



Bicycle Infrastructure

Frequently Asked Questions



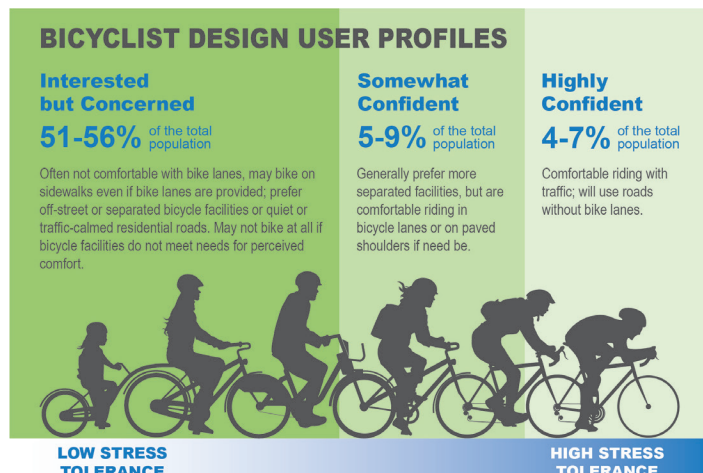
Who should we plan bicycle infrastructure for?

In many communities throughout Ohio, only a small proportion of the population currently uses a bicycle for transportation or recreation. Throughout the state, less than half a percent of workers use a bicycle to get to work. Research shows that fear of crashes with motorized traffic worries bicyclists of all confidence levels and deters would-be bicyclists more than other concerns.¹ While people already using bicycles for transportation may be relatively comfortable using existing infrastructure or riding with traffic, the majority of would-be bicyclists are concerned about their safety and have a low tolerance for traffic stress. In this light, installing more facilities that separate bicyclists from vehicles is one of the most effective

Related Resource: [Active Transportation Planning FAQ](#)

means of increasing bicycle ridership among people of all confidence levels and abilities. This is often referred to as planning for bicyclists “from 8 to 80.” Separated facilities, such as cycle tracks and side paths, increase ridership and reduce the risk of injury for bicyclists,² as well as other road users.

In addition, various members of a community may have distinct needs for cycling, and bike planning decisions should ensure equitable outcomes with regards to income, race or ethnicity, gender, age, or ability. Adopting these values in bicycle infrastructure planning can significantly affect the types of infrastructure chosen.



The majority of people interested in bicycling have concerns about their safety and comfort (Source: FHWA [Bikeway Selection Guide](#))

What are the principles for good bikeway design?

A wide variety of factors can affect a bikeway network's quality, including safety, comfort, connectivity, directness, cohesion, and attractiveness.

1 Perdomo, M., Rezaei, A., Patterson, Z., Saunier, N., & Miranda-Moreno, L.F. (2014). Pedestrian preferences with respect to roundabouts—A video-based stated preference survey. *Accident Analysis and Prevention*, 70, 84–91.

2 Lusk, A.C., Furth, P.G., Morency, P., Miranda-Moreno, L.F., Willett, W.C., & Dennerlein, J.T. (2011). “Risk of injury for bicycling on cycle tracks versus in the street”. *Injury Prevention*, 17(2), 131–135, and others.

While a community may prioritize these aspects uniquely, the first three are typically considered paramount for bikeway design that attracts new users:

- » **Safety:** Bicycle infrastructure should minimize conflicts between users to reduce the frequency and severity of crashes.
- » **Comfort:** Infrastructure should be as low-stress and anxiety-free as possible.
- » **Connectivity:** The network should take people where they want to go, offering access to the same locations that the road network serves and with direct and continuous routes and clear transitions.

What are the different types of bikeways?

Bikeway facilities vary in their degree of separation from motor vehicle traffic. Generally, more separation from traffic is considered to be more comfortable and less stressful for riders; however, this can depend on the speed and volume of traffic on the road, and the personal preferences of the rider. The bikeway types below are presented in order of those with the most separation from motor vehicles to those with the least separation.

