SHARED USE PATH
PLANNING PRIMER

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Somerville Community Path

Shared Use Paths:
FROM VISION TO REALITY

Throughout Massachusetts, communities are recognizing the many benefits of shared use paths. These public amenities provide options for active transportation and healthy recreation while contributing to economic development and sustainability goals. Consequently, the Commonwealth of Massachusetts has made investing in new shared use paths and completing existing shared use path networks a priority. This work is the focus of MassTrails, a multidisciplinary team of state agencies, including the Massachusetts Department of Transportation (MassDOT), the Department of Conservation & Recreation (DCR), and the Executive Office of Energy and Environmental Affairs (EEA).

This *Shared Use Path Planning Primer* demonstrates how to propel a path project from vision to reality. Advocates and planners, with or without technical backgrounds, should use this primer to understand the process of planning, designing, funding, and constructing shared use paths in their communities.

What is a Shared Use Path?

Shared use paths—also called trails, multi-use paths, greenways, or bike paths—are off-road infrastructure that is physically separated from motorized vehicle traffic and designed for use by people of all ages and abilities. Shared use paths tend to be ADA-compliant and are typically paved, but can also use stabilized aggregate, crushed stone, or unimproved natural surfaces. They are designed as independent facilities for two-way travel, supplementing the existing active transportation network, and provide flexible transportation options and recreational opportunities for a wide variety of settings.

Shared use paths serve users who:

- Travel by diverse modes
- Have a variety of trip purposes, including commuting, shopping, socializing, and recreation
- Embody a wide spectrum of ages, abilities, and comfort levels

Types of Shared Use Paths

Shared use paths take several common forms, and paths may transition between types at different points along their routes. The following are types of shared use paths found throughout Massachusetts, with examples of each.

Rail Trail

Rail trails are shared use paths built on abandoned rail beds. The Cochituate Rail Trail in Framingham (below) is built on the old Saxonville Branch rail line. Abandoned rail lines are often ideal for shared use paths because the corridors are undeveloped and often contiguous, form direct routes between municipalities or communities, and tend to be wide and flat. Because of their alignments and abandoned status, former rail corridors sometimes lack convenient access to businesses, schools, and other destinations. In such cases, on-street sidewalk or bike lane connections to and from the rail trail allow users to access their desired destinations.

Cochituate Rail Trail, Framingham

Rails with Trails

Rails with trails are shared use paths that run adjacent to active rail lines. MassDOT design policy allows trails to be built next to active rail lines where feasible. Examples of rails with trails include the segment of the Northampton Bike Path that runs along Amtrak's active Vermonter line (below), the Fitchburg Cutoff Path through Cambridge and Belmont, and shared use paths along the Cape Cod Canal. Rails with trails have many of the same benefits as rail trails, including flat, developable corridors that provide longer connections between communities. Similarly to rail trails, rails with trails may not provide direct access to businesses and other destinations. Safety measures are very important to the success of this path type. Sufficent corridor width is required to allow safe separation between the rails and the trail. This can be accomplished with adequate buffer space, barriers such as fencing or hedges, and by providing safe crossings.

Northampton Bike Path, Northampton. Image Source: TrainsInTheValley.org

Sidepath

Sidepaths are shared use paths that run adjacent to roadways. The Assabet River Rail Trail (right), a sidepath along Main Street in downtown Hudson, follows the original alignment of the Massachusetts Central Rail Line. Sidepaths can also be built along highways and across bridges. They supplement the established roadway and transportation network to provide a safe, separated facility. They can provide direct access to businesses, schools, and other destinations, but safety at intersections and driveways must be carefully considered during planning and design.

Assabet River Rail Trail, Hudson

Other Shared Use Paths

Other shared use path types include linear parks, canal towpaths, waterfront trails, and paths along utility corridors.

Linear parks are typically constructed in urban places where roadways, rail corridors, and other historical features have been converted to green space. For example, the Alewife Linear Park in Somerville and Cambridge is a shared use path built along an abandoned railroad corridor that now runs above a section of the Massachusetts Bay Transit Authority (MBTA) Red Line subway. Similarly, a section of the proposed Border to Boston Trail through Georgetown would run along a utility corridor that was once part of the Boston & Maine Railroad.

