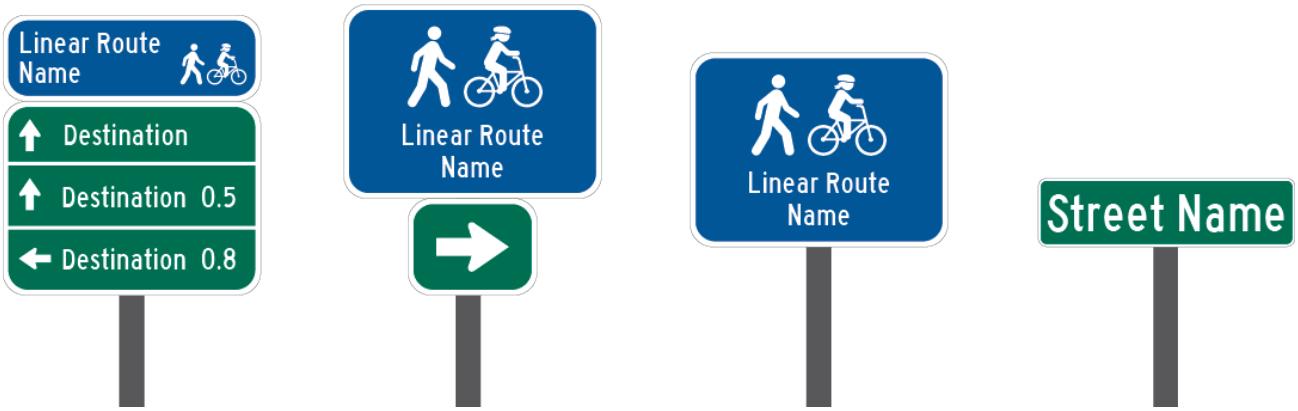

Bike Wayfinding Design Guide

Produced for the MassTrails Initiative led by the:

Governor's Office
Executive Office of Energy and Environmental Affairs
Department of Transportation
Department of Conservation and Recreation

Produced by:

Toole Design
November 2022

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1 PURPOSE AND OVERVIEW

The Massachusetts Department of Transportation (MassDOT) has produced this Bike Wayfinding Design Guide (the/this Guide) on behalf of the MassTrails initiative. The Guide presents strategies for the development of wayfinding that aids people on and en route to high-comfort bike lanes, paths, and quiet streets. The development of this Guide originates from MassDOT's 2019 Massachusetts Bicycle Transportation Plan (Bike Plan) and accompanying Municipal Resource Guide for Bikeability, which aim to promote cycling and improve public health while reducing traffic congestion and greenhouse gas emissions. The Bike Plan and this Guide seek to guide the development of wayfinding that:

- Connects people to transit and other bikeways,
- Reduces trip-planning efforts,
- Increases access to more comfortable bike facilities and the convenience of bicycling as an everyday travel option, and
- Supports bicycle tourism.

Wayfinding is about helping people find their way in unfamiliar places and giving people the means to follow new routes and modes of travel. The basic process of wayfinding involves four steps, as identified by William Lidwell, Kristina Holden, and Jill Butler in their *Universal Principles of Design*[i]:

Orientation refers to determining one's location relative to nearby landmarks and the destination.

Route Decision refers to choosing a route to get to the destination.

Route Monitoring refers to checking the chosen route to confirm that it is leading to the destination.

Destination Recognition is when the destination is recognized.

A strong wayfinding network will aid people with each of these steps, supporting movement that is more intuitive and comfortable.

1.1 CORE WAYFINDING PRINCIPLES

To help communities and agencies meet these goals, this Guide provides standards and considerations for wayfinding system planning, sign placement, and sign component design. Three core principles underlie this guidance:

Keep It Simple

Provide information in a logical format and order that can be understood by the widest possible population. Reveal information sequentially, providing only as much as needed. Avoid elements that create clutter and detract from decision-making, such as extraneous text, visuals, branding, or signs.

Be Consistent and Predictable

Use common fonts, styles, materials, and placement throughout wayfinding systems to help people quickly understand information. Help people know what to expect by exercising consistency in sign frequency and placement.

Help People Maintain Motion

Text and imagery on signs should be large and simple enough that people biking can read without stopping. To allow people biking to make decisions in time, provide adequate distance in advance of decision and turning points and between signs.

These core principles will help establish more uniform bike wayfinding signage around the Commonwealth. At the same time, the principles allow communities to develop signage that expresses identity and responds to situational context. Additionally, while the Guide primarily focuses on wayfinding for people biking on both streets

and off-street paths, it acknowledges that people on bikes often interact with pedestrians, skaters, drivers of motor vehicles, and people using other travel modes. The signage in this Guide can serve pedestrians and others who use high-comfort routes while the guidance provides the means to manage interactions with motor vehicles.

1.2 GUIDE OVERVIEW

This document provides guidance for the design and placement of wayfinding signs aimed toward people biking on high-comfort routes. The Guide includes an explanation of the connection between it and existing national and state guidance. The term, “high-comfort,” is defined, but this Guide does not address how to plan a high-comfort (also termed low-stress) network. For information related to route selection and planning high-comfort networks, refer to the MassDOT Separated Bike Lane Planning & Design Guide.

The Guide outlines the methods for selecting destinations to list on signs. It also provides criteria for determining route readiness for wayfinding. Most of the Guide delves into sign design and placement. Wayfinding sign types are discussed along with sign design for legibility. Several placement scenarios are provided to clarify how and where to use the various sign types.

Mandatory Standards vs Recommended Guidance

Like the MUTCD, this Guide contains language that indicates whether a rule is mandatory to follow or merely recommended.

Shall signifies a standard that is mandatory to follow unless an exemption is sought from the MassDOT Highway Division.

Should indicates a recommendation that is made as a best practice but which is not mandatory to follow.

Key Terms

Bike Route: a bike route is a designated route for people on bikes to take in an area. They usually include signage to establish this designation. This guide seeks to promote bike routes on high-comfort facilities, but in broader usage, bike routes may be designated for reasons that do not consider cyclist comfort and safety as a top priority.

Bikeway: a bikeway is a space designated for people biking that is distinct from motor vehicle traffic. This includes shared use paths, separated bike lanes, buffered or conventional bike lanes and advisory bike lanes. Shared lane markings (“sharrows”), bike boulevards, and signed routes are contributing elements of bikeways, not dedicated bikeways by themselves.

High-Comfort Network: high-comfort networks are comprised of interconnected high-comfort facilities, including both on- and off-street routes. A network might incorporate a popular shared use path plus multiple on-street lanes. Generally, high-comfort networks will include crossings and intersections that do not compromise bicyclist safety or comfort.

Linear Route: a linear route is a single route that stretches between one starting location and one end location. That route is not necessarily a straight line; it might involve a few turns at a tricky intersection, but the A to B nature of the route is the same. In this guide, linear route is frequently used as a bucket by which to refer to shared use paths and side paths simultaneously.

Path: short for a shared use or side path

Trail: used interchangeably with path, trail may also be used specifically when discussing “rail trails” or named trails, as many shared use paths within MA are called trails.

2 EXISTING GUIDANCE

The following sources provide national or state guidance on bicycle wayfinding.

2.1 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD 2009 edition) holds jurisdiction over all signs on any road or bikeway open to public travel. This includes all shared use paths and separated or conventional bike lanes. The MUTCD covers:

D1-3c

- Sign design for bicycle guide (wayfinding) signs, bicycle routes, and auxiliary plaques, based on a smaller size of the D-series guide signs for motorists.
- Symbols and appropriate abbreviations for destination names
- Placement, mounting height requirements, sign size, and layout

Priority MUTCD sections for bike wayfinding are Chapter 2D and **Part 9**. These sections should be consulted before undertaking any wayfinding development project.

2.1.1 Chapter 2D. Guide Signs – Conventional Roads (2D.50 Community Wayfinding Signs)

MUTCD Section 2D.50 Community Wayfinding Signs makes allowances for signs that can be recognized as part of a coordinated and continuous area-based wayfinding system. With restrictions, Section 2D.50, provides flexibility for non-standard colors, fonts, and enhancement markers.

Rigid MUTCD ⟷ Flexible MUTCD


Currently, Community Wayfinding only applies to on-street bicycle routes, but in June 2014 the National Committee on Uniform Traffic Control Devices recommended that shared use paths be incorporated under Community Wayfinding in the next update of the MUTCD. MassDOT interprets Community Wayfinding as applying to both on-street bike routes and shared use paths.

2.2 MASSDOT AMENDMENT TO THE MUTCD

MassDOT provided a 2012 amendment to the MUTCD which clarifies that the design of destination signs for Massachusetts streets and highways shall follow MassDOT *Guide Sign Policy for Secondary State Highways*. The Guide is consistent with these following policies:

- alternative fonts such as "Clearview" shall not be permitted for use on legends on directional or street name signs for streets and highways within Massachusetts.
- street name signs shall consist of white legend on green background unless otherwise approved by MassDOT for a municipality. Borders shall be provided on all street name signs.

The amendment mandates that where direction text (North, South, East West) is abbreviated in sign legends, a period must be used for emphasis (i.e. N. Attleboro). However, due to the limited size of bike wayfinding signs, abbreviated directions may be used with or without periods provided that a discernible space between the abbreviation and adjacent legend is maintained.

2.3 DEPARTMENT OF CONSERVATION AND RECREATION GRAPHIC STANDARDS MANUAL

The Massachusetts Department of Conservation and Recreation (DCR) published standards for signage on DCR property within its Graphic Standards Manual. The document does not provide guidance for high comfort bike wayfinding but does guide gateway/identification signage, road lead-in signage, internal park information signs, and map signage, called welcome waysides.

2.4 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES

The AASHTO guide is consistent with and provides supplemental information to the MUTCD. A forthcoming update will contain a full chapter on wayfinding, expanding on the current 2012 guide. The current guide discusses the MUTCD D Series and MUTCD national and state route (M1) signage. The update will expand on the nuances of these signs while covering the MUTCD Community Wayfinding Series plus the East Coast Greenway system. The forthcoming guide will also discuss applications, sign types, and supplemental signs such as mile markers.

2.5 NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS (NACTO) URBAN BIKEWAY DESIGN GUIDE

The NACTO Urban Bikeway Design Guide provides guidance based on current best practices in large cities. It covers types of signs and destinations, pavement markings, typical applications, and design guidance.

2.6 AMERICANS WITH DISABILITIES ACT (ADA) & UNITED STATES ACCESS BOARD

The ADA currently does not guide exterior wayfinding systems. It does provide guidance on protruding objects and clear width on accessible routes, with the guidance aimed toward pedestrians. Guidelines for shared use paths are under development and will address post mounted objects and sign legibility. While this guidance is still aimed toward pedestrians, of significance to note is the proposal calls for text heights of over 2 inches at sign heights and distances relevant to people biking. Font sizes are discussed later in the Guide.

2.7 MASSDOT ENGINEERING DIRECTIVE E-15-001: MASSACHUSETTS BICYCLE ROUTE SIGNING REQUIREMENTS

MassDOT Engineering Directive E-15-001 was published June 17, 2015 and designates how bike routes are to be signed in MA according to MUTCD standards. The directive applies to all bicycle route (guide) signage on State Highway and on other roads and paths that are constructed by MassDOT. It also encourages municipalities to adopt the requirements elsewhere to increase uniformity.

3 WAYFINDING FOR HIGH-COMFORT ROUTES

This Guide incorporates existing standards and recommendations while providing detailed sign design and placement guidance to address the needs of all potential bike riders.

3.1 DESIGN USER

Following the lead of the Bike Plan, this Guide is aimed to support the development of wayfinding systems for current and potential cyclists, particularly for people "interested but concerned" about biking. People who are "interested but concerned" may or may not bike currently and would consider biking as a more viable travel mode if the routes to their destinations were safe, comfortable, and convenient from start to finish. Wayfinding is a means for increasing the comfort of people in this group, by providing guidance, reassurance, and supporting ease of movement along a route. The "interested but concerned" group includes people of all ages and abilities and who account for around 60%[ii] of the general population. This group also includes visitors to and new residents of a community, and those who are established in a place but trying to follow unfamiliar routes.

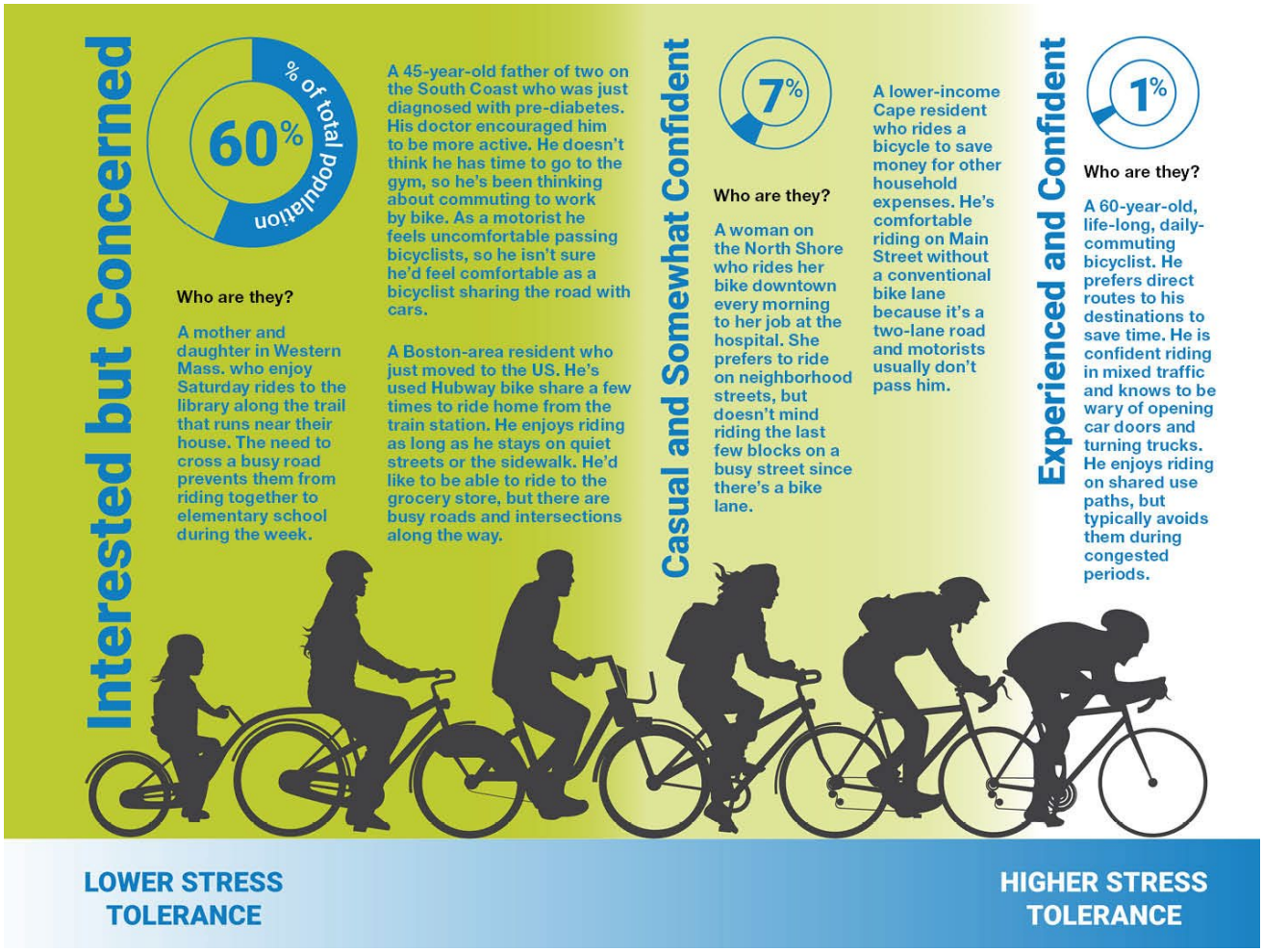

Figure 1. Different comfort levels of people who bike (MassDOT Separated Bike Lane Planning & Design Guide)

To aid the "interested but concerned," signs and sign content shall be as visible as possible for people with varying vision abilities. Sign content shall prioritize destinations important to a wide range of people – old, young, commuters, and recreational riders, etc. Symbols and route logos should be used to provide information and continuity for everyone. They will particularly aid those whose primary language is not English. Finally, sign quantity and placement shall prioritize people looking for safe and comfortable routes over the shortest routes.

