BROOMFIELD WAYFINDING SYSTEM REPORT

12/12/22

PREPARED FOR

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TABLE OF CONTENTS

Introduction 1

The Benefits of Wayfinding 1

Project Background 2

Wayfinding System Existing Conditions 6

Existing Broomfield Wayfinding 6

Wayfinding Best Practices 18

Community Engagement 24

Stakeholder Engagement 24

Public Engagement 25

Community Engagement Findings 27

System Planning 28

Priority Routes Principles and Selection 28

Route Readiness 28

Destination Selection 31

Sign Family 34

Sign Use Guidelines 36

Sign Design 42

Sign Specifications 45

Sign Selection and Placement 60

General Guidance 60

Wayfinding Plan Scenarios 62

Fabrication, Installation, and Maintenance 64

Sign Installation Plan 64

Post Types and Installation 65

Maintenance 67

INTRODUCTION

This report is a compilation of best practices, existing conditions, design details, and guidance for planning and installing wayfinding signs and markings for active transportation in Broomfield. The implementation of a communitywide wayfinding system will help people walking, rolling, and bicycling navigate to their destinations more easily and intuitively.

Concept development for the sign designs and layouts were based on input Broomfield staff, stakeholders, and the public. The guidance includes sign fabrication materials, post styles, and installation and placement information. The phasing of sign installation is based on the highest value destinations, available funding sources, and best value of capital improvements for priority routes.

In addition to engaging with community members in person and virtually, the project team met several times with a Wayfinding Working Group, the Open Space and Trails Advisory Committee, and the Transportation Forum to inform the development of Broomfield's wayfinding system.

The planning process included:

- assessing existing conditions,
- identifying priority routes,
- selecting key destinations,
- creating a sign family,
- mapping and field-verifying sign locations, and
- creating deployment plans.

The recommended active transportation wayfinding system is based on route geography and conditions, applicable research, existing precedents, best practices, accessibility considerations, policy pertaining to wayfinding signage, and the 2019 Broomfield Bicycle and Pedestrian Assessment.

THE BENEFITS OF WAYFINDING

Wayfinding is an effective and affordable way to guide and assist network users, emphasize a local or regional brand, create a sense of place, and promote community/economic development. Wayfinding also provides the following benefits:

- Encourages people to bicycle and walk for transportation by highlighting low-stress routes which can provide a safer and more comfortable experience
- Gives users the confidence to explore farther than they ordinarily would
- Encourages exploration of key destinations that may be slightly beyond a user's planned route
- Reduces confusion at junctions
- Brings awareness to historical areas, landmarks, outdoor recreation, and natural areas for locals and visitors

PROJECT BACKGROUND

Community Visioning

The City and County of Broomfield adopted the *Broomfield Comprehensive Plan* in November of 2016. This document provides the framework for ensuring a sustainable future. The following vision statement guides this section of the plan:

> Broomfield is both destination and place to call home. Inclusive, creative, and safe. We skillfully connect people with each other, services, the environment, and historical roots. Beautiful landscapes, gainful employment, and attainable housing are complemented by evolving transportation options, trail systems, recreational opportunities, and the arts. A spirit of generosity and collaboration makes us a sought after place to live, work, and play.

The vision is supported by goals, policies, and action steps. Goal CF-A: Community Form and Identity is most relevant to wayfinding signage:

Community Branding

The City & County of Broomfield (CCOB) published a *Brand Book* in 2020 (amended in 2021) to establish guidelines for its brand. The goals of this effort were to achieve consistency across all materials developed by various Broomfield Divisions and Departments. The *Brand Book* provides standards and specifications for Broomfield's style and graphic personality in a variety of situations including signage. The guidelines intend to allow for flexibility and creativity even within the constraints of the brand requirements. The Communications Department must approve all exceptions to the requirements. All wayfinding designs contained in this document have been reviewed and approved by the Communications department, and may be considered as an extension of the Broomfield brand.

For the purposes of wayfinding, the design team has focused on integrating the following elements:

- Broomfield's logo
- Color palette
- Icons

Consistent and correct use of the brand improves recognition and builds trust in the wayfinding system, and in active transportation infrastructure generally.

Language

Broomfield follows the AP Style Book. For addresses, this means spelling out “Street”, “Boulevard”, “Avenue”, etc. unless they have an address number in front of them.

CCOB Logo

All communications should use Broomfield’s logo, including signage produced by the city. The logo contains a stylized “B” bounded by a triangular ribbon, which represent the city’s residents surrounded by the guarantee of health, safety, and welfare.

The following rules apply to the Broomfield logo (also see Figure 1):

- The logo should only ever be printed in Broomfield’s blue color with white or any Broomfield color as the background, or in white with Broomfield’s blue as the background.
- Positive blank space should be used around the logo. A circular seal should not be used.
- The logo should always be shown in its entirety, not without the text or just the “B” on its own.
- Proper circular proportions should always be maintained.

Figure 1: Broomfield logo usage guidelines

Font

Broomfield uses Trebuchet as its primary font, and Allura as an accent font. Trebuchet is readily available on most systems and applications and comes in a variety of weights and styles, which provides graphic flexibility. Trebuchet is considered “reasonably accessible” by ADA standards, and may be incorporated into map layouts to reinforce the brand. Wayfinding signage should minimize the use of Allura because it is not an accessible font.

Color

Broomfield's color palette contains "Broomfield blue" and six complementary colors developed with a Pantone Matching System (see Figure 2). The palette intends to reflect Broomfield's varied natural landscape.

The following rules apply to the use of color:

- Different colors should be used for specific programs. The Lake Link Trail uses Pool Teal in conjunction with Broomfield Blue backgrounds.
- Gray may be used as an accent color and gray tints as background colors.
- The use of too many colors for a single layout should be avoided.

Icons

Icons may be used to accompany text. Although not a common practice in Broomfield, wayfinding signage often uses icons to support legibility for users with limited English proficiency, in particular in the Trail Header signs and in maps. The Brand Book recommends the National Parks (NP) Map Symbol Library as a primary resource for icons or the Maki Icon Set for anything not found in the NP Set. Additionally, a custom symbol has been developed which is specific to biking/walking trails. This custom symbol should be used for identification, and not mixed in-line with the NPS or Maki icons.

ADA Guidelines

Finally, the *Brand Book* provides a section on the Americans with Disabilities Act (ADA) guidelines. As a government entity, Broomfield makes following the ADA guidelines a priority. Related to wayfinding signage, ADA compliance requires that font and color contrast are clearly legible and significant, which is commonly interpreted as a minimum of 70% contrast between text and background. White text on a Bloomfield Blue background yields an excellent contrast ratio of 95.9%. White text on a Pool Teal background yields a contrast ratio of 75%. For the purposes of signage, Pool Teal should not be used as text on a Bloomfield Blue background, or the reverse, as the contrast ratio would be insufficient for legibility. Additionally, left-aligned text is preferred. Messages should be clear and concise.

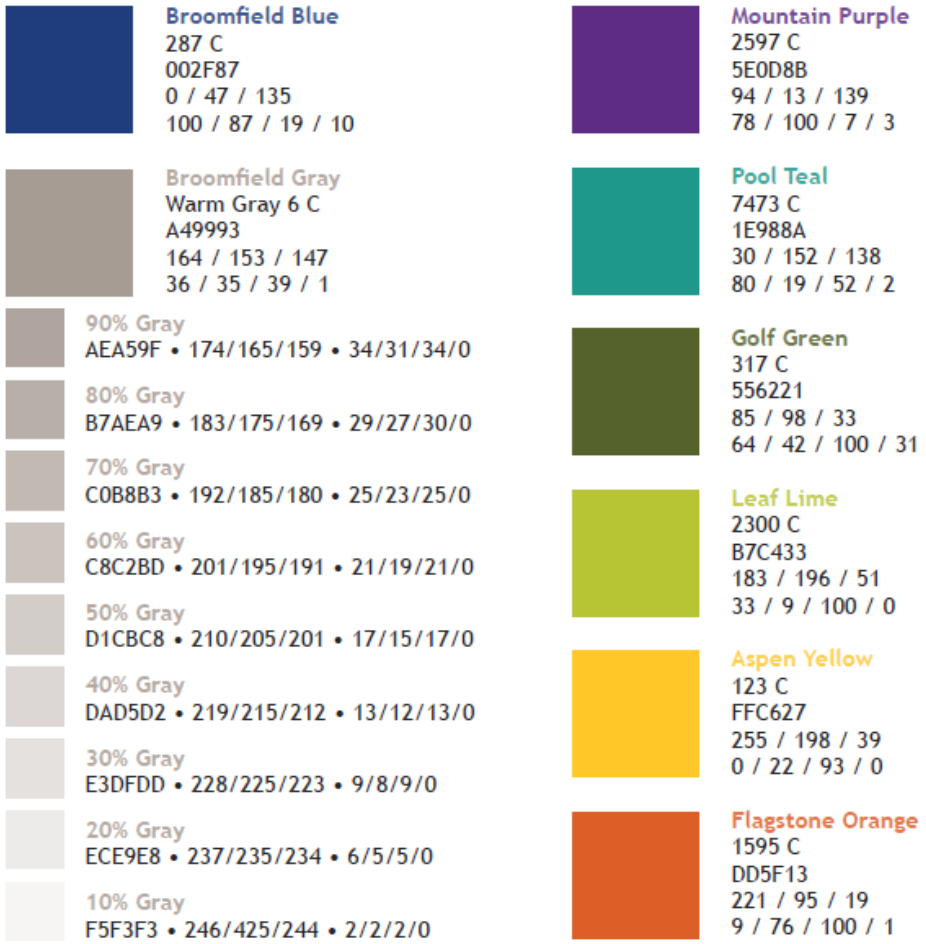


Figure 2: Broomfield color palette

Broomfield Municipal Code

Within Broomfield's Municipal Code, Chapter 44 of the Zoning Code is the City's Sign Code. The Sign Code contains legal regulations that apply to the display, construction, erection, alteration, use, location, and maintenance of all signs in Broomfield. The Sign Code is primarily intended for signs on private property that face the public right-of-way. Governmental signs to control traffic, identify streets, or for other regulatory purposes are exempt from the provisions of the Sign Code because they are already regulated by the Federal Highway Administration's Manual on Uniform Traffic Control (MUTCD, see page 18).

The Sign Code does state that one of the key purposes of signs is to assist and be an integral factor in helping to assure the implementation of the goals and policies of the comprehensive plan. Other purposes of the Sign Code include recognizing that signs are a necessary means of visual communication for the convenience of the public, ensuring that signs are compatible with adjacent land uses and with the total visual environment of the community, and promoting an overall visual effect which has a minimum of overhead clutter. Prohibited signage includes any structure that interferes with the view of traffic, the roadway, traffic control devices, or creates any other type of distraction or hindrance to roadway users. Kiosk signs are also prohibited except as a special exception in pedestrian-oriented areas, per code 17-44-330.

WAYFINDING SYSTEM EXISTING CONDITIONS

The City and County of Broomfield has an extensive trail network, a variety of on-street bicycle facilities, and an extensive sidewalk system that provide access to both local and regional destinations. Figure 1 shows a map of Broomfield's existing and proposed bicycle and pedestrian network, neighboring jurisdictions, and connectivity with regional trails.

In 2019, Broomfield completed the *Broomfield Bicycle and Pedestrian Assessment* that included the following:

- Inventory of the existing bicycle and pedestrian facilities in Broomfield
- Identification of deficiencies and missing links in the networks
- Public outreach process
- Development of a tiered bicycle and pedestrian network
- Identification and prioritization of capital projects related to bicycle and pedestrian facilities
- Developed a strategy to implement Broomfield's active transportation goals

The *Broomfield Bicycle and Pedestrian Assessment* identified wayfinding as part of the infrastructure implementation plan with the goal of improving walking and bicycling in the City and County of Broomfield. In particular, the plan recognized the importance of a wayfinding system to promote routing on low-stress, lower volume roads, neighborhood streets, sidewalks, and off-street trails.

EXISTING BROOMFIELD WAYFINDING

A field assessment was conducted to understand existing wayfinding signage and pavement markings in the City and County of Broomfield. The photos on the following pages illustrate some existing wayfinding elements including on-street signage, pavement markings, open space and trails signage, and specific district-branded signage. On-street signage is generally at the vehicle scale but is still useful for people walking and biking. A few of the major trails have decision, confirmation, and turn signs. However, many routes lack wayfinding at key decision points and a comprehensive system does not exist.

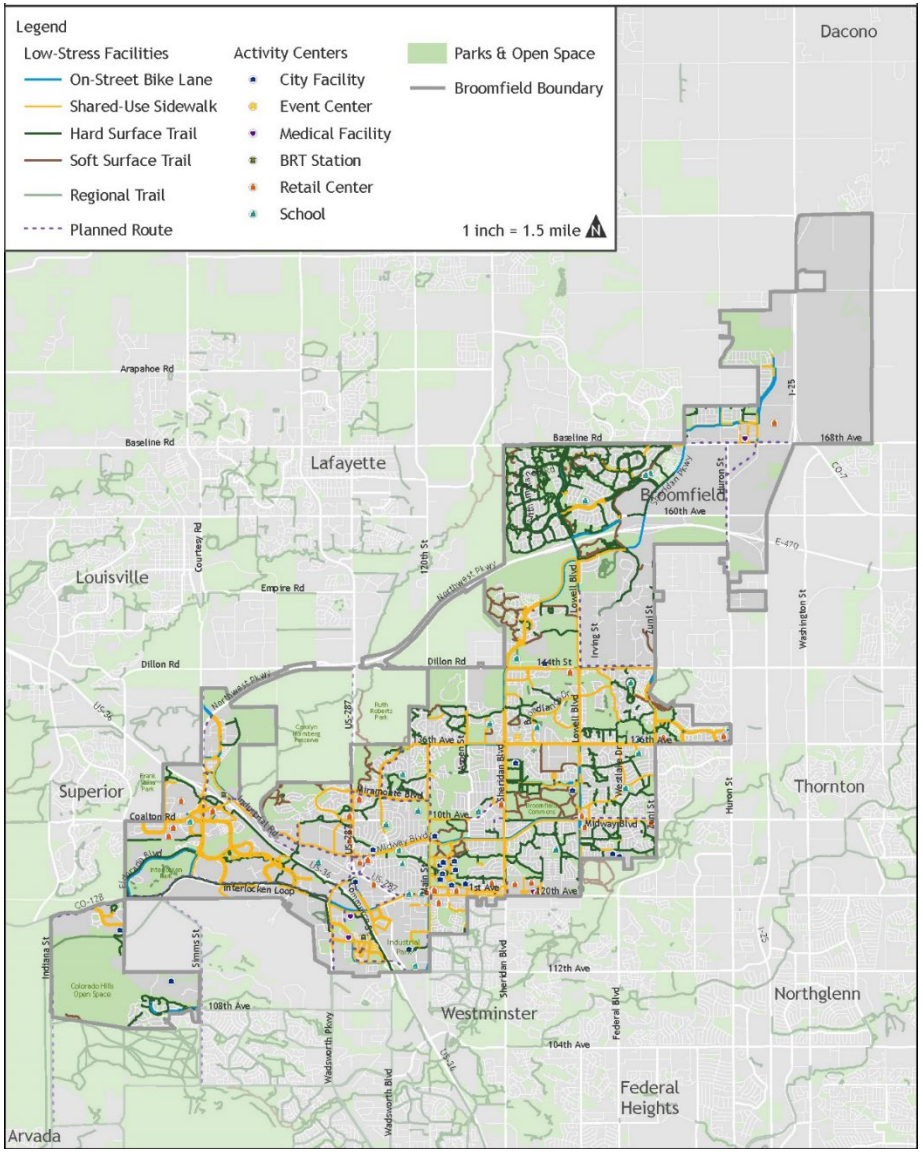


Figure 3: Existing Bicycle & Pedestrian Network

On-Street Signs

Most of the on-street signs in Broomfield are vehicle-oriented and are semi-custom (blue colored) MUTCD-compliant signs.

Street Signage

Neighborhood Street Signage

Vehicle Wayfinding

RTD Wayfinding

On-Street Pavement Markings

Some on-street bikeways include shared lane pavement markings. Shared lane markings alert drivers that bicycle traffic may be present and directs bicyclists to take the center of the lane. Some cities, like Portland, use shared lane markings to provide supplemental wayfinding. Bicycle lanes symbols are located within the bike lane and are typically marked at the end of each block to direct bicyclists into the lane and alert drivers of bicyclists using the roadway.

Shared Lane Marking

Bicycle Lane

Open Space and Trails Signage

The 2005 *Broomfield Open Space, Parks, Recreation and Trails Master Plan* established signage prototypes that have been implemented in open spaces and along many trails. The Lake Link Trail is one of the key trails that connects central Broomfield to US 36, traveling through many neighborhoods, parks, and past a few schools. The trail is comprised of both on-street bikeways and off-street trails that can be difficult to navigate. The addition of directional wayfinding elements such as pavement markings and enhanced signs at these navigational challenge areas would greatly enhance travel for people using the Lake Link Trail, thus making the experience more comfortable for all users.

