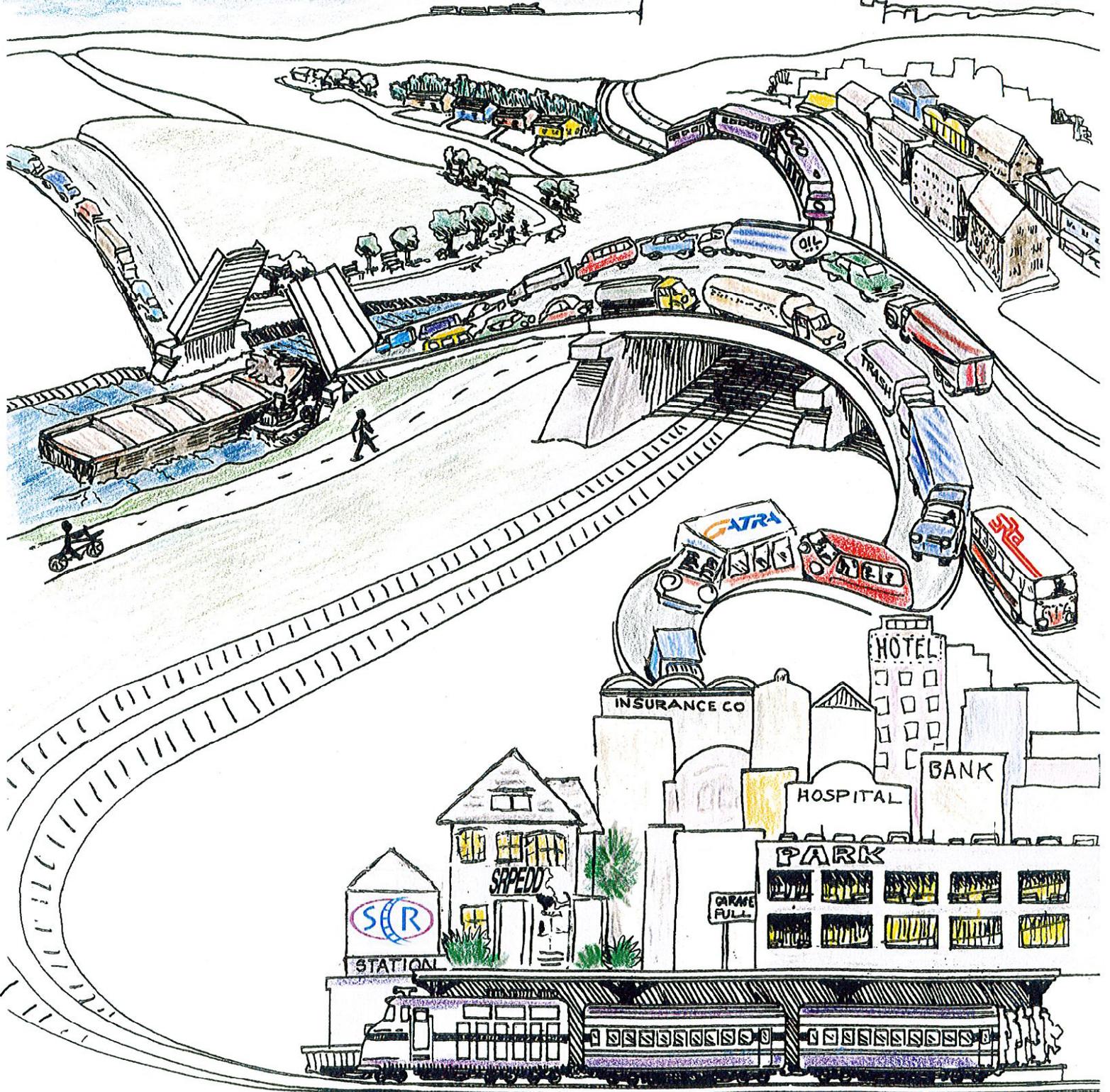


# Transportation Improvement Program

# FUNDING GUIDE



Update November 2015





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**Title VI and Nondiscrimination Notice of Rights of Beneficiaries**

The SMMPO through SRPEDD operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, federal Executive Order 12898 and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person shall, on the basis of race, color, national origin (including limited English proficiency) or income, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. For more information follow this link:

<http://www.srpedd.org/title-vi-compliance>

Portuguese: Caso esta informações não-discriminação seja necessária em outra idioma, favor siga este link:

<http://www.srpedd.org/title-vi-compliance>

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<http://www.srpedd.org/title-vi-compliance>

Individuals seeking additional information or wishing to file a Title VI / Nondiscrimination complaint may contact the SRPEDD Title VI/Nondiscrimination Coordinator at the contact information here. All such complaints must be received, in writing, within 180 days of the alleged discriminatory occurrence. Assistance will be provided, upon request, to individuals unable to provide the complaint form in writing.

SRPEDD  
Lilia Cabral  
Title VI/Nondiscrimination Coordinator  
88 Broadway  
Taunton, MA 02780  
Phone: (508) 824-1367  
Fax: (508) 823-1803  
Email: [lcabral@srpedd.org](mailto:lcabral@srpedd.org)  
[www.srpedd.org](http://www.srpedd.org)

Massachusetts Public Accommodation Law (M.G.L. c 272 §§92a, 98, 98a) and Executive Order 526 section 4 also prohibit discrimination in public accommodations based on religion, creed, class, race, color, denomination, sex, sexual orientation, nationality, disability, gender identity and expression, and veteran's status, and SRPEDD and the SMMPO assures compliance with these laws. Public Accommodation Law concerns can be brought to SRPEDD's Title VI/Nondiscrimination Coordinator OR to file a complaint alleging a violation of the state's Public Accommodation Law, contact the Massachusetts Commission Against Discrimination within 300 days of the alleged discriminatory conduct.

Massachusetts Commission  
Against Discrimination (MCAD)  
One Ashburton Place, 6th Floor  
Boston, MA 02109  
617-994-6000  
TTY: 617-994-6196

# Transportation Improvement Program Funding Guide

June 2012 --Updated November 2015





# The Funding Guide

## Introduction

This funding guide is intended as a practical handbook in the procedures that must be followed in order to get a road, bridge or enhancement project included in the Transportation Improvement Program (TIP), therefore securing the funding necessary to complete the project. The TIP is the official programming document for transportation projects in the region. The Southeastern Massachusetts Metropolitan Planning Organization (SMMPO) is responsible for transportation policy and decisions for 27 member communities and is responsible for endorsing the TIP. The TIP is a fiscally constrained document that identifies projects scheduled for construction over a 4-year period. The TIP is updated annually and is adjusted and amended over the course of the year to conform to changes in status of projects, needs and costs.

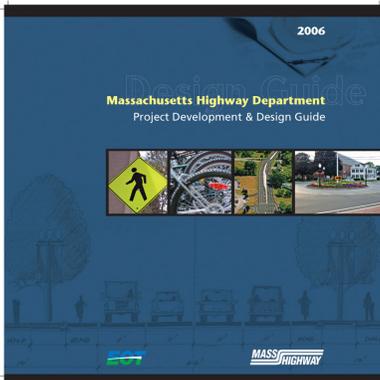


Southeastern Regional Planning and Economic Development District (SRPEDD) serves as the technical and support staff to the SMMPO, as well as providing assistance to cities, towns and agencies. SRPEDD can and should be consulted throughout the process of funding and planning a project, as should the staff of the Massachusetts Department of Transportation (MassDOT.)

The Joint Transportation Planning Group (JTPG) is the advisory group to the SMMPO for all transportation related issues, as well as the forum for citizen involvement in transportation plans and projects. The JTPG plays a very important role in the process as it prioritizes the list of projects within each TIP funding category and can vote to make adjustments to the TIP in their advisory capacity to the SMMPO. Members of the JTPG include a representative from each SRPEDD community. It is strongly encouraged that representatives from each community regularly attend JTPG meetings. JTPG involvement is essential in following and ensuring the progression of any project through the necessary process.



Any project eligible for federal or state aid needs to follow the process outlined in this document. A project may be eligible or may qualify for more than one source of funding based on a number of factors, such as road classification (collector or arterial), or types of project such as maintenance, safety improvement or congestion relief, just to name a few. To determine the eligibility or to verify road classification for a potential project, communities should consult MassDOT's Road Inventory Files or the Road Inventory Interactive Maps.



The entire statewide road network map is available on the MassDOT website (there is a reference section with a link at the end of the document) or contact SRPEDD directly for assistance and guidance on this and other factors that may affect qualification. (Road classifications are also explained in greater detail in Appendix A.)

MassDOT's Project Development and Design Guide (titled "Massachusetts Highway Department Project Development and Design Guide,") especially chapter 2 on project development is an excellent reference source to consult on all aspects of getting a project through the process. Also useful is the MassDOT Municipal Project Guide. Links can be found in the Reference section at the end of this document.

All roads are not eligible for federal funds. Arterial and collector roads are eligible for federal funds. Local roads are not. (Any bridge, however, located on a public road is eligible for funding.)

Some of the available funding sources are Surface Transportation Program (STP), Congestion Mitigation / Air Quality (CMAQ), and Highway Safety Improvement Program (HSIP), to name a few. Please note that not all projects are eligible for all categories of funds. (More detail on funding sources can be found in Appendix B.)

Projects with local jurisdiction and funding sources, such as Chapter 90 and municipal funds, are not required to follow this process. The Chapter 90 program reimburses municipalities for roadway project costs. Communities are given an annual apportionment which can be spent immediately or saved up over time. In addition to road improvements, Chapter 90 funds also cover equipment, sheds, design needs, etc. These funds may also be used to fund the design costs of a project that is eligible for state or federal funding. (The Chapter 90 program is explained in greater detail in Appendix C.)

## The Process - A Brief Overview



Taking a project from conception to completion can be a long and arduous process, but following some basic procedures can greatly simplify the process. There are some important things to keep in mind during this process. The planning and development of a project is fluid and some or all of the required tasks are interconnected and will be occurring concurrently. It is very important to maintain a close overview of the process.

A project is developed following an identification of a problem or need. The identification of a problem may occur following a formal study conducted by SRPEDD, at the request of a community, through the Regional Transportation Plan, identified by MassDOT or may arise from community or citizen input.

Once it is determined that a potential problem exists, possible solutions or measures need to be identified. This can be accomplished by requesting assistance from SRPEDD or the staff of MassDOT. SRPEDD is available to provide technical assistance and information to identify, evaluate and recommend improvement alternatives to an existing or potential problem. These services range from tasks such as traffic counts to more extensive safety or congestion studies to define the problem and identify solutions.

The information gathered during this step will also be helpful in completing a Project Needs Form (PNF) and Project Initiation Form (PIF) discussed later in this guide. An approved PNF, then PIF is necessary to gain Project Review Committee (PRC) approval. All projects advertised through the TIP must have MassDOT PRC approval. The PRC, comprised of staff from MassDOT and chaired by the chief engineer, meets regularly (approximately quarterly) to review PIFs and to assess the merits of each project. The first step in seeking approval is to prepare and submit a PNF to both the MassDOT District Office and SRPEDD.

Public participation and outreach is critical and should be initiated as early on in the project development as possible. Public outreach should be continued throughout the process, but it is particularly important early in the development of a project. A well informed community increases the chances for acceptance and support of a project, improving the opportunity for that project to proceed and ultimately, receive funding. Input and feedback from local residents and businesses should be actively pursued to garner support, as well as to identify any opposition which may become an impediment later in the process.

A major inhibitor to the implementation of a project is with land takings. If it is determined that land takings may be necessary, this information should be presented as part of the initial public outreach effort. Once this early determination is made, the proponent (the city or town) is often responsible for identifying and securing the right-of-way. It is imperative to address and resolve this issue early in the process.

JTPG involvement is always essential, as is communication and coordination with the staff of SRPEDD, the staff of MassDOT, engineers or consultants, elected officials, and local businesses and residents. Active participation of all parties is the key to the progress of a successful project.



## Public Outreach

Every successful project is the result of collaborative effort which begins with public outreach. Public outreach should begin at the identification of a problem and should continue throughout the study, design and implementation of a solution. The first step is to make people aware of a potential project, especially those groups or individuals that have an interest in, or could be affected by the project. This list could include residents, business owners, neighborhood groups, elected and government officials and public agencies, potential users, and the general public.

It is important to allow citizens and groups an opportunity to be heard and be involved in the decision making process, as well as to garner support for a project. If there is widespread opposition to a project, it is best to determine and address the objections early in the process.

