



**Washington State
Department of Transportation**

Roadside Policy Manual

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Engineering and Regional Operations

Development Division, Design Office

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Foreword

The Washington State Department of Transportation (WSDOT) is responsible for the stewardship of approximately 100,000 acres of roadside along over 7,000 miles of state roadway. This includes hundreds of ancillary facilities such as rest areas, viewpoints, environmental mitigation sites, resource conservation areas, quarries, and pit sites. For the purpose of this document, the collection of such sites will be collectively referred to as “roadsides”.

The *Roadside Policy Manual* promotes conservation and protection of resources to achieve sustainable roadsides that require low maintenance costs. It requires retention and replacement of vegetation to provide ongoing environmental stewardship. This is data-driven, flexible policy committed to restoring and providing pollinator habitat and supporting public health, safety, and welfare based on research into the ecological and societal value of trees and native vegetation. Restoration of the roadside supports economic vitality and vibrant communities by preserving the essential character and nature of the Evergreen State for future generations and aligns with agency priorities by emphasizing preservation of the asset for the State of Washington.

This manual supports management of the roadside asset through Planning, Program Management, Project Development, Construction, and Maintenance. In conformance with current WSDOT policies, the roadside policy team developed a comprehensive roadside policy that promotes our state’s healthy economy, environment, and communities. The *Roadside Policy Manual* develops vision and instructional policy for:

- Complying with legal obligations and commitments, and obtaining environmental permits and approvals.
- Roadside preservation, design, construction, and maintenance.
- The level of restoration required as a result of roadside impacts.
- Achieving roadside sustainability through the use of native plants, Integrated Vegetation Management, and a long-term management approach.
- Developing the roadside to provide functions such as stormwater, erosion control, weed control, and slope stabilization in a way that supports the visual character of Washington State.
- Providing the highest benefit at the lowest feasible cost.

For further information, contact the Roadside and Site Development Section in the Headquarters Design Office: [🔗 https://wsdot.wa.gov/engineering-standards/design-topics/roadside-development-facilities](https://wsdot.wa.gov/engineering-standards/design-topics/roadside-development-facilities)

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- 1.1 General
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1.1 General

Roadsides are an important component of highway planning, design, operation, and maintenance because of the operational and environmental benefits the roadside provides. In reality, these functional benefits are interrelated and inseparable, and they affect the appearance of the roadside. Properly designed and maintained vegetation complements the functions of the roadway, integrates the roadway into the surrounding landscape, and has a positive effect on the traveling public. Roadside restoration is the process of replacing or rehabilitating functional value of vegetation that is lost through construction or other roadside disturbances.

According to [RCW 47.40.010](#), the “planting and cultivating of any shrubs, trees, hedges or other domestic or native ornamental growth, the improvement of roadside facilities and view points, and the correction of unsightly conditions, upon the right-of-way of any state highway is hereby declared to be a proper state highway purpose.”

The purpose of this manual is to guide project planning, scoping, environmental permitting, engineering designers, landscape architects, and construction and maintenance personnel. With the exception of permitted environmental mitigation sites, it governs roadsides under Washington State Department of Transportation (WSDOT) jurisdiction.

The manual is divided into six chapters:

- Chapter 1 provides background information on how the department defines “roadside” and what activities occur within the roadside.
- [Chapter 2](#) provides the department’s comprehensive roadside policy.
- [Chapter 3](#) explains how to use this manual during project delivery or by developers within WSDOT right of way.
- [Chapter 4](#) serves as a reference guide for all readers. It includes the strategies and tools used by landscape architects during the design process, and is not intended to replace the need to consult the the RLA or HQLA during project development.
- [Chapter 5](#) discusses community gateways. The funding and landscape design of these specific areas may deviate from the baseline restoration outlined in the policy. Chapter 5 also provides roadside design parameters and examples when working on projects in conjunction with local jurisdictions.
- [Chapter 6](#) provides guidance on roadside design for roundabouts.

Active coordination between project designers, environmental permitting, maintenance staff, and landscape architects is crucial to policy implementation and project success. Further information regarding implementation of WSDOT roadside policy for maintenance is found in the Maintenance Area [Integrated Roadside Vegetation Management \(IRVM\) Plans](#) and the [Maintenance Manual](#). Design, [Construction](#), and Maintenance should work together to align roadside functional needs and IVM goals.

The roadside along all Washington State routes is considered the area outside the edge of pavement of the traveled way and inside the right of way line. The roadside includes the unpaved areas of medians and roundabouts, and ancillary facilities.

In addition to roadway roadsides, this policy applies to unpaved lands owned and managed by WSDOT, such as environmental mitigation sites and their associated buffer areas, [Resource Conservation Areas](#), quarries, and pit sites.

1.2 **Applicable Laws and References**

1. Laws

State and federal laws and directives support the use of roadsides to achieve many valuable functions the asset provides¹:

- a. Clean water through erosion control, stormwater treatment and storage
- b. Clean air through vegetation and phyto-remediation
- c. Slope and soil surface stabilization through soil bioengineering
- d. Endangered species and pollinator support through plants
- e. Noise abatement through landforms
- f. Highway beautification and scenic enhancement
- g. Carbon sequestration to slow changing climate and promote resilience.

2. References

[City Streets as Part of State Highways](#), 2013 as Amended, WSDOT and Association of Washington Cities

[Construction Manual](#), M 41-01, WSDOT

[Design Manual](#), M 22-01, WSDOT

[Environmental Manual](#), M 31-11, WSDOT

[Highway Runoff Manual](#), M 31-16, WSDOT

[Hydraulics Manual](#), M 23-03, WSDOT

[Roadside Integrated Vegetation Management Plans \(IVM\)](#), WSDOT

[Maintenance Manual](#), M 51-01, WSDOT

¹ Further information on the applicable laws is available in the WSDOT Roadside Manual (M 25-30), chapters 210 and 220.

Roadside Manual, M 25-30, WSDOT

Understanding Flexibility in Transportation Design – Washington, WSDOT

Utilities Accommodation Policy, M 22-86, WSDOT

Utilities Manual, M 22-87, WSDOT

1.3 Definitions

ancillary facilities Roadway user facilities located within the WSDOT right of way, including rest areas; roadside parks; viewpoints; historic and interpretive markers; pedestrian and bicycle facilities; wetland or stream mitigation areas; park & ride lots; transit facilities; quarries and pit sites; and maintenance facilities adjacent to the roadway. Ancillary facilities are included in the definition of roadside.

Beautification Area These areas have been renamed Resource Conservation Areas.

blend To combine adjacent elements in a way that creates a balanced, visually harmonious landscape. A roadside restoration strategy that integrates roadside elements with adjacent desirable landscape features.

Built character A roadside character category indicating a landscape in which human elements and structures are notable or predominant. “Built” character includes rural, suburban, and urban roadside character classifications.

canopy cover A measure of plant coverage of the ground by all forms of vegetation, including grasses, groundcovers, shrubs, and trees.

corridor continuity The overall coordination and sequence of visual features as experienced by the roadway user. Corridor continuity contributes to positive guidance and navigation, and a positive traveling experience, while preserving the visual integrity of the roadside environment.

cost-effective Economical in terms of fulfilling roadside functions and meeting policy objectives at the least feasible cost, including design, construction, and maintenance for the life of the facility.

expose A roadside restoration strategy, the intent of which is to preserve or open a visual sightline, or to remove vegetation for operational purposes.

Forest roadside character A roadside classification in the natural character category, indicating predominantly natural or naturalized forest. A roadside classified as “Forest” is characterized by natural-appearing landforms and native trees and/or understory vegetation. Zone 2 may be meadow or woody vegetation.

frame To design and manage roadside elements to delineate, expose, and enhance a scenic or otherwise desirable view.

hazard tree A tree that has been assessed as having characteristics that, in the opinion of a qualified tree risk assessor, make it an unacceptable risk for continued retention. To be a hazard

tree, there must be probability of failure of either the whole tree or a large limb, and there must be a target. “Targets are people and/or property.”²

HQLA Headquarters Landscape Architect

imminent threat In roadside forestry, *immediate* danger of harm to people, the traveling public, or the facility by a leaning, cracked, or split tree or branches.

Integrated Roadside Vegetation Management Plans (IRVM) The establishment of low-maintenance beneficial vegetation and the suppression of unwanted vegetation through the integration of biological, cultural, manual, mechanical, and educational methods. Chemical controls are used only when needed. IRVM uses plant growth characteristics, principles of plant succession, and knowledge of natural and human-related factors affecting environmental change to achieve management goals, while minimizing impacts on the environment

landforms All (or any portion of) the geological features of the earth, including soil, rock outcrops, and the surface and subsurface configurations of land, including human-placed earth features, such as berms or swales.

landscape A section or expanse of the earth, including natural and built elements, composing a viewshed that can be seen from a given location.

Landscape Area These areas have been renamed Resource Conservation Areas.

late successional species A plant species that can germinate and grow with limited resources. Also referred to as climax species, they are the species within forest succession that are more adapted to stable and predictable environments and will remain essentially unchanged in terms of species composition for as long as a site remains undisturbed.

life cycle costs An assessment of all the significant costs (planning, design, construction, and maintenance) of ownership throughout the anticipated life of an asset.

low-impact development (LID) A land planning and engineering design approach that avoids or minimizes impacts on hydrology and water quality. If impacts cannot be avoided, the design compensates for altered hydrology and water quality by mimicking natural processes. Low-impact development is sometimes referred to as Green Stormwater Infrastructure.

native plant Occurring naturally in a particular region, ecosystem, or habitat, without human cause or influence. Includes all plant species indigenous to, or known to exist in, a region at the time of European settlement.

Open character A roadside classified as “Open” has broad views and open skies, with low-growing native vegetation or agricultural crops associated with adjacent farming.

plant establishment Caring for all plants planted on a project and caring for the planting and seeding areas within the project limits to ensure continued healthy growth to achieve a sustainable condition prior to transfer to maintenance staff. Plant establishment includes weed control.

² From *Assessing Tree Risks in Urban Areas and the Urban-Rural Interface*. Pacific Northwest Chapter of the International Society of Arboriculture. US Release 1.0. Page 1.

project For the purposes of this document, the term “project” applies to any action that affects the roadside, including but not limited to private developers, utilities, WSDOT projects, roadway neighbors, or other non-commercial or commercial actions.