Open Space Large Informational Sign

Open Space Small Informational Sign & Directional Signs

District-Branded Signs

There are several districts within Broomfield that have specific branding for wayfinding elements. These include the Civic Center area, Arista neighborhood near Broomfield Station, and Interlocken business park.

Civic Center Wayfinding

Arista Wayfinding

Interlocken Wayfinding

US 36 Bikeway

The US 36 Bikeway passes through Broomfield and provides regional access for people bicycling throughout the northwest metro region. The branding style of the Broomfield signs is designed to complement the US 36 Bikeway signage and create a sense of continuity through the region. The consistent design is intended to appear supplemental to the US 36 corridor and make the public aware they remain on a low-stress active modes route.

US 36 Bikeway Decision Sign

US 36 Bikeway Mile Marker Sign

Other Local Wayfinding

The following section describes wayfinding examples from other Front Range communities.

Northwest Corridor

In 2014, DRCOG completed the *Northwest Corridor Bicycle and Pedestrian Accessibility Study*, which included a *Branding and Wayfinding Report* with the goal of developing a wayfinding plan for the US 36 corridor to support the US 36 Bikeway, Flatiron Flyer Bus Rapid Transit (BRT) line, and future Northwest Rail Line (B-Line extension). The study focused on the station areas surrounding six BRT stations including the Broomfield Station and Flatiron Station, which are both in Broomfield.

In 2016, Commuting Solutions and the five Northwest Corridor municipalities involved in study received a grant to implement the concepts developed. Through a community-supported design process, the station kiosks, US 36 Bikeway signs, and the First and Final Mile signs were further refined and ultimately implemented around each station and along the Bikeway to help people walk and bike to and from the Northwest BRT stations. Installation occurred in 2018.

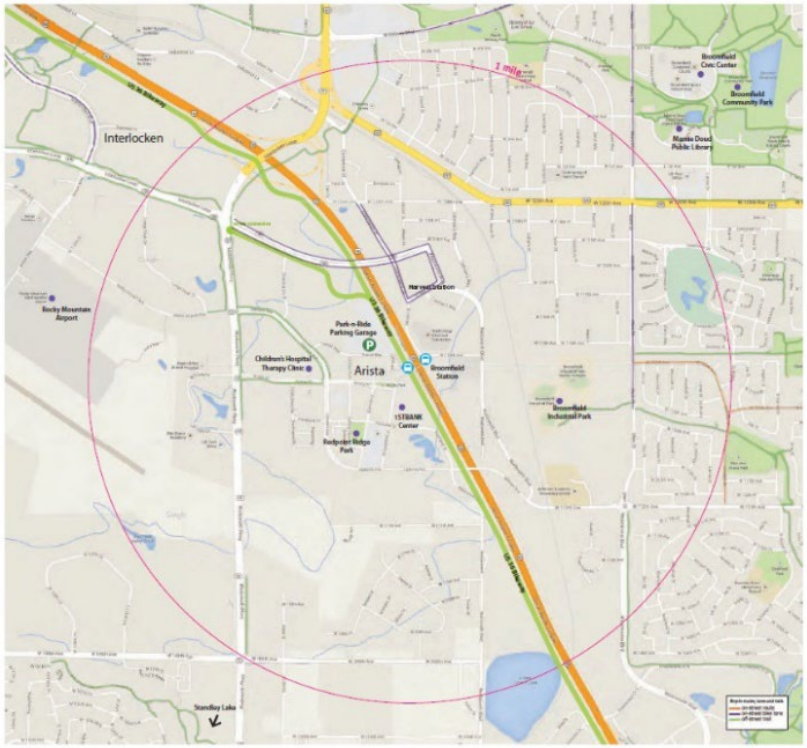


Figure 4: Map of Broomfield Station wayfinding study area

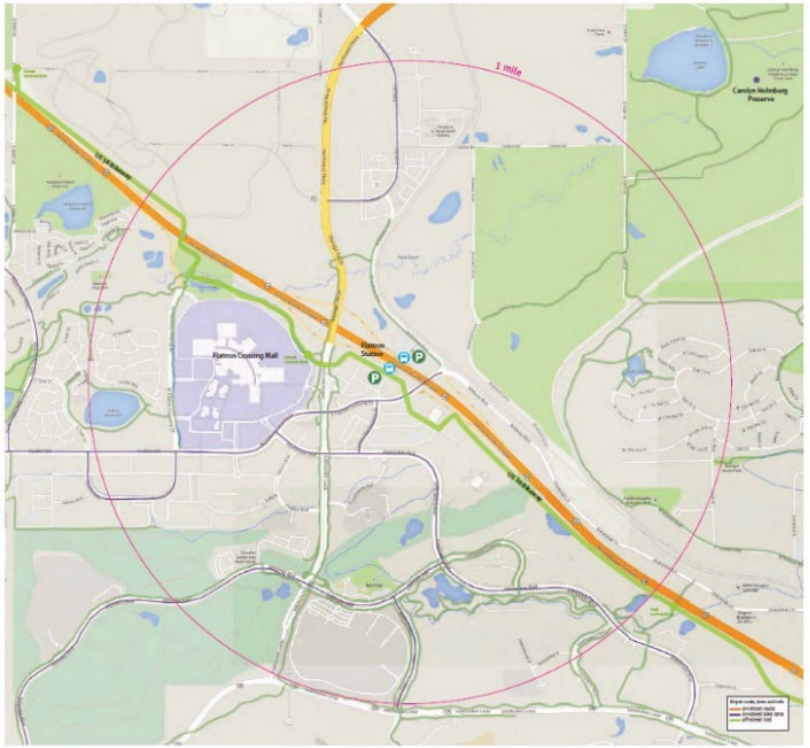


Figure 5: Map of Broomfield Station wayfinding study area

Broomfield Station

Recommendations for Broomfield Station focused on the pedestrian-oriented Arista neighborhood to the west of US 36. Key destinations included the 1STBANK Center, Children's Hospital Therapy Clinic, and Redpoint Ridge Park. The study also recommended identifying best routes for people biking from the station westbound to Main Street before placing any bike-oriented wayfinding signage. The Broomfield Station project area is shown in Figure 4.

Flatiron Station

The Flatiron Station area straddles Broomfield and Boulder counties. Flatiron Station was found to have an extreme lack of existing wayfinding signage, despite being well-served by bike facilities on either side of US 36. The Flatiron Station project area is displayed on the map in Figure 5.

Jefferson County

Jefferson County released their *Jeffco Regional Bikeways Wayfinding Guide* in October 2016. The guide identified priority routes in three tiered levels including the Big Dry Creek Trail that runs just south of Broomfield as a top priority route. Since many routes within Jefferson County had existing signage with their own wayfinding branding, such as the Golden Bikeways and Ralston Creek Trail, a supplemental Jefferson County branded marker and mile marker were developed to add to these routes. The Jeffco Regional Bikeways Wayfinding Family of Elements is shown at right.

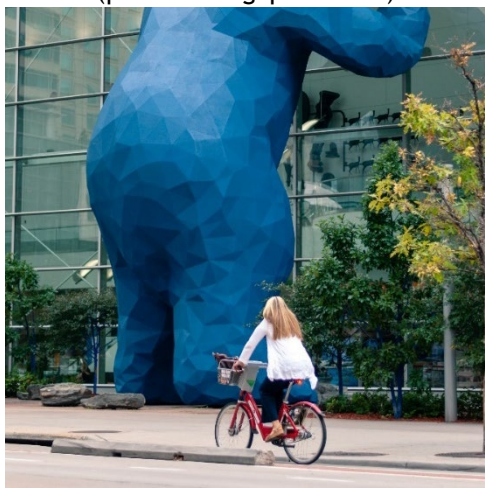
Figure 6: Jeffco Regional Bikeways Wayfinding Family of Elements

Other Local Examples

Fort Collins

Boulder

Denver (placemaking/public art)



Colorado Springs

Other Local Examples

Mary Carter Greenway Trail, Littleton

Big Dry Creek Trail, Westminster

Mary Carter Greenway Trail, Littleton

Big Dry Creek Trail, Westminster

Other Local Examples

Fort Collins (on-street)

Boulder (on-street)

South Platte River Trail, Denver (off-street)

Lakewood Gulch Trail, Denver (off-street)

WAYFINDING BEST PRACTICES

The following describes best practices related to wayfinding principles, sign family elements, placement recommendations, and destination prioritization. This review aims to explain what is involved in effective wayfinding using well-researched and proven practices.

Theory

According to the *Universal Principles of Design* (Lidwell, Holden and Butler, 2003) the basic process of wayfinding for all modes of travel should involve four steps.

1. **Orientation:** determining one's location relative to nearby landmarks and the destination. To improve orientation, wayfinding can rely on landmarks, which provide strong orientation cues. Maps can also help in the orientation step.
2. **Route Decision:** choosing a route to get to the destination. To aid in route decision making, minimize the number of destination choices, and provide signs or prompts at decision points. Maps can help improve route decision making.
3. **Route Monitoring:** confirming the chosen route will lead to the destination. "Breadcrumbs"—visual cues highlighting the path taken—can aid route monitoring, particularly to help people avoid backtracking to check if they are on the right path.
4. **Destination Recognition:** recognizing the destination. To aid people in destination recognition, give destinations clear and consistent markers, such as large gateway signs announcing each destination name.

Core Wayfinding Principles

To create a successful wayfinding system, it is helpful to keep several core guiding principles in mind. These principles can help focus the messaging and provide a framework for decision-making:

Principle 1: Keep it Simple

Easy to use and intuitive wayfinding helps travelers navigate and understand where they are in relation to nearby landmarks and destinations. Information should be clear, legible, and simple enough to be understood by a wide audience. Wayfinding must be concise, revealing enough information without overwhelming the user. Information on each sign should be kept to a minimum to avoid confusion and facilitate understanding. Wayfinding should also be placed efficiently to minimize sign clutter.

Principle 2: Be Consistent

Wayfinding signs should be predictable and consistent. When information is consistent, it can be recognized and quickly understood. Wayfinding signs should have common styles, fonts, colors, materials, and placement throughout a community to promote continuity and help users quickly understand and interpret messages. Sign frequency and placement should be consistent, so users know what to expect.

Principle 3: Design for the Inexperienced User

Wayfinding on trails should be designed for people who may be unfamiliar with the area and who prefer low-stress routes.

Principle 4: Be Inclusive

Signs that consider the needs of people with vision disabilities, or people with limited English proficiency, benefit everyone by ensuring large fonts that can be read from far away, strong contrasts between colors that make it easy to read, and the use of icons and graphics that aid in instant recognition.

MUTCD

The *Manual on Uniform Traffic Control Devices* (MUTCD) published by the Federal Highway Administration (FHWA) is the national standard for all the design and implementation of all traffic signs, signals, and pavement markings on any roadway or bikeway open to public travel. Having consistent sign and traffic control devices across the United States results in safer, more efficient travel. Part 9 of the MUTCD establishes standards and guidance for traffic control of bicycle facilities, including:

Regulatory Signs

Warning Signs

Guide Signs

Figure 7: MUTCD Standard Signs

Standards for Bicycle Guide Signs in Part 9 of the MUTCD:

Signs should list no more than three lines of destinations. A straight-ahead location should always be placed in the top slot of a sign, followed by left-turn destinations. Right-turn destinations are listed last. If two destinations are in the same direction, list the closer destination first. Position arrows for glance recognition: put straight and left arrows to the left of the destination name and right arrows to the right of the destination name.

Placement

Place bicycle guide signs so they do not distract from signs providing regulatory information to people driving cars. If the facility is two-way, provide signs displaying wayfinding guidance for and facing both directions of traffic. On curved alignments, determine the angle of placement by the direction of approaching users rather than by the roadway edge at the point where the sign is located.

MUTCD Community Wayfinding

The MUTCD also has a section on Community Wayfinding which provides standards and guidance for customized, branded wayfinding signs, which may be used on roads that are not freeways. Section 2D.50 of the MUTCD states:

> Community wayfinding guide signs are part of a coordinated and continuous system of signs that direct tourists and other road users to key civic, cultural, visitor, and recreational attractions and other destinations within a city or a local urbanized or downtown area.
> *Community wayfinding guide signs are a type of destination guide sign for conventional roads with a common color and/or identification enhancement marker for destinations within an overall wayfinding guide sign plan for an area.*

Though the Community Wayfinding section only currently applies to roadways, some communities interpret this section as providing guidance for customizing their bicycle wayfinding signs to include specific branding and flexibility in color and design, either as an element of one or more unique routes, or throughout their entire bicycle wayfinding system. The figure below illustrates the features of a community wayfinding sign. The background color of the sign may be customized but cannot use standard MUTCD colors that covey specific meanings to roadway users, such as red indicating stop. Prohibited standard colors include red, orange, yellow, purple, fluorescent yellow-green, and fluorescent pink. Enhancement markers may be any color, but the MUTCD recommends that enhancement markers occupy no more than 20 percent of the sign face on the top or side of the sign. Other features of the sign legend, such as the directional arrows, fonts, and layout are as dictated by the MUTCD.

Figure 8: Community Wayfinding Signs

Design Flexibility for Shared Use Paths and Trails

Though the MUTCD states that its standards apply to all traffic control devices on bikeways, in practice, wayfinding signage systems on paths usually do not follow strict MUTCD design standards. There are two main reasons for this:

First, the funding agencies for wayfinding systems on paths often do not have to legally adhere to MUTCD standards, and therefore may not be aware of these standards. Frequently, funds for path wayfinding come from State Departments of Natural Resources, local or regional parks agencies, or privately-raised funds.

Second, on paths and trails, many users are pedestrians, and some wayfinding systems are therefore designed exclusively for pedestrians. The MUTCD Part 9 does not cover pedestrian traffic control for paths. The MUTCD notes that pedestrian wayfinding signs may differ from bicycle wayfinding, such as by using smaller fonts and not including retroreflectivity.

The Colorado Department of Transportation should be consulted to verify that community wayfinding standards may be applied to bikeways while retaining eligibility for federal transportation funds. The photo examples below show a range of wayfinding signage from following MUTCD rigidly to not following the MUTCD.

Figure 9: MUTCD & Non-MUTCD wayfinding signage examples

Horizontal and Vertical Clearance

Mounting Height

Wayfinding guide sign mounting height and vertical clearance requirements vary by location. The minimum height, measured vertically from the bottom of the lowest sign on the assembly to the near edge of pavement or top of curb, are as follows for on-street signs:

Location	Minimum Height
Rural Areas	5 feet
Urban Areas (or where pedestrian traffic or parking is likely)	7 feet
Shared Use Path	4 feet

Sign placement and mounting height must meet pedestrian accessibility requirements. This is particularly important in urban areas where multiple sign panels are mounted on the same post and may be near pedestrian clear zones. See the proposed PROWAG and MUTCD Section 2A.18 and Section 9B.01 for more information.

Horizontal clearance

The MUTCD requires post-mounted signs on-street to be crashworthy if within the clear zone. The lateral offset, measured horizontally from the edge of curb to the left edge of the largest sign panel on an assembly, are as follows for on-street signs:

Location	Minimum Offset
Rural Areas	12 feet
Urban Areas (or where pedestrian traffic or parking is likely)	2 feet
Shared Use Path	2 feet

Visual characters on signs

Signs are more legible for pedestrians with low vision when the text contrasts as much as possible with their background. Upper-case letters on signs that are between 6-10 feet off the ground shall be at least 2 inches in height.

Pavement Markings

Directional pavement markings can confirm the designated route and supplement street signs to show where bicyclists should turn. Because they are not covered by MUTCD guidance, some communities use pavement markings to reinforce route branding or community identity.

Pavement markings can be used where a typical sign isn't practical or possible while maintaining direction to users. The use of pavement markings can limit the visual clutter of multiple signs in an open space or at the junction of trails. Because on-street markings are more separated from the posted signs, by nature of existing in the right of way, they tend to operate independently and therefore in repetition with other posted signs. These markings also inform drivers of the potential presence of bike users in the streetspace. Conversely, off-street markings are an excellent option for confirming route direction in longer stretches of trail without needing to post an additional sign.

On-street markings

The images below show different types of pavement markings that have been used for wayfinding purposes. While the shared lane marking, or "sharrow", is currently the only FHWA approved pavement marking shown, cities have experimented with the other options.

Portland has experimented with an adaptation of the standard sharrow for its bicycle boulevards by rotating the chevrons on top of the sharrow to indicate a directional change. Portland and Seattle both use thermoplastic bike dots to help indicate direction and lane positioning at challenging street crossings.

Standard

Non-Standard (Portland, OR)

Non-Standard (Seattle, WA)

Figure 10: On-street Pavement Marking Examples

Off-street markings

Some pavement markings, including off-street shared use path markings can add identity and branding to the route. While such markings are not included as traffic control devices within the MUTCD, numerous agencies around the nation follow such practices. Local examples of off-street pavement markings are shown earlier, and some additional examples are included below.