Public outreach efforts should be conducted throughout the course of a project. Following the notification of the public and all interested parties, efforts should be made to allow participation during the planning and design phases, during formalized public meetings and hearings and throughout the progression of a project. (Please note that formal public hearings are required by FHWA for federal-aid projects.)





There are various public outreach methods that can be utilized during the course of a project which include:

- notices and/or posters displayed at public libraries, town halls, civic buildings, churches, etc.;
- local cable television calendars;
- announcements on town and organization websites;
- press releases and editorial letters sent to local newspapers; and
- informational letters sent to project abutters and neighboring residents.

The required formal design hearings are sometimes intimidating to citizens so informal public meetings or charrettes and workshops or task forces can also be conducted to inform and allow the participation of interested parties of a proposed project.

Successful public outreach requires communication and coordination among all interested parties. Meetings should be held in facilities that are fully accessible and located on public transit routes during hours of operation. Public outreach and participation, the process of keeping all parties informed, is important throughout the entire progression of a project, but it is absolutely essential before the start of a project.

## Project Need Form (PNF)

A project is developed following the identification and study of a problem, with recommendations for improvements. Projects may be identified through any number of processes, including a safety or congestion study, a Road Safety Audit, community input, or the Regional Transportation Plan, to name a few. Once a problem has been identified and studied and prior to the submittal of a Project Need Form (PNF), the project's proponent (the community) should meet with SRPEDD and the staff of the MassDOT District 5 office before a project's concept is formally developed. An informal review can address any questions and determine any issues with a proposed project. Open communication and coordination with all parties will ensure a smooth progression of the process, as well as a project that will develop with fewer problems and impediments.

*Every project is required to have a completed Project Need Form (PNF).*

Every project is required to have a completed Project Need Form (PNF). (A copy of the Project Need Form is included in Appendix D and on the MassDOT website. A link can be found at the end of this document.) The PNF lists pertinent information concerning a project such as the location, a brief summary of the project need, a summary of possible alternatives, including cost estimates, and other pertinent issues including existing facilities, mobility, safety, land use, environmental and community issues, including any environmental justice issues. The PNF should document the problems and explain why corrective action is needed. Every effort should be made to be as accurate as possible with preliminary information, **particularly with construction cost estimates.**

Please keep in mind when completing a PNF that a project need is not a project description. Being clear and concise will help the process greatly. Examples of projects needs are:

“The intersection is hazardous. The high crash rate at the intersection

demonstrates this safety issue.”

-or-

“There is significant congestion at this intersection. During peak periods, the intersection operates at LOS F and long traffic queues develop.”

-or-

“There are no formal accommodations for bicycles or pedestrians between the elementary school and the residential neighborhood where a large number of students reside.”

It is always helpful to have any supporting documents attached to a PNF at the time of submittal, in particular a Transportation Evaluation Criteria (TEC) form. (A copy of SRPEDD’s TEC form can be found in Appendix E.) Contact the SMMPO staff (SRPEDD) for assistance in completing a TEC to ensure an accurate evaluation. It is very important to keep in mind that the more issues or criteria a project addresses in the TEC, the higher a project’s score. This may become very important later in the process. A Project’s TEC score becomes significant when a project is placed on the TIP and is competing against other projects for limited funding. Other supporting documents can include any additional data or statistics, plans, photographs, maps, etc. that would help to define the project need.



The completed PNF must be submitted to the MassDOT District 5 Office and SRPEDD for initial review. During review the proponent may be asked to provide additional information and / or to complete additional public outreach. Following review, one of the following determinations will be made:

- 1) the project will move into the design phase;
- 2) there is a need for the project, but further planning is necessary;
- 3) alternatives will be considered; or
- 4) a recommendation will be made to dismiss the project from further consideration.

Please note that a project proponent may seek assistance from SRPEDD and the MassDOT District 5 office at any time to gather the necessary data and to complete and submit the Project Need Form and the subsequent Project Initiation Form (PIF). The hiring of a consultant or an engineering firm is always an option, but given the fiscal constraints placed on communities, these are funds better spent as SRPEDD and the MassDOT District office are willing and capable to assist communities at no cost.

### *Project Initiation Form (PIF)*

The next step for a community seeking to have their project constructed with federal or state or funds is to have the project approved by the Project Review Committee (PRC).

The PRC, comprised of staff from MassDOT and chaired by the chief engineer, meets approximately quarterly to review and assess the merits of each project. (More detail on the PRC can be found in Appendix G.)

This step requires a completed Project Initiation Form (PIF.) (A copy of a PIF can be found in Appendix F and on the MassDOT website). The PIF requires more detailed project information to be documented by the proponent. Some of this information includes project type and description, a locus map, a preliminary ID of the project category, as well as definitions of project management responsibility, an interagency coordination plan, and public outreach plan. The PNF and TEC should be included as attachments to the PIF. **Every effort should be made to provide complete and accurate information, particularly with construction cost estimates.** Following PRC approval a sample of a municipal agreement is sent out. This agreement must be signed prior to construction and states that MassDOT agrees to fund up to 110% of the bid value of a project. If costs exceed 110% the municipality must either reduce the scope or cover the additional cost. (A sample of the municipal agreement can be found in Appendix K.)

At this point in the process, the community should hold a public meeting to present any alternatives for the project and to actively seek input from all interested parties. This will help in garnering community support and in addressing any concerns presented.

Following approval by the PRC, there are a number of events set in motion. The community or proponent should contact the staff of the SMMPO (SRPEDD) directly to request that the project be placed on the TIP. The actual design of the project can begin at this point. The staff of the SMMPO (SRPEDD) considers the project, and assigns it a Transportation Evaluation Criteria (TEC) score. The SMMPO determines its placement in the TIP. MassDOT assigns the project an ID number.



The planning and design of a project needs to be at a specific stage in the process to be placed in the TIP. A project can be placed in the TIP when the design is within 4 years of being completed or shovel ready. As a general rule a project should be at the 75% design stage entering the first or current TIP year and at least at 25% design stage in the second year. Other projects needing further development may be placed in the future element of the TIP. It can be moved from the future element into a year of the TIP when space (funding) becomes available. Generally, projects that are early in the development stage and need additional definition, are placed in the future element before advancing to the programmed years

Please keep in mind that a positive recommendation from the PRC indicates only that a project is eligible for a specific funding category, it does not guarantee that the project has dedicated funding. Advocacy for a project during the annual update and development of the TIP, which is customarily prior to the beginning of the fiscal year, is strongly recommended, as is regular attendance at JTPG meetings to continue to advocate for the project and to maintain an overview of the progress of a project.

A proponent should also understand that a project's preliminary cost estimate that appears on the TIP consists of more than bid items. Items that must be accounted for include contingencies, construction engineering, traffic police and utility relocation. Elements beyond the bid items can account for 20-25% or more of the total participating federal cost.

Once again, the staff of the SMMPO (SRPEDD) and the staff of the MassDOT District Office should be consulted for assistance. Please note that a project proponent may hire a consultant or engineering firm at any time to gather the necessary data and to complete and submit the Project Initiation Form.

## *Environmental, Design and ROW Process*

There are several design stages during the development of a project beginning with the preliminary design stage at 25%. The 75% design stage, 100% design stage and PS&E (plans, specifications and estimates) stage make up the final design stages prior to advertising a project for construction.

A Design Public Hearing is held for all projects subsequent to the review and acceptance of the 25% Design Plans by MassDOT. Continued public outreach by the community is essential during this time to maintain support and to seek meaningful input on design elements.

These are the final tasks to be completed for the 25% Design Plans. Some of these technical requirements are set and managed by MassDOT but are ultimately, the responsibility of the community, and there are many varied issues to consider and tasks to complete. Please keep in mind that at this point, the process of planning a project is not a step-by-step progression, but has become a fluid one and some or all of these tasks will be occurring concurrently. It may be complicated to keep track of these tasks, as some of the tasks mentioned here may have already been completed. Project delays can be minimized by early and on-going coordination with federal, state and local agencies with jurisdiction by law or special expertise.



Municipalities are generally responsible for the cost to design municipal projects constructed through the TIP. This consists of engineering design, environmental permitting and right-of-way plan preparation and acquisition. All projects advertised through the TIP are overseen by MassDOT engineers during construction and municipalities are not responsible for construction oversight but should allow for consultant fees during construction. It may be necessary during this time for consultants to attend meetings, fine tune traffic signal timings, and to address design related questions, etc.

There are environmental, design and right-of-way concerns to be addressed, including documentation, permitting and acquisitions. Environmental clearances and permits should be secured as early on in the design process as is practicable. There is a list of varied activities and tasks that are necessary to develop the 25 Percent Design Plans. There may be land takings to identify and right-of-way acquisitions to be made, if necessary. The securing of right-of-way acquisitions may be the responsibility of the municipality and may require City Council or Town Meeting approval. Please keep in mind the time frame of the approval process or the scheduling of any required voting necessary, such as a Town Meeting, for right-of-way acquisitions. Any delay in acquisitions may result in the delay of a project. A project may be delayed by the failure to follow through on any of these ongoing tasks, especially design, right-of-way and environmental tasks and permitting and it is imperative to maintain an overview of the process.

Here are some of the issues that need to be addressed:



#### Environmental Documentation and Permitting-

Addressing the anticipated environmental consequences of the project is essential. Essential information needs to be identified to include into the 25% design. Early identification of issues and early coordination with appropriate groups is crucial. Designer will be responsible to determine which groups (local environmental or historical, state environmental, others) are appropriate to consult and what is required (request for review, standardized letter, proposed scope of work and/or locus plan or other consultation.)

#### MEPA and NEPA Determination-

The proponent (or designer) will be responsible for determining the MEPA and NEPA project category. All environmental review and permit submissions and coordination with the agencies will be made through the MassDOT Environmental Section. If the project involves federal funds, a determination should be made regarding compliance with the National Environmental Policy Act.

#### Determine Other Applicable Federal, State and Local Environmental Laws and Requirements –

The proponent or designer will be responsible for identifying and complying with all other applicable federal, state and local environmental laws and requirements. The MassDOT Environmental Section, or its website, should be consulted for any questions regarding these efforts.

#### Identification of Applicable Permits-

Environmental clearances and permits should be secured as early on in the design process as is practicable. The identification of applicable permits is completed prior to the 25% Design Submission.

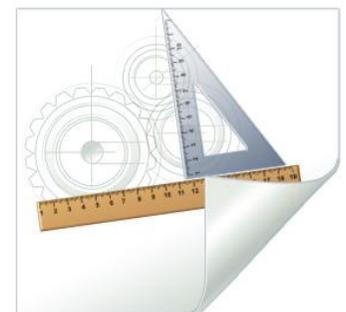
It is important to reiterate that at this point in the process, the many aspects of planning a project are happening simultaneously and some or all of these tasks will be occurring concurrently. It may be complicated to keep track of these varied tasks, as some of the tasks mentioned here may have already been completed and some may not have been addressed as of yet.

The following activities are necessary to develop the preliminary (25%) design:



- Order Necessary Survey Data – detailed aerial or ground survey data that is adequate to design the project.
- Prepare Base Plans – these include field notes, establishing coordinates, determining the scale used in plotting, etc.
- Compile Necessary Traffic Data – both existing and projected data is necessary for all modes of travel using the facility.
- Develop Basic Roadway Horizontal and Vertical Geometry – all geometric data (stations, bearings, distances, horizontal and vertical curve) must be calculated at this stage.
- Develop Typical Cross Sections – show design elements that will predominate throughout the project.

- Bridge Design Coordination (If Applicable) – develop alignments to integrate roadway and structural elements of the project.
- Landscape Design Coordination – integration of design in the roadside, structures, urban design, etc.
- Develop Draft Traffic Signal Plan (If Required) – follow guidelines in the most current Manual on Uniform Traffic Control Devices (MUTCD).
- Develop Bridge Type Studies and Sketch Plans for Bridges, Culverts and Walls (If Required) – based on guidelines in the MassHighway Bridge Manual.
- Develop Preliminary Pavement Design – including determination of rigid or bituminous pavement and a design section.
- Develop Preliminary ROW Plans - estimates should be complete, including parcel numbers, dimensions of all proposed acquisitions and areas of anticipated takings and easements.
- **Develop Preliminary Cost Estimate** – it is important that this estimate be as complete and as accurate as possible. This cost should itemize the participating costs (those covered by the funding source) and non-participating costs (those covered by the proponent.)
- Functional Design Report – necessary for all projects under 25% review, except for resurfacing and maintenance projects.
- Design Exceptions Report– when design exceptions involving speed, widths, alignments, etc. are necessary. (A copy of a Design Exception Report can be found in Appendix H.)
- 25 Percent Project Submission– a complete checklist of items needing to be addressed prior to submission is available. (A copy of the Design Submission Checklist can be found in Appendix I.)
- Submit Plans to Utilities Engineer-Concurrent with the 25 percent submission, the construction plans should be submitted to the MassDOT Utilities Engineer.
- 25 Percent Project Review – comments resulting from this review must be addressed prior to proceeding with the Design Public Hearing. (A copy of the 25% Design Review Checklist can be found in Appendix J.)
- Conduct 25 Percent Design Hearing – following the review and acceptance of the 25% design plans by MassDOT. A Design Public Hearing is held for all projects subsequent to the review and acceptance of the 25% Design Plans by MassDOT.
- Obtain 25 Percent Project Approval – a written approval granting the proceeding of the project into Final Design.



