


# CHAPTER 2

## UNDERSTANDING BICYCLE FACILITIES

### 2.1 TYPES OF BICYCLISTS

 f the many thousands of people in Hawaii who own bicycles, a small percentage would qualify as experienced or highly skilled bicyclists. Roadway treatments intended to accommodate bicycle use must address the needs of both experienced and less experienced riders. One solution to this challenge is to use the concept of “design cyclist” put forth by the FHWA (*Selecting Roadway Design Treatments to Accommodate Bicycles*, Publication No. FHWA-RD-92-073, January 1994).

Rider Group	Preferences	Transportation Improvements
<p><b>Group A: Advanced Bicyclists</b></p> <p>Experienced riders who can operate under most traffic conditions</p>	<ul style="list-style-type: none"> <li>• Direct access to destinations</li> <li>• Operate at maximum speed with minimum delays</li> <li>• Sufficient roadway space or shoulder so that bicyclists and motorists can pass without altering their line of travel</li> </ul>	<ul style="list-style-type: none"> <li>• Establish &amp; enforce speed limits</li> <li>• Implement traffic calming</li> <li>• Provide wide outside lanes (urban)</li> <li>• Provide usable shoulders (rural)</li> </ul>
<p><b>Group B: Basic Bicyclists</b></p> <p>Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles</p>	<ul style="list-style-type: none"> <li>• Comfortable access to destinations</li> <li>• Direct route, but on low-speed, low traffic-volume streets or designated bicycle facilities</li> <li>• Well-defined separation of bicycle and motor vehicles or separate bike paths</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure low speeds on neighborhood streets</li> <li>• Traffic calming</li> <li>• Provide network of designated bicycle facilities (lanes, bike paths, bike boulevards)</li> <li>• Usable roadway shoulders</li> </ul>
<p><b>Group C: Children</b></p> <p>Pre-teen riders whose roadway use is initially monitored by parents</p>	<ul style="list-style-type: none"> <li>• Access to schools, recreation facilities, shopping, or other residential areas</li> <li>• Residential streets with low motor vehicle speed limits and volumes</li> <li>• Well-defined separation of bicycles and motor vehicles or separate bike paths</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure low speeds on neighborhood streets</li> <li>• Traffic calming</li> <li>• Provide network of designated bicycle facilities (lanes, bike paths, bike boulevards)</li> <li>• Usable roadway shoulders</li> </ul>



Hawaii Bicycling League

Bicyclists cover a wide spectrum from those with significant road experience...

...to novice riders who are just learning the rules of the road.

For the purposes of bicycle network planning and design, bicyclists in Groups B and C are often combined, resulting in a two-tiered approach to meeting bicyclists' needs.

Group A riders are best served by making every street as "bicycle-friendly" as possible. This may be accomplished by utilizing highway design standards that include wide curb lanes and paved shoulders to accommodate shared use by bicycles and motor vehicles. Signage can be an effective measure to inform motorists of the presence of bicyclists within the corridor. However, signage, such as "Share the Road" should only be used when appropriate roadway conditions are met.

## Benefits of Bicycling

**Transportation** Bicycling is an easy way to complete short trips, while helping to reduce traffic congestion and parking requirements. For people with limited transportation options—those without a driver's license or motor vehicle—bicycling can provide an important transportation option.

**Health** Bicycling is an excellent form of physical activity to prevent and/or control detrimental health conditions.

**Economics** Bicycling is business—retailers, repair shops, rentals and organized tours, and sporting events, all generate income. In addition, bicycling has the potential to attract a growing number of eco-tourists, people who want a more active vacation experience.

**Community** Bikeways can help define a community's character and promote more social interaction among people who are out and about in their communities.

**Environment** Bicycling produces no pollution and doesn't consume fossil fuels. The most frequent, comfortable, and practical trips for bicyclists—those under five miles—produce the greatest environmental benefits, since trips shorter than five miles are the least fuel efficient and produce the highest emissions per mile.



