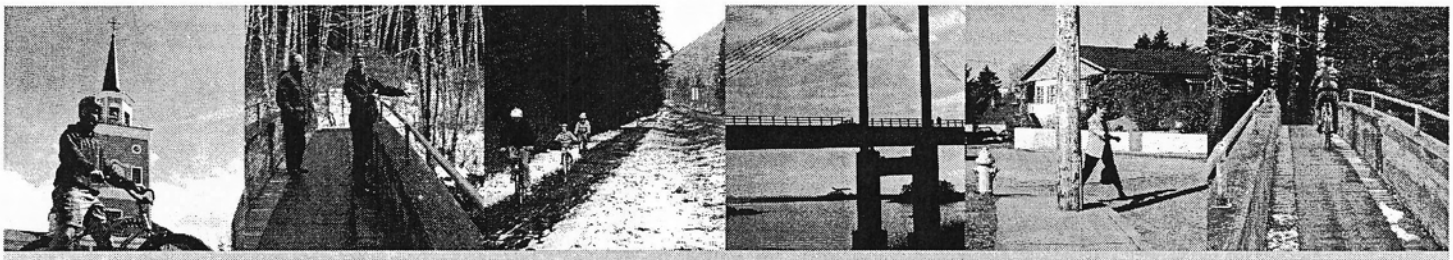
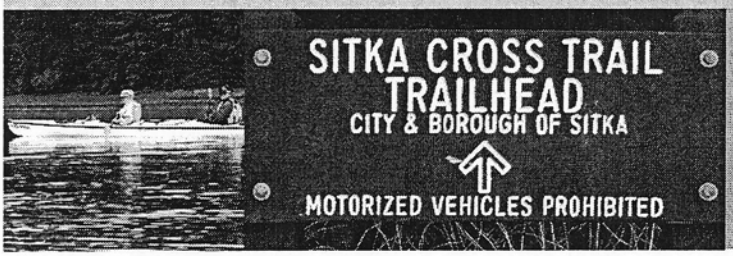
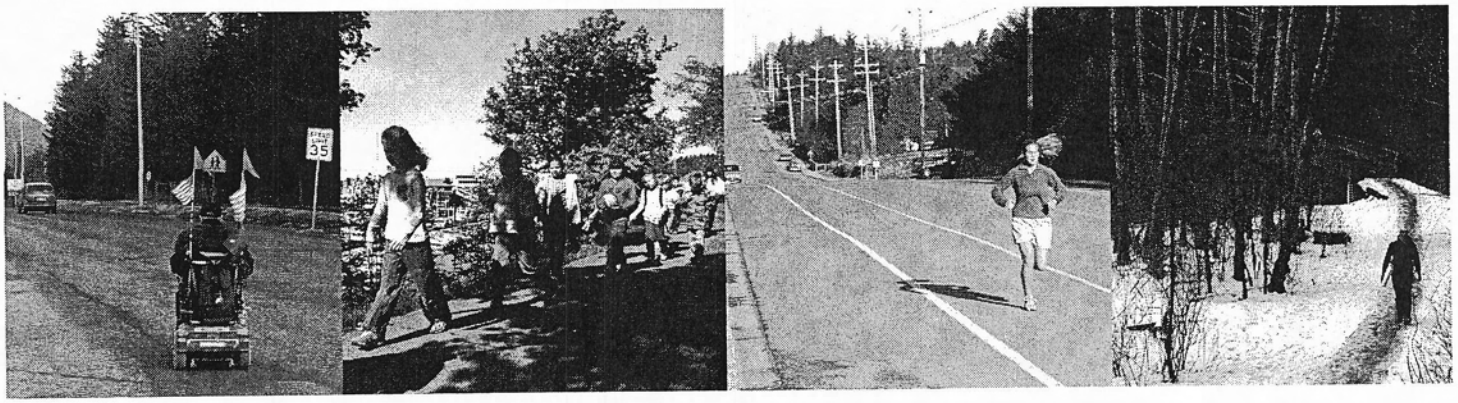


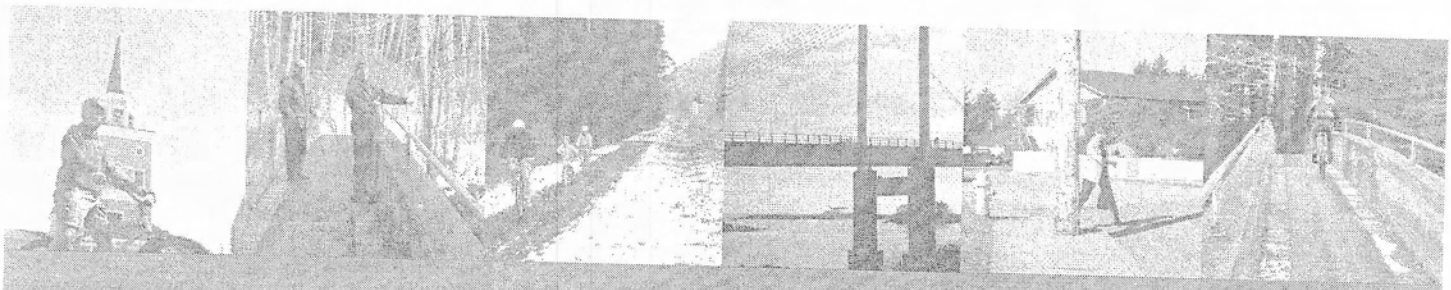
Sitka Non-Motorized Transportation Plan



for the
City and Borough of Sitka

September 2002





Sitka Non-Motorized Transportation Plan

Prepared for
The City and Borough of Sitka
Department of Parks and Recreation
Department of Engineering

September 2002

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King and Associates
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Special thanks to

The Residents of the City and Borough of Sitka
Sitka Trail Works, Inc.
The City and Borough of Sitka
The Alaska Department of Transportation and Public Facilities

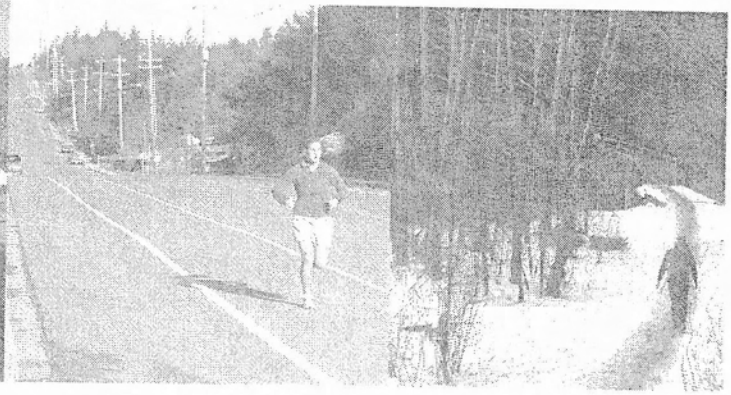


TABLE OF CONTENTS

SECTION 1
INTRODUCTION

INTRODUCTION

The Sitka Non-Motorized Transportation Plan was commissioned by the City & Borough of Sitka in an effort to plan and update Sitka's non-motorized transportation system. This plan integrates recommendations from previous plans and recent public input to enhance Sitka's existing transportation system that currently does not meet the needs of its non-motorized users. These facilities include sidewalks, bike lanes, road shoulders, trails, separated paths and accessible surfacing for walkers, commuter and recreational cyclists, strollers, scooters, wheelchairs, in-line skaters and any other form of non-motorized mobility that safely and efficiently link destinations within the community.

This plan makes recommendations for improving these facilities and was developed with a high degree of public and agency involvement to respond to the needs of the high number of Sitka's population who use and depend upon non-motorized transportation. Residents of Sitka walk three times more than the national average and bicycle over 6 times the national average for transportation.

This plan also recommends a means to fully integrate both motorized and non-motorized transportation modes in a resulting system that will be safe, enjoyable, low maintenance, convenient, and in keeping with the scale of Sitka. The implementation of this plan will improve the quality of life in Sitka.

NON-MOTORIZED TRANSPORTATION REPORT

This project was divided into two phases. The first was an Assessment Report and the second is this report, the Non-Motorized Transportation Plan. The Assessment Report was completed and approved in July 2002 and looks at the existing non-motorized transportation facilities and possible future needs of the community. The Assessment Report identified existing opportunities and constraints, as well as conflict areas that must be overcome to develop a continuous and safe non-motorized transportation system. The Assessment Report identifies the issues; it does not resolve them. That work is the basis of this report, the Non-Motorized Transportation Plan.

This Non-Motorized Transportation Plan makes recommendations for enhancing existing facilities, and the installation of new ones to create an seamless non-motorized transportation system that meets the needs of its users. The study area encompasses the roaded areas of Sitka from Starrigavin to Herring Cove, and the surrounding neighborhoods. The planning team was asked to pay particular attention to five areas of concern: Downtown; Japonski Island; Halibut Point Road area; Sawmill Creek Road area; and Sitka Cross Trail system.

An important aspect of a good transportation plan is to effectively and safely link existing and future centers of activity that produce a demand for non-motorized transportation. Centers of activity include schools, shopping areas, employment centers, restaurants, parks, office buildings, residential areas, recreational facilities and numerous other facilities or features. This Non-Motorized Transportation Plan makes both immediate and long-term recommendations for improvements. These recommendations are made to accommodate the current and expected mid term community requirements for capacity while providing facilities that are convenient, safe and appropriately scaled for Sitka.

These final recommendations strike a balance between the needs of the community and accepted industry design guidelines for non-motorized transportation facilities. The recommendations incorporate local conditions, use patterns and community preferences, into both state and national standards for design. This plan also identifies available funding for development and maintenance of these facilities. It is the desire of the City and Borough of Sitka to have many of the recommendations in this plan added to the State's Long Range Transportation Plan and the 'Needs List' for funding through the Statewide Transportation Improvement Program (STIP). The recommendations could also be considered for other funding sources including state and national grant programs, the Sitka capital improvement program, local bonding, developing partnerships and by local developers. This plan will be presented to the Sitka Planning Commission, City & Borough of Sitka Assembly, and the Alaska Department of Transportation & Public Facilities for approval.

The recommendations contained in this Sitka Non-motorized Transportation Plan should be updated every five years to reflect growth and development patterns, and to reflect changing preferences and needs of residents and visitors.

ISSUES

Successful design, development, maintenance and use of a non-motorized transportation system involve the consideration and inclusion of the public desires, agency constraints, and deficiencies in the existing system. Many of these issues were raised during the development of this plan and became the basis for the goals and recommendations that follow.

Issue #1: Subdivision & platting. There are no provisions in Sitka's municipal code that require or encourage non-motorized transportation facilities to be provided for at the time of a proposed platting action, during development of property, or during construction of roads or utilities. If everyone is to shoulder part of the financial burden of providing a good integrated public transportation infrastructure, the best place for that to occur is at the time properties are subdivided, re-platted, or developed.

Issue #2: Financial and political capital. Appropriate resources should be identified and directed toward development of an integrated and effective transportation system. This includes finding the right source of funds and directing it toward the right project at the appropriate time; marshaling support of community leaders to facilitate changes necessary in the planning and development of non-motorized transportation improvements; and planning for and providing necessary maintenance.

Issue #3: Safety. Measures need to be taken to avoid or reduce accidents by effectively integrating motorized and non-motorized modes of transportation. Some of the ways are:

- Provide effective lighting to improve visibility and focus attention on critical locations.
- Locate and design crossings & pedestrian activated signals for safe, easy and convenient use.
- Utilize physical barriers or visual cues where needed, to separate users and improve safety.
- Use signing for information and alerting users of potential dangers.
- Stripe, texture and mark pavement to help define bicycle and pedestrian areas.
- Repair ragged pavement edges.
- Eliminate non-essential driveways and road intersections.
- Ensure driveways and intersections are clearly defined and sight lines are unobstructed.
- Maintain existing facilities.

Issue #4: Convenience and Predictability. A system that is convenient and predictable for users will be used. Facilities must be continuous, free of hazards and obstacles, have a predictable surface, and avoid road splash and other inconveniences posed by motorized vehicles.

Issue #5: Education. Motorists and non-motorized users of Sitka's transportation system will benefit from additional education opportunities that can take many different forms. Both user groups should be better educated in the rules that govern themselves and the other user group. This education should start in grade school and continue into late adulthood.

Issue #6: Design. New facilities need to be planned and designed for ease of maintenance, function, access to people with disabilities, snow, rain, capacity, conflict reduction, and multiple use by a variety of non-motorized modes of transportation.

Issue #7: Scale. Facilities need to be planned that will preserve Sitka's rural character and attractiveness. This may require that some "standards" be modified in order to fit within existing rights-of-way while still providing for the needs of users.

Issue #8: Maintenance. The cost of maintaining facilities and who will perform maintenance needs to be considered from the inception of a project. Good maintenance relates directly to amount of use, safety, enjoyment, and longevity of a facility.

Issue #9: Landscaping. Landscaping can be an effective tool to reduce the scale and impact of a facility; make a route more attractive and enjoyable to use; improve safety by reducing speeds or directing the flow of traffic; and by providing a visual and physical buffer between different uses.

Issue #10: Cross Trail. The Cross Trail has long been a vision of many Sitkans. To serve as a transportation route, it's location needs to have a gentle grade, be relatively close to neighborhoods and destinations, and be relatively direct between destinations.

Issue #11. Seasonal visitors. Wider sidewalks, construction of missing links, and development of new walkways will help disperse and accommodate the summer crush of visitors to the downtown area.

Issue #12: Bicycle parking. Many destinations in Sitka are without bicycle racks where users can safely secure their bicycle. Just as motorists, bicyclists like to know they will have a place to park their vehicle at their destination.

Issue #13: Non-motorized watercraft. Because Sitka is uniquely endowed with a beautiful coastal environment, kayaking and use of other non-motorized watercraft is prevalent. People who are transporting themselves over water would benefit by having conveniently located places to secure their vessel and gear. Presently there are no such public facilities.

Issue #14: Motor vehicle parking on non-motorized facilities. Motor vehicles driving or parking on facilities intended for use by non-motorized vehicles is a problem that can be helped by education, signing, enforcement, and by using color, markers, and texture to better identify a sidewalk, bicycle lane, or other non-motorized way.

GOALS AND OBJECTIVES OF THE PLAN

Based on the issues above, the following goals and objectives were developed. Striving to achieve these goals & objectives will help ensure that a highly successful non-motorized transportation system will evolve in Sitka.

Goal #1: Development.
To plan, design, and construct a transportation system that effectively accommodates non-motorized users and improves the quality of life in Sitka.

Objective A. Plan and design an interconnected system of easy to use non-motorized transportation facilities.

1. Construct new and retrofit existing transportation corridors to safely accommodate shared use by motorized and non-motorized users.

2. Provide a continuous system of non-motorized transportation facilities, such as walkways, shoulder lanes, bicycle lanes and multi-use pathways.

3. Physically separate non-motorized users from vehicles where user volumes, user types, safety, and comfort considerations warrant.

4. Ensure that destinations like schools, libraries, ferry terminal, airport, harbors, parks, recreational facilities, shopping centers, and the downtown area are connected with non-motorized transportation routes and facilities.

5. Prioritize construction of non-motorized transportation facilities.

6. Provide options for users that try to avoid developing non-motorized facilities that force bicycles and pedestrians of all abilities to share the same path.

Objective B. Provide new facilities that meet non-motorized transportation design guidelines.

1. Provide non-motorized transportation facilities that meet applicable standards and guidelines for design and location criteria in the American Association of State Highway and Transportation Officials' (AASHTO) Guide for Development of Bicycle Facilities, and the Americans with Disabilities Act (ADA) as supplemented and adopted by the State of Alaska.

2. Provide uniform construction, signing and marking of all non-motorized transportation facilities in accordance with the Federal Highway Administration's Manual of Uniform Traffic Control Devices (MUTCD) as supplemented and adopted by the State of Alaska.

3. Ensure that when installing or upgrading traffic lights or signals, all sensors will be able to recognize bicycles.

4. Ensure that pedestrian activated crossing signals are conveniently located, easy to operate, and provide non-motorized users adequate time to cross.

5. Develop local standards that supplement and supercede AASHTO and MUTCD standards as appropriate for local conditions and preferences.

Objective C. Upgrade existing non-motorized transportation facilities to meet design guidelines referred to in Objective B.

Objective D. Provide support facilities.

1. Provide secure bicycle racks at all destinations. Local business owners or charitable organizations might be willing to provide these if asked.

2. Provide secure kayak racks and gear storage facilities at key launch/landing sites.

Goal #2: Education.
To encourage and support safety and education programs for the benefit of motorized and non-motorized users of Sitka's transportation system.

Objective A. Develop safety and education programs targeting non-motorized users.

1. Offer safety and education programs and distribute informational materials on helmet usage, cycling skills, laws, etiquette, and who has the right-of-way in different situations.

2. Conduct fairs and events for non-motorized users stressing safety and courtesy.

3. Introduce through driver education and training, the responsibilities of non-motorized users sharing transportation corridors.

Objective B. Develop safety and education awareness programs targeting motorists.

1. Introduce through driver education and training, the responsibilities of drivers regarding non-motorized users sharing transportation corridors.

Goal #3: Safety.
Reduce the conflicts with non-motorized users to reduce accidents and injuries.

Objective A. Design multi-modal transportation corridors employing state of the art design guidelines modified as necessary to meet local conditions and preferences.

Objective B. Develop educational materials and public service announcements that stress safe sharing of multi-use transportation corridors by motorized and non-motorized users.

Objective C. Most bicycle and pedestrian accidents occur at intersections. Conduct a safety analysis of intersections, with the priority being those where accidents have occurred, and modify conflict areas as necessary to improve their safe use by motorists and non-motorists.

Objective D. Analyze the need for additional cross walks at mid block locations where non-motorized use warrants and high likelihood of conflict exists.

Objective E. Design or re-design crosswalks as necessary to reduce the potential for accidents and to increase the comfort of both motorized and non-motorized users. Consider the use of raised crosswalks at low speed mid-block locations where the objective is to improve pedestrian visibility and alert motorists of an approaching crosswalk where one might not ordinarily be expected.

Objective F. Redesign streets that are unsafe for both motorized and non- motorized users.

Goal #4: Funding.
To obtain funding for development and maintenance of a non-motorized transportation system and for safety and education programs.

Objective A. Include funding for planned non-motorized facility improvements in all funding requests for motorized transportation projects.

Objective B. Submit requests to fund priority non-motorized transportation projects through the Statewide Transportation Improvement Program (STIP). Review and update requests annually until funding is received.

Objective C. Seek funding for harbor and bridge related non-motorized transportation projects through Federal TEA-21 and/or successor funding sources established for bridges and harbors.

Objective D. Develop a plan for funding maintenance of non-motorized transportation facilities.

1. Set aside a specific amount of local bed taxes, sales taxes, and/or cruise ship passenger taxes for maintenance of non-motorized facilities that directly benefit the payers of those taxes.

2. Organize, train, equip and reward volunteers for performance of non-technical maintenance tasks such as sweeping, litter removal and vegetation maintenance.

Objective E. Identify and dedicate a source of funding for safety and education programs. Possible sources include a portion of bed tax revenues a portion of the impact fees paid by cruise ship companies, Federal Highway Safety Funds, or a fee on vehicle license renewals.

Goal #5: Maintenance.
To achieve a well maintained non-motorized transportation system.

Objective A. Adopt scheduled maintenance practices that will maintain facilities in a smooth, clean and safe condition.

Objective B. Design non-motorized facilities that can be maintained easily with the minimal amount of specialized equipment or hand labor.

Objective C. Design facilities and adopt maintenance practices that do not deposit snow and roadway debris on adjacent walkways and bicycle facilities.

Objective D. Establish a method of reporting facility maintenance concerns to the responsible agency and a method of follow-up.

Objective E. Anticipate the need and establish a schedule to repair, re-paint, re-sign, resurface or reconstruct non-motorized facilities.

Goal #6: Implementation.
To achieve a supportive environment within which a non-motorized transportation system can flourish.

Objective A. Revise local codes and policies to encourage all land developers, public and private, to participate in providing right-of-way and improvements for non-motorized transportation.

Objective B. Incorporate "Sitka Non-motorized Transportation Plan" recommendations in all local planning documents, deliberations, and decisions.

Objective C. Include improvements and additions to Sitka's non-motorized transportation system whenever preparing budget documents for local, state or federal funding.

SECTION 2
INVENTORY AND DEFICIENCIES ANALYSIS

INVENTORY AND DEFICIENCIES ANALYSIS

The Assessment Report looked at existing non-motorized transportation facilities in the community. The report identified existing opportunities and constraints, as well as conflict areas that must be overcome to develop a non-motorized system. A carefully researched assessment report is the basis for a quality non-motorized transportation plan. The Assessment Report goes into great detail to identify the inventory and deficiency of the existing infrastructure, however an analysis of these issues must be further discussed to make recommendations appropriate for the community.

TRAFFIC ACCIDENTS

In analyzing accident records one must realize that bicycle accidents are generally underreported. National studies have found that in many cases where a bicycle is involved with a motor vehicle, the bicyclist suffers minor if any injury and would rather not wait around for a police officer to make out a report. In making an analysis of community bicycle accidents, one must assume that there are unreported such accidents and that the records are only the more serious collisions.

The underreporting does not seem to be a factor in pedestrian collisions with automobiles. The reason for this is most likely due to the fact that pedestrians are at an extreme disadvantage when colliding with automotive equipment. Although bicyclists are also at a disadvantage from weight and size perspective, bicyclists usually wear some protective gear, such as a helmet. This provides some degree of protection, particularly where automotive speeds are relatively slow.

Therefore, one may assume that the reported 7 pedestrian accidents for the three-year period (1997-1999) are essentially correct however, the 15 bicycle accidents may be underreported, based on national findings. As noted in the Assessment Report, Sitka has averaged 7.3 non-motorized accidents per year of which 68% (5.0) involved bicycles for this most recent 3-year period for which records were available. Considering the preponderance of reported bicycle accidents and the probability that such accidents were underreported, it appears that there is a need for additional education and enforcement efforts in the Sitka community.

Educational efforts should include media exposure such that the educational experience is a natural part of everyday experiences. Television and newspaper articles and advertisements could be utilized, particularly during the summer season when locals as well as visitors are more likely to use bicycles around Sitka. The educational effort should include motorists and pedestrians responsibilities and privileges as well as those pertaining to bicyclists.

The City of Los Angeles had a major pedestrian vs. auto accident problem. The Council directed the police to rigidly enforce **all** pedestrian laws in an effort to reduce these accidents. The enforcement efforts succeeded in that pedestrian vs. auto accidents were significantly reduced. The major item in the enforcement that made the effort succeed was that the police enforced **all** pedestrian laws, including jaywalking.

Many cities are targeting motorists who fail to yield at cross walks and intersections to reduce potential conflicts. These enforcements have been successful educational tools but only for motorists.

Likewise, both the educational and enforcement efforts need to be directed at both motorized as well as non-motorized illegal activities if significant accident reduction is to be accomplished.

CROSSWALKS

As noted in the Assessment Report, there is controversy in the traffic operations engineering community regarding the relative safety of marked crosswalks at unprotected locations. An "unprotected location" is one where neither a STOP sign nor a traffic signal protects the crosswalk. A marked crosswalk where crossing guards are actively controlling pedestrian and vehicular flows is an "unprotected location" when the crossing guard is off duty.

Of the six major studies (see *Assessment Report*) regarding the relative safety of marked crosswalks in unprotected locations, three (San Diego 1970, Long Beach 1986 and CalTrans/Chico State 1996) have found that by marking a crosswalk at an unprotected location, the pedestrian accident potential increases twofold. That is, the pedestrian has twice as great a possibility of being struck in a marked as opposed to a unmarked crosswalk at any given unprotected location. The problem appears to be that pedestrians perceive the painted markings to provide a safe crossing and use less care in entering the roadway.

The FHWA/University of North Carolina study in 2001 found no increase in safety by using marked crosswalks at unprotected locations, they did state that marked crosswalks should not be used where:

- Prevailing (85th percentile) automotive speeds exceed 40 mph,
- Average daily traffic exceeds 12,000 vehicles per day on a four or more lane facility without a pedestrian refuge island, and
- Average daily traffic exceeds 15,000 vehicles per day on a four or more lane facility with a pedestrian refuge island.

The above does not mean that marked crosswalks should never be used at unprotected locations. It does indicate that where crosswalks are used in unprotected locations their main purpose should be to direct pedestrians to the safer places to cross. Also, major effort should be expended to minimize the exposure associated with marked crossings at unprotected locations, including:

- Advance signs for motorists,
- Signs at the crossing for both motorists and pedestrians, and

- An educational and enforcement effort to alert the vehicle operators and pedestrians of the care that should be exercised in these areas of conflict.

BICYCLES

Many streets in Sitka are narrow and separate bike lanes are virtually impossible. In these situations bikes and motor vehicles must share the roadway. A shared roadway is acceptable as long as motor vehicle speeds are low and bicyclists are experienced. In general, where motor vehicle speeds are 25 mph or less, experienced bicyclists can share the roadway with motor vehicles.

Where motor vehicle speeds are 30 mph or greater, shared roadways are not advisable from a safety standpoint. As a general rule, vehicle operators, bicyclists and motorists, can adjust to 10 mph speed differentials in the traffic flow with little difficulty. Where the speed differential between vehicles in the traffic flow exceeds 10 mph, the accident potential increases significantly. Where motor vehicle speeds are between 20 and 30 mph, engineering judgment must be used to determine whether a shared roadway is advisable or not.

In assessing the acceptability of roadways for shared usage, the motor vehicle speed referred to is the 85th percentile speed. While speed limits are supposed to be set at the 5 mph increment above the 85th percentile, many speed limits are set below that figure (or follow state law) in the erroneous belief that reducing the speed limit will reduce the speed of the general traffic flow. Therefore, if the speed limit is posted at 20 mph but the 85th percentile speed is 30 mph or more, shared roadways may not be a good idea.

With respect to bicycle safety, there is a significant difference between Advanced/commuter bicyclists and basic level bicyclists. Advanced bicyclists ride fast and do not mix well with basic bicyclists or pedestrians. Basic level cyclists include less experienced riders who generally travel at reduced speeds. One of the problems with some roads in the Sitka area is that the design assumes all bicyclists will use a separate bike path. Mostly basic type riders use bike paths and mixing these slower riders and walkers with higher speed advanced riders increases the accident potential significantly.

This difference between Basic and Advanced cyclists is the reason many bicyclists choose to ride on the shoulder of a roadway rather than an available separate bikeway. Contrary to rules of the road which require pedestrians to use a sidewalk if one is available, there is no requirement that bicyclists use a separate bikeway if one is available.

Bicycles are defined by law as a vehicle and bicyclists have all the same privileges and responsibilities as motorists. This includes driving on the right side of any roadway. Therefore, the use of two-way bike lanes within the roadway is inappropriate. However, the right to use the roadway is tempered by the requirement that bicyclists use the shoulder or, if none, that they ride as far to the right as possible to minimize being struck by faster automotive equipment. Bicyclists also must obey STOP signs and traffic signals at intersections and yield to pedestrians at crosswalks.

SECTION 3
FACILITY AND PROGRAM RECOMMENDATIONS

RECOMMENDATIONS

This chapter assimilates the information gathered during the assessment phase, testimony given at public and agency meetings and state and national transportation guidelines and makes recommendations for creating a seamless non-motorized transportation system for the community.

This chapter looks at the entire community to create a non-motorized transportation system that links destinations throughout Sitka. Area maps of Sitka, as well as text and typical cross sections for specific areas are provided to help in the future design of the non-motorized system. The maps provide the general information to the types of facilities required and its location. The design of many of these facilities is illustrated in *Section 6, Design Guidelines.* Areas that have facilities that are unique to the design guidelines or require further detailed explanation are accompanied by text and cross sections in this chapter. The maps, design guidelines and detailed information in this chapter are to be used in conjunction with each other in the layout and design of Sitka's non-motorized transportation system.

Note:

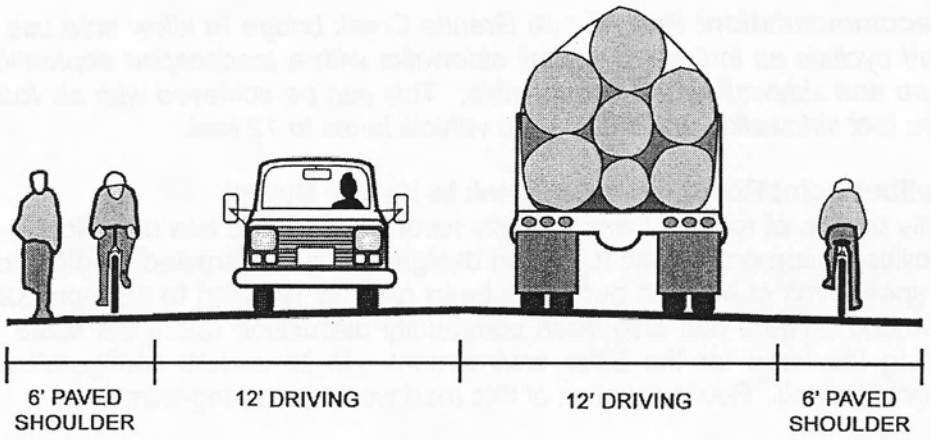
Section 3 (pages 12 – 25) are a series of fold-out maps that I am unable to scan.