Resource Conservation Area (RCA) Natural areas, purchased to provide a vegetated buffer between the highway and adjacent land uses. These areas are protected areas generally outside limited access hachures and were not acquired for the operation of the interstate, but rather as buffers. These areas have previously been called Beautification Areas, Landscape Areas, and environmental commitment areas on Right of Way Plans and Real Estate Services Maps. They serve a highway purpose, which is defined in [RCW 47.40.010. 23 U.S.C. 752.2](#) states that “preservation of valuable adjacent scenic lands is a necessary component of highway development.”

RLA Region Landscape Architect

roadside The roadside along all Washington State routes is considered the area outside the edge of pavement of the traveled way and inside the right of way line. The roadside includes unpaved areas of medians, roundabouts, and ancillary facilities such as rest areas; viewpoints; heritage markers; pedestrian and bicycle facilities; transit facilities; stormwater treatment facilities; and park & ride lots.

In addition to roadway roadsides, roadsides are defined as lands owned and managed by WSDOT, such as environmental mitigation sites and their associated buffer areas, Beautification Areas, quarries, and pit sites.

roadside character The general features of the roadside landscape, describing an identifiable ecotype or socially accepted community identity, seen from the user’s visual perspective. For example, rural, forest, open, urban or built character.

roadside management WSDOT management encompassing the planning, design, construction, and maintenance of roadsides.

roadside restoration The use of planning, design, construction, and maintenance activities to protect and/or restore the roadside and to bring back or develop desired operational and/or environmental function(s).

screen A buffer between two points or areas, used to obscure or lessen the impact of a distracting or otherwise objectionable view or sound, or to protect privacy.

structure Something constructed, such as a wall, fence, abutment, sign bridge, or cantilever support; a built element.

succession The natural tendency of plant communities to change over time.

successional species A plant species that can grow in full sun and that produces many seeds is generally an early successional, or pioneer, species. Alder and Cottonwood are examples of pioneer species. These are replaced over time by plants that are shade-tolerant and long-lived. These are referred to as climax species. Western Red Cedar and Western Hemlock are examples of climax species.

sustainable roadside A roadside that fulfills design intent and roadside functions over the long term, preserving the environment wherever possible, within available present and future funding, personnel, equipment, and methodologies.

visual distraction Any element in the roadway, roadside, or surrounding environment that detracts from essential aspects of the prudent driving task.

1.4 Roadside Functions

The term “roadside functions” refers to the reason or purpose behind specific actions or designs on the roadside and the constructive end-result expected from those actions. This is the “why?” behind each decision, and represents the benefit provided by the action, whether passive or active.

WSDOT manages the roadside to support safety, economic vitality, system preservation, mobility, the environment, and system stewardship. It does this by fulfilling operational and environmental functions. Best practices in roadside management also help WSDOT be a good neighbor, fitting the roadway into the context and community through which it travels. In reality, these functions are interrelated and inseparable. The following two functional categories help communicate the scope of roadside management issues.

1. Operational Functions

Operational functions provide safe, multi-use highways. Roadside operational functions include access control; guidance and navigation; glare and distraction screening; providing recovery areas and sight distances with accommodations for signs and utilities; and snow storage. The *Design Manual* remains the primary guidance for operational design guidance.

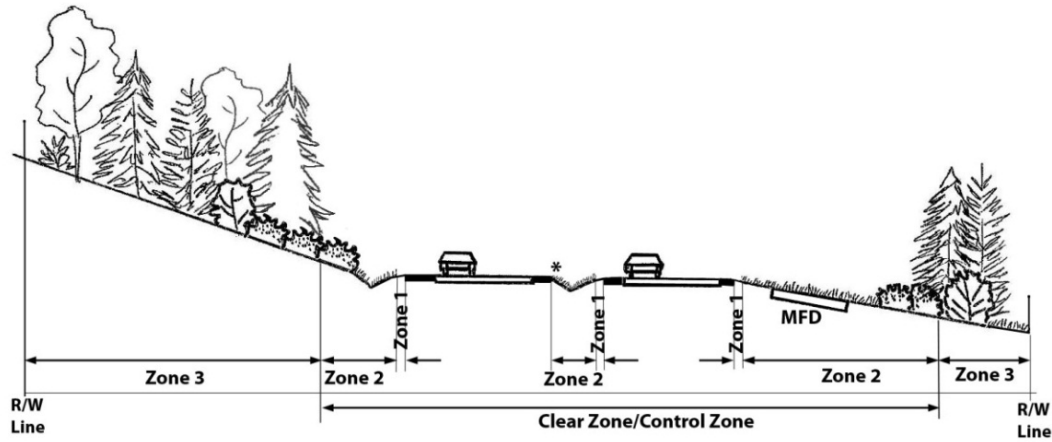
2. Environmental Functions

Environmental functions protect and enhance our natural and built surroundings and promote a positive quality of life. Environmental functions include preserving, protecting, and improving water quality; treating, infiltrating, and conveying stormwater; protecting environmentally sensitive areas; controlling noxious weeds; controlling noise; protecting and connecting habitat; improving air quality; reducing atmospheric carbon; reducing urban heat island effect; controlling erosion; screening and buffering adjacent properties from the roadway; and preserving scenic views and attractive transportation corridors.

Roadsides are the green infrastructure that contributes to the highway system. Roadside functions vary at different locations according to specific highway and site conditions. Every area of roadside simultaneously provides many functions and exhibits the character of Washington and its sense of place. The State derives economic value and benefits from high quality roadsides through maximizing these functions. Neighbors and travelers derive experiential and health benefits from environmental functions.

1.5 Roadside Zones

WSDOT Maintenance uses a system of zones to categorize roadside activities. This is a useful way to think about actions on the roadside. [Exhibit 1-1](#) shows those zones as they relate to Project Design and Maintenance activities. [Exhibit 1-2](#) describes activities that take place in each zone, or the features, such as guardrail, that are located there.



* Zone 1 may or may not be present on both sides of the median
 MFD = Media Filter Drain

Exhibit 1-1 Roadside Zones

	Zone 1	Zone 2 ³	Zone 3
Definition	The vegetation-free or routinely mowed zone adjacent to the pavement	Clear Zone as defined in the Design Manual ; also includes Zone 1 Control zone as defined in the Utilities Manual ; also includes Zone 1	Area beyond the clear zone up to the right of way line Typically contains native or naturally occurring vegetation
Activities and Features		Errant vehicle recovery	
	Guideposts and buried utilities	Signs and buried utilities	
	Sight distance	Sight distance, sign visibility	
	Erosion control	Erosion control	Erosion control
	Noxious weed control	Noxious weed control	Noxious weed control
	Pavement preservation	Slope stabilization	Slope stabilization; provides carbon sequestration
	Level spreader and filter for stormwater leaving the pavement	Stormwater conveyance and treatment, such as filter strips and swales	Stormwater conveyance, treatment, and storage, such as natural dispersion areas and ponds
		Corridor continuity	Corridor continuity
		Scenic enhancement, screening and blending, <u>pollinator support</u>	<u>Scenic enhancement, screening and blending, pollinator support</u>
	Guardrail	Signs	Walls and other structures
Mechanical or chemical control of vegetation	<u>IRVM</u> techniques to preserve sign visibility/sight distance, and provide weed control	Minimal intervention using <u>IRVM</u> techniques to encourage desirable self-sustaining plant communities	
Zone 1 has no stream or wetland buffer functions	Zone 2 has limited stream and wetland buffer functions		

Exhibit 1-2 Activities and Features within Roadside Zones

³ Zone 2 is clear zone or recovery area for errant vehicles. For more information on clear zone, see [Design Manual](#), Chapter 1600. Control Zone is used by WSDOT personnel working with utility locations in our rights of way (see [Utilities Manual](#), Chapter 9).

If guardrail is present, the offset distance to Zone 3 may be closer to the roadway.

- 2.1 Comprehensive Policy Statement
- 2.2 Implementing Policies
- 2.3 Roadside Treatment

2.1 Comprehensive Policy Statement

The Washington State Department of Transportation (WSDOT) recognizes roadsides as an asset. WSDOT roadside policy preserves and restores the native environment of Washington within WSDOT rights of way, balancing operational and environmental functions and lowest life cycle costs consistent with a reliable, safe, and sustainable transportation system.

2.2 Implementing Policies

1. **Vegetation Preservation:** Preserve mature roadside vegetation and soils to the greatest extent feasible.
2. **Vegetation Removal Only for Highway Purpose:** It is WSDOT and Federal Highway Administration (FHWA) policy to remove vegetation only for [highway purposes](#).
 - a. WSDOT does not remove vegetation simply to enhance views to or from our highways.
 - b. WSDOT has a procedure for Roadside Vegetation Permits where there is benefit to the department. Contact the Roadside Maintenance Manager or Area Maintenance Office.
 - c. Tree replacement ratios apply (see No. 6 below).
3. **Community Partnerships:**
 - a. If a community wants a higher level of design, it must pay the additional costs for items such as permanent irrigation, gateway signs, plantings requiring higher maintenance, and other amenities. Also, it must provide continuing maintenance through a signed Maintenance Agreement with WSDOT.⁴
 - b. WSDOT welcomes partnerships with communities wishing to enhance vegetation on WSDOT right of way, either at community gateways or along the roadside. Contact Developer Services and the Local Programs Manager to begin the review process for Roadside Vegetation Permits. Contact the Roadside Maintenance Manager or Area Maintenance Office.
 - c. Within Interstate Limited Access, WSDOT and FHWA retain authority over any local agency actions.
4. **Extent of Restoration:** WSDOT expects all projects to restore the area they disturb to the ecosystem appropriate to that location and within the applicable roadside zone. [Exhibit 2-1](#) shows the extent of restoration required.

