with education and enforcement, traffic calming has been used in many Seattle neighborhoods to slow speeds on residential streets and improve neighborhood livability by reducing cut-through traffic and improving the environment for pedestrians.

Traffic calming relies on physical and visual cues in, and adjacent to, the roadway to induce drivers to travel at slower speeds. Traffic calming is self-enforcing. The design of the roadway results in the desired effect, without relying on compliance with traffic control devices such as signals, signs, and without enforcement. Street trees and lighting complement traffic calming devices and are often used to provide the visual cues that encourage people to drive more slowly.

Traffic calming is such a powerful tool because it is effective. Some of the effects of traffic calming, such as fewer and less severe crashes, are clearly measurable. Others, such as supporting community livability, are less tangible, but equally important. Experience throughout Europe, Australia, and North America has shown that traffic calming, if done correctly, reduces traffic speeds, the number and severity of crashes, and noise level. Research on traffic-calming projects in the United States supports their effectiveness at decreasing automobile speeds, reducing the numbers of crashes, and reducing noise levels in certain locations.

This section defines the Seattle Department of Transportation's (SDOT) traffic calming policy, including appropriate tools for use on residential and arterial streets. Also included is a description of the steps that community members must take to get SDOT to evaluate traffic calming requests and prioritize them for design and construction.

### 6.5.2 Policy Guidance for SDOT's Neighborhood Traffic Control Program (NTCP)

Seattle's [Neighborhood Traffic Control Program \(NTCP\)](#) was established in 1978 as part of the City's annual Capital Improvement Program (CIP). Since then, Seattle's residents, in partnership with the City, have been involved in the installation of over 800 traffic circles and other traffic calming devices on

neighborhood streets. View the 2004 map of new traffic circle locations. This map is updated annually.

The purpose of the NTCP has been to reduce accidents and speeds on residential streets, thereby creating safer, more pleasant neighborhoods. Traffic circles are the most common tool used and can be seen in most residential neighborhoods throughout the City. SDOT's NTCP is guided by specific goals and policies in the [City of Seattle Comprehensive Plan \(2004\)](#) and the [Transportation Strategic Plan \(2005\)](#) as follows:

Comp. Plan Goal TG2	Manage the street system safely and efficiently for all modes and users and seek to balance limited street capacity among competing uses.
Comp. Plan Goal TG7	Protect neighborhood streets from through traffic.
Comp. Plan Policy T17	Use neighborhood traffic control devices and strategies to protect local streets from through traffic, high volumes, high speeds, and pedestrian/vehicle conflicts. Use these devices and strategies on collector arterials where they are compatible with the basic function of collector arterials.
TSP Strategy S2	Continue Seattle's Neighborhood Traffic Control Program.
	Consider requests from neighborhood organizations and citizens and consequently design and implement traffic circles and other neighborhood traffic control devices. These devices can be very effective to slow speeds and reduce collisions on neighborhood streets. In fact, to date, Seattle's traffic circles have resulted in a substantial reduction in accidents and speeds in neighborhoods. They can also encourage through traffic to stay on arterial streets, reducing the impact of cut through traffic on neighborhoods.

### 6.5.3 Neighborhood Traffic Control Program Goals

Consistent with the direction in the Comprehensive Plan and Transportation Strategic Plan, the Neighborhood Traffic Control Program (NTCP) has established the following program goals:

- Traffic calming projects shall improve neighborhood livability in balance with transportation efficiency and the safety needs of the communities.
- The NTCP shall take a holistic approach to traffic management, resulting in streets that provide access to neighborhood destinations for all modes, including walking, bicycling, transit and automobiles.
- Traffic calming devices shall complement the overall transportation network and not result in shifting the problem to an adjacent street.
- Traffic calming is not designed to address dangerous intersections, mitigate traffic noise, redesign the overall transportation and street classification system or effect a modal shift.

### 6.5.4 Considerations for Traffic Calming on All Streets

Although traffic calming is typically used on residential streets, there are certain tools that are appropriate for use on some arterial roadways. When a traffic calming approach is considered for any street, SDOT applies the following guidance:

- **Vehicle speed** is more critical than volume in terms of safety and should be addressed first where there are constraints.

