Historic Parkway Preservation
Treatment Guidelines

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Massachusetts Department of Conservation and Recreation
Division of Planning and Engineering
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How to Use These Guidelines

The historic parkway system of Massachusetts is the oldest of its kind in the country and a unique resource whose care and planning require careful research, evaluation and design. In addition to their historic value, parkways provide recreational opportunities and multiple modes of travel by drivers, cyclists and pedestrians. The Historic Parkways Preservation Treatment Guidelines recognize the parkway’s value as historic resource, scenic and recreational treasure and transportation corridor and provides a framework for incorporating those values into parkway planning, improvements and maintenance. The purpose of this document is to provide guidance to the Department of Conservation and Recreation decision-makers, project managers and consultants on a project planning process and course of action for treatment.

The project planning process and application of the guidelines should be undertaken for any project that alters the way a DCR parkway functions, introduces new elements to the parkway, impacts users or results in impacts to a significant historic parkway feature. This may include projects that are not only funded and managed by DCR, but also parkway projects that are privately funded or funded by another agency like the Massachusetts Highway Department.

The guidelines are organized into the following chapters:

**Chapter One: Introduction** describes the background for this manual, its guiding principles and a typology for the parkways.

**Chapter Two: Parkway Planning and Project Management** describes the management and design process needed to treat a parkway, centered on the Design Control Report.

**Chapter Three: Guidelines** summarizes the parameters by feature-type that parkway project managers should work within when altering a parkway.

**Chapter Four: Maintenance** summarizes routine maintenance issues and outlines the distinction between maintenance and other projects that may require review.

**Bibliography** includes references and resource information that will support on-going efforts to protect and enhance the Commonwealth’s historic parkways.

**The Appendices** include a brief history of the parkways, threats and issues, summaries of the Historic Parkways Initiative (HPI) and the National Register process, an inventory of urban parkways, HPI Sample Project Scope of Work and public participation summary.

The Guidelines are intended to be dynamic and allow for periodic updates when relevant regulations and procedures change or new technical data are developed. Appendices may also be added over time.
This manual is intended to be used in conjunction with several other key references that are applicable to parkways:


- Flexibility in Highway Design, Federal Highway Administration, U.S. Department of Transportation, 1997


Implementation of the Historic Parkway Preservation Treatment Guidelines coupled with the agency’s broader based effort to promote public participation and transparent decision-making ushers in a new era of stewardship and public awareness of the historic parkways across the Commonwealth.
Chapter 1: Introduction

In Massachusetts at the close of the nineteenth century, the momentum of labor reform, urban improvement, social welfare, and the early environmental movement was strongly influencing the ways in which public lands were being managed in the Commonwealth. Theories regarding the connections between public health and access to open space were beginning to have tangible results that were particularly evident in the development of dozens of roads on state parklands, including the Metropolitan Boston Parkway System, between 1893 and 1956. The parkway system is a highly significant part of the history of the Commonwealth that carries with it an urban, recreational, and transportation planning legacy that goes far beyond the boundaries of the state. Despite this significance, pressures such as suburban development, population growth, greatly increased traffic volumes and limited maintenance funding for the Massachusetts parkways have all put enormous strains on the system.

Originally designed as carriage roads to link and provide access to recreational areas, the function of the parkways in metropolitan Boston began to change starting in the 1920s with the emergence of the automobile. Over the next several decades, they became increasingly integrated in the regional road network. Automobiles meant changes to the parkways originally intended for horse and buggy. Parkways found elsewhere in the state suffered from limited maintenance and capital improvement funds. The pressures over the last half-century have put the parkways at risk, as unintentional incremental changes threaten to destroy their historic integrity.

In 2001, in response to the threat, the Commonwealth launched the Historic Parkways Initiative (HPI), an interagency effort involving the Executive Office of Environmental Affairs, the Massachusetts Highway Department and the Massachusetts Historical Commission. The far-reaching goal of the Initiative was to lay the groundwork for an integrated, collaborative planning approach in the development of safe and historically appropriate protection and management policies for the state’s historic parkways. The same year, the Massachusetts Historical Commission began to nominate the Metropolitan Park System of Greater Boston, with special emphasis on its parkways, to the National Register of Historic Places. Today, 70 of the parkways in the metropolitan Boston area are listed on the National Register of Historic Places either individually or as contributing features to other nominations. With 162 miles of parkways in over 20,000 acres of parkland in metro Boston alone, these nominations have established beyond any doubt the incredible significance of these historic resources.

With the support of a statewide steering committee and a broad base of stakeholders, the multi pronged approach of the HPI included an inventory of 42 representative parkways, support to the MHC on the development of the National
Register nomination, creation of public education materials and the development of two demonstration projects. In 2002, the Commonwealth partnered with MIT, the City of Cambridge, and NSTAR to develop the Memorial Drive Demonstration Project with the aim of preserving and adapting a nineteenth century parkway to the demands of the present day. The following year, the Mount Greylock Historic Parkway Rehabilitation Project was developed in partnership with various state agencies as well as the Berkshire Regional Planning Committee and the Mount Greylock Advisory Council. This effort was designed to restore the grandeur of the Civilian Conservation Corps-era road, while providing a safe route of travel for car, pedestrians, and bicycles.

The **Historic Parkway Preservation Treatment Guidelines** build on the previous efforts of the HPI by outlining a systematic procedure for the research, documentation, planning, design, and future maintenance of historic parkways. The guidelines identify the characteristics and conditions that call for parkway-specific solutions to preserve and strengthen those elements that contribute to the significance and character of each parkway. This manual is designed to be used in concert with Mass Highway’s *Project Development and Design Guide*, developed in 2006.

The goals of these guidelines are to:

- Develop a consistent collaborative approach to the planning, treatment, and maintenance of historic parkways and park roads;
- Provide a framework for decision making that balances the scenic, cultural, recreational and transportation values with the need to provide safe access and use;
- Encourage the participation of all interests in a clear, transparent planning and decision making process, and
- Raise and sustain awareness of the historical significance of the Commonwealth’s parkways and park roads.

### 1.1 GUIDING PRINCIPLES

The following principles have guided the development of this manual:

**A parkway is not a road, but a park with a road in it.**

Parkways are first and foremost recreational resources enjoyed by hundreds of thousands of users daily. The earliest parkways were developed to create “ribbons of green” to connect open space and to provide recreational travel ways within the parks and reservation system. Built on parkland, parkways and park roads are protected by Article 97 of the State Constitution, which safeguards “the natural, scenic, historic, and esthetic qualities” of public lands. Today the parkways serve multiple recreational users, including drivers, walkers, runners...
and cyclists as well as a variety of passive users. Safety and enjoyment of these resources are paramount in the consideration of all capital improvements and ongoing care.

Parkways are historic resources.
Parkways are artifacts that reflect important changes in American culture. While their origins are in the social improvement efforts of the late nineteenth century, parkways continued to be developed into the 1950s to provide improved and efficient access to the Commonwealth’s parks and open space as well as commuter routes. Recognized by the Massachusetts Historical Commission as historically significant, most parkways are listed on the National Register of Historic Places and many others are eligible for listing. A thorough understanding of the original design intent, historic integrity and character will help to guide decision-making. It is important to note, however, that as a resource type that has evolved over time, the historic parkways should not be treated as a landscape frozen in time. In those circumstances where the parkway corridor needs to be adapted or altered to accommodate contemporary needs or use, changes will be undertaken with sensitivity to history or context.

Parkways are the original multi-modal facility.
Parkways serve multiple modes of travel and should continue to function as such. Safe, comfortable and enjoyable travel should be accommodated for all users including pedestrians of all ages and abilities, bicyclists, motorists and passengers. Protecting and enhancing the landscape can be accomplished in ways that satisfy the needs of all users.
Parkway planning and preservation can only be successfully achieved through a multi-disciplinary approach. By their nature, parkways are complex, designed and engineered systems made up of structures, vegetation, lighting, drainage, signage and other roadway related features. Addressing the larger picture (or context) through collaboration among preservation and engineering professionals is essential to the parkway design process. Throughout the process, involving the expertise of all disciplines, along with timely input from a broad range of stakeholders, will ensure the best outcome possible.

1.2 PARKWAY DEFINITION AND TYPES
DCR Parkways are distinctive in that they have a special relationship with their surrounding context and perform a unique transportation function. Historic parkways in Massachusetts differ from ordinary roadways because they are generally understood to be within a park or park-like setting; and are distinguished by their scenic and landscape qualities or by their access to such qualities.

Many of the historic parkways in the urban system are designated as “pleasure vehicle only” roadways and allow for multiple modes of travel including passenger vehicles, bicycles, motorcycles, scooters and mopeds. However, these parkways have prohibitions in place, outlined in CMR 350 4.00 that restrict use by vehicles weighing more than 5,000 pounds or exceeding an overall height of seven feet. Parkways designated as “general traffic” allow for use by all vehicles. For a list of the parkways and their designations, refer to Appendix D: National Register Nomination and Metro-Boston Historic Parkways Matrix.

Today, DCR oversees a diverse network of parkways and infrastructure. Over 70 urban parkways of metropolitan Boston alone are a major historic and recreational resource used by thousands of commuters and containing over 500 lane miles, 445 crosswalks, 187 bridges, 5000 catch basins, 500 signs, and 12,800 streetlights. Other parkways across the state lie wholly within large expanses of parkland and generally carry only recreational traffic of parkland visitors.
In 2002, the inventory of 42 representative parkways and park roads across the state was conducted to provide a more in-depth understanding of the resource. The inventory documented historic integrity, landscape character, physical conditions, function and use. The inventory fieldwork coupled with the historical research conducted for the preparation of the National Register nominations led to a better appreciation of parkway types, character-defining features and preservation needs.

The following typology of parkways types is a tool to assist in determining the appropriate treatment. All DCR parkways can be categorized as one of the three primary types, and many parkways can be further defined as one of five subtypes:

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<tr>
<th>Primary Parkway Types</th>
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<td>Connecting Parkways</td>
<td>River Parkways</td>
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<td>Internal Park Roads</td>
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Connecting Parkways
Connecting Parkways link communities to public parks and reservations, and link parks and reservations to each other. Traveling through varied settings of dense urban neighborhoods and nearby suburban areas, these parkways are the most physically complex in the system.

Connecting Parkway

The travelway has four to six travel lanes with widths of 10 to 14 feet. A wide median, often planted with trees, usually occupies the center of the parkway. The outside edges of the roadway are characterized by vertical granite or quarter-round concrete curbing. Beyond the curb line, turf, formal plantings of trees and shrubs and adjacent sidewalk usually define the parkway corridor. Character-defining features include, but are not limited to, routes that connect to a public reservation or to other parkways; wide planted medians; rights of way that support a park-like setting, and curvilinear alignments. The VFW Parkway, is a good example of a Connecting Parkway that links the Charles River Reservation with the West Roxbury Parkway.
**Internal Park Roads** are the primary circulation system within parks, providing access to recreational sites such as picnic areas, trailheads, and overlooks. Their alignments generally follow the natural topography and are often more curvilinear, with greater changes in vertical alignment than other parkways.

The setting around Internal Park Roads is most often wooded with occasional breaks in the forest, often at overlooks, that provide views to park features or the surrounding area. The travelway typically consists of two 10 to 12-foot-wide travel lanes with little development along the edges beyond drainage features such as swales, culverts and headwalls, and retaining walls which are often more abundant due to excessive changes in topography. Plantings are informal and more naturalistic. Barriers, boulders, guardwalls and guardrails may also be found. In addition, due to the accessibility of natural features, trailheads, and viewsheds along Internal Park Roads, unofficial pullouts are often found along their edges. Motorists, bicyclists and pedestrian often share the road. Chickatawbut Road in Blue Hill Reservation and Berry Pond Circuit Road in Pittsfield State Forest are both examples of Internal Park Roads.
Border Roads historically form the edges of parks to ensure accessibility to public land. They are chiefly defined by the presence of protected open space on one side of the parkway and private, usually 19th or 20th century residential development on the other, although some Border Roads are now found within park interiors due to subsequent adjacent land acquisitions.

Border Road

The land on the park-side of the roadway is similar to that found on Internal Park Roads, with no curbing, planting strips or sidewalks. The vegetation of the park usually flanks the travelway. The non-reservation side, however, is often detailed with curbs, planting strips with trees, and sidewalks. Historic vertical granite curbing may be found, though it is often replaced with quarter-round concrete curbing. Two, undivided 10 to 12 feet wide travel lanes typically define the travelway. An example of a Border Road is Hillcrest Parkway, which marks the boundary between Middlesex Fells and adjacent private land.

Bellevue Hill Road is a Border Road, in the Stoney Brook Reservation.
Parkway Subtypes

**River Parkways** follow one side of a watercourse in a generally level, curvilinear alignment that parallels the shoreline. The riverine side of the travelway is generally riparian or a thin strip of developed parkland with a landscaped or naturalistic edge contrasted with private residential or commercial development on the other.

A River Parkway may provide both broad and screened views of the watercourse, large structures including culverts and bridges, vertical granite and quarter-round concrete curbing, and a number of barrier types including the common “Boston Pattern” railings. “The cross-section of a river parkway…varies from that similar to a connecting parkway to that of a border road or internal park road. This is the most versatile of the parkway subtypes.”

Memorial Drive is the quintessential River Parkway.
**Ocean Parkways** and follow the horizontal alignment of the coastal shoreline. Expansive views of the water, inland marshes, and at times, the Boston skyline can often be seen from these parkways.

Sections of Ocean Parkways adjacent to inland marshes may serve as berms and may contain tidegates. Adjacent inland land use is typically 19th and 20th century residential and commercial. The travelway is typically two to four lanes with no median, but with adjacent parking, vertical granite or quarter-round curbing, and wide sidewalks or promenades with pedestrian scale lighting. The vegetation on the waterside is low so that the views of the ocean are not obstructed. An Ocean Parkway always contains a seawall that may also have barriers, such as Boston Pattern railing on the top. Revere Beach Boulevard is a prime example of an Ocean Parkway.
**Summit Roads** wind up steep mountain slopes in a series of ascents, with rests at pullouts at overlooks. This unique parkway type provides an experience of rugged progress up steep, winding topography, with dramatic views on the way to the summit. Once there, a formal sense of arrival may highlight buildings, structures, overlooks and other recreational facilities found at the top.

Dramatic long distance views are paramount to this parkway type. Travelways are typically narrow with two lanes approximately ten feet wide and flanked by steep slopes on the upslope and steep dropoffs on the downslope side. A number of different guardrail types can be found along summit roads including steel cable and rustic hewn log guardrails. Drainage features are numerous due to the varied topography and include swales, drop inlets, headwalls, and culverts on the upslope side and outlets on the downslope. Roadway lighting is often limited to entrances, and the top of the summit. Summit Road climbs Mount Sugarloaf and is typical of this parkway type.
**Estate Roads** were designed to serve private grounds, and have been adapted for use in estates-turned-parks. These travelways typically begin at a formal entry or gateway and flow through formalized landscapes that create a sense of arrival.

Estate Roads are typically one lane, approximately ten feet wide, travel over fairly level topography, and contain few if any features. The roads at Maudslay State Park are an intact system and reflect the site’s former use as a private estate.
Vernacular Roads are a type of historic road found in virtually all forests, parks and reservations in the Commonwealth, and typically run through undeveloped areas.

Vernacular Road

Although their characteristics vary widely, Vernacular Roads are often unpaved gravel or dirt single-lane routes with adjacent stone features like walls and cellar holes, and little if any infrastructure. The former town and utility roads in Dubuque State Forest are Vernacular Roads.

Mill Street is in Moore State Park is a vernacular road separating cleared land from forest and lined by stonewalls that date from early European settlement.

2 Virginia H. Adams et al., Metropolitan Park System of Greater Boston, National Register of Historic Places Multiple Property Documentation Form, December 2002, Section F Continuation Sheet, pages 5-6.
Chapter 2: Parkway Planning and Project Development

Context-sensitive solutions for parkways result from designs sensitive to the local setting and create “transportation facilities (that) fit their physical setting and preserve scenic, historic, aesthetic, community and environmental resources to the extent possible.”\(^1\) The parkway planning and development process involves many offices and divisions within DCR and other state, local and federal agencies as well as the general public. The purpose of this chapter is to outline the project planning and design process in detail and identify the responsibilities in parkway project implementation. A clear, coordinated, transparent parkway planning process is as important as the guidelines developed to preserve the parkways.

The MassHighway *Project Development & Design Guide (2006)* is an example of how the Commonwealth is integrating natural resources, historic properties, and community character into the transportation planning and design process. These parkway guidelines are intended to complement and build upon the MHD process and focus on the specific needs of parkways.

### 2.1 PROJECT THRESHOLDS

The following planning and project development process is useful for major modifications, rehabilitation, restoration or reconstruction projects that have the potential to alter the character of a historic parkway. This comprehensive assessment is critical for projects that may result in one or more of the following scenarios:

- Alterations to the current function of a parkway (speed, capacity, or safety),
- Introduction of new elements such as signage systems, traffic control measures, grade separation, incompatible landscape features, lighting systems or signals,
- Change in the balance among users (bicyclists, pedestrians and vehicles) and
- Removal, rehabilitation or reconstruction of a significant historic feature, such as a bridge, lighting or landscape features

These thresholds apply to all parkway projects, whether they are funded and managed by DCR or by a private entity or another state agency.

Maintenance and in-kind replacement activities do not normally require an extensive planning process. These include:

- Re-surfacing,
• Re-striping,
• Catch basin reconstruction (in site, in-kind),
• Replacement of existing sign(s),
• Sidewalk repair (in-kind replacement) and
• Minimal landscape work (limited tree removal or replacement).

However, whatever the project’s magnitude, each project should be developed and specified in accordance with the treatment guidelines in Chapter 3 of this document and carried out in compliance with all regulatory requirements.

2.2 PROJECT INITIATION
At the beginning of a parkway project, the DCR Project Manager leads the following internal planning process to determine its scope, regulatory and other planning needs. The planning process described here supplements the procedures and processes outlined in the DCR Division of Planning and Engineering Project Management Manual.

2.2.1 Need Assessment
DCR staff assesses the need for capital investment in historic parkways and associated structures such as bridges or culverts through a variety of ways including specific legislative authorization and an internal capital planning process. To inform the annual capital planning process, DCR will conduct an annual system-wide spring reconnaissance inspection and evaluation of historic parkways to identify

(1) immediate/emergency maintenance repairs,
(2) annual planned maintenance activities,
(3) special initiatives,
(4) capital equipment needs and
(5) major capital improvements.

DCR incorporates the data collected during spring reconnaissance into a long-range parkway work plan. The long-range plan creates a framework for establishing annual priorities, setting project categories, establishing timetables for implementation and identifying project funding mechanisms. Once a specific capital need is identified, Planning & Engineering (P&E) submits the project for consideration for the DCR capital plan by entering the project into the Environmental Capital Planning System (ECAP).

2.2.2 Project Managment
When a project is approved on the capital spending plan, the DCR Bureau of Project Design and Management assigns a Project Manager. The DCR Project Manager assembles an internal Project Team, and prepares a draft scope of work, schedule and budget.
2.2.3 General Treatment Considerations—Preparing the Consultant Scope
To select an appropriate treatment for a parkway, it is important to understand its dual function as a multi-modal transportation corridor and a historically significant and scenic route in a parkland setting. The MassHighway Project Development & Design Guide (2006) actively promotes collaboration between design and preservation professionals to address the dual functions. The guidelines address not only road features, but also the setting and how the surrounding corridors and communities affect the character of a road. This “context sensitive design” is integral to the parkway design process.

To develop the plan for a historic parkway project, the Project Team needs to take into account many factors, specifically the following:

- historic value of the parkway, significance and the existing level of documentation,
- integrity - existing condition evaluated against historical significance and defining features,
- management goals for the parkway and
- significance and constraints of setting.

In choosing the treatment, the following factors should be considered:

- enhancement of historic and cultural features,
- protection of scenic and aesthetic features,
- functional classification of the roadway,
- traffic characteristics—traffic volume, level of service, composition of traffic, speed,
- regional transportation—patterns and impacts and
- management and sustainability – reductions to the maintenance burden.

2.2.4 Composition of Design Team
The Project Team also advises on the composition of the consulting Design Team. The range of disciplines needed to address the scope and environmental impacts may include history/historic preservation, landscape architecture, planning, transportation planning and engineering, bicycle and pedestrian expertise, arboriculture, horticulture, architecture, archaeology, ecology and biology.

2.2.5 Regulatory Strategy
The Project Team identifies significant cultural and natural resources and compiles a preliminary list of anticipated regulatory requirements.

2.2.6 Public Participation Plan
Parkways are important public open spaces that serve a wide range of communities, from residents to commuters to recreational users. The decisions made in a parkway planning process can affect both a community and the
parkway users in a profound way. Inclusion of all stakeholders in a collaborative public process including neighbors, cyclists, commuters, pedestrians and recreational users leads to better project. During the process, the public learns about a parkway’s historic, environmental, recreational and transportation values. The process provides a forum for important advice, commentary and review and can build public support and enthusiasm. The public who shapes the project has a vested interest in its future stewardship.

A good public participation plan encourages the public’s involvement and input from early planning through construction. Early in the project planning process, the DCR Project Team works with the agency’s Office of External Affairs to identify project stakeholders. Stakeholders include abutters, neighborhood residents, advocacy and special interest groups such as statewide groups like the Massachusetts Bicycle Coalition, local municipal offices, boards and commissions, community leaders, elected officials, parkway users, state and federal regulatory agencies, utility company and private area businesses. In some cases, the project may warrant the creation of an “advisory committee” or “working group.”

The DCR Office of External Affairs leads in organizing the public outreach plan and works closely with the Project Team to develop the scope. Legal notices alone are not sufficient tools for engaging the public in a planning process. The internet, press releases to media outlets and special interest groups, notices to local and statewide advocacy and friends groups, community wide notices, and flyer distribution to neighbors are all ways to communicate public participation opportunities.

While every project requires a specific public participation plan, a typical strategy includes, at a minimum, four public meetings - first, a listening meeting; second, a discussion of alternatives; third, the presentation of the preferred alternative and fourth, a pre-construction meeting. Briefings, one on one meetings and periodic updates to constituent groups may also be needed during the course of a project.

DCR’s goals for public participation, required public meetings and preparation of meeting materials (agendas, graphics, presentation slides) are all outlined in the scope for consultant services.

2.2.7 Mapping and Data Standards
Every project requires baseline mapping and data collection. The extent and detail of that data depend on the project needs and budget. Whenever possible, parkway projects should incorporate the collection of geographic data in a form consistent with the standards of MassGIS and the DCR GIS Program. Consistent parkway data build the DCR database.
Scope for Mapping and Data
The Project Manager consults with the GIS Director early in the planning process to identify the appropriate scope for data and mapping. Depending on the goals for the project and existing data on file, the project may require mapping as simple as centerline delineation or as extensive as GPS mapping of parkway features.

Executive Office of Transportation Database
For most parkways, DCR and its consultants use the Executive Office of Transportation’s (EOT) GIS data for the centerline locations. If the project requires further mapping, additional data can be collected and stored either in added fields or in separate tables that can be joined to the main attribute table. New data must follow the identical attributions to those of the EOT data. Some projects require additional data such as parkways omitted from the EOT data, sites for which there are location errors in the EOT data, projects requiring line data for individual lanes, and projects where the scale of the EOT data is not sufficiently large.

Traditional Boundary Survey
A traditional boundary survey determines limits of work, relationships among features, etc. Typical survey standards apply for parkway boundaries, and a stamped survey in both printed and digital formats is required. The survey is accompanied by a description of the boundary courses using metes and bounds in either a text document or preferably in a spreadsheet. If the boundary of a parkway is more conceptual than legal (a historic parkway through a state forest where both the forest and the road are state owned), survey standards may not apply and a more approximate location of the boundary can be created using GIS or CAD. If CAD is used, then follow the CAD specifications under the heading “Features Associated with Parkways.”

Features Associated with Parkways – Database Development
Historic parkway planning requires the identification and location of features such as catch basins, sidewalks, street trees, street lights, traffic signals, crosswalks, signs, etc. In GIS, these features are defined in terms of points, lines and polygons. Collection of these data in CAD must be in a format that allows DCR to geo-reference the data, tying the information into land coordinates and the GIS mapping database. Additionally, the scale of the data must be explicitly stated (e.g. 1:25,000). This scale represents the best scale for the use of the data. It is not necessarily the same as the scale placed on a base plan.

If a parkway project includes collection of data, the preferred formats are (in order of preference):

- GIS data with corresponding metadata (or suitable description of collection process/assumptions),
• AutoCADD data with a world file or known global coordinates included in the file and
• Linear referencing involving stations with necessary offsets.

For all of these formats, a features list in Excel format can be used to tie tabular attribute data to the mapping system. In all cases, a key (unique) field is required to discern among the individual records. If the data are not in a GIS format, the paper and digital drawings must have labels on each individual feature with the value (character or number) from the key field.

General DCR Standards for Data and Mapping

GIS Data
All data adhere to state standards set by MassGIS and specific data needs established by the DCR GIS program. All created data need an associated metadata file. Data are in the North American Datum 1983 (NAD83), registered to the Massachusetts State Plane Coordinate System, Mainland Zone (fipszone 2001) and data units are in meters. MassGIS standards can be found at http://www.mass.gov/mgis/standard.htm.

The DCR GIS Director establishes state data needs for each project (scale and attributes) during the course of the project. Some data may need to be collected with GPS while others may be digitized using existing paper maps or imagery. Known data needs for parkways are: Centerline, Light Posts, Site Furniture, Scenic Overlooks, Paths/Trails, Significant Vegetation (including street trees). All data are delivered in shapefile or personal geodatabase format.

Mapping
Maps are needed both for meetings during the planning process and for inclusion in the final project documents (Design Control Report and Bid Documents). Maps contain all necessary cartographic elements (title, legend, scale, North arrow, etc.) and may need to be produced in both electronic and printed versions.

The Project Manager works with the GIS Director to determine whether there are existing datasets for any features to be mapped such as catch basins. All new data must match the existing attributes, with data added either in additional fields or as tables that can be joined to the original table based on a key field. If there is no existing DCR data standard for the feature in question, the Project Manager, GIS director and any other parties relevant to that feature type will establish a standard. Similar decisions need to be made as to whether the data is stored as a point, line or polygon if the geometry is not already determined by existing DCR data.

2.2.8 Procurement of Consultant Services
When the Project Team decides to use consultant services, the Team identifies the necessary specialized skills or expertise. The consultant team usually is
multidisciplinary. If all the required disciplines are not available within a single firm, then the prime consultant selects one or more consultants to cover various specialties. This multidisciplinary consultant group is referred to as the Design Team.

For small projects with an estimated construction cost under $1 million, it may be appropriate to employ master service agreements in place with planning, architectural, landscape architectural and engineering firms. For larger scale projects, the DCR team develops a Request for Response and solicits proposals according to the standard procurement process. It is important to allow several weeks in the project schedule to procure design services, whether through a master agreement or RFR process. The Project Manager oversees the procurement process, with input from the Project Team.
HISTORIC PARKWAYS TREATMENT DESIGN PROCESS

Contract with Design Team

Mapping/Documentation

Parkway Context
- Cultural Landscape
- Natural Resources
- Regulatory parameters

Parkway Users

Transportation Demand

Measures of Effectiveness

Speed

Sight Distance

Additional Research/Doc. Needs

Design Control Report

Schematic Design

Alternatives Analysis

Design Development

Final Design

Bid Phase

Construction Phase

Regulatory Compliance

Treatment special considerations for Design

Preliminary Coordination/Contact

Preliminary Permit Applications

Submit Permit Applications

Secure Permits

Public Process

Listening Meeting

Presentation of Alternatives

Review of Design Development

Pre-construction Public Meeting

Construction Phase Meetings as needed

Public Meeting

Team Meeting
2.3 DESIGN CONTROL REPORT
Once the Project Team selects a Design Team, the planning process begins with a comprehensive assessment of the historic parkway and the creation of the guiding design document, the Design Control Report.

2.3.1 Developing the Design Control Report
Baseline parkway documentation
The Design Team begins with a base survey of the parkway in electronic form. Additional documentation includes:

- Available information including National Register nominations, DCR Plans Library and other relevant materials.
- Team site visit and identification of elements and issues by each discipline.
- Written, graphic and photographic data organized on forms for each discipline in a consistent manner covering the necessary details and issues. These long stretches of land are a challenge for efficient, clear documentation.
- Panoramic photos of the landscape and views, as well as photos of specific elements for study.
- Station points on the survey as reference markers so that photographs can be keyed easily and communication among team members is facilitated. If the parkway runs within non-DCR owned lands, the parkway right-of-way needs to be delineated.

Assessment, Documentation and Analysis of Basic Design Controls
Basic design controls serve as the foundation for establishing the physical form, safety and functionality of the parkway. In this manual, the design controls parallel those of MassHighway’s Project Development and Design Guide as follows:

- Parkway Context
- Parkway Users
- Transportation Demand
- Measures of Effectiveness
- Speed
- Sight Distance

Context is the most important design control for a parkway treatment. As stated in *Flexibility in Highway Design*, “One of the greatest challenges the highway community faces is providing safe, efficient transportation service that conserves,
and even enhances the environmental, scenic, historic and community resources that are so vital to our way of life.”

The design controls relating to Parkway Users, Transportation Demand, and Speed likewise call for distinctive treatment that distinguishes parkways from other roads. The design controls are not determined in isolation from one another; the values of one will influence those of another. The selection of appropriate values and characteristics for these basic design controls is essential to achieve a safe, effective and context-sensitive appropriate design.

According to the MassHighway Project Development & Design Guide (2006), basic design controls “serve as the foundation for establishing the physical form, safety, and functionality of the transportation facility.” Context sensitive design includes consideration of the environment as a design control, one of many concerns that should be identified and documented early on in the parkway planning process. The Design Control Report for a historic parkway will include, at a minimum, documentation and assessment of Parkway Context, Parkway Users, and Transportation Demand and will serve as the guiding document during design. The DCR Project Team and the Design Team work closely to develop this document.

2.3.2 Parkway Context
The MHD Guide breaks up context into three elements – Area Type, Roadway Type and Access Controls. These concepts are easily translated into the historic parkway context, but their analysis requires a more comprehensive approach. The following components of the Design Control Report will provide a thorough understanding of the parkway context.

Area Type
To define the Area Type for DCR parkways, a detailed analysis is necessary to insure the protection of natural and cultural resources. The parkway area type is documented and assessed through a combination of a cultural landscape analysis, a natural resource inventory and analysis, and a review of regulatory parameters.

The context of every roadway includes its surrounding geography and adjacent development. In the case of parkways, the environmental context is particularly rich in significant natural and scenic resources. For example, Connecting Parkways such as the VFW Parkway and the West Roxbury Parkway link the world famous Arnold Arboretum to the Stony Brook Reservation. These significant open spaces establish the physical constraints of the parkway alignment and cross-section. They also influence the selection of motor vehicle design speed. Throughout this manual, the environmental context is generalized as Area Type.
The parkways pass through three basic area types: urban, suburban, and rural. The following three plan diagrams illustrate the Area Types found along the three parkway types and the five parkway subtypes.
Urban Area Types

**Urban Non Residential**
The majority of development is mixed-use or commercial. The parkway roadway carries heavy traffic, sometimes accommodated by grade-separated intersections. Commuters may include bicyclists. Curb cuts are infrequent, although pedestrian crossings may be common. There is no street parking on parkway roadways. Parking is typically in large lots or structures.

**Urban Residential/Institutional**
Development is usually multi-family with institutions such as schools, colleges and hospitals, including mid-rise buildings, with shared curb cuts. There are high levels of pedestrian and bicycle activity.

In urban areas, most parkway roadways are restricted to pleasure vehicles only.

**Urban Park**
Parkway roadways define the edge of parkland corridors along rivers and brooks in areas otherwise densely built out. Additional parks are on individual parcels. Pedestrians and bicycle activity is heavy across and along the roadway, on sidewalks and trails. Driveways and curb cuts are infrequent.
Suburban Area Types

High Density
These areas are substantially built out, have narrow residential lot frontage, and intensive development including commercial strip development. The Connecting or Ocean Parkway right of way is typically constricted, except where it borders parkland. Pedestrian and bicycle activity can be high-volume. Parking can occur on the roadway.

