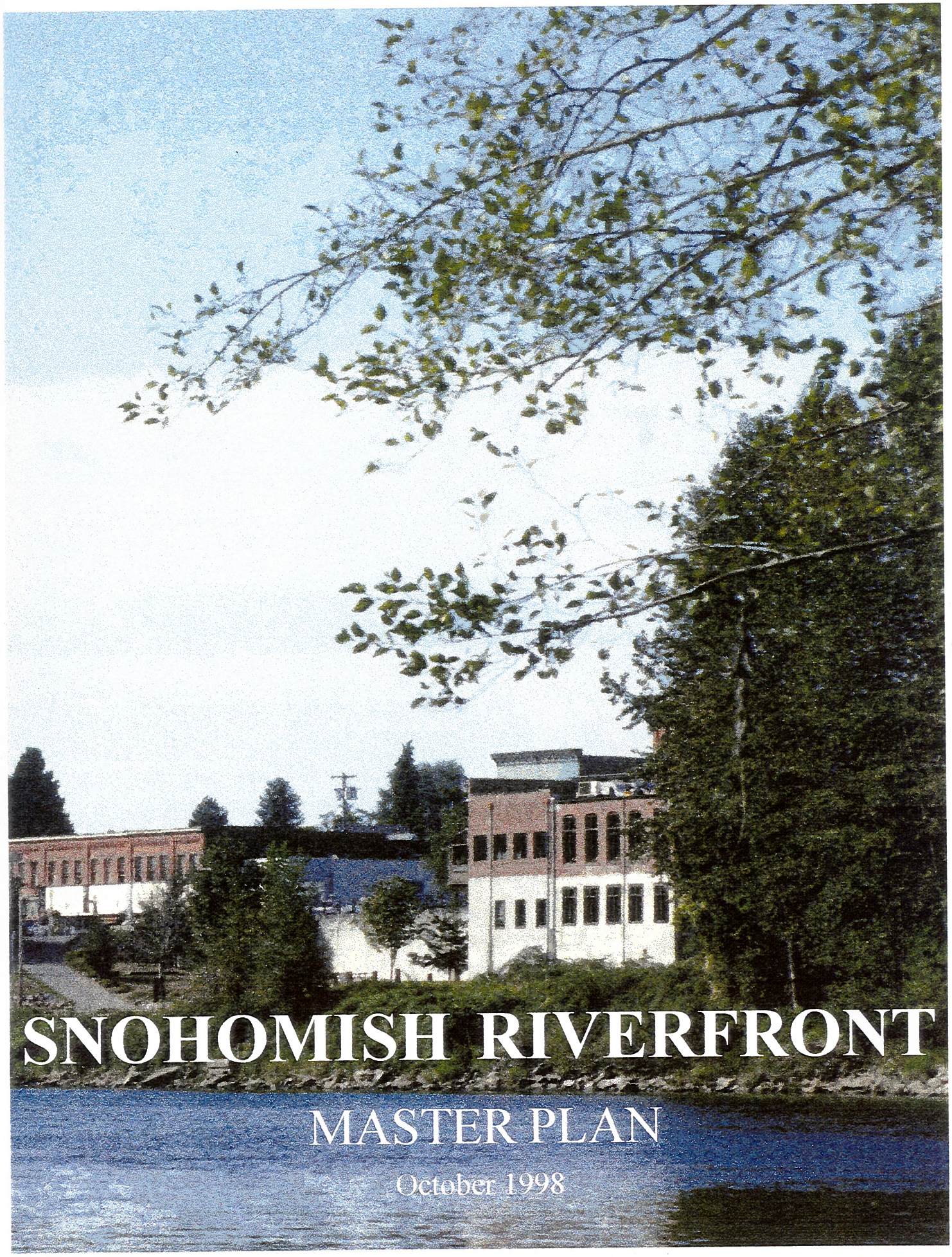

# SNOHOMISH RIVERFRONT

## MASTER PLAN

October 1998

# I. INTRODUCTION

The City of Snohomish embarked on this planning study with an expansive list of issues to be addressed. There has been considerable support for development of a trail along the riverfront for years, and citizen groups and individuals have been pushing ahead with development in many areas. The Snohomish River is a river of statewide significance experiencing increased flooding in recent years and there have been recent bank failures that threatened businesses. Flooding on the lower levels of the riverbank impacts businesses and potential trail use. Regional trail planning has moved forward and the City of Snohomish is located at a critical convergence of three County and statewide trail systems. Downtown Snohomish contains a designated National Historical District and the community has been working to increase tourist trade in recent years.

The Community Development Plan specifically addresses development along the riverfront under the Economic Development Goals in Policy ED 1.8:

> *Develop riverside access and facilities to take advantage of the Snohomish River. Development of this resource should result in increased activity in the downtown area and increased business, in addition to making the downtown more attractive.*


*Location Map*

**CITY OF SNOHOMISH**
**Snohomish, Washington**

**RESOLUTION 1051**

**A RESOLUTION OF THE CITY OF SNOHOMISH, WASHINGTON ADOPTING THE 2002 UPDATE TO THE SNOHOMISH RIVERFRONT MASTER PLAN.**

**WHEREAS**, the Community Development Plan adopted by the City contains a policy to develop the access and facilities to take advantage of the Snohomish River to further economic development of the Historic Business District; and

**WHEREAS**, pursuant to Resolution 948, the City developed a plan using a Council appointed task force and a public process involving property owners, business owners and the citizens of the City; and

**WHEREAS**, the public process included workshops and public meetings regarding development of the Snohomish Riverfront; and

**WHEREAS**, the plan also includes provision for a critical link in the regional trail system; and

**WHEREAS**, public meetings on the proposed update were held on February 26 and July 24 by the Park Board; February 13 and June 12 by the Design Review Board; and on September 3 by the City Council; and

**WHEREAS,** ensuing events and changed conditions have necessitated revisions to the adopted plan, including such events as the abandonment by the Burlington Northern Santa Fe Railway Company of the remaining section of the former Northern Pacific route in the City, and the cancellation of condemnation proceedings against riverfront property east of Cady Park,

**NOW, THEREFORE, BE IT RESOLVED** that the Snohomish City Council does hereby adopt the attached 2002 Update to the Snohomish Riverfront Master Plan.

**PASSED** by the City Council and **APPROVED** by the Mayor this 3rd day of September 2002.

CITY OF SNOHOMISH

By _____
Cameron M. Bailey, Mayor

ATTEST:

By _____
Torchie Corey, City Clerk

APPROVED AS TO FORM:

By _____
Grant K. Weed, City Attorney

# CITY OF SNOHOMISH

*Founded 1859, Incorporated 1890*

116 UNION AVENUE ▫ SNOHOMISH, WASHINGTON 98290 ▫ TEL (360) 568-3115 FAX (360) 568-1375


August 23, 2002

Mayor Cameron Bailey
City of Snohomish
116 Union Avenue
Snohomish, WA 98290

RE: SNOHOMISH RIVERFRONT MASTER PLAN UPDATE RECOMMENDATION

Dear Mayor Bailey and City Council Members:

The Snohomish Riverfront Master Plan Citizen Task Force is pleased to present the Snohomish Riverfront Master Plan 2002 Update document for council consideration.

This master plan update is necessary to allow implementation of the trail long desired by local, county, and regional citizens; and to reflect current circumstances not present in 1998 at the adoption of the original master plan.

Adoption of the master plan update will bring us another step closer to reaping these project benefits:

Improved Snohomish riverbank stability,
Promotion and preservation of National Historic District businesses,
Establish and promote Snohomish as a "hub" for trail use: Centennial Trail North, Centennial Trail South/East, Burke-Gilman/Lake Sammamish Trails, Snohomish/Lowell/Everett Trail, Interurban Trail, and
Connect and prompt redevelopment of two city waterfront parks.

We wholeheartedly recommend adoption of the Snohomish Riverfront Master Plan 2002 Update at your scheduled meeting on Tuesday, September 3, 2002.

Thank you for your enthusiastic attention to this matter. I'm looking forward to singing "Happy Trails" (Roy Roger's theme song).

Sincerely,

Ron Alldredge

Ron Alldredge
Chair, Snohomish Riverfront Master Plan Citizen Task Force

# ACKNOWLEDGMENTS

This Master Plan would not have been possible without the assistance of a great number of individuals. We wish to thank the following people for their time and input:

**CITY OF SNOHOMISH**

***Mayor and City Council***
Jeff Soth, *Mayor*
Chris Lundvall, *Mayor pro tem*
Susan Murphy
Bruce Berner
Dean Randall
Doug Thorndike
Liz Loomis

***Parks and Recreation Board***
John First, *Chair*
Phoebe Bachleda
Nancy Lemon-Knoll
Rebecca Ryan
Jim Price

***City Staff***
Bill McDonald, City Manager
Mark Beardslee, Community Development Department Director
Mick Monken, City Engineer
Ann Caley, Senior Planner

**CONSULTANTS**
MacLeod Reckord Landscape Architects
*Terry Reckord*
*Connie Reckord*
BST Associates, Economist
*Paul Sorenson*
KJS Associates, Inc., Transportation Planners
*Mike Read*
Makers, Architects and Urban Planners
*Dave Boyd*
Pacific Rim Resources, Public Involvement Specialists
*Jim Bennett*
*Janet Sundall*
Peratrovich, Nottingham and Drage, Inc., Engineering Consultants
*Mike Hartley*
Sheldon and Associates, Environmental Scientists
*Dyanne Sheldon*

**CITIZEN TASK FORCE**
Ron Alldredge, Chair
Phillip Baldwin
Bill Bates
John First
John Hager
Chris Lundvall
Frank Strahm

**OTHERS**
Snohomish Historical Society
Public Meeting and Open House Attendees

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# I. BACKGROUND

## Community Support

There is a long history of community planning and support for trail development and enhancement along the Snohomish Riverfront. The 1995 City of Snohomish Community Development Plan illustrates the current planning that has been adopted to guide the future development of the City and its Riverfront. The following plans from that document (Figure 1 and Figure 3) were used most extensively in establishing the framework for this study. Figure 2 is from the 1997 City of Snohomish Transportation Model.

Figure **1**: Map CO-3 Existing and Future Park Facilities
Figure **2**: 1996 PM Peak Hour Volumes for Downtown Snohomish
Figure **3**: Map TR-4 Pedestrian Linkage Plan

## Local Use

At the local level, the Riverfront Trail will serve the residents and businesses of Snohomish. The trail, which is routed through the Historic Business District, residential areas and local parks, will provide an important connector for residents to travel and recreate in their own community. The trail will be designed to accommodate both pedestrians and bicyclists. The Final trail plan will meet requirements for accessibility as per the Americans with Disabilities Act, however some portions of the Interim plan will require assisted access and will be signed accordingly. A separate equestrian trail for the Centennial Trail connection may be provided outside of the city along the Pilchuck River.

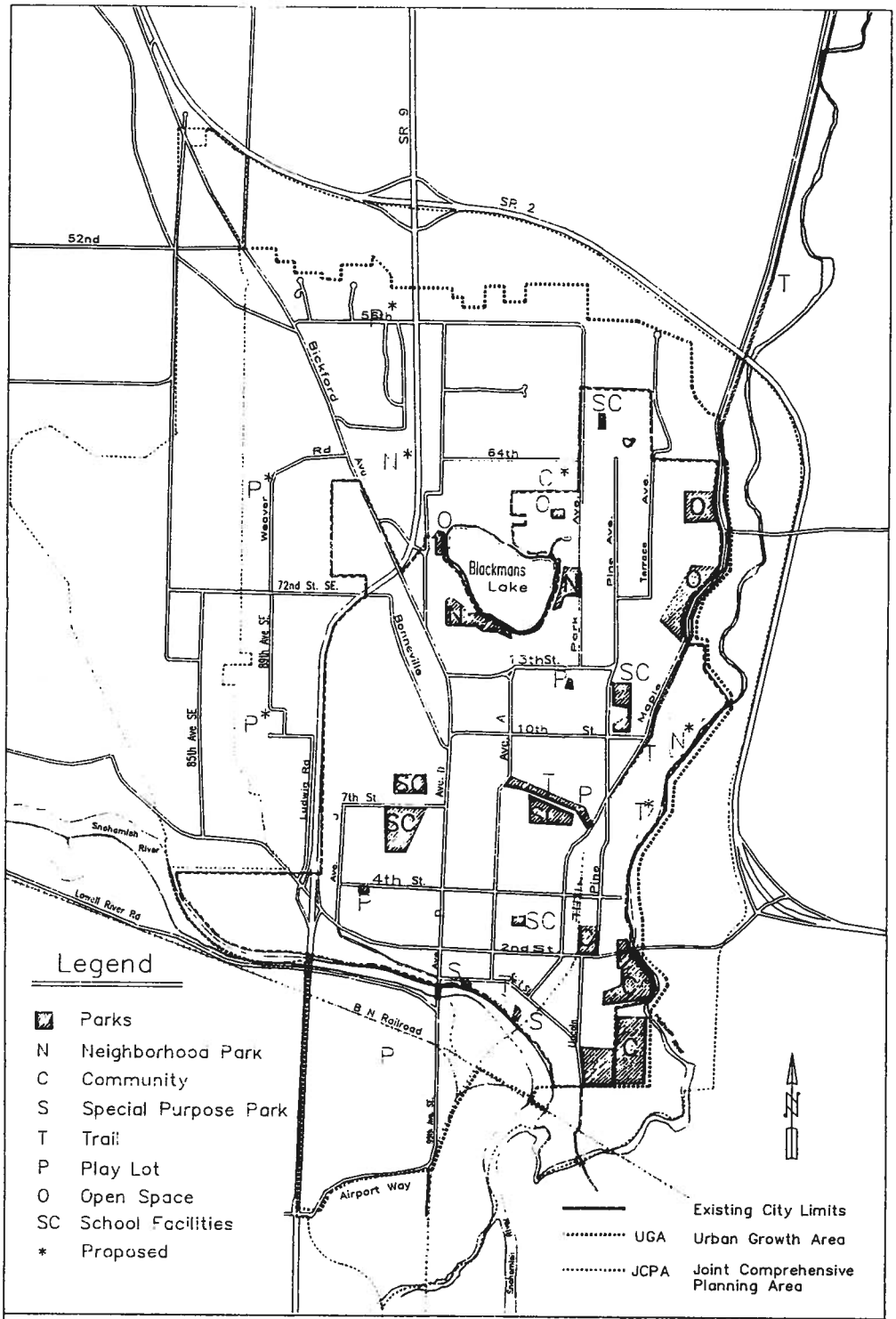
*Riverfront trail west of Cady Park*

## Regional Trail Connections

The Riverfront Trail with its connections to the two regional trails (Centennial and Lowell-Snohomish) will ultimately serve thousands of trail users each year with a variety of interests.

