

State of Vermont Agency of Transportation
Maintenance and Operations Bureau

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Best Management Practice: “STATE HIGHWAY SYSTEM MOWING”

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VTRANS STATE HIGHWAY SYSTEM MOWING BEST MANAGEMENT PRACTICES (BMPs)

PURPOSE STATEMENTS

The VTrans State Highway System Mowing BMP guides mowing activities in order to:

- ∞ Maintain safe roads and bridges for the traveling public;
- ∞ Prevent infrastructure deterioration;
- ∞ Reduce Cost (energy, equipment and personnel costs);
- ∞ Reduce VTrans energy consumption;
- ∞ Reduce VTrans greenhouse gas and unhealthy emissions from mowing equipment;
- ∞ Protect water quality, wildlife habitats and natural ecology of the highway corridor;
- ∞ Preserve the scenic qualities of the highway corridor.

GUIDING PRINCIPLES

The BMP has several guiding principles:

- ∞ Create consistent mowing requirements throughout the state;
- ∞ Form the basis for contractor specifications;
- ∞ Limit activities only to those areas where mowing is necessary for the safety of the traveling public and long-term infrastructure protection;
- ∞ Schedule mowing during the growing season to maximize benefit and minimize cost;
- ∞ Create mechanisms and standards for addressing environmentally sensitive areas, riparian areas, steep slopes, wetlands, rare & endangered species and their habitats, unique natural areas, and wildlife habitats;
- ∞ Create provisions for areas of special landscape treatment;
- ∞ Foster long term sustainable landscape vegetation management, minimizing excessive mowing and herbicide use;
- ∞ Increase and improve Pollinator habitat on VTrans-managed rights-of-way;
- ∞ Preserve the scenic qualities of the corridor to the extent practicable, while maintaining environmental stewardship and conserving resources;

MOWING STANDARDS

These standards are applicable only to the VTTrans State Highway System (limited access and non-limited access) and are subject to the conditions and exceptions noted below. A reduction in mowing must not result in putting the public at risk by reducing minimum highway safety standards. If minimum sight distance safety standards dictate that sight-lines be mowed more frequently for public safety purposes, then the VTTrans District Transportation Administrator (DTA) or its designee shall make the appropriate arrangements to maintain open sight-lines and other highway safety standards as required.

The DTA or its designee must ensure compliance with all VOSHA standards and the MUTCD (Manual for Uniform Traffic Control Devices) by use of contract language and pre-mowing safety plan review meetings with the mowing contractor or VTTrans personnel. Items to be addressed in addition to VOSHA and MUTCD standards should include, but are not limited to, equipment loading, storage, and access plans; traffic control and mobile operations sign planning, and protection of personnel, infrastructure, and the traveling public.

In order to meet the Purpose and Guiding Principles related to energy conservation, emissions control, cost savings and Pollinator habitat, every effort should be made to reduce the number of mower equipment trips or passes necessary to accomplish the mowing objectives as defined by this BMP. To accomplish this, mowing limits have been set as “up to” limits allowing some flexibility to achieve these objectives. Changes to contracting documents may be required to achieve these objectives.

NON-LIMITED ACCESS HIGHWAYS (NLAH)

NLAH.1 – MOWING ONE TIME ANNUALLY

Referred to as the “Clear Zone Cut” and defined as:

- a) One mow annually during the growing season.
- b) Mowing commencing no earlier than June 1st and completed by August 31st.
- c) Mowing is permissible subject to the following minimum and maximum limits:
 - ▶ **Minimum mowing limit:** that required to maintain highway safety standards (ie. sight distances).
 - ▶ **Maximum mowing limit:** up to (not required) the Highway Clear Zone limits (defined below).
- d) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- e) Mowing is to be accomplished in as few motorized equipment passes as is practicable.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

NLAH “Clear Zone” Defined:

For the purpose and intent of this BMP, Clear Zone for non-limited access highways is defined as follows:

- ▶ Design Speeds up to 45 mph = 16-foot Clear Zone
- ▶ Design Speeds 46 to 55 mph = 26-foot Clear Zone

The “Clear Zone” on non-limited access highways is defined based on Design Speed and Design ADT and varies for cut and fill slopes, based on the 1997 Vermont Design Standards. Clear Zone is measured from the edge of traveled way, not edge of pavement. Please note that paved shoulders outside of traveled way are included in the defined Clear Zone. The resulting limits of mowing as measured from edge of pavement will need to be determined after subtracting paved shoulder width from the Clear Zone dimension. In roadway segments with varying shoulder widths, averaging to get a one clear zone cut width for that segment of highway is allowed.

NLAH.2 – MOWING ONE TIME EVERY 3RD YEAR

Referred to as the “3rd Year Cut” and defined as:

- a) One mow every 3rd year during the growing season as a substitute for the annual “Clear Zone Cut” in that area and for that year is allowed. It is not the intent of this BMP to allow both the annual “Clear Zone Cut” and “3rd Year Cut” to occur in the same year at the same location.
- b) Mowing commencing no earlier than June 1st and completed by August 31st.
- c) Mowing is permissible subject to the following minimum and maximum limits:
 - ▶ **Minimum mowing limit:** the full extent of the non-limited access highway Clear Zone (defined above) to prevent brush and tree growth from establishing in the Clear Zone and additional mowing required to maintain highway safety standards (ie. sight distances).
 - ▶ **Maximum mowing limit:** up to (not required) the edge of the highway right-of-way.
- d) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- e) Mowing is to be accomplished in as few motorized equipment passes as is practicable.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

NLAH.3 - MOWING NON-LIMITED ACCESS HIGHWAY MEDIANS, ISLANDS & INTERSECTIONS

Increased mowing coverage and frequency in medians, islands, and intersection areas of non-limited access highways is permissible as specified below:

- a) Mowing during the growing season, is allowed and is not subject to the June 1st (start) and August 31st (end) restrictions, in order to maintain a more manicured lawn appearance throughout the growing season.
- b) Increased mowing activity must be authorized by the DTA. In doing so, the DTA shall consider public safety needs, maneuvering, turning movement, and merging sight-line needs, and the proximity of the proposed area of additional mowing to an urbanized area, ensuring the mowing plan is sensitive to the context of that area, is acceptable under current budget constraints, and to the extent practicable supports the BMP Purpose Statements & Guiding Principles. A reduction in mowing must not result in putting the public at risk by reducing minimum highway safety standards.
- c) Narrow medians on non-limited access highways, may be fully mowed (across the entire median width) beyond the clear zone for safe visibility purposes and to avoid narrow strips of grass being left in the middle of these medians.
- d) Medians with glare screen plantings shall be mowed to avoid disturbance of these glare screen plantings.
- e) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

LIMITED ACCESS HIGHWAYS (LAH)

LAH.1 – MOWING ONE TIME ANNUALLY

Referred to as the “Clear Zone Cut” and defined as:

- a) One mow annually during the growing season.
- b) Mowing commencing no earlier than June 1st and completed by August 31st.
- c) Mowing is permissible subject to the following minimum and maximum limits:
 - ▶ **Minimum mowing limit:** that required to maintain highway safety standards (ie. sight distances).
 - ▶ **Maximum mowing limit:** up to (not required) the Highway Clear Zone limits (defined below).
- d) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- e) Mowing is to be accomplished in as few motorized equipment passes as is practicable.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

LAH “Clear Zone” Defined:

For the purpose and intent of this BMP, Clear Zone for limited access highways is defined as follows:

- ▶ Limited Access Highways = 30-foot Clear Zone

Clear Zone is measured from the edge of traveled way, not edge of pavement. Please note that paved shoulders outside of traveled way are included in the defined Clear Zone. The resulting limits of mowing as measured from edge of pavement will need to be determined after subtracting paved shoulder width from the Clear Zone dimension. In roadway segments with varying shoulder widths, averaging to get a one clear zone cut width for that segment of highway is allowed.

