JEFFERSON COUNTY

TRAILS & GREENWAYS

Sponsored By:

BHJ-MPC
Brooke Hancock Jefferson Metropolitan Planning Commission

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

Prepared By:

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People throughout the region and across the nation are seeking more occasions to get out of their cars to walk or to ride bicycles. This increased interest is leading many community leaders, developers, and transportation agencies to ask the question,

"How do we make our communities more bicycle and pedestrian friendly?"

The process of developing trails and greenways is not necessarily intuitive and mastery takes practice. Unfortunately, planning isn't just riding a bike or getting outside to walk.

This Quick Reference Guide is a simplified document not intended for design purposes but rather to give the practitioner an overview of the items and features that need to be considered when deciding to build a new trail or bikeway. More detailed information is found in the supporting Jefferson County Trails and Greenways "Implementation Guidelines" document.

Jefferson County Trails & Greenways Implementation Guidelines
ODOT PID #99937

QUICK REFERENCE GUIDE

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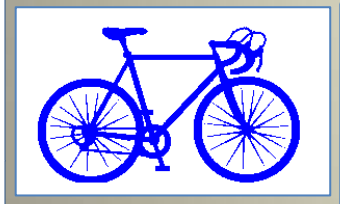

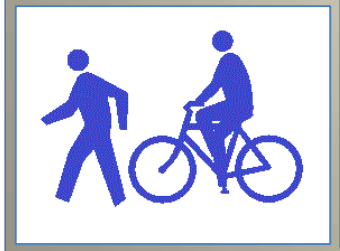

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Jefferson County Trails & Greenways Implementation Guidelines

GOALS

1. Support and promote consistency of standards and guidelines.
2. Create a framework for future trail planning.
3. Increase user safety, comfort and convenience.
4. Promote universal access to users.
5. Recognize a variety of trail users.
6. Reduce liability by following generally accepted design guidelines.
7. Ensure compatibility with roads and highways.
8. Minimize impact to sensitive natural resources.
9. Ensure the long-term viability of trails.

IMPLEMENTATION STATEGIES

- Identify key corridors
- Prioritize the corridors
- Determine likely alternatives
- Assemble a network
- Phase the development
- Implement the system
- Evaluate the results

LOGO

Shown, is the Jefferson County Trails & Greenways system logo. Use of logo must be approved by the Jefferson County Trails and Greenways Committee. The logo should be displayed on all system trails & greenways.

PROPOSED TRAIL CORRIDORS

The proposed bikeway and trail corridors for future bikeways and trails are depicted in the *Jefferson County Trails and Greenway Plan*.

http://www.jcport.com/_Assets/files/Jeff%20Co%20TG%20Plan%20Final%20-%2020121023.pdf

JEFFERSON COUNTY TRAILS AND GREENWAYS PLAN

FINAL REPORT October 2012 | Formulating a Vision, Turning it into Reality

GUIDELINE USERS

Who are these guidelines for?

- Policy Makers
- Trail Planners
- Trail Designers (Public & Private)
- Concept and/or Application Reviewers
- Maintenance and Operations Staff
- Bicycle Enthusiasts

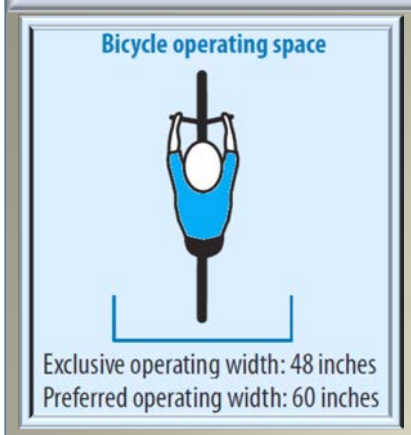
INTRODUCTION:

This is a "Quick Reference Guide". Refer to the comprehensive manual for more detailed information.

These guidelines present a comprehensive approach to designing new and modified streets, highways and trails within Jefferson County's area of influence to accommodate a variety of users. These guidelines will allow the BHJ-MPC, Jefferson County, and Local Jurisdictions to provide comfortable travel for pedestrians, bicyclists and motorists.

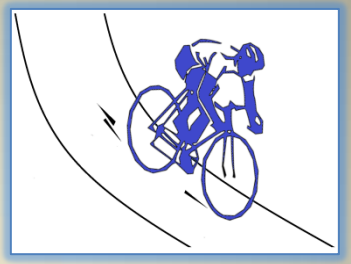
PURPOSE:

The purpose of this document is to provide implementation guidelines for trails and greenways, including bike routes in Jefferson County Ohio. The appropriate design of trails, greenways, and bicycle facilities enhances the enjoyment, safety, and comfort of bicyclists and other users.



BICYCLE SPEED EXPECTATIONS

TERRAIN	SPEED
Paved Level Surface	15 mph
Downhill	30 mph
Uphill	5 to 12 mph
Crossing Intersections	10 mph



BICYCLIST ABILITY LEVELS

(Refer to Page 25 Resource #13)

BICYCLIST OPERATING SPACE

Bicyclist operating space is the space that a bicyclist needs to ride comfortably and safely. It includes the unique needs related to powering a bicycle and staying balanced. The bicyclist operating space takes into account multiple users, including pedestrians, traveling at differing speeds.

BICYCLIST OPERATING SPACE GUIDANCE

- Bicyclist essential physical operating width: **40 inches min.**
- Operating width to exclusively or preferentially accommodate forward movement: **48 inches min.**
- Preferred operating width: **60 inches**
- Essential physical operating width to accommodate bicycling with adjacent barrier (guardrail, curb, etc.) or in stressful environment: **60 inches or more**
- Vertical clearance to accommodate adult bicyclist standing upright on pedals: **96 inches min., 120 inches preferred**
- Distance bicyclists tend to ride from curb: **32-40 inches**
- Eye height of adult bike rider: **60 inches approx.**
- Eye height of recumbent bike rider: **46 inches approx.**

GROUP A – ADVANCED BICYCLIST

Advanced bicyclists are experienced cyclists who can ride under most traffic conditions. Like motorists, advanced bicyclists prefer quick, direct access to destinations with a minimum of stops.

GROUP B – BASIC BICYCLIST

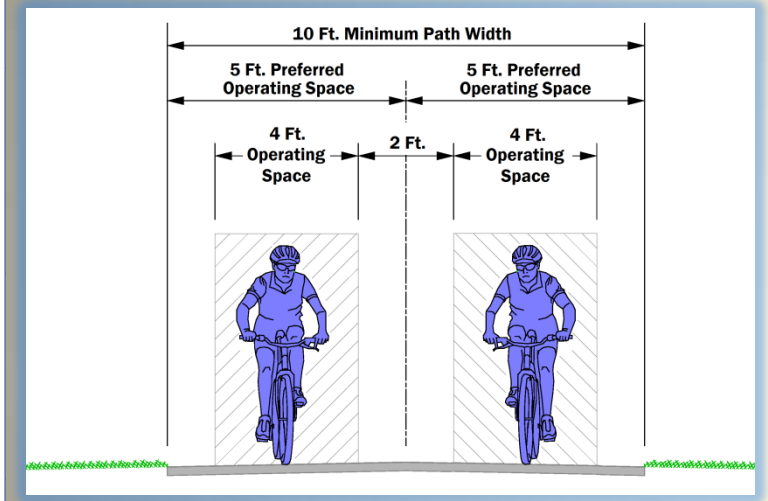
Basic bicyclists are casual, new adult or teenage riders who are less confident in their ability to operate in traffic without special provisions for bicycles. Group B cyclists consist of commuter, recreational, and utilitarian bicyclists.

GROUP C – CHILDREN BICYCLIST

Children bicyclists are pre-teen riders whose bicycling activity is initially monitored by their parents.

PAVED PATHWAY WIDTH

Under most conditions, the minimum paved width for a two-directional bicycle path is 10 feet. Wider widths (12 to 14 feet) are applicable to areas with high use and/or a wider variety of user groups.



PATH CLEARANCES

VERTICAL CLEARANCES:

- 8 Feet minimum, 10 feet recommended
- 10 Feet for maintenance vehicles
- 12 Feet recommended for tree limbs

HORIZONTAL CLEARANCES:

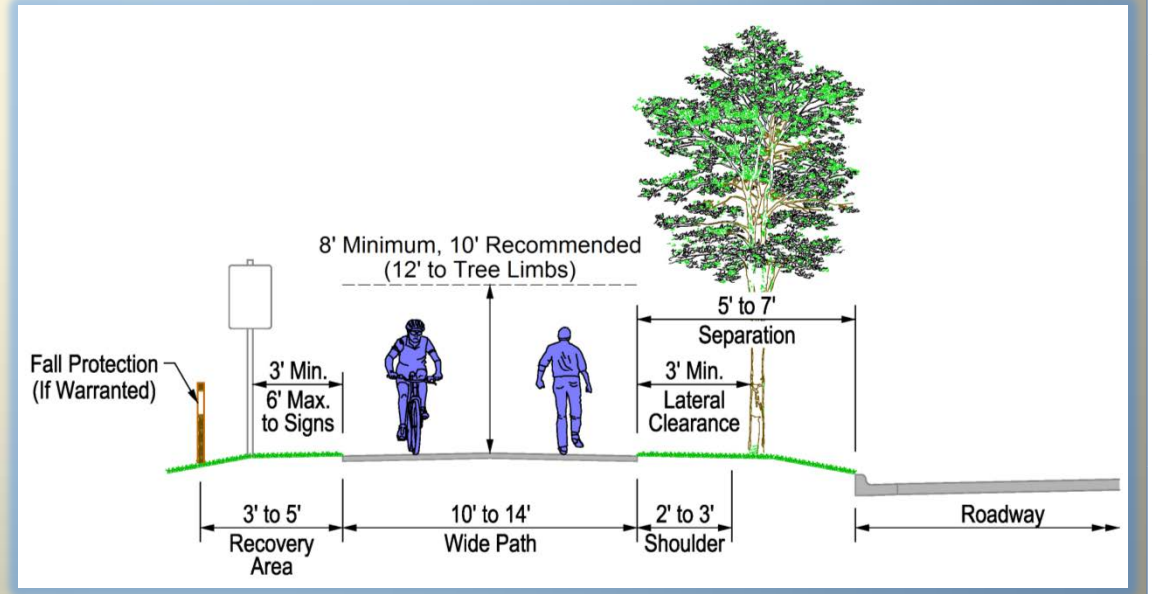
- 3 Feet minimum for obstacles
- 2 Feet minimum on bridges
- 5 Feet for steep slopes recommended

GRADES FOR BICYCLISTS

Paved path grades greater than 5 percent are not desirable but they may be greater subject to the following restrictions.

