

F. Design Guidelines

The 1995 PACTS Regional Bicycle and Interim Pedestrian Plan contained comprehensive bicycle and pedestrian planning and design standards. In this Plan Update, selective guidelines are provided to round out the information provided in the 1995 Plan.

The 1995 Plan's Standards are comprised of the following areas:

Bicycle Facilities

- The First Step: Understanding the User
- Bicycle Lanes
- Paved Shoulders
- Wide Curb Lanes
- Multi-Use Trails (called Shared Use Pathways in the Plan Update)
- Bicycle Support Facilities (Bicycle Parking/Signage/Lighting/Actuated Signals)
- Bicycle Hazards
- Roadway Maintenance

Pedestrian Facilities

- Planning for Pedestrians
- Local Planning Needs
- Pedestrian Site Plan Checklist
- Pedestrian Planning is Specific Development Types
- Traffic Calming for Pedestrians
- Pedestrian Design Guidelines
- Intersection Design for Pedestrian Safety
- Special Types of Intersections
- Obstacle Countermeasures
- Federal Requirements for Pedestrian Facilities
- Pedestrian Facility Maintenance.

New planning and design guidelines include:

- Sharrows, Shared Lane Marking
- Bicycle Parking, Short-Term
- Complete Streets
- Accessible Streets
- Regional Bicycle Route & Destination Signage.

Sharrows, or Shared Lane Marking

Description:

- Experimental (through 2010) roadway marking used for 'Shared Lane' bicycle facilities, when motorists and bicyclists share the travel lane
- Markings consist of a chevron and bicycle symbol

Purpose:

- Sharrows assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist impacting the open door of a parked vehicle.
- Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same travel lane.
- Alert road users of the lateral location bicyclists are likely to occupy within the traveled way.
- Encourage safe passing of bicyclists by motorists.
- Reduce the incidence of wrong-way bicycling. (Source: MUTCD draft, 2008.)

Application:

- Along street segments when there is not room for other types of on-road bicycle facilities such as paved shoulder or bicycle lanes.
- Note: Until 2010, Sharrows are considered experimental and require approval from the FHWA for their use.

Standards (Source: MUTCD draft, 2008):

- Sharrows shall not be used on shoulders or in designated bicycle lanes.
- Roads with on-street parking – Sharrows shall be placed so that the centers of the markings are at least 11 ft from the face of the curb or edge of pavement.

Guidance (Source: MUTCD draft, 2008):

- Sharrows should not be placed on roads with speed limits over 35 mph.
- If used, Sharrows should be placed immediately after an intersection and spaced at intervals not greater than 250 ft thereafter.
- If used on a street without on-street parking with an outside lane less than 14 ft, the center of the Sharrows should be at least 4 ft from the face of the curb or the edge of the pavement where there is no curb.



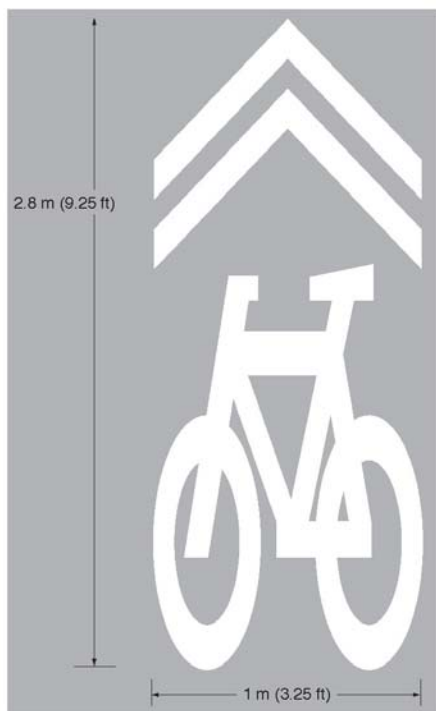
Source: FHWA, 2009.