LAH.2 – MOWING ONE TIME EVERY 3RD YEAR

Referred to as the “3rd Year Cut” and defined as:

- a) One mow every 3rd year during the growing season and as a substitute for the annual “Clear Zone Cut” in that area and for that year is allowed. It is not the intent of this BMP to allow both the annual “Clear Zone Cut” and “3rd Year Cut” to occur in the same year at the same location.
- b) Mowing commencing no earlier than June 1st and completed by August 31st.
- c) Mowing is permissible subject to the following minimum and maximum limits:
 - ▶ **Minimum mowing limit:** the full extent of the limited access highway Clear Zone (defined above) to prevent brush and tree growth from establishing in the Clear Zone and additional mowing required to maintain highway safety standards (ie. sight distances).
 - ▶ **Maximum mowing limit:** up to (not required) the edge of the highway right-of-way.
- d) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- e) Mowing is to be accomplished in as few motorized equipment passes as is practicable.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

LAH.3 - MOWING LIMITED ACCESS HIGHWAY MEDIANS

Increased mowing coverage and frequency in the median areas of limited access highways is not recommended. However, under certain circumstances, increased mowing coverage and frequency in the median areas of limited access highways is allowed as specified below:

- a) Mowing during the growing season, is allowed and is not subject to the June 1st (start) and August 31st (end) restrictions, in order to maintain a more manicured lawn appearance throughout the growing season.
- b) Increased mowing activity must be authorized by the DTA. In doing so, the DTA shall consider public safety needs, maneuvering, turning movement, and merging sight-line needs, and the proximity of the proposed area of additional mowing to an urbanized area, ensuring the mowing plan is sensitive to the context of that area, is acceptable under current budget constraints, and to the extent practicable supports the BMP Purpose Statements & Guiding Principles. A reduction in mowing must not result in putting the public at risk by reducing minimum highway safety standards.
- c) Narrow medians (75 feet in width or less) on limited access highways, may be fully mowed (across the entire median width) beyond the clear zone for safe visibility purposes and to avoid narrow strips of grass being left in the middle of these medians.
- d) Medians with glare screen plantings shall be mowed to avoid disturbance of these glare screen plantings.
- e) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- f) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

LAH.4 - MOWING LIMITED ACCESS HIGHWAY INTERCHANGES, ISLANDS, RAMP GORE AREAS, AND INTERSECTIONS

Increased mowing coverage and frequency in the interchanges, islands, ramp gore areas, and intersections of limited access highways is allowed as specified below:

- a) Mowing during the growing season, is allowed and is not subject to the June 1st (start) and August 31st (end) restrictions, in order to maintain a more manicured lawn appearance throughout the growing season.
- b) Increased mowing activity must be authorized by the DTA. In doing so, the DTA shall consider public safety needs, maneuvering, turning movement, and merging sight-line needs, and the proximity of the proposed area of additional mowing to an urbanized area, ensuring the mowing plan is sensitive to the context of that area, is acceptable under current budget constraints, and to the extent practicable supports the BMP Purpose Statements & Guiding Principles. A reduction in mowing must not result in putting the public at risk by reducing minimum highway safety standards.
- c) In no instance should mowing occur outside the right-of-way without prior written landowner agreement.
- d) Full extent of mowing is subject to the “Conditions and Exceptions” noted in this BMP.

CONDITIONS & EXCEPTIONS

These mowing standards apply in all instances except where conditions and exemptions allow for variations. Variations in mowing coverage and frequency will be allowed based on need and must continue to meet the Purpose Statements and Guiding Principles of this BMP. DTAs will take the lead on mowing variation decisions for the Districts under their supervision. Consultation with the VTrans Maintenance and Operations Bureau (MOB) Environmental Program Manager or VTrans MOB Deputy Director or Maintenance Transportation Administrator may be necessary in making these decisions.