Town Center
These are pockets of commercial or institutional uses within a predominantly residential area. The Connecting Parkway right of way is constricted, with multiple curb cuts at commercial properties. Pedestrian and bicycle activity can be high-volume.

In suburban areas, some parkway roadways carry general traffic, including trucks and busses, instead of the usual restriction to pleasure vehicles.

Low Density
The Connecting Parkway may traverse a mix of undeveloped parcels and residential development of a lower density and longer frontage than in more built-out or commercial areas. It may border local open space such as playgrounds and golf courses. The parkway roadway continues as an Internal Park Road within extensive parkland that is typically a mixture of forest and wetlands. The roadway responds to topography, environmental, scenic, and historic resources. Parking can occur on the roadway. Pedestrian and bicycle activity is to be expected.
Rural Area Types

**Village Development**
Low density large-lot residential development predominates, with dispersed commercial and civic uses. Abandoned farmland is returning to forest. Future development may significantly change the rural character near the entrance to the parkland. Pedestrian and bicycle activity is low-volume. Parkway roadway traffic is generally pleasure vehicles.

**Natural**
The roadway traverses extensive parkland and responds to topography, environmental scenic and historic resources. Pedestrian and bicycle activity is low-volume but encouraged. The parkland may include Vernacular Roads such as abandoned town roads or designed Estate Roads showcasing landscaped grounds of a former private estate now within parkland. The Summit Road culminates in a landscape arrival overlook area.
Cultural Landscape Assessment

The historic background of the parkway, its character-defining features, its period of significance and available sources of research provide the context for later decisions related to landscape treatment, construction impacts and maintenance.

As defined by the National Park Service, a character-defining feature is “a prominent or distinctive aspect, quality, or characteristic of a cultural landscape that contributes significantly to its physical character. Land use patterns, vegetation, furnishings, decorative details and materials may be such features.”

In other words, a character-defining feature is a visible aspect of the landscape that tells us about its history or contributes to the overall visual effect.

A landscape historian, preservation planner or archaeologist prepares the Cultural Landscape Assessment. The Assessment includes the following:

**Historical documentation**

- Relevant records from the Massachusetts Historical Commission (MHC) files; annual reports and planning reports of the managing agency, municipality or municipalities along the parkway, or the regional planning agency; plans, surveys and related engineering records including photographs from past construction projects in agency repositories; and newspaper articles and photographic collections in agency and historical archives.

- Historical status including listing on the state inventory, location within a local historic district, or listing on the National Register of Historic Places. Determination of eligibility for listing on the National Register (see Appendix D).

- MHC inventory form using methodology outlined in the MHC Historic Properties Manual if the property is not recorded or listed on the National Register. Documentation of how the parkway fits in with others of its time period and the system within which it was created. The relationship of the parkway to its associated parkland and, in the case of Vernacular Roads that existed before the park, their pre-park function.

- Evolution of the parkway’s role in the regional transportation system. Parkway change can be incremental, moderate or major due to adjacent development or pressures due to its function as an arterial.

- Parkway’s “period of significance.” For some parkways, the period of significance relates to park planning at the turn of the century, while others reflect modern notions of parkway design. The period of significance helps with such period specific decisions as selection of lighting.
• Archaeological features as appropriate. Likelihood of presence of Native American or later archeological resources and known and likely locations of such resources.

**Parkway Description – Existing Conditions**

• Parkway segments, if needed, to name and locate distinctive experiences along parkways. For Summit Roads, areas of “descent” vs. “rest,” hairpin turns and switchbacks are important. For Connecting Parkways, serpentine alignments with planted medians as well as undivided, open straightaways define character.

• Visual character of the roadway corridor, its setting, adjacent land uses and nearby development.

• Significant scenic resources (consult Statewide Landscape Inventory, Heritage Landscape Inventory), significant views, positive and negative mid and long distance views, opportunities to open up desirable views or historic views lost over time and existing or potential scenic overlooks.

• Features worthy of protection for historic and scenic reasons, as well as treatments that have negatively impacted the parkway’s historic character and integrity.

• Trees, rows or allées, adjacent woodland, shrubs, and grass or other groundcover, type and condition of growing environment (soft or hard surface, erosion and/or compaction), type and character of adjacent landscape.

• Location of significant geological and other features.

• Nature and level of use of the parkland or recreational destinations along the parkway such as trailheads, rinks and ball fields.

• Physical character and condition of buildings and adjacent land use.

• Digital and/or aerial photography such as GIS orthophotos of current regional environmental, cultural, and land use context of the parkway.

• Identification of threats to the historic character of the parkway.

**Character-Defining Features**

• Parkway’s extant character-defining features including alignment, travel lanes, sidewalks, pathways and structures.
• Changes to the original design over time, and how changed travelway width, adjacent development, or removal of vegetation affect use, historic and visual character, and quality of experience.

• Relative status and significance of each character defining feature and the repositories of information researched (DCR archives plan library, MHC files, CRI).

• Character-defining features listed on an Excel compatible spreadsheet and keyed into a site plan along with numbered photographs. The specific parkway elements to be addressed include:
  
  - Roadway Alignment  
  - Vistas from the Roadway  
  - Interface of Roadway and Landscape Grading  
  - Sidewalks and Pathways (pedestrian, bicycle, and/or non-motorized vehicle)  
  - Shoulders  
  - Lane Number and Width (including bicycle/parking lanes)  
  - Pavement Markings  
  - Road Surface  
  - Median  
  - Vegetation (Trees, shrubs, grass)  
  - Curbs  
  - Traffic Barriers (safety guardrails, fences, off-road access control, gates)  
  - Walls (including retaining walls)  
  - Utilities  
  - Signage (safety, wayfinding, directional and interpretive)  
  - Lighting  
  - Bridges and Pedestrian overpasses  
  - Underpasses  
  - Access ramps  
  - Intersections and Curb Cuts (traffic signals, rotaries, islands, rotaries, miters)  
  - Drainage (roadway, culverts and swales)  
  - Shade structures, overlook shelters, visitor contact stations, other user facilities

**Natural Resource Inventory**

Historic parkways nestle comfortably into their setting because the travelways’ horizontal and vertical alignments work with the topography and natural features. They also take advantage of scenic or dramatic views. Well-designed walls and bridges are visual assets as well as functional features. The original design protected natural resources. Consequently, analysis of existing conditions and
inventory of natural resources are essential to developing an appropriate treatment for the parkway. An ecologist or botanist with support from an arborist collects the following information for the inventory:

- Rare and endangered species of plants and animals as well as protected habitat.
- Wetlands and buffer zones (Determined need for an ANRAD).
- Regulated water resources, location within an aquifer recharge area and 100-year flood hazard area determination by the National Flood Insurance Program.
- Species and overall health of the vegetation within the parkway.
- Analysis of impact of project on significant or sensitive natural resources.

Definition of Regulatory Parameters
Protections on adjacent wetlands, historic or cultural resources are important to the parkway context. The Area Type section includes locations and descriptions of protected or regulated areas including:

Wetlands including vernal pools

- Protected habitat shown on the Natural Heritage and Endangered Species Atlas,
- Inventoried properties and sites, State and National Register listed properties and site, local historic districts or landmarks,
- Areas of high archaeological sensitivity and
- ACEC, Scenic Byway or other state and federal designations.

All parkway projects funded, permitted, or licensed by DCR must be reviewed by MHC in accordance with M.G.L. Ch. 9ss. 26-27c, as amended by Chapter 254 of the Acts of 1988. Activities that utilize federal funding or require federal permits or approval are reviewed by MHC, as required under Section 106 of the National Historic Preservation Act. In addition to MHC, the Design Control Report also lists contact information for other regulating agencies and commissions along with meeting schedules and review timetables.

Parkway type
In the MassHighway Project Development & Design Guide, the roadway type is what is traditionally known as the functional classification. DCR parkways represent the broad spectrum of functional classes, but because the parkway serves recreational needs as well as providing transportation, the parkway type must represent more than traffic function. The classification for parkways includes the three primary parkway types: Connecting Parkway, Internal Park
Road or Border Road and the five subtypes: River Parkways, Ocean Parkways, Summit Roads, Estate Roads and vernacular Roads.

<table>
<thead>
<tr>
<th>Primary Type</th>
<th>AASHTO Green Book comparable classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connecting Parkway</strong></td>
<td></td>
</tr>
<tr>
<td>River Parkway</td>
<td>Arterial or Collector</td>
</tr>
<tr>
<td>Ocean Parkway</td>
<td></td>
</tr>
<tr>
<td><strong>Internal Park Road</strong></td>
<td></td>
</tr>
<tr>
<td>Summit Road</td>
<td>Local</td>
</tr>
<tr>
<td>Estate Road</td>
<td>Local or Rec. Trail</td>
</tr>
<tr>
<td>Vernacular Road</td>
<td>Local or Rec. Trail</td>
</tr>
<tr>
<td><strong>Border Road</strong></td>
<td>Collector</td>
</tr>
</tbody>
</table>

Design treatments for historic parkways should begin with the premise that the parkway type will be maintained as a primary design control.

**Access Control**
MHD defines access control as “a term used to define how access to adjacent properties is regulated and designed along a roadway. Access control is one of the most useful tools available to maintain safe and efficient roadway operations for all users.” On DCR parkways, traffic is either restricted (Pleasure Vehicles Only) or unrestricted (General Traffic). The presence of a median and the frequency and type of curb cuts also play a role in access control. Although many of these features are documented in the Existing Conditions report, the consultant should prepare a summary of Access Controls in this section of the Design Control Report.

Access Control defines how access to adjacent properties is regulated and designed along a roadway. Vehicular access affects parkway character the most. Limited access control was an important parameter in the historic design of parkways both to enhance resource protection, the recreational experience, and to enhance safety. Access control continues to be a useful tool in maintaining safe roadways for parkway users. The **area type** and **parkway type** will influence the degree of access control.3

Most parkways were originally designed to accommodate pleasure vehicles in dedicated travelways, although some were designated for general traffic by legislation. Pleasure vehicles initially meant carriages and bicycles, later meant private automobiles for leisure travel and subsequently included commuters. General Traffic included trucks, commercial vehicles and buses. Truck and bus access was controlled by regulation and indicated by signage reading, “pleasure
vehicles only.” Some parkways were reconstructed to include separate service roads open to general traffic. See the last column of the Metro-Boston Historic Parkway Matrix in Appendix D for a listing of the traffic restrictions on DCR parkways.

New curb cuts, permits for truck use and other access requests are managed through DCR’s Permits Section within the Division of Planning & Engineering.

The Design Control Report documents and assesses the existing Access Controls on the subject parkway, including medians, curb cuts and traffic restrictions as well as recommendations for maintaining, increasing or regulating such controls.

2.3.3 Parkway Users
From the beginnings of parkway design, with Frederick Law Olmsted’s parkway systems in Buffalo and New York City, the express intention for these linear parks was to accommodate the triple purposes of delight, recreation and circulation. This legacy of accommodating multiple use—transportation and recreation—sets parkways apart from highways.

Contemporary planning for historic parkways must put people first. The composition and characteristics of parkway users create an important control that influences the parkway treatment. This design control category captures the importance of accommodating recreational users in addition to the motoring public, specifically:

- Pedestrians
- Cyclists
- Other recreational users

Pedestrians
Throughout the Commonwealth, people walk through the parkways’ attractive natural surroundings. Recreational preferences now include running and jogging as well. Connecting Parkways sometimes provide a dedicated pathway in the park separated from the travelway. Ocean Parkways provide ocean side promenades. River Parkways are popular places for runners and bicyclists, sometimes sharing pathways close to the travelway. Border Roads have a sidewalk on the side of the travelway across from the parkland. On Internal Park Roads, Summit Roads and Estate Roads, pedestrians, hikers and runners share the travelway with vehicles, since the low level of vehicular traffic does not justify a dedicated off-road pathway. Independent trails meet the travelway at crosswalks and trailheads.

Pedestrians require a certain amount of physical space to maneuver comfortably. They need connections and safe crossings between destinations. The *Massachusetts Highway Department Project Development and Design Guide* (2006) provides methodologies for evaluating how a pathway serves the demand placed on it and how wide the sidewalk should be given the demand. Space requirements are considered with the widest range of users in mind, including people with disabilities. Pedestrian facilities must comply with 521 CMR, The
Rules and Regulations of the Massachusetts Architectural Access Board, which has jurisdiction over walkway width, grade and surface. The Design Team reviews these requirements within the historic context.

Bicyclists
The large constituency of recreational and commuter cyclists, particularly in urban areas, justifies improvements to bicycle accommodation and safety throughout the DCR system. DCR recognizes that bicyclists are legal users of the roadway under MGL Chapter 85 Section 11B. It is therefore, essential to provide safe, convenient and well-designed facilities for bicyclists. Conditions and constraints on different parkways dictate whether a bicycle lane, roadway bicycle route or shared use pathway is most appropriate. The MassHighway Project Development and Design Guide lays out the methodologies for determining the spatial needs of bicyclists along with bicycle level of service.

Other Recreational Users
The parkways accommodate a wide range of recreational use by individuals and groups from meditation to marathon training, fishing to family picnics. Connecting Parkways and Border Roads often provide access to active recreational facilities such as swimming pools and hockey rinks. Other parkways have overlooks and shelters. River Parkways have launches for canoes and other small boats, and Ocean Parkways abut beaches. Internal Park Roads have vistas, hiking and horseback riding trails, wildlife observation, campgrounds, and picnic areas.

Recreational users require parking. Widening the travelway to provide parking blocks views, particularly on River and Ocean Parkways, and dilutes the experience of the natural corridor. Parking poses safety concerns for bicyclists using the road. Informal parking degrades the road edge. Parking needs to be studied, documented and carefully incorporated into the parkway corridor.

A random survey conducted in 1995 found that 95% of park visitors in Massachusetts want to learn about the natural and cultural history of the site. The story of the parkways’ cultural and environmental significance is an educational opportunity. For example, interpretation of Ocean Parkways can tell the story of its design and inform the public about coastal erosion. These park visitors are important users of the parkways.

The Design Control Report documents the parkway user types, frequency of use, types of pathways, etc. and includes recommendations to maintain, adapt or regulate such uses.

2.3.4 Transportation Demand
Transportation demand, volume, composition and patterns are important design controls. The original historic number of travel lanes, auxiliary lanes, sidewalks, and pathways affect the parkway’s capacity. Accommodation for a variety of trip types and a variety of users was and is still an important consideration.
In highway projects, the Design Team selects a design year on which to base any rehabilitation and restoration, or new project and evaluates a typical project for a design year defined as twenty years in the future. It establishes estimates of pedestrian, bicycle (and other non-motorized vehicle), and motorized vehicular traffic for peak hour travel times in the design year. It balances uses and accommodates pedestrians and bicyclists.

For historic parkway projects, the Design Team considers other issues and looks at design year in a different light. The team documents the following in the Design Control Report:

- Use and function of the travelway and the travelway’s role in the regional transportation network.

- Physical character and condition of the travelway, including horizontal and vertical alignment, sight distance, posted speed limit, barriers, traffic controls, side slopes and lighting.

- Capacity
  - Assess the traffic capacity, level of service, and other measures of effectiveness for the design hour conditions of the preferred parkway configuration as established in the Cultural Landscape Assessment in the Design Control Report. For example, if the parkway was designed with two lanes in each direction, its capacity is defined as the amount of traffic that can be safely accommodated by these two lanes.
  - In areas where excess travelway capacity exists, examine ways to recapture parkland or provide enhanced accommodation for bicyclists and other users.
  - In areas where travelway capacity accommodates travelway demand, examine ways to improve safety and maximize multimodal opportunities.
  - In areas where the parkway is expected to operate over capacity, determine the traffic and safety implications of the congested condition on the parkway and parallel corridors. Determine specific design elements that will improve capacity and reduce congestion, especially where improved capacity in one area may result in the ability to restore parkland in another area.
• Analysis of traffic conditions
  • Review existing peak hour and daily vehicle volume and classification counts, including pedestrian, bicycle, and other non motorized vehicle volumes.
  • Review summary of accident frequency and rates for a minimum three year period, and compare rates to statewide and/or area wide averages.
  • Perform a safety evaluation based on available accident and safety data. Use the data to calculate accident rates and frequency throughout the travelway. Identify any potential safety deficiencies, and develop strategies to eliminate these deficiencies and improve safety throughout the corridor.
  • Determine parkway status with respect to the National Highway System (NHS) and any implications for treatment including Section 106 Review by the MHC.

• Recommendation of transportation demand control
  • Establish specific design criteria selected for lane and shoulder widths, curb type, barriers, clear zones, and other controlling criteria
  • Conduct engineering studies as needed to support drainage, geotechnical, structural, electrical or other design elements.
  • Evaluate relative significance of the above issues and describe the recommended specific list of controls to guide management and treatment decisions.
  • Document features by type, description, condition, and cause of problems by visual inspection.

2.3.5 Measures of Effectiveness
Throughout the design process, the Design Team evaluates the parkway treatment using several measures of effectiveness. MassHighway’s Project Development and Design Guide suggests methods of effectiveness and analysis tasks for the Design Team’s consideration. Their contextual Measures of Effectiveness are particularly helpful.

Speed
In parkways that follow the topography, safe travel speeds are limited by horizontal curvature, travelway centerline profile, sight distance, total travelway and travel lane width, and roadside friction (roadside friction results from features in close proximity to the travel lane). The surrounding landscape influences these limiting characteristics. Speed and the physical characteristics of the parkway are interrelated. Many design elements are directly related to speed. Once the appropriate speed is selected, the Design Team tailors design elements to that speed.

- For any parkway rehabilitation or new parkway project, establish the target speed (the desired operating speed) and the design speed, which will govern many of the critical defining geometric elements of the parkway corridor. When selecting the target speed and design speed, follow the principles outlined in the MassHighway Project Development & Design Guide.

- Parkways are not intended to be high speed roadways and typical posted speeds rarely exceed 40 mph. In the selection of the appropriate target speed and design speed, take into account the following:
  - The context of the existing parkway,
  - Existing posted speed limits, if applicable,
  - Existing operating speeds at representative points along the travelway,
  - Accident history and safety evaluation,
  - Existing sight lines and other design constraints based on the horizontal and vertical alignment and cross section elements,
  - Design year traffic and vehicle composition and
  - Planned use of the parkway corridor.

Once the Design Team selects an appropriate target speed and design speed, it can develop design elements that reflect and reinforce the desired speed. For example, a parkway that was reconstructed with wider lanes and a straighter alignment may benefit by reestablishing narrower lanes and/or a curvilinear alignment as long as it is historically appropriate and maintains or improves safety for parkway users.

The Design Control Report documents the factors leading to the selection of the design speed for the parkways.

### 2.3.6 Sight Distance

Sight distance is the length of the roadway ahead that is visible to the roadway user. Sight distance is related to the design speed of the roadway. A character-defining feature on the roadside that potentially blocks the view around a horizontal curve may be too significant to be removed simply to achieve a current standard of sight distance. There may be cases where reduced sight distance, with
its implications for speed and other safety measures, is a design control. The Design Control Report determines the appropriate sight distance.

2.4 DETERMINATION OF TREATMENT

The documentation and analysis of the data compiled in the Design Control Report provide a basis of understanding of the issues that need to be addressed in determining treatment. Treatment is defined by the Secretary of the Interior as a physical intervention carried out to achieve a historic preservation goal—it cannot be considered in a vacuum. Many practical and philosophical variables influence the selected treatment for a historic parkway. These include but are not limited to, the extent of historic documentation, existing physical conditions, historical value, use, long and short term objectives, operational and code requirements, anticipated capital improvement, staffing and maintenance cost.4

The four treatments defined by the Secretary of the Interior, Preservation, Rehabilitation, Restoration and Reconstruction, carry with them varying degrees of intervention and application:

**Preservation** retains the existing character and fabric of the historic parkway landscape with the highest possible degree of integrity in regard to materials, setting, design, feeling and location. Preservation-based treatment plans typically emphasize maintenance and stabilization regimes aimed at ensuring the longevity of existing features. Measures may be taken to protect and stabilize historic road resources, and limited and sensitive upgrading of technical systems is permissible, but distinctive materials, features and design elements should not be substantially altered or replaced. When original features or materials have deteriorated to the point that they compromise the historic character of safety of the site, limited replacement-in-kind is permitted.

**Rehabilitation** aims to protect the essential character of the parkway landscape while accommodating compatible uses that may require modest alterations to the resources physical fabric and design qualities. Rehabilitation allows for replacement of deteriorated features on a wider scale than preservation-based treatments, along with more extensive substitution of compatible materials to meet current needs. Because rehabilitation based treatment plans respond to current demands while safeguarding key historic values, they often provide the most acceptable means of resolving the inherent tensions of park road stewardship. The primary challenge in devising rehabilitation strategies is to identify character defining features and ensure that planned alterations do not compromise the roads overall historic character.

**Restoration** focuses on returning a historic road to its appearance during the period of significance. This process may include the reconstruction of damaged or missing features and the removal of elements from other areas that detract from the historic scene. Limited upgrading of technical systems is permitted as long as these interventions are discreet and compatible. Existing features from the period
of significance will be retained and stabilized. All changes should be carefully researched and specified to ensure that they are historically accurate in regard to design, materials and overall impression. A long term management plan should be devised to maintain the desired historical appearance.

**Reconstruction** is the process of recreating a non-surviving site, structure, feature or landscape. This approach should only be employed when the non-surviving resource is deemed exceptionally significant and sufficient documentary evidence exists to ensure an accurate replication of the historical precedent. Because of the inherent technical challenges and philosophical implications, reconstructions require extensive consideration and high level review and are rarely pursued as a treatment. If reconstruction is deemed a suitable strategy, the artificial nature of the landscape should be explicitly identified and interpreted.

The Design Control Report recommends an overall parkway treatment, identifies special considerations for treatment and calls out areas or features where a higher level of preservation or resource protection is recommended. The Design Team compiles the comprehensive assessment in a binder for easy reference during project development.

Now that the overall treatment is determined and the basis for the design is established, project design can begin. The application of guidelines in Chapter 3 assists in making informed design decisions about specific elements of the parkway.

### 2.5 PROJECT DESIGN

The project design consists of three phases: (1) schematic design, (2) design development and (3) final design. The DCR Project Team reviews the project at each phase. Each design phase should be paralleled by a public process to garner community support, field local concerns, and ultimately build a better project. Regulatory compliance may require consultation, preliminary permit applications or other filings during early design phases as well.

DCR either reviews submittals of contract documents prepared by the Design Team or prepares the contract documents for smaller jobs in-house. The DCR Project Team works to meet project schedules for start of construction. The primary objective of the Design Phase is to produce a quality set of contract documents ready for bid that meets all criteria for the project including budget.

Working with the DCR Project Team and Design Team, the Project Manager expedites the development of complete and accurate working drawings and specifications. Acting as DCR’s representative, the Project Manager assures that appropriate approvals and information are completed on time, coordinates the Project Team, project budgeting, tracking, permit applications and public participation strategy.
2.5.1 Schematic Design
Schematic Design begins after the finalization of measured drawings of existing architectural and structural features; site survey including topography, vegetation and site utilities; soils investigations; environmental data collection; and any other surveys needed to document existing site conditions.

The team analyzes existing conditions and evaluates the data gathered during the development of the Design Control Report to better understand the issues and opportunities that need to be addressed in the parkway treatment.

Initial Public Outreach--Public Meeting #1
At the outset of the design process, the Project Team meets with stakeholders to discuss and understand issues, opportunities and constraints in an informational meeting. The team delineates the project area, presents agency goals for the project, presents the outcomes of the Design Control Report, discusses opportunities and lays out the project schedule. This is an initial opportunity to identify the issues and concerns that may affect the design and project outcome. The Project Manager along with other key Project Team members may participate in individual meetings with elected officials, regulatory agencies and key special interest groups. Once the issues have been identified, the Project Team must work to incorporate this input into project planning and decision-making.

Environmental Review and Permitting Requirements
Environmental review and permitting should be taken into account early in the planning process to identify potential impacts to wetlands, endangered species habitat, historic/archeological resources and other protected areas (i.e. ACEC). The Design Control Report should have included an assessment of regulatory parameters, filing requirements and contact information. It is also important to foster positive communication with permitting agencies as early as possible in the project planning to become familiar with their procedures and regulatory scopes. The List of Common Regulatory Thresholds in Appendix G is a helpful tool in identifying the necessary permits.

Upon completion of schematic design, it is important to coordinate review of the project by the Massachusetts Historical Commission in accordance with the procedures of the Office of Cultural Resources (OCR). To initiate review, a Project Notification Form (PNF) must be prepared and submitted to the MHC. The Office of Cultural Resources coordinates the development of the PNF and acts as the liaison to the MHC. The MHC reviews the project for consistency with the Secretary of the Interior’s Standards for the Treatment of Historic Properties and makes a determination of “no effect,” no adverse effect,” or “adverse effect.” If MHC determines that a project will have an “adverse effect” on historic properties, additional consultation is required. By law, MHC has a maximum of 30 days to respond to the PNF with a Determination of Effect so this regulatory timetable must be factored into the overall project schedule.
Presentation of Alternatives--Public Meeting #2
The Design Team presents cost effective alternatives that meet the project’s program, minimize environmental impact, meet the DCR’s design objectives, and are consistent with the Design Controls established for the project. The team presents these designs to the public for feedback. The team explains data used to prepare the alternatives such as traffic counts and design criteria. The team presents plans and sections of the alternatives.

Preferred Schematic Design Alternative
Based on input from the public, the Design Team then prepares layout plans, elevations, cross sections, key details, outline specifications, narrative description, and an outline cost estimate for the preferred alternative for review and approval of the Project Team. Upon approval of the Schematic Design by DCR, the project enters Design Development.

2.5.2 Design Development
The Design Team now refines the design and selects materials, equipment, finishes and plantings in preparation for starting working drawings. The team furthers, from the approved Schematic Design, drawings, sections, elevations and details to fix and describe the size and character of the entire project as to site, structural, mechanical and electrical systems, materials and storm water management.

Public Meeting #3
The team presents the preferred alternative refined during design development to the public for feedback. The team presents drawings, sections and the Traffic Management Plan (TMP). The TMP describes ways for vehicular, pedestrian and bicycle traffic to flow and ways to minimize impact to the other users of the parkway while the work is in progress. Issues raised by the public at this meeting can still be considered and addressed prior to Final Design.

Preliminary Specifications
The Design Team then writes preliminary specifications for all the items of work and materials in design development. Upon completion of these drawings and specifications, an independent cost estimator prepares an estimate of probable cost. The team updates the schedule for obtaining all local, state and federal approvals during the Final Design stage of the project.

The DCR Project Team reviews the submission to assure that the program and design decisions are adhered to and that the budget and schedule remain intact.

2.5.3 Final Design
During this phase, the Design Team incorporates public comment, as appropriate, and completes contract documents in sufficient detail to permit firm bids in open competition and a detailed estimate of probable cost. Final Design documents are prepared in accordance with Chapter 30 for public works projects and Chapter
149 for building projects over $100,000 in value. The Design Team takes the approved design development drawings and specifications and prepares complete working drawings and detailed specifications describing all materials and methods of work in conformity with the DCR’s Description of Site Design Services for Chapter 30 Public Works Projects, or DCAM Form 9 for Chapter 149 building projects, until they are satisfactory to the DCR Project Team.

During this phase, the Design Team completes any outstanding permit applications and makes sure that all regulatory requirements are either addressed or incorporated into the project contract documents.

Pre-Construction Public Meeting #4
The fourth and often final public meeting is held after the project has been put out to bid to inform the public about the construction schedule and constructed related impacts.

2.6 MAINTENANCE AND OPERATION PLANNING
An important aspect of the project planning and design process is the development of a maintenance and operations plan. The document is developed concurrently with the design process and provides a framework for operational staff to maintain a safe and functional parkway while at the same time preserving its natural, cultural and recreational features. The plan is finalized upon completion of construction to reflect as-built conditions of the parkway. For more information on this subject, please see Chapter 4: Maintenance.


3 Access control options can be complex and limited for parkway treatments. The *Access Management Manual* published by the Transportation Research Board in May 2003 provides guidance on the application of access management techniques for existing roadways.

Chapter 3: Guidelines

Treating a parkway in a way that protects and enhances its historic, scenic and recreational characteristics while providing safe, comfortable and multimodal travel is critical. A considerable degree of flexibility and opportunity for engineer or designer judgment are built into the principles of context sensitive design, established design criteria and current engineering practices, as reflected in the MassHighway Project Development and Design Guide. These guidelines illustrate how to take advantage of this flexibility in order to preserve and enhance the character of historic parkways throughout the Commonwealth. These guidelines do not establish new or different geometric design standards or criteria for parkways, nor do they imply that safety and mobility are less important design considerations. Where these guidelines do not provide specific dimensions, refer to the MassHighway Project Development and Design Guide or, in turn, sources listed in the Bibliography.

The guidelines are organized into the following categories and sequence, consistent with the MassHighway Project Development and Design Guide:

- Alignment
- Cross Section Elements
- Major Structures/Bridges
- Intersections and Curb Cuts
- Stormwater Management/Drainage
MassHighway’s Project Development and Design Guide (2006) is easy to use and clearly organized. Finding the information relevant to a particular parkway project is straightforward. Appendix F: Table of Cross Reference with Federal Highway Administration Flexibility in Design (1997) and MassHighway Design Guide tabulates the location of information in the three guides.

The guidelines in this chapter are consistent with The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.¹ The two most frequent treatments are preservation and rehabilitation. A given project may include some elements for which preservation is appropriate and others for which rehabilitation is appropriate instead. For as many elements as possible, these guidelines adhere to the standards for preservation. For those elements where preservation is neither feasible nor appropriate, then at the minimum the guidelines adhere to the standards for rehabilitation.

Preservation treatment is preferred for alignment, vistas, interface of travel way and landscape grading, shoulders, lane number and width, medians, vegetation, curbs, walls, bridges, rotaries, and culverts and swales. For other elements, rehabilitation is the appropriate treatment.

Although preservation is the preferred treatment for these twelve elements, there are situations where straight preservation does not satisfy overall parkway goals. The recently completed Memorial Drive Rehabilitation Project is a good example. Preserving three lanes of eastbound traffic next to the Charles River would have retained the travel way’s lane number and width, but would have missed the opportunity to increase riverfront parkland and to accommodate the large number of bicyclists and pedestrians. DCR met overall parkway preservation goals by reducing three lanes to two and increasing the width of the parkland rather than preserving three lanes. This rehabilitation approach was based on an analysis of existing conditions and the resulting design controls.
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3.1 ALIGNMENT

Goal
Preserve existing roadway alignment and profile except where alterations are needed for traffic calming.

A sinuous vertical and horizontal alignment combined with magnificent trees.
(VFW Parkway, a Connecting Parkway)

Issues for Alignment
Of all the elements of parkway design, alignment affects the user’s experience of the parkway the most. Alignment is the combination of curved and straight segments in the vertical and horizontal dimension. Consistent with the original design intent, every parkway should convey its traffic enjoyably and comfortably as well as safely, whether the traffic is vehicular, cyclist, pedestrian, or a combination.

Most travel ways have curvilinear horizontal and vertical alignments that conform to the landscape. Rises in profile and sweeping curves often provide the traveler with middle and long distance views. Landscape elements and prominent scenic features are frequently close to the pavement edges.

Design speed was not a consideration in the original design of many parkways because travel speeds were slow. Curvilinear alignments enhanced driving for pleasure. With the advent of motorized travel, however, the desire of motorists for faster travel speeds began to conflict with the travel speeds implicit in the degree of curvature of the alignments. On parkways that are major transportation corridors, the
number and higher-than-posted speed of vehicles strain the ability of the curvilinear alignment. Higher travel speeds conflict with the original design intent.

The existing minimum radius dictates the maximum safe travel speed and allows sufficient sight lines for adequate stopping distance. The travel speed should also be compatible with pleasure vehicles. Altering the alignment to attain a higher travel speed significantly affects the historical cross section, its character and original design intent and detracts from shared use of the travelway by bicyclists and pedestrians.

Guidelines for Alignment

- Evaluate measures to improve safety and restore the balance of users in a progressive manner starting with the least intrusive approach. For example: better enforce the existing speed limit, evaluate the need for a change in the speed limit, install warning signs on crest curves, install traffic calming measures such as increased curb reveal up to eight inches, narrower travel lanes and shoulders where safe, elevated intersections or walkways on low-speed roadways, or roundabouts at major intersections if historically appropriate, and implement planning measures to lower the volume of demand by redirecting traffic.

