



CENTRAL OHIO GREENWAYS

Urban Greenway Design Guide



MID-OHIO REGIONAL
MORPC
PLANNING COMMISSION



ACKNOWLEDGEMENTS

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Introduction

The Urban Greenways Design Guide outlines the various and appropriate design recommendations for implementing trails. Appropriate trail design is contextual, factoring in land use, topography, demography, and other relevant considerations. To ensure that appropriate trail design is implemented within Central Ohio, The Central Ohio Greenways Board has developed this Urban Design Greenways Design Guide.

The Central Ohio Greenways (COG) Board serves as a formal committee of the Mid-Ohio Regional Planning Commission's (MORPC) Sustainability Advisory Committee (SAC). Board members represent the public, private, and non-profit sectors. The COG Board's focus is to expand the regional trail system, increase trail accessibility, improve branding and marketing, and establish new public, private, and non-profit partnerships. This focus is reflected in the COG Regional Trail Vision.

The COG Regional Trail Vision features a world-class network of trails easily accessible to every Central Ohioan, and its mission is to increase greenway trail mileage and use of trails for recreation & transportation needs. With Central Ohio being on track to become a region of up to 3 million people by 2050, the region must prepare for an increased demand for walkable neighborhoods, multi-modal transportation options, and economic opportunities. Trails are a critical element of a diverse transportation system & livable communities, and capitalizing on limited opportunities requires regional support and coordination.

In 2018, the COG Board developed a vision to add approximately 500 new trail miles in Central Ohio. New miles will extend existing trails, fill gaps in trail corridors, connect neighborhoods to job centers, and create a truly interconnected network useful for both transportation and recreation. Since then, COG has continued to build support for implementing the Vision through projects such as the 2019 Clarity Report, the 2020 Prioritization Effort, and the 2021 Impact of Trails Study. These projects have set the stage for implementation by identifying a strong regional desire for more trails, and also revealing a clear need to invest in lower income and minority neighborhoods. Urban connections such as east-west connections near roadways as well as linkages from neighborhoods to jobs are needed in Central Ohio to provide a well-connected trail network for all.

The Urban Greenways Design Guide is a resource for local communities and their trail design partners, offering recommendations for envisioning trails in urban spaces that are safe, accessible, beautiful, and inviting.



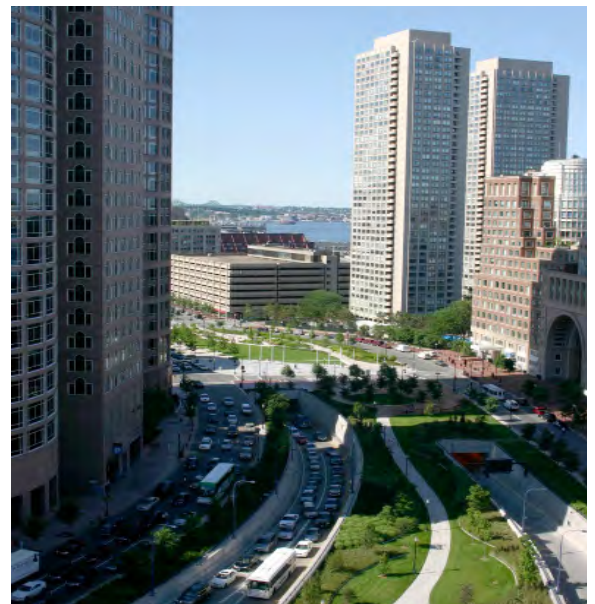
URBAN GREENWAY CONTEXT

Central Ohio Greenways understands urban greenways to be high quality protected trails that provide transportation and recreation opportunities for all people in urban and suburban environments. They can be located along roadway corridors, along riverfronts, or abandoned corridors. The greenways protect uses from other urban transportation uses such as transit, vehicle, and trains while providing a scenic and comfortable atmosphere. The following greenway examples provide inspirational recommendations for how diverse places can implement greenways in various contexts.

