

Guidelines for Vegetation Management

Appendices

March 2011



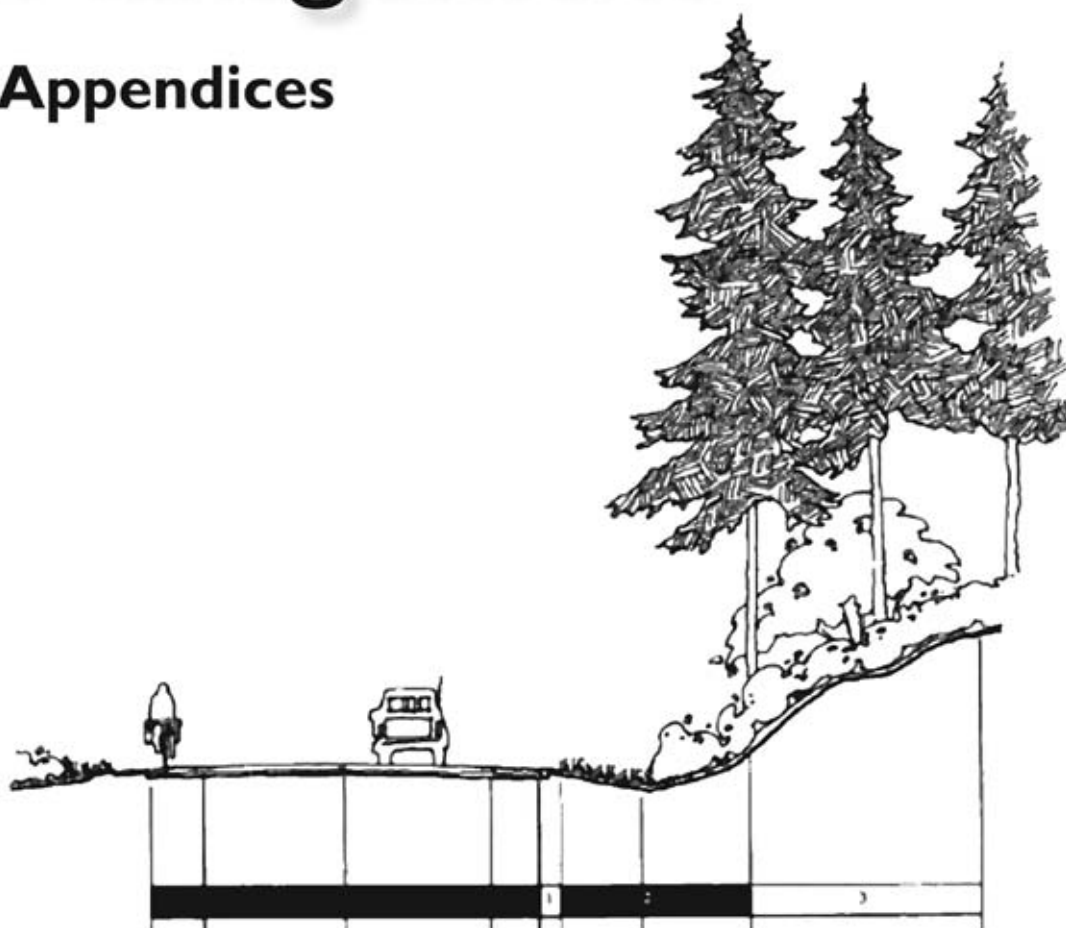
American Association of State Highway and Transportation Officials. **The Voice of Transportation**



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Guidelines for Vegetation Management

Appendices



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FOREWORD

These guidelines will be of interest to local, regional, state and federal officials as well as other transportation professionals who work with them in dealing with roadside vegetation management. They will be of particular interest to those roadside vegetation managers just beginning their careers. The guidelines provide an overview of current agency practices, recent literature findings, and research on roadside vegetation management. Their primary purpose is to assist roadside vegetation managers in integrated roadside vegetation management decision-making processes into highway project planning, design, construction, and maintenance, as well as to document existing research and practice. Roadside vegetation managers are often faced with problems for which information already exists, in the form of reports and documents, or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated and as a result much of this useful information may go unused by the majority of roadside vegetation managers. These guidelines incorporate the current knowledge and practice of roadside vegetation management. The guidelines also include information extracted from survey responses from 29 state agencies, a glossary that defines technical terms and acronyms, and a compendium of 40 common roadside invasive species, with descriptions of each species, its biology, and common methods of control.

PREFACE

The impetus to writing these guidelines came about from the realization that there was an enormous amount of practical information on roadside vegetation management available but much of it was not being used because it was scattered and unevaluated. The information was dispersed not only in the mainstream literature, but in localized documents and research reports within government agencies. Upon undertaking this task, it quickly became apparent that another major source of the most current practical information on roadside vegetation management was that of the undocumented experience and expertise of roadside vegetation management practitioners. The unselfish cooperation of these individuals has greatly enhanced the utility of these guidelines. These guidelines provide DOT executive managers, middle managers, and supervising practitioners with a toolbox of effective strategies for planning and executing integrated roadside vegetation management programs.

ACKNOWLEDGEMENTS

This study was requested by the American Association of State Highway and Transportation Officials (AASHTO), and conducted as part of the National Cooperative Highway Research Program (NCHRP) Project 14-16. The NCHRP is supported by annual voluntary contributions from the state Departments of Transportation. The report was prepared by a team led by Ian Heap and including David Nelson and Joseph DiTomaso. The work was guided by a task group led by John Rowen and including John W. Bell, Jack Broadbent, Charles T. Edson, Bonnie Harper-Lore, Frank Lisle, Mark C. McConnell, Juanita M. Owens, Danna Powell, Joy H. Williams, and William W. Wit-tand. Thanks are also given to the many state department of transportation vegetation managers that participated in the survey. The project was managed by Christopher Hedges, NCHRP Senior Program Officer. Graphic design and layout by Mario Olivero, AASHTO Senior Graphic Designer.

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Q1. Do you have a mission statement for your vegetation management program?

ARIZONA

Bruce Eilerts and Chuck Barclay—Yes

DELAWARE

Eugene Rosan—Yes: to provide for the scenic enhancement and cost-effective maintenance of highway rights-of-way.

FLORIDA

Tim Allen—The purpose statement for our “Roadway and Roadside Maintenance Procedure” is as follows: “To establish procedures for maintaining a safe, aesthetically pleasing, and stable roadside along the State Highway System right-of-way.”

IDAHO

Kathy Ford—We have a mission statement on our website: http://itd.idaho.gov/highways/ops/maintenance/Roadside/Roadside_Management.htm

“It is ITD’s goal to be responsible land managers and neighbors and to successfully manage noxious and invasive weeds by reducing the negative impacts they cause to our environment. ITD promotes a comprehensive and integrated vegetation management program that assures water quality, improves erosion and sediment control, reduces roadside maintenance, enhances natural beauty, manages noxious weeds, and protects natural habitats.”

ILLINOIS

Craig Mitckes—No

INDIANA

William Fielding—Yes, we have a program.

IOWA

Joy Williams—No, but goals are set out in IRVM legislation and we have applicable department, office, and District mission statements.

KANSAS

Scott Shields—We have a management policy in place that is tailored for management of our safety clear zone and the areas that have native vegetation.

KENTUCKY

Dave Cornett—No

MASSACHUSETTS

Thomas Ferris—The IVM strategy for Mass Highway aims to eliminate nuisance vegetation, invasive and noxious weeds along our rights-of-way under guardrail, along Jersey barriers, bridge abutments, sign supports, curbing, and cracks, and other highway appurtenances for safety purposes; more specifically, safety to pedestrians, traffic, and highway workers and preserving the integrity of our roadway. Our goal is to identify target vegetation and appropriate control methods. The particular method(s) chosen will be part of an integrated effort based on a variety of factors to establish an easily maintainable, stable plant population that will not interfere with vehicles or pedestrians. It is Mass Highway’s responsibility to provide for a safe R.O.W. for the Commonwealth’s motoring public. We believe that the most efficient, safe, and cost-effective way to achieve this is through mechanical and cultural means complimented by the strategic use of chemical herbicides where applicable.

MINNESOTA

Paul Walvatne and Gabe Guevara—*The Roadsides chapter of the Maintenance Manual* does not contain an over-arching Mission Statement, but the district’s individual IRVMs may... Met District Website: <http://www.dot.state.mn.us/metro/maintenance/IRVM2006.pdf>

MISSOURI

Stacy Armstrong—Yes, preserve, enhance, and diversify the roadsides of Missouri’s transportation system.

NEBRASKA

Alison Krohn—Yes, it comes from a landscape vision the department is currently crafting.

NEVADA

Kent Mayer—No

NEW HAMPSHIRE

The NHDOT currently does not have a “vegetation mission statement.”

NEW YORK

John Rowen—The mission of the NYSDOT vegetation management program is to provide a roadside environment that is safe, environmentally friendly, and appears as though it is being managed by nature. Our informal slogan is that vegetation management is intended to “do the right thing in the right place at the right time.”

NORTH CAROLINA

Derek Smith—Yes, our mission statement revolves around the National Roadside Vegetation Management Association’s (NRVMA) Integrated Roadside Vegetation Management Program.

OHIO

Scott Luckas—No

OREGON

Will Lackey—Currently, ODOT does not have a mission statement for vegetation management. The mission statement for all of ODOT is: “To provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians.”

PENNSYLVANIA

Joe DiPietro—Yes

Joe Demko—Provide safety, utility, economy, and beauty to the roadside area for the traveling public and integrity of the roadway.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No; however, we work to eradicate invasive and we plant natives when we can.

SOUTH CAROLINA

Kelly-Jo Swygert—Not specifically for the program; it is covered under the umbrella with our office operations mission statement.

TENNESSEE

Estel Hagewood—No

TEXAS

Dennis Markwaldt—No, we have objectives. Mission statements are for the department as a whole.

UTAH

Ira Bickford—No

VIRGINIA

Robert Burris—It is our mission to create and maintain a safe, functional, and attractive roadside landscape.