If you want to view these documents, you'll have to go to the library.

Halibut Point Road (Starrigavan Creek to Ferry Terminal)
A paved shoulder should be added on both sides of Halibut Point Road to provide for bicyclists and the separated pedestrian walkway on the east side of the road should be completed to create a continuous separated walkway from the ferry terminal to the campground.

Halibut Point Road (Ferry Terminal to Granite Creek)
The bridge across No Name Creek should be widened to provide minimum 6' shoulders for bicyclists and pedestrians. The current situation creates an accident potential, especially for bicyclists. Proceeding either direction the shoulder ends at the bridge forcing the pedestrians and bicyclists into the vehicular way.

PROPOSED SHOULDER WIDENING ALONG LOWER VOLUME PORTION OF HPR WITH 45 MPH



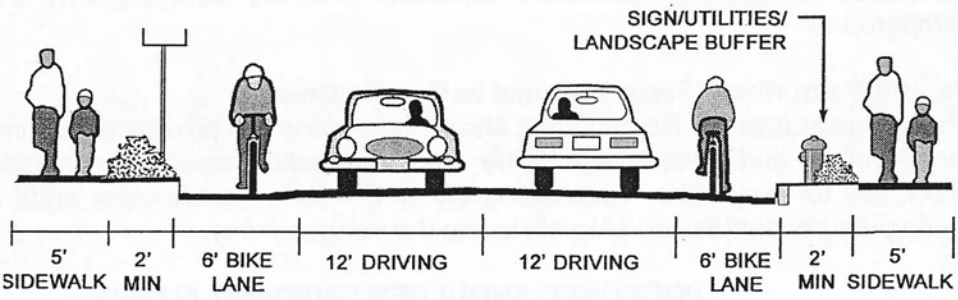
A separate pedestrian/bicycle bridge on each side may be an alternative answer however such bridges should be at least 10'-12' wide to accommodate both bicycles and pedestrians and allow a shy distance from the railings.

Widen or repair broken edges of existing paved shoulders to maintain a continuous 6' route on both sides of roadway for both pedestrians and cyclists to share.

Halibut Point Road (Granite Creek to Cascade Creek)
The existing narrow bridges across Granite Creek for non-motorized traffic are inadequate for bicycles and not pedestrian friendly. They are too narrow for bicycles and the railings are too low. For pedestrians there are large openings in the railings and sharp edges along the rails. The best solution would be to widen the bridge so as to carry the existing roadway cross section with paved shoulders across the waterway. This would provide adequate room for both bicycles and pedestrians.

Closer to town, the dwelling density of this area starts to increase and will likely see future growth. Add new sidewalks as well as bike lanes along this portion of the HPR. Where the ROW allows, create a landscaped separation between the curb and sidewalk wherever possible to reduce the large-scale feeling of the road. Minimum width should be two feet wide and planted with a low grow grass mix or low landscaping. This can be achieved with five foot bicycle lanes, five foot sidewalks, and striping the vehicle lanes to 11 feet.

PROPOSED CROSS SECTION FOR HIGHER VOLUME PORTION OF HPR WITH 45 MPH

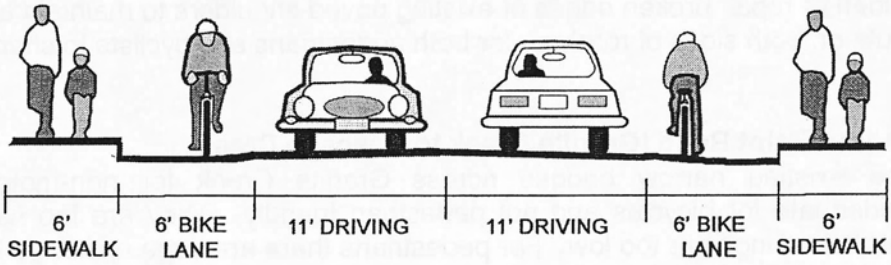


Recommendation: *Reconfigure Granite Creek bridge to allow safe use by pedestrians and cyclists as indicated. Install sidewalks with a landscaped separation between the curb and sidewalk wherever possible. This can be achieved with six foot bicycle lanes, five foot sidewalks, and striping the vehicle lanes to 12 feet.*

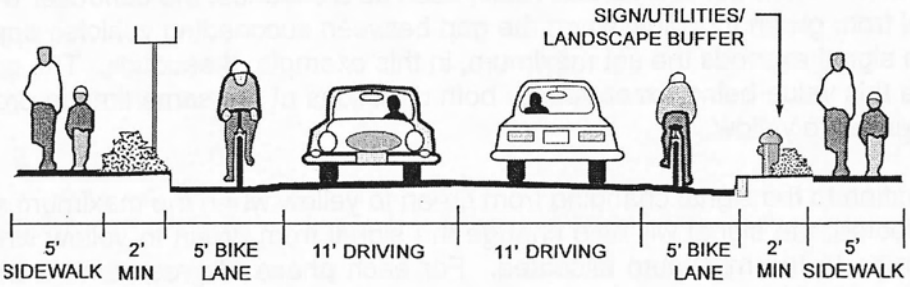
Halibut Point Road (Cascade Creek to Katlian Street)

This portion of roadway was recently reconstructed and has new bicycle and pedestrian facilities incorporated into it. When designed and constructed, portions of this road had a speed limit of 45 mph but it has been recently reduced to 35 mph due to community demand. There has also been community discussion about the scale of the roadway being too large for the Sitka environment. In its current configuration, this roadway functions well. Reconstruction of this road would be a long-term goal.

EXISTING CROSS SECTION OF NEWLY CONSTRUCTED PORTION OF HPR WITH 35 MPH



PROPOSED LONG TERM IMPROVEMENTS TO HPR WITH HIGH TRAFFIC VOLUME AND 35MPH



Recommendation: *By creating a landscaped separation between the curb and sidewalk wherever possible the large-scale feeling of the road can be reduced. Minimum width should be two feet wide and planted with a low grow grass mix or low landscaping. This can be achieved with five foot bicycle lanes, five foot sidewalks, and striping the vehicle lanes to 11 feet.*

Halibut Point Road at Katlian Street

The traffic signal at this intersection should be modified. One of the pedestrian push buttons is located such that it is not ADA (Americans With Disabilities Act) accessible. The crosswalk on the east side of Katlian should be realigned such that it points to the pedestrian signal on the southeast corner. At present the crosswalk is about 15' east of the signal and a pedestrian on the south side tends to follow the crosswalk line of sight to find the signal. This will also require relocating the pedestrian push button to the signal pole. An alternate modification would be to place the pedestrian signal head where the existing pedestrian push button is located at the end of the crosswalk.

The cycle for a traffic signal is the time it takes for the signal to complete a full cycle from the beginning of red on Halibut Point Road to yellow to green and then back to the beginning of red again. The existing traffic signal timing cycle is too long. Pedestrians activate the push button and then have to wait a long time for a "walk" signal even though the intersection is empty. As a consequence, pedestrians cross against the "don't walk" indication.

This is a fully actuated traffic signal and therefore the cycle length is variable, depending upon the volume of traffic entering the intersection. One method of shortening the cycle length on a fully traffic actuated signal is to reduce the "allowable gap" for Halibut Point Road traffic. The traffic signal responds to traffic on the roadway by sensing vehicles as they pass over detectors placed in the roadway. When there is traffic waiting against a red light, the signal controller looks for a gap in traffic with the green light in order change the signal during a natural gap to minimize the potential for causing a sudden stop of free flowing traffic.

If a roadway is flowing at capacity, the gap between successive cars is approximately 1.5 seconds. At a normal traffic flow this gap is closer to 2.5 seconds. In the traffic signal controller there is a control for setting the "maximum allowable gap" for the controller. When set at a certain value, such as 3 seconds, the controller will change the signal from green to yellow when the gap between succeeding vehicles approaching the green signal exceeds the set maximum, in this example, 3 seconds. The controller must sense this value being exceeded for both directions at the same time in order to change from green to yellow.

In addition to the signal changing from green to yellow when the maximum allowable gap is detected, the signal will also change the signal from green to yellow when the green time runs to the maximum allocated. For each phase of green time a maximum time may be set which causes a loss of the green indication at that time limit provided there is a vehicle waiting against a red indication. If there is no waiting vehicle, the maximum timer does not function and the signal continues to show green for that phase until there is a call on an opposing leg, unless the signal is set for "recall". Recall is sometimes used to recall the green signal to the main thoroughfare whether there is a call on the thoroughfare or not.

The cycle length on a traffic actuated signal may be reduced by either reducing the maximum allowable gap or reducing the maximum green time for each phase such that the total maximum time does not exceed a certain time which would be the cycle length. One can reduce both the maximum allowable gap and the maximum green time for each phase. For the Halibut Point Road – Katlian Street intersection it is recommended that a maximum allowable gap of 3.5 seconds and a total maximum time of 80 seconds be considered.

In addition to reducing the cycle length, it was noted during the assessment of existing conditions that certain modifications are needed in the pedestrian signal timing. Pedestrian signals are operated in the following manner:

- "Walk" indicates that the pedestrian may start across the street.
- "Flashing don't walk" indicates that there is enough time for a pedestrian who has just stepped off of the curb to walk across the street at a rate of 4 feet per second (2.7 miles per hour, which is less than the normal 3 miles per hour for pedestrians).
- "Steady don't walk" indicates that the vehicular indication has turned yellow and the cross-traffic green will shortly be illuminated.

"Walk" indications vary from 4-7 seconds at most traffic actuated signals, providing sufficient time for the pedestrian to get started across the street. Because the flashing "don't walk" must be long enough for a pedestrian who enters the intersection at the last of the "walk" indication to cross safely, long "walk" times are avoided. Flashing "don't walk" indication duration is a direct function of the length of the pedestrian path in the roadway. The pedestrian path across the south leg of the intersection is 50', which indicates a 12.5-second flashing "don't walk" should be used. The existing timing is 7 seconds. The pedestrian path across the east leg is 68' long, which indicates a 17-second flashing "don't walk" should be used. The existing timing is 13 seconds.

It is recommended that consideration be given to modifying these pedestrian timings to 12.5 and 17 seconds respectively.

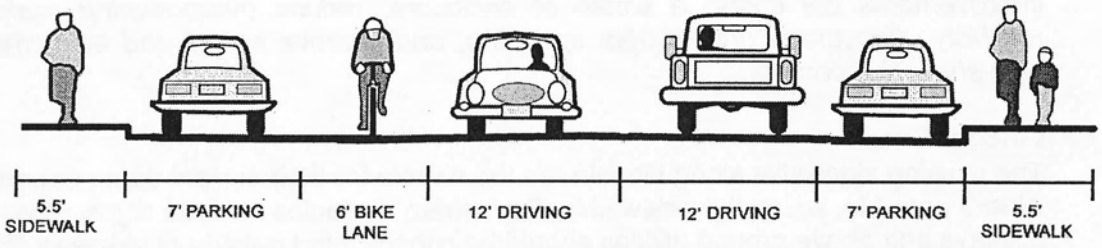
Halibut Point Road (Katlian Street to Lake Street)
It appears that at one time there was a 6' bike lane along Halibut Point Road adjacent to Swan Lake. However, a Jersey barrier between the roadway and the sidewalk now occupies most of that bike lane. Although bicyclists could use the sidewalk along this stretch of roadway, the sidewalk is narrow and there is no easy transition from the roadway onto the sidewalk. There is a 6' bike lane on the west side of Halibut Point Road and there are two 12' traffic lanes plus the remnants of the east side bike lane. It appears that remarking this portion of Halibut Point Road so as to provide two 5' bike lanes and two 11' vehicle lanes is feasible.

The Blatchley School crossing at HPR has a high volume of young users. There is a general misunderstanding about who has the right of way that causes conflict. Additional signs need to be incorporated to allow safe crossings by pedestrians and make the crosswalk more obvious to motorists. Install pedestrian activated crosswalk signal.

Recommendation: *Halibut Point Road between Katlian Street and Lake Street should be remarked adjacent to Swan Lake so as to provide two approximately 5' bike lanes and two approximately 11' automotive lanes. Add additional signs and crosswalk signal at school.*

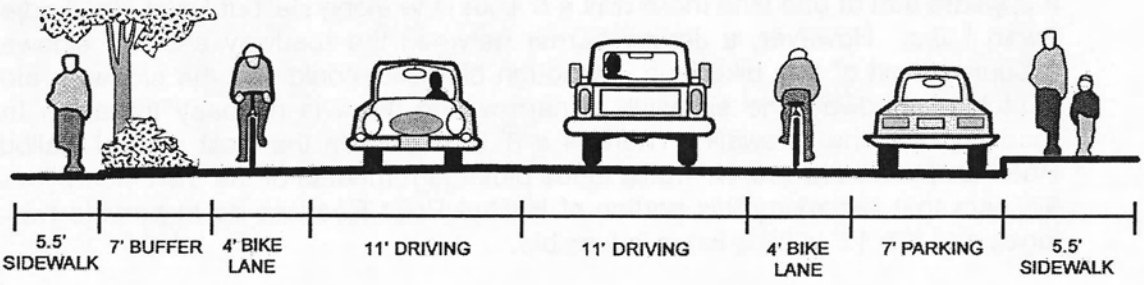
Edgecumbe Drive
Edgecumbe Drive runs essentially east and west just to the north of Halibut Point Road. Between Charteris Street and Peterson Street, is approximately 44' wide marked for a 7' parking lane on each side, two 12' traffic lanes and a 6' bike lane on the south side between the parking lane and the auto lane. It appears that the bike lane was originally marked as a 2-way bike lane but inasmuch as bicycles may not operate contrary to auto traffic, those 2-way markings have been removed.

EXISTING EDGECUMBE DRIVE CROSS SECTION



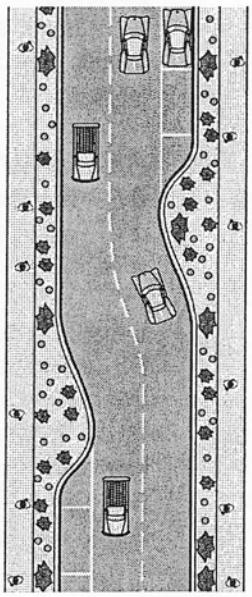
Although this is a local street serving single-family residential units, it appears as a high-speed throughway because of its alignment and width. There is no provision for bicycles on the north side thereby making this a "mixed use" roadway for westbound traffic. The road is posted at 20 miles per hour and although the environment is conducive to higher speeds with straight alignment and wide pavement, it appears that actual speeds are relatively low making mixed use palatable. Accident records and personal observations indicate that Edgecumbe Drive is not a safety problem. However, aesthetically it is less than desirable and potentially could be a trouble spot if "hot rodders" started taking advantage of the width and alignment.

PROPOSED REALIGNMENT



In some areas, streets like this have been converted into more pleasant conditions by narrowing them up and making them curvilinear within the existing right-of-way. To implement this for Edgecumbe Drive some of street parking would have to be removed to make room for the landscaping and creating a curvilinear roadway. A parking lane would alternate from one side to the other to create the curved nature of the road. Discussion with the neighborhood should be initiated to determine the level of reduction for on-street parking. If the pavement and curbs are left as is, the street should be remarked to provide the following:

Buffer	Bike	Auto	Auto	Bike	Parking
7'	4'	11'	11'	4	7'

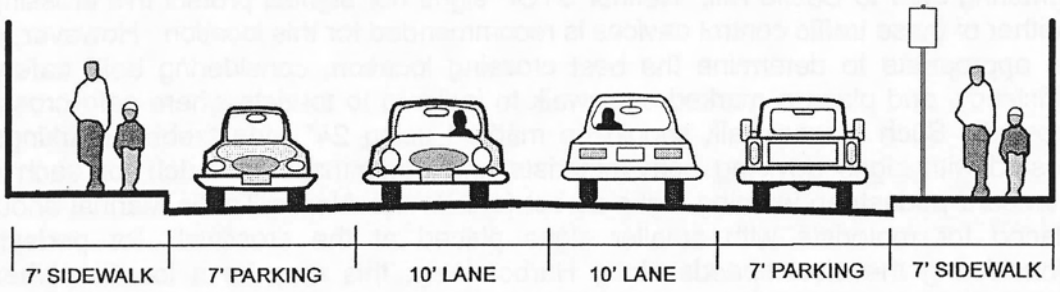


Recommendation: *Replace some parking on alternating sides of Edgecumbe Drive with landscaping and re-stripe roadway creating smaller vehicle lanes and bike lanes to re-create the feeling that Edgecumbe Drive is a neighborhood street. These improvements will create a sense of enclosure, reduce overpowering scale of the roadway, discourage drivers from speeding, and improve safety and enjoyment of all who share this corridor.*

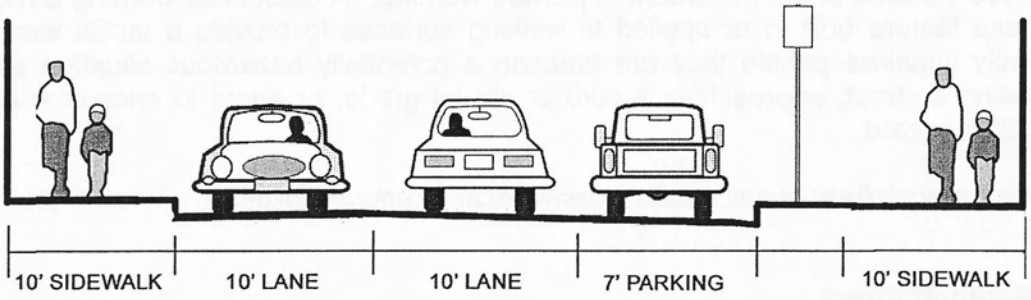
Lincoln Street

The existing sidewalks along Lincoln are too narrow for their current summer capacity. Where possible, widen the sidewalks. Pedestrian obstacles such as signs, store displays and above ground utilities should be consolidated outside of sidewalk area to limit obstacles. The widening and restriping configuration is dictated by the right-of-way width along Lincoln Street. On narrow portions of the street reduce on-street parking to one side and restripe. Wider portions of the roadway can have parking on both sides and widened sidewalks. The removal of parking is always a contentious issue for communities and this should only be done if supported.

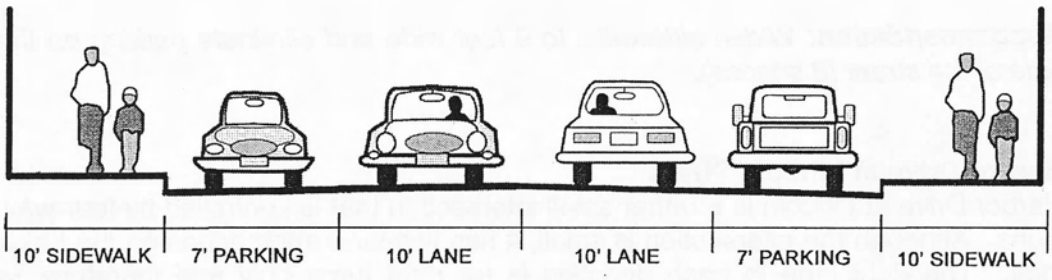
TYPICAL EXISTING LINCOLN STREET CROSS SECTION



PROPOSED LINCOLN STREET MODIFICATIONS (BUILDING TO BUILDING DISTANCE 47'-53')



PROPOSED LINCOLN STREET MODIFICATIONS (BUILDING TO BUILDING DISTANCE 54' OR GREATER)



Recommendation: *Remove parking on one side of street where possible, re-stripe parking lane to seven feet, stripe travel lanes to 10 feet, and widen sidewalks on both sides within space gained (10' min each side). Where spaces allows, re-stripe for parking on both sides of Lincoln Street.*

Harbor Way

There is a demand for pedestrians to cross Harbor Way from the O'Connel Bridge lightering area to Castle Hill. Neither STOP signs nor signals protect this crossing and neither of these traffic control devices is recommended for this location. However, it may be appropriate to determine the best crossing location, considering both safety and efficiency, and place a marked crosswalk to indicate to tourists where safe crossing is located. Such a crosswalk should be marked using 24" wide "zebra" markings and posted with signs advising both motorists and pedestrians to watch for each other. Standard pedestrian warning signs as set forth in the Alaska Traffic Manual should be placed for motorists with smaller signs placed at the crosswalk for pedestrians. Considering the slow speeds along Harbor Way, this may be a location where an elevated crosswalk could be advantageous. Also a raised crosswalk on Harbor Drive between Matsoutoff and the base of O'Connell Bridge may be advantageous.

The crosswalk is raised to the level of curb. Vehicle approach ramps should raise four inches in 12 feet. Raised crosswalk should be wide enough for all four tires of a car to rest on top. Crosswalk approaches for pedestrians should have detectable warning devices installed in the pavement to provide warning. A detectable warning device is a surface feature built in or applied to walking surfaces to provide a tactile warning to visually impaired people they are entering a potentially hazardous situation such as crossing a street, approaching a curb or abrupt grade, or about to encounter another possible hazard.

Recommendation: *Install raised crosswalks at locations indicated.*

Maksoutoff Street

Maktusoff Street has narrow sidewalks and is a major pedestrian thoroughfare between Lincoln Street and Harbor Drive. The existing sidewalk should be expanded to better accommodate the high volume of pedestrian flow from the lightering facility to downtown. This could be accomplished by eliminating parking on the south side (2 cars) and widening the sidewalks from five and one half feet to nine feet wide.

Recommendation: *Widen sidewalks to 9 feet wide and eliminate parking on the south side of the street (2 spaces).*

Harbor Drive at Lincoln Street

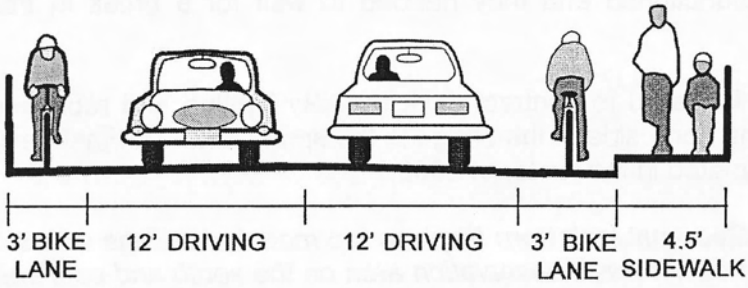
Harbor Drive at Lincoln is a rather small intersection that is controlled by four-way STOP signs. Although the intersection is small, it has two-lane approaches on the Lake Street legs. The right lane in each direction is for right turns only and therefore, vehicles moving from the stop-line do not necessarily move at the same time. This is a cause for hesitation and concern by pedestrians who cannot be sure that motorists actually perceive them before entering the intersection. Part of the problem is the very smallness of the intersection, which prevents the motorist from viewing the "big picture". A traffic signal at this intersection would better organize traffic flow and to that extent make it a safer intersection. In August of 2002 the City and Borough of Sitka and ADOT&PF have initiated the process for installation of a signal at this location.

Recommendation: *A traffic signal warrant study be performed for the intersection of Lincoln and Lake and if signals are warranted that they be installed.*

O'Connell Bridge

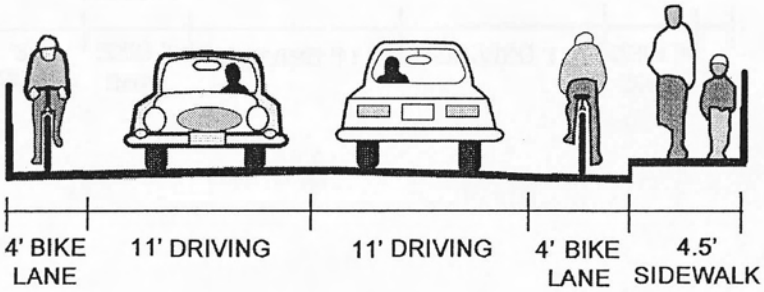
The O'Connell Bridge has a number of deficiencies including inadequate lighting and inadequate width for non-motorized users. Although the bridge lighting was acceptable when new, the fact that a number of units are malfunctioning is a current matter of concern. In addition to reducing the overall illumination level, the intermittent illumination is distracting to drivers. The Alaska Department of Transportation and Public Facilities is reportedly considering replacing the existing fluorescent lighting with more efficient units, probably units mounted above the roadway to provide more conventional illumination. When the existing units are removed from the bridge railing, new railings should be installed consistent with the most recent federal standards for bridge railings where bicyclists are riding adjacent to the railing.

EXISTING O'CONNELL BRIDGE CROSS SECTION



At present, there is a fog line indicating a minimal shoulder outside each vehicular lane. This shoulder is approximately 18" – 24" wide and is used by bicyclists in accordance with the rules of the road to use a shoulder when possible. The deck width between curbs on the bridge appears to be 30', which on the surface, could be marked so as to create two 11' automotive lanes and two 4' bike lanes. This would maintain the desired ratio of proportionally reducing bike and auto lanes when total width of roadway is insufficient for two 12' automotive lanes and two 6' bike lanes.

RESTRIPING OF THE O'CONNELL BRIDGE



Immediate Recommendation: *Restripe to provide better bike lanes, the suggested markings would be as follows:*

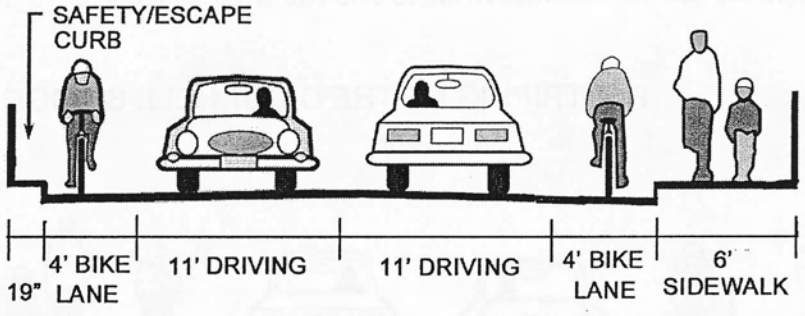
Bike	Auto	Auto	Bike
4'	11'	11'	4'

The existing railings of the bridge overhang the bridge decking on each side by 19". If the railing was removed and reattached to the outside of the bridge with side mounted railings, 19" of useable space on each side can be utilized for non-motorized transportation. Most importantly, 19" added to the sidewalk width will greatly enhance pedestrian traffic over the bridge. In addition, on the opposite side of the bridge a 19" curb would be created. This would increase the useable space for bicyclists by reducing the shy distance from the railing. Bicyclists tend to shy further from a railing than they do a curb. The curb would also create a safe zone for a cyclist to get out of traffic if their bicycle malfunctioned and they needed to wait for a break in traffic to cross to the sidewalk.

ADOT&PF is slated to contract work for new lighting and replacement of the existing railing on the north side of the bridge in the spring of 2003. Final design is underway and will be completed in the winter of 2002.

Mid Term Recommendation: *Replace top mounted railings with side mounted railings. Construct a cantilevered observation area on the south and east side of the bridge near the top. Re-stripe the travel lanes to 11 feet wide and the bicycle lanes to 4 feet wide. Make good the sidewalk surfacing as required.*

MOVING THE RAILINGS TO THE OUTSIDE OF THE BRIDGE



Japonski Island – Pedestrian Access to O'Connell Bridge

There is no clearly indicated safe crossing for pedestrians approaching the O'Connell Bridge from the airport on the southeast side of Airport Road. A long term solution would be to continue the southeast sidewalk along the bridge approach fill such that pedestrians could walk along the side of the fill and then cross under the bridge before climbing stairs or a ramp in order to reach the bridge level sidewalk on the northwest side. However, until such time as that pedestrian facility can be constructed, there is a need to identify the safest and most logical crossing for pedestrians coming from the airport on the southeast side to cross to the northwest side so as to access the sidewalk on the bridge.

Pedestrians crossing at a protected location as opposed to unprotected locations is desired. Crossing at intersections, even though unprotected, is better than mid-block crossings. This is because motorists appear to be more conscious of cross traffic at intersections than mid-block. Therefore, it appears that a marked crosswalk across Airport Road at Tongass Street may be appropriate, *provided* appropriate warning signs are placed in advance and at the crosswalk for motorists and appropriate signs are placed at the crosswalk, advising pedestrians of the conflicting vehicular traffic.