- **Neighborhood involvement** is important to successful implementation. Rationale for traffic-calming and management measures should be explained clearly to community residents and installation of these treatments should incorporate public input.
- Traffic-calming and management measures should fit into, and preferably **enhance, the street environment**.
- Traffic-calming designs should be **predictable and easy to understand** by drivers and other users.
- **Devices that meet multiple goals** are usually more acceptable. For example, a raised crosswalk may be more understandable to motorists than a speed hump. The former has a clear goal, whereas the latter may be perceived as a nuisance.
- **Treatments need to be well designed** and based on current available information on their applications and effects. Information on U.S. experiences with various traffic-calming measures can be found in [ITE's \*Traffic Calming: State of the Practice\*](#).
- Devices should **accommodate emergency vehicles**. Emergency response times shall be considered.
- Traffic-calming areas or facilities should be **adequately signed, marked, and lit** to be visible to motorists.
- **Treatments need to be spaced appropriately to have the desired effect on speed**—too far apart and they will have a limited effect, too close and they will be an unnecessary cost and annoyance. Devices usually need to be spaced about 300 to 500 feet apart. If they are spaced too far apart, motorists may speed up between them. This is particularly the case where the devices are added onto the street (e.g., speed humps).
- **Whole street designs** are usually able to create an environment that supports slower speeds for the entire length.
- **Facilities should not be under-designed or they will not work**. Keeping the slopes too gradual for a speed table or curves too gentle for a chicane will not solve the problem and will appear as a waste of money and may ruin chances for future projects.
- Traffic-calming measures should **accommodate bicyclists, pedestrians and people with disabilities**.
- If a measure is likely to divert traffic onto another local street, **the area-wide street system should be considered** so as not to shift the problem from one place to another.
- Devices should be thought of as **elements of a traffic calming system** and be placed to improve pedestrian conditions throughout an area.

#### 6.5.5 Additional Considerations for Traffic Calming on Arterial Streets

Seattle has streets within the arterial network that are primarily residential and are optimally used as routes to “collect” local traffic to move it to higher capacity arterial streets. Since Seattle’s street grid is largely built and congestion continues to increase, collector arterials are being used as cut-through routes by motorists trying to avoid congestion. Communities are concerned about higher traffic speeds and volumes on the collector arterials in their residential neighborhoods and are requesting traffic calming solutions. In order to balance the demands placed on the arterial network, including use by large vehicles such as buses, trucks and emergency responders, with neighborhood concerns, the City needs clear policy direction about traffic calming practices appropriate on arterial roadways.

1. Traffic calming on arterials is most successful when applied on arterial streets where adjacent land uses are primarily residential.
2. SDOT will attempt to resolve the issue using the following approaches: 1) education; 2) enforcement, and if education and enforcement do not solve the problem; and 3) engineering methods. If traffic calming devices are an appropriate solution, they shall be planned and designed in keeping with sound engineering and planning practices appropriate to the particular functions of the arterial street.
3. Through traffic should be encouraged to use higher-classification arterials (principal and minor

- arterials), as designated in Seattle’s Street Classifications.
4. Emergency vehicle access shall be maintained and traffic calming devices should not unreasonably degrade emergency vehicle response times.
  5. Arterial traffic calming projects should not significantly impact transit service access, safety, and scheduling.
  6. Pedestrian and bicycle movement should be given equal consideration with vehicle movement in the design and implementation of arterial traffic calming projects.
  7. Parking issues should be considered on a project-by-project basis. Parking needs of residents should be balanced with the equally important functions of traffic, emergency vehicle access, transit, bicycle, and pedestrian movement.
  8. Traffic calming on arterials should not divert traffic to non-arterial roadways through the use of traffic diversion devices.
  9. When arterial traffic calming is being considered, certain procedures should be followed by SDOT in processing traffic management proposals in accordance with applicable codes and related policies and within the limits of available resources. At a minimum, the procedures should provide for project selection and evaluation; citizen participation in plan development and evaluation; public and life safety review, and communication of any test results and specific findings to area residents and affected neighborhood organizations.

### 6.5.6 Typical Traffic Calming Devices in Seattle

The City of Seattle has used the following traffic calming devices in locations deemed appropriate by the City Engineer in consultation with neighborhoods. Refer to the City of Seattle [Making Streets that Work](#) guide.

Not all traffic calming devices are appropriate for use on every type of street or in every location. [Traffic Calming Device and Applications](#) (table below) describes the name of the device, they type of issue it is typically used to resolve, and the street classification(s) where the device could be applied. The “typical use” category describes, in general, what kind of change each device can affect: managing traffic, conditions along streets, or pedestrian crossing conditions:

**Managing traffic:** Concerns about traffic speed and volume can be addressed through effective traffic management. The following devices are used to help manage traffic. Many of these devices restrict the movement of traffic on streets. In most cases the least restrictive method of solving a traffic management problem is the most cost effective, and the easiest for all to agree on.

