



## MARYLAND DEPARTMENT OF TRANSPORTATION (MDOT) BIKEWAYS NETWORK PROGRAM DESIGN & IMPLEMENTATION REFERENCE GUIDE

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This guide and resource list summarize the steps needed to advance bicycle and pedestrian projects from planning through design and to construction, through MDOT's Bikeways Network Program. This reference guide was developed for Maryland jurisdictions and agencies to clarify the processes, design considerations, and constructability factors associated with bicycle and trail projects.

**While this guide aims to include most construction elements for consideration, the information offered is not a substitute for consultations with local jurisdiction agencies and MDOT, including the State Highway Administration and the other modal administrations.**

### **A. Who owns the road?**

- Locally owned roadway
  - Coordinate with local agencies
- State owned roadway or intersects with State-owned roadway
  - Consult the State Highway Administration (SHA)
- Utility company easement
  - Obtain utility company approval of design documents

### **B. If outside of roadway right-of-way, who owns the property(ies)?**

- Private landowners
  - Obtain Letter of Permission or Temporary Construction Easement for temporary activities
  - Obtain permanent easement or acquire land fee simple for permanent impacts and maintenance
- Utility company
  - Obtain Letter of Permission or Temporary Construction Easement for temporary activities
  - Obtain permanent easement or permit for permanent impacts, long-term operation, and maintenance
  - Obtain utility company approval of design documents
- Railroad
- Any improvements adjacent to or across highway-rail grade crossings will require initial coordination with the MDOT Office of Rail and Intermodal Freight (ORIF). Further

coordination may be needed with the Maryland Transit Administration (MTA), railroad owner/operator, and the applicable roadway owner (SHA, County, Municipality, etc.)

- Execute applicable agreements (design, license, right-of-way, construction, flagging, etc.), provide proof of required insurance, and pay applicable fees (application, engineering review, license, flagging/inspection, etc.) fees (contingency fees may also be required)
- Obtain leasing agreement for permanent impacts, long-term operation, and maintenance; and pay lease payments (contingency fees may also be required)
- Local government agency (other than your own)
  - Obtain interagency transfer of property
  - Obtain agency approval of design documents
- State or federal government agency
  - Obtain Temporary Construction Easement or Permit/Licensing Agreement for temporary activities
  - Obtain Permanent Easement or Permit/Licensing Agreement or acquire property fee simple for permanent impacts, long-term operation, and maintenance
  - Obtain agency approval of design documents

**C. Do I need to submit a formal Request to Experiment to SHA Office of Traffic and Safety (OOTS)?**

- Yes, if the project includes elements not in the MUTCD

**D. Do I need to submit notification to SHA OOTS for project include elements subject to existing statewide or local FHWA Interim Approval?**

- Yes, if the project includes any other treatments listed on [FHWA's website](#) (subject to change)

**E. Who is doing the work?**

- In-house staff
- Consultants

**F. Can I take advantage of other projects/budgets to accomplish the work?**

- Repaving projects
- Maintenance projects
- Stormwater/drainage projects
- ADA projects

**H. What background information is needed?**

- Project includes pavement marking and signing only
  - Aerial photography or GIS
  - Field reconnaissance to confirm pavement widths
  - Utility clearance by Miss Utility or similar (for signpost installation)
- Project includes shallow excavation for sidewalk, curb, or pavement repairs/restoration; may include minor structures (retaining walls less than 2-feet in height); work remains well within right-of-way; no utility or drainage impacts anticipated
  - Topographic survey

- Quality Level C utility survey
- Project includes significant excavation/fill, steep slopes, large pavement repairs, full-depth pavement construction, utility relocation, or structures (retaining walls greater than 2 feet in height, bridges); work extends beyond right-of-way
  - Topographic survey
  - Initial Quality Level B utility survey, Quality Level A utility survey where conflicts are identified
  - Right-of-way survey
  - Geotechnical investigation
  - Desktop environmental review
- Project includes lane removal (road diet), parking removal, or operational changes to intersections/access points
  - Traffic study and/or parking study
- If, based on desktop environmental review, project has potential to impact wetlands,
  - Formal environmental investigations