Sharrow, or Shared Lane Marking (continued)

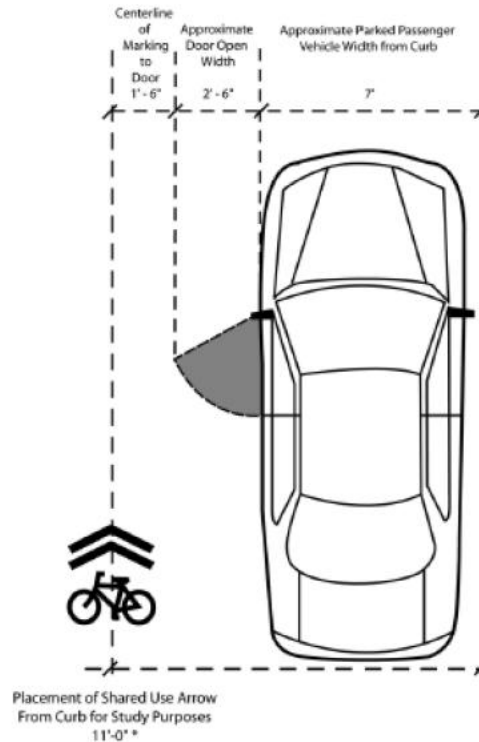
Additional Resources:

- http://mutcd.fhwa.dot.gov/resources/proposed_amend/npa_text.pdf (p. 526-527)
- <http://www.dot.ca.gov/hq/traffops/signtech/signdel/policy/05-10.pdf>
- <http://www.iowabicyclecoalition.org/sharrows> Youtube video regarding Sharrows

Figure 9C-9. Shared Lane Marking



Source: MUTCD draft, 2008.



Source: City of San Francisco.

Optional : Long Beach, CA 'Green Carpet' Sharrows



Source: www.RussRoca.com

Bicycle Parking: Short-Term

Description:

- Bicycle racks provide for secure, short-term bicycle parking
- Several types of racks are more desirable based upon their design and functionality – racks that provide two points of contact (rather than one) are recommended

Standard Application:

Location and Design of Bicycle Parking Facilities

- Bicycle parking should be located in close proximity to the building's entrance (ideally within 50') and clustered in lots not to exceed 16 spaces each.
- Bicycle parking facilities shall support bicycles in a stable position without damage to wheels, frame or other components.
- Bicycle parking facilities should be located in highly visible well-lighted areas to minimize theft and vandalism.
- Bicycle parking facilities shall be securely anchored to the lot surface so they cannot be easily removed and shall be of sufficient strength to resist vandalism and theft.
- Bicycle parking facilities shall not impede pedestrian or vehicular circulation, and should be harmonious with their environment both in color and design. Parking facilities should be incorporated whenever possible into building design or street furniture.
- Racks must not be placed close enough to a wall or other obstruction so as to make use difficult. There must be sufficient space (at least 24 inches) beside each parked bike that allows access. This access may be shared by adjacent bicycles. An aisle or other space shall be provided to bicycles to enter and leave the facility. This aisle shall a minimum width of four (4) feet to the front or rear of a bike parked in the facility.
- Paving is not required, but the outside ground surface shall be finished or planted in a way that avoids mud and dust.
- Bike parking facilities within auto parking areas shall be separated by a physical barrier to protect bicycles from damage by cars, such as curbs, wheel stops, poles or other similar features.

(Source: Adapted from Santa Cruz Bicycle Ordinance.)

Number of Parking Spaces and Signs

- The number of parking spaces provided shall be based upon an anticipated usage but not less than parking for two bicycles
 - Example: The City of Portland, Maine, requires 1 bicycle parking space for every 10 automobile parking spaces up to the first __ spaces and then __ spaces thereafter, with a minimum of two spaces.
- Bicycle parking facilities shall be provided for any new building, addition or enlargement of an existing building, or for the change in the occupancy of any building that results in the need for additional auto parking facilities
- When more than 10 bicycle parking spaces are required, half should be covered parking
- Signage should clearly indicate the location of bicycle parking if it is not visible from the street or main building entrance.

