# VEGETATION MANAGEMENT PLAN

2021

Deschutes County
Road Department



# INTRODUCTION

Vegetation management affects all users of the Deschutes County transportation system. Whether you're a driver, bicyclist, pedestrian, adjacent property owner or tourist, the vegetation on the side of the road affects your overall user experience. Overgrown vegetation or vegetation in the wrong location can reduce sight distances and the ability to see signs, traffic signals, pedestrians, bicycles, livestock and wildlife. It can also reduce the effectiveness of other maintenance projects like chip sealing, snow and ice removal, painting and sign placement.

The Deschutes County Road Department uses an Integrated Vegetation Management approach utilizing multiple types of control including mowing, tree trimming, brush cutting (mechanical and hand), herbicide applications and re-vegetation projects. Each of these types of control plays a vital role and are all necessary to achieve a successful vegetation management plan. While public safety is our first priority, there are many other benefits to managing roadside vegetation. Using the best practices for roadside vegetation management preserves the value of our transportation system infrastructure. It also promotes a resilient native roadside plant community and helps to reduce the threat of wildfire while helping to preserve the natural beauty of this unique area.

This plan represents the Road Department's approach to Vegetation Management. It outlines each of the control methods used and the purpose of each method. It also identifies the priorities, objectives and strategies of the Deschutes County Road Department and should be used as guidance document.

## SECTION I: PRIMARY GOALS

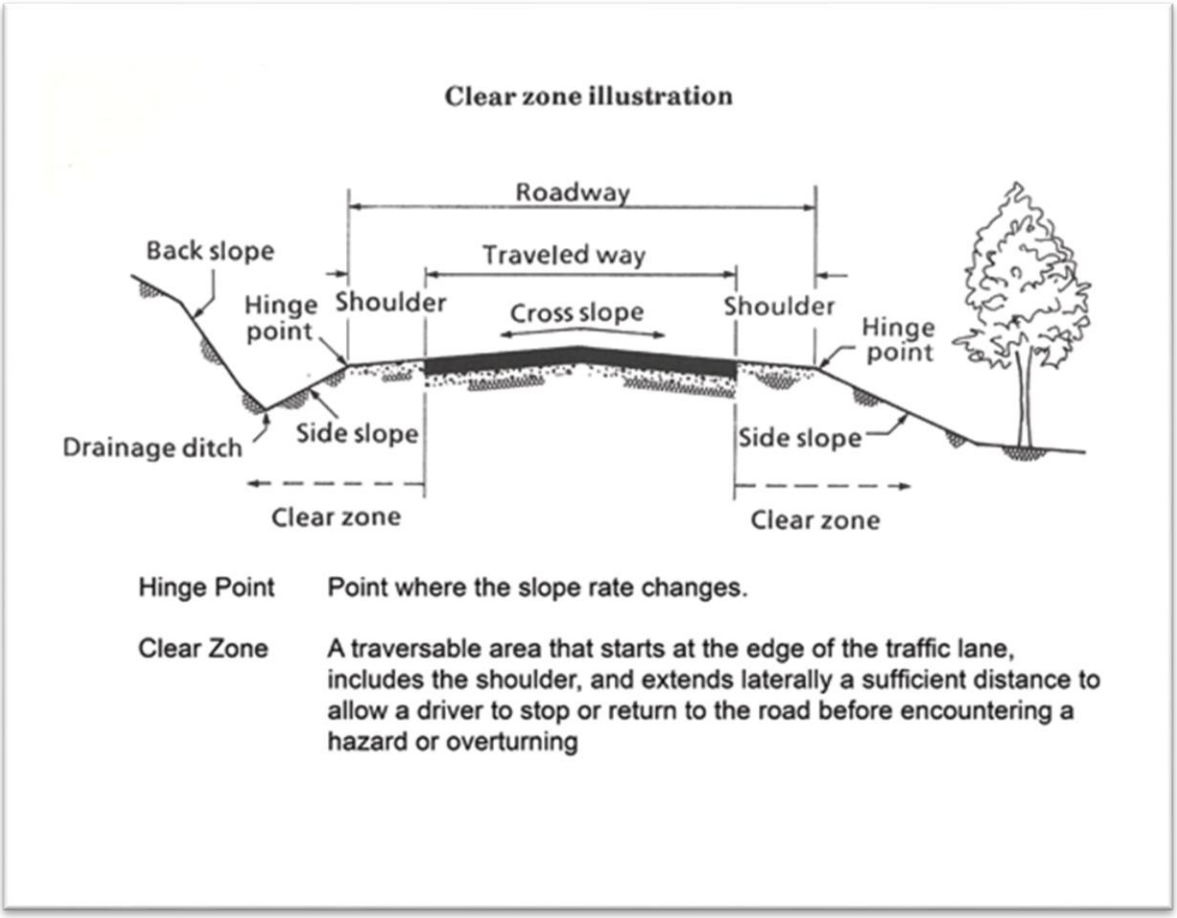
The primary goals for vegetation management in Deschutes County include:

- Keeping road users (vehicles, bicycles and pedestrians) visible to drivers.
- Improving visibility of livestock and wildlife near the road.
- Helping pedestrians and bicyclists see motor vehicles.
- Keeping signs visible to roadway users.
- Improving sight distances on curves and intersections.
- Keeping sidewalks and road shoulders clear from overhanging vegetation.
- Preserving pavement and infrastructure.
- Helping drainage systems function as designed.
- Helping prevent wildfires.
- Providing snow storage for winter snow and ice removal.
- Controlling noxious weeds.

## SECTION II: CLEAR ZONES

Creating clear zones can increase the likelihood that a roadway departure results in a safe recovery rather than a crash, and mitigate the severity of crashes that do occur.

A clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely, or regain control of a vehicle that has left the roadway. The width of the clear zone should be based on risk (also called exposure). Key factors in assessing risk include traffic volumes, speeds, and slopes. Clear roadsides consider both fixed objects and terrain that may cause vehicles to rollover. The goal of the Road Department is to provide a minimum 10-foot clear zone where possible.




Deschutes County Road Department's vegetation management priorities, in order of importance are, shoulders, hinge point, side slopes, ditches and back slopes. The vegetation free road shoulders are achieved through an annual herbicide application.

The hinge point is a transition area that changes from vegetation free to native and desirable vegetation. This transition area often has the most weed pressure because weeds are generally more opportunistic than desirable vegetation and can grow on the outside edge of the herbicide application where the herbicide rate diminishes. This area is generally only a few inches wide but in some instances, can grow substantial amounts of weeds.

The side slopes are where the majority of our mechanical vegetation management activities occur. This is where most of the mowing, brush cutting and tree trimming happens. The drainage ditches and back slopes receive routine maintenance and noxious weed spraying but generally do not receive as much tree trimming, brush cutting and mowing.

## SECTION III: MOWING

Mowing can and should be used selectively when appropriate for roadside vegetation management. Timing, location and environment all play major roles in planning because mowing can have opposite effects on plant growth depending on when and how it is done. The goals of the Road Department's mowing program are as follows:

- Maintaining visibility of hazard markers, guardrails and delineators.
- Improving sight distance at cross streets and intersections.
- Controlling weeds and brush, often coordinated with herbicide applications.
- Increasing native vegetation populations by promoting seed production and distribution.
- Reducing summer fire fuels.
- Reducing snow drift and increasing snow storage areas.

## General considerations for mowing include:

- Do not mow during high fire danger periods as prescribed within the Industrial Fire Precaution Levels as published and declared by the Oregon Department of Forestry**.**

- Do not mow when desirable plants are blooming or before seed has set so they can reseed for next year.

- Do not mow carelessly and scar desirable trees and shrubs.