Dan Burden, Walkable Communities

The utilitarian bicyclist—running errands the healthy, economical, and environmentally friendly way. Honolulu, Oahu

## 2.2 LEVELS OF URBANIZATION IN THE BICYCLING ENVIRONMENT

**Urban Setting (Cities and Towns).** In an urban area, where development is relatively dense, there are many destinations within short distances of one another. The density of development creates a great potential for bicycling as a means of commuting and running errands. Places with a grid pattern of roadways benefit from more routing choices, but there are also more potential conflict points with motorists. Accordingly, the focus of the bicycle network in an urban area is to create safe and convenient routes for bicyclists to use in traveling to and from work, accessing transit, and traveling to other community destinations.

**Suburban Setting.** In suburban environments where development is less dense, connections to commercial areas, schools, parks, and other activity centers may be more challenging due to the distances involved. Since the 1960s, the grid system of roadway development has declined, replaced by a distinctly hierarchical road system where traffic is channeled from local roads to collectors to major arterials. Bicyclists must travel on these arterial roadways to make important connections to destinations. While the arterials usually present fewer street crossings, traffic volumes and speeds may be high. Promoting safe and efficient bicycle travel and encouraging bicycling within a community are key goals in suburban settings.

**Rural Setting.** In rural areas, distances between residences and destinations may be large enough to discourage bicycling as a means of transportation for all but the most avid bicyclists. Lower density is often accompanied by greater open space, which is ideal for recreational bicycling. Like beads on a string, small, rural communities are often spaced out along a major highway (for example, the belt roads and coastal highways). Residents who bicycle may need to travel along relatively busy highways to get to their local commercial center or to public facilities. In rural settings, the primary focus of the bicycle plan is both to enhance recreational opportunities that take advantage of natural or cultural assets, and to provide safe connections on the main roads.

### Bikeway vs. Bicycle Facility

“Bikeways” and “bicycle facilities” are not used interchangeably in this document. Bikeway is a generic term referring to all types of bicycle accommodations or treatments that are linear in nature. Any street that is “bicycle friendly” contains a bikeway, but not necessarily a bicycle facility. Bicycle facility is a more restricted term and refers to a bikeway that is specifically designated for bicycle use through signs and/or pavement stencils. Bicycle facilities may be on or adjacent to the roadway (e.g., bike lanes or paved shoulders) or an independent facility (bike paths). Bicycle facilities also include non-linear improvements, such as bicycle shelters, parking, and bicycle-oriented traffic control devices.

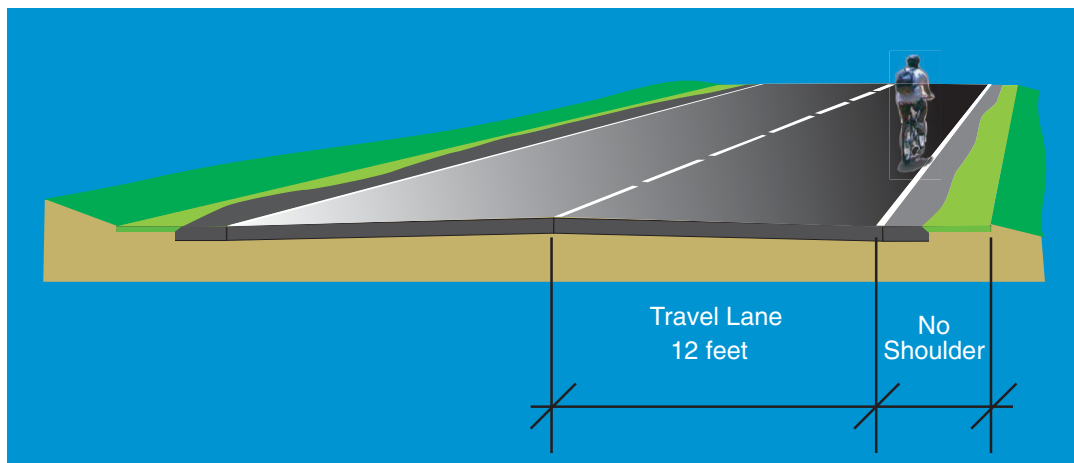
## 2.3 TYPES OF BIKEWAYS

Selection of facility type is generally based on an examination of the targeted user group, environmental conditions (including topography, roadway, and traffic characteristics), and capital and maintenance costs. The major types of bicycle facilities are briefly described below. See Chapter 7 for a more thorough discussion of design issues and considerations.