#### **I. What type of environmental documentation is needed?**

- Project is locally funded, involves only local roadways, does not impact State or federal properties
  - Follow local agency process
- Project is State funded, does not impact federal properties
  - Project is exempt from the Maryland Environmental Policy Act (MEPA) process based on project scope/type (COMAR 11.01.08.07), follow local process.
- Project is federally funded or impacts federal property
  - Follow National Environmental Policy Act (NEPA) process administered by Federal Highway Administration (23 CFR 771) or impacted agency. To determine the appropriate NEPA process, coordinate with the agency providing project funding, or with the federal agency affected by the project.
- **All funding sources will require sponsoring agency to initiate the following actions at 30% design or show proof of completion:**
  - Consult Maryland Historic Trust for potential impacts to historic/cultural resources (Maryland Code, Maryland Historical Trust Act, §10-2A-06) Please see Appendix A for this process.
  - Consult Department of Natural Resources (DNR) Wildlife & Heritage Service (WHS) for potential impacts to rare/threatened/endangered species and DNR Environmental Review Program (ERP) for impacts to fisheries, DNR lands, and other natural resources (Maryland Code, Natural Resources Article, §10-2A-06). Please see Appendix B for this process.
  - Consult MDE for issues related to contaminated/hazardous materials as needed.
  - Consult Maryland Department of the Environment (MDE) for impacts to wetlands/waters of the US (MDE/Corps of Engineers Joint Permit Application may be needed).

#### **J. What permits/approvals are needed?**

- Locally owned roadway, project locally funded
  - Local jurisdiction land development permit

- Local jurisdiction building permit for structure construction
- Local jurisdiction soil conservation service erosion and sediment control permit and stormwater management plan approval if disturbing more than 5,000 square feet or 100 cubic yards of soil.
- Local jurisdiction grading permit
- National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) for disturbance over 40,000 square feet
- Local jurisdiction lane closure permit for preliminary site investigations and construction
- State owned roadway or intersects with State-owned roadway, project State or federally funded projects
  - SHA approval of plans, specifications, and estimate (PS&E) package (OOTs and respective District office)
  - MDE erosion and sediment control permit and stormwater management plan approval if disturbing more than 5,000 square feet or 100 cubic yards of soil.
  - National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) for disturbance over 40,000 square feet
  - Formal utility clearance required
  - Formal right-of-way clearance required
  - Formal design waiver required if physical or environmental constraints prevent compliance with SHA design requirements
  - Formal design exception required if physical or environmental constraints prevent compliance with American Association of State Highway and Transportation Officials (AASHTO) design requirements
- Maryland Historic Trust approval
- Department of Natural Resources (DNR) Wildlife & Heritage Service (WHS) Approval
- Project located within 1000 feet of tidal waters
  - Maryland Critical Area Commission approval
- Project impacts floodplains, wetlands, or waterways
  - MDE Joint Federal/State permit for work within floodplains/wetlands/waterways
- Project impacts forest resources
  - DNR Roadside Tree Permit for cutting or clearing of less than 1 acre in roadway right-of-way
  - DNR Forest Service approval for cutting or clearing of 1 acre or more for State funded projects
- Project includes construction of a bridge over navigable waters
  - United States Coast Guard (USCG) permit
- Project site contains contaminated/hazardous materials
  - MDE review/concurrence with Phase I Environmental Site Assessment
  - MDE review/concurrence with Phase II Environmental Site Assessment
  - MDE Remedial Investigation/Feasibility Study approval
- Impacts to railroad grade crossings
  - MTA Office of Real Estate approval (if along state-owned rail lines)
  - MTA Office of Track and Structures Engineering approval (if along state-owned rail lines)
  - MDOT ORIF approval
  - Railroad company approval

