SECTION 5
POLICY RECOMMENDATIONS

In addition to building non-motorized transportation facilities to enhance Sitka's quality of life, these new facilities must be backed up by local policy to ensure new facilities are properly designed, constructed and maintained.

The most important policy recommendation is that the City and Borough of Sitka municipal code must make provisions for requiring non-motorized transportation facilities. Without an ordinance, there is no legal requirement requiring developers to set aside easements nor plan and develop facilities for non-motorized users. There is nothing in the code to ensure that platting actions, subdivision approvals, or development of roads include any provisions for bicyclists or pedestrians. In fact, there are no provisions in code that encourage private developers or public agencies to provide safe and convenient non-motorized transportation within neighborhoods. Most, if not all newly constructed roads, even those within or leading to residential subdivisions, are being designed with no provisions for bicycles or pedestrians.

The City and Borough of Sitka adopted the objective to create non-motorized transportation facilities, however it has not made it an ordinance, which must happen. The Draft Comprehensive Plan, July 1998 lists under *Governmental and General Infrastructure Goals, Policies and Objectives the following objective:*

"City Streets and Roads

2.3.7 To develop extensions to the existing street system that will serve the long term needs of the residents directly served, the traveling public, safety needs and utility services; and to achieve the following objectives and policies:

B. Incorporate pedestrian and bicycle use of the street system in the design of the improvements."

Code revision recommendation: This policy objective must be followed up with local ordinances to ensure these non-motorized facilities are developed in conjunction with new roads and developments in the community. Until that time, developers, government agencies and landowners will not be bound to build such facilities.

Code revision recommendation: Include consideration and implementation of bicycle and pedestrian facilities in all new street and highway development and when reconstructing or upgrading existing streets and highways.

Code revision recommendation: Require developers who create subdivisions with a density of one dwelling per acre or more to dedicate sufficient sidewalk right-of-way and either construct sidewalks, or pay an equivalent amount into a municipal sidewalk development fund.

Policy recommendation: Sweeping of bicycle lanes and pathways be part of a regular maintenance program. Increase the maintenance priority for sweeping and snow removal by the City and Borough of Sitka and ADOT&PF through additional funding or partnerships.

Policy recommendation: Street sweeping and snow plowing should avoid using adjacent sidewalks and bicycle lanes for storage of the debris or side cast snow, even temporarily.

SECTION 6
FUNDING

The Transportation Equity Act for the 21st Century (TEA-21) is the largest potential source of funding for non-motorized transportation facilities within public rights-of-way in Sitka. Signed into law in 1998, TEA-21 encourages by policy and funding eligibility the integration of bicycling and walking into the transportation mainstream. All bicycle and pedestrian projects recommended in this plan are eligible for funding from one or more of the existing Federal-aid highway, transit, safety, and other programs funded through TEA-21 and administered in Alaska by the Alaska Department of Transportation & Public Facilities (DOT/PF). Projects must be "principally for transportation, rather than recreation purposes".

A non-motorized transportation project can be funded as a stand alone project under the TRAAK Program of the STIP or included as part of a larger road improvement project funded with other STIP category funds. A good strategy for getting a non-motorized transportation project funded is to plan its inclusion in the scope of work and budget of an adjacent motorized transportation project. That way non-motorized and motorized facilities can best be integrated and cost savings realized. Non-motorized facilities must become an equal priority as motorized facilities for transportation projects.

If federal funds are anticipated as the source for funding a non-motorized transportation project, the project must appear in the DOT/PF's Statewide Transportation Improvement Program (STIP). This is where surface transportation projects are prioritized for funding and development. The STIP is a three year plan which identifies the highest priority projects that can be funded with the estimated amount of available funds during that three year period.

But, before a project lands in the STIP, it must be nominated to DOT/PF's Needs List. The Needs List is a dynamic inventory of approximately six years worth of projects, including the three year pre-draft STIP. Project nomination forms are available from the Southeast Region of DOT/PF, 6860 Glacier Highway, Juneau, AK 99801. Telephone (907) 465-1776. Forms should be filled out in consultation with one of the Southeast Region planners for DOT/PF in Juneau.

For a non-motorized transportation facility to rank high enough on the Needs List to make it into the STIP a proposed project must score high on these "standards" appearing on the evaluation form used to score TRAAK projects.

- Health and quality of life
- Safety
- Local contribution of land, money, assumption of ownership, assumption of operations & maintenance costs.
- Public support
- Project bridges gap or removes barrier between existing trail systems
- Project is tied to an annual recreation, educational or tourism event or activity
- Any of the six intrinsic qualities: scenic, historic, cultural, natural, archaeological, or recreational.

- Project includes stabilization or renovation of a historic property related to transportation
- Capital cost (The more expensive, the fewer points. Ex. maximum points are awarded for a project costing $250,000 or less)
- Other factors not specified

It is important to do an annual review of all previously nominated projects to the Needs List to determine their score, ranking, and likelihood of receiving funding. A project's score can often be raised by submitting additional information. The STIP can also be amended if there is a compelling reason.

Some other sources of funding for non-motorized transportation projects include:

- Harbors Improvement Program (through DOT/PF)
- State Capital Improvement Program (through DOT/PF, Legislature, or other state agency)
- Highway Bridge Program (through DOT/PF)
- Safety Improvement Project (through DOT/PF)
- National Highway System (through DOT/PF)
- Sitka Capital Improvement Program (local funding through bonding & bed/cruise ship/property/sales taxes)

Some project proposals will be eligible for federal funds through DOT/PF as "Safety Improvement Projects". These include highway signing, pavement marking, pedestrian & bicycle crossings, and removal of obstacles posing a danger for motorized or non-motorized transportation.

Federal funding is also available through DOT/PF for safety and educational projects, programs and materials, and for landscaping to enhance transportation projects.

Priority projects in the 2001-2003 STIP "TRAAK Program" for specific Sitka non-motorized transportation projects:

- Harbor Drive Seawalk. For construction of a waterfront walkway between the lightering facility and the existing sidewalk on Harbor Drive, with interpretive displays.
- UAS Pedestrian Connection. Construct a sidewalk connecting Harbor Drive and the University of Alaska Southeast.

Priority projects in the 2001-2003 STIP "National Highway System Program" for projects that could benefit non-motorized transportation:

- Harbor Drive Lighting, Pedestrian and Bicycle Improvement.
- Rocky Gutierrez Airport Access Improvements.

Priority projects in the 2001-2003 STIP "Community Transportation Program" for projects that could benefit non-motorized transportation:

- Indian River Road Improvements.
- Japonski Island Streets and Utilities.
- Sawmill Creek Road Upgrade.

SECTION 7
DESIGN GUIDELINES

INTRODUCTION

As bicycle, in-line skating, pedestrian and other non-motorized transportation use in Sitka increases, so do conflicts between these uses and motor vehicles. A well-designed transportation system is needed to provide a safe, efficient environment for both non-motorized and motorized movement. This chapter provides guidelines for the development of non-motorized transportation facilities throughout the City and Borough of Sitka, Alaska. The purpose of these standards is to ensure that all organizations involved in bikeway development are in agreement on the design and construction of bicycle facilities.

Roadway accommodating non-motorized and motorized movement

These standards are based on the best practices in use throughout the United States, as well as, accepted national standards and supplementary material from the 1996 Oregon Department of Transportation "Oregon Bicycle and Pedestrian Plan." Guidelines should be used with the understanding that each project is unique and in some situations design adjustments may be needed to achieve the best results. Such projects should be evaluated on a case-by-case basis, in consultation with a qualified engineer or landscape architect.

CHOOSING THE APPROPRIATE FACILITY TYPE

Facility selection involves a critical analysis of the types of bicyclists and other users that are likely to use the corridor, as well as the current conditions within the corridor. The different kinds of facilities are defined in this chapter Clearly, if the proposed facility is an off road corridor, a multi-use path will be the facility of choice. If the route is along an existing or planned roadway, primary users, traffic volume, traffic speed and presence of truck and bus traffic should be considered.