### 2.3.1 SHARED ROADWAY

Shared roadway refers to any street or highway that is open to both bicycle and motor vehicle travel, but has no special signage for bicyclists. Shared roadways typically feature lane widths that are 12 feet or less, with no shoulders (see Figure 2-1). Most bicycle travel in the U.S. now occurs on streets and highways without bicycle designations.

**Figure 2-1: Shared Roadway**



*Bicyclist on shared roadway. Alii Drive in Kailua-Kona, Hawaii.*





### Street with Wide Curb Lanes

One type of shared roadway is a street with wide curb lanes. Wide curb lanes (or wide outside lanes) are through traffic lanes farthest to the right and wider than 12 feet. Fourteen feet—usually measured from the lane stripe to the edge of the gutter pan—is the minimum width necessary to allow a bicyclist and motorist to share the same lane without coming into conflict, changing lanes, or potentially reducing the motor vehicle capacity of the lane.



### Street with Paved Shoulders

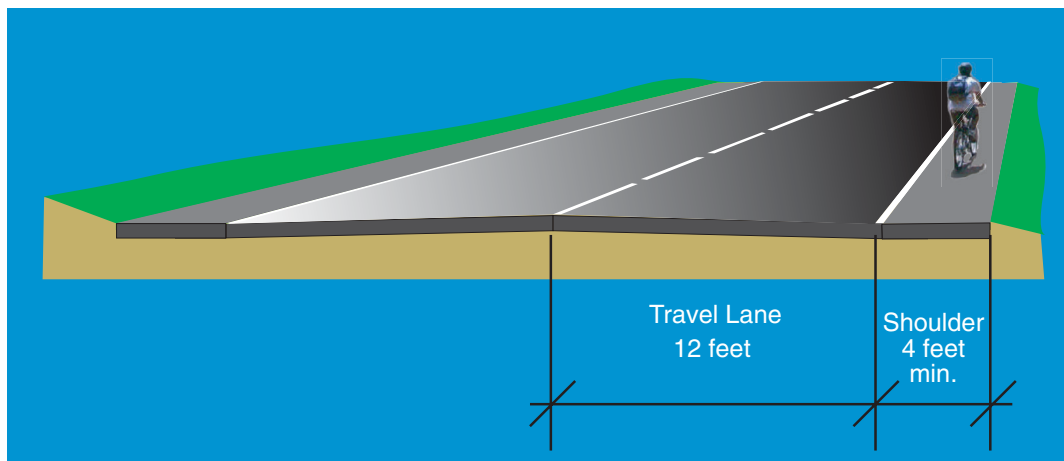
Adding or improving paved shoulders is often the best way to accommodate bicyclists in rural areas. Paved shoulders should be at least 4 feet to accommodate bicycle travel (Figure 2-2). A shoulder width of 5 feet is recommended from the face of guardrails, curbs, or other roadside barriers.



*Diamond Head Road has a wide curb lane. Waikiki, Oahu.*

*Paved shoulder along Kalanianaʻole Highway, near Sandy Beach, Oahu.*

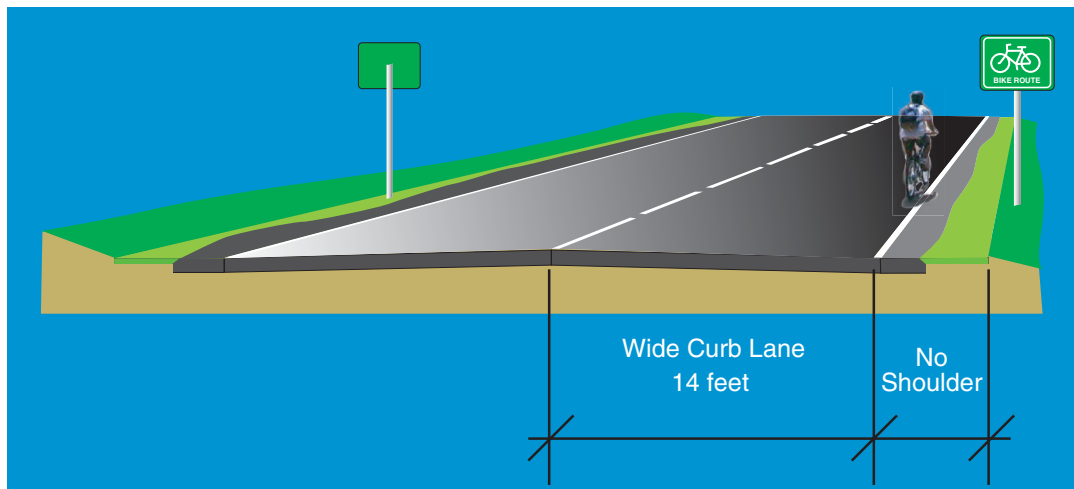
**Figure 2-2: Shared Roadway with Paved Shoulder**