Not all shared use paths are built along a distinct historical corridor. Some paths follow a waterfront or other natural resource, while others transition between different path types. For example, the Connecticut River Walk and Bikeway (above) is a waterfront path along the Connecticut River spanning several communities. In Springfield, it is a linear park that also travels adjacent to an active rail line. In Agawam, it is a sidepath adjacent to River Road.

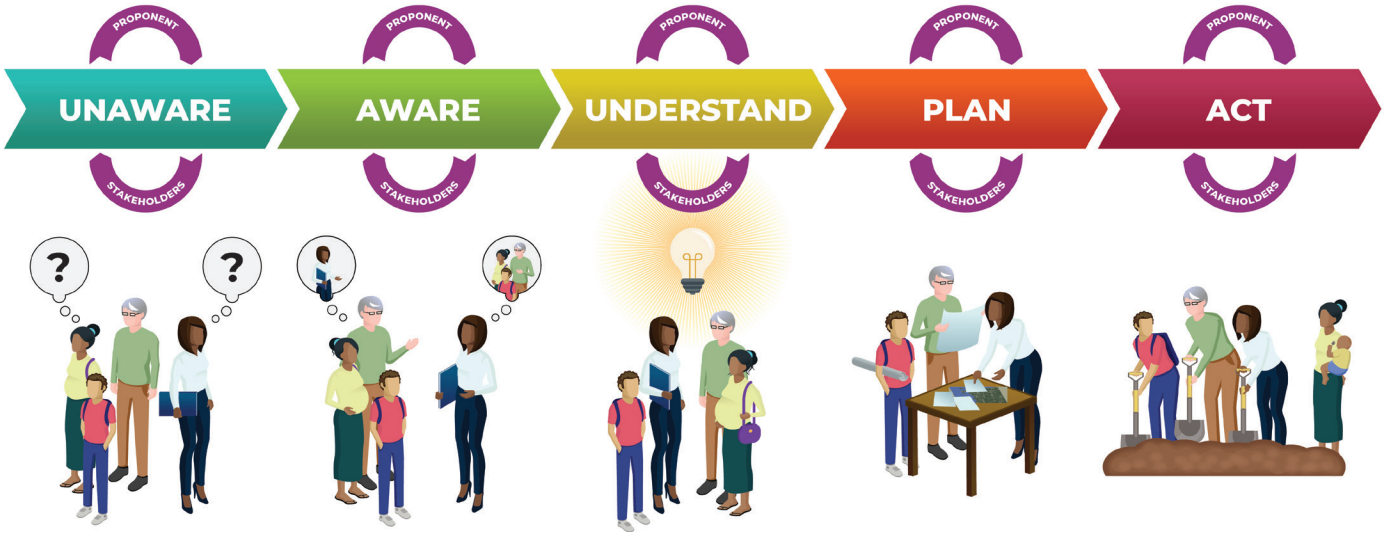
Connecticut River Walk and Bikeway, Springfield.
Image Source: Mark M. Murray

What is the Vision?

Every path begins with a vision, whether initiated by citizens, students, planners, advocacy groups, or public officials. The details of each path project are unique, but six common elements are critical to the success of any project. Every path should be:

- **Useful:** A useful path should serve a purpose (it has independent utility), whether for transportation, recreation, or both. Logical access points (termini) should connect, or provide the opportunity to connect in the future, key destinations via local and regional bicycle, pedestrian, roadway, and/or transit networks.
- **Safe:** A safe path is one designed to reduce the likelihood of conflicts between travel modes, and reduce crash severity both along the path and at roadway crossings.
- **Secure:** A secure path allows users to fully perceive and react to their environment. Security also includes the perception of safety, no matter the user's age, gender, orientation, race, or other characteristics.
- **Comfortable:** A comfortable path utilizes design, routing, and the surrounding context to provide a low-stress, pleasant environment that will attract users.
- **Enjoyable:** An enjoyable path leverages surrounding natural or urban resources, landscaping, and amenities to enhance the user experience.
- **Inclusive:** An inclusive path welcomes people of all ages, abilities, genders, races, ethnicities, and income levels. It also serves the needs and preferences of people engaging in different activities.