In order to determine primary use, the types of users that live and work nearby, as well as the types of nearby destinations need to be considered. For example, connections between neighborhoods, schools and parks should be planned with the child cyclist in mind. However, actual conditions may warrant a different design solution. Each project should be fully analyzed by a professional who is knowledgeable about bicycle facility designs.

Designs: There are several different types of facility improvements that can be utilized in a non-motorized transportation system. They vary from simple design considerations, such as incorporating appropriate drainage grates, to detailed design work for a multi-use pathway. Some designs will be more appropriate where traffic volumes and speeds are higher while others are designed for areas where use of the road right-of-way is not practical.

In selecting the appropriate facility for an area, the primary purpose along with several other factors should be considered to determine the type, location, and priority. These factors include:

Physical barriers	Prevention/Reduction of Accidents
Directness of Route	Frequent/Convenient Access
Attractiveness	Security
Minimum of Delays	Use Conflicts
Maintenance	Pavement Surface Quality
Truck and Bus Traffic	On-Street Motor Vehicle Parking
Cost/Funding	Traffic Volumes and Speeds
Local Laws	Intersection Conditions
Bridges	

State of Alaska shall follow the guidelines set up by the American Association of State Highway Transportation Officials (AASHTO) should be consulted when designing or planning any bicycle facility. This guide contains information that will help engineers, planners and policy makers design bicycle facilities, which accommodate bicycle traffic in a safe and efficient manner.

Special Design Considerations: Certain conditions exist that warrant special attention to assure that a safe system of bikeways is maintained. The following section will discuss those situations and how they can be prevented or the hazard reduced.

Transition Zones and Ending Points: The frequency of transition zones between facility types should be minimized to provide a more coherent non-motorized transportation system. Where such transitions are unavoidable, care should be taken to inform the bicyclist or other users of the transition, and provide an effective changeover. For example, where a multi-use path connects to a roadway with bicycle lanes, signage and intersection, improvements should be used to encourage bicyclists to ride correctly, rather than proceeding forward on the wrong side of the road.

Because bicycle lanes and multi-use paths tend to attract novice users, who may not be comfortable in difficult traffic situation, it is important to ensure that these facilities do not end at hazardous areas or leave users in traffic conditions that may exceed their capabilities. This is especially important during the early construction of non-motorized transportation facilities, when there will be inevitable gaps in the bicycle transportation system.

In circumstances where a facility ends in a roadway environment that is less then ideal, cyclists and motorists should be warned in advance of the upcoming transition. Signage and pavement makings should clearly indicate that the bicycle facility ends. Advance signage should be placed to give cyclists and motorists plenty of time to take evasive action if needed.

A measure to warn motorists of the likelihood of encountering a bicyclist is a "Share the Road" sign. These signs consist of the standard bicycle warning sign with a "Share the Road" sub-plate.

Combining Types of Bicycle Facilities: Combining different types of bicycle facilities can create confusion for the cyclist and motorists and can result in an unsafe situation. For example, if a two-way separated bike path ended up on a highway shoulder with no accommodation for a cyclist to reach the correct side of the road, unpredictable behaviors might result. Some bicyclists may dart across traffic to reach the other side, some may continue down the highway riding against traffic. The confusion resulting from erratic behavior of a bicyclist can surprise and anger motorists. These types of situations should be avoided.

Paths under Bridges: Special design practices must be considered when multi-use pathways cross under bridges. Pathways should be constructed above the spring and fall flooding marks, while maintaining adequate vertical clearance. Vertical clearance under bridges should be a minimum of eight feet, though ten feet is desirable. This clearance should be considered in all bridge reconstruction. If the potential for flooding exists, the pathway should be designed to withstand the flooding. Maintenance may need to be scheduled after each flooding to remove debris from the pathway.

Adequate lighting needs to be provided under bridges where practical. This will increase user visibility and discourage crime. Approaches to bike paths under bridges are also important. The transition from bright sunlight to the shaded crossing under bridges can be a hazard. Care should be taken in designing approaches that are of minimal grade and at an angle where oncoming multi-use path traffic can be seen easily.

TYPES OF FACILITIES

"We expect every transportation agency to make accommodations for bicycling and walking a routine part of their planning, design, construction operations and maintenance activities." *Federal Highway Administration (FHWA) Administrator, Kenneth R. Wykle, in a memorandum to FWHA field offices.*

Numerous types of facilities exist to accommodate the non-motorized user. Many of these facilities are located behind the curb line or are separated entirely from the roadway. In some instances non-motorized users share the road with motorized users. This is true for low volume roads and for many commuter cyclists who prefer ride on the roadway. Because bicycles often ride on both motorized and non-motorized facilities it is important to keep in mind that bicycles are legally classified as vehicles and are ridden on most public roads in Sitka. Roadways must be designed to allow bicyclists to ride in a manner consistent with the vehicle code.

SIDEWALKS

"Providing safe places for people to walk is an essential responsibility of all government entities involved in construction or regulating the construction of public rights-of-way." *AASHTO Policy on Geometric Design of Highways and Streets.*

Sidewalks are considered to be a portion of a road that is designated for the use of pedestrians and wheelchairs as well as basic and intermediate level in-line skaters and scooters. These facilities are not normally designed for bicycle use and the Alaska Administrative Code prohibits riding a bicycle on business area sidewalks.

Width Standards: The American Association of Highway and Transportation Officials (AASHTO) recommends that sidewalks be a minimum of 4' wide with at least a 2' safety setback from the face of curb or edge of roadway for all rural highways with an average daily traffic count of less than 2000. Where sidewalks are placed directly behind the curb, a 6' minimum sidewalk width is recommended. Safety setbacks of at least 2' are often paved, however they can be a landscaped strip to provide aesthetics, create a comfortable walking environment as well as a location to put signs and utilities. Where space allows, these landscaped safety setbacks can be widened to provide additional aesthetics and space for the planting of trees.

As the land use increases to 1 to 4 dwellings per acre the sidewalk width increases to a minimum of 8' wide with at least a 2' safety setback from the face of the curb or edge of roadway. Where sidewalks are placed directly behind the curb, a 10' minimum sidewalk width is recommended.

The actual width necessary to accommodate pedestrians is a function of the pedestrian traffic on the sidewalk, the greater the pedestrian volume, the wider the sidewalk must be.

Sidewalks located in urban and commercial areas should provide a frontage zone in front of stores in addition to the sidewalk width to allow for door swings, the gathering of pedestrians and transition. Signs, utility poles, parking meters, landscaping and site furniture should not be located in the sidewalk width. Areas with these features should have additional width added to provide an obstacle free width as indicated by AASHTO.

Sidewalks should be on both sides of the roadway except for rural highways with an average daily traffic count of less than 2000 and a dwelling density of less than 1 per acre.

The FHWA, Pedestrian Facilities Users Guide defines "rural area" as an area having less than one dwelling unit (du) per acre adjacent to the roadway. Traffic volumes have an influence on the comfort and safety of pedestrians and as a consequence, these guidelines have different design criteria for differing traffic volumes. The Pedestrian Facilities Users Guide, FHWA contains the following:

ROADWAY CLASSIFICATION & LAND USE	SIDEWALK/WALKWAY REQUIREMENTS
Rural Highways <2000 ADT	4'
Rural/Suburban Highways <2000 ADt and <1 du per acre	8'
Suburban Highway 1 - 4 du's per acre	Sidewalks on both sides recommended
Local Urban Street	Sidewalks on both sides preferred
Residential <1 du per acre	Sidewalks on both sides recommended
Local Urban Street Residential 1-4 du's per acre	Sidewalks on both sides recommended
Local Urban Street >4 du's per acre	Sidewalks on both sides recommended
Urban Collector & Minor Arterial Residential	Sidewalks on both sides recommended
Major Urban Arterial Residential	Sidewalks on both sides recommended
All Commercial/Urban Streets	Sidewalks on both sides recommended
All Industrial Streets	Sidewalks on both sides preferred Sidewalk on one side and Min. 5' shoulder recommended

The AASHTO guidelines are just those, guidelines. Therefore, some judgment must be used in applying these guidelines to any specific situation. For example, in most jurisdictions, if there is a sidewalk present, pedestrians are required to walk on the sidewalks and are prohibited from walking in the roadway. Consequently, if a sidewalk is located on only one side of the roadway, some pedestrians may be required to cross the street twice in order to reach their destination within the constraints of the law.