Once again, continued public outreach is essential during this time to maintain support and to seek meaningful input on design elements. Once again, the staff of SRPEDD or the staff at the MassDOT district office is available to assist in this process.

## The Next Step

This document guides the reader through the funding process as an overview and with specifics during the first or preliminary design stage, the 25% design stage. The process does not stop there, but it is well on its way. There are three additional design phases of a project. They are 75% design stage, 100% design stage and PS & E (plans, specifications and estimates.)

Once the preliminary design has been reviewed and approved by MassDOT, and a public hearing has been held, a project can proceed into the final design process, the 75% design. There is a checklist of 75% design submission requirements in the Appendix to Chapter 2 – Project Development in the Massachusetts Highway Department Project Development and Design Guide, which is a necessary reference source for this process.

The 75% design approval is granted when plans are approximately 90% complete and all the steps between the 25% and 75% stages in the Submission Guidelines have been properly addressed. Following 75% approval, the preparation of the 100% / PS&E can proceed.

The community or proponent must understand that all the design for a project must be complete, all environmental permits and rights of way must be secured in order to advertise a project.

It cannot be emphasized enough that municipalities should actively seek the assistance and expertise of the staff of SRPEDD and the MassDOT District 5 office, especially during the beginning stages of developing a project and getting it through to the 25% design phase.

## References

The MassDOT Development Guide is your best resource for specifics.

<http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/ManualsPublicationsForms/ProjectDevelopmentDesignGuide.aspx>

MassDOT Environmental Project Development Section

<http://www.massdot.state.ma.us/highway/Departments/EnvironmentalServices.aspx>

Links to the Project management page, including current forms of PIFs and PNFs.

<http://www.massdot.state.ma.us/highway/Departments/ProjectManagement.aspx>

Map of Functional Classifications in District 5:

<http://www.massdot.state.ma.us/Portals/17/Images/DataMaps/func/FuncClass-District5.pdf>

Road Inventory Interactive Map:

<http://services.massdot.state.ma.us/maptemplate/roadinventory>

Project Inception	Project Initiation	Environmental, Design and ROW
<p><b>Project Identification</b></p> <ul style="list-style-type: none"> <li>• needs and solutions developed</li> </ul> <p><b>Public Outreach</b></p> <ul style="list-style-type: none"> <li>• garner support</li> </ul> <p><b>Informal Review</b></p> <ul style="list-style-type: none"> <li>• with SRPEDD</li> <li>• with MassDOT District staff</li> </ul> <p><b>Prepare Project Need Form (PNF) -</b></p> <ul style="list-style-type: none"> <li>• include Transportation Evaluation Criteria (TEC)</li> <li>• include accurate cost estimates</li> <li>• submit to MassDOT for evaluation</li> </ul>	<p><b>Prepare Project Initiation Form (PIF)</b></p> <ul style="list-style-type: none"> <li>• include Transportation Evaluation Criteria (TEC) and Project Need Form</li> <li>• include accurate cost estimates</li> </ul> <p><b>Formal Review</b></p> <ul style="list-style-type: none"> <li>• to the Project Review Committee</li> <li>• the SMMPO staff</li> </ul> <p><b>Public Outreach</b></p> <ul style="list-style-type: none"> <li>• actively seek input from interested parties</li> </ul>	<p><b>25% Design Plans and Review</b></p> <ul style="list-style-type: none"> <li>• environmental documentation &amp; permitting</li> <li>• MEPA &amp; NEPA determination</li> <li>• identification of applicable permits</li> <li>• right of way process</li> <li>• develop preliminary cost estimates</li> <li>• functional design report</li> </ul> <p><b>25% Design Public Hearing / Outreach</b></p> <ul style="list-style-type: none"> <li>• maintain support</li> <li>• seek meaningful input</li> </ul>
<p>← Possible Results →</p> <ul style="list-style-type: none"> <li>• Determination to Advance Project</li> <li>• Determination to Dismiss Project</li> </ul>	<p>← Possible Results →</p> <ul style="list-style-type: none"> <li>• Determination to Advance / Dismiss Project</li> <li>• Programming in a TIP year and a TEC score</li> <li>• Eligibility for funding</li> <li>• Assigned a project ID# by MassDOT</li> </ul>	<p>← Possible Results →</p> <ul style="list-style-type: none"> <li>• Proceed into Final Design - 75% design, 100% design, and PS&amp;E</li> <li>• Construction</li> </ul>

## Updated Documents Attached

A - Project Needs Form

B - Project Initiation Form

C- Design Exceptions Directive

D – Design Exceptions Certification

E – Design Criteria Workbook

F – Highway Design Review Checklist

G – 25% Design Submissions Guidelines

## **A - Project Needs Form**

**MASSDOT - HIGHWAY DIVISION**  
**Project Need Form**

This form is intended to provide preliminary information about the proposed project. It is not expected that all information that is asked for is available or known but applicants are encouraged to complete the form as fully as possible.

Proponent: \_\_\_\_\_ Title: \_\_\_\_\_

Municipality/Organization: \_\_\_\_\_

PNF completed by: \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Date: \_\_\_\_\_

---

**Part I – Facility Location and General Information**

Municipality: \_\_\_\_\_

Route and/or Street(s): \_\_\_\_\_

MassDOT District: \_\_\_\_\_ MPO Region: \_\_\_\_\_

Estimated project limits by mile marker, station or other distinguishing landmarks such as cross street(s).  
**Please include a locus map of the project.**

Start: \_\_\_\_\_

End: \_\_\_\_\_

Total Mileage: \_\_\_\_\_

What is the federal functional classification of the road? Identify each section.

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Interstate               | <input type="checkbox"/> Urban Collector          | <input type="checkbox"/> Rural Major Collector      |
| <input type="checkbox"/> Urban Principal Arterial | <input type="checkbox"/> Rural Principal Arterial | <input type="checkbox"/> Rural Minor Collector      |
| <input type="checkbox"/> Urban Minor Arterial     | <input type="checkbox"/> Rural Minor Arterial     | <input type="checkbox"/> Other Classification _____ |

Is the proposed project on the National Highway System?       Yes       No

Is the proposed project eligible for Transportation Alternatives?       Yes       No

Who owns the roadway/facility? \_\_\_\_\_

**Project Need:** Briefly describe or characterize, in general terms, the primary project need or goal (e.g. rehabilitate a roadway, improve safety at an intersection, reduce corridor congestion, improve pedestrian facilities, or provide bike accommodation).

---

Identify the **Primary Asset** included in the project area (e.g. roadway, intersection, bridge, bike trail, structure). \_\_\_\_\_

**Part II: Project or Program Description**

Provide whatever information is available to characterize the existing, general attributes of the facility.

CHARACTERISTIC	DATA	Comments
Number of Lanes		
Lane Width		
Shoulder Width		
Existing Right of Way		
Annual Daily Traffic (ADT)		
Percent Truck Traffic		
Traffic Control (signal, flash, signs, etc.)		
Roadway Lighting		
Posted Speed Limit		
Transit Routes & Facilities		

**In what type of area is the project located?** *Project limits may include more than one type of area. For a definition of areas, please refer to Chapter 3 of the Guidebook.*

- Rural Natural
- Rural Village
- Rural Developed
- Suburban Low Density
- Suburban High Density
- Suburban Village/Town Center
- Urban Residential or CBD

**How does the roadway/facility function in the community?**

- High-speed, primary corridor with limited access
- Moderate speed, major corridor between towns/regions
- Low to moderate speed corridor between towns/regions
- Moderate speed, major street connecting residential areas to a town center or major connector
- Low to moderate speed street connecting residential areas with other streets
- Primarily or exclusively a residential street
- Exclusive pedestrian/bicycle facility

**Regional Considerations:** Identify any regional use of the roadway (Characterize how neighboring communities use the roadway, what kind of link it provides to major arterials or highways).

---

**Part III: Identification of Problem, Need or Opportunity**

**A. Condition of Existing Facilities - Problem, Need, or Opportunity**

1. Please describe the condition of the roadway, path, or other horizontal facility, such as type and extent of cracking, ride-ability, utility patching or other surface defects such as rutting, raveling, shoving, bleeding, etc. This may be based on visual inspection or automatic detection methods. Are deformations related to the pavement structure, indicating road sub-base issues? Include any PMS (Pavement Management System) ratings, PCI (Pavement Condition Index) data and/or photos, if available.

---

2. Please describe the condition of facility appurtenances, such as signs, signals, lighting, median barriers, guardrail, pavement markings, curbing, landscaping, fences, ITS components, etc.

---

3. Please describe any specific concerns related to the existing drainage system. If there is a history of flooding in the project area, describe the potential solutions under consideration, such as increased maintenance, repair/replacement of drainage infrastructure, raising the vertical profile, or culvert replacement, etc. Are there opportunities for improving storm water management, including drainage outfalls, within the project limits?

---

4. Please describe the condition of any other structures, or equipment (retaining walls, buildings, noise barriers, bus shelters, bike racks, etc.)

---

5. If the project/program includes a bridge or bridges, please describe the condition, such as bridge ratings, dates of inspection, weight restrictions, closings, structural adequacy, functional obsolescence, condition of other bridge elements, etc. Identify the bridge location and ID number (if known).

---

6. Please describe the condition of any existing pedestrian facilities. Include the limits and width of any existing sidewalks and identify any obstructions. Are the existing sidewalks ADA/AAB compliant? In addition, please characterize the pedestrian need, including any indication that pedestrians use the corridor beyond existing sidewalks (rutted paths, pedestrian using the roadway shoulder, etc.). ● GreenDOT

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7. Please describe the existing bike accommodation (4' minimum shoulder width, bike lane, or shared use path), including the limits and width of any existing facility. In addition, please characterize existing bike traffic. ● GreenDOT

---

8. Identify and locate any underground utilities (water, sewer, gas, other) and overhead utilities (electric phone, cable). Identify any larger utility appurtenances, above ground or underground, such as cabinets or vaults. Identify any active or inactive railroad crossings.

---

9. Describe any repair or preventive maintenance to the roadway or appurtenances. Include the extent of the work (resurfacing, rehabilitation, reconstruction or replacement) and when the last repair was done? ● GreenDOT

---

**B. Mobility - Problem, Need, or Opportunity**

1. Please describe any existing or prospective highway congestion issues. Identify the nature and extent of congestion, including when it occurs and whether there is queuing. Include any traffic analysis, including LOS (Level of Service) data, if available. ● GreenDOT

---

2. Please describe any need or opportunity for greater connectivity or improved access along the corridor or to particular points along the facility. Identify any missing connection or constraint in access that could be improved for greater mobility. ● GreenDOT

---

3. Please identify any mobility issues for pedestrians, bicyclists and transit users. Identify if roadway is included in any local, regional or statewide bicycle routes. Include any obstacles or missing connection of existing pedestrian facilities, as well as any impediments that effect pedestrian access and mobility. Include any pedestrian or bicycle data, including bicycle LOS (Level of Service) analysis, or user count data, if available. ● GreenDOT

---

**C. Safety and Security - Problem, Need, or Opportunity**

1. Please describe any safety concerns on the facility. Provide any crash history within the project limits, including number and severity of crashes, type of crashes and whether there have been any fatalities. Include the calculated crash rate, if available.

---

2. Please describe adjacent significant activity centers (schools, senior centers, places of assembly, industrial operations, or parks). Please describe any safety issues for other users such as pedestrians, bicyclists, persons with disabilities, transit riders, trucks, school children, etc. ● GreenDOT

---

3. Please describe whether there are any known evacuation routes identified at the state, local or private level.

---

**D. Economic Development - Problem, Need, or Opportunity**

1. Please describe any current, planned, or potential economic development opportunities within the project limits, that would be supported by improvements to the facility. Do these developments reflect Smart Growth Development and Sustainable Development principles? ● GreenDOT

---

2. Identify any need or opportunity to improve access to services, promote industry clusters, facilitate affordable housing or job creation within the area. ● GreenDOT

---

**E. Environmental - Problem, Need, or Opportunity**

Please describe any need or opportunity associated with environmental aspects, as listed below. Links to guidance clarifying the resource areas are provided in brackets.