⁴ For additional information, see [City Streets as Part of State Highways Guidelines](#), April 2013

<u>Project Development Action</u>	Restore soil and vegetation in disturbed areas, or an equivalent area, with the goal of restoring functions	Restore soils and seed in disturbed areas only
Minor disturbance to the roadside within Zone 1		X
Disturbance beyond Zone 1	X ⁵	
Non-WSDOT actions (public transit agencies, developer projects, utility owners, private parties, etc.) with disturbance beyond Zone 1	<u>X⁵</u>	

Exhibit 2-1 Restoration Required by Project Type

- a. When a project is unable to fully restore vegetation and function within the disturbed area to fulfill Roadside Policy requirements, outside agencies (permit applicant) as well as WSDOT and WSDOT contractors may utilize the Fee-in lieu or Vegetation Mitigation Agreements process (Appendix E). Use of the Fee-in lieu programs can only be used once reasonable on-site restoration alternatives have been exhausted.
5. **Native Plants:** Prioritize the use of long-lived native plant species that can compete against or exclude weeds and grow with minimal maintenance after plant establishment. Plan for diversity and a succession of flowering times to improve pollinator habitat.
6. **Vegetation Replacement Ratios:** Minimize loss of tree canopy cover, as measured by canopy cover using air photos and current urban forestry methodology. Refer to the Tree Replacement Flow Chart (Appendix C) when determining replacement requirements for new projects or proposals that remove existing vegetation on WSDOT right of way. In order to use Appendix D or E, all impacted trees shall be identified on a plan sheet and quantified by species and DBH size.
 - a. Avoid impacts where feasible. When a project cannot be constructed without removing trees, restore within the disturbed roadside areas of the project according to the following guidelines:
 - **Street or Boulevard Trees:**
 - o Replace on 1:1 basis (2.5" caliper B&B)
 - **Category 3:** Small coniferous and other late successional species trees less than 4 inches in diameter, measured 6 inches from the ground and all shrubs:
 - o Replace disturbed functions in all roadside zones.
 - o Restore all disturbed areas in zone 3 using a mix of trees and shrubs.
 - o Use best management practices (BMPs) for restoration of the disturbed areas (see the *Highway Runoff Manual*, Chapter 5).
 - **Category 2:** Moderate-size coniferous and other late successional species trees between 4 and 30 inches in diameter, measured 4.5 feet from the ground:

⁵ Restoration may be provided outside disturbed areas if functions cannot be provided within the disturbed area.

- o Replace at a ratio of one 1-gallon replacement tree for each 1-inch of trunk diameter, or the equivalent. Work with the RLA or the HQLA, for regions without an RLA, to determine equivalents using the Tree Replacement Calculator Tool (Appendix D).
 - Use BMPs for restoration within the disturbed roadside areas of the project (see the *Highway Runoff Manual*, Chapter 5).
 - **Category 1:** Mature, old-growth, large specimen, historical or heritage trees greater than 30 inches in diameter, measured at 4.5 feet from the ground:
 - o Consult with the RLA or the HQLA to determine appropriate project-specific restoration.
 - o Environmental benefits of the project can balance impacts to individual trees, such as those resulting from fish passage improvement projects.
- b. Mitigate tree canopy loss in the following locations, as appropriate:
- Within the area disturbed by the project or action.
 - Within WSDOT Resource Conservation Areas.
 - Within WSDOT right of way in areas outside the disturbed limits along the same highway corridor, in coordination with Maintenance IRVM plans.
 - Within WSDOT right of way on another highway within the same region with areas available for planting or protection.
- If areas outside the project limits are to be planted, the decision must be made before NEPA/SEPA⁶ is completed.
- c. Where a future project has been funded for design and there is an interrim project, restore the area of anticipated impact to meadow within the current project. Soil bioengineering may be used to stabilize surface soil movement, if needed. It is not practical or sustainable to restore the roadside to its full restored condition in a forested or built context. Provide tree replacement plantings, if applicable, outside areas that will be disturbed by the future project.
- d. WSDOT Maintenance Tree Removal:
- Zones 1 & 2
 - o **Ongoing Maintenance:** Where trees must be removed within the clear zone, no replacement is required.
 - Zone 3 – See [Appendix B](#) for a graphic of this information
 - o **Imminent Threat:** No replacement is required for the removal of a single tree that presents a current danger to public safety.
 - o **Removal of a Single Tree**
 - **Potential Risk Tree:** Where a single weak-wooded tree is in a location that indicates increased risk over time, it should be removed as Maintenance is able to fit this into its workload.

⁶ NEPA: National Environmental Policy Act – SEPA: State Environmental Policy Act

- o **Removal of a Stand of Trees**
 - **Species Shift:** It may be desirable to shift to a more stable and appropriate plant community. In locations where there is no near-term risk anticipated, undesirable species of trees, such as cottonwood or alder, may be removed and replaced with desirable species. The process should be part of the Area IRVM Plan.
- o **Tree Replacement Process**
 - **Sensitive Areas:** In many cases, trees within these areas have not been disturbed due the “sensitive” designation, so may have grown to be very large. Removing trees in this situation has implications with regulatory agencies and tribes. The Region Maintenance Environmental Coordinator (RMEC) needs to be involved to determine any regulatory impacts and mitigation required.
 - Contact the RMEC, the Roadside Maintenance Manager, and the RLA or HQLA.
 - The RMEC will evaluate the status of the site as a sensitive area (stream or wetland buffer, etc.).
 - The RLA or HQLA will determine the number of trees to be planted based on mitigation requirements.
 - **Roadside Location Outside of Sensitive Areas:** The functions of roadside vegetation, such as screening and stormwater interception, must be preserved. Replanting may or may not be needed depending on the remaining canopy or the presence of desirable trees in the understory. Consult with the RLA or HQLA and stormwater engineer. Include this removal and planting in the Area IRVM plan.
 - The RLA or HQLA will determine the number of trees to be planted based on replacing the hole in the canopy that is created by the removal. In some cases where remaining trees cover the canopy, or there are young conifers in the understory, there may be no replacement required, while in others, multiple trees may be required.
- 7. **Resource Conservation Areas (RCA):** These have previously been called Beautification Areas, Landscape Areas, and environmental commitment areas on Right of Way Plans and Real Estate Services Maps. They serve a highway purpose, which is defined in [RCW 47.40.010](#). [23 U.S.C. 752.2](#) states that “preservation of valuable adjacent scenic lands is a necessary component of highway development.” The location of these RCAs can be found under “Land Use – Land Cover” on the WSDOT GIS Workbench.
 - a. **Unavoidable Impacts:** All Resource Conservation Areas are to be protected. **It is FHWA and WSDOT policy that impacts must be avoided.** However, due to the constrained, linear character of highway facilities, project impacts may be unavoidable. If impacts are unavoidable, they must be minimized, and mitigated as described below in [item d](#).
 - Resource Conservation Areas may be used as natural dispersion areas for stormwater as long as native vegetation is not damaged by the additional

water. Regions are encouraged to look for opportunities for this beneficial dual use.

- b. **FHWA Approval:** FHWA has an interest in all Resource Conservation Areas along Interstates or National Scenic Byways. Any proposed impacts and mitigation for unavoidable impacts on these routes must be approved through FHWA. Involve FHWA early in discussions regarding potential design choices.
- c. **Conservation Easements:** Some areas have been set aside as conservation easements and have been labeled as Conservation Easements or Landscape Easements on Right of Way Plans. The terms of deed restrictions apply to those parcels. They are being relabeled Resource Conservation Easements.
- d. **Mitigation:** There must be an equal value exchange when mitigation is necessary. The project proponent must work with the RLA or HQLA, or the Headquarters Roadside & Site Development Manager to evaluate the performance of the impacted parcel for its visual and cultural qualities, and the function of the landforms and vegetation. Mitigation measures need to look at the following performance values:
 - The proposed replacement parcel must provide resource conservation functions.
 - Depending on the ecoregion, the parcel should either buffer the highway from adjacent land use or integrate the highway into the surrounding native landscape.
 - The parcel must enhance or frame views from and toward the highway. Therefore, it must be adjacent to the highway right of way.
 - The proposed parcel needs to ensure no-net-loss. It must be of equal or greater size and must support and sustain native vegetation comparable to the vegetation on the Resource Conservation Area impacted.
 - The proposed property must sustain the equivalent type, size, and density of vegetation. If that is the case, the acreage purchased will be at a 1:1 ratio.
 - For parcels that do not sustain equivalent type, size, and density of vegetation, the size of the replacement parcel must be greater than the size of the impacted property.
 - Replacement parcels cannot be currently protected by another agency; for example, a city park, conservation easement, or a federal land.
 - Other priority vegetation communities that are impacted (such as an Oregon White Oak community) may have additional environmental protections and higher mitigation ratios based on on-site evaluation of the impacted parcel and vegetation.
 - Other desirable characteristics:
 - The proposed parcel is adjacent to or contiguous with another protected vegetated area.
 - The parcel has been identified on a list of properties that conservation or environmental groups want to acquire and protect. This could lead to a maintenance or management agreement with those groups to care for the land.

- o The parcel is identified by another government agency as a priority property to protect.
- o Remainder parcels purchased for the project can be set aside as Resource Conservation Areas when mitigation is needed.

For further information, see the Procedure [Working with Resource Conservation Areas](#).

8. **Permanent Irrigation:** Provide permanent irrigation for lawns, ornamental plantings, public art or gateway areas or permanent flower displays only where the initial cost, ongoing cost, and maintenance are provided by a local jurisdiction, unless roadside planting would be impossible without it (raised planting areas, freeway lids, etc).
 - a. Conversion to native vegetation species is encouraged when a project disturbs ornamental areas and the conversion meets the intention of the Comprehensive Roadside Policy Statement.
 - b. When a mature and irrigated planting area is disturbed and there is a remaining planting area, repair or replace the existing irrigation system to ensure plant survival and to retain the original investment. An example is I-90 between Seattle and Mercer Island.
9. **Plant Establishment Period:** A minimum of three years of plant establishment work is required for all newly planted and/or seeded areas in western Washington and eastern Washington.
 - a. The first year of plant establishment is funded through the highway construction program, and the work is part of the construction contract.
 - b. Subsequent years will be funded from Capital Program Development & Management through environmental mitigation and roadside restoration funding. Work will be managed by WSDOT.
 - Design-Build projects will be responsible for paying for and ensuring a minimum of three years of plant establishment work.
 - c. Plant establishment resulting from non-WSDOT projects (public transit agencies, developer projects, utility owners, etc.) must be funded by the project. The project may perform the plant establishment or execute a signed agreement with WSDOT to perform the plant establishment period beyond first year.