**Conditions along streets:** Conditions along streets affect pedestrian travel, comfort, orientation, safety, and affect the aesthetic quality of our streets. This group of traffic calming devices includes on-street parking, lighting, street furniture, and plantings and trees.

**Pedestrian crossing conditions:** Crossing a street shouldn’t be unreasonably difficult, and there are devices that can help improve pedestrian safety, including pedestrian crossings.

**Traffic Calming Devices and Applications**

Traffic Calming Device	Typical Use	Residential Streets (non-arterial)	Collector Arterials	Minor Arterials	Principal Arterials
Curb bulbs	Pedestrian Crossing Conditions	?	?	?	?
On-street parking (parallel and angle)	Conditions Along Streets	?	?	?	?
Streetscape	Conditions Along	?	?	?	?

Streets					
improvements (street trees, lighting, street furniture, special paving treatments)					
Signs	Managing Traffic	?	?	?	?
Crossing islands or short medians	Pedestrian Crossing Conditions		?	?	?
Medians	Managing Traffic		?	?	?
“Road Diets” (reducing number of travel lanes)	Managing Traffic		?	?	??
Speed cushions (for 25 mph or below)	Managing Traffic	??	?	??	
Gateway treatments	Pedestrian Crossing Conditions	?	?		
Neighborhood speed watch program	Managing Traffic	?	?		
Limited access	Managing Traffic	?	?		
All-way stop	Managing Traffic	?	?		
Raised crosswalks	Pedestrian Crossing Conditions		?		
Raised intersections	Managing Traffic		?		
Speed limit reduction	Managing Traffic		?		
Chicanes	Managing Traffic	?			
Chokers	Managing Traffic	?			
Diversers	Managing Traffic	?			
Partial street closure	Managing Traffic	?			
Pedestrian districts	Pedestrian Crossing Conditions	?			
Speed humps	Managing Traffic	?			
Traffic circles	Managing Traffic	?			

**Legend**

- Appropriate for Consideration (?)
- May be Applicable (??)

**6.5.7 Process for Installing Traffic Calming**

SDOT has an evaluation process for all traffic calming proposals. Refer to [Figure 6-12: Traffic Calming Evaluation Process](#) [ 395 kb ]. This process is necessary due to the high demand and limited resources available for traffic calming projects. This section outlines the steps that must be completed before a location may be considered eligible for traffic calming. Note: locations with physical characteristics that do not allow the feasible placement of traffic calming will not be considered.

**Step 1: Community Contacts SDOT with Traffic Calming Proposal**

SDOT requires support from the residents of the affected area before constructing traffic calming devices. Responsibility for demonstrating community support for a traffic calming completion of this step lies with the community. To initiate the NTCP process, a community group must contact SDOT NTCP to request inclusion in the annual NTCP evaluation period. Refer to [Section 6.6 Contact Information](#) for more information. All requests should be made prior to July 15; any request received after this date will be considered for funding in June of the following year.

## **Step 2: SDOT Evaluation of Community Request and Initial Action**

SDOT staff will work with NTCP applicants to determine conditions on the street that the community believes need to change. After initial evaluation, the SDOT Traffic Engineer may authorize actions be taken within the scope of his or her authority to address the applicant's concern and solve the problem. If problem persists, SDOT may initiate education and enforcement activities to resolve the problem. The SDOT NTCP staff, in consultation with the Fire Department and King County/Metro Transit, may also deem the project to be infeasible at this point and recommend another course of action that does not involve traffic calming.

SDOT will evaluate the safety record of each location which can include collision history, speed data emergency response implications, and traffic volume counts. The data will be used to prioritize the locations for construction using the point criteria described in [Section 6.5.8 Point Criteria for Traffic Calming Project Ranking](#).

## **Step 3: Petition Process**

If the problem is not successfully resolved in Step 2, SDOT will request a demonstration of community support for traffic calming. SDOT will provide the applicant with an NTCP petition and signatures must be gathered as follows:

- **Traffic Calming on a Residential Street:** Signatures are required from at least 60% of the households (owners or renters) and businesses (property or business owner) typically within one block of the proposed traffic calming device. For more restrictive traffic calming devices (e.g., diverters or partial closures) SDOT may specify a petition area beyond one block.
- **Traffic Calming on an Arterial Street:** Arterial roadways play a major role in moving people and goods within neighborhoods as well as throughout the city. For this reason, any traffic calming proposal on an arterial street must be supported by adjacent neighborhoods. In addition to the petition process defined above, additional letters of support will be requested from the community councils adjacent to arterial locations being considered for traffic calming, as well as the appropriate district council.

