

Introduction

Transportation and quality of life in our Commonwealth communities are inextricably linked. This connection is largely influenced by the role that highways, streets, and sidewalks play in our lives. Excellent transportation is critical to a healthy and vibrant Commonwealth. One of the priorities of the Executive Office of Transportation (EOT) is the development and maintenance of a comprehensive and effective multimodal transportation network.

MassHighway, in its role as steward for our roadways, must consider a broad range of factors in maintaining and improving this system, including:

- Safety for all users
- Functionality – the need for access and mobility
- Accessibility for people with disabilities – as a prerequisite to access to employment, recreation, and healthcare
- Mutual support and compatibility between transportation facilities and services and the adjacent land uses and associated activities they serve
- Consistency with transportation plans and policies, and environmental regulations, that guide the community, the region, the state, and the Federal government
- Transportation facility design and operational requirements established by others
- Input and participation from local constituents, and the appropriate local, regional and state reviewing agencies
- Cost effectiveness – the value returned to the Commonwealth for the investments made in transportation

The Commonwealth of Massachusetts is committed to caring for the built and natural environments by promoting sustainable development practices that minimize negative impacts on natural resources, historic, scenic and other community values, while also recognizing that transportation improvements have significant potential to contribute to local, regional, and statewide quality of life and economic development objectives.

1.1 Purpose of the Guidebook

Well-designed transportation infrastructure that is responsive to its context is the product of thoughtful planning. By bringing together transportation professionals, local residents, and interest groups, transportation planning can produce public facilities and programs that support community goals, provide safe and efficient transportation for individuals and goods, enhance the economy, and protect the natural environment.

The purpose of this Project Development & Design Guide (Guidebook) is to provide designers and decision-makers with a framework for incorporating context sensitive design and multi-modal elements into transportation improvement projects. The emphasis is to ensure that investments in transportation infrastructure encourage projects that are sensitive to the local context while meeting the important needs of the people they serve.

1.2 Guiding Principles of the Guidebook

The following are the Guiding Principles for development of this Guidebook.

- **Multimodal Consideration** — to ensure that the safety and mobility of all users of the transportation system (pedestrians, bicyclists and drivers) are considered equally through all phases of a project so that even the most vulnerable (e.g., children and the elderly) can feel and be safe within the public right of way. This includes a commitment to full compliance with state and federal accessibility standards for people with disabilities.
- **Context Sensitive Design** — to incorporate, throughout project planning, design, and construction, the overarching principles of Context Sensitive Design (a collaborative, interdisciplinary approach that involves all constituents 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).

- **A Clear Project Development Process** — to establish a clear and transparent project development and design process that can be administered consistently throughout the state. The ideal is a process that results in project consensus among constituents which can be expeditiously accomplished within reasonable project cost.

1.2.1 Multi-Modal Consideration

A guiding principle of the Guidebook is that the roadway system of the Commonwealth should safely accommodate all users of the public right-of-way including:

- Pedestrians, including people requiring mobility aids (canes, service animals, wheelchairs, walkers, and scooters)
- Bicyclists
- Drivers and Passengers
 - Transit vehicles
 - Trucks
 - Automobiles and Motorcycles

Chapter 87 of the Acts of 1996 requires MassHighway to “make all reasonable provisions for the accommodation of bicycle and pedestrian traffic...”

Historically, highway design manuals have been focused on guidelines to ensure safe operation of motor vehicles. This Guidebook does not diminish the importance of providing a safe operating environment for motor vehicles -- rather the Guidebook provides balanced guidance on public right-of-way design objectives to serve both non-motorized (i.e. bicycles and pedestrians) and motorized travel.

This Guidebook takes the approach that non-motorized transportation modes are fundamental considerations in the design process. As such, pedestrian and bicycle design requirements within a shared right-of-way are integrated throughout the design chapters. In addition, guidance and references for off-road pedestrian and bicycle facilities is presented as a separate chapter within this Guidebook. Design requirements associated with public transit operations are also integrated into the chapters throughout the Guidebook.

It is the policy of EOT and the Commonwealth to encourage designers and decision-makers to fully consider these modes of transportation throughout the planning, design, and construction phases of a

transportation improvement project. Ultimately, thoughtful consideration and evaluation of all modes should result in a robust, multimodal transportation system for the Commonwealth that accommodates all users safely and efficiently within the public right-of-way.

1.2.2 Context Sensitive Design

A second guiding principle of the Guidebook is that roadway projects should be planned and designed in a context-sensitive manner. This Guidebook has been developed to ensure that projects intended to improve the roadway network in the Commonwealth are implemented in such a way that the character of the project area, the values of the community, and the needs of all roadway users are fully considered.

