MassDOT Bicycle Plan

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Timeline

Bicycle and Pedestrian Coordinator

1990s

1997

2004

2005

2006

2008

2009

E-97-004: Engineering Directive on Bicycle and Pedestrian Accommodation

Safe Routes to School

Massachusetts Bicycle Transportation Plan

Healthy Transportation Compact

E-14-006: Updated Engineering Directive on Bicycle and Pedestrian Accommodation

Complete Streets Funding Program

New MassDOT Bike Plan

2009

2013

2014

2015

2016

2017

2018

P-13-0001: Healthy Transportation Policy Directive

Separated Bike Lane Planning and Design Guide

Interagency Trails Team

E-09-005: Updated Engineering Directive on Bicycle and Pedestrian Accommodation
About the Bike Plan

**Complete Streets** refers to an approach to transportation policy and infrastructure design that ensures that everyone using streets is safe and feels safe, regardless of age, ability, or mode of travel. In practice, this means considering the needs of and providing safe space for people walking, bicycling, taking transit, or driving, as well as for transporting freight.

A **Connected bike network** is comprised of segments (roadways and paths) and nodes (intersections and crossings) designed to enable uninterrupted travel to destinations along high-comfort streets and bikeways. Connected networks—sometimes called “complete networks”—follow the principles of cohesion, directness, accessibility, alternatives, safety and security, and comfort established by the Federal Highway Administration.

**Connectivity** is a measure of how well bikeways are linked together to form a convenient and attractive network that facilitates biking for everyday trip purposes. In general, this means that high-comfort bike routes follow the most direct path between origin and destination points.

**Convenience** refers to the minimization of time, cost, and physical or cognitive effort when traveling.

**Environmental Justice** is based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment.

**Everyday biking** refers to riding a bike for everyday travel.

**Everyday travel** refers to routine trips such as commuting, shopping, running errands, social visits, accessing medical services, and other typical trip purposes.

**High-comfort bikeways** appeal to people who are interested in biking but do not because of concern for their safety. Where vehicle speeds or volumes are high, high-comfort bikeways provide physical separation from motor vehicles. Sharing travel lanes with motor vehicles should be limited to locations where vehicle speeds and volumes are low.

**Safety** is the condition of being protected from the risk of injury or fatality as a result of traveling within the public way.

**Short trips or bikeable distance** refers to distances of up to three miles for non-work trips and up to six miles for work trips.
How This Plan Was Developed

- Data
- Bicycle Plan
- Steering Committee
- Public Engagement
- Review/Incorporation of Nationwide Best Practices
Vision and Goals

Vision
Biking in Massachusetts will be a safe, comfortable, and convenient option for everyday travel.

Goal 1
Create high-comfort connected bike networks for people of all ages and abilities.

Goal 2
Increase the convenience and attractiveness of everyday biking.
Principles

**Principle 1**
Treat all people the same regardless of travel mode

**Principle 2**
Address gaps and barriers known to discourage everyday biking

**Principle 3**
Lead by example and partner with municipalities to advance everyday biking
Public Outreach

Peter Sutton, Bicycle and Pedestrian Program Coordinator
How We Reached People

Listening Sessions
1. Youth (8/14, Revere)
2. Rural and small-town residents (8/15, North Adams)
3. Women cyclists (8/16, Somerville)
4. Residents of low-income communities (6/28, Lawrence)
5. Residents of majority-minority communities (6/30, Dorchester)
6. Non-English speakers (7/15, Boston)
7. People with disabilities (8/4, Hadley)
8. Families (9/15, Cambridge)
9. Senior cyclists (10/5, Hyannis)

Attending public events

Engaging on Social Media

Online and In-Person Surveys

MassDOT's Massachusetts Bicycle Transportation Plan

MassDOT's Massachusetts Pedestrian Transportation Plan

MassDOT's Massachusetts Transportation Plan

MassDOT's Massachusetts Roll & Stroll

MassDOT's Massachusetts Bike Plan
Key Results

Frequency of “Needs Improvement” Comments on Online Map

56% of rural respondents want to bike to parks and 55% want to bike to work

59% of suburban respondents want to bike to work and 48% want to bike to shopping

The streets in my community were better maintained
Snow and ice were cleared from bike paths
I had somewhere to securely lock my bike
I could take my bike on transit

“I would bike if...” Survey Results

The streets in my community were better maintained
Snow and ice were cleared from bike paths
I had somewhere to securely lock my bike
I could take my bike on transit

Bicyclists have a lower tolerance for stressful conditions when biking with others

The places existing bicyclists are comfortable biking changes depending on if they are alone or with family or friends.
Initiatives and Actions

Andrew Paul, P.E., State Highway Design Engineer
The Initiatives - *draft*

Initiative 1: Build connected bicycle and trail networks with local, regional, and state partners and close critical gaps.

