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Publication Date

2003-08-24

ENVIRONMENTAL STEWARDSHIP IN NYSDOT HIGHWAY MAINTENANCE

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Abstract: The New York State Department of Transportation operates and maintains approximately 16,500 miles of highway that occupies approximately 1 percent of the state's land area. Due to the tendency of the highway system to follow streams, coastlines and other natural landscape features, this 1% of land is located within, over and adjacent to many very sensitive and important environmental areas. Considering that NYSDOT, like most transportation departments, is now shifting its efforts more and more towards improving, operating and maintaining the existing transportation infrastructure, as opposed to building large-scale new alignment projects, the role of incorporating environmental improvements into maintenance and operational programs is increasing in importance.

The project objective was to Proactively reach out to internal and external partners to identify priorities and develop multi-agency strategies and projects that improve environmental conditions along NYSDOT's rights-of-way and roadsides.

The approach required thorough internal teamwork involving many regional groups and external partnering with resource agencies and environmental organizations in order identify, develop and coordinate prioritized environmental stewardship projects. These "best practices" are then implemented during highway maintenance activities.

NYSDOT has 11 regional offices with each region having a Landscape Architecture/Environmental Services unit located within the Regional Design Group. Although, located within the Design Group, these Units provide environmental services to all regional groups - including maintenance. In addition, in 2001, a senior environmental specialist (a.k.a. maintenance environmental coordinator or MEC) was assigned to each regional maintenance group to supplement existing programs by dedicating full-time effort coordinating environmental issues in the maintenance group. One aspect of this effort has been a focus on incorporating environmental right-of-way and roadside "Best Practices" into regional maintenance programs. Critical elements of this strategy include fostering internal teamwork within the region and developing partnerships with external groups. By using internal knowledge and resources and external expertise and assistance, the Department's organizational strengths can be efficiently and effectively managed to expand right-of-way roadside environmental stewardship programs.

Examples of 2002 "best practices" to be discussed include: (1.) control methods for invasive plants; (2.) installation of water level control structures at chronic nuisance beaver locations; (3.) installation of water quality improvement structures near drinking water supplies; (4.) turtle mortality abatement efforts; (5.) alternative mowing strategies to enhance grassland songbird nesting habitat; (6.) establishment of living snow fences; (7.) osprey nesting enhancements; (8.) methods to reduce deer vehicle collisions; (9.) migratory bird protection on bridges; (10.) herbicide education programs; and (11.) small petroleum spill abatement measures. These strategies and Best Practices are applicable to any national, provincial, state or local transportation department with an interest in incorporating environmental improvements into daily maintenance activities.

Purpose

This is not a peer-reviewed technical paper, nor is it a formal research project intended to prove or dispell a particular scientific hypothesis. Rather, this is a description of how the New York State Department of Transportation (NYSDOT) "walks the talk" regarding environmental stewardship in its Highway Maintenance Program.

Introduction

Highway roadsides and rights-of-way (ROW) occupy about 1 percent of the land area in New York State. Due to the tendency of highways to follow and traverse natural terrain features, such as lakeshores, river valleys and wetlands, past highway construction has had a considerable effect on sensitive and fragile ecological systems. With the days of large-scale new highway construction projects largely a by-gone era, most transportation construction projects now involve the modification of existing highways on essentially the same alignment. These two factors 1. existing highways in sensitive environmental areas and 2. a decrease in scale of new construction projects point to the emerging importance of improving environmental stewardship in highway operation and maintenance practices.

Methods

Historically, here at NYSDOT, maintenance forces were left to their own devices to consider the environmental impacts - or not - of various maintenance programs. The focus was primarily on safety, cost and efficiency with little to sporadic consideration given to the natural environment. Over the last couple of decades, NYSDOT began to hire professional landscape architecture and environmental staff into our Highway Design Division. These combined landscape architecture/environmental Service Units provide services to all department programs in each of NYSDOT's 11 regional offices with an emphasis on project design. In the last decade, as additional landscape architecture and environmental staff have been hired and as regional priorities allowed, additional emphasis has been directed towards environmental programs in highway maintenance. This

increased effort has resulted in significant improvements in environmental compliance and laying a strong foundation for using maintenance programs to proactively improve environmental conditions along NYSDOT roadsides and ROWs.

In 2001, NYSDOT raised the bar further by taking the organizational leap of reclassifying 11 senior engineering titles into senior environmental specialist titles and assigning them to maintenance. This environmental commitment from the department's commissioner, executive staff and maintenance managers is particularly significant considering that the department has been steadily "downsizing" for the past decade and all titles, especially at the senior level, are jealously guarded by program areas. Each regional maintenance group then hired one senior environmental specialist to focus full time on coordinating environmental issues in Maintenance. In addition, an associate environmental specialist position was created in the main office of the Environmental Analysis Bureau to provide program oversight, direction and statewide coordination. The decision to place these new environmental titles directly into the Regional Maintenance Groups, and not in the Regional Landscape Architecture/Environmental Groups, was not made lightly. The over-riding rationale was that the best way to improve the environmental ethic in the very large and decentralized Maintenance Program was to get them to help themselves rather than relying solely on staff from other department groups. In addition, by placing the positions directly into the regional maintenance groups, the regional maintenance engineer retains managerial responsibility for the position and remains directly involved in environmental issues.