Currently the Centennial Trail is used primarily as a recreational trail, with some commuter use. There are plans

*Centennial Trail at Pine & Maple*




**Map CO-3 Existing and Future Park Facilities**

Basemap\CMPMAP 95

***from City of Snohomish COMMUNITY DEVELOPMENT PLAN***



Figure 1

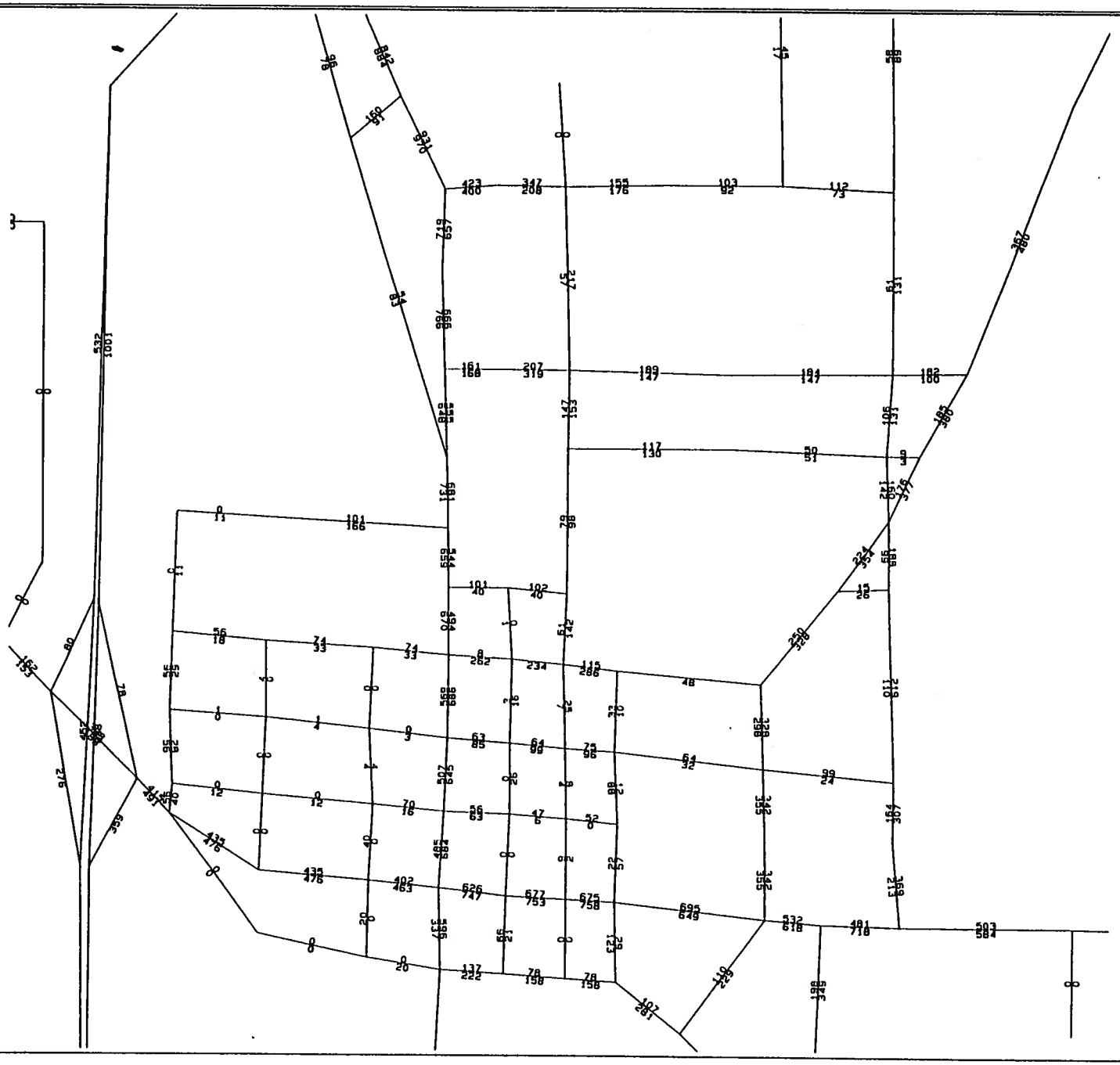


Figure 2

TMODEL™2

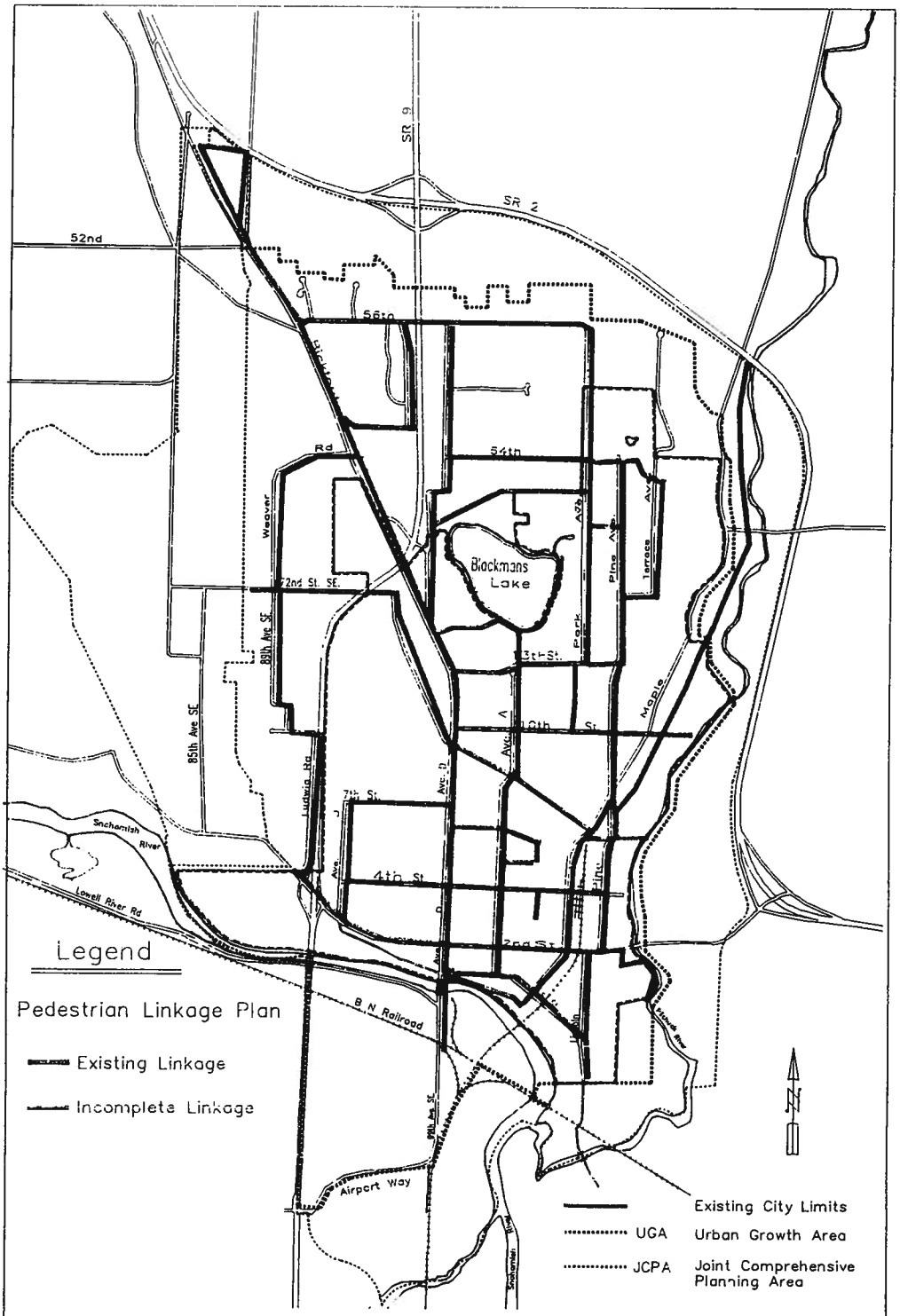
# 1996 PM PEAK HOUR VOLUMES

## CITY OF SNOHOMISH DOWNTOWN AREA

WILLIAM POPP ASSOCIATES, BELLEVUE, WA

WILLUM95.LLX
SNOH04.NDE

LL: 2175/ 1089
UA: 3879/ 2689
03-31-1997




**Map TR-4 Pedestrian Linkage Plan**

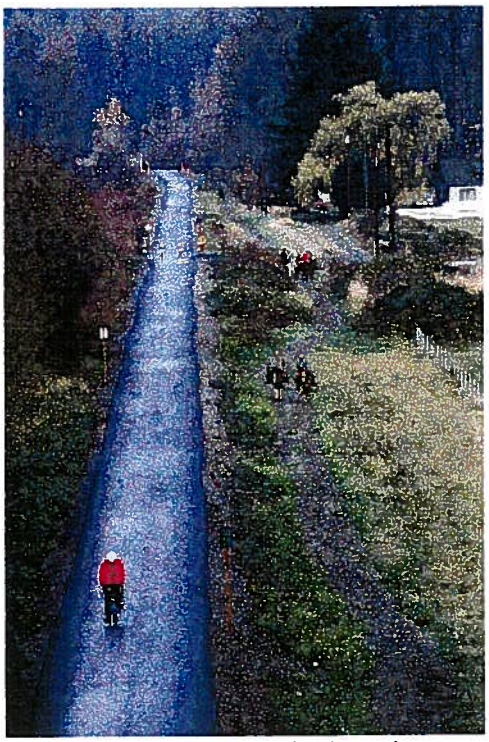
***from City of Snohomish COMMUNITY DEVELOPMENT PLAN***



Figure 3

underway to extend the existing 7-mile trail between Snohomish and Lake Stevens another 18 miles north through the city of Arlington to the Skagit County line and another 9 miles southeast to Monroe and 6 miles further south to the King County line. These connections to other larger regional trail systems will allow expanded recreational and commuter use of the trail as it passes through Snohomish.

Portions of the Lowell-Snohomish Trail are planned to be under construction by 1999. This 5-mile trail extends from Snohomish to Everett, and will include a recreational (off-road) trail as well as a commuter (on-road) trail over most of its length. The Riverfront Trail through Snohomish will serve as the connector between these two County regional trail systems.



*Centennial Trail north of Snohomish*

## Countywide Trail Systems

Snohomish County has developed a Draft Non-Motorized Transportation Plan which illustrates overall County systems of trails and identifies how these systems connect to the trail systems in neighboring Counties. See Figure 4 on the following page.