It is also necessary to remember that these guidelines apply to new sidewalks and walkways. They may be used to evaluate whether existing sidewalks and walkways need to be considered for a given area where conditions have changed to a more intensive land use.

In certain areas sidewalks will need to be widened to accommodate specific pedestrian usage. Adjacent to schools, auditoriums, theaters and other places of high pedestrian usage, wider sidewalks will be required. The Transportation Research Board has established criteria for determining required sidewalk width for pedestrians based on volume of pedestrians.

The Transportation Research Board (TRB) publication *Highway Capacity Manual* (HCM) recommends that in determining the maximum flow rate of sidewalks that a 1.5' safety clearance be allowed between the curb face or edge of roadway and the usable area of sidewalk. In addition, the HCM states that the sidewalk area adjacent to a fence, building or commercial building with display windows will reduce the usable width of sidewalk.

The unusable sidewalk area adjacent to each impedance caused by non-vehicles is as follows:

- Wall, fence or curb 1.5'
- Building adjacent to sidewalk 2.0'
- Commercial building with displays 2.5'

The HCM also reports that, based on extensive studies, each pedestrian requires 2.5' of usable sidewalk width in which to walk. Pedestrians who know each other will travel closer together. In the latter case each pedestrian requires 2'-2" of usable sidewalk width for travel. Although the "shy distance" from buildings, etc. is more a function of capacity vis-à-vis safety; if there is insufficient room on the usable sidewalk, pedestrians will encroach into the sidewalk safety area and even into the street, creating a safety problem.

Grades and Cross Slopes: ADAAG mandates that no sidewalk or other pedestrian route have a slope greater than 8.3%. Slopes greater than 5% require ramps and railings as indicated by ADA and those of 5% or less do not require any special features. The maximum cross slope is 2% to meet ADA requirements and should have a least 0.5% for drainage. Stairs should be avoided unless an accessible route can be located in close proximately. Special circumstances are granted to sidewalks along roadways in which topography limits the ability for roadways to have desirable slopes. In these instances, slopes of sidewalks can be greater than ADAAG Standards provided they follow the grade of the road and no other option exists.

Special circumstances are granted for to sidewalks along roadways in which topography limits the ability for roadways to have desirable slopes. In these instances, slopes of sidewalks can be greater than ADAAG standards provided they follow the grade of the road and no other option exists.

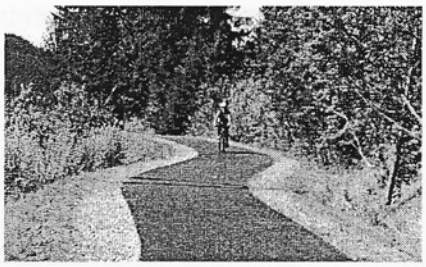
Curb Ramps: Sidewalks and curbs are typically 6 inches above the roadway and curb ramp are required to transition from the roadway to the sidewalk. Curb ramps are the only feature that is allowed to have slope of 8.3% without the need for railings provided the rise is 6 inches or less. Curb ramps should be located at intersections and crosswalks in such a manner the user is not placed in the flow of on-coming traffic.

Pavement Quality and Maintenance: Sidewalks are typically concrete or paver to ensure a hardwearing surface that maintains a level-walking surface. Asphalt can be used but has a shorter lifespan due to its nature to buckle and undulate and create an uneven walking surface. Surfacing should be able to withstand heavy mechanical methods of snow removal as well as deicing products.

Detectable warning surfaces such as truncated dome surfacing should be used to warning pedestrians with impaired vision that they are entering a vehicle traffic areas. These include the base of curb ramps, the border of crosswalks or raised crosswalks, and the edge of transit platforms or where railway tracks cross a sidewalk.

MULTI-USE PATHS

Though originally conceived to provide a facility for bicyclists, paths separated from motor-vehicle traffic often see greater use by a wide range of non-motorized users including pedestrians, in-line skaters, and wheelchairs. The planning and design of multi-use paths must therefore take into account the various skills, experience and characteristics of these different user types. Multi-use paths are typically designed for cyclists, who have higher design criteria than other users due to their speed. By designing for cyclists, multi-use paths can accommodate a wide range of non-motorized users.



Good design of a multi-use path

Where Paths are Appropriate: Well-planned and designed multi-use paths can provide excellent pedestrian and bicycle mobility as well as safety. They can have their own alignment along streams and greenways or may be components of a community trail system. Paths can serve both commuter and recreational cyclists. Many inexperienced cyclists fear motor vehicle traffic and will not ride on streets until they gain experience and confidence. A separated path provides a learning ground for potential bicycle commuters and can attract experienced cyclists who prefer an aesthetic ride.

The key components to successful paths include:

1. **Continuous separation from traffic** can be achieved by locating paths along a river or a greenbelt with few street or driveway crossings. Paths directly adjacent to roadways that have many street or driveway crossings are not recommended, as they tend to have many conflict points for cyclists.

2. **Scenic qualities,** offering an aesthetic experience that attract non-motorized users.

3. **Connection to land-uses,** such as shopping malls, downtown, schools, recreation areas, neighborhoods and other community destinations.

4. **Well-designed street crossings,** with measures such as bike and pedestrian activated signals, median refuges and warning signs for both motor vehicles and path users.

5. **Shorter trip lengths** than the road network, with connections between dead-end streets or cul-de-sacs or as short cuts through open spaces.

6. **Visibility:** proximity to housing and businesses increases safety. Despite fears of some property owners, paths have not attracted crime into adjacent neighborhoods.

7. **Good design,** by providing adequate width and sight distance and avoiding problems such as poor drainage, blind corners and steep slopes.

8. **Proper maintenance,** with regular sweeping and repairs. The separation from motor vehicle traffic can reduce some maintenance requirements, such as sweeping the debris that accumulates on roads.

Crossings: The number of at-grade crossings with streets or driveways should be limited. Poorly designed crossings put pedestrians and cyclists in a position where motor vehicle drivers do not expect them at street crossings.

Access: Limiting crossings must be balanced with providing access. If a path is to serve bicyclists and pedestrians well, there should be frequent and convenient access to the local road network. Access points that are spaced too far apart will require users to travel out of direction to enter or exit the path. The path should terminate where it is easily accessible to and from the street system, such as at a controlled intersection or at the end of a dead-end street. Directional signs should direct users to and from the path.

Security: Multi-use paths in secluded areas should be designed with personal security in mind. Clear sight distances improve visibility. Location markers, mileage posts and directional signing help users know where they are. Frequent accesses improve response time by emergency vehicles.

Maintenance: Multi-use paths require special trips for inspection, sweeping and repairs. They must be built to a standard high enough to allow heavy maintenance equipment to use the path without deterioration.

On-Street Facilities: As bicyclists gain experience and realize some of the advantages of riding on the road, many stop riding on paths placed adjacent to roadways. This can be confusing to motorists, who may expect bicyclists to use the path. The presence of a nearby path should not be used as a reason to not provide adequate shoulders, bike lanes or sidewalks on the roadway.

Standards: Paths intended for multiple use by commuters and recreationists should be built to a standard that accommodates the various users with minimal conflicts. Designing to a low standard to save money can lead to problems if the path is popular.

Paths Next to Roadways: Multi-use paths should not be attached linearly to roadways at the back of curb. Although appropriate for pedestrians, half of the bicycle traffic will ride against the normal flow of motor vehicle traffic, which is contrary to the rules of the road, with the following consequences for bicyclists:

When the path ends, bicyclists riding against traffic tend to continue to travel on the wrong side of the street, as do bicyclists getting to a path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile crashes and should be discouraged.

At intersections, motorists crossing the path often do not notice bicyclists, especially where sight distances are poor.

Bicyclists on the path often are required to stop or yield at cross-streets and driveways.

Stopped motor vehicle traffic on a cross-street or driveway may block the path.

Because of the closeness of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary to separate motor vehicles and bicyclists. These barriers are obstructions, complicate maintenance of the facility and waste available right-of-way.