Bicycle Parking: Short-Term

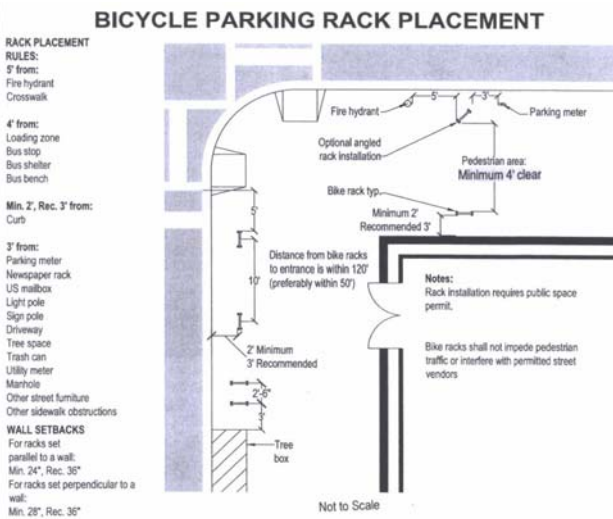
Additional Resources:

Parking Guidelines

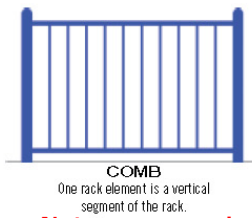
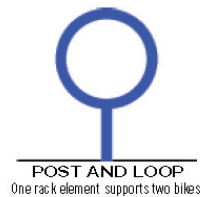
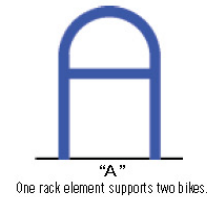
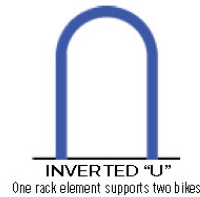
- <http://www.cityofmadison.com/trafficEngineering/documents/MadisonBikeParking.pdf>
- <http://www.massbike.org/bikelaw/parking.htm>

Parking Ordinance

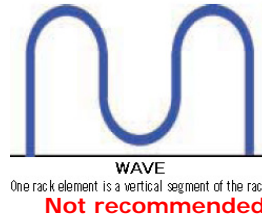
- <http://www.portlandmaine.gov/planning/bicycleparkingtechnicalstds.pdf>
- <http://www.cityofmadison.com/trafficEngineering/documents/z2811bik.pdf>
- <http://www.bikeplan.com/sc-ord.htm> (Santa Cruz, CA ordinance)



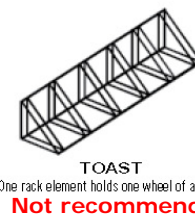
See: Portland, ME Ordinance, above.



Not recommended



Not recommended



Not recommended

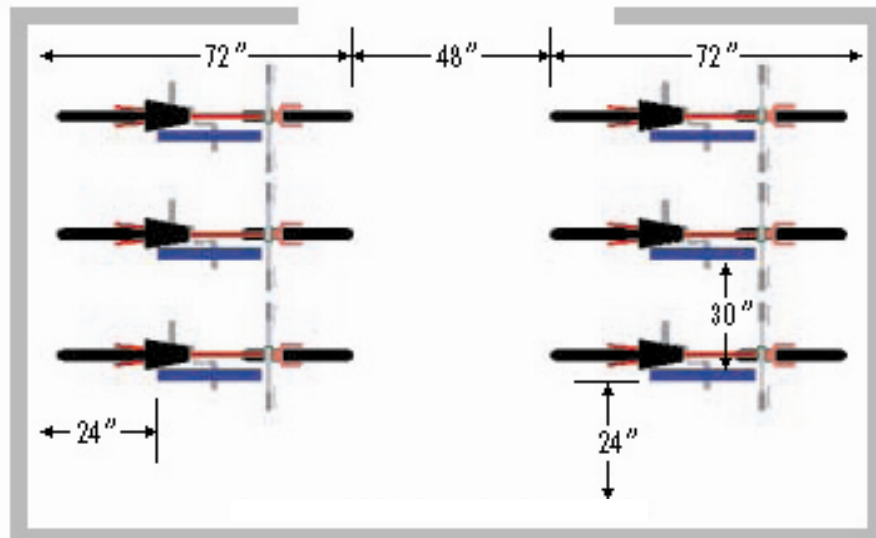
Source: Adapted from APBP.