Sawmill Creek Road at Jeff Davis Street and Biorka Street

This is essentially a 5-leg intersection. An attempt has been made to organize the conflict area in the intersection by "hooking" Biorka Street such that it intersects Sawmill Creek Road at approximately right angles. Unfortunately, the short radius used to make the hook is such that a larger motor vehicle has a difficult time making the curve. Also, the resultant intersection of Biorka and Sawmill is too close to the Sawmill/Jeff Davis intersection.

Although there are no reported non-motorized traffic accidents at this location, the motor vehicle weighted accident rate of 2.19 accidents per million entering vehicles is 21% higher than the average weighted accident rate for all Sitka intersections where accidents occurred. This is second only to the Halibut Point Road at Brady intersection that has a rate of 3.31 accidents per million entering vehicles. The relatively high accident rate may be a function of the close proximity of the two intersections and the confusion caused by the less-than-desirable geometrics of the roadways. A more detailed study of this location is needed to ascertain what measures should be taken to minimize the collision potential between conflicting traffic flows.

To put the high weighted accident rate in perspective, in the three years for which records were available, 1997-1999, a total of 56 motor vehicle accidents were reported at seven intersection locations in Sitka. The average weighted accident rate for all seven of the intersections combined is1.81 accidents per million entering vehicles. The lowest accident rate, 0.63 accidents per million entering vehicles, is at the intersection of Halibut Point Road and Katlian Street.

To determine the relative safety of intersections it is common practice to indicate accident experience in terms of accidents per million entering vehicles. The total number of vehicles entering the intersection during the same time period, usually one to three years, is divided by the total number of accidents for the same given time period. Because the resultant quotient is very small, the quotient is multiplied by one million and the rate is expressed in accidents per million entering vehicles.

To refine this method in order to present a more useful safety index, accidents are weighted based on severity of injuries. One weighting index used is:

Type of Accident	Weight
Property damage only (PDO)	1
Minor injury accident	5
Major injury accident	25
Fatal accident	50

Although ADOT&PF has been requested to provide the specific weights used in the 1997-1999 accident-reporting period, no response has been received to date. The above weights are shown to provide an explanation of how the seriousness of accidents are included in weighted accident rates.

Crescent Harbor to Indian River

After the Cross Trail, this link has been one of the most discussed and desired link in the community. There is a strong desire to connect the waterfront walk along Crescent Harbor to the separated path along Sawmill Creek Road and to the existing Cross Trail at Indian River. This link would be a separated path parallel to Lincoln Street beyond Sheldon Jackson and either skirt or run through the Sitka National Historic Park along Indian River to the existing separated path. The Park Service currently does not allow cycling through the park however there is a great demand to do so. The only bridge in the park over Indian River is narrow and heavily used by pedestrians. The Park Service recently acquired new land along Indian River that would accommodate a non-motorized connection between the Park and Sawmill Creek Road. The National Park Service is currently developing a management plan for this area. It is strongly recommended that this corridor allow the use by pedestrians and cyclists. Safety concerns at Jeff Davis Street and between Indian River and the Post Office could be mitigated. The Park Service will soon be taking public comment on how best to utilize its new land. This new corridor should allow use by both pedestrians and cyclists. A new separated path in this location would also solve another major issue for non-motorized transportation crossing Sawmill Creek Road. Should a route run along Indian River, it could continue underneath the Sawmill Creek Road Bridge as it crosses Indian River and provide an underpass for pedestrians and cyclists. The underpass would link to another separated path on the north side of Sawmill Creek Road. This crossing would significantly reduce the potential for conflicts for users who want to cross over to the Raptor Center and the Post Office. Ramps would allow users to enter or exit the separated paths and go under the bridge.

There has been additional discussion to continue the Indian River non-motorized corridor beyond Sawmill Creek Road and to link to the existing Indian River Trail and the Cross Trail. Many have expressed an interest to use the Sheldon Jackson flume along Indian River as a potential route, however Sheldon Jackson is less receptive to the idea. The issue the school is concerned with is potential damage to their new flume. A similar situation occurs in Juneau where pedestrians are allowed to walk along the Perseverance flume that is owned by AEL&P and is a popular recreation trail.

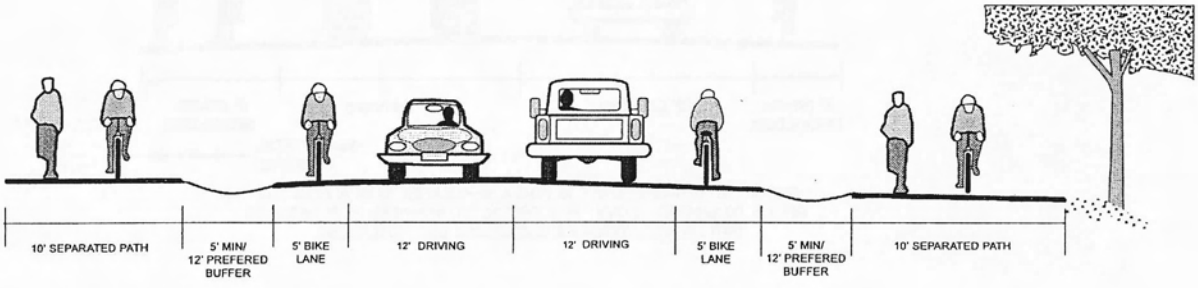
Sawmill Creek Road – Jeff Davis Street to Sawmill Cove

Sawmill Creek Road is to be redesigned in the winter of 2002/2003 and conceptual plans are already developed. This portion of roadway will see immediate improvements in the coming years and will include non-motorized transportation. In the short stretch where separate walkways currently are provided between Jeff Davis and the Post Office, these are too narrow to accommodate both recreational bicyclists and pedestrians. The Indian River Bridge has no non-motorized accommodations along the road edge. Commercial and recreational destinations between Jeff Davis Street and Sawmill Cove that need to be accessible by non-motorized transportation users. The edge of the roadway and adjacent property boundaries are undefined between the Post Office and National Guard facility. Vehicles park in undefined locations along the roadway and create numerous safety hazards. An attached bikeway runs outbound to bottom of Jamestown but no inbound facilities exist for most of this section. Much of this area does not have defined facilities for pedestrians or cyclists. At present bicycles must ride in the vehicular way where prevailing roadway speeds are too great to be safely used as a mixed-use facility. Pedestrians can walk on the shoulder in some areas creating numerous unsafe pedestrian situations. Sawmill Creek Road has paved shoulders along Jamestown Bay and then are non-existent non-motorized facilities as the road leaves the bay to climb towards Shot Gun Alley. This puts cyclists and pedestrians into serious potential for harm.

Between Jeff Davis Street and the Post Office there should be a separated path on each side as well as bike lanes. Where the right-of-way allows, continue separated path on the waterside of road. Provide at a minimum a paved shoulder on both sides of road, and where dwelling density exists add a sidewalk.

At destination points south of the Post Office, crosswalks should be considered to indicate to pedestrians where the safer crossing should be made. As with all crosswalks in unprotected locations appropriate warning signs for both motorists and pedestrians should be erected and maintained for the crosswalk. Motorists should be presented with an advance warning sign and a sign at the crosswalk for each direction. Pedestrians should be presented with a sign at the edge of the roadway cautioning them to be aware of conflicting motor vehicle traffic.

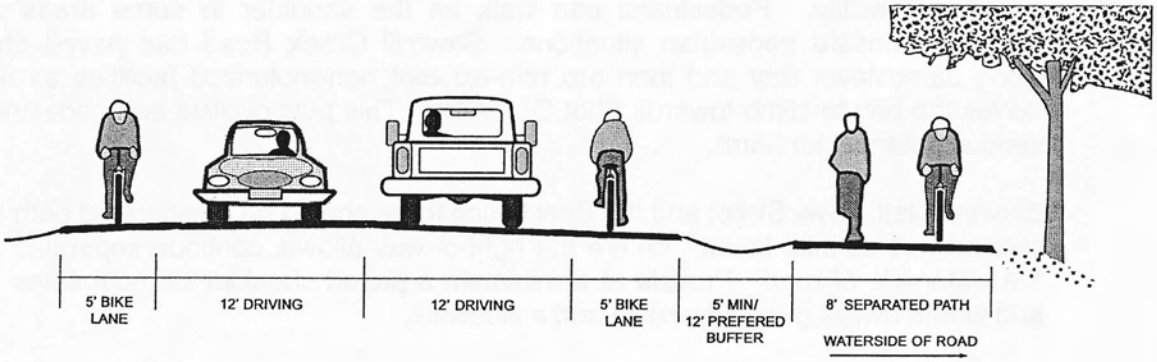
PROPOSED SAWMILL CREEK ROAD CROSS SECTION
BETWEEN JEFF DAVIS AND THE POST OFFICE



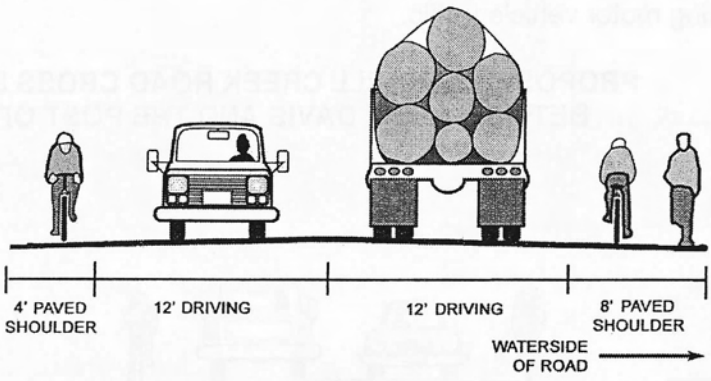
Recommendation: *When Sawmill Creek Road is reconstructed the basic roadway should be 34' wide consisting of the following section:*

Shoulder Bike Lane	Motorway Lane	Motorway Lane	Shoulder Bike Lane
5'	12'	12'	5'

PROPOSED SAWMILL CREEK ROAD CROSS SECTION ALONG AREAS WITH LESS TRAFFIC VOLUMES



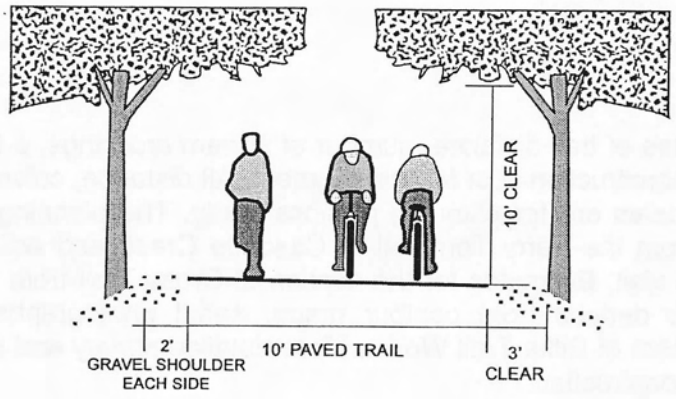
PROPOSED SAMMILL ROAD CROSS SECTION IN AREAS WITH LOWER TRAFFIC VOLUMES



COMMUNITY PREFERENCE IS FOR A SEPARATED PATH ALONG THE WATER TO SAWMILL COVE. SEE PREVIOUS DRAWING. IF SEPARATED PATH IS NOT POSSIBLE USE CROSS SECTION ABOVE.

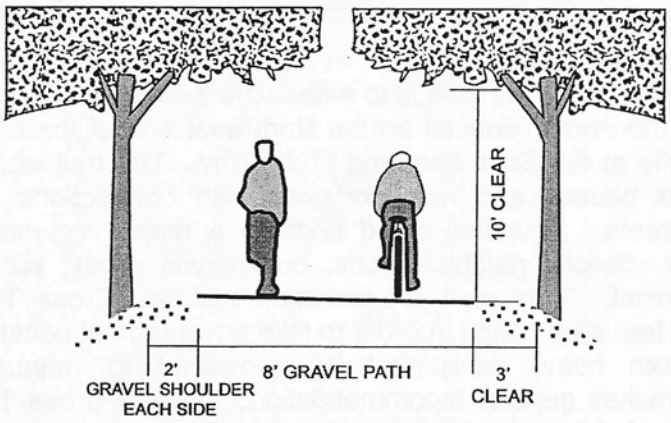
CROSS TRAIL

The most talked about project during public meetings, at agency reviews and in existing planning documents is the Cross Trail. The idea is to extend the existing trail, forming a transportation route between the Ferry Terminal on the Northwest end of the City and the Sawmill Cove Industrial site at the Southeast end of the City. The trail would run along the hillside above the houses and neighborhoods with connections to the neighborhoods and major streets. This trail could become a major non-motorized transportation route between schools, neighborhoods, commercial areas, recreation facilities and the Ferry Terminal. This plan recommends that the Cross Trail be constructed on a minimum 12 feet wide bench in order to take advantage of construction cost efficiencies derived from heavy equipment as compared to manual trail construction. This plan also makes general recommendations that the Cross Trail be relocated closer to neighborhoods in the downtown area and further from some property owners in the Charteris Street area. Relocating the existing trail will meet objectives of transportation efficiency and will minimize negative reactions by property owners to traffic on the Cross Trail. The following trail tread and width recommendations vary and are designed to meet current needs, to accommodate future growth in use, and to allow for phased construction.



The most heavily used section of the Cross Trail between Cascade Creek and Indian River is recommended to be constructed as a 10 or 12-foot wide paved trail with 2-foot gravel shoulders. The gravel shoulders have the effect of widening the trail corridor and allowing bicyclists to utilize the entire width of the pavement. Gravel shoulders also provide a softer surface for runners and minimize damage to pavement edges on occasions when maintenance vehicles are driven on the trail surface.

For the currently less-heavily-used sections of the Cross Trail, such as the link from the Ferry Terminal to Cascade Creek, minimum Phase 1 construction standards require a ten feet wide bench with a two foot wide shoulder consisting of a gravel surface. Phase 1 construction would be to a standard that would allow for paving if desired at a later date. Multi-use trails of a width less than eight feet do not safely accommodate bicyclists and pedestrians and therefore are not recommended for the Cross Trail. Careful attention should be given to Cross Trail design in order to minimize grade changes especially over short distances.



Where the Cross Trail intersects public roadways, most such crossings will be at unprotected locations. "Unprotected" means that the trail user is not protected by either a STOP sign or a traffic signal. Unless the volume of traffic using the trail meets appropriate warrants set forth in the MUTCD, no STOP sign or traffic signal should be installed to create a protected crossing for trail users. Therefore, the cautions stated in addressing unprotected pedestrian crossings will apply to trail crossings of public roadways.

Discussion of Cross Trail recommendations is organized into four sections:

Ferry Terminal to Harbor Mountain Road
Harbor Mountain Road to Cascade Creek
Cascade Creek to Indian River
Indian River to Sawmill Creek

Each section provides estimates of trail distance, number of stream crossings, a Phase 1 construction cost and total construction cost for the segment. All distance, culvert and bridge counts, and cost estimates are for planning purposes only. The planning team walked the proposed route from the Ferry Terminal to Cascade Creek and estimates were derived from the on site visit. Estimates for the section of Cross Trail from Indian River to Sawmill Cove were derived from contour maps, aerial photographs, and information supplied by members of Sitka Trail Works. More detailed survey and design work will be required prior to construction.

Ferry Terminal to Harbor Mountain Road

Distance: 12,280 feet
Small creek crossings: 48
Large creek crossings: No Name Creek = 90', creek = 70', Granite Creek = 80'

Access Points:

No Name Creek Access

Distance: 4,070 feet
Small creek crossings: 15

Forest and Muskeg Trail Access

Distance: 1,000 feet
Small creek crossings: 4

The Cross Trail would start at the Forest and Muskeg Trail parking area and run through the valley behind No Name Mountain crossing Harbor Mountain Road above the rock quarries and near the water tank. An additional access down No Name Creek would

give more direct access from the Ferry Terminal to the trail. A short access trail from the cross trail to the Forest and Muskeg trail would provide access to that trail system. The Trail running through the valley behind No Name Mountain should remain on the East side of the valley a short way up the slope of the mountains, away from the stream and out of most of the muskegs.

Construction of this segment of the Cross Trail would serve two important transportation and safety objectives. First, bicyclists and pedestrians would choose the route over the existing route to the Ferry Terminal and the Starrigavan recreation area. Large semi-tractor traveling from the Ferry Terminal and from the nearby tug and barge facilities bring all the freight arriving to Sitka via the Halibut Point Road. Bicycle and pedestrian travel on the roadway is unpleasant and unsafe and will not be significantly improved by the recommendation for an increase in bike lane width in the absence of reconstruction of the roadbed to provide a wider road corridor. A fast ferry connection with Juneau is planned. Sitka is a partner in the Alaska Marine Highway Scenic Byway program and the SEAtrails program. Many of these visitors will be arriving with an expectation of opportunities to bicycle and hike into town and would utilize the Cross Trail as a transportation alternative. This portion of the Cross Trail would also link the Starrigavan and Harbor Mountain Trail systems.

Harbor Mountain Road to Cascade Creek

Distance: 16,189 feet
Small creek crossings: 60
Large creek crossings: Cascade Creek = 100'

Access Points:

Crater View Trailer Park

Distance: 400 Feet
Small Creek Crossings: 3

Dodge Circle to Jacobs Circle Access

Distance: 2,100 feet
Small creek crossings: 6
Large creek crossings: Cascade Creek = 80'

From Harbor Mountain Road the trail will follow the contours of the mountain paralleling the new Harbor Mountain access road. When the trail hits the undeveloped subdivision on University land it could follow Kramer Avenue to Jacobs Circle. This would provide a great trail corridor until the subdivision is developed at which time the trail could be moved up the hill behind the subdivision. From Jacobs Circle the trail would head up the hill and cross Cascade Creek near the end of Cascade Creek Road. A possible connection from Jacobs Circle to Dodge Circle could provide a valuable connection for the neighborhood and users coming off of Edgecumbe Drive.

Cascade Creek to Indian River

Distance: 16,898 feet
Small creek crossings: 55
Large creek crossings: 0

Access Points:

Cascade Creek Access

Georgeson Loop Access
Distance: 400 feet
Small creek crossings: 3
Parking

Kashevaroff Street Access
Distance: 400 feet
Small creek crossings: 3
Parking

Lake Street Access
Distance: 200 feet
Small creek crossings: 2

Flume Circle Access

Tilson Street Access
Distance: 400 feet
Small creek crossings: 2

Charles Street Access
Distance: 150 feet
Small creek crossings: 1

Pherson Street Access
Distance: 200 feet
Small creek crossings: 2

Shennett Street Access
Distance: 880 feet
Small creek crossings: 5

Baranof Street Access
Distance: 600 feet
Small creek crossings: 4

Sisters Lane Access
Distance: 400 feet
Small creek crossings: 2

Andrew Hope Street
Distance: 625 feet
Small creek crossings: 3

The old flume road that runs behind the houses along Cascade Creek Road would make a good trail corridor until it gets to close to the houses. Where the old road is to close to

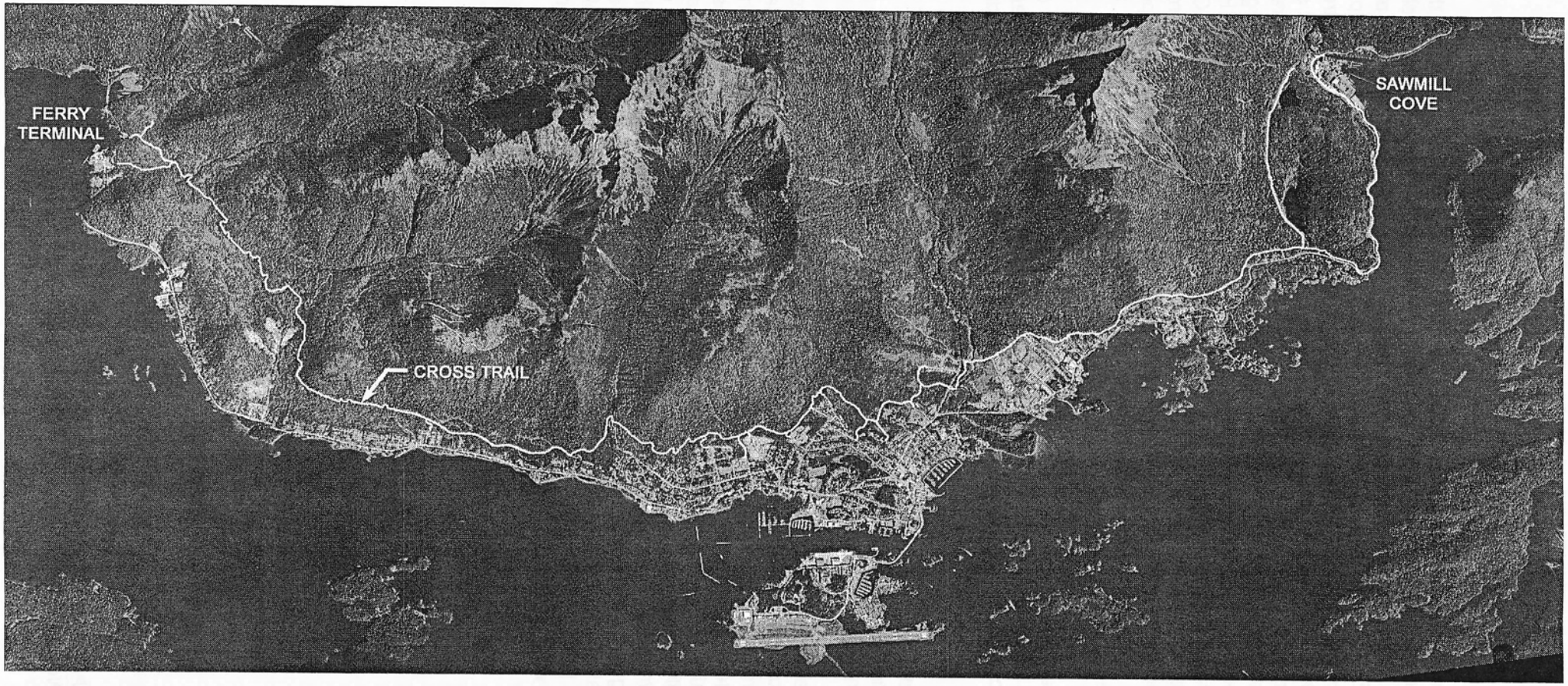
the houses the trail should be shifted up hill a short distance to preserve the privacy of the homes. From Georgeson Loop to Keet Gooshi Heen Elementary school the trail would follow the old road. Between the Keet Gooshi Heen Elementary and the Sitka High School the trail could follow the old road or be down the slope, closer to neighborhood to reduce the grades and amount of ups and downs in the trail and make it more accessible from the neighborhoods. From the High School the trail should follow the contours of the land to minimize hills and valleys in the trail. The trail should go close by the end of Charles Street and Pherson Street and then follow along close to the neighborhoods until it reaches Indian River Road west of Andrew Hope Street. Trailhead facilities with parking should be considered at Cascade Creek Road, Georgeson Loop, Kashevaroff Street, Lake Street and Flume Circle. Small neighborhood connections without additional parking should be developed at Tilson Street, Charles Street, Pherson Street, Shennett Street, Baranof Street, Sisters Lane and Andrew Hope Street.

This section of trail has the most existing non-motorized transportation demand and should be considered as the first phase of the project. Because this part of the trail connects neighborhoods, schools and businesses it is the most likely for federal funding.

Indian River to Sawmill Creek

Distance: 26,400 feet
Small creek crossings: 100
Large creek crossings: Indian River = 100'

The trail from Flume Circle would run up Indian River on the west side to Near Peter Simpson Road where it would cross Indian River and run up hill from Haley Avenue. The Trail would be up hill from the neighborhoods until it hits Thimbleberry Lake Trail and then connects to Sawmill Creek Road near Whale Park. Sitka residents were emphatic at the public meetings that a separated pathway be constructed below the Sawmill Creek Road as described in the Sitka Trail Plan, Sawmill Creek Road Improvements Section. At Thimbleberry Lake Trail there are two options. The first would be to go up the Thimbleberry Trail and come out on Blue Lake Road. The Sitka Trails plan talks about this option. The other would be to cross Sawmill Creek Road near Whale Park and construct the trail on the lower side of the road. The desirability of this option was preferred in the public meetings.


FERRY
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CROSS TRAIL
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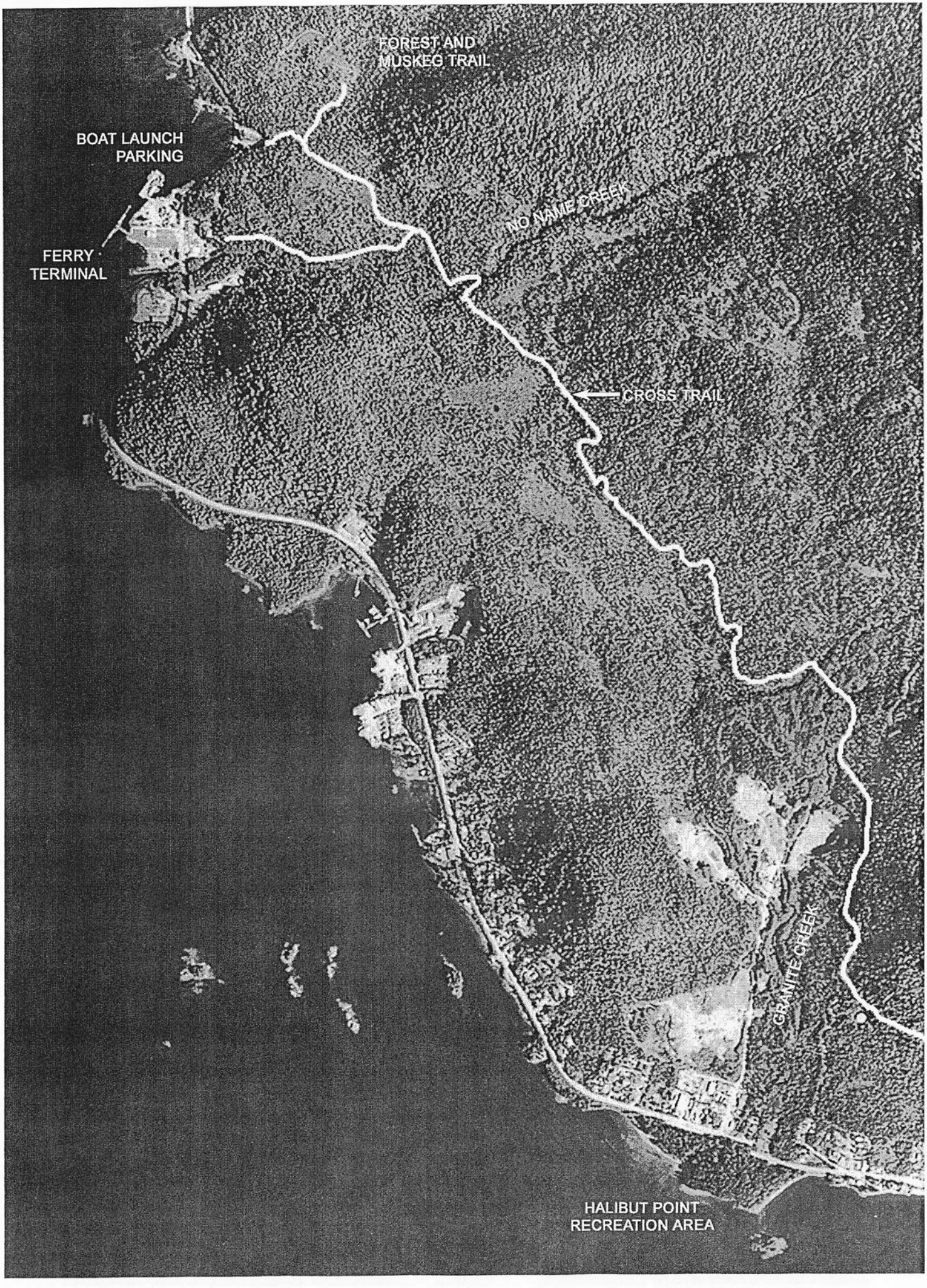

FOREST AND
MUSKEG TRAIL
BOAT LAUNCH
PARKING
FERRY
TERMINAL
NO NAME CREEK
CROSS TRAIL
GRANITE CREEK
HALIBUT POINT
RECREATION AREA


HARBOR MOUNTAIN ROAD
GRANITE CREEK
NEW HARBOR MOUNTAIN ROAD
CROSS TRAIL
CASCADE CREEK
UNIVERSITY BENCHLANDS
HALIBUT POINT RECREATION AREA


EXISTING
CROSS TRAIL
INDIAN RIVER
CASCADE CREEK
REALIGNED
CROSS TRAIL
TROOPER
ACADEMY
CROSS TRAIL
WATERTANK
HIGH
SCHOOL
ELEMENTARY
SCHOOL
SWAN
LAKE


SAWMILL
COVE
ALTERNATE
CROSS TRAIL
ROUTE
HEART
LAKE
WATERFRONT
CROSS TRAIL
THIMBLEBERRY
LAKE
WHALE PARK
CROSS TRAIL
INDIAN RIVER
JAMESTOWN
BAY

SECTION 4
COMMUNITY PRIORITIES

On September 16th, 2002 a public workshop asked the community to provide input on the priorities for the non-motorized transportation facilities listed in this document. Over a two-week period, the residents of Sitka submitted their priorities for improving the community's non-motorized transportation facilities. The projects listed represent ones that the Sitka public identified as being important to the community for improved safety, quality of life and non-motorized transportation efficiency. The project priority list found below does not rank each project as a numeric priority, however groups projects into immediate, mid term and long term. This allows projects to be selected from a group rather than being installed in numeric order and allows flexibility to partner non-motorized improvements with motorized projects when they are scheduled for design and construction. This format is designed to be an adaptive guide and projects may shift between priority levels as funding becomes available. This list should be used as a reference for determining community preference, but is not meant to be a complete priority listing of every project in the plan. As new projects come on-line, community priorities may need to be reevaluated.