3.2 BIKE FACILITIES TO BE SIGNED

Generally, high-comfort bike facilities will have higher levels of separation between bikes and motor vehicles, such as wide buffers or vertical separation. Alternately, all modes may share the same space on low-speed, low traffic volume streets, such as on bike boulevards. The following are typical high-comfort facilities:

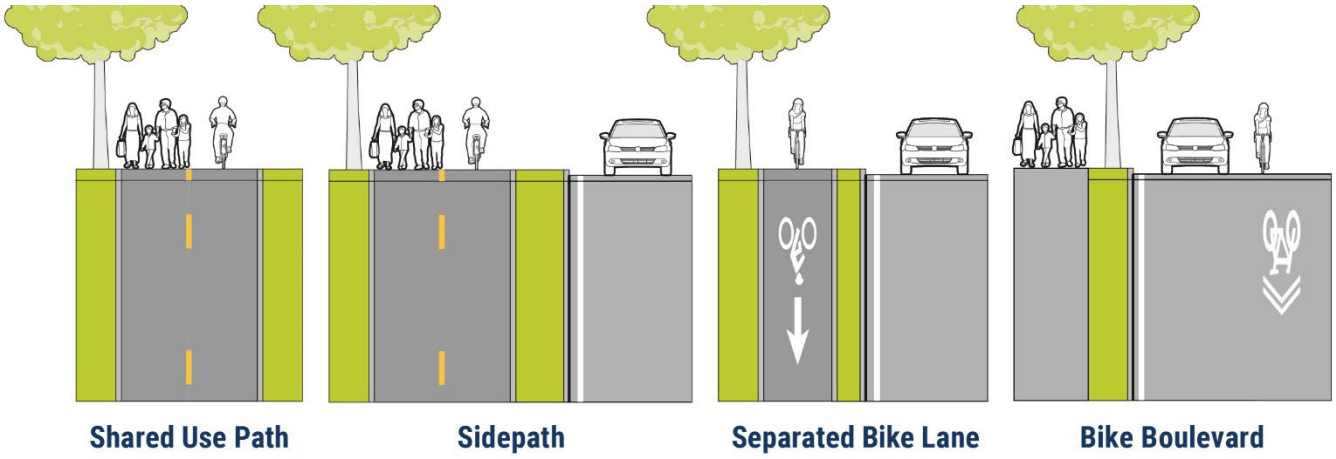

Figure 2. High-comfort facilities

Shared use paths are used by people biking, pedestrians, skaters and others and can be separated from motor vehicle routes by buffers of any size or by entirely separate routes. Regional shared use paths provide connections between municipalities. Short shared use path segments can provide links between disconnected neighborhood streets.

Side paths are shared use paths that parallel and run near roadways, often with a small grass/vegetated buffer separating the path and roadway.

Individually, shared use paths and side paths can be considered linear routes, since they stretch between one starting location and one end location. These paths may include some gaps, such as a jog at an intersection, but the A to B nature of the routes is the same. Signage examples in this Guide may say “Linear Route Name” to refer to these types of facilities.

Separated bike lanes provide vertical buffers, whether curb or parked cars, between people biking and motor vehicle travel lanes.

Bike boulevards are low speed (≤ 20 miles per hour), low traffic volume (≤ 2000 vehicles per day) streets designated for use by people on bikes with signage and pavement markings. They are also called neighborhood greenways, neighborways, or slow streets. Technically, bike boulevards are not dedicated bike facilities (or bikeways), since the roadway is shared with motor vehicles, but they can be important components of high-comfort bike routes.

High-comfort networks are comprised of interconnected high-comfort facilities. For instance, a network might incorporate a popular shared use path, with gaps in the path filled by quiet bike boulevards and streets with separated bike lanes. Generally, high-comfort networks will include crossings and intersections that do not compromise bicyclist safety or comfort. Successful networks will connect people to destinations and provide comfortable routes to transit. Consult MassDOT’s *Municipal Resource Guide for Bikeability* for more information on high-comfort networks and facilities.

It is important to note that wayfinding alone will not help improve the comfort of a route. Wayfinding is meant to supplement and support high-comfort bikeway infrastructure like the facilities described above.

3.3 ROUTE READINESS FOR HIGH-COMFORT FACILITIES

Route readiness refers to the overall status of a route in terms of its conditions for safe, comfortable bike riding and wayfinding signage. MassDOT has defined on the previous page the types of facilities that should be available for routes to be considered high-comfort. Level of infrastructure completion, bicycle volumes, topography, and site context also help determine route readiness.

3.3.1 Infrastructure Completion

A high-comfort facility might be complete unto itself and appropriate for applying wayfinding to just that facility if it reaches priority destinations. However, consider that most routes tend to have some gaps in high-comfort infrastructure, such as at complex intersections. Within a selected route and regardless of length, assess:

- How frequently bicyclists need to use curb ramps and sidewalks;
- Whether signal modifications, crossing islands, or other infrastructure are needed to increase safety and comfort at intersections;
- Potential difficulty with left turn movements;
- Maintenance issues – poor pavement conditions, debris accumulation, and striping needs.

Determine how to fill observed infrastructure gaps. If multiple gaps exist with too few funds to fix them, consider that the route may not really be high-comfort and worth signing for wayfinding until the gaps are filled. Also consider that many destinations are likely to be reached through a combination of paths and streets – a network – and that it may be wiser to invest in high-comfort facilities throughout a network before investing in wayfinding.

Where an otherwise high-comfort route is broken up by unsafe conditions in a limited but complex location, such as at a major intersection undergoing reconstruction, consider providing temporary signage that warns of the hazards and how more comfortable conditions can be found while creating safer conditions in that location.

In general, prioritize modifications that help slow motor vehicles, increase visibility for all users, and clearly designate spaces for people biking. Where those changes can be made in tandem with wayfinding, prioritize both, but recognize that wayfinding needs well-placed, well-designed signs that lead people to destinations to be an effective investment in a high-comfort network.

3.3.2 Bicycle Volumes and Demand

When evaluating facilities in your community, observe the high-comfort routes with higher bike traffic. These may be good candidates for signage if they connect priority destinations. These routes may gain more bike traffic, particularly in tourist seasons, so balance signing high-volume facilities with placing signs on quieter streets.

3.3.3 Topography

Massachusetts slopes may be unexciting for some confident riders, but they can be intimidating for many people, including those with health problems, parents riding with children, and people who fear unexpected vehicles or faulty bicycle brakes. Flatter routes make riding more manageable for a broader range of abilities and age groups.

3.3.4 Site Context

While level of separation, traffic volumes, and speeds are traditionally prioritized factors when determining whether a route is “high-comfort,” MassDOT acknowledges that views, shade, lighting, availability of seating, and other amenities like public art can contribute to comfort as well. Routes with these features may be some of the readiest for wayfinding and the best routes for recreation and promoting bicycle tourism.

Signage should not be prioritized for placement where it physically damages environmental and cultural resources or noticeably detracts from an important viewshed. Consider that wayfinding signs, like any other signage, can contribute to visual clutter and the incoherence of the sign(s). Consider placement so that visual clutter is minimized, and avoid shoehorning signs where they cannot be viewed or understood quickly. See *Chapter 7 Sign Installation & Placement* for more details.

4 DESTINATION SELECTION

MassDOT encourages municipalities to view wayfinding as one tool of many for increasing comfort and forming connected bike networks. To aid bicyclists in route decision-making and orientation, municipalities must first identify the content to include in wayfinding signage – destinations, services, and any named routes.

4.1 PLANNING BASICS

Many communities have created or are in the process of creating bike master plans where streets and shared use paths are already being analyzed for their potential to support high-comfort bike travel. Staff and consultants working on wayfinding should coordinate on the availability of these plans in their communities and work with other stakeholders to evaluate the routes highlighted within for their wayfinding potential. This involves identifying the routes that connect people to priority destinations and assessing the comfort level of those routes. MassDOT encourages advocates and municipal staff to conduct planning sessions aimed to capture the input of people of all ages, abilities, socio-economic status, and identities. Consider asking people to create mental maps of routes they take or would like to take to destinations they consider significant, including those in neighboring communities. MassDOT encourages municipalities to partner together to plan wayfinding systems for the routes that connect them.

4.1.1 Planning for US Bicycle Routes, Named Bicycle Routes, State Numbered Routes

As per MassDOT Engineering Directive E-15-001, the planning of a U.S. Bicycle Route in Massachusetts is the responsibility of MassDOT's Office of Transportation Planning. The final route designation of any U.S. route must be approved by the American Association of State Highway Transportation Officials (AASHTO) Special Committee on U.S. Route Numbering. Only after this approval has been received may the U.S. Bicycle Route signs be used.

The planning of named bicycle routes, such as the East Coast Greenway, or state numbered routes should also be coordinated through the Office of Transportation Planning. This will help to improve connectivity and consistency with the statewide Bicycle Transportation Plan and other state bicycling initiatives.

4.2 DESTINATION SELECTION

Whether with the public or in smaller advisory groups, wayfinding planners need to identify destinations for inclusion in wayfinding and to categorize destinations according to their distance and significance. This affects the content that changes by sign. To select destinations, communities should consider whether destinations are:

- Of significant interest to many people, including both tourist sites and major transit centers
- Distinctive in their contribution to local identity, heritage, culture, or recreation
- Useful for general orientation (e.g. landmarks)
- Publicly owned or not-for-profit.
- Reachable by high-comfort route

General shopping areas or corridors (e.g. Chelmsford Shopping District) may serve as destinations, but avoid referring to specific businesses.

4.2.1 Destination Hierarchy

Destinations that meet the above criteria should be prioritized within a hierarchy. This will help planners further distinguish which places are truly important to include on wayfinding while aiding in the determination of how far from a destination references to it will appear on signs. Figure 3 provides a potential model for establishing a hierarchy. Level 1 destinations will be cities, towns, or other major destinations that are most likely to communicate to riders where a route is ultimately going. These destinations will be included on the most signs. Level 2 destinations will have broad appeal for riders looking to stop in a municipality or connect to other modes of travel. Level 3 destinations may be relevant only to locals or those looking for specific services, such as restrooms located in a park.

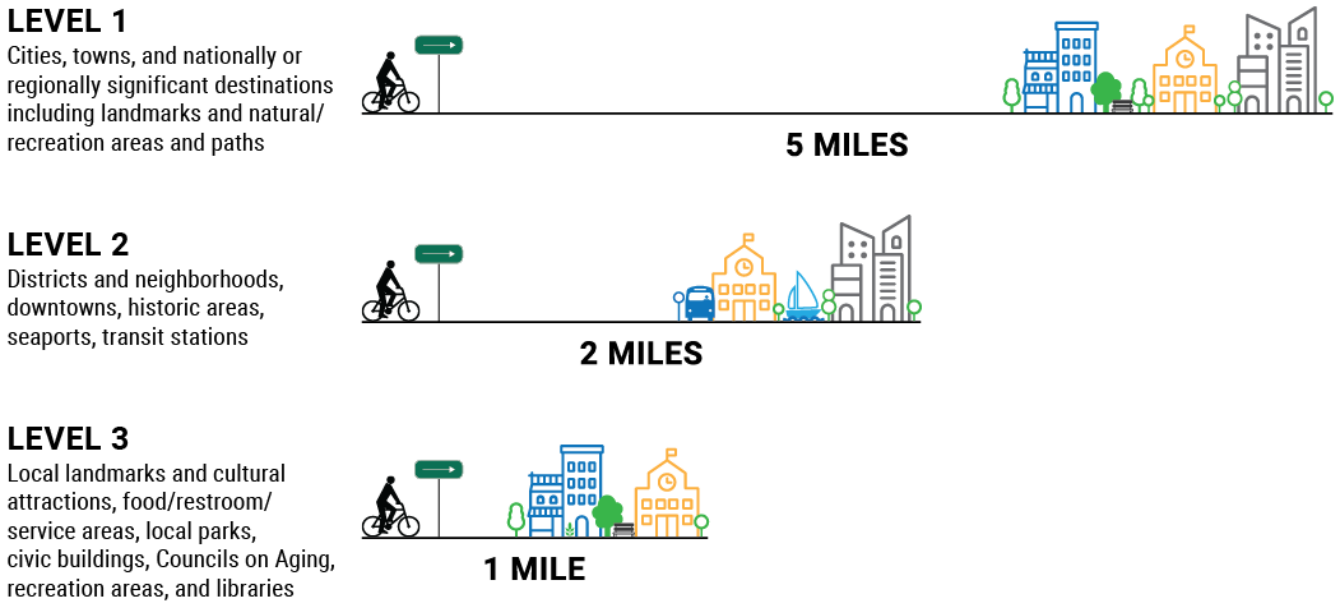

Figure 3. Hierarchy of destinations by distance

4.2.2 Destination and Distance

The names of destinations should be progressively disclosed so people on bikes are not overwhelmed at any one decision point or sign assembly. Knowing when to introduce a new destination depends largely on its importance and distance from the sign. Note that destinations are not always dots on a map. Recreational bikeways can be destinations themselves. As Massachusetts builds more of its high-comfort route system, wayfinding should aid people biking on multiple routes.

