



Division of Public Works  
355 Montevue Lane, Suite 200  
Frederick, Maryland 21702

## STANDARD PROCEDURES

Effective  
Date: Dec. 7, 2021

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Subject:

### Tractor and Boom Mowing for Vegetation Control

I. **Purpose:** To assist Office of Highway Operations (OHO) employees in the promotion of traffic and pedestrian safety, this procedure establishes guidelines for the maintenance of roadside vegetation. The goal of the maintenance effort is to provide a clear zone in the travelway to accommodate the safe operation of vehicles, cyclists, pedestrians, and others who use the right of way. It also provides guidance for maintenance crews regarding safe mowing, brush cutting, and other methods to control roadside vegetation. Furthermore, this procedure addresses limits of vegetation control with respect to the public travelway, furnishes a recommended schedule for tractor and boom mowing, and provides for recognition of property owners' requests for specific action or non-action by OHO staff.

(See the *Highway Operations Mower Training Program Standard Procedures* for additional information regarding the safe operation of the mower.)

#### A. Definitions

1. **Boom mower:** Tractor with an articulating arm with a mower attachment for reaching behind guardrails or roadside banks.
2. **Clear Sight Lines:** Sight lines established along a travelway so that the driver of a vehicle can see oncoming traffic that may otherwise be obstructed.
3. **Clear Zone:** An area that is clear of obstacles such as tree limbs, branches and vegetation that may impede a vehicle on the travelway. Required dimensions with respect to this procedure are included in the attached exhibits.
4. **Dedicated right of way:** An area, typically over the surface of land, that has been dedicated to public use through plats or deeds which allows for use by others for a specific purpose subject to the fee simple property interests of the adjacent landowner.
5. **Invasive species:** Plants, animals or pathogens that are not native to the ecosystem under consideration, and whose introduction causes or is likely to cause harm. Lists of invasive species may be found on the U.S. Department of Agriculture WEB site: [National Invasive Species Information Center \(NISIC\)](#)
6. **Noxious weed:** a weed which is considered to be harmful to the environment or animals, especially one which may be the subject of regulations governing attempts to control it. Maryland Department of Agriculture: [Noxious Weeds in Maryland](#)
7. **Prescriptive right of way:** The right to use of another's land, which has been established by exercising this right over a period of time. For many Frederick County



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Roads, this is the only type of right of way that exists and is generally recognized as being the width of the travelway and may also extend to include roadside ditches if maintained by the County or other public entity. This may include installed driveway culverts. The adjoining property owner(s) retain fee simple ownership of the underlying property.

8. **Public travelway:** The travel surface of a public road which may consist of concrete, asphalt tar and chip or gravel.

9. **Recovery Zone:** An area adjacent to the public travelway that facilitates the safe recovery of a vehicle that leaves the travelway.

10. **Rural Road:** Those roads listed on Exhibit "B" of Resolution No. 02-23 of the Board of County Commissioners of Frederick County, Maryland with an effective date of September 24, 2002, as amended from time to time.

11. **Safe Sight distance:** A distance which provides adequate time for a vehicle to see an object such as a pedestrian or another vehicle and take such action as required to avoid a collision. The distance required is determined by the speed of the vehicle(s). Minimum sight distance listed in the Frederick County Roads and Streets Design Manual is 200 feet for stopping and 300 feet at intersections. Required distance increases with speed.

12. **Shoulder:** An area immediate adjacent to the travelway. This area may be paved, gravel or grass, which may also constitute a Recovery Zone.

13. **Tractor mower:** A tractor with a side mounted mower deck used for roadside mowing where the terrain is relatively flat.

II. **Background/Program Objectives:** Highway and street agencies facilitate roadway safety with a sound maintenance program. Employees of local road agencies are responsible for reviewing their roads and rights-of-way to identify hazards and foster safe conditions for the public and employees.

Uncontrolled vegetation may be hazardous for many reasons: trees close to the road can present a fixed object hazard; tall grass, weeds, brush, and tree limbs obscure or limit a driver's view of the road ahead, including traffic control devices, approaching vehicles, wildlife, pedestrians, and bicycles. Controlling vegetation helps reduce crashes and injuries.

#### A. Objectives

The benefits achieved by meeting these objectives are clear sight lines, improved drainage conditions, an unobstructed travelway for all vehicles, including farm equipment, emergency





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responders and County snowplows, which require a clear height of up to seventeen feet for winter operations, when plow and salting operations require a raised truck bed and a safe area of refuge for bicyclists and pedestrians.