- Impacts to railroad or utility company properties/easements
  - Any improvements regarding highway-rail grade crossings will require initial coordination with MDOT Office of Rail and Intermodal Freight (ORIF). Further coordination may be needed with the Maryland Transit Administration (MTA), railroad owner/operator, and the applicable roadway owner (SHA, County, Municipality, etc.)
  - Railroad or utility company approval

**K. Does project include any common triggers for unanticipated work?**

- ADA improvements
  - Resurfacing (other than micro-resurfacing)
  - Full-depth pavement construction
  - Sidewalk improvements
  - Crosswalk striping
  - Intersection and traffic signal improvements
- Traffic signal improvements
  - Road diets
  - Lane diets involving lane shifts greater than 3 feet
  - New crosswalk installation
  - Sidewalk and ADA curb ramp improvements
- Utility relocations/drainage improvements
  - Curb extensions/realignments
  - Impacts to landscape embankments/berms
  - Incomplete/poor quality utility survey
  - Excavation

**L. Is public/community engagement required?**

- Project is State or federally funded
  - Project sponsors with federal aid funds administered by SHA should review the [Development Guide For Local Public Agencies and Other Subrecipients of Federal Funds](#) and any other relevant documents
  - NEPA and MEPA both require public engagement
  - MDOT's Complete Streets Policy prioritizes public engagement, especially with underserved and underrepresented communities
  - Grant agreements (and other project-related agreements) may stipulate engagement requirements
- Required on local projects? Check with local agencies
- While not always required, public engagement during the planning and design phases promotes greater understanding and support of bicycle and trail projects.
  - At a minimum, a project website detailing the project's purpose, schedule, and point of contact provides the public with helpful information.

**M. Who will construct the project?**

- Self-perform if in-house staff and equipment available

- Existing local maintenance contract(s)
- Hired contractor
- Volunteers can assist with some activities

#### **N. What type of construction documents are needed?**

- Project includes pavement marking and signing only, involves only local roads
  - Signing and marking plans, specify materials on drawings
  - Details
  - Comprehensive cost estimate
  - If SHA standard traffic control details do not apply, maintenance of traffic plans may be required
  - Local jurisdiction bidding document, if using hired contractor
- Project includes pavement marking and signing only, involves State roads
  - Signing and marking plans approved by State Highway Administration
  - If SHA standard traffic control details do not apply, maintenance of traffic plans, traffic management plan required
  - Details
  - Specifications/Special provisions
  - Comprehensive cost estimate
  - Local jurisdiction or SHA bidding document, if using hired contractor
- Other projects on local roads
  - Fully detailed construction plans (including maintenance of traffic), specify materials on drawings
  - Design calculations/reports
  - Comprehensive cost estimate
  - Local jurisdiction bidding document, if using hired contractor
- Other projects on State roads
  - Fully detailed PS&E package
  - Design waiver/exception documentation
  - Utility and right-of-way clearance documentation
  - Approved FHWA request to experiment, if applicable
  - Design calculations/reports
  - Local jurisdiction or SHA bidding document, if using hired contractor

#### **O. When must design documents be submitted?**

- Project follows local approval process. Local jurisdiction determines number of submissions needed.
- Project follows MDOT Bikeways approval process. Grant agreement requires minimum design review(s) needed, but typically:
  - Preliminary design (30%)
  - Semi-final design (65%)
  - Final design (90% or 100%)
- Project follows SHA approval process
  - Preliminary (30%) design
  - Semi-Final(60%) design
  - Final (90%) design (100% - multiple review cycles may be required)
  - Final (100%) PS&E

- For permits, permitting agency determines number of submissions needed, but typically:
  - Preliminary design (65% to 75%)
  - Final design (100% - multiple review cycles may be required)

## RESOURCES

This list of resources complies with MDOT's updated Complete Streets Policy and aggregates state and federal design guidance; this list will be revised as new resources are released. New design standards and references will apply to projects which have not reach 65% design at the time the new documents are adopted. If a project has reached 65% design or final design, the previous design standards may still be used.