WASHINGTON

Ray Willard—No, but program goals and objectives are explained in the WSDOT Roadside Classification Plan. www.wsdot.wa.gov/Maintenance/Roadside/vegetation.htm

WEST VIRGINIA

James Riggs—Policy

WYOMING

Ken Ketterling & John Samson—No

Q2. Do you have an inventory of your roadside vegetation? If so, how do you inventory the roadside vegetation?

ARIZONA

Yes, Arizona Department of Transportation (ADOT) conducts a yearly survey for the following categories:

trees and brush in the recovery zone, vegetation encroachment, sign and hazard marker visibility, ground-cover deficiency, noxious weeds in the right-of-way, vegetation height in the rights-of-way, and vegetation height in the recovery zone.

DELAWARE

No

FLORIDA

Yes, the roadway characteristics inventory. Yes, mowing areas are inventoried under 4 different activities (large machine, intermediate, small, and slope mowing), weed control areas, and landscape areas maintained by the department are also inventoried.

IDAHO

It is inconsistent. We have mostly noxious weed inventory but have not included native or desirable vegetation. There is some GPS data but mostly is documented using our herbicide log.

ILLINOIS

No

INDIANA

No

IOWA

Yes—but it is outdated. For the statewide inventory in 1994 and 1995, we did drive-by inventories of ¼-mile segments for brush (>6 inches, 6 inches) in the clear zone and general vegetation type (noxious weeds, presence of native vegetation). Following the statewide inventory, we did walk-through inventories of areas identified as remnant native (prairie) vegetation. Species present were ranked by presence and visual impact to evaluate potential wildflower routes.

Present

More than one plant present. More than two plants present and visible to drivers. Additional stretches were inventoried for wildflower routes in drive-by surveys. Maintenance areas are not yet required by policy to do weed inventories, but are encouraged in training to do

simple invasive weed inventories by hand marking locations of severe weed infestations and non-listed invasive weeds on the garage's responsibility area map (map of highways, includes mile makers). One of six districts currently inventories Canada Thistle patches for size and location. Information is recorded on a spreadsheet to use for estimating herbicide needs and monitoring treatments.

KANSAS

No

KENTUCKY

Yes, but only for mowing acres. It was conducted when we did our initial inventory for a Maintenance Management program in 1974.

MASSACHUSETTS

Yes, management areas are mapped out and well known by our maintenance field personnel. Areas proposed for chemical control are measured and included in a Yearly Operational Plan that must be approved by our governing agency (The Department of Agricultural Resources). The areas are monitored and maintained accordingly by in-house personnel and contracted help also assists us in our maintenance efforts throughout the growing season.

MINNESOTA

We do not have a comprehensive inventory of our roadside vegetation. This is a massive undertaking. However, we do have landscape plans which are a close approximation of trees and shrubs planted under contract or landscape partnership agreements. We also have weed inventories for some road segments, including early detection and rapid response tactics for new invaders such as Teasel and Meadow Knapweed. We participated in a Cooperative Weed Management Area (CWMA) involving inventorying the presence of three weeds on one hundred-seventy miles of state maintained roadsides in Clay County Minnesota. We expect to participate in the newly developed CWMA in Becker County during the 2007 growing season. MN/DOT will inventory weed species agreed upon by the CWMA. Tom Jacobson, District 1 Roadside Vegetation Manager,

Duluth, has inventoried weed infestations on several highways in District 1. Weed infestations are typically inventoried using GPS technology. Most inventory work is done with Trimble units. MN/DOT's Clay County CWMA inventory was completed with less expensive equipment including a Hewlett Packard iPAQ and a GPS Receiver with Bluetooth Wireless Technology.

MISSOURI

Very limited. Remnant prairies in northeastern Missouri and landscape beds in the Kansas City area were inventoried using GPS/GIS. Roadside vegetation along I-35 was inventoried using the 'windshield' method.

NEBRASKA

No

NEVADA

Contractor inventories first eight feet of roadway for weed species annually.

NEW HAMPSHIRE

No

NEW YORK

Our inventory is not complete. We have inventory information on identified hazardous trees. Our Environmental Analysis Bureau has an inventory of reported invasive species infestations. We are working on an inventory of environmental stewardship activities. The hazardous tree inventory is conducted by staff in the Department's Residencies. The information is kept in the residencies and regional offices. The invasive inventory is kept in our Main Office and receives data from Regions. The environmental stewardship inventory is anticipated to be a joint activity between the Main Office and regional contacts.

NORTH CAROLINA

Some divisions have been more diligent than others in developing their vegetative asset inventory. Items such as lengths of guardrail/cable rail, acreage of ornamental beds, numbers of capped islands, and acres of roadside turf are fairly accurate. But, honestly, more work is

needed. Typically GPS Technologies are used to track these items.

OHIO

No

OREGON

ODOT does not have a formal roadside vegetation inventory system. The vegetation personnel are, however, very aware of the vegetation problems, including noxious weed infestations, that exists in their sections.

PENNSYLVANIA

Joe DiPietro—No, by eye

Joe Demko—No

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No, but we are starting.

SOUTH CAROLINA

We inventory aspects. Wildflower plots, landscape plots, problem/invasive weeds.

TENNESSEE

No

TEXAS

No

UTAH

Yes. We have a GIS system using arcview, we call it Roadveg.

VIRGINIA

Yes, we have an inventory of much of our roadside vegetation. For example, acres of maintained turf areas along major routes, wildflower plots, and reported invasive weed areas. We use data from herbicide and fertilizer application reports, GIS collection, and field inspections.

WASHINGTON

The only vegetation aspect that is maintained in an inventory is locations for reoccurring noxious weed infestations. These locations are mapped by route and begin/end milepost and updated annually as part of the maintenance area IVM planning process. Area IVM plans are available online. www.wsdot.wa.gov/Maintenance/Roadside/vegetation.htm

WEST VIRGINIA

No

WYOMING

Partial; Designated and Prohibited noxious weeds inventoried only. GPS and hand mapping by County Weed and Pest field crews.

Q3. Have you recently done an assessment of your vegetation management program? If so, can you share your report with us?

ARIZONA

No, but ADOT's Natural Resources Management Group (NRMG) is in the process of producing an Integrated Natural Resources Management Practices (INRMP) best management practices guidance.

DELAWARE

No

FLORIDA

Each of our Districts are required by procedure to develop and maintain a written turf management plan, and to perform quality control checks, also random sample ratings performed three times a year throughout each district with a score generated for the level of quality, and an annual quality assurance review performed by the state maintenance office on different areas of each district.

IDAHO

We updated our maintenance and other manuals biannually. This includes various vegetation programs. There is

no official report generated. There is a website, http://itd.idaho.gov/manuals/Online_Manuals/Maintenance/Index.htm where you can download various ITD manuals.

ILLINOIS

No

IOWA

Yes, through annual performance measurement. Field surveyors measure compliance with Iowa DOT Maintenance standards (see Question 9). We can send it later, if interested.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

We have not assessed our VM program recently. We are in the final year of an approved Five-Year Vegetation Management Plan and will be submitting a new one for approval for 2008–2012.

MINNESOTA

Yes, we just revised our Roadside Vegetation Management Chapter in the Minnesota Department of Transportation Maintenance Manual. Also we are currently in the process of revising the “Best Practices for Roadside Vegetation Management” Manual 2000–2019 which will include a new chapter addressing “Roadside for Wildlife” opportunities and challenges. Our vegetation management program responds to MN/DOT Marketing surveys which reveal that our customers value attractive, well managed roadsides; however, when pressed to make choices between smooth and ice free roads and attractive roadsides, they are willing to reallocate more for smooth roads and are in favor of reducing expenditures for roadside vegetation management. This is the URL for the Roadsides Chapter: http://www.dot.state.mn.us/maint/files/Maint_Manual/CH5.pdf

MISSOURI

Informal assessment is on-going and evaluated and enhanced as needed.

NEBRASKA

No

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

Yes, a copy of the management report is attached.

NORTH CAROLINA

Yes, we complete an assessment every two years and have recently published the 2006 assessment. Yes. Survey results are attached. For clarification of content or for future inquiry, please contact Lonnie Watkins at 919-733-3725, lwatkins@dot.state.nc.us

OHIO

Yes, about two years ago we placed all of our maintenance program guidelines into a manual called the Maintenance Administration Management (MAM) manual. The MAM is designed to be a “one stop shopping information resource” for maintenance managers. Section four hundred contains the Vegetation Management policy and provides basic directions to the managers.

OREGON

To answer questions three to eight, ODOT is currently in the process of reviewing the vegetation management program. These topics will be addressed.

PENNSYLVANIA

Joe DiPietro—To some degree. It is not in a format that I can do that.

Joe Demko—No

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

Year 2005. Yes, I will send under a separate attachment.

TENNESSEE

No, Pat Thurman retired and his position has not been replaced.

TEXAS

Yes, an Environmental Impact Statement and we conduct condition assessments on the roadsides. Yes.

UTAH

We use a Maintenance Management Quality Assurance (MMQA) to measure our spraying and mowing program. Yes.

VIRGINIA

A comprehensive, formal, overall assessment—no. However, we are constantly evaluating various program components.

WASHINGTON

All information on our program can be accessed online: <http://www.wsdot.wa.gov/Maintenance/Roadside/vegetation.htm>

We are currently assessing alternative methods for maintenance of vegetation at the pavement edge.

WEST VIRGINIA

No

WYOMING

No

Q4. Have you further developed your plan to project the economic benefits of a good vegetation management program? If so, can you share that projection with us?

ARIZONA

N/A

DELAWARE

Yes. See, <http://www.deldot.gov/information/pubs/forms/manuals/edh/index.shtml>

FLORIDA

The Office of Maintenance developed and maintains the procedure, and four handbooks for guidance on these activities, to help the districts support their turf management plans. These handbooks are currently being updated.

IDAHO

No official report has been developed.

ILLINOIS

No

INDIANA

We are in the very beginning of trying to develop a program that is based on surrounding areas.

IOWA

Yes, primarily in the area of reduced mowing and use of native vegetation. Estimated cost savings for reduced roadside mowing were projected at approximately one million dollars per year. The verdict is still out on the true economic benefit because reduced mowing results in increased need for brush control and (initially) increased need for spraying.

KANSAS

Yes, lower maintenance costs.