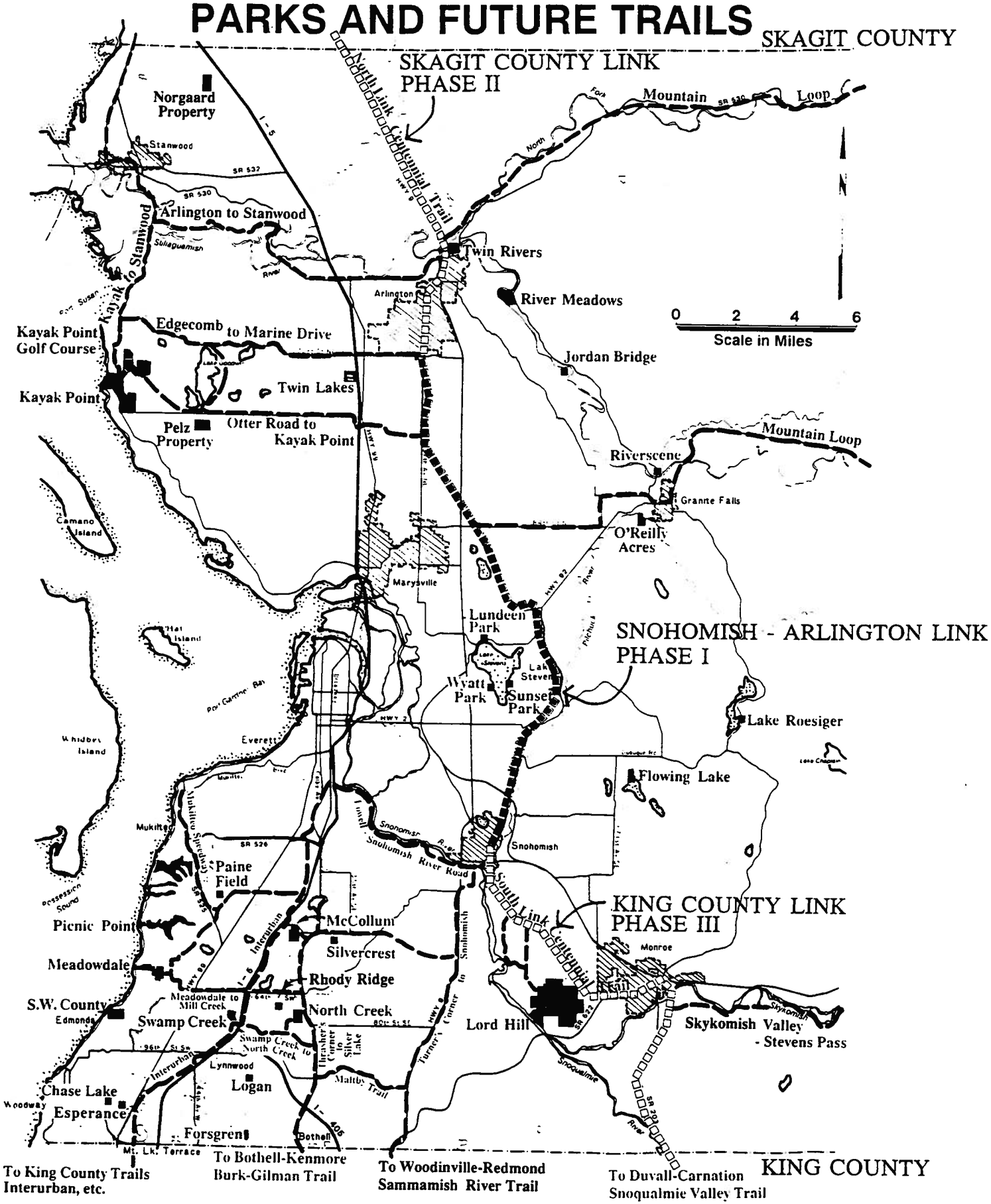
## Program

With the long history of planning for the Riverfront Trail, the City staff, Task Force members and many residents had a good understanding of the major issues and programmatic needs for the trail. As part of the planning process it was important to assure that all issues of concern and interest to the community were addressed. A series of public meetings and open house presentations were held to gather input and test preliminary design ideas. From these gatherings and meetings with the staff and Task Force, an Interim and Final plan were developed that reflect the needs and the desires of the community at large.

The Final plan is the preferred ultimate plan. However, it involves properties not currently owned or available to the City. It was necessary to develop an Interim plan that utilized only those properties in public ownership or with public access easements or lands that

*Riverfront Public Meeting*

# SNOHOMISH COUNTY PARKS AND FUTURE TRAILS



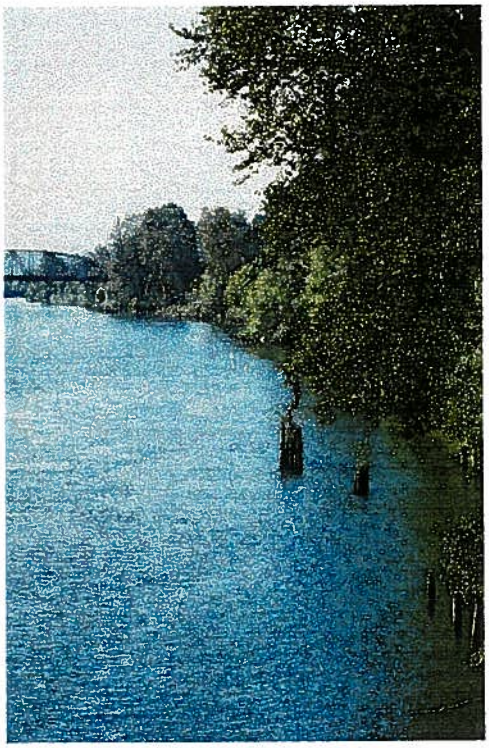

Snohomish County Trails Plan



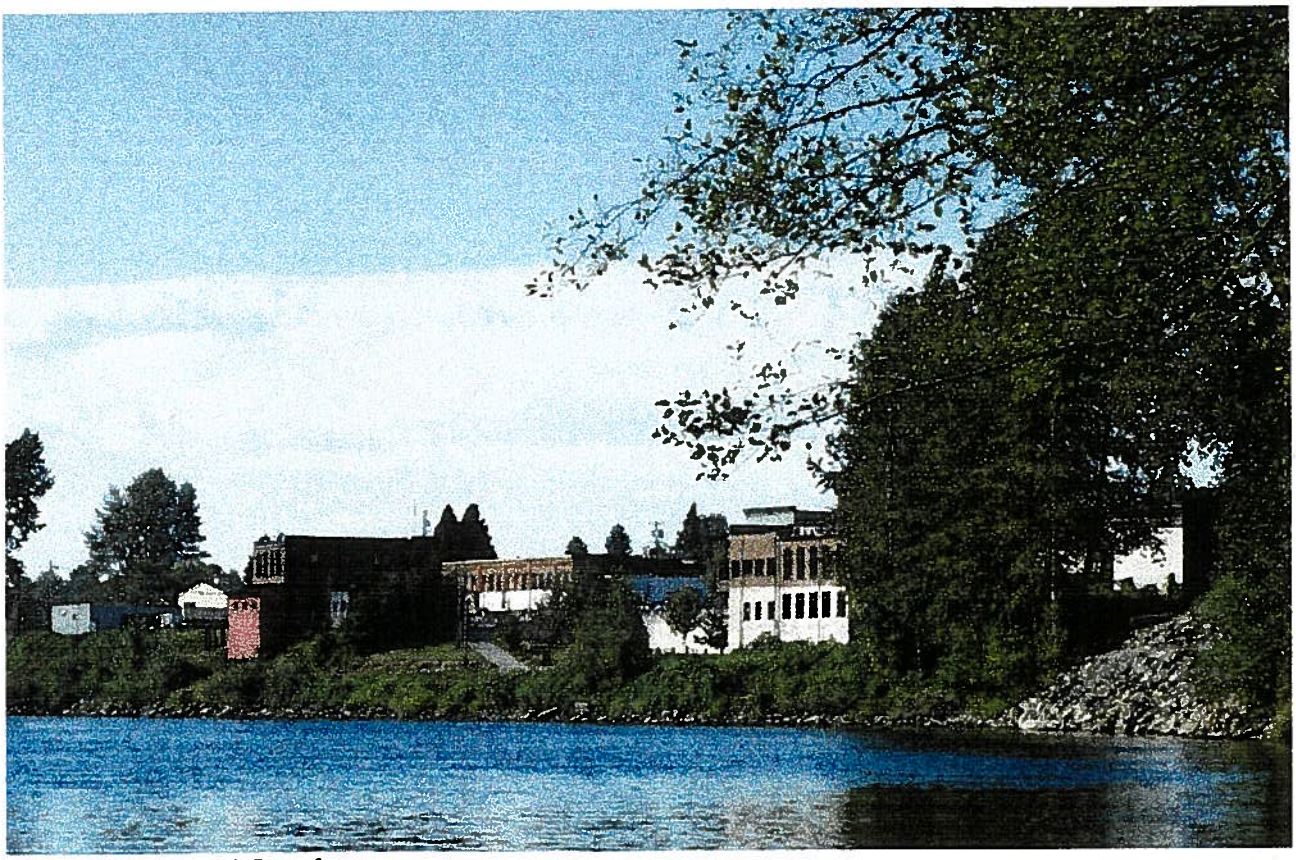
Figure 4

were anticipated to be in available through easement or public ownership by the time trail development occurs.

Generally, the program includes a multi-use trail that serves to improve and enhance access and viewing along the riverfront, improve and increase connections to First Street and the Historic Business District (HBD), and make connections to local parks and public facilities as well as the two regional trail systems. In addition, the program includes redevelopment of two riverfront parks that serve as important destinations along the Riverfront, the trail, and the HBD.



*View west of Avenue D*



*Downtown Snohomish Riverfront*

# III. INVENTORY & ANALYSIS

## Study Area

The study area covers approximately 600 acres and extends along the north bank of the Snohomish River from the Wastewater Treatment Plant at the west end to the Pilchuck River at the east end of town including the area from the riverfront to Second Street and south to the proposed terminus of the Lowell-Snohomish Trail. It also includes the area from the southern terminus of the Centennial Trail (Phase 1) to the BNSF Railroad main line and the future extension of the Centennial Trail to Monroe (Phase 3), between Maple Avenue and the Pilchuck River.

## Inventory by Segment

The study area was evaluated in terms of suitability for trail development, ease of connectivity, value and desirability to businesses and residents, cost and safety. Lands in public ownership, including right-of-ways, were identified, as were prospective properties that were well suited to trail and park development. The end result was identification of a network of corridors that could accommodate trail development to varying degrees. Those corridors have been identified as follows:

***Central Section:*** from Kla Ha Ya Park to Cady Park along the riverbank. A narrow trail has already been developed along this section, and is testimony to the fact that the City and community strongly support riverfront trail development here. Businesses in the HBD fronting First Street back up to this trail, some using the trail as service access to their establishments. The City and many businesses recognize the commercial benefit of trail construction and redevelopment of the riverfront and are interested in seeing improvements along this corridor and in the two parks that are the east and west termini of this section.

*Existing trail east of Kla Ha Ya Park*

***Avenue D Crossing:*** includes the area from the American Legion building to the City-owned property on the west side of Avenue D. Avenue D is a busy arterial that represents a major obstacle to making trail connections between the Central Section and the West Side of the project area. In addition, the Avenue D bridge structure as currently designed will not safely accommodate the high volumes of

*Avenue D bridge*

*Trail at the Treatment Plant*

*Stocker property*

*BNSF at Central Feed*

*Lincoln Avenue*

bicycle and pedestrian traffic expected when the Lowell-Snohomish Trail is constructed.

***West End:*** is that portion of the study area from the Wastewater Treatment Plant to the Avenue D crossing. It includes First Street and properties between the street and the river in public and private ownership. City-owned land in this section is significant and includes the Public Works Shop, with its maintenance yard and storage facilities, and the Treatment Plant, with a large decommissioned lagoon. Privately owned land further west includes a Class I wooded wetland recognized locally for its habitat value for many species of birds. This section of the study area does not serve as a critical connector for other regional trails, as do the other sections, however there is considerable local support for a trail system connecting to the features in the west end of the community.

***East End:*** extends from Cady Park to Lincoln Avenue and Centennial Trail Phase 3. This part of the study area includes First Street and the Stocker property located between Cady Park and the Stocker Soccer Fields. The City is acquiring the Stocker property, which will provide room for additional trail and park development along the river.

***BNSF Railroad Spur Line:*** is the north-south running rail line that connects Central Feed at 4th Street and Maple Avenue to the Burlington Northern Santa Fe main line, located south of the Snohomish River. There are no immediate plans for abandonment of this line, and the City anticipates shared use of the right-of-way in the future. The study area includes the city streets that run parallel and perpendicular to the spur line (Maple, Willow, Pearl, etc.) as potential corridors for shared (and formalized) bicycle/ pedestrian/vehicular use.