Due to potential obscuration via snow or leaves as well as general reduced visibility to off-trail users as compared to a posted sign, off-street markings should never operate alone at essential route points, such as direction changes or major intersection crossings.

Weir Gulch Trail, Denver

Centennial Trail, Spokane, WA

Cultural Trail, Indianapolis, IN

East Boston Greenway, MA

COMMUNITY ENGAGEMENT

Wayfinding is a powerful tool that can make active transportation more intuitive for everyone, especially for people who are new or less confident with walking and bicycling. Active transportation wayfinding systems should reflect the needs of ordinary people, including people in underserved communities. Public input and engagement can also garner support from the community for wayfinding system expansion.

Community engagement for the Broomfield Active Transportation Plan included engagement with the general public and with key stakeholders, including the Open Space and Trails Advisory Committee. Public input and feedback influenced the selection of priority routes, the identification of important destinations, and the creation of the sign family.

Figure 11: Project Teammates talk to residents at the Broomfield Brewhaha

STAKEHOLDER ENGAGEMENT

Wayfinding Working Group

The City and County of Broomfield chartered a Wayfinding Working Group to guide the planning and design process for the Broomfield Active Transportation Plan. The Wayfinding Working Group included representation from:

- City departments
  - Transportation
  - Open Space and Trails
  - Communications and Engagement
  - Library, Arts, and History
  - Public Works
  - Capital Improvements Program
  - Diversity, Equity, and Inclusion
- City committees
  - Open Space and Trails Advisory Committee (OSTAC)
  - Advisory Committee on Environmental Sustainability (ACES)
- Transportation management associations
  - Commuting Solutions
  - Smart Commute Metro North
- Chamber of Commerce
- RTD

The project team facilitated four work sessions with the Wayfinding Working Group (March 2021, July 2021, September 2021, and March 2022) to solicit input, review draft deliverables, and confirm next steps. The project team also met separately with Wayfinding Working Group members as needed. For example, the project coordinated route selection with the Library, Arts, and History Department to align a priority route with the proposed ARTery route.

Transportation Forum

The project team made one presentation to Broomfield's Transportation Forum in April 2021. The presentation introduced the project and presented existing conditions for wayfinding in Broomfield. The Transportation Forum comprises the Mayor of Broomfield, Broomfield City Council, the Denver Regional Council of Governments (DRCOG), RTD, and the Colorado Department of Transportation (CDOT).

Open Space and Trails Advisory Committee

In addition to the inclusion of two OSTAC members in the Wayfinding Working Group, the project team met with OSTAC three times (April 2021, August 2021, and October 2021). OSTAC provided feedback on the planning and design phases and supported ongoing community engagement.

PUBLIC ENGAGEMENT

The public engaged in the development of the Broomfield Wayfinding Plan in several ways—online and in person. Public engagement activities took the form of general information, open houses, questionnaires, and pop-ups.

General Information

The project team maintained a project webpage on Broomfield Voice, Broomfield's engagement platform. The webpage included information about wayfinding, it housed online questionnaires and interactive maps, and it provided information for ongoing engagement. The project team also installed yard signs at high-traffic locations to promote the Plan and direct people to the Broomfield Voice webpage.

In addition to the webpage on Broomfield Voice, Broomfield's Communications and Engagement team used social media to invite the public to participate in upcoming events and activities.

Figure 12: Yard Sign near a playground

Open Houses

The project team hosted two online open houses in July and October of 2021. During these open houses, the project team presented information about the wayfinding planning and design process and solicited feedback from participants.

Questionnaires

The Broomfield Active Transportation Wayfinding Plan's public engagement included three questionnaires, which were available online and in paper form. The questionnaires collected input and feedback from the public regarding:

- Priority routes and destinations
- Visual preferences for wayfinding
- Decision sign concept options

Pop-Ups

To maximize the number of people engaging with Active Transportation Plan, the project team hosted pop-ups at several community events in Broomfield and facilitated intercept surveys to collect additional feedback. The project team hosted pop-up booths at the following events:

- National Trails Day
- Library Summer Reading
- BrewHaha
- Library Summer Concert (2)
- National Night Out
- Broomfield Days

To collect feedback from passersby to influence the creation of the Broomfield active transportation sign and marking family, the project team staffed intercepts at the following locations:

- Lake Link Trail near Legacy High School
- Broomfield Community Center
- Broomfield Library

Figure 13 (left): Resident completes a Wayfinding Survey at Broomfield Days

Figure 14 (above): Project Teammates talk to residents at the Broomfield Brewhaha

Figure 15: Residents review Wayfinding Signage design at Trail Intercepts

COMMUNITY ENGAGEMENT FINDINGS

Community engagement influenced the Broomfield Active Transportation Plan in several important ways. Public input and feedback directly influenced:

- The identification of 11 priority routes for wayfinding and the most important destinations to be signed along those priority routes
- The development of the 4 wayfinding sign family options
    - Respondents to the visual preference survey stated their preference for more traditional, organic, and muted materials and colors.
- The creation of a single, preferred wayfinding sign family
    - Respondents to the decision sign concept options survey and people who interacted with the project team at intercept locations stated their preference for an identifiable sign topper, a bicycle/pedestrian icon, and a dark blue and teal color combination.

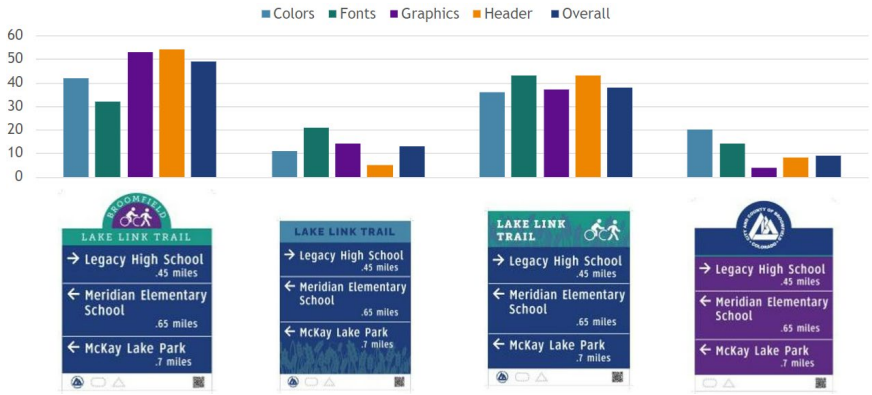


Figure 16: Decision Sign concept options survey results

SYSTEM PLANNING

PRIORITY ROUTES PRINCIPLES AND SELECTION

ROUTE READINESS

Considerations for bicycle wayfinding routes should include the following:

- Level of Comfort
- Proximity to Destinations
- Access to Bikeshare Stations
- Bicycle Volumes
- Route Topography

Level of Comfort

Bicycle wayfinding routes should include streets and shared use paths with favorable conditions for safe and comfortable bicycling, including those with dedicated bicycle facilities, low motor vehicle volumes, low traffic speeds, or enough width for shoulders or appropriate lane sharing. High-stress routes for bicyclists that include difficult crossings of highways and arterial roadways should be avoided.

The PeopleForBikes Bicycle Network Analysis (BNA) online tool, accessible at bna.peopleforbikes.org, may be used to identify high-comfort, low-stress bicycling routes. The tool shows high and low-stress streets in Broomfield based on OpenStreetMap data. The City may wish to modify the rating based on its own knowledge of local conditions.

Bicycle Volumes

Existing facilities with high volumes of bicyclists are often ready for wayfinding application, as they often act as primary routes that connect to existing bike facilities and are near destinations. Expected use should also be considered, as low-stress routes identified during the routing process can increase bicyclist volumes with the addition of wayfinding signs.

Routes with high existing or expected bicyclist traffic can be identified by reviewing Strava data, local bicycle counts, PikeRide data (though the services area is limited), or information provided by the City or stakeholders.

Topography

Local topography should also be considered when determining bicycle wayfinding routes. Routes that include continuous steep grades should be avoided to accommodate a broader range of ages and abilities. Using an alternative route or “stair stepping” a route, though it may add complexity and increase trip length, can minimize steep grades and improve comfort.

“Weak Links” in the Route Network

High-stress routes that are critical to connecting destinations should be flagged as barriers, or “weak links,” to the wayfinding network, and appropriate design changes or spot treatments should be applied before wayfinding is implemented along these routes. Bicycle wayfinding signs are useful for a variety of purposes, but they should not be considered a stand-alone alternative or substitute for safety improvements.

Non-Contiguous Route Sections

Wayfinding can be used to connect segments of a bike network by taking advantage of existing low-stress streets and paths. These connections can often be identified in the field and may require additional informative signs that direct users to use curb ramps or sidewalks to continue along a signed route. Where pedestrians are expected on the sidewalk and bicyclists are expected in the street, on-road pavement markings may be necessary in addition to sidewalk markings and signage to guide both user types. Public input can also be useful for identifying route connections that may otherwise be difficult to identify in a desktop review or field visit.

DESTINATION SELECTION

Connecting places is the first core principle of bicycle wayfinding system design. Determining where bicyclists are trying to go will ultimately inform their desired route, which is why destination selection typically comes prior to route selection.
These guidelines describe the approach used to select and prioritize potential destinations to be included on the wayfinding signs.

Types of Destinations Considered

- Parks
- Business districts
- Major sports venues
- Major bikeways
- Well-known landmarks
- Schools & universities
- Libraries

It is typically best to limit the inclusion of privately held destinations, such as commercial businesses, on wayfinding signs. Usually there are too many to choose between, and decisions on which are and are not included can risk the appearance of partiality by the government. Additionally, the frequent turnover of businesses can make their inclusion an expensive proposition as updates to wayfinding signs would be required frequently. In most cases, a general district, such as "High Street Shopping" may be signed to, as businesses tend to be located near one another. If more specifics are desired, it is recommended to use symbols (such as for dining, shopping, drinking, etc.) instead of specific names. Symbols may also be more easily included on maps than in directional signage.

Hierarchy of Destinations

Potential destinations can be assigned to one of three groups, Level 1 (Primary) – Citywide/Regional Destinations, Level 2 (Secondary) – Local Destinations, and Level 3 (Tertiary) – Neighborhood Destinations, based upon their usefulness as navigational references for bicyclists and their likelihood of being origins or destinations for bicycling trips. The hierarchy will determine how far from the destination references to it will appear on wayfinding sign panels and is meant to help planners decide which destinations are included on wayfinding signs.

The general hierarchy of what to include in Primary, Secondary, and Tertiary destinations will vary depending on whether the bike route is in the more urban, suburban, or rural part of Broomfield. In urban areas, destinations are close together and only the most regionally-significant destinations should be noted as Primary destinations. However, in rural areas, destinations are sparsely spaced. Neighborhoods and small, local parks should be included on wayfinding signage as Tertiary destinations to help as both navigational aids and informational aids for bicyclists to know where they can access services such as water and bathrooms.

To establish a hierarchy, consider the following:

- How well-known is the destination and how useful is it as a navigational reference? The most well-known destinations and most useful navigational references should be in the **Primary** destination group.
- How many people are likely to visit the destination annually? Is the destination commonly accessed by bicyclists and pedestrians? Does the route provide good access to the destination? The venues with the most visitors, especially ones who arrive by bicycle, should be in the **Primary** or **Secondary** destination group. If the destination is likely to be visited only by bicyclists who live or work nearby, it should be considered a **Tertiary** destination.
- If the destination is a bikeway or a bike trail, how well-known is it? How many people use it? Is it part of a statewide or national bikeway network?

Level 1 (Primary)—Citywide/Regional Destinations

Primary destinations include cities, regional destinations, or other major destinations. These are often the key destinations included on most signs and establish the origin and destination of a route. Including primary destinations on wayfinding signs helps a rider identify where a route is ultimately going, and where they can expect to go if they continue along the main bicycle route. These destinations can be five miles away or more when a rider begins to see signs for primary destinations along the route.

Level 2 (Secondary) —Local Destinations

Secondary, or Level 2 destinations, often include districts, neighborhoods, and major landmarks. These destinations can be signed to from up to two miles away, and often include parks, major shopping districts, etc.

Level 3 (Tertiary) —Neighborhood Destinations

Tertiary, or Level 3 destinations, include pocket parks, small schools, and other minor landmarks that may only be visited by bicyclists who live or work nearby. These destinations may only be listed on wayfinding signs that are within a quarter mile or two blocks. Neighborhood destinations within a quarter mile may not be listed if the wayfinding sign assembly already includes three destinations.

Standards for Measuring Distance to Destinations

A core principle of wayfinding sign design is progressively disclosing information by not overwhelming the bicyclist 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.

Distance to Destination

In many cases, sign designers will have more possible destinations that could be included in a wayfinding assembly than space available for them. The destination hierarchy should guide the designer when deciding at what distance destinations should be included on wayfinding signs. Suggested distance guidelines for the urban/suburban and rural destination hierarchy are displayed in the figure on the following page. In practice, however, the distance at which each destination appears on wayfinding signs will require the judgement of the person or committee who is planning the wayfinding along the bikeway.

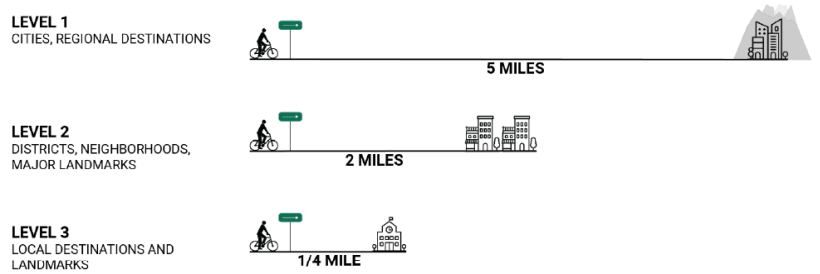


Figure 17: Destination Hierarchy

Measure-To Points

If the destination is a neighborhood, municipality, or a large park, designers will have to establish a measure-to point.

- For large parks or facilities, it may make sense to measure distance to the main entrance.
- For smaller destinations, the measure-to point may be the front door.
- The distance to a city, district or neighborhood should be measured to the area's center point, as is the practice in highway wayfinding; Google Maps' bicycle navigation feature also measures distance to the city's center point.

Establishing measure-to points after identifying destinations will keep the distance measurements consistent throughout the bicycle wayfinding network.

Destinations Along and Adjacent to Identified Bicycle Routes

Destinations along the main spine of the bicycle route, or within one turn off the route are very simple to sign. For routes that are adjacent to the route, but not along the main spine of the route, the designer should consider if it's easily navigable to reach the destination with minimal signs.

- If the route ends before reaching the destination but the path between is a straightforward one, sign through to the destination
- If several turns are needed between the path and the destination, consider installing additional signs along the route
- If signing the route is not an option, consider installing a map kiosk at the nearest major entry/exit from the path, to help users plan their own route there.
- If none of the above are possible, remove the destination from wayfinding signage.

SIGN FAMILY

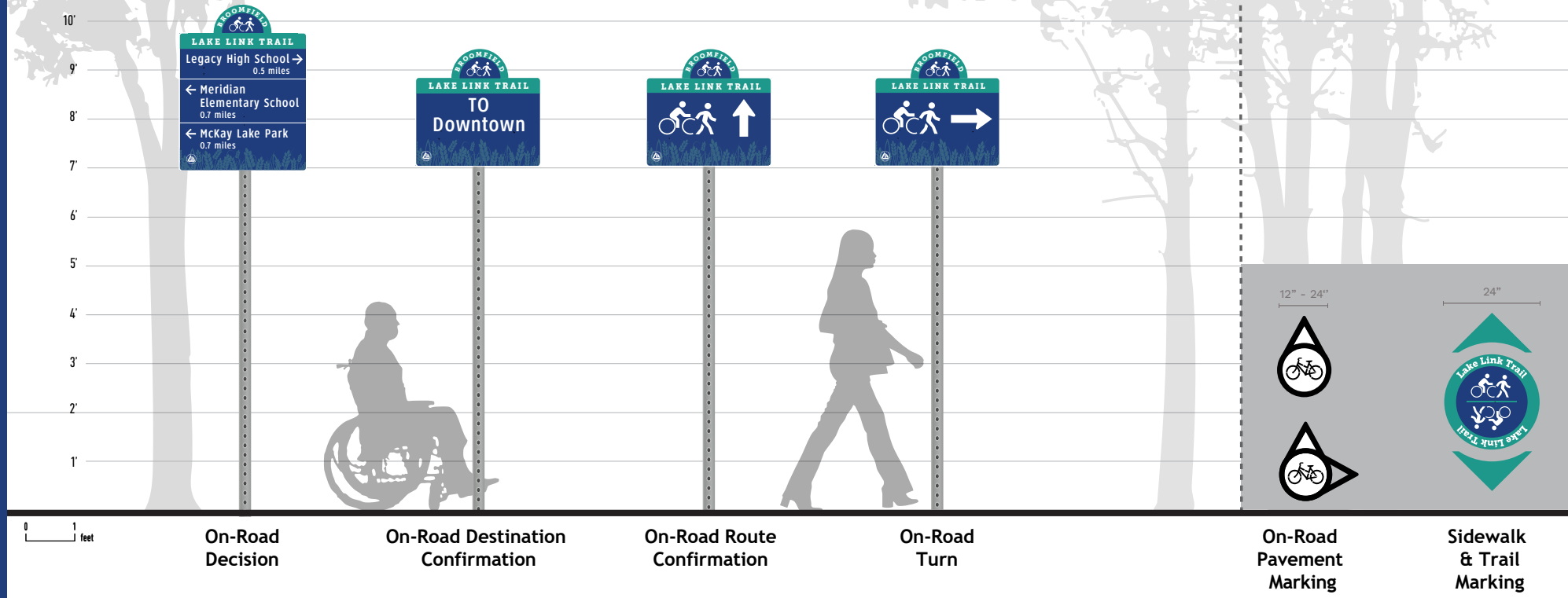
ON-ROAD SIGN PANEL: 1/8" ALUMINUM, DIGITALLY PRINTED ON 3M 3930 High Intensity Reflective SHEETING (OR SIMILAR), UV COATING

On-Road Signs

These sign types are intended to be used along the right of way immediately adjacent to roads where automobiles will be travelling, and are the appropriate selection for bike lane facilities. These sign types have been designed for placement on sidewalks or parkways adjacent to heavier pedestrian traffic.