- Do not mow too short. Try to keep the minimum mowing height at around six inches. This is beneficial to the vegetation and the equipment. Keep the apparatus out of the dirt.

- Visually inspect the area before mowing. Check for utilities, washouts or debris that could be thrown or damage equipment.

- Mow in the direction of traffic. This provides the best visibility and causes less impact if a rock or stick is thrown by the mower.

- Try to keep the tractor on level ground. If a hill side must be mowed, keep the boom mower on the uphill side to reduce the risk of rollovers.

## Traffic control for mowing operations

Mowing is a moving operation taking place on the side of the road or off the road way. Therefore, it requires different traffic control from other maintenance operations.

The most important thing to remember is to make the mower visible to drivers. That way, drivers will be alert to the mower and be able to avoid any potential collisions. Some tips include:

- Turning on headlights, rear working lights and hazard flashers.

- Turning on all roto-beam lights and making sure the slow moving vehicle triangle is visible.

- Make sure the tractor is not excessively covered in dirt or mud that reduces the visibility of safety lights or emblems.

Warning signs such as MOWING AHEAD, ROAD WORK AHEAD or similar signs may be placed along the road. The MOWING AHEAD sign is preferred. Place it on the shoulder so that approaching traffic can read the message easily. As work progresses, move the signs so there are one or two miles between the signs and the actual mowing work.

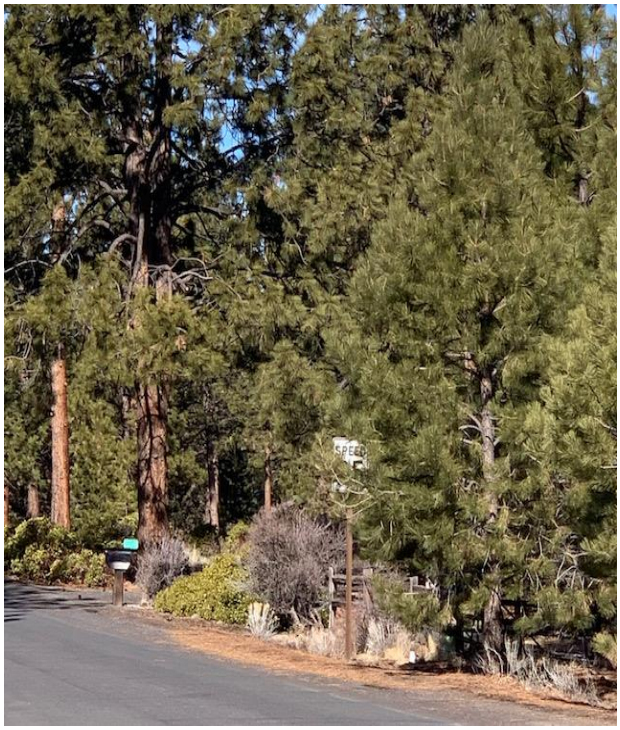
## SECTION IV: CUTTING TREES AND BRUSH

Removing trees and brush from within the right-of-way that interfere with the safe operation of the road system is an important part of vegetation management. The reason for cutting back plants or removing them entirely include:

- Keeping the recovery area clear of fixed hazards.
- Maintaining sight distance at intersections, cross roads, and along curves.
- Removing vegetation that may obscure wildlife or livestock.
- Removing trees that may pose the threat of falling on the roadway under conditions of high wind or unstable soil.
- Controlling invasive species.
- Removing trees or brush that obscure traffic signs, signals, and markers.
- Preventing encroachment of plants into guardrails, drainage features, and shoulders.
- Removing plants that are unhealthy or dead due to traffic damage, lightning, disease, or other problems.
- Preventing snow drift and reducing ice on the roadway due to shading.