An important concept in planning and design is that every project is unique. Whether the project is a modest safety improvement, or a ten-mile upgrade of an arterial street, there are no generic solutions. Each project requires designers to address the needed roadway improvements while safely integrating the design into the surrounding natural and built environment. Several characteristics of context-sensitive projects have been identified through Federal Highway Administration (FHWA) research and workshops. Among these concepts, the following are adopted by this Guidebook:

- The project satisfies its purpose and needs as agreed to by a wide range of constituents. This agreement is forged in the earliest phase of the project and amended as warranted as the project develops.
- The project is a safe facility for users of all ages and abilities as well as for the surrounding community.
- The project meets minimum design standards for accessibility for people with disabilities and gives attention to universal design principles.
- The project is in harmony with the community and preserves environmental, scenic, aesthetic, historic, and built and natural resources of the area.
- The project is well managed and involves efficient and effective use of the resources (time, budget, community) of all involved.

- The project is designed and built with the least possible disruption to the community.
- The project is seen as having added lasting value to the community.

The Guidebook draws from the state-of-the-art in roadway design. Design guidelines are consistent with those described in the 2004 Edition of *A Policy on the Geometric Design of Highways and Streets by the American Association of State Highway and Transportation Officials (AASHTO)*, also known as the "Green Book." The Guidebook also incorporates the additional guidance contained in AASHTO's *A Guide for Achieving Flexibility in Highway Design* (2004), *Guide for the Planning and Design of Pedestrian Facilities* (2004), and *Guide for the Planning and Design of Bicycle Facilities* (1999), as well as the Federal Access Board's *Draft Guidelines for Accessible Right-of-Way* (2002), the Massachusetts Architectural Access Board's *Rules and Regulations* (2005), and the USDA Forest Service's *Outdoor Recreation Accessibility Guidelines* (2005).

In addition, research conducted under the auspices of the *Transportation Research Board (TRB)* and other organizations was considered and incorporated into the Guidebook, as appropriate. Finally, best-practices found in the manuals of other states and communities, as well as design guidance formulated specifically for this Guidebook, are included throughout.

1.2.3 A Clear Project Development Process

A third guiding principle of the Guidebook is to present a clear project development process that can be easily understood by project proponents and constituents and simply and consistently administered throughout the Commonwealth.

Often, the process through which a project is developed is as important as the design standards employed. The project development process outlined in this Guidebook defines the need for early identification of issues and alternatives, open and continuous involvement with project constituents, and a clear decision-making process. This process should ensure that community values, natural, historic, and cultural resources, and transportation needs are fully considered throughout the planning, design, and construction phases of a project.

A clear and consistent project development process is important for a number of reasons. The most significant are:

- To encourage early planning and evaluation so that project needs, goals and objectives, issues, and impacts can be identified before significant resources are expended.
- To ensure context sensitivity through an open, consensus-building dialog with project constituents.
- To achieve consistent expectations and understanding between project proponents and those entities who evaluate and prioritize projects (including MassHighway's Project Review Committee and Metropolitan Planning Organizations as described in Chapter 2).
- To facilitate efficient allocation of resources based on pre-established project selection criteria and consistency with local, regional, and statewide priorities.

An effective process, helps achieve projects that respect the values of the community and the natural and built environment, while meeting the transportation needs. The FHWA and AASHTO clearly establish the importance of a sound project development process for achieving context-sensitive highway solutions in their *Flexibility in Highway Design* and *A Guide to Achieving Flexibility in Highway Design* publications.

1.2.3.1 Objective, Coordinated, Transparent, and Inclusive Transportation Decision-making

The transportation decisions we make today will affect our Commonwealth for many years to come. While transportation improvements can generate increased mobility and allow economic growth, they also profoundly affect the nature of our communities and our environment. For these reasons, it is vital that the Commonwealth have an objective and inclusive transportation planning and project-development process, in which all of the effects of transportation proposals can be understood and considered.

Communication about, administration of, and understanding of the process through which potential projects are evaluated can improve the efficiency of the allocation of transportation resources. If project proponents and reviewers share a continuing dialog about project issues, review procedures, and evaluation criteria, then proponents are likely to focus their energy on projects that have strong support and avoid spending scarce resources to advance projects that will ultimately be rejected.

Decisions should be made in a coordinated manner, with decision-makers considering the needs of all affected citizens and ensuring that services are delivered in the most efficient and orderly way. Decisions should also be made in as transparent a way as possible, with public knowledge not only of the final decisions but of the process used to reach those decisions. And lastly, all decisions should be made in an inclusive manner, with the active participation of individuals, businesses, interest groups, and affected constituencies.

Early in 2003, the Executive Office of Transportation initiated an effort to develop a set of objective transportation *Project Evaluation Criteria*. These evaluation criteria make it possible for all decision-makers to assess transportation projects across modes in a consistent and systematic manner.

Transportation agencies and Metropolitan Planning Organizations (MPOs) are using objective evaluation criteria at several steps of the project development process:

- To evaluate projects early in the planning process;
- To evaluate projects at various milestones to ensure that resources are allocated to sound projects, thereby increasing effectiveness and reducing costs; and
- To evaluate projects for inclusion in MPO Transportation Improvement Programs, Regional Transportation Plans, and transportation agency capital plans.