Pavement Markings

May be used to supplement wayfinding signage whether on road or on trail.

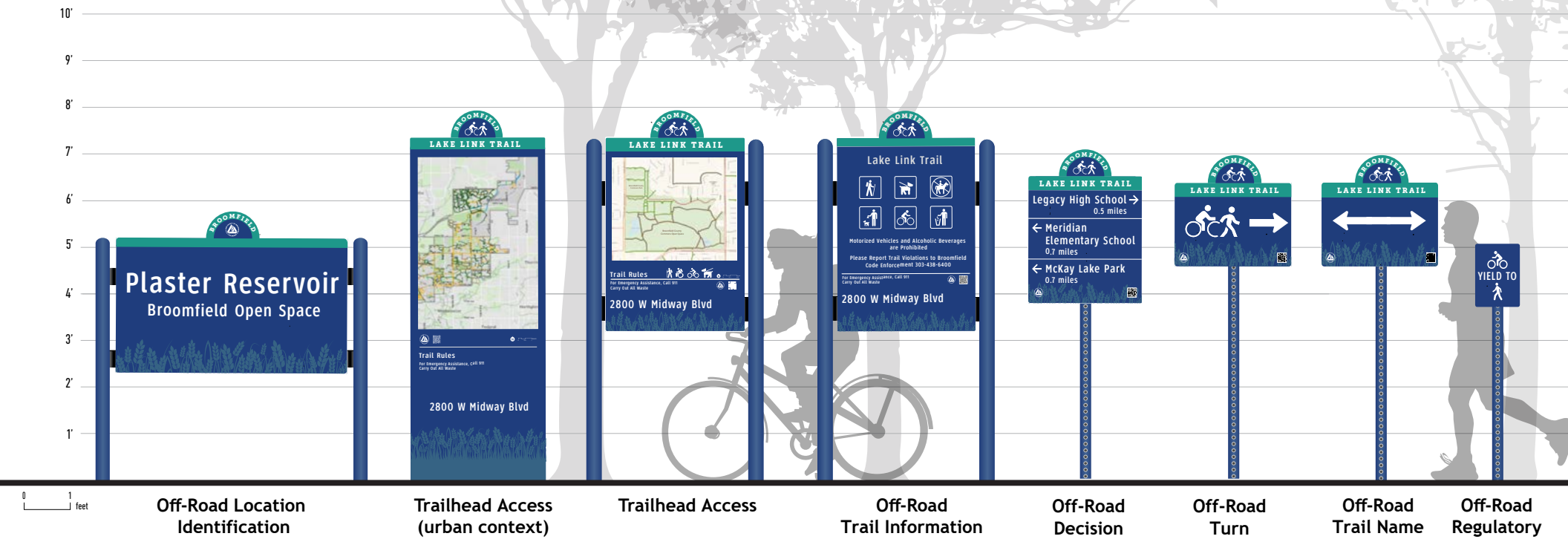


On-Road Decision | On-Road Destination Confirmation | On-Road Route Confirmation | On-Road Turn | On-Road Pavement Marking | Sidewalk & Trail Marking

OFF-ROAD SIGN PANEL: 1/8” ALUMINUM, DIGITALLY PRINTED ON 3M 680 REFLECTIVE FILM (OR SIMILAR), UV COATING

Off-Road Signs

These sign types are intended to be used along separated bicycle pathways and multi-use trails, where signs will typically be surrounded by planting. These signs have not been designed to meet accessibility standards for placement within the path of travel, and should be placed with that in mind.

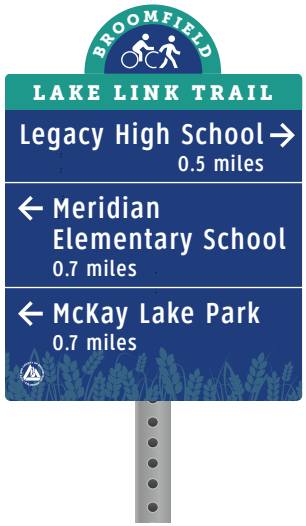


Off-Road Location Identification | Trailhead Access (urban context) | Trailhead Access | Off-Road Trail Information | Off-Road Decision | Off-Road Turn | Off-Road Trail Name | Off-Road Regulatory

SIGN USE GUIDELINES

On-Road

Applies to on-street bike lanes, regional routes



On-Road Decision

DESCRIPTION: Decision signs inform users of route choices at junction.

WAYFINDING STEP: Orientation and Route Decisions

HOW TO USE

At intersections to indicate the overall direction of a route towards and end destination, and identify nearby destinations by direction and distance.

Directions on these signs will point to immediate destinations or to farther destinations along the network, including unnamed trails.

PLACEMENT GUIDELINES

Advanced placement is preferred in accordance with the guidelines detailed in section section 5, Sign Selection and Placement, but signs may be placed directly at a junction to serve more than one direction of travel.

Double-sided (two sign faces mounted in opposite directions on one post) may be used to serve users in multiple directions of travel.

The maximum number of destinations on one sign is three.

On-Road Destination Confirmation

DESCRIPTION: Destination Confirmation signs indicate the overall direction of travel via end-point destinations in or near the network.

WAYFINDING STEP: Route Monitoring

HOW TO USE

Display destinations that are significant to the area such that orientation and navigation is clear relative to these landmarks.

PLACEMENT GUIDELINES

Place after a complex segment of trail where there is not a Trailhead Access or Decision Sign to orient users.

Use in winding or looping areas of trail where there is low visibility or the need to turn in an unexpected direction (turning left to eventually go right) to reassure users that they are moving in the correct direction.

On-Road Route Confirmation

DESCRIPTION: Route confirmation signs reassure network users that they are going the right direction.
WAYFINDING STEP: Route Monitoring
HOW TO USE
Provide verification along a route, after a turn, or near a large intersection or crossing.

PLACEMENT GUIDELINES
Mark the start of an on-road route
Use as “breadcrumbs” in long stretches of the trail without other signage in accordance with sign frequency guidance detailed in section section 5, Sign Selection and Placement.
Place in the tree lawn where the network has sidewalk and on-road bike lanes to be visible to both user groups.
Double-sided (two sign faces mounted in opposite directions on one pole) may be used to serve users in multiple directions of travel.

On-Road Turn

DESCRIPTION: Turn signs indicate when the bike route turns to a different road or where a bikeway or trail changes from a dedicated trail to a roadway.
WAYFINDING STEP: Route Decision and Route Monitoring
HOW TO USE
Place anywhere users may be confused about which direction the trail follows and are intended to show users how to stay on the network.

PLACEMENT GUIDELINES
Place where multiple paths of the same surface material and relative width join and the correct direction to stay on the network is not clear.
Not needed in locations where the main trail is obvious, at bends and curves without additional joining paths, or where the trail splits for a short, visible length with both routes as a safe option.
Limit the number of signs at switchback and s-curve locations where a sign at each end will suffice.

Off-Road

Applies to hard surface, soft surface trail

Off-Road Location Identification Sign

DESCRIPTION: Identification signs name a specific destination. Location identifiers also serve as de facto meeting points.

WAYFINDING STEP: Arrival

HOW TO USE

At major trail destinations to confirm arrival.

PLACEMENT GUIDELINES

May be placed at the entry to a destination. Where a trail leads directly to the destination, should be placed far enough off trail that those using it as a meeting point will not block trail use.

NOTE: This sign will be produced as needed by the City of Broomfield Open Space and Trails Department to replace existing signage.

Trailhead Access (Trail & Urban Contexts)

DESCRIPTION: Trailhead Access signs provide orientation information with a map of the surrounding area and active modes network.

WAYFINDING STEP: Orientation and Safety, Rules, and Regulations

HOW TO USE

To help network users locate a broader range of destinations on and adjacent to trails, and identify trail amentities such as stopping areas with parking, rest, and other facilities. Trailhead Access signs also present important information like trail rules, open hours, and safety tips as well as the nearest address for navigation and emergency services.

PLACEMENT GUIDELINES

At trail entrance or access points near facilities (bathrooms, bike racks, shelter, etc.

Offset from the trail or along wide trails such that people stopping to read the map will not block other users.

NOTE: Maps and addresses displayed on signs included in the sign family and on the sign layout pages are used only to exemplify what signs might look like. Scale of maps and addresses displayed in this document are not accurate and should not be reproduced.

Off-Road Trail Information

DESCRIPTION: Trail information signs provide information about the trail and have the physical address to support emergency access system.

WAYFINDING STEP: Safety, Rules, and Regulations

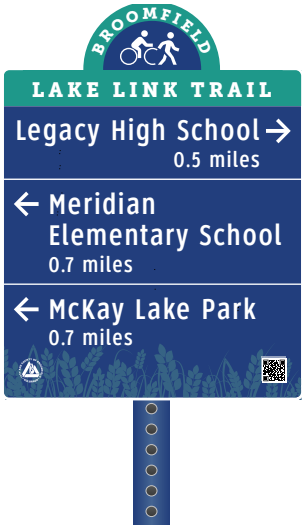
HOW TO USE

At major trail points or waysides to provide relevant rules and regulations, trail etiquette information, general safety tips, and contact information for emergencies or maintenance.

PLACEMENT GUIDELINES

Far enough off the trail so that people stopping to read the sign will not block the trail.

NOTE: Maps and addresses displayed on signs included in the sign family and on the sign layout pages are used only to exemplify what signs might look like. Scale of maps and addresses displayed in this document are not accurate and should not be reproduced.



Off-Road Decision

DESCRIPTION: Decision signs inform users of route choices at junction.

WAYFINDING STEP: Orientation and Route Decisions

HOW TO USE

At intersections to indicate the overall direction of a route towards and end destination, and identify nearby destinations by direction and distance. Directions on these signs will point to immediate destinations or to farther destinations along the network, including unnamed trails.

PLACEMENT GUIDELINES

Advanced placement is preferred in accordance with the guidelines detailed in section 5, Sign Selection and Placement, but signs may be placed directly at a junction to serve more than one direction of travel Double-sided (two sign faces mounted in opposite directions on one post) may be used to serve users in multiple directions of travel.

The maximum number of destinations on one sign is three.

Off-Road Turn

DESCRIPTION: Turn signs indicate when the bike route turns to a different road or where a bikeway or trail changes from a dedicated trail to a roadway.
WAYFINDING STEP: Route Decision and Route Monitoring
HOW TO USE AN ON-ROAD TURN SIGN
Place anywhere users may be confused about which direction the trail follows and are intended to show users how to stay on the network.

PLACEMENT GUIDELINES
Place where multiple paths of the same surface material and relative width join and the correct direction to stay on the network is not clear.
Not needed in locations where the main trail is obvious, at bends and curves without additional joining paths, or where the trail splits for a short, visible length with both routes as a safe option.
Limit the number of signs at switchback and s-curve locations where a sign at each end will suffice.

Off-Road Trail Name Sign

DESCRIPTION: Trail Name signs primarily inform users arriving to the network from other sidepaths.
WAYFINDING STEP: Route Monitoring
HOW TO USE AN OFF-ROAD TURN SIGN
When there are long stretches of a trail route without any turns or other route signs, to indicate the dual-direction and continuation of the trail.
PLACEMENT GUIDELINES
Parallel to the trail where sidewalks and paths join the network.

Double-sided (two sign faces mounted in opposite directions on one pole) may be used at 4-way trail intersections to serve both legs of a crossing sidewalk or path.
Not utile to users on the trail except in select locations where the sign is both parallel to the route and visible to route users. This sign may be placed below, and perpendicular to, other sign types at T-intersections.

Off-Road Regulatory Signs

DESCRIPTION: Regulatory signs provide information about trail traffic rules that must be followed for the safety of all network users.
WAYFINDING STEP: Safety, Rules, and Regulations
USE AN OFF-ROAD REGULATORY SIGNS
At junctions and major trail access points or waysides

PLACEMENT GUIDELINES
Advanced placement is preferred in accordance with the guidelines detailed in section x, Sign Placement Guidance, or where bikes and pedestrians must merge onto one trail.

Pavement Markings

Applies to streets, sidewalks, and off-road trail segments

On-Road Pavement Marking

DESCRIPTION: Pavement markings indicate where users can or should go in the network.

WAYFINDING STEP: Route Decision and Route Monitoring

HOW TO USE AN ON-ROAD PAVEMENT MARKING

Can be placed on any paved surface but are intended for roadways and intersections.

PLACEMENT GUIDELINES

Similar to sharrows in roadways where it is safe and preferred for bike users to travel

Single marking with two arrows on roadways without a centerline

Double markings (one in each lane) with single arrows on roadways with centerlines

Quarter-mile distance between each single or paired marking

In the middle of the intersection with arrows clearly pointing to legs of the network

Trail/Sidewalk Marking

DESCRIPTION: Trail and sidewalk markings are complimentary to other signs and can provide directional information and route confirmation.

WAYFINDING STEP: Route Monitoring

HOW TO USE A TRAIL/SIDEWALK MARKING

Preferable in areas with many posted signs to reduce post density.

PLACEMENT GUIDELINES

On paved surfaces, including sidewalks and paved trails

Arrows may be rotated to indicate precise direction

Additional arrows may be added where routes intersect or there are multiple trail direction options

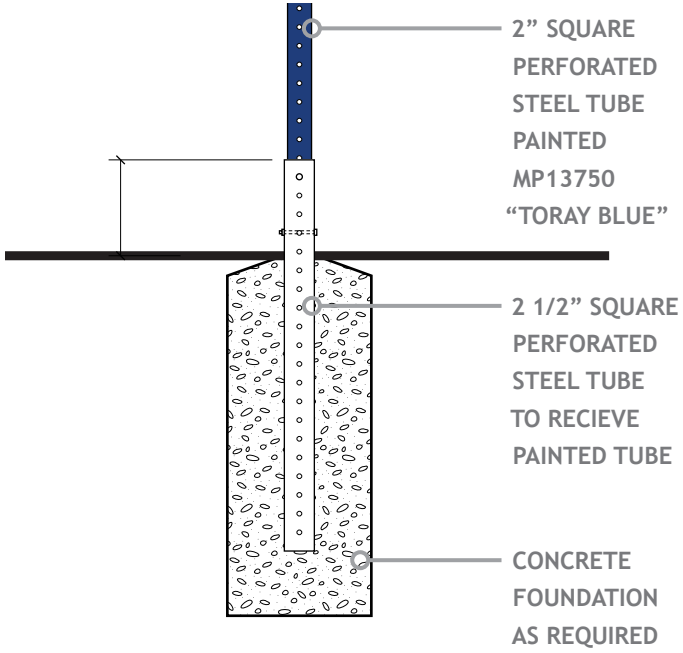
SIGN DESIGN
Typical Fabrication Strategies

MATERIALS

- Sign panels to be 1/8” aluminum
- Layouts/messages for on-street applications are to be digitally printed on 3M 3930 high intensity reflective sheeting (or approved equal). For off-street applications and 3M 680cr retro reflective vinyl with 8518 luster overlaminate (or approved equal)for off-street applications, securely mounted to sign panel, and laminated with UV coating
- On-road signs to be mounted to 2” perforated square tube post
- Off-road sign posts to be painted with Matthews Paint MP13750 “Toray Blue.” Where off-road signs are mounted to a single post, that post is a 2” perforated square tube. Where off-road signs are mounted between two posts, those posts shall be 4” round tubes with rounded caps, also painted.
- Painted posts shall not extend into post foundations, to allow for the replacement or repainting of the painted post without impact on the foundation. See detail at right.
- Where back of off-road signs is highly visible, the back and edges may be painted MP13750 “Toray Blue.”