### 2.3.2 SIGNED SHARED ROADWAY

A signed shared roadway is a street or highway that is specifically designated by signs as a preferred route for bicycle use. The *Guide for the Development of Bicycle Facilities*, prepared by the American Association of State Highway and Transportation Officials (AASHTO), 1999, lists several criteria to consider prior to signing a route (see also Section 7.2.3, below). Signed facilities generally should meet or exceed widths of 14 feet for curb lanes (Figure 2-3) or 4 feet for paved shoulders (Figure 2-4). In limited cases, mitigating factors may result in the designation of a signed shared roadway where these dimensions are not met.

**Figure 2-3: Signed Shared Roadway with Wide Curb Lane**

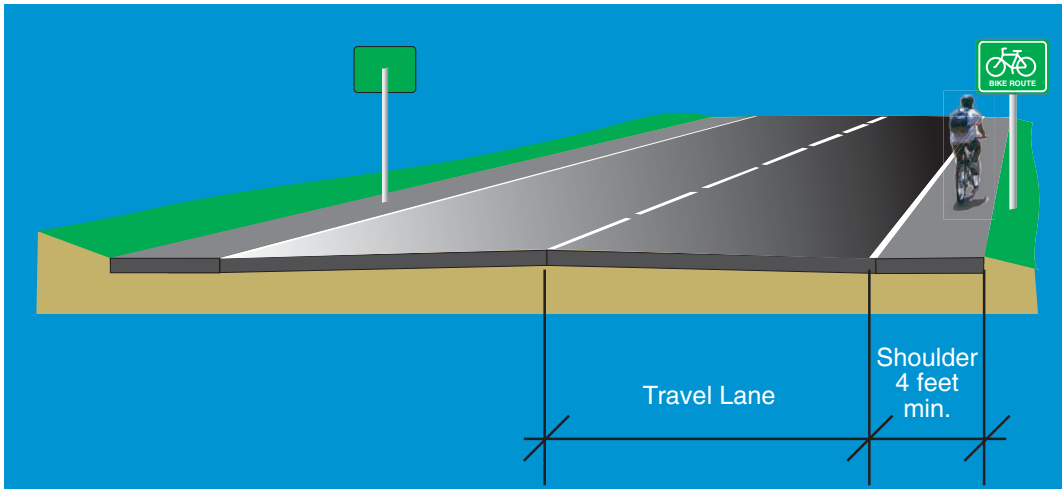


*Wide outside lane (without parking) on Hamakua Drive. Kailua, Oahu.*



Wide outside lane (with parking) on the McCully Street Bike Route. Honolulu, Oahu.

**Figure 2-4: Signed Shared Roadway with Paved Shoulder**



Whitmore Avenue is a signed shared road with paved shoulder. Whitmore Village, Oahu.

### 2.3.3 BIKE LANE

Bike lane refers to a section of roadway that has been designated by striping, signing, and/or pavement markings for the preferential or exclusive use by bicyclists. It delineates the right-of-way assigned to bicyclists and motorists; in part, to provide for more predictable movements by each.