KENTUCKY

No

MASSACHUSETTS

Spraying herbicides where applicable allows us to reduce maintenance costs substantially in treatment areas, and also reduces the need for repeated manual trimming. Due to stringent regulations in the state and opposition from the public, our VM program is currently limited to high volume and Interstate roadways beneath guide rails, barriers, curbing, cracks, signs, and appurtenances.

Chemical control makes up less than 1/2 of 1 percent of our total management effort.

MINNESOTA

Not really sure how to address this other than to say that we are doing a lot of collaboration with the MNDNR in trying to maximize the benefits of roadsides for wildlife in the form of providing suitable habitat for small birds (pheasant size and smaller) and animal life and yet reduce conflicts with whitetail deer. Our legislature is really interested in the potential of roadsides for bio-fuels and wildlife benefits. We are also stressing the importance of native prairie plant regimes for improving water quality, providing blowing snow control, and reducing long-term energy, fertilizer, and pesticide inputs. Really have not projected the savings.

MISSOURI

No

NEBRASKA

No

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

We have not done so, but plan to develop such information in a future research effort.

NORTH CAROLINA

Our upper management is just beginning to look at vegetation as a valuable asset. The NC Division of Travel and Tourism tells us that 85 percent of the state's tourists arrive via our road system. Tourism is a \$12 billion business and North Carolina is the eighth most visited state in the nation.

OHIO

Yes, we are always looking for new ways of providing high quality vegetation management practices at an

affordable price, while maintaining an environmentally sound policy to our managers. One of the projects our District Five location is piloting is the use of Plant Growth Regulators (PGRs) and broadleaf herbicides. Their first pilot provided enough positive results to encourage them to expand the program throughout most of their District. The application of PGRs has reduced their mowing cycles and provided broadleaf weed control with seed head suppression.

PENNSYLVANIA

Joe DiPeitro—To some level. No at the present time.
Joe Demko—No

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—We are in the process of developing a reduced mowing policy.

SOUTH CAROLINA

No. N/A

TENNESSEE

We evaluate each section of the state for specific cost due to the varying terrain.

TEXAS

Yes

UTAH

No

VIRGINIA

No

WASHINGTON

Benefit/cost analysis will be a central factor in the research being conducted for maintenance of vegetation at pavement edge; in the coming year we will begin studying benefit/cost in relation to other aspects of roadside vegetation design and maintenance.

WEST VIRGINIA

No

WYOMING

No

Q5. Do you use the zone concept to plan your vegetation management program? If so, can you share your concept with us?

ARIZONA

Zone concept? No, we do not. Work plans are prioritized based on annual survey results, district priorities, and ADOT Office of Environmental Services (OES)/NRMG priorities.

DELAWARE

Not specifically. Basically considers “Engineering” Clear Zones

FLORIDA

The FDOT currently has eight districts, seven of these districts are regional, defined by boundaries, and the eighth district is our Turnpike system located throughout the state.

IDAHO

Yes. You can access our Maintenance Manual on the website. Vegetation is located in section 230, http://itd.idaho.gov/manuals/Online_Manuals/Maintenance/Index.htm

ILLINOIS

No

IOWA

Yes, the zones are: the 10-foot mowed swath adjacent to the shoulder; the rest of the ROW to the fence line, left un-mowed unless mowing needed for safety or noxious weed control that may not be treated with herbicide; 2a. the clear zone for purpose of brush control; 2b. the ditch bottom (brush control if drainage concerns, herbicide restrictions if wet or seasonally wet); 2c. the back-slope (greater aesthetic attention in plant selection, very limited brush control); 2d. 10 to 15 feet adjacent to the property line (increased weed control efforts if concerns

from adjacent property owner, location of shrub plantings for snow control); 2e. two to four feet adjacent to the fence (native plantings not planted with two to four feet of ROW line); and 2f. fence line (brush control for purposes of fence maintenance).

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

No

MINNESOTA

Yes. Yes, it is a spin-off of the concept developed by Robert Burger, now retired Washington DOT Landscape Architect.

MISSOURI

Yes. A greater degree of management practices are required in the zone fifteen feet from the nearest traveled way due to sight distance concerns. The next zone extends up to 30 feet with less stringent vegetation height controls, followed by the lowest degree of management practices outlined for areas greater than thirty feet from the nearest traveled way.

NEBRASKA

Do not know what that is.

NEVADA

No

NEW HAMPSHIRE

Not familiar with the zone concept.

NEW YORK

Yes, see attached schematic.

NORTH CAROLINA

Yes, we follow the zone concept outlined by NRVMA. In North Carolina, we manage turf grass from the pave-

ment to the ditch lines and refer to this as our Operational Zone. Behind the ditch we manage a Safety Clear Zone that transitions to the mature tree line.

OHIO

Yes, we use four different zones. Zone one is the Vegetation free zone and is between the white edge line of the roadway and the outer edge of the berm. Zone two is the Operational Zone and begins where zone one ends and continues approximately 30 feet from the white edge line of the roadway (which includes zone one). Zone two is typically mowed before each of the major holidays, Memorial Day, Fourth of July, and Labor Day. Zone three is called the Transitional Zone. Zone three connects with zone two and continues to the bottom of the drainage ditch and may continue to the back side of the ditch as well. Zone three is typically only mowed once a year. The final zone is the Undisturbed Zone. This zone is not mowed and receives little vegetation management care other than noxious weed control. All of the zones are not present on every roadway and the widths are different on two lane highways compared to Interstates.

OREGON

No

PENNSYLVANIA

Joe DiPietro—To some degree.

Joe Demko—Yes, areas of no woody growth and selective woody growth. (Chapter 13 of our *Maintenance Manual*).

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

No. N/A

TENNESSEE

N/A

TEXAS

Yes

UTAH

Yes, but we do not have a bare ground zone. We use the basic zone concept without the bare ground zone.

VIRGINIA

Yes. We use the same basic model that is promoted by various roadside vegetation management proponents, which includes a vegetation free zone, an operational zone, and a transitional zone.

WASHINGTON

WSDOT's vegetation management zones are explained in the introduction portion of each of the area IVM plans mentioned above and referenced online.

WEST VIRGINIA

No

WYOMING

Partial. Fore slopes higher maintained versus borrow ditches, lowest maintained are the back slopes. Overlays reinforce fore slope sod cover every 5 to 10 years.

Q6. Do you integrate condition assessment and inventory into the zone concept?

ARIZONA

N/A

DELAWARE

No

FLORIDA

Yes, please see answer to question (three) this is done with our random sample sites for our maintenance rating program.

IDAHO

I am not sure what you are looking for here. I do not understand "integrate condition assessment"?

ILLINOIS

No

IOWA

Yes, but more the other way around. Some performance measures apply only to particular zones.

KANSAS

No

KENTUCKY

N/A

MASSACHUSETTS

No

MINNESOTA

Not formally, but I believe it is accurate to say that it is constantly being done informally by the maintenance folks who manage the roadsides.

MISSOURI

No

NEBRASKA

No

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

Yes, understanding conditions and the vegetation types is key to the manager's decisions on which management techniques to use.

NORTH CAROLINA

Yes, our condition assessment survey, which is conducted by independent parties, is a very useful tool to identify areas that require additional focus.

OHIO

Currently, we do not because we do not have an inventory of our vegetation.

PENNSYLVANIA

Joe DiPietro—The condition aspects more so.
Joe Demko—No

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

N/A

TEXAS

No

UTAH

No

VIRGINIA

Yes

WASHINGTON

WSDOT's measurements for condition assessment do not correlate directly to management zones. We measure roadside vegetation condition as part of our Maintenance Accountability Process: <http://www.wsdot.wa.gov/Maintenance/Accountability/default.htm>. Roadside vegetation within this system is measured in terms of noxious weeds, nuisance weeds, vegetation obstructions, and urban landscape maintenance.

WEST VIRGINIA

No

WYOMING

N/A

Q7. Do you have a current condition assessment of your roadside vegetation?

ARIZONA

Our annual survey data is used to that end.

DELAWARE

No

FLORIDA

The maintenance rating program has guidelines for rating mowing heights and turf at each random sample site.

IDAHO

Do not know

ILLINOIS

No

IOWA

Yes, performance measurement to Iowa DOT maintenance standards, but this is not a comprehensive assessment.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

Yes

MINNESOTA

No! Although the statewide omnibus survey of over eleven hundred participants gives us a rating on a scale of one to ten. We do condition assessments on specific segments, such as the 35E Parkway, when time allows and when needed.

MISSOURI

No

NEBRASKA

Not really. Prior to new construction, we photograph roadside vegetation to document percent cover for post-construction comparison. When 90% pre-project coverage is attained, we terminate the storm water permit. These photos could be used for other assessment purposes.

NEVADA

The annual inventory specifies density of weeds in the eight feet from edge of pavement.

NEW HAMPSHIRE

No

NEW YORK

Roadside vegetation is included in our annual roadside quality assurance effort. In this effort, our research group selects a statistical sample of all roadsides. These are evaluated by teams from our Residencies, Regions, and Main Office. A copy of the assessment document is attached.

NORTH CAROLINA

Yes, our latest survey was completed in Fall 2006.

OHIO

The safety assessment is tied to the OPI mentioned in Question 8.

PENNSYLVANIA

Joe DiePetro—Not a very comprehensive one.
Joe Demko—No

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

We have a sample of locations performed during quality inspections.

TENNESSEE

Each District evaluates for their specific needs.

TEXAS

We evaluate each of the 25 districts each year. Vegetation is just one component.

UTAH

No

VIRGINIA

No

WASHINGTON

See answer to Question 6.

WEST VIRGINIA

No

WYOMING

Since WYDOT uses seeded Rangeland communities for rural section cover, these would need to be range condition surveys and very labor intensive per lane-mile (i.e., number of Range Sites represented/road-mile with identified appropriate condition class).

Q8. Have you established any vegetation management performance measures? If so, what are they?

ARIZONA

ADOT uses the PECOS system to track performance; however, it is not an ecological assessment, but rather a budgetary system. It does allow us to track certain aspects of our work.