This list should be used as a reference for determining community preference, but is not meant to be a complete priority listing of every project in this plan. As new projects come on-line and time passes, community priorities may need to be reevaluated.

Immediate Priorities:

- Sawmill Creek Road Improvements from Jeff Davis Street to Shotgun Alley
- Cross Trail realignment and resurfacing from Price Street to Cascade Creek
- Indian River Bridge non-motorized underpass
- Separated path from Shotgun Alley to Sawmill Cove
- Connection from Crescent Harbor to Sawmill Creek Road via Lincoln Street to Metlakatla and through the Sitka National Historical Park Indian River Path
- Reconfiguration of the Jeff Davis Street, Biorka Street, Geodetic Way and Sawmill Creek Road intersection
- Katlian Street sidewalks
- Sidewalk and bike lane improvements on the O'Connell Bridge
- Price Street neighborhood sidewalks
- Reconfigure jersey dividers and bike lane along Swan Lake on HPR
- Maintenance of existing and new facilities

Mid Term Priorities:

- Establish Cross Trail from Cascade Creek to Harbor Mountain Road
- Japonski Island sidewalk and bike lane improvements
- Indian River Road improvements
- Sheldon Jackson Flume Trail
- Halibut Point Road improvements from Seamart to the Ferry Terminal
- Lincoln Street sidewalk widening
- Kayak launch and storage facilities
- Moller Park to Lake Street Connection
- Edgecumbe Drive improvements
- Improvements around all schools
- Remove power poles from Sawmill Creek Road sidewalk

- ADA improvements
- Harbor Drive improvements

Long Term Priorities:

- Thompson Harbor to HPR connection
- Establish Cross Trail from Harbor Mountain to Ferry Terminal
- Establish Cross Trail from Price Street to Thimbleberry Lake
- Lighting for separated paths
- Coastal Trail from Centennial Hall to the O'Connell Bridge
- Connection through Russian Orthodox and Lutheran cemeteries

Many of these projects will require major funding for design before being constructed. Smaller improvements could begin immediately such as installing accessible ramps, reconfiguring the crosswalk at Katlian and Halibut Point Road, restriping existing roadways to accommodate cyclists, new directional and traffic signs, education of motorists and non-motorized users, enforcement, and maintaining existing facilities.

Three Sitka non-motorized transportation projects are currently slated for STIP funding for the 2004-2006 cycle. A brief description of the projects follows:

***Moller Field to Lake Street Pedestrian Connection**: A multi-use path from Moller Park and down the slope to Swan Lake and back up to Lake Street. The project would include an elevated platform and viewing platform along the Swan Lake portion of this path.*

***Path Connection to Indian River Trail**: A multi-use path that parallels Indian River and connects a new trailhead and parking area with the Indian River Trail. The trail would include an interpretive and viewing area.*

***Cross Trail Pedestrian Access**: A multi-use path linking Charteris Street to the northwest extent of the Sitka Cross Trail.*

In addition, there are several planning, design and construction projects in progress or slated to begin in the near future that will have an impact on non-motorized transportation. *These projects, with an immediate or near term schedule, should include and refine recommendations for non-motorized transportation found in this plan.* These include:

The Sawmill Creek Road Redesign
Survey work has been completed and design will begin in autumn 2002 for the roadway from Jeff Davis to Sawmill Cove. Construction is to begin in 2005, or sooner if funding is expedited.

O'Connell Bridge Improvements
ADOT&PF is in the design process looking at redesigning the railings and lighting on the bridge and restriping lanes on the bridge. Construction is slated for spring 2003.

Japonski Island Roads and Utilities Master Plan
Master planning work is underway to consolidate and improve transportation and utilities on Japonski Island. Japonski Island Stakeholder meetings are occurring at this time and will continue into 2003.

Indian River Trailhead Extension
Design work is underway to relocate the existing Indian River Trailhead and parking facilities from the end of Indian River Road. The new trail extension would be accessible.

Sitka National Historical Park Land Acquisition Master Plan
The National Park Service is master planning 6.5 acres of land it recently acquired adjacent to the Sitka National Historic Park along Indian River. Conceptual planning for this land has begun and public input will begin this autumn.

Lake and Lincoln Street Intersection
The City and Borough of Sitka passed a resolution in January of 2002 supporting the installation of a traffic light at this intersection and asked that it be included for the STIP.

Security Measures
Several agencies, organizations and institutions are reevaluating their master plans, regulations and policies as they relate to access by the public. Some of these include the US Coast Guard, ADOT&PF: Sitka Airport, Sheldon Jackson College, and the City and Borough of Sitka. New policies may potentially reduce or restrict public access to or through their land.

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

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.

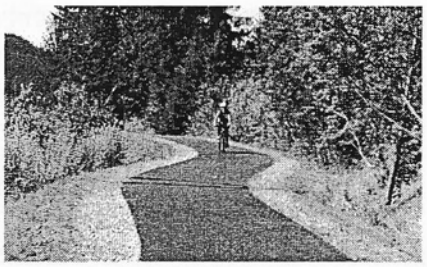
Curb Ramps: Sidewalks and curbs are typically 6 inches above the roadway and curb ramp are required to transition from the roadway to the sidewalk. Curb ramps are the only feature that is allowed to have slope of 8.3% without the need for railings provided the rise is 6 inches or less. Curb ramps should 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:

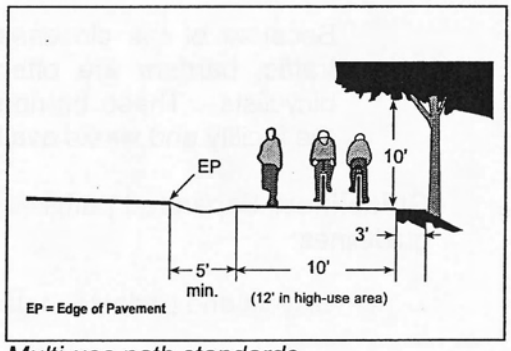
a) Grading, paving, drainage, fences, retaining walls, sound walls, signs and other necessary design features.

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).

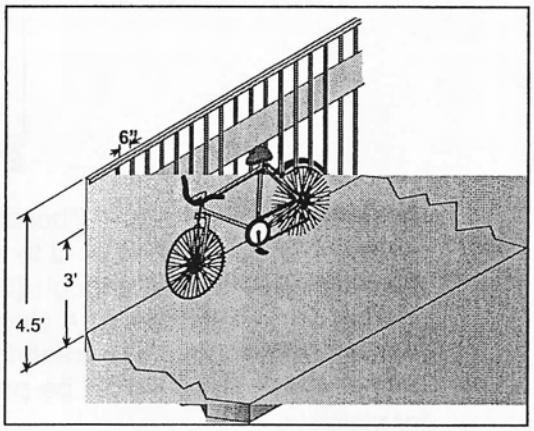
Separation from roadway: Where a path is parallel and adjacent to a roadway, there should be a 5 ft or greater width separating the path from the edge of the roadway or a physical barrier of sufficient height should be installed (see section on railings).

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.

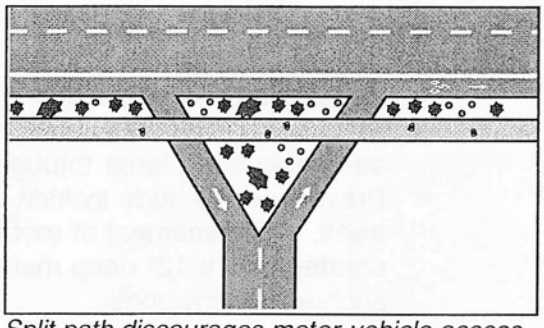
Fences should only be used where they are needed for safety reasons. They should be placed as far away from the path as possible. Duplication of fences should be avoided, such as fences on the right-of-way and fences to keep pedestrians off highways.

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

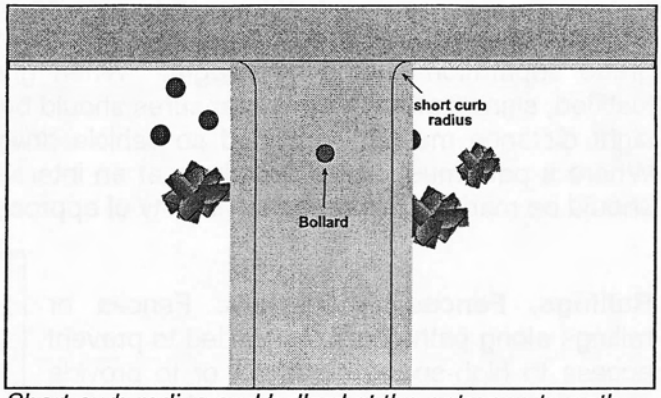
Multi-use paths can be attractive for motorized users looking for adventure or as a short cut. Motor vehicle access must be eliminated to reduce conflicts, prevent damage to the facility and maintain a safe non-motorized route.

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

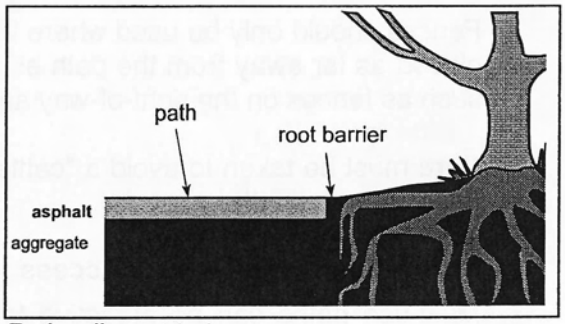
Short Curb Radii: Short curb radii of 5 ft can make it difficult for motorists to enter a path from the roadway.



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.

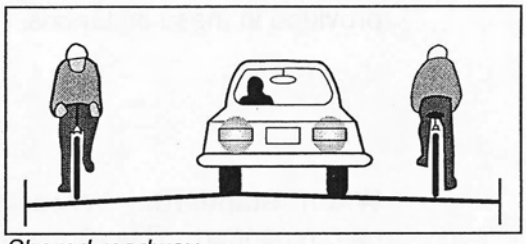
Drainage: Multi-use paths must be constructed with adequate drainage to avoid washouts and flooding and to prevent silt from intruding onto the path.

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.



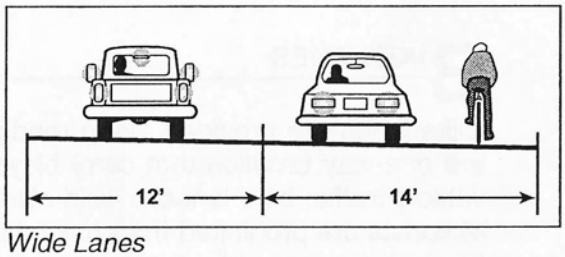
Shared roadway

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.

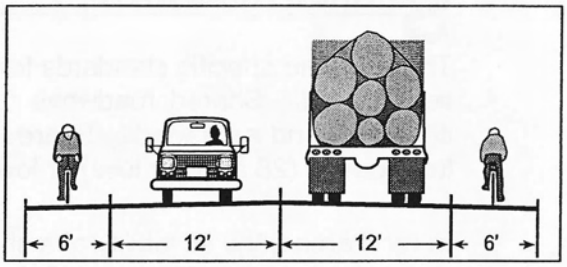


Wide Lanes

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.

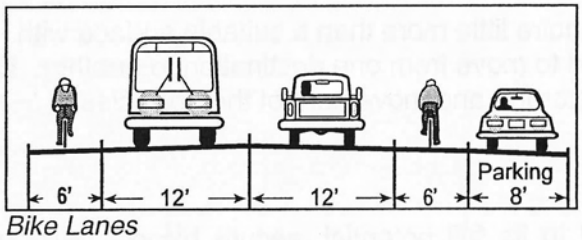
Pavement Quality and Maintenance: Paved shoulders should have the same pavement structural design as that of the roadway. On shoulder widening projects it is best to do it in conjunction with pavement overlays. This provides a smooth, seamless joint, reduces cost of both projects due to increased quantities 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

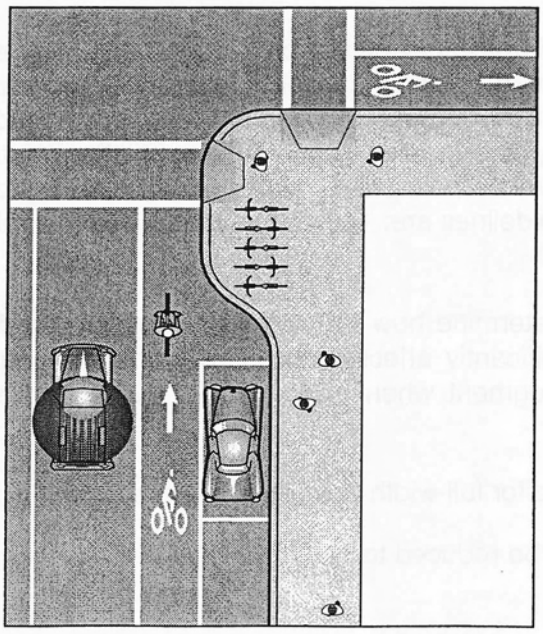
A majority of non-motorized users require little more than a suitable surface with adequate width to reduce conflict and to move from one destination to another. Cyclists however do require facilities for the storage and movement of their bicycles.

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.

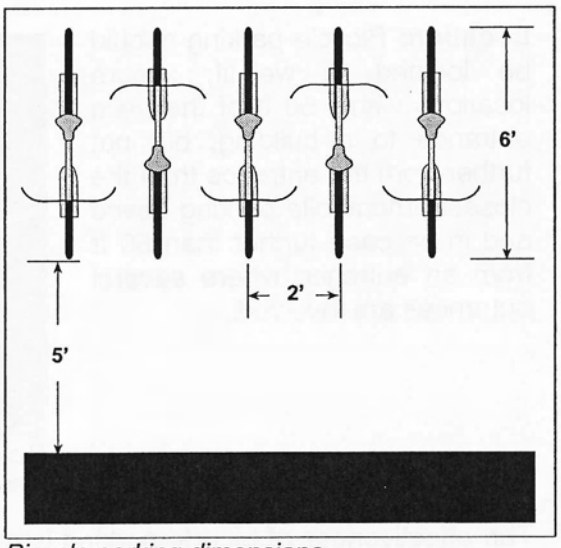
Recommended Standards

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

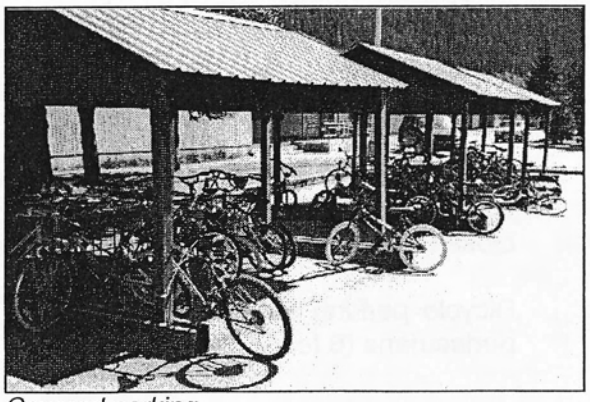
These dimensions ensure that bicycles can be securely locked without undue inconvenience and will be reasonably safeguarded from theft as well as intentional or accidental damage.

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.

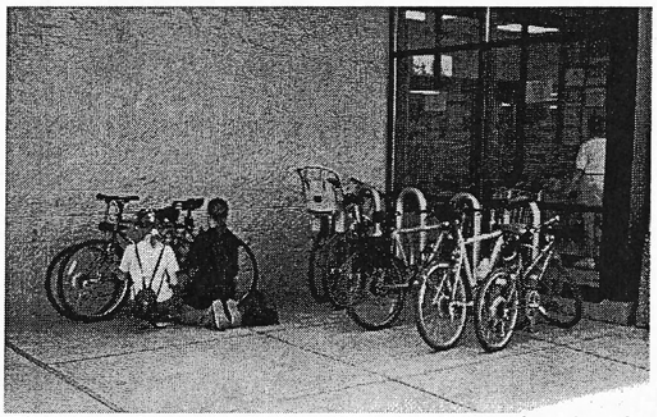

Covered parking

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.

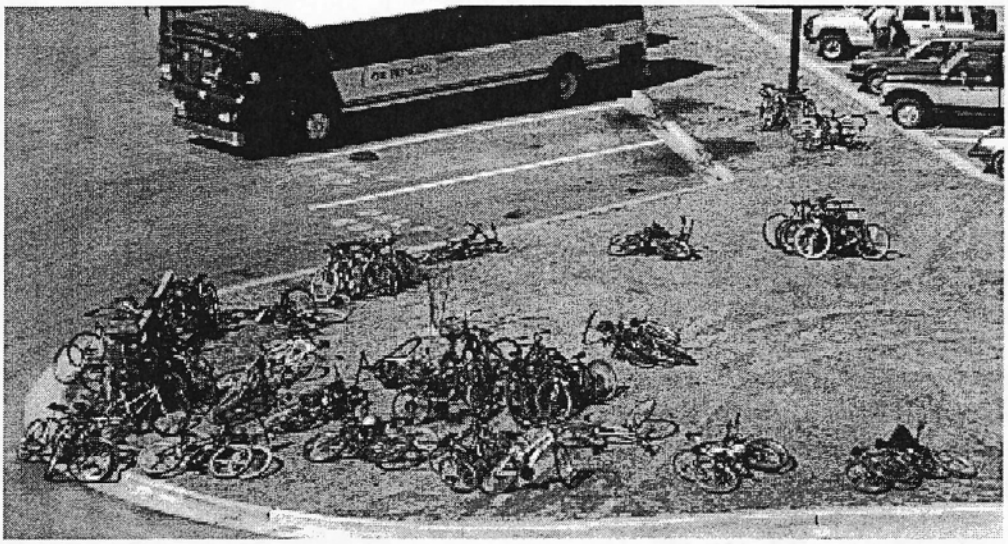
This provides a high degree of security and protection, at the expense of some convenience. Dedicated rooms with card locks are very effective. Locating a room close to changing and showering facilities enhances its attractiveness.

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.

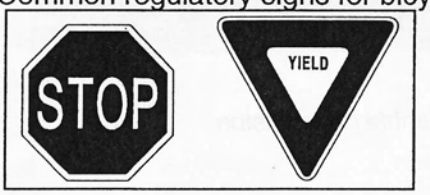
Well-designed roads make it clear to users how to proceed and require very little signing. Conversely, an over-abundance of warning and regulatory signs may indicate a failure to have addressed problems. The attention of drivers, bicyclists and pedestrians should be on the road and other users, not on 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.

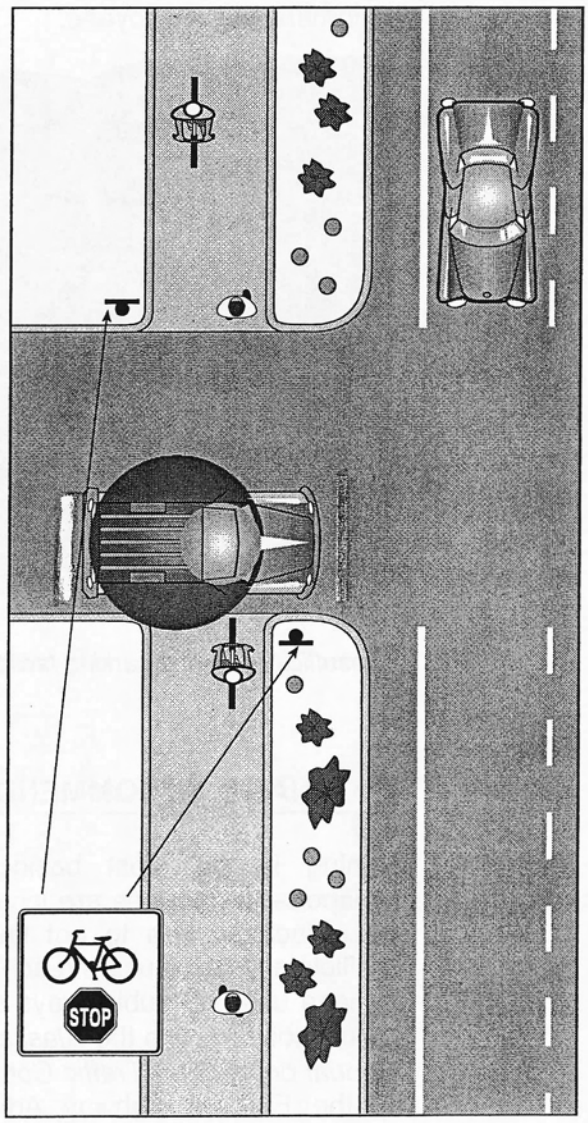
Sign Placement: Signs placed adjacent to roadways must conform to adopted standards for clearance and breakaway posts.

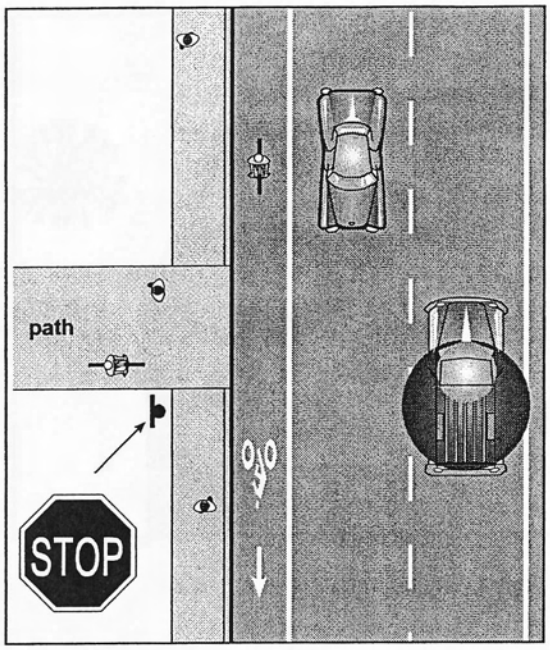
Multi-Use Path: Paths should be signed with appropriate regulatory, warning and destination signs.

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:

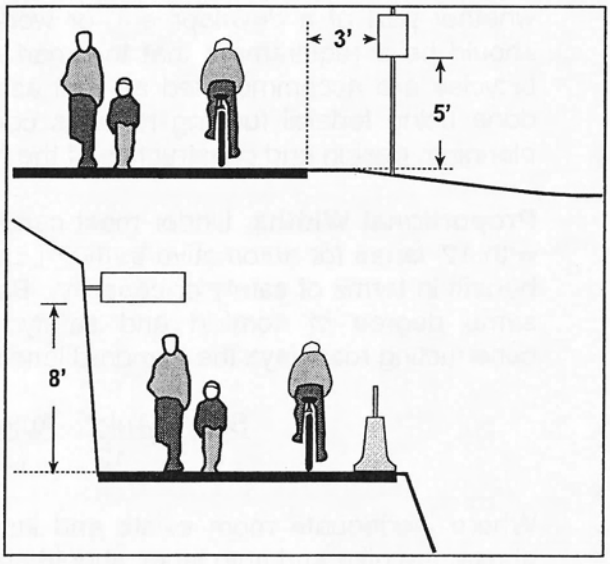
1. Curves
2. Intersections
3. Hill
4. Height and Width Constraints
5. Path Crossing Roadway

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.

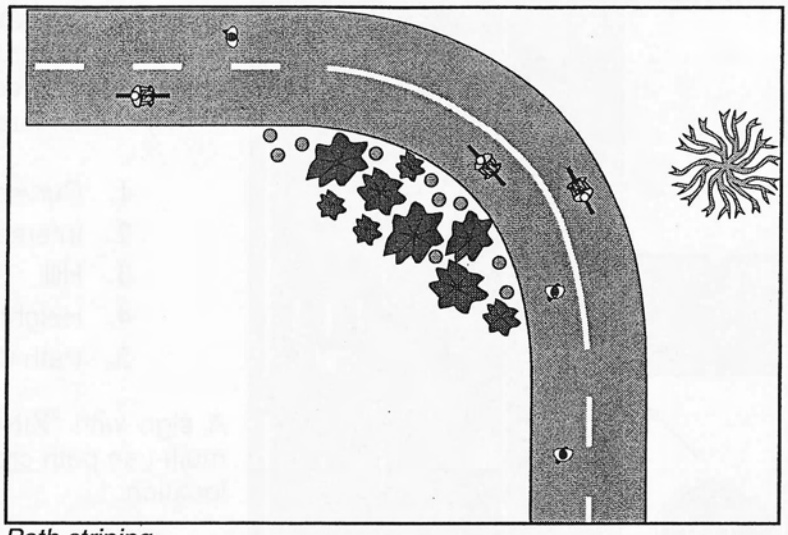
Placement of Signs: Signs should have 3 ft lateral clearance from the edge of the path (min 2 ft). Because of cyclists' and pedestrians' lower line of sight, the bottom of signs should be about 5 ft above the path. If a secondary sign is mounted below another sign, it should be a minimum of 4 ft above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

Recommended Number of Bicycle Parking Spaces

Land Use Category	Minimum Required Bicycle Parking Spaces	Minimum Covered
Residential		
Multi-family residential, general	1 space per unit	100%
Multi-family residential, seniors or with physical disabilities	4 or 1 space per 5 units, whichever is greater	100%
Institutional		
Schools —		
Elementary	4 spaces per classroom	100%
Jr. Hi or Middle School	4 spaces per classroom	100%
Sr. High	8 spaces per classroom	100%
College	1 space per 4 students *(plus 1 space per student housing room)*	100%
Transit Centers/Park & Ride	5% of auto spaces *(or 100% of demand, depending on accessibility to bicyclists)*	100%
Religious Institutions	1 space per 40 seat capacity	25%
Hospitals	1 space per 5 beds	75%
Doctor, Dentist Offices	2 or 1 space per 1000 ft2, whichever is greater	25%
Libraries, Museums, etc.	2 or 1 space per 1000 ft2, whichever is greater	25%
Commercial		
Retail Sales	0.33 space per 1000ft2	50%
Auto-oriented Services	2 or 0.33 space per 1000 ft2, whichever is greater	10%
Groceries/Supermarkets	0.33 space per 1000 ft2	10%
Office	2 or 1 space per 1000 ft2, whichever is greater	10%
Restaurant	1 space per 1000 ft2	25%
Drive-in Restaurant	1 space per 1000 ft2	25%
Shopping Center	0.33 space per 1000 ft2	50%
Financial Institutions	2 or 0.33 space per 1000 ft2, whichever is greater	10%
Theaters, Auditoriums, etc.	1 space per 30 seats	10%
Industrial		
Industrial Park	2 or 0.1 space per 1000 ft2, whichever is greater	100%
Warehouse	2 or 0.1 space per 1000 ft2, whichever is greater	100%
Manufacturing, etc.	2 or 0.15 space per 1000 ft2, whichever is greater	100%

Note: Each individual use needs to be evaluated for bicycle parking - e.g. a commercial accessory use in an industrial district may have different requirements than the industrial uses around it. Similarly, in mixed-use developments, the amount of each use and required bicycle parking needs evaluation. Finally, within each use category one needs to consider the different user categories - residents, employees, customers, etc. - and parking requirements for each.

Signing

1. Directional signs are needed where bicycle parking locations are not visible from building entrances or transit stops.

2. Instructional signs may be needed if the design of bicycle racks isn't readily recognized as such.

3. For security reasons, it may be desirable not to sign long-term employee parking within a building, to avoid bringing bicycles to the attention of potential thieves.

Other Recommendations

Long-term bicycle parking spaces should be provided at no cost or with only a nominal charge for key deposits, etc. Residential parking spaces should be available to residents as part of rental or ownership contracts. Short-term bicycle parking should be available near the building entrances of all land uses and should be free.