## SECTION V: SIGN VISIBILITY

Signs should be visible to drivers at all times. Maintenance patrols should be on the lookout for trees and brush that block the view of signs and other traffic control devises. Tree branches or brush in front of a sign can hide it from the view of motorists. Regulatory signs, such as stop and yield signs, are the most critical. Brush and tree branches in front of them should be removed immediately. It is important that motorists see warning and guide signs as well. Vegetation in front of these signs should be trimmed and removed as soon as possible.



*Above: Examples of signs obscured by vegetation.*

Drivers need a clear line of sight to any roadside signs or hazards far enough ahead to allow them to react safely to each situation. When on maintenance patrol, look for signs and other traffic control devices (including chevron signs in curves) blocked by brush, trees, grass or weeds. Often, a small branch from an overhanging tree or bush near the sign is all that needs to be trimmed. If vegetation along the ditch or shoulder blocks a driver's view of a sign, then cut enough to allow a driver sufficient time to see the sign and respond to its message.

The below table provides a suggested guideline that considers two groups of signs, critical Regulatory signs like STOP, YIELD and DO NOT ENTER or any sign that requires a driver to stop and noncritical signs Regulatory, Warning, and Guide signs.

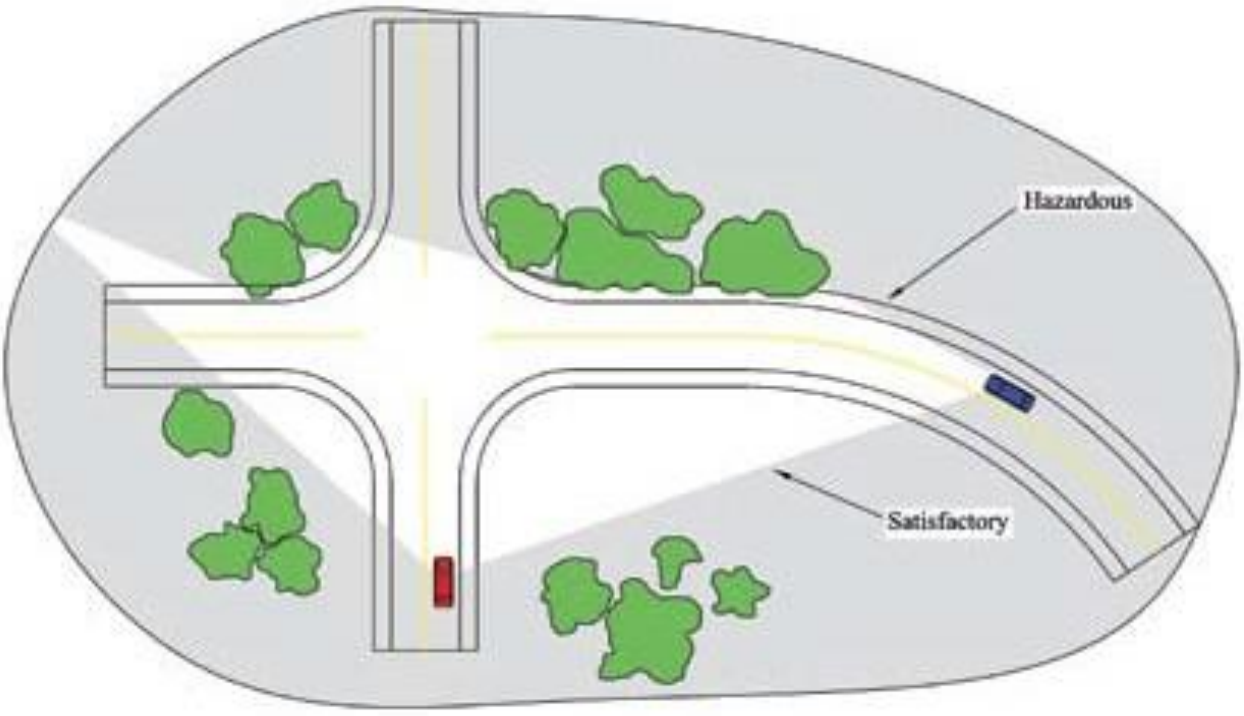
**Sight Visibility to critical Regulatory (Stop and Yield) and other non-critical Regulatory, Warning or Guide Signs**