DELAWARE

No

FLORIDA

Yes. The random sample points are selected by facility type, and are rated by the teams under the Vegetation and Aesthetics section of the Florida Department of Transportation's Maintenance Rating Program handbook.

IDAHO

On construction projects we have a minimum vegetation establishment of 70 percent. If 70 percent is not achieved within the time frame we set, then our environmental department does not sign off on the projects.

ILLINOIS

No

INDIANA

No, but would love to have information on how other state do their measures.

IOWA

Yes.

Brush and Trees

No dead trees in the ROW capable of falling on the roadway or damaging adjacent property. No dead trees in the ROW visible from the roadway except in forested areas. No vegetation that obstructs signs, illumination, drainage, interferes with roadside safety features, or located in the established clear zone (table clear zone distance based on ADT and fore slope grade from AASHTO *Roadside Design Guide*).

Mowing

No more than 50 percent of mowing areas (one mower swath width on fore slopes and medians) will have vegetation taller than 14 inches.

Noxious Weeds

No more than one hundred feet combined areas of untreated noxious weeds (as defined by weeds in the “Iowa Noxious Weed” booklet, which includes not only weeds listed in the state weed law, but those added by county ordinance, or other invasive weeds). “Untreated” is defined as not sprayed, or not mowed, unless the weed re-growth is taller than the grass.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

Yes. Treatment areas are evaluated after a two to three week translocation period and a 95 percent effectiveness rate must be achieved by our contractors before final payment is issued.

MINNESOTA

No, but in a broad sense we probably do if one counts the omnibus survey of over eleven hundred people statewide. “Roadsides free of weeds” and “plants look attractive”—something like that.

MISSOURI

Yes, Roadsides are rated in the annual Maintenance Performance Indicators inspections. Vegetation management is a part of this. The performance indicators are included in the attached table.

NEBRASKA

No

NEVADA

Not yet working on all performance measures.

NEW HAMPSHIRE

No

NEW YORK

We are beginning to establish such measures. The Office of Operations Management has developed a management system called the Maintenance and Operations Program (MOP). The MOP is a first step to identifying needs and matching budget resources to them. The MOP is in relatively simple MS Office software. The Main Office and Regions have developed a list of vegetation activities, such as tree work, herbicides, mowing, and invasive. For each activity, regions can input information on the number of assets, the number that will be addressed in a year, and the resulting rate or rates of accomplishment. They can also identify needs by work type and funding type (State versus Federal funds). Through the MOP, we can add inventory information as it is developed. Having the MOP and good inventories will help us to start developing performance measures and provide better information for budget justifications.

NORTH CAROLINA

Yes, these are defined in our condition survey manual. Please see the attachment document.

OHIO

Yes, we evaluate all of our roadways once a year by driving every highway system and performing a Maintenance Quality Survey (MQS). The survey information is placed into the Organizational Performance Index (OPI) and used to calculate a standard level of highway condi-

tion. Vegetation obstruction is a category on the OPI. Vegetation obstructions are listed as vegetation of any type that are fixed objects along the highway that blocks motorists views of hazards or hazardous conditions.

PENNSYLVANIA

Joe DiPietro—Most of my performance measures are related to safety. The major ones are sight distance and sign visibility.

Joe Demko—Under development.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

Only for contract work.

TENNESSEE

We have a *Vegetation Management Manual* as a guide for field operations.

TEXAS

Yes, mainly with contracts. Depends on the contract.

UTAH

Only for contracts. We use GIS, no GPS, we use route and mile post.

VIRGINIA

Yes. Requirements such as 90 percent control of all targeted broadleaf weed for an herbicide contract.

WASHINGTON

See answer to Question 6. Also the area IVM plans define performance criteria for various activities for each of the area maintenance offices.

WEST VIRGINIA

Yes, performance standard.

WYOMING

Maintenance Manual functional standards. Copies of standards for mechanical and chemical vegetation control and manual chapter information are attached.

Q9. Have you used GPS/GIS methods in vegetation assessment? If so, how did you integrate GPS?

ARIZONA

Yes, we currently use GPS whenever appropriate e.g., delineate project boundaries, establish monitoring plots, map creation, etc...Our people use GPS during the planning, implementation, and monitoring phases of projects and activities.

DELAWARE

No

FLORIDA

No. The roadways are identified by county section and subsection and the department has them mapped on straight line diagrams with mile post assigned to the sections.

IDAHO

Some. To input data into GIS and potentially generate reports. We have no sections or personnel identified to generate reports at this time.

ILLINOIS

Very limited.

INDIANA

No.

IOWA

No (except for wetland mitigation); we are looking into using strip map software, which can be integrated with GPS/GIS but not dependent on it for field input.

KANSAS

No

KENTUCKY

We are in a trial on the use of these methods.



MASSACHUSETTS

No

MINNESOTA

Yes, for weed inventories and for Forestry Plans for construction projects. GPS is used to document locations of the above listed items. Also District 4 Maintenance equips all of their spray rigs with GPS Units to capture locations of weeds sprayed on a real time basis.

MISSOURI

Yes. To monitor plant populations on limited basis (See Question 2).

NEBRASKA

Not yet, a pilot project using GPS/GIS to map noxious weeds will be conducted Summer 2007.

NEVADA

Yes and no; noxious weed spray program uses GPS. Normal (8ft) does not.

NEW HAMPSHIRE

No.

NEW YORK

All 11 regions have GPS units and software—and GIS. Regions and residencies are using GPS and GIS to capture and analyze data for selected vegetation management issues. Because of information technology staff shortages, statewide applications are not yet underway.

NORTH CAROLINA

Yes, GPS is used to locate and calculate areas for such roadside features as guardrail, ornamental plantings, etc. We also record some of our herbicide applications through GPS technology.

OHIO

Yes, our MQS inspections use GPS/GIS to locate deficiencies.

OREGON

ODOT has only limited use of GPS for vegetation management.

PENNSYLVANIA

Joe DiPietro—Yes, on the spray trucks.

Joe Demko—Yes, spray information is stored and tracked in our Roadside Spray Application (RoSA) program where users access various components of our GIS department, generate maps, and print reports.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Yes, on an as needed basis for invasive species. Only a very few roadways were done.

SOUTH CAROLINA

Yes, to identify some wildflower plots.

TENNESSEE

No

TEXAS

Yes, we use it on certain noxious/invasive weed locations and endangered and threatened species locations.

UTAH

We use GIS, not GPS; we use route and mile post.

VIRGINIA

No

WASHINGTON

WSDOT has an extensive set of GIS layers and a workbench tool for reference of geographic features. Locations for area IVM plans are referenced by route and MP and displayed through ArcIMS which is a web based map viewing application.

WEST VIRGINIA

No

WYOMING

Yes, GPS, see Question 2.

Q10. How do you monitor the performance of your vegetation management program?

ARIZONA

Performance monitoring is an in-house activity conducted by management and technicians.

DELAWARE

Lack of complaints.

FLORIDA

The maintenance rating program performed three times a year rates the random samples and assigns a score for the cost center, district, and statewide total.

IDAHO

We do not. We have no maintenance database system to generate reports or track vegetation management practices at this time. We have not had a program or system in place for two years now.

ILLINOIS

We presently are short staffed and do not have the ability to do this.

INDIANA

Mowing dates and complaints.

IOWA

We do not have a comprehensive evaluation of the vegetation management program. Maintenance standards are monitored through performance measurement.

KANSAS

No

KENTUCKY

Daily review by our district Roadside Administrators and field visit reviews by our Central Office State Roadside Administrators.

MASSACHUSETTS

Maintenance Field Personnel and District Roadsides Engineers routinely monitor and evaluate the management needs along our roadways.

MINNESOTA

Omnibus survey listed above. Weed control complaints, yearly expenditures for mowing, spraying weeds and brush, tree and brush removal, landscape maintenance, and planting.

MISSOURI

With annual performance indicators (see Question 8), customer satisfaction surveys (vegetation management is a very small part of an overall MODOT survey), and roadside quality assurance checks.

NEBRASKA

Number of complaints from the field and the public.

NEVADA

Individual sub-districts review roadways and if re-growth from the pre-emergency program occurs—warranty is evoked and contractor treats weed growth.

NEW HAMPSHIRE

We typically mow the same areas year after year, as funding permits.

NEW YORK

The Main Office, Regions, and Residencies monitor performance through several mechanisms:

Main Office: Vegetation and Environmental program Manager reviews spending through monthly reports with detail at the Regional, Residency, and object code (e.g., vegetation supplies and materials, contracts, other objects of expenditure). Program Manager also reviews work accomplishment information from MAMIS, a computerized work and accomplishment reporting system.

Regional Office: Staff reviews spending and work accomplishment information. Regional vegetation managers review performance by frequent meetings, conversations, and field visits.

Residency: Staff reviews spending and work accomplishment. Residency managers review performance during patrols of state highways.

NORTH CAROLINA

Supervisors and higher level managers within each Division oversee operations.

OHIO

By using data in the MQS inspections and public response.

OREGON

Roadside evaluations mainly; ODOT also responds to citizens complaints.

PENNSYLVANIA

Joe DiPietro—By public observations, contract monitoring, and personal observations.

Joe Demko—Varies according to the needs of the executive staff.

RHODE ISLAND

Shaleen Clark and Carolyn Cauette—Most of our work is done by state force and scheduled. However, some is contracted and these are monitored.

TENNESSEE

We evaluate ours by working with our Regional Maintenance Managers.

TEXAS

Condition assessment, research, and district visits.

UTAH

With our MMQA system.

VIRGINIA

Field inspections.

WASHINGTON

Assessments are conducted annually as part of the MAP referenced in answer to Question 6 above. Also, annual meetings are held with each maintenance area each fall

to discuss program aspects from the previous season and make adjustments if necessary. These discussions and any changes are documented as part of the area IVM plan.

WEST VIRGINIA

Field inspections.

WYOMING

Visual surveys by maintenance Foreman and State Agronomist throughout growing season. We have also started a quality control program that includes collection of data for mowing and chemical vegetation control. A copy of the pertinent information is in the attached “QC Manual” PDF file.

Q11. What percentage of your vegetation management is accomplished with in-house forces vs. contracting?

ARIZONA

Loosely, 80 percent is done in-house.