- » **Shared Use Path (SUP) or Sidepath:** A pathway intended to be used by bicyclists and pedestrians, with two-way travel. This may be a sidepath, aligned alongside an existing roadway, or a trail with an independent alignment.

- » **Separated Bicycle Lane (SBL):** A bikeway within the road right-of-way that has vertical and horizontal separation from motor vehicles; this may be provided through flexible posts, planters, curbs, or parked cars. SBLs may allow for one- or two-way bicycle travel.
- » **Buffered Bicycle Lane:** A one-way bikeway that is horizontally separated from motor vehicle traffic with a painted, striped buffer on the roadway.
- » **Standard Bicycle Lane:** A one-way facility demarcated on the road with paint only, either with a white lane stripe or with colored paint on the entire lane.
- » **Bicycle Boulevard:** A neighborhood street with low vehicle speeds and volumes that is designated as a low-stress bicycle route, usually with painted pavement markings and signage. Bicyclists share the same lane as motor vehicles, who are expected to yield to them. Also known as a Neighborhood Greenway.
- » **Shared Lane Markings (or Sharrows):** A bicycle and chevron symbol painted on a vehicle travel lane to indicate that cars are expected to share the lane with bicyclists. The markings are generally located along the expected path of travel for bicyclists at regular intervals. These can be augmented with “Bicyclists may use full lane” signage.
- » **Signed Route:** A roadway that has been designated as a preferred bicycle route, indicated only with directional signage.

Shared Use Path



Sidepath



Separated Bicycle Lane



Buffered Bicycle Lane



Standard Bicycle Lane



Bicycle Boulevard



Shared Lane Markings

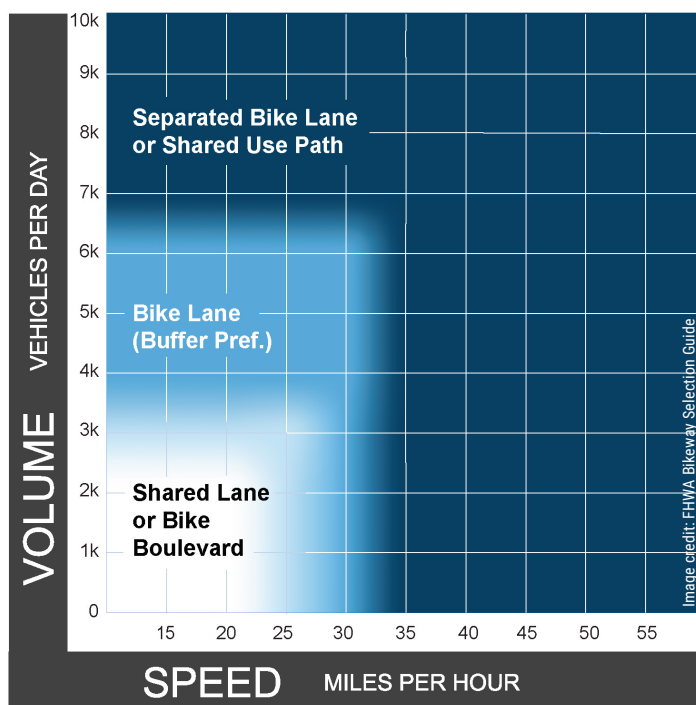


Signed Route



How do we select the appropriate type of bikeway?

The types of facilities you choose will affect who chooses to ride on them. The most appropriate type of bikeway for your context will depend on a number of factors; vehicle speed and volume are the primary consideration. The Federal Highway Safety Administration's (FHWA) [Bikeway Selection Guide](#) provides general guidelines for bikeway selection in both urban and rural contexts, depending on vehicle speed and volume. The risk of crashes and fatalities rises sharply when motor vehicles drive at speeds over 25 mph and when roadways support more than 6,000 vehicles per day. Nevertheless, the boundaries are not rigid, and the existing roadway width and many other conditions all play a role. The type of bikeway needed also depends upon the design user; while casual and "interested but concerned" cyclists generally prefer to ride on neighborhood streets or more separated facilities, more experienced or faster riders may prefer facilities more integrated with vehicle traffic.