Initiative 2: Integrate and promote the safety, comfort, and convenience of people biking in transportation and development projects.

Initiative 3: Advance roadway safety through education and programs for people driving, people bicycling, and potential everyday bicyclists.
The Initiatives - *draft*

Initiative 4: Increase the convenience of biking as an everyday travel option for people of all ages and abilities.

Initiative 5: Launch the development of a year-round maintenance and operations plan for MassDOT-owned bikeways and support municipalities to do the same.

Initiative 6: Invest in data collection and evaluation to inform Initiatives 1-5 and to track progress.
Sample Action Items from Initiatives 1 and 2

• Initiate priority bicycle projects on MassDOT-owned roadways to help improve bike and trail connectivity by using the Potential for Everyday Biking analysis, which identifies non-limited access roadways with the highest potential demand for bikeway investments.

• Revise the Healthy Transportation Policy and Healthy Transportation Policy Engineering Directive to ensure that designs attract potential bicyclists. To support this effort, MassDOT will develop design criteria and guidance for roadways and intersections based on motor vehicle volume, speed, and curbside activity.
The Potential for Everyday Biking – MassDOT-owned

Shows where to implement bicycle infrastructure to best match where short trips are made today and where there is the greatest need for bike infrastructure on MassDOT roads.
Performance Measures and Implementation

Jackie DeWolfe, Director of Sustainable Mobility
The Importance of Tracking Performance

• Inform initiatives

• Know what is working

• Know what can be improved

• Track progress

• Make data public

• Provide data to help public, municipalities, and partners advance goals
Goal 1

Create high-comfort connected bike networks for people of all ages and abilities

- Total bicyclist fatalities and serious injuries (rolling 5-year average)
- Percentage of households in areas with high potential for everyday biking within 0.25 miles of a high-comfort bikeway

Goal 2

Increase the convenience and attractiveness of everyday biking

- Percentage of all trips under three miles that are made by bike
- Percentage of households and jobs accessible to transit via high-comfort bikeways
Sample of Measures for Tracking Progress - DRAFT

- Number of miles of high-comfort bikeways created on state roadways
- Percent of MBTA and RTA transit stops connected to a high-comfort bikeway
- Percentage of municipalities with bike network plans
- Percent of schools in areas with high potential for everyday biking that participate in Safe Routes to School
- Percent of MBTA transit stops with bike parking
- Snow and/or ice cleared from percentage of MassDOT bikeways within a specific timeframe of an event
- Percent of MassDOT work zones that maintain dedicated bike access
- Percent of bikeways classified as “high-comfort”
- Number of temporary and permanent bicycle count locations
Looking Ahead: Implementation

MassDOT will use **data** from the Bike Plan to locate bicycle improvement project locations.

Potential for Everyday Biking Score on MassDOT Roads
Pilot Count Program
Capital Investment Plan

- $60M Ped and Bike Plan Funding
- Complete Streets Funding Program
- Multi-Use Pathway Program
- Chapter 90
Partnerships

The vast majority of roadways in Massachusetts are under municipal control, highlighting the need for interjurisdictional cooperation.
Municipal Resources Guide

Michelle Danila, P.E., PTOE., Complete Streets Engineer
What’s in the Resource Guide?