In practice, the distance at which each destination appears on wayfinding signs will require the judgement of the people planning wayfinding along a route. However, municipalities may consider the distance ranges in Figure 3 for selecting destinations to sign. Regionally important destinations will be signed starting at greater distances from their locations than more local destinations. Specific sign placement information is provided under *Chapter 7 Sign Placement and Installation.*

5 WAYFINDING SIGN TYPES & ASSEMBLY PLACEMENT

Bicycle wayfinding systems are made up of four fundamental sign types:

- **Confirmation signs** let people on bikes know they are on a designated bike route while alerting motorists to bicyclists' likely presence. These signs may identify an official name/brand for the route.
- **Decision signs** provide guidance at decision points, or where multiple routes intersect, where bicyclists must decide which way to proceed.
- **Turn signs** indicate to people on bikes when the only option to remain on a route is to turn. Turn signs include a confirmation plate plus turn arrow.
- **Street name signs** aid in orientation by providing the names of streets at intersections and crossings.

Signs may be combined with one another in an assembly, a term used to refer to the full collection of signs on a post, often including the post itself. With this Guide, MassDOT has standardized the appearance and dimensions of these sign types and assemblies for use in the Commonwealth. The standard sign family includes the signs shown below and with optional details as provided within this section. Colors, fonts, and other sign features are specified. Allowances for signs with historic styles are provided in *6.6 HISTORIC-STYLE SIGNAGE*.

Standard Sign Family

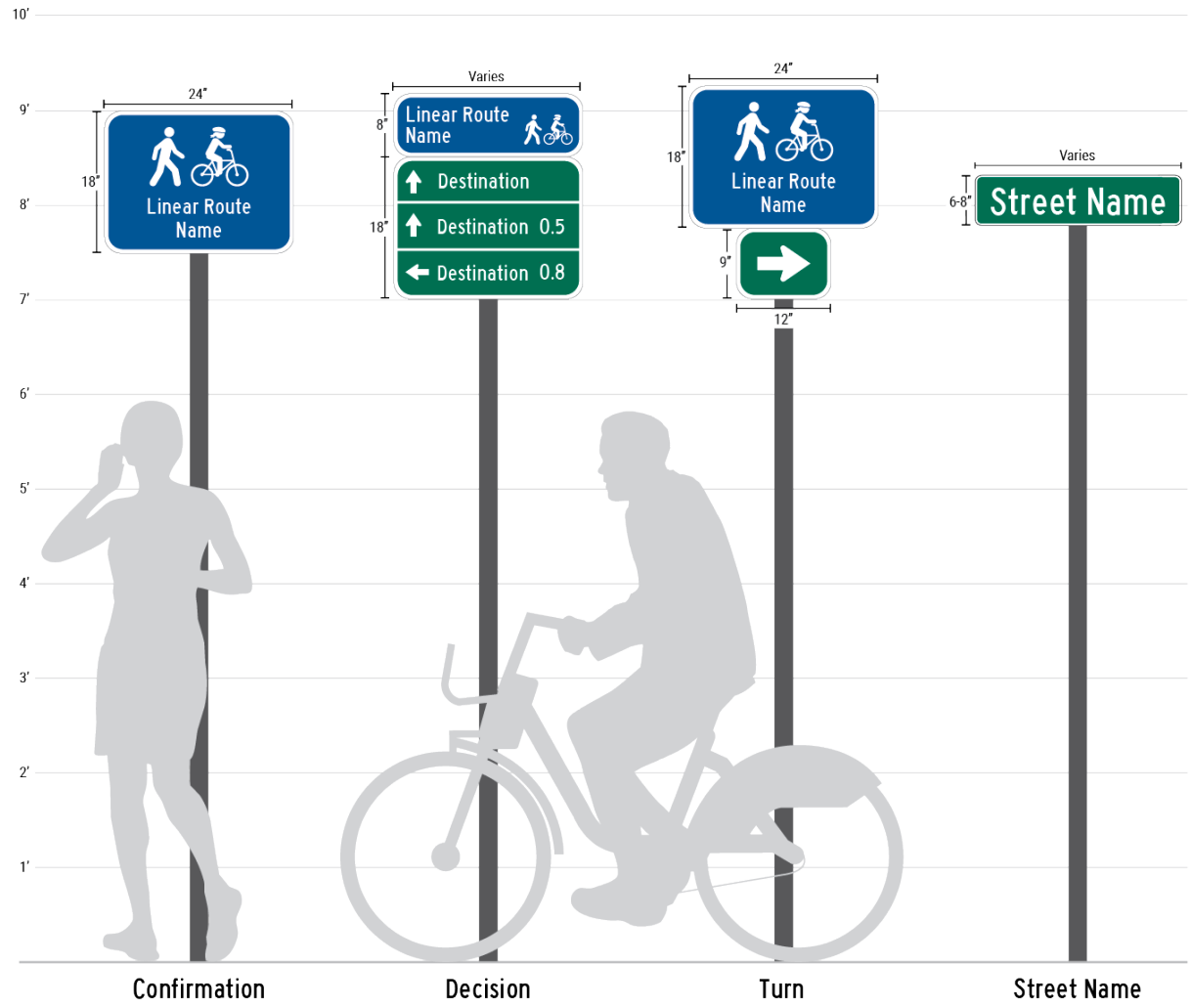

Figure 4. The four sign types that make up the standard sign family

5.1 CONFIRMATION SIGNS

Confirmation signs assure people on bikes of being on their chosen route. They do this either by identifying the route a rider is on or by identifying the destination toward which a person is headed. When used near roadways, they also signal to drivers that people on bikes may be present. Confirmation signs may be used by themselves. They should be used on top of decision signs and shall always accompany turn arrows placed along a route.

Standard MUTCD D11-1 signs contain a bike symbol plus the words “BIKE ROUTE.” While this helps to identify that a bike route exists, the Commonwealth wants to make guide signage more informative. In Massachusetts, confirmation signs should contain the following:

- On named linear routes: the route name and/or logo shall be provided instead of BIKE ROUTE as seen on standard D11-1 signs.
- On unnamed routes: the nearest or most significant destination should be listed after “TO” (ex. TO DOWNTOWN)” instead of BIKE ROUTE. Where no clear destination may be listed, such as when a rider has just passed or is facing away from a destination, a D11-1 BIKE ROUTE sign is permissible.

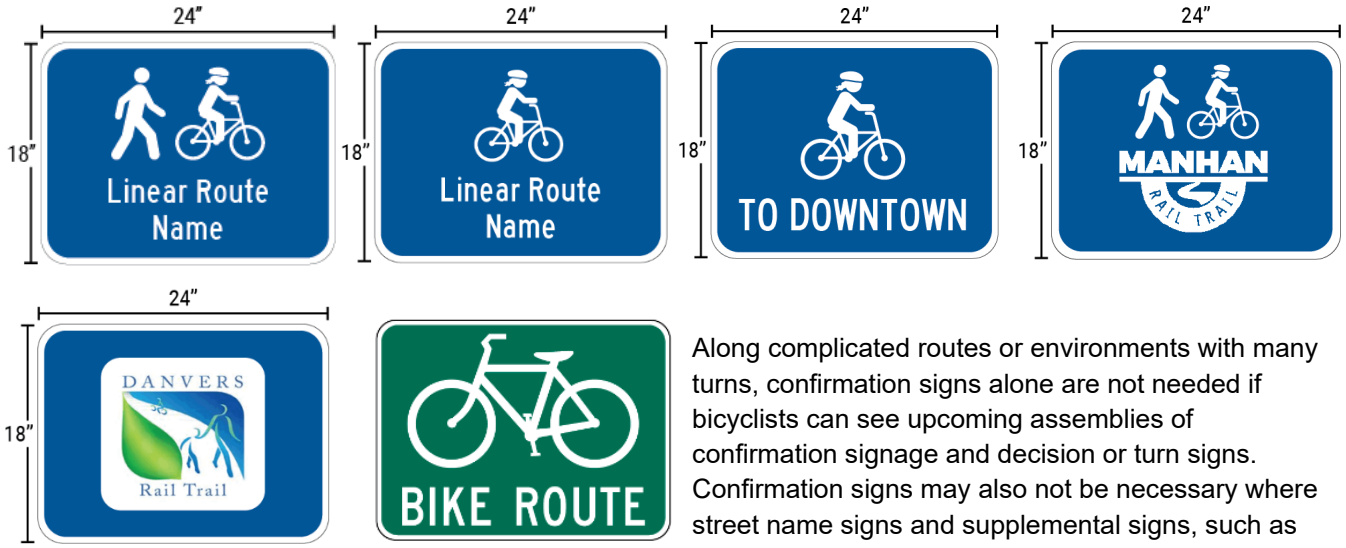

Figure 5. Acceptable confirmation sign variations with the green MUTCD D11-1 sign to be used when routes are unnamed or no clear destination can be listed.

Along complicated routes or environments with many turns, confirmation signs alone are not needed if bicyclists can see upcoming assemblies of confirmation signage and decision or turn signs. Confirmation signs may also not be necessary where street name signs and supplemental signs, such as map kiosks or gateway signs, already establish the identity of the route.

See specific placement considerations under *5.1.2 Placement*.

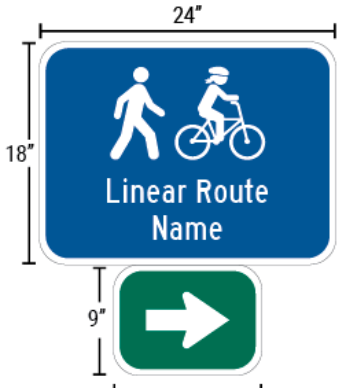

Figure 6. Confirmation sign with turn sign

5.1.1 Style

When Provided Alone or with a Turn Sign

Confirmation signs should appear in 18” x 24” rectangular format when provided alone or with a turn sign. The bicyclist symbol, described under *6.11.2 User Symbols* should appear over top the route name or “TO [destination]” on roadside signs and/or when a named linear route is not uniquely branded. The pedestrian symbol is also encouraged for use where pedestrians share the same facility. If used, the pedestrian symbol should be placed to the left of the bicyclist symbol.

If the route has an established logo, that logo may be incorporated according to the guidance under *6.5 BRANDING AND ENHANCEMENT MARKERS*.

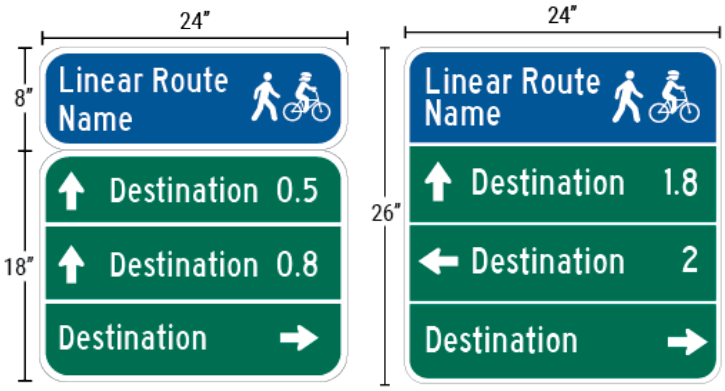

Figure 7. Confirmation signs on top of decision signs, both in separate and incorporated panels

When Provided with a Decision Sign

If provided on top of a decision sign, the confirmation plate can be considered an enhancement marker as described in *MUTCD Chapter 2D. Community Wayfinding*. In this case the confirmation plate should appear on top of the decision information in either a(n):

- 8" tall rectangular shape plate that varies to match the width of the sign or,
- semicircular shape in any of the sizes shown below in Figure 8.

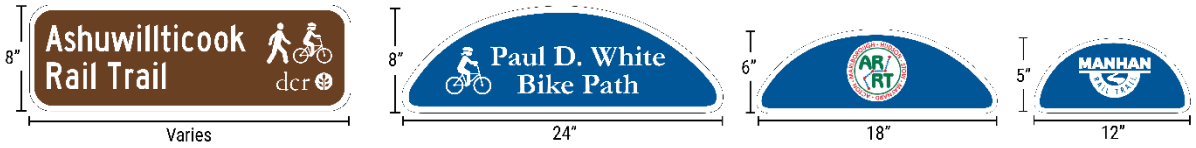

Figure 8. When placed at the top of decision signs, confirmation signs are called enhancement markers and may be formatted in half circles at the sizes shown. See Chapter 6 SIGN DESIGN FOR LEGIBILITY AND VISIBILITY for details on formatting and fonts.

A confirmation panel can either be mounted in its own plate or incorporated into the decision panel as shown in Figure 7.

A bicyclist symbol shall be used within a confirmation plate for roadside signage to designate the route for cyclists. This includes signage on side paths where drivers may otherwise be confused by the wayfinding.

Pedestrian and bicyclist symbols are encouraged for use together on shared use paths.

Colors, fonts, and branding are described in *Chapter 6 SIGN DESIGN FOR LEGIBILITY AND VISIBILITY* along with more details on use of bicyclist and pedestrian symbols.

5.1.2 Placement

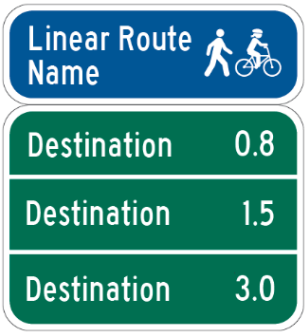

Figure 9. Confirmation sign and distance panel

Confirmation signs should be located:

- At the start of a route unless a supplemental sign clearly identifies the route. See *5.4 Supplemental Signage* for more details on supplemental signs.
- 50-100 feet beyond the far side of roadway intersections and beyond locations where bike routes intersect. Confirmation signage is most important to include where people may question a decision and movement they have made, such as intersections that require indirect routing or where intersections have more than 4 approaches and/or turns that are not 90 degrees.
- At intervals on bike route segments without turns or other signs. In rural areas, confirmation signs should be placed every 2 miles where signage is scarce.