2.3 Roadside Treatment

The intent is to preserve roadside character and to use construction activities to restore disturbed roadside functions within the construction limits of the project, including construction easement areas such as staging and stockpile sites.

Restore disturbed roadside functions by blending and integrating various elements within the right of way, to provide corridor continuity. Respond selectively to adjacent land use by using plant material appropriate to the ecosystem and character of the roadside. Corridor continuity and roadside character is attained by using the same scale and plant materials throughout the corridor. Ensure the design is maintainable using equipment and workforce time that fits within the available resources of WSDOT Maintenance.

Provide permanent erosion control. Restore operational and environmental functions. Buffer adjacent land uses. Where possible, work with land use agencies and adjacent landowners.

The following restoration principles are to be used as appropriate for the project.

2.3.1 Landforms

Regardless of roadside character, the following apply to all roadside efforts:

- Minimize site disturbance to protect trees and native soils, and keep ecosystem functions intact.
- Adjust grading limits to protect desirable vegetation, if possible, within geometric design standards; screen undesirable views or expose scenic views; provide natural habitat; and protect wetlands, sensitive areas, and cultural resources.
- Design slopes and drainage to manage stormwater runoff, minimize erosion, assist in achieving slope stability, and facilitate maintenance activities.
- Use low-impact development (LID) techniques for stormwater management to minimize the area needed for detention.⁷
- Grade slopes to blend with adjacent slopes and reflect surrounding topography and landscape character, but balance that with the impacts to desirable vegetation from additional grading.
- Satisfy safety criteria for rock outcrops within roadside management Zone 2 through the use of graded landforms at the base of rock cuts or traffic barrier extensions, as advised by the Region Traffic Office.
- Where necessary to preserve soil biology, save topsoil for redistribution where there is enough room to create long windrows of soil that can be protected from weeds.

For Built character segments:

- Consider vegetated earth berms or earth walls where a roadside screen or visual barrier between the roadway and adjacent land use is needed.

2.3.2 Vegetation (in coordination with IRVM goals)

Regardless of roadside character, the following apply to all restoration efforts:

- Minimize site disturbances to protect native plant communities and specimen trees.
- Amend soil to ensure adequate soil characteristics for healthy and sustainable plant growth.
- Consider climate changes and extreme weather events when selecting plant materials.
- Select native plant material to close the canopy quickly, mimic surrounding native plant communities, and facilitate cost-effective maintenance.
- Select and locate plant material to facilitate driver guidance, frame scenic views, and screen visual distractions and undesirable views.
- Select vegetation to control stormwater runoff, minimize erosion, and achieve slope stability.

⁷ See the [Highway Runoff Manual](#) for LID requirements and BMPs.

- Use soil bioengineering techniques where appropriate.
- Vary construction clearing edges to minimize visual impact.
- Select and place vegetation to integrate and blend structures into the landscape.
- Calculate plant spacing and type based on site conditions, growth habit, expected plant survival rate, and density needed to discourage the establishment of weeds.

For Forest character segments:

- Zone 2: Seed disturbed areas with native seed mixture where feasible; shrubs and groundcovers may be planted.
- Zone 3: Restore roadside character with small-container native tree and shrub seedlings or species most appropriate to blend with the local character.

For Open character segments:

- Zones 2 and 3: Seed disturbed areas with native grass, forb, and shrub species.

For Built character segments:

- Zone 2: Seed disturbed areas with erosion control seeding mixture; include native grass and forb species in the seeding mixture where feasible.
- In urban interchanges, design using a combination of trees and groundcovers or grasses for ease of maintenance. Provide tree spacing to allow mowing.
- Provide and maintain clear lines of sight through urban plantings to discourage illegal activities. Incorporate applicable Crime Prevention Through Environmental Design⁸ (CPTED) principles.
- Incorporate planned/existing local street tree programs into roadside plans. Plant trees of up to 2 inches DBH in pedestrian areas and use tree-watering bags or temporary irrigation systems for establishment.
- Use temporary irrigation for plant establishment where necessary. Design permanent irrigation in coordination with the community where communities assume the cost and responsibility of the system and water through agreement.

2.3.3 Structures

Regardless of roadside character, the following apply to all roadside efforts:

- Consider scenic views in location, color, finish, and design of structures and signs.
- Use nonreflective guardrail and color-coated materials when required in natural brown tones to blend into the view within Scenic Byways and Scenic Highways, and on State and National Forest lands.
- Follow established standards for the highway corridor regarding color, texture, and style to provide corridor continuity.
- Utilize [International Dark Sky](#)-compliant lighting wherever feasible. WSDOT standard lighting is compliant with the International Dark-Sky Association guidelines.

⁸ CPTED is a multi-disciplinary approach to deterring criminal behavior through environmental design.

- Locate cameras and other Intelligent Transportation Systems (ITS) structures in front of trees to preserve them wherever feasible.
- Custom formliners can be used at the request and at the expense of the community requesting their use. Designs of an artistic nature must follow the procedures of *Design Manual Chapter 950, Public Art*. Custom formliner designs must fit with the current corridor theme, and they must not be a visual distraction. Approval is required from the State Bridge and Structures Architect and the RLA or HQLA for custom formliner designs.

For Forest character segments:

- Design structures to blend with the site and the natural landscape.

For Built character segments:

- Design structures to provide visual continuity, in coordination with other structures within the roadway corridor. Where the opportunity to replant is limited, give special attention to architectural detail.
- Where right of way is limited:
 - Use structural screens or fences where it is necessary to screen undesirable views or sources of glare.
 - Provide planting pockets between guardrail/barrier and walls when feasible.
 - Select colors from existing standards or standards set by local jurisdictions, or set new standards that blend in.
- Consider views below bridges from community streets when designing columns. Consider the potential for public art funded by cities in these locations.

- 3.1 Scoping
- 3.2 Program Management
- 3.3 Project Office
- 3.4 Landscape Architect

This section is provided for planning and scoping, and for the engineering designer and the landscape architect. Maintenance involvement is critical starting as early as possible and continuing throughout the design phase to achieve maintainable roadsides.

Following are the roles and steps to determine the extent of restoration and the roadside restoration elements used to restore the roadside.

3.1 Scoping

For projects with work that will disturb or alter the existing roadside beyond Zone 1, or if new roadside will be created, the scoping team will work with the RLA or HQLA in regions without a Landscape Architect, to ensure projects are scoped to provide roadside restoration that is sustainable and requires minimal maintenance, and that plant establishment funding is provided.

3.2 Program Management

For projects with work that will disturb or alter the existing roadside beyond Zone 1, or if new roadside will be created, provide plant establishment funding as part of the project budget. Maintenance will not spend its funding to establish roadside plantings. Once plantings are established, Maintenance will take over the responsibility for maintaining them. The duration of plant establishment will vary by ecosystem.

Refer to Capital Program Development & Management guidance on environmental mitigation and roadside restoration funding.

Whenever irrigated or ornamental vegetation is impacted by construction work and requires restoration, include in the project definition that restoration can include conversion to native vegetation. The conversion to native vegetation must meet functional needs and be consistent with the Region's Maintenance [Integrated Roadside Vegetation Management Plan \(IRVM\)](#) and the Comprehensive Roadside Policy Statement.

3.3 Project Office

1. Determine land ownership to identify level of restoration needed. Is the project within federal lands, parks, or cities?
2. Determine clearing and grubbing acreage, grading limits, and commitment boundaries, and provide to the RLA or HQLA. This will need to include all construction staging and stockpile areas to be restored post project.
3. Collaborate with the RLA or HQLA and other specialty groups, including the Area Maintenance Superintendent.

4. Estimate the number and average size of trees impacted or removed by the proposed project. The [RLA or HQLA](#) or Environmental Office can assist with this process.
 - a. Use information gathered for environmental documentation.
 - b. Estimate the maximum and minimum trunk diameter measured at 4.5 feet above the ground surface.
 - c. Estimate the spacing of impacted trees and average that for the number of trees in an acre, if more than half an acre of trees is impacted.
5. Determine whether any environmental permit commitments are present and incorporate these into the scope of the project.
6. Work with the Cultural Resource Specialist in the Region Environmental Office to determine whether the project area is within an area of cultural significance.
7. Work with Program Management and the [RLA or HQLA](#) to ensure plant establishment and site activities are included in the project estimate. Funding for plant establishment beyond the contractor's 1 year guarantee will be transferred from the project to the Plant Establishment budget item. (See the Capital Program Development & Management guidance for more details.)
8. Develop a "maintenance manual" for all stormwater best management practices (see the [Highway Runoff Manual](#)).

3.4 Landscape Architect

1. During scoping, provide the Project Office with a scoping level estimate for roadside work and include the cost for at least 3 years of plant establishment work.
2. Obtain project data from Project Office.
3. Identify roadside functions that can be provided within the impacted areas in a cost-effective way.
4. Determine the vegetation community that the ecosystem can support naturally at that location, assuming soils are amended.
5. Determine the [roadside character](#) (see [Chapter 4](#)):
 - a. [Forested](#)
 - b. [Open](#)
 - c. [Built](#)
6. Determine whether any environmental commitments are present.
7. Level of restoration:
 - a. Restore disturbed areas and functions within project limits. (See Chapter 5 of the [Highway Runoff Manual](#) for requirements on the use of compost and planting.)
 - b. Restore roadside functions based on the adjacent or nearby native plant community, or the plant community that can be maintained without permanent irrigation at that location.

- c. Work with the Area Maintenance Superintendent throughout design to ensure maintainability of the vegetation. Continue this dialog until the project is completed. Design in conjunction with IRVM goals.
 - d. Blend or screen as needed.
 - e. If a community wants a higher level of design, it must pay the additional costs for items such as permanent irrigation, gateway signs, plantings requiring higher maintenance, and other amenities; and it must provide continuing maintenance through a signed Maintenance Agreement with WSDOT.⁹
8. Provide operational and environmental functions at the lowest life cycle cost.
 9. Use [Roadside Zones](#) for plant placement relative to the roadway.
 10. Develop maintenance procedures for special features to be incorporated into Area IRVM Plans. This is especially critical for stormwater facilities, urban gateways, and mitigation areas. Include the purposes behind the selection and location of the plantings.
 11. Design for canopy closure and weed exclusion as soon as feasible for that ecosystem.
 12. Verify that designs meet the intent of the Comprehensive Roadside Policy Statement.
 13. Work with Program Management and the Project Office to ensure plant establishment and site activities are covered by the project and included in their overall project funding estimate. Funding for the first year of plant establishment is included in the contract (under the “PSIPE ____”) bid item (Contractor’s 1-year guarantee). Funding for plant establishment years 2 and beyond will be transferred from the project to the Plant Establishment I-4 fund. (See the Capital Program Development & Management guidance for more details.)