| Speed Limit (MPH) | Sight Distance to Stop or Yield Sign (feet)<br><br>*AASHTO Stopping Sight Distance* | Other Regulatory, Warning or Guide Signage (Curve Signage, Stop Ahead, Speed Limit, etc) |
|---|---|---|
| 25 | 155 | 100 |
| 30 | 200 | 100 |
| 35 | 250 | 100 |
| 40 | 305 | 125 |
| 45 | 360 | 175 |
| 50 | 425 | 250 |
| 55 | 495 | 325 |

The minimum sight distance and visibility measurements noted above should be provided from the full width of the travel lane to the entire surface of the sign. Vegetation should be trimmed or removed to the greatest degree possible to allow for maximum visibility and future growth without sight obstruction.

## SECTION VI: INTERSECTION SIGHT DISTANCE

Another important sight distance requirement that can be affected by vegetation is intersection sight distance. Drivers approaching an intersection need a clear line of sight to the intersection and along the crossroads early enough to see any conflicting vehicles, bicyclists or pedestrians to avoid a collision. Together these sight lines provide a sight triangle. These sight triangles can be limited by buildings, curves, other physical objects and vegetation. Clear sight triangles at intersections are critical for the safety of all road users, make sure that vegetation overgrowth is not limiting the sight distance in these sight triangles.