- Where the stopping sight distance (per MassHighway Project Development and Design Guide, 3.7) is inadequate for a given speed limit, if above measures do not improve safety sufficiently, remove minor sight obstructions such as tree branches in a way that does not substantially alter roadside character.

- Allow minimal alignment changes only where safety data clearly and overwhelmingly indicate a deficiency directly attributable to the alignment of the travelway.

- Only remove ledge to achieve improved sight lines if based on sound assessment of safety needs and only as a last resort. Minimize ledge removal and match the resulting ledge face to the original slope, texture, and height as much as possible. Preserve or restore native plantings and drainage systems.

- Recognize the value of trees in providing visual clues to drivers on changing horizontal and vertical curves.

- **Internal Park Roads:** In areas where alignment reduces sightlines and visibility, clearly post and enforce lower speeds. If no longer needed for vehicular use, improve alignment as appropriate for a recreational trail.
• **Summit Roads**: Do not alter the alignment, unless safety data indicate a deficiency directly attributable to the alignment and minimal change can correct it. If the alignment has already been altered, use interpretive materials to educate visitors about the Summit Road’s original configuration. Whenever possible, preserve the original route as a trail.

• **Estate Roads**: Preserve formal entrance sequences and alignment. Even if these roads are converted for the sole use of pedestrians, cyclists or equestrians, continue to maintain their alignment.

### 3.2 CROSS SECTION ELEMENTS

Parkway cross sections are often as complex as this Summit Road on Mount Sugarloaf.

The cross section refers to the travelway and its immediate parkland corridor as illustrated in the sections in Chapter 1. The Design Control Report defines the width of the travelway. The following elements are discussed below:

- Vistas from the Travelway
- Interface of Travelway and Landscape Grading
- Sidewalks and Pathways
  - Pedestrians
  - Bicyclists
  - In line skaters
- Shoulders
- Lane Number and Width
- Pavement Markings
- Travelway Surface
- Medians
- Vegetation
- Curbs
3.2.1 Vistas from the Travelway

**Goal**
*Preserve and restore positive vistas from the travelway and mitigate negative ones.*

**Issues for Vistas from the Travelway**
The viewshed, where scenic, is a fundamental character-defining feature. Roadside trees often frame special vistas. Over time, designed views of features inside the parkway decline due to poor maintenance, new overhead utility lines, or the growth of invasive vegetation. For example, walls and fences deteriorate or disappear. Overgrown vegetation hides vistas to fields, riverbanks and ponds beyond the parkway. Development of abutting property destroys once attractive views outside the parkway.
**Guidelines for Vistas from the Travel Way**

- Preserve vistas of natural and historic features such as rivers, ponds, fields, walls, fences and historic buildings. Open, restore and maintain vistas that are overgrown. Preserve publicly owned historic features within the vistas.

- Screen incompatible views that degrade parkway character by managing vegetation, including allowing plant succession where the landscape is wide enough, and planting buffers in narrow corridors.

- Remove invasive vegetation in areas where it blocks historically significant views.

- **Border Roads**: Selectively clear the publicly owned side to improve the woodland character and allow visual access into the parkland.

- **Summit Roads**: Provide unobtrusive overlooks with interpretive markers and parking for no more than five (5) cars.

**3.2.2 Interface of Travel way and Landscape Grading**

![Context-sensitive grading enhances an Internal Park Road](image)

**Goal**

*Preserve and use context-sensitive grading to integrate the travelway into the landscape.*
Issues for Interface of Travelway and Landscape Grading
Integrating the alignment of the travel way into the terrain is a character-defining feature. Side slopes as gentle as space and underlying geology permit transition smoothly to existing grades. Where space is constricted, walls retain slopes that are unstable or vulnerable to erosion. Riprap for steep slope stabilization is unusual. So, too, are sharp changes in slope between steep fill embankments or cuts and the adjacent undisturbed terrain. Steep cuts are only present when the underlying bedrock is stable.

Guidelines for Interface of Travelway and Landscape Grading

- Match road profiles to minimize cut and fill sections. Avoid long lateral cut and fill slopes.

- Grade and stabilize subsoil and loam to create smooth transitions from the travel way’s side slopes to the natural topography. Involve the landscape architect in both the design and inspection of grading.

- Restore the adjacent topography to its prior natural contours wherever possible.

3.2.3 Sidewalks and Pathways

Goal
Accommodate the safety and comfort of pedestrians, bicyclists and in line skaters within the parkway on an equal level with vehicles without sacrificing character-defining historic features, shade trees and geological features.

People engaged in commuting, active recreation or exercise use parkway sidewalks and pathways. Their needs are an essential concern in parkway design and management. They use bituminous concrete or concrete sidewalks that are parallel to the roadway, separated by a grass strip. They also use less formal pathways, sometimes unpaved, further within the parkland with alignments independent of the travelway alignment. In addition to moving along the length of the travelway, these users also cross the travel way to other destinations. Proper crossing design reduces user conflicts and increases safety. The accommodation of pedestrians, cyclists and in line skaters is discussed below.

Issues for Pedestrians
People walking to work, walking for pleasure, jogging, pushing strollers or traveling in wheelchairs, all use parkways. Pedestrian crossings are often far apart from each other. On urban parkways, crossings at uncontrolled locations and at rotaries are not safe. When the historic design does not provide safe crossings, the Design Control Report may support some alterations to improve pedestrian safety.
On popular urban parkways, runners and bicyclists degrade the grass shoulders, compact and erode the soil, damage turf and expose tree roots. Runners prefer grass as a running surface.

Some paths too close to vehicular traffic pose safety risks. Grass strips serve as a visual benefit and separation, improve the safety setback for pedestrians, allow a place for trees and signs and allow for snow storage in winter while keeping the pathway clear.

Guidelines for Pedestrians

- Design all walkways in accordance with the Massachusetts Architectural Access Board (MAAB) and Americans With Disabilities Act (ADA) requirements. Consult MassHighway engineering directives on pedestrian accommodation.

Separate Pathways for Bicyclists and Pedestrians

- In areas of high demand where shared path use is causing unsafe conditions for pedestrians, cyclists and other users, provide, if space allows, a separate pedestrian pathway.

Pedestrian Pathway Only

- Where adjacent space allows, locate pathways that run parallel to the roadway at least ten (10) feet back from the immediate edge of the road.
Low-deflection Guardrails Protect Pedestrians

- When a ten foot setback is not feasible, or when the historic alignment of a significant path takes it close to the road, install low-deflection guardrails to protect pedestrians.

- Where improved pedestrian safety is needed and soil compaction and erosion are significant, provide a walking/running surface such as stabilized aggregate to discourage off-path foot traffic.

Shared Roadway for All Users

- When pedestrians share the travelway with vehicles and bicyclists, install warning signs and pavement markings about shared use at regular intervals. If there are wide travel lanes and paved shoulders, delineate a separate cyclist lane on the shoulder.
• Provide safe pedestrian passage across parkways. Retain historic crossing locations. On heavy-traffic parkways with insufficient crosswalks, add crosswalks to provide safe and convenient crossing for pedestrians. Use a consistent system of white crosswalk markings, supplemented where needed with crosswalk warning signs, warning striping, and such traffic calming measures as speed tables. Discourage unauthorized crossings at other locations, preferably with vegetation.

• Consult the MassHighway Project Development and Design Guide and publications of the Institute of Traffic Engineers for traffic calming guidance.

• Add pedestrian-actuated crossing signalization if warranted by actual or potential pedestrian crossings. Use signal support, housing and ancillary equipment designed to be as unobtrusive as possible. Paint dark green (Standard Federal Color #14062), to match sign posts and, if controlled by DCR, light poles.

• **Internal Park Roads:** Create a sufficient number of convenient crossing points and discourage or prevent access at other locations by using native vegetation. Use signage and special warning striping or rumble strip paving at pedestrian/horseback rider crossings. Avoid signalization. If there are no paths or sidewalks for bicyclists and/or pedestrians and creating separate facilities creates insurmountable problems, then at a minimum, provide shoulders of sufficient width to accommodate pedestrians and bicyclists. Where insufficient width reduces the safety of cyclists sharing the roadway with motorist, convert underused bridle trails into bicycle trails.

• **Border Roads:** Avoid sidewalks along the travel way. If providing a pathway benefits hikers, runners or horseback riders, provide an unpaved trail. Maintain the appearance of the parkland edge and place a new separate pedestrian trail well back from the travel way. Enhance public use of the parkland by creating and maintaining convenient points of trail access to the recreational amenities.

**Issues for Bicyclists**
Parkways, especially in the urbanized areas of greater Boston, are popular bicycle routes. Although bicycles were popular when parkways were created, there were no dedicated bicycle lanes. Historical documents demonstrate that from the beginning cyclists shared the paved roadway with other users. By law, “Every person operating a bicycle … shall have a right to use all public ways in the commonwealth except . . . express state highways where signs specifically prohibiting bicycles have been posted.” (MGL, Chapter 85, Section 11B) DCR acknowledges the right of bicyclists as road users and will provide on-road bicycle accommodations wherever possible.
With the advent of heavy traffic, the narrow lanes, curvilinear alignments and rotaries, are increasingly inhospitable to shared use by motor vehicles and bicycles. Shared use of sidewalks and pathways by cyclists and pedestrians raises safety concerns. Consequently, the dual objectives to preserve historic design features and to accommodate bicycle access on parkways can be a source of conflict. There is a range of ways to accommodate safe and efficient travel for cyclists.

Guidelines for Bicyclists

- Design bicycle facilities in accordance with the MassHighway Project Development and Design Guide. Consult MassHighway engineering directives on bicycle accommodation.

- Where dedicated bicycle lanes are desirable in the travel way, provide a width between four (4) to six (6) feet, with a solid four (4) inch white pavement marking between the travel lane and the bicycle lane. Width will vary based on the setting.
Bicycle Lane Adjacent to Roadway Parking

- Where a bicycle lane is located adjacent to roadside parking, delineate the right side of the bike lane and the left edge of the parking lane with a solid 4-inch white line.

Bicycle Accommodation in the Roadway

- Otherwise, provide adequate on-road accommodation either through wide shoulders or wide outside curb lanes, wherever feasible. The optimal shared lane use by bicycles and motorists consists of a fifteen (15) foot minimum lane width from centerline to pavement edge. Install signs and pavement markings to indicate where motorists and bicycles share the roadway.
• If the lane width from centerline to pavement edge is less than fifteen (15) feet, in the Design Controls analysis, evaluate travel speeds and traffic volumes to determine if narrower pavement width will safely accommodate both users. Provide the shoulder with a smooth, clean, even, well-drained travel surface (such as bituminous concrete or cement concrete) and bicycle-safe drainage structure grates.

• In cases where the travel way is too narrow to accommodate a designated bicycle lane and there is no adjacent landscape, provide “share the road” signs.

• Where a dedicated off-road bike path is needed and feasible, integrate it with the landscape yet design it to be separate and clearly distinguishable from pedestrian paths, unless specifically designated as a shared path. Adhere to current bikeway design criteria as described in the Guide for the Development of Bicycle Facilities, 1999, American Association of State Highway and Transportation Officials.

• Discourage bicycle use of sidewalks and pedestrian footpaths with signage.

• **Internal Park Roads:** If there are no separate ways for bicyclists, improve conditions for bicyclists on the roadway.

• **Border Roads:** Explore creating dedicated bike lanes, but do not widen the roadway. Where insufficient width is available, create bicycle paths in the parkland. Take advantage of historic bridle paths no longer in use.

• **Ocean Parkways:** Create a shared wider outside lane, add a dedicated bicycle lane if width allows or if shoulder width allows, improve the shoulder. Use multi-use pathway within parkland if space and degree of pedestrian use allow.

• **Summit Roads:** Provide signage indicating shared use by automobiles and bicyclists.

**Issues for In Line Skaters**

Narrow lanes, curvilinear alignments and rotary intersections can be unsafe for in line skaters and skateboarders. They are more compatible with bicyclists than with pedestrians, because of their speed and preference for pavement. Their presence on roadways and shared pathway can be dangerous.

**Guidelines for In Line Skaters**

• Follow the conclusions in the Design Control Report about meeting the needs of in line skaters and whether a separate or a shared-use pathway is needed.
• If the width permits, provide two separate off-roadway trails: a paved trail at least eight (8) feet wide for two-way traffic, for bicyclists/in line skaters and an unpaved trail at least five (5) feet wide with specialized soils for pedestrians/runners.

• If separate off-roadway accommodation is not possible, provide shared paved accommodation at least eight (8) feet wide, set a minimum of ten (10) feet back from the curb and outside the clear zone so as not to require a guardrail, for pedestrians, cyclists and in line skaters.

Shared Pathway Behind Guardrail

• Otherwise, if the historic roadway cross section does not include a curbside sidewalk, provide shared paved off-roadway accommodation, at least eight (8) feet wide, set a minimum of three (3) feet behind a compatibly designed guardrail, for pedestrians, cyclists, and in line skaters.

Pedestrian Pathway at Travel Way Edge

• Base design decisions on level of use and recreational traffic demands. For example, on heavily traveled corridors, 12 feet may be the appropriate width for a shared use path. In some situations, if the corridor width permits, provide two separate off-roadway trails: a paved trail for two way bicycle and
in line skater traffic and an unpaved trail with specialized soils at least five feet wide for pedestrians and runners.

- Balance need for new off-roadway paved trails with the maintenance of green space. Make decisions on a case-by-case basis.

- If the historic cross-section includes a sidewalk, provide cautionary signage indicating shared use of sidewalk.

- Otherwise, provide the following two features: a fifteen (15) feet wide lane within the roadway paving to be shared by motorized vehicles, bicycles, and in line skaters, and an off-roadway unpaved trail at least five (5) feet wide with specialized soils for pedestrians and joggers, set a minimum of ten (10) feet back from the curb if no guardrail, or a minimum of three (3) feet behind a compatibly designed guardrail.

- In all cases provide appropriate cautionary signage indicating proper use of the roadway and pathway or pathways.

### 3.2.4 Shoulders

Well maintained shoulders on an Internal Park Road in Pittsfield State Forest at Berry Pond Circuit Road
Goal

Preserve the historic configuration of shoulders and avoid any increase in pavement width.

Issues for Shoulders
Shoulders are the useable or graded area between the edge of the travel lane and the curb line or edge of embankment. Shoulders direct surface drainage off the roadway and toward a subsurface drainage system. They serve as “recovery areas”, allowing errant vehicles to correct their direction without leaving the roadway or risk hitting roadside obstructions. Shoulders also provide areas for pullovers in an emergency, avoidance maneuvers, bicycle travel, parking, and snow storage. Shoulders may be paved or unpaved and vary in width from less than one foot to 10 feet.

Many early roadways, designed before the automobile, have narrow or minimal shoulders. Current traffic demand can occupy all available width. Consequently, there is no place along the roadway for emergency uses such as speed enforcement or breakdowns. The roadway is unfriendly to cyclists. The perception of speed is heightened and slows down travel speed.

When park visitors pull off the roadway to park or enjoy the view, they damage shoulders, cause erosion and destroy vegetation. Because vegetation at the edge of the roadway is a character-defining feature, these informal pull-off areas are a problem.

For some Internal Park Roads, wide, grassy shoulders also serve as fire breaks and help contain forest fires. On Summit Roads, shoulders are narrow and unpaved, and, in most cases, vegetation grows up to the edge of the travel way. Estate Roads do not have shoulders unless the roadway serves a more formal purpose.

Guidelines for Shoulders

- Change shoulder dimension only if necessary to
  (a) support bicycle use or
  (b) provide police pullovers for speeding motorists.
  In the latter case, identify the least intrusive locations and minimize impact on parkland.

- Where repaving raises the road surface higher than the shoulder, regrade the shoulder to a shallow roadside swale while assuring a safe slope and avoiding erosion, or lower the roadway through full-depth reconstruction.

- Re-vegetate the shoulders using methods that sustain vegetation, while still occasionally supporting the weight of a vehicle. Use the method developed for non-sandy areas at Acadia National Park in Maine: scarify the deteriorated...
shoulder to an adequate depth, cover with an aggregate/topsoil mixture, and reseed with a native plant mix.

- When shoulders have inappropriate informal pull-offs, discourage pulling off through signage, plantings and barriers, if necessary. Avoid parking stones, which detract from the character of the landscape.

- When wide shoulders are appropriately used for parking, allow shared shoulder use by cyclists during peak commuter hours, with appropriate signage.

- **Internal Park Roads:** Preserve the historic configuration of shoulders, including the vegetated edge.

- **Border Roads:** Do not add shoulders unless there were shoulders historically and the addition of a shoulder would enhance bicycle safety.

- **Summit Roads:** Preserve the historic configuration of shoulders including the vegetated edge, unless safety data support modifying the shoulder. Discourage informal pull-offs where the shoulder is vulnerable to erosion by installing signage, plantings and appropriate barriers, if necessary. Avoid parking stones. To resist erosion on steep slopes, use coarse locally sourced aggregate instead of finer gravel.

- **Estate Roads:** When historically documented, preserve the shoulder as a component of the historic parkway landscape.

### 3.2.5 Lane Number and Width

**Goal**

*Preserve original lane number and widths, where feasible. Avoid increasing traffic capacity by increasing the number of lanes or making lanes wider. Avoid any net loss of parkland.*

**Issues for Lane Number and Width**

The number of lanes and lane width are character-defining features that contribute to the parkway experience and have a profound impact on historic character. DCR parkways are not designed to be primary travel routes and should not be substantially modified to accommodate increasing traffic demands.

Most parkway travelways have a maximum of two lanes in each direction. Parkways in rural settings usually have one lane in each direction, and on Summit Roads in steep terrain, a parkway is often a one-lane/one-way loop. Lane width ranges between 9 and 12 feet.
As traffic volumes increase, some roadways are now wider with auxiliary turning lanes that diminish historic parkway character.

**Guidelines for Lane Number and Width**

- Evaluate existing lane configurations and widths, traffic demand and composition, to assure a safe roadway that enhances all permitted transportation modes and is consistent with parkway purposes, character and context. Keep the number of lanes consistent throughout the various sections of the parkway, and in keeping with the historic context.

- In areas where parkways are over capacity, explore other measures to manage traffic or reduce demand, such as appropriate traffic calming. Refer to the MassHighway *Project Development and Design Guide* for traffic calming information.

- Do not widen or add turning lanes, transit service areas, or parking lanes for a nominal capacity and safety benefit. The addition of turning lanes has a significant negative impact on the historic parkway, either by displacing parkland next to the road, or by displacing or eliminating the median.

- In cases where the capacity and safety benefit strongly favor the development of auxiliary lanes, identify areas where the added capacity of these lanes may be offset by the reduction of other lanes if they are no longer needed and can be reclaimed for parkland. Document how any capacity enhancement for motor use is consistent with protecting the resource.

- Remove parking or travel lanes to increase space for bicycle use or green space, after assessing its impact on the roadway’s historic design and current function.

- Avoid widening lanes that encourage driving above the design speed, with no gain in safety.

- In areas where travel lanes are wider than necessary, narrow them to as little as ten (10) feet to slow traffic and increase safety, reclaim green space, and restore the historic travelway and landscape.

<table>
<thead>
<tr>
<th>Typical Roadway Lane Widths (feet)</th>
<th>Pleasure Vehicles Only</th>
<th>General Traffic (Trucks permitted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parkway Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecting Parkway</td>
<td>9-10</td>
<td>10-11</td>
</tr>
<tr>
<td>Park Border Roads</td>
<td>9-10</td>
<td>10-11</td>
</tr>
<tr>
<td>Internal Park Roads</td>
<td>9-10</td>
<td>10-11</td>
</tr>
</tbody>
</table>
• **Internal Park Roads:** Retain one-way loops which follow a specific sequence of views. If a wider travel way is needed for access by lifesaving equipment or other operations, use pull-outs or minimal widening. Do not convert one-way loops to two-way traffic.

• **Ocean Parkways:** Reduce the view-obstructing character of parking wherever possible, remove spaces at particularly important viewpoints and create nearby off-road parking on the landside of the road, with carefully controlled pedestrian crossing facilities. Preserve the relationship between the travel way and the shorefront parkland. Do not widen or add lanes and create a broad “hardscape”.

• **Summit Roads:** If safety data support changes to the width of travel lanes in these fundamentally narrow roadways, make only minimal modifications. Distinguish paved swales from the paved roadway to avoid creating the illusion of a wider travel way.

• **Estate Roads:** Preserve the historical roadway width. Where serving as a recreational trail, maintain a single lane with a surface suitable for walking, running, and bicycling, thereby keeping users on the trail and protecting adjacent land. Realign only for an extraordinary environmental benefit such as protecting an endangered species.

### 3.2.6 Pavement Markings

![Clear Pavement Markings on VFW Parkway in West Roxbury](image)

**Goal**

*Mark pavement to promote safe conditions for all parkway users.*
Issues for Pavement Markings
Urban parkways are usually marked with double yellow centerlines, white shoulder lines, stop lines and crosswalks. Words, arrows and channelizing markings at intersection islands and rotaries are also common. These required markings maintain safe travel conditions and are intended to be consistently and uniformly applied in accordance with current national safety standards on most parkways, with certain exceptions. The trend towards use of wider longitudinal pavement markings responds to the aging population and the need for increased visibility. Introduced well after many of the parkways were first built, and modified over time, pavement markings are not generally considered to be character-defining features for historic parkways.

Where parkway roadways accommodate not only drivers, but also pedestrians, cyclists and in line skaters, clear pavement marking to delineate safe use is essential.

Guidelines for Pavement Markings

- Design pavement markings to meet the requirements of the ITE Manual on Uniform Traffic Control Devices.

- Mark travel lanes with a consistent width (as measured from the center of the centerline to the center of the shoulder line) for consistency within each segment of parkway, as based on an engineering evaluation. Mark shoulders for consistent width as measured from the center of the shoulder line to the edge of pavement or curb.

- For longitudinal pavement markings for centerlines, lane lines and shoulder lines, use lines no greater than four (4) inches wide, except where a six (6) inch width will match widths on adjacent roadways.

- Do not delineate lanes wider than necessary. Excessive width invites fast driving and allocates space for cars that could accommodate bicycle use.

- **Internal Park Roads**: If distinctive single yellow centerlines are present and are considered character-defining, preserve or restore them.

- **Internal Park Roads, Summit Roads, and Estate Roads**: Where existing pavement markings are redundant or unnecessary safety measures, remove them. Where safety under certain use and low-visibility weather conditions is an issue, or where pavement width is greater than twenty feet or average daily traffic is greater than 6,000, add centerline and shoulder lines (fog lines) for lane and pavement edge delineation.
3.2.7 Travelway Surface

Unpaved road at Borderland State Park in North Easton is not open to public vehicles and is an enjoyable walking surface.

**Goal**

*Assure a safe properly graded and well-drained surface appropriate to the level of use on the travel way.*

**Issues for Travelway Surface**

The predominant material for most travel ways is bituminous concrete. Until the early twentieth century, unpaved “broken stone”, gravel or dirt surfaces were used by bicycles, horses and horse drawn wagons and carriages.

The change from unpaved to paved roadways was a response to changes in vehicular use. During the first two decades of the 20th century, many parkways were used by automobiles and pleasure carriages, with one side of a median paved with bituminous concrete to accommodate two-way automobile traffic and the other side paved with crushed stone for horse-drawn carriages. By the 1930s, dual use ended and bituminous concrete became the norm.

Without periodic maintenance, the bituminous concrete surface deteriorates. If aggregate materials on unpaved road surfaces are not regularly replenished, the crown on the road diminishes and areas of compaction or erosion are created. Resurfacing reduces the height or reveal of curbs and their ability to channel surface drainage, and keep stray vehicles on the road.
Although bituminous concrete is usually the appropriate roadway surface, some non-urban travel ways with light traffic such as Internal Park Roads are still unpaved. Users enjoy these lightly traveled unpaved country roads.

Guidelines for Travel Way Surface

- Follow the DCR paving specification for bituminous concrete.

- Restore adequate curb reveal lost through resurfacing. If curb reveal is below the recommended minimum of six (6) inches, use cold planing. Resurface unpaved roads with aggregate and regrade crowns. Recycle removed bituminous concrete.

- In the Design Control Report, determine the appropriate roadway surface for each historic parkway in light of its historic design and current function. Where possible and desirable for interpretive and visual purposes, remove paving or replace with alternative paving. Evaluate non-bituminous alternatives such as chip seal and resin pavement systems.

- Where the side of the road is curbless and the road edge is deteriorated, reconstruct the pavement. Extend the compacted aggregate base material at least two feet beyond the pavement edge. Grade the finished surface down away from the pavement at a slope of no more than one inch per foot. In addition, determine if subdrains or surface drainage improvements are needed to maintain the integrity of the pavement section and prevent further pavement edge deterioration.

- **Internal Park Roads and Vernacular Roads:** If warranted by historic precedent or interpretive goals, remove pavement on a parkway that no longer carries traffic and replace with historically appropriate surfacing.

- **Estate Roads:** For a formal entry road, use treatment appropriate to historic design and current function. Where necessary, retain paved surfaces to support park operations and management. If possible, retain or restore unpaved entry roads to evoke the historic entry experience.
### 3.2.8 Medians

**Goal**

*Preserve the historic character-defining features of existing medians.*

**Issues for Medians**

The median is an important character-defining feature on many parkways with two lanes in each direction. Mature shade trees in a generous strip of turf of uniform width are bordered by separate travel ways on the same alignment. Far less frequently, parkways in wide corridors may have travel ways on different alignments separated by generous medians of varying width, integrating the travel way into the terrain. Curbs are not always used. Medians combine safety and scenic benefits. Historically, medians separated conflicting modes of travel from each other — trolley lines from vehicles, or pleasure vehicles from general traffic. They are most typical of Connecting Parkways, but also can be found on Border Roads, River Parkways, and Ocean Parkways.

Medians of uniform width vary from ten to thirty feet wide. Some medians as narrow as three feet are paved in concrete or asphalt, since they cannot support trees or be easily mowed. Medians this narrow impart a highway quality that detracts from parkway character.

Particularly in urban contexts, medians provide an amenity that is in short supply—trees and grass. Where the corridor is narrow, a median is wide enough to support...
shade trees unifies the parkway. Unfortunately, over the years, many medians have been reduced in width to provide additional travel lanes, especially dedicated turn lanes.

Guidelines for Medians

- Wherever space permits, restore a median wide enough to accommodate two (2) rows of shade trees. If space does not permit two rows, restore a median wide enough to accommodate a single row of shade trees. If the medians never had trees, respect the historic design intent for the median.

- Provide a curb when the median planted with shade trees is too narrow to meet clear zone safety standards, that is, less than seven (7) feet from the curb to the tree trunk (that is, a total median width of fourteen feet).

- If the roadway lane widths or number can be reduced, and historical research supports it, restore the median or add to the width of an existing median. If the median is already over twenty-four (24) feet wide, add to the landscaped shoulders of the roadway instead.

<table>
<thead>
<tr>
<th>Median width</th>
<th>Recommended treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4 feet</td>
<td>Flush pavers or other material.</td>
</tr>
<tr>
<td>4 to 6 feet</td>
<td>Grass, some tree species (too narrow for root spread for most)</td>
</tr>
<tr>
<td>6 to 12 feet</td>
<td>Grass, trees, one row or staggered (too narrow for two rows)</td>
</tr>
<tr>
<td>12 to 24 feet</td>
<td>Grass, two rows of trees, staggered if rows are less than 15 feet apart.</td>
</tr>
<tr>
<td>24 feet and up</td>
<td>Grass, two rows of trees, tree clumps</td>
</tr>
</tbody>
</table>
3.2.9 Vegetation

Trees are often adjacent to the travelway. Estate Road at Maudslay State Park, Newburyport.

Goal

Preserve, protect and restore parkway vegetation according to the original design intent.

Issues for Vegetation

Trees and grass, and in some instances shrubs, perennials and other non-woody species are critical character-defining features. Protection of vegetation is essential to the historic integrity and quality of parkways across the state.

Rows of stately shade trees forming tunnel-like canopies are the glory of many parkways. Trees are often located closer to the pavement edge than would be allowed today on roads with comparable traffic volume. Some planting of inappropriate ornamental small trees has occurred where the historic character calls for large shade trees.

Vegetation occurs both within the travel way cross section and the wider parkway. Farther back from the roadway (but rarely in medians), there is either (1) a designed landscape of trees and shrubs on turf, mostly indigenous species, including evergreens, in a naturalistic or random pattern or (2) a typical Southern New England forest such as along Internal Park Roads and Border Roads.
Areas once groomed are now undergoing natural succession. Although succession increases the ecological and aesthetic quality of the landscape, it also changes the historic character of the parkway. Invasive species alter the species composition even within established forests. Volunteer indigenous and invasive trees and shrubs are common along River Parkways, Border Roads, and Internal Park Roads with limited maintenance. The *Massachusetts Prohibited Plant List* includes approximately 150 invasive species, mostly shrubs and herbaceous species, but also four tree species: Black Locust, Common Buckthorn, Norway Maple, and Tree of Heaven. (Refer to Appendix I: Massachusetts Prohibited Plant List.)

Throughout the urban parkways, particularly along the shoulders, trees suffer from drought stress, car exhaust, deicing salt deposition, mechanical injury by mowers and maintenance trucks, soil compaction by runners and bicyclists, soil loss through erosion, lack of pruning, invasive species competition, and diseases and pests. Lack of pruning poses a safety hazard and block views. Use of a single species increases susceptibility to wholesale loss.

Grass is typical along the Connecting, River and Ocean Parkways and Estate Roads. These areas often become barren patches of soil due to erosion and compaction. Turf shoulders are susceptible to salt damage. The most intensively used turf, particularly along pathways preferred by joggers, is especially subject to compaction.

Historic shrub selections may have been non-native species that are now considered invasive.

**Guidelines for Vegetation**

- Ensure that the historic character of trees and contributing vegetation is not inadvertently lost or inappropriately altered. Support stewardship and ecological values.

- Wherever the vegetation has deteriorated or is absent—and space permits—plant new historically appropriate vegetation well suited to a historic parkway and if possible, the historic planting plan.

- Select native shade tree and shrub species and varieties (replant historic choices or close substitutes) unless exotic species are consistent with historic exotic landscape. Refer to historic plant lists and planting plans in the Design Control Report.

- Unless the use of a single species is character-defining, select a variety of tree and shrub species for a more robust ecosystem, rather than relying on a single species.
• Protect and care for champion trees. A champion tree is the largest-known species of a native or naturalized tree variety as recorded in the National Register of Big Trees. Start a replacement program for lost champion trees.

• Locate new trees so that different species are compatible with one another in stature, form, branching pattern and leaf texture and reinforce parkway character.

• In planting, follow best practices to ensure establishment and survival to maturity; do not place root ball too deeply or bury the trunk flare in excess soil or mulch, and assure regular watering until tree is established.

• On medians or in the green space between the paved roadway and a sidewalk or pathway, provide a width of six (6) feet minimum, optimally at least eight to ten (8–10) feet for healthy tree growth.

• Plant new trees no closer to the curb than five (5) feet to allow for long-term trunk growth. For grass, plant fine-leaved fescues, which require only two mowings per season and are adaptable to inhospitable conditions. Turf coverage will reduce water transpiration and soil compaction of the shoulder zone.

• For special tree row or allee planting, use same species or species of similar height and spread, space trees evenly, optimally no closer than fifteen to twenty (15-20) feet on center, taking into account coordination with light pole spacing.

• In places where vegetation is deteriorated or absent, and space permits, plant new vegetation.

• Replace damaged or dead invasive tree specimens by a native or non-invasive species of similar character.

• Along travel ways once bordered by lawn and now colonized by invasive plants or compacted and eroded, reestablish mowable grass.

• Remove invasive shrub species and replace with native species, if they can be adequately maintained. Monitor removal over a three-year period to ensure that removal is completely successful. Consult the Massachusetts Prohibited Plant List (see Appendix I) for tree, shrub and perennial species considered invasive.

• As small ornamental trees planted in place of deciduous shade trees die off, replace with deciduous shade trees.
• **Internal Park Roads, Estate Roads, and Vernacular Roads:** Use naturalistic turf mix comprising less fine species, mowed at least one (1) inch higher than conventional turf in high use parkland areas, for a less manicured but historically correct look, or wildflower mix if to be mowed only once a year.