Confirmation signs may be paired with a destination plate that contains distance listings in miles without directional arrows to signal distance to destinations further along a route. This combination is particularly helpful to place where routes leave settled areas so path users are informed of when they will next reach a destination. The nearest destinations should be listed on top and the farthest at the bottom.

5.2 DECISION SIGNS

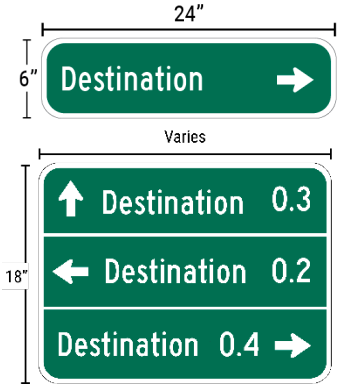

Figure 10. Single- and multiple-destination decision sign panels.

Figure 11. Decision sign panel with destinations grouped

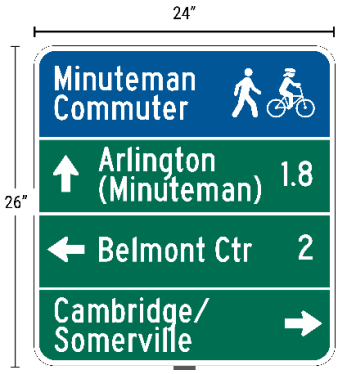

Figure 12. Decision sign panel with route confirmation/ID sign

Decision signs are installed where a bicyclist needs to decide about their destination and direction. Decision signs shall be used:

- In advance of intersections/crossings
- At junctions of intersecting bikeways
- On cross streets that may generate a significant number of route users to inform people biking and motorists of the presence of the bikeway and the destinations that can be reached on it.

5.2.1 Style

Decision sign panels are part of the D series Destination signs referenced in Chapter 9B of the MUTCD. Decision panels shall contain a green background, white border, and white font except as listed under *6.2 COLORS*. Information shall include destination names and directional arrows. Decision signs may contain one destination, or white horizontal divider lines shall be used to separate each destination or groups of destinations. Decision signs should list a maximum of three destinations to maintain legibility.

Order the destination panels from top to bottom as follows:

- Through (straight) destinations
- Left-turn destinations
- Right-turn destinations

This order does not change according to proximity to location. A through destination that is a mile further away than a left located destination should still be listed at the top of the panel. If two locations share the same arrow direction, the closer location shall be listed above the other.

Through and left arrows shall be placed to the left side of the destination name while right arrows shall be placed to the far right of the destination name and distance information if included. One arrow may be used for multiple destinations located in the same direction. In this case the arrow should be centered to the left or right of the group.

Diagonal destination arrows are not specifically guided within MUTCD decision signage for bikes, but MUTCD Part 2D clarifies that arrows should be pointed at angles that clearly indicate the directions of routes. On Massachusetts routes, diagonal arrows may be used on signage where horizontal or vertical arrows may otherwise confuse viewers.

Decision signs should include distance numerals:

- calculated in miles
- written in decimal format and rounded to tenths as a smallest increment
- written with a zero placed before the decimal, e.g. 0.5, when distances are less than one mile

Numerals can compete with other sign content, and super accuracy becomes less relevant at greater distances. For instance, 10.3 miles occupies much space, while the .3 barely registers against the 10 miles. So, for distances up to 5 miles round to the nearest tenth of a mile; between 5-10 miles, to the nearest half-mile; and over 10 miles, to the nearest mile.

Distance does not need to be included when .2 miles or under or when the destination is a landmark, such as a water body, that is easily viewed and recognized from a route. The destination itself could be excluded from the sign in that case. Distance numerals shall be placed to the right of destination names and should not be written with “mi” or any other unit of measurement.

On named routes, a route confirmation/identification sign should be placed over top the decision sign or incorporated at the top of the same panel with the decision information listed underneath.

As in the MUTCD, a bicyclist/bicycle symbol should be placed next to each destination or group of destinations if near a roadway. This may be accomplished either with bicyclist symbols in the decision panel or in accompanying confirmation panels/enhancement markers. Full use and layout details for the bicyclist symbol are listed under *6.11.2 User Symbols.*

5.2.2 Placement

On shared use paths, decision signs should be placed 100 feet before a turn is to occur, or as close to 100 feet as feasible if space is limited. Along on-street routes, or where linear routes cross intersections, decision signs should be placed at the following distances based on number of lanes people biking need to cross to make legal left turns:

- Zero-lane merge (also right turns): 25 feet
- One-lane merge: 100 feet
- Two-lane merge: 200 feet

When a decision sign is placed more than 100 feet in advance of a turn, a “second chance” decision sign should be placed at the intersection so it can be seen from the waiting area for the left turn.

5.3 TURN SIGNS

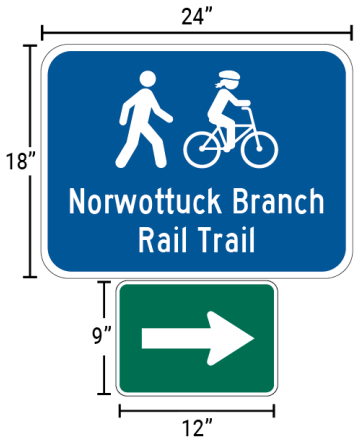

Figure 13. Turn arrows aid cyclists in understanding route direction

Turn signs include MUTCD M6 series arrows that show a change in the direction of a route. Turn signs are:

- Used in advance of a turn in the route
- NOT used at the junction of intersecting bikeways where a decision sign should be used instead or when a decision sign would be used to indicate destinations off the bikeway.

5.3.1 Style

A turn sign shall always have a white arrow on a green background. M6 turn arrows shall not appear alone but in assemblies that include a confirmation sign.

Turn signs may include any of the MUTCD M6 series arrows.

5.3.2 Placement

Turn signs should generally be located 25-50 feet in advance of turns across low traffic/narrow streets. These scenarios may include:

- intersections where routes turn to follow low-traffic bike boulevards
- locations where a sidepath transfers from one side of the road to another
- jogs in a shared use path, such as from a path to a short on-road segment back to the path

On sloped streets in the downhill direction, signs should be about 50-100 feet in advance of the intersection due to the higher travel speed of people biking.

When the route indicates a left turn that requires people biking to move across traffic lanes, a decision sign should be placed the following distances in advance of the turn:

- One lane merge: 100 feet
- Two lane merge: 200 feet

Figure 14. A trail sign assembly with turn sign and confirmation sign

When a decision sign is placed more than 100 feet in advance of a turn, a “second chance” turn sign should be placed at the intersection so it can be seen from the waiting area for the left turn. Consider that left turns for people on bikes may be uniquely designed to increase safety and that waiting areas may include queue boxes or jughandles where people on bikes have turned perpendicular to the direction from which they rode.

When a street widens to include a right turn lane for motorists in advance of an intersection, people on bikes must decide what lane they should use to reach their destination. If the main bike route follows the turn, aid people on bikes by placing turn signs near the start of the taper of the right turn lane.

5.4 BLADE SIGNS

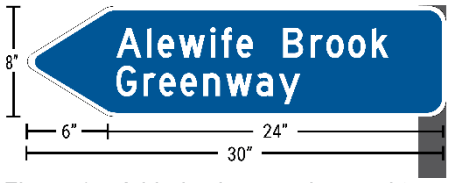

Figure 15. A blade sign may be used to indicate a turn in a route

Blade signs make up unique assemblies that provide direction through the pointed ends and alignment of each blade. These are not new types of sign assemblies but rather substitutes for the decision and turn signs from 5.2 and 5.3. Blades may be single- or double-sided, and double-sided blades may be aligned around a post in up to four directions.

Blade sign assemblies shall only be used on off-road paths/trails with enough space to meet required vertical and horizontal clearances. Blade assemblies may be used as the principle wayfinding system along a linear route or in spot locations such as trail junctions and on-street to off-road path transitions.

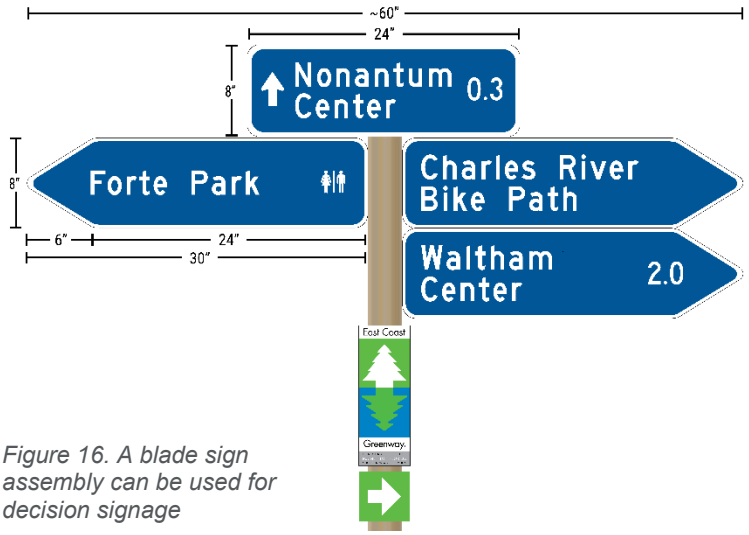

Figure 16. A blade sign assembly can be used for decision signage

Exercise caution in designing blade assemblies and determining placement, as sign faces must be visible to riders approaching from multiple directions. Blade signs require more planning, construction drawing time, and in-field install observation to ensure correct panel formatting and placement.

5.4.1 Style

Unlike rectangular assemblies with blue confirmation signs and green turn arrows or decision panels, color for all panels in a blade assembly shall be blue, with brown saved for DCR. Pointed blades should be 30” long and 8” tall. Through destinations may be indicated with 8”x24” rectangular panels with arrow symbols.

Font, legend height, multi-destination listings, symbols, branding, and vertical and lateral clearances shall meet the requirements set in Chapters 6 and 7 of this Guide. Pointed ends of blades shall be rounded to prevent injury.

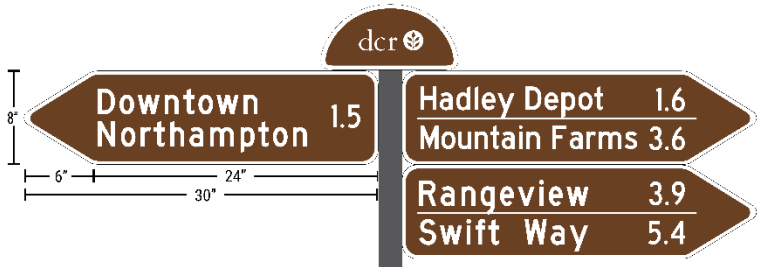

Figure 17. The 8” panel height accommodates two lines for one destination or two separate destination lines in each panel

Confirmation logos and user symbols, if used, should appear in enhancement markers at the tops of assemblies with multiple blades.

Sign faces must be visible to riders on all approaches. Consider whether blade panels should be single- or double-sided and whether blades should be aligned parallel and/or perpendicular to each other per location.

5.4.2 Placement

Blade signs used for route turns should follow the same placement standards as described in 5.3.

If blade assemblies are meant to confer decision points at road crossings, consider whether signs will be readable from approaches on both sides of the road and place one or more assemblies either in advance or directly at crossings. Where blade assemblies are used at path junctions, place directly at the junction for visibility from all approaches.

Avoid placing single assemblies in the middle of large medians or bike roundabouts where they are not legible from all approaches. More than one assembly may be needed to address different approaches to these areas.

Depending on mounting system and placement, blade signs may be pointed in the exact direction of their route, but ensure that angled signs will be visible upon approach from all necessary directions.

5.5 STREET NAME SIGNS

Figure 18. Size street name signs for shared use paths at 6 inches in height

Street name signs help people on bikes orient themselves and stay aware of their location along a route. Municipalities should ensure that street names are visible to people on bikes. Use street name signs:

- At intersections where roadway street names either do not exist or are not visible to trail users.
- At midblock crossings.
- Overhead where people on bikes follow an underpass beneath a roadway.

Figure 19. Overhead Street Name sign on Norwottuck Branch Rail Trail

Also consider that signs identifying a trail may be posted overhead, such as on bridge, so that it is visible either to riders elsewhere on the trail or to drivers in the roadway. This helps establish the presence of the bike route.

5.5.1 Style

Street name signs or trail name signs meant to be read by drivers shall conform to all formatting, color, and legend height standards set within the MUTCD. For street name signs targeted toward path users only, street name signs shall be 6” inches in height and composed of white letters on green backgrounds with or without white borders. Street name signs on DCR trails are an exception and may include brown backgrounds. Lettering shall be composed of initial upper-case letters at least 4 inches in height followed by 3-inch lower-case letters.

As per the MUTCD, street name signs may be mounted over regulatory STOP or YIELD signs.

Street name signs may be posted overhead where people on bikes ride underneath a roadway. Consider the mounting height and whether larger lettering should be used to ensure legibility of an overhead sign.

Street name signs on shared use paths may incorporate pictographs as defined by the MUTCD. The height of the pictograph shall not exceed the height of the upper-case lettering on the sign. The pictograph should be placed to the left of the street name. Do not use the bicyclist or bicycle symbol on street name signs.

5.5.2 Placement

Street names shall be visible to people on all path approaches to a roadway. If one double-sided street name sign is visible to trail users approaching a crossing from both sides of a roadway, only one street name sign needs to be placed. Otherwise, place street name signs on both sides of the crossing.

If street name signs are placed on a structure overhead, ensure visibility to riders approaching from both directions.

5.6 SUPPLEMENTAL SIGNAGE

Map and information signs, entry signs, gateway markers, mile markers, and pavement markings are all part of high-comfort wayfinding systems. These supplemental forms of wayfinding are often used to reinforce the presence, character, or brand of paths while providing orientation help to viewers. In doing so, supplemental signs work as and can often replace confirmation signage to help minimize clutter.

MassDOT sets no standards for supplemental wayfinding signage but is providing limited best practice guidance to make supplemental signage more accessible to all. Supplemental signage on Department of Conservation and Recreation (DCR) property is subject to the standards set forth within the DCR Graphic Standards Manual. This section does not address rules signs and general trail information sign content.

5.6.1 Map & Information Signs

Figure 20. Map kiosk on the Clipper City Rail Trail

Map and information kiosks, called Welcome Waysides by DCR, can be located at trailheads, where regionally significant bikeways intersect, at points of interest, parks or locations where important features are nearby but not on a trail. People are accustomed to reading maps with north oriented at the top, so attempt to place map panels so that they will be read by people facing as close to north as possible.