Linear Park



Linear parks are creative ways to introduce greenspace into urban areas by taking advantage of excessive right-of-way or roadway width. They can transform wide roadway corridors into public greenspace useful for active and passive recreational, active transportation, and public space gathering. Linear parks with high quality trails can stitch together small urban parks to create the feel of a large public park. The greenspace surrounding the trail provides protection from pollution, noise, and vehicles while also creating an opportunity for public art, playgrounds and outdoor gatherings.



Kennedy Greenway - Boston, MA



South Waterfront Greenway - Portland, OR

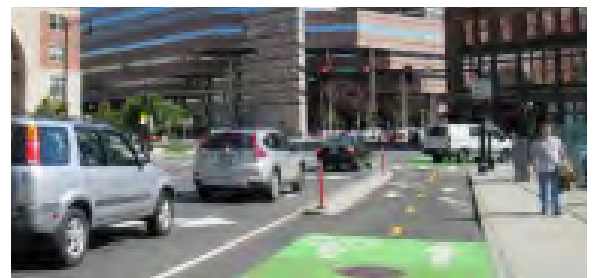


Scioto Mile Greenway - Columbus, OH

Commercial Corridor



A greenway in a commercial setting has the potential to dramatically increase economic development opportunities and property values. The comfortable pedestrian and cyclist environment encourage to travel to shopping destination on bike or foot, reducing the need for parking lots and expansive dedicated motor vehicle space. Protected greenways promote safe active transportation opportunities around and through the corridor and can comfortably connect to transit options.



Atlantic Ave Greenway - Boston, MA



Greenway - The Netherlands



Cultural Trail - Indianapolis, IN

Mixed-Use District



Urban greenways in mixed-use areas provide an additional form of transportation to connect areas across communities. Making connections on neighborhood streets offers a safer environment for an urban greenway where road speeds are slower.





MKSK

Bridge Park - Dublin, OH



Creekside - Gahanna, OH

Residential Neighborhood



Incorporating urban greenways on residential boulevards provide recreation and transportation opportunities near residential homes. Residential boulevards tend to be wider in their design and ideal to incorporate trail infrastructure.





Olentangy Trail, Columbus, OH



Heritage Trail - Hilliard, OH

URBAN GREENWAY TYPES

Urban greenways are located in urban environments and provide users with safe, typically protected trails, for recreation and transportation needs. The following examples illustrate various greenway facilities types implemented in diverse urban contexts.

Median Greenways

Median greenways are located in the middle of a roadway and are physically separated from vehicle traffic by a barrier, curb, or buffer on either side.



Opportunities

- Replace under utilized center turn lanes
- Serve as a pedestrian refugee island on wide corridors
- Separated uses: Sidewalks for access to businesses; greenway for travel through a corridor.
- Avoid safety concerns associated with unsignalized right vehicle turns
- Free the curb lane for other urban transportation needs such as transit boarding, loading, and parking.

Challenges

- Managing intersection crossings
- Managing turning movements
- Maintaining access to essential driveways from both directions on vehicle travel



Downtown Street

9th Avenue and Delancey St

New York, NY



Shopping District

Spring Garden Street Greenway

Philadelphia, PA



Residential/Mixed-Use Boulevard

W Orange Trail

Winter Garden, FL

Shared Use Path

Shared use paths are physically separated from motorized vehicular traffic by an open space, curb, or barrier and may be used by pedestrians, bicyclists and other non-motorized users.



Opportunities

- Green storm water infrastructure between curb and the greenway may also provide natural scenery for trail user
- May be more cost effective than a traditional concrete sidewalk

Challenges

- Managing trail user conflict
- Managing intersections and crossings



Downtown Street

Indianapolis Cultural Trail
Indianapolis, IN



Commercial Street

Route 347
New York, NY



Neighborhood Street

Murphy Parkway
Powell, OH

Rail Trail

A multi-purpose, public path or paved trail created in place of an inactive railroad corridor. Linear rail corridors provide unique opportunities to convert linear abandoned spaces into trails and parks.