⁹ For additional information, see [City Streets as Part of State Highways Guidelines](#), April 2013

- 4.1 Roadside Character
- 4.2 How to Use Roadside Treatments
- 4.3 Roadside Treatment Strategies
- 4.4 Other Design, Construction, and Maintenance Considerations
- 4.5 Native Vegetation Ecosystems

4.1 Roadside Character

Roadside character is classified by the Washington State Department of Transportation (WSDOT) from the roadway user's visual perspective of the landscape. Roadside character classifications fall within two main categories: Natural and Built. State roadsides are to be created, restored, and maintained according to their character, to ensure the preservation and enhancement of our cultural, historical, and natural roadside environment.

4.1.1 Natural Character

Natural character refers to a landscape in which vegetation and landforms are predominant. Human elements and structures are rare or visually insignificant in the overall context. Within the Natural classification, roadsides fall into either a Forested or Open category.

4.1.1.1 Forested Roadside

The Forested landscape is predominantly natural or naturalized trees.

A Forested roadside is characterized by natural-appearing landforms and native trees and/or understory vegetation. Zone 2 may be meadow or shrubs. Forest may appear different from location to location due to climatic and elevation differences.

The following pictures show examples of the Forested character in various settings.



In drier zones, trees may be more widely spaced and understory vegetation may consist of grasses and forbs.



Natural-appearing landforms and native trees with understory vegetation blend with surrounding forested vegetation.



Zone 2 may be meadow. Native trees and large shrubs screen the views of adjacent land use from the roadway.



Some Forested roadsides appear sparsely vegetated with trees due to the climate zone.

4.1.1.2 Open Roadside

In the Open landscape, sky and sweeping views prevail in a landscape of few or no trees. Open landscapes include prairie, steppe, desert, and agricultural fields.

An Open roadside is characterized by natural-appearing landforms and low-growing native vegetation or agricultural crops associated with adjacent farming.

The following views show examples of the Open character in various settings.



There are few or no trees in Open landscapes. Sky and landforms dominate the view.



Open landscapes may be enclosed on one side.



Agricultural crops associated with farming may predominate in Open landscapes.

4.1.2 Built Character

Built character indicates a landscape in which human elements and structures are notable or predominant in the overall context. Built character includes suburban and urban areas. Once structures dominate the natural environment and human manipulation of the land is dominant, we consider the roadside to have a Built classification.

Vegetation may be native or non-native within a setting that has a predominance of built elements such as buildings, walls, and bridges. In some locations, a more consistent, refined appearance is evident throughout the management zones. Special attention is given to architectural detail within suburban and urban areas and on Scenic Byways.

Roadside management is used to develop a consistent, informal, and moderately refined appearance in Zone 2. The following views show examples of the Built character in various settings.



Vegetation is native and non-native. Trees and shrubs are predominant where sufficient right of way exists.



In the urban environment, human-built structures may be the principle elements in the view.



Urban roadsides may exhibit a consistent, refined appearance throughout all management zones.



Roadside vegetation in the Built environment is often mostly ornamental trees, shrubs, and groundcovers, with remnants of native vegetation.

4.2 How to Use Roadside Treatments

By combining landform/grading, vegetation, and structures, roadside character can be enhanced, created, or damaged. The goal is to optimize the use of one or more of these elements in a way that improves the roadside, and is sustainable, maintainable, and cost effective over the long term.

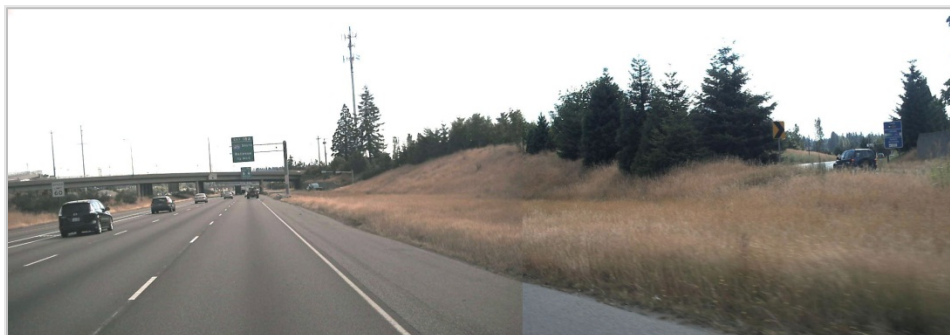
4.2.1 Landform and Grading

Landforms include soil, rock outcrops, and the surface and subsurface configurations of land. Landforms may be either natural or constructed. Grading can be used within the right of way to blend the highway with the adjacent natural landforms. Landforms may be used to accomplish operational and environmental functions.

The project RLA or HQLA works with the project designer to keep roadside native soils intact where possible. Soil provides many ecosystem services, including stormwater treatment/infiltration and carbon storage.

Roadside landforms can be designed and graded to manage stormwater runoff and surface water infiltration where necessary, and to carry out permitted environmentally sensitive area preservation and mitigation measures. Balance the extent of grading with impacts to desirable vegetation to achieve optimum function.

Landforms, such as berms, may be used to screen distractions and unsightly elements and to separate conflicting land uses. These uses frequently do not blend with the natural contours of adjacent land. If used, placement of vegetation is critical to blend landforms into the surrounding area.



Berms are planted to blend with the natural contours of the land.



A before and after view of a meandering bioswale graded to blend into its surroundings.

4.2.2 Vegetation

Roadsides are planned, designed, constructed, and maintained for permanent vegetative cover, in coordination with roadside management zones, to provide permanent erosion control and other roadside functions. The highest priority is to protect existing native vegetation wherever possible. If existing vegetation cannot be protected, the use of native plant material is the next highest priority. Encourage desirable volunteer native plants, and create conditions that discourage invasive species, such as the use of high carbon-to-nitrogen soil amendments and quick canopy closure.

When non-native plant material is used, select species for adaptability to specific roadside conditions; compatibility with native species and necessary roadside functions; and corridor continuity.

Perform appropriate site and soil analyses during design. Select and locate plant material for minimal long-term maintenance (including low water use) and minimal fertilizer and pesticide use.



Native Vegetation Planting along an Interstate

Retaining large masses of native trees is desirable to intercept rainfall, provide canopy cover to compete against weeds, and minimize mowing and the need for herbicides. The following is an example of a maintainable interchange, with trees that have been preserved. Only the edges are mowed to provide operational functions.



In urban areas, Maintenance is able to cost-effectively maintain a landscape of grass and trees.

For security and crime prevention, islands of trees or individual trees with mowable groundcovers are desirable. Salal is an example of a groundcover that can withstand occasional mowing.

Because slopes steeper than 3H:1V cannot be mowed, masses of shrubs or mixed shrubs and trees are appropriate. The goal is that little or no long-term maintenance is required after plant establishment.



In selected urban gateway locations, this grass and trees concept is desirable from a Maintenance perspective.

When a community wants a design that will require a higher level of design and maintenance, the local agency shall enter into an agreement with WSDOT so the community maintains the vegetation within the highway right of way.



Urban interchange with vegetation maintained by community through an agreement.

WSDOT also consults with community projects when the highway is the community's main street. Outside the curb, the community is responsible for design, installation, and maintenance of its roadside vegetation.



WSDOT consults with cities on efforts to improve their communities.

4.2.3 Structures

Structures, such as traffic and noise barriers, utility structures, retaining walls, bridges, wildlife crossings, and vegetated earth walls, are designed and located to fit into their context. Work with the State Bridge and Structures Architect and RLA or HQLA to blend the structure with local architecture and history where appropriate, and to enhance corridor continuity. Materials are selected to complement the roadside character, and vegetation is used to soften or enhance the appearance of structures. Standard off-the-shelf form liners can be used to texture walls at minimal cost. Combinations of form liners can be used to create more complicated patterns.



Context-appropriate walls used to blend the adjacent forested character with the Built environment where there is no longer room for vegetation. Simple, large-scale patterns are effective at freeway speeds.



Wall textures using standard formliners to convey a theme.



Continuity is enhanced by maintaining a single architectural theme throughout the corridor.

4.3 Roadside Treatment Strategies

Operational and environmental roadside functions are accomplished by applying the restoration treatment strategies shown below. These strategies fulfill the roadside policies by providing the functions through construction and/or maintenance activities.

4.3.1 Enclose/Screen

Vegetation is used to both screen the roadway from views by adjacent landowners and screen undesirable views by travelers. Vegetated strips also decrease the perception of noise from the highway and reduce solar and headlight glare. Nearby vegetation has been shown to help reduce speeds and provide traffic calming.

In order to provide screening, preserve existing mature desirable vegetation. When that is not feasible, screen using evergreen trees with other trees and large shrubs mixed in.



A junkyard is screened using trees and shrubs.



Selective screening is used in the Built environment.

4.3.2 Blend

Vegetation and structures can be used to provide a transition in land use between the roadway and the adjacent properties. They can also be used to create corridor continuity and to match the character of the surroundings. They are most commonly used on Scenic Byways, federal lands, or in urban areas. Blending can be achieved by:

- Matching with existing roadside character and providing corridor continuity by acknowledging elements from adjacent land in the roadside design.
- Integrating the various roadside elements within the right of way by using a consistent theme to provide corridor continuity.



New guardrail is designed to blend with existing guardrail.



Texturing on the outside of bridges can be used when there are anticipated viewers from this perspective.