## DESIGN GUIDANCE

### 1. Maryland State Highway Standards

- [Development Guide For Local Public Agencies and Other Subrecipients of Federal Funds](#) provides process guidance for federally funded projects.
- [Environmental Documentation for Local Government Projects](#) provides information on requirements for environmental documentation for federally funded projects.
- [Bicycle Policy and Guidelines](#) provides design guidance for on-road bike facilities, shared use paths, and work zone traffic control for bike facilities.
- [Maryland Manual on Uniform Traffic Control Devices \(MDMUTCD\)](#) provides design guidance for all roadway and trail pavement markings and signs (supersedes FHWA MUTCD).
- [SHA's Accessibility Policy and Guidelines for Pedestrian Facilities](#) along State Highways

### 2. American Association of State Highway Transportation Officials (AASHTO) provides guidance for all roadway, roadside, and trail geometry (manuals must be purchased).

- [Guide for the Development of Bicycle Facilities](#)
- [Guide for the Planning, Design and Operation of Pedestrian Facilities](#)
- [A Policy on Geometric Design of Highways and Streets \(Green Book\)](#)
- [Roadside Design Guide](#)

## NATIONAL BEST PRACTICE REFERENCE GUIDE

### 1. Federal Highway Administration

- [Separated Bike Lane Planning and Design Guide](#) provides information on design best practices for physically separated bike facilities.
- [Achieving Multimodal Networks](#) provides information on design best practices to reduce multimodal conflicts and applying flexibility in multimodal design.
- [Incorporating On-road Bicycle Networks into Resurfacing Projects](#) provides information methods for incorporating bicycle facilities during annual repaving activities via lane diets, road diets, and parking removal.

- d. [Small Town and Rural Multimodal Networks](#) provides information on supporting safe, comfortable, and active travel for people of all ages and abilities in small town and rural contexts.
  - e. [Guide for Maintaining Active Transportation Infrastructure for Enhanced Safety](#) provides information on maintaining active transportation facilities to increase safety, access, and mobility.
  - f. [Improving Safety for Pedestrians and Bicyclists Accessing Transit](#) provides information on addressing safety of vulnerable road users connecting to transit.
- 2. National Association of City Transportation Officials (NACTO)**
- a. [Urban Bikeway Design Guide](#) is a design resource for more innovative bicycle infrastructure such as separated bike lanes, bicycle boxes and bicycle boulevards.
  - b. [Urban Street Design Guide](#) provides design guidance for incorporating Complete Streets features into urban roadways.
- 3. Institute of Transportation Engineers (ITE)**
- a. [Designing Walkable Urban Thoroughfares: A Context Sensitive Approach](#) provides information methods of implementing projects aimed at restoring and enhancing commercial and social functions of roadways in addition to enhancing mobility.
  - b. Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges (manual must be purchased) provides recommendations for bicycle and pedestrian crossing safety enhancements at interchange on- and off-ramps and single-point urban interchanges.

## ENVIRONMENTAL RESOURCES

Conduct an environmental resource screening within the project study area using the following online tools and resources:

1. [Maryland's Environmental Resource & Land Information Network \(MERLIN\)](#)
2. [MDDNR Aquatic Resources Pre-Screening Tool](#)
3. [Maryland's Cultural Resource Information System \(MEDUSA\)](#)
4. [Maryland's Wetlands Inventory](#)
5. [Maryland's Critical Area Boundary Map Viewer](#)
6. [FEMA Flood maps in Maryland](#)

Use the following links to access additional information and technical resources:

1. [Maryland's Roadside Tree Permit](#)
2. [Maryland's Stormwater Management Program](#)
3. [Maryland Land Records Database \(account setup required\)](#)

For additional guidance, refer to Appendix A and Appendix B.