Recommended Minimum Dimensions



D4-3

Source: MUTCD.



Source: APBP.

Complete Streets

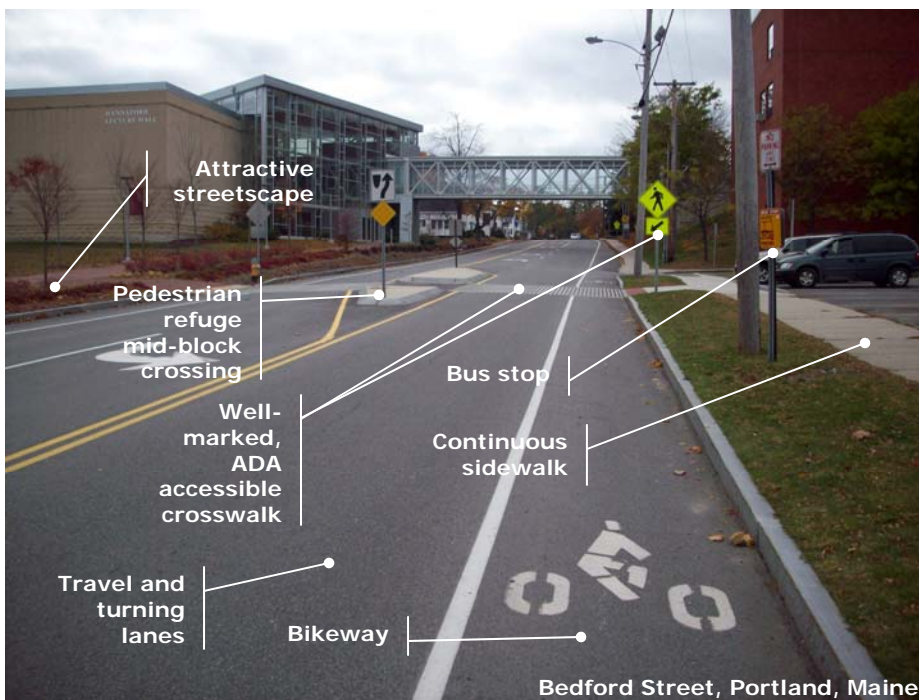
Description:

- Complete Streets are streets that safely provide a context appropriate level of access along and across streets for all users of a street -- pedestrians, bicyclists, motorists, and transit riders -- based upon the roadway and land use context. Complete streets are 'accessible streets' in the sense that they provide quality access for persons of all abilities (See 'Accessible Streets' Guidelines).
- Each complete street is unique but they are typically comprised of all or many of the following design elements on arterial and collector streets, dependent upon the context:
 - * *for pedestrians* – continuous sidewalks (or a paved shoulder in rural settings), frequent safe street crossing opportunities/crosswalks, median islands/pedestrian refuge islands, accessible pedestrian signals, curb extensions
 - * *for bicyclists* – on-road bicycle facilities (bike lanes, paved shoulders, wide curb lanes or quiet neighborhood streets), bicycle parking at destinations
 - * *for transit users* – convenient, comfortable and accessible transit stops, transit information
 - * *for motorists* – clearly defined travel ways and signage, adequate capacity
 - * *for all users* - attractive streetscapes.

Standard Application:

- Most all streets should be complete streets in the broadest sense. Based upon the roadway and land use context there will be differing levels of transportation facilities provided and accommodation of each mode, striking a balance appropriate for each situation. Urban complete streets will look and function very differently from rural complete streets.
- Many existing streets can be and will need to be retrofitted to meet the definition of complete streets.
- New streets should be designed to be complete streets.