1. Wetland(s) [<http://www.mass.gov/dep/water/waterres.htm>]

---

2. Water Supply Watershed(s) [<http://www.mass.gov/dep/water/drinking/sourcewa.htm>]

---

3. Impaired Water Body(ies) [<http://www.mass.gov/dep/water/resources/10list3.pdf>]

---

4. Priority Habitat(s) [[http://www.mass.gov/dfwele/dfw/nhesp/gis\\_resources.htm](http://www.mass.gov/dfwele/dfw/nhesp/gis_resources.htm)]

---

5. Historic/Cultural/Scenic Resource(s): Are there listed or eligible properties, any archeological resources or scenic by-ways within or adjacent to the project area?

---

6. Air Quality and Greenhouse Gases: Is there a potential to reduce greenhouse gases, through construction methods; operational modifications; changes in connectivity, access, or travel behavior; or other methods? ● GreenDOT

---

7. Hazardous Materials: Are there concerns about hazardous materials within the project limits or on any adjacent properties? Could any prior use of adjacent properties be an issue?

---

**F. Community - Problem, Need, or Opportunity**

Please provide some background about the area where the facility is located and describe any need or opportunity that may be may address or impact the community or neighborhood, as outlined below.

1. Please characterize the abutting land use in the area surrounding the facility. How does the facility function within the area? Please note if some or all of the area falls within an environmental justice (EJ) area.

---

2. Are there opportunities to promote healthy transportation modes of walking, biking or transit use by improving pedestrian, bicycle or public transit infrastructure or operations? ● GreenDOT

---

3. Identify any need or opportunity to improve access to services, jobs, housing, transit or recreation for residents within the area. ● GreenDOT

---

**G. Transportation Enhancements - Problem, Need, or Opportunity**

1. Identify any need or opportunity to incorporate transportation alternatives, such as provisions and programs related to pedestrians, bicyclists or rail trail facilities or education; landscaping; scenic/historic acquisition, beautification, preservation, programs, or facilities; outdoor advertising management; archeological planning and research; environmental mitigation or wildlife mortality reduction efforts.

---

**H. Planning and Public Outreach - Problem, Need, or Opportunity**

1. Describe any Public Outreach that has occurred so far on the proposed improvements, including public informational meetings, local mailings, workshops, etc.

---

2. Are there any special needs that need to be accommodated to fully engage the public with respect to public outreach?

---

---

3. Identify any local or regional planning documents that identify the problem, need or opportunity outlined within this PNF.

---

4. Identify efforts to coordinate with relevant government agencies, including RTA(s), DCR, regulatory agencies, or neighboring municipalities.

---

**Thank you for completing this form. Please submit the PNF to the Regional MPO/RPA and the MassDOT Highway Division District office.**

## **B - Project Initiation Form**

**MASSDOT - HIGHWAY DIVISION**  
Project Initiation Form

Proponent: \_\_\_\_\_ Title: \_\_\_\_\_

Municipality/Organization: \_\_\_\_\_

PIF completed by: \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Date: \_\_\_\_\_

**Part I – General Information**

Project Location: \_\_\_\_\_

**Project Need:** Briefly restate the primary project need or goal as developed in the Project Need Form (e.g. rehabilitate a roadway, improve safety at an intersection, reduce corridor congestion, improve pedestrian facilities, or provide bike accommodation).

**Regional Benefit:** Describe any regional benefits that would be realized should the Project Need be met.

**Part II – Project Costs and Responsibilities**

**Estimated Costs:** Provide available cost estimates or estimated cost ranges in current-year dollars and attach any cost estimate work sheets or summaries.

Estimated Construction Costs:		Estimated Other Costs:	
Construction Items:	_____	Planning/Design:	_____
Contingencies (10%):	_____	Right-of-way:	_____
Other Constr. Costs (10%):	_____	Environmental Mitigation:	_____
<b>Total Construction Cost:</b>	_____	<b>Total Other Costs:</b>	_____

**Anticipated Funding Program:**

STP	_____	CMAQ	_____	HSIP	_____
TAP	_____	NHPP	_____	HPP	_____
NFA	_____	Other	_____		_____

Indicate all potential sources of funding that may apply to the project

Project Responsibilities:	MassDOT	Community	Other (specify)
Project Management			
Design			
Permitting			
Right of Way			

**Part III: Project Description**

**A. Proposed Improvements to Facility**

**1. Scope of Work:** Describe the proposed improvements including limits of work, length of the project, major improvements, proposed cross-section, improvements to secondary assets, and related work. The description of proposed improvements to secondary assets should include improvements to curbing, sidewalks, traffic signals, signs, lighting, landscaping, drainage, walls, etc. The scope of work for a multi-use path should also identify at-grade crossing treatments.

---

**2. Proposed pavement rehabilitation:** Describe the proposed rehabilitation methods that are being considered. Keep in mind that the final pavement improvements will be identified through the development of a pavement design submitted as part of the project design process.

---

**3. Pedestrian Accommodations:** Describe how the improvements are addressing pedestrian accommodation according to ADA/AAB requirements, through improving existing facilities, improving safety and traffic calming, as well as proposing new or expanded facilities.

---

**4. Bicycle Accommodations:** Describe how the improvements are addressing bicycle accommodation through improving existing facilities, as well as proposing new or expanded facilities.

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**5. Design Exceptions:** Identify whether any exceptions to MassDOT design criteria are anticipated.

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**6. Alternatives Analysis:** Identify any alternatives that have been considered. Attach any pertinent information related to that analysis.

---

**7. Retention of Existing Infrastructure:** Identify efforts to retain/preserve existing Infrastructure, e.g. reuse of curbing, sidewalk, minimized/targeted vertical or horizontal geometric changes, etc. ● GreenDOT

---

**8. Potential Impacts to Utilities:** Identify any anticipated impacts or complications the proposed improvements will have on utilities.

---

**B. Mobility Improvements**

1. Describe how the proposed improvements will impact mobility. Include any traffic analysis, including LOS (Level of Service) data, if available. ● GreenDOT

---

2. Identify whether the proposed improvements will impact connectivity or access along the corridor or to facilities. If this is a new connections, include existing and proposed travel times. ● GreenDOT

---

3. Identify how the project will impact mobility for pedestrians, bicyclists and transit users. ● GreenDOT

---

**C. Safety and Security Improvements**

1. Describe any improvements that are expected to reduce the crash potential. Provide any highway safety analysis that has been completed.

---

2. Describe any improvements that are expected to improve safety for other multi-modal users such as pedestrians, bicyclists, persons with disabilities, transit riders, trucks, school children, etc. ● GreenDOT

---

3. If the project is on a designated evacuation route or NHS corridor, how will the project impact the route?

---

**D. Economic Development - Problem, Need, or Opportunity**

1. Describe any improvements that improve a business district, business related elements or support proposed economic development opportunities.

---

2. Identify improved access to services, industry clusters or job creation in the project area. Include the number of jobs to be created, if available. ● GreenDOT

---

3. Identify how the improvements reflect Smart Growth Development and Sustainable Development Principles. ● GreenDOT

---

**E. Environmental Impacts and Improvements**

Describe any improvements or impacts to the resources. Consider any storm water improvements and changes in impervious area. Identify any anticipated permitting that could be problematic.

1. Wetland(s):

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2. Water Supply Watershed(s):

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3. Storm Water Improvements/Impaired Waterbodies:

---

4. Priority Habitat(s):

---

5. Historic/Cultural/Scenic Resource(s):

---

6. Air Quality and Greenhouse Gases: Will the improvements impact greenhouse gases through construction methods, operational modifications, and changes in connectivity, access, or travel behavior.

● GreenDOT

---

7. Hazardous Materials: Is it anticipated that the proposed work will involve handling hazardous materials within the project limits or on any adjacent properties?

---

**F. Community Effects**

1. Identify how much right of way is anticipated to complete the project, including fee takings, permanent and temporary easements.

---

2. Describe how the project will improve/impact the neighborhood with respect to access to services, jobs, and public transit.

---

3. Describe any effect the improvements will have on the existing housing stock or potential for new housing development.

---

4. Identify any improvements that involve community planning and equitable sharing of benefits/burden or are particularly targeted within an Environmental Justice area.

---

**G. Transportation Enhancements**

1. Identify any transportation enhancements, such as pedestrians, bicyclists and transit accommodations, education; landscaping; scenic/historic acquisition, beautification, preservation, programs, or facilities; outdoor advertising management; archeological planning and research; environmental mitigation or wildlife mortality reduction efforts.

---

2. Are the proposed enhancement elements supported by the MPO?

---

**H. Planning and Public Outreach and Support**

1. Describe any additional Public Outreach that has occurred since the PNF was submitted. Include any public informational meetings, local mailings, workshops, planning documents, etc., where the proposed improvements were specifically presented to abutters, businesses and/or the general public. Include information on meeting dates, attendance, concerns, and support.

---

2. Were there any special needs that needed to be accommodated to fully engage the public with respect to public outreach?

---

**I. Maintenance**

1. Identify any improvements that involve particular long-term or ongoing maintenance implications.

---

2. Identify any improvements that will improve the environmental sustainability of the facility related to operation and maintenance.

---

**Thank you for completing this form. Please submit the PIF to the Regional MPO/RPA and the MassDOT Highway Division District office.**

## **C- Design Exceptions Directive**

## **ENGINEERING DIRECTIVE**

Patricia A. Leavenworth, P.E. (signature on original)

\_\_\_\_\_  
CHIEF ENGINEER

### **Design Criteria for MassDOT Highway Division Projects**

The purpose of this Engineering Directive is to clarify the design criteria that shall be applied to MassDOT Highway Division projects, as listed below. This Directive introduces new controlling criteria for pedestrian and bicycle accommodation that will be used together with FHWA's 13 controlling criteria for roadways and bridges. This Directive updates and supersedes Engineering Directive E-14-001, dated 2/4/14, and supports MassDOT Healthy Transportation Policy Directive P-13-0001, dated 9/9/13.

This Directive applies to all projects not yet advertised for construction. Projects that have received 25% Project Approval as of 2/4/14 are exempt from meeting the pedestrian and bicycle accommodation requirements of this Directive, unless directed otherwise by MassDOT on a case-by-case basis. However, designers are encouraged to apply all elements of this Directive, where practical, to every project regardless of design status.

As stated in the *MassHighway Project Development and Design Guide* (Guide), the design criteria and processes contained herein apply when:

1. MassDOT Highway Division is the project proponent, or
2. MassDOT Highway Division is responsible for project funding (state or federal aid), or
3. MassDOT Highway Division controls the affected infrastructure (State Highway).

### **Design Criteria for Roadways and Bridges (FHWA's 13 Controlling Criteria)**

1. For projects not on the NHS, the design criteria shall be in accordance with the Guide.
2. For projects on the NHS, the design criteria shall be as follows:
  - a. For projects on NHS Interstate Highways:
    - i. For Interstate non-3R\* projects, the design criteria shall be in accordance with the latest edition of the *AASHTO, A Policy on Design Standards, Interstate System* (AASHTO Interstate).
    - ii. For Interstate 3R\* projects, the minimum design criteria for horizontal alignment, vertical alignment and widths of median, traveled way and shoulders remain the standards that were in effect at the time of original construction or inclusion into the Interstate System.

- b. For projects on other NHS freeways (other than Interstate) the design criteria shall be in accordance with the latest edition of the *AASHTO, A Policy on Geometric Design of Highways and Streets* (Green Book). 3R\* allowances for NHS freeways are included in the Green Book.
- c. For projects on non-freeway NHS roadways:
  - i. For non-freeway non-3R\* projects, the design criteria shall be in accordance with the Green Book.
  - ii. For non-freeway 3R\* projects, the design criteria shall be in accordance with the Guide.