## OTHER RESOURCES

1. [Maryland State Highway Maps by County](#)
2. [Maryland Bicycle Level of Traffic Stress Map Application](#)
3. [Maryland Short Trip Opportunity Areas](#)
4. [Maryland Bicycle Accessibility Map Application](#)

## APPENDIX A:

# MHT HISTORIC PRESERVATION PROJECT REVIEW PROCESS FOR MDOT BIKEWAYS GRANT PROJECTS

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Projects receiving funding through the MDOT Secretary's Office (TSO) Bikeways Grant Program involve state financial assistance and are subject to review by the Maryland Historical Trust (MHT) under Section 5A-325 of the Maryland Historical Trust Act. This regulation requires state agencies to consider the effects of their undertakings on historic and archaeological properties.

MHT serves as Maryland's State Historic Preservation Office (SHPO) and reviews state-assisted projects to determine whether they may affect properties listed in or eligible for listing in the National Register of Historic Places. The review process involves consultation among the project sponsor, the responsible state agency, and MHT. Through consultation, potential effects on historic resources can be identified and addressed as project planning proceeds.

**Recipients of funding through the TSO Bikeways Grant Program are responsible for initiating consultation with MHT for their project.**

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**When to Submit a Project for Review:** Consultation with MHT should occur during a feasibility study or prior to 30% design, well before construction or implementation of project activities. If your project is beyond 30% design, please submit your project for review as soon as possible. All coordination must be completed prior to construction. Initiating consultation early helps ensure that historic preservation considerations can be addressed in a timely manner and helps prevent delays later in the project development process.

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**How to Submit a Project:** Requests for review should be submitted through the MHT's e106 system. The e106 system is MHT's online portal for submitting projects and coordinating historic preservation review.

[Click Here for e106](#)

When preparing the submission, Project Sponsors should **clearly identify that the project is receiving funding from the "MDOT Secretary's Office (TSO) Bikeways Grant Program."** This information should be included in the cover letter or project description. In addition, include TSO Bikeways Grant Program representatives as a secondary point of contact and in all correspondence.

To initiate review, submit the following information:

**Required:**

- Cover letter or memo that describes the proposed project, identifies the involvement of the TSO Bikeways Grant Program, outlines the project scope of work, and includes any additional information that may assist MHT in evaluating the project.
- Project location map, such as an aerial photograph or Google map, clearly showing the project area.

**Recommended supporting documentation as applicable:**

- Plans or drawings illustrating the proposed improvements.
- Photographs of the project area showing existing conditions, if possible.

Providing clear and complete documentation helps facilitate MHT's review and may reduce response time.

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**MHT Review:** After a project is submitted, MHT logs the request into its compliance tracking system and assigns it to a staff reviewer. MHT evaluates the project to determine whether historic properties may be present and whether the proposed work could affect those resources. MHT generally provides written comments within **approximately 30 days of receiving a complete submission**.

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**Bikeways Compliance:** Project sponsors should provide evidence to the MDOT Bikeways Program that they have completed, or are undergoing, historic preservation project review with MHT. Project sponsors may submit a copy of the e106 submission confirmation, MHT's determination, correspondence with MHT, or any other relevant documents. MHT coordination and effects determination must be completed prior to the start of construction.

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**Questions:** For assistance with project submissions or questions about the historic preservation review process, please contact:

**Kim Lamphier Bikeways Network Program**  
[MDbikeways@mdot.maryland.gov](mailto:MDbikeways@mdot.maryland.gov)

**OR**

**Maryland Historical Trust**  
Project Review and Compliance Unit  
[mht.section106@maryland.gov](mailto:mht.section106@maryland.gov)

## APPENDIX B:

# DNR WHS AND ERP PROJECT REVIEW PROCESS FOR MDOT BIKEWAYS GRANT PROJECTS

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Projects receiving funding through the MDOT Secretary's Office (TSO) Bikeways Grant Program involve state financial assistance and are subject to the Maryland Department of Natural Resources (DNR) Wildlife & Heritage Service (WHS) coordination in compliance of the Maryland Nongame and Endangered Species Conservation Act (MD Code, Natural Resources Article, §10-2A-06). This regulation requires state agencies to ensure that actions they authorize, fund, or carry out do not jeopardize listed species or their habitat. DNR WHS reviews projects specifically for potential project impacts to rare, threatened, and endangered (RTE) species and their habitats. Separately, the DNR Environmental Review Program (ERP) reviews projects for the presence of and potential project impacts to fisheries, DNR lands, and/or additional natural resources.

