

ENGINEERING DIRECTIVE

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OBSOLETE

EXECUTIVE OFFICE OF TRANSPORTATION AND CONSTRUCTION LANDSCAPE RESTORATION POLICY

Introduction

The design process for transportation construction projects includes careful consideration of environmental conditions in order to minimize impacts on the landscape. However, some disturbance--including removal of trees, shrubs, groundcover, and other landscape features--is unavoidable, whereupon mitigation becomes necessary. From a regulatory standpoint, the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA) require mitigation beyond certain impact thresholds. From the standpoint of ecological or aesthetic impact, however, such thresholds do not necessarily prevent projects from having a substantial effect.

A plan for restoring both the ecological qualities and the visual character of the landscape should be incorporated into each construction project. This plan should be based on careful analysis of the affected area and its context. Damage to natural areas associated with highway projects can often be mitigated through careful attention to grading, plant selection and location. The visual impacts, which are exacerbated by the highly visible nature of roadway projects, can also be reduced by efforts to replace lost material and enhance the views of and from the highway.

The benefits of restoration are significant. The recovery of damaged landscapes is in keeping with state and federal policies to protect and enhance the roadside environment. Highway rights-of-way constitute a large amount of state land, some of it quite unique or quite valuable in terms of plant community and wildlife habitat. In addition, the restoration of visual quality will better integrate roadways into the landscape, improve public perception of highway projects, and help preserve and enhance the overall quality of the highway environment.

Purpose

This policy is intended as a framework for appropriate landscape restoration for impacts resulting from roadway projects. It does not impose further restrictions, but is intended as an umbrella policy that incorporates existing regulatory protection and promotes efforts to restore landscapes damaged by new construction. The policy is intended to be specific enough to help direct mitigation proposals, while allowing for the wide variation of conditions encountered in construction projects.

Policy Objectives

It shall be the policy of the Executive Office of Transportation and Construction to restore landscapes disturbed by construction in a manner that ensures:

- 1) The safety of individuals using the roadways;
- 2) The renewal of existing or the establishment of new, self-sustaining, balanced ecosystems that bear close relationship to surrounding ecosystems;
- 3) To the extent possible, the efficient return of the land to its pre-construction visual character and enhancement of its attractive features;
- 4) Efficient maintenance to preserve the safety, ecological value, and visual character of the right-of-way.

Implementation

Landscape restoration is a site-specific process that requires consideration of right-of-way limits, highway safety requirements, ecological conditions, and aesthetic character of the site. Analysis of the proposed project area, including on-site visits and documentation, is key to proper understanding of the site constraints, the type of ecosystem, visual quality, and cultural value of the landscape.

1. Safety of individuals using the roadway is the primary consideration governing the landscape restoration.

The size of the right-of-way will constrain design alternatives. Within the right-of-way, safety requirements for adequate recovery zones and sight

distances will limit the type and location of replacement vegetation. At the same time, careful selection of plants can improve the safety of the right of way. The following is an outline of recommended plant constraints and uses.

- Preservation of sightlines at intersections and along horizontal curves.
- Maintenance of a vehicle recovery zone along the road right-of-way. Trees with trunks larger than 4" in diameter may not be planted in recovery zones. Setback recommendations are as follows:

<u>Guardrail</u>	<u>Distance from edge of travelled roadway</u>
No guardrail:	30'
W-beam:	3'
Masonry (concrete) walls:	0'

- Avoid use of coniferous trees on the south side of east-west roads, in order to allow solar warming in winter and reduce the risk of localized ice formation.

Within the restrictions cited above, plantings along the roadside and in the median offer the following benefits:

- Reduction of headlight glare from oncoming vehicles
- Delineation of changes in highway alignment
- Softening of recovery zones using shrubs and ground cover

[Source: AASHTO. 1991. A Guide for Transportation Landscape and Environmental Design]

2. In areas damaged by new construction, restoration will seek to renew or re-establish self-sustaining ecosystems that bear close relationship to surrounding ecosystems.

Given the constraints of right-of-way and safety, the principal issues governing restoration are the preservation and enhancement of the ecosystem and the visual quality of the site and its context. The New England landscape is comprised of a range of plant communities. Wetlands are protected by state and federal regulation, and guidelines for their

analysis, as well as restoration, have been carefully developed. Yet there are other types of landscape -- such as upland forests, sandplain communities, post-agricultural fields -- that are worthy of preservation and enhancement.

In order to establish an appropriate strategy for ecosystem restoration, the project site should be evaluated prior to construction. Where the value of the ecosystem and prospects for its successful protection and enhancement are good, the existing ecosystem should be restored using plant species and sizes that will ensure the most effective return of the plant community. Where the disturbed system may be of little ecological value or is no longer viable, the site should be re-established using appropriate materials, depending on such site conditions as microclimate, soils, topography, highway runoff and related hydrology. When construction projects occur in urban areas, landscape restoration should address environmental conditions such as sun and wind.

Effective ecosystem establishment may require planting of species other than those removed. Plants for renewal and establishment should meet the following criteria:

- Indigenous species that will thrive under the site conditions
 - Species supportive of wildlife, providing cover, nesting, or food
 - Species reasonably available through nurseries, hardy enough to withstand transport and planting
3. To the extent possible, restoration plans will restore the visual and cultural character of the land affected by construction projects.

The visual impact of highway projects is frequently a highly sensitive public issue, making restoration or enhancement of the roadside an essential part of highway construction projects. In conjunction with the analysis of ecological conditions, project sites should be assessed as to the visual character and cultural value of the landscape, the extent of disturbance caused by construction; and the potential for restoration and enhancement.

Where the scenic or cultural value of the landscape will be lost by construction, planting design should seek to restore those lost qualities. The

species, sizes and quantities of plants should be selected to return the landscape character at maturity (typically within 10 to 20 years). Where feasible, for wooded areas, two or more trees should be planted for each tree removed in order to restore lost tree canopy. The microenvironment of the highway is subject to harsh conditions, and it may not be feasible or advisable to replace species in kind.

For areas characterized by open land or having scenic vistas, replanting should strive to preserve existing views as well as capitalize on new views resulting from construction. In addition, cultural artifacts uncovered by construction should be properly addressed by the restoration plan.

In some circumstances, new planting may not provide sufficient buffer between the road and other land uses. Other structures -- such as berms, fences or walls -- may be required to restore the separation previously offered by trees and shrubs.

4. Restoration plans should ensure that ecological and visual qualities are easily maintained or self-maintaining, and thus adequately preserved.

The following guidelines should govern selection of and location of plants to minimize management requirements.

- Plant species should be self-sustaining and pest resistant.
- Shrubs and tree plantings should be grouped in order to facilitate mowing, where necessary, and to provide windbreaks.
- Trees and shrubs should be set back from roadside to allow snow storage.