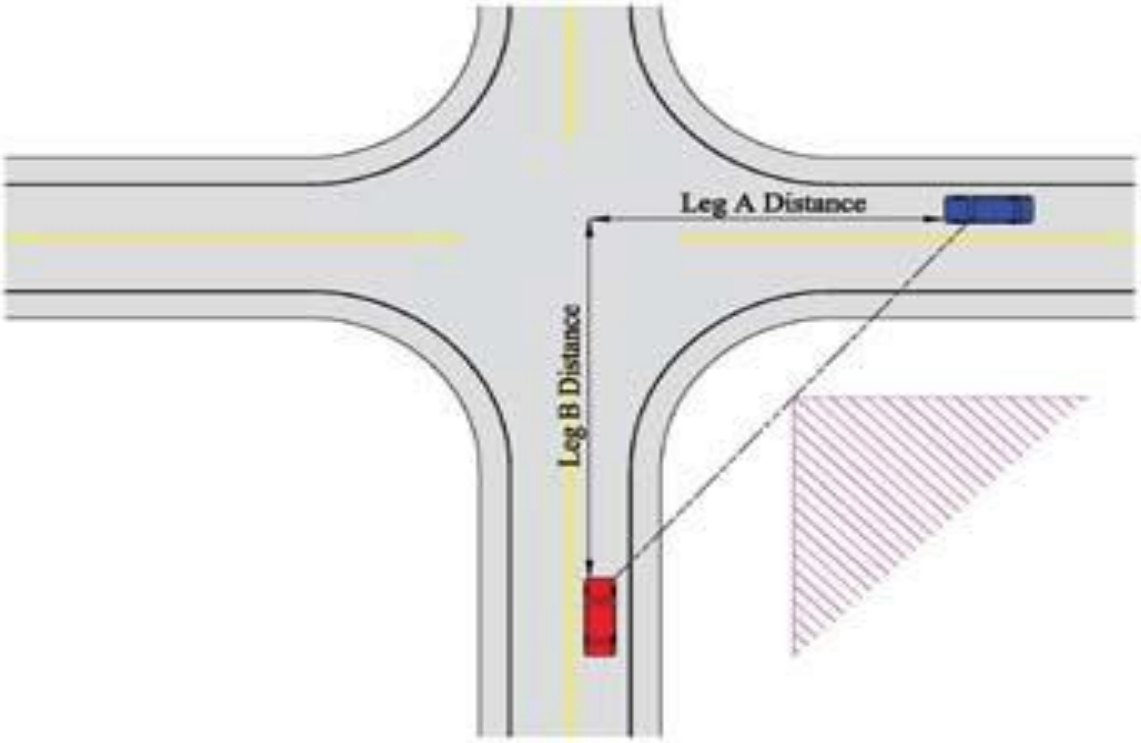

***Satisfactory and hazardous sight lines at an intersection.***

There are several sight distance requirements for drivers approaching and entering an intersection which are dependent on the type of intersection control (uncontrolled, yield sign, stop sign or traffic signal) and the desired maneuver (turn left or right or travel straight through).

**Uncontrolled Intersection:**

Uncontrolled intersections within the County's network are rare, however they do exist in remote areas. A driver approaching an uncontrolled intersection should be able to see potentially

conflicting vehicles in sufficient time to slow down and if necessary, stop before reaching the intersection, this applies for both roads. The corner sight triangle for this situation is determined by the length of the two legs, A and B, in the figure that follows. These distances are based on the vehicle speed as shown in the table. If road A has a speed limit of 35 mph and road B has a speed limit of 45mph, the length of leg A would be 165 feet and leg B would be 220 ft. If the speed traveled is usually higher than the speed limit posted, take that into account.




**Intersection Sight Distance: No Traffic Control**
**(AASHTO Stopping Sight Distance)**

| Speed Limit (MPH) | Leg Distance (Feet) |
|---|---|
| 25 | 115 |
| 30 | 140 |
| 35 | 165 |
| 40 | 195 |
| 45 | 220 |
| 50 | 245 |
| 55 | 285 |

**Controlled Intersections**

If a driver is stopped at an intersection, there is a need for sight distance to vehicles approaching from either direction of the approaching road so that the stopped driver can safely turn left, right or proceed across the intersection. Of the three options, the sight distance to turn left is the longest and can be used to establish the required corner sight triangle for both legs of the minor road. These distances are shown in the table below for automobiles turning left onto a two-lane, two-way road on a level grade. If the intersection approaches are on steep grades, are skewed, the major road has more than two lanes or there is significant truck traffic entering from the minor road, contact the County Engineer for a modified intersection sight distance calculation.

**Intersection Sight Distance for Left Turn from Stop (AASHTO Case B1)**

| Speed Limit (MPH) | Intersection Sight Distance (Feet) |
|---|---|
| 25 | 280 |
| 30 | 335 |
| 35 | 390 |
| 40 | 445 |
| 45 | 500 |
| 50 | 555 |
| 55 | 610 |

If vegetation is limiting the corner sight distance, it should be trimmed back or removed as long as it is within the right-of-way. If the vegetation is not within the right-of-way or if unsure it is in the right-of-way, an Operations Supervisor, the County Surveyor or County Engineer should be consulted prior to removal.

Intersection sight distance should be measured and therefore provided from a point 15-feet from the fog line or edge of travel lane. This position approximates the location of the driver's eye when stopped at an intersection.

## SECTION VII: HERBICIDE APPLICATION

Herbicide use is one of the primary methods for managing roadside vegetation, protecting roadway integrity, and improving motorist safety. It is also one of the most cost effective ways of controlling roadside vegetation. Herbicide application is used in coordination with physical methods to control vegetation in the right-of-way and should be used as part of an integrated vegetation maintenance program.

Herbicides are used to:

- Help maintain a clear recovery zone.
- Protect roadside infrastructure and pavement integrity.
- Control vegetation around roadside features such as guardrails, sign structures, delineators, and bridges to maintain visibility of hazard markers and reflectors.
- Preserve sight lines.
- Remove fire fuel accumulations.
- Selectively target vegetation that disrupts desirable vegetation communities.
- Remove invasive weeds.

The noxious weed program and noxious weed listings can be found on the Road Department's website.