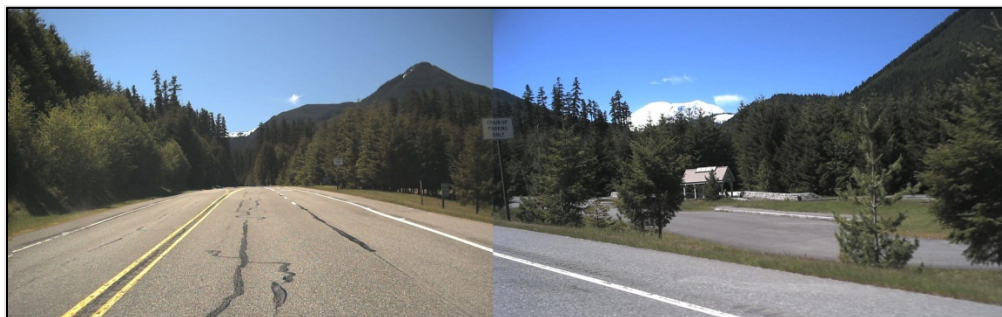
New structures are designed to blend with a nearby Forest Service area.

4.3.3 Expose

Exposing is the intentional removal of trees and planting of low vegetation to provide clear lines of sight for safety reasons or to provide views toward scenic landmarks. To expose, remove or prune vegetation, grade landforms, and/or remove structures to:

- Preserve or restore existing scenic or desirable views seen from the roadway.
- Remove vegetation for solar exposure of pavement when such removal is calculated to significantly reduce icing in a highway corridor.
- Provide visibility for WSDOT signs, traffic camera equipment, traffic movements, utilities, and clear zones.

Note: It is WSDOT and Federal Highway Administration policy to remove vegetation only for [highway purposes](#). Roadside vegetation is not to be removed or pruned to expose outdoor advertising or to provide views to or from other improvements or developments on adjacent lands.



Trees are spaced to allow views of the rest area and Mount Rainier.

4.4 Other Design, Construction, and Maintenance Considerations

Appropriate design and maintenance practices are highly influenced by factors that are unique to each roadside location. These factors should be discussed during the design process and addressed in the maintenance [IRVM](#) plans. The following should be considered during design:

- Access and safety requirements—provide for:
 - Maintenance pullouts, adequate shoulder width, gaps in guardrails or barriers, walls, and raised planting areas.
 - Maintenance access to ponds, fence lines, and utility poles and boxes, etc. Provide gates in fenced areas and access along fences or walls for maintenance.
 - Fall restraint.
 - Traffic control requirements, etc.
- Security issues: known or potential issues with encampments or other unauthorized activities.
- During construction, communicate any changed roadside conditions to the Landscape Architect to develop strategies to restore based on the changed condition.
- During construction, communicate changes that affect access to the roadside with the Area Maintenance Superintendent.
- Consider soil, water, and light: low structure heights limit moisture and light.
- Consider shoulder finishing with compost to allow grass to the edge of pavement, when this meets the Maintenance [IRVM](#) Plan.
- Consider adjacent weed density: aggressive weeds such as blackberry and Scotch broom will move into newly planted areas. This will affect plant establishment work. If feasible, remove adjacent aggressive weeds or create a weed-free buffer to allow new plantings to grow enough to become competitive.
- Consider the needs of adjacent residential property owners for screening and buffering roadway impacts.

4.5 Native Vegetation Ecosystems

Ecoregions denote areas within which ecosystems (the type, quality, and quantity of environmental conditions) are generally similar.

It is WSDOT's policy to use native plants. The [ecoregion map](#) is an aid in determining what is considered native and may be used to help in specifying and obtaining plant materials.

- 5.1 General
- 5.2 FHWA Actions on Interstates for Partnership Projects
- 5.3 Interstate Gateways
- 5.4 Community Gateways on State Routes

5.1 General

Community gateways are roadside areas designed and maintained in partnership with communities to convey first impressions to visitors and to express community identity. These are high- to low-speed transition areas. They are found where traffic slows or stops, or at community jurisdictional boundaries.

As entryways to towns or cities, gateways provide special opportunities to highlight an area through landscape design and community-provided public art. Gateways are established and funded at the request of a city or community organization. Any art features must be in conformance with Federal Highway Administration (FHWA) and Washington State Department of Transportation (WSDOT) policy, and they must be maintained by the city or community organization.

Gateway features commonly include vegetation and may include “welcome to” community entrance markers. The gateway entrance markers themselves are typically funded and maintained by cities. For freeway locations, the community entrance markers may be located at the end of off-ramps, outside the clear zone, where ramps enter into a community. A transitional planting area can be established up to half the ramp length to blend roadside planting with a community’s vegetation plan.

For roadside enhancements, an agreement with the local jurisdiction is necessary to document design and maintenance responsibilities, and it must include applicable legal requirements and permits. Gateway agreements must meet the following requirements:

- Designs must put safety first.
- Designs must be compatible with operational requirements such as sight distance and clear zone.
- Designs must retain character continuity within the corridor and be in harmony with site characteristics.
- Gateway features must not constitute a present or future financial burden on WSDOT.
- Proposals must include exact location and materials and how the gateway will be maintained .

There may be other local agency areas where the same principles will apply. Each case is site specific and should involve early coordination.

Gateway signs must comply with [Chapter 2](#) (Section 2.20(3)) of the *Traffic Manual*, City/Community Entrance Markers. Any signs larger than standard must go through the public art process found in [Chapter 950](#) of the *Design Manual*.

5.2 FHWA Actions on Interstates for Partnership Projects

When a community wants to partner with WSDOT on the Interstate within limited access, FHWA involvement is required. (See [Chapter 530](#) of the *Design Manual* for more information on the process that must be followed.)

5.3 Interstate Gateways

Interstate gateway features are found at the end of ramps at entry points to cities. They cannot be placed where they are easily viewed from the main line. [Exhibit 5-1](#) shows gateway markers at the end of ramps on urban interchanges on the Interstate. When urban gateways are located on Interstates, FHWA approval is required.



Exhibit 5-1 Urban Interchanges

In coordination with local agencies through a Maintenance Agreement with funding by the local agency, WSDOT may provide a higher level of maintenance at community entrances. As agreed upon with the local agency, WSDOT will transition from native vegetation occurring along the route, to a community's landscape program at the end of ramps or where state highways intersect community streets.

5.4 Community Gateways on State Routes

Community gateways help to provide a sense of place and community pride. Sign sizing, location, and approval requirements are found in [Chapter 2](#) (Section 2.20(3) of the *Traffic Manual*, City/Community Entrance Markers.

[Exhibit 5-2](#) shows examples of community gateways on state highways.



Exhibit 5-2 Community Gateways

Through agreement, communities may place gateway signs on state routes outside the clear zone at entry points. On managed access routes, the local jurisdiction assumes responsibility beyond the curb.¹⁰

¹⁰ *City Streets as Part of State Highways*, 2013

- 6.1 General
- 6.2 Roles and Responsibilities
- 6.3 Design Considerations

6.1 General

Chapter 1320 of the *Design Manual* provides policy on roundabout design. This chapter provides further discussion on how roundabouts and their approaches can be designed. Vegetation can help the function of the roundabout by focusing the attention of drivers, and proper placement of appropriately sized vegetation can help lower speeds. Vegetated roundabouts can also provide a community entrance feature.

6.2 Roles and Responsibilities

In most cases, roundabout vegetation within incorporated cities will be the responsibility of the city. Involve the city as early as possible and have a signed Maintenance Agreement that shows the exact design and the planned maintenance items and timing.

If the roundabout is located in a rural setting, and the Washington State Department of Transportation (WSDOT) will maintain it, low-maintenance vegetation is necessary. Each roundabout is unique; however, a combination of grass and trees or small rock and trees is desirable when WSDOT will be doing the maintenance.

Roundabout design requires a discussion between the Project Office, the Landscape Architect, the Region Traffic Office, and the entity that will be maintaining the roundabout to determine a solution that meets the needs of all.

6.3 Design Considerations

Federal Highway Administration approval is needed for features on Interstate projects. This is especially important to remember when communities ask for changes to existing roundabout design. (See [Section 5.2](#) for requirements on Interstates within limited access.)

Pigmented and/or textured concrete pavement helps contrast the roundabout apron from the roadway pavement. Coordinate with the Project Office, the Region Traffic Office, and [RLA or HQLA](#) to determine the appropriate color and/or texture. A General Special Provision is available.

6.3.1 Interior of Roundabouts

The interior portion of a roundabout is considered Zone 2, the operational zone, and encompasses the central island. The central island is a place to provide elements that would be visible from a distance and alert drivers to a change in road configuration. Roundabouts provide opportunities for something that is visually attractive, can be a gateway feature, and can improve the visual quality of a community or project in addition to providing operational functions.

- Approach speed matters when considering what will be in the central island of a roundabout and when considering vegetation options.

- **Ramp terminals:** The ramp terminal intersection with a crossroad is an example of a low-speed environment where trees or other features can be used; this can include gateway features that meet safety standards.
- **Roadway intersections:** On roadway intersections where higher posted approach speeds (45 mph and above) are found leading toward the roundabout, or on freight corridors, provide traversable designs:
 - On central islands, use trees or large shrubs with mature trunks less than 4 inches in diameter.
 - Do not use large boulders or fixed objects (see [Design Manual, Chapter 1600](#)).
- The scale of roundabouts matters; multi-lane roundabouts with large central islands need more grouping of trees or large shrubs outside the clear zone and sight triangles to match the scale of the central island.
- Sight distance matters when designing roundabout features:
 - Roundabout designs generally include a feature to prevent drivers from looking across the central island of the roundabout.
 - Mound the landform and provide vegetation in the center of the roundabout to prevent headlight glare and views of oncoming traffic.
 - Keep sightlines around the edges of the central island clear for drivers entering a roundabout to see vehicles moving in the roundabout and where pedestrian sidewalks are located.
- Discourage public access to the central island. Do not place anything that will draw pedestrians to the central island.

The following photos show examples of roundabouts:



Gently mounded roundabout and concrete color and texture on splitter islands.



Low-growing groundcovers outside the roundabout, with trees and low shrubs within the roundabout.



Mounding within the center of a low speed roundabout.

Hardscaping decisions are costly to reverse, so decisions to use cement concrete or hot mix asphalt (HMA) paving within the center of a roundabout should be made with caution. Use a material in the central island that can be landscaped in the future. It is better to use grass or interlocking pavers than HMA pavement in this situation, especially near local communities or expanding cities that may want to make changes in the future.