Applicability of all conditions and exceptions and the resulting distance of mowed area as measured from the edge of pavement will vary depending on the presence or absence of riparian buffers, wetlands, rare, threatened & endangered species, habitats, invasive species, wildflower/landscaped areas, Pollinator habitat, established shrubs & trees, special topographic features, ledge, guardrail, stormwater treatment infrastructure, or the need to comply with minimum safety standards, line of sight clearances, or minimum clear zone requirements. Refer to each section to follow for discussion on conditions and exceptions.

- A. Requests for Variations in Mowing Coverage or Frequency from that authorized in this BMP:** Requests received for increased mowing coverage or frequency will be screened by the DTAs to confirm compliance with the conditions and exceptions noted in this BMP. Variations in mowing coverage or frequency may be allowed based on public safety needs, maneuvering, turning movement, and merging sight-line needs, and the proximity of the proposed area of additional mowing to an urbanized area, ensuring the mowing plan is sensitive to the context of that area, is acceptable under current budget constraints, and to the extent practicable supports the Purpose and Guiding Principles of this BMP. Requests for increased mowing coverage or frequency outside of these conditions and exceptions or not supportive of the Purpose Statements and Guiding Principles should not be allowed.
- B. Highway Clear Zone, Safety Standards, and Line of Sight Clearances:** The DTAs shall make arrangements to mow more frequently and outside of the above noted standards in order to maintain minimum highway “clear zone”, safety standards, and sight line clearances (ie. maintaining sight lines to signs, around curves, and for merge and turning movement visibility at ramp gore areas and intersections). Mowing outside the limits of the right-of-way is prohibited without the prior written consent of the land owner.
- C. Stormwater Treatment Infrastructure (swales, ditches, detentions ponds, other...):** This type of infrastructure shall be maintained pursuant to the terms and conditions under Local, State and Federal Regulations governing these facilities or pursuant to best management practices established for this infrastructure. This may require more frequent mowing schedules and mowing outside the limits defined under this BMP. Annual mowing outside of the above noted standards is permissible only for access and maintenance of stormwater treatment measures and erosion prevention and sediment control devices located within the highway right-of-way. Consultation with the VTrans MOB Environmental Program Stormwater Technicians, VTrans Program Development Bureau (PDB) Environmental Stormwater Engineer, and/or PDB Environmental Biologist may be required. It is recommended that all existing man-made ditches intended to transfer and/or treat stormwater runoff be maintained in accordance with best management practices governing stormwater treatment or any other guidance documents put in place by VTrans addressing work on stormwater treatment practices, ditches or culverts.
- D. Highway Safety Items: (Guard Rails, Signs, Delineators, and other):** In areas where these safety items are present and located outside of the prescribed mowing limits noted above, it is permissible to mow around them for access and maintenance purposes.

E. Steep Slopes: Slopes greater than 2:1 shall not be mowed in order to help stabilize banks and avoid soil erosion unless grass, brush and/or small trees on these slopes constitute a highway “clear zone” hazard, affect the line of sight of the traveling public, affect a bridge or structure, or over hang the roadway thus exacerbating icing and interfering with winter maintenance. Steep slopes are and excellent area to promote Pollinator habitat given the lack of mowing they will receive.

F. Rare, Threatened, Endangered Species, Natural Communities, Unique Natural Areas, and Habitats of Concern: The VTrans PDB Environmental Section Biologists will be available to consult with the VT Department of Fish and Wildlife biannually and identify specific areas where mowing may be postponed or restricted to protect an identified resource while not compromising roadway safety. The PDB Environmental Section Biologist, when requested to by the DTA, will coordinate with the VTrans MOB Environmental Program Manager and DTA or its designee regarding the location and treatment of these areas. Coordination should be completed well in advance of the upcoming mowing season. If coordination is not complete in time for the upcoming mowing season, then mowing may commence as planned.

G. Pollinators and Their Habitats of Concern: Bees and butterflies are pollinator species that rely on specialized habitats including those abundant with wildflowers, milkweed and other flowering vegetation. Increasing and improving Pollinator habitat on VTrans-managed rights-of-way is one of the many guiding principles under this BMP.