***Lincoln Avenue:*** from Fifth Street south to the City limits where it would connect to Centennial Trail Phase 3. North of Fifth Street, the study area includes the private property of Olympic Four by Four, which extends north from the Lincoln Street right-of-way and abuts the BNSF Railroad spur line. Other corridors within this part of the study area are Pine Avenue, the Pilchuck River and the east-west routes that connected these streets. On Lincoln Avenue, north of Second Street, the street is paved but un-

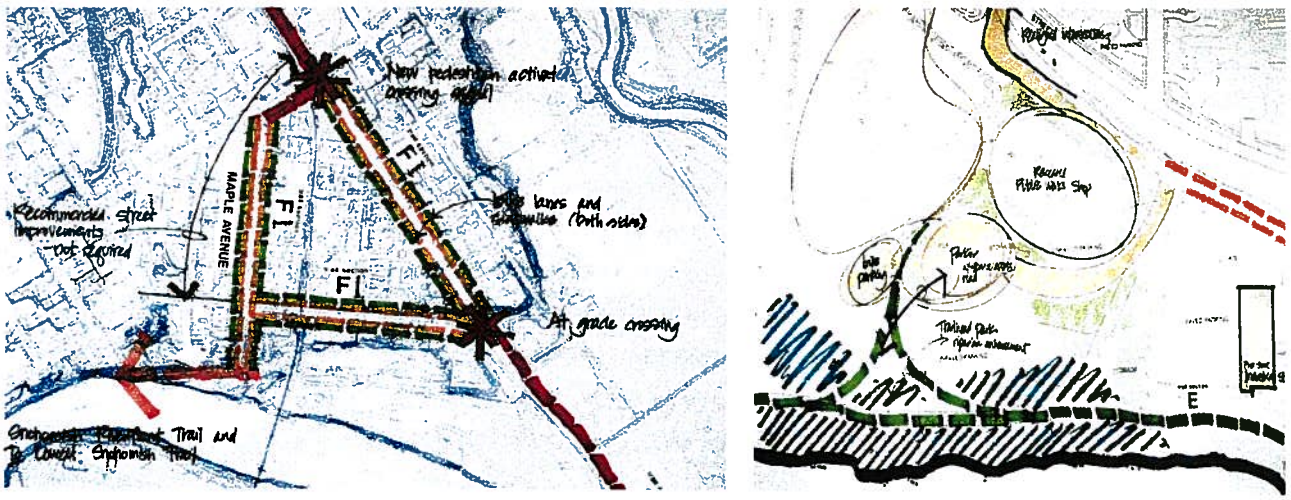
improved, without defined parking or curbed edges. South of Second, Lincoln is a main arterial with wide paved shoulders and consistent curb, gutter and sidewalk. Just beyond the current city limits the County has plans to improve Lincoln where it crosses under the BNSF Railroad main line and crosses over the Pilchuck River.

*Aerial perspective between Avenue D bridge and Cady Park*

*Aerial plan view of Snohomish*

# IV. ALTERNATIVES

Within each of these segments of the study area, there are numerous possibilities for trail routing. Some include on-street solutions (bike lane and sidewalk), while others can accommodate a more typical full-width trail separated from traffic. Some alternatives require acquisition of property or cooperative efforts with neighboring properties. The range of routing and construction options means there are a number of permit issues, costs, and construction impacts to consider. The City and the Task Force, with input received at the public meetings, open houses and surveys, reviewed and evaluated the alternatives presented (see Appendix). The Master Plan compiles the preferred options from each segment into one cohesive plan.




*Alternative Plans*

# V. MASTER PLAN

## Final Plan

Figure 5

The final plan provides all the connections necessary to fully integrate the Riverfront Trail with the surrounding regional trails. It is an off-road trail, which does not share roadway with vehicular traffic, except at crossings. The main paved trail into Snohomish does not accommodate equestrian traffic, however a recommended separated equestrian trail located along the Pilchuck River does provide the Centennial Trail connection (Phase 1 to Phase 3) and provides equestrian access from the Centennial through the Stocker property to Cady Park.

*Final Plan detail*

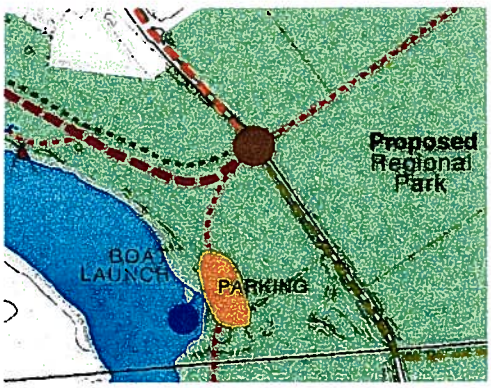
It is necessary to acquire property or easements from private property owners in order to implement the final plan. Use of the BNSF spur line would require an Interim Trail Use Agreement or, as a minimum, a joint use agreement would have to be negotiated. Private property between the City Public Works Shop and Avenue D would have to be acquired or easements dedicated. This may be more readily accomplished with the recent land use designation change to commercial in this area. City/County coordination would be required to provide paved and equestrian access under the Pilchuck River vehicular bridge on Lincoln Avenue.

## Interim Plan

Figure 6

The Interim Plan is one that can be accomplished on land currently owned or planned for acquisition easement by the City in the near future. Portions of the route are located on existing and opened public right-of-ways, requiring redevelopment or rechannelization of existing streets. Not all parts of the route are considered ADA accessible, however accommodations for handicap parking are provided at various points along the way to make a majority of the route accessible.

Proposed improvements identified in the Interim Plan will be beneficial additions, improving non-motorized transportation throughout the city.



*Interim Plan detail*

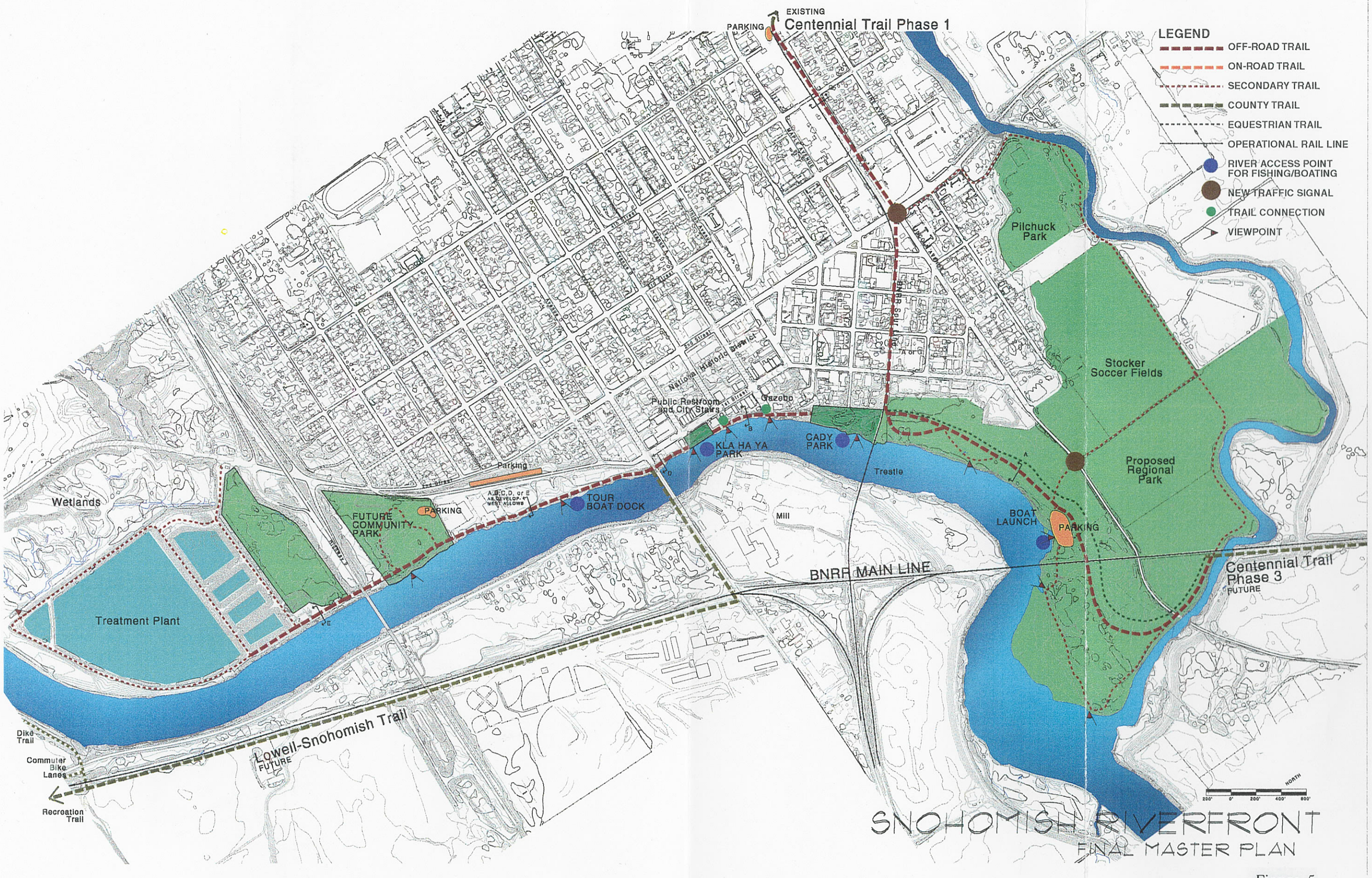
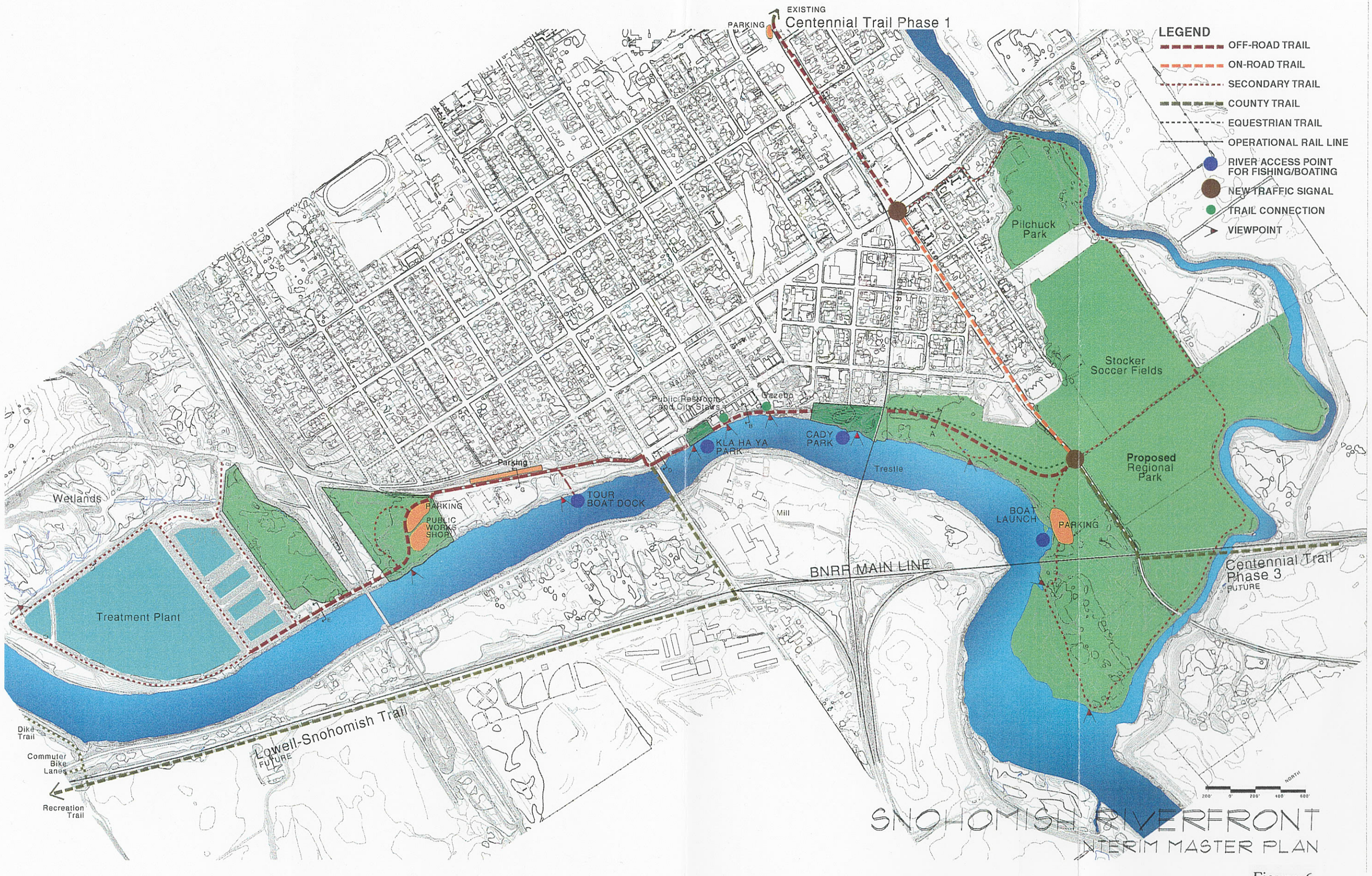

EXISTING
Centennial Trail Phase 1
PARKING
LEGEND
OFF-ROAD TRAIL
ON-ROAD TRAIL
SECONDARY TRAIL
COUNTY TRAIL
EQUESTRIAN TRAIL
OPERATIONAL RAIL LINE
RIVER ACCESS POINT FOR FISHING/BOATING
NEW TRAFFIC SIGNAL
TRAIL CONNECTION
VIEWPOINT
Pilchuck Park
Stocker Soccer Fields
Proposed Regional Park
Public Restroom and Ctr Stairs
Gazebo
KLA HA YA PARK
CADY PARK
Trestle
Parking
Wetlands
FUTURE COMMUNITY PARK
PARKING
TOUR BOAT DOCK
Mill
BOAT LAUNCH
PARKING
BNRR MAIN LINE
Centennial Trail Phase 3
FUTURE
Treatment Plant
Lowell-Snohomish Trail
FUTURE
Dike Trail
Commuter Bike Lanes
Recreation Trail
NORTH
SNOHOMISH RIVERFRONT
FINAL MASTER PLAN

Figure 5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PUBLIC WORKS SHOP
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Treatment Plant
Mill
BOAT LAUNCH
PARKING
BNRR MAIN LINE
Centennial Trail Phase 3
FUTURE
Dike Trail
Commuter Bike Lanes
Recreation Trail
Lowell-Snohomish Trail
FUTURE
NORTH
SNOHOMISH RIVERFRONT
INTERIM MASTER PLAN

Figure 6

## Kla Ha Ya Park Plan

Figure 7

The location of Kla Ha Ya Park makes it a critical element in planning for the trail and making positive connections between the trail and First Street. The park is low on the bank and out of view from the busy commercial corridor of First Street, making it underutilized. The program called for making the park a more vital part of the commercial corridor as well as enhancing the Riverfront connection.