*\* 3R projects are projects that are primarily resurfacing, restoration or rehabilitation projects that extend the service life of highways, bridges and related appurtenances; and/or restore safe, efficient travel on an existing facility. Normally, 3R projects include most of MassDOT's resurfacing projects and most bridge preservation and rehabilitation projects. They also include roadway projects where box widening is proposed to widen shoulders for improved bicycle accommodation and safety. 3R projects generally have no significant geometric changes to horizontal or vertical alignment and generally have no significant widening such as widening for additional capacity. Projects that include minor lane and/or shoulder widening may be considered to be 3R projects. Projects that are beyond the 3R definition are normally defined as reconstruction projects and new construction projects which are subject to the respective standards identified above and their established design exception approval process.*

<b>DESIGN CRITERIA for ARTERIAL TRAVEL LANES AND SHOULDERS</b>						
<b>ROADWAY TYPE</b>	<b>PROJECT TYPE</b>	<b>BOOK</b>	<b>EXHIBIT NUMBER</b>	<b>ARTERIAL MINIMUM WIDTHS<sup>1,3</sup></b>		
				<b>TRAVEL LANE</b>	<b>LEFT SHOULDER</b>	<b>RIGHT SHOULDER<sup>2</sup></b>
Interstate	Non 3R <sup>4</sup>	Interstate	2005 Page 3	12'	4' (to 12') <sup>2</sup>	10' (to 12')
Interstate	3R <sup>4</sup>	Interstate	1956 or later	12'	3.5' offset	10' (to 12')
NHS Freeway	All	Green	7-3	12'	4' <sup>2</sup>	10'
NHS Non- Freeway	Non 3R <sup>4</sup>	Green	7-3	12'	2' offset	8'
NHS Non- Freeway	3R <sup>4</sup> Only	Guide	5-12 5-14	11'	2' offset	4'
Non NHS	All	Guide	5-12 5-14	11'	2' offset	4'

1. These are the minimum widths below which a Design Exception is normally required.
2. These dimensions are for usable shoulder. Add a 2' offset for objects over 6" high, such as guardrail.
3. These criteria apply regardless of project funding.
4. "3R" stands for resurfacing, restoration or rehabilitation.

## **Design Criteria for Pedestrian and Bicycle Accommodation**

### **Pedestrian Accommodation**

- Pedestrian accommodation shall be in accordance with Chapter 5 of the Guide and the *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities*.
- Wherever adjacent land uses include commercial or residential development greater than 5 units per acre, a sidewalk shall be provided along the roadway adjacent to the use. (See P-13-0001, Section 2C.)
- For projects in urbanized areas on roadways where pedestrians are legally allowed, sidewalks shall be provided on both sides of the roadway. (See P-13-0001, Section 2E. Refer to MassDOT's Road Inventory Maps for urbanized area boundaries.)
- For bridge projects, sidewalks shall be provided on both sides of the roadway if pedestrians are legally allowed. (See P-13-0001, Section 2E.)
- For projects on roadways that pass under bridges and where pedestrians are legally allowed, sidewalks shall be provided on both sides of the roadway beneath each bridge. (See P-13-0001, Section 2E.)
- The minimum sidewalk width below which a design exception is required is 5', exclusive of curb.

### **Bicycle Accommodation**

- Bicycle accommodation shall be in accordance with Chapter 5 of the Guide and the *AASHTO Guide for the Development of Bicycle Facilities*.
- For all freeways, arterials and collectors where bicycles are legally allowed, a paved outside shoulder or designated bicycle lane shall be provided on both sides of the roadway.
- The minimum paved outside shoulder or designated bicycle lane width below which a design exception is required is 5', exclusive of any parking lane.
- In lieu of paved outside shoulders or designated bicycle lanes, protected bicycle facilities (i.e. cycle tracks, side paths, shared-use paths, bicycle paths, etc.) may provide accommodation for bicycles. However, the presence of such facilities does not relieve the designer of the need to properly consider applicable design criteria for outside (right) shoulder width.
- Refer to the *AASHTO Guide for the Development of Bicycle Facilities* and other current guidance documents for design criteria for off-road paths and cycle tracks.

### **Design Exceptions**

- Criteria proposed below minimum values may be considered after providing sufficient justification and documentation while following the Design Exception process outlined in Chapter 2 of the Guide.
- In determining the standards for horizontal alignment, the minimum length of curve criteria need not be met on 3R projects.
- Refer to the guidance in the previous sections of this Directive to determine design criteria for lane and shoulder widths. When using the Guide, the values in Exhibits 5-12 and 5-14 shall apply. When using the Green Book, the values in Exhibit 7-3 shall apply. Additional language in the Green Book, particularly for constraints associated with Urban Arterials, may be used to support justification for a Design Exception.
- In using the AASHTO Interstate standards, the shoulder width criteria, regardless of the terminology used, such as "shall", "should be considered", etc., by virtue of their adoption by

FHWA, are the minimum values for each condition described. Design Exceptions are therefore required for projects that do not provide applicable widths.

- In some cases, the minimum shoulder width criterion for bicycle accommodation exceeds the minimum right shoulder width criterion for roadways. Regardless, the designer must consider each element independently, and must document any necessary design exceptions accordingly. In cases where design exceptions are required for both elements, the discussion and justification of these exceptions may be combined in the Design Exception Report.
- The designer shall prepare and submit any necessary Design Exception Reports as part of the 25% design submission, or for permit projects, as part of the permit application.
- Upon receipt of a Design Exception Report, the Project Manager shall provide by email a copy of the Report to the Chair of the Design Exception Review Committee. The Committee shall discuss project elements and offer advice or endorsements to the Project Manager and the project reviewers for each issue. The Committee is responsible for tracking and reporting on all Design Exception issues, and for ensuring consistency in the application of design standards and in the documentation of Design Exceptions.
- The primary project reviewer, typically the District office, shall review the Design Exception Report. In addition, the Complete Streets Engineer shall review the 25% design submission, including the Design Exception Report, for all projects on roadways where pedestrians and bicyclists are allowed, including projects to be completed under a permit.
- If all reviewers recommend approval of the Design Exception Report, the Project Manager shall forward the signed Design Exception Report to the Chief Engineer for approval. If the Design Exception Report includes exceptions to the design criteria for Pedestrian and Bicycle Accommodation, the Project Manager shall subsequently request project sign off by the Secretary and CEO of Transportation, or their designee, in accordance with P-13-0001. The approved Design Exception Report shall be used as justification for the Secretary's sign off. If the project is subject to FHWA oversight, the Project Manager shall subsequently forward the approved Design Exception Report to FHWA for final approval.
- Projects should not be advanced beyond the 25% design stage until all necessary Design Exception approvals and project sign offs are secured. Highway Access Permits should not be approved by District Highway Directors until all necessary Design Exception approvals and project sign offs are secured.
- For maintenance projects that are not categorically exempt from design criteria for pedestrian and bicycle accommodation and for which design plans and normal design review submissions are not applicable, the project proponent shall ensure that the proposed typical section(s) are reviewed by appropriate District Projects staff and the Complete Streets Engineer, improvements to pedestrian and bicycle accommodation are considered, and reasons for not making pedestrian and bicycle accommodation improvements are documented and retained in the project file.

### **Exemptions from Controlling Criteria**

#### **Design Criteria for Roadways and Bridges (FHWA's 13 Controlling Criteria)**

The following types of projects are exempt from the need to comply with FHWA's 13 controlling criteria. When design criteria for these types of projects are not in compliance, a formal Design Exception Report is not required; however, geometric deficiencies should be identified in a Functional Design Report or other documentation:

- 3R projects within the existing roadway footprint where the project Purpose and Need is solely to maintain the roadway surface or bridge structure and the crash history does not indicate any apparent geometric deficiency.
- Interstate 3R projects (if the roadway meets the standards used for horizontal alignment, vertical alignment and widths of median, traveled way and shoulders that were in effect at the time of original construction or inclusion into the Interstate System, and the crash history does not indicate any apparent geometric deficiency).
- Non-NHS Footprint Bridge projects in accordance with the Footprint Bridge Policy.
- Isolated single intersection safety improvement projects (with minimal work on approach roadways).
- Routine roadway maintenance projects such as crack sealing, joint repair, micro surfacing, chip seals, etc.
- Non-roadway maintenance projects such as catch basin cleaning, street sweeping, grass mowing, etc.
- Bridge maintenance projects such as joint repair, deck repair, superstructure repair, substructure repair, etc.
- Sidewalk and curb ramp only projects.
- Drainage only projects.
- Noise barrier only projects (provided sight distance and horizontal clearance met).
- Guardrail only projects (provided sight distance and horizontal clearance met).
- Landscape only projects (provided sight distance, vertical clearance and horizontal clearance met).
- Highway lighting only projects (provided sight distance, vertical clearance and horizontal clearance met).
- Signing only projects (provided sight distance, vertical clearance and horizontal clearance met).
- Pavement marking only projects.
- Traffic signal equipment only projects (provided horizontal and vertical clearance met).
- Vertical construction and other non-roadway/bridge projects.
- Projects done under Minor Vehicle Access Permits or Non-Vehicular Access Permits.

#### Design Criteria for Pedestrian and Bicycle Accommodation

The following types of projects are exempt from the need to comply with Pedestrian and Bicycle Accommodation design criteria:

- All projects on facilities where bicyclists and pedestrians are prohibited, such as Interstates and freeways.
- Routine roadway maintenance projects that don't involve application of new pavement markings, such as crack sealing, pothole patching and joint repair.
- Bridge maintenance projects such as joint repair, deck repair, superstructure repair, substructure repair, etc. In addition, any bridge deck resurfacing work to be done as part of a roadway resurfacing project shall have the same design criteria and exemptions as the full roadway resurfacing project.
- "Footprint" Bridge projects on Rural Collector Roads and Rural Local Roads where no sidewalks currently exist on the approach roadways, and that are also exempt from the 13 Controlling Criteria in accordance with the "Footprint" Bridge Policy.
- Drainage only projects.

- Noise barrier only projects.
- Guardrail only projects.
- Lighting only projects.
- Traffic Signal Equipment only projects.
- Signing only projects.
- Landscape only projects.
- Vertical construction and other non-roadway/bridge projects.
- Projects done under Minor Vehicle Access Permits or Non-Vehicular Access Permits.

<b>EXEMPTIONS FROM CONTROLLING CRITERIA SUMMARY TABLE</b>		
<b>Project Type<sup>1</sup></b>	<b>Exemption Type</b>	
	<b>FHWA's 13 Controlling Criteria</b>	<b>Pedestrian and Bicycle Accommodation Criteria</b>
3R Roadway (Non-Interstate) <sup>1</sup>	✓	
3R Interstate <sup>1</sup>	✓	✓
Non-NHS Footprint Bridge <sup>1</sup>	✓	
“Footprint” Bridge on Rural Collector Road or Rural Local Road <sup>1</sup>	✓	✓
Isolated Intersection <sup>1</sup>	✓	
Routine Roadway Maintenance <sup>1</sup>	✓	
Routine Roadway Maintenance – No New Pavement Markings <sup>1</sup>	✓	✓
Non-Roadway Maintenance <sup>1</sup>	✓	✓
Bridge Maintenance <sup>1</sup>	✓	✓
Sidewalk and/or Curb Ramp Only <sup>2</sup>	✓	
Pavement Marking Only <sup>3</sup>	✓	
Drainage Only	✓	✓
Noise Barrier Only <sup>1</sup>	✓	✓
Guardrail Only <sup>1</sup>	✓	✓
Lighting Only <sup>1</sup>	✓	✓
Traffic Signal Equipment Only <sup>1</sup>	✓	✓
Signing Only <sup>1</sup>	✓	✓
Landscape Only <sup>1</sup>	✓	✓
Non-Vehicular or Minor Vehicle Access Permit	✓	✓
Vertical Construction and other Non-Roadway/Bridge	✓	✓
On Facilities where Bicycles and Pedestrians are Prohibited		✓

**Notes**

<sup>1</sup> See expanded Project Type descriptions above.

<sup>2</sup> These projects are also exempt from Bicycle Accommodation Criteria.

<sup>3</sup> These projects are also exempt from Pedestrian Accommodation Criteria.

## **D – Design Exceptions Certification**

**ENGINEERING DIRECTIVE**

Thomas F. Buellich  
CHIEF ENGINEER

**CERTIFICATION OF DESIGN EXCEPTION REPORTS**

Design Exceptions (waivers) from controlling criteria are vital project components that require appropriate documentation by design engineers. This documentation must be in report format based on the guidelines identified in Chapter 8 of the Highway Design Manual and should be submitted at, or prior to, the 25% Highway submittal.