• **Internal Park Roads, Estate Roads, and Vernacular Roads:** Avoid disturbance during construction or maintenance of delineated wetlands, woodland vernal pools, and State-listed Rare Species and Natural Communities identified by the Massachusetts Division of Fisheries and Wildlife (DFW) Natural Heritage and Endangered Species Program (NHESP), the protection of which overrides other goals including opening vistas.

• **Border Roads:** If the side of the parkway opposite the parkland lacks regular street trees, provide them in the public right of way to improve parkway character and discourage private incompatible landscaping on the roadway shoulder.

• **Ocean Parkways:** If absent, along the landside plant salt-resistant tree species to mitigate the visual impact of adjacent development and create a visual cue that the oceanfront parkland extends across the parkway.

• **Summit Roads:** Treat the summit as a historic landscape, integral to the parkway’s character. Preserve historic plant materials, layout and vistas. Monitor the summit for overuse and modify the maintenance program as needed to deal with erosion, compaction, drought and other stresses.

• **Estate Roads:** Determine if succession growth is appropriate and desirable for a specific site. Define and manage boundaries of succession growth.
3.2.10 Curbs

An eight-inch curb on the high-traffic VFW Parkway in West Roxbury is compatible with parkway character and helps calm traffic.

**Goal**
*Preserve historic curb if structurally intact.*

**Issues for Curbs**
Curbs delineate the edge of the travel way, control stormwater runoff, define and protect walkways. They also protect roadside and median plantings from wayward vehicle tires, soil erosion and compaction, road salt, oil, fuels and transmission fluid.

There are two types of curbing, vertical curb and mountable curb. Vertical curb is intended to keep vehicles on the road and prevent them from pulling off the road. Vertical curbs protect vegetation. Vertical curb is appropriate for low speed rather than high speed roadways. Therefore, where vertical curb already exists, low speeds are intended. Mountable or sloped curbs come in a number of different shapes and permit vehicles to cross over them.

Although some early Connecting Parkways have curbs only at corners, later Connecting Parkways usually have continuous curbs, and the earlier parkways were retrofitted with them. Where Connecting Parkways still lack them, cars may pull off the road and compact the soil.
A variety of curbs are found on historic parkways, including granite, either sloped or vertical, and quarter-round cement concrete. In the New England weather, granite is the most durable material. The quarter-round cement concrete curb on many former MDC parkways is inset with small (2”-3”) cobblestones. These mountable curbs installed in the 1950s represent the end of the period of historic significance. In some cases, the concrete has failed at the joints, weeds have gained a foothold and accelerated failure. Other segments, however, appear to be in good condition. Another more recent form, though not widely used, is a sloping curb made of three courses of granite pavers set in concrete.

Additional layers of pavement over the years have reduced curb reveal, or vertical exposed curb height. When curb reveal decreases, its ability to contain stormwater, define the road edge for drivers, and protect pedestrians and vegetation diminishes. Roadside erosion is increased.

Internal Park Roads without heavy traffic usually lack curbs, except at some parking areas, significant intersections such as an entrance to an education center, and in steep terrain where gutters are needed for storm drainage.

Guidelines for Curbs

- Where new curb is deemed appropriate, use vertical granite with a six (6) inch reveal, with two exceptions: (1) where driving speeds exceed the design speed for a high-traffic parkway, use vertical curbs with an eight (8) inch reveal, and (2) at access points for maintenance equipment, use sloped granite curb with a four (4) inch reveal. Eight inch curbs calm traffic because they provide “friction.” Drivers are concerned about hitting eight inch curbs so they slow down.

- Where a rock outcrop exists behind vertical curb and cannot be removed, provide a minimum horizontal clearance of 1.5 feet from the face of the curb to the obstruction.

- Restore 6-inch curb reveal either by resetting the curb, if no negative impact to adjacent trees occurs, or by milling the existing pavement and resurfacing to achieve the desired reveal. Reset uneven granite curb, unless doing so damages trees. Replace missing curb along medians and shoulders where new curb would protect vegetation, channel water or improve safety of pedestrians. Assure adequate setting bed and mortar joints throughout.

- Consider various treatment options for the repair or replacement of the pre-cast concrete-and-cobble curb from the 1950s.

- In locations where curb does not exist and the pavement edge is substantially deteriorated, repair the damage and end the cause of the deterioration. Do not install curb unless no other options are feasible.
- **Internal Park Roads, Summit Roads** and **Estate Roads**: Avoid installation of new curbing. Where deemed appropriate to resolve a stormwater or water quality control problem or to protect vegetation or stem erosion, install mountable curbing such as sloped granite whose scale, profile, and material is compatible with the landscape. When routine turning might override the road edge and degrade the roadside landscape, install vertical granite curbing.

### 3.2.11 Clear Zone

A beautiful character-defining ledge along the Jamaicaway occupies the clear zone.

**Goal**

*Maintain or improve parkway safety and preserve character defining roadside features such as old trees and rock outcrops within the clear zone by respecting the parkway’s historic layout.*

**Issues for Clear Zones**

Clear zones are unobstructed, traversable areas at the edge of the roadside where motorists who have driven their vehicles off the road may safely recover control of the vehicle. Many parkways lack clear zones. Magnificent old trees and rock outcrops line the travelway and enhance the parkways. The creation of a clear zone requires removal of all fixed objects such as trees and rocks and grading a traversable slope within a certain distance from the travel lane, a distance dependent on travel speed and traffic volume. Consequently, the design approach to a clear zone is of paramount importance to the maintenance of historic character of parkways.
Most urban parkways are low speed roadways (below 40 mph) and have vertical curbs. These curbs are not recommended where higher travel speed is allowed. Therefore, where vertical curb already exists on a travel way, the speed limit is under 40 mph. Utility poles, signs, trees, rock outcrops, and other fixed objects are and may be located behind the curb on these low speed roadways.

Guidelines for Clear Zones

- Determine if there is any accident history associated with roadside obstacles within the clear zone.

- Only add a recovery area if the accident history is significant, the potential impact on right of way is slight, construction cost is minimal, and the site context is appropriate. Keep increases in clear zone width to an absolute minimum.

- Protect character-defining large trees.

- If certain objects such as light poles or sign posts are required within the clear zone and cannot be removed, design a breakaway or other safety device.

3.2.11 Traffic Barriers

Guardrails and access control barriers include steel beams with a W cross-Section (Type-SS or Thrie Beam), mounted on steel posts at Hampton Ponds State Park, Westfield.
**Goals**

*Minimize the use of guardrails, and where used, minimize their visual intrusion.*

*Where vehicular access to parklands needs to be controlled, and safety guardrails are not required, provide access barriers compatible with the landscape setting. Design gates to be consistent with one another and compatible with other site furnishings.*

Traffic barriers—guardrails, Boston pipe rails, fences and security gates—are prominent features on many parkways. Some post-date the period of historic significance, and are not character-defining features. Guardrails protect motorists from roadside hazards and pedestrians from traffic.

Traffic barriers for safety, for control of access, and security gates are discussed below.

**Traffic Barriers for Safety - Guardrails**

*Guardrail Issues*

Modern guardrails, lining one or both sides of the roadway for long distances, block views and impart a highway character. Other types of barriers are also used for relatively short distances.

Guardrails are most common on Connecting Parkways which carry large traffic volumes. The typical design—Type-SS or Thrie Beam galvanized steel or pre-cast concrete barriers (“Jersey barriers”) diminish the visual quality and historic integrity of the parkways.

Wooden rustic fences are appropriate to parkways with compelling vistas. Along many Internal Park Roads within the state park system, the CCC constructed guardrails fashioned from wood logs resting on wooden posts, or the state installed three-cable barrier systems mounted on wooden posts. Boston pipe rails are also historic character-defining features found on Connecting Parkways.

The Type-SS or Thrie Beam guardrails and Jersey barriers used today lack the rustic quality of the old log rails. However, the issue here is safety. The log rails and Boston Pipe rails lack the safety features needed for certain speed limits.
Some parkways have barriers with three cables on wood posts and recall slower speeds before World War II (Middlesex Fells, 1934).

The Cor-ten steel guardrail is an alternative because it weathers to a rust-brown, which blends into the winter woods. However, their form is intrusive and rusting steel leaves stubborn stains on the sidewalk and curb.

Steel-backed timber guardrail is closer in appearance to the historic wooden fence guardrail in the urban parkway system. A wood rail backed with a steel plate is supported on timber posts. The steel plate provides the needed tensile strength. The “weak posts” provide the breakaway capability required for the safety of errant drivers. The wood members provide a more rustic appearance than the steel and concrete normally used in barriers. This railing is often used on National Park
Service roads, as well as on the Merritt Parkway in Connecticut. Cost is comparable to the cost of the Thrie Beam. Timber is recommended as the best option from an aesthetic point of view and meets safety standards if steel backed.

**Guidelines for Guardrails**

- Evaluate the need for guardrails and Jersey barriers, especially if visually intrusive or historically inappropriate. Where guardrails and barriers are unnecessary for safety or access control purposes, remove them or do not use them.

- Where guardrails on roads are needed for safety, use a steel backed timber/weak post system. On a given parkway, use the same design for all guardrails installed for safety purposes. Replace existing Type SS or Thrie Beam guardrails with a steel-backed/weak post system.

- Implement a guardrail replacement program for every parkway treatment project.

- **Internal Park Roads**: Preserve in place original guardrails and stone barriers. If safety requires the replacement of the original, design compatible historic guardrail of appropriate scale, materials and construction. Use all-timber systems or three-cable barrier with wooden posts. On trails and paths, for historic interpretive purposes, install guardrails that replicate the documented historic type, even if they require more maintenance.

- **Border Roads**: Avoid barrier systems, as none have existed historically.

- **Ocean Parkways**: Preserve existing historic barrier systems. If the barriers do not meet current safety needs, exhaust all preservation options, such as internal reinforcement, reconstruction, or addition of materials to the existing barriers before replacing with new materials. Design guardrails to be compatible with the historic barrier system. Do not obstruct water views from the travel way.

- **Estate Roads**: Avoid use of guardrails and barriers. On pedestrian-only routes, do not use crash-proof barriers. Where access control or protection of users from hazardous terrain is necessary, install wood fences. If steep slopes present a hazard to park staff vehicles, install a minimal length of guardrail or other barrier whose design, scale and materials is consistent with the setting and period of historic significance.
Local Roxbury puddingstone harking back to Olmsted controls access on the Jamaica way in Boston.

Traffic Barriers For Control of Access

Control of Access Issues
Some travelway edges without safety guardrail may require barriers to prevent vehicular trespass to the adjacent land or to channel movements. The placement on the road surface or adjacent ground of loose boulders, stone blocks, granite curbs, concrete Jersey barriers or concrete bollards detracts from parkway character. Wooden bollards are sometimes used as well and are generally less obtrusive, but do not last long.

Guideline for Control of Access

- Select a design that does not exceed the scale, strength and size needed for the specific purpose. Use timber guardrails, wood fences or stone bollards that are appropriate to the historic character of the parkway.
Gates

Gates at Maudslay State Park in Newburyport are a character-defining feature.

Gates Issues
Gates restrict non-employee vehicular access onto some parkland, or restrict off-season or nighttime vehicular access to the parkway itself.

Guidelines for Gates

- Use Shurcliff gate to restrict access in appropriate locations, as needed. Paint metal gates to blend with the landscape.

- Use reflectors instead of bright paint for safety. Avoid decorative gates unless consistent with the historic design of a facility such as a former estate.
3.2.13 Walls

Stone wall on Chickatawbut Road in Blue Hills Reservation, Milton and Quincy probably constructed by the Civilian Conservation Corp between 1933 and 1941.

**Goal**

*Preserve existing historic walls.*

**Issues for Walls**

Stone walls are character-defining features along many parkways. Pre-cast concrete caps and mortared quarried stones are more prevalent in urban areas; fieldstone walls, both dry-laid and mortared, are more prevalent in rural settings. Most date from the original construction of the parkway or state park roadway.

Stone walls are susceptible to collisions, falling trees, invasion by roots, foot traffic, heaving, and differential thermal or freeze-thaw expansion and contraction. Masonry stone walls are susceptible to the different expansion and contraction rates of stone and mortar. Improper mortaring accelerates moisture damage.

Retaining walls are also constructed of reinforced concrete. Some walls include railings such as the “Boston pattern” railing, as found on Memorial Drive along the Charles River Basin.
Guidelines for Walls

Dry Laid Freestanding Wall

- If stone walls require repair or replacement, use stone with the same texture, quality, and size. Match mortar to historic color and joints, recessed to the same dimension as the historic wall. Repair dry-laid walls as dry-laid. Use the best stonemasonry practices. Where traffic and safety considerations permit, dry-lay stone walls, since they are generally less expensive to maintain than masonry stone walls.

- In unusual cases where the original design is significantly more maintenance-intensive than current construction, allow historically acceptable modifications to increase durability. In new construction, such as thick stone veneer over a concrete core, replicate the materials, texture, and quality of the historical stonework to provide the same visual character as the original.

- When rehabilitating a dry-laid wall, investigate the subgrade to assure good drainage and absence of silts. Do not use mortar because it increases internal stresses. The thicker the wall, the less maintenance will be required; good construction will exceed engineering minimum thickness recommendations for retaining walls or high free-standing walls.

- Use local stone, if possible.
Mortared Freestanding Wall

- For mortared stone walls, reduce freeze-thaw damage with natural sands. Match the historic mortar color. Never use premixed mortar-sand combinations. Do not assume that locally available sand meets the necessary requirements.

- Replace missing capstones or header stones, to curtail water damage within the wall, with overhang and heavy enough to resist foot traffic. If a mortared wall lacks a capstone, introduce a capstone only if historically compatible. Deflect water away from the wall with a sufficient overhang, avoid thin vertical edge, use recessed joints, control joints, and appropriate unobtrusive flashing. Choose compatible materials. Place control joints at suitable intervals or at a change in the wall support. If the wall did not have a capstone or header stones, use a sealant on top of wall only (used elsewhere it traps moisture).

- For retaining walls, intercept uphill surface drainage by either sloping backfill away from the wall to promote lateral drainage and assure that no runoff pours over the wall or creating an impervious swale along the top of the wall to deflect drainage around the wall or to area drains. If an existing masonry wall without weep holes is rebuilt, introduce weep holes, and assure adequate inward batter, in accordance with standard retaining wall design. Use crushed stone on the upper side to encourage drainage away from the wall.
• If railings on retaining walls need to be replaced, match the appearance and dimensions of the original as closely as possible, consistent with applicable safety standards and codes.

• Remove plants such as small trees that have taken root between the stones to avoid eventual toppling of the wall. Remove graffiti by techniques gentle enough to avoid surface damage. Never use mortar to patch or stabilize dry-laid walls to avoid damage from entrapped internal moisture.

3.2.14 Utilities

Goal

Minimize visual impact of above ground utilities and minimize impact of utility construction and servicing on vegetation.

Issues for Utilities
The clutter of overhead wires diminishes parkway character. Utility poles were added after parkway trees reached maturity. Cable and fiber optic wires now share poles with electric and telephone. Stately tree branches encroach on the wires and require pruning. When trees die, replacement locations are hard to find in some narrow parkway corridors.

Planting smaller species that will not compete with the lines will eventually change the character of historic parkways and is not an appropriate solution. Trees will always require selective pruning in order to co-exist with utility lines. Where this level of maintenance is not practical, underground utilities have the substantial aesthetic benefit of removing wires from the landscape.

Sometimes utility companies pay to use parkland for their utility lines and add many above ground features including fenced in transformers. Utility companies usually conduct all work involving their own facilities. They require access onto the landscape to perform servicing tasks. Policies relating to collaboration between DCR and utility companies are important to the maintenance of historic parkways.

Guidelines for Utilities

• Relocate overhead utility lines as unobtrusively as possible, preferably off the travelway for scenic and safety reasons. Put them underground if feasible.

• Conduct an inventory and survey of utility lines and structures, including location and elevations, and have utility companies and responsible public agencies verify and supplement, as necessary, this information.

• As early as possible in the project, coordinate relocation and accommodation of existing utilities in a parkway in order to avoid increased cost and delay.
• Identify available utility company programs for replacement, abandonment, and expansion of utilities even if such programs are only in the planning stages.

• Identify and assess impacts to existing utilities for the design alternatives being considered during preliminary design.

• In design, take into account clear zone requirements and post-construction periodic utility servicing to avoid utility vehicle damage to trees and soil compaction.

• On plans and in specifications, illustrate and describe all utility work and include information on the work space, work hours, and work duration requirements of the utility companies.

• Throughout the project, maintain and periodically verify complete utility company contact information.

• **Internal Park Roads**: Whenever possible, locate utilities as unobtrusively as possible. Restrict clearings for utility rights-of-way or severe pruning of the trees. Avoid overhead wires, poles and junction boxes as they often require clearing of the right-of-way or pruning of the tree canopy. If utility poles must lie adjacent to the travelway, use wood poles in scale with the surrounding landscape.

### 3.2.15 Signage

**Goal**

*Provide clear attractive signage to promote user safety and inform users.*

**Issues for Signage**

Signage is important to the function of historic parkways. There are five basic types:

- **Regulatory**: enhances the safety of motorists and other parkway users—stop, yield signs, no entry, no U turn, one way traffic, load limit, speed limit.

- **Warning**: also known as public safety signage (typically yellow) provides information about potentially unsafe road conditions ahead, such as sharp bends in the road, merging traffic, and narrowing lane width.

- **Guide**: also known as wayfinding signage provides information on destinations and their distances, identifies routes numbers, and indicates directional information.

- **Identification**

- **Interpretation**
Regulatory, warning and guide signage adheres to national standards. DCR has its own signage serving identification, and interpretive purposes as well. Here DCR has flexibility in its choice of materials and fonts to reinforce parkway character.

Identification signage along the state’s historic parkways evokes the special historic character, and places the parkways in a larger system of special roads across the Commonwealth. A signage system that distinguishes these historic parkways from ordinary roads or highways and reflects their history will send a powerful message to the public about their importance.

Guidelines for Signage

- Install regulatory, warning and guide signage.

- Provide warning signage to encourage safer driving and caution where stopping sightlines are blocked or where cyclists and pedestrian share the roadway.

- Avoid or reduce sign clutter. Avoid overly large signs. Do not block views (especially water), and vistas.

- Use alternatives to the standard steel post mounting systems such as posts with darker and less reflective finishes or wooden posts.

- Create a statewide parkway identification signage to distinguish parkways from ordinary roads, and convey that a particular parkway is part of the larger system of parkways across the Commonwealth. Incorporate a simple graphic symbol to distinguish among the parkway types. Choose fonts, symbols, materials, and sign colors and scale to assure system-wide consistency in accordance with the DCR Graphic Design Standards.

- To further distinguish parkway signage from other highway signage, match the color of the back of the sign to that of the front, rather than metallic. Use dark green paint color (Standard Federal Color #14062) for sign poles to match traffic signals, and, if they are controlled by DCR, light poles.

- Provide interpretive pedestrian wayfinding, and recreational signage of consistent, coordinated design at trailheads and adjacent recreational parking areas.

- Install truck exclusion signage on travel ways for Pleasure Vehicles Only, as appropriate.

- Internal Park Roads: Develop signage as part of a trail wayfinding and interpretive educational signage system that describes park and archaeological
history. Design scale and materials consistent with the facility and compatible with the historic landscape.

- **Border Roads**: Install signage that identifies the parkland as part of the park system and that locates points of public access.

- **River Parkways and Ocean Parkways**: Do not place signage that intrudes on ocean, river or long views.

- **Estate Roads**: If closed to public motor vehicles, install interpretive signage to facilitate use as a self-guiding trail.

3.2.16 Lighting

**Goals**

*Where required for safety, maintain minimal safe lighting with consistent, uniform historically compatible fixtures along a parkway.*

**Issues for Lighting**

Lighting plays a major role in determining parkway character. Inappropriate travel way lighting can diminish parkway character.

A number of different light fixture designs have been used over the years. The older lights are more compatible with parkway character than the new ones. Some Connecting Parkways originally boasted Welsbach gas or naptha lights, some displaying the name of the parkway. By the 1920s brighter electric lamps were installed. Styles changed frequently until the arrival of the first cobra head fixtures in the 1950s. In the 1970s and 1980s, the shoe box fixture was installed on a concrete, metal pole or wood pole.

Many urban parkways need lights for safe night travel. The most common light—the cobra head on a metal or precast concrete pole—diminishes the historic appearance of the parkway. Wooden poles can be compatible with parkway character, but cannot offset the cobra head effect.

Fortunately, many Internal Park Roads do not have lights or require them. Some are closed at night, others are closed to vehicular traffic.
Responsibility for lighting service and maintenance is often shared between DCR, the community through which it passes, and the utility company. Different interests often control the pole, the fixture, the luminaire, and the wiring. Although DCR may not have control over the choice of fixture now, over the long term it may be able to work with the utility companies to offer a historically compatible, energy efficient fixture that meets these guidelines.

Guidelines for Lighting

- Preserve historic lighting fixtures as character-defining features. If necessary to improve performance, retrofit the lamps with modern fixtures to achieve the intensity and range of illumination required for safety and adjust spacing or locations.

- On parkways where lights are required, provide sufficient and uniform level of illumination.

- Avoid dead spots between fixtures and glare that compromise the vision of the driver or the bicyclist.

- Reduce glare, sky glow, light trespass onto abutting private property, and reduce energy waste with fully shielded fixtures, cut-off optics and reflector and flat lens rather than the more commonly used round prismatic lens.

- Avoid amber/yellows of low-pressure sodium (LPS) or high-pressure sodium (HPS) or cool white of metal halide.

- On urban parkways in the metropolitan Boston area, use the 1907 MDC Boulevard light.

- For poles, use either metal with dark green paint color (Standard Federal Color #14062), or dark-stained wood. Avoid light colors or reflective metallic finishes.

- Be consistent with design of roadway and pedestrian fixtures on adjacent walkways. For roadway lighting, provide poles no more than twenty (20) feet in height. For pedestrian lighting, provide poles no more than twelve (12) feet in height.

- Locate poles to assure even spacing and alignment with tree rows and if possible traffic signal poles as well. Avoid conflicts with mature street trees.

- Consider lighting along shared use paths that are used by commuting bicyclists and pedestrians.
- **Border Roads** and **Internal Park Roads**: Replace cobra-heads with historically-appropriate or less obtrusive design alternatives.

- **Ocean Parkways**: Preserve historic lighting fixtures. Consider the scale, natural setting, and wind exposure of the landscape. Replace cobra-heads with historically appropriate lights.

- **Summit Roads**: Avoid adding lighting, given that the infrastructure (poles, cables, etc.) and the ambient light detract from the character of the parkway and views to the mountain from its surroundings.

- **Estate Roads**: Do not install lighting, unless lighting fixtures were used in the period of historic significance, in which case match the form of the original as closely as possible.

### 3.3 MAJOR STRUCTURES

#### 3.3.1 Bridges

Bridge – Historic Blue Hills Parkway

**Goals**

*Preserve historic bridges. Avoid adding pedestrian overpasses.*
Issues for Bridges

Beautiful historic bridges carry parkway motorists, pedestrians, and cyclists over other roadways, pathways, rail lines, and waterways. Bridges over the roadway may carry vehicular or rail traffic. On some heavy traffic parkways, pedestrian overpasses traverse the travel way. They do not reinforce parkway character or appeal to pedestrians. New facilities will require extensive ramps to make them handicapped accessible.

Stone arch bridges display the technology and craft of their period. The arch itself is formed by a stone, brick, concrete, or corrugated metal liner. Parallel to the sides of the roadway and below the level of the road surface are walls that retain the embankment. Some arch bridges have parapets extending above the level of the travelway and, in most cases, these are extensions of the retaining walls.

The interior of the structure is usually filled with a granular material topped by the travelway surface or pavement. Some bridges have curbs along the road, paved walkways and grassy embankments. Where the arches extend over waterways, riprap may protect the embankment from scour.

Stone veneer bridges, with stone masking the reinforced concrete structure, were constructed more recently, mostly on urban parkways, but their finishes integrate them well into the historic parkway landscape. These structures usually include concrete barrel arches with stone fascias and solid stone or stone veneer parapets.

With the advent of motorized travel, these structures underwent changes that affected their appearance and longevity. Approaches to bridges were raised to provide a smoother and safer profile. As a result, bridge parapets were partially buried. Consequently, the retaining walls to which the parapets are attached are subject to loading and to moisture associated with the material used to raise the roadway profile. Both of these unanticipated conditions accelerate deterioration.

Appropriate maintenance is essential to preserve these bridges. Fortunately, many of the stone veneer bridges are well designed, low-maintenance and add to parkway character.

Bridges are generally maintained and rehabilitated with a separate report and construction contract under a different process than parkways. Through that process, bridges, including parkway bridges, are subject to current MassHighway and federal criteria for structural integrity and safety, which dictate safe horizontal and vertical alignments and clearances. Because bridges are important character-defining features, the focus here is on the choice of treatment that affects character.
Guidelines for Bridges

- When bridge work is needed, evaluate user requirements to determine the type and extent of structural alterations needed to adapt the structure to current uses in an historically appropriate manner.

- Research the original structure’s design and materials prior to implementing any work. Carry out repairs using preservation techniques that match the materials and craftsmanship of the original.

- When alterations are needed, retain or reproduce the appearance of original structure to the greatest extent possible. Identify sources of historically acceptable building materials so that smaller repairs can be performed quickly and satisfactorily.

- Use latest technology to identify and correct the underlying causes of distress at historic bridges, but integrate the work with the original appearance unless hidden.

- For parapets, refer to guidelines on Walls.

- Control the detrimental effects of water at bridge embankments. If necessary, alter roadway drainage to eliminate low points where water can collect either on the bridge deck or in close proximity on the approaches. If necessary, regrade the roadway embankments to divert stormwater runoff from the bridge substructure.

- Avoid new pedestrian overpasses and provide adequate and safe at grade pedestrian crossings wherever possible.

- Connecting Parkways: Do not construct new pedestrian overpasses unless both high traffic, pedestrian volumes and safety evaluation support their construction. Design new overpasses to reflect the historic character of the parkway.

3.4 INTERSECTIONS AND CURB CUTS

3.4.1 Interface with Municipal Roads
Parkway terminus points, intersections with municipal roads, traffic signals, rotaries, roundabouts, intersections with non-parkway roads, and with recreational facilities, all affect overall parkway character.
Goal

Enhance parkway character and ensure ease of travel by simplifying the landscape treatment at intersection with municipal roads and parkway terminus points.

Issues for Interfaces with Municipal Roads and for Parkway Terminus Points

Terminus points to the urban parkways often occur at signalized intersections with other busy roadways, while entrance and exit points to the rural parkways usually occur at unsignalized intersections with two-lane rural highways or other roadways.

On urban parkways, the parkway terminus points are often planted with annuals, small shrubs and other inappropriate site elements that do not enhance the parkway character or respect the historic design intent. The confusion at the junction of these busy travelways merits a simple treatment of lawn and trees. On rural highways, the parkway terminus point may be an opportunity for a simple marker to show the transition to the rural highway.

Connecting Parkways and Border Roads provide smooth relatively uninterrupted travel because the number of intersections is restricted mostly to collectors and local roads. These roads convey general traffic including trucks across the parkway. Municipal sidewalks accommodating pedestrians and bicyclists also intersect with parkways. Treatment over the decades has not been consistent. Parkway character is diluted at busy intersections. Traffic controls, signage, lighting, sightlines, and sidewalks are not necessarily consistent with those found elsewhere on the parkway.

Guidelines for Interfaces with Municipal Roads and for Parkway Terminus Points

- Provide consistently spaced and designed pedestrian crossing treatments at interfaces with municipal roads.

- Improve accommodation for bicyclists in these locations so that it is consistent and safe.

- Design the intersections for the safe accommodation of truck cross traffic if the parkway is for pleasure vehicles only. Design intersections so that it is clear that the parkway is for pleasure vehicles only.

- Add shade trees where they do not interfere with required sightlines.

- Add islands or bumpouts, if appropriate. Incorporate landscape if appropriate.

- Remove annuals and other inappropriate site elements that do not enhance the historic parkway character. Remove elements such as the ramped planting at the terminus of the Alewife Brook Parkway at Route 2 and replace with simple grass and shade trees where possible.
• Enhance the parkway's green character, ease maintenance, and facilitate changing direction at parkway terminus points.

• On rural parkways, herald the change to a rural roadway with a simple marker, if desired at similar parkway terminus points. Construct the simple marker with natural materials that are consistent with the particular parkway character. Use these markers sparingly to ease maintenance.

• Avoid visual clutter.

3.4.2 Traffic Signals

Goal
Provide required traffic signals as unobtrusively and sparingly as possible.

Issues for Traffic Signals
Traffic signals have been introduced throughout the parkway system as traffic volumes have increased. The most essential safety and guide signing are appropriate and necessary for the safety and guidance of parkway users. In urban areas, the introduction of traffic signals has in some cases adversely impacted the aesthetics of the parkway corridor, but has also improved safety and access for many users.

Guidelines for Traffic Signals

• Explore all other traffic control features before adding a traffic signal.

• Avoid mast arm mounted signals unless absolutely necessary. Remove unnecessary devices if warranted based on the Manual on Uniform Traffic Control Devices.

• Install vehicular traffic signals where needed for safety and capacity reasons. Provide mast arms when necessary to align signal pole with streetlight poles and tree trunks.

• Coat traffic signal equipment and large sign structures with dark green paint color (Standard Federal Color #14062).

• Provide safe and convenient signal phasing and timing for protected pedestrian crossing and bicycle friendly signal loops.

• Install LED traffic lights.

• Facilitate pedestrian crossing on lower-volume parkways with a pedestrian activated signalized crosswalk, where needed.

• Time traffic signals to provide desired parkway operating speed of 30-35 mph.
• Coordinate DCR traffic signals with those that are owned or operated by municipalities.

3.4.3 Rotaries and Roundabouts

Rotaries can be daunting for pedestrians trying to cross the Travel Way.

Goals

*Preserve or rehabilitate character-defining rotary/island systems and features as appropriate.*

*Wherever possible, improve safety for multiple users by redesigning and rehabilitating rotaries as roundabouts.*

Issues for Rotaries and Roundabouts

At rotaries, approaching motorists drive around a circular center island in a counterclockwise direction without stopping. There are usually a central island and miters also known as channelization or splitter islands. These islands of trees and shrubs contribute to the historic character and integrity of Connecting Parkways. On most Ocean Parkways, historic rotaries facilitate traffic flow. Rotaries with miters provide refuge for pedestrians. Single island rotaries can be daunting to pedestrians wishing to cross the road.
Roundabouts are smaller, and include miters. The alignments of approaching travel lanes and splitter islands require road users, including cyclists, to slow down or stop in order to enter the intersection. Such designs can be safely combined with pedestrian crossings, and are a recommended rehabilitation treatment of a rotary configuration that is part of a parkway’s historic design.

All of the available options can be made safer if combined with traffic calming measures that are appropriate for the parkway including enhanced or raised pedestrian crossings and specific pavement marking improvements.

Guidelines for Rotaries and Roundabouts

- If a rotary is an impediment to pedestrian cross movements, redesign as a roundabout and integrate pedestrian crossings. Refer to the MassHighway Project Development and Design Guide.

- Do not change a roundabout to a traffic signal or other control which can aggravate queueing of cars and create bottlenecks during peak hours of use, unless necessary for safety reasons.

- Where historic rotaries are being replaced with modern roundabouts, integrate pedestrian accommodation, including crossings into the design.

- Avoid reduction of the central island diameter of the rotary.

- **Ocean Parkways:** Preserve rotaries with modifications for improved pedestrian safety.

3.4.4 Interface with Public Recreational Facilities

Summit Road at Purgatory Chasm State Reservation in Sutton provides parking for a picnic shelter.
Goal
Preserve and enhance the passive recreational functions of parkways. Minimize impact of active recreational facilities.

Issues
Because Connecting Parkways are recreational spaces, they now have active recreational facilities such as hockey rinks, stadiums, baseball diamonds, basketball and tennis courts, and skateboard parks. In some parkways, these facilities diminish parkway character, reduce space available for passive recreation and block views. Other recreational facilities, such as the picnic shelters built by the CCC along Internal Park Roads, are character-defining features.