Trailhead facilities built with federal funds shall include information on the length of the trail or trail segment, surface type, typical and minimum trail width, typical and minimum running slope, and typical and minimum cross slopes per the Americans with Disabilities Act (ADA).

Place maps off the trail so people do not block the path while viewing. All parts of the map should maintain at least 2' of clearance from paths per ADA guidelines. Map kiosks should be installed on firm and stable surfaces to be accessible to people of all abilities. All sides with information should be wheelchair accessible. Provide minimum accessible width per ADA guidelines.

Use simple, high contrast graphics with few layers to make maps more legible. Good references for kiosk map design include the National Park Service's *Wayside Map Standards,* and Colorbrewer 2.0, an online resource that helps choose map color palettes that can be read by people who are colorblind.

Mount map information so all content is between 2 and 6 feet off the ground. The legend and any important information should be close to the eye level of a person in a wheelchair, so somewhere nearer to the bottom of the map. Where feasible, use larger fonts (often at least 24 point, font-depending) so that maps can be read from 2-3 feet away.

Figure 21. Granite mile marker on the Assabet River Trail

5.6.2 Mile Markers

Mile markers aid people tracking their travel distance or communicating with emergency services. Markers may be vertical posts or path inlays. At least 2' of horizontal clearance should be maintained between vertical mile markers and paths, and path inlays should not change the surface level more than ¼" per ADA standards. Mile marker materials may vary, but in all designs the legibility of mileage information is key. A minimum of 2" text should always be maintained. The design of mile markers should consider potential expansion of a trail network to allow for re-numbering.

5.6.3 Gateway Signage

Gateway signage helps people recognize their destination. Where many entries to trails are nondescript, gateway signs convey welcome and define an identity for a site or route. Materials vary widely, though granite markers are often seen at trail entries in Massachusetts. When designing gateway signage, consider the intended viewer for sign information when determining size and position.

Figure 22. (Far Left) Granite gateway marker on the Norwottuck Branch Rail Trail

Figure 23. (Left) Granite gateway marker on the Tri-Community Greenway

5.6.4 Pavement Markings

Figure 24. Shared-lane markings may be used on bike boulevards

Pavement markings can supplement wayfinding signs by helping people navigate difficult route segments and enforcing trail identity. They can be used to instruct people on bikes to use sidewalks at gaps in high-comfort routes. They are also useful for cautioning drivers that people on bikes may be present on designated bike boulevards.

Shared-lane markings (SLMs) may be used per the MUTCD on bike boulevards. SLMs cue people on bikes where to ride on the street while alerting drivers where to expect bicyclists. When used in a series, SLMs can be used to help guide people on bikes through a network of low-traffic streets. Do not use SLMs on paths, separated bike lanes, or sidewalks. The MUTCD does not allow shared lane markings to be adapted with turned chevrons or other symbols.

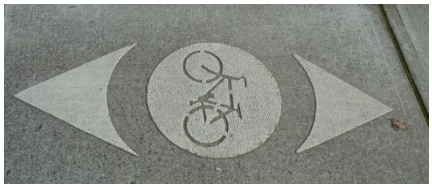

Figure 25. Bike dot (bike zone marking)

Bike dots, or bike zone markings, are an increasingly popular addition to wayfinding systems. Bike dots incorporate a bicycle symbol with arrows that signify the direction of a route. They are a means to aid people on bikes through portions of a route that would otherwise be unclear, such as where riders need to use sidewalks temporarily between path segments. Bike dots have not been sanctioned by the MUTCD and shall be used off-road only. When designing, keep symbols and colors simple and consistent.

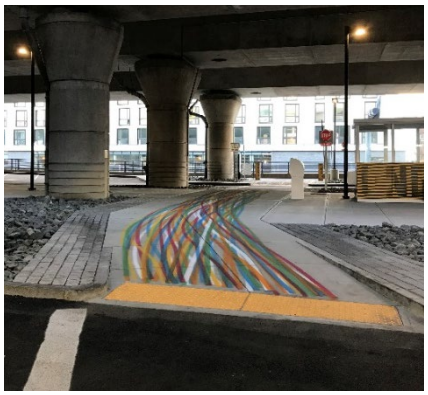

Figure 26. The Ink Block Underground painting leads trail users under Interstate 93

Besides bike dots, pavement markings that incorporate unique paint or other pavement patterns may be used on sidewalks, separated bike lanes, and shared use paths to assist in wayfinding while enforcing trail identity. Artful markings could be developed through community engagement programs for individual projects. Consider positioning and size to ensure marking visibility. Do not use creative markings in the roadway.

6 SIGN DESIGN FOR LEGIBILITY AND VISIBILITY

Keep It Simple. Be Consistent and Predictable. Help People Maintain Motion. The Core Principles for this guide are instrumental in the design and placement of signs. Signs must be visible and clearly readable at a distance for wayfinding systems to work. Sign size, color, contrast, retroreflectivity, and branding all affect legibility and visibility. Font and text layout, symbols, and naming conventions also affect legibility of sign information. The features are all covered in this section.

6.1 SIGN ASSEMBLY SIZE

Three principle sign assembly widths shall be allowed, with the decision sign as the width determiner:

30” – this size should be prioritized for use in all bike facility contexts as the width allows most destination names to be listed on one line while providing room for user symbols and logos

- **24” –** this size should be prioritized for use in all bike facility contexts where sidewalk or shoulder space is limited or where other vertical elements may block a 30” sign
- **20” –** this size may be used on a limited basis in urban street networks where space is restricted. Potential applications are in areas with very narrow sidewalks and minimal building setbacks, such as historic downtowns or quiet bike boulevards.

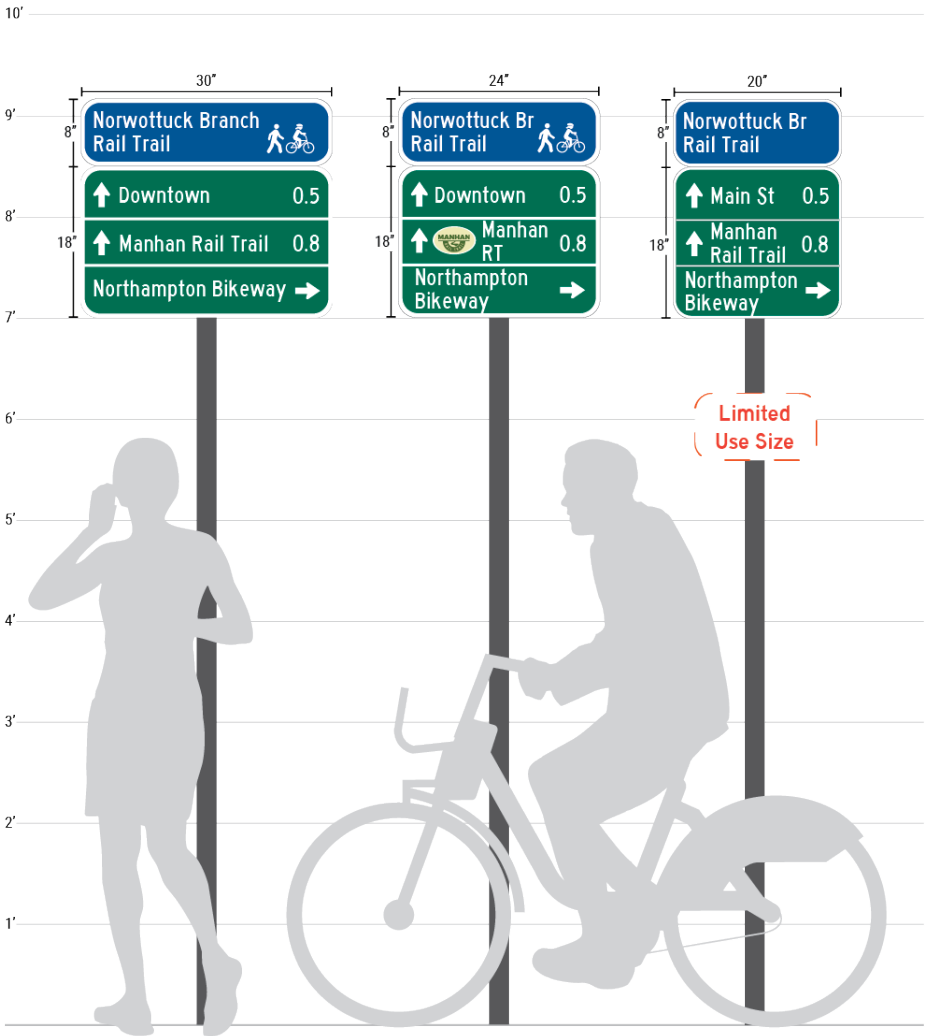

Figure 27. Signs in 30", 24", and 20" width at required clearance heights (see “Sign Installation and Placement”

6.2 COLORS

The following guidance is provided for wayfinding sign colors to increase consistency while providing flexibility for expression of municipal and/or route identity.

6.2.1 Sign Background Colors

The following are colors to be used on sign backgrounds except for enhancement markers in certain cases. Colors are expressed with Pantone numbers as identified in the MUTCD. Sign manufacturers should match these colors as closely as possible.

Green - Pantone 342 Following the MUTCD, the backgrounds of turn signs and legends of all decision signs shall be green.

Brown - Pantone 469 Brown is reserved to be used solely by the Department of Conservation and Recreation and the National Park Service and may appear on either confirmation/identity or decision signage.

Blue - Pantone 294 Blue shall be used on backgrounds for identity/confirmation signs and enhancement markers. This color was elected for this purpose over green to draw the eye to a sign assembly where green may disappear among vehicular guide signage and vegetation. While blue is often associated with service and tourist information and parking for people with disabilities, MassDOT feels this limited use of blue in wayfinding does not detract from other signage types.

6.2.2 Font & Border Color

White font and white borders shall be used over top the background colors.

6.2.3 Restricted Colors

Due to their other MUTCD designations, the following colors and their similar or fluorescent variants, are expressly prohibited from use on wayfinding backgrounds. The colors are listed with their Pantone numbers:

Red – 187 | Orange – 152 | Yellow – 116

Purple – 259 | Yellow-Green – 382 | Pink - 198

These colors may be as part of logos and seals as long as the logo or seal cannot be confused for a regulatory or warning message.

6.2.4 Enhancement Marker and Logo Colors

Logos and seals may incorporate a mix of colors, but designers are encouraged to minimize color count for better legibility. Enhancement marker background colors must remain blue (or brown for DCR). Existing branded routes must adapt logos where needed so they contrast against the blue background and are legible.

6.3 CONTRAST

For all sign legends, white letters shall be used on dark green, blue, or brown backgrounds. Enhancement marker logos and seals are permitted to contain a mix of light and dark colors but must contrast against backgrounds.

6.4 RETROREFLECTIVITY

As required by the MUTCD, all wayfinding signs for all bike facilities, including shared use paths, shall be retroreflective. This includes enhancement markers, supplemental street name signs, and pavement markings. It does not include other supplemental signage. Community Wayfinding standards state that pedestrian wayfinding signs do not need to be retro-reflectorized, but all the facilities in this Guide are considered by MassDOT to be separate from pedestrian-only wayfinding and covered by standards for bike facilities.

6.5 BRANDING AND ENHANCEMENT MARKERS

Figure 28. Decision sign with branded confirmation sign/enhancement marker and East Coast Greenway sign provided below in separate panel

Identity features help route signage within local context and differentiate between paths. Some linear routes are already branded in Massachusetts. As urban cycling continues to develop, MassDOT expects that branding may also be desired for whole high-comfort networks. Considering the above, the following are standards for adding branded content to signs.

6.5.1 Route Names

If the name of a route is usually expressed in a certain font in lieu of an official logo, that font is permitted to be used in the enhancement sign at the top of a sign assembly, as in Figure 28. Legends must be a minimum of 2" tall, with larger size preferred. Abbreviations to route names may be made as needed according to the table under *6.7.3 Abbreviations.*

6.5.2 Logos and Logo Hierarchy

Where a route has an official logo, that logo may be used within sign assemblies according to the rules below. In all cases, a logo shall not appear as the dominate feature of a decision sign, as the directional information has priority.

Logos for Local Linear Routes (Shared Use Paths/Sidepaths)

Logos may be used in confirmation sign panels either with user symbols if visible to drivers or without user symbols where routes are well separated from roadways. Where linear routes run adjacent to roads and signs would be visible to drivers, logos should appear with bicyclist symbols.

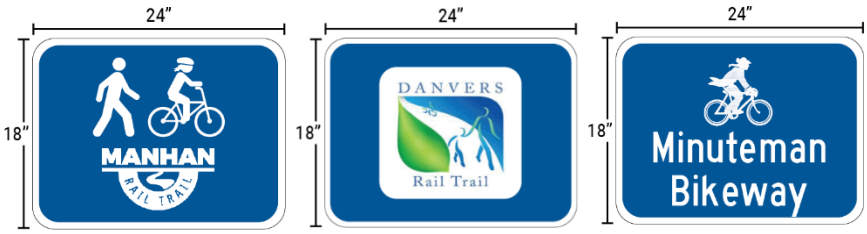

Figure 29. Options for 18"x24" branded confirmation signs

In 18" x 24" sign formats, logos should be center aligned when used alone or with a separate route name legend. If used near roadways, logos should appear under the bicyclist symbol (and pedestrian symbol if used).

Figure 30. Options for rectangular branded confirmation/enhancement markers

For rectangular confirmation panels (semi-circular described below), logos should either be center-aligned if alone or aligned to either the left or right of the sign in balance with route name and user symbol content. Again, near roadways, the bicyclist symbol (and pedestrian symbol if used) should appear within the confirmation area. Where user symbols are included, they should appear to the right of route names.

Figure 31. Options for semicircular branded confirmation/enhancement markers

As part of semicircular enhancement markers, logos should be center-aligned if used alone or else positioned to the left or right of the route name. This enhancement marker shape may not be a good option adjacent to roadways where user symbols cannot be incorporated within the restrictive format. It is possible, however, to incorporate user symbols in semicircular markers alone.

Figure 32. The East Coast Greenway logo appears below decision signage

Regional/State/National Linear Route Logos

Local linear routes are often part of a larger named trail work. The Mass Central Rail Trail includes multiple branch trails. The East Coast Greenway includes both named local and regional routes plus many unnamed on-street segments. Larger parent routes with established branding should be incorporated into wayfinding sign assemblies. Unless the parent trail is the only name of a trail branch, all parent trail branding shall be provided underneath and in separate panels than the standard sign assembly panels. Parent trail branding may be shown in circular or rectangular panels that do not dominate the assembly in size, color, or graphics.