1. Clear Sight Lines - Tall grass, weeds, and brush along the shoulder, ditch, and back slope areas of a roadside can create problems. Tall grass may hide low fixed-object hazards, such as culvert headwalls, drainage inlets, guardrail ends, and the object markers in front of them, as well as wildlife and livestock. High grass can also obscure the edge of pavement and shoulder condition. OHO performs shoulder and roadside maintenance, such as grading or mowing, to define the edge of shoulder and ditch so that motorists can see the shape, condition, and limits of the roadside.

2. Horizontal Curves - On the inside of horizontal curves, vegetation growth close to the pavement edge can block a driver's view of motor vehicles, bicycles, and pedestrians traveling in the same or opposite direction. Maintaining roadsides so headlights and taillights are visible around the inside of horizontal curves increases horizontal sight distance.

3. Drainage - Weeds, turf, and sod can interfere with roadside drainage. A high shoulder creates a secondary ditch along the edge of the road which may damage the pavement. Water on the pavement due to high shoulders causes safety problems, including hydroplaning and isolated icy conditions during winter. Grading is necessary to ensure the shoulder continues the slope from the road crown smoothly.

4. Side Road Visibility - The potential for vehicle crashes increases at intersections. Safe and efficient vehicle movement through an intersection requires good visibility. As drivers approach an intersection, they need to check each quadrant of the intersection for entering vehicles. Similarly, drivers pulling out from a STOP sign need a clear view of oncoming traffic. OHO strives to maintain clear site distance at each corner of the intersection for driver safety.

5. Maintained Shoulder area - Providing a mowed shoulder along the road provides an area for vehicles to pull off the road to allow oncoming traffic to pass. It also provides a safe area of refuge for bicyclists and pedestrians from vehicular traffic on narrow roads.

#### B. Benefits

Mowing rights-of-way regularly and consistently:

1. Ensures regulatory and wayfinding signs are visible to drivers.



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2. Ensures road users (vehicles, bicycles, and pedestrians) are visible to drivers.
3. Helps pedestrians and bicyclists see motor vehicles and provides an area of safe refuge on narrow road segments.
4. Improves driver sighting of livestock and wildlife near the road.
5. Ensures sidewalks and pedestrian paths are free and clear of overhanging vegetation.
6. Removes trees close to the roadway that may cause property damage or severe injury if struck.
7. Keeps edge-of-road shoulder area clear of obstructions to maintain a recovery area for vehicles that veer off the road.
8. Improves winter road maintenance in snow and ice areas.
9. Helps drainage systems function as designed.
10. Preserves pavements through daylighting and root system control.
11. Controls noxious weeds and invasive tree species, in accordance with local laws and ordinance, reducing the need for herbicides.

### III. Techniques:

**A. Bank Mowing** - Mowing of banks, predominately by boom mowers towards the end of the growing season, discourages fast growing invasive tree species from becoming established. If allowed to establish, trees such as Ailanthus (Tree of Heaven), Bradford pear, and Bamboo can quickly spread, requiring considerable manual labor to keep them from overhanging the road and entering the clear zone. (See Exhibits 1 and 2.) Mowing of brush and undergrowth also provides a safe, accessible work area for tree trimming operations.

**B. Roadside Mowing –**

1. General - Mowing of flatter, roadside shoulder areas will be performed by tractor mowers, making single or double five (5) foot passes depending on schedule and time of year. Holding to the established frequency maintains sight distance, controls turf to





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maintain adequate drainage, provides a safe area of refuge for pedestrians and cyclists and provides a recovery area for vehicles.

2. Rural Roads - those roadways within the Rural Roads program, generally narrower with lower traffic count, are suitable for single pass mowing unless different treatment is warranted due to

- a) The presence of Dedicated Right of Way.
- b) Intersection sight distance
- c) An adjoining property owner request pursuant to section V.C.3, below

**C. Roadside Tree Maintenance** - One of the most common causes of fatal and serious injury crashes on rural roads involves vehicles leaving the road and striking a tree. The concept of a clear or recovery zone -- an area adjacent to the travelway where slope, surface, and an absence of fixed objects can permit recovery of a vehicle that leaves the roadway -- is important for providing a safe roadside. Trees are potential hazards because of their size and location with respect to vehicular traffic. Trees larger than four inches in diameter can be a hazard to a vehicle. The closer trees are to the travel lane, the more likely a vehicle is to strike them.