Typical Elements of an Urban Complete Street:



- Potential Additional Improvements:**
- Paved/stable surface at bus stop from curb to sidewalk (for wheelchair access)
 - Truncated domes within pedestrian refuge to define extent of travel lanes
 - Buffer/screening between sidewalk and parking lot

Complete Streets

Retrofitting Existing Streets:

Many existing streets that lack quality facilities for all street users can be readily retrofitted to accommodate them within existing rights-of-way.

A Typical Village Setting



A 'Road Diet'

Route 1/Veranda Street in Portland, an important bicycle commuter route, was a four lane urban street with no shoulders converted to three lanes to create 5' paved shoulders and to improve motorist safety in this redeveloping area.



A Best Practice Example (Source: City of Charlotte, NC.):

In 2007 Charlotte, NC, adopted new Urban Street Design Guidelines that prescribe a planning and design process to result in complete streets. Key to this process is the definition of street types that are related to but not dependent upon roadway functional classification.

Guiding Principles of the Urban Street Design Guidelines:

Achieving a "Complete Street" Network

- 1) Streets are a critical component of public space.
- 2) Streets play a major role in establishing the image and identity of a city.
- 3) Streets provide the critical framework for current and future development.
- 4) Charlotte's streets will be designed to provide mobility and support livability and economic development goals.
- 5) The safety, convenience, and comfort of motorists, cyclists, pedestrians, transit riders, and neighborhood residents will be considered when planning and designing Charlotte's streets.
- 6) Planning and designing streets must be a collaborative process, to ensure that a variety of perspectives are considered.

Additional Resources:

- National Complete Streets Coalition, www.completestreets.org
- Charlotte, NC Complete Streets Policy documents:
www.charmeck.org/Departments/Transportation/Urban+Street+Design+Guidelines.htm
- Bicycle Coalition of Maine: www.bikemaine.org/legislation_Id1333.htm

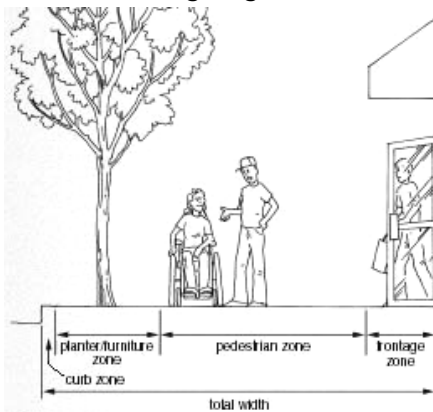
Accessible Streets

Description:

Accessible Streets provide safe and well-designed access along and across streets for street users of all abilities. Accessible streets in particular meet the access needs of persons with disabilities such as the blind and visually impaired, the deaf, and persons in wheelchairs. (See also, 'Complete Streets.')

Along Streets

(source: Designing Sidewalks and Trails for Access)



On commercial streets, the frontage zone separates pedestrians from store fronts and provides space for sidewalk cafes, window sills, store entrances, street vendors, and doorways.

The pedestrian zone is the area of the sidewalk corridor that is specifically reserved for pedestrian travel. It should be a minimum of 5' but in no instances less than 3'. 8' is recommended in downtowns.

The planter/furniture zone is the area where any potential obstacles such as trees, parking meters, benches, bus shelters and signs are placed.

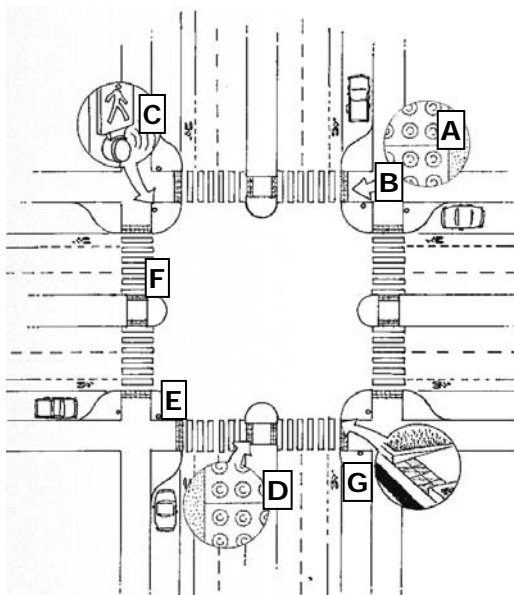
The curb zone (approx. 6") is adjacent to the roadway and is an important cue to the visually impaired to identify the border between the sidewalk and roadway.