Recommended Grade Restrictions for Paved Paths

Grade Value (%)	Maximum Length of Grade Segment (Feet)
5 to 7	800
7 to 8	400
8 to 9	300
Greater Than or Equal to 9	200



BIKEWAY FACILITY TYPES

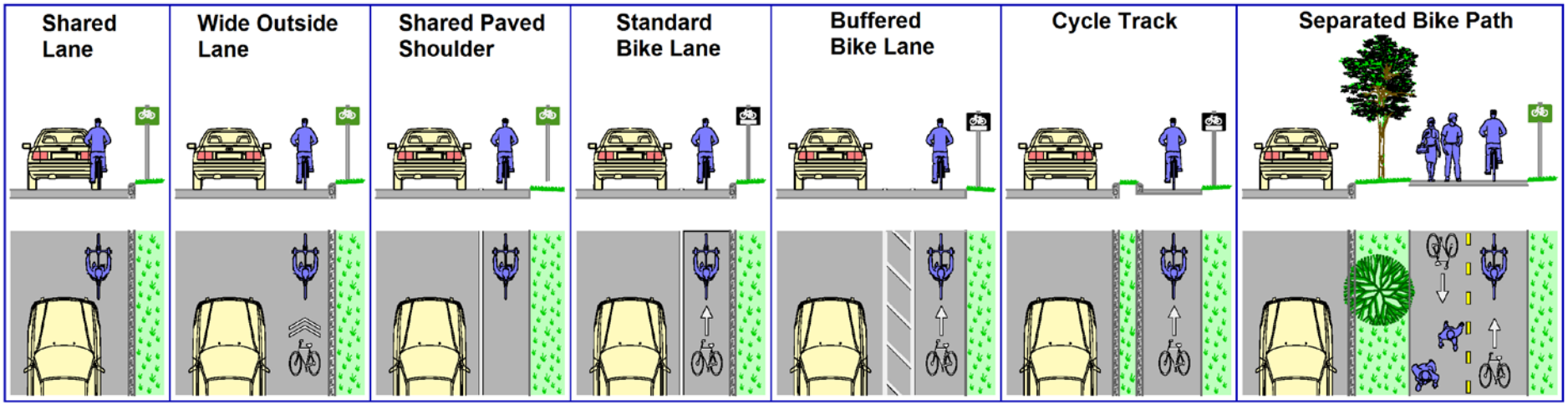
The bikeway facility types should be used as building blocks for a safe and comfortable bicycle network.

LEVEL OF TREATMENT FOR SAFETY

The following illustrates the range of bicycle facilities levels of treatment for safety and protection.

BICYCLIST LEVEL OF PROTECTION

LEAST PROTECTED → **MOST PROTECTED**



Shared Lane: A shared lane is a standard width roadway travel lane shared by motor vehicles and bicyclists.

Wide Outside Lane: A wide outside lane is an outside travel lane with at least 14 feet width.

Shared Paved Shoulder: A shared shoulder is a paved portion of a roadway to the right of the edge stripe designed to serve bicyclists.

Standard Bike Lane: A bike lane is a portion of the roadway designated for preferential or exclusive use of bicycles.

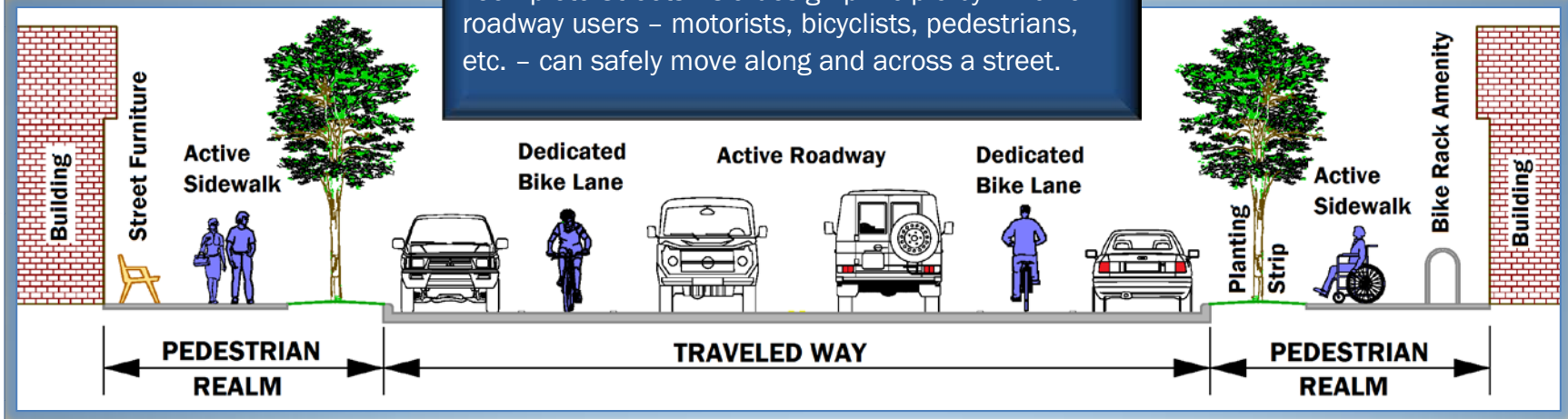
Buffered Bike Lane: A buffered bike lane separates bicyclists from motor vehicles with a space delineated with pavement markings or surface treatments.

Cycle Track: A cycle track separates bicyclists from motor vehicles with a physical barrier or space.

Separated Bike Path: A separated bike path is a facility physically separated from the roadway and intended for bicycle use. A separated bike path is usually shared with pedestrians.

COMPLETE STREETS

"Complete Streets" is a design principle by which all roadway users – motorists, bicyclists, pedestrians, etc. – can safely move along and across a street.



ROAD DIETS: Right-Sizing Roadways

Reconfiguring the number and/or size of vehicle lanes can right-size a roadway to better serve the needs of a community and improve safety for all roadway users.

ROAD DIET: Lane Narrowing

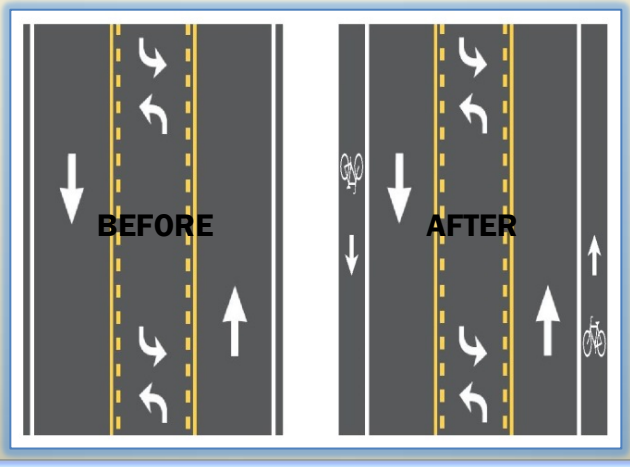
Narrowing lanes on streets with unnecessarily wide travel lanes can calm traffic, create space for bicycle lanes, and increase safety for all users.

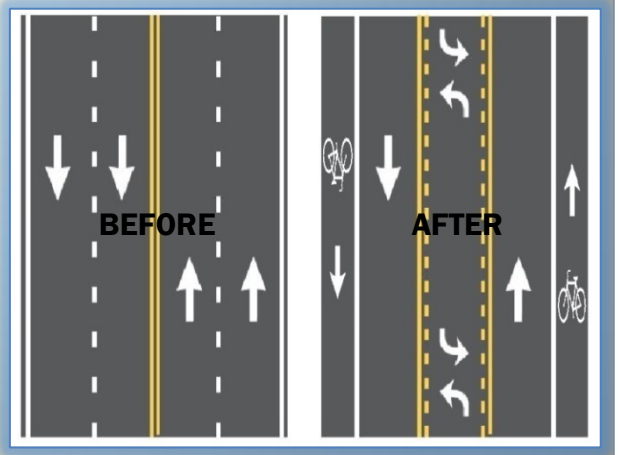
ROAD DIET: Lane Conversion

A Road Diet typically involves converting a 4-lane road into a 3-lane street. This realignment creates room for bike lanes and pedestrian movements.

ROAD DIET: Benefits

- Increase road safety and access
- Create space for bicycle lanes, walks, and/or on-street parking
- Create space for median refuge islands
- Decrease crossing distance for pedestrians
- Reduces likelihood of rear-end and side-swipe crashes with center turn lanes
- Improves compliance with speed limits





INTERSECTION CROSSING MARKINGS FOR BICYCLISTS

Intersection crossing markings indicate the intended path of bicyclists. They guide bicyclists on a safe and direct path through intersections, including driveways and ramps. They provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

BIKE BOX

A bike box is placed ahead of queuing motor vehicle traffic. They increase a bicyclist's visibility, facilitate left turning movements, alleviate "right hook" conflicts, and allow intersections to clear faster.

TWO STAGE TURN BOXES

A two stage turn box provides a safe method of making left turns on multi-lane roadways from bikeways located to the right side of traffic, or vice versa.

THROUGH BIKE LANE

A through bike lane allows bicyclists to correctly position themselves to the left of right turning vehicles to avoid "right hook" collisions.

SHARED TURN LANE

A shared turn lane provides the same benefits as a through bike lane where roadway space is constrained.

INTERSECTION CROSSING MARKING BENEFITS

- Raises awareness for both bicyclists and motorists to potential conflict areas.
- Reinforces that through bicyclists have priority over turning vehicles or vehicles entering the roadway
- Guides bicyclists through the intersection in a straight and direct path.
- Makes bicycle movements more predictable.
- Increases the visibility of bicyclists.
- Reduces conflicts between bicyclists and turning motorists.