Opportunities

- Revitalization and repurpose abandoned corridor
- Typically, dramatically separated from other transportation
- Scenic linear parks are possible due to wide rights-of-way
- The typically long corridors can connect at the regional, state, and national levels

Challenges

- Maintenance of vegetation and trail areas
- Trail access
- User isolation
- Wayfinding



Downtown Area

Dequindre Cut

Detroit, MI



Commercial area

Beltline

Atlanta Georgia



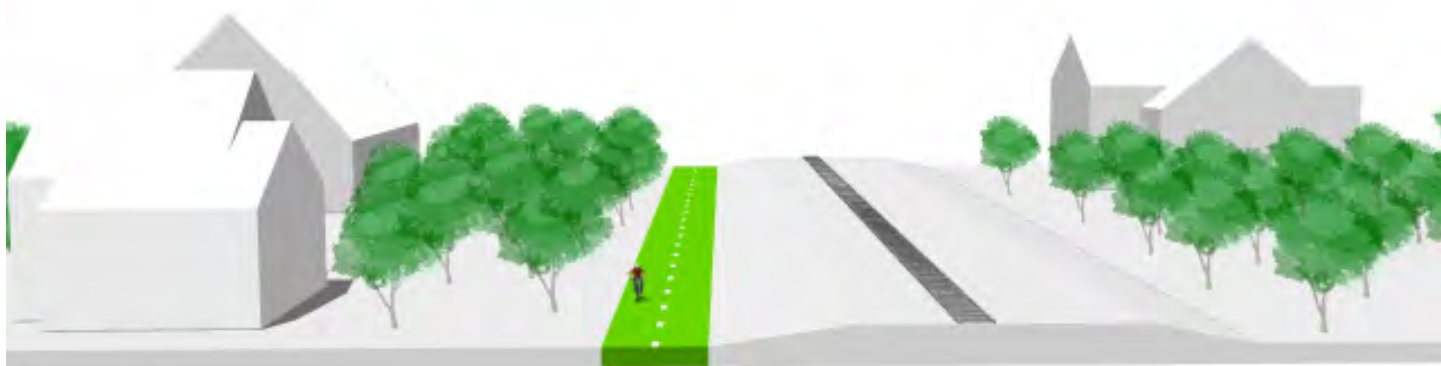
Residential Area

Shepard Rail Trail

Columbus, OH

Rail-with-Trail

A Rail-with-Trail is similar to a rail trail, in that it takes advantage of an existing linear corridor, however a Rail-with-Trail runs parallel to an active commuter or freight rail line. In Central Ohio the Rail-with-Trail intent could also be achieved by building a trail parallel to a fixed route transit line such as a Bus Rapid Transit corridor.



Opportunities

- Activate an under-utilized rail corridor
- Scenic linear parks are possible due to wide rights-of-ways
- Provide comfortable connection to active commuter transit lines
- Provide protection from most other transportation uses
- Connect trails at the regional, state, and national levels