DELAWARE

Chemical: 96 percent contract, 4 percent in-house
Mechanical: 95 percent in-house, 5 percent contract

FLORIDA

Currently the range is 20 percent in-house, 40 percent traditional contract, and 40 percent asset maintenance contract.

IDAHO

Do not know.

ILLINOIS

It varies from district to district and year to year.

INDIANA

70 percent in-house, and 30 percent contract.

IOWA

98 percent (approx. 60 percent if maintenance items on construction contracts are considered, e.g., mowing and spraying items following seeding).

KANSAS

50/50.

KENTUCKY

70 percent with in-house forces and 30 percent by contract.

MASSACHUSETTS

Approximately 50/50.

MINNESOTA

90 percent in-house and 10 percent contracting.

MISSOURI

Mowing is the primary contracted vegetation management activity, with 7.5 percent contracted and 92.5 percent done with in-house forces.

NEBRASKA

Not sure.

NEVADA

85 percent contractor and 15 percent in-house.

NEW HAMPSHIRE

Guessing 75 percent of the mowing is done in-house. Currently, the department does not use herbicides as a form of vegetation control. Pilot trials may be done in the near future. Those would be utilizing in-house forces.

NEW YORK

Not sure of percentages. Measurement systems under development.

NORTH CAROLINA

In June 2007, NCDOT will “let” our first segment of interstate to contract management. In June, contractors will manage approximately 133 lane miles (4 percent)

of our rights-of-way. This number excludes mowing and contract plant bed maintenance in other regions of the state.

OHIO

Mowing—80 percent in-house, 20 percent contract.

Tree and Brush cutting—75 percent in-house, 25 percent contract.

Herbicide Application—50 percent in-house, 50 percent contract.

OREGON

ODOT accomplishes 80 percent in-house.

PENNSYLVANIA

Joe DiPietro—95 percent contracting.

Joe Demko—79 percent department forces and 21 percent contractors by cost.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette —90 percent in-house and—10 percent contracting.

SOUTH CAROLINA

Estimated approximately 75 percent in-house vs. 25 percent contract; depends upon available resources.

TENNESSEE

100 percent in-house.

TEXAS

90 percent of mowing is done by contract, 90 percent of pesticide applications are done in-house.

UTAH

At this point its 80 percent in-house and 20 percent contracting.

VIRGINIA

100 percent contracted.

WASHINGTON

All WSDOT maintenance is in-house.

WEST VIRGINIA

90 percent.

WYOMING

All chemical noxious weed control and bare ground sterilization are contracted out. Mechanical mowing is done by state crews (i.e., total labor breakdown: 50 percent private, 50 percent state forces).

Q12. If work is done “in-house,” are they held to the same standards as a contractor?

ARIZONA

Yes, we hold ourselves to a higher standard.

DELAWARE

No

FLORIDA

Yes

IDAHO

I would think so, if not more so.

ILLINOIS

Yes

INDIANA

Yes, it is at the same level.

IOWA

Yes, for the most part.

KANSAS

Yes

KENTUCKY

No

MASSACHUSETTS

Yes

MINNESOTA

I do not think so.

MISSOURI

No

NEBRASKA

Yes

NEVADA

Yes

NEW HAMPSHIRE

Yes

NEW YORK

Yes. In addition, residency maintenance staff has a strong sense of ownership of all transportation assets. In addition to standards, staffs meet or exceed contractor standards because of work ethic and pride.

NORTH CAROLINA

Yes

OHIO

Yes. The in-house work is not inspected the same way as contractor projects are, but the outputs are expected to be the same.

OREGON

Yes

PENNSYLVANIA

Joe DiPietro and Joe Demko—Yes

RHODE ISLAND

Shaleen Clark and Carolyn Cauette—Yes

SOUTH CAROLINA

Yes

TEXAS

In-house standards are usually much tighter.

UTAH

No

VIRGINIA

N/A

WASHINGTON

Yes and no. There are inherent differences in program delivery between in-house and contract maintenance. The IVM plans are intended to define maintenance for the local WSDOT maintenance crews.

WEST VIRGINIA

Yes

WYOMING

All work conducted per maintenance Functional Standards and overseen by various section foremen whether state forces or private contractors.

Q13. Do you have a long-term, life-cycle management plan? If so, can you share it with us?

ARIZONA

No, not at this time.

DELAWARE

No

FLORIDA

Roadways and roadsides are evaluated through different systems in place like our resurfacing program, and scope and plan review process.

IDAHO

None at this time, since we are unable to access any reports or monitor practices and costs.

ILLINOIS

No

INDIANA

Not at this time.

IOWA

No, not a written plan.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

No, we have what is called a Five-Year Vegetation Management Plan (VMP) that must be approved by our governing agency. It is essentially our master plan for addressing Vegetation Management.

MINNESOTA

Not that I know of! I am sure we do for the road surface. The only thing that comes to mind (and I'm not sure if it addresses this question) is our current efforts (Policy?) to re-establish Native Prairie Grasses in the R/W where feasible.

MISSOURI

No

NEBRASKA

No

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

No, we are beginning to develop 20-year funding needs for vegetation but those are in draft and not ready for release.

NORTH CAROLINA

No, not for vegetation; but yes, for structures.

OHIO

No

OREGON

No

PENNSYLVANIA

Joe DiPietro—No

Joe Demko—Yes, three of four life cycles.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

Individual offices generate annual plans.

TENNESSEE

No

TEXAS

Yes, and IPM program.

UTAH

No

VIRGINIA

No

WASHINGTON

Area IVM plans and the annual area review and plan update is intended to accomplish this. Please reference plans online.

WEST VIRGINIA

No

WYOMING

Yes, in simple terms called “native community vegetative cover.” Compared to weed-active, drought sensitive exotic vegetative cover utilized in prior policy, mid-1980. Late serial naturalized vegetation and associated topsoil self-sustaining from weed (exotics) invasion and drought disturbance. Construction disturbance a temporary flux during the life cycle.

Q14. Is your vegetation management team centralized or decentralized?

ARIZONA

Our vegetation management is centralized.

DELAWARE

Decentralized.

FLORIDA

See answer to Question 5.

IDAHO

I work with our district vegetation foremen and try to establish a consistent program, but it is up to the districts to implement the plans. So I guess it is mostly decentralized at this time.

ILLINOIS

I control the funds to the districts but they control what work is done.

INDIANA

Decentralized.

IOWA

Decentralized. This is the key question!!!!

KANSAS

Centralized.

KENTUCKY

Decentralized.

MASSACHUSETTS

Decentralized.

MINNESOTA

Decentralized. Every district is responsible for developing its own IRVM, but OES and C.O. Maintenance do provide guidance to the districts.

MISSOURI

Decentralized, with guidance from the Central Office.

NEBRASKA

Centralized.

NEVADA

No real team. Statewide contacts done by Central Maintenance Office.

NEW HAMPSHIRE

Decentralized.

NEW YORK

Both. The NYSDOT Main and Regional Offices provide policies, procedures, standards, and resources. For special situations, such as difficult negotiations with landowners, Main and Regional Offices are notified and involved. However, Regional crews and Residencies have a significant amount of autonomy to identify needs and to schedule the work.

NORTH CAROLINA

NCDOT is decentralized. Each Division makes their own plan, but the Central Unit helps issue Statewide commodity contracts.

OHIO

Decentralized, Central Office only provides guidance.

OREGON

The vegetation management team is decentralized. The statewide vegetation management coordinator and myself coordinate activities and provide training and guidance. Each of the 15 maintenance districts also has a vegetation management coordinator. The district coordinator is the point of contact for the district and organizes activities within the district.

PENNSYLVANIA

Joe DiPietro—If you consider my team to be all my contractors, it would be considered centralized.
Joe Denko—Decentralized.

RHODE ISLAND

Shaleen Clar and Carolyn Cauette—Centralized: 2 LA in Design, 1 LA in Maintenance.

SOUTH CAROLINA

Currently consists of four designated employees statewide with full-time vegetation management responsibilities.

TENNESSEE

Decentralized.

TEXAS

Decentralized.

UTAH

It is decentralized.

VIRGINIA

N/A

WASHINGTON

WSDOT headquarters provides statewide policy and guidance where necessary, but area IVM plans allow individual areas to adapt various aspects of program delivery depending on local conditions.

WEST VIRGINIA

Decentralized

WYOMING

Very decentralized at the District and Field maintenance shop level. See comment in Question 13.

Q15. If possible, please provide details (such as an org chart)

IDAHO

ACE-Hwy Operations and Safety Engineer—Maintenance Services Eng.—Roadside Program Administrator—District Maintenance Engineer—Vegetation Foremen.

IOWA

Administrative tasks related to vegetation management are spread between three separate offices within the central department and six districts. Vegetation management responsibilities are now officially at the district level. Each district administers the program differently, so essentially we have six different programs, plus what the central maintenance offices try to pull together through standards, performance measurement, general budget management (maintenance office) and training, providing information as requested, and coordinating projects with maintenance (design). There are no staff members dedicated specifically to vegetation management on the district level, and delegation of responsibilities to particular positions is not uniform. The vegetation management agronomist who formerly functioned as a program manager in the central (maintenance) office is now a “resource person,” based in the central design office.

KENTUCKY

The District Roadside Administrators report to the Engineering Branch Manager for Operations (Maintenance). This Branch Manager reports to the Executive Director of the District, formerly the Chief District Engineer. The Executive Director reports to the State Highway Engineer, who reports to the Commissioner of the Department of Highways, who reports to the Secretary of the Transportation Cabinet. The Central Office Roadside Administrators report to the Roadside Environment Branch Manager, who reports to the Director of the Division of Maintenance, who reports to the Deputy State Highway Engineer for System Preservation and operations, who reports to the State Highway Engineer, who reports to the Commissioner of the Department of Highways, who reports to the Secretary of the Transportation Cabinet.

NEBRASKA

Roadside stabilization unit provides chemical and mowing guidelines to the field. A comprehensive management plan will be developed as an off-shoot of the Landscape Vision in a year or two.

NEW HAMPSHIRE

Each of the six maintenance Districts, plus Turnpikes, is responsible for their own mowing program.

NORTH CAROLINA

Please visit our web site <http://www.NCDOT.org>.