Who is Involved?



An active and iterative engagement process is a conversation between project proponents and stakeholders, supporting and improving the project from planning through construction.

Community engagement captures and responds to the needs and concerns of project stakeholders. A robust public process allows the community to have a voice in making a desirable and useful path. Without engaging the community, there is little to no chance of building consensus around the project; if consensus breaks down, the project is unlikely to be successful. But engagement must be more than a checkbox; it is an active and iterative conversation between proponents and stakeholders where both can contribute in a meaningful and creative way to the project. A robust public process allows the community to have a voice in making a desirable and useful path.

Community engagement allows for an open and active exchange of information, often including an educational component to dispel common misperceptions. It also provides an opportunity for trail proponents to learn from residents about their needs and priorities. Proponents should consult affected property owners and neighbors early in the process and continue to engage them from visioning to design to construction.

The range of stakeholders includes:

- Neighbors and affected property owners
- Local residents
- Local businesses
- Local government
- Advocacy and stewardship organizations, including "friends of the trail" groups, bicycle coalitions, public health non-profits, and environmental or conservation groups
- Historic preservation and heritage organizations
- Cultural community organizations
- Environmental justice communities
- Railroad owners
- Regional planning agencies and councils of governments
- Regional and metropolitan planning organizations (RPAs and MPOs)
- State agencies including MassDOT, DCR, EEA, and Massachusetts Department of Environmental Protection (DEP)
- Federal agencies

Common outreach and engagement efforts include:

- A task force and/or advisory committee established by a local community or municipality that can help coordinate outreach, state and regional collaboration, feasibility study activities, funding source identification, and other tasks
- Surveys and online mapping
- Community forums
- Design charrettes or workshops

Local government includes local elected officials, boards, commissions, committees, and planning, engineering, and public works departments, all with different interests. Each of these local government bodies may play a role at different points of the process; understanding their interests and relationships with constituents helps create a more cohesive push to bring the trail from vision to opening day. For instance, releasing a request for proposals (RFP) for the feasibility study typically falls to the planning or community development department of a town or city.

In addition to local government, trail projects that cross multiple communities usually need to involve the appropriate regional agency, such as an MPO. A regional agency may provide technical support, including completing the feasibility study or coordinating multi-community agreements.