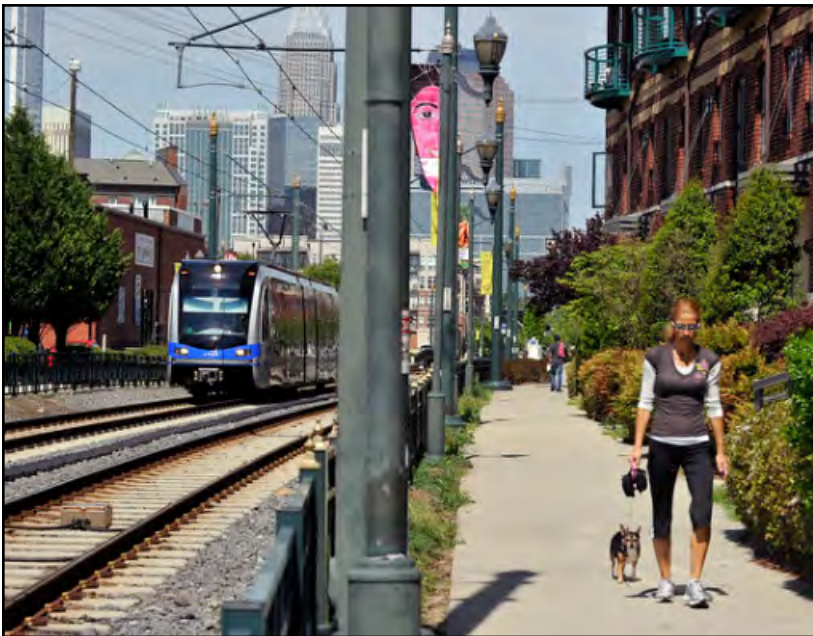
Challenges

- Maintenance of vegetation and trail areas
- Trail access
- User isolation
- Wayfinding
- Protection from rail uses



Downtown Area

2nd Ave Cycle Track
Seattle, WA



Commercial Area

Charlotte Trolley Trail
Charlotte, NC



Residential Area

Camp Chase Trail
Columbus, OH

Protected Bike Lane

A portion of the roadway that has been designated for cyclists only. Bike lanes enable cyclists to ride at their preferred speed with no interference from traffic conditions. Bike lanes are typically one-way facilities located parallel to the curb. A bike lane used as part of a Central Ohio Greenway trail must offer safe protection from other users. Buffer, barriers, grade changes, another protection may be used. Identification of bike lanes can include color treatments, pavement markings (bicycle stencil or directional arrow), stripping, signage, and intersection treatments. **To fulfill the purpose of the greenway, in addition to the bike lane high quality sidewalk or other appropriate pedestrian accommodation must be made.**



Opportunities

- Quick implementation: modify pavement marking and add low cost barriers
- Cost effective
- Reduce vehicle lane widths to encourage lower vehicle speeds
- Prevents trail user conflict

Challenges

- Managing intersections and trail crossings
- Maintenance of the bike lane
- Protection from high speed vehicles
- Accommodating natural and scenic elements
- Managing conflicts within parked car door zones



Downtown Street

Raised bike lane
Cambridge, MA



Commercial St

One-way protected bike lane
New York, NY



Residential

Raised & protected bike lane
Vancouver, BC

Cycle Track

Cycle tracks are physically separated from other uses and run parallel to the roadway. Cycle tracks are typically two-way and can be at street level or elevated. Additional pavement markings such as a bicycle stencil and directional arrow can be used directly on the cycle track to signal travel directions. Typically, the cycle track is a different color from the sidewalk to distinct the various uses and contains a protective barrier protecting users from motorized traffic. **As with bike lanes a sidewalk or other pedestrian facilities must be combined with the cycle track to fulfill the purpose of an urban greenway.**



Opportunities

- Cost effective
- Quick implementation if using existing infrastructure and drainage
- Reduce vehicle lane widths to encourage lower vehicle speeds
- Prevents trail user conflict
- Reduced need to cross vehicle traffic if destinations mostly located on one side of the corridor

Challenges

- Managing bicycle turning movements
- Maintenance of the bike lane
- Protection from high speed vehicles
- Accommodating natural and scenic elements
- Managing conflicts within parked car door zones



Downtown

Contra-flow

Dunsmuir, Vancouver



Commercial

Two-way protected

Charlotte, NC



Residential

3rd St Cycle Track

Columbus, OH

Bike Boulevard

Bike boulevards are shared roadway bike facilities on low-volume, low-speed residential streets on which motorized vehicles yield to cyclists. They leverage traffic calming & reduction strategies, signage & pavement markings, and intersection crossing interventions to discourage through-traffic of motorized vehicles in favor of providing a convenient & comfortable riding experience to cyclists & pedestrians. Bike boulevards go by several different names and vary greatly in terms of their individual design elements, but they all share the common theme of reducing motor vehicle traffic to prioritize active transportation modes. Bike boulevards are an essential component of an effective urban cycling network.