Guidelines for Interface with Public Recreational Facilities

- For new facilities, minimize curb cuts by using existing access.
- Screen intrusive facilities such as hockey rinks and swimming pools and their parking with planting. Avoid building such facilities along the parkways. If these facilities do not need to be on the parkway in order to function, relocate them, for example, to an urban lot, and reclaim the parkland for outdoor use.
- For new facilities, minimize curb cuts by using existing access points.
- If additional parking is needed and space is available, choose off-road locations that minimize loss of parkway features.
- Design parking facilities to a high standard.

3.4.5 Curb Cuts

Goal
Avoid adding curb cuts along parkways. Avoid expanding existing curb cuts. Allow no net loss of parkland where a curb cut is allowed or expanded.

Issues for Curb Cuts
DCR usually controls access to abutting private land from parkways to protect resources, enhance the recreational experience, and improve safety. Owners of abutting property continue to seek curb cuts to increase accessibility to their property, and potentially increase property value as well. Curb cuts undermine parkway character by substituting paving for vegetation, and by adding vehicular traffic. Parkways in urban commercial areas already operate at or beyond capacity. Granting permission for curb cuts is detrimental to parkways and sets a bad precedent for the future. Widening an existing curb cut to a commercial property, ostensibly for safety, in fact allows faster speeds rather than calming them. Incremental alterations damage
parkway character. The appearance of certain segments of Revere Beach Parkway is a case in point.

Guidelines for Curb Cuts

- Do not add curb cuts along parkways that are operating at or beyond capacity.

- If a curb cut is to be introduced, mitigate its effect on the landscape by keeping the width to a minimum of ten feet, contributing private property to the parkland equal in area or greater to the square footage of the proposed curb cut, and adding trees and other roadside vegetation.

- Grant permission to expand curb cuts only if there is a clearly demonstrated need and only if equal or greater parkland is added and new trees are planted.

- Do not add more than one driveway to a frontage unless justified by detailed study.

- When a wide expense of undifferentiated asphalt abuts the parkway with no provision for pedestrians, study ways to improve pedestrian accommodation. For example, construct a concrete sidewalk across the driveway.

3.5 STORMWATER MANAGEMENT/DRAINAGE

This section includes guidelines for stormwater management and roadway drainage, best management practices during construction projects, and culverts and swales.

3.5.1 Roadway Drainage

Goal
Preserve or maintain the effective functioning of roadway drainage system, reduce the volume of runoff and improve water quality.

Issues for Travelway Drainage

Stormwater management systems on historic parkways are either closed or open drainage systems. Closed systems consist of catch basins or drop inlets, some with sumps and some without, with drain pipe from these structures either connecting to a larger drainage pipe and manhole network or through the roadway embankment with discharge to a ditch or watercourse. Connecting Parkways, River Parkways and Ocean Parkways usually have closed systems where water is conveyed to catch basins and drain inlets. Newer closed systems can be constructed to recharge drainage back to groundwater depending on drainage catchment area, soil properties and local depth to groundwater.

Open systems consist of swales and ditches, either paved or unpaved, and culverts. Some early Connecting Parkways had cobblestone gutters and no curbs, a system
replaced by curbs within the period of historic significance. The drainage systems of many Internal Park Roads and Border Roads are open. Water is not collected but rather directed off the road surface to culverts, swales, and ditches. Curbing can sometimes be found on parkways with open drainage systems.

Proper design and maintenance of drainage systems are essential to the positive function and character of historic parkways. DCR has performance standards in the Stormwater Management Plan. Low Impact Development (LID) best management practices are important tools.

Maintenance of both drainage structures and the cross-section of the road ensures positive drainage of water off the road. Inadequate treatment of surface drainage on the shoulders of many parkways leads to soil erosion, loss of pavement, and undermining of the roadway subbase.

In addition, drainage systems must comply with current environmental standards. To meet water quality standards for stormwater runoff, the quantity of total suspended solids and other pollutants must be controlled through the design, management, and maintenance of storm water structures. The quantity and quality of storm water runoff are also subject to regulatory control. The standards and methodology for providing compliant drainage systems are described in MassHighway’s *Stormwater Handbook for Highways and Bridges*. This publication adheres to the Massachusetts Department of Environmental Protection’s policy for stormwater management and it is specifically written for linear drainage systems typical of roadways. The DCR Stormwater Website provides additional references and links to the DCR Storm Water Handbook. It includes construction examples of best management practices for parks and parkways.

**Guidelines for Travelway Drainage**

- Where alterations to the existing closed drainage system are required, establish the quantity of runoff contributing to various inlet points to the system. Several acceptable methods, properly applied to represent watershed characteristics, are available for determining this number.

- Prior to the design of closed drainage system improvements, thoroughly document existing conditions, with a cleaning and video survey if necessary. If during review of existing systems any unauthorized piped connections (drain or sewer) are discovered, document them and observe whether there is any flow through the connection. Forward any information concerning unauthorized piped connections to the DCR Chief Engineer.

- Continue the use of existing open drainage systems. When appropriately designed and maintained, open systems provide stormwater pollution attenuation and are resilient to high runoff peak flows. Direct runoff to
vegetated infiltration areas, minimize soil disturbance and maximize stabilization of adjacent land.

- For swales, either replace continuous paved surfaces with stone spaced to allow some infiltration or recharge to groundwater, or, if maintenance can be provided, plant low height turf species to allow more storm water to infiltrate to the ground and reduce volume of water to manage and to promote transpiration instead of run-off.

- Mow two times per season to maintain vegetation height and health. Include periodic cleaning to avoid accumulation of litter.

- Where manholes or catch basin will be installed, where possible specify pre-cast concrete manhole and drainage structures instead of brick, which requires more frequent repair and repaving of nearby parkway surfaces, especially in high vehicle traffic areas.

- Where necessary, increase unpaved roadway crowns to allow water in open drainage systems to flow more laterally off the surface into ditches, keeping velocities low and avoiding runoff concentration.

- **Internal Park Roads:** Where waterbars channel water across an unpaved parkway lacking a crown, remove the waterbar and establish a crown.

### 3.5.2 Stormwater Best Management Practices

**Goal**

*Use best management practices for stormwater.*

**Issues for Stormwater Best Management Practices**

During construction, storm water runoff can erode exposed soils, transport pollutants and degrade local water quality. Stormwater must be managed to reduce the volume of runoff and to prevent the possibility of degradation. To be in compliance with the U.S. Environmental Protection Agency’s National Pollutant Discharge Elimination System Program (NPDES), soil disturbance greater than one acre requires filing a Notice of Intent with the EPA under the Construction General Permit and preparation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP generally includes the means and methods of controlling soil erosion and water quality degradation and requires periodic inspections of the erosion control measures at the construction site. Copies of the SWPPP should be provided to the local municipal authorities.

Any surface waters within or with hydrological connection to the project site may be considered Massachusetts impaired waterways listed in MA DEP Section 303(d). Massachusetts DEP identifies certain waterways as impaired due to one or more pollutant or stress factors. When construction induces discharges of these pollutants
or amplifies stress factors to receiving waters, site control measures are necessary to improve water quality to manage those pollutants or stresses.

Guidelines for Stormwater Best Management Practices

- Place hay bales and silt fence to reduce sediment loads in storm water discharges, control construction vehicle access and egress, and reduce the tracking of dirt onto adjacent roadways.

- Use appropriate control measures for the site. If storm water leaving the site appears silted or murky, employ additional control measures or treatment improve water quality prior to discharge.

- Where construction activity involves excavation, dewater if the excavation is lower than the level of groundwater and may involve continuous pumping and result in large volumes of water to manage on site.

- Depending on the grade of the site and the adjacent landscape and hydrology, construct a treatment train, or sequence of one or more treatment units to remove suspended solids or other target pollutants prior to discharge from the site, if warranted.

- For the finished project to comply with DCR stormwater management policies and with applicable federal (USEPA and COE) discharge permits, the policy and performance standards of the Massachusetts Wetlands Protection Act and various state regulations governing surface and ground water quality, implement the most “practicable” stormwater management practices. These include post-construction operation and maintenance planning and periodic inspections to ensure that drainage systems are operating properly and that no soil erosion is taking place while vegetation becomes established. Best management practices for stormwater are listed in the DCR Storm Water Management Plan and in the DCR Stormwater Handbook available through the DCR Stormwater website which can be found at http://www.mass.gov/dcr/stewardship/stormwater/index.htm.

- Follow appropriate stormwater Best Management Practices (BMPs) including water quality swales, deep sump catch basins, sediment traps, vegetated filter strips, various configurations of detention/retention basin systems, leaching basins, recharge installations and street sweeping. Where detention of water is necessary to manage stormwater peak flows, consider infiltration/exfiltration galleries constructed underground where soils are suitable (Class A, B or C soils) instead of detention/retention basin systems that detract from historic settings.
• Use design techniques and construction methods to prevent concentrated flow of stormwater. These flows occur along slopes greater than 5%, but can also occur if the surface area is impervious or saturated on slopes of less than 5%.

• Where construction involves excavation on slopes, install stone check dams installed at the curb line or in the flow path and spaced approximately every 100-feet to reduce run-off velocity and erosion.

• If roadways are designed to have slopes of 5% or greater, use curbing to control storm water and direct it to a collection system.

• Evaluate BMPs to meet the following objectives:
  • control peak runoff rate
  • provide groundwater recharge, where site soils are suitable (Class A, B or C soils) and contain no known hazardous contaminants that could mobilize or migrate in groundwater.
  • maintain acceptable water quality

• Evaluate the effectiveness and practicability of the full range of BMPs by employing a systematic screening process with the following criteria:
  • physical constraints,
  • installation, operational and maintenance requirements,
  • regulatory restrictions,
  • site soils,
  • proximity of installation to critical wetland resource areas and other regulated receiving waters and
  • contribution from land uses with higher potential pollutant loads than roadways.

• Perform backup calculations and documentation in support of the BMP selections in accordance with MassHighway’s Storm Water Handbook for Highways and Bridges.
3.5.3 Culverts and Swales

Character-defining culvert headwalls deserve preservation.

Goal
Preserve character-defining headwalls, culverts and swales.

Issues for headwalls, culverts and swales
Culverts are covered drainage channels beneath a road that convey surface water runoff from one side to the other. They may or may not tie to the roadway drainage system. They consist of a manufactured metal, concrete or plastic pipe and masonry or concrete headwalls on either side of the roadway embankment. Culverts can be character-defining features, especially if constructed by the CCC.

Swales are shallow ditches with gentle side slopes that are paved, stone lined, or vegetated. Culverts are susceptible to clogging by accumulated debris and headwall root damage. Culverts and swales are susceptible to erosion, often from uncontrolled roadway runoff. When slopes are steep, the culvert and swale drainage system are more susceptible to damage and require increased routine maintenance.

Local drainage may include paved waterways to channel brooks in the vicinity of the travelway. These are not character-defining, and detract from the landscape.

Guidelines for headwalls, culverts and swales

- Where stone headwalls of culverts are character-defining features, do not replace them with concrete unless clad with masonry veneer replicating original character. For mortared headwalls, match the mortar. Do not patch dry masonry with mortar as this accelerates deterioration. Refer also to stone wall guidelines.
• Mark culverts consistently and clearly (but unobtrusively) to assure their inclusion in routine maintenance. For culverts with open basins, introduce a grille to screen debris.

• If surface drainage is spilling over the edge of the travelway onto the headwall from behind, regrade locally to redirect the runoff to a swale or if runoff is excessive to a grate connected directly to the culvert pipe.

• If the culvert pipe is to be replaced and is highly visible, use the same material as the original. For the rare culverts constructed with stone channels, preserve them when possible even if not highly visible.

• Remove paving from paved waterways and restore natural soil and vegetation. Where pavement stabilized the stream bed or banking, place stone pavers, field stones, or synthetic matting covered in stone to stabilize the stream bed and banking. Avoid placement of loam in swales. Loam is high in nutrients and erodes quickly. Use a synthetic mat or vegetation anchor to secure vegetation temporarily until it is established.

• When replacing a culvert over a perennial stream, ACOE regulations (implemented through local conservation commissions) require an appropriately-sized box culvert instead of a piped culvert to allow wildlife passage and improve flood control.

• Design new culverts and swales to minimize erosion by paying close attention to the road grade and other attributes that would slow the rate of runoff.

• Summit Roads: Assess the effectiveness and safety of paved swales adjacent to the road. Mark paved swales so that they do not create the illusion of wider travelways. If the road must be widened into the swale, determine whether to change the swale to insure proper drainage into a narrower, deeper swale with underground drainage. Correct cross-slopes to assure proper cross-drainage.

Chapter 4: Maintenance

This chapter provides guidance for the maintenance tasks necessary to achieve a minimum standard of care for parkways. The guidelines focus on essential tasks. At present, DCR is undertaking a collection of data to update the agency’s Facility Asset Management Information System (FAMIS), a system-wide inventory of facilities and parkways that will enable the agency to go from the basic maintenance of today to more comprehensive maintenance in the future.

The guidelines are intended to assure that parkway maintenance is consistent with a rehabilitation, if not a preservation treatment, as these terms are defined in The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The maintenance standard is predicated on existing capacity, both in house and contracted, for both labor and equipment. Determining what financial resources are necessary to bring current maintenance practices up to an acceptable level is outside the scope of this manual.

Basic routine maintenance is critical to ensuring public safety as well as maintaining parkway character. The importance of consistent parkway maintenance cannot be overstated. The public has the right to expect an adequate level of maintenance for all parkways. Obviously, the more people using the parkway, the more wear and tear they will cause a parkway. High volume parkways need more intense maintenance.

Inadequate parkway maintenance can manifest itself in many ways: rutting, potholes, erosion of the road surface and shoulders, clogged drain systems, crumbling walls, compacted soil, deadwood, weeds growing along guardrails and litter. Inadequate maintenance creates the potential to accelerate deterioration of structures and vegetation. Facilities in disrepair and overgrown vegetation send signals to the user not only about lack of care, but also about lack of safety. The strictest adherence to the design guidelines described in Chapter 3 in a parkway project can be nullified in a matter of a few years without adequate maintenance. Put another way, the key to maintaining parkway character and safety is preventive and corrective maintenance.

The following maintenance guidelines are not intended to be prescriptive. They establish baseline goals and levels of service that are consistent throughout the parkway system. More specific standards will be developed over time.

The following are goals for the maintenance of the historic parkways:
Goals
Develop parkway maintenance plans in conjunction with the implementation of capital improvement projects. Keep maintenance plans current and update as conditions and staffing patterns change. Develop a more systematic approach to preventative and corrective maintenance by integrating parkway maintenance plans into FAMIS work order system.

Develop new models of stewardship by exploring partnerships with appropriate private organizations and state agencies.

Adhere to maintenance strategies and best maintenance practices that are ecologically sustainable, enhance visual interest, and reduce maintenance costs.

Take special precautions during maintenance or repair operations to preserve the natural surroundings within and adjacent to the work area, control erosion, and avoid injury to resources or creation of a safety hazard to parkway users.

This chapter follows the general order of the guidelines in Chapter 3, but with similar tasks lumped into more general categories.

4.1 PARKWAY TRAVELWAYS

Pavement surfaces, shoulders, parking areas, markings or striping, landscape grading, sidewalks and pathways, and retaining walls all fall into this category.

4.1.1 Pavement or Travelway Surface
Resources for maintenance will logically be focused on maintaining safe travelway conditions. Routine maintenance includes snow removal and deicing in the winter and street sweeping on a regular schedule throughout the year. Resurfacing is as needed, and includes emergency filling of potholes, and filling and sealing of cracks and potholes as needed. (Maintenance trucks may not exceed nine feet in height in order to achieve clearance under bridges and overpasses.)

4.1.2 Shoulders
Shoulders are subject to debris accumulation, washouts and deposition of material left by runoff. They require at least annual maintenance, and emergency attention after severe storms. Shoulder material may not be standardized; crushed stone may be appropriate in one locale, gravel in another, and grass in yet another, requiring replenishment in kind. In areas of roadside ledge, shoulders may accumulate fallen ledge debris, which needs to be cleared as soon as it falls. Shoulders should be graded back to their original grades as necessary.
4.1.3 Parking Areas
Routine maintenance includes keeping parking areas clear of snow and litter, and emptying litter receptacles. Impervious pavements are subject to cracking and frost heaving and settling of improperly compacted subgrade. These conditions need to be analyzed every spring and repaired at the appropriate time. Pervious pavements may need new grading in the spring if conditions have deteriorated over the winter.

4.1.4 Pavement Markings
Routine repainting of faded markings is one of the most important maintenance tasks to maintain safe conditions on the travelway. Fresh, easily legible marking of crosswalks is particularly important for pedestrian safety. The work should be done with care to assure accurate application of striping each spring, after street sweeping is completed. Striping should be inspected again in the fall to make sure that all markings are still visible and easy to read.

4.1.5 Landscape Grading, Slopes and Ledge Outcrops
Landscape grading, especially within ten feet of the curb line, may need repair and new grading after heavy piles of snow have melted in these areas. Plow damage, salt, and sand accumulation and compaction are all problems that recur every spring and need to be remedied on a regular basis.

Established earth slopes are subject to erosion, and exposed ledge is subject to falling rocks. All require routine monitoring for signs of instability or erosion. Debris deposited by ledge outcrops requires attention as needed, immediately when rock large enough to pose a safety hazard has fallen within the clear zone.

4.1.6 Sidewalks and Pathways
Routine maintenance includes keeping sidewalks and pathways clear of snow and litter, and emptying the litter receptacles. Sidewalks and pathways are subject to cracking and frost heaving, settling of improperly compacted subgrade, and localized storm deposition. Deferred repair can allow invasive plants to accelerate deterioration. The DCR Planning and Engineering Division administers contracts for repairs to sidewalks and pathways. A systematic approach to a replacement schedule for sidewalks and pathways is needed.
4.1.7 Retaining Walls

Walls are subject to wear and tear from water and ice damage, requiring repair that is often not within DCR staff expertise and therefore is deferred. A systematic inspection of all retaining walls is recommended at least yearly in the spring. After this inspection, minor repairs should be made and serious problems put on a capital improvements list. For guidelines on non-routine repair tasks that may be addressed as part of a project, refer to the wall guidelines in Chapter 3.

Walls are also easy targets for graffiti. If left in place for a long time, they convey a negative message about parkways and parkland care. Every effort should be made to remove graffiti within 72 hours of discovery. When operations staff is not able to address the graffiti, the location and nature of the graffiti should be recorded in FAMIS.

4.2 PARKWAY CONTROL OF VEGETATION

Tree care, shrub care, grass care, vistas and overlooks, trailheads and crossings, and invasive vegetation control all fall under this category.

Roadside parkland routinely accumulates windblown litter and snowplow debris. The soil here is highly vulnerable to compaction by pedestrians and stray vehicles. Roots of trees, shrubs and grass suffer from deicing chemicals and overuse by pedestrians and runners. Grass within the first ten feet of the roadway does more poorly than anywhere else in the parkway landscape, and yet is the most visible to parkway users.

An inventory, in electronic format, of all trees, shrubs and grasses should be maintained. The size, species and condition should be put into the inventory so...
that long-term care can be systematically planned and the cost of vegetation management and replacement can be ascertained and put in the annual budget.

Coded signage, flagging, fencing or other barriers should protect Commonwealth-listed rare plant species during any intense use, such as a large event, during maintenance operations or during construction projects.

4.2.1 Tree Care
Trees contribute to the beauty of a parkway more than any other natural element. Their presence, especially the presence of mature specimens, is critical to the character of the historic parkways. Their preservation, continued survival and wellbeing are critical. The level of maintenance for trees must be as high as their importance.

A vegetation management plan should be included in every parkway maintenance plan. A regular, rotating system of tree maintenance – pruning, fertilizing, pest management and replacement is recommended.

Deferred maintenance along Alewife Brook Parkway now necessitates clearing the path and removing a mature tree to reset the stone step.

Mowing has damaged a tree trunk on Blue Hills Parkway, Milton.
At least five common shade trees, Norway Maple, Sycamore Maple, Autumn Olive, Amur Cork Tree, Black Locust are now listed on the Commonwealth’s invasive plant list. Planning for their replacement over time along the historic parkways should be done now as well.

Trees routinely accumulate deadwood. Only when a major branch is dead or an unsafe condition has arisen, should tree work be undertaken. All pruning should be done under the supervision and direction of a certified arborist. In such situations, large equipment and a bucket truck may be required. Special attention needs to be paid to protecting the soil and lawn when using these large trucks to minimize compaction. To protect tree roots, no large equipment should be parked under the canopy of parkway trees at any time.

Pruning live branches or healthy trees may be required in some circumstances. If a volunteer tree of a common species is significantly blocking an important view, the removal of a healthy tree or limb should be considered. In some cases where the naturalistic form of highly visible trees has been lost, judicious pruning can recover their original form.

Invasives along the Internal Park Road in Bradley Palmer State Park, Topsfield, need removal.
4.2.2 **Shrub Care**

Shrub care, like tree care, needs to occur on a yearly basis in the spring. Shrub care in more rural parkways means occasional pruning, monitoring of shrub masses, and litter pickup. In more urban areas with high volume pedestrian, bicycle and roller blade use, the planting of shrubs should be done carefully and only in areas with little traffic because of the high mortality rate of the shrubs. A regular program of fertilization, pruning, pest management and replacement is recommended. In urban areas, shrub masses can attract rats and create hiding places, so careful monitoring is warranted.

4.2.3 **Grass Care**

Grass along the travelway should be healthy and vigorous. These areas should be mowed when the grass exceeds 6 inches in height. Litter should always be removed before mowing. Established turf requires not only regular mowing in season, but also annual fertilizer application and weed control, and reseeding and aeration as needed.

Weed removal, where control has failed, needs to be put on the summer task list. Weeds thrive under guardrails and fencing and between boulders where mowing is difficult. Environmentally friendly herbicides may be used. However, consideration should be given to the environmental sensitivity of certain parkways. Relevant agency policies and permit requirement regarding the application of these substances must be followed.

4.2.4 **Vistas and Overlooks**

Vistas or special view corridors require monitoring every two years to make sure that the character-defining views to the water, the beach or the valley below are maintained for parkway users. A certified arborist who is sensitive to the specific characteristics of the local plant community should make the decisions about tree removal. The arborist should retain any uncommon or important habitat species, and remove all invasive species, as identified in the Design Control Report. After vistas have been re-established, they should be replanted with an appropriate seed mix so that the disturbed slopes are not bare and susceptible to erosion. Erosion control matting will help stabilize banks.

Summit Roads, where side slopes may approach 1.5:1, may require selective thinning or clearing of volunteer trees within 200 feet of the travelway, for a distance of at least 100 feet along the travelway. Vista corridor maintenance operations should avoid disturbance of Commonwealth-listed Rare Species and Natural Communities, identified by the Massachusetts Division of Fisheries and Wildlife (DFW) Natural Heritage and Endangered Species Program (NHESP). No new vistas should be created in these areas, within delineated wetlands or woodland vernal pools. Even for existing vistas, any unnecessary clearing of vegetation, grading, planting, or dumping of materials within these areas should be avoided. The maintenance activity may require permits from both the NHESP and the local conservation commission.
4.2.5 Trailheads and Crossings

Other special vegetation maintenance areas are trailheads and crossings. The vegetation must be pruned back so that the trailheads and important crossings are visible to trail users at all times. Spring and fall inspections of these areas are recommended. Pruning should be done under the supervision and direction of someone skilled in shrub and tree pruning.

4.2.6 Invasive Vegetation Control

Invasive species and weed trees, which are second growth volunteer species, are an issue on all parkways. The 2006 Massachusetts Prohibited Plant List is included in Appendix I of these guidelines. Updating the maintenance plan for each parkway with a new phased plan to eliminate all the specified invasive plants within the parkway is a priority. While some of these plants can be easily eliminated, most of the invasive plants are difficult to eradicate and it often takes a three-year program to get rid of them. Invasive tree eradication should be phased in over a ten-year period, because several of the trees listed have helped form the distinctive character of the parkway. The shrub, perennial and grass plants are easier to replace with native plantings because they are not as visible and character defining.

Invasive eradication is especially sensitive along Internal Park Roads, which lie in the heart of parkland that is likely to have the least disturbed plant communities in its region. These invasive species are identified in the Design Control Report for each parkway project. For sites without such documentation, regional data are helpful. The Nature Conservancy’s Wildland Weeds Program 2002 provides...
specifics for such rapidly spreading species as garlic mustard, which is already a threat at Mount Greylock.

4.3 PARKWAY SITE ELEMENTS

Traffic barriers, guardrails, gates, fencing, railings, signs, trailheads, benches, picnic tables and trash receptacles are all addressed in this section.

Parkway site elements add safety, comfort and information to both the vehicular and pedestrian environments. The condition of the parkways is probably most evident when they have been vandalized or have deteriorated. There should be an inventory, in electronic format, of all these elements so that they can be replaced periodically and repaired as needed. Readily accessible replacement items or parts are especially important for to facilitate repair.

4.3.1 Traffic Barriers and Guardrails

Maintenance of guardrails is usually performed, by contract, administered by the Planning and Engineering Division and, in the case of post-collision repairs, coordinated with insurance companies. Given that the annual operating budget includes only a modest budget for repairs, they are concentrated in areas where damage creates a safety hazard for vehicles, cyclists or other users. Over time, a regular system of spring inspection for all traffic barriers and guardrails and summer repair is recommended.

Timber guardrail in Joseph Allen Skinner State Park in Hadley leans from vehicular impact.
4.3.2 Gates, Fencing, Railings
Like the guardrails, the current maintenance is administered by the Planning and Engineering Division and is concentrated where there is a safety threat. The gates, fencing and historic railings are important character-defining features of the historic parkway system, and regular maintenance and repair are recommended.

4.3.3 Signs
Well-maintained signage is important for safety and enhancement of the parkway experience. Signs in disrepair—especially problems with support, the legend, or reflectivity—undermine the message that DCR parkways are special and receive adequate care. A regular inspection of their condition and immediate replacement of missing parts are warranted.

4.3.4 Trailheads and Trail Crossings
As in the parkway vegetation control section of this chapter, the regular inspection of the trailhead and crossing signs and directional information is needed to protect the parkway users’ safety.

4.3.5 Benches, Picnic Tables and Other Site Furniture
While these site elements are not always visible from the travelway, their condition sets the tone for the pedestrian parkway experience. If the benches or picnic tables are vandalized or have broken parts, pedestrians will feel less safe in this environment and may curtail their use of the parkways. Graffiti on site furniture needs to be removed immediately to foster the sense that the parkway is being well watched and maintained. The site elements themselves should be inspected twice a year, in the spring and the fall, for any missing pieces. If the broken part does not affect safety, it can be replaced during the summer or winter months. If there is a safety issue, the part should be replaced immediately.

4.3.6 Trash Receptacles
Trash or litter baskets need daily attention during the months that the parkways are actively used. Trash receptacles should never become more than three quarters full and certainly should never overflow. Each parkway should have a Design Control Report and a maintenance plan. Those two documents should determine how often the trash is picked up during the different seasons of the year. The trash receptacles themselves should be inspected in the spring and fall and replaced with new receptacles if warranted, or else repaired.

4.4 PARKWAY UTILITIES
Utilities other than drainage, traffic signals and lighting fall under this category.
4.4.1 Utilities
Local utility companies maintain electric, telephone and telecommunication, and gas service, on and adjacent to DCR land. The utility company gets permission to enter DCR parkland for routine maintenance and upgrading service. These tasks constitute a DCR management issue because any routine maintenance service by these companies affects the parkland. DCR must educate outside utilities about the fragile natural environment present at these work sites and the impact their equipment has on these natural areas that are enjoyed by many people on a daily basis. It is not a typical repair on a municipal street. DCR needs to monitor the utility to assure safety and resource protection, and restoration of the landscape to pre-construction conditions.

4.4.2 Traffic Signals
Traffic signals within the parkway are also under different ownership. The ones owned by DCR and MassHighway also require maintenance of the Boston Traffic Department loop detectors. DCR has the added management responsibility for notifying all the owners of any signal malfunction. An annual monitoring of all traffic signals and their standards will identify which ones need repair.

4.4.3 Lighting
Maintenance of lighting on or adjacent to DCR land depends on the ownership of the lights. DCR maintains the streetlights within its ownership, which are usually the historic “1907” fixtures. However, most lighting along parkways is not owned by DCR, but is owned and maintained by the local electric utility. Again, this management issue requires DCR monitoring of the utility to assure safety and resource protection, and restoration of the landscape to conditions as good as or better than the preexisting conditions after the repairs are complete.

DCR is phasing in programs of relamping the parkway lights with full cut-offs, and of converting all parkway fixtures to the historic “1907” or a parkway-appropriate fixture.

4.5 PARKWAY DRAINAGE UTILITIES

Drop inlets, catch basins, stone ladders, paved and grass waterways or swales, and headwalls fall under this category.

4.5.1 Drop Inlets, Catch Basins, and Stone Ladders
The structural condition of all drainage structures, inlets, outlets, sumps, and piping should be checked yearly. The cleaning of the sumps should be part of a regular maintenance program, from four times to once a year, depending on the volume of use on the parkway and the use of salt and sand. In the annual visit, needed repairs for the structures are noted for repair in the summer months. If the structure is seriously damaged, it is listed for replacement. Grills and grates need
cleaning after big snow and rain storms and in the fall after the leaves drop to keep them workable.

4.5.2 Paved Waterways or Swales
In the spring, paved waterways and swales need to be checked for any cracks or holes in the paved waterway surface. Swales need to be checked for the structural integrity of the pavement or stones for washouts. If the damage is minor, it needs to be repaired in the summer months. If the damage is major, it should be listed for structural work within the same year if possible.

4.5.3 Vegetated Waterways or Swales
In the spring, vegetated waterways and swales need to be checked for erosion and clean debris. The sub drain system should be inspected for structural problems, problems that should be repaired in the summer months. Eroded areas should be reseeded with grass using rye grass, as a nurse crop, mixed with the appropriate seed mix for the parkway. Slopes greater than 5% need erosion control matting as well. The grass should be mowed to the proper height as per the parkway maintenance plan.

Erosion near the Estate Road bridge at Maudslay State Park in Newburyport requires immediate attention.
4.5.4 **Headwalls**

After the spring rains, the headwalls should be checked for internal drain line damage and structural damage to the headwall itself. Minor repairs should be made in the summer months and any volunteer vegetation removed yearly. Major structural damage to the headwall structure should be listed for major repair or replacement using the same materials.

Deferred maintenance on Wickett Pond Road in Wendell State Forest has left the culvert clogged.

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MAINTENANCE SCHEDULE
for
HISTORIC PARKWAYS

- Routine maintenance, now done by DCR
- Desired or enhanced maintenance level

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DCR Maintenance Activities (includes some MHD maintenance activities)

- Replace in kind, restore crown and cross slope as necessary, fill and seal cracks.
- Fill and repair potholes.
- Power sweep the roadway surface according to the volume of parkway. Ocean parkway swept daily.
- Determine whether DCR/MHD plows roadway during winter storms and frequency.

- Use reduced salt regimens in environmentally sensitive areas in winter.
- Plow selected DCR parking areas.
- In spring, regrade shoulders to predetermined slopes, replace materials lost to washouts, remove debris.
- Sweep and monitor parking at curbs and adjacent parallel and perpendicular vehicular parking.
- Make list of unmaintained parking areas.

- Repaint all pavement striping every spring; check in the fall for fading and repaint if necessary. DCR policy to reduce pavement markings to a minimum.

- Inspect for winter damage and debris in the spring.
- Remove accumulated salts within the first ten feet of parkland curb by soaking with water in spring time to leach out salts.
- Repaint all pavement striping every spring; check in the fall for fading and repaint if necessary. DCR policy to reduce pavement markings to a minimum.

- In spring, check for damage, overhanging branches.
- Sweep all salt/sand off pathways.
- Make list of repairs for summer work.
- In summer, pull weeds from pavement cracks.
- In fall, remove leaves weekly.
- In winter, plow around schools and designated commuter routes.

- In spring, check for damage, make list of repairs for summer work.
- In summer, pull weeds/ volunteer plant growth from cracks in masonry and repair.
- Remove leaves from weepholes in fall.