OHIO

In the Districts, maintenance operations are overseen by the Highway Management Administrator (HMA). The HMA supervises the Roadway Services Managers (RSM) and the County Managers (CM). The RSMs in some of the districts oversee vegetation management operations; in others another person at the district level controls the issues. The CMs oversee the county operations. They have the most direct control over the in-house forces and provide a large portion of the direction given to the contracted vegetation management personnel.

PENNSYLVANIA

Joe DiPietro—Roadside Spec—Various contractors.

Joe Demko—One central office, eleven districts, sixty-seven counties.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—See above.

TEXAS

The central office writes policy and specs for chemicals, mowing, seeding, etc. and the district personnel implement.

WASHINGTON

Two state programs manager (plus staff) work with six regions and 24 maintenance areas throughout the state.

Q16. *What contracting methods do you use? (Performance based, line item, lump sum, hourly, etc.)*

ARIZONA

All of the above are used.

DELAWARE

Primarily lump sum/end result.

FLORIDA

All of the above are available.

IDAHO

Hourly or as work is completed and approved.

ILLINOIS

Performance-based, lowest qualifying bid.

INDIANA

Lump sum.

IOWA

Line item, but payment is withheld unless specifications (performance standards) are met.

KANSAS

Line item and lump sum.

KENTUCKY

Item, lump sum, daily, and hourly.

MASSACHUSETTS

Line item, hourly, and lump sum.

MINNESOTA

All! Our landscape contracts typically cover a two year establishment period. If the contractor ends up with over 90 percent of the original landscaping surviving in good condition, they are eligible for a 10 percent bonus. We have not done much in the area of long-term roadside management contracting after the landscape contract is up. Nor have we done much contract weed spraying. Some districts have gone back and forth due to poor performance either way.

MISSOURI

Lump sum per mowing cycle.

NEBRASKA

Lump sum.

NEVADA

Line item.

NEW HAMPSHIRE

Hourly.

NEW YORK

The methods that we use depend on the scope of the work and state contracting laws. For example, the department uses construction contracts for some vegetation management work. These include pay items and inspection before payment. We have Work Order Contracts (WOC) for tree work and removal of dead deer which have unit costs. For some smaller contracts, such as training, the contract is monitored and a single lump sum is paid after the work is satisfactorily completed.

NORTH CAROLINA

Depending upon the type of contract, we use all four methods. For example, contractor managed interstate contracts are “performance based”. Plant bed installations are lump sum contracts. Commodities are ordered via line item contracts and fully operated equipment contracts are usually issued on an hourly basis.

OHIO

We use a wide range of contracting methods. Most of the above mentioned areas are used in some way. Each district runs their operations in a different way.

OREGON

Line item mainly.

PENNSYLVANIA

Joe DiPietro—All of those.

Joe Demko—We use all the items listed in parenthesis.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette —Line item (unit bid).

SOUTH CAROLINA

Line item.

TENNESSEE

N/A

TEXAS

Yes

UTAH

Contracting is performance based.

VIRGINIA

Performance based line item, lump sum, and hourly.

WASHINGTON

N/A

WEST VIRGINIA

Line item.

WYOMING

For chemical vegetation control we utilize contracts with line item per acre rates and hourly rates with private contractors. We also process memorandums of understanding with local county weed and pest districts to contract weed spraying when this option is available. The line items are similar to the private sector contracts.

Q17. Have you evaluated which contracting method is most effective?

ARIZONA

I have not and do not know if ADOT has.

DELAWARE

Yes

FLORIDA

Currently being done.

IDAHO

No

ILLINOIS

No

INDIANA

Yes

IOWA

Yes

KANSAS

No

KENTUCKY

No, we just use the method that is most effective for the type of work that is being contracted

MASSACHUSETTS

No

MINNESOTA

Not formally, I do not believe. We have lots of informal, anecdotal opinions.

MISSOURI

No

NEBRASKA

No

NEVADA

Used both RFP and low-bid contract; either way has provided effective vegetation control.

NEW HAMPSHIRE

No

NEW YORK

Yes, each contract has different applicability, based on the situation. A more formal contract offers better pricing as the bidder has a specific scope of work. However, such a contract has significant administrative overhead, which requires it to be used on larger projects. A WOC is flexible but unit costs may be higher as a contractor bids on a general service rather than a service at a time and place. The smaller contracts are effective for completing smaller tasks in a timely manner, but they

face constraints based on the amount of money the state contract laws allow for them.

NORTH CAROLINA

Each method has its place in vegetation management.

OHIO

Each has its best attributes. If you know the work area and the site the work is to be performed at, but you do not have an inspector, I recommend using a performance based contract. If we do not know the scope of work to be performed, we use hourly rate. If we know the site and that future control is not needed, lump sum work is fine.

PENNSYLVANIA

Joe DiPietro—To some degree.

Joe Demko—There are too many variables to compare work in a city to a rural setting.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Line item.

SOUTH CAROLINA

Developing performance-based contracts has been challenging.

TENNESSEE

N/A

TEXAS

Line item seems to be doing better than the rest.

UTAH

No

VIRGINIA

Yes and the answer can and does vary from one project to the next.

WASHINGTON

N/A

WEST VIRGINIA

No

WYOMING

No

Q18. What contracting method do you believe will best suit your program in the future?

ARIZONA

Probably all of them as they are used now.

DELAWARE

Lump sum/end result.

FLORIDA

Currently being reviewed.

IDAHO

Not sure.

INDIANA

For mowing, lump sum; for herbicide and planting, performance based would work better.

IOWA

It depends on the type of work, the experience of the available contractors, and available inspection. Most of our contracting would be considered design/construction rather than maintenance, but maintenance items are included for the second year after installations. For these, line items with selected performance-based specifications work best. Full performance-based contracts are difficult to administer due to the experience and data required in setting performance criteria, the level of expertise of inspectors, and the reality that vegetation is biological and responds to many variables out of the contractor's control.

KANSAS

N/A

KENTUCKY

There is no one method that will apply to all contract situations.

MASSACHUSETTS

All of the above depending on the control technique used.

MINNESOTA

Pre-qualified folks for landscape maintenance, prairie restoration, etc. Also “Request for Proposals.” Conventional contracts often give us low-ball bids and we end up battling with contractors.

MISSOURI

Depends on the objective of the contract.

NEBRASKA

Performance.

NEVADA

Low bid—with pre-qualification of contractors.

NEW HAMPSHIRE

Hourly.

NEW YORK

We will continue to use a mix of contracting methods.

NORTH CAROLINA

I believe we will continue to operate using several methods.

OHIO

Same answer as above in Question 17.

PENNSYLVANIA

Joe DiPietro—Performance.

Joe Demko—Operations would be greatly restricted and confined if limited to one method.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Line item.

TENNESSEE

N/A

TEXAS

It will be a combination depending on the site and situation.

VIRGINIA

Something that allows a manager to consider several different methods; there is no one method that is the best for each project.

WASHINGTON

N/A

WYOMING

Will most likely continue with current line item and hourly type contracts. The field crews indicated that the current contract process is working well. We will continue to expand our work with the county weed and pest districts, if they have the manpower to perform the needed work. This is our most cost effective option.

Q19. Is your vegetation manager routinely involved in the planning, design of new or rehab highway projects?

ARIZONA

We do not know.

DELAWARE

No

FLORIDA

During scope and plans review process at the District offices.

IDAHO

Yes, that is me.

ILLINOIS

No

INDIANA

No, but hopefully we will get involved with every issue.

IOWA

No, involvement is by request.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

No, but our Landscape Architecture Section is involved.

MINNESOTA

Each district has an Environmental Coordinator involved primarily with program delivery of the above mentioned projects. To a lesser extent, they provide expertise to maintenance functions. Only one district has a designated roadside manager. Otherwise we have Central Office Advisory folks, forester, horticulturist, ecologist, botanist, and wildlife biologists that provide technical expertise and leadership in pre-design, design, construction, and maintenance functional areas statewide.

MISSOURI

May be involved on a limited basis during the plan scoping process.

NEBRASKA

Yes

NEVADA

No

NEW HAMPSHIRE

Only if special landscaping is involved.

NEW YORK

Involvement varies by region.

NORTH CAROLINA

Division Roadside Environmental Engineer and Field Operations Engineers in each of our 14 Divisions closely manage these items. They work with Division Operations Engineer and, with input from the Central

Unit, plans are developed to address the various management issues.

OHIO

No

OREGON

ODOT maintenance personnel are getting more involved in planning and construction, including vegetation management.

PENNSYLVANIA

Joe DiPietro—Not a very large amount.

Joe Demko—Vegetation manager's involvement varies between our 11 districts.

RHODE ISLAND

Sheleen Clark, Carolyn Cauette—Yes

SOUTH CAROLINA

No

TENNESSEE

No

TEXAS

No

VIRGINIA

No

WASHINGTON

Yes, maintenance managers work with statewide and regional landscape architects and project engineers on standards and project specific issues.

WEST VIRGINIA

No

WYOMING

No State Vegetation Control Manager. WYDOT utilizes State Agronomist that oversees the planning and design of all re-vegetation on new construction and rehab jobs, statewide.

Q20. *Do you have a formal, organized, and continuing training program?*

ARIZONA

Yes, we do.

DELAWARE

No

FLORIDA

Yes

IDAHO

Yes

ILLINOIS

Yes

INDIANA

Yes, herbicide and mowing training every year.

IOWA

Yes

KANSAS

No

KENTUCKY

Not for Roadside Managers.

MASSACHUSETTS

Not in-house.

MINNESOTA

Annual Pesticide Applicator Pre-season sessions for both licensed and non-licensed applicators. These are organized and annual but I would characterize them as informal. Certified Landscape Specialist training conducted annually, however participants who attend the one day course and pass the test are certified for three years.

MISSOURI

Yes

NEBRASKA

No, operators are required to maintain a non-commercial pesticide applicator's license if they apply pesticides to ROW.

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

Yes

NORTH CAROLINA

Yes, our "Transportation Worker Series" employees have a "Skill-Based Pay" Program used to compensate staff that become proficient in new skills. For higher level Technicians we have a "Competency-Based Pay" Program. Because of funding, the CBP Program is currently on hold. In addition, the Central Unit holds recertification training, and an annual vegetation management conference to update field forces involved in specific issues.