Opportunities

- Prioritizes bike travel
- Can be implemented with non-infrastructural interventions
- Serve as trail connectors through neighborhoods
- Utilize signage & boulevard names to formalize bike routes

Challenges

- Constrained to low-traffic, residential streets
- Managing intersections with major arterials
- Traffic calming interventions may be needed
- Enforcement of low speed limits



Residential

Signage Enhancements

Portland, OR



Residential

Traffic Calming

Tuscon, AZ



Residential

Olentangy Trail Connector

Columbus, OH

DESIGN CONSIDERATIONS

The following considerations are intended to illustrate typical urban greenway concerns and infrastructure options that has been used locally and across the world to solve the common concerns.

Conflict Zones

Trail Crossings

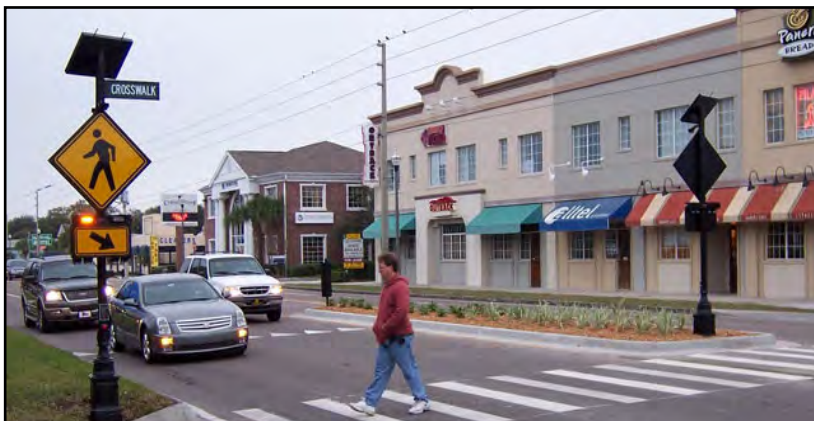


Refuge Islands

Summit St., Columbus, OH

The minimum width of a refuge island that accommodates bikes, strollers, etc. and fully protects pedestrians is 6-ft, though 8-10 feet is preferred. That said, narrower islands are preferable to nothing in certain contexts.

[More info](#)



Rectangular Rapid Flashing Beacon

St. Petersburg, FL

The unique stutter flashes of RRFBs elicits an enhanced response from drivers at high-volume pedestrian and/or cyclist crossings where driver compliance is low, and if powered via a solar panel, RRFBs have very low maintenance demand.

[More info](#)



Colored Pavement Markings

Long Beach, CA

Colored pavement painted the standard green with reflective markings and skid-resistant surfaces most effectively increase road-adjacent bike lane visibility and reinforce priority to bicyclists in conflict areas.

[More info](#)

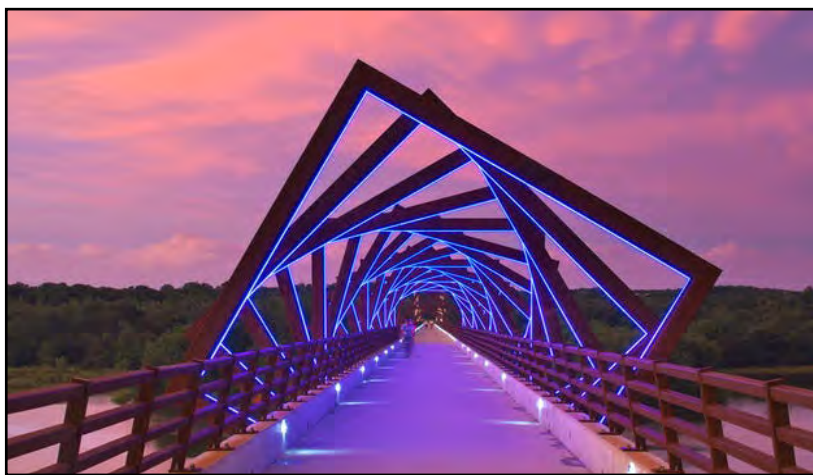


Tunnels

Mill Creek MetroParks Trail Link
Austintown, OH

The Mill Creek bikeway tunnel is a 300-foot long illuminated passage that connects the MetroParks trail underneath I-76. It cost \$2.75 million to both remove the previous bridge connector and construct the tunnel.