Considering that the sheer scope of environmental work in maintenance is far more than any one individual per region could hope to address, the emphasis of these new positions, from day one, has been as an environmental leader and coordinator; hence these staff have been dubbed maintenance environmental coordinators or MECs.

So that the new MECs could hit the ground running, learn as a group and be integrated with other department programs, a system was set-up immediately upon their hiring that: (1.) provided a clear description of the MEC role and responsibilities; (2.) provided comprehensive MEC training in priority environmental areas; (3.) provided bi-annual statewide MEC coordination meetings; and (4.) provided for each MEC to submit a monthly activity report. While this may appear to be a bureaucratic paper chase, each of these activities is intended to improve MEC effectiveness through direction, knowledge, shared experience and communication – especially communication!

Placing the MECs directly into the Regional Maintenance Groups was intended to address specific areas for department-wide environmental improvement in Maintenance, as follows: (1.) increased environmental field presence; (2.) increased familiarity with maintenance staff, activities and issues; (3.) improved responsiveness to maintenance environmental needs; (4.) greater leadership and follow-through on priority environmental issues in maintenance; (5.) improved environmental training for maintenance staff; and (6.) improved intra-regional communication on environmental issues.

Upon hiring, the MECs were directed to spend about 50 percent of their time "in the field" observing, learning, advising and proactively identifying environmental stewardship opportunities; arm chair quarterbacking will not suffice, the MECs need to be out there where the action is. There is also no substitute for the MECs actually being a maintenance employee. This enables the MECs to become very familiar with the maintenance staff, their daily operations, activities and their priorities in a way that a "visitor" from another unit cannot. In addition, and very importantly, this sense of the MEC being "our environmental person," as is commonly expressed by many maintenance workers, results in a very close and open working relationship grounded on familiarity, trust and mutual respect. Unlike some aspects of NYSDOT's many programs, things tend to happen very quickly in maintenance with little or no time, or need, for formal design. Due to storms, accidents, etc., maintenance forces are often called upon to react immediately to a safety situation and need timely environmental advice and recommendations. Having the MEC set up as the "go to" first point of contact results in improved coordination and faster response to environmental needs. By focusing solely on environmental issues in maintenance, the MECs are also able to learn what issues are priorities and commonplace and then prepare regional guidance and training to address these areas in a proactive and programmatic manner. In addition, by working in and focusing solely on maintenance issues the MECs have the support, time and ability to identify and coordinate the follow-through on environmental stewardship opportunities. In the past, many of these environmental stewardship opportunities would have been missed simply because no one was directly responsible for this area in NYSDOT's maintenance programs.

Results

There are scores of successful examples of incorporating environmental stewardship into NYSDOT highway maintenance activities. A few representative, recent examples of stewardship partnerships that highlight the diversity of topics and range in scope will be discussed here as follows: (1.) Adirondack Invasive Plant Control Demonstration Project, (2.) Skaeneateles Lake Watershed Improvement Project, (3.) Keg Creek Public Access Enhancement, (4.) American Kestrel Roadside Nest Box Program, (5.) Osprey Nesting Structure Enhancement, (6.) Taconic State Parkway Deer-Vehicle Accident Mitigation, and (7.) Cascade Lakes Snow and Ice Control Research Project.

Adirondack Invasive Plant Control Demonstration Project

The continued introduction, spread and tolerance of invasive plants is widely recognized as a serious environmental threat. For Japanese Knotweed (*Polygonum cuspidatum*), effective, efficient and environmentally sound control methodologies are not well understood. In Essex County, NYSDOT regional maintenance staff, in partnership with the Adirondack Park Agency and the Adirondack Chapter of The Nature Conservancy, have begun a demonstration knotweed control program in the environmentally sensitive Adirondack Park. The pilot demonstration project involves hand cutting individual knotweed plants, properly disposing of the harvested plants and using NYSDOT-certified herbicide applicators to swab the residual cut knotweed stems with "rodeo." This project also incorporates a training component by inviting local Department of Public Works (DPW) maintenance workers and resource agency staff to observe and participate.