OHIO

Yes

OREGON

Yes

PENNSYLVANIA

Joe DiPietro and Joe Demko—Yes

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Yes

SOUTH CAROLINA

Yes

TENNESSEE

Yes

TEXAS

Yes

UTAH

Yes

VIRGINIA

No

WASHINGTON

Yes, annual training on IVM statewide for spray applicators and area by area training for all maintenance on implementation of area IVM plans.

WEST VIRGINIA

Yes

WYOMING

Not formalized, but utilize industry sponsored workshops and field tours to educate district and field staff. Spray contractors specified to hold EPA commercial Pesticide License and renewal education within contract documents.

Q21. If so, please describe the method your department uses to educate your staff—both management and field training?

ARIZONA

We utilize ADOT mandatory training regimen and have set mandatory annual training for NRMG personnel. Yes, we require both.

FLORIDA

The maintenance rating program teams are formally trained annually, the district and maintenance yards offer field training, also there is training offered by extension services, universities, and private training organizations. Available for anyone who would require the training.

IDAHO

We have an annual ITD foremen's meeting and weed conference sponsored by our Idaho Weed Control Association; we also have a statewide herbicide contract that includes training for our District personnel. Yes.

ILLINOIS

Pesticide training and licensing through Dept. of Agriculture and district training by our state pesticide vendor.

INDIANA

Herbicide applicators are given a six hour training class that is approved by the State Chemist office. Mowers are given safety training and the proper mowing height. Field managers are not given any training as of today, but will be offered by the beginning 2008.

IOWA

The training has changed greatly over the past fifteen years. The department now has a formal training academy, but vegetation management is not (yet) included. Annual herbicide applicator recertification training is still done in-house for approximately four hundred certified applicators, with approval from the regulatory agency. The vegetation management agronomist puts on ten five-hour sessions at field locations for approximately four hundred applicators. The idea is to limit expenses of attendees (no overtime or lodging), keep the sessions small enough to allow discussion, and cover as much material as possible because this is the annual training opportunity (the field crews have very limited time for non-required training). Managers are encouraged to attend but seldom do.

Other training is done "as requested" by the districts or performance measurement leaders (e.g., districts sometime request training to prepare new employees for certification exams, performance measurement sometimes request training in noxious weed identification, construction offices sometimes request training in erosion control inspection and NPDES compliance monitoring, etc.). Other training is attendance at conferences. Currently, it is up to Districts to register and send employees. When there was a statewide vegetation

management program, registration was coordinated on a statewide level and attendance was much greater.

We had a comprehensive vegetation management training program from 1995–2001 for 24 “roadside coordinators.” This started as a train the trainer program to use new herbicides, and evolved into a more comprehensive program for equipment operators who specialize in vegetation management, but continue to plow snow and do other maintenance activities as needed. Through monthly training meetings in all areas of vegetation management, the roadside coordinators networked, exchanged ideas, and provided field input to the program manager. These roadside coordinators served as resources to other equipment operators (in sprayer operation and repair), garage supervisors and managers (estimating herbicide needs and monitoring inventories), and designers (who need local information on vegetation, drainage, etc.). This intensive “roadside coordinator program” was discontinued after the decentralization.

One district has set up its own “roadside coordinator program” in which each supervisor designates an equipment operator to handle roadside vegetation responsibilities. This program appears to be a good structure and is currently being adopted by another District. The first program operates completely independent of the central office.

Field training is currently done as requested or when problems come up. From 1995–2002, it was left to the roadside coordinators, sometimes with slide shows and materials prepared by the program coordinator. There were also organized equipment seminars for roadside coordinators that were open to other equipment operators and mechanics. These were rotated to different districts each year so most applicators could attend (without travel expenses) every five to six years. The seminars included equipment representatives, vendors, and manufacturer representatives.

MASSACHUSETTS

VM personnel attend professional training seminars and recertification training workshops.

MINNESOTA

We assist the Districts in developing and implementing their local Integrated Roadside Vegetation Management Plan. We hold annual Pesticide Applicator Pre-season Meetings for licensed and non-licensed pesticide applicators and mower operators in small (20–25 people per session) informal sessions aimed at interactive, informal dialogue. Licensed applicators must recertify every other year at sessions coordinated by Minnesota Pesticide Information and Education (MnPIE). We hold IRVM sessions on a less regular basis. In-field training on any vegetation matter is provided on a requested basis.

MISSOURI

The primary vegetation management training is herbicide certification and recertification geared towards the field employees.

NEW YORK

We have a series of courses to provide skills training for techniques and equipment. We have spring and fall safety meetings which usually include vegetation topics. We have region-wide herbicide safety meetings, a full course to earn recertification credits, and a beginning course for new applicators. To operate most equipment, field staff must receive training specialized to the equipment. Once a worker believes he or she is trained, they are evaluated by an equipment operator instructor (EOI). NYS DOT also offers specialized training with vegetation, for example, in September 2006, our Southern tier Region, Region 6 in Hornell, offered a course on designing and installing natural stream restoration work with David Derrick. At this course, Mr. Derrick provided classroom instruction on stream, vegetation, and design concepts. He and class participants then spent three days applying these concepts in the field by “building” and vegetating a stream restoration project.

NORTH CAROLINA

In-house and professionals from the private sector are used to train employees. Yes, both management and field staff.

OHIO

We have an HT Roadside course that provides a day and a half of training on roadside operations and construction. We also have an annual vegetation Management conference at our Central office location which provides information on vegetation management and recertification credits. In addition, our Office of Training provides mowing, bucket truck, chain saw, and tree trimming training on how to properly operate the different types of equipment.

OREGON

ODOT offers continuing education credits for personnel with spray licenses. A statewide meeting is held in the fall and regional trainings are held in the spring.

PENNSYLVANIA

Joe DiPietro—Various seminars and training tasks.

Joe Demko—Management staffing has two trainings per year. Field training is limited to four regional pesticide recertification sessions.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette —Training classes, yes.

SOUTH CAROLINA

Training provided to employees with vegetation management duties at least annually.

TENNESSEE

Training for recertification is performed two to three times a year.

TEXAS

One day classroom for all personnel involved including supervisors; one day equipment, field work, and calibration; and one day testing individuals. This class is performed in all districts. In addition, many field trainings when requested and classroom courses in revegetation.

UTAH

Our training is for people in the field.

VIRGINIA

N/A

WASHINGTON

Use of interactive exercises and guest speakers, break-out groups, also consultation in the field throughout the year.

WEST VIRGINIA

An annual WV Vegetation Management Seminar and by attending other Vegetation Management conferences.

WYOMING

See Question 20 as to field staff. State Agronomist holds a Commercial Pesticide License and attends annual training to maintain and update IVM technology.

Q22. Does your department have a formal, organized, and continuing research program? If so, can you please provide details?

ARIZONA

No, we do not.

DELAWARE

No

FLORIDA

Research funds are requested if there is a need; the Universities do a lot of our research in turf and landscape areas.

IDAHO

We used to but it has been inactive the last couple of years. Do not have any details at this time.

ILLINOIS

No

INDIANA

No continuing, but we do have a research department that must be presented with a request. The request is given to a committee and if approved they send out to

each department a needs statement. If enough people believe it is needed, then funding is approved.

IOWA

Yes. The department funds grant applications and research agreements with universities.

KANSAS

No

KENTUCKY

Yes. We have an agreement with the University of Kentucky college of Agriculture to perform Roadside Vegetation Management research. This is funded by the Division of Maintenance and managed through our Research Office.

MASSACHUSETTS

Yes, our continuing research program is done in collaboration with the University of Massachusetts Cooperative Extension Service and the Department of Plant and Soil Sciences.

MINNESOTA

Yes, check with our research department (Research Services Section). We submit formal problem statements. After research is completed we can request research implementation dollars to get the findings integrated into practice. We are exploring pooled research projects with other states. The URL for our Research Section is <http://www.research.dot.state.mn.us>.

MISSOURI

Yes, products or methods are provided to a single source within the department and evaluations are coordinated through one office.

NEBRASKA

No, but special projects have been initiated with University faculty to study effects of seed-priming, erosion control blankets, manure, etc. on success of vegetation establishment. New studies have been initiated on compost blankets, and the composition of vegetation 10

years post planting versus what was seeded on north-south orientations.

NEVADA

No, contractor supplies research on new products.

NEW HAMPSHIRE

No

NEW YORK

Yes, we use Federal SPR monies to annually address vegetation issues on a programmatic or task specific basis. We participate in pooled funds and NCHRP projects. Our maintenance residencies are encouraged to provide information on vegetation conditions to local university research wherever feasible. Maintenance residencies also experiment with materials and work practices on their own initiative.

NORTH CAROLINA

Yes. Because of limited funding, only a portion of the research projects requested each year are funded. NCDOT has developed a method that allows individuals from various sectors of our organization to evaluate the proposals. Those with the most support and those that will impact the Department most usually get funding.

OHIO

No

OREGON

No, the vegetation management program relies on the ODOT research branch to conduct studies and reports.

PENNSYLVANIA

Joe Dipietro—Yes, no

Joe Demko—Yes, research has been ongoing since 1986.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette —Yes, we have a Research and Technology Dept. which manages all research (i.e., NCHRP projects).

SOUTH CAROLINA

Yes, but limited research on vegetation. Most research performed in-house. Cooperation with research institutions only as funding and priority allows.

TENNESSEE

Currently working on a new program.

TEXAS

Yes, in-house pesticide research and many research projects with universities each year.

UTAH

Yes, would have to get the research department to do this.

VIRGINIA

N/A

WASHINGTON

Yes. <http://www.wsdot.wa.gov/research>

WEST VIRGINIA

No

WYOMING

Yes, a title 23 Federal Research & Development program as most DOTs (NCHRP). Vegetation Mgt. Projects have not received funding from this WYDOT/FHWA grant program.

Q23. *Do you think vegetation research adds value or believability to the vegetation program?*

ARIZONA

Yes, I do.