The minimum width of cleared area for a sidewalk of 36" is only acceptable when:

- A wider width is impossible
- The narrow width continues for as short a distance as possible
- Passing spaces are provided at intervals of no more than 200'.

At Intersections and Street Crossings

(source: Designing Sidewalks and Trails for Access)



Full accessibility at intersections and other street crossing locations is especially important for persons with disabilities.

Important intersection design features –

- curb ramps oriented to crosswalks with detectable warnings [A]
- sufficient level landing width at ramps [B]
- accessible pedestrian signals (APS) [C] with audible beaoning, where warranted
- sufficient crossing time
- minimized crossing distances with pedestrian refuge islands (min 6' recommended) for crossings over 60' [D]
- minimized corner radii [E]
- well-marked crosswalks [F]
- countdown timers
- good sight distance for pedestrians and vehicles
- curb extensions [G] where feasible.

Accessible Streets

Accessible Pedestrian Signals (APS) – Purpose and Applications

“Pedestrians who are blind use audible and tactile cues in independent travel. At intersections with fixed-time signal phasing and consistent traffic flow, traffic light changes will be reflected in parallel or perpendicular traffic surges. The sounds of these surges are used by blind pedestrians to identify appropriate crossing intervals.

Intersections that have actuated signal timings, complex traffic patterns, or intermittent or sporadic traffic volumes may pose problems for pedestrians who have vision impairments. At these intersections, the signals for automobile and pedestrian traffic do not automatically correspond. Frequently, a separate WALK signal and phase is provided for pedestrians in response to a pushbutton. At this type of crossing (as well as at several other types, including midblock crossings where there is no parallel flow to rely on), an accessible pedestrian signal (APS) may be desirable to provide blind and low-vision pedestrians with an equivalent to the visual signal provided for other pedestrians.”

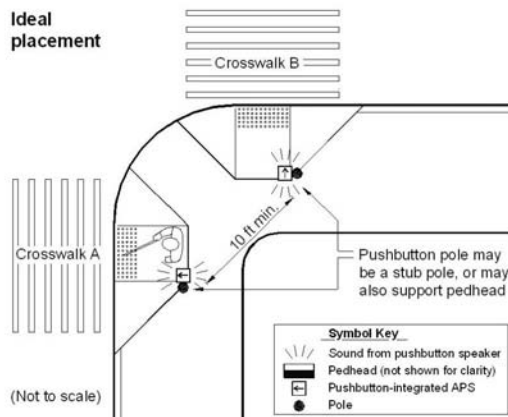
(Source: Accessible Rights-of-Way: A Design Guide, 1999.)

An **Accessible Pedestrian Signal** (APS) installation should:

- Provide pedestrian signal information to those who cannot see the pedestrian signal head across the street
- Provide information to pedestrians about the presence and location of pushbuttons, if pressing a button is required to actuate pedestrian timing
- Provide unambiguous information about the WALK indication, as well as which crossing is being signaled
- Use audible beaconing only where necessary
- Put as little additional sound into the environment as possible to avoid disturbing neighbors

and to allow pedestrians who are blind or visually impaired to hear the traffic sounds, as well

as the APS. (Source: Accessible Pedestrian Signals: Best Practice, NCHRP, 2007.)



Source: Accessible Pedestrian Signals.

Accessible Pedestrian Signals –
Pushbuttons and audible beacons (where necessary)

- no closer than 10' from each other
- located within 10' of curb
- located no farther than 5' from crosswalk.