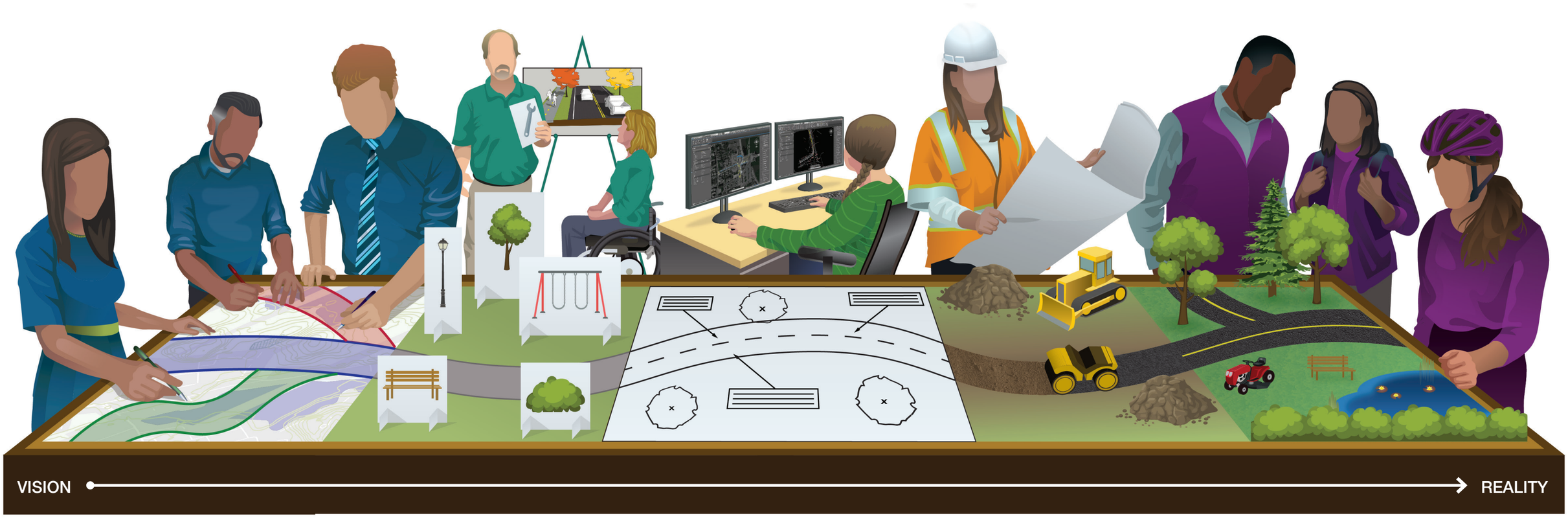
Environmental Justice (EJ): EJ seeks to ensure that low-income residents and communities of color have meaningful participation in decision-making processes, are not disproportionately affected by potential negative impacts, and benefit fairly from projects and programs. Federal agencies are directed to address EJ by Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Title VI of the Civil Rights Act of 1964: A federal law that prohibits discrimination on the basis of race, color, or national origin in any program or activity that receives federal funds or other federal financial assistance. This protection includes Limited English Proficiency (LEP) communities and non-citizens. Nondiscrimination is one way to achieve EJ.

What is the Process?

Building a shared use path is not a completely linear process, although all projects share five major phases and two continuous processes. The diagram on the following pages walks through the major common features which carry a path from vision to reality. The color coding for each phase in the diagram corresponds with the following sections of text that provide details about the tasks included in each phase.

Process Overview: From Vision to Reality



Public Engagement

Regulatory and Fiscal Processes

Planning & Project Development

- Opportunity/need
- Context sensitivity
- Alternative alignments
- Feasibility
- Preferred alternative
- Major design elements
- Early right of way (ROW) considerations
- Early environmental considerations
- Conceptual design
- Early cost estimate
- Surveying
- Traffic data analysis
- Programming and funding
- Environmental permitting

Preliminary Design

- Horizontal alignment
- Vertical profile
- Typical cross-section
- Intersection treatments
- Stormwater plan
- Landscaping, lighting, and amenities plans
- Environmental measures
- Right of way acquisition

Final Design

- Programming & funding
- Construction plans
- Construction details
- Construction specifications
- Cost estimate
- Maintenance plan
- Bidding and contract award

Construction

- Programming & funding
- Scheduling
- Traffic management and site preparations
- Building the path
- Punch-list and completion

Maintenance

- Path operations
- Landscaping
- Amenities

Feasibility

The feasibility study is a planning activity that lays the foundation for project development. For this reason, the Process Overview diagram on the previous page represents these early activities as a single phase. Once a vision, purpose, and goals for the path are established, the municipality conducts a feasibility study to determine whether and where a path can be built based on specific costs, constraints, and challenges.

The feasibility study evaluates different potential routes and recommends a preferred route. Engagement helps identify community needs and priorities, which then inform the evaluation metrics developed for choosing between different route alternatives. The feasibility study should also consider the path's physical, social, economic, environmental, and historical context; how the path will connect with local and regional transportation networks; what coordination is necessary with other groups; what opportunities exist for land acquisition; major design elements; and how the path design and construction may be funded. For local projects, feasibility studies are often conducted by consultants for the local government. For larger projects, regional planning agencies may play a role in conducting or coordinating the study.

Cost is a key consideration in the feasibility of a proposed path. The *Shared Use Path Cost Estimating Tool* is a starting point for a preliminary estimate based on path length, width, surface type, topography, and roadway or water crossings. The early cost estimate informs conversations about potential funding sources, project scope, alignment alternatives, land acquisition, and necessary coordination. It should be updated as more information becomes available during preliminary and final design.