Isolated trees provide a better opportunity for removal compared to forest conditions, where removal involves significant cost. OHO recognizes that removing individual trees may be controversial and bases its decisions to proceed with removal primarily upon potential crash frequency and severity. OHO assigns trees closest to the road removal priority; assesses trees in critical locations, such as curves and intersections, for removal; and pays particular attention to trees that drivers have previously struck.

1. Snagging occurs when a vehicle undercarriage catches on a stump or other object. Generally, any stump higher than four inches above the surrounding ground can cause snagging.

- a) Cut trees close to the ground so that no stump remains as a fixed object or snagging hazard or schedule the stump to be ground flush.
- b) Cut small-diameter trees no more than four inches from the ground.
- c) Cut large-diameter trees flush with the ground.



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- d) Cut trees of any size growing on a slope flush with the ground.
- e) Remove all trees within the clear zone when they are small saplings rather than small trees. At that time, they are easy to cut off at ground level and cause no stump problems.

2. Fell and dispose of via approved methods any dead and leaning trees within the road right-of-way that endanger the traveling public.

3. Contact property owners prior to removal of any potentially hazardous trees outside the right-of-way. Note that an emergency may warrant immediate OHO intervention. Documentation is especially important in these situations. OHO must maintain records regarding receipt of emergency notice, date of review, OHO employees involved in resolution, and other relevant facts.

**D. Winter Maintenance** - When trees and shrubs (particularly evergreens) in the right-of-way cast shadows on the pavement (trees growing on the south side of the road cause this issue), freeze/thaw cycles may create isolated icy patches on the pavement. Since the rest of the road is dry, drivers do not anticipate these icy patches and loss-of-control crashes result.

- 1. Work on the south and west sides of the roads first if time and money for brushing are limited.
- 2. "Daylight" by cutting taller vegetation to enable the sun to help with thawing and ice control (and generally to help preserve pavement).
- 3. In areas receiving heavy snow, provide vegetation clear zones for snow storage.
- 4. In the fall, when crews perform winter maintenance dry runs, identify dead limbs overhanging the road and remove. Dead branches overhanging roadways are problematic because winter snow and ice accumulate on the dead branches and the extra weight often causes them to fall on the roadway and traffic.

#### IV. Resources:

OHO utilizes tractor mowers and boom mowers, as well as mowing contractors, to control vegetation along County rights-of-way. Contractors or Homeowner's Associations primarily mow medians because the County does not have the equipment to maintain this part of the right-of-way safely, nor does it have enough median area to justify the purchase of this type of equipment.





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Tractor mowers mow the flat shoulder areas. These mowers can mow a five-foot-wide pass, mowing one or two passes per mowing, depending on the time of year. Boom mowers mow hard-to-reach areas, such as behind guardrail, around culverts and headwalls, and along the steeper banks where the deck on the tractor mower cannot reach. When mowing in high-traffic or high-posted-speed roads, OHO may employ a chase vehicle with warning lights to enhance safety.

#### V. Operations:

OHO utilizes tractor mowers to make single or double five-foot-wide passes to the roadside to control vegetation. For those areas the tractor mower cannot reach (behind guardrail, around culverts/headwalls, and on banks), OHO will use boom mowers.

##### A. Various factors influence off-the-road-edge limit decisions:

1. Safe sight distance around curves and at intersections.
2. Visibility of traffic control devices, such as regulatory signs and roadside delineators.
3. Visibility of infrastructure in the right-of-way, such as culvert headwalls and bridge abutments, telephone and cable utility boxes and mailboxes.
4. Controlling the growth of trees adjacent to the roadway that may become hazardous to the traveling public due to their size and/or location.
5. Maintaining a recovery zone for vehicles that may leave the travel surface.

(Exhibits 1 and 2 identify the optimal clear zone dimensions for the safety of the traveling public, including OHO equipment employed in snow and ice maintenance operations. OHO may not always be able to maintain the optimal clear zone, where mowing operations will need to occur outside the dedicated or prescriptive right-of-way.)

##### B. Frequency

1. Tractor mowing begins in April with the objective of making a pass every four to six weeks. The primary purpose of the tractor mower is to maintain clear sight distance, keep drainage swales open, and clear the recovery area of vegetation, brush, and stumps. Mowers will make a single pass while vegetation is growing rapidly. They will then make a



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double pass during the slower summer months, except for areas specifically exempt for Rural Roads per section III.B.2.

2. Boom mowers will mow banks and behind guardrail yearly, or more often where sight distance is a major issue. OHO may mow other locations once every two to four years due to scheduling, weather, or equipment availability.