• Companion document to the Plan
• Online resource for municipalities
• 7 sections covering a range of topics related to biking
• Links to additional resources
Why Bikeability is Important

• Mobility and Efficiency
• Safety
• Health and Wellness
• Economy and Cost Reduction
• Environmental
• Equity

On average, Massachusetts households spend over 12% of their income on transportation

Bicycling can help households reduce their transportation spending by up to 94%

$8,500 cost per year

$300 cost per year
Potential for Everyday Biking

Biking must be safe, comfortable, & convenient to appeal to a broad range of people

Interested but Concerned 60%
Most people are only comfortable bicycling on shared use paths, separated bike lanes, & quiet streets

Somewhat Confident 7%
Some people people are comfortable in bike lanes

Highly Confident 1%
Few people are comfortable bicycling with vehicle traffic

Bicyclists have a lower tolerance for stressful conditions when biking with others

The places existing bicyclists are comfortable biking changes depending on if they are alone or with family or friends.
Planning for Bikeable Communities

Connected Bike Networks in Suburban Areas

- Shared Use Path
- Shared Use Path Along Roadway (Sidewalk)
- Separated Bike Lane
- Bike Boulevard
- Buffered or Conventional Bike Lane

- School
- Shopping
- Intermodal Transit Center
- Shopping
- School

- Suburban shopping areas may be best served by separated bike lanes or sidewalks, depending on context such as population density, volumes, transit access needs, and land use configuration.
- Separated bike lanes provide local access to homes and shopping.
- Shared use paths provide connections between neighborhoods and improve regional connectivity.
- Bike boulevards can be a cost-effective solution to create routes on quiet neighborhood streets.
- Existing school pathways often link neighborhood streets which would otherwise be disconnected.
- Existing utility corridors may provide opportunities for shared use paths.
- Buffered or conventional bike lanes can provide comfortable connections on lower volume, low-speed streets.
- Buffered or conventional bike lanes can make comfortable routes for bicyclists where vehicle volumes are moderate and speeds are low.

"Last mile" connections between regional paths and the transit center help bring bike users to destinations. Bike boulevards—signed routes along quiet streets—can be an effective way to make this connection.

Sidepaths on roads with higher vehicle speed and volume enable people on foot or bike to access destinations that are typically located along major roadways.

Regional shared use paths provide direct, seamless, high comfort routes between towns. Wherever possible, connect paths to local streets to increase access.

Figure 2. Connected Bike Networks in Rural Areas
Designing Connected Bike Networks
Establishing Bikeshare

Marlborough launched a two-year bikeshare pilot in 2017. This lease-option smart bike system includes 30 bikes served by 5 stations. Credit: Assabet River Rail Trail, Inc.

Communities served by self-locking bikeshare systems are experimenting with new sidewalk markings that encourage customers to leave bikes in designated areas outside of pedestrian access routes. Credit: Seattle Department of Transportation

Boston, Brookline, Cambridge, and Somerville are served by Blue Bikes, a smart dock system of 3,000 bikes and 300 stations. It is one of the largest bikeshare systems in the U.S.
Collecting and Evaluating Data

• Network data
• Safety data
• Travel data
• Economic data

Bicycle Crash Evaluation
Bicycle crashes and perceived safety issues can be grouped into two categories and addressed through specific evidence-based countermeasures. FHWA’s BIKESAFE Bicycle Safety Guide and Countermeasures Selection System identifies 13 crash types and 46 corresponding countermeasures that can be applied to improve bicycle safety. The tool includes matrices to help select countermeasures based on either crash type or performance measures.

Knowing the type of bicycle crashes and perceived safety issues that are occurring at a site, municipalities can use the BIKESAFE selection tool to identify applicable countermeasures specific to the site’s circumstances. Designing Connected Bike Networks on page 28 discusses several of these countermeasures and recommends various applications to attract bicyclists of all ages and abilities.

Additional detail as to what comprises a crash type and the countermeasures, including planning-level cost estimates, is available on the BIKESAFE website.

Finally, a Road Safety Audit (RSA) is a process involving a multidisciplinary team of local and regional partners that identifies safety issues and provides countermeasures at crash clusters locations, including bicycle hot spots. As RSA is required for HSTP funding applications, and it is part of a project’s HSTP eligibility, an RSA is required for 25 percent design plans. For more information about reporting and conducting an RSA, visit MassDOT’s RSA webpage.

Travel Data
Collecting and analyzing data on the number, percentage, modes, and characteristics of bicyclists within a community can serve many uses. Understanding trends in bicycle usage can allow communities to develop a measure of exposure against which to compare safety data (e.g., crashes per bicyclist), compare before-and-after project conditions, prioritize walkway investments, and monitor the efficacy of investments.