Once a proposed path is determined to be feasible, the municipality or one of the state agencies that is part of the MassTrails team advances the path through a project development process.

Environmental Resources

EARLY CONSIDERATIONS

Early in the feasibility study, the project team should consider potential impacts to wetland and water resources, endangered species, or cultural and historic resources, and potential disturbance of sites containing hazardous materials. If environmental impacts are expected, an alternative alignment or impact mitigation strategy is necessary. Striking a balance between cost, impacts, and mitigation is critical to the success of the shared use path.

PERMITTING

The project team must acquire environmental permits during the design phase. Permits are required by federal, state, and local agencies to demonstrate compliance with environmental laws. Depending on the project context and funding sources, the environmental review and permitting process may range from simple to complex. In addition to environmental permits, the project team must also obtain permits for impacts to bridges and historic areas where applicable.

Lay of the Land

RIGHT OF WAY (ROW) CONSIDERATIONS

During planning and project development, the team should assess land ownership, property line location, topography, and geographic constraints through an analysis of land title information and surveying of the corridor area. These factors influence the route alignment and typical cross-sections.

Land ownership information is available on the Massachusetts Interactive Property Map, which is an online map of parcel boundaries that provides ownership information in pop-up boxes as the user clicks on a parcel. Another online resource is the Massachusetts Property Information Finder, which requires only the address. Municipal land use data or the statewide MassGIS Land Use dataset (2005) can help determine if the land use is residential, commercial, industrial, or open space. If the corridor in question is a rail corridor, its status as active or abandoned can be determined using the Massachusetts Rail Inventory.

LAND ACQUISITION

The box to the right includes ways to purchase land or obtain the rights to use another's land needed for a shared use path.

ROW can be acquired at various times throughout the planning and design phases. In some cases, land for building the shared use path is already owned by a public agency. In other cases, necessary parcels are assembled over time, and acquisition may not be completed until after the design phase. A single trail may require multiple methods to acquire rights to the land. For example, part of the land for the Bruce Freeman Rail Trail, which runs through Lowell, Chelmsford, Westford, Carlisle, Acton, Concord, Sudbury, and Framingham, was acquired through funding from the state and federal government, and part of the land was donated by the railroad company CSX.

The land is often acquired by the local municipality. In some instances, local stakeholders may establish a non-profit organization to facilitate fundraising for land acquisition. A "friends of the trail" group can be incorporated as a non-profit to hold private funds, write grants, and negotiate land donations. These groups can also play substantial roles from planning and development through construction and maintenance. Funding for land purchases or the land itself can also come from the local, state, or federal governments.

Path proponents should understand land acquisition needs and options months to years before land may be acquired.

COMMON LAND ACQUISITION METHODS

Fee simple purchases transfer the land ownership for the sale price of the land.

Easements allow the right to use land for a specific purpose without owning it. These come with terms such as width, allowed users, allowed amenities, fencing requirements, and address issues such as owners' rights and liability. Easements remain in place even when the land ownership changes.

License Agreements allow the right to use land for a specific purpose without owning it, with terms and conditions. These agreements are similar to easements, but are dissolved by a change in ownership.

Leases allow the right to use or occupy land by renting it for a specific amount of time. A shared use path would typically be accommodated with a long-term lease, such as 99 years. One such example is the Frisco Trail in Fayetteville, AR.

Eminent domain is the acquisition of land through government expropriation with compensation. One example is the Wonderbread Spur of the Cochituate Rail Trail. Eminent domain is not an option where rail corridors have been preserved for future use through the ICC Termination Act of 1995.

Throughout the planning, project development, and design processes, the project team should consider barriers to acquisition and seek alignments if necessary. It is important to examine future land use, as new developments are opportunities for negotiating path ROW. Land acquisition requires patience, persistence, and flexibility in the design without compromising on key elements of the shared use path, such as safety.