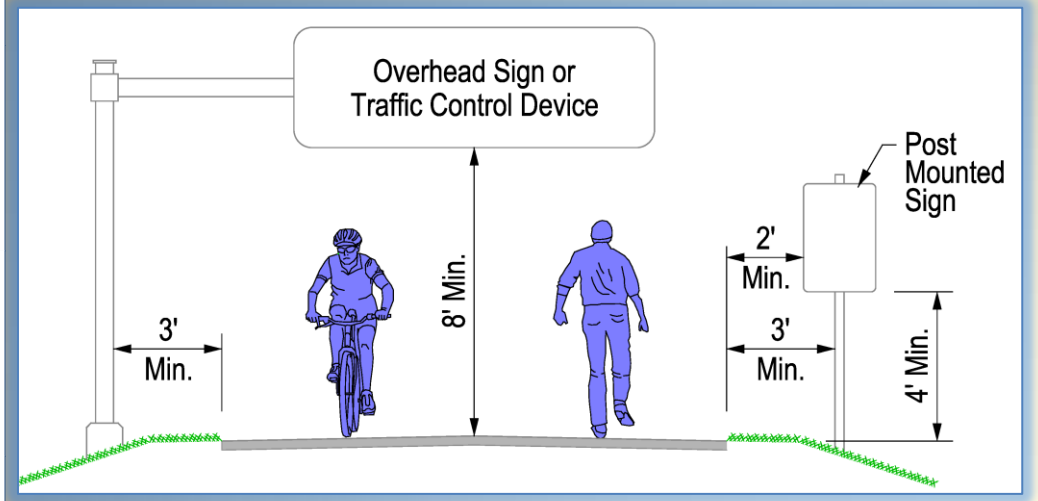
DOTTED LINES

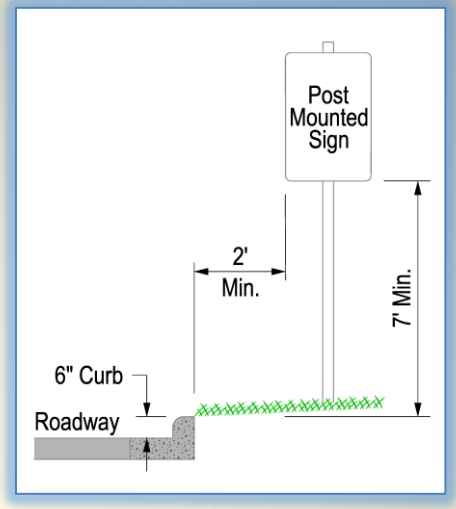
Dotted lines define intersection bicycle crossing space. Pavement markings extended into or continued through an intersection shall be the same color and width as the line markings they extend.

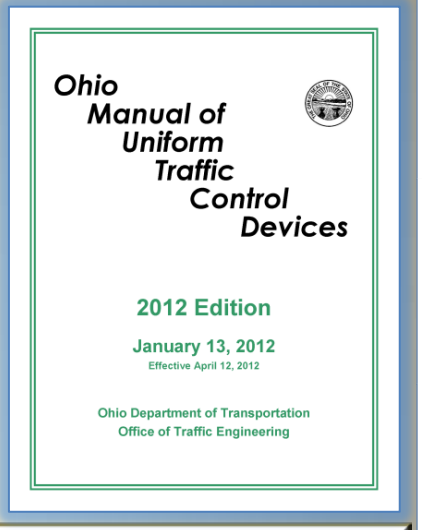
STRIPING WIDTH

Striping width shall be a min. of 6 inches adjacent to motor vehicle travel lanes and shall otherwise match the width and lateral positioning of leading bike lane striping.

SIGNAGE PLACEMENT STANDARDS







REGULATORY AND WARNING SIGNS

Regulatory and warning signs will alert bicyclists to potential conflicts and convey regulatory messages to both bicyclists and motorists at highway intersections.

PAVEMENT MARKINGS

Pavement markings provide wayfinding and will alert bicyclists to potential conflicts and convey regulatory messages to both bicyclists and motorists at highway intersections.

Ohio Manual of Uniform Traffic Control Devices (OMUTCD)

Consult the OMUTCD Part 9 for the latest and most complete set of bicycle-related signs and pavement markings.

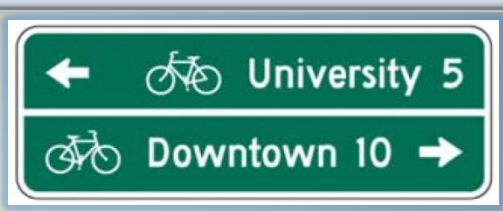
(Refer to Page 25 Resource #8)

SIGNAGE AND PAVEMENT MARKINGS

The use of appropriate signs and pavement markings will improve the safety and general public acceptance of bicycles on public roadways.

BIKE ROUTE SIGNAGE

Bike Route signs help label roads and direct bicyclists. Specially marked bike routes ensure that bikers can travel quickly and safely.



CONFIRMATION SIGNS

- Indicate to bicyclists that they are on a designated bikeway.
- Make motorists aware of the bicycle route.
- Can include destinations and distance/time.
- Do not include arrows.
- Place as often as every ¼ to ½ mile on off-street facilities if needed for confirmation.
- Place every 2 to 3 blocks along bicycle facilities, unless another type of sign is used (e.g., within 150' of a turn or decision sign).
- Should be placed soon after turns to confirm destination(s).

Pavement markings also provide confirmation that a bicyclist is on a preferred route.

TURN SIGNAGE

- Indicate where a bikeway turns from one street onto another street.
- Include destinations and arrows.
- Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through).
- Pavement markings can also indicate the need to turn to the bicyclist.

WAYFINDING SIGNAGE NETWORKS

Wayfinding signage networks, such as the U.S. Bike Routes and State Bike Routes, utilize a route numbering system. Route numbering systems may not be intuitive for bicyclists without a map or directory.

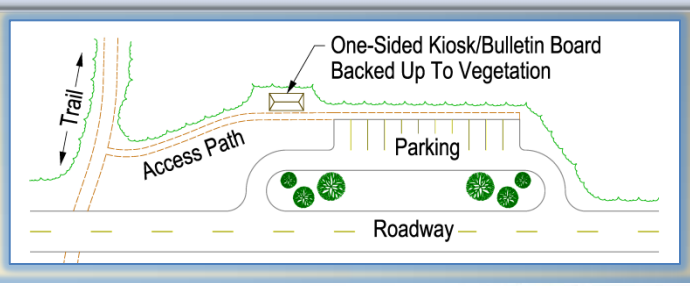
The placement of wayfinding signs may be limited specifically to the designated bicycle network, as other streets may be difficult or dangerous for bicyclists.

DECISION SIGNS

- Mark the junction of two or more bikeways.
- Inform bicyclists of the designated bike route to access key destinations.
- Destinations and arrows, distances, and travel times are optional but recommended.
- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

TRAILHEADS

A trailhead is the primary starting point of access to trails intended for public use, which may be reached by pedestrian or vehicular access, including bicycles and public transit.



MAJOR and MINOR TRAILHEADS

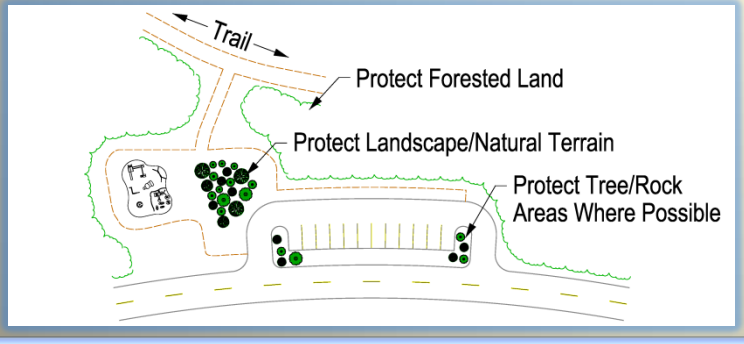
- Trailheads should be installed throughout the greenway system to give the public access.
- A "trailhead" is a point of formal public entry into the greenway system that may provide certain related public facilities such as parking, restrooms, drinking fountains, trail signage, etc.
- Major trailheads and minor trailheads are suggested.

MAJOR TRAILHEADS:

Major trailheads should be located in significant areas. An exhibition building or an interpretive exhibit may be incorporated, along with restrooms, water fountains, picnic tables, parking, signage, etc.

MINOR TRAILHEADS:

Minor trailheads can be used to connect a smaller number of people to surrounding trails, open space, parks, etc.



TRAILHEAD IMPLEMENTATION GUIDANCE

Trailheads should be placed at each terminus of a trail corridor and any place where a large concentration of trail users is expected.

An accessible pathway should be developed that connects parking and other accessible elements to the trailhead.

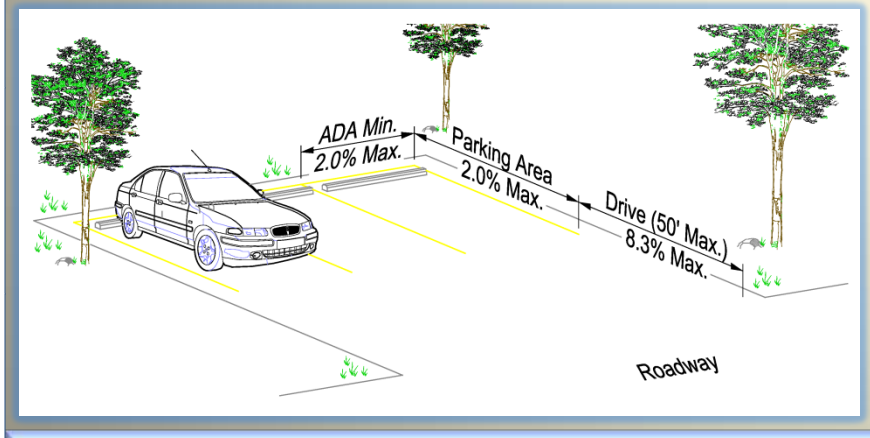
Trailheads should include parking, benches, bike racks, signage, trash receptacles and a trail map.

Trailhead facilities located adjacent to or within residential neighborhoods should be designed to ensure compatibility with the surrounding neighborhood.

Trail access points should be placed wherever trail access is expected, such as at adjacent communities, schools, commercial areas, and parks.

Trail access points should include signage identifying the trail.

Parking areas need to meet the technical requirements for accessible parking spaces found in *Americans with Disabilities Act Accessibility Guidelines* (ADAAG).