- In spring, check for damage, make list of repairs for summer work.
- In summer pull weeds/ volunteer plant growth from cracks and repair.
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**DCR Maintenance Activities (includes some MHD maintenance activities)**

- DCR now maintains trees within ten feet of parkway, curb or edge of paving, and needs to develop a plan to expand the care for its adjacent parklands, either by starting public-private partnerships or by standardizing and funding more maintenance staff.
- A certified arborist checks all winter damage in the spring, removes large branches/fallen trees in circulation areas after winter storms, makes list of pruning work for late spring and summer.
- In remote areas, prune in winter months when ground is frozen.
- Prune dead branches and trees overhanging pathways and roadways as a priority maintenance task.
- For tree replanting follow recommendations of Parkway Report for location and species, including replanting from insurance from accidents.
- In fall, remove deciduous leaves and needles off pathways and roadways. Rake into plant beds as mulch.

A street tree management and replacement program, including pruning, fertilization, pest management, protection from mechanical stress, species diversity and programmed replacement is in process.

- In spring, check for damage, make list for pruning and replacements.
- Plant new shrubs in spring and fall planting seasons, pruning damaged shrubs after blooming is completed. Check proper pruning times for specimen plants.
- Clean trash out of shrubs on a weekly basis.
- Do not plant shrubs in unprotected areas of the urban parks. Replant shrubs in locations and with species recommended in Parkway Report for each parkway.

- In mid-March, take soil sample(s) and send to UMASS Soil Testing Service for soil amendments.
- Apply the required fertilizers and weed controls as per DCR specifications.
- Mowing of traditional grasses shall be as per DCR specifications for grass length.
- Meadow grasses and other special grasses may only be mowed once in the summer months. Investigate correct time for mowing for each grass plant type.
- Coordinate mowing with the nesting times of indigenous birds so that no mowing occurs during this time.

- Remove hazardous trees and limbs.
- Selectively prune and thin trees and underbrush for scenic enhancement every two-to-five years.
- Identify invasive vegetation in the spring and remove.
- Recheck location of invasives for the following three years.
- Replant these disturbed areas immediately after removal of invasives.
- Repeat vista/overlook monitoring every other year.

- Remove hazardous trees and limbs.
- Selectly prune and thin trees and underbrush for access and safety.

- Check the January 2006 Commonwealth list of invasive plants. Identify invasive plants in visible locations on each parkway.
- Develop a ten-year plan for replacing the large trees on the invasive list with native trees. Do the same for shrubs, perennials, vines and grasses.
- Replace the less visible plants in the second ten-year period.
- Monitor all removal spots for a period of three years and remove any new invasive vegetation as per Nature Conservancy or Arnold Arboretum specifications.
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<td><strong>A. Traffic barriers/guardrails</strong></td>
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<td>• Check in spring for repair and/or replace segments.</td>
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<td>• Repair guardrail in areas where there has been significant enough damage to create a safety hazard for vehicles.</td>
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<td>• Weed below barriers/guardrails every month during the summer. Repair and repaint in the summer.</td>
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<td><strong>B. Gates, fencing and historic railings</strong></td>
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<td>• Check in spring for repair and/or replace foundations, fencing and gates. Repair during summer months.</td>
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<td>• Check for DCR’s casting patterns for fencing and historic railings. Immediately repair railings and fences to protect safety of users.</td>
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<td><strong>C. Signs</strong></td>
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<td>• Check in spring for repair and/or replace foundations, posts, panels and legends.</td>
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<td>• Repair directional and traffic signs immediately. Make other repairs in summer.</td>
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<td>• In all parkway signage, conform to DCR graphic standards manual. When a dispute arises between the MUTCD and DCR manual, follow DCR standards.</td>
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<td><strong>D. Trail heads and trail crossings</strong></td>
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<td>• In spring replace material lost to washouts and/or reconstruct shoulders and parking areas with specified design material to stabilize.</td>
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<td>• Inspect stone and wood steps for failure. Repair steps and signage immediately.</td>
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<td>• Perform less immediate trail and vegetation control work in the summer months.</td>
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<td><strong>E. Benches/picnic tables/railings</strong></td>
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<td>• In spring, check damage to benches, picnic tables and railings and replace immediately if dangerous.</td>
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<td>• Check site furniture and replace any serious damage immediately. Inventory less serious damage for summer repair.</td>
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<td>• Do annual maintenance chores, like repainting and crack repair, as needed in the summer months.</td>
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<td><strong>F. Trash receptacles</strong></td>
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<td>• In urban areas and areas of high use, empty receptacles daily, on ocean parkways twice daily during season.</td>
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<td>• Make ocean trash receptacles bird proof. In areas with less traffic, empty either twice a week or weekly depending on maintenance schedule for the parkway.</td>
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<td>• In the spring, check the condition of the receptacles and repair as needed in the summer months.</td>
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**Parkway Site Elements**

| **A. Utilities, other than drainage** | ![■■■■](image) | | | | | | | | | | | |
| • After the winter, check all DCR utilities to determine their condition. |
| • Set up an electronic survey of all utilities in the parkway, their ages and the condition of their lines and elements, and determine a 20-year replacement plan. |
| • Fix any urgent problems immediately. |
| • After the DCR utility replacement plan is completed, work with other utilities owners to coordinate their utility replacement plans. |
| **B. Traffic signals** | ![●■](image) | | | | | | | | | | | |
| • Coordinate traffic signal repair with proper owner. |
| • Coordinating with MHD, maintain all loop detectors, including BTD loop detectors in parkway. |
| • Notify owner immediately of signal malfunction. |
| **C. Lighting** | ![●](image) | | | | | | | | | | | |
| • Repair or replace lights outside curb-to-curb boundaries as needed. |
| • Coordinate other light repair with proper owner. Notify other owners immediately of light malfunction. |
| • For DCR light poles, check all parkway poles in the spring for working order of bulbs and damage to poles. |
| • Replace luminaire bulbs within a week of their failure. |
| • Repair damage to pole during summer months. |
| • Replace fallen poles and lights within the week of notification. |
|-------------------|------|------|------|------|-----|------|------|------|-------|------|------|-----|---------------------------------|
| A. Drop inlets, catch basin, stone ladders | | | | | | | | | | | | | In spring, check all structures. Clean debris from structure and grate. |
| | | | | | | | | | | | | • Remove sand/debris from sumps as needed on an annual basis in low use areas, and in high use areas, clean sumps either twice or four times a year depending on the particular parkway maintenance plan. |
| | | | | | | | | | | | | • Repair any leaks and concrete or masonry cracks in structures during the summer months. |
| B. Paved waterways | | | | | | | | | | | | | In spring, check for any cracks or holes in waterway surface. |
| | | | | | | | | | | | | • Repair/repave eroded waterways as needed in the summer months. |
| | | | | | | | | | | | | • Inspect sub drain system where erosion is evident. |
| | | | | | | | | | | | | • Remove weeds twice during the summer months. |
| C. Grass waterways | | | | | | | | | | | | | In spring, check for erosion and clear debris. |
| | | | | | | | | | | | | • Mow grass to maintain proper height as per each parkway’s maintenance plan. |
| | | | | | | | | | | | | • Inspect sub drain system where erosion is evident. |
| | | | | | | | | | | | | • Reseed if necessary but inspect weekly for six weeks to reseed after rainstorms until new grass is established. |
| | | | | | | | | | | | | • Add rye grass seed for quick cover. |
| D. Headwalls | | | | | | | | | | | | | In spring, check for winter damage. |
| | | | | | | | | | | | | • Repair masonry or concrete during summer months. |

This matrix is based on the model for the Mt. Greylock Parkway Maintenance Plan prepared by Vollmer Associates.

* Notes: 1. Immediately paint over or remove spray paint graffiti and other visible signs of vandalism as it has been observed that visible acts of vandalism appear to attract more destructive acts. 2. If any hazardous material is spilled on the parkway, immediately contact the appropriate DCR department for instructions for removal. Cordon off the area immediately.
Bibliography

I. Available in Print (Web availability is noted)

An essential companion to this manual.

An essential reference and in many respects the model of this manual.

General


http://www.cr.nps.gov/hps/tps/briefs/brief36.htm
Good basic guideline for the process of planning for the treatment of historic landscapes. Provides definitions of various historic landscape types and treatments, and a step-by-step process

Gives the fullest guidance on treatment of historic landscapes

http://bookstore.gpo.gov
Provides guidance in the identification, inventory, evaluation and treatment for historic roads within National Park System, in particular the preparation of a Cultural Landscape Report (CLR). Highly analogous to the process and guidelines contained in this manual.

A paper presented at the Preserving Historic Roads conference in Omaha, Nebraska, April 2002.

Marriott, Paul Daniel. 1998. *Saving Historic Roads.* New York: John Wiley & Sons, Inc. Provides a good examination of the complex issues surrounding historic roads, and provides design and policy guidelines for adapting contemporary transportation laws and engineering practices to these resources.


Good general history of parkways included in this far-ranging survey by a practicing landscape architect.

Describes the content and format for a cultural landscape report (CLR), which is the primary tool for long-term management of a cultural landscape. The section entitled Documenting the History describes the work that results in a CLR. A CLR is often prepared when a change is proposed, which is particularly important for historic parkways that can be threatened by “improvements”. Documents tasks from research through development of a treatment plan and maintenance guide.

Access


ADA Accessibility
http://www.fhwa.dot.gov/environment/sidewalk2/

**Barriers**

http://www.aot.state.vt.us/planning/Documents/Guardrail.pdf

**Bicycle Users**


**Pedestrian Users**


**Signage**


**Walls**


II. Available on Web only

**General**


National Scenic Byways Program, includes information on state scenic byways program and corridor management plans

http://www.clf.org/general/index.asp?id=386
*Take Back Your Streets: How to Protect Communities From Asphalt and Traffic*

http://commpres.env.state.ma.us/index.asp
Community Preservation Initiative – Massachusetts Executive Office of Environmental Affairs

http://www.ecs.umass.edu/baystate_roads/index.htm
Bay State Roads - Massachusetts Local Technical Assistance Program

Federal Highway Administration – Historic Preservation and Archeology Program

http://www.historicroads.org
“Dedicated to the identification, preservation and management of historic roads”

http://www.ite.org
The Institute of Transportation Engineers is an international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs.

http://www.mass.gov/dcr/stewardship/histland/histland.htm
Historic Landscape Preservation Initiative

http://www.nationaltrust.org/issues/transportation/design_guidelines.html
National Trust for Historic Preservation – Transportation Issues and Initiatives
http://www.sec.state.ma.us/mhc
Massachusetts Historical Commission Homepage. Technical Services Division FAQs on Review and Compliance, availability of PNFs, MACRIS on-line search tool of MHC historic properties database and other relevant topics.

http://www.sec.state.ma.us/mhc/mhcpdf/difference.pdf
There’s a Difference! (Massachusetts Historical Commission) defines the difference between national and state registers of Historic Places

**Design and Design Alternatives**

http://www.contextsensitivesolutions.org
“the Transportation community’s Online Resource Center for Context Sensitive Solutions” includes case studies, national and international, searchable by road cross section element, and traffic calming

http://www.fhwa.dot.gov/csd/
Federal Highway Administration – Context Sensitive Solutions

http://www.frcog.org/planpub.html
Franklin Regional Council of Governments - Design Alternatives for Rural Roads Includes information on low speed/low volume design

https://www.ite.org/traffic/tcsatate.htm#tc sop
Good survey and toolbox of traffic calming techniques by Institution of Transportation Engineers (ITE)

http://www.pedbikeinfo.org/
The Pedestrian and Bicycle Information Center is a clearinghouse for information about health and safety, design and engineering, advocacy, education, enforcement and access mobility.

http://tfhr c.gov/
Federal Highway Administration – Turner-Fairbank Highway Research Center

http://www.trafficcalming.org
Good survey of traffic calming techniques

**Laws and Regulations**

http://commpres.env.state.ma.us/content/ptbo.asp
Preservation Through Bylaws and Ordinances (updated through 2003)
Overview of legal issues (including roads) related to historic preservation in Massachusetts
http://www.mass.gov/czm/envpermitmaprotectionact.htm
   Wetlands Protection Act – overview

http://www.mass.gov/expr/mepa/
   Massachusetts Environmental Policy Act Office

http://www.state.ma.us/legis/laws/mgl/40-15c.htm
   Scenic Road Bylaws – full legal text

http://www.mass.gov/legis/laws/mgl/gl-44b-toc.htm
   Community Preservation Act – full legal text

   Wetlands Protection Act – full legal text
Appendices

Appendix A: Parkway History

The parkways of the Metropolitan Parks System contained the first American recreational travel ways. Their management over the past century reflects the changing context of automobile culture and transportation design nationwide.

The metropolitan Boston parkways evolved from the work of noted landscape architect Frederick Law Olmsted who, along with Calvert Vaux, created the first scenic carriageways in Central Park in 1858. Ten years later, the partners coined the term “parkway”, as part of their 1868 designs for the Park and Parkway System of Buffalo, New York and Prospect Park in Brooklyn. Olmsted’s parkway concept came to Boston in 1887, when he proposed a system of parkways linking the Boston Common and Public Garden to the Fens, Leverett Pond, Jamaica Pond, the Arnold Arboretum and Franklin Park in an “Emerald Necklace” of public green space that would encircle the city. This ribbon of green space, connected by parkways, heavily influenced the development of the metropolitan parks system.

Construction of the Emerald Necklace was nearing completion in 1893 when the Metropolitan Park Commission was established for the purpose of protecting open space for regional public benefit. For this new agency, journalist Sylvester Baxter and landscape architect Charles Eliot proposed a parkway system, noted as “the most notable scheme of comprehensive metropolitan park planning” in the United States.1 As Charles Eliot wrote in 1893, “Local breathing spaces and the existence of pleasant features of natural scenery in the neighborhood are really as essential to the moral and physical health of a community as the absolutely utilitarian improvements that are usually given precedence.”2 Although Eliot was himself a noted landscape architect with ties to the Olmsted firm’s Boston work, it was Baxter, the journalist, who envisioned landscaped “special Pleasure-ways” as part of the system from the start.

Since the 1870s, Baxter argued for a regional government for Boston and towns within a ten mile radius to handle functions that “are of general public concern rather than local interest,” including water supply, sewers, transportation and public parks. The state’s creation of the Metropolitan Sewerage Board in 1887 and the founding of the Trustees of Public Reservations by Eliot and Baxter in 1891 set the stage and illustrated the need for establishing a regional governmental body to protect the threatened open spaces of the Boston area. Within ten years of its creation, the Metropolitan Park Commission had acquired much of the park system known today, including major woodland reservations at Blue Hills and Middlesex Fells, Revere Beach, the Upper Basin of the Charles River, Hemlock Gorge and Beaver Brook.

The Commission quickly added parkways to its vision of publicly owned reservations of significant uplands, river corridors, and beaches. The Boulevard Act of 1894 empowered the Commission to create parkways to connect the reservations to each other and to population centers in order to increase recreational access. The two earliest Connecting Parkways were the Middlesex Fells and Blue Hills Parkways, which linked Boston with the two largest...
Metropolitan Park reservations. These parkways were designed to provide a pleasing travel experience within scenic surroundings, with carriages, horseback riders and trolleys traveling on separate travel ways separated by planted medians.

The first generation of metropolitan parkways provided direct access from urban areas to major reservations, defined the edges of shore reservations, or followed Boston’s major rivers. After the Metropolitan Park Commission merged with its water and sewer counterparts to form the Metropolitan District Commission (MDC) in 1919, a second generation of parkways was created to link various parts of the regional park system. Parkway character was protected by legislation restricting parkway cross-traffic and “curb cuts” for abutters. While most parkways were restricted to recreational pleasure vehicles, some Connecting Parkways were open to general traffic, and later became part of the state highway system.

Park-ways and the state park system

Although the park roads of the broader state park system did not grow out of one regional vision, their history is closely tied to the history of outdoor recreation in Massachusetts. Long before the Commonwealth even had a park system, the early road systems of many early state parks such as Mount Greylock (1898) and Wachusett Mountain (1899) were improved to provide access to profitable summit houses and observatories at the state’s higher peaks. The Department of Conservation (DOC) was created in 1919 to manage these state reservations, and by World War II had acquired 180,000 acres, all with an increasing need for improved access. Between 1933 and 1940 the Civilian Conservation Corps (CCC) transformed many nineteenth century roads into comprehensive recreational parkways. The CCC had thirty-one camps in operation, providing forty-seven state forests with roads and recreational facilities based on the rustic planning and design principles of the National Park Service.

Between 1905 and 1945 the popularity of automobile travel soared, and demand for public access to the reservations in the Boston area spurred great developments in the parkways of the Metropolitan District Commission. During this period some travel ways were widened, and traffic circles and overpasses were built to accommodate the growing traffic flow. These “modern” improvements were an important phase of the parkways’ historic evolution. Despite these growth spurts, however, the parkways remained a defining recreational function of the Metropolitan Park System.

After World War II, the growth of the middle class, the relocation of urban populations to the suburbs, and the expansion of the national movement toward superhighways changed the management context of the MDC parkways. Between 1949 and 1956, many Boston parkways were transferred to MDC and Route 128 was built to reroute traffic around Boston. On June 29, 1956, President Eisenhower signed the Federal Aid Highway Act, in response to overwhelming national pressure for safer and speedier highways. The Cold War-era President also felt that the
newer, multi-lane highways were essential to a strong national defense. The same year, the American Association of State Highway Officials (now AASHTO) published the first national road standards. The emphasis of highway development had shifted to safety, utility and efficiency, and away from recreational and scenic values – a trend that continued into the 1990s.

In the 1990s the federal transportation model experienced a renaissance that reintroduced beautification, natural resource enhancement, and cultural resource protections into the federal highway program. Passage of the Intermodal Surface Transportation Act (ISTEA) of 1991 and the Transportation Equity Act (TEA-21) of 1998 provided incentives for systematic integration of aesthetics and place-making and provided comprehensive planning and design opportunities for transportation facilities. In 1997 the Federal Highway Administration published *Flexibility in Highway Design*, underscoring the positive movement of highway engineers to integrate historic and aesthetic considerations into highway design. The FHA stated that “this Guide has been prepared for the purpose of provoking innovative thinking for fully considering the scenic, historic, aesthetic and other cultural values, along with safety and mobility needs, of our highway transportation system.”

More recently, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) authorized the federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009, emphasizing safety and flexibility of approach in design decisions.

Following the larger trends in traffic engineering and road design, the New England region took the lead in parkway preservation in the 1990s. For example, the sensitive treatment of the Merritt Parkway in Connecticut provided a compelling example for heavily used parkways everywhere. The 2006 District Court decision preventing major alterations to the parkway continues this trend.

Vermont was at the forefront of context sensitive design, publishing its own Vermont State Design Standards in 1997 as an alternative to the AASHTO model, and in 2001 the Vermont Agency of Transportation published its *Study of Guardrail Selection Criteria for Vermont Highways*, driven substantially by scenic road issues.

In Massachusetts, however, the history of parkway management in the second half of the twentieth century is complicated. As the Eisenhower Interstate Highway System evolved as the primary transportation model, funding for the maintenance of the MDC parkways decreased. As a result, many of the metropolitan parkways and the roads of the Massachusetts park system fell into disrepair between 1945 and 1970. In 1959, the state legislature first considered and decided against a transfer of MDC parkways to the Department of Public Works, establishing a precedent for the doctrine articulated here that parkways should not be managed like ordinary highways.³

Although state legislature authorized open space bond bills in the 1980s that funded park and parkways improvements, maintenance funding continued to shrink. In 1991, a proposed organizational merger of the MDC and the Department of Environmental Management (DEM) recommended that the Massachusetts Highway Department (MHD) manage parkways. This
proposal has not been realized despite ten years of legislative efforts supporting the transfer of parkways to the highway department.

In 2001, the Executive Office of Environmental Affairs (EOEA) launched the Historic Parkways Initiative to establish a framework for the preservation and management of the historic parkways under the care of the MDC and the DEM. This interagency initiative involved the DEM and MDC as well as the Massachusetts Highway Department and the Massachusetts Historical Commission (MHC). The development of these parkway treatment guidelines was one of the primary goals of the Initiative.

Despite changes in leadership in state government since 2001, the work of the Historic Parkways Initiative continued. In 2003 the Metropolitan District Commission and the Department of Environmental Management merged to form the Department of Conservation and Recreation (DCR), bringing the management of the state’s parkways under one parks agency. Over the past five years, the Massachusetts Historical Commission has nominated and listed most of the parkways of the Metropolitan Parks System of Greater Boston on the National Register of Historic Places. In addition, the Massachusetts Highway Department published their new context-sensitive-design-based Project Development and Design Guidebook in January 2006.

The completion of these parkway treatment guidelines is an important step into the next phase of historic parkway stewardship.
Appendix B: Managing Historic Parkways---Understanding the Threats and Issues

The Commonwealth is under constant pressure to modernize parkways. Legitimate issues such as safety and increasing traffic volume are often cited as the primary reasons for altering a parkway in the name of modernization (see Tort Liability sidebar). However, the actual culprit is the lack of information concerning the historic status of the parkway and the characteristics that support this determination. Preserving parkways while ensuring that safety guidelines are followed is an attainable goal. Collaboration between designers, engineers, planners, historic commissions, and preservationists can prevent the degradation or loss of parkways or parkway features. Through collaboration, stakeholders who start on opposing sides can find common ground and identify methods to preserve their historic characteristics and ensure public safety.

A major milestone in this effort is the Massachusetts Highway Department’s *Project Development and Design Guide* (2006). It promotes collaboration between design and preservation professionals in road development projects. Not only do the guidelines address issues directly associated with road features, they also emphasize the setting and how changes in the surrounding corridors and communities can strongly affect the character of a road. Addressing the larger picture when developing road projects is known as “context sensitive design” – a relatively recent strategy in municipal transportation planning, and one that takes into account the historic significance of a parkway.

The following is a selection of the major threats to the integrity of a parkway.

**Lack of Awareness and Understanding**

Engineers and preservationists can find themselves in opposition when discussing options for the alteration of a parkway. However, the root of this disagreement often lies in reluctance to learn the language of the other’s profession, and not in the stubbornness or ignorance (real or perceived) of the other side. It is imperative that all parties learn each other’s vocabulary, which often uses the same words with different definitions, and attempt to develop a common language for furthering their project.

For example, to preservationists the terms restoration and rehabilitation (as well as preservation and reconstruction) are defined in the *Secretary of the Interior’s Standards for the Treatment of Historic Properties* and are exclusively concerned with outlining the levels of treatment for historic properties. For traffic and civil engineers, the terms restoration and rehabilitation usually refer to roadway improvement projects (also known as “resurfacing, restoration, and rehabilitation” or 3R projects) projects that are associated solely with federally-funded projects that address pavement condition and minor road modifications. When discussing the future of a historic parkway, not being clear with vocabulary can needlessly hamper communication and affect the outcome of the project.

**Inappropriate Zoning and Altering the Setting**

The character of the privately-owned lands along parkway boundaries contributes to its historic integrity, visual quality, and its experience as a pleasure route. The zoning, land use, and development density in the surrounding community may have drastically changed since the
parkway was first built, severely impacting the surrounding setting. While commercial
development is most often cited as the primary culprit, residential subdivision and the re-zoning
of abandoned agricultural lands also alter the historic setting of a parkway.

**Transportation Demands**
As population and traffic demands grow, the pressure to increase capacity and speed on historic
parkways is greatly increased, often as the result of traffic mitigation for adjacent development.
Without adequate protections in place, historic parkways may be subject to construction efforts
that do not consider the parkway’s place in the context of the larger community. This type of
construction may result in significant changes to historic parkway character including:

**Realignment**
Altering the parkway’s original vertical and horizontal placement on the topography is often
done to increase traffic flow, safety, and speed in reaction to increased population and traffic.
The subsequent roadway alterations such as straightening curved segments, widening curves,
adding lanes, increasing superelevation, removing rotaries, or leveling steep grades can destroy
historic parkway integrity.

**Widening**
Adding lanes, or widening existing lanes, shoulder, or clear zones not only affects the character
of the parkway itself, but also may affect the parkway corridor as a whole, particularly median
width, roadside planting and other features. Widening projects often involve a widened clear
zone to meet safety requirements of increased traffic and higher design speeds.

**Impacts to Trees and Stone Walls**
Altering or removing trees, ledges, or stone walls during road widening, clear zone expansion,
or adjacent development can significantly change these highly characteristic elements of many
Massachusetts parkways.

**Inappropriate Treatment**
Joined with the pressure to increase capacity and speed is the pressure to update those design
characteristics of a parkway that are most easily lost, sometimes by adopting a highway design
vocabulary that may be inappropriate for parkway design.

**Resurfacing**
Resurfacing raises a number of issues for historic parkways that may not be immediately
apparent. Obvious changes such as converting the surface of Vernacular Roads from dirt to
pavement can heavily alter historic character. However, more subtle changes in the color of
asphalt, the size of the aggregate, and additional travel way elevation if accumulated underlying
layers are not removed, can have significant impacts on historic integrity.

**Threats to Roadside Plantings**
Automobile exhaust, public utility placement, deicing chemicals and other automobile impacts
threaten trees. In addition, historic planting beds and groundcovers associated with historic
parkways can also be easily affected by any number of roadway alterations.
Guardrails and Guardwalls
Historic guardrails and guardwalls are often heavily altered, removed, or replaced to implement current design standards. These changes are most prevalent and easiest to implement and detract significantly from the historic character of the parkway. The new barrier is usually a far more intrusive style of rail or wall than is necessary to ensure public safety.

Small-scale Features
The steady accretion of small-scale features can ultimately cause a historic parkway to lose integrity. Inappropriate utilities, lighting, signage, parking meters and curbing can clutter and overwhelm a parkway with non-historic features. Examples include cobra-head light fixtures, “Jersey” barriers, boulders, and salvaged granite curb lining the roadside to prevent vehicular off-road access.

Deferred Maintenance
Faced with declining physical conditions, rising maintenance costs and budgetary constraints, the Commonwealth has been unable to perform essential cyclic maintenance on many parkways. The resulting pattern of deferred maintenance and reliance on interim repairs can result in the unintentional loss of significant parkway character or even complete loss of portions of the roadway itself.

Vegetation Decline
Neglecting to prune dead branches or replace dead trees, inadequate watering, lack of soil aeration to relieve compaction, and mechanical injury to tree trunks caused by grass mowing equipment increase trees’ susceptibility to disease and contribute to the decline of tree health along parkways.

Overgrowth
Trees, brush, shrubs, and grass left unattended decrease sightlines and affect the physical stability of parkway features. If allowed to grow unchecked, vegetation along the parkway will grow over the clear zone and shoulders. Furthermore, vegetation will grow in joints and cracks in the pavement, curb, sidewalks and walls, breaking apart the roadway and roadside features, thereby exposing them to further water and frost damage. Allowing parkway vegetation to grow unchecked also results in the loss of informal views and designed vistas to the surrounding setting, an essential part of parkway design and experience.

Drainage Features
The swales, drains, and culverts along the travel ways are often neglected and quickly become clogged by overgrowth and debris. The resulting drainage problems may pose a safety hazard for passing motorists and result in the loss of historic features, or the undermining of the travel way itself through erosion.

Surface Patching
The high costs of road paving projects often result in road surface patching with inappropriate materials. Broken pavement may be filled with quick-setting concrete and asphalt mixes whose quality and color detract from the historic character of the parkway.
Appendix C: Historic Parkways Initiative

Mission of the Historic Parkways Initiative
The Historic Parkways Initiative (HPI) — a coalition of the Executive Office of Environmental Affairs (EOEA) and other public and private organizations — works to protect, preserve and enhance historic parkways throughout the Commonwealth. Through advocacy, education and action, and in the spirit of partnership, the Initiative celebrates the invaluable scenic, cultural, recreational, and transportation roles of these remarkable and diverse parkways. A catalyst for change, the Initiative is building new models of stewardship and revitalization for these treasured resources.

The goals and philosophy of the Initiative are founded on the visionary thinking that produced the state’s incredibly diverse system of parkways we enjoy today. That thinking is relevant for us now, as we work to preserve, strengthen and build awareness of the legacy of historic parkways in every region of the Commonwealth.

The parkways forming the former metropolitan system of roads became the links and pleasure drives of America’s first regional park system at the turn of the twentieth century, created by the farsighted commitment of leaders who recognized the need for comprehensive protection of “the rock hills, the stream banks, and the bay and seashore” for present and future generations. The parkways were integral ingredients in that park system, and with the “reservations” they provided a rational response to the explosive growth of metropolitan Boston at the turn of the century. The variety of parkway types represented within the MDC system reflects a design response to physical place, circumstance and need, rather than imposition on the land of an efficient route to a destination. Whether it be Hillcrest Parkway, a Border Road that marks the boundary between Middlesex Fells and private land, Revere Beach Boulevard, an Ocean Parkway that provides beach access and dramatic ocean views, or VFW Parkway, a Connecting Parkway that extends the park experience beyond the Charles Reservation into the residential and commercial environs, each parkway type and individual road responds to the topography and natural features of its landscape to provide a pleasurable as well as practical travel.

The parkways that serve the state forests and parks system represent the combined vision of Franklin D. Roosevelt’s Civilian Conservation Corps of the 1930s and the Massachusetts legislature’s move to preserve areas of dramatic natural scenery as well as to restore the state’s depleted forest resources. The legacy of the efforts of that time — during which thousands of acres of land and valuable scenic resources were made accessible — is a system of roads and associated structures that are some of the most impressive examples of their kind. The parkways that serve the state parklands include the incredible design achievements of this era as well as those of previous times in the parkways of estate and vernacular sites, such as the rich network of roads at Moore State Park or Borderland State Park.

The planning and design principles that created today’s well integrated DEM parkway system were based on those of the National Park Service and summarized in the Massachusetts Department of Conservation’s 1934 Annual Report:
In planning for recreation, every effort is made to provide the most intensive recreation possible without changing the character of the place; for example, if any area is a typical forest possessing a wildness or a natural beauty, the problem is to make that accessible and to provide facilities and such recreational opportunities that the natural character of the forest is not changed into that of the city park.

Today these parkways are integral contributors to a community’s character and quality of life. They are the front yards of residential neighborhoods and institutions, and the routes along which we can enjoy the recreational treasures of our state parks. The beautiful details and composition of their designs are too often taken for granted by the millions for whom they are essential means of travel or of recreation.

There are multiple challenges to stewardship of these irreplaceable historic resources. As commuter routes, urban parkways face the stresses of high volumes of traffic which threaten their restorative experience and pose safety challenges which have necessitated additions such as guardrail structures out of character with the historic landscape. Allees of mature trees are one of the most fundamental elements that define the urban parkway, and yet along many parkways, trees are in poor condition due to urban stress combined with inadequate maintenance resources, or have been removed altogether and not replaced. The parkways that thread throughout the state’s forests and parks suffer from overuse in places, inadequate resources and competition for dwindling dollars.

The perspective of historic landscape preservation has not been regularly integrated into processes of parkway improvements, with the result that engineering needs have been satisfied at times without taking advantage of opportunities to preserve or enhance a historic parkway’s character-defining features. There is a clear need to bring multiple interests together in a collaborative effort to protect and improve the health and vitality of these incomparable open space treasures.

**HPI Accomplishments**

The Initiative has demonstrated a remarkable interagency partnership, with a broad spectrum of public agencies and stakeholders meeting regularly to discuss issues and shepherd the process. The product of this multi-pronged initiative is a preservation planning prototype for the treatment and management of historic parkways.

Stakeholder workshops held in the fall and winter of 2001-2002, drew hundreds of participants across the state in lively and constructive dialogue. Listening to the public and raising awareness of the values and threats to these historic parkways have been critically important components of the effort. This approach will continue to be a core element in the sustainability of the Initiative’s plans, elaborated below in Public Education and Outreach Strategy.

In the fall of 2002, a daylong workshop was held at the Harvard Graduate School of Design with a delegation from Los Angeles working to protect and enhance the Arroyo Seco Parkway. Also attending was Dan Marriott of the National Trust for Historic Preservation, a nationally known advocate for historic road preservation and author of *Saving Historic Roads*. Landscape architect Grant Jones and his colleague from Jones and Jones attended to contribute insights.
from their innovative work on historic road preservation and collaborative process in Kentucky and Montana. The workshop found that there was a national groundswell of change and acceptance of historic road preservation—a “tipping point” for the visions and strategies embodied in the work being done within the Initiative.

The development of the Initiative was guided by a statewide Steering Committee representing a broad spectrum of perspectives including public agencies, public officials, non-profit and professional organizations, and community representatives. The Steering Committee and several subcommittees, as well as an interagency committee representing EOEa, DEM, MDC, the Massachusetts Historical Commission (MHC) and the Massachusetts Highway Department (MHD) met regularly during the planning of the Initiative to discuss issues and shape a process. The consultant team also met with agency engineers to discuss their work, needs and issues relative to their agency’s parkways, to receive specific information about their roads, and to ensure that the Guidelines will be responsive and useful to them.