3. Tree trimming begins early December and continues through mid-April. OHO inspects roads to identify overhanging limbs, sight distance issues at intersections, dead trees, and trees affected by scheduled road improvements. Tree trimming will continue to a lesser extent throughout the remainder of the year, as OHO identifies issues when trees are in full foliage, after storm damage, or upon receipt of citizen complaints.

**C. Property Owner Requests** - OHO respects the rights of property owners and understands that some property owners may request assistance from its workforce to provide maintenance of roadside vegetation.

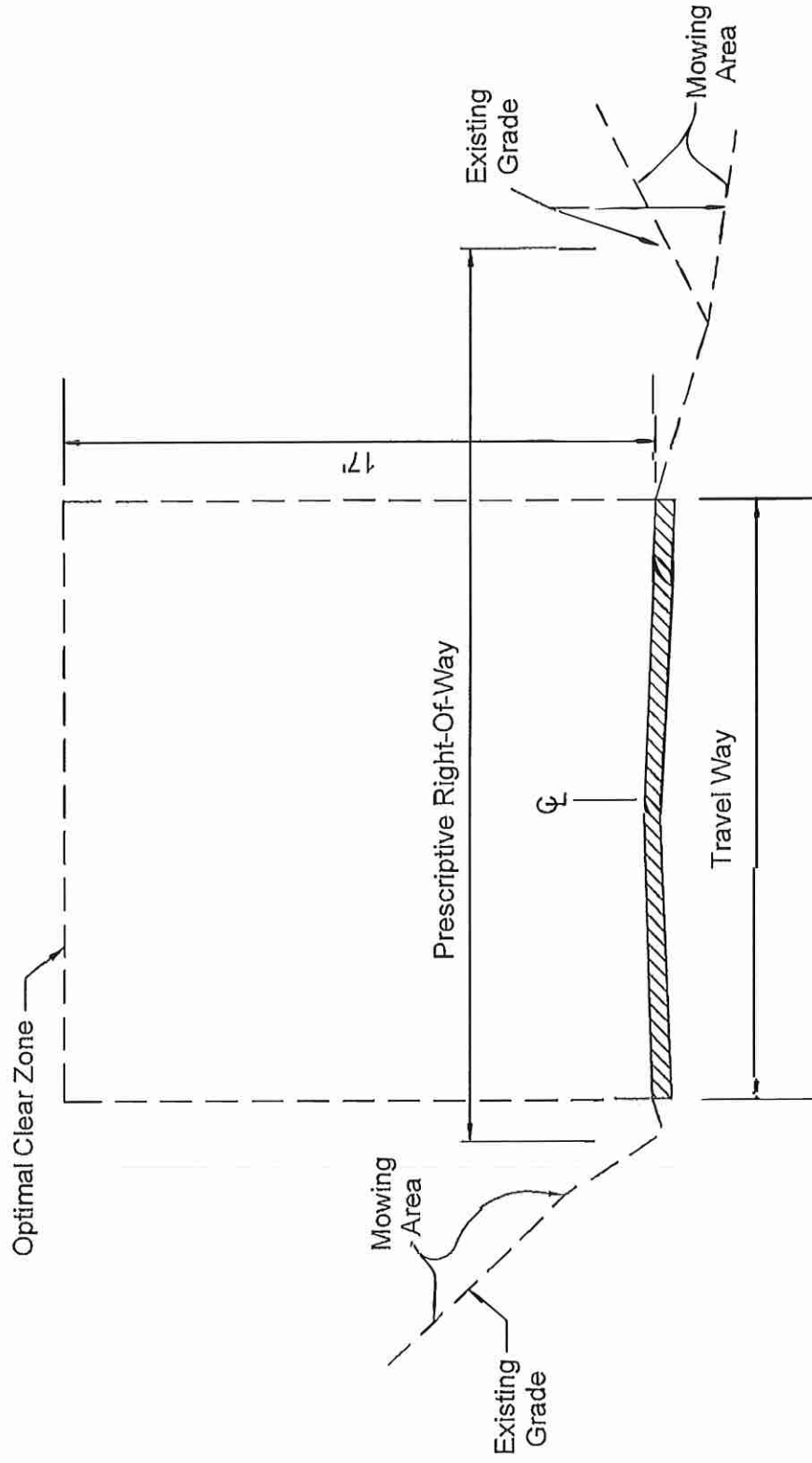
1. OHO does not mow outside the right of way if the area is mowed by the property owner.