ROADWAY FACILITIES FOR BICYCLES

Intersections: Most conflicts between roadway users occur at intersections, where one group of travelers crosses the path of others. Good intersection design indicates to those approaching the intersection what path they must follow and who has the right-of-way, including pedestrians and bicyclists, whose movements are complicated by their lesser speed and visibility.

Basic Principles

1. Signals should be timed so they do not impede bicycle or pedestrian traffic with excessively long waits or insufficient crossing times.

2. Simple right angle intersections are usually the simplest to treat for bicycle and pedestrian movement. The problems are more complex at skewed and multiple intersections.

3. Good design creates a path for bicyclists that is direct, logical and close to the path of motor vehicle traffic; only in rare cases should they proceed through intersections as pedestrians.

4. Bicyclists should be visible and their movements should be predictable.

5. Bike lanes should be striped to a marked crosswalk or a point where turning vehicles would normally cross them. The lanes should resume at the other side of the intersection.

Skewed & Multiple Intersections: Skewed intersections are generally undesirable for all roadway users and introduce complications for bicyclists. Every reasonable effort should be made to design the intersection so that only two roads cross at a given point and they do it at a right angle.

Right-Turn Lanes: Right-turn lanes should be used only where warranted by a traffic study, as they present these problems for cyclists:

1. Right-turning cars and through bicyclists must cross paths.

2. The additional lane width adds to the crossing distance of the intersection.

3. Right-turn moves are made easier for motorists, which may cause inattentive drivers not to notice pedestrians on the right.

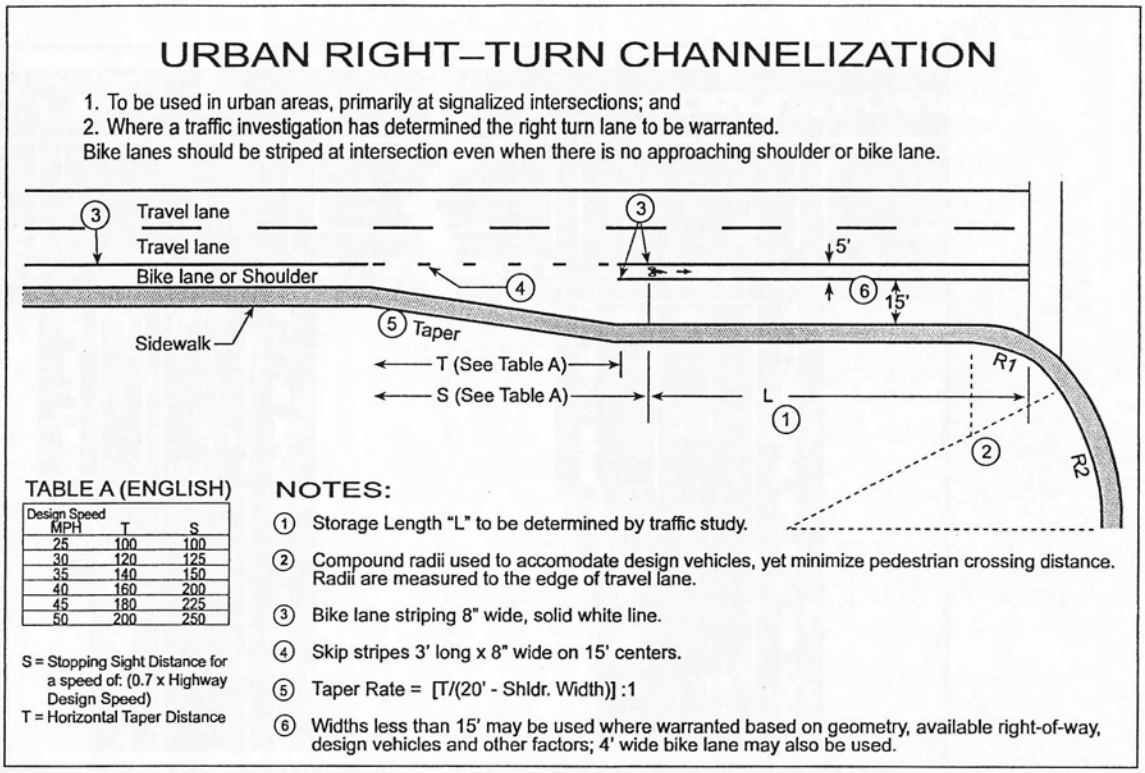
Good designs make through bicyclists and right-turning motor vehicles cross prior to the intersection, with these advantages:

1. This conflict occurs away from the intersection and other conflicts.

2. The difference in travel speeds enables a motor vehicle driver to pass a bicyclist rather than ride side-by-side.

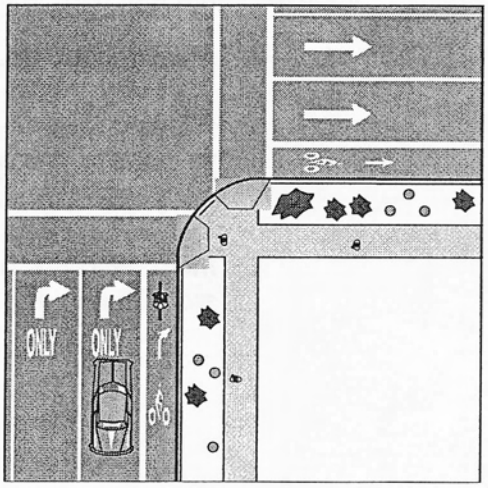
3. Bicyclists are encouraged to follow the rules of the road: through vehicles (including bicyclists) proceed to the left of right-turning vehicles.

Where it is not possible to add a full-right turn lane, the bike lane should still be placed to the left of right-turning motor vehicles.



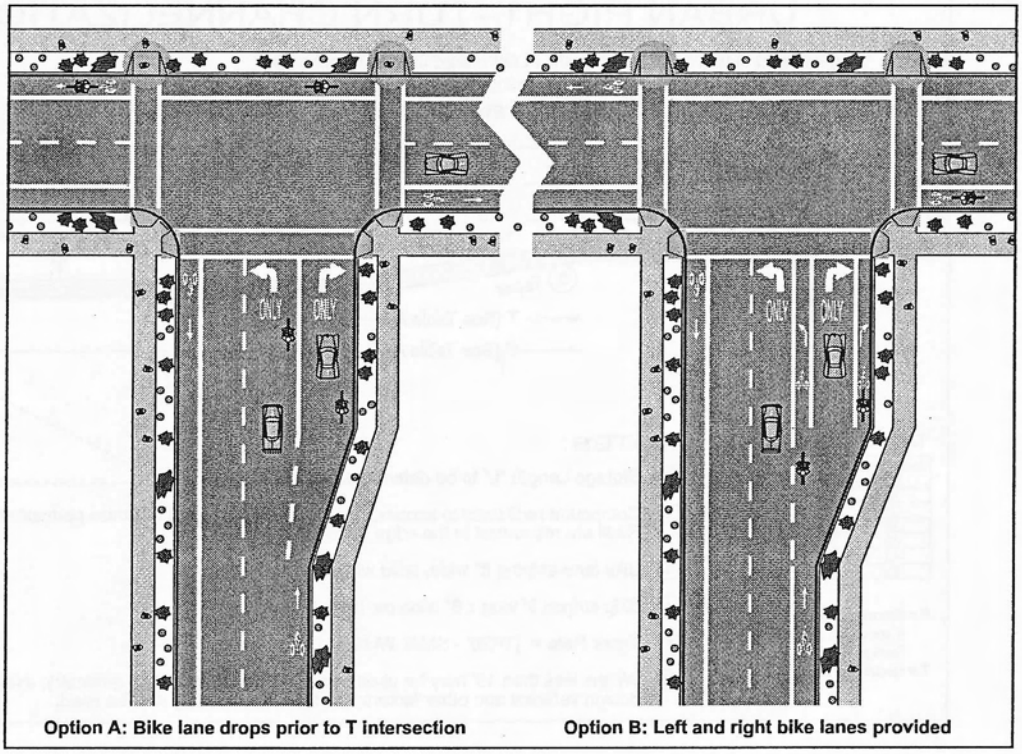
Exceptions

Heavy Right Turns: If the major traffic movement at an intersection is to the right, and straight through leads to a minor side street, then the bike lane may be placed on the right and wrapped around the curve, assuming that the majority of cyclists will desire to turn right too.



Tee Intersections: At a Tee intersection, where the traffic split is approximately 50% turning right and 50% turning left, the bike lane should be dropped prior to the lane split.

This encourages cyclists to position themselves in the correct lane instead of making a left turn from the right side of the road. Where traffic volumes are very high, a left- and right-turn bike lane should be considered.



Option A: Bike lane drops prior to T intersection

Option B: Left and right bike lanes provided

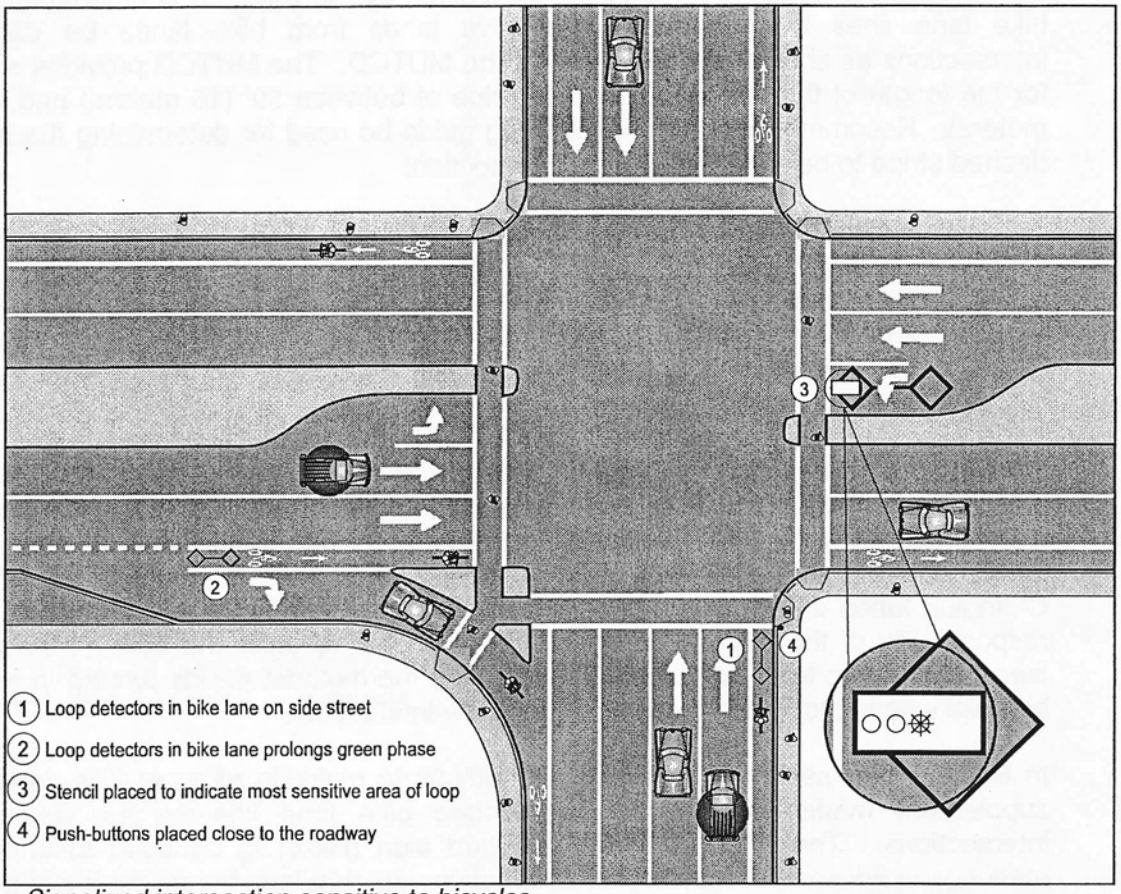
Signals: On signals that function "on-call" (with loop detectors), there are several improvements that can be made to benefit cyclists:

1. Placing loop detectors in bike lanes on side street to trip the signal.

2. Placing loop detectors in bike lanes to prolong green phase when a bicyclist is passing through (the upcoming yellow phase may not allow enough time for a cyclist to cross a wide intersection).

3. Increasing the sensitivity of existing loop detectors in bike lanes and painting stencils to indicate to cyclists the most sensitive area of the loop.

4. Placing push-buttons close to the roadway where a bicyclist can reach them without dismounting.



Signalized intersection sensitive to bicycles

Right-turn Lane without Room for a Bike Lane: Where there is insufficient room to mark a minimum 4 ft bike lane to the left of the right-turn lane, a right-turn lane may be marked and signed as a shared-use lane, to encourage through cyclists to occupy the left portion of the turn lane.

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.

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Bike Lane Signs and Markings

Bike lane signs and markings should conform in all respects with the MUTCD Chapter 9 *Traffic Controls for Bicycle Facilities* as modified by the ATM. It is recommended that bike lane lines that separate automotive lanes from bike lanes be dashed at intersections as shown in Figure 9C-5 of the MUTCD. The MUTCD provides an option for the length of the dashed section of stripe of between 50' (15 meters) and 200' (60 meters). Recommended that the following guide be used for determining the length of dashed stripe to be placed at a given intersection:

Prevailing Speed Of Autos (mph)	Length of Dashed Stripe
20 or less	50'
25 - 35	100'
35 – 45	150'
Over 45	200'

By using the dashed stripe prior to the intersection both the motorist and the bicyclist are put on notice that there is an approaching intersection and that the motorist may be making a right turn. The dashed stripe indicates to the motorist that he must change lanes, entering the previously exclusive bike lane, prior to making his right turn. Changing lanes safely is the responsibility of the lane changer and therefore it is the responsibility of the motorist to make sure it is safe to enter the now mixed-use bike lane. By turning from the mixed-use bike lane the motorist avoids turning in front of a bicyclist who is proceeding straight through the intersection.

In Sitka, where pavement markings are difficult to maintain all year, it is advisable to supplement markings such as the dashed bike lane line on the approach to intersections. The MUTCD has a standard sign (R4-4) to be used to supplement markings in advance of a dedicated automotive right turn lane but no such standard sign exists for intersections where there is no dedicated automotive right turn lane. With a minor modification, the R4-4 sign could be used at intersections where there is no dedicated automotive right turn lane. The modified sign would read:

BEGIN
RIGHT TURN
(arrow)
YIELD TO BIKES

This sign would be placed at the beginning of the dashed stripe approaching the intersection.

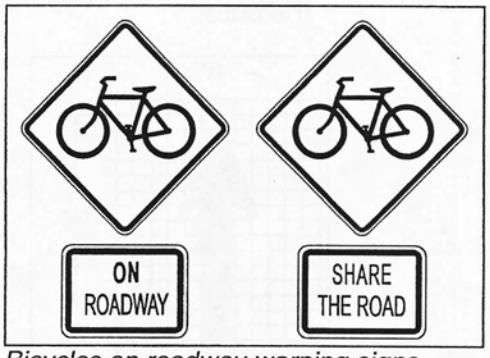
Language Barriers: As stated earlier, many people don't read English. The message conveyed by signs should be easily understandable by all roadway users: symbols are preferable to text.

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

On-Road Bikeways

Shared Roadways & Shoulder Bikeways: In general, no signs are required for these two types of bikeways. Bicyclists should be expected on all local streets, which are mostly shared roadways. Bicyclists riding on shoulder bikeways are well-served with adequate width and a smooth pavement.

On narrow roads heavily used by cyclists, it may be helpful to install bike-warning signs with SHARE THE ROAD on the sign, where there is insufficient shoulder width for a significant distance. This signing should be in advance of the roadway condition. If the roadway condition is continuous, an additional rider "NEXT XX MILES" may be used.



Bicycles on roadway warning signs

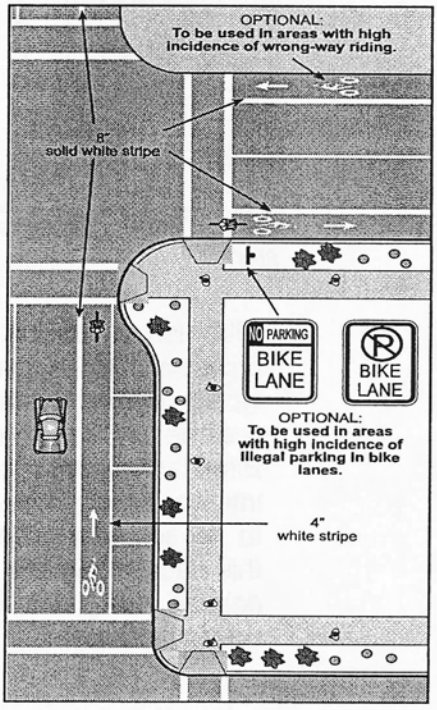
Directional signs are useful where it is recommended that bicyclists follow a routing that differs from the routing recommended for motorists. This may be for reasons of safety, convenience or because bicyclists are banned from a section of roadway (the routing must have obvious advantages over other routes).

Marking: A normal 4" wide fog line stripe is used on shoulder bikeways.

Bike Lane Designation: Bike lanes are officially designated to create an exclusive or preferential travel lane for bicyclists with the following markings:

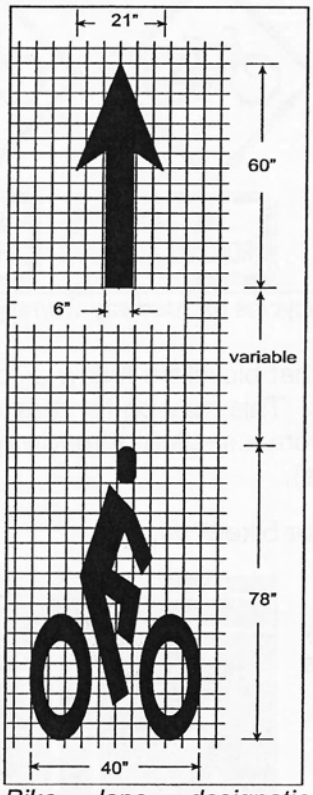
1. An 8 inch white stripe.
2. Bicycle symbol and directional arrow stencils on pavement.

Optional NO PARKING signs may be installed if problems with parked cars occur; painting curbs yellow also indicates that parking is prohibited.



Stencil Placement

Stencils should be placed after most intersections; this alerts drivers and bicyclists entering the roadway of the exclusive nature of the bike lanes. Stencils should be placed after every intersection where a parking lane is placed between the bike lane and the curb.



Bike lane designation stencil

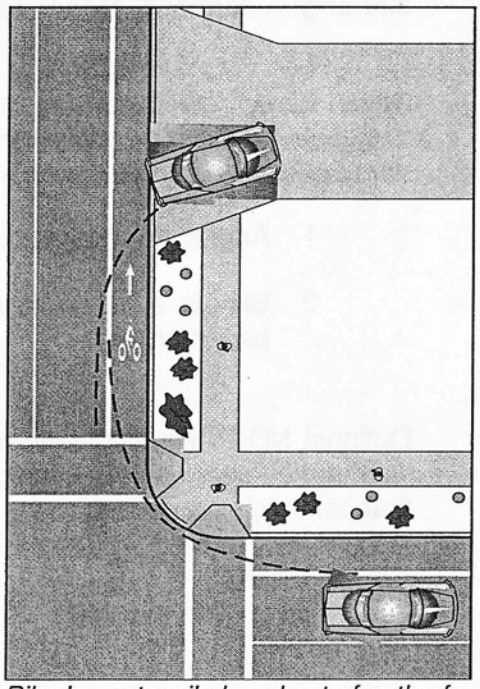
Supplementary stencils may also be placed at the entrance of intersections, to warn cyclists not to enter a bike lane on the wrong side of the road.

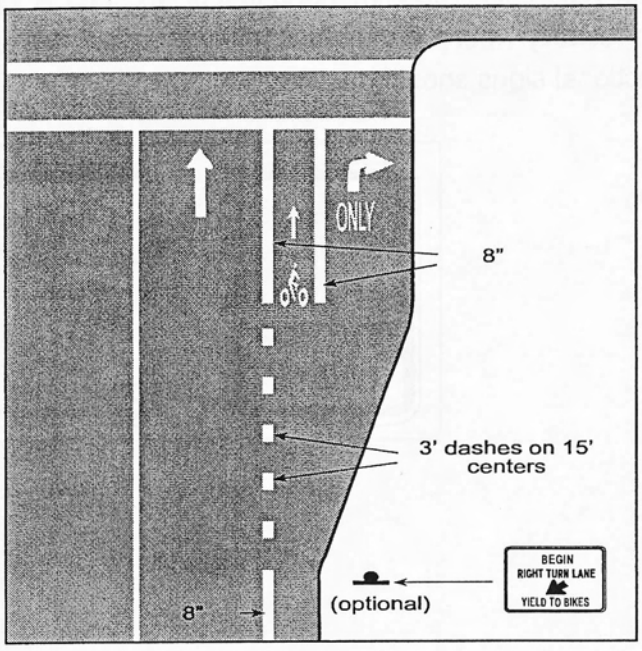
Additional stencils may be placed on long sections of roadway with no intersections. A rule of thumb for appropriate spacing is: multiply designated travel speed (in MPH) by 40. For example, in a 35 MPH speed zone, stencils may be placed approximately every 1400 feet.

Care must be taken to avoid placing stencils in an area where motor vehicles are expected to cross a bike lane - usually driveways and the area immediately after an intersection.

Intersections

Bike lanes should be striped to a marked crosswalk or a point where turning vehicles would normally cross them. The lanes should resume at the other side of the intersection. Bike lanes are not normally striped through intersections; however, it may be appropriate to do so where extra guidance is needed; in this case, they may be striped with dashes or colored to guide bicyclists through a long undefined area.


Bike lane stencil placed out of path of turning vehicles



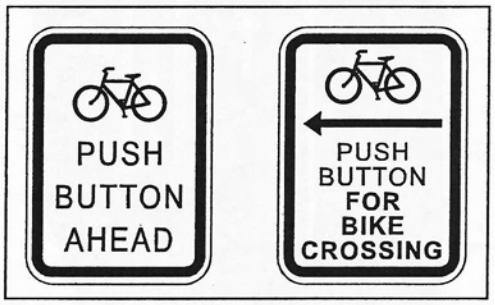
Bike lane marking at right-turn lane

Right Turn Lanes at Intersections: The through bike lane to the left of a right-turn lane must be striped with two 8" stripes and connected to the preceding bike lane with dashes 8" x 3 ft on 15 ft centers. This allows turning motorists to cross the bike lane. A stencil must be placed at the beginning of the through bike lane. Sign, BEGIN RIGHT TURN LANE, YIELD TO BIKES, may be placed at the beginning of the taper in areas where a through bike lane may not be expected.

Outer Edge of Bike Lane: Where parking is allowed next to a bike lane, the parking area should be defined by parking space markings or a solid 4" stripe. If pavement markers are needed for motorists, they should be installed on the motorist's side of the stripe and have a beveled front edge.

Special Use Signs: Where bicyclists are allowed to use sidewalks and the sidewalks are too narrow for safe riding (usually on a bridge), a sign may be used to encourage cyclists to walk.

Bicycle Use of Push-Buttons: Where it is recommended that bicyclists use a push-button to cross an intersection (usually where a multi-use path crosses a roadway at a signalized intersection), instructional signs should be used:

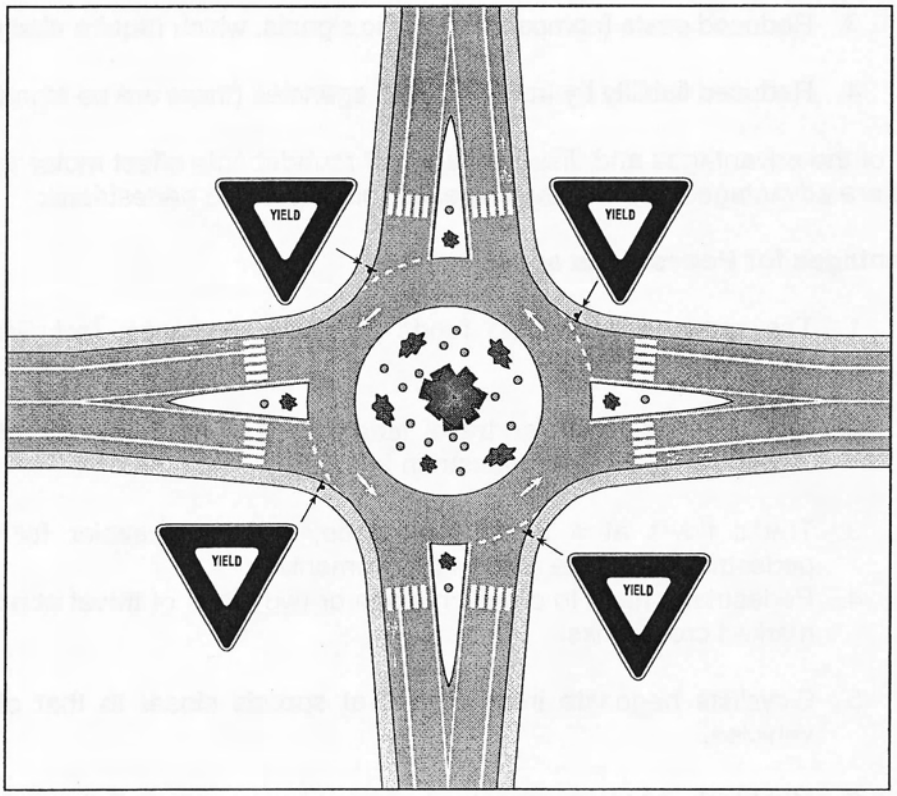


ROADWAY MODIFICATIONS

In some instances the existing configuration of the vehicle roadway creates conflicts for both motorized and non-motorized users. Occasionally, adding the aforementioned facilities can create additional conflict, or perhaps the behavior of motorized users needs to be modified to create a safe environment that meets the needs of both motorized and non-motorized users. The following are some potential solutions for dealing with difficult intersections and neighborhoods with excessive vehicle speeds and should be used when studied by a traffic engineer.

Modern Roundabouts: A roundabout is a method of handling traffic at intersections commonly used in Europe, Australia and Japan. Roundabouts are now gaining acceptance in this country. Early attempts at roundabouts were often not successful for several reasons, mainly:

1. The radius was too small (creating difficulties for trucks).
2. The radius was too large (encouraging high speeds).
3. The right of way was not clearly defined (causing confusion and collisions).
4. Pedestrians were allowed access to the middle of the roundabout.



Modern urban roundabout

Modern roundabout design has several distinctive features:

1. A radius large enough to allow movement by trucks, but small enough to slow traffic speeds.

2. A visual obstruction, through landscaping, that obscures the driver's view of the road ahead, to discourage users from entering the roundabout and proceeding at high speeds.

3. The right-of-way clearly established: drivers entering the roundabout yield to drivers already in the roundabout.

4. There is no bicycle or pedestrian access to the center of the roundabout, which should not contain attractions such as fountains or statues.

One of the major advantages of roundabouts is the reduced need for travel lanes, as traffic is constantly moving (signals create stop-and-go conditions for motor vehicles - extra travel lanes are needed to handle capacity at intersections).

Other advantages include:

1. Reduced crash rates.

2. Reduced severity of injuries (due to slower speeds).

3. Reduced costs (compared to traffic signals, which require electrical power).

4. Reduced liability by transportation agencies (there are no signals to fail).

Most of the advantages and disadvantages of roundabouts affect motor vehicle flow, but there are advantages and disadvantages for bicyclists and pedestrians:

Advantages for Pedestrians and Bicyclists

1. The reduced cost frees funds for other purposes, including bicycle and pedestrian facilities.

2. The reduced need for travel lanes frees right-of-way for other purposes, including bicycle and pedestrian facilities.

3. Traffic flows at a more even pace, making it easier for bicyclists and pedestrians to judge crossing movements.
4. Pedestrians have to cross only one or two lanes of travel at a time, in clearly marked crosswalks.

5. Bicyclists negotiate intersections at speeds closer to that of motor vehicles.

6. Mid-block crossing opportunities may be improved if the number of travel lanes can be reduced.

Disadvantages for Pedestrians and Bicyclists

1. Traffic flowing more evenly may reduce pedestrian crossing opportunities as fewer gaps are created.

2. Pedestrians are responsible for judging their crossing opportunities; there is no signal protection provided, though pedestrian signals can be added at special sites.

3. Bicyclists must share the road and occupy a travel lane; by riding too far to the right, they risk being cut off by vehicles leaving the roundabout in front of them.

Traffic Calming: Citizens are often concerned about excessive traffic volumes and speeds on residential streets. Local streets are intended to serve the adjacent land use at slow speeds, yet they are often designed so that high speed travel is accommodated. Well-designed traffic calming devices effectively reduce traffic speeds and volumes while maintaining local access to neighborhoods.