Guidelines: Separated paths along roadways should be evaluated using the following guidelines:

1. Bicycle and pedestrian use is anticipated to be high.
2. The adjacent roadway is a heavily-traveled, high-speed thoroughfare where on-road bikeways and sidewalks may be unsafe.
3. The path will generally be separated from motor vehicle traffic, with few roadway or driveway crossings.
4. There are no reasonable alternatives for bikeways and sidewalks on nearby parallel streets.
5. There is a commitment to provide path continuity throughout the corridor.
6. The path can be terminated at each end onto streets with good bicycle and pedestrian facilities or onto another safe, well-designed path.
7. There is adequate access to local cross-streets and other facilities along the route.
8. Any needed grade-separation structures do not add substantial out-of-direction travel.
9. The total cost of providing the proposed path is proportionate to the need. This evaluation should consider the costs of:

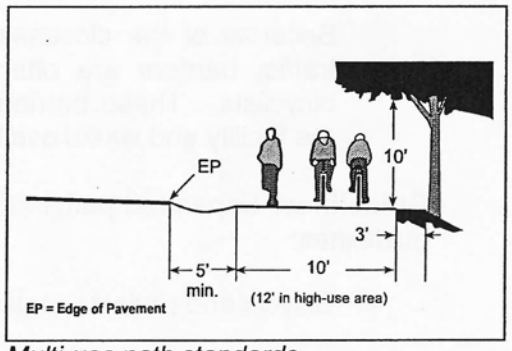
a) Grading, paving, drainage, fences, retaining walls, sound walls, signs and other necessary design features.

b) Structures needed to eliminate at-grade crossings.

c) Additional maintenance, including the need for specialized maintenance equipment.

Width & Clearances: The standard width for a two-way multi-use path is 10 ft; they should be 12 ft wide in areas with high mixed-use. Faster-moving bicyclists require greater width than pedestrians; optimum width should be based on the relative use by these two modes. High use by skaters may also require greater width. The minimum width is 8 ft. However, 8 ft wide multi-use paths are not recommended in most situations because they may become over-crowded and they are not wide enough for maintenance vehicles. On 8 ft wide pathways maintenance vehicles often cause edge cracking and do not leave room for users to safely pass them. They should only be constructed as short connectors, or where long-term usage is expected to be low and with proper horizontal and vertical alignment to assure good sight distances.

Lateral Clearance: A 3 ft or greater (2 ft minimum) "shy" or clear distance on both sides of a multi-use path is necessary for safe operation. This area should be graded to the same slope as the path to allow space to stop and get off the path. This space can also accommodate other uses such as pedestrians, joggers or horses.



Multi-use path standards

Overhead Clearance: The standard clearance for overhead obstructions is 10 ft (minimum 8 ft).

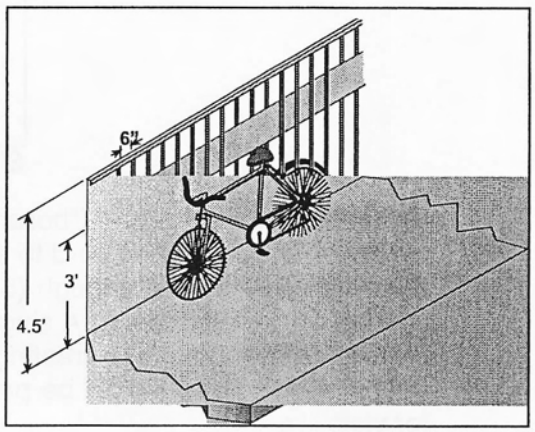
Separation from roadway: Where a path is parallel and adjacent to a roadway, there should be a 5 ft or greater width separating the path from the edge of the roadway or a physical barrier of sufficient height should be installed (see section on railings).

Grades & Cross-Slope: ADA requirements stipulate that pathways should not exceed 5% to accommodate wheelchair users without the use of ramps and railings. Slopes may not exceed 8.3%. 5% should be considered the maximum grade allowable for multi-use paths. AASHTO does however recommend a maximum grade of 5% for bicycle use, with steeper grades allowable for up to 500 ft, provided there is good horizontal alignment and sight distance. Extra width is also recommended. Engineering judgment and analysis of the controlling factors should be used to determine what distance is acceptable for steep grades for bicycle only facilities.

The standard cross-slope grade is 2% to meet ADA requirements and to provide drainage. Curves should be banked with the low side on the inside of the curve to help bicyclists maintain their balance.

Grade Crossings of Thoroughfares: At-grade crossings introduce conflict points and grade separation should be sought. When grade separation structures cannot be justified, signalization or other measures should be considered to reduce conflicts. Good sight distance must be provided so vehicle drivers can see approaching path users. Where a path must cross a roadway at an intersection, improvements to the alignment should be made to increase the visibility of approaching path users.

Railings, Fences & Barriers: Fences or railings along paths may be needed to prevent access to high-speed highways or to provide protection along steep side slopes and waterways. A height of 4.5 ft keeps a cyclist from falling over the railing or fence. However, the use of these facilities should be carefully evaluated and used only where absolutely necessary. Excessive fences and railings can become safety hazards.



Railing with "rub rail"

Openings in the railing must not exceed 6" in width. Where a cyclist's handlebar may come into contact with a fence or barrier, a smooth, wide rub-rail should be installed at a height of 3 ft. Where concrete barriers are used, adding tube railing or chain link fencing may be necessary to achieve the required height.

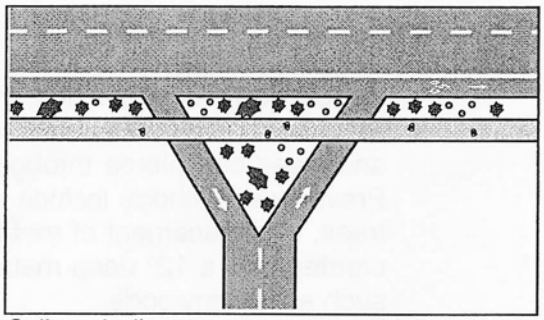
Fences should only be used where they are needed for safety reasons. They should be placed as far away from the path as possible. Duplication of fences should be avoided, such as fences on the right-of-way and fences to keep pedestrians off highways.

Care must be taken to avoid a "cattle chute" effect by placing a high chain-link fence on each side of a path.

Preventing Motor-Vehicle Access

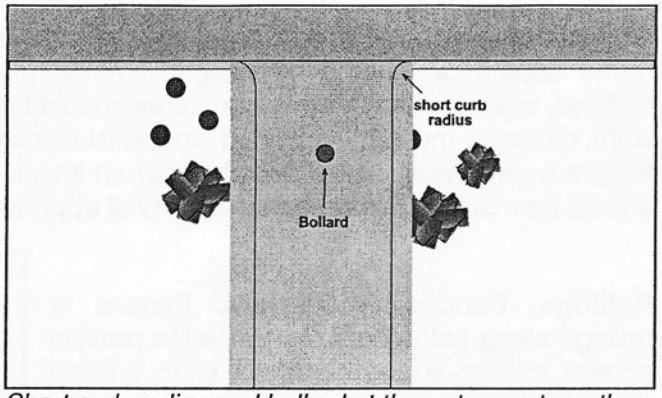
Multi-use paths can be attractive for motorized users looking for adventure or as a short cut. Motor vehicle access must be eliminated to reduce conflicts, prevent damage to the facility and maintain a safe non-motorized route.

Geometric Design: One method branches the path into two narrower one-way paths just before it reaches the roadway, making it difficult for a motor vehicle to gain access to the path:



Split path discourages motor-vehicle access

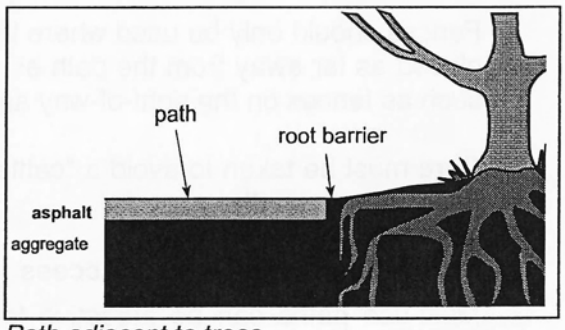
Short Curb Radii: Short curb radii of 5 ft can make it difficult for motorists to enter a path from the roadway.