Notes

- 1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- 2 Advisory bike lanes may be an option where traffic volume is <3K ADT.
- 3 See page 32 for a discussion of alternatives if the preferred bikeway type is not feasible.

A graphic for selecting bikeway types in urban areas according to roadway speed and volume from the FHWA [Bikeway Selection Guide](#).

How can bicyclists remain safe at intersections?

Bicyclists are exposed to the most conflicts and risks at intersections. Providing protection and direction at intersections and maintaining facility continuity through intersections are among the most important factors for creating safer bicycling networks.

- » **Reduced Curb Radius:** Wide, gradual curbs at intersections encourage drivers to take turns quickly, often turning right in front of bicyclists riding straight. Reducing the curb radius sharpens the curve and forces drivers to slow down.
- » **Bike boxes and two-stage turn queue boxes:** Green painted areas between the crosswalk and vehicle stop bar (bike boxes) allow bicyclists to be seen at intersections and get a head start at a green light. Green queue boxes indicate where bicyclists should wait to turn left in two stages, rather than having to move from the right side of the street all the way across to make a left turn.
- » **Mid-block crossings:** Shared use paths often intersect with roadways in the middle of a block; treatments such as raised crosswalks, signage, and flashing beacons can alert drivers to the presence of crossing bicyclists who are then able to continue on their path of travel.
- » **Mixing zone/conflict point markings:** Green paint and other pavement markings indicate "conflict points" on the road where different modes of traffic may cross, reminding all road users to be alert.
- » **Protected intersections:** At a protected intersection, the physical separation of a separated bike lane continues into the intersection and channelizes turning vehicles to a single path, reducing the weaving and merging conflicts otherwise present. Signal phasing can also be used to help cyclists cross the intersection before cars begin turning.
- » **Recessed crossings:** Often used at roundabouts and at sidepath crossings, the crossing area can be set back from the main path of travel. In this configuration, there is space for a vehicle to turn the corner or exit the roundabout, see a crossing bicyclist at a perpendicular (and therefore more visible) angle, and stop to wait until the intersection is clear.



A protected intersection reduces conflicts between motor vehicles and bicyclists.

- » **Bikeshare systems** come in all shapes and sizes and help make bicycling accessible to more people in the community.
- » **Trailheads** for shared use paths provide additional amenities for longer-distance riders and bicycle tourists, and can help brand your city or village as a welcoming place for bicyclists.
- » **Fix-it Stations** with freely available tools placed in strategic locations on the bicycle network help bicyclists keep their bikes in working order, ensuring they don't get stranded with a broken bicycle.

What other types of infrastructure are needed to support bicycling?

- » **Wayfinding signage and pavement markings** help cyclists easily navigate the bicycle network. Wayfinding also raises awareness of the network to other roadway users.
- » **Safe and convenient bicycle parking** allows people to access community locations by bicycle. Different types of parking is needed for different types of users, such as curbside parking for shoppers or indoor covered parking for bicycle commuters.



Wayfinding signage helps bicyclists navigate the bikeway network.

Where can I find out more?

- » Federal Highway Administration (FHWA) (2014). *Bicycle Safety Guide and Countermeasure Selection System*. <http://www.pedbikesafe.org/BIKESAFE/index.cfm>
- » FHWA (2015). *Separated Bike Lane Planning and Design Guide*. https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/separated_bikelane_pdg/page00.cfm
- » FHWA (2019). *Bikeway Selection Guide*. https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf
- » Massachusetts Department of Transportation (2015). *Separated Bike Lane Planning & Design Guide*. <https://www.mass.gov/lists/separated-bike-lane-planning-design-guide>
- » National Association of City Transportation Officials (NACTO) (2014). *Urban Bikeway Design Guide*. <https://nacto.org/publication/urban-bikeway-design-guide/>
- » NACTO (n.d). *Designing for All Ages and Abilities*. <https://nacto.org/publication/urban-bikeway-design-guide/designing-ages-abilities-new/>