[More info](#)



Bridges

High Trestle Trail Bridge, Madrid, IA

A successful trail bridge will have railings of no less than 42 inches, an approach that's wider than the width of the trail to avoid bottlenecks, unobstructed sight lines, and a memorable design that's mindful of the local context and history.

[More info](#)

Intersections



Bicycle signal

Salt Lake City, UT

Bicycle signals better inform bicyclists about how to enter intersections safely & legally compared to pedestrian signals, especially where separated bike lanes join roads, bike movements are contra-flow, or high bike volumes necessitate leading cyclist intervals or "all-bike" signal phases.

[More info](#)



Roundabouts

New Albany, OH

Roundabouts do not accommodate bike lanes and often increase difficulty for bicyclists and pedestrians, but where they exist, vehicle speeds should be managed to allow experienced riders to safely share the road, and ramps to pedestrian crosswalks should be installed to allow less experienced riders to easily dismount and cross the roundabout.

[More info](#)



Curb Extensions

Kansas City, MO

Curb extensions narrow the roadway to slow vehicle speeds and turns, shorten pedestrian crossing distances and increase their visibility, increase available space for street furniture and transit stops, and enhance the multi-modality of the roadway in general.

[More info](#)

Driveways



Trail Priority Driveway Crossings

Yarra, Melbourne, Australia

Where possible, trail users should be given priority at trail-roadway intersections to keep vehicle speeds low and minimize stop-and-start instances for bicyclists.

Transit



Bus Bulbs

Summit St

Columbus, OH

Bus bulbs should have a minimum length of one bus-length, with a width of at least 6-ft. These allow buses to stop and board passengers without needing to leave and then re-enter the travel lane, ensuring faster and more reliable transit movement.

[More info](#)



Shared Bus/Bike Lane

Boston, MA

Shared bus/bike lanes are low-comfort bike facilities, so they should only be implemented on low-speed (< 20mph) and low bus-volume streets, as well as streets where no space is available for dedicated bikeways.

[More info](#)



Floating Transit Stop

Seattle, WA

Like bus bulbs, floating transit stops allow buses to board passengers without leaving the travel lane, but they're also separated from the sidewalk by a dedicated bikeway, eliminating conflicts between bicyclists and transit vehicles at stops.

[More info](#)

Buffers and Barriers

Sound Buffers



Sound Wall

Scottsdale, AZ

Sound walls must be tall enough to fully block the line of sight to adjacent noise sources in order to force sound waves above or around the wall, allowing the wall to provide a perceivable noise reduction.

[More info](#)



Street Tree Buffers

Brooklyn, NY

For vegetation to obstruct noise, it must be dense enough to be visually impenetrable. Though street tree buffers are rarely so dense, the tree canopy, visual relief, and restorative feel they provide are highly valuable benefits.

Scenic Visual Buffers



Parklet

Des Moines, IA

Parklets convert curbside areas into community seating & gathering spaces. They should be at least 6-ft wide with vertically visible barriers between them and vehicle travel, with a flush transition with the sidewalk and lack of obstruction of stormwater runoff.

[More info](#)

Safety Barriers



Car Parking - Door Zones

Oakland, CA

“Dooring” accounts for 12-27% of all urban car-bike collisions, making it a very common crash type. Door zones should provide at least 4 feet of separation between cyclists and parked cars.

[More info](#)



Concrete Barriers

Salt Lake City, UT

Low-lying concrete barriers should be paired with vertical elements, like flex posts, to visually alert their presence to motorists and avoid collisions between vehicles and barriers.