A path often needs separate funding sources for each phase of the project. Some funding sources can cover multiple phases, while others only apply to construction.

PLANNING AND PROJECT DEVELOPMENT

- Municipalities typically cover the cost of the planning efforts, including the feasibility study.
- In some cases, private organizations such as foundations provide grant funding for path planning.

DESIGN

- Chapter 90 Program funds can be used by any municipality for path design.
- The Recreational Trails Program can be used for design and construction. Limited land acquisition activities, such as obtaining easements, are also supported by this program.
- The Massachusetts Community Preservation Act (CPA) can be used by municipalities that have adopted a local Community Preservation Fund to design, acquire land for, and construct paths.

CONSTRUCTION

- The Complete Streets Funding Program is a competitive program that rewards municipalities demonstrating a commitment to complete streets; shared use paths are an eligible project category.
- A variety of federal transportation funding programs are available through the State and/or MPOs:
  - Safe Routes to Schools (SRTS)
  - Surface Transportation Block Grant Program (STBGP), which includes funds reserved for Transportation Alternatives including shared use paths
  - Congestion Mitigation and Air Quality Improvement Program (CMAQ)

FEDERAL FUNDING SOURCES

To receive federal aid, projects need to be programmed and meet all requirements of federal aid projects.

Programming is the annual process of compiling projects into regional and statewide plans for construction funding. At the regional level, the MPO prioritizes projects into its transportation improvement program (TIP). MassDOT compiles regional TIPs and statewide funding programs into its State Transportation Improvement Program (STIP), making them eligible for federal aid.

Projects can be programmed for construction as early as the preliminary design phase. Early coordination with the MPO and MassDOT District Office clarifies project evaluation and scoring criteria. Once the project is programmed, continued advocacy at MPO meetings is still needed to advance the project. MPOs can be located using the Massachusetts MPO Finder.

Any project seeking federal funding will need to adhere strictly to federal design criteria and procedures. For instance, federally funded projects need a secured ROW certificate for the design to move into construction.

MassTrails can provide guidance on which of these funding sources are appropriate.

Design

The preliminary design includes determination of the major horizontal alignment and geometric features of the path, including appropriate cross-sections, intersection treatments, stormwater management, environmental impact minimization, landscaping and amenities, and permitting, in a way that meets the overall vision for the path. These includes:

- **Horizontal alignment:** The route of the path
- **Vertical profile:** Elevation changes over the length of the path
- **Typical cross-sections:** The typical condition along the path, often shown perpendicular to the corridor, slicing through the path to illustrate widths, depths, slopes, and adjacent features
- **Intersection treatments:** Intersection treatments: The design of locations where the path crosses existing roadways. These can be at-grade or elevated, may include signals or other traffic controls, and should be designed to facilitate safe crossings for path users of all ages and abilities
- **Stormwater plan:** Drainage patterns that keep the path surface free of puddles without adversely impacting adjacent areas
- **Environmental measures:** Minimization of impacts to the land and water, vegetation, habitats, and wildlife surrounding a path; for example, building boardwalks in environmentally sensitive areas
- **Landscaping, lighting, and amenities plans:** Plans for landscaping, lighting, benches, waste receptacles, information kiosks, and other path-side elements
- **Cost estimate:** Updated cost estimate based on the preliminary design

The final design phase produces four items:

- **Construction plans:** Final design drawings that include drainage, limits of work, and traffic plans
- **Construction details:** Drawings or sketches which provide a higher level of detail for items listed in the construction specifications
- **Construction specifications:** A written description of how non-standard or special features should be built
- **Detailed cost estimate:** This includes all necessary items to complete the work as shown on documents such as plans and specifications. Labor and materials are inclusive to each item listed in the detailed cost estimate.

Where possible, shared use paths should be designed to accommodate emergency response and maintenance vehicles.

Construction

Once permits have been approved, the ROW certificate secured, and the final design completed, the path can be constructed. The agency or municipality puts the construction project out to bid and chooses a contractor. Path length, number of crossings, topography, weather conditions, and ease of construction access are among the factors that affect the length of construction, which can range from months to years. Construction of the path is complete once a final walkthrough and punch list process has been performed.