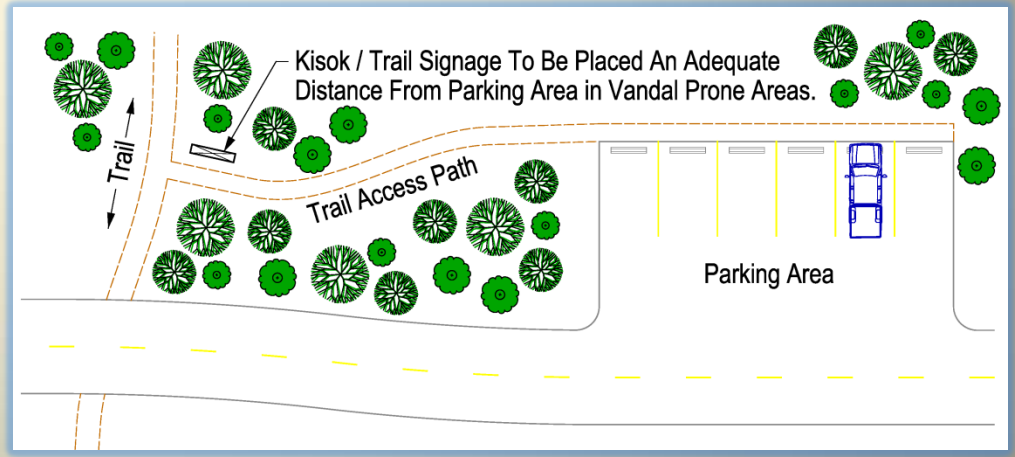
RESTROOMS

Public amenities, such as restrooms, etc., are suggested to be located and concentrated at the confluence of vehicular and pedestrian traffic.

ADA accessible restrooms should be placed at major trail access points in order to accommodate trail users.

Where possible, other uses should be incorporated into the structure, such as storage for maintenance equipment. These structures should be located adjacent to thoroughfares for security, maintenance and access to utility hookups. They should also make use of natural light and ventilation as much as possible.

SIMPLE ROADSIDE MINOR TRAILHEAD



TRAILHEAD SIGNS

A trailhead sign is used to provide trail-specific information at the trailhead of each trail.

TRAILHEAD ENTRANCE SIGNS

A trailhead entrance sign is typically located at the entrance or gateway to a trailhead facility. It is usually located to be visible from a public roadway.

The trailhead entrance sign will show the trailhead facility name and/or associated trail names. Additionally they will identify sponsor, funding, and maintaining agencies.

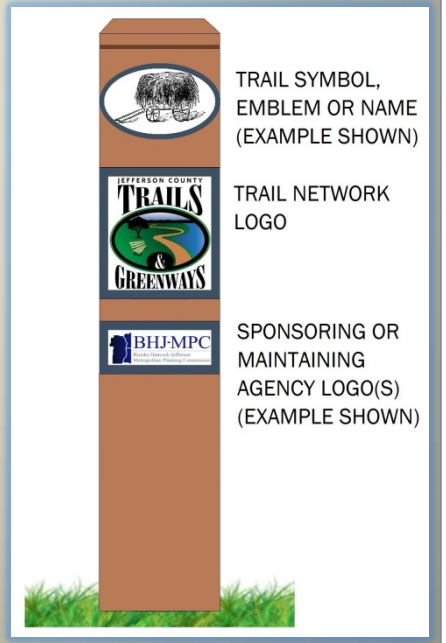
TRAILHEAD SIGN GUIDANCE

Trailhead signs may be posted on an informational kiosk if the kiosk is at the trailhead of a single trail. In locations without a trail-specific kiosk, the single-sided trailhead sign should be posted conspicuously so that it is readily visible to users entering the trail. At secondary trail junctions and road crossings, marker posts may be used to provide trail-specific information instead of using trailhead signs.

Information on all trailhead signs may include:

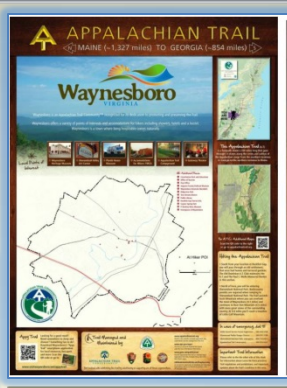
- Trail name
- Map of trail
- Symbols showing allowable uses of the trail
- Total trail length
- Trailhead elevation along with maximum and minimum trail elevations
- Surface type, firmness, and stability
- Known trail hazards
- Difficulty rating, if rated
- Trail condition statement

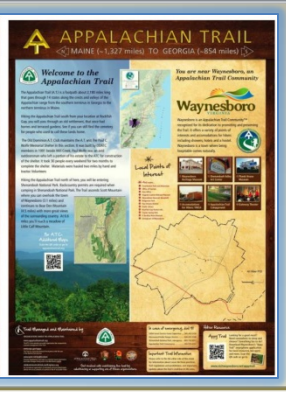
EXAMPLE TRAILHEAD AND TRAIL SIGNS



TRAIL KIOSKS

Trail information kiosks provide a central location, typically near trailheads or adjacent to parking areas, to welcome visitors to one or more trails and to prevent sign clutter by consolidating visitor information in one place.





TRAIL KIOSK IMPLEMENTATION GUIDANCE

- Kiosks should display an overall park map showing facilities and trails, either as part of the trailhead sign or displayed separately
- A map of a large park could be displayed across one entire side of the kiosk
- Be sure that the kiosk is designed to accommodate the needs of its intended location
- The kiosk may include brochures and maps
- Interpretive kiosks are used to educate visitors about natural, cultural, historical, or recreational features of a trail
- Kiosk designs should accommodate 36”x48” panels to display multiple signs but can vary in size
- A kiosk offers the potential to recognize the input and accrues value from a number of partners working together to plan, develop, fund and maintain a trail

KIOSK PANEL IMPLEMENTATION GUIDANCE

The elements of a panel include graphics and images, accompanying text, and a map. They should coalesce to provide a common look between designated communities and agencies. Key visual elements will help achieve this goal and a template should be made available for use by communities.

- Kiosks and fabricated panels placed outdoors are exposed to the elements therefore set appropriate expectations for its lifespan and scheduled replacement
- Panels will include the logos of the agencies and communities funding, sponsoring and maintaining the kiosk or trail
- The header should have the trail name
- An overview map of the entire trail or trail system
- A trail map is recommended that shows the encompassing length of the trail such that it conveys the magnitude of the entire trail
- The **“YOU ARE HERE”** feature is the most important part of a map
- Community Map and/or Community Name
- Theme, Headline & Copy
- Local Points of Interest
- Quick Response (QR) Code
- Dynamic content, such as a bulletin board
- Maintenance and Emergency Contact Information

INTERPRETIVE SIGNAGE

Interpretive facilities allow the trail user to gain an understanding of the unique environment through which they travel. They should be incorporated into the overall planning and design of each trail.

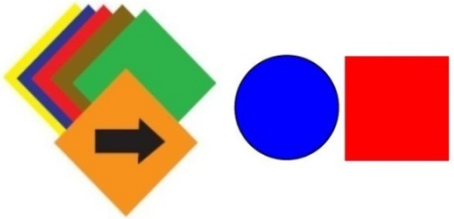
Interpretive signs point out features of interest along the trail and educate trail users about those features, which can be natural, cultural, historical, or recreational. Interpretive signs can also direct users to avoid impacting ecologically sensitive areas and educate recreational users about the environment, thereby creating a new purpose for recreational trails.

WAYMARKS: TRAIL MARKER SIGNS & BLAZES

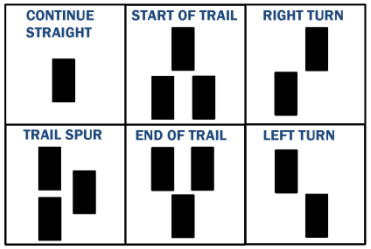
Trails can be marked in many ways. Blazes can be painted on trees, stakes, or other objects. Posts can be set into the ground and markers or trail marker signs can be mounted to the posts.

Trail marker signs are small simple signs that mark the route of the trail and reassure trail users that they are on the correct trail. They often contain additional information for the trail user.

TRAIL MARKER EXAMPLES



TRAIL BLAZES



TRAIL POST MARKER SIGN EXAMPLES

SMALL SIMPLE TRAIL SIGN EXAMPLES

TRAIL AND BIKEPATH GEOMETRICS

The major geometric features that affect the speed at which a bicyclist can travel safely and comfortably are curvature, superelevation, gradient, and width of the traveled way. In addition, factors such as traffic, intersections, type of bicycle, physical condition of the rider, wind, and surface condition also affect the bicyclist's speed.

GEOMETRIC DESIGN CONSIDERATIONS (Refer to AASHTO Bicycle Guide)

DESIGN SPEED: A design speed of 20 mph should be used except a 30 mph design speed should be used for descending grades longer than 500 feet and steeper than 4 percent.

CROSS SLOPE: A cross slope of 2 percent is recommended for drainage on tangent (straight) sections of a shared-use path.

SUPERELEVATION: Superelevation (transverse sloping of path down toward the inside of the curve) of 2 percent to 3 percent should be provided on most curves. For most conditions, the minimum superelevation rate of 2 percent will be adequate.

HORIZONTAL CURVATURE: The minimum radius of horizontal curvature depends on design speed, rate of superelevation, coefficient of friction and the allowable lean angle of the bicyclist.

GRADES: The grade that a bicyclist can be expected to negotiate depends on the length of the grade, wind velocity, and surface condition. The maximum grade recommended for shared-use paths is 5 percent and sustained grades should be limited to 3 percent, as much as practical.

SIGHT DISTANCE: A shared-use path should be designed with adequate stopping sight-distance on vertical curves, horizontal curves, and at intersections to provide users an opportunity to see and react to other users and unexpected conditions.

STOPPING SIGHT DISTANCE: The stopping sight-distance for bicyclists is typically calculated as a function of brake reaction time and the ability of a bicyclist to come to a complete stop. Stopping distances for bicyclists traveling at the same speed may vary dramatically.

SIGHT DISTANCE AT HORIZONTAL CURVES: The amount of lateral clearance required on the inside of a horizontal curve is a function of the design speed, curve radius, and the grade.