Motorists often choose short-cuts through residential areas when the arterial or collector street system is not functioning properly. Traffic calming should be viewed as an area-wide treatment, rather than a solution for only one or two problem streets, so that through traffic is not diverted onto other residential streets; this may require improving the arterial street system.

Public involvement is needed for residents, businesses, planners and engineers to understand the issues and agree with the proposed changes.

The benefits of traffic calming for bicycling are:

1. Reduced traffic speeds and volumes allow bicyclists to share the road with vehicles.

2. Quieter streets and increased ease of crossing enhance the non-motorized environment.

3. Lower traffic speeds increase safety (high speeds are responsible for many accidents).

4. Parents will be more likely to let their children walk or ride a bike in the neighborhood if the streets are made safer.

Some earlier attempts at traffic calming in this country have not proven effective for several reasons:

1. The technique slowed cars down excessively, encouraging drivers to accelerate to higher speeds to make up for lost time, which increases noise and air pollution. For example, speed bumps are uncomfortable to cross at even very low speeds and are unpopular with bicyclists.

2. The technique was a misuse of traffic controls, breeding disrespect for their legitimate use; for example, four-way stop signs are often ignored where there is no perceived danger.

3. No further efforts were made beyond placing speed limit signs. Most drivers travel at a speed they feel comfortable with, which is usually a product of roadway design.

Effective traffic calming techniques rely on these general principles:

1. The street design allows drivers to drive at, but no more than, the desired speed.

2. The street design allows local access, while discouraging through traffic.

3. Traffic calming works best when roads are properly designed in the first place.

Traffic calming can be viewed as a method to help reestablish the proper hierarchy for streets:

1. Local streets should carry local traffic at slow-speeds, with bicyclists sharing the road and pedestrians crossing freely.

2. Collector streets should carry traffic to and from local streets and arterioles at moderate speeds. Bicyclists should be able to share the road or ride on bike lanes.

3. Pedestrians should be provided with buffered sidewalks and frequent crossing opportunities.

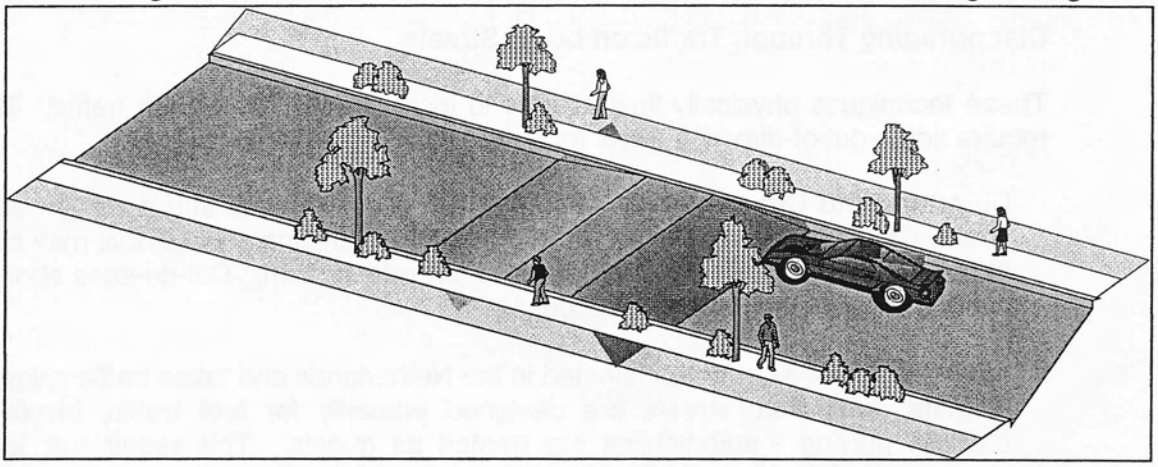
4. Arterial streets should carry mostly through traffic. Bicyclists should be accommodated with bike lanes. Pedestrians should have buffered sidewalks and reasonably-spaced crossing opportunities.

Reducing Traffic Speeds: Reducing traffic speeds can be accomplished through physical constraints on the roadway or by creating an "illusion of less space". Motorists typically drive at a speed they perceive as safe; this is usually related to the road design, especially available width.

Physical Constraints

Narrow Streets or Travel Lanes: Narrow cross-sections can effectively reduce speeds, as most drivers adjust their speed to the available lane width. Narrow streets also reduce construction and maintenance costs.

Speed Humps (not speed bumps): If well designed, speed humps allow a vehicle to proceed over the hump at the intended speed with minimal discomfort, but driving over the hump at higher speeds will rock the vehicle. The hump is designed with a reversing curve at each end and a level area in the middle long enough to



Speed hump

accommodate most wheelbases.

Chokers (curb extensions): Chokers constrict the street width and reduce the pedestrian crossing distance.

Illusion of Less Space

Creating Vertical Lines: By bringing buildings closer to the roadway edge or by adding tall trees, the roadway appears narrower than it is. The addition of trees on both sides of the street reduces traffic speed as well as adds aesthetic value.

Coloring or Texturing Bike Lanes: Drivers see only the travel lanes as available road space, so the roadway appears narrower than it is. Painting the road surface is expensive; lower-cost methods include:

1. Paving travel lanes with concrete and bike lanes with asphalt or the reverse.
2. Slurry-sealing or chip-sealing the roadway and not the bike lanes.
3. Incorporating dyes into concrete or asphalt.

Creating vertical lines and colored bike lanes can be used on higher speed arterials, as there is no change in the roadway width available to motor vehicles.

Chicanes: By alternating on-street parking, landscaping or other physical features from one side of the road to the other, the driver does not see an uninterrupted stretch of road. The roadway width remains adequate for two cars to pass.

Discouraging Through Traffic on Local Streets

These techniques physically limit access to local streets for through traffic. This may require some out-of-direction travel for some trips. Techniques include:

Diverters and Cul-de-Sacs: These prohibit all movements into a certain section of street. Caution should be used when physically restricting access: this may contradict other transportation goals, such as an open grid system. Cul-de-sacs should allow through bicycle and pedestrian access.

Living Streets: This idea originated in the Netherlands and takes traffic calming to its ultimate realization: streets are designed primarily for foot traffic, bicyclists and children playing - automobiles are treated as guests. This requires a legislative change, as this is a modification of existing right-of-way laws. The burden of responsibility for safety is on motorists: they are assumed to be at fault if they hit a pedestrian.

The street is designed with physical constraints that allow only local motor vehicle access (residents and visitors) at low speeds. Streets are designed with physical constraints that do not allow high speed. Signs are posted warning entering motorists of the street characteristics - the signs depict children playing and pedestrians.

A new treatment such as this requires public involvement, support from the residents and a street system that functions well enough so that through traffic has access to a reasonable alternative route. As with all traffic calming measures, emergency vehicles must be able to access residences.

One major advantage is cost: streets are very narrow, which reduces the total paved surface area and there is no need for curb and sidewalks.

Other traffic-calming techniques and design details not discussed here may be found in other publications such as FHWA-PD-93-028, Case Study No. 19: "Traffic Calming, Auto-Restricted Zones and Other Traffic Management Techniques - Their Effects on Bicycling and Walking."

On-Street Parking: While the primary purpose of a public right-of-way is to transport people and goods, on-street parking is often cited as an advantage for pedestrians, primarily as a buffer. Yet on-street parking also uses space that could be used for wider sidewalks or bike lanes.

SECTION 8
ENGINEERING REPORT

The following definitions for "guidelines" and "standards" have been used in describing technical issues in the Sitka Non-Motorized transportation Plan.

Guidelines are generally accepted good practice, which have yet to be adopted as firm policies by government or professional organizations.

Standards are generally accepted good practice, which have been adopted by government or professional organizations.

The State of Alaska by statute has required that DOT&PF adopt standards that "...must conform as closely as practicable to those adopted by the American Association of State Highway and Transportation Officials" (AASHTO). The authoritative document published by AASHTO with regard to highway design is *A Policy on Geometric Design for Highways and Streets*, commonly referred to as the "Green Book".

Source materials for the Sitka Non-Motorized transportation Plan included:

- AASHTO's publication, *A Policy on Geometric Design of Highways and Streets.*
- The Transportation Research Board Publication 209, *Highway Capacity Manual.*
- The California Department of Transportation (CalTrans) publication; *Highway Design manual – Bikeway Planning and Design.*
- The *Manual on Traffic Control Devices for Streets and Highways* adopted by the Federal Highway Administration.

AASHTO provides that the standard automotive traffic lane should be 12' wide but allows reductions in with to 11', 10' and even 9' under certain local road conditions. AASHTO also provides basic guidelines for sidewalks placed adjacent to roadways.

Caltrans provides for minimum widths of bike lanes under differing conditions and further recommends that bike lane widths be greater where possible. The recommended widths in the Sitka Non-Motorized Transportation Plan are adapted from these Caltrans guidelines.

The *Highway Capacity Manual* contains considerable information relative to the widths of sidewalks necessary in order to accommodate pedestrians, taking into consideration the impact of adjacent motorways, buildings, etc. In essence, a 6' wide sidewalk contiguous to the roadside curb with a fence or building on the property side has an effective useful width for pedestrians of 3'.

The *Manual on Traffic Control Devices for Streets and Highways* (MUTCD) contains the traffic control devices recommended for use on streets and highways including controls for bikeways and pedestrians. The traffic control devices specifically for bicycles are contained in "Part 9 – Traffic Controls for Bicycle Facilities".

In addition to the references cited above, recommendations contained in the Sitka Non-Motorized Transportation Plan were developed by professionals who have considerable experience in surface transportation, pedestrian, bicycle and automotive, planning, design and operations.

Christopher Mertl, ASLA, is a landscape architect and has been involved in several transportation and planning studies in both Alaska and Canada. He helped develop the Juneau and Ketchikan Vehicular & Pedestrian Improvement Plans and recently completed a transportation corridor study for Alaska's Marine Highway, which resulted in the marine highway being designated as a National Scenic Byway.

Roger Allington, PE, is a civil engineer licensed to practice in Alaska, California, Oregon and Washington. He is also licensed as a traffic engineer in California and has been certified nationally by the Transportation Professionals Certification Board as a Professional Traffic Operations Engineer. He has over 45 years of transportation planning, design and operations experience.

James King is a trail specialist who has developed numerous trail-planning studies including the Juneau Non-Motorized Transportation Plan. He is the executive director of Juneau' s Trail Mix Inc. and has an outstanding understanding of the planning, design and construction of a wide array of trail systems appropriate for Southeast Alaska.

Ronald Crenshaw is a trail planner and has researched and authored many trail plans including the Alaska Recreation Trails Plan and the Anchorage Trails Plan. He has administered the Alaska State Parks trail grant program and is a board member of the Governor's Trails & Recreational Access for Alaska Citizens Advisory Board (TRAAK).

SECTION 9
APPENDICES

Acknowledgements

Numerous individuals, organizations and agencies provided information and insight in the development of this plan.

City and Borough of Sitka Assembly
City and Borough of Sitka Staff
Sitka Parks and Recreation Committee
Sitka Trail Works Inc.
USDA Forest Service
National Park Service
Alaska State Parks
Alaska Department of Transportation and Public Facilities Statewide Planning
The Sitka Bike Group
SEAtrails Inc.
Sitka ADA Committee
The residents of Sitka
And many others.....

Glossary

Area Plan. A regional, multi-modal transportation plan prepared as an element of the Statewide Transportation Plan, and serving to provide project-level guidance for transportation investments.
Vision 2020. Also known as the Statewide Transportation Plan. It is produced by the Alaska Department of Transportation and Public Facilities. It forms the basis of Area Plans and for decisions about which projects will be funded in the Statewide Transportation Improvement Program (STIP).

DOT/PF. Alaska Department of Transportation and Public Facilities

CTP. Community Transportation Program. A state program that includes the Community and rural transportation corridors that receive a portion of Federal Highway funding.

FHWA. Federal Highway Administration. The federal funding agency for most of Alaska's transportation projects.

NHS. National Highway System. An interconnected system of interstate highways and roads created by Congress in 1991 and designated as important for interstate travel, national defense, intermodal connections, and international commerce. In Alaska, 2,100 miles of highway and 1,900 miles of Marine Highway make up this system.

Needs List. An inventory of proposed transportation improvements developed and maintained by the Department of Transportation and Public Facilities. Contains the draft three-year STIP.

PEB. Project Evaluation Board. A six member board established by the Department of Transportation and Public Facilities to evaluate projects for funding through the Statewide Transportation Improvement Program. Members are all DOT/PF employees. They include the Deputy Commissioner, Director of Design and Engineering Standards, Director of the Division of Statewide Planning, and the Directors of the Central, Northern, and Southeast Regions.

SHS. State Highway System. Those transportation facilities designated by the Commissioner, excluding those on the National Highway System, that provide greater utility to the State of Alaska than to individual municipalities or tribal governments.

STIP. Statewide Transportation Improvement Program. The statewide three-year capital improvement program of surface transportation projects. This list is composed of projects nominated by local governments, state agencies, interested organization, and citizens.

TRAAK. Trails and Recreational Access for Alaska. A multi-agency state program with a citizens advisory board (TRAAK Board) that directs the development of trails and recreational access projects statewide.

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1999 Trail Survey Results; Sitka Trail Works, Inc., 1999.

Sitka Preliminary Bicycle Plan; City and Borough of Sitka. June 1993.

Draft Sitka Trail Plan; Sitka Trail Works, Inc., 2000.

Sitka Trails; Tongass National Forest, Sitka Ranger District, US Forest Service and Alaska Natural History Association, 1995.

Review of Planning Guidelines and Design Standards for Bicycle Facilities; Institute of Transportation Engineers, Alaska Section, July 1997.

Sitka Vehicular and Pedestrian Study; Department of Transportation and Public Facilities, 1997.

Sitka Parks and Recreations Plan; City and Borough of Sitka, 1991.

Sitka Non-Motorized Transportation Plan; City and Borough of Sitka, 1997.

Draft Vision 2020 Update; Department of Transportation and Public Facilities, 2002.

Designing Sidewalks and Trails for Access Part II: Best Practices Design Guide, U.S. Department of Transportation, Federal Highway Administration; Publication No. FHWA-EP-01-027, 2001.

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Helpful Web Sites

Alaska Department of Transportation and Public Facilities web page with STIP information & other relevant publications: http://www.dot.state.ak.us/

Pedestrian and bicycle information from the Pedestrian and Bicycle Information Center: http://www.bicyclinginfo.org

Bicycle planning and program guidance and extensive reference library from Tracy-Williams Consulting: http://www.bikeplan.com

Federal Highway Administration site with funding, planning and design information relevant to bicycling and walking: http://www.fhwa.dot.gov/environment/bikeped/bp-broch.htm

TEA-21 and other federal legislation affecting non-motorized transportation: http://www.fhwa.dot.gov/legsregs/legislat.html

John Allen's opinions and reviews of publications: http://www.Bikexprt.com

Record of Public Involvement

Numerous public meetings were held as an integral component of this work.

Public meetings/workshops allowed the community to Sitka to hear presentations by the design team and provided direction on the plan were held on the following dates:

March 13, 2002
April 17, 2002
June 10, 2002
August 22, 2002
September 16, 2002

The planning team met with the Sitka Parks and Recreation Committee who served as the Steering Committee for this project on the following dates:

March 12, 2002
April 17, 2002
June 10, 2002
August 23, 2002
September 16, 2002

Presentations were made to the City and Borough of Sitka Assembly and Planning Commission on the following dates:

March 12, 2002
June 11, 2002
September 16, 2002

Existing State & Local Laws

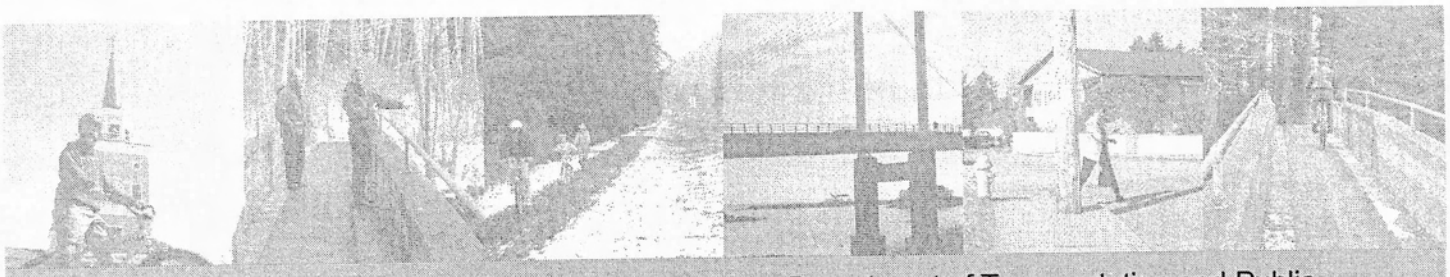
Sitka Municipal Code of Regulations:

- Chapter 11.64.020 – Requires drivers to yield to pedestrians in crosswalks when signals are inoperative or absent. Notes that crosswalks can be marked anywhere and all intersections are "crosswalks" whether marked or not.
- Chapter 11.64.050 – Requires pedestrians to yield to all vehicles unless in a crosswalk.
- Chapter 11.64.060 – Requires pedestrians to use crosswalks in the central business district. Further prohibits pedestrians from crossing streets between adjacent intersections with working traffic signals.
- Chapter 11.64.070 – Prohibits pedestrians from walking in the street if there is an adjacent sidewalk. Also requires pedestrians to walk facing traffic when on a road or road shoulder.
- Chapter 11.68.020 – Requires bicycles to be registered.
- Chapter 11.68.030 – Sets registration fee for bicycles at $1.00 per year per bicycle and says licence plates will be provided for each bicycle by the Chief of Police.
- Chapter 14.04.020 – Requires property owners abutting walkways or public thoroughfares to keep free of snow and ice and other obstructions.
- Chapter 14.04.030 – Provides that the city may clear sidewalks or thoroughfares referred to in 14.04.020 and assess the owner.
- Chapter 14.04.040 – Exempts the City and State from 14.04.030.
- Chapter 21.24.130 – Requires pedestrian walkways to be 10 feet wide unless more is needed for slopes.
- There are no provisions in Code for providing sidewalks or bicycle paths in areas zoned Residential (R-1 or R-2), Commercial (C-1), Central Business District (CBD), or Waterfront Districts(WD).

The *Manual on Traffic Control Devices for Streets and Highways* (MUTCD) contains the traffic control devices recommended for use on streets and highways including controls for bikeways and pedestrians. The traffic control devices specifically for bicycles are contained in "Part 9 – Traffic Controls for Bicycle Facilities". Part 9 is included below.

MANUAL ON TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS - Part 9, Traffic Controls for Bicycle Facilities

PART 9. TRAFFIC CONTROLS FOR BICYCLE FACILITIES
TABLE OF CONTENTS
Page



The preparation of this document was aided by the Alaska Department of Transportation and Public Facilities through a Federal grant from the US Department of Transportation, Federal Highway Administration.

The Sitka Non-Motorized Transportation Plan

Agreement Number 74932

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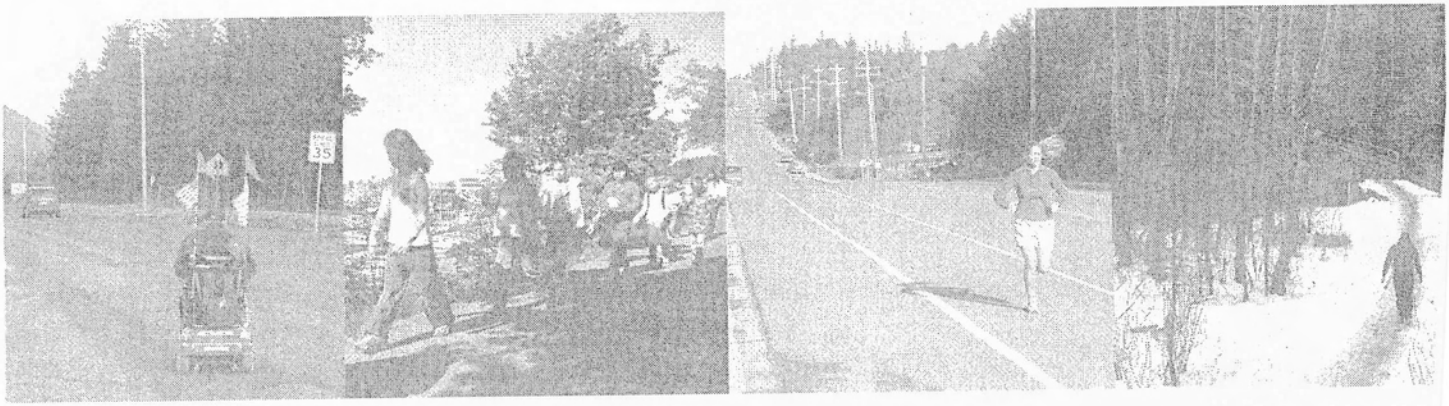

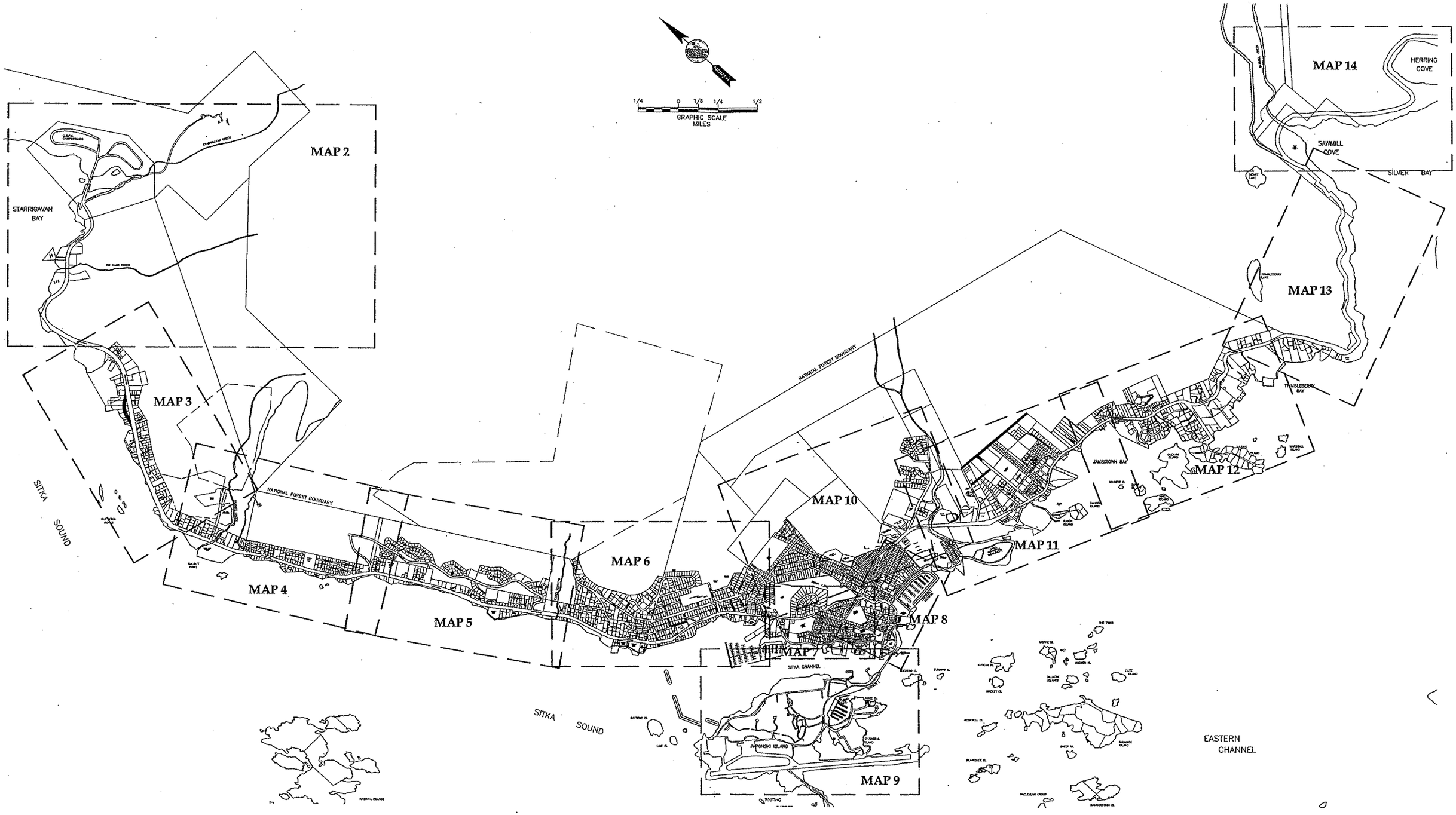

SITKA NON- MOTORIZED TRANSPORTATION PLAN

KEY MAP

SHEET NO.

1

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DATE: SEPTEMBER 15, 2002
FILE NO: 0202

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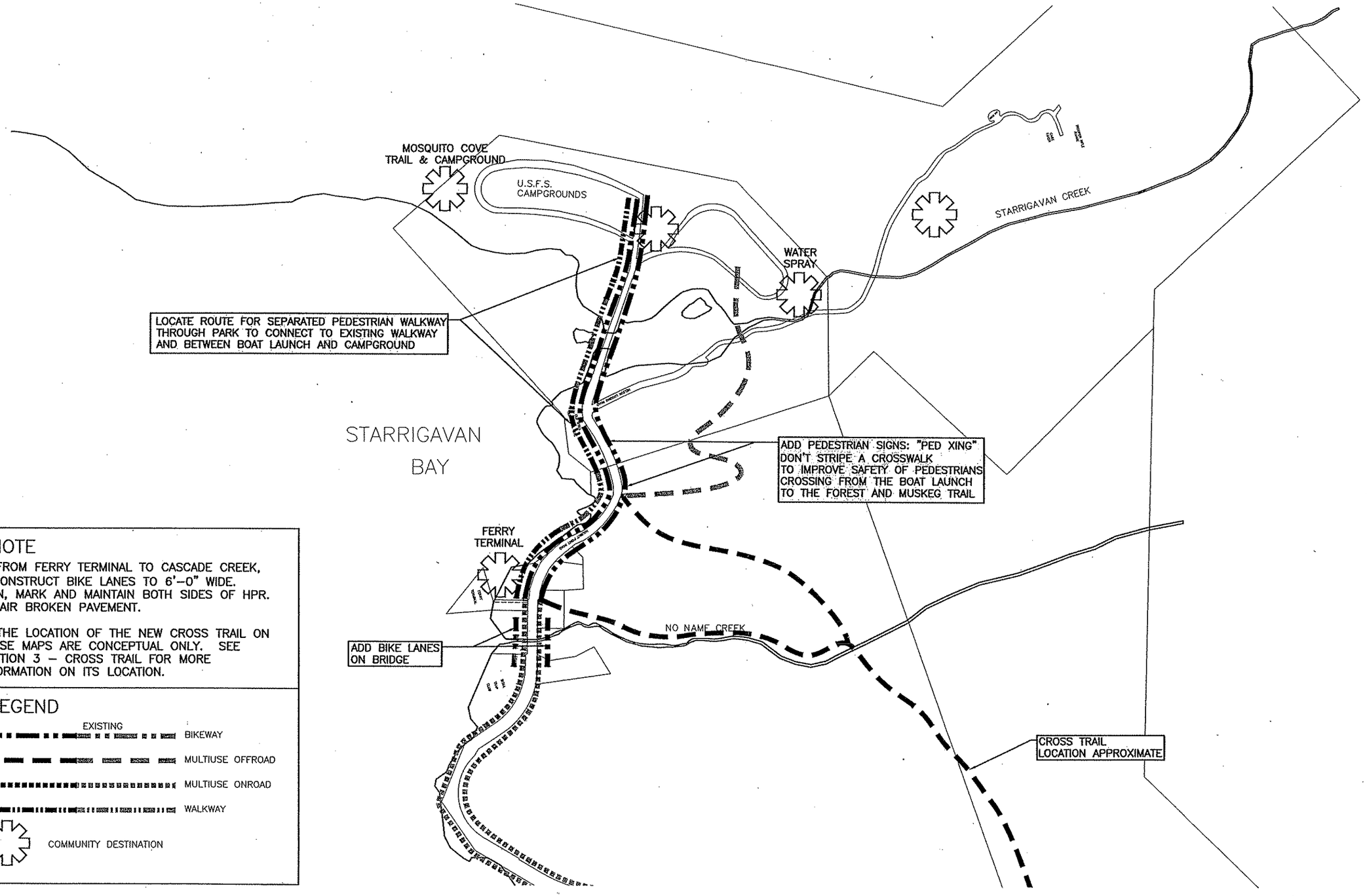

NOTE

1. FROM FERRY TERMINAL TO CASCADE CREEK, RECONSTRUCT BIKE LANES TO 6'–0" WIDE. SIGN, MARK AND MAINTAIN BOTH SIDES OF HPR. REPAIR BROKEN PAVEMENT.