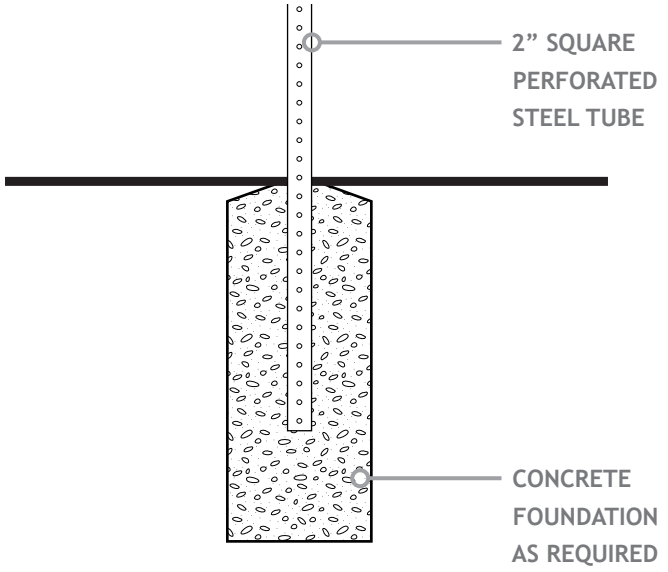
MOUNTING

- Hardware shall be placed to avoid interruption to typography
- Where two signs of the same size are co-located back to back, they shall be mounted to align with one another using a single hardware assembly
- Where two signs of different sizes are co-located back to back, the mounting height of the larger sign shall dictate the overall height of the assembly. The smaller sign shall be mounted so as to obscure the top of the post and minimize attachment points. See diagram at right.
- In some cases, up to three signs may be located on the same post. Where this occurs, decision signs should be mounted back-to-back, with trail identification mounted below. In this case, the branded sign topper may be omitted.



Off-Road Sign Foundation

TYPICAL SIGN BASE, T SIGN TYPES



On-Road Sign Foundation

TYPICAL SIGN BASE, R SIGN TYPES

Typical Layout Strategies

DESTINATION NAMES

For long names that do not fit on one line, try these steps before adding a second line:

- Use tracking to compress the font horizontally to no less than 90% of the standard size
- Use intuitive abbreviations (see Naming Conventions and Abbreviations section)
- To insert a two-line destination, the other destination rows can be compressed.

DISTANCE

- When distances are less than one mile, a zero is placed before the decimal, e.g. 0.5
- Rounding distance measurements:
- Distances under 5 miles should be rounded to the nearest tenth of a mile, e.g. 4.3 mi
- Between 5-10 miles, to the nearest half-mile, e.g. 5.5 mi
- Over 10 miles, to the nearest mile, e.g. 11 mi
- For distances under 0.2 miles, use blocks, feet, or do not include

ORDER OF DESTINATIONS

- Signs should not include more than three destinations.
- Destinations should be ordered from top to bottom as follows:
    1. Straight/continuous destinations. In cases where the trail itself turns, this may mean that left or right-hand destinations take priority.
    2. EITHER all Left-turn destinations OR all Right-turn destinations, depending on which category contains the nearest destination.
    3. The last remaining destination direction
- All destinations with the same direction should be displayed sequentially. Within a category (straight/left/right), destinations should be ordered from nearest to farthest.

ARROWS & ICONS

- Arrows should be placed between destination names and the location to which they refer. For example, a right arrow should be on the right side of the sign, left arrow on left side of sign, etc. Straight arrows should generally be located on the left side of sign.
- Arrows should be placed between icons and the direction of travel being encouraged. For example, a right arrow should be on the right side of the sign, left arrow on left side of sign, etc. Straight arrows may be positioned to either left or right of icons.
- Trail rules should be updated periodically to current, and be supported by use of relevant NPS Recreation symbols. These symbols were created with the Society for Environmental Graphic Design (SEGD) to communicate to a broad audience and are freely available at: https://segd.org/symbols.

MAPS

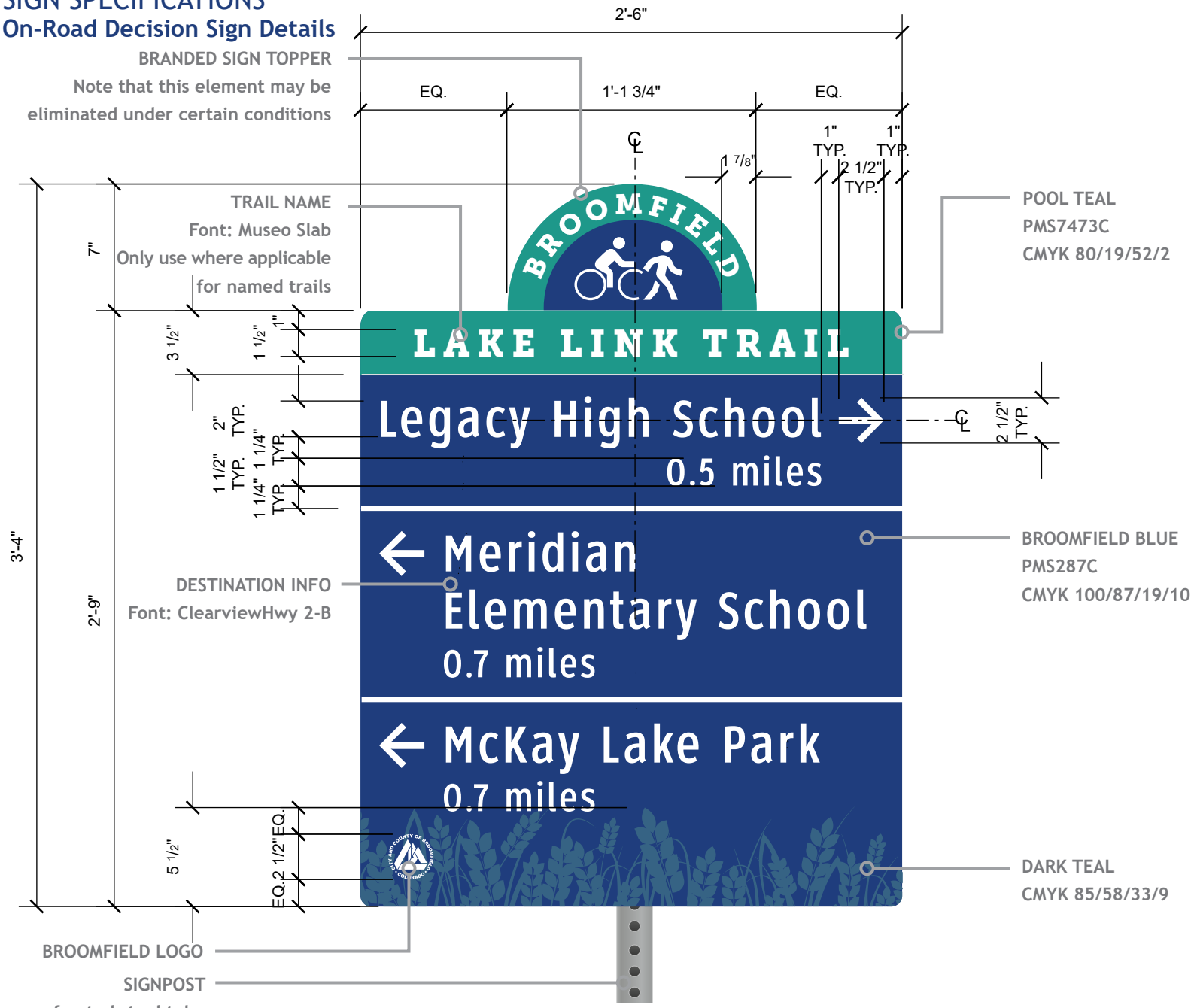
- Shown for placement only. Area selected should be focused on immediate vicinity of sign location as much as possible so that information is legible.
- For longer trails, it is advisable to include a key map, which shows how the immediate vicinity map fits into the larger picture.
- Extents of map should include at least two local landmarks for orientation (ex: a river, freeway, well-known park, university)
- Map should be oriented “heads up” so that the forward direction when reading is located at the top of the map.
- All icons, arrows, trail names, street names, and abbreviations used in map artwork should be consistent with those shown on wayfinding signs wherever possible to maintain consistency.

OPTIONAL INFORMATION

- Not all routes have designated trail names. Where trail names are used, they should be placed in the teal header of the sign, or border of the pavement graphic.
- The City may choose to include QR codes on off-road signs. They may be simply added as stickers to previously fabricated signs. Accessible to users with a mobile device and Internet access, QR codes provide one option for travelers to access detailed or regularly updated information, such as trail history or trail conditions. For this resource to be effective, the City must maintain the URLs and update the information on the webpage as needed. Information to be accessed via QR code may include maps, alternative language translations, and natural resource info (e.g., coyote habitat info).

SIGN SPECIFICATIONS

On-Road Decision Sign Details



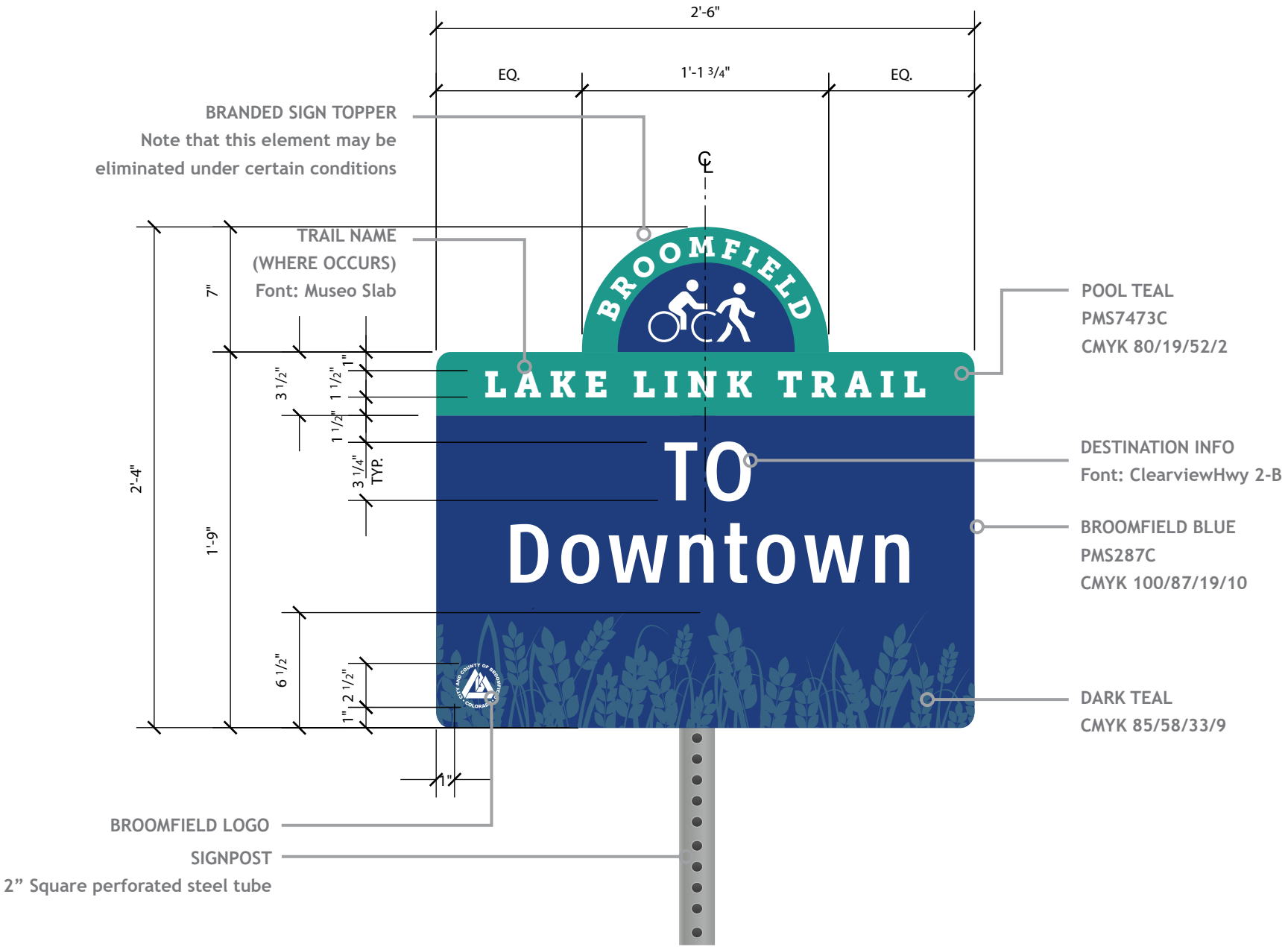
Off-Road Decision Sign Details

ALL DIMENSIONS,
COLORS, MATERIALS, AND
TYPOGRAPHY SIMILAR TO
ON-ROAD DECISION UNLESS
NOTED OTHERWISE

QR CODE
Optional, shown for
placement only (FPO)

SIGNPOST
2” Square perforated steel tube
Painted MP13750 “Toray Blue”

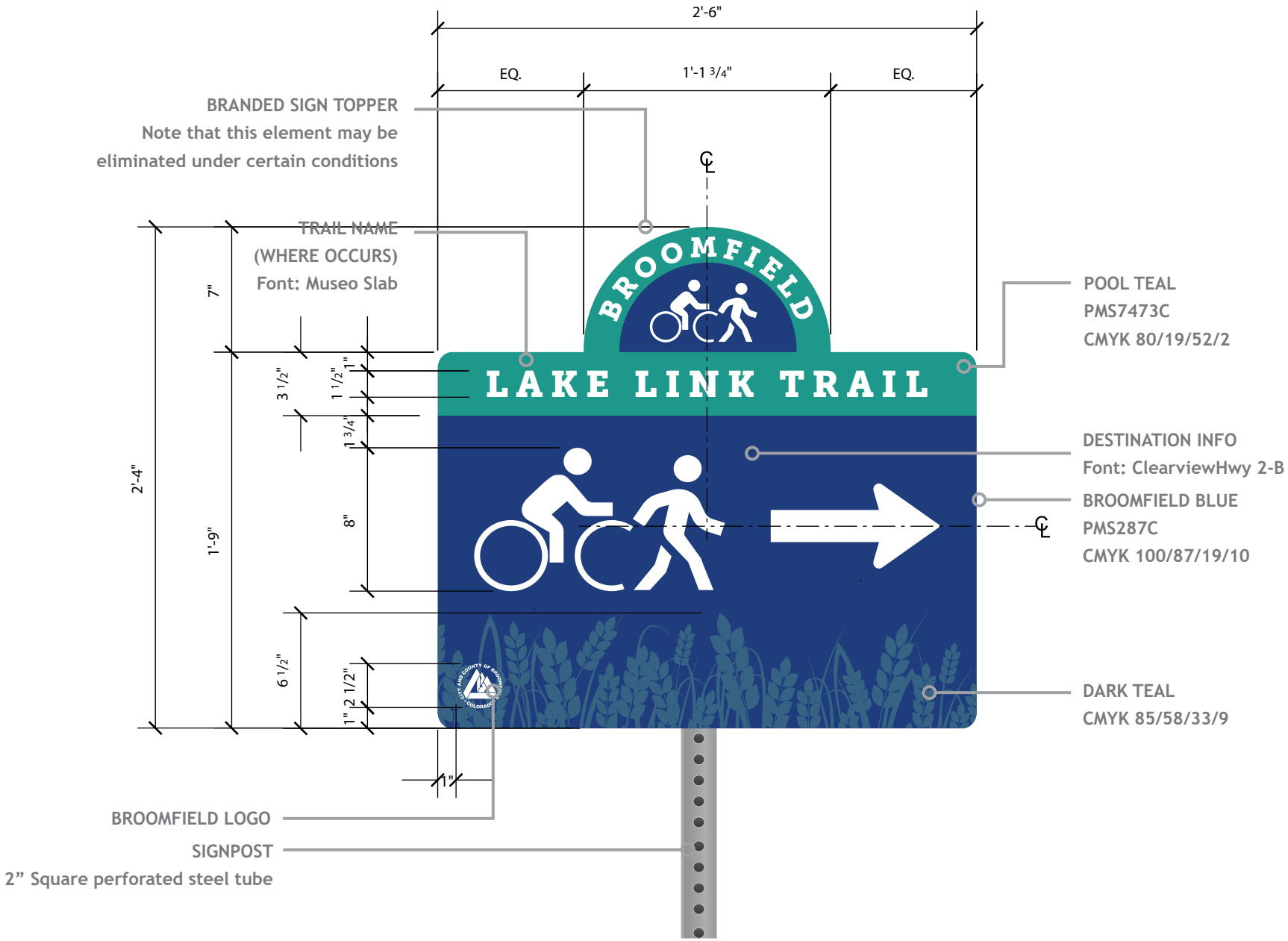
On-Road Confirmation Sign Details



On-Road Trail Confirmation Sign Details

ALL DIMENSIONS, COLORS, MATERIALS, AND TYPOGRAPHY SIMILAR TO ON-ROAD TRAIL CONFIRMATION UNLESS NOTED OTHERWISE

On-Road Turn Sign Details



Off-Road Turn Sign Details

ALL DIMENSIONS, COLORS, MATERIALS, AND TYPOGRAPHY SIMILAR TO ON-ROAD TURN UNLESS NOTED OTHERWISE

QR CODE
Optional, shown for placement only (FPO)

SIGNPOST
2" Square perforated steel tube
Painted MP13750 "Toray Blue"

ADDITIONAL LAYOUT EXAMPLES

Layouts below may apply to both on-road and off-road turn signs. QR code may be added to Off-Road signs only.