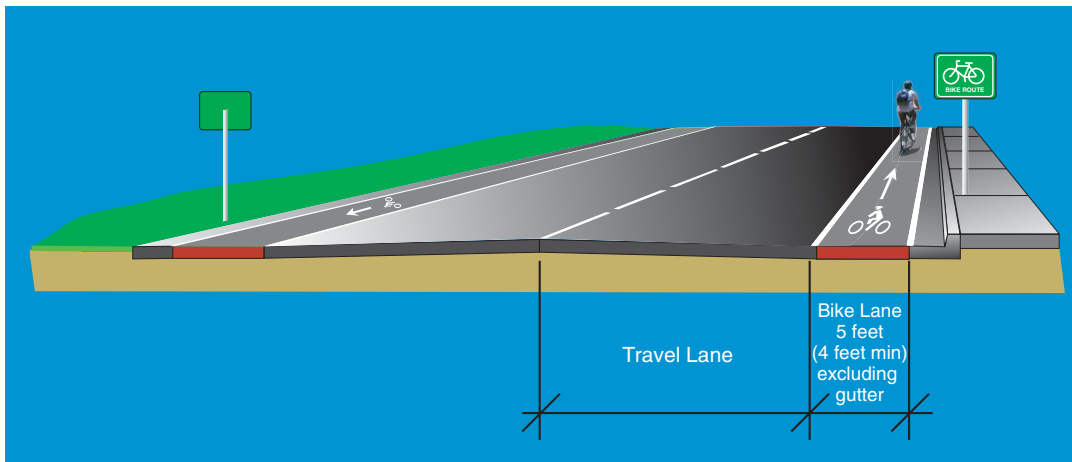
*Bike lane on recently completed Kuala Street through Manana, Pearl City, Oahu.*

*(right) Bike lane with parking on University Avenue, Honolulu, Oahu.*

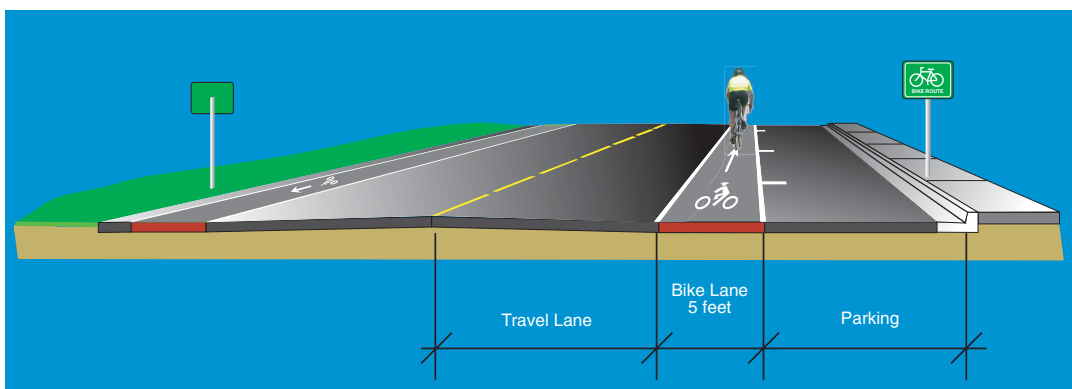
As shown in Figure 2-5, the recommended width for a bike lane is 5 feet (4 feet minimum). With on-street parking, the minimum width is 5 feet (Figure 2-6).