HORIZONTAL CLEARANCE: Shared-use paths should be designed to provide clearance from hazards, barriers, and slopes. Horizontal clearances are designed to provide emergency operating space in case path users must maneuver to avoid conflicts, or to safely recover control if they have drifted or have been forced off the path.

AASHTO BICYCLE GUIDE

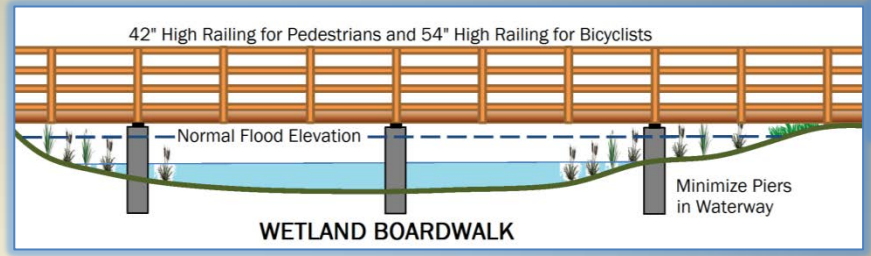
The guide provides guidance for:

- Bicycle planning
- Choosing a facility type
- Wayfinding
- Bicycle operation and safety
- Design of on-road facilities
- Design of shared-use paths
- Bicycle Parking Facilities
- Maintenance of Operations

(Refer to page 25 resource #1)

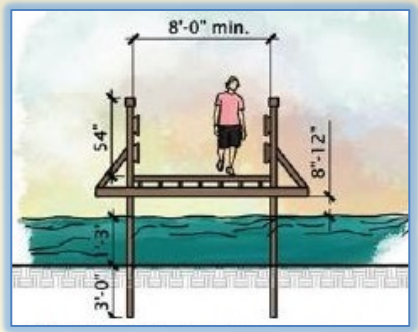
BRIDGES

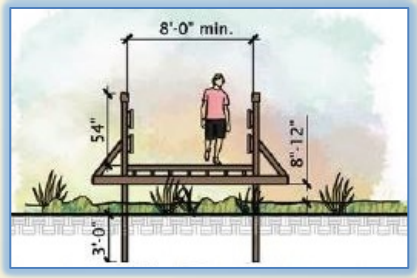
Bridges serve an important function by providing bicycle and pedestrian access across barriers. An overpass, underpass, small bridge, drainage facility or facility on a highway bridge may be necessary to provide continuity to a bicycle path.

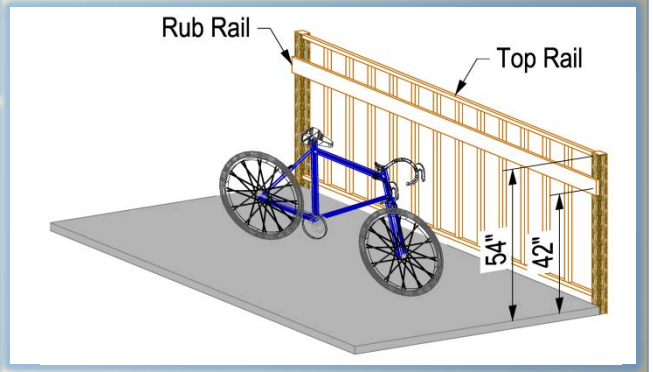


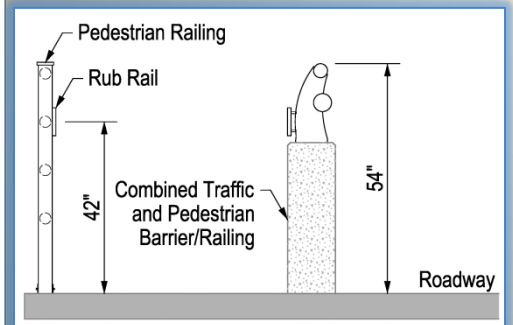
BRIDGE DESIGN CRITERIA CONSIDERATIONS

- On new structures, the minimum clear width should be the same as the approaching paved bicycle path.
- The desirable clear width should include minimum 2 feet wide clear areas.
- A vertical clearance of 10 feet is desirable for adequate overhead clearance distance.
- Railings, fences, or barriers on both sides of a bicycle path structure should be a minimum of 54 inches high.
- Smooth rub rails should be attached to the barriers at handlebar height of 42 inches.
- Bridges designed exclusively for bicycle traffic may be designed for pedestrian live loadings.
- On all bridge decks, special care should be taken to ensure that bicycle safe expansion joints are used.

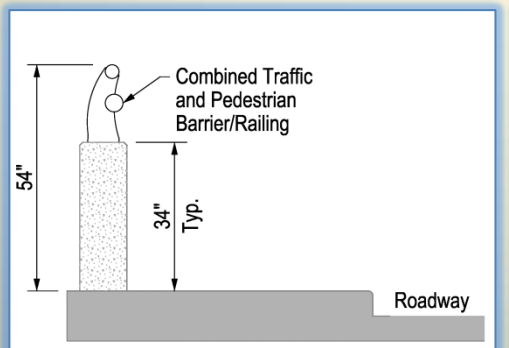




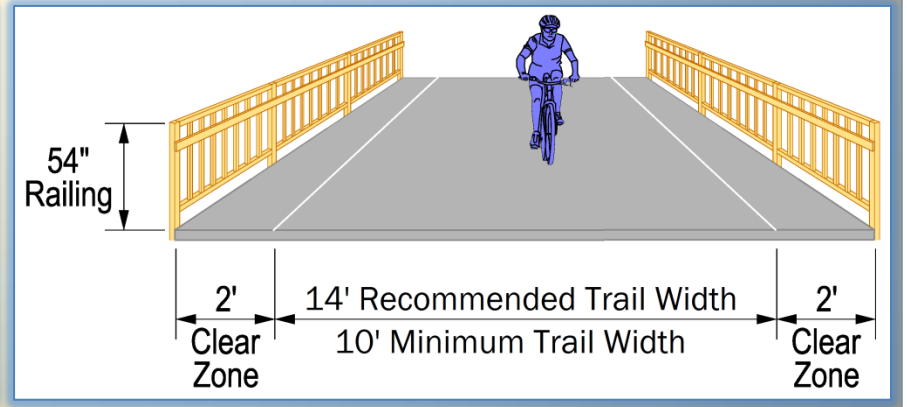




HIGH SPEED APPLICATION
(NON-FREEWAY PREFERRED)



LOW SPEED APPLICATION

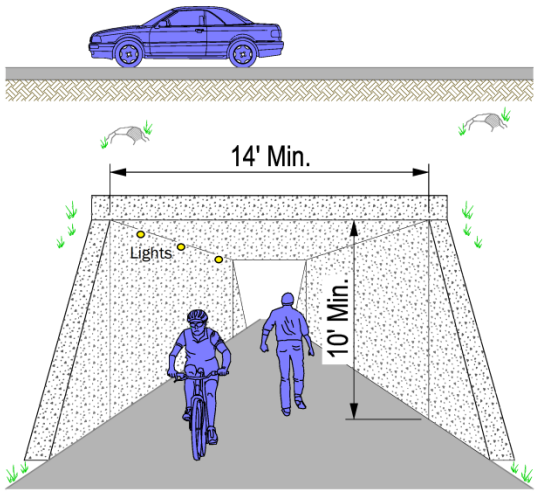


OVERCROSSINGS

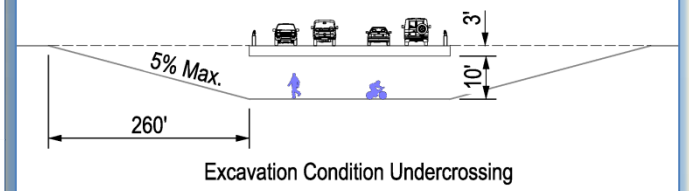
- Generally preferred over undercrossings
- More open and less security problems
- Generally more expensive than other options
- Require 17' vertical clearance over roadway
- Require vandal fencing
- Steep grades should be moderated
- Short steep grades < 5% preferred over long modest grades >500'

UNDERCROSSINGS

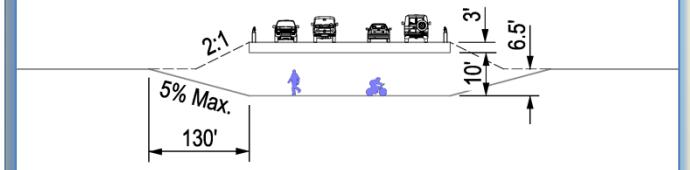
- Allows shorter and flatter approaches than overcrossings
- Approach grades to be <5%
- Upper portion of tunnel should be above surrounding grade
- Short approaches with modest grades are preferred
- Design for gravity drainage.
- Should be fully lighted
- Should be designed for visibility for sense of safety