Skaeneateles Lake Watershed Improvement Project

Skaeneateles Lake provides drinking water to one-quarter million people. State highways completely encircle this 15-mile-long oligotrophic lake providing numerous direct pathways for contaminants and tanker truck "spills" to enter the lake, potentially compromising the quality of the drinking water and the fragile lake ecology. NYSDOT's Region 3 Maintenance Group has formed a partnership with the City of Syracuse Board of Water Supply, NYS Department of Environmental Conservation (NYSDEC) and local officials and has taken the lead in addressing spill-related water quality concerns. The resulting Watershed Spill Control Plan directly reduces vulnerabilities to the lake's water quality by utilizing the organizational strengths of NYSDOT maintenance forces. The plan, which has been completely enacted, calls for NYSDOT to identify the potential contaminant pathways that most directly threaten water quality. These 15 sites have since been mitigated through the installation of stone check dams/retention basins to treat daily runoff and to temporarily retain any spills that may occur at these sites. Also, all Department maintenance staff working in the 20-square-mile watershed have been provided sensitivity training and spill clean-up materials. In addition, local DPWs in the watershed have been provided with similar spill control materials and the local fire department has been provided with culvert plugs, absorbent materials and a commercial grade spill containment boom.

Keg Creek Public Access Enhancement

New York's highway system is vital to connecting people and places of interest. Niagara County maintenance staff took the lead in forming a partnership with local business, the NYS Office of Parks Recreation and Historic Preservation and NYSDEC to provide a public fishing access site and picnic area at a popular salmon and trout stream – Keg Creek. Anglers traditionally would park haphazardly along the state highway and traverse a very steep, slippery and dangerous ravine to fish for Lake Ontario's world famous migrating trout and salmon. This created a safety problem for passing motorists and for the anglers themselves. NYSDOT maintenance crews designed and constructed a paved parking area, a series of wooden stairs and a picnic area with lumber donated by a local company and tables donated by the State Parks Department.

American Kestrel Roadside Nest Box Program

Like the populations of all native, secondary cavity nesting birds in NYS, the American Kestrel (*Falco sparverius*) has suffered from a lack of suitable nesting sites. This smallest of American Falcons readily adapts to nesting in artificial nest boxes – *if* (and this is a big if!) the boxes are properly constructed, placed in suitable locations, monitored for competitors and maintained regularly. These boxes also provide a controlled environment for collecting valuable scientific information. Region 6 environmental and maintenance staff developed a program that involves a federally licensed bird bander and volunteers to manage a roadside trail of 15 nest boxes. NYSDOT maintenance workers constructed the boxes and installed them on the support posts of existing large expressway signs. Environmental staff and volunteers regularly monitor the boxes and NYSDEC biologists band the hatchling kestrels to collect scientific information.

Osprey Nesting Structure Enhancement

Osprey (*Pandion haliaetus*) are listed as a "Species of Special Concern" in New York State. Osprey populations in the state declined dramatically in the 1960s and 70s due to the widespread use of organochlorine pesticides and biomagnification of these persistent, fat-soluble pesticide residues through aquatic food chains

to top predators, such as osprey. This scenario resulted in egg shell thinning, decreased reproduction and subsequent widespread population declines. Due to improved environmental conditions in NYS and restoration assistance from NYSDEC raptor biologists, osprey populations are steadily increasing throughout much of the state. Possibly due to the widespread use of osprey nesting poles/platforms, osprey now readily nest on active utility poles, which threatens the integrity of the power grid, poses a physical danger to the birds and creates a maintenance headache for utility companies. In an effort to lure an established nesting osprey pair away from such a situation, NYSDOT Region 7 Maintenance in St. Lawrence County is working with Niagara Mohawk Power Company, and state and federal raptor biologists. The demonstration project involves identifying a suitable natural nesting tree in NYSDOT ROW near the established utility pole nest – yet far enough away to discourage perching on the utility poles – and modifying this tree (a mature white pine, *Pinus strobus*) by removing obstructing branches and placing a nest frame near the tree top. The objective is to attract the osprey pair away from the utility poles/lines and induce the pair to nest at this safer, more aesthetic, “natural” location. No nest material was initially placed in the constructed nest frame; however, to increase the attractiveness of the new location, material will be added prior to the 2004 nesting period. Placing artificial nest poles/platforms in the cleared utility or highway right of way was considered and discounted due to the sites being too close to the active poles/lines.