Left Arrow

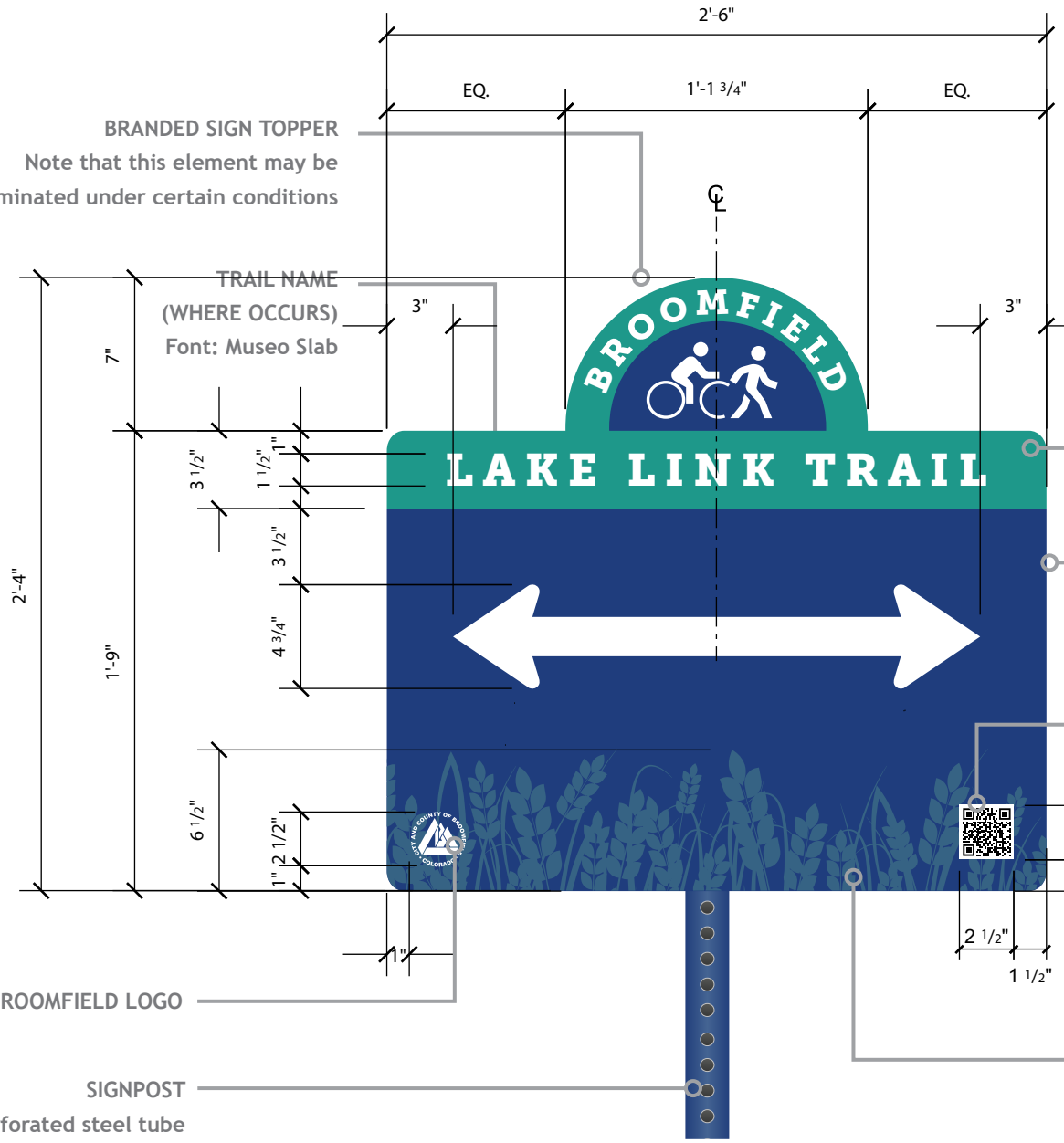
Right Elbow

Left Elbow

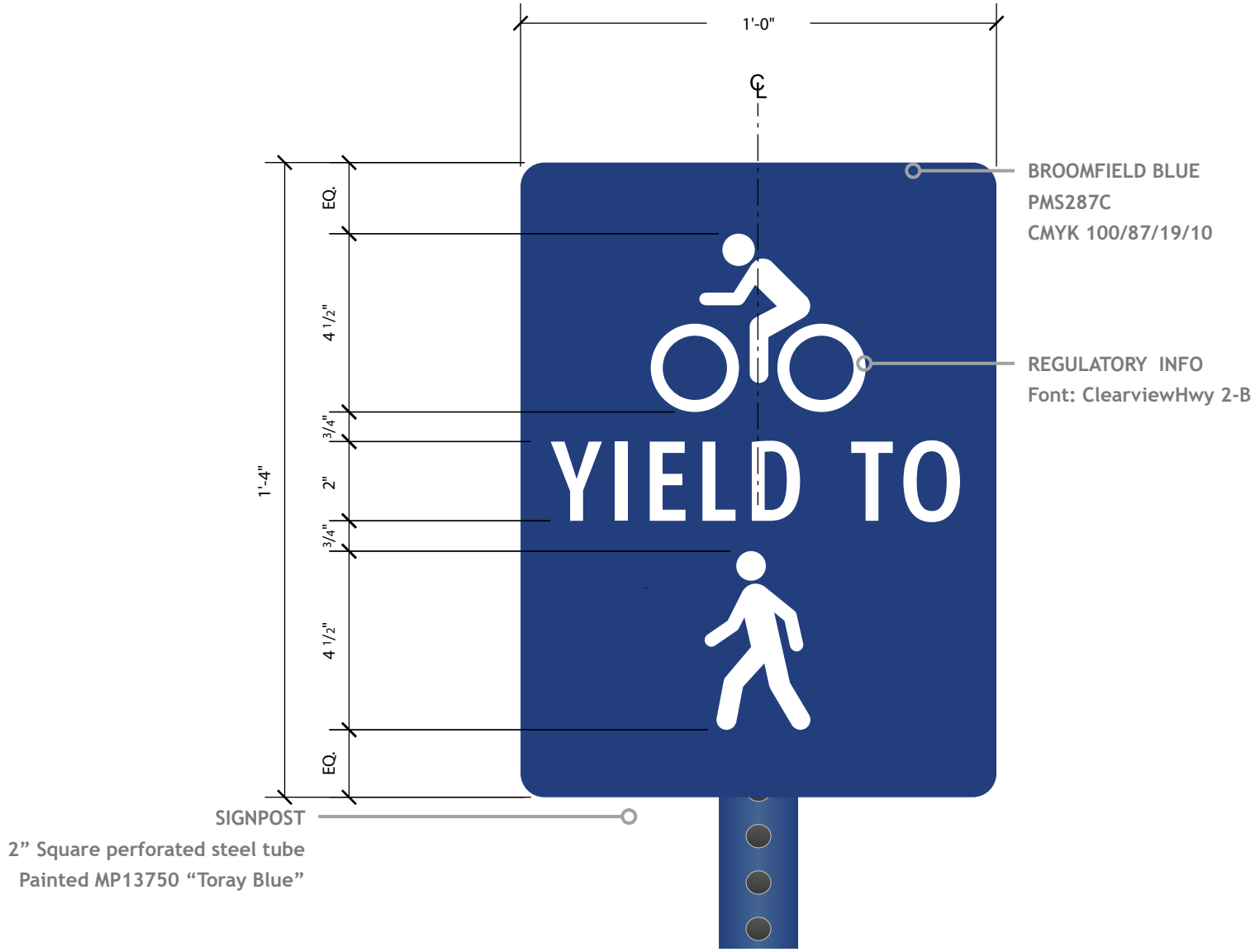
Right Diagonal

Left Diagonal

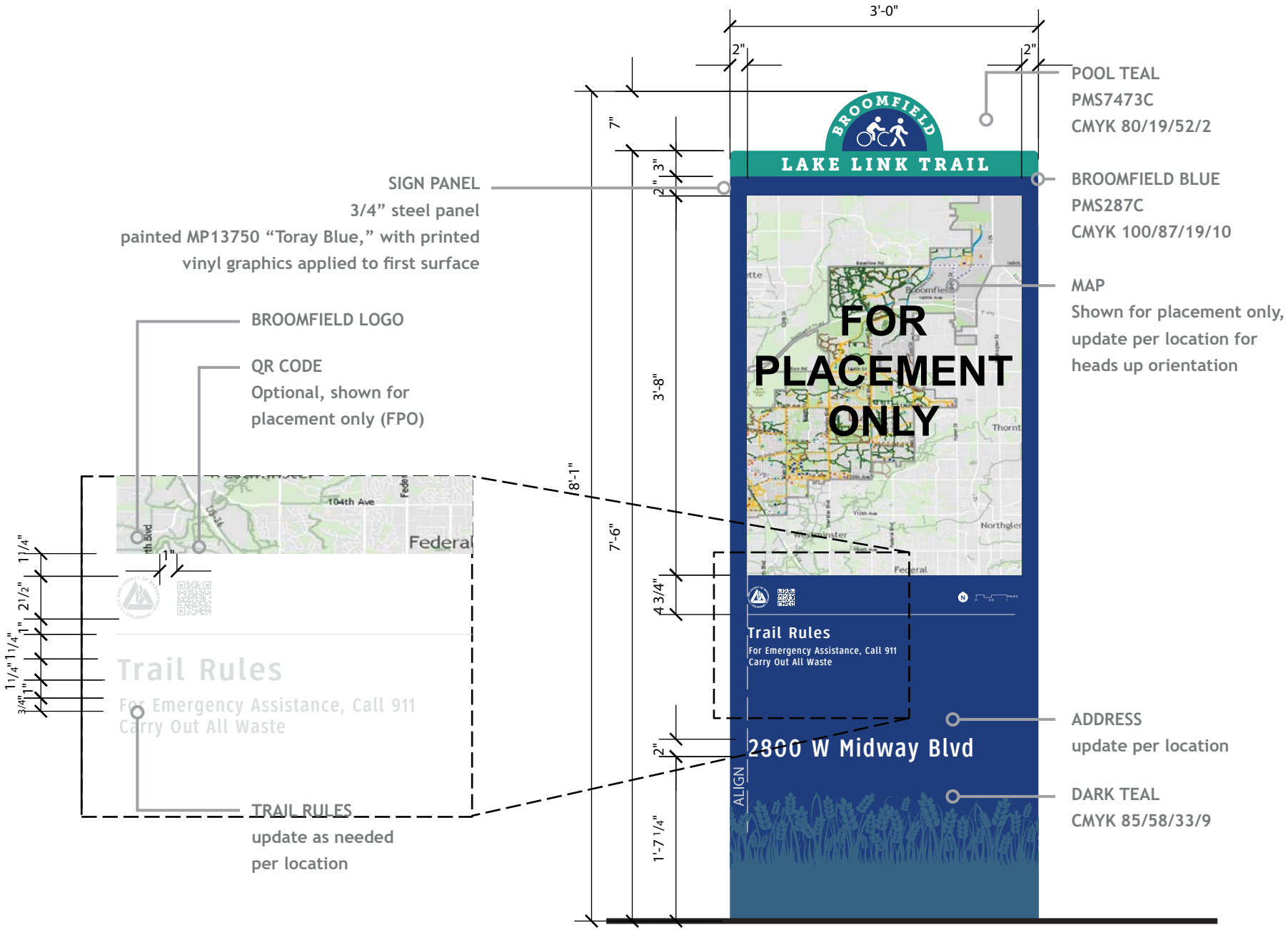
Off-Road Trail Name Sign Sign Details



Off-Road Regulatory Sign Details



Trailhead Access (Urban Context) Sign Details



Trailhead Access Sign Details

POOL TEAL
PMS7473C
CMYK 80/19/52/2

BROOMFIELD BLUE
PMS287C
CMYK 100/87/19/10

MAP
Shown for placement only, update per location for heads up orientation

METAL SIGN BRACKETS

SIGNPOST
4" Round steel tube w/ rounded cap
Painted MP13750 "Toray Blue"

TRAIL RULES & ICONS
update as needed per location

TOTAL SIGN HEIGHT MAY VARY, position so that Trail Rules text is 2'-4' above ground for accessible viewing

QR CODE
Optional, shown for placement only (FPO). If QR is not used, shift logo to align with edge of map

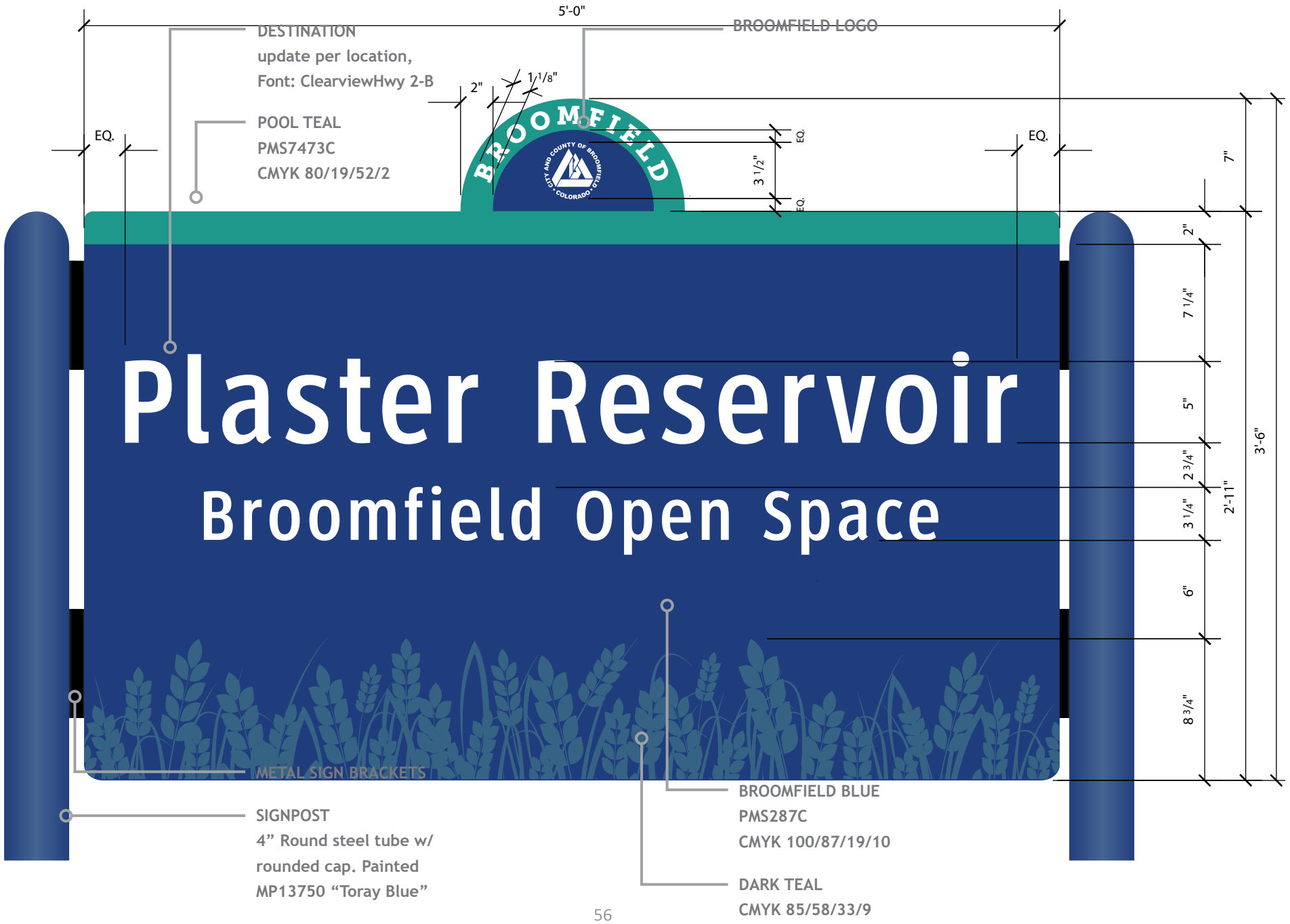
ADDRESS
update per location, Font: ClearviewHwy 2-B

DARK TEAL
CMYK 85/58/33/9

Off-Road Trail Information Sign Details

ALL DIMENSIONS, COLORS, MATERIALS, AND TYPOGRAPHY SIMILAR TO TRAILHEAD ACCESS UNLESS NOTED OTHERWISE

Off-Road Location Identification Sign Details



Co-Location Of Signs

ALIGN SIMILAR SIGNS TO CONCEAL BACKS OF EACH

BACK-TO-BACK MOUNTING

LARGER SIGN TO DETERMINE TOTAL HEIGHT

MOUNT SMALLER SIGN SO AS TO CONCEAL TOP OF POST COMPLETELY

MOUNTING OF UNMATCHED SIGNS

ALIGN SIMILARLY SIZED SIGNS BACK-TO-BACK

MOUNT DISSIMILAR SIGN BELOW. THE BRANDED TOPPER MAY BE ELIMINATED.