The designer's obligation regarding Design Exceptions shall be to design the work in a manner consistent with that of skill and care ordinarily exercised by members of the same profession practicing under similar circumstances. The American Society of Civil Engineers Code of Ethics states, in part,

*Engineers shall approve or seal only those design documents, reviewed or prepared by them, which are determined to be safe for public health and welfare in conformity with accepted engineering standards.*

With this in mind, the cover page of all Design Exception Reports prepared by design consultants must be stamped by the responsible professional engineer and signed by a Principal or Chief Engineer of the firm preparing the report. Reports that do not contain this certification shall not be reviewed by MassHighway and shall be returned to the designer. This certification shall be in addition to and separate from other required project certifications, such as those normally shown on the Title Sheet and on the Bridge Plans.

All Design Exception Reports prepared by MassHighway personnel must be reviewed and stamped by the Highway Design Engineer prior to being submitted to the Chief Engineer for approval.

This Directive is effective immediately.

## **E – Design Criteria Workbook**

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## I. Project Description

### A. Type of Work Proposed

- |  |  |
|--|--|
| <input type="checkbox"/> New Construction          | <input type="checkbox"/> Bridge Replacement/Rehabilitation |
| <input type="checkbox"/> Full Depth Reconstruction | <input type="checkbox"/> Intersection Improvement          |
| <input type="checkbox"/> Reclamation               | <input type="checkbox"/> Other                             |
| <input type="checkbox"/> Resurfacing/Box Widening  |  |

### B. Primary Purpose of Project

- |  |                                      |
|--|--------------------------------------|
| <input type="checkbox"/> Additional Capacity | <input type="checkbox"/> Maintenance |
| <input type="checkbox"/> Safety Improvement  | <input type="checkbox"/> Other       |

Brief Project Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**C. 3R Project?**  Yes  No

**D. Footprint Bridge Project?**  Yes  No

## II. Description of Facility

### A. Functional Classification

- |  |  |
|--|--|
| <input type="checkbox"/> Urban Freeway   | <input type="checkbox"/> Rural Freeway   |
| <input type="checkbox"/> Urban Arterial  | <input type="checkbox"/> Rural Arterial  |
| <input type="checkbox"/> Urban Collector | <input type="checkbox"/> Rural Collector |
| <input type="checkbox"/> Urban Local     | <input type="checkbox"/> Rural Local     |

*If Roadway Type differs from Functional Classification, describe here:* \_\_\_\_\_  
\_\_\_\_\_

**B. NHS Interstate**  Yes  No

**Other NHS**  Yes  No

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## C. General Description of Project Area (check all that apply)

- |                                      |   |
|--------------------------------------|---|
| <input type="checkbox"/> Undeveloped | <input type="checkbox"/> Residential                            |
| <input type="checkbox"/> Commercial  | <input type="checkbox"/> Industrial                             |
| <input type="checkbox"/> Scenic      | <input type="checkbox"/> Urbanized Area                         |
| <input type="checkbox"/> Historic    | <input type="checkbox"/> Development Density > 5 Units per Acre |

Describe if Other: \_\_\_\_\_  
\_\_\_\_\_

## D. Traffic Volumes

ADT (Current)	_____	T - Peak Hour	_____
ADT (Design Year)	_____	T - Avg. Day	_____
K	_____	DHV	_____
D	_____	DDHV	_____
Average Daily Pedestrian Volume	_____		
Average Daily Bicycle Volume	_____		

## E. Speeds

Posted	_____	85th Percentile	_____
Observed	_____	Existing Design Speed	_____

## F. Lane and Shoulder Widths

LT (Inside) Shoulder	_____	Travel Lane	_____	RT (Outside) Shoulder	_____
				Bicycle Lane	_____
				Parking Lane	_____

## G. Sidewalks

Number of Sidewalks (0, 1, 2)	_____	Typical Width	_____
-------------------------------	-------	---------------	-------

## H. Right of Way

- |  |   |
|--|---|
| <input type="checkbox"/> State Highway (MassDOT) | <input type="checkbox"/> County                   |
| <input type="checkbox"/> City/Town               | <input type="checkbox"/> Other Jurisdiction _____ |

Average Width \_\_\_\_\_

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## III. Design Criteria for Pedestrian and Bicycle Accommodation

Exempt. Exemption Type: \_\_\_\_\_

### Pedestrian Accommodation

#### Sidewalk Presence

*Refer to Healthy Transportation Policy Directive P-13-0001.*

Minimum Number of Sidewalks \_\_\_\_\_

Proposed Number of Sidewalks \_\_\_\_\_

Design Exception required.

#### Sidewalk Width

*Refer to Engineering Directive E-14-001.*

Minimum \_\_\_\_\_ 5'

Proposed \_\_\_\_\_

Design Exception required.

#### Accessibility

*Refer to Notes on Walks and Wheelchair Ramps for Designers and Construction Engineers, issued under Engineering Directive E-12-005.*

Variance required from the Massachusetts Architectural Access Board.  
(Note, this Variance is separate from the MassDOT Design Exception.)

### Bicycle Accommodation

*Refer to Engineering Directive E-14-006.*

Indicate if provided in Protected Path, Bicycle Lane or Shoulder: \_\_\_\_\_

Minimum Width \_\_\_\_\_

Proposed Width \_\_\_\_\_

Design Exception required.

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## IV. Design Criteria for Roadways and Bridges (FHWA's 13 Controlling Criteria)

Exempt. Exemption Type: \_\_\_\_\_

### Shoulder Width

*Refer to Guide, Exhibit 5-12, and to E-14-006.*

	Left (Inside)		Right (Outside)
Desirable	_____		Desirable _____
Minimum	_____		Minimum _____
Proposed	_____		Proposed _____

Design Exception required.       Design Exception required.

### Lane Width

*Refer to Guide, Exhibit 5-14, and to E-14-006.*

Desirable \_\_\_\_\_  
Minimum \_\_\_\_\_  
Proposed \_\_\_\_\_

Design Exception required.

### Cross Slope

*Refer to Guide, Section 5.5.2.*

HMA      0.020  
Concrete      0.016  
Proposed \_\_\_\_\_

Design Exception required.

### Design Speed

*Refer to Guide, Section 3.6.5.*

Desirable \_\_\_\_\_  
Minimum \_\_\_\_\_  
Proposed \_\_\_\_\_

Posted Speed \_\_\_\_\_

Design Exception required.

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## Horizontal Alignment

Refer to Guide, Exhibits 4-8 and 4-9.

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

PI Sta. \_\_\_\_\_

PI Sta. \_\_\_\_\_

PI Sta. \_\_\_\_\_

Radius \_\_\_\_\_

Radius \_\_\_\_\_

Radius \_\_\_\_\_

Design Exception required.

Refer to Guide, Chapter 4, Section 4.2 (Compound Curves).

Check all Compound Curves.

The radius of the tighter curve should be no less than 50% of the radius of the flatter curve.

Design Exception required.

Length of Curve

$L_{min} = 30 V$  (freeways)

$L_{min} = 15 V$  (other major highways)

$V =$  Design Speed

Design Exception required.

Exempt per E-14-006.

## Vertical Alignment

For Crest Vertical Curves, refer to Guide, Exhibit 4-26.

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

PVI Sta. \_\_\_\_\_

PVI Sta. \_\_\_\_\_

PVI Sta. \_\_\_\_\_

K \_\_\_\_\_

K \_\_\_\_\_

K \_\_\_\_\_

Design Exception required.

For Sag Vertical Curves, refer to Guide, Exhibit 4-27.

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

PVI Sta. \_\_\_\_\_

PVI Sta. \_\_\_\_\_

PVI Sta. \_\_\_\_\_

K \_\_\_\_\_

K \_\_\_\_\_

K \_\_\_\_\_

Design Exception required.

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## Stopping Sight Distance

*Refer to Guide, Exhibit 3-8.*

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

- Design Exception required.

*Refer to Guide, Section 3.7 and Exhibit 4-5 (SSD Middle Ordinate).*

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

- Design Exception required.

## Grades

*Refer to Guide, Exhibit 4-21.*

Maximum \_\_\_\_\_

Proposed \_\_\_\_\_

- Design Exception required.

## Superelevation

*Refer to Guide, Section 4.2. Check required values for superelevation rates, transitioning, runoff, banking, etc. for all lanes and shoulders.*

- Design Exception required.

## Lateral Offset

*Refer to AASHTO A Policy on Geometric Design of Highways and Streets and AASHTO Roadside Design Guide.*

*Minimum Lateral Offset behind curb = 1.5' from face of curb.*

*Minimum Lateral Offset with no curb = 4' from travel way.*

Desirable \_\_\_\_\_ *(from Roadside Design Guide)*

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

- Design Exception required.

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## Bridge Only Design Criteria

### Lane and Shoulder Width

*Refer to AASHTO A Policy on Geometric Design of Highways and Streets.*

- Design Exception required.

### Structural Capacity

*Refer to Bridge Manual, Chapter 3.*

- Design Exception required.

### Vertical Clearance

*Refer to Guide, Exhibit 4-28.*

Minimum \_\_\_\_\_

Proposed \_\_\_\_\_

- Design Exception required.

## V. Design Exception Report Content Checklist

*If a Design Exception is required, the Designer shall prepare a Design Exception Report containing the following items:*

- Cover Page, including certification and approval signatures
- Executive Summary
- Locus Map
- Detailed Narrative
- Recommendation
- Design Criteria Workbook, including Summary of Impacts sheets

Additional Supporting Information (as necessary)

- Typical Sections
- Plan Drawings
- Photographs
- Crash Data/Crash Rates
- Letters, Testimonials and other supporting documents

# MASSDOT DESIGN CRITERIA WORKBOOK

Project: \_\_\_\_\_

Project File No.: \_\_\_\_\_

## VI. Summary of Impacts

*Provide a summary of the incremental impacts associated with the Desirable, Minimum and Proposed alternatives. Include impacts of incremental alternatives.*

*Prepare a separate Summary of Impacts sheet for each element that requires a Design Exception.*

Controlling Criteria: \_\_\_\_\_

### Summary of Impacts

Design Criteria Values	Wetlands (SF)	Trees (EA)	Stone Walls (LF)	Other*	ROW Cost (\$)	Construction Cost (\$)	Total Cost (\$)
Desirable							
Minimum							
Alternative 1							
Alternative 2							
Proposed							

*Note - Other\* elements that may be impacted include Salt Marsh, Parkland, Buildings and historically significant properties. Add or modify columns as necessary.*

*Note - Add rows as necessary to show the impacts of additional Alternatives.*

## **F – Highway Design Review Checklist**

PURPOSE

The 25% Traffic Engineering Review is intended to provide MassDOT the opportunity to evaluate the proposed design and Functional Design Report relative to current design standards, operation impacts, safety impacts and other potential community concerns associated with the proposed design.

GENERAL

This checklist represents the minimum amount of issues that should be considered when reviewing a 25% traffic submittal. The information below is not intended to address all aspects of report or plan preparation. To the extent practical, any comments relative to plan preparation made at the 25% stage will certainly improve the quality of the 75% submittal.

Any question listed below with a No or N/A answer requires a written comment.