U.S. Bicycle Routes

On highway facilities without high-comfort routes, the standard U.S. Bicycle Route (M1-9) sign shall be used on all established U.S. routes. However, it is MassDOT's goal to establish future U.S. numbered routes on high-comfort facilities, where signs shall conform to the standards set in this Guide. The M1-9 sign face design shall conform to MUTCD standards if placed beneath decision signage. Sign face drawings for the M1-9 sign may be found in the *MUTCD's Standard Highway Signs, 2004 Edition* or in *MassDOT Engineering Directive E-15-001.* Route numbers may also be listed on a destination line within decision signage or as part of a confirmation/identification sign at the top of an assembly.

Figure 33. US and State Route numbering on decision sign

State Numbered Bicycle Routes

On highway facilities without high-comfort routes, the standard Bicycle Route (M1-8) sign shall be used on all state numbered bicycle routes as guided in Directive E-15-001. However, it is MassDOT's goal to establish any future state numbered routes on high-comfort facilities, where signs shall conform to the standards set in this Guide. Route numbers may be listed on a destination line within decision signage or as part of a confirmation/identification sign at the top of an assembly.

Bike Boulevard Networks (Neighborways, Neighborhood Greenways)

Signage is needed to designate routes as bike boulevards. Sign bike boulevards with confirmation panels/markers to clarify their inclusion either in a linear route or bike boulevard network. As signs on bike boulevards will be visible to drivers, signs shall include either a bicyclist symbol or logo that includes a person on a bike and which follows standards for color and legend height set in sections 6.2 and 6.6.

6.5.3 Logo Background Colors

See *Enhancement Marker and Logo Colors* under 6.2 COLORS.

6.6 HISTORIC-STYLE SIGNAGE

Many communities have invested much time and hard-earned funding to maintain the historic character of their town/city centers, cultural sites, and open spaces. Maintaining historic character is not a valid reason for avoiding design treatments that make streets and routes safer and more comfortable for people on bikes. However, MassDOT recognizes the value that historic character can lend to community identity, civic pride, and tourism-building. For this reason, MassDOT will allow some alterations to the standard wayfinding family detailed in sections 5.1 – 5.4 for purposes of perpetuating a historic style or brand.

Alterations generally include font, color, and sign layout. Historic-style wayfinding signage plans must be submitted for review and approval by MassDOT Highway Division before installation.

Standards to Follow

- At all times, historic-style signage shall respect the *Core Wayfinding Principles* set forth at the beginning of this Guide.
- Sign legend height and placement for visibility and vertical and horizontal clearance shall follow the standards set forth in Chapters 6 and 7.
- Signs shall not incorporate branding in a manner that conflicts with the standards of *6.5 Branding and Enhancement Markers.*
- As follows *6.11.2 User Symbols*, the bicyclist or bicycle symbol shall be incorporated where a sign might be otherwise be confused as meant for a driver.
- Signs shall be retroreflective to ensure evening visibility whether on paths or roadways.

Permitted Alterations

- Sign background colors may be adapted to include alternate shades of blue for confirmation signs and blades; alternate shades of green for turn arrows and decision panels. Brown is again reserved for DCR. The content of *6.2.3 Restricted Colors* still applies, and high contrast between white font and background must be maintained.
- Font style may diverge from the standards provided in *6.6.1 Font Style and Size*. However, fonts must be demonstrated to MassDOT to be as legible as the standard. Cursive font is not permissible.

Also consider that historic-style wayfinding can be established through material choices, through supplemental signs such as map kiosks and granite or other gateway markers, and through historic-style posts.

6.7 FONTS AND SIGN LAYOUT

Font style, size and text layout on a sign must reflect that people biking regularly move at speeds of 10+ miles per hour and have limited time to spot and read signs. Fonts and the layout of sign elements should be composed so that a visual balance is achieved, and the sign is clean and legible.

6.7.1 Font Style and Size

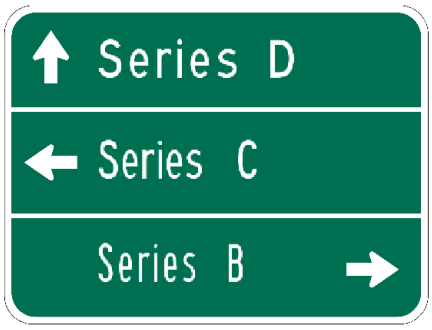

Figure 34. MUTCD Standard Alphabets Series fonts

Font style as part of decision legends or where used to identify a route name shall be consistent with MUTCD Standard Alphabets Series font specifications. Series D is preferred, then Series C, followed by Series B. Other Series fonts shall not be used.

Series B should be used as a last resort for long route names. Sign size should be increased and abbreviations and symbols used before Series B font is implemented.

Clearview font is not permitted for use on decision sign legends. It is generally prohibited from use on confirmation/identity signs unless commonly recognized as part of a route's branding.

For all standard family wayfinding sign content, destinations shall begin with upper-case letters followed by lower case (sentence case). This does not apply to supplemental wayfinding, though the legibility of fonts and cases should be considered in supplemental sign design.

6.7.2 Legend Alignment

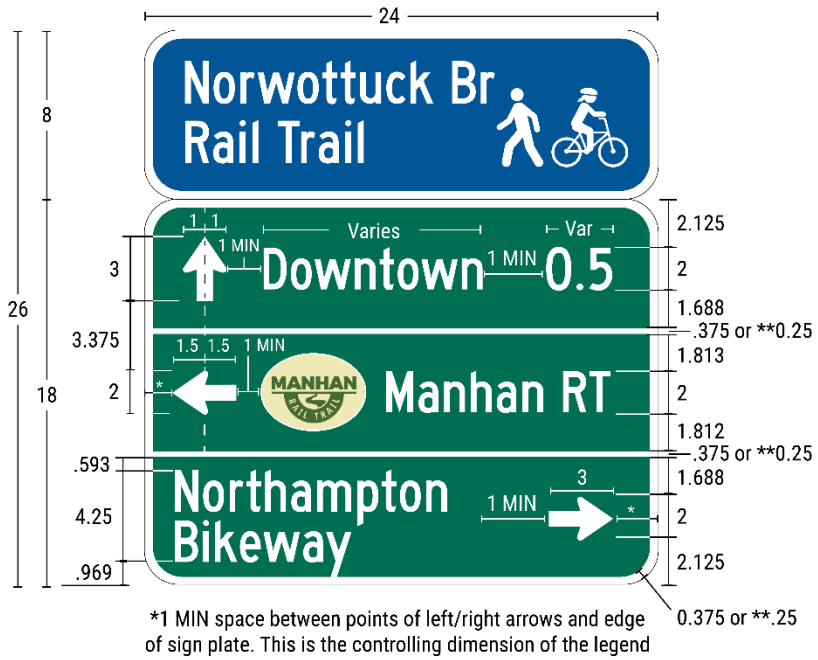

Figure 35. Recommended spacing between text and borders, though sign size may vary according to the sign types previously described.

A legend is all the text within a sign. Legend alignment varies with sign type and content:

- Standalone confirmation sign legends should be center aligned.
- Confirmation sign legends above decision signs should be left-aligned.
- On decision signs with one destination listed, single- and multi-line legends should be left aligned.
- On decision signs with more than one destination listed, all legends should be left aligned.

6.7.3 Legend Height

Legend height for upper-case letters on any decision sign or in route names on confirmation signs shall be 2" tall minimum, except where route names are incorporated into logos. Distance

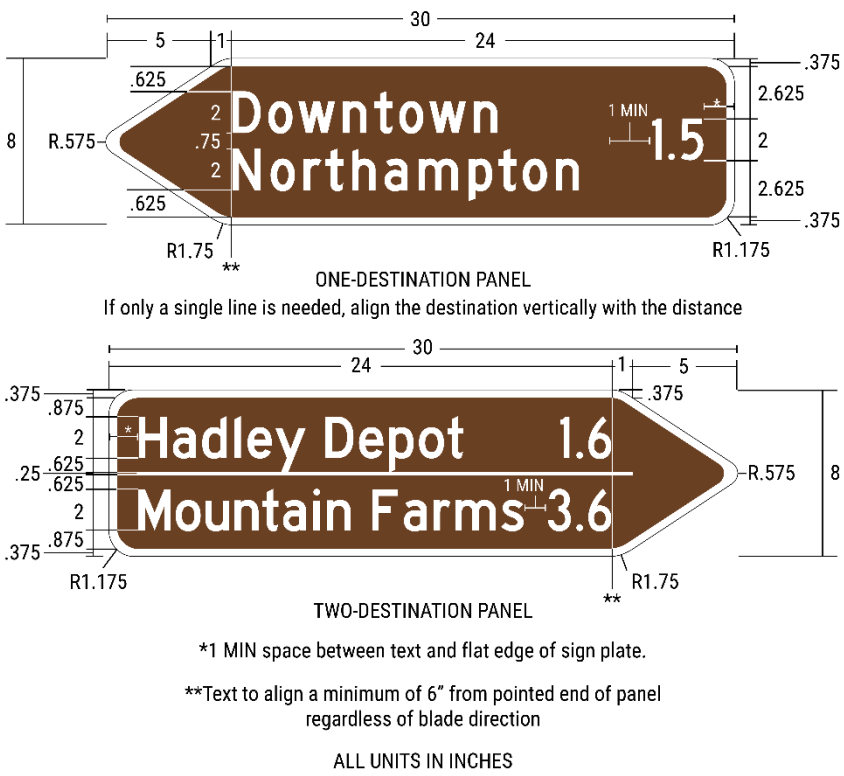

Figure 36. Recommended spacing for both one-destination and two-destination blade signs

numerals shall also be 2" minimum. This applies to 20" wide signs. Supplemental sign font sizes may vary (see 5.4 Supplemental Signage).

In contrast with the MUTCD, MassDOT will allow the use of logos within destination legends. Logos may not be shown on their own. They may be used to the left of the route names and their height shall not exceed two times the height of the uppercase characters of the principal legend.

Borders and spacing should follow the dimensions provided within the sign examples in Figures 35 and 36, regardless of sign size, or according to the 2012 MUTCD Supplement of *Standard Highway Signs.*

6.7.4 Bike Roundabout Signage

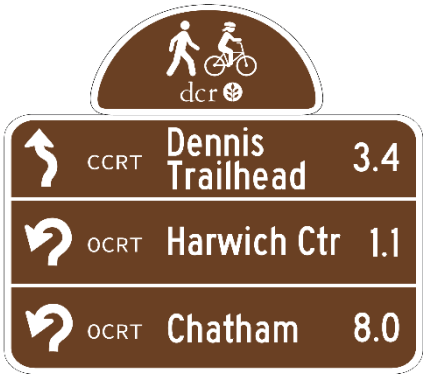

Figure 37. DCR-branded example decision sign for bike roundabout on the Cape Cod and Old Colony rail trails.

Where complex movements are required at bike roundabouts, communities may format decision signage to include special fishhook arrows that indicate paths of travel around the roundabout.

Roundabout signage should otherwise follow the color and branding rules established this Guide.

Place roundabout signage on each approach so that destinations off the other approaches are clear.

6.8 NUMBERING, NAMING, AND SYMBOL CONVENTIONS

Figure 38. US Route on decision sign

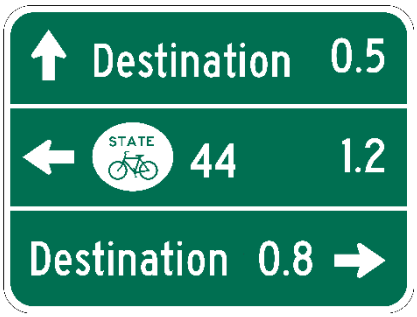

Figure 39. State route on decision sign

This section covers how numbering, naming, including abbreviations, and symbols should be designed into sign layouts. Consult the *Planning Basics* section for how route numbers and names are planned.

6.8.1 Numbering and Naming

Deviating from Directive E-15-001, named bicycle routes on high-comfort wayfinding signs shall generally list their full names, with commonly understood abbreviations for subjects within a name (i.e. rail trail, trail, river) applied per the *Abbreviations* guidance below. If a named route has a commonly used 1-3 letter abbreviation and that abbreviation is approved by the MassDOT Office of Transportation Planning, the abbreviation may replace the full name on high-comfort wayfinding where sign space is limited.

Any US or State Numbered Bicycle Route shall have its number shown either within the standard sign family for high-comfort sign types or as a separate sign following MUTCD standards at the bottom of the assembly. If shown within a confirmation or decision sign, the US or State number should be displayed per Figures 38 and 39 at left.

6.8.2 Long Destination Names

Long route and destination names are problematic for bike wayfinding signage due to space constraints. MassDOT encourages sign designers to address name listing issues on decision and confirmation signs by working through the following steps in order of 1 to 6. Consistency is key, so once a pattern for handling long destination names is established, stick with it on signs throughout a route.

1. Increase the width of the sign assembly to 30” where feasible. Reformat half circle confirmation signs to rectangular if needed.
2. If destination lengths are within .2 miles, remove destination numerals.
3. Split names between two lines fitting within one destination area. Both lines shall be aligned left.
4. Abbreviate parts of names that are listed within the table under *Section 6.7.3 Abbreviations.* Abbreviate the entire name if approved by the Office of Transportation Planning. Consider using a well-known nickname or acronym for the route instead.
5. Remove symbols on decision signs and/or the pedestrian symbol on confirmation signs.
6. Switch text to Series C followed by Series B font.

Legends shall not be made smaller than 2” to resolve issues arising due to word length.

6.8.3 Abbreviations

Common abbreviations may be used for places and as part of route names where sign space is limited. Abbreviations should not be followed by periods, as in Figure 37. The abbreviations listed in the table below are approved for use. Other permitted abbreviations for route names may be found in the MUTCD or as part of Street Suffix Abbreviations listed online by the US Postal Service. For abbreviations that are not established by these sources, seek permission for use from the MassDOT Office of Transportation Planning.