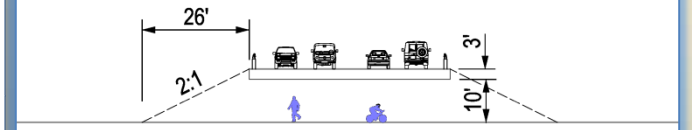
Undercrossing Dimensions



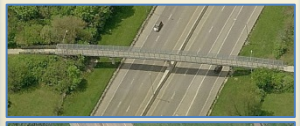
Excavation Condition Undercrossing

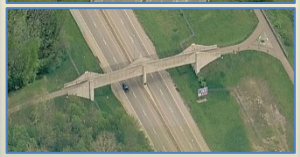


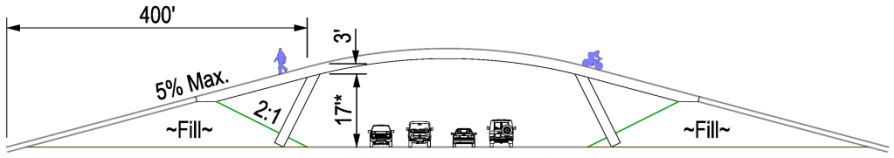
Partial Excavation Undercrossing



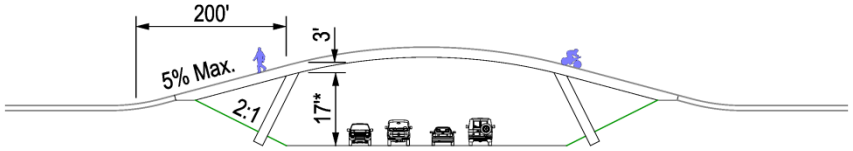
At-Grade Undercrossing



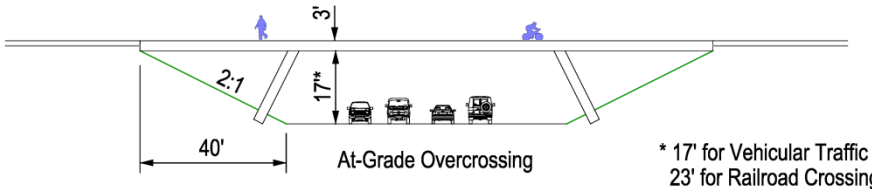




Fill Condition Overcrossing



Partial Fill Overcrossing

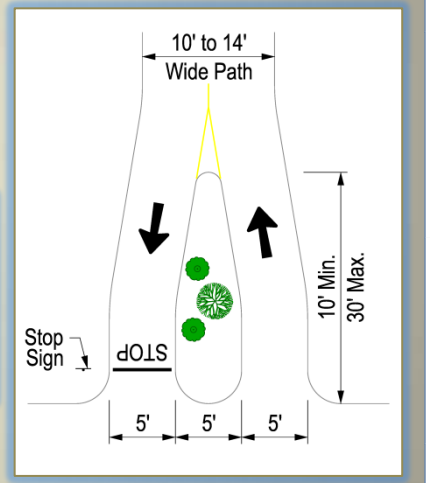


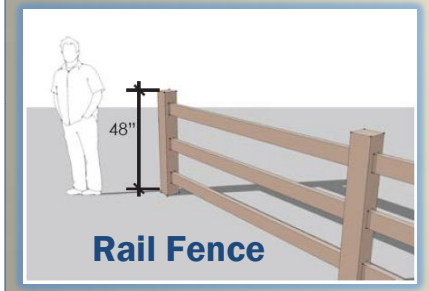
At-Grade Overcrossing

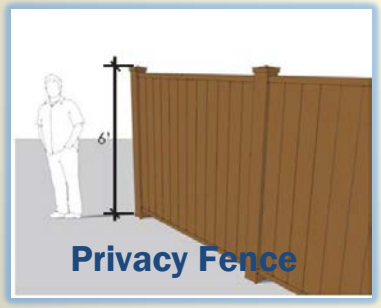
* 17' for Vehicular Traffic
23' for Railroad Crossing

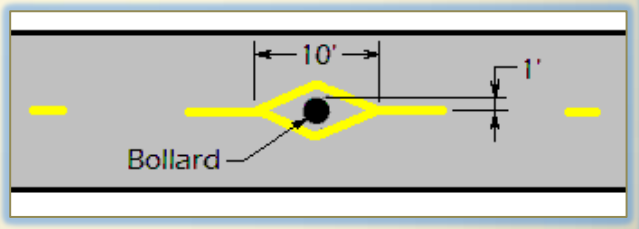
FENCING

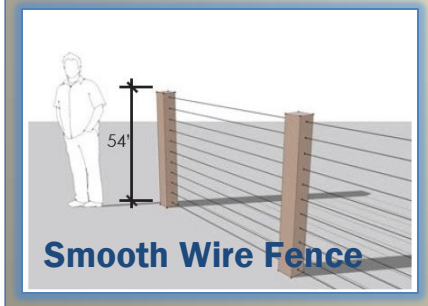
Fencing will typically be used for safety, security, trespass prevention, environmental impacts and privacy. The use of fencing along a trail corridor should be used conservatively to maintain the open feel and views of the environment as well as to maintain neighborhood connectivity.











TRAFFIC BARRIERS FOR TRAILS

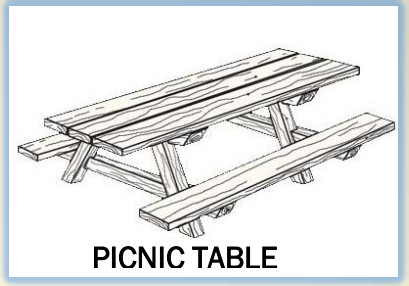
Bicycle paths often need some form of physical barrier at highway intersections to prevent unauthorized motor vehicles from using the facilities. At the same time, the barrier should be designed to minimize the danger it poses for bicyclists and to allow the passage of emergency or maintenance vehicles.

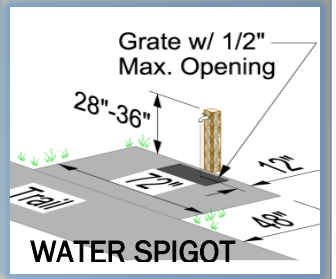
AMENITIES

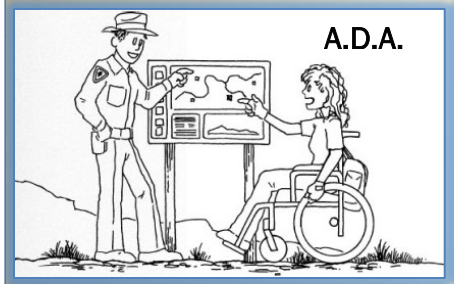
Amenities are an integral part of the trail experience and should be incorporated into the early planning stages and final design of each trail. In addition, the need for special lighting, fencing, and landscaping needs to be addressed.

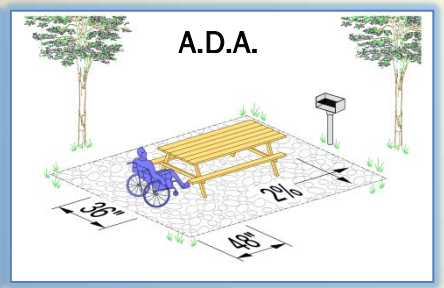
COMMON AMENITIES

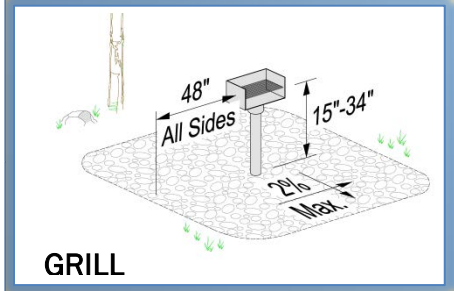
- Shelters
- Rest Rooms
- Flag Poles
- Water Fountains
- Vehicle Parking
- Take Away Maps
- Pet Waste Bags
- Bicycle Racks
- Bicycle Lockers
- Power Receptacles
- Litter Receptacles
- Recreational Facilities
- Lighting
- Grills
- Picnic Tables
- Telephones
- Landscaping
- Bicycle Repair Stations

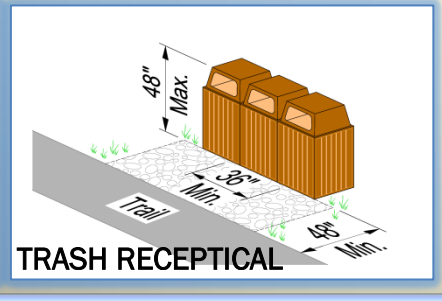






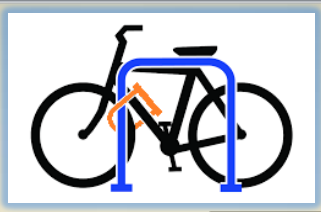


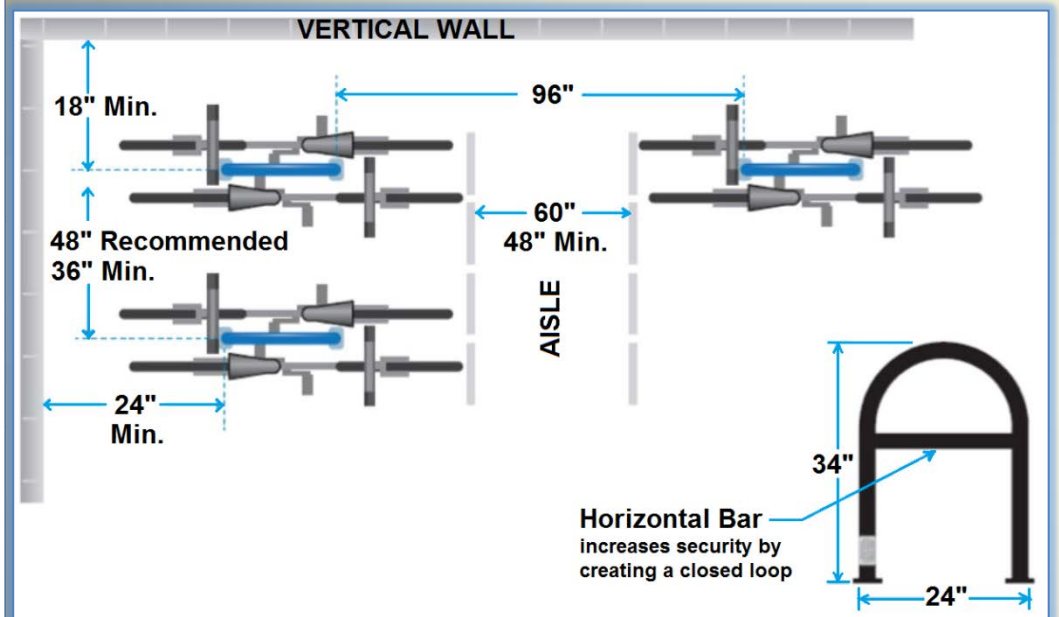




BICYCLE PARKING

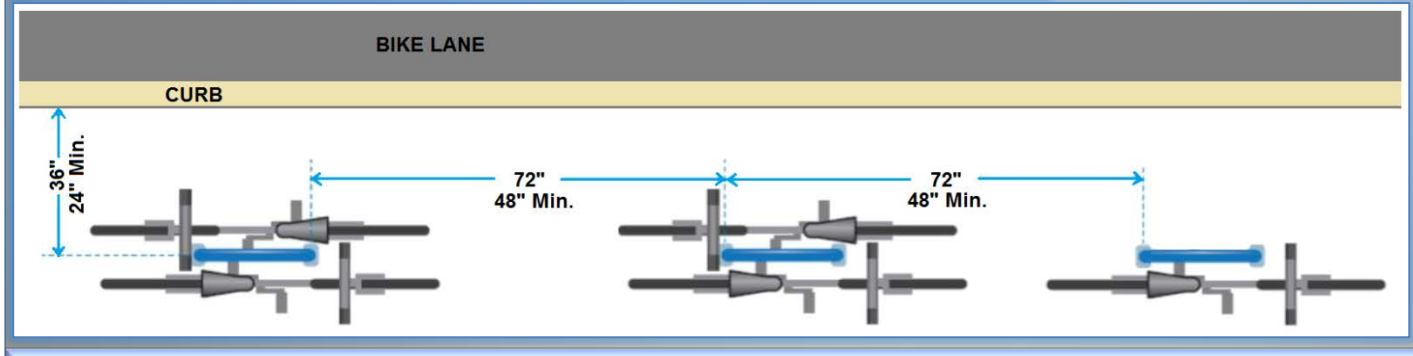
Every bicycle trip has two main components: the route selected by the bicyclist and the "end-of-trip" facilities at the destinations, such as safe and secure bicycle parking. This section provides guidance on the provision and placement of safe, secure, and convenient bicycle parking facilities.