I. Functional Design Report

- |    | Yes                      | No                       | N/A                      |   |
|----|--------------------------|--------------------------|--------------------------|---|
| 1  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | A. Existing Conditions<br>Is a description of the project study area included?<br>Comment: _____  |
| 2  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the project location (locus) map included?<br>Comment: _____   |
| 3  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a discussion of existing deficiencies and an evaluation of the existing signs, signals and markings<br>Comment: _____  |
| 4  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | B. Traffic Volumes<br>Is the traffic count data less than 2 years old from the date of FDR submission?<br>Comment: _____  |
| 5  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the Automatic Traffic Recorder (ATR) Counts included for the minor street approach for signalized intersections?<br>Comment: _____                          |
| 6  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are Manual Turn Movement Counts (TMC): Peak hour data for all study intersections included?<br>Comment: _____   |
| 7  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are Peak Hour Factors (PHF) identified?<br>Comment: _____   |
| 8  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are heavy vehicle, bicycle, and pedestrian count data included in the TMC?<br>Comment: _____  |
| 9  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do the base year volumes represent an average month during the year the FDR is submitted or no more than 2 years for MEPA permitted projects?<br>Comment: _____ |
| 10 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have seasonal factors been reviewed and applied as necessary?<br>Comment: _____   |
| 11 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do the future year volumes represent a minimum of 7 years from the base year?<br>Comment: _____   |
| 12 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do the future year volumes include background growth and site development as necessary?<br>Comment: _____   |
| 13 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are trip generation/distribution data for private development trips schematically displayed on the network?<br>Comment: _____                                   |
| 14 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are base year and future year traffic volume networks provided?<br>Comment: _____   |

	Yes	No	N/A	
<b>C. Safety Analysis</b>				
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are three years of Crash Data analyzed for project locations? (5 years is preferred)
	Comment: _____			
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are crash rate calculations included for all study area intersections and segments?
	Comment: _____			
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are collision diagrams provided for all study area intersections with more than 3 crashes per year?
	Comment: _____			
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there a High Crash Cluster within the project study area?
	Comment: _____			
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a collision map provided for all study area segments?
	Comment: _____			
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Was a Roadside Safety Audit conducted? (only applicable if #18 was checked "YES".)
	Comment: _____			
21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Was the Safety Review Prompt List utilized during a site visit?
	Comment: _____			
22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is discussion regarding the Safety Review Prompt List included?
	Comment: _____			
<b>D. MUTCD Signal Warrants</b>				
23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is traffic count data provided for a minimum of the 8 highest hours for the major streets and minor street?
	Comment: _____			
24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Was the minor street count data collected by a manual turning movement count method?
	Comment: _____			
25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the signal warrant analysis follow procedures from MUTCD?
	Comment: _____			
26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do proposed signal installations meet an 8-hour volume warrant?
	Comment: _____			
<b>E. Operational Analysis</b>				
27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the intersection approaches evaluated using observed/appropriate peak hour factors?
	Comment: _____			
28	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are heavy vehicle percentages used in the analyses?
	Comment: _____			
29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are pedestrian volumes and phasing incorporated into the analyses?
	Comment: _____			
30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are capacity analyses completed for all the required analysis scenarios?
	Comment: _____			
31	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do capacity analyses reflect the existing and proposed geometry conditions?
	Comment: _____			
32	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are coordinated signals/closely spaced intersections evaluated under a systems analysis?
	Comment: _____			
33	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the 50th and 95th percentile vehicle queues documented?
	Comment: _____			
<b>F. Proposed Design</b>				
34	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a description of the proposed geometric changes and/or alternative designs included?
	Comment: _____			
35	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a narrative describing the pedestrian and bicycle accommodation improvements included?
	Comment: _____			
36	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is discussion included of how the proposed design will alter the traffic control conditions?
	Comment: _____			
37	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Was a roundabout design an alternative considered?
	Comment: _____			
38	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are the Section 61 Findings attached for the Private Development projects?
	Comment: _____			
39	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all traffic calming design treatments (where allowed) follow the Traffic Calming Guidelines?
	Comment: _____			
40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all study area intersections include corrective design measures?
	Comment: _____			

- 41    Has "work to be done by others" been factored into schedule/design?  
 Comment: \_\_\_\_\_
- 42    **Yes No N/A** G. Traffic Management  
 Is a Construction Management Outline included?  
 Comment: \_\_\_\_\_
- 43    Are the appropriate traffic counts and capacity analyses included?  
 Comment: \_\_\_\_\_

II. 25% Design Plans

- 44    **Yes No N/A** A. Basic Design Plan Set  
 Does the plan set follow the preparation guidelines specified in the current Project Development and Design Guidebook?  
 Comment: \_\_\_\_\_
- 45    Do the plans provide linework and details of the existing conditions for use in reference to the proposed design?  
 Comment: \_\_\_\_\_
- 46    Do the proposed roadway cross-sections conform to current standards?  
 Comment: \_\_\_\_\_
- 47    Are provisions made for bicycle accommodation where applicable?  
 Comment: \_\_\_\_\_
- 48    Do pedestrian facilities meet the Massachusetts Architectural Access Board (MAAB) standards?  
 Comment: \_\_\_\_\_

- 49    **Yes No N/A** B. Traffic Signal Plans  
 Do the plans indicate the proper placement of the signal heads?  
 Comment: \_\_\_\_\_
- 50    Are the signal head configurations in conformance with the MUTCD standards?  
 Comment: \_\_\_\_\_
- 51    Do the signal layout plans show the proposed lane assignments and stop lines?  
 Comment: \_\_\_\_\_
- 52    Is the Sequence and Timing Chart provided on the plans?  
 Comment: \_\_\_\_\_
- 53    Is the Preferential Phasing Diagram, including pedestrian phases, shown on the signal plan?  
 Comment: \_\_\_\_\_
- 54    Is a Time-Space Diagram for the interconnected signals included?  
 Comment: \_\_\_\_\_
- 55    Is signal detector type and location included on the signal plans?  
 Comment: \_\_\_\_\_

- 56    **Yes No N/A** C. Traffic Management Plans (TMP)  
 Are preliminary Temporary Traffic Control Plans provided?  
 Comment: \_\_\_\_\_
- 57    Do the typical layouts follow MassDOT's Standard Details and Drawings for the Development of TMP's?  
 Comment: \_\_\_\_\_
- 58    If required, have the detour routes been clearly defined?  
 Comment: \_\_\_\_\_
- 59    Is pedestrian and bicycle accommodation maintained during construction?  
 Comment: \_\_\_\_\_

## **G – 25% Design Submissions Guidelines**

**Massachusetts Department of Transportation**  
**Highway Division**  
*Revised 2/15/11*

**Traffic and Safety Engineering**  
**25% Design Submission Guidelines**

As noted in Section 2.4.3 of MassDOT's *Project Development & Design Guide*, the following guidelines provide additional information related to the traffic and safety engineering elements of a project. These guidelines contain detailed descriptions and requirements of the report and plans to be included with the 25% Design Submission. A functional design report (FDR), preliminary design plans, and the completed 25% Traffic and Safety Engineering Review Checklist are necessary components for all Transportation and Safety Improvement Projects submitted to the Massachusetts Department of Transportation (MassDOT), including mitigation projects (referred to as "private development") permitted through the Massachusetts Environmental Policy Act (MEPA) process. These guidelines standardize the preparation of Functional Design Reports and streamline the MassDOT review process.

## **I. Functional Design Report**

### **A. Existing Conditions**

1. *Study Area* – Description of the study area including, but not limited to: project length, roadway jurisdiction and classification, roadway geometry (i.e. lane layouts, usage, and width, shoulder widths, location of crosswalks, guardrail etc.), pavement conditions, vehicular, bicycle and pedestrian traffic control, posted speed limits as compared to the Speed Regulations, adjacent land use, number and operation of existing adjacent driveways, transit stations/stops, and on-street parking conditions. Include a project locus map.
2. *Existing Conditions* – Discussion of any deficiencies or problem areas with the existing design (e.g. poor sight distance, high speeds, inefficient signal operation, lack of turn storage, etc.). Evaluate the condition of the existing signals, signage and pavement markings for potential repair or replacement. Document any field specific areas of concern.

### **B. Traffic Volumes**

1. *Traffic Count Data* – Traffic count data should be current and is preferred to be less than 2 years old from the date of submission of the FDR. Data between 2 and 4 years old may be acceptable if a low growth rate factor can be documented and approved by the State Traffic Engineer (include approval in the submission). When considering volume warrants for a traffic control signal, traffic count data shall be less than 2 years old from the date of submission of the FDR. The traffic count data should be collected on an average Tuesday through Thursday when schools are in session, if possible, and exclude weeks with a holiday. The timeframe for conducting traffic counts may be altered based on land use or seasonal variations. Additional traffic count data may be required for the preparation of the Construction Management Outline (refer to Section I.G. Traffic Management for details).

- a. *Automatic Traffic Recorder (ATR) Counts* – Counts should be conducted on the major roadway (both directions) for construction and safety improvement projects and on the roadway providing primary access to private development projects. The counts shall be continuous and completed over a minimum of 48 weekday-hours. The counts should be summarized in 15-minute, hourly, and daily intervals. If the project includes potential installation/modification of a traffic signal, ATR counts for the side street approaches shall be collected for a minimum of 24 continuous weekday-hours.
  - b. *Turning Movement Counts (TMC)* – Manual turning movement counts shall be collected in 15-minute intervals on all approaches of study area intersections, generally for a minimum of 2 hours during both the morning and afternoon roadway peak periods. However, additional peak hours shall be counted if the Private Development project trips peak at a time different from the roadway peaks. 8-hour turning movement count data is required for justification of warrant analysis for proposed signal installation. It may be necessary to review the ATR counts to determine the morning, afternoon, and 8-hour peak periods. The number of heavy vehicles, bicyclists, and pedestrians shall be collected as part of the TMC.
2. *Base Year Traffic Volumes* – Base year traffic volumes should represent an average month during the year the FDR is submitted. If the traffic count data were not collected during the FDR submission year, the data shall be factored by a seasonal/growth rate and increased by any new traffic from developments that have been completed since the time of the original count as necessary. In the case of a private development project permitted through MEPA, the base year traffic should represent an average month no more than 2 years from the date of the FDR submission. Traffic network figures that show the base year volumes shall be provided for reference.
- a. *Seasonal Factors* – Base year volumes should be adjusted, in addition to the above, if the project is located in a region that experiences a notable seasonal variation or is primarily retail. A seasonal factor should be based primarily upon a relevant permanent count station noted in MassDOT's *Monthly ADT Comparisons Report*. If a relevant permanent count station data is unavailable, a seasonal factor may be obtained from the appropriate Regional Planning Agency (RPA). If the above mentioned data is unavailable, MassDOT's *Weekday Seasonal Factors Report* may be used.
  - b. *Annual Background Growth Rate* - Background growth rate, associated with region-wide population and employment trends, can be developed from documented historical data, or be directly supplied by the Office of Transportation Planning or the RPA. Justification of the background growth rate used shall be documented.
3. *Future Year Traffic Volumes* – All projects shall be evaluated with future year volumes. The future year is defined as 7 years, as a minimum, from the base year. In the case of private development projects, a timeframe of 7 years is recommended as the future year to allow for 2 years for the permitting process and a mandatory 5 years from occupancy. The volumes are typically comprised of the base year

volumes, factored by the compounded annual background growth rate (refer to Section I.B.2.b Annual Background Growth Rate for details), and estimated vehicle trips for other specific development within the study area. Traffic network figures that show the future year volumes shall be provided for reference.

- a. Other Specific Development – Vehicle trips for other specific development should be included as identified by a MEPA filing or discussions with local and regional planning agencies or MassDOT.
- b. Private Development Trips – All private development projects should show new trip generation estimates and calculations. The method used for distributing trips should be documented and shown graphically, this includes pass-by and diverted link trips. Pass-by rates should be consistent with the EOEAEOT *Guidelines for EIR/EIS Traffic Impact Assessment*. Theoretical reductions in trip generation due to Transportation Demand Management (TDM) may be quantified in tabular format; however, full trip generation shall be used to provide a conservative analysis. Traffic network figures that show the base year volumes, the future year volumes without the project, the new trip generation/distribution, the future year project trip assignment (to study area intersections), and the future year volumes with the project trips should be provided for reference.

### C. Safety Analysis

1. *Crash Analysis* – Collection and analysis of crash records for all corridors and intersections within the study area is required. The crash data should be based on the latest 5 years of data available (preferred) or the latest 3 years of data available (minimum) and can be requested through the Traffic and Safety Engineering Section of the MassDOT Highway Division. Crash data should be compiled in tabular format and analysis of the data shall include, but not be limited to: discussion of trends, probable causes, and geometric shortfalls (e.g. stopping and intersection sight distance) based on all collected data.
2. *Crash Rate Worksheets* – Calculation of the study area intersection(s) and segment(s) crash rates, as applicable, using the standard MassDOT Crash Rate Worksheet are required. Discussion shall be provided noting how the intersection(s) and segment(s) calculated rates for the project compare to the District and State-wide average crash rates.
3. *Collision Diagrams* – Collision diagrams are a helpful tool used to examine crash patterns at intersections and determine where improvements should be considered. Collision diagrams shall be based on the Massachusetts State Police or local police reports with crash diagrams and narratives and shall be completed for all study area intersections with more than 3 crashes per year. Back-up data to support the collision diagrams shall be provided.
4. *Collision Mapping* – Collision mapping is also a helpful tool used to examine patterns of crashes along a corridor. A collision map shall be created for study area corridors noting the number, type, and location of crashes.
5. *Safety Review*– Consideration shall be given to (but not limited to) the items listed in the Safety Review Prompt List during a site visit. Discussion shall be included in the FDR regarding the safety evaluation. If all or a portion of the project area is

considered HSIP-eligible, the Safety Review shall be replaced with a Road Safety Audit (RSA) for the specific area. The Road Safety Audit shall be conducted in accordance with MassDOT Road Safety Audit Guidelines and shall be conducted prior to developing the 25% Design Plans. A HSIP-Eligible location is a high crash location, designated by region, which is highlighted on the map contained in the following website link:

<http://services.massdot.state.ma.us/maptemplate/TopCrashLocations> and identified as the latest year HSIP cluster (including Bicycle, Pedestrian, etc.).