Accessible Streets

Additional Resources:

- <http://www.access-board.gov/news/sidewalk-videos.htm>. *Accessible Sidewalks* is a four-part video developed by the Access Board to illustrate issues and considerations in the design of sidewalks. The series covers access for pedestrians with mobility impairments, including those who use wheelchairs, and pedestrians who are blind or have low vision. The videos are open captioned and incorporate running descriptive audio.
- Accessible Pedestrian Signals: A Guide to Best Practices, NCHRP, Web-only 117A, 2007.
- Accessible Public Rights-of-Way: Planning and designing for alterations, 2007.
- Designing Sidewalks and Trails for Access: Part II, Best Practices, FHWA, 2001.

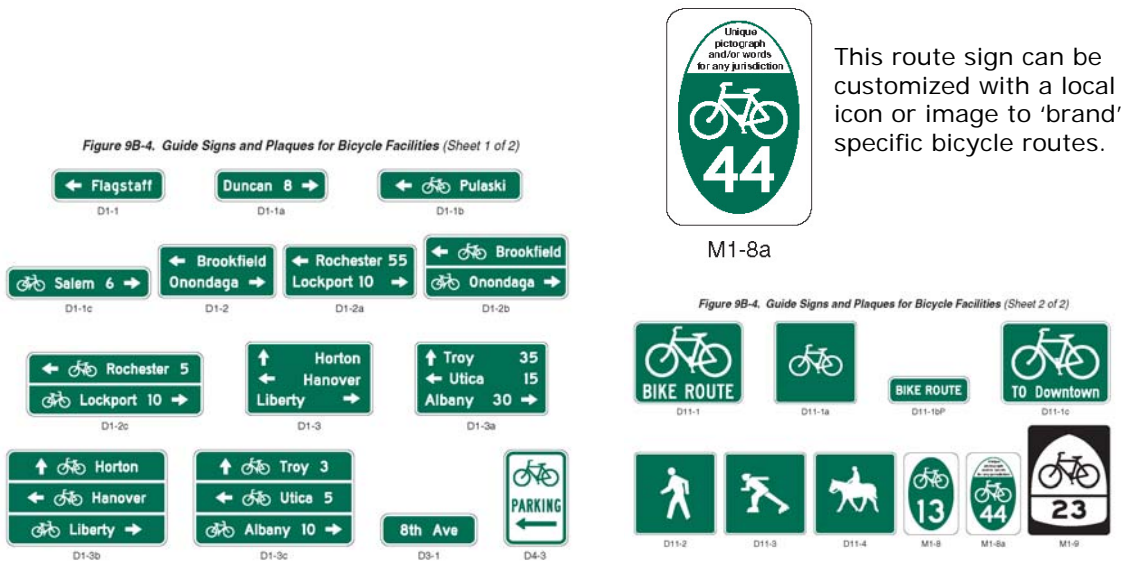
Regional Bicycle Route & Destination Signage

Description:

Regional Bicycle Route and Destination Signage is an integrated signage and route designation program to provide enhanced wayfinding to bicyclists to regional destinations such as village centers/downtowns and major tourist/recreation attractions.

Standard Application:

- A route may consist of any combination of on-road (bike lane, paved shoulder, or shared lane) and/or off-road (shared use pathway) bicycle facilities.
- The route should, as a minimum, safely accommodate moderately skilled bicyclists.
- Desirable route characteristics include:
 - low to moderate volume roadways (under ~ 8,000 ADT preferred)
 - low to moderate speed traffic (posted for 35 mph or lower)
 - connections between major destinations and attractions
 - visually attractive
 - continuity of bicycle facilities – the type of bicycle facility should not change frequently.
- Signage characteristics include:
 - meaningful route designation name
 - destination information and directional aids at decision points – destination name, distance and directional arrows (where needed)
 - attractive icon or logo to 'brand' the route
 - conformance to the latest Manual on Uniform Traffic Control Devices manual.



This route sign can be customized with a local icon or image to 'brand' specific bicycle routes.

Examples of MUTCD bicycle route, destination, directional and distance placards that can be combined and added to bicycle route signs. (Source: MUTCD, 2003.)

Additional Resources:

- MUTCD, 2003, Part 9B: <http://mutcd.fhwa.dot.gov/HTM/2003/part9/part9b.htm>.