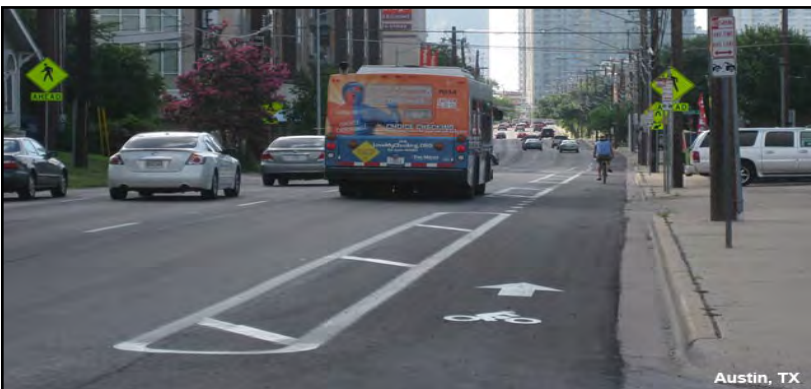
[More info](#)



Landscaped Barriers

Coral Gables, FL

Landscaped buffers or planter boxes physically and visually separate bike lanes from travel lanes, as well as provide aesthetic value and potential stormwater capture benefits.



Space Buffers

Austin, TX

Buffers should be at least 18 inches wide, with those 3-feet or wider marked with interior diagonal cross hatching or chevrons to discourage occupying the space. That said, the buffer is considered part of the bike lane, where bicyclists can pass or avoid door zones.

[More info](#)

Utilitarian Amenities

Bike Storage / Repair



Bike Depot

Westerville, OH

The Westerville Bike Depot sits in Hanby Park along the Ohio-to-Erie trail. Here, trail users can find water fountains, bike racks, restrooms, lockers, picnic area, and a fireplace. With intermodal connections, the depot can serve both as a restful stopping point and a connector to the surrounding area.

[More info](#)



Covered Bike Parking

Portland, OR

Bike shelters provide some protection from rain and the sun, especially when outfitted with green roofs. With the addition of maintenance stations or information panels, these amenities can increase awareness of and support for active transportation.

[More info](#)



Intermodal Bike Storage

Washington, DC

Intermodal bike stations can provide both long- & short-term storage, and when located within 50-feet of a transit stop or station, they can remove the need to use bus racks and readily facilitate modal shifts.

[More info](#)

Signage



Urban Street Wayfinding

Winona, MN

Wayfinding makes the urban landscape legible, helping people to interpret their surroundings and orient themselves directionally. Accessible methods incorporate multi-sensory feedback to reach travelers of all abilities.

[More info](#)



Safety Wayfinding

Los Angeles, CA

Wayfinding also guides & directs people through the physical environment, ensuring that conflict points between travelers in different modes are minimized, and giving users a sense of well-being, safety, & security.

[More info](#)



Donor/Partners Recognition Signage

Durham, NC

Recognition signage, when designed creatively & uniquely, can attract travelers and even add to the aesthetic of the trail. When paired with historical or nature-related information, it can serve as a restful & interesting stopping point.

[More info](#)

Lighting



Solar-Powered Lighting

Whittier, CA

Given that fatal bike accidents are more likely to occur in dark conditions, lighting trails & bikeways is a key step to preventing collisions & enhancing the security of users. Solar-powered lighting is ecologically-friendly and requires little maintenance.

[More info](#)