Short curb radius and bollard at the entrance to path

Bollards: Barrier posts ("bollards") may be used to limit vehicle traffic on paths. However, they are often hard to see and cyclists may not expect them. When used, they must be spaced wide enough (5 ft) for easy passage by cyclists and bicycle trailers as well as wheelchair users. A single bollard is preferred, as two may channelize bicyclists to the middle opening, creating conflicts. They should not be placed right at the intersection. They should be painted with bright, light colors and have reflective strips for visibility.

Curb Cuts: Curb cuts for bicycle access to multi-use paths should be built so they match the road grade without a lip. The width of the curb cut is the full width of the path when the approaching path is perpendicular to the curb and a minimum of 8 ft wide when the approaching path is parallel and adjacent to the curb. Greater widths may be needed on downhill grades.



Path adjacent to trees

Vegetation: All vegetation, including roots, must be removed in the preparation of the subgrade. Paths built in wooded areas present special problems. The roots of shrubs and trees can pierce through the surface and cause it to bubble up and break apart. Preventive methods include removal of vegetation, realignment of the path away from trees, and placement of root barriers along the edge of the path. An effective barrier is created with a 12" deep metal or plastic shield; greater depth is required for some trees such as cottonwoods.

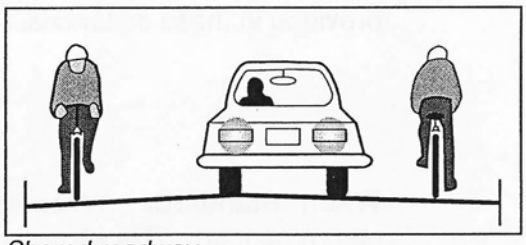
Drainage: Multi-use paths must be constructed with adequate drainage to avoid washouts and flooding and to prevent silt from intruding onto the path.

Paths with Heavy Use: If a path must handle a high number of users, it should be wider than standard (10 ft). A separate soft-surface pedestrian path may be constructed alongside the paved path strictly for cyclists.

SHARED ROADWAYS

There are no specific standards for most shared roadways; they are simply the roads as constructed. Shared roadways function well on *low volume* local streets and minor collectors and rural roads. Shared roadways are suitable in urban areas on streets with low speeds (25 MPH or less) or low traffic volumes.

In rural areas, the suitability of a shared roadway decreases as traffic speeds and volumes increase, especially on roads with poor sight distance. Where non-motorized use or demand is potentially high, roads should be widened to include shoulder lanes where travel speeds and volumes are high.



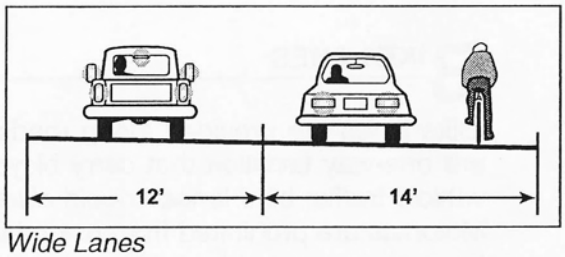
Shared roadway

Many urban local streets carry excessive traffic volumes at speeds higher than they were designed to carry. These can function as shared roadways if traffic speeds and volumes are reduced. There are many "traffic calming" techniques, discussed later in this chapter that can make these streets more amenable to bicycling on the road.

WIDE LANES

A wide lane may be provided where there is inadequate width to provide the required sidewalk, bike lanes or shoulder lanes. Again, lower traffic volumes and vehicle speeds are essential. A wide lane may occur on retrofit projects where there are severe physical constraints and all other options have been pursued, such as removing parking or narrowing travel lanes. Wide lanes are not particularly attractive to pedestrians and many would rather walk on the gravel shoulder, should it exist. Most cyclists do not find these facilities attractive but they do allow a motor vehicle to pass cyclists within a travel lane. A wide lane should be a last resort facility.

To be effective, a wide lane must be at least 14 ft wide, but less than 15 ft. Usable width does not include curb and gutter. Widths greater than 15 ft encourage the undesirable operation of two motor vehicles in one lane. In this situation, a bike lane or shoulder bikeway should be striped.

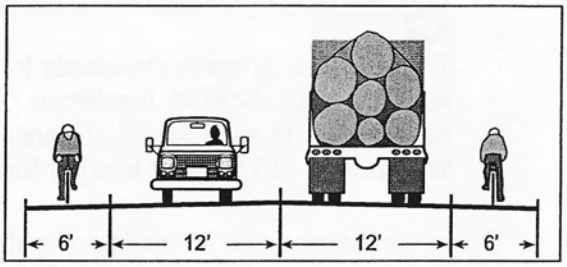


Wide Lanes

SHOULDER LANES

Paved shoulders are a way to accommodate a wide array of non-motorized users on low volume and low to medium speed roadways. These shared facilities can result in conflict when the users is forced into the roadway due to the lane being occupied by a parked car, or other non-motorized user.

Paved shoulders in rural areas serve the needs of all types of users, however on higher speed roads (over 45 mph) and in urban areas they may only be useable by advanced cyclists. Separate facilities for other non-motorized users must be provided in these instances.



Shoulder Lanes Min: 5' against curb or guardrail 4' open shoulder

Width Standards: When providing shoulders for bicycle use, a width of 6-ft is recommended. This allows a cyclist to ride far enough from the edge of the pavement to avoid debris, yet far enough from passing vehicles to avoid conflicts. If there are physical width limitations, a minimum 4-ft shoulder may be used. Shoulders against a curb face, guardrail or other roadside barriers must have a 5-ft minimum width or 4-ft from the longitudinal joint between a curb and gutter and the edge of the travel lane. On steep grades, it is desirable to maintain a 6-ft, (min. 5-ft) shoulder, as cyclists need the additional space for maneuvering. Shoulder lanes should be striped with a 4" fog line.

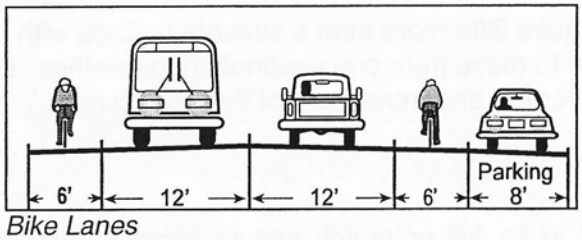
Pavement Quality and Maintenance: Paved shoulders should have the same pavement structural design as that of the roadway. On shoulder widening projects it is best to do it in conjunction with pavement overlays. This provides a smooth, seamless joint, reduces cost of both projects due to increased quantities of material being purchased and disrupts traffic only once. The thickness of pavement and base material will depend upon local conditions, and engineering judgment should be used.

Shoulder lanes should be regularly swept and kept free of potholes. Unpaved parking lots and access roads should be paved 15 ft away from the shoulder to reduce the encroachment of debris onto the shoulder.

BIKE LANES

Bike lanes are provided along roads where there is high volume of bicycle use. They are one-way facilities that carry bicycle traffic in the same direction as adjacent motor-vehicle traffic; bike lanes should always be provided on both sides of a two-way street. Motorists are prohibited from using bike lanes for driving and parking, but may use them for emergency avoidance maneuvers or breakdowns.

Width Standards: The standard width of a bike lane is 6 ft, as measured from the center of stripe to the curb or edge of pavement. This width enables cyclists to ride far enough from the curb to avoid debris and drainage grates, yet far enough from passing vehicles to avoid conflicts. By riding away from the curb, cyclists are more visible to motorists.



Bike Lanes
Min: 5' against curb, parking or guardrail: 4' open shoulder

The minimum bike lane width is 4 ft on open shoulders and 5 ft from the face of a curb, guardrail or parked cars. A clear riding zone of 4 ft is desirable if there is a longitudinal joint between asphalt pavement and the gutter section.

