

BICYCLE AND PEDESTRIAN PROJECTS: DESIGN & IMPLEMENTATION REFERENCE GUIDE

This guide and resource list are a general overview of the steps needed to advance bicycle and pedestrian projects from planning through design and to construction. This reference is provided to local Maryland jurisdictions and agencies to illustrate the design considerations and constructability factors associated with bicycle and trail projects in the State of Maryland. While this document aims to include most construction elements for consideration, the information offered is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration.

<p>A. Who owns the road?</p> <ul style="list-style-type: none">➤ Locally owned roadway<ul style="list-style-type: none">• Coordinate with local agencies➤ State owned roadway or intersects with State-owned roadway<ul style="list-style-type: none">• Consult State Highway Administration (SHA)➤ Utility company easement<ul style="list-style-type: none">• Obtain utility company approval of design documents
<p>B. If outside of road right-of-way, who owns the property(ies)?</p> <ul style="list-style-type: none">➤ Private landowners<ul style="list-style-type: none">• 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<ul style="list-style-type: none">• 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<ul style="list-style-type: none">• Any improvements regarding roadway-rail grade crossings will require coordination with the State Highway Administration.• Execute design phase agreement, and pay review fees (contingency fees may also be required)• Execute construction phase agreement, and pay flagging/inspection costs (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)

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

<ul style="list-style-type: none"> ➤ Local government agency (other than your own) <ul style="list-style-type: none"> • Obtain interagency transfer of property • Obtain agency approval of design documents ➤ State or federal government agency <ul style="list-style-type: none"> • 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
<p>C. Do I need to submit a formal Request to Experiment to SHA Office of Traffic and Safety (OOTS)?</p> <ul style="list-style-type: none"> ➤ Yes, if the project includes: <ul style="list-style-type: none"> • Two-stage turn boxes • Green-colored pavement for use with shared-lane markings • Bicycle signals with conflicting turning vehicles • Dashed (advisory) bike lanes • Destination Guide Signs for Shared-Use Paths • Or any other treatments listed on FHWA’s website
<p>D. Do I need to submit a request to SHA OOTS for Interim Approval for my jurisdiction?</p> <ul style="list-style-type: none"> ➤ Yes, if the project includes: <ul style="list-style-type: none"> • Bicycle Boxes • Bicycle Signal Faces • Green-colored pavement • Or any other treatments listed on FHWA’s website
<p>E. Do I need to submit notification to SHA OOTS for project include elements subject to existing statewide or local FHWA Interim Approval?</p> <ul style="list-style-type: none"> ➤ Yes, if the project includes: <ul style="list-style-type: none"> • Alternate Design for the U.S. Bicycle Route sign • Rapid flashing beacons • Any other treatments listed on FHWA’s website
<p>F. Who is doing the work?</p> <ul style="list-style-type: none"> ➤ In-house staff ➤ Consultants
<p>G. Can I take advantage of other projects/budgets to accomplish the work?</p> <ul style="list-style-type: none"> ➤ Local jurisdiction repaving projects ➤ SHA annual repaving projects ➤ Local Jurisdiction maintenance projects ➤ Local jurisdiction stormwater/drainage projects ➤ Local jurisdiction ADA projects

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

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 sign post 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
 - Follow Maryland Department of the Environment's (MDE's) Maryland Environmental Protection Act (MEPA) process

- Project is federally funded or impacts federal property
 - Follow National Environmental Protection Act (NEPA) process administered by Federal Highway Administration, or impacted agency

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

- All funding sources will require sponsoring agency to
 - 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)
 - Consult MDE for issues related to contaminated/hazardous materials
 - Consult Department of Natural Resources (DNR) for potential impacts to rare/threatened/endangered species
 - Consult Maryland Historic Trust for potential impacts to historic/cultural resources (in some cases, historic/cultural impacts are administered by the local jurisdiction)

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
- 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