**Recipients of funding through the TSO Bikeways Grant Program are responsible for initiating consultation with DNR WHS and ERP for their project.**

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**When to Submit a Project for Review:** Coordination with DNR WHS and ERP should occur during a feasibility study or prior to 30% design, well before construction or implementation of project activities. If your project is beyond 30% design, please submit your project for review as soon as possible. All coordination must be completed prior to construction. Initiating coordination early helps avoid and/or minimize impacts to natural resources and helps prevent delays later in the project development process.

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**How to Submit a Project:** Project Sponsors are required to formally submit projects to the DNR for review by email:

### WHS Contact:

Lori Byrne  
Wildlife & Heritage Service  
Department of Natural Resources  
580 Taylor Ave.  
Tawes Office Bldg E-1  
Annapolis MD 21401  
Phone: 410-260-8573  
Email: [lori.byrne@maryland.gov](mailto:lori.byrne@maryland.gov)

**ERP Contact:**

Environmental Review Program  
Department of Natural Resources  
580 Taylor Ave., B-3  
Annapolis MD 21401  
Phone: 410-260-8336  
Email: [environmentalreview.dnr@maryland.gov](mailto:environmentalreview.dnr@maryland.gov)

When preparing the submission, applicants should **clearly identify that the project is receiving funding from the “MDOT Secretary’s Office (TSO) Bikeways Grant Program.”** This information should be included in the cover letter or project description. In addition, include TSO Bikeways Grant Program representatives as a secondary point of contact and in all correspondence.

To initiate review, submit the following information:

**Required:**

- Cover letter or memo that describes the proposed project, identifies the involvement of the TSO Bikeways Grant Program, outlines the project scope of work, and includes any additional information that may assist DNR in evaluating the project.
  - **For WHS coordination:** Request any information concerning state-listed threatened or endangered species and/or any unique habitat that may occur in the project area.
  - **For ERP coordination:** Include any known natural resources (wetlands, forested areas, floodplains, streams, protected lands, etc.) within the project area and request any additional information concerning natural resources and proposed impacts in the project area.
- Project location map, such as an aerial photograph or Google map, clearly showing the project area.

**Recommended supporting documentation as applicable:**

- Plans or drawings illustrating the proposed improvements.
- Photographs of the project area showing existing conditions, if possible.

Providing clear and complete documentation helps facilitate DNR’s review and may reduce response time.

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**DNR Review:** After a project is submitted, DNR will review the project for the presence and potential impacts to natural resources and generally provides written comments within **approximately 30 days of receiving a complete submission.**

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**Bikeways Compliance:** Project sponsors should provide evidence to the MDOT Bikeways Program that they have completed, or are undergoing, environmental project review with DNR WHS and ERP. Project sponsors may submit a copy of the email submissions to WHS and ERP, DNR's comments, correspondence with DNR, or any other relevant documents. DNR's project review must be completed prior to the start of construction.

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**Questions:** More information can be found at  
[https://dnr.maryland.gov/wildlife/pages/plants\\_wildlife/er.aspx](https://dnr.maryland.gov/wildlife/pages/plants_wildlife/er.aspx)

For assistance with project submissions or questions about the review process, please contact:

**Kim Lamphier Bikeways Network Program**  
[MDbikeways@mdot.maryland.gov](mailto:MDbikeways@mdot.maryland.gov)