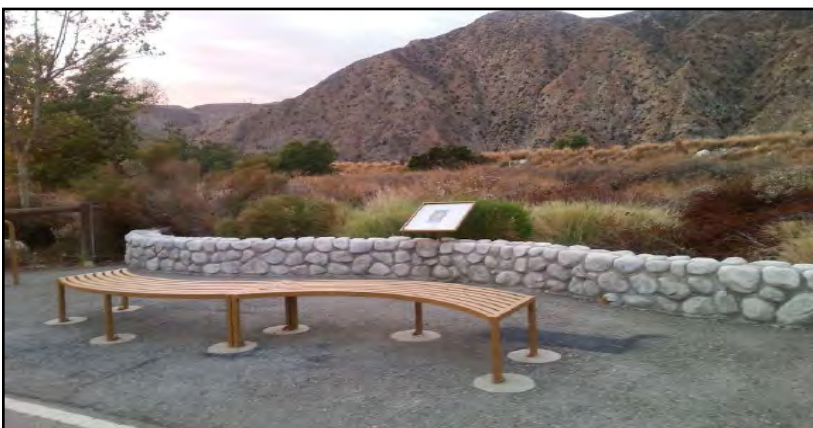
Public Facilities



Public Restrooms

Austin, TX

Regular public restrooms along greenways are more than an amenity -- they are a necessity for trail planning & infrastructure that is inclusive of those with all digestive conditions and thus accessible to people of all ages & abilities.



Rest Areas

Azusa, CA

Rest areas along trails should provide seating, like benches and tables; bike parking; water fountains; and other restorative amenities. They should also incorporate informational signage and locate near a scenic vista.

Natural, Scenic, & Comfort Amenities

Scenic Amenities



Riverfronts

Batelle Riverfront Park, Columbus, OH

Riverfront parks are dynamic greenspaces that can offer picnic-style seating areas, tables, scenic views, blueway entrances, and multi-use paths winding along flood-prone river-banks, unlocking space that's otherwise undevelopable.



Planter Boxes

Cannon Cycle Track, Hamilton, Ontario

Planter boxes provide bike lanes with more protection than flex posts, and can also offer aesthetic and ecological benefits as well. However, care should be taken to ensure they're anchored to the ground and not conflicting with street-parking.

[More info](#)



Vegetation

Fairfax, VA

Vegetation must be sufficiently dense so as to be visually impenetrable in order to provide a perceivable level of noise reduction from nearby sources. Trail vegetation can also result from natural habitat restoration projects.

Green Storm Water Management



Bioswales

Indianapolis Cultural Trail, Indianapolis, IN

Bioswales are a linear type of rain garden well-suited for the narrow space between the sidewalk and curb. They're vegetated, mulched, or xeriscaped channels that slow, infiltrate, and filter stormwater flows as they move them from one place to another.

[More info](#)

Public Art



Murals

Beltline Greenway, Atlanta, GA

Murals and public art are invaluable forms of creative placemaking that imbue focal points along trails with a sense of definition and identity. They can express the area's culture, heritage, or history, or simply add color and variety to the visual environment.



Sculptures

Kennedy Greenway, Boston, MA

Sculpture trails serve as open-air, active art galleries. The trail or multi-use path acts as guides leading users from sculpture to sculpture, blending nature with structural art.

Benches / Rest Areas



Scenic Seating

Black Hills, SD

Rest area seating is well-suited for clearings across from scenic views generated from topographical variety, gatherings of wildlife, or lush forests.



Rest Area

British Columbia, Canada

Rest areas are necessary components of a trail system that aims to be accessible and inclusive for people of all ages & abilities.

Education



Interpretive Signage

Platte River Greenway, Denver, CO

Interpretive signage is a form of storytelling, expressing themes of history, environment, or culture. Interpretive signs should visually stimulate visitors' interest, telling a sequenced story as they lead users from one story to the next.

[More info](#)

Maintenance



Snow Clearing

Columbus, OH

Research has shown that people continue to walk & bike during winter months, provided that trails are cleared for them to do so. As such, pre-treating paths or trails with anti-icing mixtures and clearing snow can unlock trails during winter months.

[More info](#)



Trail Alerts

Redding, CA

Trail alerts warn users about incoming topographical changes, like steep hills or sharp turns. They also inform users about codes or regulations that govern the trail.



Trail Counters

Madison, WI

Trail counters are highly-sophisticated technology capable of detecting and counting trail users that pass by. They are invaluable tools for understanding trail volumes and maximizing information when seeking resources for trail infrastructure and improvements.



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