In the proposed plan this is accomplished by lowering the concrete parapet wall that extends above the sidewalk on First Street and widening out the sidewalk to accommodate viewing areas, interpretive displays and room for vendors or portable booths. From this point, the park is terraced towards the river with a series of stairs, shallow ramps and landings, creating more viewpoint areas and terraces for commercial or interpretive displays. Just above existing trail grade and the ordinary high water level the terraces would end at a boardwalk 'trail', twenty or more feet wide and constructed to accommodate trail users, small public gatherings and vendors. There would be access from this boardwalk to a seasonal floating dock at water level, making fishing and boat access possible from the park and the trail. Emergency and limited business vehicle access would be accommodated on the trail from east and west of the park. Business access would be restricted to certain hours of the day and vehicles would be limited in size and weight.

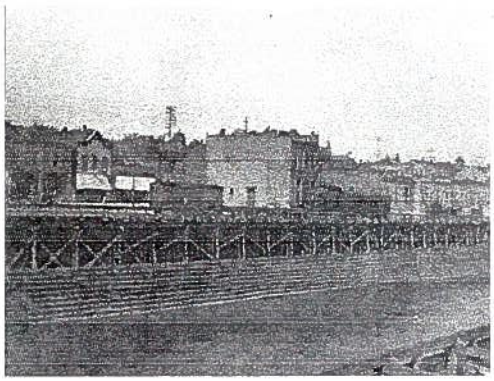
The boardwalk and terrace structure would be built to withstand periodic flooding. Detailing for the riverfront façade of the boardwalk structure would draw from the design of the historic docks along the river. Refer to Issues/Recommendations portion of this report for further discussion about ***Riverbank Engineering and Stabilization*** and ***Urban Design*** relating to Kla Ha Ya Park.

Other possible program elements for the park that were considered but not shown at master planning level include:

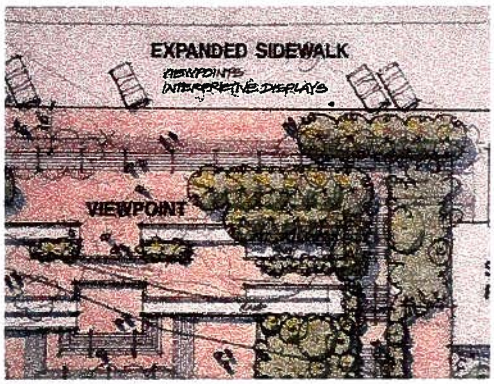
- removal of the sewer lift station from the park
- incorporating a children's play area
- expanding decks and terraces to include connections to the adjacent private commercial establishments
- adding special features such as artwork incorporated in the walls or railing

*Kla Ha Ya Park Boardwalk*

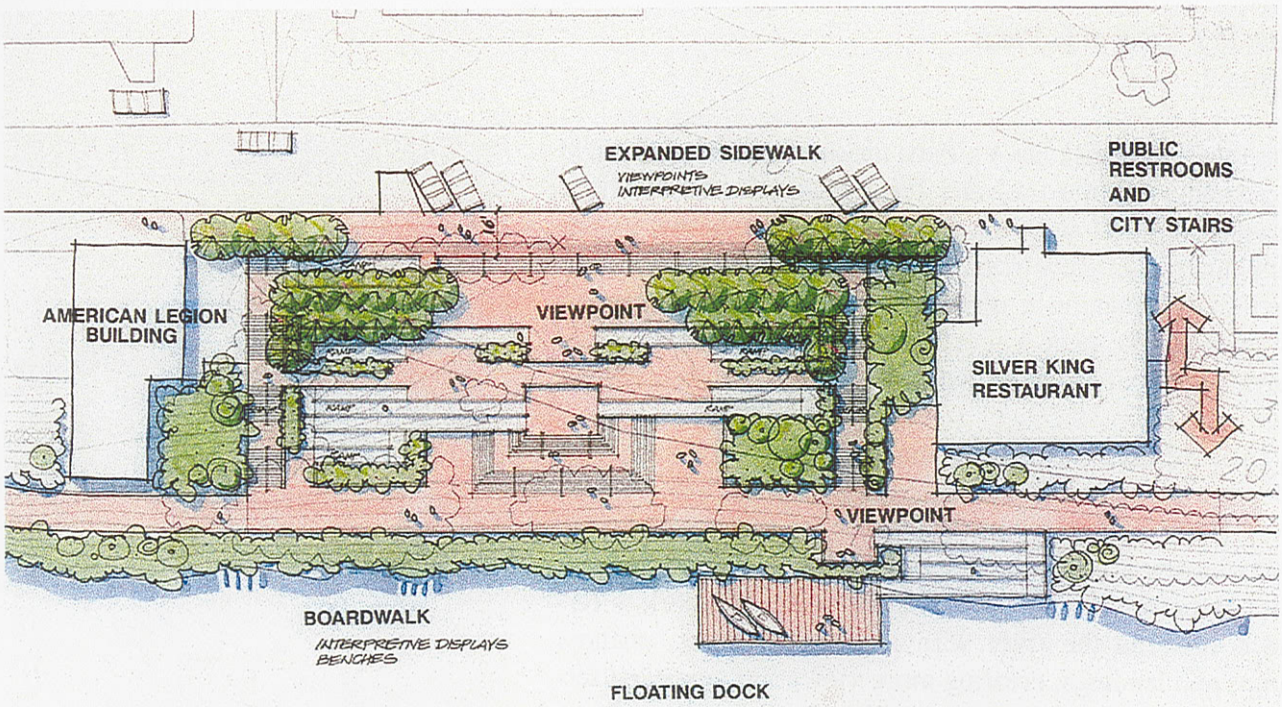
*Kla Ha Ya Park View from First Street*



*Historic Snohomish*

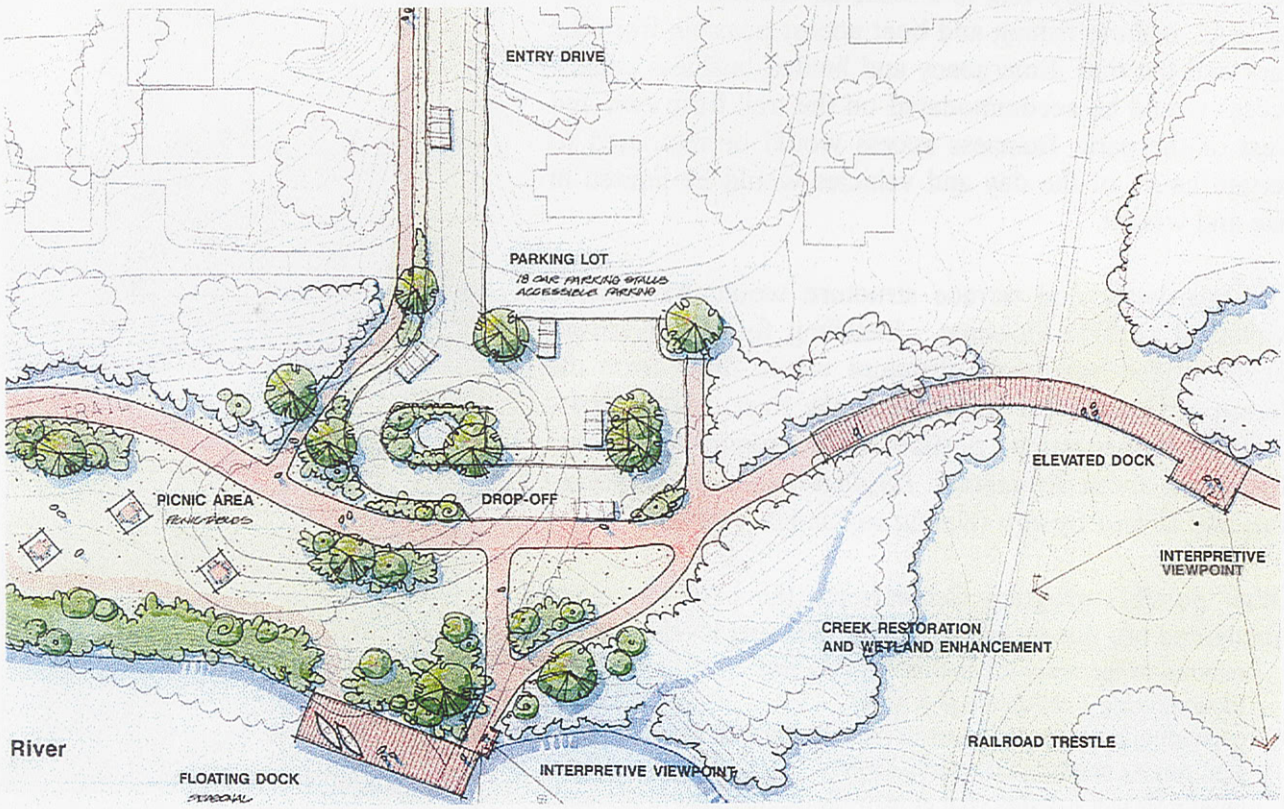



*Kla Ha Ya Park detail*




*Kla Ha Ya Park Plan*

*Figure 7*



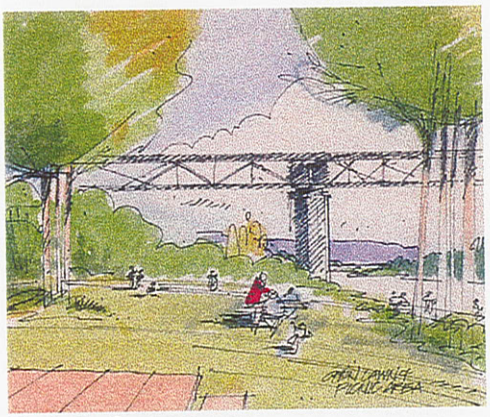

*Cady Park Plan*

*Figure 8*

## Cady Park Plan

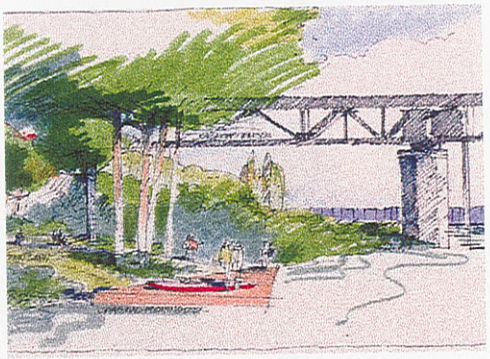
Figure 8

Located at the far east end of the First Street business district, Cady Park represents another opportunity for trail users to make connections to the riverfront and up Maple Avenue to First Street. The use of this park is as a trailer boat launch site and parking area for river viewing. With the acquisition of the Stocker property, a new trailer boat launch site will be planned and the one at Cady Park will be abandoned. The program for Cady Park includes parking, picnic areas, interpretive displays (historic and environmental) and fishing and car-top boat access.



*Cady Park picnic area*

This site and some of the nearby structures have significant history that should be interpreted for the public. In addition, there is opportunity to enhance the existing drainage area on the east side of the site, increasing the interpretive value and offsetting any adverse impacts of construction elsewhere along the trail corridor.



*Cady Park floating dock*

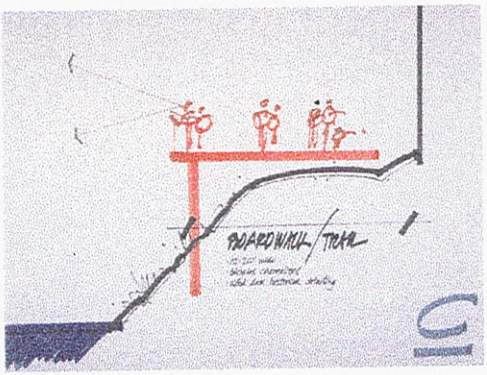
Refer to Issues/Recommendations portion of this report for further discussion about ***Riverbank Engineering and Stabilization*** relating to Cady Park.

Other possible program elements for the park that were considered but not shown at master planning level include:

- incorporating a children's play area
- changing the seasonal floating dock to concrete stairs, or another hard edge that would allow for access, but not require the same high level of annual maintenance
- adding special features such as artwork incorporated at the viewpoints or in the park

## Sections/Details

Typical cross sections are shown in Figures 9 through 16 and the letters correspond to the letters on the plan. These Figures are referenced throughout the Issues/ Recommendations section of this report.