Maintenance

Even before a path is constructed, the project team or municipality should identify maintenance needs and responsibilities. The local municipality typically takes responsibility for maintenance; however, in certain cases a path may be adopted and maintained by a state agency or local advocacy group. A municipality may be able to claim anticipated maintenance and upkeep costs as part of its local match to secure federal funding. In addition, a commitment to snow removal during the winter can help designate the path as a year-round facility, garnering support, and in some cases funding, for construction.

Maintenance falls into three main categories:

- **Path operations:** Repaving, striping, patching, snow clearance, and other upkeep needed to keep the facility safe and operational
- **Landscaping:** Mowing, clearing, and planting to keep the path clear and maintain the surrounding environment
- **Amenities:** Repair or replacement of amenities such as lights, benches, water fountains, or play equipment

Different agencies or groups may be involved in maintaining and operating the path, including the local police department, public works department, or volunteer groups such as cycling clubs and tree planting organizations. Whoever takes responsibility for the path needs to plan to have resources available to coordinate the groups involved.

With regular maintenance, the hard work and resources that go into building a shared use path will endure, improving quality of life not just for today's users but for future generations.

Maintenance includes operations, landscaping, and amenities.

East Boston Greenway, Boston

Resources

City of Toronto. (2015). Toronto Multi-use Trail Design Guidelines
https://www.toronto.ca/wp-content/uploads/2017/11/96a5-TORONTO_TRAIL_DESIGN_GUIDELINES.pdf

CTPS Massachusetts MPO Website Finder
www.ctps.org/map/www/apps/mpoFinder/index.html

DCR Recreational Trails Program
www.mass.gov/guides/recreational-trails-program

EEA Gateway Cities Parks Program
www.mass.gov/service-details/gateway-city-parks-program

Federal transportation funding programs
www.mass.gov/service-details/funding-considerations

FHWA Congestion Mitigation and Air Quality Improvement Program (CMAQ)
www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm

FHWA Surface Transportation Program Block Grant (STBGP)
www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm

FHWA Transportation Alternative (FHWA Fixing America's Surface Transportation Act or "FAST Act")
www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm

Massachusetts Community Preservation Act (CPA)
https://communitypreservation.org/content/cpa-overview

Massachusetts Interactive Property Map
www.mass.gov/service-details/massachusetts-interactive-property-map

Massachusetts Property Information Finder
gisprpxy.itd.state.ma.us/ParcelAccessibility/MassPropertyInfo.aspx

MassDOT Chapter 90 Program
www.massdot.state.ma.us/highway/DoingBusinessWithUs/LocalAidPrograms/Chapter90Program.aspx

MassDOT Complete Streets Funding Program
https://masscompletestreets.com/

MassDOT Safe Routes to Schools (SRTS)
www.massdot.state.ma.us/saferoutestoschool/Home.aspx

MassGIS Land Use datalayer (2005)
https://docs.digital.mass.gov/dataset/massgis-data-land-use-2005

MassINC Gateway Cities
https://massinc.org/our-work/policy-center/gateway-cities/about-the-gateway-cities/

O'Donnell, E., Knab, A., & L. Athey. (2007) Sidewalk and Shared-Use Paths: Safety, Security, and Maintenance. University of Delaware Institute for public Administration. Funded by the Delaware Department of Transportation.
http://atfiles.org/files/pdf/SharedUsePathSafetyDE.pdf

Rails-to-Trails Conservancy. (2013). America's Rails-with-Trails: A Resource for Planners, Agencies and Advocates on Trails Along Active Railroad Corridors.
https://www.railstotrails.org/resourcehandler.ashx?id=2982

Rails-to-Trails Conservancy Active vs. Abandoned Corridors
www.railstotrails.org/build-trails/trail-building-toolbox/acquisition/active-vs-abandoned-corridors/

Rails-to-Trails Conservancy Fact Sheet
www.railstotrails.org/resourcehandler.ashx?id=3768

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