**Figure 2-5: Bike Lane**



**Figure 2-6: Bike Lane with On-street Parking**

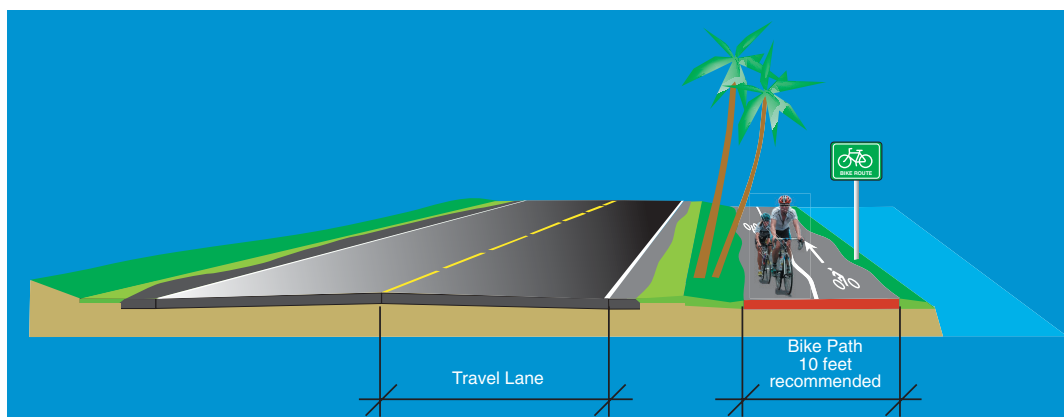




### 2.3.4 SHARED USE PATH

Shared use path refers to a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier, and is either within the highway right-of-way or has an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Under most conditions, the recommended paved width for a two-directional shared use path is 10 feet (Figure 2-7). Under certain conditions, such as substantial use by different types of users, use by maintenance vehicles, and/or steep grades, it may be necessary or desirable to increase the width to 12 feet, or even 14 feet.

**Figure 2-7: Shared Use Path**



Shared use paths are popular with the general public in Hawaii, as seen in the survey findings presented in Chapter 3. This preference is echoed in surveys nationwide. Paths are a valuable addition to the highway system and to the range of facilities available to planners and engineers seeking to improve conditions for all categories of bicyclists. They serve both a transportation and recreation function and can be significant generators of bicycle use.

However, paths require special considerations

in terms of location and design. In particular, paths are most appropriate for long, continuous routes with minimal vehicular cross-flows (driveways or intersections). They can also provide good access to destinations not otherwise available to bicyclists, such as short-cuts in the street network.



*Shared use path through Kailua Beach Park, Kailua, Oahu.*

## Liability Issues Related to Off-road Bikeways

In survey after survey, not only in Hawaii, but across the country, the general public tends to favor bike paths over other types of bikeways. Paths are used not only for bicycling, but also for walking, jogging, and in-line skating, by people in wheelchairs, and sometimes equestrians.

With all these uses have come a host of concerns about liability. Public agencies that are considering building a shared use path may worry about a user being injured. Similarly, private landowners who own land adjacent to a path may be concerned about users wandering off the facility, onto their land, and injuring themselves or causing property damage. Landowners who may want to open their land for recreational use, or provide an easement over their land, may have reservations about the potential liability of doing so.

Hawaii's Recreational Use Statute, Chapter 520, Hawaii Revised Statutes (HRS), substantially limits public and private landowner liability. The intent of this law is to protect landowners who want to open their land to the public for recreation free of charge. Private landowners who have land adjacent to paths are also protected by trespassing laws. Adjacent landowners generally are not at risk as long as they do not engage in "willful and wanton misconduct" against trespassers, such as recklessly or intentionally creating a hazard.

Chapter 520, HRS, is not applicable to public lands. In general, the State and Counties "self-insure" against tort claims arising from bicycle accidents. Payments on tort claims from bicycle accidents on HDOT facilities are made from the State highway fund.

While concerns about liability are understandable, real-world experience with thousands of miles of paths and trails nationwide have shown that liability exposure can be minimized through appropriate legal protection and proper design, maintenance, and management.

### Useful Risk Management Strategies

During design and development:

- Develop a list of potential hazards
- Design and locate the path such that dangerous locations are avoided
- Develop a list of permitted path uses and the risks associated with each
- Make it clear that users are not invited onto the adjoining land. This can be accomplished through signs, landscape screening, or fencing
- If a hazardous condition exists and cannot be mitigated, signs should be developed to warn users of the hazard
- Identify applicable laws
- Design and construct the pathway in accordance with recognized guidelines

After path is open for use

- Conduct regular inspections and monitor conditions
- Document the results of the inspections and correct hazards in a timely fashion
- Adhere to maintenance standards and keep written records
- Maintain a plan for handling medical emergencies

Source: Rail-Trails and Liability: A Primer on Trail-related Liability Issues and Risk Management Techniques by Hugh Morris, Rails-to-Trails Conservancy in cooperation with the National Park Service, Rivers, Trails and Conservation Assistance Program, September 2000.