Because of the complexity of parkways as historic resources, scenic travel ways and transportation networks, the interagency process was critical for the Initiative. It provided fertile ground for improved understanding across agencies and disciplines of the missions, perspectives and priorities of agencies that have not historically come together to find common ground and mutually agreeable courses of action. The working relationships that have been forged during the Initiative will provide a platform for continuing conversations and shared stewardship.

Subcommittees of the Steering Committee included a Communications Committee that focused on the message of the Initiative and the most effective way to deliver it. Members of this committee contributed expertise in marketing and communications as well as public education and advocacy. They worked with a marketing and communications consultant to explain their ideas about the purposes and vision of the Initiative in clear and arresting text and graphics. The mission of the Initiative was initially formulated for review by the entire Steering Committee, while the Communications Committee spent several meetings delving into the Initiative’s purpose and goals to craft a mission statement for full committee review. The Communications Committee met several times to review and make recommendations to the Steering Committee for a Historic Parkways Initiative logo that captures the concept and energy of the Initiative.

Another important committee was the Guidelines Subcommittee. Members of this committee brought expertise in historic preservation, landscape architecture, landscape preservation, transportation engineering, and municipal transportation design and process to work closely with the consultant team conducting the statewide parkway assessment and formulating the Guidelines. Committee members made valuable contributions throughout the process of inventory, and served as peer reviewers of this document.

Research on National Models
Awareness of the importance of concerted action to save our threatened historic road resources has risen exponentially across the country in recent years. Conferences focused on historic road preservation, books dedicated to the subject, and friends groups have proliferated. The Initiative has benefited from this climate of attention and the growing expertise in the national road
preservation community over the last several years. Guidelines and management plans have been collected and assessed from over a dozen states. The advice and perspective of advocates and researchers, locally and nationally, have been sought. Models and best practices from initiatives elsewhere have been culled and used as reference points for the current effort. Of particular importance has been the excellent work done by the National Park Service, documented both in proceedings from conferences, corridor management plans, and in the rehabilitation guidelines for the motor road system at Acadia National Park.

Study of the breadth of excellent nation-wide work revealed that the Initiative is the first attempt to define, categorize, assess and make recommendations for preservation treatment of an entire statewide system of parkways. The Initiative has also reached beyond current assumptions to expand the definition of parkways to include the variety of roads within parks as well. It has looked critically at AASHTO’s functional classification to conclude that the system does not provide adequate guidance for historic parkway resources, and has adapted that system to define functional classes that meaningfully respond to the variety of conditions present on historic parkways.

In addition, another factor that limited the utility of existing national models for the Massachusetts effort was that most of the existing documents focused on a single historic road, the individual corridor and its historic and current context. While the preservation principles were applicable, and the processes good ones, the level of detail and specificity was more at the level of a corridor management plan for a specific parkway than guidelines for a system of parkway types. Some projects addressed parkway systems, but often did so as part of a larger plan for a park and parkway system. In these cases, recommendations for the parkway components were helpful to an extent, but were less focused and therefore less useful than an initiative solely addressing a historic road system would have been.

Several documents do address systems, and they were important sources of guidance for the Initiative. One is the Vermont State Standards for the Design of Transportation Construction, Reconstruction and Rehabilitation on Freeways, Roads and Streets. While it does not treat roads from a purely historic preservation perspective, and addresses all roads from freeways to rural corridors, a central purpose of the document is the enhancement of a road’s context and the mitigation of negative impacts on its important scenic, cultural and natural resources. This inspiration and practical guidance helped develop the treatment guidelines for Massachusetts’ parkways.

The Federal Highway Administration’s Flexibility in Highway Design was another important guide. The Foreword states that it “has been prepared for the purpose of provoking innovative thinking for fully considering the scenic, historic, aesthetic, and other cultural values, along with the safety and mobility needs, of our highway transportation system.” This represents a sea change in thinking about how roads should be treated, and was an important touchstone for the development of these guidelines.

Perhaps the Initiative’s two most significant early accomplishments were leading the National Register Nomination process and launching the first two Demonstration Projects: Memorial Drive in Cambridge and on Mount Greylock.
Appendix D: National Register Nomination and Metro-Boston Historic Parkways Matrix

Another important component of the Initiative has been the effort to secure formal recognition of the historic significance of the metropolitan parks and parkway system and to heighten public awareness of this remarkable system. The Massachusetts Historical Commission funded and prepared a National Register of Historic Places Multiple Property Documentation Form for the Metropolitan Park System of Greater Boston, and National Register nominations for the parkways within the system. Extensive historical research and documentation of existing conditions supported this process, proceeding under an unusually accelerated timetable. Over 40 nominations were prepared, covering more than 60 parkways. They are listed here.

If the parkway is not yet listed on the Register, first consult the Massachusetts Historical Commission for a determination of eligibility for listing on this official federal list of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, engineering and culture. National Register properties have significance to the prehistory or history of their community, state or nation. Properties listed on the National Register must possess historic significance and integrity (see sidebar).

In order for a property to be listed on the National Register, prepare a nomination form, which includes a detailed description of the property and an evaluation of its historic significance. With the exception of federally owned properties, nominations for properties in Massachusetts are submitted to the Massachusetts Historical Commission for evaluation. Nominations recommended for listing by the state review board are then referred to the National Park Service who administers the National Register program.

Significance of a historic property is determined by evaluating it against four criteria laid out in the National Register:

Criterion A: Associated with historic events or activities or patterns
Criterion B: Associated with important persons
Criterion C: Distinctive physical characteristics of design, construction, or form
Criterion D: Potential to provide important information about prehistory or history

Most parkways would be eligible for listing under Criterion C, because of their subtlety of design integrating the road into the topography and natural surroundings, and the quality of their associated structures such as stone walls, bridges or box culverts. Vernacular Roads could qualify under Criterion A, their association with pre-park patterns such as the road systems of former villages or farm access roads.

Integrity, as defined by the Secretary of the Interior’s Guidelines for the Treatment of Cultural Landscapes, is “the authenticity of a property’s historic identity, evinced by the survival of physical characteristics that existed during the property’s historic or prehistoric period. The seven qualities of integrity as defined by the National Register Program are location, setting, feeling, association, design, workmanship, and materials.” The National Register Bulletins 16 and 16A, How to Complete the National Register Registration Form, are helpful resource documents for this part of the process.
Preparation of a National Register nomination often provides the first complete record of the history, significance, and current conditions of a resource, and can be a valuable asset in the Design Control Report. The findings are not only an enormous benefit to the design process, but they also increase public awareness and appreciation of the parkway system as one of the most significant in the nation.

Listed National Register properties are eligible to apply for state and federal preservation grant programs, and the nomination provides guidelines for a more efficient, informed and timely review process. Listing does not in itself impose restrictions on a property; it does, however, require Massachusetts Historical Commission review for all actions funded, licensed or permitted by state or federal government agencies.
<table>
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<th>ROAD NAME</th>
<th>PARKWAY</th>
<th>GIS Coverage Notes</th>
<th>DCR (WOC) Ownership years (if available and source)</th>
<th>Listed in Multi Property OR Charles River Basin OR Olmsted OR Chestnut Hill OR Diamond HD (C)=Contributing</th>
<th>Period of Significance</th>
<th>Nomination Status</th>
<th>Primary Parkway Type: Connecting (C) Internal (I) Border (B) Source: DCR</th>
<th>Secondary Parkway Type: River (R) Ocean (O) Summit (S) Estate (E) Vernacular (V) Source: DCR</th>
<th>Pleasure (P) vs. General Traffic (G) Not Listed (T) Source: Pleasure and General Traffic Roads of the Metropolitan District Commission</th>
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### Road Name

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Note: This list outlines metro-Boston parkways listed on the State and National Registers of Historic Places. A full inventory of parkways throughout the state has not been completed. However, the following two Summit Roads have been identified.

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<th>Summit Road</th>
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Appendix E: Public Participation Summary

The Historic Parkway Preservation Treatment Guidelines were developed in conjunction with a public participation process to ensure that all interested parties had an opportunity for involvement in the formulation of the document. This appendix provides:

- An Overview of public participation process,
- A Summary of comments, and
- DCR’s response to comments.

In November 2005, DCR announced its plans to finalize the Historic Parkway Preservation Treatment Guidelines. The general project goals included:

- Reorganization of format and reworking of Guidelines content,
- Identification of gaps in content or topics that require additional analysis,
- Resolution of areas of conflict between preservation, transportation planning, and roadway design,
- Illustration of key concepts and content through diagrams, photographs, and graphics and
- Presentation of guidelines in a clear, concise, and consistent format.

The draft Guideline document was completed and made available for public review on May 25, 2006 with written comment due on June 28, 2006. DCR posted the Guidelines on the agency website and noticed the availability of the draft and public meeting dates in the Environmental Monitor. DCR also issued a statewide press release announcing the release of the Guidelines. DCR received over 50 requests for copies of the Guidelines.

Two public meetings were held to present the guidelines and solicit public comment. The first meeting was held on Tuesday, June 13, 2006 at the Doyle Conservation Center in Leominster. Another meeting was held on Wednesday, June 14, 2006 at the Boston Public Library, Copley Branch. Written comments were received by DCR until July 1, 2006.

A summary of the written comments received and the DCR response is presented in the following tabular format. Copies of the comment letters are on file with the DCR office of cultural resources.
## Summary of Written Comment and DCR Response

<table>
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<tr>
<th>Code</th>
<th>Name</th>
<th>Comment Summary</th>
<th>Response Summary</th>
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</table>
| HP-1 | John S. Allen  
7 University Park  
Waltham, MA 02453 | Commenter expressed concern over preservation and recreational focus of the report and the inadequate attention given to the needs of bicyclists especially commuting cyclists. | DCR revised the report to explicitly acknowledge the legal right of bicyclists as road users. The report now includes recommendations that support on-road bicycle accommodations wherever possible in a manner compatible with the historic character of the parkways. |
| HP-2 | City of Boston Environment Department  
Boston City Hall, Room 805  
Boston, MA 02201 | Comments reflect the need for consistency in planning, design and maintenance of parkways. Commenter also noted the increased efficiencies in traffic management on parkways resulting from coordination with local municipalities. | DCR revised the report to clarify applicability of the guidelines and thresholds for triggering comprehensive assessment and planning process. |
| HP-3 | City of Boston Water and Sewer Department | Commenter requested that the report include specific reference to coordination with municipal officials in description of parkway planning process. BWSC also wants castings installed by catch basins to indicate “No Dumping” in storm drains and to receive copies of storm water pollution prevention plans where they are required for parkway work in Boston. | Comments in the BWSC letter reflect common goals and approaches with the proposed guidelines with their emphasis on communication of proposed work and confirmation of ownership of storm drains where they may interconnect with drains or sewer lines owned by BWSC. Catch basin stenciling or identification of catch basins with castings are elements included in the DCR storm water management plan, but may not be elements necessary to include specifically in the historic parkway preservation guidelines. |
| HP-4 | Charles River Conservancy | Comment letter noted support for the effort and implementation of the guidelines. Commenter felt the current tone of the guidelines was more roadway oriented and requested that the document focus more on recreation user experience and preservation of parkland. Commenter expressed concern over the use of the adoptive references to AASHTO design standards. CRC was one of many commenters that questioned the oversight of an implementation strategy. All references to AASHTO have been removed unless a strong justification is provided. AASHTO publications are now referenced in the bibliography. DCR has made changes throughout the text to reinforce the recreational value and user experience of the parkways. DCR Historic Parkways Policy # (not yet assigned) sets forth an implementation strategy and oversight role by the DCR Stewardship Council. |
| P-5 | Charles River Watershed Association | Letter commended DCR on the development of the guidelines. Comments focused on three areas: Maintenance, Stormwater Management and Public Participation. The letter requested that the maintenance standards be detailed and clear to ensure appropriate level of maintenance. The letter noted that the guidelines should include policy of DCR use of herbicide for invasive and weed management. CRWA letter also requested the guidelines include specific references to low impact development practices. CRWA felt that DCR storm water plan should be included in the guidelines. Commenter made numerous suggestions for expanding the public role in project development and developing a mechanism for incorporating public input into a given project. A policy for use of herbicide by DCR for weed control and invasive vegetation management is currently in development and will not be adopted in time for inclusion in the document. Inclusion of the policy will be considered upon adoption. Low impact development practices are currently included by reference in the guidelines. As the environmental standards applicable to storm water continue to evolve, it is preferable to refer to the changing rules with appropriate references rather than identify each standard separately in these guidelines. DCR revised text throughout the parkway planning process to enhance the public participation and outreach and to ensure the public's input into the process is validated. |
| HP-6 | Communities for Fells Preservation  
37 Ravine Road  
Stoneham, MA 02180 | CFFP letter asked for clarification on a number of aspects of the guidelines including project thresholds, project roles, responsibilities, design process and terminology. The letter applauded DCR on outreach plan and maintenance goals of guidelines. CFFP requested that examples of parkway projects be included in the appendix to build a case history. The letter also questioned oversight of guideline implementation. | See HP-2. DCR made revisions to text to differentiate roles and responsibilities of DCR project manager and those of the project team. DCR agrees with the need to develop a case history and will explore ways including use of DCR internet site to make project information available to the public. Refer to HP-4. |
|---|---|---|---|
| HP-7 | Emerald Necklace Conservancy  
Two Brookline Place  
Brookline, MA 02445 | The ENC applauded DCR on completion of the draft document. Letter emphasized importance of oversight strategy. ENC identified speeding as a major problem and felt that guidelines fail to recommend design solutions to address the problem. ENC also questioned references to AASHTO standards. | Refer HP-4. Enforcement of speeding is primarily a management issue and is outside the scope of this document. Reference to AASHTO standards has been removed. |
| HP-8 | Environmental League of Massachusetts  
14 Beacon Street  
Boston, MA 02108 | ELM noted comprehensive approach to the guidelines and congratulated DCR on the effort. Letter expressed concern over implementation and oversight and suggested Stewardship Council should be involved in carrying out this responsibility. As other commenters pointed out, references to AASHTO standards are a concern. The letter also noted the need to raise awareness and, recognizing that it may be beyond the purview of this document, offered assistance with ways ELM can assist DCR in carrying out this goal. | Refer to HP-4, |
<p>| HP-9  | The Fenway Alliance | The commenter's primary concern was the lack of attention paid to the issue of access on parkways, particularly truck and bus use. The Commenter requested that consideration be given to creating a separate section of this issue. | The issue of enforcement of use restrictions on parkways is primarily an operations issue and outside the scope of the document. In response to this issue, DCR made changes to the signage guidelines specifically stating the need for signage restricting heavy vehicles from pleasure vehicle only parkways. |
| HP-10 | Sarah Freeman 22 Arborway Jamaica Plan, MA 02130 | Commenter made editorial comments to improve user-friendliness. | DCR noted comments and incorporated suggestions. |
| HP-11 | Isabella Stewart Gardner Museum 280 The Fenway Boston, MA 02115 | Letter urges DCR to include language in the guidelines specifically outlining what types of vehicles should be permitted on pleasure vehicle only parkways which explicitly should not. | This is primarily a management/enforcement issue to be addressed by legal and operations staff. The guidelines have incorporated general language about access restrictions on pleasure vehicle only parkways. |
| HP-12 | Stephen H. Kaiser 191 Hamilton Street Cambridge, MA 02139 | Letter provides engineering insights into the issues of AASHTO, Value Engineering, and Speed Control. Commenter stresses the need for flexibility in parkway design. | Comments do not require a modification of the guidelines or a DCR response. |
| HP-13 | Massachusetts Audubon Society | MAS letter acknowledges that the completion of the draft guidelines is a key step in addressing concerns about parkway maintenance and improvement. The letter expressed thanks for efforts that were made to include input from all interested stakeholders. MAS recommends that DCR staff work with the Stewardship Council over the next month or so to prepare for Council endorsement of the final. | Refer to HP-4 |</p>
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<td>guidelines and to identify the process and appropriate thresholds for Council review and approval of parkway projects. The MAS letter also notes the importance of an outreach and public education program as part of implementation strategy.</td>
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<td>HP-14</td>
<td>MassBike, Metro Boston Chapter 230 Lexington Ave. Cambridge, MA 02138</td>
<td>MassBike also expressed concern over the lack of attention and detail on accommodating bicycle use for transportation purposes. The letter urged DCR to acknowledge explicitly the rights of cyclist as users of the roadway and requested that the agency establish a policy that would provide on road accommodation, wherever possible. The letter provided specific comments and suggestions for design guidelines and urged DCR to maintain the same level of maintenance and management of the parkway shoulders and bicycle lanes as vehicle travel lanes.</td>
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<td>HP-15</td>
<td>Massachusetts Historical Commission 220 Morrissey Boulevard Boston, MA 02125</td>
<td>MHC’s letter suggests further clarification on the MHC’s regulatory review and request that language be added to describe more fully the internal DCR procedures for compliance. The letter provides specific recommendations and proposed revised language on the treatment guidelines including vegetation, curbs, traffic barriers, and traffic signals. MHC also noted several corrections.</td>
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<td>Refer to HP-1 DCR incorporated specific comments on design of shared use paths, maintenance and lighting.</td>
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| HP-16 | MASCO  
375 Longwood Avenue, Boston, MA 02215 | MASCO letter request flexibility in DCR’s consideration of restrictions on access by heavy commercial vehicle on pleasure vehicle only roadways. | DCR regulations, not the treatment guidelines restrict access. Pleasure vehicle only parkways have prohibitions in place, outlined in CMR 350 4.00, that restrict use by vehicles weighing more than 5,000 pounds or exceeding an overall height of seven feet. Parkways designated as “general traffic” allow for use by all vehicles. For a list of the parkways and their designations, refer to Appendix D. Editorial comments and corrections incorporated as appropriate. |
| HP-17 | Hugh Mattison  
hmattison@aol.com | Commenter provided editorial comments and corrections. | |
| HP-18 | Muddy River Restoration Project  
Maintenance and Management Oversight Committee | MMOC letter comments on two primary areas: public participation and maintenance. The letter urges DCR to engage the public early and often to make the process meaningful. The letter suggests that the sample consultant scope be modified to include early consultation with the public. The MMOC recommends that outreach should not be limited to immediate abutters, but should include a broader constituency for parkways. The MMOC, as have other commenters, expressed the need to provide a mechanism for incorporating public input into design process. Regarding maintenance, MMOC reinforces others comments for the need to develop parkway specific maintenance plans and suggest that the scope should be included in the consultant scope. The MMOC letter recommends that the plans address Storm water BMPs, graffiti removal and contending with homeless. | DCR revised text throughout the parkway planning process to enhance the public participation and outreach and to ensure that the public’s input into the process is validated. DCR’s goals for public participation, required public meetings and preparation of meeting materials (agendas, graphics, presentation slides) have all been included in the scope for consultant services. Discussion of design process and consultant scope has been revised to include maintenance and operational planning. |
| HP-19 | Mike Ryan | The commenter provides detailed editorial and organizational comments. The letter requests that the guidelines include public education and outreach strategy. The commenter also recommends that DCR and EOE reconstitute Historic Parkways Steering Committee. The letter asks for an explanation of the role of the Massachusetts Historical Commission in the evaluating and overseeing Historic Parkway projects. The commenter suggests a role for the Stewardship Council in providing oversight and further opportunities for public involvement. | DCR editorial and organizational comments were incorporated as appropriate. DCR revised the text to describe MHC's regulatory authority and process. Comments regarding the development of a public education and outreach program and reconstitution of the HPI Steering Committee are beyond the scope of guidelines development and will be considered in future implementation. |
| HP-20 | David Spiller | Commenter raises concerns about making incremental decisions that may in effect destroy the character of a parkway over time. | The guidelines lay out a comprehensive planning process with the Design Control report as its centerpiece. The purpose of developing the Design Control Report is to provide a basis for informed decision-making. |
| HP-21 | Ron Headrick | Commenter urges DCR to phase-out use of jersey barriers, type SS and Thrie-beam barriers. | The guidelines recommend steel-backed wood guardrails as the DCR standard to be installed as part of major rehabilitation project. |
| HP-22 | WalkBoston | WalkBoston's letter provides detailed comments on improving pedestrian facilities along parkways. The letter expresses concern about a lack of attention to pedestrian needs and urges a change in tone and focus in guiding the incorporation of pedestrian facilities. | DCR revised text throughout the document to incorporate specific comments of WalkBoston. DCR revised the guiding principles to reflect that pedestrian use, whether for recreation or commuting, is an important design control and must be accommodated at an equal level with other uses. |
Appendix F: Table of Cross Reference with Federal Highway Administration

_Flexibility in Highway Design_ (1997) and

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<td>2. Parkway Planning and Project Management</td>
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<td>Intersections</td>
<td>Chapter 8</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>Drainage</td>
<td></td>
<td>Chapter 8</td>
</tr>
<tr>
<td>4. Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FILING/PARTICIPATION APPLICATION</td>
<td>COMMON REGULATORY THRESHOLDS</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
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<td></td>
</tr>
<tr>
<td><strong>ANRAD</strong></td>
<td>Required when seeking approval of BVW boundary lines prior to proposing work or designing a project.</td>
<td></td>
</tr>
<tr>
<td><strong>CG Permit</strong></td>
<td>Required for work in commercially navigable (includes historic usage) or tidal waterways where there is a change in the hydraulic opening of the bridge.</td>
<td></td>
</tr>
<tr>
<td><strong>CH 91 License</strong></td>
<td>Bridge projects subject to the Footprint Bridge Exemption are exempt from CH 91. Maintenance projects are exempt from CH 91. CH 91 applies to all waterways including Great Ponds (10 or more acres in size), the Connecticut River, sections of the Westfield River, non-tidal portions of the Merrimack River and any non-tidal river or stream on which public funds have been expended for stream clearance, channel improvement, or any form of flood control or prevention work, either upstream or downstream within the river basin, except for any portion of any such river or stream which is not normally navigable during any season by any vessel including a canoe etc. and work in all filled tidelands except landlocked tidelands and all filled lands lying below the natural high water mark of Great Ponds. Activities requiring a license include any construction, placement, excavation, addition, improvement, replacement, reconstruction, demolition or removal of any fill or structures, not previously authorized.</td>
<td></td>
</tr>
<tr>
<td><strong>CH 91 Permit</strong></td>
<td>Activities requiring a permit include beach nourishment and dredging within jurisdictional areas. Lowering the water level of a Great Pond.</td>
<td></td>
</tr>
<tr>
<td><strong>ENF</strong></td>
<td>Widening 4 feet or more for a half mile or more. Cutting 5 or more mature living public shade trees (not trees within State Highway Layout) 14&quot; or more in diameter @ breast height. Altering bank or terrain 10 ft or more from the edge of pavement for 1/4 mile or more except for the installation of structures such as sidewalks, drainage systems, etc. Work in an ACEC. Altering 5,000 sf or more of BVW. Eliminating 300 linear feet of stone wall. Provided that a permit is required in accordance w/MGL c 21D, new capacity or expansion in capacity for the storage, recycling, treatment or disposal of hazardous waste. Creation of 5 or more acres of impervious area. Direct alteration of 25 or more acres of land. Conversion of land in active agricultural use to nonagricultural use. Conversion of land held for natural resources purposes in accordance with Article 97. Construction of 300 or more new parking spaces at a single location.</td>
<td></td>
</tr>
<tr>
<td><strong>EIR</strong></td>
<td>Constructing a new road 2 or more miles in length. Widening an existing road by 1 or more travel lanes for 2 or more miles. New interchange on a completed limited access highway. Requiring a variance from the WPA. Altering 1 or more acres of Salt Marsh or BVW. Altering 10 or more acres of other wetlands. Altering 50 or more acres of land. Creating 10 or more acres of impervious area.</td>
<td></td>
</tr>
<tr>
<td><strong>MCZM Concurrence</strong></td>
<td>Work in water within the coastal zone when at least a PGP II or a Coast Guard Permit is required. Also will require concurrence when MEPA thresholds are triggered.</td>
<td></td>
</tr>
</tbody>
</table>
## COMMON REGULATORY THRESHOLDS

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>NOI</strong></td>
<td>Under the WPA, required when proposing direct activity in or impact to resource areas subject to protection, including BVW, LUW, Bank, RFA, BLSF, ILSF, etc. The NOI is a 1 page form which the contractor must complete and file with EPA at least 48 hours prior to the start of construction.</td>
</tr>
<tr>
<td><strong>NPDES</strong></td>
<td>The National Pollution Discharge and Elimination Systems Program is administered by EPA and requires the filing of an NOI and the preparation of a SWPPP for projects involving construction projects with 1 or more acres of earth disturbance.</td>
</tr>
<tr>
<td><strong>PGP I</strong></td>
<td>Under 5,000 s.f. of cumulative impacts to Waters of the U.S. Instream work limited to July 1 to October 1. Maintenance dredging less than 1,000 c.y. not in a Special Aquatic Site. No impacts to Special Aquatic Sites or Essential Fish Habitat.</td>
</tr>
<tr>
<td><strong>PGP II</strong></td>
<td>Over 5,000 s.f. but under 1 acre of cumulative impacts to Waters of the U.S. Maintenance dredging greater than 1,000 c.y. but less than 25,000 c.y. not in a Special Aquatic Site. Work within the confines of a Wild and Scenic River. Temporary fill and excavation up to 1 acre in Special Aquatic Sites including salt marsh. Work in Essential Fish Habitat.</td>
</tr>
<tr>
<td><strong>Individual ACOE Permit</strong></td>
<td>Over 1 acre of impacts to Waters of the U.S. Maintenance dredge over 25,000 c.y. or any amount in a Special Aquatic Site. Permanent fill or excavation (any amount) in Special Aquatic Sites such as salt marsh, mudflats, pools and riffles, and vegetated shallows.</td>
</tr>
<tr>
<td><strong>Programmatic 4(f)</strong></td>
<td>Programmatic 4(f) Evaluations &amp; Approvals for FHWA Projects that Necessitate the Use of an Historic Bridge. Note: NFA NR Eligible historic bridge projects requiring a CG Permit will need an Individual 4(f) Evaluation and Approval.</td>
</tr>
<tr>
<td><strong>RDA</strong></td>
<td>Required when work/activity will occur within 100 feet from the edge of BVW, LUW, Bank etc. or sometimes within Riverfront Area especially 100-200 feet from a perennial stream or river.</td>
</tr>
<tr>
<td><strong>SWPPP</strong></td>
<td>As of March 1, 2003, any construction project resulting in earth disturbance of 1 or more acres must file a NOI and a SWPPP concurrently with EPA in accordance with the NPDES requirements. The SWPPP is generally a list of best management practices to be used during construction in order to control erosion and sediment transport.</td>
</tr>
<tr>
<td><strong>WQC</strong></td>
<td>If under 5,000 s.f. of cumulative impacts, WQC is considered automatic with the issuance of an OOC. Over 5,000 s.f. of cumulative impacts. Over 100 c.y. of dredging. Any impacts associated with Bridge Projects that are exempt from the WPA. Work within an ORW. Any work requiring an Individual ACOE permit.</td>
</tr>
<tr>
<td><strong>WQC SF</strong></td>
<td>Expedited 42 day DEP review and permit issuance on Footprint Bridge projects may be sought provided certain criteria are met and provided DEP agrees to the expedited review.</td>
</tr>
<tr>
<td><strong>Variance from the WPA</strong></td>
<td>Non Limited projects with over 5,000 s.f. of impacts to BVW. Direct impacts to salt marsh or work within 100 feet of a salt marsh that will directly impact the salt marsh.</td>
</tr>
</tbody>
</table>
Appendix H: Standards for Preservation and Rehabilitation


Standards for Preservation

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of technical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Standards

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standards for Rehabilitation

Rehabilitation is defined as the act or process of returning a property to a state of utility and of making possible a compatible use for a property through repair, alterations, and additions which makes possible an efficient contemporary use while preserving those portions or features which convey its historical, cultural, or architectural values.

Standards

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Appendix I: Massachusetts Prohibited Plant List

**Effective January 1, 2006: The importation of the plants listed below is banned by the listed importation ban date. The one and three year propagation ban phase-out dates listed are allowed only on plants that have entered the state prior to the listed importation ban date and remain in the channels of trade within the Commonwealth.**

**NOTE:** After the listed 'propagation ban' date, the sale, trade, purchase, distribution and related activities for that plant are prohibited.