1. **Presidential Memorandum** - Under a 2014 Presidential Memorandum addressing the need to create a federal strategy to promote the health of honey bees and other pollinators, a Pollinator Health Task Force has been established (including the transportation sector) to develop an action plan addressing, among other things, the need to increase and improve pollinator habitat across the nation.

<http://www.whitehouse.gov/the-press-office/2014/06/20/presidential-memorandum-creating-federal-strategy-promote-health-honey-b>

More specifically under the Presidential Memorandum.....”(i) The Department of Transportation shall evaluate its current guidance to identify opportunities to increase pollinator habitat along roadways and implement improvements, as appropriate. The Department of Transportation shall work with State Departments of Transportation and transportation associations to promote pollinator-friendly practices and corridors.”

2. **Roadside Mowing Practices that Promote Pollinator Habitat** – the DTA shall consider the following practices in determining how to implement this Mowing BMP to preserve and promote pollinator habitat along state highways:
 - a. If resources permit conduct visual inventory of Interstate corridors identifying areas to avoid cutting based on the existence of or opportunities to promote Pollinator habitat. If pre-mowing inventory is not possible, then educate mowing staff/contractor on what to look for in the field so it can be avoided if possible (refer to “Links” for Milkweed identification information). There is no minimum size for a milkweed patch, even small milkweed stands of 20 or fewer plants are valuable for two reasons:
 - i. If you leave it, monarchs will find it. They can and will utilize as few as a couple of plants. Monarchs are known to find a single milkweed plant in a tiny patch of vegetation.
 - ii. Milkweed spreads easily when not mowed. Therefore, if milkweed is present in a small patch – and you don’t mow the surrounding area – a small patch can grow into a large patch.

- b. Large milkweed stands are obviously best. There is more milkweed available for breeding, higher plant diversity is beneficial, and large patches mean monarchs don't have to travel as much (and thus roadside mortality is minimized);
- c. During "3rd Year Cut" avoid mowing areas established with wildflowers and milkweed and consider alternating sections of highways mowed to the edge of ROW leaving large tracts of uncut vegetation between cut vegetation. One option currently being implemented by some Districts is to divide the LAH within a District into thirds and only mow to the edge of ROW or tree line in one third of the LAH annually cycling through all LAH over a three year period;
- d. Shift the start of mowing to June 1 as it will be a very valuable change for monarchs if mowing can be completed statewide before mid-July. The very worst time for mowing is mid-July to September 1 as that is the time Monarch Butterflies are using its host plant (Milkweed);
- e. Mow as little as necessary to meet safety needs and to meet the "Purpose" of this BMP;
- f. Mow from south to north;
- g. Introduce wildflower seeds and milkweed seeds in areas generally not mowed, giving special consideration to steep slopes and areas not regularly mowed.

H. Wildlife/Vehicular Conflict and Safety Considerations: The VTrans PDB Environmental Section Biologists will be available to consult with the VT Department of Fish and Wildlife biannually and identify specific areas where changes to prescribed mowing limits and frequencies are recommended to decrease the risk of public safety and property damage due to wildlife/vehicle conflict. In areas where wildlife/vehicle collisions have been identified as an ongoing problem and raised as a safety issue by either VTrans or VT Department of Fish & Wildlife, mowing every 3rd year to the full extent of the limits noted above will likely be recommended to keep vegetative cover low enough to provide more visibility and advance opportunity for traveling public to react and avoid this type of collision. At the request of the District, the PDB Environmental Section Biologist will coordinate with the VT Department of Fish & Wildlife and the DTA or its designee regarding the location and treatment of these areas. Coordination should be completed well in advance of the upcoming mowing season. If coordination is not complete in time for the upcoming mowing season, then mowing may commence as planned.