Taconic State Parkway Deer-Vehicle Accident Mitigation

NYSDOT maintains and operates 16,556 miles of highway, or about 15 percent, out of NYS’s total of 110,000 miles. Although the percentage is small, it accounts for 85 percent of the total vehicle miles traveled in the state (NYSDOT 2003 and FHWA 2004). In FY 2001-2002, Deer Vehicle Accidents (DVAs) resulted in 24,098 roadkilled deer being removed from state highways by NYSDOT maintenance forces and contract vendors (NYSDOT). These *known* DVAs resulted in NYSDOT paying vendors \$550,000 to remove 5,000 deer, 3 human fatalities, 700 human injuries, and approximately \$50 million in property damages. New York State is home to approximately 1.1 million whitetails, with approximately 80 percent of the state considered good to prime deer habitat. The widely distributed nature of the State’s deer herd coupled with ubiquitous and unpredictable travel patterns results in a DVA mitigation nightmare for transportation officials. The literature regarding the use of “Deer Reflectors” to reduce DVAs is difficult to interpret due to inconsistencies in procedure and conflicting results. To help clarify the issue in NYS and to help mitigate these losses, NYSDOT Region 8 Maintenance has initiated a three-year pilot project utilizing the “Strieter-Lite Deer Warning Reflector System.” The project area is a one half mile stretch of the Taconic State Parkway. The TSP is a rural divided highway with a 55-mph posted speed limit and good sight distance visibility. Reflectors were purchased for \$6,000 and installed as per manufacturer direction by NYSDOT maintenance crews. The year prior to reflector installation, there were 25 confirmed DVAs at this location with only two DVAs the year after reflector installation – both of which occurred in the day time. As regular inspection and maintenance of the reflector network is key to performance, an “Adopt-A-Highway” agreement has been signed with the Dutchess County Federation of Sportsmen Club to regularly inspect, maintain vegetation, clean the reflectors and report any damage to NYSDOT. The 92 percent DVA reduction observed in year one is promising; however the site will continue to be closely monitored before drawing any firm conclusions (perhaps ICOET 2005).

Cascade Lakes Snow and Ice Control Research Project

While information on the general environmental effects of snow and ice control products is becoming more available, what to do at specific difficult locations can still be problematic. At the Cascade Lakes area in New York’s Adirondack Mountains, NYSDOT’s Essex County Residency is faced with the challenge of how to effectively control snow and ice on the heavily traveled Route 73 and at the same time not contribute to the tenuous plight of the State Endangered Round Whitefish (*Prosopium cylindraceum*). At this location, the winter weather conditions are among the most severe in NYS, the highway sits on bedrock, and the lakes are immediately adjacent to and down gradient from the highway. In addition, Route 73 is the most heavily traveled eastern gateway to the year-round tourist and recreation destination of Lake Placid. To help unravel this riddle, using federal SPR (State Planning and Research) funds, NYSDOT has contracted with Clarkson University and Paul Smiths College to document environmental conditions, investigate the effects of past and present snow and ice control practices and develop specific management recommendations. This \$150,000, 30-month research project has been developed cooperatively between NYSDOT, the Adirondack Park Agency and the New York State Department of Environmental Conservation.

Conclusion

Two years ago, NYSDOTs maintenance managers asked for assistance with improving the environmental performance of maintenance programs, and the department responded by creating a senior environmental specialist position in each Regional Maintenance Group. Two years later, this experiment has been nothing short of an unqualified success due largely to: (1.) a proactive approach, (2.) the commitment of the MECs,

(3.) the on-going support of environmental stewardship from the maintenance managers, (4.) the strong environmental programs previously established by the Regional Landscape Architecture Environmental Service Units, and (5.) the outstanding level of inter and intra-Departmental teamwork, cooperation and partnering. One particular aspect of this program that stands out is the enthusiasm, eagerness, creativity and dedication of many of the maintenance line staff. These hardworking, intelligent and resourceful individuals care deeply about environmental quality and, now more than ever, are out there making a positive contribution. We still have a long way to go here in New York, but now, with consistent guidance and support, NYSDOT is on the right track towards realizing our environmental stewardship potential in maintenance. For additional information on NYSDOT's environmental stewardship activities, please visit our web site at www.dot.state.ny.us.

Biographical Sketch: Kyle Williams received an A.A.S. degree in fish and wildlife management from the State University of New York at Cobleskill in 1981 and a B.S. degree in fish and wildlife management from Cornell University in 1983. Since 1993 he has worked for the New York State Department of Transportation as an ecologist in the Environmental Analysis Bureau. During this time he has been involved in developing department policy, guidance and support regarding a variety of natural resource topics including highway permeability, wetlands mitigation, stream restoration, invasive species management and water quality improvement. Currently he is the head of the Operations Section and is responsible for statewide coordination and leadership regarding environmental issues in roadside and ROW maintenance activities. Prior to joining NYSDOT, he worked for 10 years as a fisheries technician and wildlife biologist with the New York State Department of Environmental Conservation's Division of Fish and Wildlife. During this time he was involved with data collection, interpretation and implementation for the management of a variety of species, including whitetail deer, ringneck pheasant, mink, wild turkey, raccoon, woodcock, common tern, waterfowl and inland fisheries.

References

FHWA 2004. "Our Nation's Highways, Selected Facts and Figures," FHWA-PL-92-004.

Williams, K. 2003. "Status of Deer Vehicle Accident Information in New York State." NYSDOT. Unpublished Paper.