DELAWARE

Yes

FLORIDA

Yes

IDAHO

Yes

ILLINOIS

Yes

INDIANA

Yes

KANSAS

Yes

IOWA

Yes

KENTUCKY

Yes

MASSACHUSETTS

Most definitely. It shows that we are open to exploring new alternatives to Vegetation Management and implementing promising new technologies and control strategies.

MINNESOTA

Absolutely! It puts us at the “cutting edge.”

MISSOURI

Yes

NEBRASKA

Yes

NEVADA

Application of test plots on new products allows flexibility for more effective vegetation control products.

NEW HAMPSHIRE

Yes

NEW YORK

We strongly agree with this statement. In New York, research has provided techniques to help with vegetation and maintenance issues. For example, Professor Tim

Volk, of the New York State College of Environmental Science and Forestry, has provided maintenance residencies with the technical support to use a new shrub willow hybrid to limit or curtail blowing and drifting snow. In the early 2000s, research on alternatives to vegetation enabled us to evaluate whether certain organic substances, mowers, or weed barriers were effective substitutes for pesticides. Working with Professors Chris Nowak and Ben Ballard, also of the College of Environmental Science and Forestry, we have the beginnings of a system that could be used to audit vegetation management programs. The summary of this system is attached in response to Question 3, above. An issue with “believability” is the audience for the research; for example, if researchers are working with vegetation managers, these managers will believe in the research outcome if they see it has concrete value to their operations.

NORTH CAROLINA

Without a doubt; it is very hard to argue with scientific data.

OHIO

Yes, we are looking into working with researchers, but have not started as of yet.

PENNSYLVANIA

Joe DiPietro—Yes

Joe Demko—I do not know how you could have a valued vegetation program without research.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Yes

SOUTH CAROLINA

Yes

TENNESSEE

Yes

TEXAS

Yes

UTAH

It adds value in that it helps us do things better.

VIRGINIA

Yes

WASHINGTON

Yes, if done well.

WEST VIRGINIA

Yes

WYOMING

Potential for redundancy due to efficacy trials conducted in herbicide labeling and state requirements. States like Oklahoma and North Carolina have strong roadside university programs where efficacy data is assessable. State-specific, strip comparison trials of more value in calibrating rates and timing. Generally, accomplished by herbicide marketing companies and Cooperatives Extension. Believability proven in the right-of-way by program in place.

Q24. Does your department have a quality assurance program? If yes, please send us a copy of the policy.

ARIZONA

No, that is done in-house at the regional management level.

DELAWARE

No

FLORIDA

Yes

IDAHO

I believe so. I am not sure who has access to this and will have to find out.

ILLINOIS

No

INDIANA

Yes

IOWA

Yes (assuming this is material quality monitoring).

KANSAS

No

KENTUCKY

Yes, but not for vegetation management activities.

MASSACHUSETTS

No, but we do have labs and routinely take herbicide samples and test them. We also do calibration testing.

MINNESOTA

Not, officially, but the IRVM plans and the Roadside chapter of the *Maintenance Manual* provide guidance on scheduled filed inspection, pruning, herbicide application, etc.

MISSOURI

Yes, Central Office Roadside staff performs random quality assurance checks during district visits May through October.

NEBRASKA

No

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

Yes, see Question 7 above.

OHIO

Yes

PENNSYLVANIA

Joe DiPietro—Yes

Joe Demko—Under development.

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

SOUTH CAROLINA

Yes

TEXAS

No

UTAH

Yes, MMQA.

VIRGINIA

N/A

WASHINGTON

Reference MAP as discussed in answer to Question 6.

WEST VIRGINIA

No

WYOMING

See response and attached information for Question 10.

Q25. Do you have a process to evaluate emerging innovative technology? If so, please provide details and recent examples.

ARIZONA

No, we do not.

DELAWARE

Field trail/performance based.

FLORIDA

Yes, through training.

IDAHO

Yes, we have an erosion control and qualified products program with temporary and permanent erosion control measures and committees as well as a website with

information about the teams, the process, and practices and products used. We also have a BMP committee that updates our BMP Manual and explores new innovative practices. The website is <http://apps.itd.idaho.gov/apps/materials/QPL.aspx/>.

ILLINOIS

Our state pesticide vendor puts on a yearly seminar with manufacturers attending and presenting.

INDIANA

No

IOWA

Yes, new products and technologies are evaluated in a variety of ways, and eventually go through rigorous evaluation before purchased. The “New Products Committee” can evaluate any product. Usually new products come through the central office, to the person who specifies products. Herbicides are evaluated by the agronomist both through product information and field trials. Process improvement teams evaluate sprayers and GPS sprayer technology and mowers, GIS software is evaluated by department IT personnel. Equipment is evaluated by equipment specialists and a committee of district mechanics.

KANSAS

No

KENTUCKY

No

MASSACHUSETTS

No

MINNESOTA

NTREC—will have to check with Maintenance for correct language. This is the website where information on the MOR/NTREC can be found: <http://www.dot.state.mn.us/maintenance/research/research.html>. Some sample projects are: 1) The Rotary Mower; 2) The Roadsides Trash Harvester; and 3) The “Guard Rail Mower,” etc.

MISSOURI

Same as Question 22 above

NEBRASKA

Somewhat—a maintenance and operations subcommittee meets regularly to determine what technology to evaluate and how. The GPS pilot study is an outgrowth of this committee process.

NEVADA

No

NEW HAMPSHIRE

No

NEW YORK

Yes.

Main Office, Regional, and Residency staff identifies innovative technologies and test them within their capabilities. For example, we tested the shrub willow living snow fence in pilot plantings relatively near the College of Environmental Science and Forestry in Syracuse.

Bart Howe, the Resident Engineer in Nassau South Residency, on his own initiative, observed that grass was growing between concrete joints on parkways and other urban roads. Howe asked his staff to choose some select locations and cover them with traffic tape. He and his staff found the practice was successful. The Residency and Regional Office staff then took the experience and used it to write a specification to control unwanted vegetation with traffic tape.

On a statewide basis, we have a research contract with Professor Leslie Weston of the Horticulture Department of Cornell University. Weston has been working with her research greenhouses and Department residencies to test whether certain groundcovers can suppress weed growth without the need to use pesticides.

NORTH CAROLINA

Yes, the Central Unit acts as a clearing-house for new products and technologies. We then provide feedback to the Divisions. Also, we work closely with the Research and Development Unit to fund research to investigate emerging technologies or ideas. Also, the Department

has a ‘new’ products committee to evaluate products offered by industry. Over the last few years, we have funded research through NC State University to evaluate weed control in wildflower beds. In addition, we have funded various other research projects to evaluate erosion and sedimentation prevention, the use of organic (animal waste) fertilizers, and low-volume herbicide placement technologies.

OHIO

We do not have a formal process, but we post innovative information and processes on our internal website to be referenced by our own forces. They are encouraged to review them and use the information to connect research to new processes. We posted a power point on our website showing the information learned during the PGR pilot.

OREGON

ODOT has no formal process to evaluate innovative technology.

PENNSYLVANIA

Joe DiPietro—No

Joe Demko—Yes, research contracting evaluates emerging technology. Research has recently evaluated alternatives to Diuron, herbicide controls for invasive weed species, and comparison of the establishment of different seed mixtures. (20th year report will be e-mailed separately.)

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—Yes, this is part of our Research and Technology Dept.

SOUTH CAROLINA

Evaluation occurs in-house.

TEXAS

Yes, all products go through the Maintenance Division for testing purposes and evaluation. If chemicals, then a three-to-five-year testing period prior to any use in the department.

UTAH

Yes, we work with Utah State University on this.

VIRGINIA

No

WASHINGTON

For roadside maintenance technology, this is one of the responsibilities of the HQ maintenance office.

WEST VIRGINIA

No

WYOMING

No formal process. Our districts will occasionally work with manufacturers to test new techniques and materials.

Q26. Do you have and control your own vegetation management line item budget in the maintenance budget?

ARIZONA

Yes, NRMG controls its own budget once it is allocated.

DELAWARE

No

FLORIDA

The districts receive funding as part of their overall maintenance budget.

IDAHO

We used to, but I think it was lumped together as one item such as herbicide, seed, and erosion control.

ILLINOIS

Yes and no; I request funds, but the administration determines how much I receive.

INDIANA

Not at this level; each district controls.

IOWA

No

KANSAS

Yes. Do not have budget figures.

KENTUCKY

No

MASSACHUSETTS

No

MINNESOTA

We do not necessarily have a line item budget for vegetation maintenance, but the district does usually budget for yearly expenditures for herbicides and other chemicals; they do this independently from Central Office.

MISSOURI

MODOT's 10 districts have individual budgets that may have a one item for vegetation management. The Central Office Roadside budget does not have a line item of vegetation management.

NEBRASKA

No

NEVADA

Yes

NEW HAMPSHIRE

No, mowing comes out of the general equipment rental funds and has to compete with other required maintenance functions.

NEW YORK

The Vegetation management budget is part of the budget of the New York State Department of Transportation (NYSDOT). All moneys in NYSDOT are appropriated or re-appropriated annually through an executive budget process where the Governor recommends a budget and the Legislature enacts appropriation bills. New York has a centralized budgeting system and all funds, for vegeta-

tion and every other purpose, must first be appropriated by the Legislature.

The department prepares an annual budget request, which is submitted to the Division of the Budget in the Governor's Office. The Governor makes a recommendation on all aspects of the NYSDOT budget, including vegetation, to the Legislature. After the Legislature passes the budget, the department prepares a spending plan for all programs. As part of operations, the department sets an allocation of operating and capital funds to address vegetation management issues.

Once the money is allocated to vegetation program, Main Office, Regional, and Residency staff may spend the money consistent with state and federal laws and regulations.

NORTH CAROLINA

Yes, each division has a specific budget for their operations. Division management controls these budgets.

OHIO

No, I only provide guidance.

OREGON

No, the individual maintenance districts control their budgets.

PENNSYLVANIA

Joe DiPietro—To a large measure.

Joe Demko—Somewhat

RHODE ISLAND

Sheleen Clark and Carolyn Cauette—No

TENNESSEE

No

TEXAS

No, it is the district's responsibility.

UTAH

Yes, we keep some money in central for projects.