6.3.2 Roundabout Approaches

Splitter islands and planting areas on the outside of the roundabout are used to slow and direct traffic as it approaches the roundabout and to improve pedestrian safety. Low-growing (under 2 feet) vegetation can be used in these locations. Where pavement is necessary, consider permeable pavements to reduce impervious surfaces.



Splitter islands with low-growing vegetation in an urban setting.

6.3.3 Maintenance Access

Maintenance is always needed within roundabouts and splitter islands for weed control and sign maintenance at a minimum. Consider a pullout in the central island for maintenance vehicles that will provide a safe place to pull off to work within the roundabout. This needs to be inside the roundabout apron. The following photos show examples of how this can be done.



Examples of maintenance pullout designs.

On each of the example photos, there is an area between the roundabout lane edge and the raised truck apron where a maintenance vehicle can pull in or out of traffic safely. Locate these pullouts so that vehicles can see approaching traffic and they are not directly in line with oncoming traffic; verify the pullout is not in the truck turning path.

Appendix A

Hyperlinks

If you have a printed manual, you may find electronic links to documents within the *Roadside Policy Manual* at the web addresses below.*

Document Name	Electronic Link
Beautification Area – 23 CFR 752	https://www.ecfr.gov/current/title-23/part-752
Beautification Area – 23 USC 319	https://www.law.cornell.edu/uscode/text/23/319
<i>City Streets as Part of State Highways Guidelines</i>	https://www.wsdot.wa.gov/publications/fulltext/design/DevelopmentServices/DevelopmentServices-StateHighwaysasCityStreetsGuidelines.pdf
<i>Construction Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/construction-manual
<i>Design Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/design-manual
Ecoregion map	https://www.epa.gov/eco-research/ecoregion-download-files-state-region-10
<i>Environmental Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/environmental-manual
<i>Highway Runoff Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/highway-runoff-manual
<i>Hydraulics Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/hydraulics-manual
Integrated Roadside Vegetation Management Plans (IRVM)	https://wsdot.wa.gov/construction-planning/protecting-environment/maintaining-vegetation-along-our-highways/integrated-roadside-vegetation-management-plans
International Dark Sky	http://www.darksky.org/outdoorlighting
<i>Maintenance Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/maintenance-manual
<i>Roadside Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/roadside-manual
<i>Traffic Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/traffic-manual
<i>Understanding Flexibility in Transportation Design – Washington</i>	http://www.wsdot.wa.gov/publications/fulltext/design/csd/understandingflexibility.pdf
<i>Utilities Accommodation Policy</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/utilities-accommodation-policy
<i>Utilities Manual</i>	https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/utilities-manual

*If you are having trouble accessing links, please open the *Roadside Policy Manual* on WSDOT's Publications Services webpage (<https://wsdot.wa.gov/engineering-standards/all-manuals-and-standards/manuals/design-manual>). Select *Roadside Policy Manual* and follow the link(s) within the electronic manual. Some links may have been updated, and the online manual will have the current link(s).

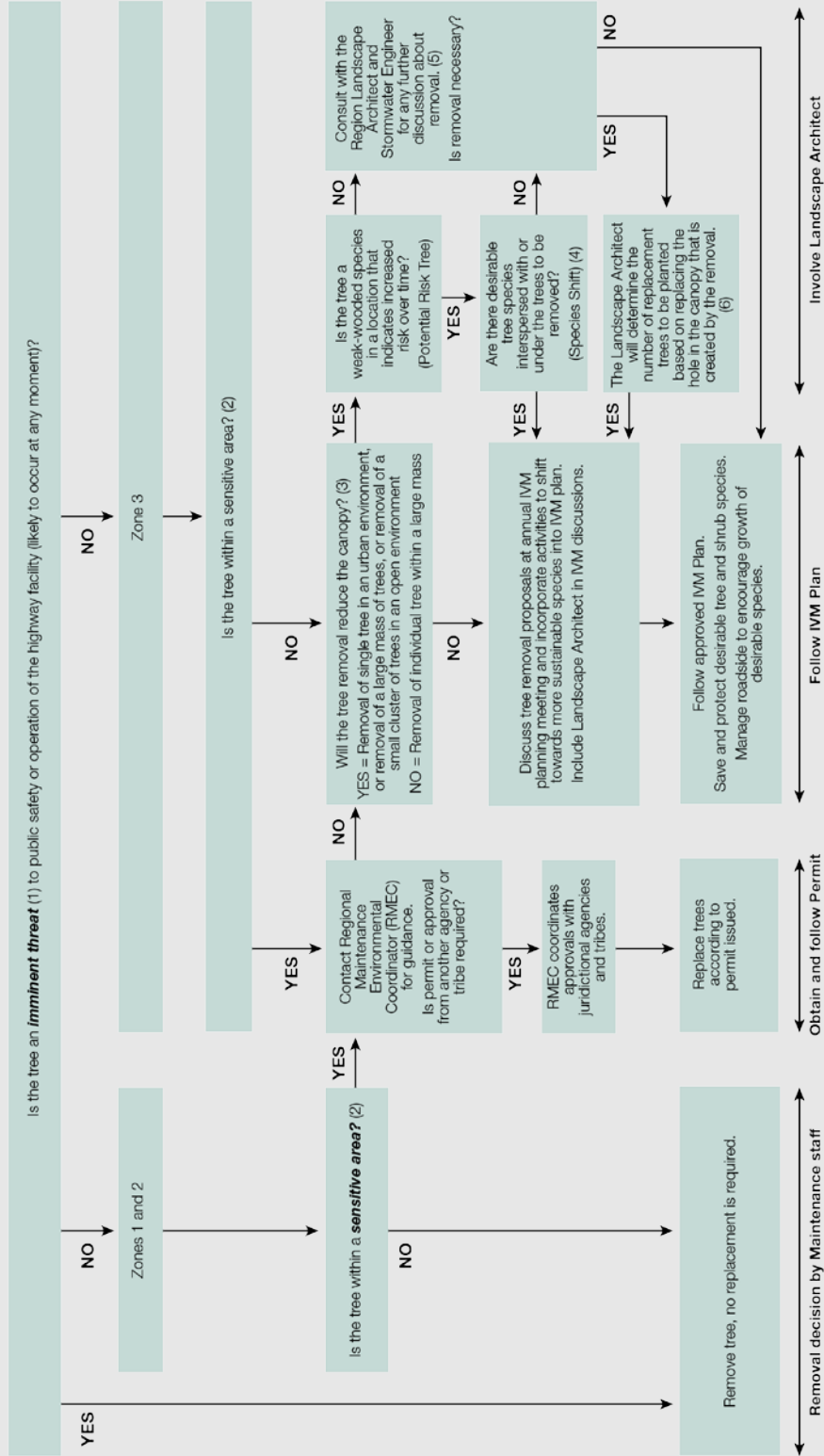
Appendix B

Maintenance Tree Removal and Replacement Chart

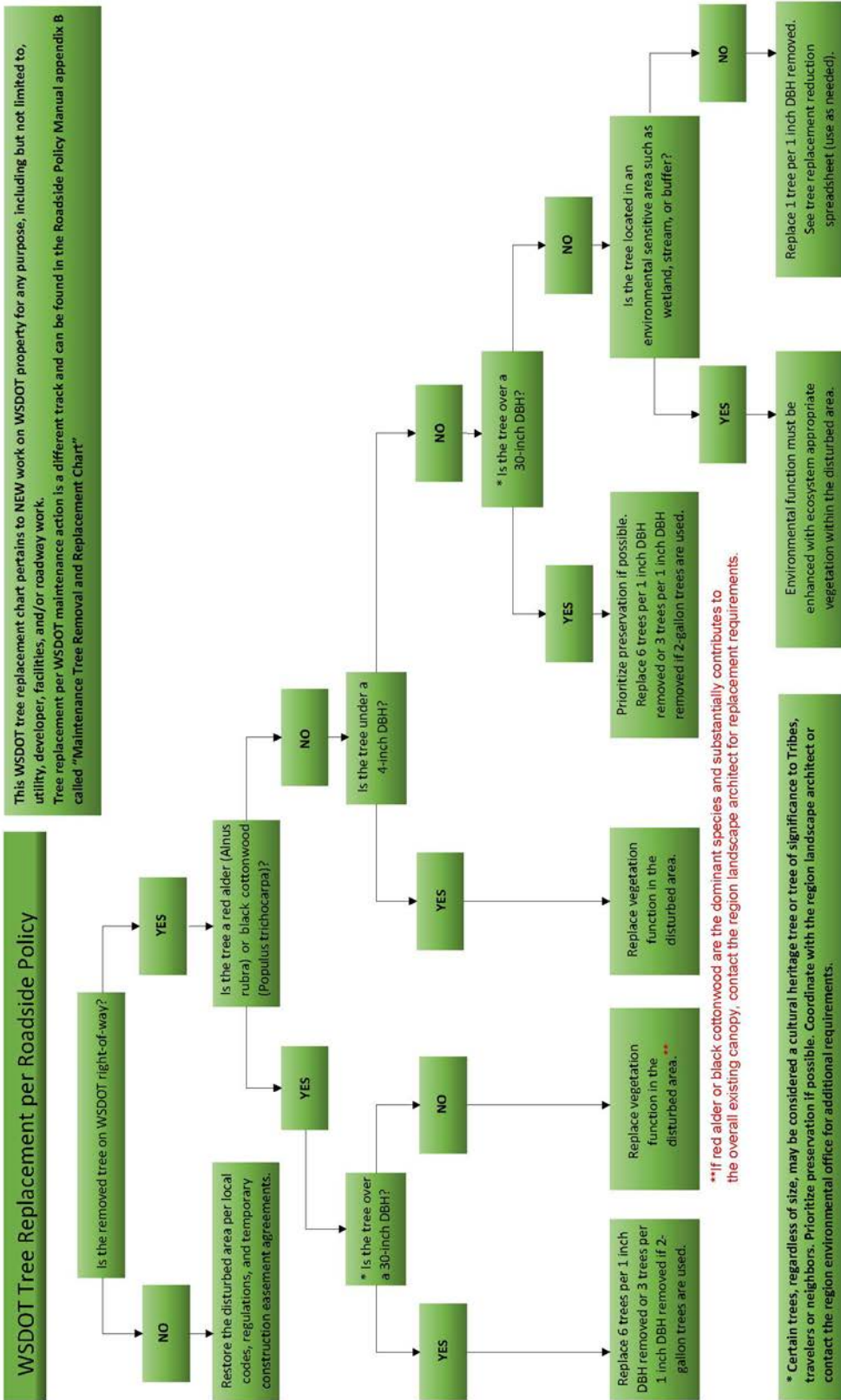
DRAFT

WSDOT Maintenance Tree Removal and Replacement Decision Chart

Note: Use this chart for trees within WSDOT highway ROW. Other requirements apply for highways on leased property (National Parks, Forest Service, Tribal land, etc.) and trees within Stormwater BMPs