Only one signature per household or business is needed. Signed petitions must be submitted by July 15, to be considered for the following year's construction. Completed petitions can be mailed or delivered to the [Seattle Department of Transportation](#). Projects that meet the required support rate will be considered for funding through an SDOT annual program.

## **Step 4: SDOT and Community Seek Funding for Project**

If the location does not qualify for funding through SDOT's NTCP program, the contact person listed on the petition will be notified by mail. Information about other potential funding sources may be provided. If the location ranks sufficiently high on SDOT's prioritization list for Neighborhood Traffic Control Program (NTCP) funding, the contact person will be notified.

At this point in the process, SDOT staff will determine if it is necessary to hold a meeting in the neighborhood to discuss the project, including results of the traffic analysis, the design concept, and the procedures leading up to construction. Maintenance of landscaping in traffic calming devices, an important component of this project, and identification of a landscape volunteer will also be discussed during the meeting. For traffic calming on arterial streets, meeting notices will be sent to the community councils in adjacent neighborhoods as well as the appropriate district council.

## **Step 5: Project Funded**

Project funding is identified and SDOT proceeds with the design and construction process.

## **Step 6: Design & Construction Overview**

Traffic calming devices are designed according to the existing geometry of each intersection and sized

to accommodate the passage of emergency vehicles. The Fire Department, Metro/King County Transit and other agencies review locations for new calming and may conduct a field test to check for maneuverability. Then, final plans are made and sent to construction crews with specifications. If a volunteer signs up to maintain plantings, soil and plants will be supplied; otherwise, the device will be covered in asphalt.

**Step 7: Construction**

The first visible evidence that traffic calming devices will be built is typically an outline of the device drawn in on the street. Construction will follow, including any landscaping and signs (e.g., reflector or directional signs).

**Step 8: Post Construction Monitoring**

After construction of speed humps, speed cushions and chicanes, the traffic calming device will be monitored for a period of six months to one year. During this time, traffic speeds and volumes are measured to help determine the effectiveness of the device.

**6.5.8 Point Criteria for Traffic Calming Project Ranking**

SDOT ranks locations for traffic calming based on a number of criteria. For traffic circles, a point criteria is used to assign points to an intersection for accident history, traffic volumes and traffic speeds refer to point values in tables include in [Section 6.5.8a Accident History](#), [6.5.8b Traffic Volumes](#) and [6.5.8c Traffic Speeds](#)). The points assigned for accident history, traffic speeds and traffic volumes are then added together to prioritize the location based on need.

To address traffic calming requests at mid-block locations, SDOT evaluates each corridor based on number and type of mid-block collisions, speeds and volumes.

**6.5.8a Accident History**

Accident history is determined based on the average number of accidents per year over the most recent 3 year period. The annual accident rate is determined by the number of accidents/number of years over which they occurred. For example if a location has had 6 collisions in the last 3 years, the average annual rate per year is 2.000. As a result, 4 points would be assigned to this location for accident history.

Points	Annual Accident Rate (accidents/year) at Intersection
1	0.5 - 0.875
2	0.876 - 1.250
3	1.251 - 1.625
4	1.626 - 2.000
5	2.001 - 2.375
6	2.376 - 2.750

For midblock locations, a score of .5 is assigned if the accidents on the midblock section of street exceed two accidents per year over the last three years.

**6.5.8b Traffic Volumes**

Points for traffic volumes are assigned according to the number of vehicles per day on an average weekday.

Points	Traffic Volumes (Vehicles per Day—Average Weekday Traffic)		
	Residential Streets	Collector Arterial	Minor/Principal Arterial
0.5	500 - 1100	500 - 1500	2000 - 4000

1.0	1101 - 1700	1501 - 3000	4000 - 8000
1.5	1701 - 2300	3001 - 4000	8000 – 12,000
2.0	2300+	4000+	12,000+

### 6.5.8c Traffic Speeds

Points for traffic speeds are allocated based on the 85th percentile speed in miles per hour. The 85th percentile speed is the speed at which 85% of the vehicles are traveling at or below. Speed limits for residential streets are 25 miles per hour, unless otherwise marked. Speed limits for arterial streets are 30 miles per hour unless otherwise marked.