*Typical cross section*

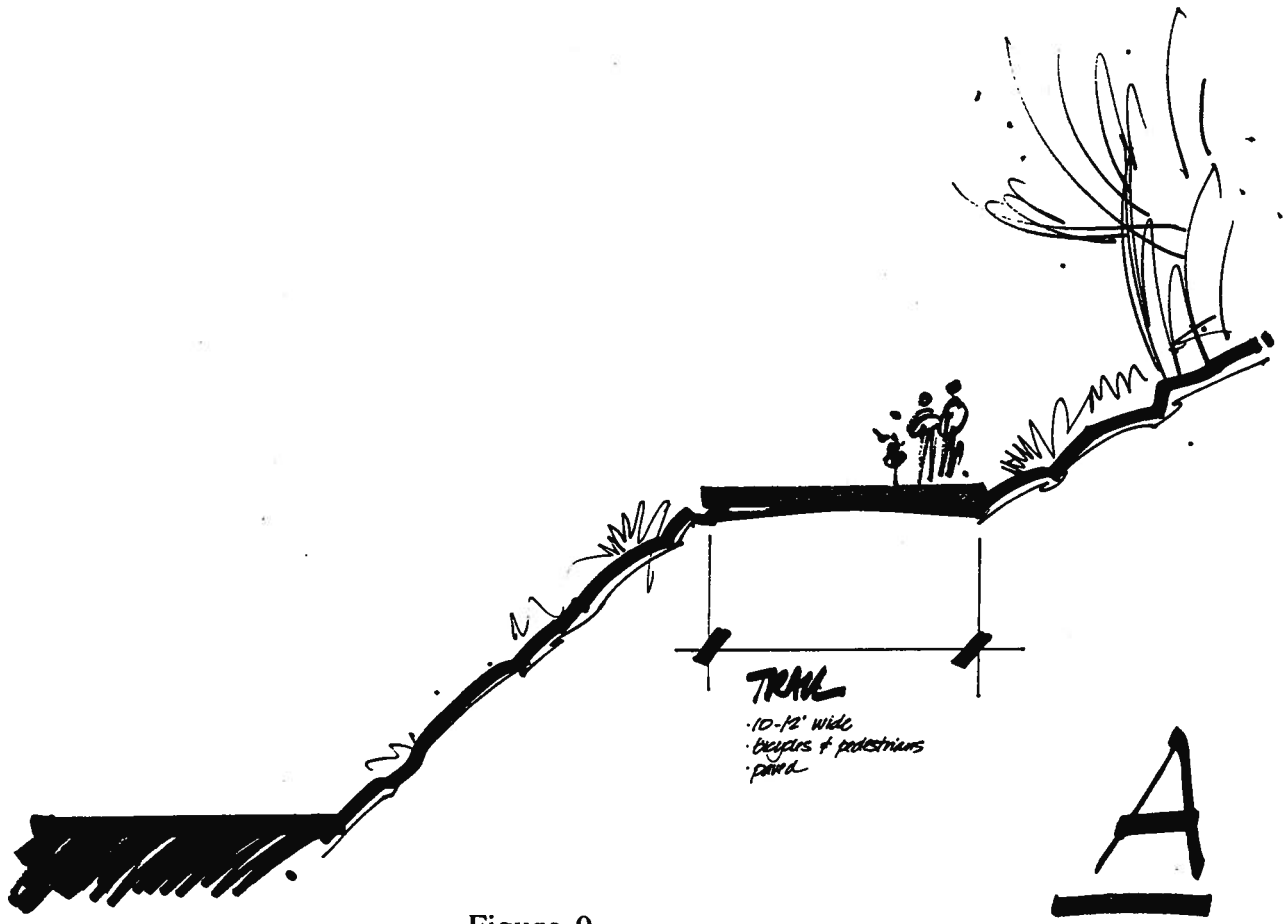



Figure 9

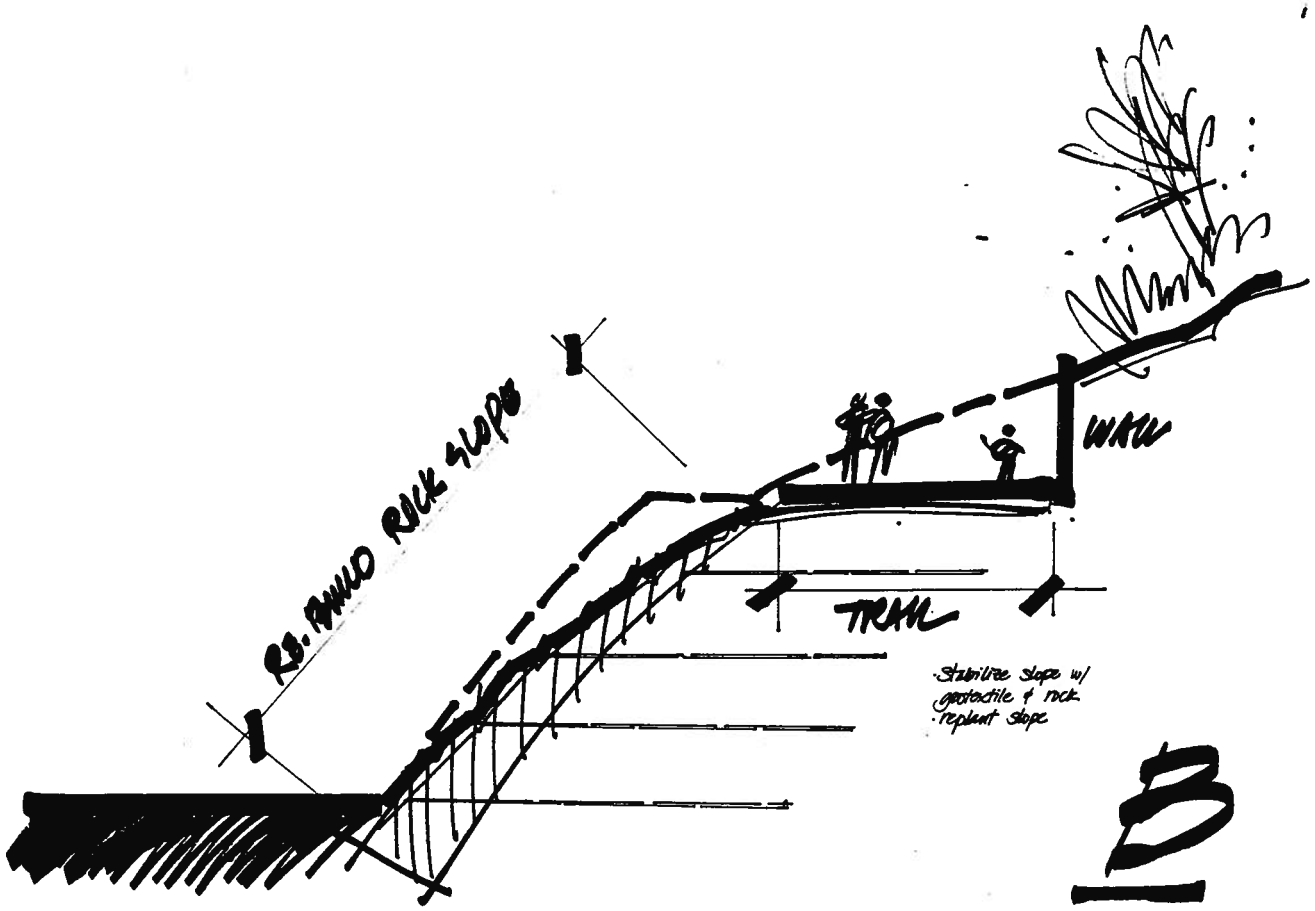



Figure 10

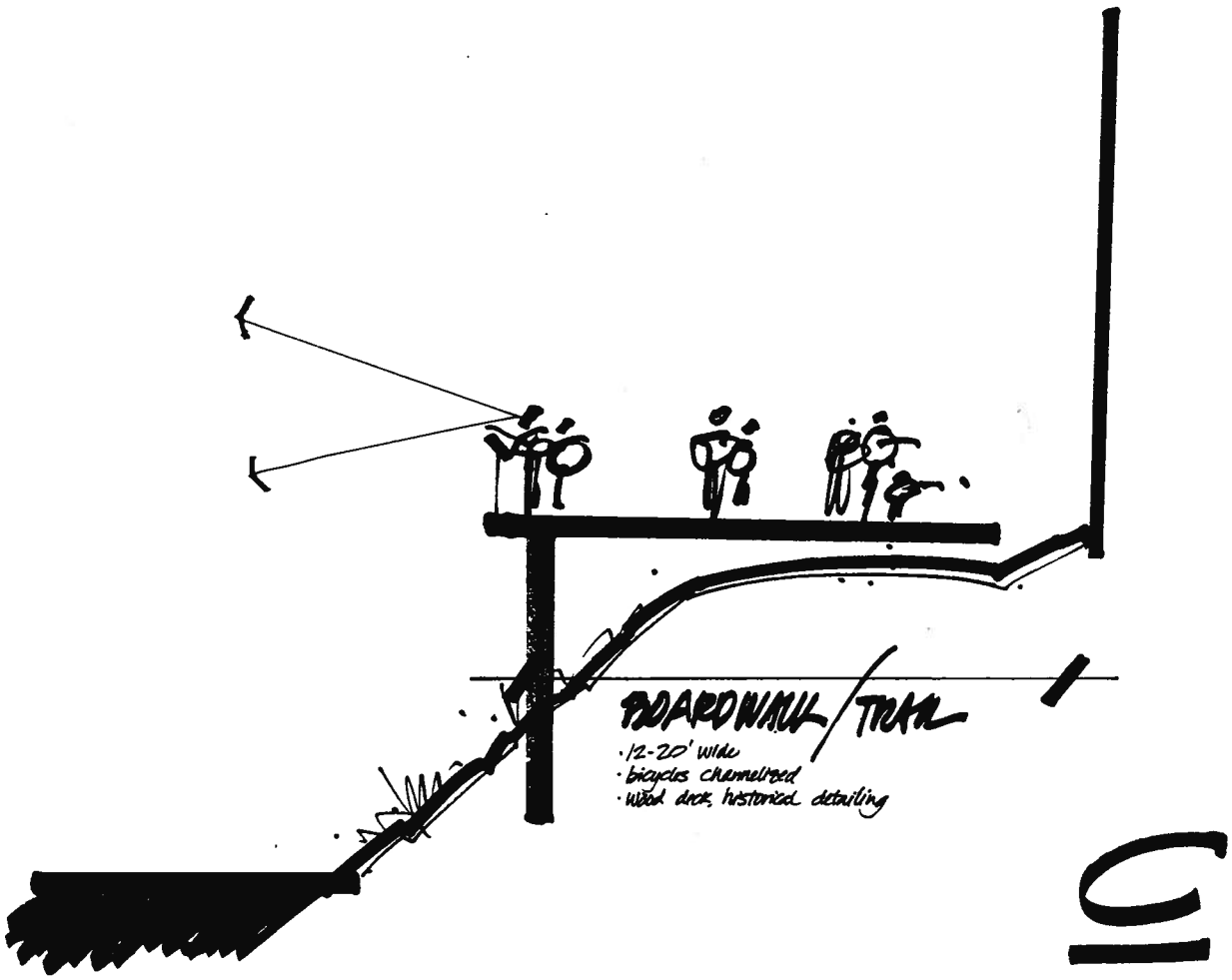



Figure 11

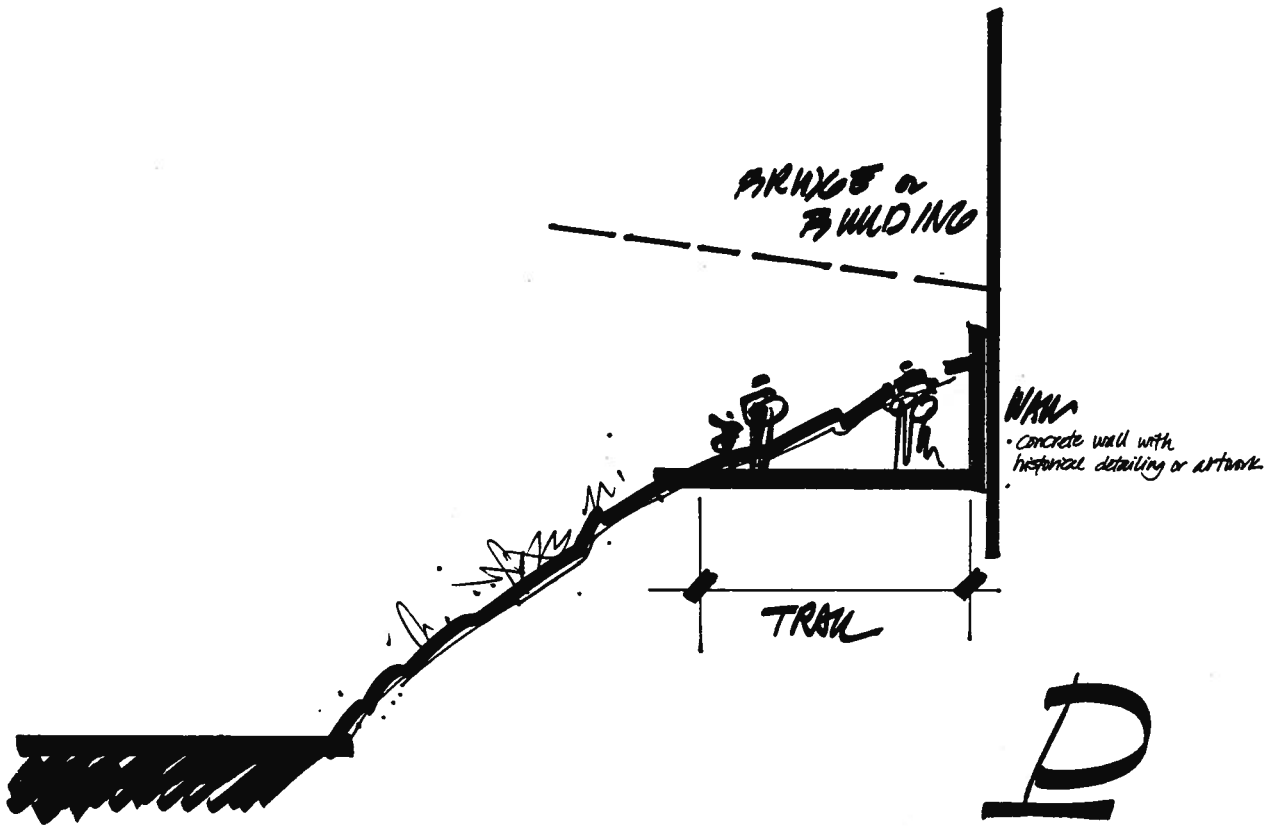



Figure 12

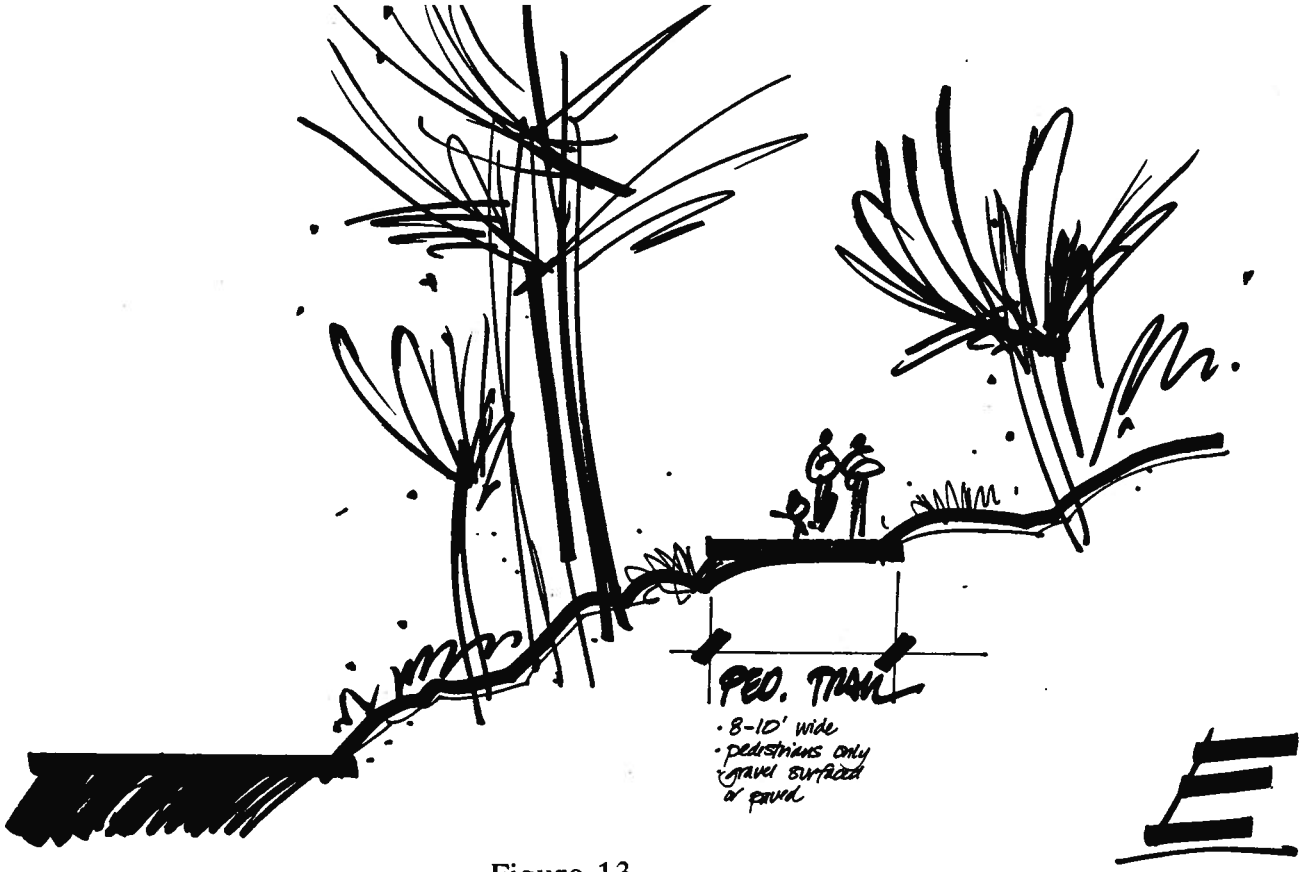



Figure 13

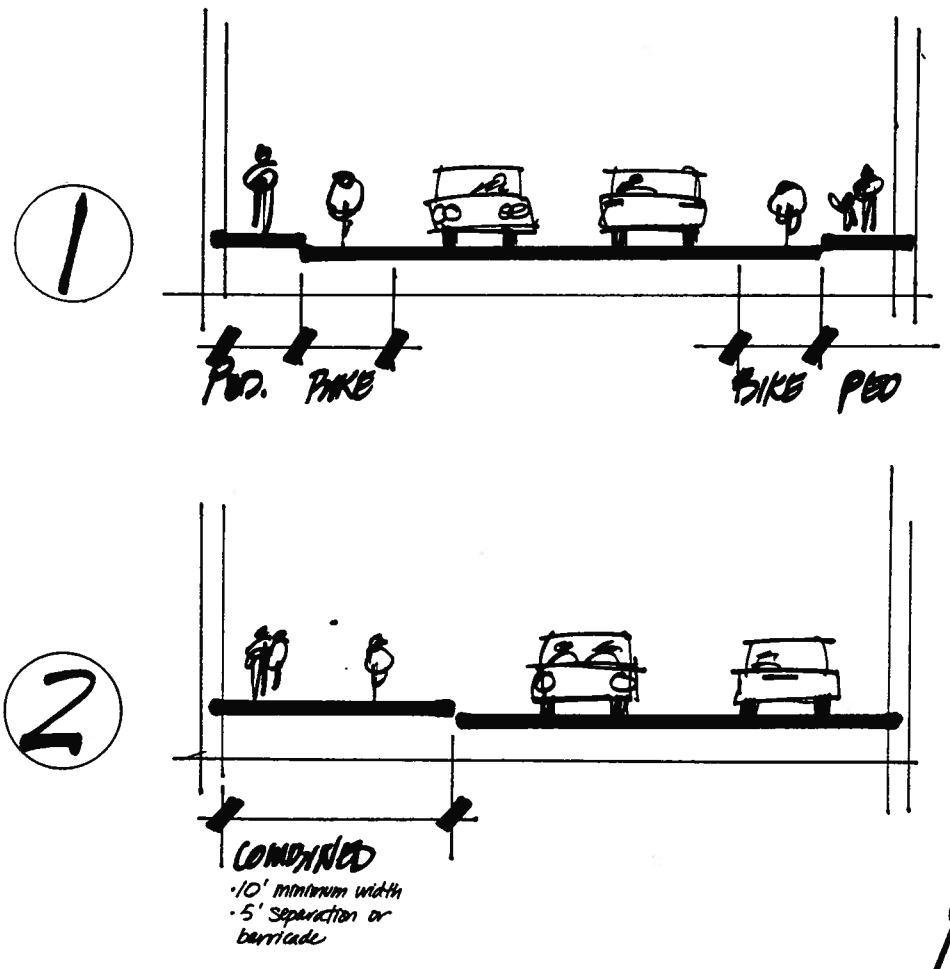



Figure 14

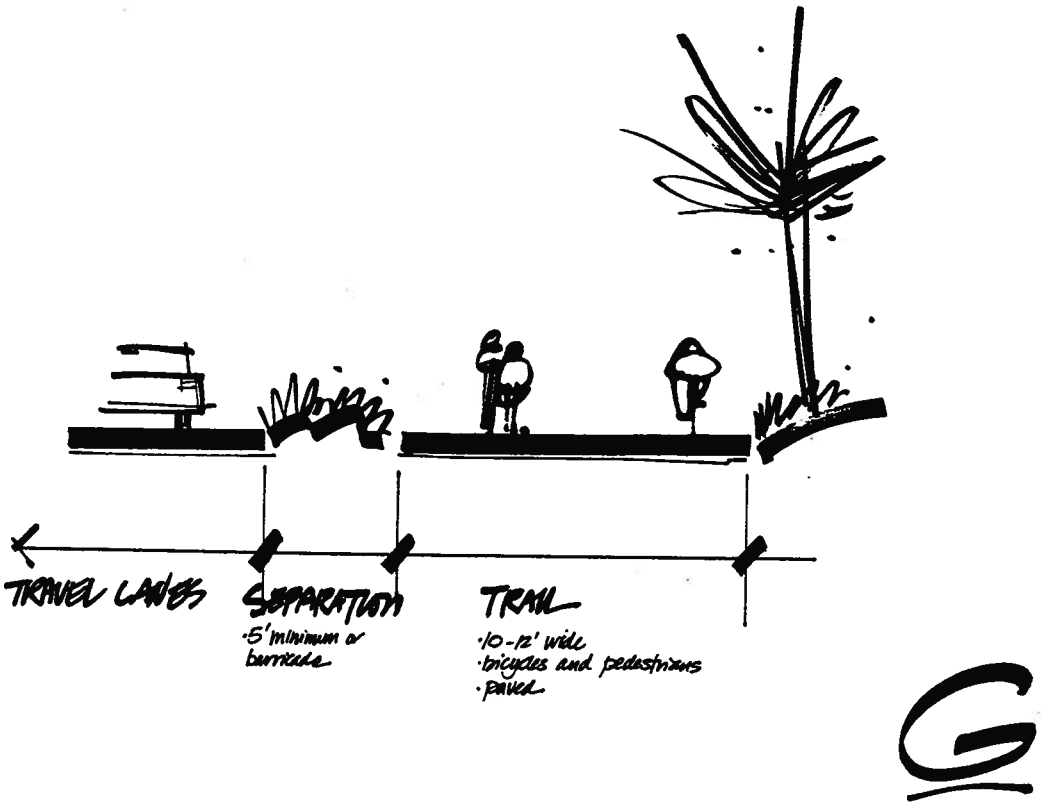



Figure 15