Communities can obtain bicycle count data to support such analyses via several methods:

• Existing data sources such as the U.S. Census, MassDOT, regional planning agencies and metropolitan planning organizations, app developers, or do-it-yourself bike counters

Regional Planning Agencies typically collect and provide bicycle count data. These count programs can be in contemplation (see Bicycle Counting Programs on page 30). More broadly, the Metropolis, an NGO closely linked to Massachusetts streets for biking: The Local Access Access program. These scores identify which streets would be the most useful for bicyclists to get to point A to point B. As such, the Local Access Bicycle Counting Programs

Communities can count bicyclists over a variety of timeframes using one or more methods of data collection.

Basic bicycle count programs involve manually counting bicyclists on one or more days per year at one or more fixed locations. Manual counts have the lowest up-front cost and are typically completed by municipal staff, consultants, or as volunteer counts with municipal bike committee members, interested citizens, advocates, or students. In addition to counting the number of bicyclists, basic bicycle count programs should consider capturing select bicyclist characteristics such as gender, helmet use, type of conveyance, and wrong-way riding.

To illustrate trends over time, count efforts should be repeated annually in the same locations, during the same time periods, and approximately at the same time of the year. MassDOT recommends counting every May and September counts, at a minimum, to record usage under favorable conditions and when schools are in session. An expanded program can cover other times of year to measure seasonal variations.

Case Study: Permanent Bicycle Count Equipment
The City of Cambridge conducts internal bicycle crash counts through the city, providing groups and organizations with access to the data over time. One visible part of the counting program is an “Eco Token” at Kendall Square, which counts bikes using infrared detection technology and displays the daily count of bicyclists in real time. These data are available online for public viewing, and provide the ability to compare local impacts to levels of bicycling resulting from infrastructure projects and events, various weather conditions, and special events.

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As a municipality expands its counting program, the need may arise for more advanced and sophisticated approaches. Municipalities may pursue a comprehensive bicycle count program that involves dedicated equipment to electronically record data and a combination of short and continuous counting timeframes.

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As a municipality expands its counting program, the need may arise for more advanced and sophisticated approaches. Municipalities may pursue a comprehensive bicycle count program that involves dedicated equipment to electronically record data and a combination of short and continuous counting timeframes. Short-duration counts (typically two- to five-week-long periods) can be conducted with equipment that is moved from one place to another to extend the breadth of the counting program. Municipalities can also perform continuous counts with permanent equipment to track or analyze short-duration counts by season, weather condition, geography, etc.

For permanent equipment, resource needs include identification and evaluation of potential sites, installation and maintenance of equipment, and regular review of count data to make corrections. Routine oversight of counts is also needed, including monitoring data several times per week to ensure proper equipment performance. Similar to short-duration counter resource needs include installation, reinstallation, and maintenance of equipment as well as routine oversight. The equipment needs for
Maintaining Year-Round Bikeways

Narrow maintenance vehicles help maintain separated bike lanes and shared use paths in all seasons.

Case Study: Prioritizing Winter Maintenance

The Massachusetts Department of Conservation & Recreation (DCR) follows a comprehensive storm management plan for the snow and ice season. The plan designates facilities according to three levels of snow removal priority. Level 1 (during storm event) and Level 2 (within 12 hours) include pathways accessing schools, foot bridges, and transit facilities, and other heavily traveled paths. Greater detail, including a map viewer, is available at https://www.mass.gov/service-details/dcr-winter-storm-plan-and-priority-map.

Bicyclists are sensitive to detours. Where feasible, provide a bike route through construction zones, even if access is restricted for motor vehicles, as shown.
Seeking Feedback – Municipal Resource Guide for Bikeability

Mass.gov or MassDOT website: *bicycle plan* in search box
or
Google *massdot municipal resource guide for bikeability*

MassDOT wants your feedback on this DRAFT guide. Please email Bicycle and Pedestrian Program Coordinator Pete Sutton at *Peter.sutton@state.ma.us*. Or mail to MassDOT Office of Transportation Planning, 10 Park Plaza, Suite 4150, Boston MA 02116. Please submit comments by **December 1st, 2018**. Thank you!

[https://www.mass.gov/service-details/bicycle-plan](https://www.mass.gov/service-details/bicycle-plan)