Bike lanes wider than 6 ft may be desirable in areas of very high use, on high-speed facilities where wider shoulders are warranted or where they are shared with pedestrians. Adequate marking or signing must be in place so lanes are not mistaken for a motor vehicle lane or parking area. A bike lane must always be marked with pavement stencils and a 8" wide stripe. This width increases the visual separation of a motor vehicle lane and a bike lane. If parking is permitted, the bike lane must be placed between parking and the travel lane and have a minimum width of 5 ft.

Drainage Grates: Care must be taken to ensure that drainage grates are bicycle-safe. Grates and manhole covers should be placed outside the bicycle travel lane. Grates with wide slots running parallel to the road may cause bicycle wheels to fall between the slots, causing the rider to fall. Replacing this particular style of grate is a necessity. The most effective way to avoid drainage-grate problems is to eliminate them entirely and replace them with inlets in the curb face. All inlets, grates and manhole covers should be flush with the pavement and raised after a pavement overlay to within 1/4" of the new surface. If this is not possible or practical, the pavement must taper into them to eliminate abrupt edges at the inlet.

Restriping Existing Roads with Bike Lanes: Retrofitting bike lanes onto many existing roadways by marking and signing existing shoulders as bike lanes can accommodate the needs of cyclists. This may require physically widening the roadway to add bike lanes or restriping the existing roadway to add bike lanes. Where existing width does not allow full standards to be used, it may be possible to modify portions of the roadway to accommodate bike lanes. Current guidelines are: 14 ft center lanes, 12 ft travel lanes, 6 ft bike lanes and 8 ft parking lanes.

These guidelines should be used to determine how the roadway could be modified to accommodate bike lanes, without significantly affecting the safety or operation of the roadway. It is crucial to use good judgment when planning bike lanes and a traffic engineer should review each project.

Reduce Travel Lane Widths: The need for full-width travel lanes decreases with speed:

1. Up to 30 MPH: travel lanes may be reduced to 10 or 10.5 ft.

2. 30 to 40 MPH: 11 ft travel lanes and 12 ft center turn lanes may be acceptable.
3. 45 MPH or greater: try to maintain a 12 ft outside travel lane and a 14 ft center turn lane especially if there are high bus or truck volumes.

BICYCLE FACILITIES

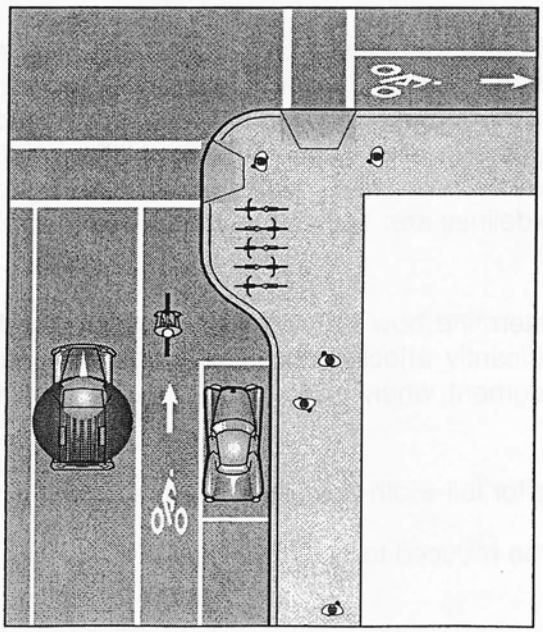
A majority of non-motorized users require little more than a suitable surface with adequate width to reduce conflict and to move from one destination to another. Cyclists however do require facilities for the storage and movement of their bicycles.

Bicycle Parking

For a bikeway network to be used to its full potential, secure bicycle parking needs to be provided at likely destination points. Bicycle thefts are common and lack of secure parking is often cited as a reason people hesitate to ride a bicycle to certain destinations. The same consideration should be given to bicyclists as to motorists, who expect convenient and secure parking at all destinations.

Bicycle racks must be designed so that they:

1. Do not bend wheels or damage other bicycle parts.
2. Accommodate the high security U-shaped bike locks.
3. Accommodate locks securing the frame and both wheels.
4. Do not trip pedestrians.
5. Are covered where users will leave their bikes for a long time.
6. Are easily accessed from the street and protected from motor vehicles.
7. Readily visible to deter theft or vandalism.



To provide real security for the bicycle (with its easily removed components) and accessories (lights, pump, tools and bags), either bicycle enclosures or lockers are required.

Bicycle parking facilities are generally grouped into 2 classes:

Bicycle parking provided away from main sidewalk area

Long Term: Provides complete security and protection from weather; it is intended for situations where the bicycle is left unattended for long periods of time: apartments and condominium complexes, schools, places of employment and transit stops. These are usually lockers, cages or rooms in buildings.

Short Term: Provides a means of locking bicycle frame and both wheels, but does not provide accessory and component security or weather protection unless covered; it is for decentralized parking where the bicycle is left for a short period of time and is visible and convenient to the building entrance.

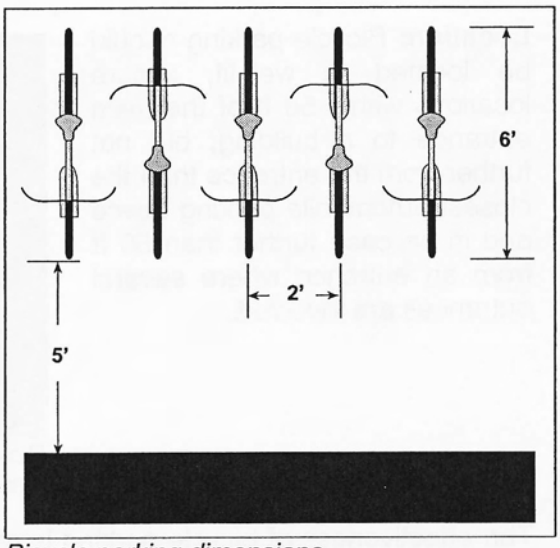
Recommended Standards

Dimensions

1. Bicycle parking spaces should be at least 6 ft long and 2 ft wide, and overhead clearance in covered spaces should be at least 7 ft.

2. A 5 ft aisle for bicycle maneuvering should be provided and maintained beside or between each row of bicycle parking.

3. Bicycle racks or lockers should be securely anchored.



Bicycle parking dimensions

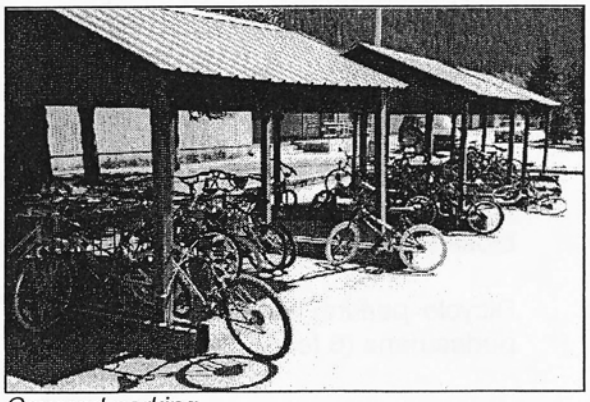
These dimensions ensure that bicycles can be securely locked without undue inconvenience and will be reasonably safeguarded from theft as well as intentional or accidental damage.

Covered Parking

1. Bicycle parking for residential, school and commercial uses should be covered.

2. Where motor vehicle parking is covered, bicycle parking should also be covered.

3. Where there are 10 or more bicycle parking spaces, at least 50% of the bicycle parking spaces should be covered.

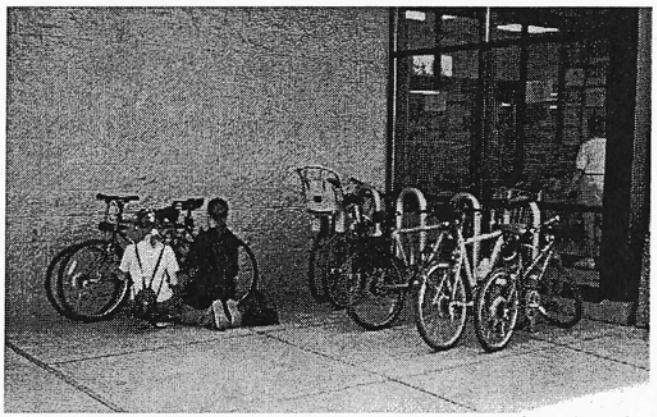

Covered parking

Sitka weather has mild temperatures with periods of intermittent rain. Many short trips can be made by bicycle without getting wet; however, if the bicycle must be left unattended for a long time, a rider might hesitate to leave it exposed to the weather.