2. OHO approves "no mow" requests along individual properties on a case-by-case basis if the property owner maintains their frontage to OHO standards, for the safety of all who utilize the road network. For these cases, the property owner must complete a *No Mow Request* form which must be approved by the Division of Public Works.

3. OHO approves requests to mow farther off the road edge on a case-by-case basis, when there is a definitive safety benefit to the County, such as increasing sight distance, enlarging the recovery area, or eliminating overhanging trees. For these cases, the property owner must complete a liability waiver before OHO equipment may enter upon private property.



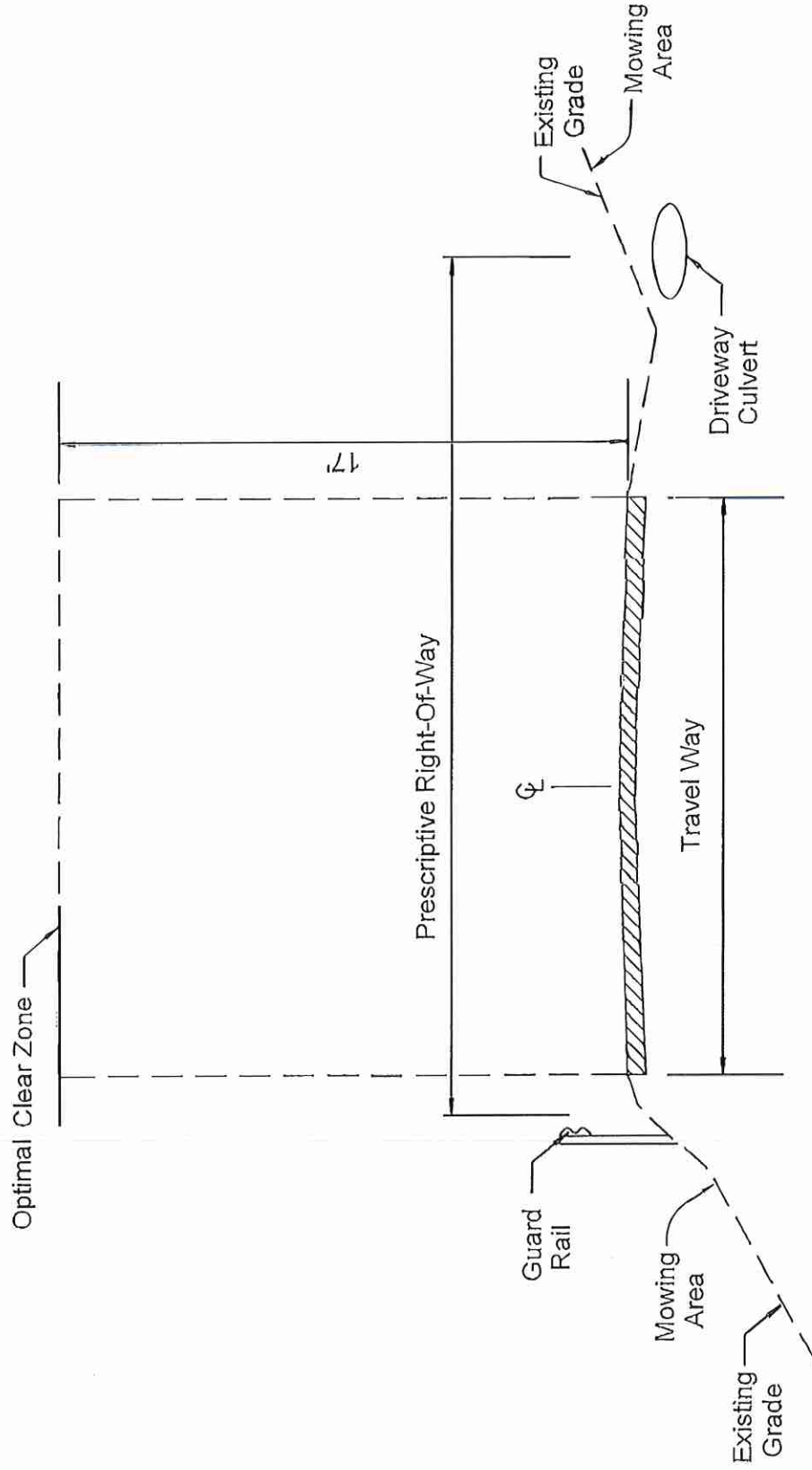
# EXHIBIT 1



## TYPICAL CLEAR ZONE

NOT TO SCALE

# EXHIBIT 2



## TYPICAL CLEAR ZONE

NOT TO SCALE