2. THE LOCATION OF THE NEW CROSS TRAIL ON THESE MAPS ARE CONCEPTUAL ONLY. SEE SECTION 3 – CROSS TRAIL FOR MORE INFORMATION ON ITS LOCATION.

LEGEND

NEW EXISTING

- BIKEWAY
- MULTIUSE OFFROAD
- MULTIUSE ONROAD
- WALKWAY
- COMMUNITY DESTINATION

SITKA NON-MOTORIZED TRANSPORTATION PLAN

STARRIGAVAN BAY

SHEET NO. 2

SCALE: 1:400
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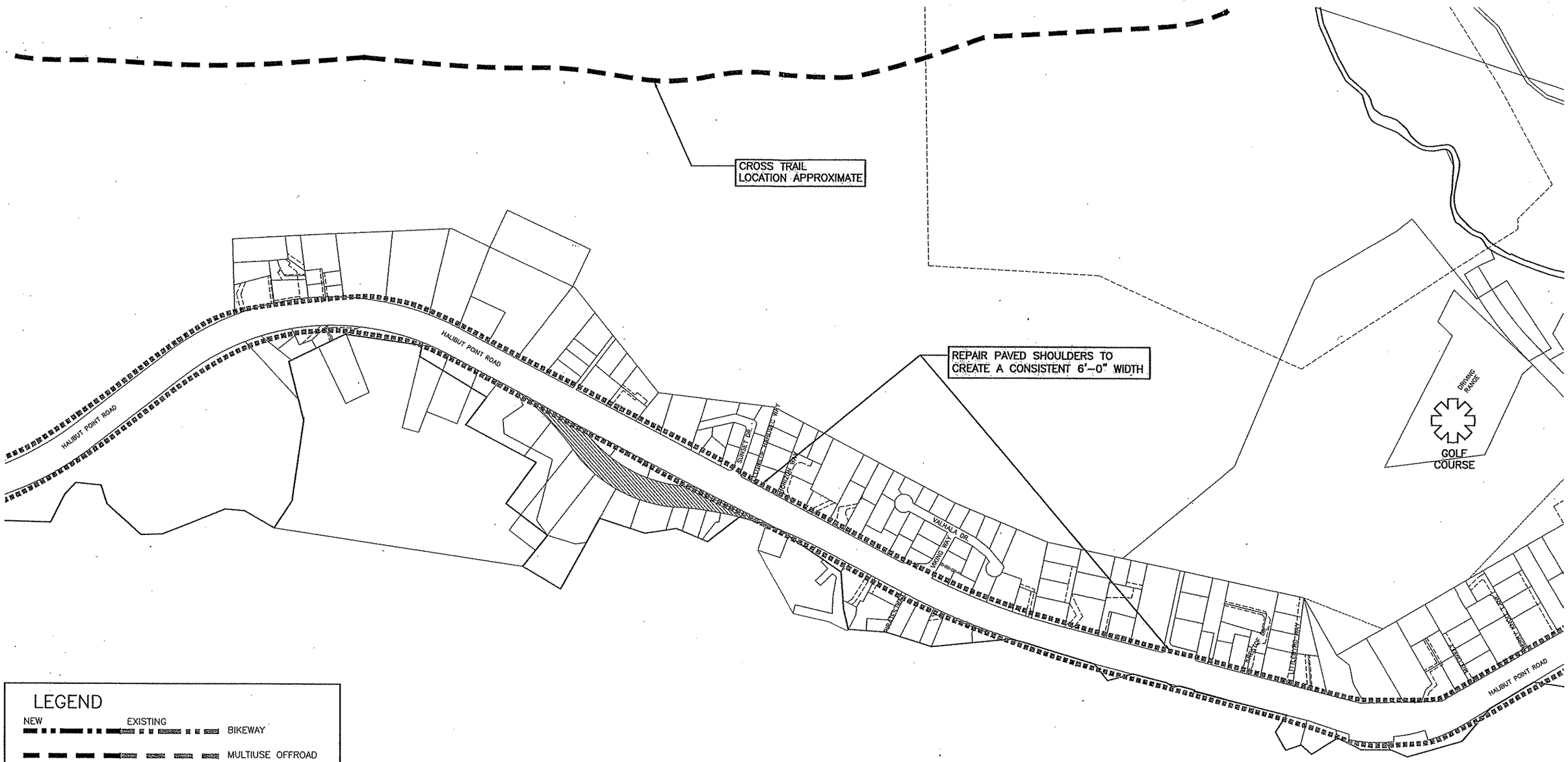

SITKA NON- MOTORIZED TRANSPORTATION PLAN

NORTH HPR

SHEET NO. 3

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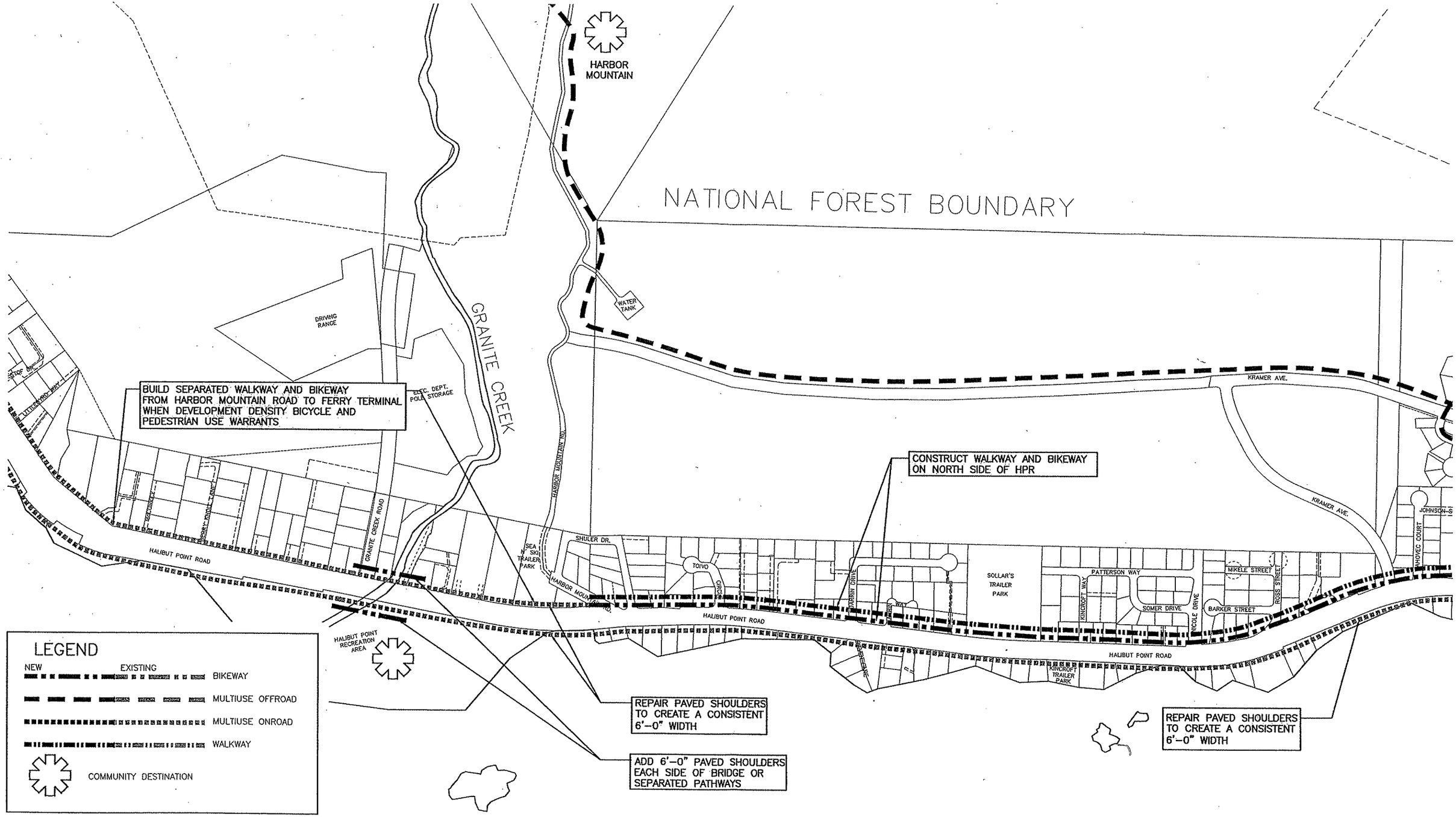

SITKA NON-MOTORIZED TRANSPORTATION PLAN

GRANITE CREEK

SHEET NO. 4

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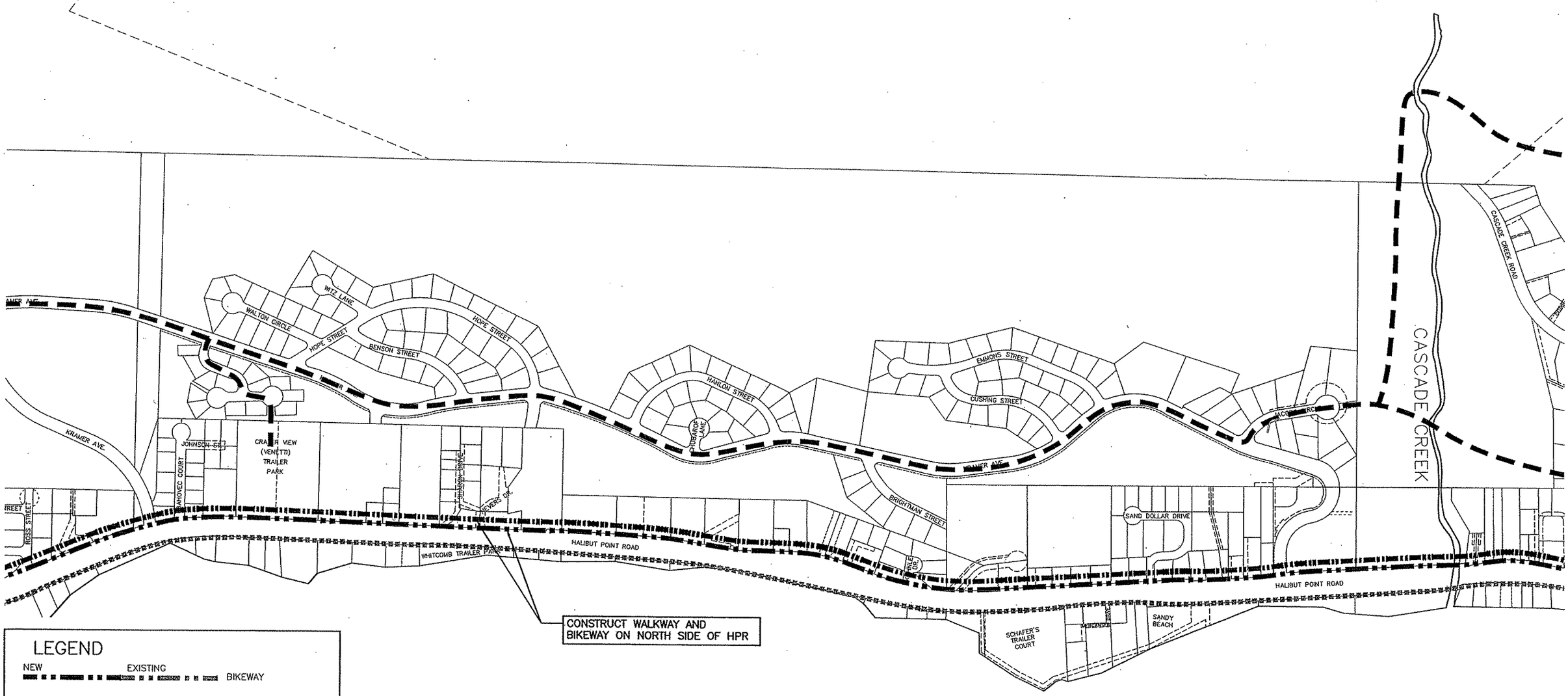

LEGEND

NEW	EXISTING	
		BIKEWAY
		MULTIUSE OFFROAD
		MULTIUSE ONROAD
		WALKWAY
		COMMUNITY DESTINATION

SITKA NON-MOTORIZED TRANSPORTATION PLAN

UNIVERSITY LANDS

SHEET NO. 5

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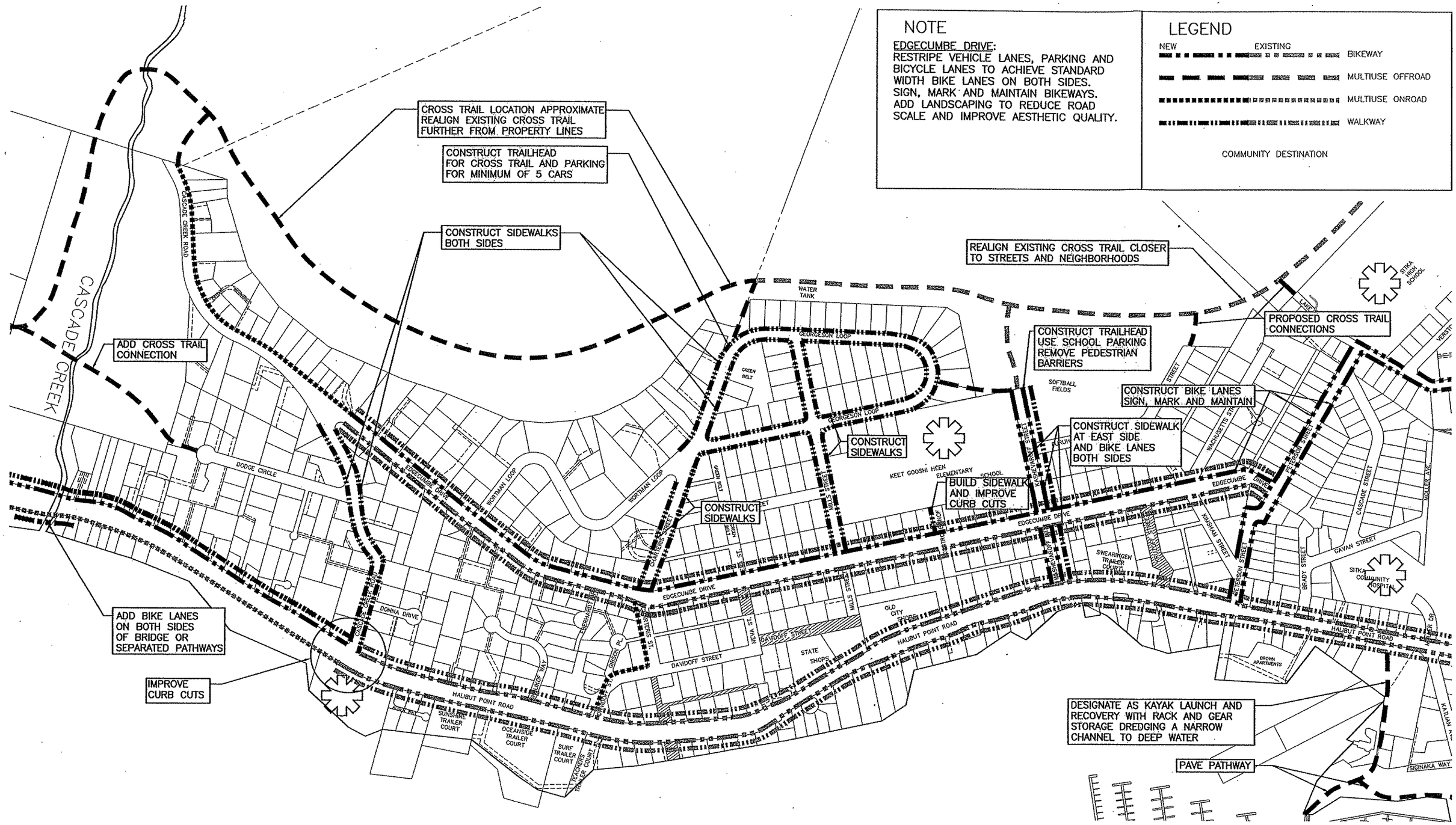

SITKA NON- MOTORIZED TRANSPORTATION PLAN

EDGECUMBE DRIVE

SHEET NO. 6

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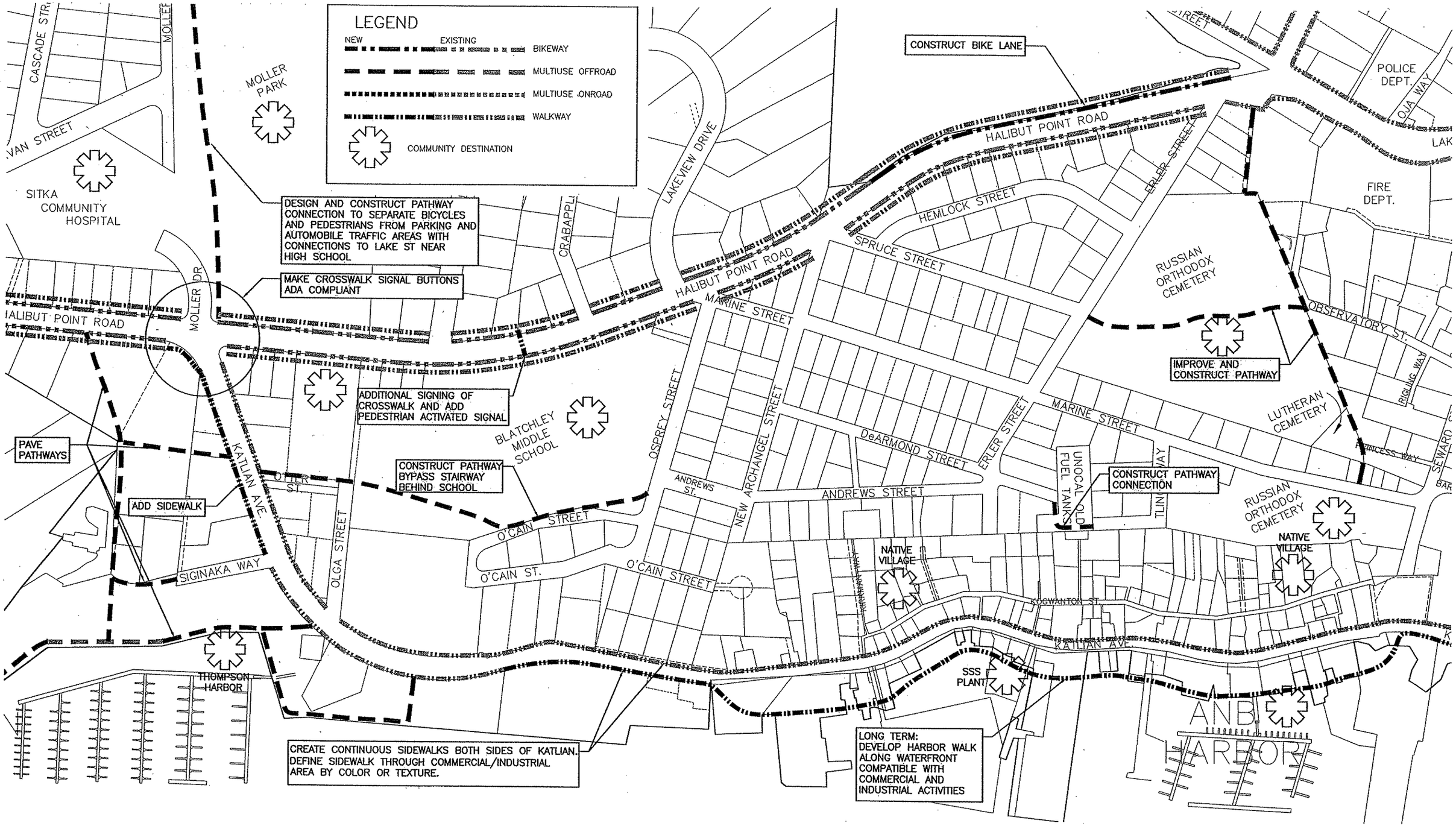

SITKA NON-MOTORIZED TRANSPORTATION PLAN

KATLIAN WAY

SHEET NO. 7

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FILE NO: 0202

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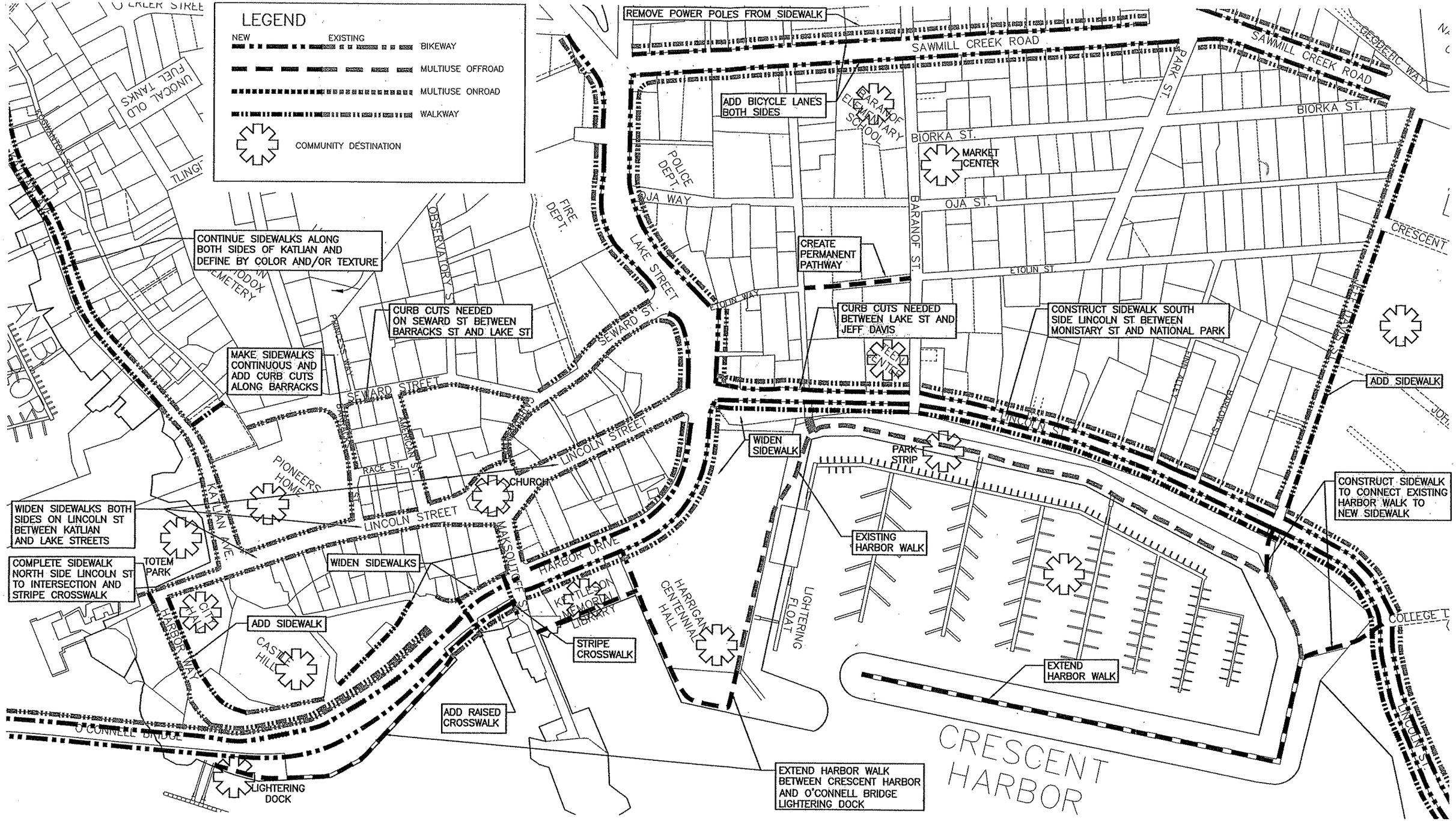

SITKA NON-MOTORIZED TRANSPORTATION PLAN

CRESENT HARBOR

SHEET NO. 8

SCALE: 1:100
DATE: SEPTEMBER 15, 2002
FILE NO: 0202

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LEGEND

NEW / EXISTING

- BIKEWAY
- MULTIUSE OFFROAD
- MULTIUSE ONROAD
- WALKWAY
- COMMUNITY DESTINATION

NOTE

1. THE JAPONSKI ISLAND ROADS AND UTILITIES MASTER PLAN IS UNDERWAY AND MAY RELOCATE ROADS AND BUILDINGS AS PART OF THE WORK. THIS PLAN SHOULD BE UPDATED WHEN THE WORK IS COMPLETE.

2. LONG TERM: ESTABLISH A COASTAL PATHWAY BETWEEN THE WEST END OF O'CONNELL BRIDGE AND THE AIRPORT WHEN APPROVED BY LANDOWNERS.

SITKA CHANNEL

ESTABLISH A COASTAL PATHWAY BETWEEN WEST END O'CONNELL BRIDGE AND AIRPORT

ADD PATHWAY LIGHTING ON THIS SECTION ONLY

MT. EDGECUMBE SCHOOL

UAS

SEWARD AVE

ADD SIDEWALK

ADD MISSING SECTIONS OF SIDEWALK AND CURB CUTS

ADD CURB CUTS AND RAISED CROSSWALK TO ALLOW SAFE CROSSINGS

LIFESAVER DR.

HARBOR WAY

CITY HALL

O'CONNELL BRIDGE

O'CONNELL BRIDGE LIGHTE FACILITY

HARBOR I.

ALEUTS

SEALING COVE

ALICE IS.

ALICE LOOP

AIRPORT ROAD

COAST GUARD

AIRPORT

JAPONSKI ISLAND

ADD MISSING SECTIONS OF SIDEWALK AND CURB CUTS AND BIKE LANES BOTH SIDES OF AIRPORT ROAD BETWEEN BRIDGE AND AIRPORT

CHARCOAL ISLAND

RUNWAY

SITKA NON-MOTORIZED TRANSPORTATION PLAN

JAPONSKI ISLAND

SHEET NO. 9

SCALE: 1:200
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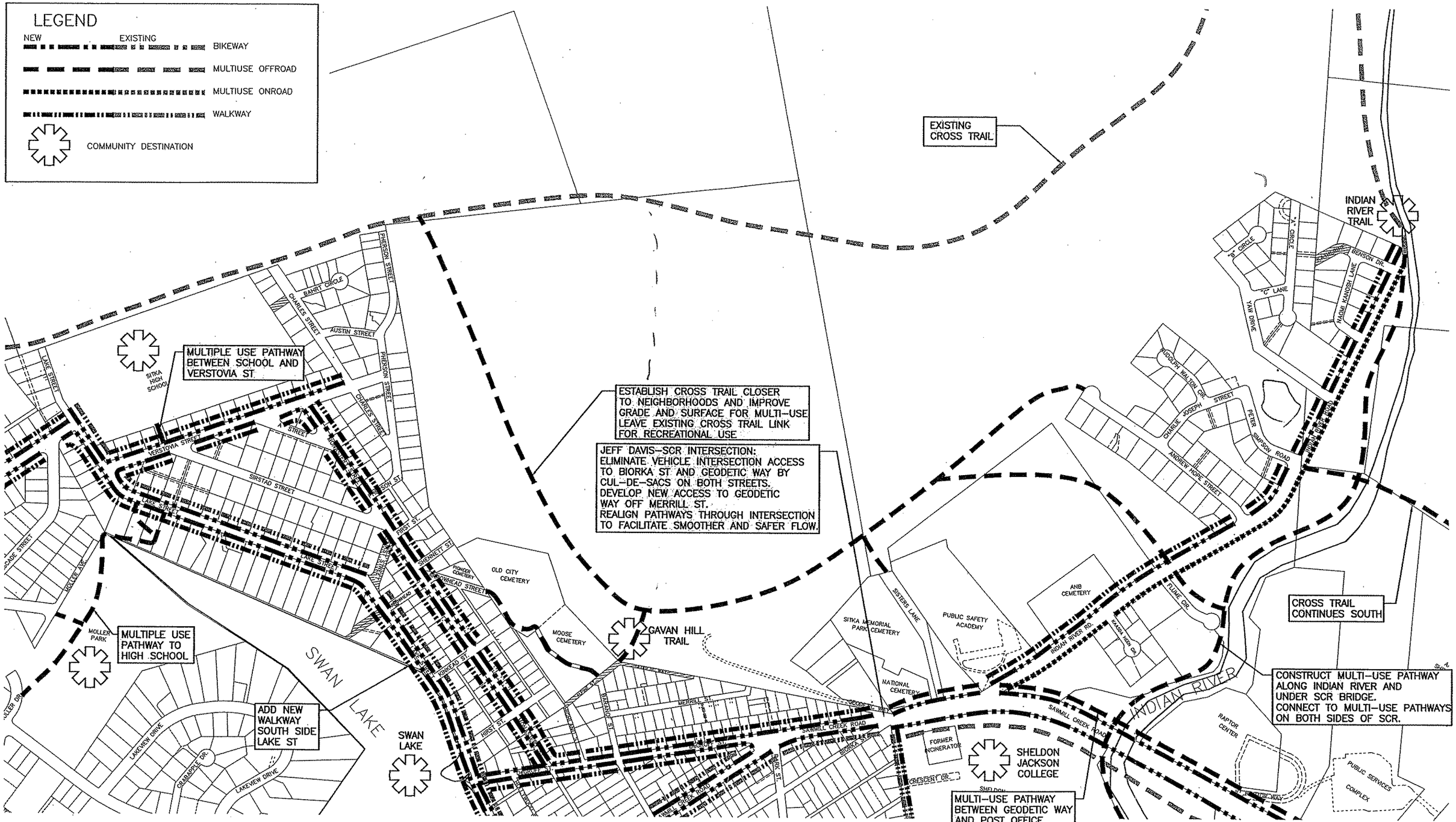

SITKA NON-MOTORIZED TRANSPORTATION PLAN

GAVAN HILL

SHEET NO. 10

SCALE: 1:200
DATE: SEPTEMBER 15, 2002
FILE NO: 0202

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INDIAN RIVER BRIDGE AT SAWMILL CREEK ROAD: NEW BRIDGE TO INCLUDE SEPARATED PATHWAYS AND BIKE LANES ON BOTH SIDES. PROVIDE RAMPS NORTH SIDE OF RIVER FOR BIKE AND PEDESTRIAN ACCESS BETWEEN RIVER PATHWAY AND BOTH SIDES OF BRIDGE PATHWAYS. PROVIDE SIGNAGE TO INDICATE THIS IS WHERE POST OFFICE TRAFFIC CROSSES SCR.