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

Maryland Department of Transportation

- 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 impacts historic or cultural resources
 - Maryland Historic Trust or local jurisdiction approval (if applicable) for locally funded projects
 - Maryland Historic Trust approval for State or federally funded projects
- Project impacts rare, threatened, or endangered species
 - Maryland DNR Fish and Wildlife Service approval
- 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
 - SHA OOTS approval
 - Railroad company approval
- Impacts to railroad or utility company properties/easements
 - Any improvements regarding roadway-rail grade crossings will require coordination with the State Highway Administration
 - Railroad or utility company approval

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

- ADA improvements
 - Resurfacing (other than microsurfacing)
 - 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

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

<ul style="list-style-type: none"> ➤ Utility relocations/drainage improvements <ul style="list-style-type: none"> • Curb extensions/realignments • Impacts to landscape embankments/berms • Incomplete/poor quality utility survey • Excavation
<p>L. Is public/community engagement required?</p> <ul style="list-style-type: none"> ➤ Project is State or federally funded ➤ Required on local projects? Check with local agencies ➤ While not always necessary, public engagement during the planning and design phases promotes greater understanding and support of bicycle and trail projects
<p>M. Who will construct the project?</p> <ul style="list-style-type: none"> ➤ Self-perform if in-house staff and equipment available ➤ Existing local maintenance contract(s) ➤ Hired contractor ➤ Volunteers can assist with some activities
<p>N. What type of construction documents are needed?</p> <ul style="list-style-type: none"> ➤ Project includes pavement marking and signing only, involves only local roads <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

- 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, but typically
 - Preliminary design (30% to 75%)
 - Final design (100% - multiple review cycles may be required)
- Project follows SHA approval process
 - Preliminary (30%) engineering
 - Intermediate (65%) 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)

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

RESOURCES

DESIGN GUIDANCE

1. Maryland State Highway Standards

- a. [Development Guide for Local Public Agencies](#) provides process guidance for federally funded projects.
- b. [Environmental Documentation for Local Government Projects](#) provides information on requirements for environmental documentation for federally funded projects.
- c. [Bicycle Policy and Guidelines](#) provides design guidance for on-road bike facilities, shared use paths, and work zone traffic control for bike facilities.
- d. [Maryland Manual for Uniformed Traffic Control Devices \(MDMUTCD\)](#) provides design guidance for all roadway and trail pavement markings and signs (supersedes FHWA MUTCD).
- e. [SHA's Accessibility Policy and Guidelines for Pedestrian Facilities along State Highways](#) provides design guidance on ADA compliance (more stringent than U.S. Access Board).

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

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

NATIONAL BEST PRACTICE REFERENCE GUIDE

1. Federal Highway Administration

- a. [Separated Bike Lane Planning and Design Guide](#) provides information on design best practices for physically separated bike facilities.
- b. [Achieving Multimodal Networks](#) provides information on design best practices to reduce multimodal conflicts and applying flexibility in multimodal design.
- c. [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.

2. U.S. Access Board

- a. [Streets & Sidewalk Standards](#) provides design guidance on ADA compliance.

3. 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.

4. 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.

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other State and federal offices or agencies

Maryland Department of Transportation

- 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.
- 5. Massachusetts Department of Transportation**
- a. [Separated Bike Lane Planning & Design Guide](#) provides information on design best practices for physically separated bike facilities, and describes additional treatments not included in the FHWA guide.

ENVIRONMENTAL RESOURCES

1. [FEMA Flood maps in Maryland](#)
2. [Maryland's Wetlands Inventory](#)
3. [Maryland's Stormwater Management Program](#)
4. [Maryland's Roadside Tree Law and Permit](#)
5. [Maryland DNR's Rare, Threatened, and Endangered Species Program](#)
6. [Maryland Historic Trust's Preservation Planning for Local Governments](#)
7. [Maryland Land Records Database](#) (account setup required)

OTHER RESOURCES

1. [Maryland State Highway Maps by County](#)
2. [FHWA List of Bike Treatments Subject in Experimentation and Interim Approval](#)
3. [FHWA List of Jurisdictions with Interim Approval](#)

Information offered in this document is not a substitute for consultations with local jurisdiction agencies and the Maryland Department of Transportation / State Highway Administration and other state and federal offices or agencies