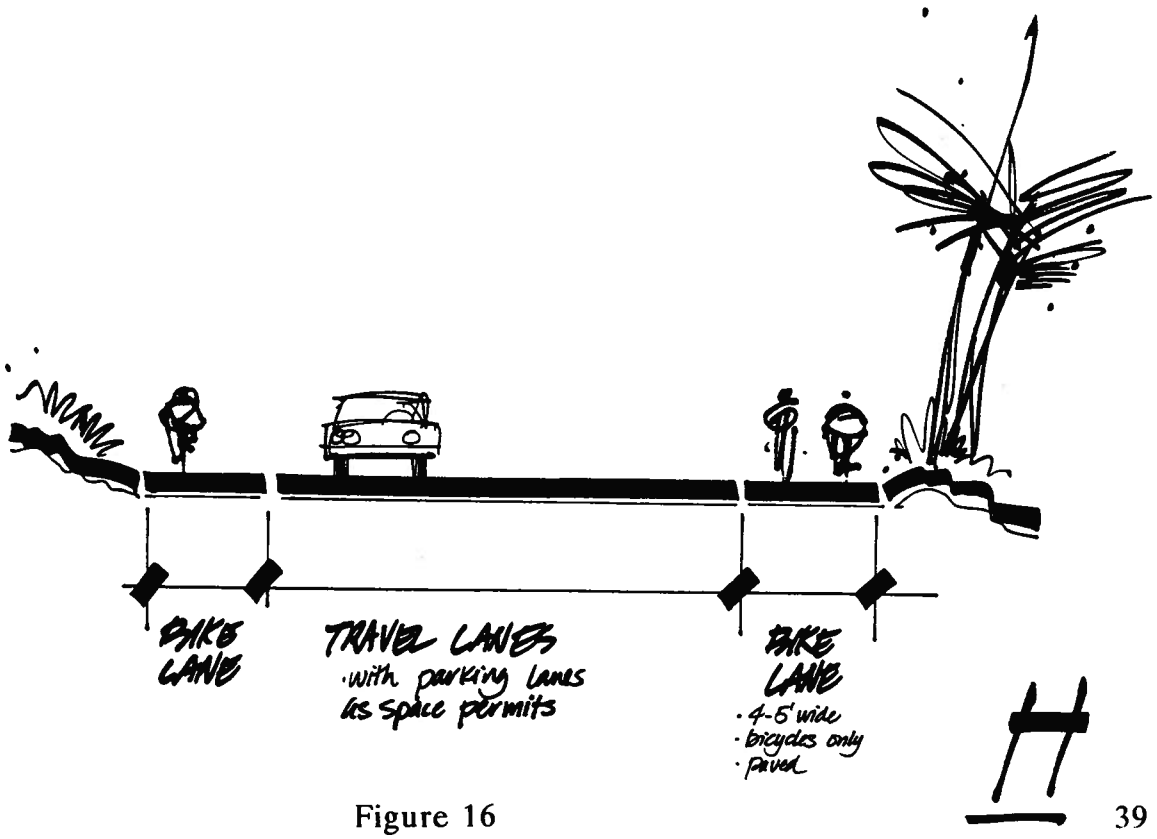



Figure 16

## Issues/Recommendations

This portion of the report identifies the major issues of the project that were discussed and evaluated at all levels of the study. A summary recommendation is given for each issue, sometimes in the form of specific design recommendations, other times in the form of an approach to take when refining the plan and scope of work for any given phase.