MOUNTING OF PERPENDICULAR SIGNS

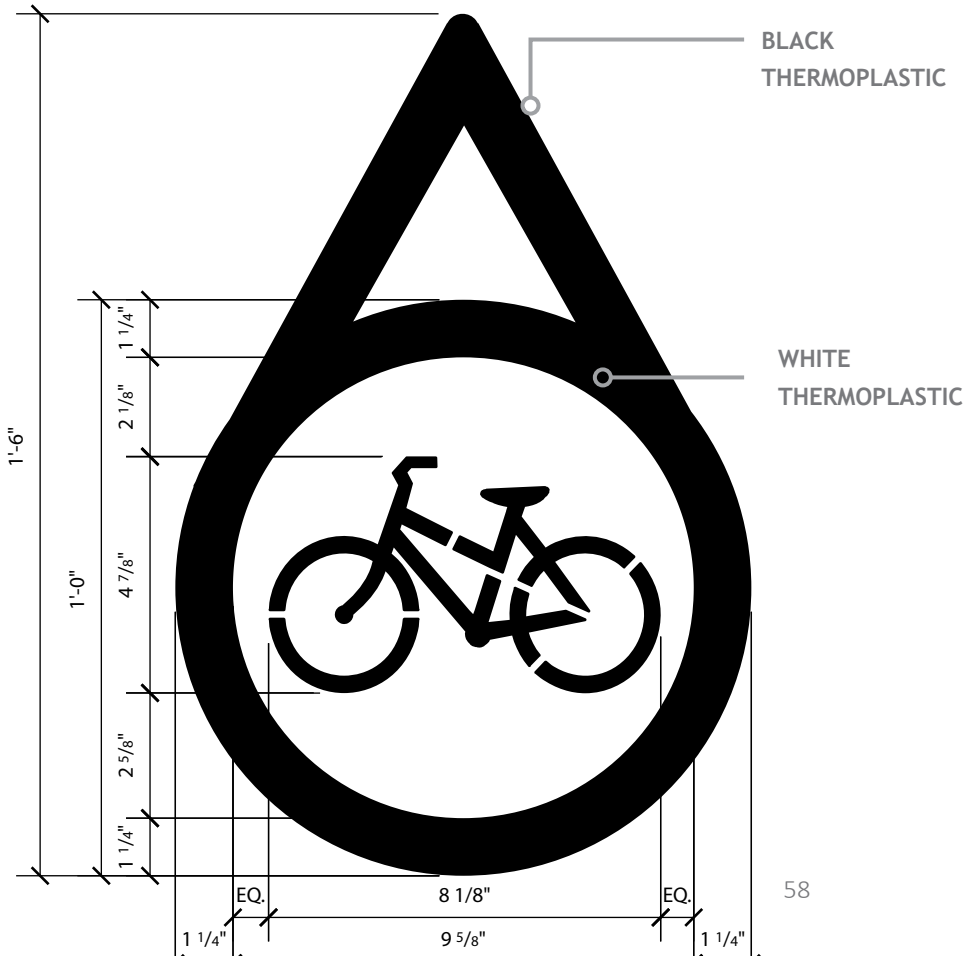
On-Road Pavement Marking Sign Details

ARROW(S)

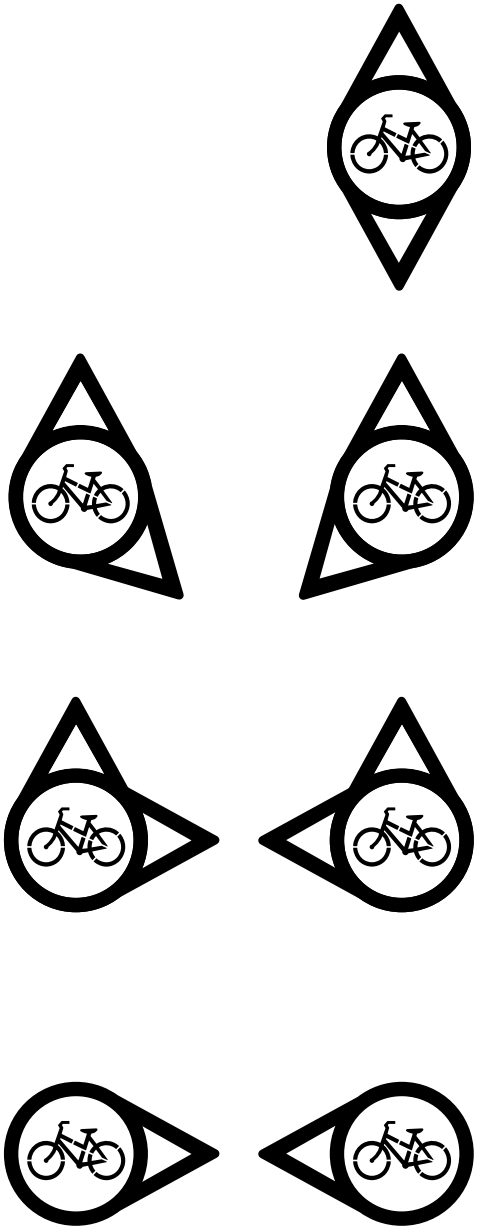
- Should be adjusted in the direction of travel

SIZE

- Depending on context, these markings can range from 12'' to 24'' in width. 12'' is used as a the standard here and adjustments should be made as needed.



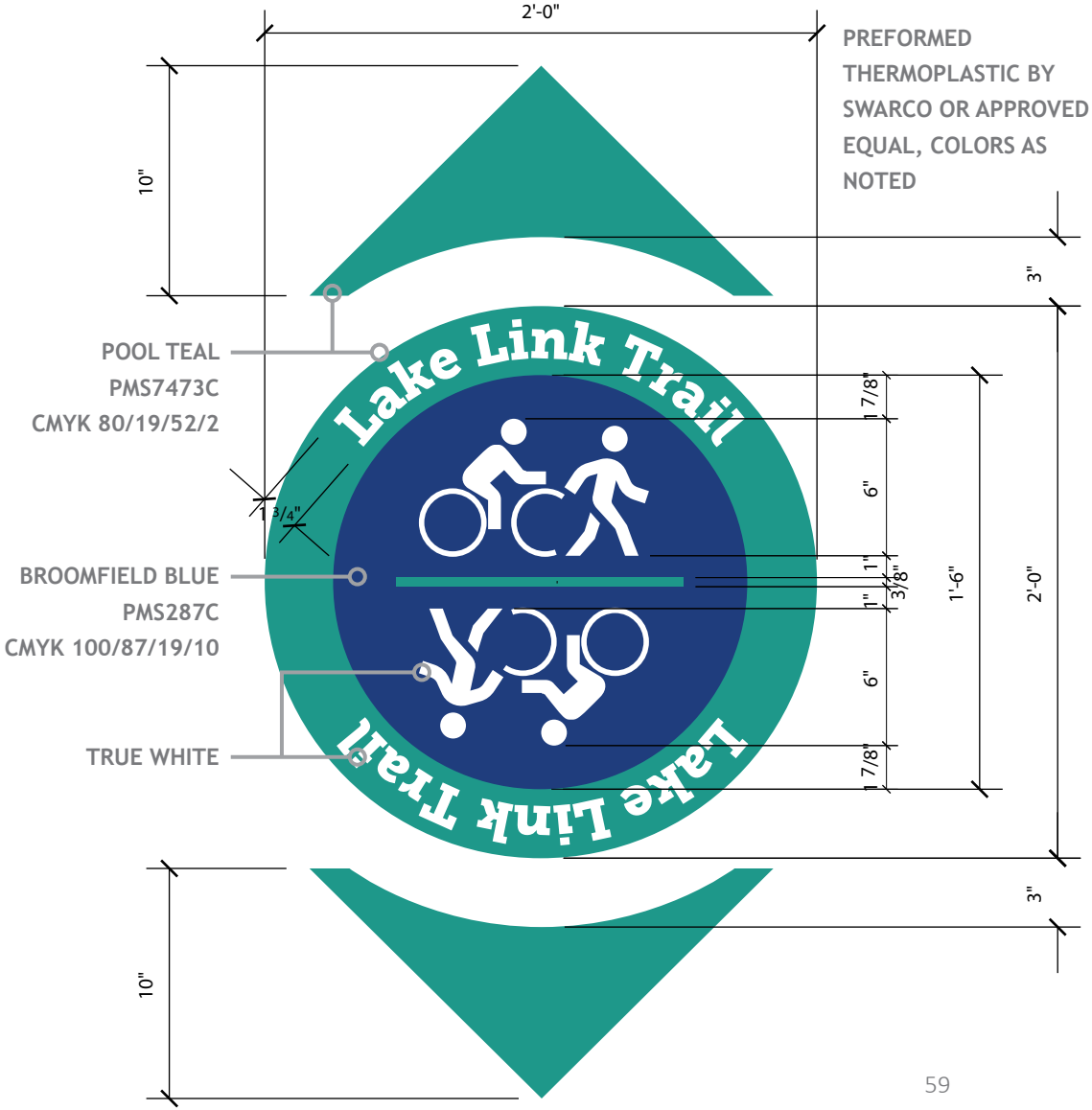
ADDITIONAL LAYOUT EXAMPLES



On-Road Trail/Sidewalk Marking Sign Details

ARROW(S)

- Should be adjusted in the direction of travel



ADDITIONAL LAYOUT EXAMPLES

SIGN SELECTION AND PLACEMENT

Consistent and appropriate placement of wayfinding elements helps to provide a legible wayfinding system. Many communities find that implementing a wayfinding system as a component of an active modes network enhances other encouragement efforts because it provides a visible invitation to new users, while also encouraging current or experienced users to explore new destinations. Guidance by the American Association of State Highway Transportation Officials (AASHTO) regarding sign placement includes:

- Guide signs may be used to designate continuous routes that may be composed of a variety of facility types and settings.
- Wayfinding guidance may be used to provide connectivity between two or more major facilities, such as a street with bike lanes and/or sidewalks and a shared-use path.
- Wayfinding may be used to provide guidance and continuity in a gap between existing sections of a facility, such as a bike lane or shared-use path.

GENERAL GUIDANCE

Wayfinding signs and markings serve four fundamental purposes: informing route decisions, providing advance notice for turns in the route, confirming turns in the route, and providing information. General rules for sign placement are intend for the signs to be selected and placed such that they clearly and effectively communicate to the most users while limiting the number of signs to be manageable.

For all signs, signage frequency should not allow for gaps in wayfinding elements longer than a quarter-mile to a half-mile in urban environments, or a half-mile to one-mile in rural environments. This spacing can be achieved primarily through the placement of necessary Turn and Decision signs on sinuous routes.

For all signs, place wayfinding signs to the right of the direction of travel. Signs on trails may be placed on the left side as a result of space constraints, signage collocating, or other constraints if necessary. Wayfinding signs can be mounted on the same posts as parking restriction signs, bike lane signs, street lamps, and telephone poles. In general, do not mount additional wayfinding signs to the poles of Location Identification signs or Trail Information signs.

To limit the number of new poles, multiple signs can be attached to a single pole. Most commonly signs are posted in opposite directions, but 45-degree angles on co-posted signs are also permitted. In these instances, confirm that the minimum clearance distance in the next chapter is met. Do not post multiple signs on one pole in the same direction that serve the same purpose (do not post one Decision sign above another Decision sign or above a Turn sign).

For signs that indicate a turn, advanced notice is preferred and dependent upon the required merging action of a bike user. For network areas where a zero-lane merge is required (trails, designated paths, low-volume roadways without a centerline) signs should be placed 25' from the point of inflection. For roadways with a single-lane merge, signs should be placed 100' in advance of the turn, and for roadways with a double-lane merge, signs should be placed 200' in advance of the turn. In some trail areas, signs are placed at the point of inflection to serve multiple legs of the route and reduce the total number of poles installed. In these instances, signs should be clearly visible to approaching network users from 25' away, and unobstructed by foliage, structures, or other visual impediments. The rational for this exception is that high-speed users who may not have time and space to read the signs are generally experienced network users and know their route well.

For signs that indicate a turn, ensure that the arrows do not point to a driveway that could be mistaken for the intended turn. Adjust placement and use arrows in 45-degree increments and straight-then-turn arrows to clearly indicate where to go.

For all Decision Signs, do not include more than three destinations.

Figure 18: Example of multiple signs posted to a single pole at a 90-degree angle

Figure 19: Example of multiple signs posted to a

WAYFINDING PLAN SCENARIOS

Non-linear alignments, changing surface materials, and crossing paths can cause confusion for trail users and in the sign placement practice. Common scenarios in the Broomfield trail system are depicted in Figures 15–20. They show sign selection and placement in relation to path alignment, roadway alignment, and other common facilities.