BICYCLE PARKING FACILITY GUIDANCE

- Place short-term bicycle parking as close to the building entrance as possible.
- Make bicycle parking visible to bicyclists.
- Provide lighting for bicycle parking areas if needed.
- Install parking devices which support the frame of the bicycle, not just the wheel. The parking devices should provide two points of contact.
- Install parking devices which accept a variety of locks.
- Make the parking facility simple.
- Keep the bicycle's parking area clean.
- Provide cover from the elements.
- Develop a bicycle locker rental program that is low cost and convenient.
- Avoid posting "No Bike Parking" signage.
- Avoid installing lockers which could be used for anything other than bicycle storage.

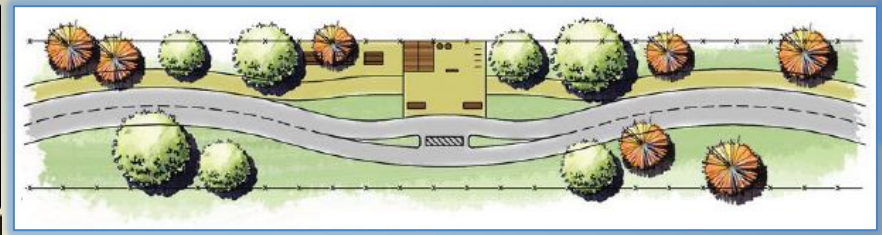


INVERTED-U BIKE RACK

BOLLARD BIKE RACK

TRAIL REST AREAS

Rest areas and support facilities promote the use of trails and bikeways. On long uninterrupted paths, amenities should include minor and major comfort stops.



MAJOR COMFORT STOPS

Major comfort stop facilities should provide restrooms, water or other conveniences. Water services can include drinking fountains designed with spigots to fill water bottles.

MINOR COMFORT STOPS

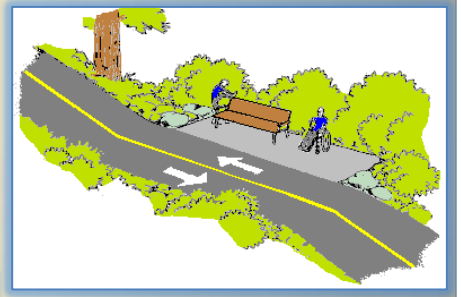
Minor comfort stop facilities are a designated place to stop along a trail. They may consist of a concrete pad, a bench, bike rack, trash receptacle and/or a covered shelter, all secured by tamper proof bolts. Rest areas are defined as level portions of a trail wide enough to provide wheelchair users and others a place to rest. Users can benefit from rest stops on steep, rough or very exposed trails (e.g. sun exposure) to pause from their exertions and enjoy the environment.

LOCATION GUIDANCE

Rest areas should generally occur every mile, if needed, and should be located with consideration given to existing grade, shade, existing vegetation, views, environmental conditions and security.

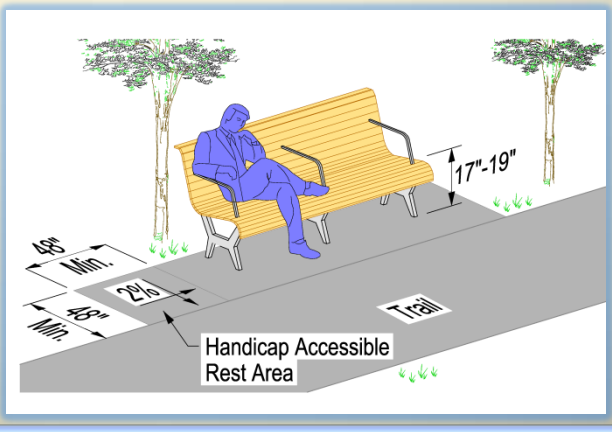
Rest areas are most effective when placed at intermediate points, scenic lookouts, or near trail amenities.

Users can benefit from rest stops on steep or very exposed trails to pause from their exertions, recover and/or to enjoy the environment.



BENCHES

Benches along trails are important for people with disabilities or who may have difficulty getting up from a seated position on the ground. Some benches should have backrests to provide support when resting, and at least one armrest to provide support as the user resumes a standing position. Accessible seating should provide the same benefits as seating for users without disabilities. For example, providing a wheelchair space facing away from the intended view would not be appropriate.



TRAIL LANDSCAPING

Landscaping can be designed to provide numerous benefits for the trail environment. The trail designer needs to consider the existing landscape, as well as proposed landscaping during the initial phase of trail design.





TRAIL LANDSCAPING GUIDANCE

- The existing landscape should be preserved and incorporated into the design.
- Existing native plants should be maintained as a buffer between parallel trails.
- Trailhead facilities and rest stops can benefit from an overhead tree canopy to provide shade relief from the summer sun.
- Low level landscaping can enhance the look of the facilities and screen objectionable views.
- The landscape can be designed to identify the facility as part of the trail system.
- Provide sufficient visibility to maintain security.
- Proposed landscaping can be designed to provide edge protection along steep slopes and other trail hazards.

TRAIL LIGHTING

Lighting encourages pedestrian and bicyclist use by increasing visibility, comfort, and perceived safety. Lighting can enhance an environment in addition to increasing comfort and safety.

TRAIL LIGHTING GUIDANCE

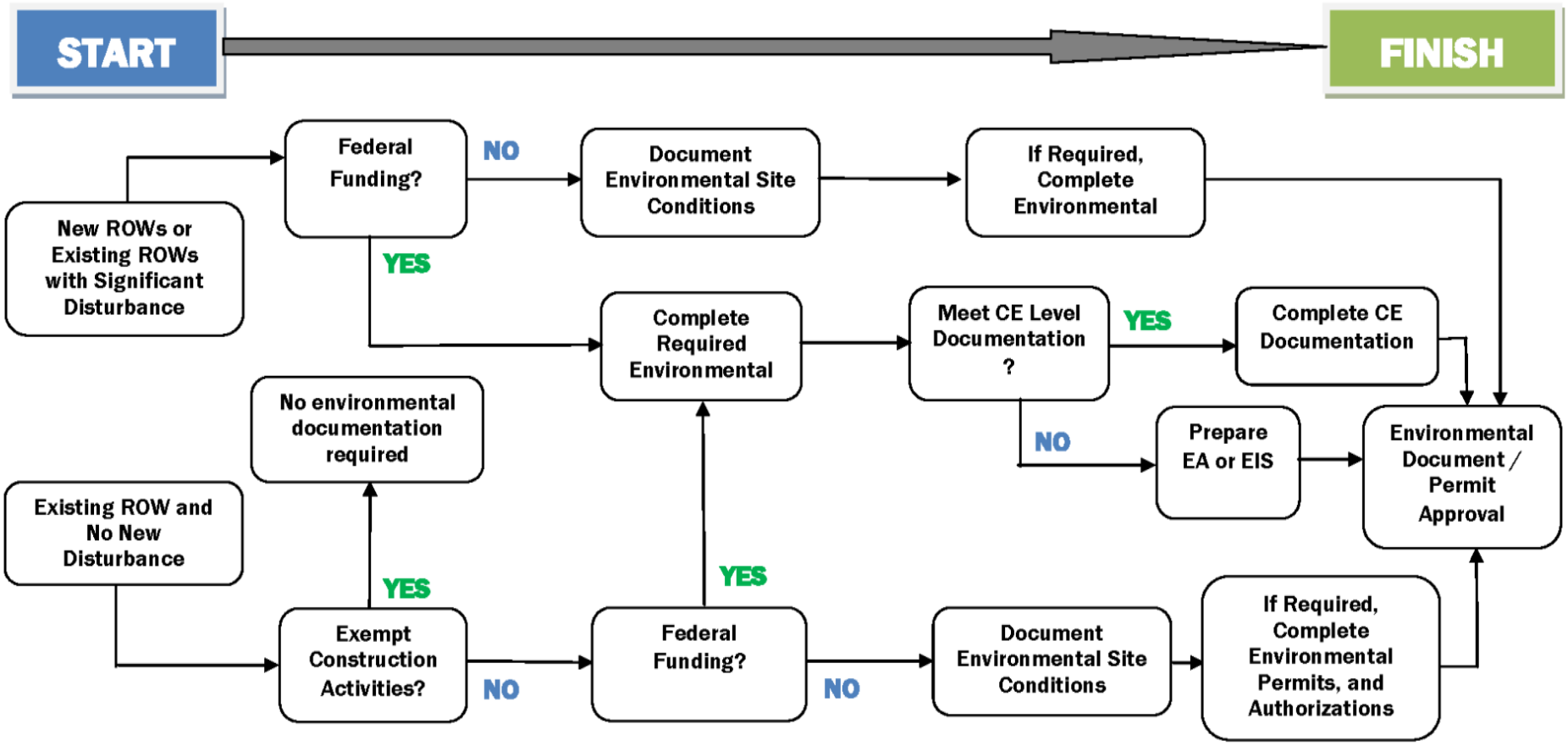
- The AASHTO Guide recommends using average maintained illumination levels of between 0.5 foot candles and 2 foot candles.
- Light poles should be 12 feet to 15 feet high.
- Vandal resistant lighting fixtures are recommended.
- Mercury vapor or metal halide illumination is preferred for pedestrian level lighting.
- Modern LED lighting offers a cost-effective alternative.
- Underpasses and tunnels may need additional lighting.
- Lighting should be placed wherever there is signage and accessible electricity.
- Each lighting situation is unique and must be dealt with on a case-by-case basis.