#### **D. MUTCD Signal Warrants**

1. *Traffic Data* – The traffic count data for the major-street and the minor-street approaches shall be collected and analyzed for a minimum of the highest 8 hours of the day. The minor-street volume shall be conducted by manual turning movement count method. The volume data should be shown in tabular form for review.
2. *Warrant Analysis* –MUTCD Chapter 4C: Traffic Control Signal Needs (Warrants) should be reviewed in conjunction with the prevailing geometric and speed conditions to determine if signal installation should be considered or if an existing signal remains warranted. Note: MassDOT prefers that the data satisfy an “Eight-Hour Vehicular Volume Warrant” for signal installation justification.

#### **E. Operational Analysis**

1. *Capacity Analysis* – Capacity analysis should be conducted for all study area intersections using an approved traffic analysis tool as noted in MassDOT’s *A Guide on Traffic Analysis Tools*. Capacity analysis results, including volume-to-capacity ratio, vehicle delay, and level of service (as available) should be shown in tabular format by lane group and overall intersection (as available). Where appropriate, short lane segments that operate effectively in the field as turning pockets, without being striped or signed as such, can be included in the capacity analyses. Engineering judgment shall be used in making this adjustment. All assumptions should be field verified and documented in the report text, and, to the extent possible, reviewed with MassDOT prior to conduct of the work. All analyses shall be included in the appendix; electronic files of these analyses shall be made available to MassDOT upon request.
  - a. *Peak Hour Factor (PHF)* – All intersection approaches shall be evaluated based on the peak 15 minutes of data collected during the peak hour. The PHF shall be applied on an approach-by-approach basis for analysis of base year traffic volumes. For future year traffic volumes, the PHF shall be 0.88 for rural areas and 0.92 for urban areas.
  - b. *Heavy Vehicle Percentage* – The traffic volume data used in the analysis shall include the percentage of heavy vehicles reflected in the actual TMC data. The percentage may be applied on an approach-by-approach basis, or by lane group as necessary.
  - c. *Pedestrian Phase* - If applicable, a pedestrian phase should be incorporated into the analysis based on field review and engineering judgment.
  - d. *Analysis Scenarios* - The following cases should be reviewed:
    1. Base Year Traffic Volumes with Existing Geometry

2. Future Year Traffic Volumes with Existing Geometry
3. Future Year Traffic Volumes with Proposed Geometry

For Private Development Projects, scenarios 1 and 2 above shall be considered in addition to the following two scenarios:

- Future Year Traffic Volumes including full build development trips with Existing Geometry
- Future Year Traffic Volumes including full build development trips with Mitigated Geometry

2. *Systems Analysis* – A systems analysis shall be completed for closely spaced intersections and/or coordinated signal systems, using an approved traffic analysis tool. The systems analysis can be either arterial or network format. The scope for systems analysis shall be defined by the designer and approved by the Boston Traffic and Safety Engineering Section or the designer shall justify why a systems analysis is not needed. Areas of influence beyond the project limits may be included in the simulation if determined necessary by MassDOT. The most appropriate modeling software for the simulation shall be determined by the designer and also approved by the Boston Traffic and Safety Engineering Section. The system model shall appropriately simulate the existing conditions before modeling alternative scenarios. Electronic files of these analyses shall be submitted to MassDOT for review.
3. *Queue Length Analysis* – Both 50<sup>th</sup> (average) and 95<sup>th</sup> Percentile Back of Queue calculation results should be depicted graphically as well as summarized in tabular format for the analysis scenarios listed above. The approved software programs provide vehicle queue results as part of the analysis and should be used for all situations. Queues calculated as part of a coordinated systems analysis are preferred over the isolated intersection results. A standard vehicle length of 25 feet should be used unless data can be provided to support an alternate length.
4. *Basic Signal Strategy* – The capacity analyses evaluating the existing condition should accurately reflect the existing conditions such as timing and phasing, as determined by a field visit. The capacity analyses evaluating the Build condition shall replicate what is depicted in the plans.

## **F. Proposed Design**

1. *Modified Geometry* – The report shall include discussion of the alternative designs considered, if any, and the proposed geometric changes associated with the preferred alternative. List out the strengths and weaknesses of each alternative and how a preferred alternative was determined. Discussion shall include the rationale for selecting the design criteria for the project.
2. *Bicycle and Pedestrian Accommodation* – A narrative describing how the project improves or addresses bicycle and pedestrian accommodation shall be included. This narrative should also include impacts associated with meeting design requirements (i.e. ROW, environmental impacts, change in scope, construction costs).

3. *Proposed Traffic Control Modifications* – Modifications to the existing traffic control should be documented, including specific details regarding the layout and intended operation of any new equipment.
4. *Roundabouts* – A roundabout should be considered, when feasible, to address intersection traffic control. When a roundabout intersection is proposed for a project, we recommend reviewing the latest edition of the Federal Highway Administration’s publication, *Roundabouts: an Informational Guide* for design assistance. Design criteria are explained in depth with detailed explanations of the characteristics of the modern roundabout vs. the traditional rotary that is common in Massachusetts. If feasible, the offset left geometry should be proposed.
5. *Mitigation Requirements* – For all Private Development projects the proposed mitigation requirements (Section 61 Finding, if applicable) should be clearly defined and a copy shall be included in the Appendix. This includes all phased work up to full build-out (mitigation phases based on occupancy, trip generation or other means). The schedule for improvements should be clearly defined in the document.
6. *Traffic Calming* – If a project is submitted to MassDOT for review that includes any form of traffic calming, it should follow the “Traffic Calming Guidelines” as developed by the New England Section of the Institute of Transportation Engineers on behalf of MassHighway. Traffic Calming is primarily intended for functionally classified local roads.
7. *Safety Enhancements* – All study area intersections shall include corrective design measures based on the safety analysis. Discussion shall include all detailed recommendations to reduce the severity and number of crashes and enhance the overall safety condition of the roadway based on the field visit, collision diagrams/mapping and engineering judgment. In addition, all potential enhancements identified in the RSA report should be included in the proposed design, or justified in the FDR why they are not feasible or appropriate.
8. *Work by Others* – The project shall document the “work to be done by others” and how the schedule for this work impacts the proposed project. Lapses in construction sequencing should be addressed with temporary improvements as necessary.

## **G. Traffic Management**

1. *Construction Management Outline* – Provide a description of all major construction components of the project (utilities, culverts, sidewalks, roadway grading, etc.) and how vehicle, pedestrian, and bicycle accommodations will be maintained during that construction component (lane closures, pedestrian routes, detours and detour route descriptions, etc). The description should be detailed and include at a minimum: the number and width of available travel lanes for each direction of travel and proposed work hours. The traffic management approach selected for each component should result in the least adverse impact possible to all facility users. All temporary facilities shall be handicap accessible as directed by the Massachusetts Architectural Access Board (MAAB) and the Federal Americans with Disabilities Act Accessibility Guidelines (ADAAG).
  - a. *Traffic Count Data* – Traffic count data will be necessary for all construction projects that impact the roadways. In general, the criteria set forth in the

I.B.1 Traffic Count Data section shall apply in addition to the following statement: Friday through Monday (weekend) counts will be necessary if construction will occur on those days given the difference in traffic patterns and time of day volumes when compared to a typical weekday. Traffic count data shall consist of 48-hour (minimum) ATR data for all roadways impacted by construction within the project limits. The ATR data shall include vehicle classification and speed information. If there is an existing or proposed traffic signal, existing designated turn lane(s), or multiple lanes approaching an unsignalized intersection, peak hour (based on the ATR data collected) Turning Movement Counts (TMCs) shall be submitted in addition to the ATRs. The TMCs shall provide classification by vehicle, bicycle and pedestrians. If the traffic signal is part of a coordinated system of signals additional TMCs and ATRs are required at the adjacent intersections both upstream and downstream of the project location. If construction impacts are such that they may have corridor or regional impacts additional count data may also be required as directed by the State Traffic Engineer.

- b. *Capacity Analysis* – Roadway capacity shall be evaluated using the required ATR data and the Measured Work Zone Capacities table provided on Figure Gen-1 of the *Standard Details and Drawings for the Development of Temporary Traffic Control Plans*. If the analysis shows traffic impacts, and backups are expected, additional mitigation may be required.

## II. Preliminary Design Plans

### A. Basic Design Plan Set

1. *Format* – The plan set should follow the guidelines specified in MassDOT’s current *Project Development & Design Guide*. Refer to the most current “25% Highway Design Review Checklist” for step-by-step procedures. Where possible, “cut sheets” are preferred for Traffic Signal and Sign & Pavement Marking plans rather than being included on “roll plans”.
2. *Dimensions* – All projects shall be designed using English Units.
3. *Roadway Cross-Section* – The typical cross-section for the roadway segments included in the project should be developed in accordance with MassDOT’s *Project Development & Design Guide* to ensure a context-sensitive design that accommodates all users safely. This includes, but is not limited to, the provision for bicycle accommodation. Right-of-Way, environmental, historic and other constraints may influence the development of the roadway cross-section. The Designer is responsible for obtaining any necessary design exceptions at this stage of the design process.
4. *Additional Detail* – It is recommended to supply additional details on the preliminary plans, including but not limited to: lane and shoulder pavement markings, sign locations, crosswalk and wheelchair ramp placements, location of sidewalk facilities, and other bicycle and pedestrian accommodations.

**B. Traffic Signal Plans**

1. *Signal Head Placement* – All existing and proposed traffic signal heads shall be identified on the plans and positioned at their intended angle of sight. Heads shall be located within the cone of vision as specified by the *MUTCD*.
2. *Signal Head Data* – The type and quantity of each signal head configuration shall be noted on the plans and in accordance with the *MUTCD*. The signal head configuration detailed on the plans shall be consistent with the text and analysis in the Functional Design Report.
3. *Pavement Markings* – The pavement markings necessary to the operation of the traffic signals (e.g. lane layouts, stop lines, dedicated turn lanes) should be included on the traffic signal layout plans.
4. *Sequence and Timing Chart* – Each signalized location shall have the appropriate sequence and timing chart included with the plan set. The sequence and timing chart detailed on the plans shall be consistent with the text and analysis in the Functional Design Report
5. *Preferential Phasing Diagram* – A preferential phasing diagram shall be shown for each signalized location and should include concurrent or actuated pedestrian phases and emergency vehicle preemption phases as necessary. The phasing sequence detailed on the plans shall be consistent with the text and analysis in the Functional Design Report.
6. *Coordinated System* – A proposed method of coordination shall be noted for new coordinated traffic signal systems. If modification of an existing coordinated system is proposed, then the additional components shall be noted. A Time-Space Diagram for the interconnected signals is recommended at the 25% submission, although not required until the 75% submission stage.
7. *Signal Detectors* – Although this is not a requirement at the 25% design stage, it is recommended that traffic signal detector information be included in the signal plans. Location and detector type information is more important than specifics on hardwiring and geometrics. Bicycle accommodation is required at all signal installations, except on approaches to and from limited access highways.
8. *Miscellaneous* – Early coordination is helpful when considering the pre-emption needs of the municipality, the ownership and maintenance of signal equipment, and the payment of utility expenses.

**C. Traffic Management Plans (TMP)** - For significant projects, a TMP consists of a Temporary Traffic Control Plan (TTCP) and addresses the Intelligent Transportation System Monitoring Plan (IMP) and the Public Information Plan (PIP) aspects of the project.

1. *Basic TTCPs* – While it is not a requirement at the 25% design level, it is recommended that some preliminary temporary traffic control plans (TTCP) be provided at this stage. At a minimum, construction staging for bridge work shall be submitted at this stage if not sooner (pre-25%).
2. *Typical Layouts* – Each project shall, at a minimum, include a typical TTCP layout as provided in the *MUTCD* or as provided in MassDOT's Standard Details and

Drawings for the Development of Temporary Traffic Control Plans, however, modifications are usually necessary.

3. *Detour Routes* – All proposed detour routes should be clearly marked out and be “user friendly” to the general public. If a detour route uses roads under local jurisdiction then the plan shall be reviewed by the local community.
4. *Pedestrian and Bicycle Accommodations* – All TTCPs shall address pedestrian and bicycle accommodation. If bicycle or pedestrian facilities are temporarily closed due to construction then alternate routes shall be provided and clearly marked. All temporary facilities shall be handicap accessible as directed by the MAAB and the ADAAG.