Covered parking is necessary for long-term parking (mostly residential and employee uses). For customers, visitors and other occasional users, covered parking is also beneficial. Covered spaces can be building or roof overhangs, awnings, lockers or bicycle storage spaces within buildings.

Covered parking needs to be visible for security, unless supplied as storage within a building. Covering should extend 4 ft beyond the parking area, to prevent crosswinds from blowing rain onto bicycles.

Location: Bicycle parking should be located in well-lit, secure locations within 50 ft of the main entrance to a building, but not further from the entrance than the closest automobile parking space and in no case further than 50 ft from an entrance where several entrances are involved.



Bicycle racks near store entrance yet out of pedestrian flow

The effectiveness of bicycle parking is often determined by location. To reduce theft, a highly visible location with much pedestrian traffic is preferable to obscure and dark corners. Because of its smaller size, the bicycle can be parked closer to the rider's destination than a car.

Racks near entrances should be located so that there are no conflicts with pedestrians. Curb cuts at the rack location discourage users from riding the sidewalk to access the racks. Many sites need two types of bicycle parking: short-term for customers, which should be up front; and long-term (covered) for employees, which may be placed farther away. Separating bicycle from car parking by a physical barrier or sufficient distance protects parked bicycles from damage by cars.

Bicycle parking may also be provided inside a building in secure and accessible locations.

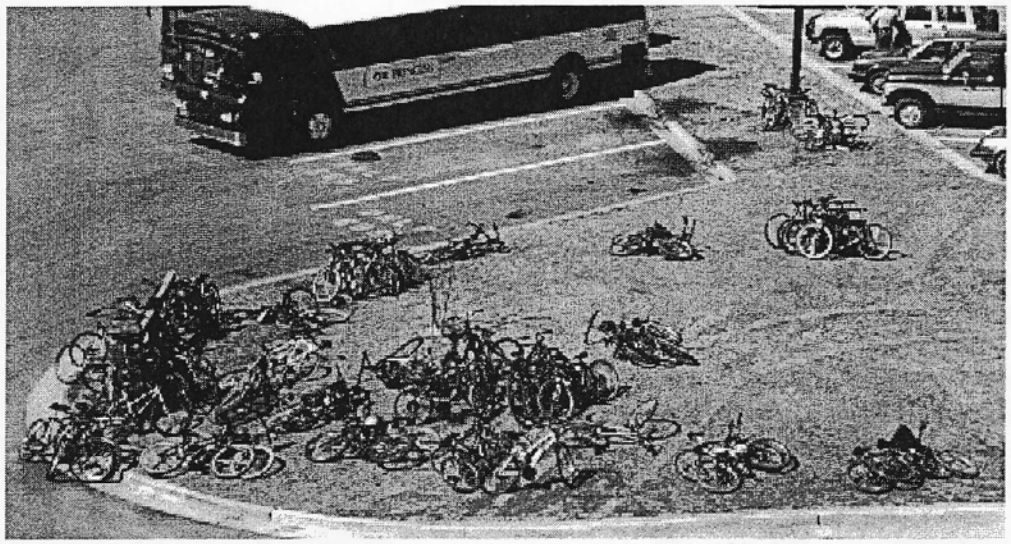
This provides a high degree of security and protection, at the expense of some convenience. Dedicated rooms with card locks are very effective. Locating a room close to changing and showering facilities enhances its attractiveness.

Bicycle parking provided in the public right-of-way should allow sufficient passage for pedestrians (6 feet).

Number of Spaces: The recommendations are based on specific and easily measurable criteria such as size of buildings, number of residential units, number of classrooms, etc. Combined parking could be allowed in areas of concentrated small businesses, such as downtown and in business parks. Publicly provided bicycle parking could also be used.

For park-and-ride lots, requirements need to relate the number of bicycle parking spaces to the probable service area such as the number of residents within a three mile radius of a facility.

The amount, location and usage of bicycle parking should be monitored and adjusted to ensure that there is an adequate supply. If bicycle use increases, the need for bicycle parking may increase above that specified when facilities are constructed. Employment and retail centers should voluntarily provide additional parking to satisfy the demands of customers and employees.



Insufficient bicycle parking facilities can create a jumble of confusion

SIGNAGE RECOMMENDATIONS

Signing is the most basic method to communicate where the non-motorized transportation facilities are located. Without signs, many people will be unable to use these facilities due to not knowing their whereabouts. Signing also helps reduce conflicts and helps users reach their destinations. To the maximum extent possible, any signage used on public ways and ways open to the public for transportation purposes should conform with the *Alaska Traffic Manual*. The *Alaska Traffic Manual* (ATM) is the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) adopted by the Federal Highway Administration (FHWA) with appropriate modifications to conform to Alaskan conditions. Use of this manual will not only present a consistent signage situation for residents of Sitka, but such signage will be more readily understood by visitors as the MUTCD is the national standard for transportation facilities.

Signing and Marking: Signing and marking of bikeways and walkways must be uniform and consistent for them to command the respect of the public and provide safety to users. Signing and marking must be warranted by use and need. All signing and markings of bikeways and walkways within the City and Borough of Sitka should be in conformance with the recommendations of this section.

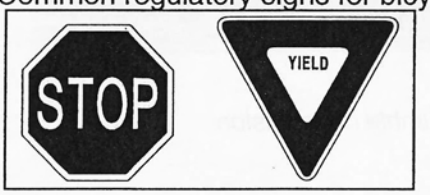
Well-designed roads make it clear to users how to proceed and require very little signing. Conversely, an over-abundance of warning and regulatory signs may indicate a failure to have addressed problems. The attention of drivers, bicyclists and pedestrians should be on the road and other users, not on signs on the side of the road. Over signing degrades the usefulness of signs, causes distractions, creates a cluttered effect, is ineffective and wastes resources.

Language Barriers: Many people don't read English. The message conveyed by signs should be easily understandable by all roadway users: symbols are preferable to text.

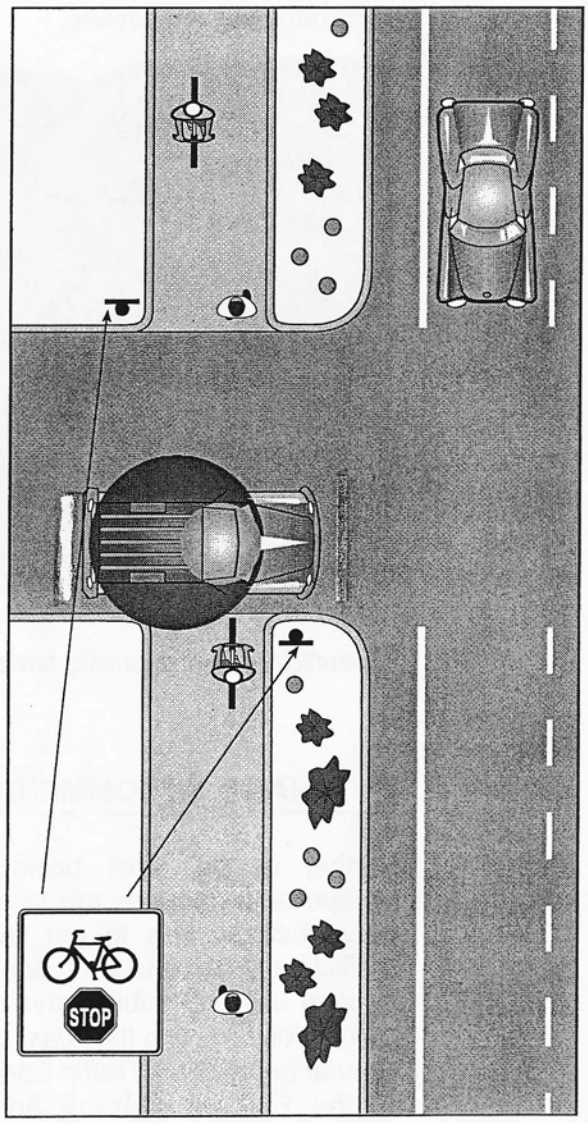
Sign Placement: Signs placed adjacent to roadways must conform to adopted standards for clearance and breakaway posts.