I. Scenic Resources and Viewsheds: VTrans realizes that scenic resources and view sheds along the state highway system are important to Vermont citizens and tourists who expect to enjoy scenic routes when traveling through Vermont. VTrans is committed to preserving the scenic qualities of the highway corridor to the extent practicable, while maintaining safety for the traveling public, fostering environmental stewardship, conserving resources, and maximizing benefit while minimizing costs. As such, this BMP has been set up to allow for (not require) mowing every 3rd year up to the edge of the right-of-way.

J. Wildflower Plantings, Landscaped Areas, and Areas with Established Shrubs and Trees: Will be avoided per consultation with the VTrans PDB Environmental Section Landscape Coordinator. Consult with the VTrans PDB Landscape Coordinator prior to mowing in areas where these features are known or suspected to exist.

K. Invasive Species Management: Will be avoided and/or managed per consultation with the VTrans "Roadside Terrestrial Invasive Plants" Best Management Practices. Consult with the VTrans MOB Environmental Program Manager with questions regarding this BMP (refer to "Links" for additional information and contacts).

- L. Riparian Areas:** To the extent practicable and subject to the conditions and exceptions noted below, all Riparian Areas will be avoided. Riparian areas provide necessary shade to lakes, rivers and streams, stabilize shorelines, prevent erosion and provide habitat for fish, birds, amphibians, reptiles and water-dependant mammals. Riparian areas are defined, for the purpose of implementing this BMP, as the area from the water's edge up the bank slope and typically 50 ft from the top of the water body slope inland. Riparian areas do not extend across the state roadway system.

RIPARIAN AREAS SHALL NOT BE MOWED EXCEPT UNDER THE FOLLOWING CONDITIONS:

1. The riparian area is within the highway "clear zone";
2. The riparian area is immediately behind the guard rail – in this instance mowing will be restricted to the minimum distance needed for access to the guardrail for ongoing maintenance. If steep slopes are present behind the guardrail, the above defined conditions apply;
3. Grass, brush and/or small trees affect a bridge or structure or the line of sight of the traveling public;
4. There is the potential for successional species to over hang the roadway thus posing a safety hazard, exacerbating icing and/or interfering with winter maintenance.

Riparian areas of special concern may be identified during the Agency of Natural Resources' (ANR) watershed or MS4 planning processes. Treatment in these areas will be the result of coordination between the appropriate ANR watershed planner, VTrans MOB Environmental Stormwater Technicians, and the VTrans District Transportation Administrator (DTA) (refer to "Links" for Vermont DEC Tactical Watershed Basin Planning web site, more information and contacts).

- M. Wetland Areas:** Wetlands and wet areas will be avoided. Wetlands in Vermont are protected by State and Federal Regulations because they provide many valuable and irreplaceable functions that benefit the public. Some functions and values that wetlands provide include surface and ground water quality maintenance, flood water storage, fish and wildlife habitat, erosion control, threatened and endangered species habitat, open space and aesthetics, recreation, and education (refer to "Links" for Vermont DEC Wetlands Program Wetlands web site, more information regarding the definition and benefits of wetland areas and contacts).

USEFUL LINKS

Vermont DEC Watershed Management Division Home Page

<http://www.anr.state.vt.us/dec/waterq/wqhome.htm>

Vermont DEC Rivers Management Program Home Page

<http://www.anr.state.vt.us/dec/waterq/rivers.htm>

Vermont DEC Rivers Management Program Contacts

http://www.anr.state.vt.us/dec/waterq/rivers/docs/RME_districts_12.14.pdf

Vermont DEC Tactical Watershed Basin Planning Home Page

<http://www.anr.state.vt.us/dec/waterq/planning.htm>

Vermont DEC Wetlands Division Home Page

<http://www.anr.state.vt.us/dec/waterq/wetlands.htm>

VTrans Maintenance & Operations Bureau BMPs

<http://vtransoperations.vermont.gov/bmp>

How to identify Milkweed

<http://www.learner.org/jnorth/tm/monarch/sl/12/gallery.html>

How to identify Invasive Plants

<http://www.vtinvasives.org/plants/prevention-and-management/tools-resources>