6.9 Place/Feature	6.10 Abbreviation	6.11 Place/Feature	6.12 Abbreviation
Avenue	Ave, Av	**Middle School**	MS
Beach	Bch	**Miles(s)**	Mi
Bicycle	Bike	**Mount**	Mt
Boulevard	Blvd	**Mountain**	Mtn
Branch	Brg	**Museum**	Mus
Bridge	Brdg	**National**	Natl
Brook	Brk	**Neighborhood**	Nbhd
Center	Ctr	**North / Northwest / Northeast**	N / NW / NE (with or without periods)
Circle	Cir	**Park**	Pk
Community	Comm	**Parkway**	Pkwy
County	Cty	**Path**	Path
Court	Ct	**Pedestrian**	Ped
Creek	Crk	**Place**	Pl
District	Distr	**Rail Trail**	RT
Downtown	Dtwn	**Recreational**	Rec
Drive	Dr	**River**	Riv
East	E	**Road**	Rd
Elementary School	Elem	**South / Southwest / Southeast**	S / SW / SE (with or without periods)
Garden / Gardens	Gdn / Gdns	**State**	State
Harbor	Hbr	**Station**	Sta
High School	HS	**Stream**	Strm
Highway	Hwy	**Street**	St
Hospital	Hosp	**Terrace**	Ter
Information	Info	**Trail**	Trl
Lake	Lk	**US Numbered Route**	US
Lane	Ln	**Veteran(s)**	Vet
Marina	Mar	**Village**	Vlg
Memorial	Mem	**West**	W

Table 1. Abbreviations for common destinations

6.12.1 Service and Destination Symbols

Symbols provide instant communication that overcomes language barriers. MassDOT encourages the use of symbols to reference transit centers, activities at a destination, or to describe amenities such as food and restrooms.

Figure 40. Service symbols on decision sign.

Per the MUTCD, if a symbol is used, its height shall not exceed two times the height of the upper-case letters of the destination legend. The outer edges of symbols should be spaced a minimum of 1" from adjacent sign content.

International symbols shall be used as guided in MUTCD *Chapter 2M. Recreational and Cultural Interest Area Signs* and in the 2016 Bureau of Land Management *National Sign Handbook* (H-9130-1). MassDOT requires that permission is sought before using any symbols not recognized on the international symbols list within the *National Sign Handbook*. Symbols for use on gateway, map, and other supplemental or non-wayfinding trail signage do not require permission for use.

Due to the notability of the MBTA logo, MassDOT is permitting the use of the "T" symbol on high-comfort wayfinding signage. MUTCD guidance still applies for sizing and color standards in the use of this logo.

Figure 41. MBTA "T" logo

The following are considerations for use of symbols in wayfinding:

- Business logos, commercial graphics, or other forms of advertising shall not be used on wayfinding.
- Except for hospital symbols, do not include symbols for services that are more than a mile away.
- Do not use both words and symbols.
- Symbols do not include route logos or municipal seals.

6.12.2 User Symbols

Confirmation signs should display the MUTCD bicycle symbol or a symbol for a person biking (bicyclist symbol) on bikeways adjacent to roadways to designate the space used by people on bikes. Where space allows, pedestrian and bicyclist symbols should be shown together where a sign is meant to be viewed by both users.

Figure 42. The approved symbol for expressing use of a route by people on bikes. This shall replace the MUTCD bike symbol.

MassDOT seeks to recognize that bikes are ridden by human beings whose safety is important to ensure. The symbol at left should replace the MUTCD rider-less bicycle symbol in Massachusetts. Helmets and protective gear are recommended for all people biking and are required for children under 16 years of age. However, the MassDOT bicyclist symbol does not enforce a rule for helmet use.

The bicyclist symbol should appear within standalone confirmation signs or within confirmation signs/enhancement markers at the top of decision assemblies.

Where confirmation signs do not show a bicyclist symbol and the sign assembly is located adjacent to a roadway, the MUTCD standard bicycle symbol shall be added to the decision panel per MUTCD guidelines on bicycle destination signs. Recognize that this will increase panel width.

Figure 43. The approved pedestrian symbol for use in Massachusetts

The pedestrian symbol shown in Figure 43 is used on MUTCD RS-122/123 signs. This symbol is preferred for use on bike wayfinding signs in Massachusetts as its rounded features more closely match the person riding a bike in the bicyclist symbol. This pedestrian symbol should be shown as much as possible on signs meant for both people biking and pedestrians. The pedestrian symbol is intended as a stand-in for multiple modes – skateboarders, scooter riders, among others – as showing all modes would decrease sign legibility. Supplemental signs for shared use and side paths may be designed to show other modes.

Bicyclist and pedestrian symbols should appear at 3” tall minimum when used within confirmation panels. This does not apply to the MUTCD standard bicycle symbol in decision panels, where the symbol should be sized according to MUTCD guidelines.

Pedestrian symbols shall never be placed within decision sign panels. If used, they shall be used within confirmation signs, grouped and to the left of the bicyclist symbol. Both the pedestrian and the person biking should face the same direction, usually to the right. The symbols may face left or opposite of each other if stylized as part of a brand. In this case, the symbols shall remain legible.

7 SIGN INSTALLATION & PLACEMENT

For approved bicycle routes on State Highway, MassDOT will work with a contractor prequalified for signage work to install appropriate bicycle route signage, and MassDOT will maintain the signage after installation. For bicycle routes on Non-State Highway, MassDOT may install bicycle route signage; otherwise, the local jurisdiction is responsible for installation using a contractor prequalified for signage work by MassDOT. After installation, the local jurisdiction is responsible for maintenance of any bicycle route signage on Non-State Highway roads and paths.

Per the MUTCD, do not place guide signs where they obstruct visibility of warning or regulatory signs. Bicycle guide signage should usually be installed independently on a separate signpost. Additionally, the ruling set forth in MassDOT Engineering Directive E-15-001 stating that bike route (guide) signage shall never be combined with any warning or regulatory signage is given exception in this Guide. Bike guide signage should never be combined with warning signage and most regulatory signage. However, confirmation signage may be installed above R5-2, R5-3, R5-4, and R5-8 selective exclusion signs if vertical clearance standards are met.

7.1 PLACEMENT FOR VISIBILITY

Wayfinding signs must be visible to be useful.

- Place signage in locations within a bicyclist's normal field of view.
- Avoid placing signage behind tall shrubs and trees with large trunks or low-hanging canopies unlikely to be maintained.
- Do not place wayfinding signage directly behind other types of signage. At least a 20' separation should be maintained. Also, do not place wayfinding signage so that it blocks views of regulatory or warning signage.
- Do not place wayfinding signs that block sightlines of drivers, pedestrians, and people on bikes at intersections.
- Where a guide sign is to share the same post with another route sign, the height of the wayfinding sign shall meet the vertical clearance standards established below.

7.2 VERTICAL AND LATERAL CLEARANCE

Vertical clearances should be measured from the top of the traveled facility (i.e., shoulder, bike lane, separated bikeway, etc.) to the bottom of the lowest sign in the assembly, unless otherwise noted. Lateral clearances shall always be measured from the edge of pavement or curb line. The following vertical and lateral clearance standards shall be met for all installations:

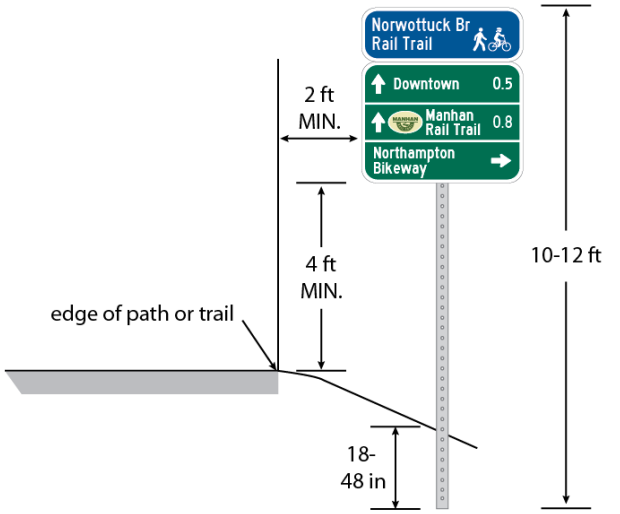

Figure 45. Clearances when installed adjacent to a shared use path or side path.

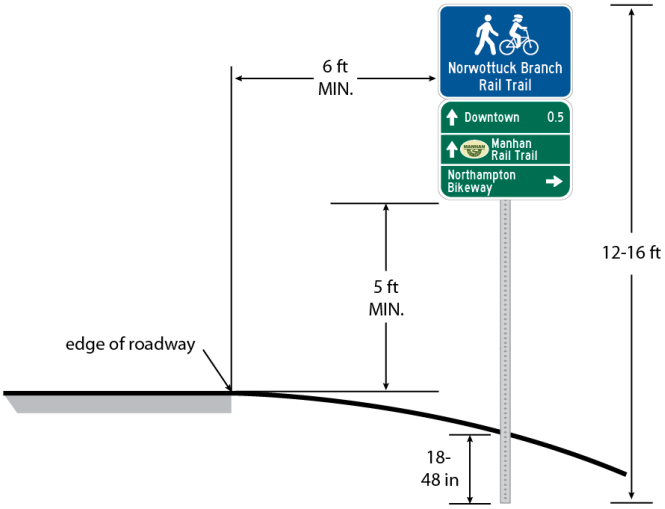

Figure 44. Clearances when installed adjacent to a facility used by motor vehicles. Except when protected by a barrier, the minimum lateral clearance shall be 6 feet when installed adjacent to a road facility with no curb.

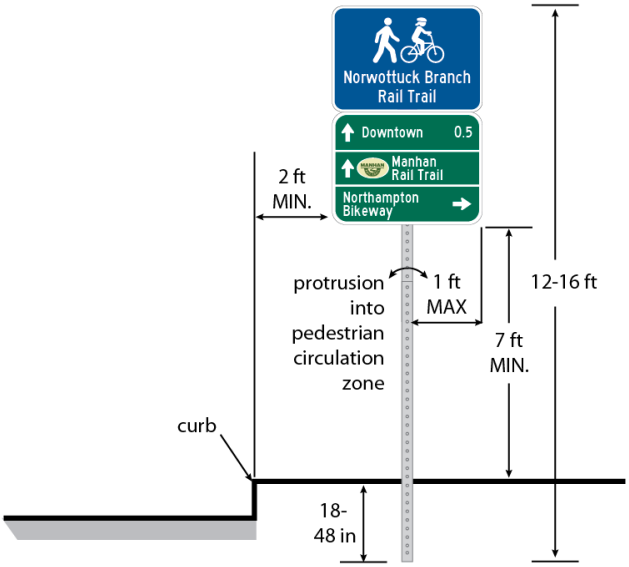

Figure 46. Clearances when installed on sidewalks or other accessible pedestrian areas. The minimum lateral clearance shall be 2 feet when the bicycle route is separated from pedestrians by a curb.

7.3 PLACEMENT SCENARIOS

Typical scenarios are shown on the following pages to illustrate how sign assemblies may be placed in varying contexts. Consider that each scenario could have multiple signage solutions. The scenarios presented below are not required treatments.

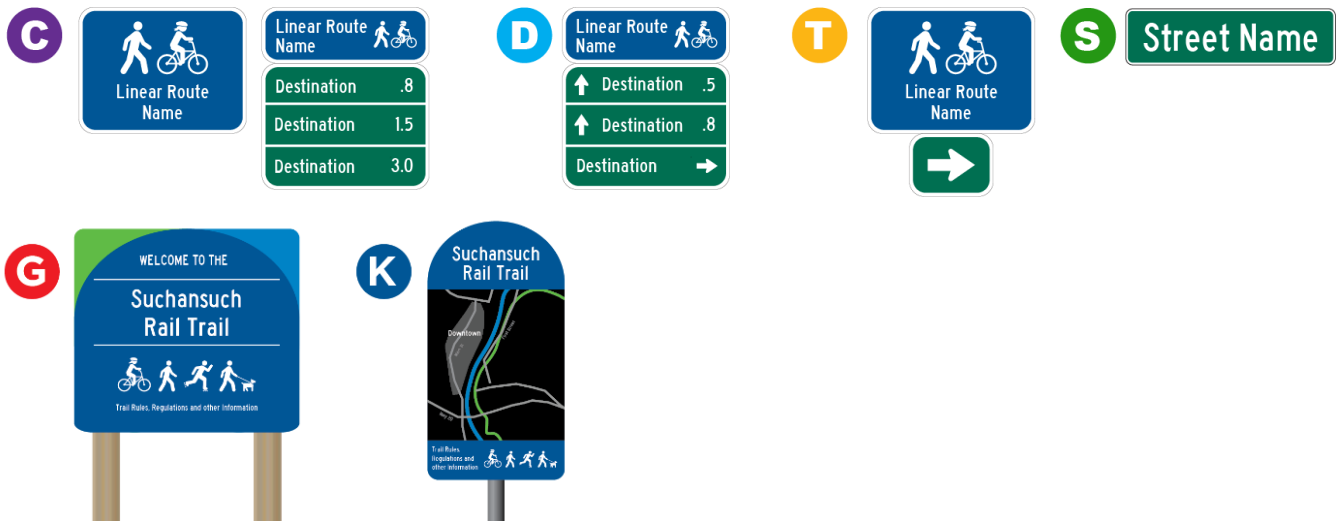

Figure 47. "C" - Confirmation/identification signs; "D" – Decision sign; "T" – Turn sign; "S" – Street sign; "G" – Gateway sign; "K" – Map kiosk

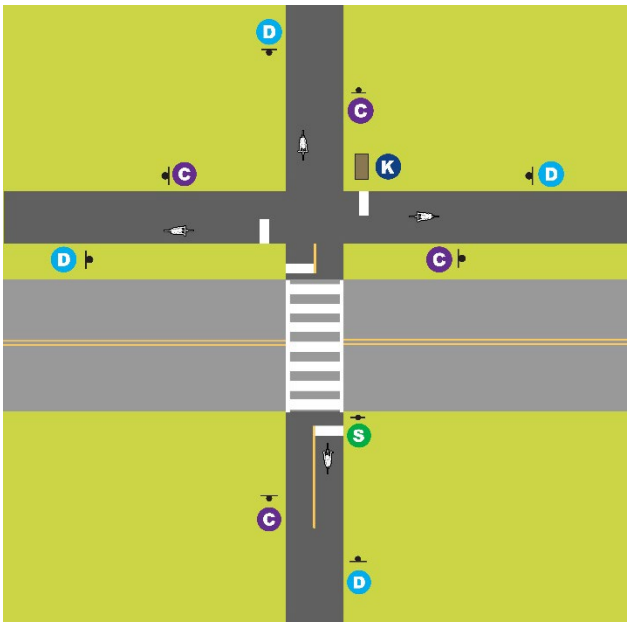

Figure 48.