Chapter 2 of this Guidebook provides a description of the *project evaluation criteria* and provides guidance on how they should be integrated into the MassHighway project development process.

1.3 Use of this Guidebook

The Guidebook describes the project development procedures and design guidelines applicable to projects with MassHighway involvement. It is expected that this guidance will also be valuable to municipalities, authorities, and other entities involved in the design and development of highways and streets, and other transportation facilities.

This Guidebook should be followed if one or more of the following situations exist:

- When MassHighway is the proponent; or
 - When MassHighway is responsible for project funding (state or federal-aid projects); or
 - When MassHighway controls the infrastructure (projects on state highway).
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This may include projects that are privately funded or projects that are funded by other state or federal sources. If a municipality is pursuing a project on local roads with local funds, Chapter 90 allocations, block grants, or other programs, the procedures described in this Guidebook remain useful but do not need to be strictly followed. Municipalities should consult with the District Highway Office for guidance to ensure compliance with the requirements of the specific funding program.

In addition to MassHighway, many other entities may be involved in a project, either as a proponent or as a constituent. The Guidebook is a useful resource to a broad range of constituents, including:

- MassHighway and other State Authorities
- Metropolitan Planning Organizations
- Regional Planning Agencies
- Local elected officials, boards, and authorities
- The general public and interest groups
- State and Federal regulatory agencies
- Consultants and design professionals

Before any project design work is undertaken, users of this Guidebook are urged to read Chapter 2 - Project Development. Chapter 2 details

the progression of steps to be taken, ranging from project conceptualization through completion. The Chapter also discusses the importance of coordinating project elements with appropriate groups or organizations to ensure a successful process.

1.4 Structure of the Guidebook

All projects from this point forward will be developed using English Units and incorporate applicable elements from this point forward of *A Policy on Geometric Design of Highways and Streets* (2004) by the American Association of State Highway and Transportation Officials (AASHTO), as reflected in this Guidebook. An outline of the various chapters of the Project Development & Design Guide follows:

Project Development (Chapter 2)

The Project Development chapter is designed to broaden the users' understanding of project development, from idea through construction. The chapter describes how projects progress through planning, design, environmental review, and right-of-way steps; how projects move from the design phase into the construction phase; and a suggested process for assessing projects after completion.

Basic Design Chapters (Chapters 3 to 14)

The Basic Design chapters describe guidelines which are the basis for how pedestrians, bicyclists, and drivers of motor vehicles will share roads safely. These include:

- Chapter 3, Basic Design Controls – provides important guidance on roadway and area type (context), the design values for facility user groups, level-of-service criteria, and target design speed.
- Chapter 4, Horizontal and Vertical Alignment – establishes parameters for designing the horizontal and vertical alignments of streets and highways.
- Chapter 5, Cross-Section and Roadside Elements – discusses the spatial requirements and options for allocating roadway right-of-way among the various facility users (pedestrians, bicycles, and vehicles).
- Chapter 6, Intersections – addresses the proper treatment of intersections of streets, highways, and pedestrian facilities.

- Chapter 7, Interchanges – gives guidance on how to access and egress controlled-access transportation facilities through interchange design.
- Chapter 8, Drainage and Erosion Control – provides design approaches and methods for drainage control and storm water management for transportation improvement projects.
- Chapter 9, Pavement Design – details the pavement design requirements for transportation projects.
- Chapter 10, Bridges – addresses how structural design elements should be approached in the overall context of the transportation project.
- Chapter 11, Shared Use Paths and Greenways – provides guidance on the planning and design of off-road shared use path and trail facilities.
- Chapter 12, Intermodal Facilities and Rest Areas – overviews the design considerations for intermodal facilities and rest areas.
- Chapter 13, Landscape and Aesthetics – integrates landscape planning and design considerations in the overall project development process.
- Chapter 14, Wildlife Accommodation – provides a framework for when and how to provide for wildlife accommodation as part of transportation improvement projects.

Toolbox (Chapters 15 to 17)

The Toolbox chapters deal with special design elements and traffic management strategies to address special and unique circumstances. These include:

- Chapter 15, Access Management – overviews the Commonwealth and local responsibilities and strategies for managing access along highways.
- Chapter 16, Traffic Calming and Traffic Management – provides a primer on traffic calming and traffic management strategies and their applicability.
- Chapter 17, Work Zone Management – discusses the safe and efficient management of travel through construction zones.

Plans, Specifications, and, Cost Estimates (Chapter 18)

The Plans, Specifications, and Cost Estimates chapter outlines standard technical plan and specification requirements for designers and MassHighway officials that are engaged in the design of projects.

1.5 Addenda and Updates

Transportation planning processes and design guidance are constantly changing. This section is provided in order to present any new or refined planning and design guidance or procedures as they are issued.

There are no addenda or updates to this Guidebook currently available.