<table>
<thead>
<tr>
<th>Latin</th>
<th>Common Common</th>
<th>Importation Ban</th>
<th>Propagation Ban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer platanoides</td>
<td>Norway maple</td>
<td>July 1, 2006</td>
<td>January 1, 2009</td>
</tr>
<tr>
<td>Acer pseudoplatanus</td>
<td>Sycamore maple</td>
<td>July 1, 2006</td>
<td>January 1, 2009</td>
</tr>
<tr>
<td>Aegopodium podagraria</td>
<td>Bishop's goutweed; bishop's weed; goutweed</td>
<td>July 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Ageratina adenophora</td>
<td>Crofton weed</td>
<td>January 1, 2006</td>
<td>January 1, 2009</td>
</tr>
<tr>
<td>Ailanthus altissima</td>
<td>Tree of Heaven</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Alliaria petiolarata</td>
<td>Garlic mustard</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Alternanthera sessilis</td>
<td>Sessile joyweed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Ampelopsis brevipedunculata</td>
<td>Porcelain-berry; Amur peppervine</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Anthriscus sylvestris</td>
<td>Wild chervil</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Arthraxon hispidus</td>
<td>Hairy joint grass; jointhead; small carpetgrass</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Asphodelus fistulosus</td>
<td>Onion weed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Avena sterilis</td>
<td>Animated oat</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Azolla pinnata</td>
<td>Mosquito fern</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Berberis thunbergii</td>
<td>Japanese Barberry</td>
<td>July 1, 2006</td>
<td>January 1, 2009</td>
</tr>
<tr>
<td>Berberis vulgaris</td>
<td>Common barberry; European barberry</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Cabomba caroliniana</td>
<td>Carolina Fanwort; fanwort</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Cardamine impatiens</td>
<td>Bushy rock-cress; narrowleaf bittercress</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Carex kobomugi</td>
<td>Japanese sedge; Asiatic sand sedge</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Carthamus oxyacantha</td>
<td>Wild safflower</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Caulerpa taxifolia</td>
<td></td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Celastrus orbiculatus</td>
<td>Oriental bittersweet; Asian or Asiatic bittersweet</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Centaurea biebersteinii</td>
<td>Spotted knapweed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Chrysopogon aciculatus</td>
<td>Pilipilila</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Commelina benghalensis</td>
<td>Bengal dayflower</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Crupina vulgaris</td>
<td>Common crupina</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Cuscuta</td>
<td>Dodder</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Cynanchum louiseae</td>
<td>Black Swallow-wort; Louise's swallow-wart; Autumn olive</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Cynanchum rossicum</td>
<td>European swallow-wort; pale</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Common Name</td>
<td>Remarks</td>
<td>Date Added 1</td>
</tr>
<tr>
<td>----------------------------</td>
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</tr>
<tr>
<td>Digitaria abyssinica</td>
<td>African couch grass</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Digitaria scalarum</td>
<td>Velvet fingergrass</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Digitaria velutina</td>
<td>Alfombrilla</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Egeria densa</td>
<td>Brazilian waterweed; Brazilian eloda</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Eichhornia azurea</td>
<td>Anchored waterhyacinth</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Elaeagnus umbellata</td>
<td>Autumn Olive</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Emex spinosa</td>
<td>Devil's thorn</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Epilobium hirsutum</td>
<td>Hairy willow-herb; Codlins and Cream</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Euonymus alatus</td>
<td>Winged euonymus; Burning Bush</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Euphorbia esula</td>
<td>Leafy Spurge; Wolf's Milk</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Euphorbia cypriussias</td>
<td>Cypress spurge</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Festuca filiformis</td>
<td>Hair fescue; fineleaf sheep fescue</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Frangula alnus</td>
<td>European buckthorn; glossy buckthorn</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Galega officinalis</td>
<td>Goatsrue</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Glaucom flavum</td>
<td>Sea or horned poppy; yellow horn poppy</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Glyceria maxima</td>
<td>Tall managrass; reed managrass</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Heracleum mantegazzianum</td>
<td>Giant hogweed</td>
<td></td>
<td>January 1, 2006</td>
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<tr>
<td>Hesperis matronalis</td>
<td>Dames Rocket</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Homeria</td>
<td>Cape tulip</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Hydrilla verticillata</td>
<td>Hydrilla; water-thyme; Florida elodea</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Hygrophiya polysperma</td>
<td>Miramar weed</td>
<td></td>
<td>January 1, 2006</td>
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<tr>
<td>Imperata brasiliensis</td>
<td>Brazilian satintail</td>
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<td>January 1, 2006</td>
</tr>
<tr>
<td>Iris pseudacorus</td>
<td>Yellow Iris</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Iscaemum rugosum</td>
<td>Murain-grass</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Laggerosiphon major</td>
<td>Oxygen weed</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Lepidium latifolium</td>
<td>Broad-leafed pepperweed; tall pepperweed</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Leptochloa chinensis</td>
<td>Asian sprangletop</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Ligustrum obtusifolium</td>
<td>Border privat</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Limnophila sessiliflora</td>
<td>Ambulia</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Lonicera japonica</td>
<td>Japanese honeysuckle</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Lonicera maackii</td>
<td>Amur honeysuckle</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Lonicera morrowii</td>
<td>Morrow’s honeysuckle</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Lonicera tatarica</td>
<td>Tatarian honeysuckle</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Lonicera x bella [morrowii x tatarica]</td>
<td>Bell’s honeysuckle</td>
<td></td>
<td>July 1, 2006</td>
</tr>
<tr>
<td>Lycium ferrocissimum</td>
<td>African boxthorn</td>
<td></td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>First Appearance</td>
<td>Last Appearance</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>Lysimachia nummularia</td>
<td>Creeping jenny; moneywort</td>
<td>July 1, 2006</td>
<td>January 1, 2009</td>
</tr>
<tr>
<td>Lythrum salicaria</td>
<td>Purple loosestrife</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Melaleuca quinquenervia</td>
<td>Melaleuca</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Melastoma malabathricum</td>
<td></td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Microstegium vimineum</td>
<td>Japanese stilt grass; Nepalese browntop</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Mikania cordata</td>
<td>Mile-a-minute</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Mikania micrantha</td>
<td>Mile-a-minute</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Mimosa diplotricha</td>
<td></td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Mimosa invisa</td>
<td>Giant sensitive plant</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Mimosa pigra L.</td>
<td>Catclaw mimosa</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Miscanthus sacchariflorus</td>
<td>Plume grass; Amur silvergrass</td>
<td>July 1, 2006</td>
<td>January 1, 2007</td>
</tr>
<tr>
<td>Monochoria hastata</td>
<td>Monochoria</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Monochoria vaginalis</td>
<td>Pickerel weed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Myosotis scorpioides</td>
<td>Forget-me-not</td>
<td>July 1, 2006</td>
<td>January 1, 2007</td>
</tr>
<tr>
<td>Myriophyllum aquaticum</td>
<td>Parrot-feather; water-feather; Brazilian water-milfoil</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Myriophyllum heterophyllum</td>
<td>Variable water-milfoil; Two-leaved water-milfoil</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Myriophyllum spicatum</td>
<td>Eurasian or European water-milfoil; Spike water-milfoil</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Najas minor</td>
<td>Brittle water-nymph; lesser naiad</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Nassella trichotoma</td>
<td>Serrated tussock</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Nymphoides peltata</td>
<td>Yellow floating heart</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Opuntia aurantiaca</td>
<td>Jointed prickly pear</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Orobanche L.</td>
<td>Broomrape</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Oryza longistaminata</td>
<td>Red rice</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Oryza punctata</td>
<td>Red rice</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Oryza rufipogon Griffiths</td>
<td>Red rice</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Ottelia alismoides</td>
<td>Duck-lettuce</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Paspalum scrobiculatum</td>
<td>Kodo-millet</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Pennisetum clandestinum</td>
<td>Kikuyugrass</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Pennisetum polystachyon</td>
<td>Missiongrass</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Phalaris arundinacea</td>
<td>Reed canary-grass</td>
<td>January 1, 2006</td>
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<tr>
<td>Phellodendron amurense</td>
<td>Amur cork-tree</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Phragmites australis</td>
<td>Common reed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Polygonum perfoliatum</td>
<td>Mile-a-minute vine or weed; Asiatic Tearthumb</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Potamogeton crispus</td>
<td>Crisped pondweed; curly pondweed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Prosopis pallida</td>
<td>Kiawe</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Prosopis reptans</td>
<td>Tornillo</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Scientific Name</td>
<td>Common Name</td>
<td>First Appearance</td>
<td>Last Appearance</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Prosopis strombulifera</td>
<td>Argentine screwbean</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Prosopis velutina</td>
<td></td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Pueraria montana</td>
<td>Kudzu; Japanese arrowroot</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Ranunculus ficaria</td>
<td>Lesser celandine; fig buttercup</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Ranunculus repens</td>
<td>Creeping buttercup</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Rhamnus cathartica</td>
<td>Common buckthorn</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Robinia pseudoacacia</td>
<td>Black locust</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Rorippa amphibia</td>
<td>Water yellowcress; great yellowcress</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Rosa multiflora</td>
<td>Multiflora rose</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Rottboellia cochinchinensis</td>
<td>Itchgrass</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Rubus fruticosus</td>
<td>Wild blackberry complex</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Rubus moluccanus</td>
<td>Wild blackberry</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Rubus phoenicolasius</td>
<td>Wineberry; Japanese wineberry; wine raspberry</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Saccharum spontaneum</td>
<td>Wild sugarcane</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Sagittaria sagittifolia</td>
<td>Arrowhead</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Salsola vermiculata</td>
<td>Wormleaf salsola</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Salvinia auriculata</td>
<td>Giant salvinia</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Salvinia biloba</td>
<td>Giant salvinia</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Salvinia herzogii de la Sota</td>
<td>Giant salvinia</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Salvinia molesta</td>
<td>Giant salvinia</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Senecio jacobaea</td>
<td>Tansy ragwort; stinking Willie</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Setaria pallidifusca</td>
<td>Cattail grass</td>
<td>January 1, 2006</td>
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<tr>
<td>Setaria pumila</td>
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<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Solanum tampicense</td>
<td>Wetland nightshade</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Solanum torvum</td>
<td>Turkeyberry</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Solanum viarum</td>
<td>Tropical soda apple</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Sparganium erectum</td>
<td>Exotic bur-reed</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Spermacoce alata</td>
<td>Borreria</td>
<td>January 1, 2006</td>
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<tr>
<td>Striga Lour.</td>
<td>Witchweed</td>
<td>January 1, 2006</td>
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<tr>
<td>Trapa natans</td>
<td>Water-chestnut</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Tridax procumbens</td>
<td>Coat buttons</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
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<tr>
<td>Tussilago farfara</td>
<td>Coltsfoot</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
<tr>
<td>Urochloa panicoides</td>
<td>Liverseed grass</td>
<td>January 1, 2006</td>
<td>January 1, 2006</td>
</tr>
</tbody>
</table>
Appendix J: HPI Sample Project Scope of Work

Please note: The following is a composite scope of work based on the demonstration projects developed through the Historic Parkways Initiative. It is intended to be representative of the range of research, planning and design that may be needed on a typical historic parkway project. This scope is for reference only. The scope of work for a parkway project should be determined based on project goals and the specific resource.

SCOPE OF WORK

CONSULTANT SERVICES FOR THE REHABILITATION OF THE [insert name of parkway]

I. INTRODUCTION

A. Background
The historic [insert name of parkway] is located in [insert town name], Massachusetts and [include any other geographic description here]. The Parkway and surrounding Reservation are a part of the DCR parkways network and are listed on the National Register of Historic Places. The Reservation lands are also home to a number of significance flora and fauna, protected under the Natural Heritage and Endangered Species Program. It is the intent of this project to maintain the overall character of the roadway and avoid impacts to rare species while implementing safety improvements.

The Historic Parkways Initiative
This project must be consistent with the preservation protocols of the DCR Historic Parkway Preservation Treatment Guidelines.

B. Purpose/Objective
The Massachusetts Department of Conservation and Recreation (DCR) is seeking professional consulting services for preliminary and final roadway design, natural and cultural resource assessment, permitting, and designer services during construction, for improvements relative to [insert name of parkway] in the town of [insert town name], MA. The Consultant shall assess the historic roadway and its associated landscape and develop recommendations for rehabilitation and reconstruction that are appropriate to the historic character and natural features of the resource. The consultant will develop detailed construction plans, assist with bidding and provide construction oversight of the [insert name of parkway].

The proposed [insert name of parkway] improvement program includes preservation, rehabilitation, and/or reconstruction of the following components within the context of the historic landscape:
• Pavement
• Drainage Structures (culverts, headwalls and inlets, sub-drains, paved and rip-rap drainage channels)
• Roadway side-slopes and retaining walls
• Bollards and guard rails.
• Vista Restoration

The [insert name of parkway] project is intended to be designed and bid as a single construction contract for the entire XX roadway system.

If the project will be phased:
The [insert name of parkway] project may be implemented in phases as follow:

Phase I – Scope/project limits and schedule
Phase II – Scope/project limits and schedule

Work in Phase 1 will consist primarily of demolition, civil and structural work in the first segment. Work for Phase 2 will consist of final landscape work for the entire project area as well as civil work in the second segment. Plans and Specifications will be prepared for two independently biddable construction phases. Conceptual planning for Phase 2 shall begin with the initiation of the contract and following completion of Task 1. Although unanticipated, if budget considerations appear to result in a substantial delay in the bidding of Phase 2, the final landscape work for the first segment should be in a format able to stand alone for bidding as an intermediate phase. Cost estimates for Phase 1 should insure that funds for this landscaping work are reserved either for application to Phase 2 or as Phase 1A.

DCR has established a construction budget in the amount of [dollar amount] for this project.

All work and proposed design shall be consistent with the recommendations of the [insert name of reservation] Master Plan, the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Cultural Landscapes and the DCR Historic Parkway Treatment Guidelines.

II. GENERAL

A. DCR Personnel
Staff of the Department of Conservation and Recreation’s (DCR) Division of Planning and Engineering are the primary contacts for all work performed under this contract.

B. Consultant Team Composition
The consultant team shall include all necessary professional disciplines necessary for the successful completion of all project elements including, but not limited to civil engineers, historical/cultural landscape specialists, bridge engineers, transportation planner or engineer knowledgeable about bicycle requirements, landscape architects, arborists, ecologists, botanists and environmental permit specialists.
C. Reduction of Non-Point Source Pollution & Adoption of Best Management Practices
The DCR is committed to the reduction of non-point source pollution through the adoption and implementation of Best Management Practices. Project designs should include BMP features designed to eliminate or attenuate pollution from storm water run-off and other sources; construction plans should incorporate BMPs to eliminate or minimize pollution from erosion and construction related run-off.

D. Reporting Formats
All deliverables submitted to the DCR shall be in hard copy and include two copies in digital format. The DCR IT Department shall specify the computer format for the individual pieces of information (i.e., reports, plans, maps, or details). The standard software used by the Division is Access, Excel, and ArcInfo (E00 exchange format), EDSC AutoCAD, Microsoft Word 2002. ASCII files should be in comma-delimited format with character strings in quotes.

E. Locus for Project Work
The locus for project work is the [insert name of parkway] section of the historic [insert name of reservation] and includes all roadways, pathways, open space and parklands, landscaping and plantings with the jurisdiction of the DCR from the northern terminus of the [insert name of parkway] at First Street to the southern terminus at Main Street, inclusive of the University Rotary.

III. SCOPE OF WORK

A. Orientation
The Consultant shall review and become familiar with available materials related to the engineering, history and design of [insert name of parkway], as well as current manuals on historic parkway treatment, project design and development including:

1. [insert name of reservation] base survey maps
2. [insert name of reservation] Master Plan or Resource Management Plan (if one exists)
3. [insert name of parkway] Scenic Byway Corridor Management Plan (if one exists)
4. National Register nomination for [insert name of parkway]
5. Massachusetts Historical Commission (MHC) Inventory Forms for [insert name of reservation]
6. DCR’s Historic Parkways Treatment Guidelines;
7. The Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Cultural Landscapes
10. DFW/NHESP Maps Pertaining to Locations and Extent of Rare Species
The Consultant will have access to the DCR Plans Library and Archives, by appointment with the respective archivists.

**B. Documentation**
The consultant shall prepare baseline documentation of the [insert name of parkway] as described below:

1. **Site Survey**
The Consultant shall conduct field surveys and prepare base plans as necessary for conceptual plans and final designs including bathymetry and geotechnical borings, as required. All surveys shall be referenced to the State Plan Coordinate System and supplied to the DCR in a digital format in addition to plan form. Plans should include, at minimum, relevant elevations, the locations of all site drainage, utilities, surface and subsurface natural (including wetland resource areas in accordance with 310 CMR 10) and artificial features. Survey plans should be in forty-foot scale with one-foot contours. Datum reference is the Boston City Base. Construction plans shall include horizontal controls.

2. **Mapping and Data Collection**
In addition to traditional survey, the [insert name of parkway] project requires collection of geographical data on specific features including:

- Locations and identification of all trees over 6” dbh
- Locations and materials of trails and pathways
- Locations of light posts

Geographic data shall be assembled in an Excel compatible spreadsheet and tied into a base map. The Consultant shall work with DCR’s GIS Director to insure consistency among data.

**C. Design Control Report (Inventory and Analysis)**

1. The Consultant shall document and assess the [insert name of parkway] including inventory and analysis of historic and character-defining features and elements and intrusive elements. The report shall also include an assessment of the historical integrity of individual features and the overall resource area.

2. The Consultant shall prepare a graphic and written inventory and report of the existing conditions at the project site, as necessary to augment, but not duplicate, the [insert name of reservation] Master Plan. The report shall include any additional required detailed description and analysis of site elements including facilities, circulation and parking, utilities (including DCR and municipal facilities) site furnishings, structures (including shore protection), environmental, wetland and water quality issues. The report shall include an analysis of the opportunities and constraints of the site.
3. The Consultant shall make recommendations for the rehabilitation of the parkway in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Cultural Landscapes;

4. The Consultant shall prepare illustrative sections and other drawings as needed to supplement the narrative assessment;

5. The Consultant shall prepare maintenance guidelines for the roadway in accordance with the Secretary of the Interior’s Standards for the Treatment of Historic Properties;

6. The Consultant shall perform an assessment of natural resources along the [insert name of parkway]. The assessment shall locate and define the extent of rare and endangered species that may be impacted by this road improvement project. The consultant shall prepare guidelines for species protection prior to, during, and after construction.

7. The Consultant shall prepare a draft and final Design Control Report in accordance with the requirement described in the Historic Parkway Treatment Guidelines.

8. The Consultant shall meet as necessary with the Department, and shall prepare and submit to the Department a statement, relative to the Consultant's review of existing design plans and roadway assessment plan for [insert name of parkway]. The statement shall be based on the Consultant's review and analysis of the existing documentation including drawings, cost estimates, assessments, and collected data. It shall present a corroboration of all information in the design plans and master plan and/or a modification to the information wherever appropriate and necessary in order to make the documents acceptable to the Consultant.

9. The Consultant shall analyze the proposed construction work represented by the roadwork repairs and reconstruction and shall prepare a graphic representation of a time and function schedule. The schedule shall relate to licenses, permits and variances requiring Departmental application to municipal, state and federal agencies during the final design phase. The schedule shall include a detailed outline of time scheduled for all required applications, appeal periods, and sequences of applications. The consultant is required to obtain and furnish to the Department a draft application or blank form for each of the required licenses, permits, variances, and the like.

**Deliverables**

Six (6) Copies, Draft and Final Survey Plans  
Six (6) Copies, Draft and Final Design Control Report  
Six (6) Copies, Draft and Final Summary Statement and Schedule

**D. Project Management**

1. General Contract and Project Management
Under this task, the consultant shall be required to complete the following:
a. An Initial Plan and Schedule for all Work for review and approval and thereafter, Semi-Monthly Progress Reports and Meeting will be required to summarize the activities that have been conducted during the reporting period and outline work planned for the upcoming period. A project status table shall indicate the budget, person-hours, and percent completion, for all project activities shall accompany Progress Reports and Invoices for payment. At an initial meeting an outline of the final report shall be submitted for review and approval. Progress meetings may be conducted at the Department's Boston Office or on site and are to be a requirement of the Consultant's services.

b. Interim Reports shall be submitted upon completion of each task's deliverables.

**Deliverables**
Six (6) Copies, Semi-monthly Progress Reports & Tables

**2. Public Participation Requirements**
The Consultant shall be responsible for coordinating, attending, and keeping minutes of up to four (4) public meetings as directed by the DCR Project Manager and as indicated in the Historic Parkways Treatment Design Process. The Consultant shall prepare materials and handouts and provide any necessary audio-visual equipment for the public meetings. The Consultant shall provide an up-to-date listing of project abutters to the DCR Project Manager, at least four weeks prior to the second public meeting. A meeting may precede these meetings with DCR personnel to brief the Commissioner and Deputy Commissioners. In addition, the Consultant shall meet with other DCR personnel, including landscape, parkway and maintenance, as directed.

**E. Design**
The Consultant shall design roadway improvements to accommodate existing uses, meet current safety needs, protect listed plant species and preserve the historic parkway in accordance with standards and guidelines established in the Design Control Report.

**1. Schematic Design**
The consultant shall prepare a series of cost effective alternatives for parkway treatment consistent with the recommendations of the Design Control Report.

Alternatives shall take into consideration any potential impacts to historical, natural and wetlands resource features and areas. Plans shall avoid, where practicable, unnecessary or adverse impacts to historical, natural and wetland resource areas. Conceptual alternative plans shall include landscape preservation and renewal as determined in the Design Control Report (Cultural Landscape section).

Following completion of the services of this task, and after acceptance by the DCR, the plans shall be presented for review and discussion at a public meeting. This meeting shall be scheduled and coordinated in conjunction with the DCR Office of External Affairs. Public presentation materials shall include graphical presentation plans and perspective drawings in color, as appropriate.
Based on input from the public, the consultant will prepare layout plans, elevations, cross sections, key details, outline specifications, narrative description, and an outline cost estimate for the preferred alternative for review and approval by DCR.

**Deliverables**
- Six (6) Copies, Each Alternative, Conceptual Plan
- Six (6) Copies, Preliminary Specifications
- Six (6) Copies, Preliminary Cost Estimates

**2. Design Development**
The consultant shall develop a preferred design for implementation including plans, outline specifications and a cost estimate.

The consultant, in conjunction with DCR personnel, shall evaluate public response to the conceptual plans as presented. This review period may include other public meetings and presentations. Following the consultative process, the consultant shall proceed to develop the design including plans, outline specifications and revised cost estimates.

Following completion of the services of this task, and after acceptance by the DCR, the preferred design plan shall be presented for review and discussion at a public meeting. This meeting shall be scheduled and coordinated in conjunction with the DCR Office of External Affairs.

**Deliverables**
- Six (6) Copies, Design Development Plans for each Phase
- Six (6) Copies, Design Development Specifications for Each Phase
- Six (6) Copies, Design Development Cost Estimate for Each Phase
- Public Meeting materials in quantities as needed

**3. Permitting**
The Consultant shall be responsible for obtaining all permits, approvals, licenses, variances, and the like, and for the preparation of all applications for permits, licenses, and the like which will be required prior to construction together with any and all required application fees and copies of supplementary materials, plans, and specifications. All documents, applications and appeals shall be submitted in draft and final forms. The consultant shall present as many drafts as necessary to prepare a final form acceptable to the DCR. The consultant is responsible for calculation and payment of all fees that are reimbursable expenses.

The Consultant shall identify all necessary environmental permits and required filings including, but not limited to, Massachusetts Historical Commission (MHC) review (950 CMR 71.), wetlands protection act filings, water quality permits, and Federal Section 10, 401 and 404 permits. All permit applications for this project shall meet all of the requirements of
the Massachusetts Environmental Policy Act (MEPA), Massachusetts Endangered Species Act (MESA), and the Massachusetts Historic Commission.

The Consultant shall prepare sufficient copies of all necessary applications, notices and documentation for submission by the DCR. The consultant shall prepare for and attend all necessary meetings and hearings. At the discretion of the DCR project manager, the Consultant shall prepare any supplementary information necessary for clarifications or appeals. This task shall be completed and all drafts prepared at the 50% design stage.

The Consultant shall be responsible for responding to all issues raised and for incorporating into design documents any procedures or alterations to plans as required by permits.

The Consultant shall work with public agencies, boards and commissions as necessary and will attend any required public hearings and meeting in order to obtain the required approvals.

**Deliverables**
Draft and Final Environmental Filings, as Required

4. Preparation of Final Design & Construction Documents
The Consultant shall be responsible for preparing all design and construction documents for all phases including necessary plans, elevations, specifications, schedules and cost estimates. Plans shall be presented to the DCR for review and approval at the 20%, 50% and 100% [% complete submission at the discretion of the project manager depending on complexity of project] design. Plans shall incorporate all permit and licensing requirements and conditions. 100% Plans shall include horizontal survey controls. Plans shall be prepared in accordance with DCR format with supplements from the MHD Design Guide.

The final estimate shall be prepared in “unit price” format with all estimated quantities. Lump sum prices and allowances should only be included when unit prices are demonstrated to be impractical.

a. 20% Plan Submittal
The Consultant shall prepare a 20% Design Submittal of Construction Documents (plans, specifications and cost estimate) conforming to guidelines established under the Design Control Report, as well as the Massachusetts Highway Department format and recommended standards. The Report shall discuss all components to be included in the roadway improvement project. Conclusions, options, and costs shall be presented in this Report. Any Design exceptions (waivers) identified earlier in the Design Control Report should be fully documented at this stage. The plans shall show the locations of all proposed improvements. The Consultant will submit six (6) copies of the 20% Plans for Department approval. Comments resulting from the review will be addressed in writing prior to proceeding. When the Department grants the approval of this submittal, the project will proceed to the next design phase.
b. 50% Design Submittal
The Consultant shall prepare 50% Design Submittal of Construction Documents (plans, specifications and cost estimate) conforming to guidelines established under the Design Control Report, as well as the DCR Project Management Manual format and recommended standards. Six (6) copies of the 50% submittal are required. In addition to all known existing details, the plans shall include, but not be limited to, the following proposed details:

- Road surface
- Roadway width
- Base line
- Edging, curbing and berms
- Drainage appurtenances and channels
- Sub-drains
- Guardrail and Bollards
- Demolition
- Slopes and retaining walls or structures
- Fences
- Pavement markings
- Erosion Control
- Signage
- Resource Protection Barricades

Contract documents shall be in such form that competitive bids can be received from contractors.

c. Obtain 50% Project Approval
The Consultant will submit six (6) copies of construction documents (plans, specifications, and cost estimate) for Department approval. Comments resulting from the review will be addressed in writing prior to proceeding to 100% documents. When the 50% approval is granted, by the Department, the project will proceed to final design plans, specifications and estimate.

d. Final Design (100%)
Construction Plans shall be prepared in accordance with the DCR Project Management Manual and accepted guidelines established in the Design Control Report. The complete set of construction plans shall include:

- Title Sheet
- Index Sheet
- Key Sheet
- Typical Sections
- Plans and Profile of the roads
- Grading
- Drainage and Special Construction Details
- Erosion Control Plans
• Sign Plans
• Landscape Plans and Details
• Cross-Sections.
• Renderings

All items required in the 100% submission guidelines shall be submitted to the Department for approval.

e. Traffic Management Plan
A traffic management plan shall be developed working with DCR staff, to allow vehicular traffic to flow along the parkway as well as allowing pedestrian and bicycle traffic within the reservation while work is in progress. The Consultant shall prepare a Traffic Management Plan and Drawings to be used during each construction phase. Plans must indicate work hours, lane closures, signs, barricades, drums and traffic signals as required.

f. Development of Special Provisions
The Consultant shall develop Special Provisions to explain conditions and construction practices not covered in the current edition of the DCR Standard contract form. Special Provisions may include but not necessarily be limited to the following:
• Scope of Work
• Provisions for Travel and Prosecution of the Work
• Work Schedule
• Special Precautions (Protection of natural and historic resources)
• Individual items not covered in the Standard Specifications
• Copies of Permits, Licenses, Certificates and Order(s) of Conditions
• Scheduling requirements, milestones, completion dates
• Special requirements of the Department of Environmental Management.
• Staging and Mobilization

g. Bid Form
A bid form shall be developed that contains all items of the work based on the standard MHD nomenclature, along with the estimated quantities of each item.

**Deliverables**
Six (6) Copies, 20%, 50%, 100% Plans, Specifications, Traffic Management Plan, Schedules, Special Provisions, Cost Estimates and Bid Form

F. Services During Construction

1. Assistance with Bidding
The consultant shall attend any pre-bid conferences, respond (in writing) to inquiries, as directed by the DCR, prepare addenda as required and provide other services as required. Otherwise, the DCR shall be responsible for providing all bidders with plans and specifications, issuing addenda, as well as qualifying bidders in accordance with laws and practices. The consultant shall be required to review bids, prepare a canvas of bids in an electronic format and provide a written analysis of the bidding process and actual bids. The
consultant shall include a line expense for printing of construction drawings for distribution by the DCR.

2. Construction Phase Services
The DCR shall provide full-time resident engineer services for construction, which accounts for the majority of construction oversight. The Consultant shall review and approve shop drawings and submittals, prepare change orders, interpretations and alterations as required, attendance at weekly job site meetings, field inspections as needed and consultation and otherwise assist the DCR Resident Engineer during construction. Subtasks are outlined below:

a. Review of Submittals
Within one week of receipt, the consultant shall check and approve shop drawings, samples, schedules, and other required submittals from the General Contractor after the construction contract has been awarded. The Consultant will provide advice during construction and site visits on a bi-weekly basis to address questions and unanticipated conditions.

b. Reporting
The Consultant shall report bi-weekly to the Department, in writing, on the following subjects: site visits including job meeting minutes; construction progress with photos; work found to be non-compliant or deficient; project schedule and completion status; shop drawing reviews; and any problems. The consultant shall keep track of all field changes and verify all as-built plans as submitted by the general contractor. The consultant shall prepare all necessary certificates of compliance required for project permits.

c. Closeout Report
The Consultant shall prepare and submit a final construction closeout report that documents the construction phase. The report shall include, but not be limited to the following: construction progress photos, job site meeting minutes, all consultant project correspondence, and final inspection punch list. It is anticipated that the Department will provide full-time resident representation.

Deliverables
Attendance at Pre-Bid Conferences
Addenda and Clarifications as required
Canvas of Bids
Evaluation of Bids
Weekly Job Site Meetings
Verification of As Built Drawings
Prepare and submit all Permit Certificates of Compliance
Review and Approve Submittals, Shop Drawings & Construction Schedules
Closeout report
G. Additional Services
The Consultant agrees to provide additional services not specified in the Scope of Services on an hourly basis as required by the Department to complete unanticipated tasks required for this project. Additional services may include, but are not limited to:

- Additional project meetings or public hearings with interested parties or agencies.
- Modifications to the contract documents subsequent to the submission of the Final Plans, Specifications, and Estimate.
- Additional copies of reports and plans.

Additional Services shall be provided on an hourly basis at the Consultant's and all Sub-consultants' Standard Billing Rates for the year in which the services are provided.

IV. PROJECT SCHEDULE

The Department expects to meet the following schedule and milestones:

Bidders Conference [insert date]
Proposals Due [insert date]
Notice to Proceed Issued [insert date]
Submission of draft Design Control Report [insert date]
Schematic Design Submission [insert date]
Preliminary permit application [insert date]
Design Development Submission [insert date]
Final Design [insert date]
100% Design Submittal [insert date]
Begin Construction [insert date]
Construction Completion [insert date]

- END OF SCOPE -
Appendix K: Glossary

3R – term generally used by engineers to refer to “resurfacing, restoration, rehabilitation” projects that are usually solely associated with paving projects.

access control – the degree of connection and separation between the travel way and the surrounding land use.

area type – the built and natural environment surrounding a parkway.

average daily traffic (ADT) – the daily average number of vehicles traveling on a particular road.

border road – parkway that historically formed the edges of reservations.

character defining features – those historic aspects of a parkway that establish its unique character.

clear zone – sometimes called a recovery zone, an area free of obstacles beyond a road shoulder.

connecting parkway – primary parkway type that links communities to public parks and reservations, and links parks and reservations to each other.

context sensitive design – collaborative, interdisciplinary approach to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility for all users.

cross-section – sometimes called the road prism, it is the locations, dimensions, and materials of a road and its adjacent environment.

cultural landscape assessment – that part of the design control report that documents history and historic role and significance, existing conditions and character defining features.

cyclic maintenance – scheduled routine parkway maintenance on an established timeline.

design control report – report outlining the parkway-specific design controls.

design controls – the acceptable parameters for speed, congestion, curvature, peak hour service, and other design elements on a parkway project.

design hour volume – one-hour volume in the design year selected for determining the highway design.

design speed – selected speed used to determine the various design features of the travel way.
estate road – parkway originally designed to serve private grounds, and has been adapted for use in estate-turned-park.

functional classification – classification of roadway types based on the degree of access and mobility provided.

geographic information system (GIS) - a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

historic integrity – the physical evidence of the history of a historic entity and the entity’s ability to convey that significance; defined by the NPS as the culmination of location, setting, design, materials, workmanship, feeling, and association.

horizontal alignment – sometimes called the plan, the curves and straight tangents of a travel way.

intelligent transportation system (ITS) – wireless and wire line communications-based information and electronics technologies which relieve congestion, improve safety and enhance productivity.

internal park road – primary parkway type that is the primary circulation system within a park, providing access to recreational sites; alignments generally follow the natural topography and are often more curvilinear, with greater changes in vertical alignment than on other parkways.

level of service (LOS) – measure of user satisfaction with degrees of movement through a transportation network.

metropolitan planning organization (MPO) – federally mandated transportation decision-making organization charged with allocating federal funding to transportation projects.

natural resources inventory – identification of natural resources directly associated with a parkway corridor.

ocean parkway – located exclusively along the ocean and follow the horizontal alignment of the shoreline.

period of significance – years during which a site achieved the local, state, or national significance as required by the National Register of Historic Places.

plan – road engineering term referring to the layout of a road including its location and alignment.
**profile** – road engineering term referring to the vertical layout of a road.

**project manager** – leads an internal planning process to determine a scope of work, schedule, budget, and roles and responsibilities of team members.

**project review committee (PRC)** – convenes for formal review of parkway projects and gives full consideration to the project’s viability and design details.

**reconstruction** – the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

**rehabilitation** – the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

**restoration** – the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period.

**river parkway** – parkway that follows one side of a watercourse in a generally level, curvilinear alignment that parallels the shoreline.

**roadway type** – the role the parkway roadway plays in providing regional connections and local access.

**shoulder** – portion of a roadway adjacent to a traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of the base and surface courses.

**sight distance** – line of sight available to the driver to see another roadway user or a fixed object.

**summit road** – parkway that winds up steep mountain slopes in a series of ascents, with rests at pullouts at overlooks; provides an experience of rugged progress up steep, winding topography, with dramatic views on the way to the summit.

**superelevation** – also known as banking, the tilt of a road surface to counteract centripetal forces.

**target speed** – the desirable vehicular operating speed along a roadway for a particular context.

**technical evaluation criteria (TEC)** – criteria, as specified in the request for proposal, for scoring for ranking proposals based on technical merits.
tort liability – when an injury is sustained due to negligence on behalf of a managing agency or design professional and the responsibility of the managing agency to make restitution for damages.

traffic volume – number of vehicles or persons that pass over a given section of a lane, roadway, or other traffic way during a time period of one hour or more; can be expressed in terms of daily traffic or annual traffic, as well as on an hourly basis.

transportation demand – demand by motorists, pedestrians, and bicyclists for a facility, assessed in terms of volume, composition, and patterns.

transportation improvement program (TIP) – five year funding program that allocates state and federal transportation funds, both highway and transit, for the region; prepared by MPOs every year.

vernacular road – parkway found in virtually all forests, parks and reservations in the Commonwealth; typically simple in construction and located in undeveloped areas.

vertical alignment – sometimes called a profile, the up and down movement of a road.

3 For more detailed discussion of the history of the urban parkways, see the National Register of Historic Places Multiple Property Documentation Form for the Metropolitan System of Greater Boston, prepared by Virginia H. Adams et al., 2002.