Points	Traffic Speeds (85th Percentile Speed—miles per hour)	
	Residential Streets	Collector/Minor/ Principal Arterial
0.5	26 - 29	31 - 33
1.0	29.1 - 32	33.1 - 36
1.5	32.1 - 35	36.1 - 39
2.0	35.1+	39.1+

### 6.5.9 Trials and Temporary Installations for Traffic Calming

In neighborhoods trying traffic calming for the first time, it may be useful to lay out a new design with cones or temporary markings to test it. This provides emergency vehicle drivers, residents, and others with an opportunity to test the design. Some communities have constructed elaborate temporary devices with concrete or plastic (“jersey”) barriers. These can instill a negative reaction in the community due to their unaesthetic appearance and they do not generally have any significant benefits over the simpler test devices.

### 6.5.10 Landscaping for Traffic Calming Devices

Neighbors are responsible for the planting and maintenance of traffic calming devices after they are built. Landscaping is installed during the planting season (spring or fall). [SDOT’s Urban Forestry Division](#) staff, takes input from residents about plant material selection during the months of January and June, depending on the season when construction is completed. Plants are chosen based on their drought tolerance, resistance to occasional car traffic and street right-of-way landscaping guidelines, which promote visibility. The [recommended street right-of-way plant list](#) contains a variety of suitable plants that have performed well in the past. Plants are delivered to the home of the landscape coordinator in the spring or fall and a planting party usually follows.

Residents are responsible for the [maintenance](#) of traffic circle plantings. Replacement plants are not typically available through the NTCP if the originals die due to neglect or automobile run-overs. Funding for vegetation rehabilitation is available through the [Department of Neighborhoods](#). View more information on traffic calming and landscaping through the on-line version of [The Neighbors’ Gardening Circular \(Traffic Circle Newsletter\)](#). Also view resource information on [Salmon Friendly Gardening Tips from Seattle Public Utilities](#).

#### 6.5.10a Plants Provided at the Time of Installation

Each year SDOT provides plants for between 60 to 120 new traffic circles, chicanes, triangles and medians. Purchases are made in bulk to keep costs down, so this requires selecting a common plant pallet that accommodates the needs of everyone. Although every effort is made to get the plants neighborhood groups request we sometimes need to make substitutions. As always, purchasing depends upon plant availability. So, we ask for flexibility and patience as we are serving a considerable number of neighborhood groups.

Groups may purchase their own plant material if they would like to plant sooner or have specialty plants

in mind that we might not be able to get. SDOT can not reimburse groups for these expenses, but your planting plan should be sent to SDOT Urban Forestry staff for permitting before plant purchases are made. Flower bulbs are not provided, but they are a lovely addition and we encourage you to plant them! Daffodils, in particular, grow really well. They need little care and will increase in number as they bloom each spring!

A traffic circle must be at least 14 feet in diameter to qualify for a tree. For a typical 16 foot diameter device we usually provide:

Type of Landscaping	Amount
Trees	1
Shrubs (no more than two different types)	4-5
Perennials (no more than three different types)	12
Flats of groundcover (one type)	2

All plant material and trees must be maintained consistent with City of Seattle Ordinance 4.03.010: Planting Strip and Landscaping and Paving. Multi-stemmed trees and shrubs that can grow tall, such as roses and lilacs are not acceptable. It is also advisable not to plant shrubs that require shearing. Usually the plants remain long after the person willing to consistently maintain them has left.

## 6.6 Contact Information

Organization Name/Website	Phone
Department of Planning and Development (DPD) General Information	
<a href="#">DPD City Design</a>	(206) 684-0763
<a href="#">SDOT Major Projects Division: Integrating the Monorail</a>	(206) 733-9271
<a href="#">SDOT Major Projects Division: Link Light Rail Team</a>	(206) 684-4652
<a href="#">SDOT Neighborhood Traffic Control Program: Traffic Calming</a>	
-North/NE/NW/Ballard	(206) 684-0817
- West/Central/East	(206) 684-0815
-South/SE/SW	(206) 684-7577
<a href="#">SDOT Street Use Division</a>	(206) 684-5283
Seattle Public Utilities (SPU) General Information	
<a href="#">SPU Resource Planning Division, Natural Drainage Systems</a>	(206) 615-0866

Additional contact information and resources are located in the [City of Seattle Staff Directory](#), which is searchable by Department, Division and individual staff.