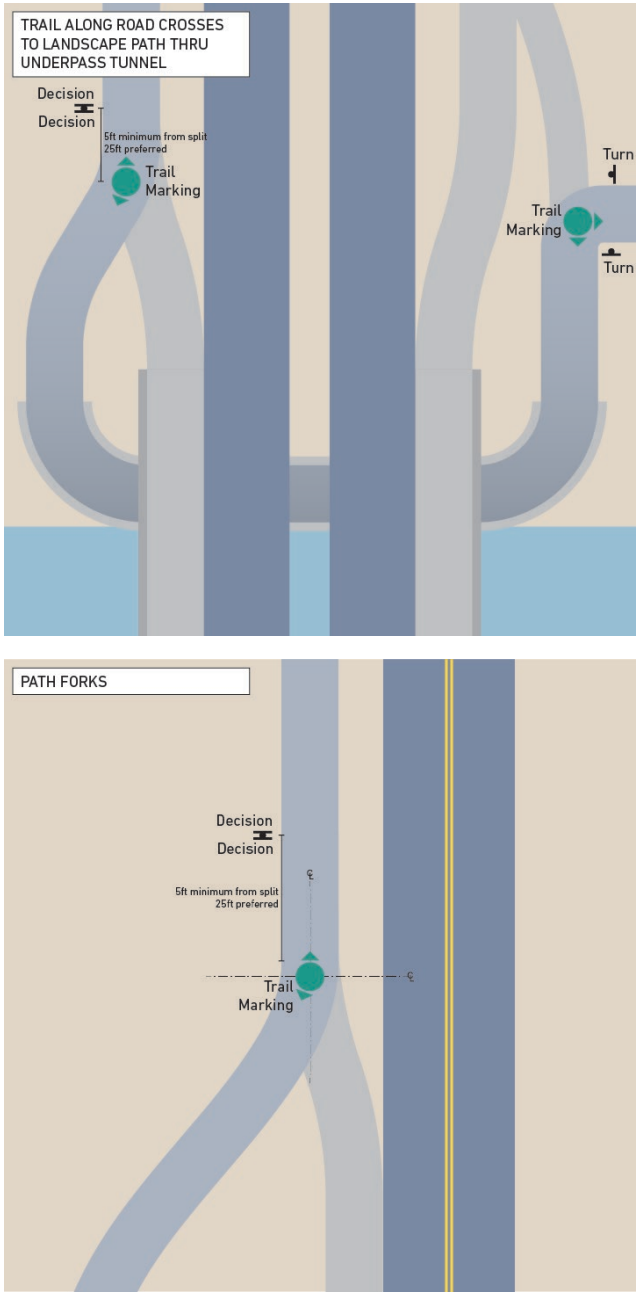
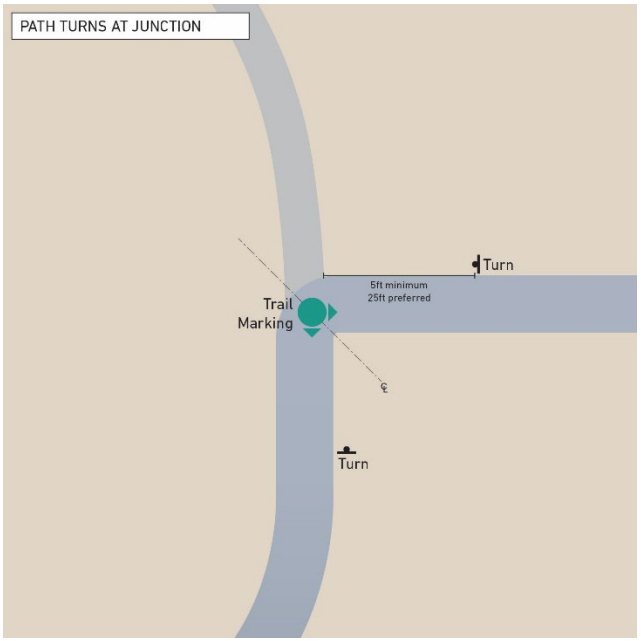
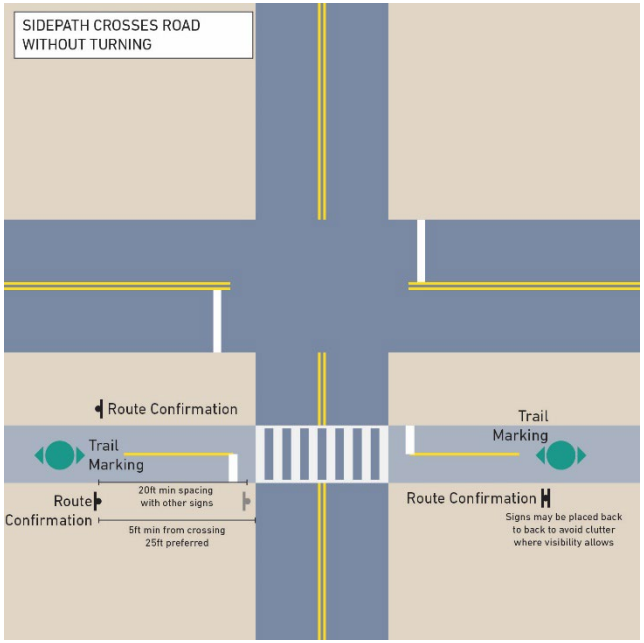
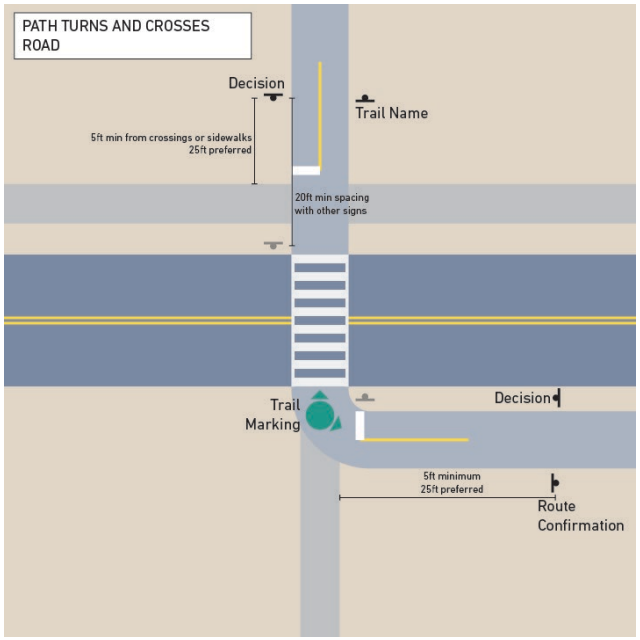
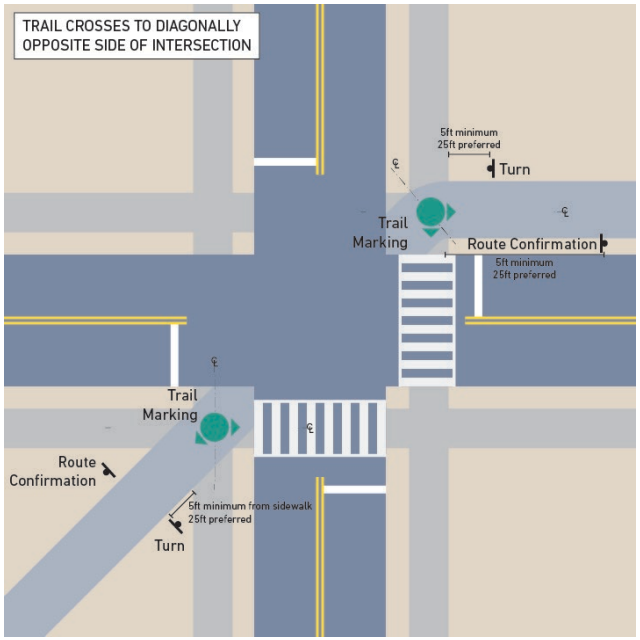


Figure 20 – 25: Wayfinding Plan Scenarios


PATH TURNS AT JUNCTION
Turn
5ft minimum
25ft preferred
Trail
Marking
℄
Turn


SIDEPATH CROSSES ROAD
WITHOUT TURNING
Route Confirmation
Trail
Marking
20ft min spacing
with other signs
Route
Confirmation
5ft min from crossing
25ft preferred
Trail
Marking
Route Confirmation
Signs may be placed back
to back to avoid clutter
where visibility allows


PATH TURNS AND CROSSES
ROAD
Decision
Trail Name
5ft min from crossings or sidewalks
25ft preferred
20ft min spacing
with other signs
Trail
Marking
Decision
5ft minimum
25ft preferred
Route
Confirmation


TRAIL CROSSES TO DIAGONALLY
OPPOSITE SIDE OF INTERSECTION
5ft minimum
25ft preferred
Turn
℄
Trail
Marking
Route Confirmation
5ft minimum
25ft preferred
℄
Trail
Marking
℄
Route
Confirmation
5ft minimum from sidewalk
25ft preferred
Turn

FABRICATION, INSTALLATION, AND MAINTENANCE

Active transportation facilities require thoughtful installation and continued maintenance to ensure safe and dependable access. Preventative maintenance on sidewalks and bike lanes can reduce hazards for users and the life-cycle cost of facilities. Additionally, continual upkeep of active transportation facilities can encourage mode shift by showing that the roadway owner is dedicated to preserving bicycle and pedestrian transportation options.

SIGN INSTALLATION PLAN

After the destinations, routes, sign design, and sign placement in determined, the information is compiled into a deployment plan that is shared with the sign shop or work crews responsible for fabricating and/or installing the signs. A deployment plan should include the following components:

Plan Maps

- Paper sizes can be 8.5” x 11”, 11” x 17”, or 22” x 34”
- Plan maps should use a standard sign symbol labeled with the sign ID number. It is useful to use a symbol that shows the orientation of the sign

Sign Schedule

A sign schedule is a table—such as an Excel spreadsheet—that lists all of the information about each sign on the corridor. A sign schedule should cover the following:

- Panel sizes and identification codes—such as MUTCD ID numbers and/or unique letter codes
- Panel facing direction
- Location on street or trail (“ON Galena River Trl AT S River Rd”)
- Sign legends
- Post location and post type
- Mounting arrangements, adjustments to existing signs on posts, and other notes
- Panel Fabrication Specifications and Details

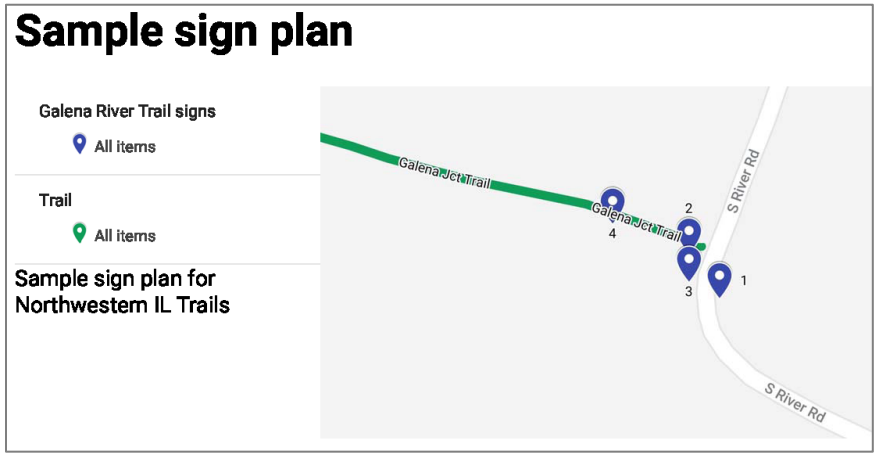


Figure 26: If using the Google “My Maps” Tool, sections of the trail can be printed to include in the sign installation plan.

Panel fabrication specifications and details include:

- Typical and variations for each sign panel size; layout of text and symbols; spacing, letter sizes, symbol sizes, symbol types, symbol enlargement or reduction allowances; colors, fonts, and borders.
- Sign fabrication standards (in accordance with each jurisdiction’s standards and specification)

POST TYPES AND INSTALLATION

Signs and sign posts should be installed in accordance with local standards.

Posts for Streets and Roads

All posts along streets or roads should be breakaway to improve street and road user safety. Posts should be 2" square perforated galvanized steel poles.

Posts for Trails

Posts should be should be 2" square perforated galvanized steel poles for most sign types. 2 3/8" round aluminum poles may be used for the sign types that use two poles.

Clearance Guidelines

The sign mounting height and clearance guidelines in this Guide are drawn from the MUTCD (Part 2, Section 2A.18, and Part 9, Section 9B.01).

Trails

- Minimum of 4’ from edge of trail to the lower edge of sign
- For signs placed overhead of trails, a minimum of 8’ vertically over entire width of trail
- Mile markers on trails, should be installed so the bottom of the sign is 3’ above the height of the trail
- Minimum of 2’ from edge of trail or trail to the side edge of the sign

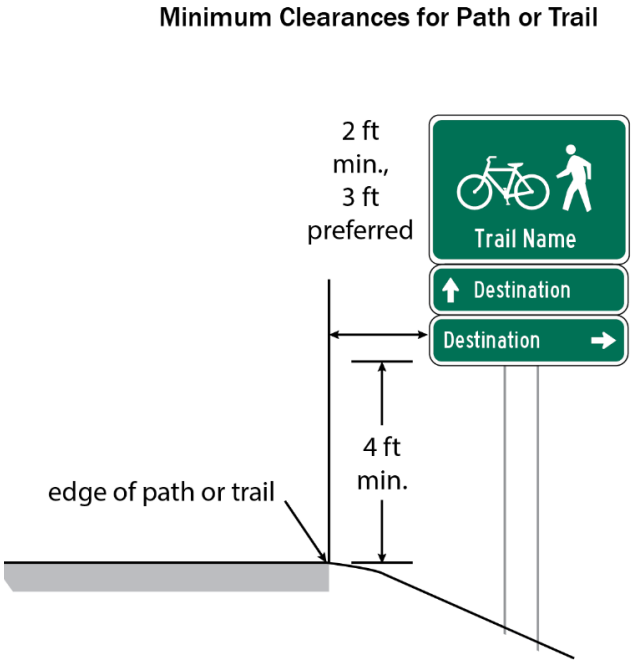


Figure 27: Minimum clearance requirements for signs on paths or trails.

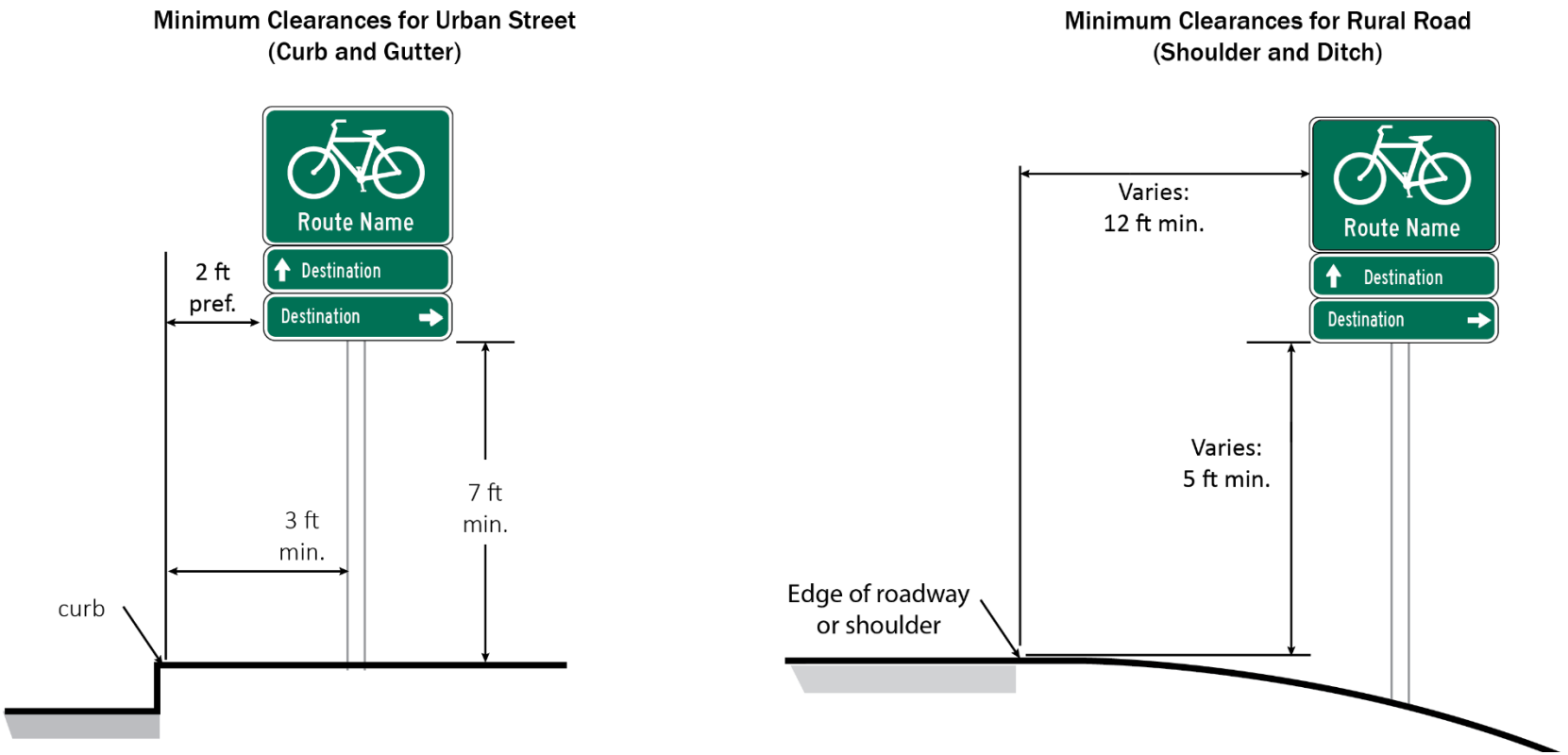
Roads

Urban Streets:

- Minimum of 7’ from pavement to the lower edge of sign
- Minimum of 2’ from edge of travel lane to the edge of sign

Rural Road:

- Minimum of 5’ from pavement to the lower edge of sign
- Minimum of 12’ from edge of travel lane to nearest edge of sign



Figures 28 – 29: Minimum clearance requirements for signs on streets and roads.

MAINTENANCE

Sign Replacement Costs as Part of a Maintenance Plan

Agencies that maintain signs and markings should have an overarching maintenance and management plan that includes strategies for regular wear and tear, destination updates, as well as dealing with vandalism and theft. A maintenance plan would include and budget for both routine and remedial maintenance and define responsibilities for the agency and its partners.

- **Routine Maintenance.** Routine maintenance should be scheduled to occur weekly, monthly, and annually. The best sign routine maintenance programs perform routine inspections that both inspect and respond to minor maintenance issues at the same time. Responding to issues immediately saves time and provides a better experience for users but requires that maintenance staff have equipment (such as paint, gardening tools, graffiti removal supplies, etc.) at all times. Routine maintenance includes graffiti removal, and vegetation management.
    - **Graffiti Removal.** Regular maintenance and quick repair or replacement of vandalized signs sends a message that vandals will not impact the trail. Routine trail inspections should remove graffiti from signs and identify which signs need to be replaced due to damage, fading, or other issues.
    - **Vegetation Management.** An annual maintenance program should be established to address vegetation encroaching into travel ways, limiting sight distances, or obscuring wayfinding. This program should be responsive to both routine inspections and user complaints.
- **Remedial Maintenance.** Remedial maintenance is maintenance that remedies a specific issue that cannot be addressed immediately such as trail wash-outs, damaged posts, or replacement of trail amenities. Agencies should expect to replace about 5 percent of their signs every year. It is important to address trail amenity issues—especially those that take an amenity off-line—because in doing so, trail users can have confidence in the information being provided by wayfinding.

The Rails to Trails Conservancy's *Rail-Trail Maintenance and Operation Survey* (www.americantrails.org/images/documents/railtrailmaint.pdf) is a good resource for trail agencies to refer to when developing a maintenance plan. The report's Appendices include example maintenance schedules and maintenance budgets.

Mitigate Maintenance Costs

When planning to purchase and install wayfinding signs, agencies can spend additional money during fabrication and installation on features that will help reduce future maintenance needs:

- **Anti-Graffiti Coating.** Graffiti overlays are available as film or liquid laminates. When these are overlaid on a sign, harsh solvents can be used to remove the graffiti without damaging the underlying sign. Some sign vendors may already include "Anti-Graffiti Overlay" as part of the cost of their standard sign fabrication. If they do not, it may be worth it to purchase overlays for an extra $1-2 per sign.
- **Anti-Theft Sign Hardware**. A variety of theft-resistant sign hardware such as sloped nuts, security bolts, and special screws can help deter sign thieves. The additional cost of this hardware is an extra $1-2 per sign.