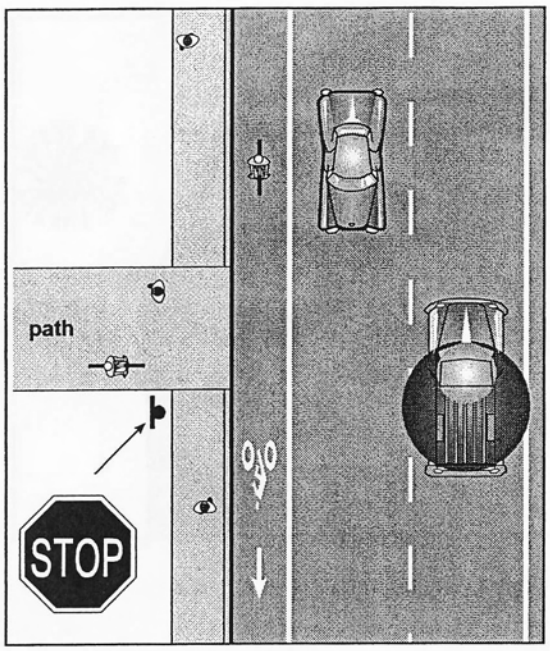
Multi-Use Path: Paths should be signed with appropriate regulatory, warning and destination signs.

Regulatory Signs: Regulatory signs inform users of traffic laws or regulations. They are erected at the point where the regulations apply. Common regulatory signs for bicyclists are:



Note: The standard stop sign and yield sign are reduced versions of standard motor vehicle signs, to be used where they are visible only to non-motorized user. (where a path crosses another path or where a path intersects a roadway at right angles).





Warning Signs: Warning signs are used to inform users of potentially hazardous conditions. They should be used in advance of the condition. Most are reduced versions (18" X 18") of standard highway warning signs:

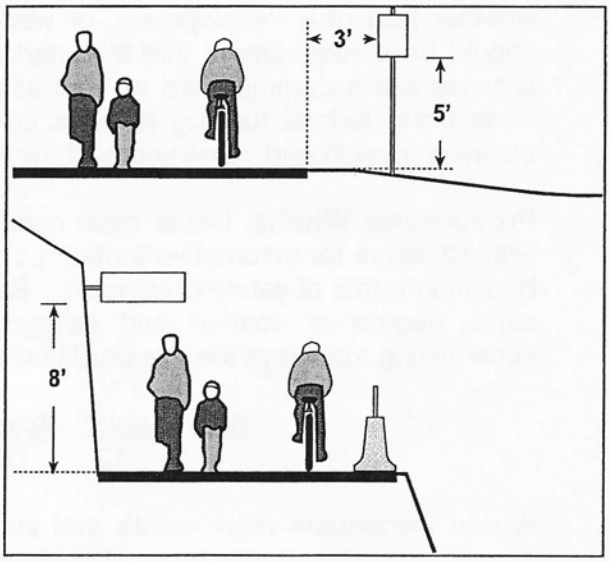
1. Curves
2. Intersections
3. Hill
4. Height and Width Constraints
5. Path Crossing Roadway

A sign with "XING" should be used only where a multi-use path crosses a roadway in an unexpected location.

Directional, destination & street signs: Where a path crosses a roadway or branches off into another path, directional and destination signs should be provided. It is also helpful to have street name signs at street crossings and access points. Signs directing users to the path are also helpful.

End of path: Where a path ends, and bicyclists must continue riding on the roadway, signs should be used to direct cyclists to the right side of the road to minimize wrong-way riding.

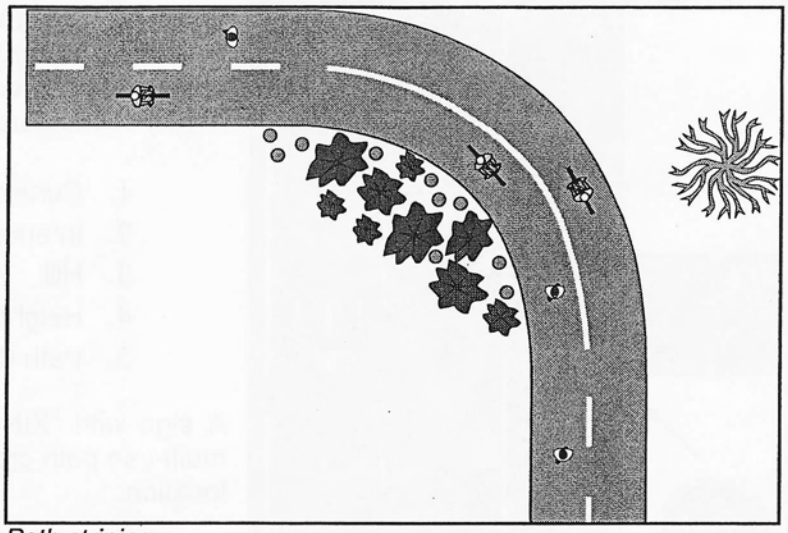
Placement of Signs: Signs should have 3 ft lateral clearance from the edge of the path (min 2 ft). Because of cyclists' and pedestrians' lower line of sight, the bottom of signs should be about 5 ft above the path. If a secondary sign is mounted below another sign, it should be a minimum of 4 ft above the path. Signs placed over a path should have a minimum vertical clearance of 8 ft.



Sign clearances

Striping; On paths with high use, a broken yellow centerline stripe may be used to separate travel into two directions. Spacing may be either 3 ft segments and 9 ft gaps or 10 ft segments and 30 ft gaps. A solid centerline stripe should be used through curves and areas of poor sight distance.

Note: Attempts to separate pedestrians from cyclists with an additional painted lane have not proven successful and are not recommended.



Path striping

Review of Existing Signing: Many non-motorized routes are signed and marked in a manner that is not consistent with current standards and practices. Periodic review of existing signs is recommended to upgrade and standardize signing. Other signs that are not appropriate for the situation, as well as stencils, should be removed.

CONSTRUCTION OF NEW ROADWAYS

Whenever new roadways or reconstruction of existing roadways are contemplated, whether part of a development, or work done by the municipality or DOT&PF, there should be a requirement that the roadways be multimodal such that pedestrians and bicycles are accommodated as well as motorists. Any construction or reconstruction done using federal funding requires consideration of pedestrians and bicycles in the planning, design and construction of the facility. [See 23 USC 135(a)(3)]

Proportional Widths: Under most conditions roadways are designed and constructed with 12' lanes for automotive traffic. Lanes over 12' wide do not appear to provide any benefit in terms of safety or capacity. Basic bicycle lanes 6' wide appear to provide the same degree of comfort and safety for bicyclists. Therefore, in designing and constructing roadways the standard lane configurations would be:

Bike	Auto	Auto	Bike
6'	12'	12'	6'

Where inadequate room exists and lanes must be less than the standard indicated above, the bike and auto lanes should be reduced proportionally such that each mode is equally impacted by the reduced width. This seems logical yet in many instances bike lanes have narrowed while auto lanes remained at 12' in order to accommodate restricted rights of way or other controls. It is recommended that if there are restrictions that require narrowing of lanes in order to design and construct (or reconstruct) a facility that the lanes be reduced proportionally as follows:

ROW	Bike	Auto	Auto	Bike
>36'	6'	12'	12'	6'
32'	5'	11'	11'	5'
28'	4'	10'	10'	4'
24'	(3'	9'	9'	3')*

*These minimal lanes should only be used where there are essentially no trucks or buses as these large vehicles normally require 9.7' lanes to accommodate the vehicle and the associated safety items such as mirrors.

Where local streets are too narrow to accommodate the minimal lane widths, then the street should be designated a mixed-use street and posted accordingly.