

Trail Design

Shared use paths and side paths are bikeways physically separated from motorized vehicle traffic by an open space or physical barrier, typically designed for two-way travel. Both types of path may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. A shared use path is typically located within the highway right-of-way or an independent right-of-way, whereas a side path is located immediately adjacent and parallel to a roadway. It is generally preferable to select path alignments within an independent ROW, however in certain situations, existing roads may provide the only corridor available.

Chapter 5 of the *AASHTO Guide for the Design of Bike Facilities* describes design and technical standards for shared use paths. Minimum paved width of shared use paths should be 10' (3m), although this can be reduced to 8' (2.4m) for short distances if necessary. Wider trail widths, typically up to 14' (4.3m) can be considered in areas with higher traffic and/or a greater variety of users. There should be a 3-5' graded shoulder on both sides of the path, with a maximum cross-slope of 1V-6H. Areas with steeper cross slopes may require wider shoulders or physical barriers/guidrails.

For most paths, hard, all-weather pavement is the most appropriate surface structure. To best accommodate users with disabilities and properly convey surface drainage, a 1 percent cross slope is desirable. Where not possible, cross slopes should not exceed 2 percent. Similarly, path grade should be between 0.5 and 5 percent. There is no standard speed recommended for all paths, but for most paths in a relatively flat area, a design speed of 18 mph (30 km/h) is sufficient.

Trail intersections should be 90 degrees (perpendicular) if possible. In some cases where there may be right-of-way constraints, 60 degrees is acceptable. Intersections should have high-visibility crosswalk markings, preferably zebra or ladder style. Any pavement markings should be retroreflective, not slippery, and rise no more than 0.16" (4mm) above the pavement. The use of a centerline stripe can be considered to clarify direction of travel and help organize traffic in areas with heavy peak volumes or where operational challenges may exist.

Bridges

Proper planning, design, and decision making about bridge type and materials can have a substantial impact on the cost, longevity, maintenance requirements, and user safety and experience. Bridge structures can employ any of a variety of materials. For example, weathering steel has become a popular material choice for pedestrian bridges. As this material weathers, it builds up a protective layer of oxidation, eliminating the need for painting and reducing the need for ongoing maintenance. It also blends well with many surroundings. Pedestrian bridge decks are typically poured concrete or rot-resistant wood planking. Decking should be textured for bicyclist safety.

The "receiving" clear width on the end of a bridge (from inside of rail or barrier to inside of opposite rail or barrier) should allow 2 ft (0.6 m) of clearance on each side of the pathway. At transitions from paths to bridge decks, heights should match in order to provide a smooth transition. Railings should be 42" to 48" high with a maximum of 6" between posts (8" near top) to prevent falls. Where a bicyclist's handlebar may come into contact with a railing, a smooth, wide rubrail may be installed at a height of about 36" (0.9 m) to 44" (1.1 m).

Signage

Both traffic control and wayfinding signs may be considered at points along the bikeway. Post-mounted signs require a minimum 2' (0.6m) clearance from the path's edge, and the sign's bottom should be not less than 4' (1.2m) from the ground. All signs should be retroreflective.

For more specific information and types of signs, please see Ch. 9 of the Manual on Uniform Traffic Control Devices (MUTCD).

Lighting

Lighting along trails can improve user safety and security by improving visibility in low light conditions and can be used to extend the typical "dawn to dusk" hours of operation. Pedestrian-scale lighting (shorter light poles, lower illumination levels) is recommended for shared use paths, with an average level of 0.5 to 2 foot-candles. Lighting should be Dark Sky compliant (minimized glare, downcast). Special attention should be paid to lighting at crossings as they may benefit from higher illumination.

Types of Lighting:

- Wired – most expensive to install and repair, but easiest to operate and maintain.
- Battery Power – cheapest to install and repair, difficult to maintain.
- Solar – Solar-powered lighting can be implemented but take care to consider the pathway's environmental conditions.
- LED – Pros: lots of light, little power (efficient), durable / Cons: greater initial cost, uneven/unnatural lighting
- Reflective Striping – not a lighting source, but supplements existing light

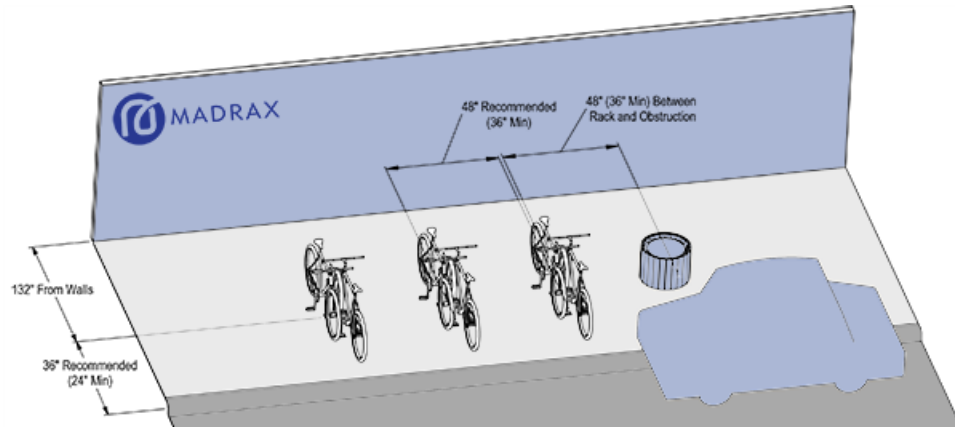
More information: <https://www.railstotrails.org/build-trails/trail-building-toolbox/design/lighting/>

Bike Parking

Bike racks – in ground mount (most secure) vs surface.

Layout:

- Need enough clearance from fixed objects (e.g., walls) – 36" minimum setback, 48" recommended
- Access to rack from all sides so all available spaces can be used. Setback depends on layout (48" minimum setback, 72" recommended for parallel; 36" minimum, 48" recommended for perpendicular – see below.)
- If near a wall/building, recommended 96" to 132" setback from walls to ensure pedestrian/sidewalk passage
- More information on [different types of layouts](#)



Essential elements of bike parking racks:

- Locking frame and wheel to bike rack
- Supports bike in two places
- Resists cutting, bending, or deformation
- Securely mounts to ground

Types of racks:

- U rack



- Post and ring



- Wheel pocket



Other Amenities

Other amenities to consider include trash receptacles (including pet waste disposal), benches, and water fountains.

Any lateral obstructions require a minimum 2' clearance from the path's edge.

Public Art

Also, consider adding public art – can help boost trail identity, community identity, sensory engagement, beautification.

In the next UPWP, NVCOG hopes to create a public art guide with more information about planning, selecting, funding, and maintaining public art.

Maintenance

Development of a bikeway requires a maintenance program to ensure that facilities are adequately maintained. Maintenance activities may include regular sweeping, litter removal, surface repairs and pavement overlays as needed, vegetation control and removal, drainage improvements, and snow clearance.