INDIAN RIVER PATHWAY

PATHWAY UNDER BRIDGE

NEW MULTI-USE PATHWAY AND BRIDGE

WIDEN EXISTING PATHWAY TO AT LEAST 10'-0" PLUS 2'-0" SHOULDERS

VISITOR CENTER

SITKA NATIONAL HISTORIC PARK

RAVEN ISLAND

JAME

RUDOLPH WALTON CIR.
CHARLIE JOSEPH STREET
PETER SIMPSON ROAD
ANDREW HOPE STREET
INDIAN RIVER ROAD
ANB CEMETERY
FLUME CIR.
HASSANAN CIR.
INDIAN RIVER RD.
SISTERS LANE
KA MEMORIAL PARK CEMETERY
PUBLIC SAFETY ACADEMY
NATIONAL CEMETERY
FORMER INCINERATOR
SAWMILL CREEK ROAD
INDIAN RIVER
RAPTOR CENTER
PUBLIC SERVICES COMPLEX
ANIMAL SHELTER
TRANSFER STATION
JARVIS ST.
POST OFFICE
CRESCENT DR.
SHELDON JACKSON COLLEGE
JOHN BRADY DR.
SHELDON JACKSON DR.
HILLCREST DR.
MUSEUM
KELLY ST.
KATLIAN ST.
JELIKA'A ST.
ARROWHEAD TRAILER PARK
COLE'S TRAILER PARK
EAGLE WAY
CANNON ISLAND DR.
ARROWHEAD ESTATES
HARVEST WAY
SPRUCE GROVE APARTMENTS
BURNHART ST.
PRICE STREET
LILLIAN DR.
KIKSADI COURT
KIKSADI TRAILER COURT
WITSKARI STREET
WITSKARI ST.
HILLSIDE TRAILER PARK
SAWMILL CREEK ROAD

LEGEND

NEW	EXISTING	
		BIKEWAY
		MULTIUSE OFFROAD
		MULTIUSE ONROAD
		WALKWAY
		COMMUNITY DESTINATION

SITKA NON- MOTORIZED TRANSPORTATION PLAN

SITKA NATIONAL HISTORIC PARK

SHEET NO. 11

SCALE: 1:200
DATE: SEPTEMBER 15, 2002
FILE NO: 0202

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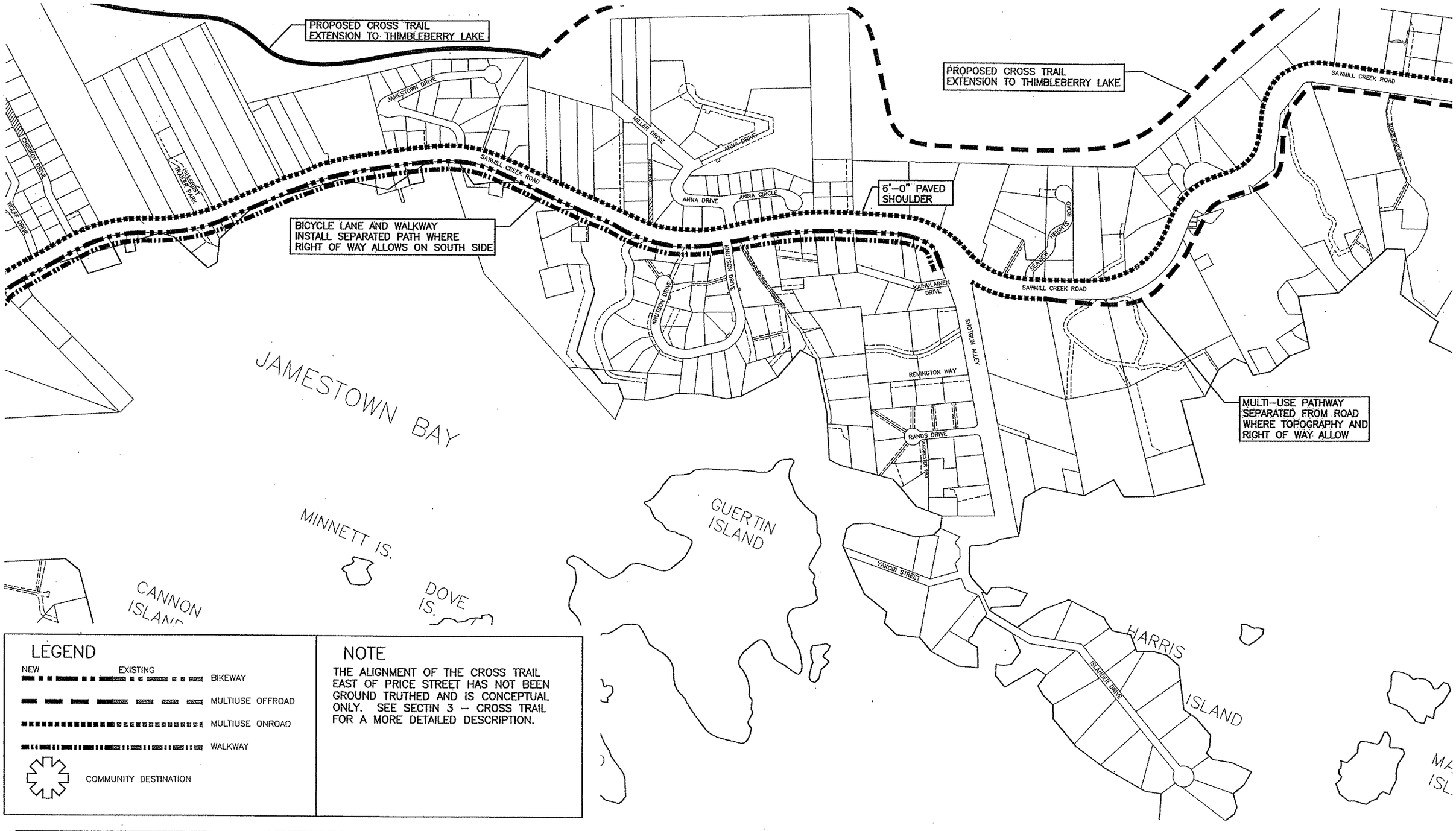

LEGEND

NEW / EXISTING

- BIKEWAY
- MULTIUSE OFFROAD
- MULTIUSE ONROAD
- WALKWAY
- COMMUNITY DESTINATION

NOTE

THE ALIGNMENT OF THE CROSS TRAIL EAST OF PRICE STREET HAS NOT BEEN GROUND TRUTHED AND IS CONCEPTUAL ONLY. SEE SECTIN 3 – CROSS TRAIL FOR A MORE DETAILED DESCRIPTION.

SITKA NON-MOTORIZED TRANSPORTATION PLAN

JAMESTOWN BAY

SHEET NO. 12

SCALE: 1:200
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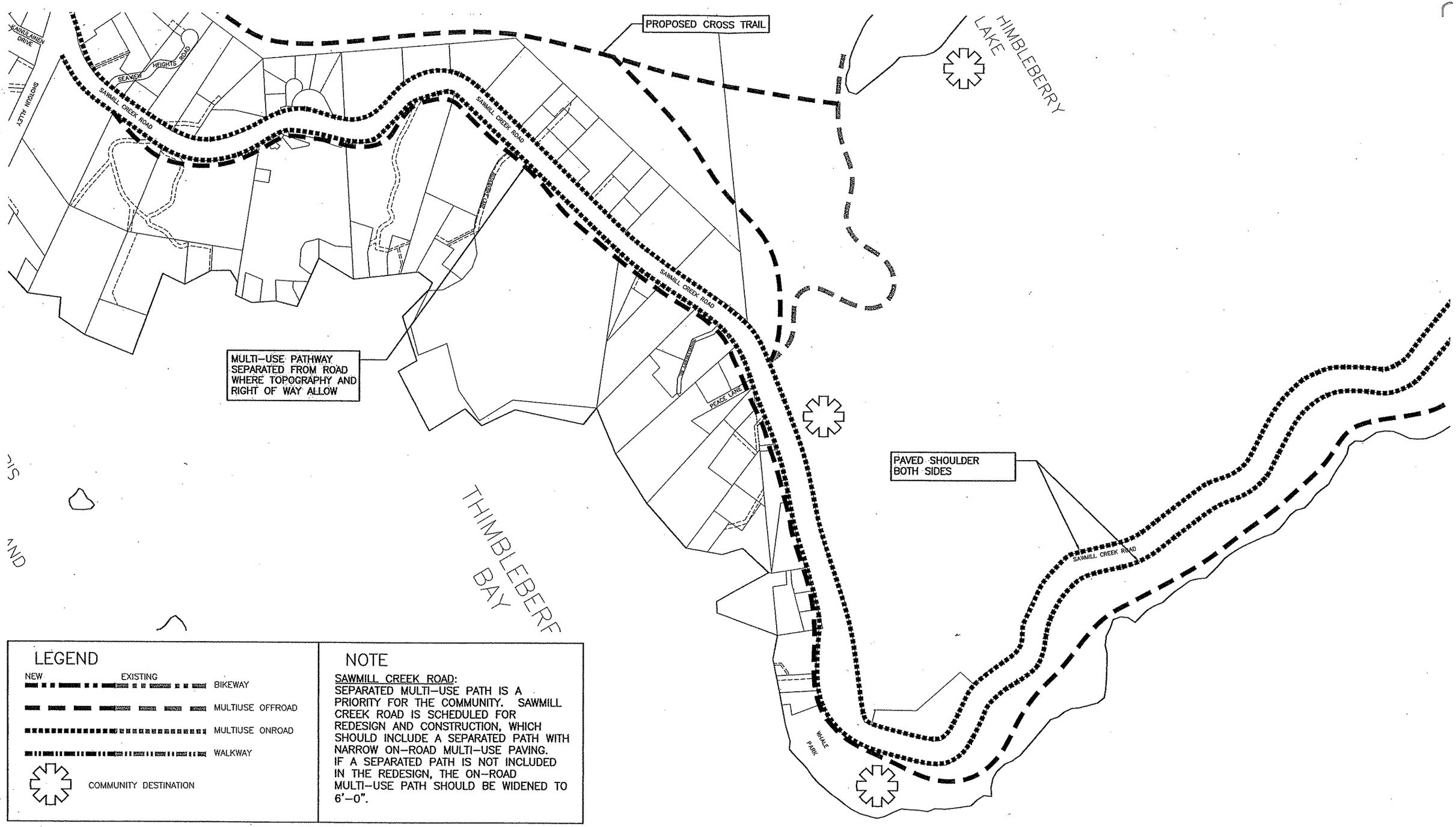

LEGEND

NEW / EXISTING

- BIKEWAY
- MULTIUSE OFFROAD
- MULTIUSE ONROAD
- WALKWAY
- COMMUNITY DESTINATION

NOTE

SAWMILL CREEK ROAD:
SEPARATED MULTI-USE PATH IS A PRIORITY FOR THE COMMUNITY. SAWMILL CREEK ROAD IS SCHEDULED FOR REDESIGN AND CONSTRUCTION, WHICH SHOULD INCLUDE A SEPARATED PATH WITH NARROW ON-ROAD MULTI-USE PAVING. IF A SEPARATED PATH IS NOT INCLUDED IN THE REDESIGN, THE ON-ROAD MULTI-USE PATH SHOULD BE WIDENED TO 6'-0".

SITKA NON-MOTORIZED TRANSPORTATION PLAN

THIMBLEBERRY

SHEET NO. 13

SCALE: 1:200
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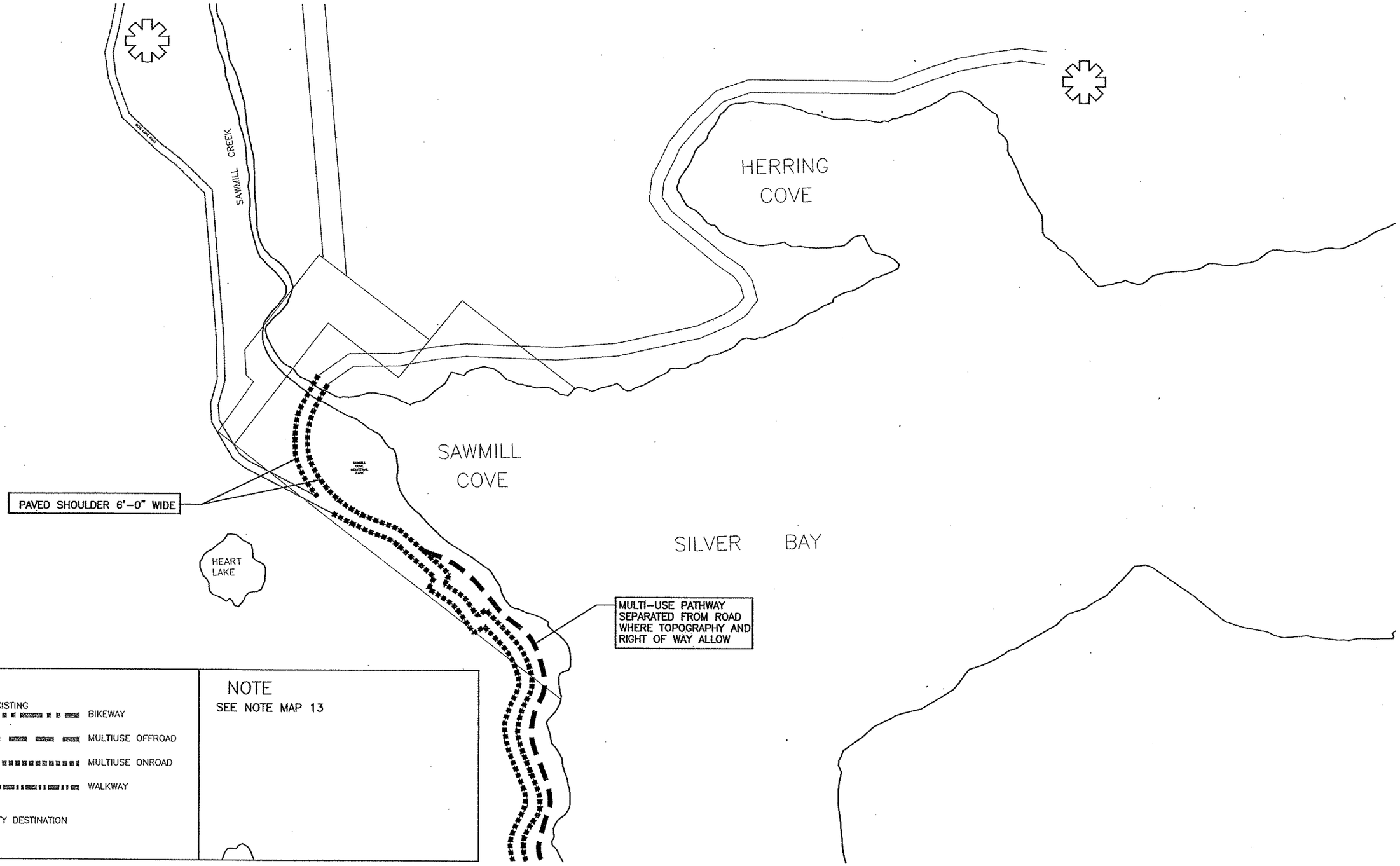

SITKA NON-MOTORIZED TRANSPORTATION PLAN

SAWMILL COVE

SHEET NO. 14

SCALE: 1:400
DATE: SEPTEMBER 15, 2002
FILE NO: 0202

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ASSESSMENT LEGEND

A- NO SIDEWALK
B- OBSTACLE IN SIDEWALK
C- SIDEWALK TOO NARROW
D- SIDEWALK SURFACE IN POOR CONDITION
E- END/START OF SIDEWALK
F- SIDEWALK IN POOR LOCATION
G- NO BIKE LANE
H- NO BIKE LANE OVER BRIDGE
I- BIKE LANE TOO NARROW
J- BIKE LANE SURFACE IN POOR CONDITION
K- END/START OF BIKE LANE
L- BIKE LANE IN POOR LOCATION
M- BIKE LANE FORCES RIDER AGAINST TRAFFIC
N- OBSTACLE ON BIKE PATH
O- NO ADA CURB CUT
P- UNDESIRABLE CROSSING POINT (DESIRE TO CROSS)
Q- ADA OBSTACLE
R- UNSAFE INTERSECTION
S- EXISTING TRAIL NEEDS UPGRADING
T- BLIND CORNER/INTERSECTION/ DRIVEWAY
U- POOR STRIPING/IDENTIFICATION OF BIKE LANE
V- NO BICYCLE FACILITY (ie. STORAGE)
W- MISCELLANEOUS

Sitka Non-Motorized Transportation Plan

Assessment of Deficiencies and/or Needs

Draft Spring 2002

The planning team of Jensen Yorba Lott has reviewed applicable planning documents and spent time in Sitka assessing the non-motorized transportation system and collecting input from agencies and the public. Sitka is a community with a large demand for non-motorized facilities as many of the residents are avid walkers, joggers and cyclists both as recreationists and commuters. Sitka has many non-motorized facilities and this list does not identify these existing facilities, rather lists the deficiencies and/or needs for safe travel. This is not a list of solutions or proposals, it is simply a list of problems, safety concerns and/or needs as identified by the community and the planning team.

1. **Halibut Point Road** (Starrigavan to Ferry Terminal)
   - No bicycle lanes, separated pedestrian pathway not adequate for commuter style of bicycle traffic.
   - Separated pathway is not continuous through Old Sitka Historic Park.
   - No safe crossing to Forest and Muskeg Trail.

2. **Halibut Point Road** (Ferry Terminal to Granite Creek)
   - No bike lanes across No Name Creek Bridge.
   - No sidewalks requiring pedestrians to walk in roadway.
   - Poor definition of bicycle facilities due to faded striping and lack of signs.
   - Vehicle parking in bike lanes including vehicles overhanging from driveways.
   - Gravel and debris creating unsafe riding conditions especially near rock quarry.
   - Broken pavement edge near McConkey Street creating narrow usable bike lane.

3. **Halibut Point Road** (Granite Creek to Cascade Creek)
   - No bike lanes across Granite Creek Bridge.
   - Separated pedestrian facility on bridge not adequate for bicycle use because of narrow width, metal decking, dangerous rails and poor transition created by guardrails.
   - Separated pedestrian facility on bridge has large openings in railings, and sharp handrails.
   - Broken pavement edge from Nicole Drive to Ross Street creating narrow bike lane.
   - No sidewalks requiring pedestrians to walk in roadway.
   - Poor definition of bicycle facilities due to faded striping and lack of signs.

4. **Halibut Point Road** (Cascade Creek to Lake Street)
   - No sidewalk from Cascade Creek to Cascade Creek Road.
   - Sidewalks at Cascade Creek Road have no curb cuts and bike lanes pinch to 3 feet wide.
   - Poor definition of bicycle facilities due to faded striping and lack of signs from Cascade Creek to Cascade Creek Road.
   - Crosswalk activation button at Katlian Avenue not ADA accessible.

- No on-street bike lane on Swan Lake side of road from Spruce Street to Lake Street.
- Separated pathway along Swan Lake has no entry for bicycles coming from Lake Street Intersection.

5. **Cascade Creek Road**
   - Steep road with poor sight distances, limited pedestrian and bicycle facilities.

6. **Edgecumbe Drive**
   - Existing bike lane only on one side of the road encouraging cyclists to disobey rules of the road and ride against traffic.

7. **Charteris Street**
   - No pedestrian or bicycle facilities feeding uphill residential neighborhoods.

8. **Georgeson Loop**
   - No trail head, parking facilities and poor surfacing from Charteris Street and Georgeson Loop to Cross Trail.
   - Trail in close proximately to rear yard of residential neighborhood.

9. **Gavin Subdivision to Indian River Subdivision**
   - Inadequate bicycle and pedestrian connection linking the Gavin Subdivision, Keet Gooshi Heen Elementary School, Sitka High School, Sheldon Jackson College, Trooper Academy and all of the neighborhoods in between.

10. **Keet Gooshi Heen Elementary School**
    - Mill Street does not have sidewalks or bicycle lanes to school.
    - Kostrometinof Street does not have sidewalk on west side of street and curb cuts require widening.
    - Does not have bike lanes on this street.
    - Kashevaroff Street does not sidewalk on east side of street and is without bicycle lanes.
    - There is no trailhead for Cross Trail at school.

11. **Peterson Avenue, Lake Street, Degroff Street**
    - Narrow with few markings or facilities for bicycle use.
    - There is a demand to use this as an alternate route around the congestion at the south end of Swan Lake.
    - No sidewalk along lakeside of Lake Street although a user created trail in evident.

12. **Moller Park**
    - There is demand for non-motorized traffic to move from Lake Street to Halibut Point Road through the park and along Moller Avenue.

13. Verstovia Street

- No sidewalks or bike lanes.
- Connection to High School from the end of Sirstad Street does not accommodate pedestrians or bicyclists due to steep gradient and poor surfacing.

14. Monastery Street

- There are no sidewalks or bike lanes.

15. Thomsen Harbor

- There is a demand for upgrading the existing trail between Thomsen Harbor and the old seaplane turnaround facility.
- Docks, ramps and transition decking of harbor have numerous barriers to individuals with disabilities.

16. Katlian Street

- Narrow, heavily used with no separated bicycle facilities.
- Channel side sidewalks are discontinuous and many are obstructed by vehicles parking on them.
- Street has many blind driveways and curves.

17. Kogwanton Street

- Narrow street with no sidewalks or bicycle lanes.

18. Lincoln Street (near City Hall)

- There is no sidewalk on waterside of street across from City Hall.
- There is no safe crossing to Harbor Way.

19. Lincoln Street (along Crescent Harbor)

- Street is narrow with no bicycle facilities.
- Sidewalk along harbor between Harbor Drive and Jeff Davis Street is too narrow to accommodate summer pedestrian traffic.
- This sidewalk leads people behind basketball courts and traps them.
- Sidewalk on town side of street needs curb cuts in several locations.

20. Lincoln Street (to Sitka National Monument)

- Narrow discontinuous sidewalk on one side of the street that does not accommodate existing demand.
- No bike lanes.

21. Harbor Way

- No sidewalk along City Hall side of street although there is a demand from Castle Hill to lightering facility.
- No safe crossing from lightering facility to Castle Hill or from Harbor Way to Harbor Drive.

22. Harbor Drive

- Existing sidewalks are too narrow for number of pedestrians moving between lightering facility and Lincoln Street intersection.
- Sidewalk on waterside of Harbor Drive from end of bridge to Maksoutoff Street creates desire to cross road in an undesirable location.

23. Waterfront (General)

- Lack of continuous pedestrian facilities from Thomsen Harbor, Katlian Street, the lightering dock, downtown, the National Historic Park and the Post Office.

24. Seward Street

- Many of the existing sidewalks have no ADA curb cuts.

25. O'Connell Bridge

- Heavily used by bicyclists and pedestrians, very narrow shoulders are not wide enough to safely accommodate bicycle use, narrow sidewalk on one side of the bridge.
- Poor lighting for safe bicycle and pedestrian travel.

26. Japonski Island (Road to UAS and Mt. Edgecombe High School)

- There is no sidewalk or bike lane between University of Alaska Southeast, Mt. Edgecombe High School and the bridge.
- The existing road between these facilities has poor lighting, is narrow and floods causing non-motorized traffic to walk down the middle of the road.

27. Japonski Island (Airport Road)

- Sidewalks and bike lanes are not continuous from the bridge to the airport.
- In front of the airport ADA curb cuts and safe crossings are needed.

28. Japonski Island (Seward Avenue, Tongass Drive)

- Sidewalks are not continuous and need ADA curb cuts.
- There are no bike lanes.

29. Cross Trail (Ferry Terminal to Whale Park)

- Better off-highway bicycle and pedestrian facilities are needed from the Ferry Terminal to Indian River and on to Whale Park with connections to all of the neighborhoods, schools and destinations along the way.

30. Sawmill Creek Road (Lake Street to Jeff Davis Street)

- The street is narrow with no bike lanes and narrow sidewalks.
- On the north side of the street the utility poles are in the sidewalk forcing wheel chairs and other users into the street.

31. Jeff Davis Intersection

- Lack of sidewalks, bike lanes and the many different directions of motor vehicle travel make it undesirable for pedestrians and bicyclists trying to cross any of the streets in this intersection.
- The connection to the separated path is well behind the stop sign on Jeff Davis Street making it hard and undesirable to transition on and off the path.
- Motor vehicle drivers are not accustomed to having to watch for bicyclists crossing in front of them before they get to the stop line.

32. Sawmill Creek Road (Jeff Davis Street to Post Office)

- There are no on-street bike lanes.
- The separated path along this section of road is too narrow to safely accommodate existing use.
- The separated pathway bridge has rough transitions on and off of it and the railing is unsafe due to the sharp ends.
- The separated pathway is not continuous, encouraging non-motorized traffic to make multiple crossings of Sawmill Creek Road or continue travel on the wrong side of the road.

* ~~post~~ pedestrian crossing

33. Sawmill Creek Road (Post Office to Sawmill)

- The road is narrow with no bike lanes or sidewalks, it has poor sight distances and is undesirable for commuting and recreating by bicycle and foot.
- The road needs facilities for safe bicycle and pedestrian use.

34. Monastery Street

- From Oja to Lincoln Street is too narrow for a two-way travel.
- There is no sidewalk from Baranof School to Lincoln Street.

35. Baranof Elementary Playground

- There is a well-used route through the playground, between Monastery Street and Baranof Street that needs upgrading.

36. National Historic Park

- Lack of non-motorized facilities through the park to Sheldon Jackson College, the Post Office, Raptor Center and Indian River Subdivision.

37. Indian River Road

- Lack of pedestrian and bicycle facilities between subdivisions and waterfront

38. Lance Drive and Price Street Neighborhood

- No sidewalk or bicycle facilities.

39. Barracks Street

- No sidewalk or bicycle facilities.

Need to work with planning commission

State Historical Park GMP

General Assessment Comments

1. **Signage** – A regulatory and directional signing plan should be developed for the community that is consistent with the Manual On Uniform Traffic Control Devises.
2. **Lighting** – Non-motorized scale lighting is deficient throughout the community.
3. **Sidewalks** – Many of the existing sidewalks are narrow and do not have ADA curb cuts in older sections of town.
4. **Intersections** – Every intersection is different in how pedestrians and bicyclists are expected to pass through. A uniform treatment is needed. Many ADA improvements are needed.
5. **Bike Racks** – Need more throughout the community at destination points
6. **Parking** – Parking in bike lanes is a problem
7. **Bike Lanes, paved shoulders and separated pathways** – Many of these facilities do not get adequate sweeping in the summer or snow removal in the winter.
8. **Education** – Drivers don't understand rights of bicyclists, bicyclists don't obey rules of the road
9. **Subdivision Review** – Lack of ordinance to require easements through subdivision before they are built.
10. **Scale of Transportation Facilities** – Character and proportions of some existing transportation facilities are inconsistent with environment and scale of Sitka
11. **Non-Motorized Water Craft** – Lack of launch, recovery and storage facilities for kayaks, canoes and other non-motorized watercraft at water based destinations.