PATH JUNCTION & MIDBLOCK CROSSING

In this scenario a shared use path crosses a roadway to intersect with a sidepath. A street name sign is provided for orientation at the crossing. Decision signs are placed in advance of the trail junction and crossing to aid path users approaching in all directions. Optional confirmation signs help assure users of being on the right route. Often located at trail junctions, a supplemental map kiosk can be provide much helpful information for trail use

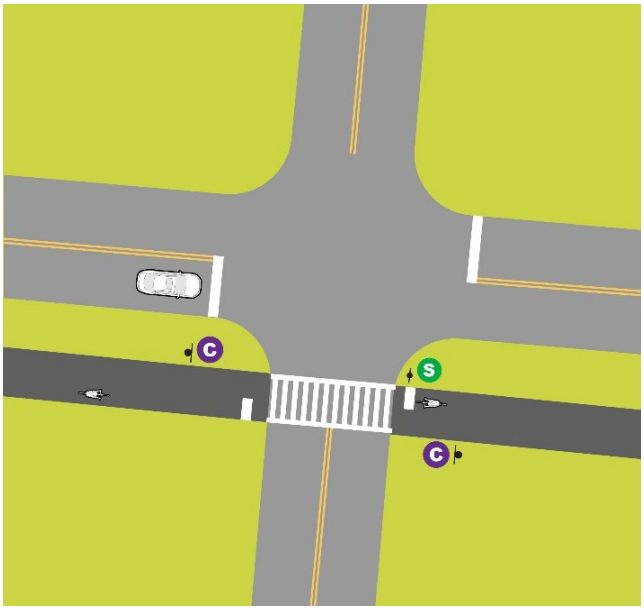

Figure 49.

SIDEPATH CROSSES INTERSECTION

Multiple signing options exist in this common scenario. A street name sign is placed at the trail when the intersection street name signs are not visible to path users. The street name sign, if branded for the path, may be the only sign needed. If desired, confirmation signs may be used to identify the path to both people on bikes and to passing drivers.

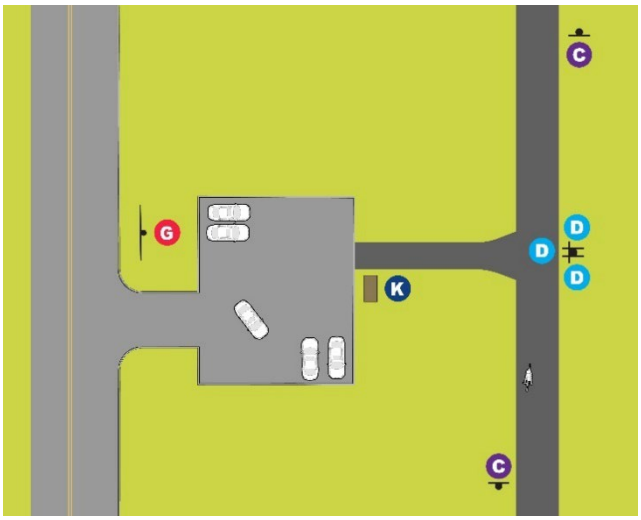

Figure 52.

TRAILHEAD WITH SPUR TO TRAIL

This scenario includes gateway and map kiosk supplemental signage to establish the presence of the trail and to provide navigational information. Decision signs at the junction of the spur and main path will help people on bikes determine their route from any approach. Decision signs with confirmation panels on top will help assure path users approaching from north or south that they continue to follow the correct route.

Optionally, standalone confirmation signs may be added to ensure path users that they made the right decision in turning onto their route.

Figure 50.

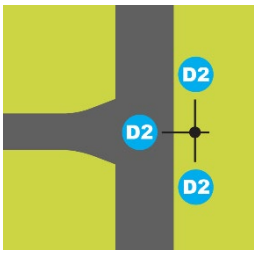

Figure 51.

Blade signs may be substituted for rectangular decision and confirmation signs. Following the example at left (Figures 51 and 52), a confirmation sign is used at the top to assure people who are already on the main trail that should continue through to stay on their route. The confirmation sign could be turned toward people on the spur to let them know they have reached the trail.

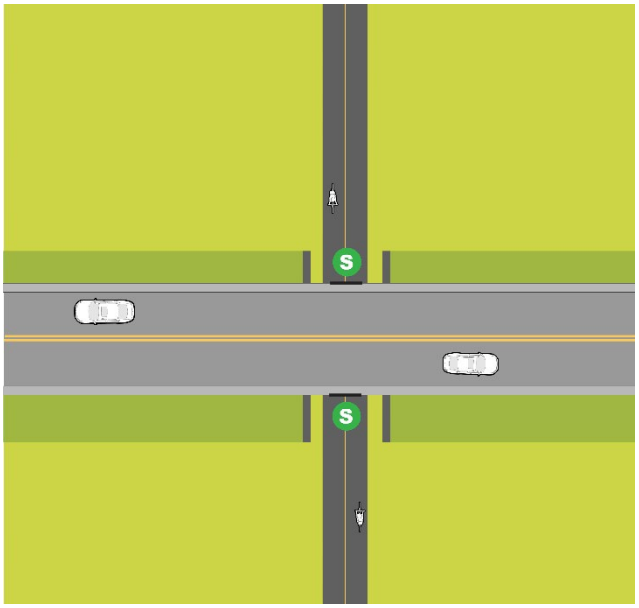

Figure 53.

TRAIL UNDERPASS

Street name signs overhead will orient people on bikes passing underneath a roadway.

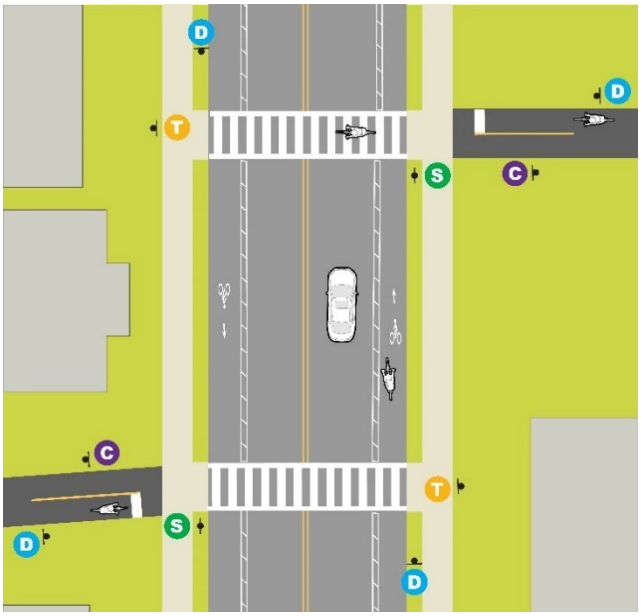

Figure 54.

TRAIL JOGS ACROSS STREET

On-street bike facilities are assumed to connect people on bikes with destinations to the north or south, so decision signage should be provided on all legs to help people navigate. Turn signs at the backs of crosswalks must be visible from across the road and will help show path users where their route continues. Confirmation signs should be included to reassure path users of having reached the correct leg of their path. Street name signs provide extra navigational context or, with route branding, may be used in place of confirmation signs.

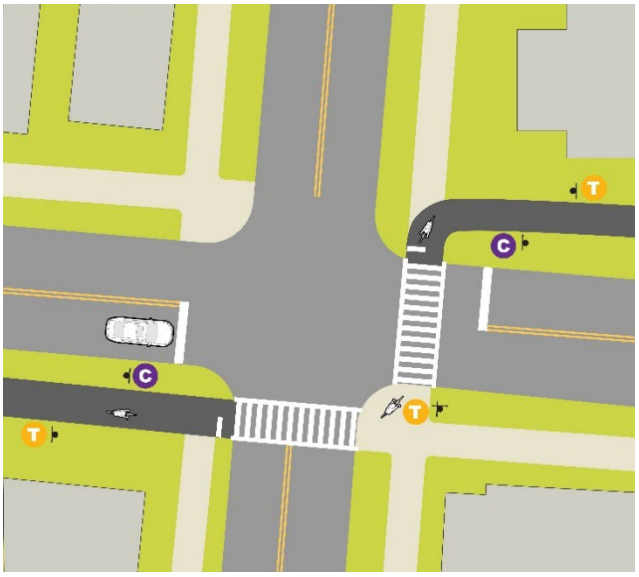

Figure 55.

TRAIL CROSSES TO DIAGONALLY OPPOSITE SIDE OF INTERSECTION

Turn signs are used in this case to guide people through the intersection. The turn signs in advance of the intersection are assumed to have straight arrows that point people across the crosswalk, where additional turn signs let them know where the trail continues. This scenario assumes that visibility across the intersection is low. Otherwise, path users on one corner will likely be able to see the opposite leg of the path. Extra signage may be needed to instruct people on bikes to use crosswalks.

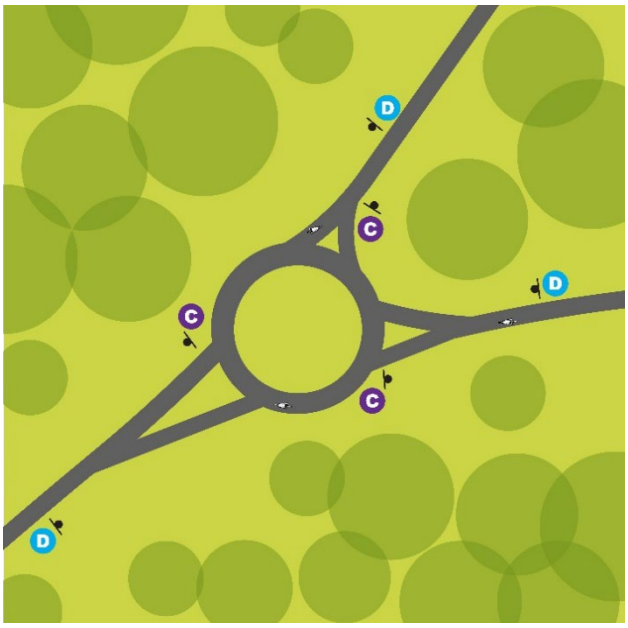

Figure 56.

BIKE ROUNDABOUT

The bike roundabout includes decision signage with unique fishhook arrows on all approaches and confirmation signs on all exits to ensure path users they have made the right decision.

7.4 SIGNING NETWORK GAPS

High-comfort, dedicated bike facilities will not exist from start to finish in and between most municipalities and destinations. In this case, wayfinding project managers must set priorities for wayfinding installation according to their knowledge of planned projects, budgets, and desired outcomes for cycling in their communities. Some suggestions are as follows:

Figure 57. R3-17 sign

- Where a shared use path meets a standard or paint-buffered bike lane that connects within .5 mile or less with another high-comfort segment, consider providing a regulatory R3-17 “BIKE LANE” sign along with decision signage that notes the distance to the destination/next high-comfort route, if it is named. If the original high-comfort route is a separated bike lane, just note the distance to the destination/next high-comfort route.
- Where a high-comfort route stops and meets a road with no bike facilities, but the road has:
    - An unused parking lane
    - A wide, bikeable shoulder
    - Clear sightlines between drivers and people on bikes
    - Low-medium traffic volume
    - And a destination/high-comfort route is available within .2 miles

  Consider providing decision signage that states the distance to the destination/next high-comfort route. Do not lead people on routes where riders’ safety and comfort is in doubt.
- Where a high-comfort route ends at a high-traffic location, such as a highway, without comfortable bike facilities, consider providing a D11-1c “[NAMED BIKE ROUTE]” sign plus a M4-1 “END” sign. Use signage to transition users to a sidewalk or another means to exit. If planning a high-comfort route, avoid ending it where no safe facilities exist or can be constructed in the short-term.

Figure 58. D11-1c and M4-1 signs to signal end of route

7.5 WEBSITES & SUPPLEMENTAL WAYFINDING TECHNOLOGY

Websites, web map services, and tag/code technology may be used to complement and enhance wayfinding systems by assisting in trip planning and awareness raising about the resources along a route. Advocates and municipalities should consider how the following web-based technology can benefit their trails.

Websites: The Commonwealth publishes information online about DCR-owned rail trails and other shared use paths. MassDOT encourages advocates to create websites to garner support and spread information for their trails. Websites can be used to:

- identify routes and make trail maps available interactively and/or for download
- provide information on hours, parking, rules, activities, facilities, services, and accessibility
- identify the advocacy and funding groups supporting trails
- describe segments of trails that are open or in planning or construction
- help potential riders understand what destinations and services they can expect to reach on a trail

Web map services: Municipalities and trail advocacy groups should ensure that trail route data is accurate and complete on popular online platforms, such as Google Maps. Many riders will use these services for trip planning.

Trailhead wayfinding support: At trail access points, consider listing website addresses or providing tag/code technologies on supplemental signs such as map kiosks. These addresses and tags may link to maps, apps, or websites with trail information, updates on trail condition and access, and short-term or special event information. This technology can include Quick Response (QR) codes and Near Field Communication (NFC) chip tags. Custom mobile apps can also be created which riders can download and allow Bluetooth beacons to automatically transmit pre-recorded information to their phones when in-range. This technology is rapidly evolving and should be carefully researched before implementation. Do not use web addresses or tag/code technologies on confirmation, decision, turn, or street name signs.

Establishing the digital presence of a trail is beneficial, but online content requires various levels of management and updating. Additionally, while many riders may follow real-time map directions given by a phone or other GPS-enabled device, many people on bikes prefer to stay disconnected from the internet while riding, and signage ensures that navigational information is available when phone signals are poor. Web-based technology is not a substitute for a well-planned wayfinding sign system.

8 MORE RESOURCES

For more resources on design and planning for bikes in MA, information on existing DCR trails, and how to apply for trails grants in the Commonwealth, check out the following resources:

DCR Greenways and Trails Program

Find DCR Rail Trails and Oher Shared-Use Paths

MassDOT Massachusetts Bicycle Transportation Plan

MassDOT Separated Bike Lane Planning & Design Guide

Interagency MassTrails Program

[i] Lidwell, W., Holden, K., Butler, J., & Elam, K. (2010). Universal principles of design: 125 ways to enhance usability, influence perception, increase appeal, make better design decisions, and teach through design.

[ii] Dill, J., McNeil, N. (2012). Four Types of Cyclists? Examining a Typology to Better Understand Bicycling Behavior and Potential. Transportation Research Board. Bicycles 2013: Planning, Design, Operations, and Infrastructure, 01514640, 129- 138.