- (1) Imminent threat - In roadside forestry, immediate danger of harm to people, the traveling public, or the facility by a leaning, cracked, or split tree or branches.
- (2) Sensitive area - Trees within these areas may not have been disturbed due to the sensitive designation. Removal of trees has implications with jurisdictional agencies and tribes.
- (3) The WSDOT Roadside Policy Manual prioritizes retention and enhancement of tree canopy and emphasizes a low-maintenance, primarily natural appearing roadside.
- (4) Species Shift - A tree with no near-term risk anticipated, but proposing to replace an undesirable species (such as cottonwood or alder) with a more stable and desirable plant community.
- (5) The Stormwater Engineer will evaluate proposed vegetation removal and replacement to determine stormwater impacts.
- (6) The functions of the roadside vegetation (such as screening or stormwater interception) must be preserved/restored. Replanting may or may not be needed depending on the remaining canopy.



Appendix D

Tree Replacement Calculator Tool

WSDOT TREE REPLACEMENT CALCULATION TOOL

Please contact your Region Landscape Architect for the excel worksheet. This is a sample of how to use this tool.

1. Specific information in contract plans, specifications, RFPs, and all appendices take precedence over this calculator tool. Contract information can be combined with this calculator tool to reduce the amount of replacement trees required for planting areas.
2. Credits may be used to reduce required tree quantities in order to avoid or minimize a need for tree plantings outside of the project limits.
3. Credits cannot be used to avoid restoration of disturbed areas.
4. Restoration of all disturbed areas to the appropriate roadside character is required. Fully optimize tree planting in WSDOT maintenance zone 3 within project limits.
5. Category 1 trees have a DBH (diameter at breast height) over 30-inches and must be replaced at a 6:1 ratio. Category 2 trees have a DBH between 4 and 30-inches and must be replaced with 1:1 ratio. See the Roadside Policy Manual (RPM) for additional information.
6. Acceptable replacement trees are trees that are 30 feet high at maturity per references in WSDOT standard specification 8-02.2. Red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*), and big leaf maple (*Acer macrophyllum*) are not acceptable replacement trees.
7. Bare root plant material may be used for deciduous trees only and must not exceed 25 percent of total quantity of replacement trees.
8. If irrigation is used, it will remain in place and working for a minimum of 3 years. Irrigation will be removed at the end of 3 years unless WSDOT approves that it will remain in place.
9. If planting areas have different "added plant establishment years" or "planting prior to impact credits", a plan set or exhibit must be submitted for approval by the region landscape architect illustrating the various planting years, plant establishment areas, and total years of plant establishment.

REPLANTING STRATEGY SCENARIO 1												
Category of Tree Per RPM	Impacts	Tree Size Credit			Plant Establishment Credit			Planting Prior to Impact Credit			Credit Limitation	Tree Planting Quantity
		dbH Impacts to Mitigate	Size Credit Ratio 1 gal = 1 2 gal = 2 2 gal w/irrigation = 3.3 5 gal w/irrigation = 4 15 gal w/irrigation (street trees only) = 5	Tree Quantity using Selected Plant Size (not including other credits)	Added Plant Establishment Years (beyond year 3)	5% Credit per Year (of Column E Quantity)	Tree Quantity Reduction for Added Plant Establishment Credit	Full Years Planted Prior to Impact (partial years not counted)	5% Credit per Year (of Column E Quantity)	dbh Credit for Planting Prior to Impact		
Category 2	100	2.0	50	7	5%	18	1	5%	3	40%	30	
Category 1	384	2.0	192	7	5%	67	1	5%	10	40%	115	

In this scenario, there are 100 total inches of category 2 trees (4.15-inch trees multiplied by 1) and 384 total inches of category 1 trees (2.32-inch trees multiplied by 6). The replacement trees will be planted 1 year before the project impacts occur because they will be planted in locations adjacent to the project area. 2 gallon trees will be planted and 7 additional years of plant establishment will be added to the required 3 years of plant establishment to total 10 years of plant establishment.

REPLANTING STRATEGY SCENARIO 2												
Category of Tree Per RPM	Impacts	Tree Size Credit			Plant Establishment Credit			Planting Prior to Impact Credit			Credit Limitation	Tree Planting Quantity
		dbH Impacts to Mitigate	Size Credit Ratio 1 gal = 1 2 gal = 2 2 gal w/irrigation = 3.3 5 gal w/irrigation = 4 15 gal w/irrigation (street trees only) = 5	Tree Quantity using Selected Plant Size (not including other credits)	Added Plant Establishment Years (beyond year 3)	5% Credit per Year (of Column E Quantity)	Tree Quantity Reduction for Added Plant Establishment Credit	Full Years Planted Prior to Impact (partial years not counted)	5% Credit per Year (of Column E Quantity)	dbh Credit for Planting Prior to Impact		
Category 2	100	3.3	30	10	5%	15				50%	15	
Category 1	384	3.3	116	10	5%	58				50%	58	

In this scenario, there are 100 total inches of category 2 trees (4.15-inch trees multiplied by 1) and 384 total inches of category 1 trees (2.32-inch trees multiplied by 6). 2 gallon trees will be planted and 10 additional years of plant establishment will be added to the required 3 years of plant establishment to total 13 years of plant establishment. This is the maximum amount of plant establishment credits. Irrigation will be added to the planting areas and remain in place and working for a minimum of 3 years. Irrigation will be removed after 3 years.

Any vegetation removal work done in the WSDOT right-of-way, which includes the removal of trees not considered an imminent threat, is then subject to tree replacement per the WSDOT Roadside Policy Manual. This applies to WSDOT contractors and third-party entities impacting desirable vegetation on WSDOT land. Third-party entities include but are not limited to developers, utility companies, cities, counties, and neighbors.

We are not placing unique expectations on specific third-party entities or projects – this policy is applied to any work done by any entity or contractor. WSDOT’s policy includes a provision that imminent threat trees do not require replacement per the policy. All other vegetation removal must follow the Roadside Policy Manual. Fee in lieu for vegetation replacement can be applied to any restoration work on WSDOT land, but ground disturbance must be restored per contract or agreement. The restoration of project impacts must be reviewed and approved by a WSDOT landscape architect prior to fee-in-lieu use.

When tree removal within the right-of-way is necessary, there are 2 options available for replacement:

Option 1:

A Vegetation Mitigation Agreement can be used to pay a fee in lieu for trees and/or other vegetation that cannot be restored per the Roadside Restoration Policy on WSDOT land. A third-party entity or contractor can pay a fee for the DBH (Diameter at Breast Height) of removed trees. This fee is \$300/DBH per inch for trees 4”-30” DBH and \$450/DBH per inch for trees greater than 30” DBH. A per acre cost of 195,000 dollars will be applied for early successional trees such as black cottonwood, red alder, and/or trees and shrubs under 4” DBH). The merchantable timber value must also be calculated and included in the Agreement unless the work is already included in a WSDOT contract. Indirect costs are added to the Agreement at the approved annual rate. Once payment to the Vegetation Mitigation Fund has been completed, there is no further commitment.

Option 2:

The impacted trees and/or shrubs can be planted on WSDOT land per the Roadside Policy Manual.

Tree replacement must follow the replacement ratio outlined in Appendix C of the Roadside Policy Manual as well as spacing and offset requirements. There are options to reduce the number of replacement trees. Appendix D, the ‘WSDOT Tree Replacement Calculation Tool’, outlines these options.

If the required number of replacement trees won’t fit in the project area on WSDOT land, the entity shall work with WSDOT to select a nearby site and submit a replacement planting plan which shows areas where trees would be planted, type of trees, soil preparation, offsets, irrigation if needed and spacing. The restoration design must comply with WSDOT standards for planting and/or contract documents. WSDOT planting standards include not only the plant material but also providing 3 inches of soil amendment incorporated to a 12 inch depth of native or existing topsoil, 3 inches of bark or wood chip mulch, and three years of plant establishment

with WSDOT Landscape Architecture oversight for the duration of plant establishment period. Plant establishment activities must include watering, weed control, litter pick up, and plant replacement for a minimum of four times per year to ensure successful plant growth. In addition, a traffic control plan shall be provided by the permit applicant to ensure safety during planting and plant establishment activities.

All plan sets shall be reviewed and approved by WSDOT landscape architecture, maintenance, utilities, and traffic prior to acceptance. Costs for plan review and planting/plant establishment oversight shall be paid for by setting up a separate expense account (JA account) with funding in place to charge time to, unless this work is associated with a WSDOT contract. WSDOT has calculated the cost for restoration to be an estimated \$195,000 per acre, however this cost may vary depending on site conditions. This includes site preparation, traffic control, soil amendment, mulch, plant material, plant establishment, and oversight via a separate expense account.

Vegetation Mitigation Agreements – Merchantable Timber Evaluation for fee-in-lieu

This section is not applicable to WSDOT and WSDOT contractors.

It is highly recommended that the third-party entity have a forester create a merchantable timber evaluation using the Scribner Decimal C log rule method if there is a high likelihood that the impacted trees will total over 1, 000BF (Board Feet) of timber for any category of merchantable species (per the US stumpage value table).

The merchantable timber value was written into the Vegetation Mitigation Agreement using the current US Forest Service stumpage value table. The US stumpage value table is also where we can rule out merchantable timber less than 1,000 BF for each species or category. The third-party entity shall identify all impacted trees(s) on the plans and provide the calculations for merchantable timber value.

Helpful Tools:

<https://webgis.dor.wa.gov/taxratelookup/ForestTax.aspx>