ENVIRONMENTAL CONSIDERATIONS

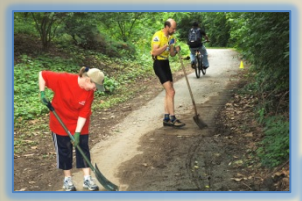
The National Environmental Policy Act (NEPA) of 1969 established environmental policies to ensure federal agencies assess and determine if an action will result in significant environmental impacts.

The below environmental process is provided as a guideline only. The process is periodically updated. The user should consult and collaborate with the appropriate lead agency during the very early planning phases of a project to determine concerns and specific environmental requirements. The lead agency may be ODOT, ODNR, OEPA or the USACE.



TRAIL FACILITY OPERATION AND MAINTENANCE

The condition of the trail surface is an important element for the safety and level of service for bicycles and pedestrians. Bicycles and pedestrians with disabilities require a higher standard of surface maintenance than motor vehicles.



TRAIL OPERATION AND MAINTENANCE GUIDANCE

- Create a smooth surface free of potholes and debris
- Eliminate drop-offs from pavement edges
- Inspect pavement conditions - do not allow unraveled pavement edges
- Inspect signs - making certain that signs do not intrude into bicycle travel space
- Control growth of trees, shrubs, and vegetation
- Supply trash and recycling receptacles and be sure they are regularly emptied
- Mow areas in the vicinity of bike paths
- When plowing snow - do not use deicing agents
- Enforce and prevent unauthorized motor vehicles from using the path
- Maintain bicycle and shoulder lane striping and markings.
- Establish an agency responsible for the control, maintenance, and policing of bicycle facilities

VANDALISM

Most trail owners report vandalism of their signs, including graffiti, damage and theft. You should expect this to happen and be prepared. Here are some tips for combating vandalism:

- Repair or replace vandalized signs quickly to send a message that vandals will not deter the trail effort.
- Anchor signs and sign posts securely.
- Use materials less subject to vandalism, such as metal versus wood posts.
- Limit signs in remote areas or other areas where vandalism is a concern.
- Cover unique or intricate signs with Lexan to protect them from direct contact.

SIGN MAINTENANCE

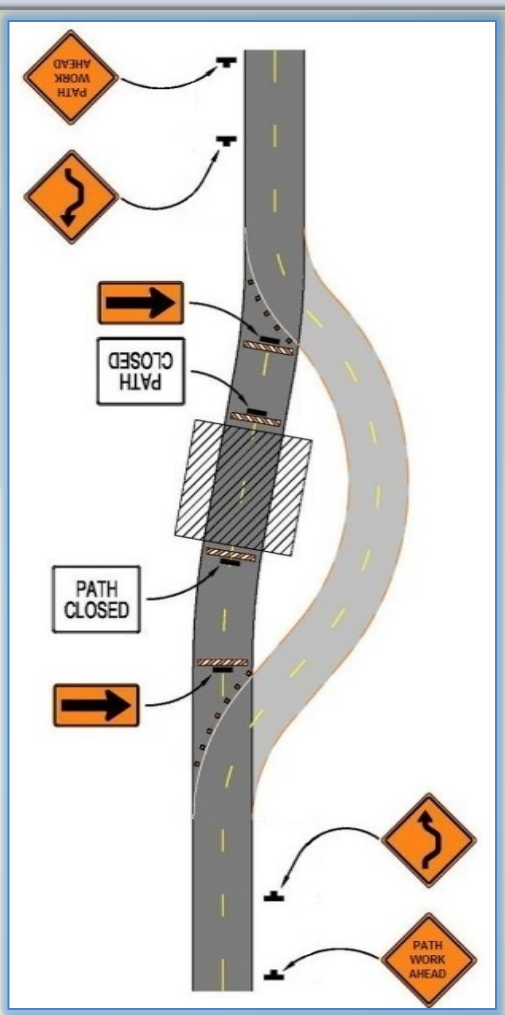
Regular maintenance of signage should be part of any trail plan. Signs are highly visible and their maintenance or lack of maintenance leaves the visitor with a positive or negative impression about the trail and the park. Well-maintained signs convey a sense of pride and reduce vandalism. Poorly maintained signs may contribute to a diminished visitor experience and may cause the disorientation of trail users.

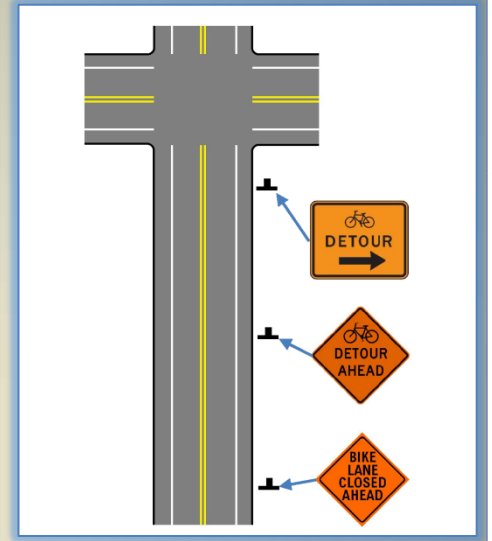
WORK ZONES

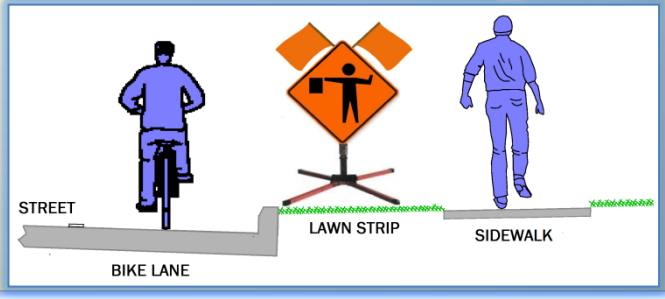
Construction zones can account for an inordinate amount of the safety and liability problems. Preparing a detour plan ensures public safety and minimizes disruption where possible.

WORK ZONES

- Existing paths of travel for bicycles (bike lane/usable shoulder) should be maintained during construction at all times.
- Every effort should be made to avoid using bicycle lanes for construction staging areas.
- Where bicycle lanes are not present or cannot be maintained, provide for a shared vehicle lane as wide as physically feasible.
- Where bicycles are directed to share a travel lane, the merge point should be easy to navigate and obvious for both motorists and bicyclists.
- Bicyclists should not be directed onto sidewalks with pedestrians unless there are no reasonable alternatives.
- Bicycle lanes should be comprised of a smooth, hard travel surface. Loose gravel, compacted aggregate, sand, mud and standing water should be avoided.
- Maintain adequate drainage during construction to avoid pooling on shoulders and in bike lanes.







RESOURCES FOR ADDITIONAL INFORMATION

1) AASHTO (American Association of State Highway and Transportation Officials), Guide for the Development of Bicycle Facilities 4Th Edition, (Washington, D.C.: AASHTO, 2012)
https://bookstore.transportation.org/item_details.aspx?ID=1943

2) AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, July 2004
https://bookstore.transportation.org/collection_detail.aspx?ID=131&gclid=CNzomMHGmdACFRCqaQod71Ulrw

3) AASHTO - A Policy on Geometric Design of Highways and Streets 6Th Edition (2011 Green Book)
https://bookstore.transportation.org/Item_details.aspx?id=1917

4) AASHTO - Roadside Design Guide, 4Th Edition (2011)
https://bookstore.transportation.org/collection_detail.aspx?ID=105&gclid=CIbgzf7XmdACFQYGaQodhNcPRg

5) Ohio Department of Transportation (ODOT) Location and Design Manual, Volume 1, 2016

- Section 308 On Road Bicycle Guidelines
- Section 700 Multi-Modal
- Section 905.2, Figure 904-2, Urban Landscaping Typical Curbed Section 45 MPH or Less

https://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/roadway/Pages/locationanddesignmanuals.aspx

6) Ohio Department of Transportation (ODOT), 2014, Bikeway Pavement Marking Details, Plan Insert Sheet
https://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/traffic/PISs/Documents/0207000_07-18-2014.pdf

7) Ohio Department of Transportation (ODOT), Standard Construction Drawing, 2014, Bikeway Railing, RM-5.2
http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/roadway/Archive%20Roadway%20Standard%20Construction%20Drawings/RM-5.2%20Bikeway%20Railing%202003-2014.pdf

8) Ohio Manual of Uniform Traffic Control Devices (OMUTCD), 2012 Edition, Part 9, Traffic Control for Bicycle Facilities
http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/traffic/OhioMUTCD/Documents/2012_Part09_011312_Final_bookmarked.pdf

9) National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, Second Edition, 2016
http://nacto.org/publication/urban-bikeway-design-guide/

10) Federal Highway Administration (FHWA) Safety Program – Road Diet Information Guide (2014) FHWA-SA-14-028
http://safety.fhwa.dot.gov/road_diets/info_guide/rdig.pdf

11) FHWA – Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries, FHWA-HRT-04-082
http://www.fhwa.dot.gov/publications/research/safety/humanfac/04082/04082.pdf

12) FHWA Implementing Bicycle Improvements at the Local Level, Publication No. FHWA-98-105, 1998
http://www.fhwa.dot.gov/publications/research/safety/98105/98105.pdf

13) FHWA – Selecting Roadway Design Treatments to Accommodate Bicycles (1994) FHWA-RD-92-073
http://safety.fhwa.dot.gov/ped_bike/docs/select.pdf

14) United States Access Board Guidelines and Standards
https://www.access-board.gov/guidelines-and-standards

15) Shared-Use Paths Best Practices for Bikes & Pilot Treatments, September 2006, Mid-Ohio Regional Planning Commission, 285 East Main Street, Columbus, Ohio 43215
http://www.morpc.org/trans/BikePedSharedUsePathBestPractices.pdf

16) Jefferson County Trails & Greenways Implementation Guidelines, 2016, Brooke Hancock Jefferson County Metropolitan Planning Commission
http://www.bhjmpc.org/wp-content/uploads/2015/05/Jeff-Co-TG-Plan-FINAL-20150526.pdf