### *Trail Design*

*General Design Standards for Off-Road Trails – Sections A through E*

In the interest of safety and continuity, the portions of the Riverfront trail that connect to the larger regional trails should be similar to the regional systems in width and surfacing. Both the Centennial and the Lowell-Snohomish Trail are 12'-wide paved asphalt surfaces with 2' gravel shoulders on both sides, and this is the recommended trail section for the Riverfront Trail (see Figure **9**). The maximum cross-slope for the trail should be 2% and the direction of pitch should vary over the length of the trail. The maximum running grade is best if kept under 5%, but in no case should it exceed 8.3%. If ramp construction is necessary, ADA guidelines for landings and railings should be used. Vertical clearance should be 10' for pedestrians and bicyclists and 12' for equestrians. Other minimum clearances (to obstacles, vehicular travel lanes, etc.) should be per AASHTO standards.

*Off Road trail construction*

*Separated trail – Section G*

For the trail segment along Lincoln Avenue, north of Second Street and south of Fifth Street, the trail will be constructed within the existing Lincoln Street right-of-way. Lincoln Street will be realigned and improved, with parking provided on one side of the street only. The trail will be constructed with a minimum 5' separation from the travel or parking lane (see Figure **15**). In the block between Second and Third Streets, the existing parking lot and gravel access driveway for the pool and playfield will require redesign to accommodate the trail.

*Parking lot at sports fields*

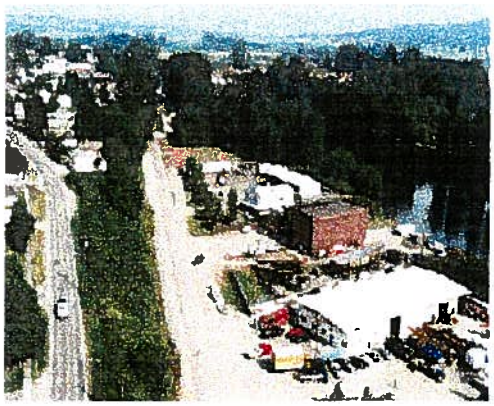
*On-Road Trails – Section H*

For the trail segment along Lincoln Avenue, south of Second Street and extending all the way to the south City lim-

*Bike lanes*

its, the roadway is built out to (or nearly to) the right-of-way limits. The most efficient means of trail construction here is to develop a Class II facility which consists of bike lanes and sidewalks. It would require rechannelization of the (2)travel lanes and (2) parking lanes to (2) travel lanes, (2) bike lanes and (1) parking lane (see Figure 16). The existing sidewalks would remain and new sidewalks would infill where none currently exist. This would provide a safe interim solution to making the connection between Centennial Trail at the north end and the Riverfront Trail and Centennial Trail at the south end. When the Final Plan is implemented (trail on the BNSF spur), these improvements would still be valuable in that more roadway in the community would be bicycle/pedestrian friendly. In addition, it would match the (bike lane) improvements the County is planning to make to Lincoln Avenue south of the City limits.

West of Avenue D the trail does not serve as a regional trail system link, but it provides access to amenities that would draw users off the larger system. Currently, the Wastewater Treatment Facility (decommissioned pond) and the adjacent wetlands support a diverse array of bird species, making this a popular area for birdwatchers. The dikes between the ponds and the river are little used service roads and create ideal trails for walking. This area is regarded as an important destination for trail users. Because much of the area along the riverbank is in private ownership, the Interim Plan proposes trail development along First Street. Similar to the Lincoln Avenue segment north of Second Street, the existing roadway would be redeveloped, shifted in the right-of-way as necessary to accommodate a separated trail and parking on one side of the road. Parking for busses and a Tour Boat Launch would be provided near the Avenue F access trail to the river. As an option, this street could be redesigned for one-way vehicular movement (east-bound) to free up more space for parking and eliminate the dangerous intersection (for west-bound travelers) of First and Second Streets.



*View east along First Street*

With the recent change to the land use designation in this area (from industrial to commercial), it is likely that the City may see major changes in property development in the segment from Avenue D to the City Shops (see ***Urban Design*** section of this report). The Final Plan recommenda-

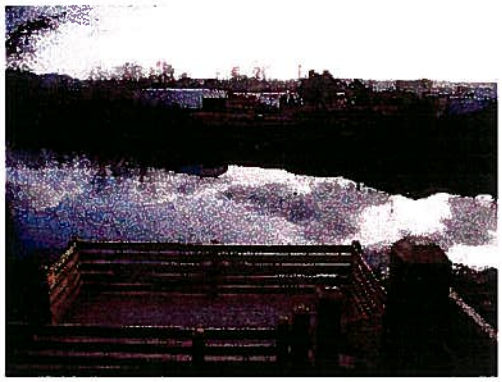
tion is to develop the trail along the riverfront in conjunction with any redevelopment plans. With the major pedestrian/bicycle access along the river, First Street could be redeveloped as a Boulevard and/or with additional street parking.

*Secondary Trails and Connections*

There are a number of other trail connections that will be important to make as the phases of this plan are implemented. These trails may serve to make the connections between the main trail and a destination or they may be destinations in and of themselves. These trails will vary in width and surfacing, depending upon the location and the use. Some should be ADA accessible, while others may simply be signed to alert the user to the hazards or obstacles. Some examples include:

- Wastewater Treatment Plant Dike Trails will most likely continue to function primarily as service roads and be maintained as wide gravel trails.
- City Public Works Shop Site is a valuable resource for the City, and in time may be better used as a trailhead or community park. There is opportunity for connections to trails that might be developed on this site.
- Avenue F is an unbuilt street right-of-way that could be developed as an access route from First Street to the riverfront. This location along the river has been identified as a potential site for a Tour Boat dock.
- Avenue B between First Street and the riverfront has been developed with public amenities such as a restroom, viewpoint and stairs. Other improvements might include additional interpretive signage and planting.
- Avenue A south of First Street is an open street dead-ending at the top of the bank. A city-owned gazebo and stairs down to the trail are located at the street end. There are many opportunities to enhance the connection between First Street and the Riverfront trail along this corridor (see ***Urban Design*** section of this report).
- The E.C. Ferguson House, located at the top of the bank between Avenue A and Union Avenue is an historical feature that should be acknowledged in the interpretive information for the Riverfront trail.
- Stocker Property Trails will be a combination of paved

*Public Works Shop site*



*View to river from City stairs*

and unpaved trails. Trails connecting to major facilities such as the Boat Launch or sports or designated fishing areas should be paved and ADA accessible. Other trails will be informal and unpaved and their frequent use may cause or exacerbate riverbank erosion. In these areas, trails may be constructed of native material with a liquid polymer or other admixture, creating a trail with a hard, stable surface that is more natural in appearance.

- Pilchuck Park and Stocker Soccer Fields are real amenities, with internal systems of paved and unpaved trails. There should be connections to the Riverfront Trail and Centennial Trail systems at both the north and south ends of the park/playfields.

*Equestrian Trail*

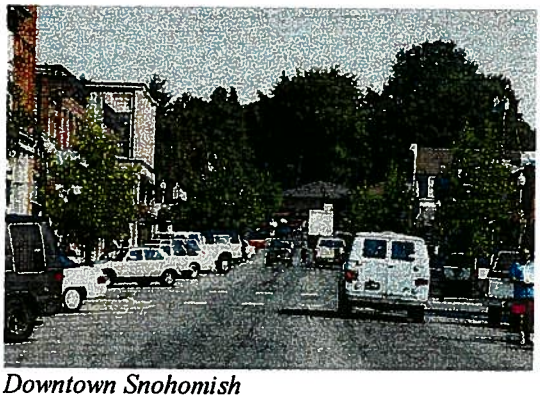
In evaluating the various routes available through the City, none stood out as being safe or appropriate for equestrians. It was determined that the best solution was to provide a route from the Centennial Trail near the southern City limits onto the Stocker property and from there into Cady Park. It is not feasible to extend an equestrian trail west of Cady, as the corridor is too steep and narrow to accommodate more than the main paved trail. It was determined that the equestrian trail connection between Phase 1 and Phase 3 of the Centennial Trail should occur in the more rural setting on the east side of the Pilchuck River.

*City/County Coordinated Efforts*

In developing the Final Plan there will be opportunities for the city and county to coordinate planning and property acquisition efforts. At Avenue D, the preferred method of crossing would be to provide a new pedestrian/bicycle – only bridge just west of the existing bridge. This, as well as trail alignment to the south, would require agency coordination.

At the Lincoln Avenue/Pilchuck River Bridge, planned for replacement in 1998, Snohomish County has designed the abutment to allow for trail construction on the north bank of the Pilchuck River. Further coordination will be required as the proposed Regional Park is developed.

## *Urban Design*



*Downtown Snohomish*

*General*

The urban design element of the Riverfront Master Plan deals with how the trail will be integrated with the urban fabric of Snohomish in a way that will both enhance the trail as a way of moving through and enjoying the city, while providing a trail amenity and a stronger riverfront connection.

Specifically, this section focuses on two general areas. First, integrating the trail with Downtown Snohomish, particularly with First Street from Avenue A to Avenue D. Second, laying the framework for eventual construction of the trail along the riverfront west of Avenue D, and how rezoning and future redevelopment of this area can work with the trail.

*Downtown*

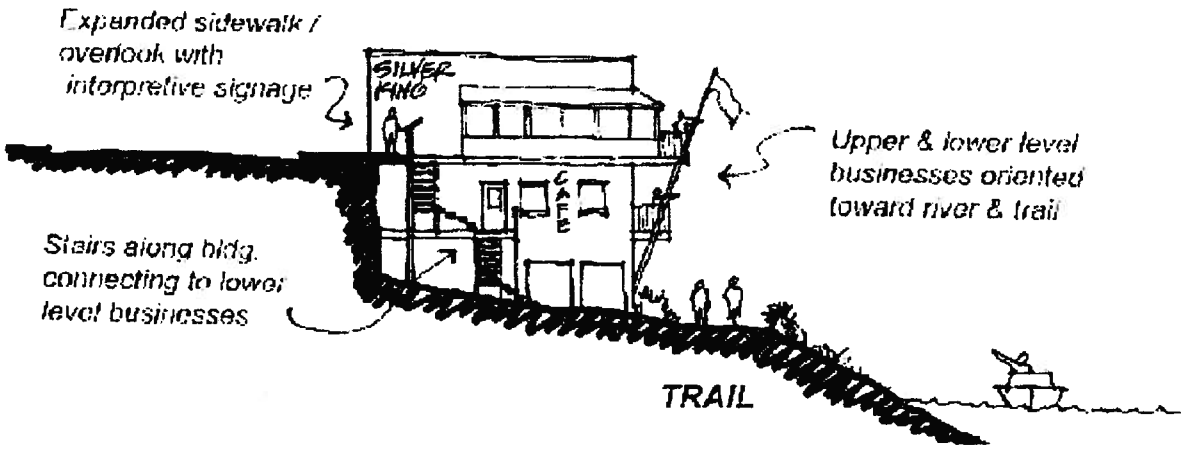
The Riverfront Trail should not be just a connection to and through Downtown Snohomish, it should become an *integral part* of the city center. This can be accomplished by strengthening not just the physical connections between the trail and downtown, particularly First Street, but also the functional and visual connections. The stairs and ramps leading from First Street down to the trail provide physical connections. These need to be reinforced with functional connections that start to bring some of the activity of First Street down to the riverfront, and visual connections that not only improve views between the riverfront and First Street, but also link the trail and First Street aesthetically through the use of similar urban design elements such as streetlights, benches and other furnishings.

The more physical connections there are between First Street and the trail, the more opportunities there will be for the downtown street life to spill down to the riverfront and for downtown visitors and workers to have a stroll along the river or a picnic lunch beside the trail. Conversely, more connections increase the likelihood of attracting trail users into downtown. The recently constructed stairs at Avenue B provide a valuable addition to connections at the west end of Kla Ha Ya Park and at the end of Avenue A. Improvements to all of these connections and additional connections at a reconfigured Kla Ha Ya Park will do much

to tie the Riverfront Trail and Downtown Snohomish together.

*Kla Ha Ya Park*

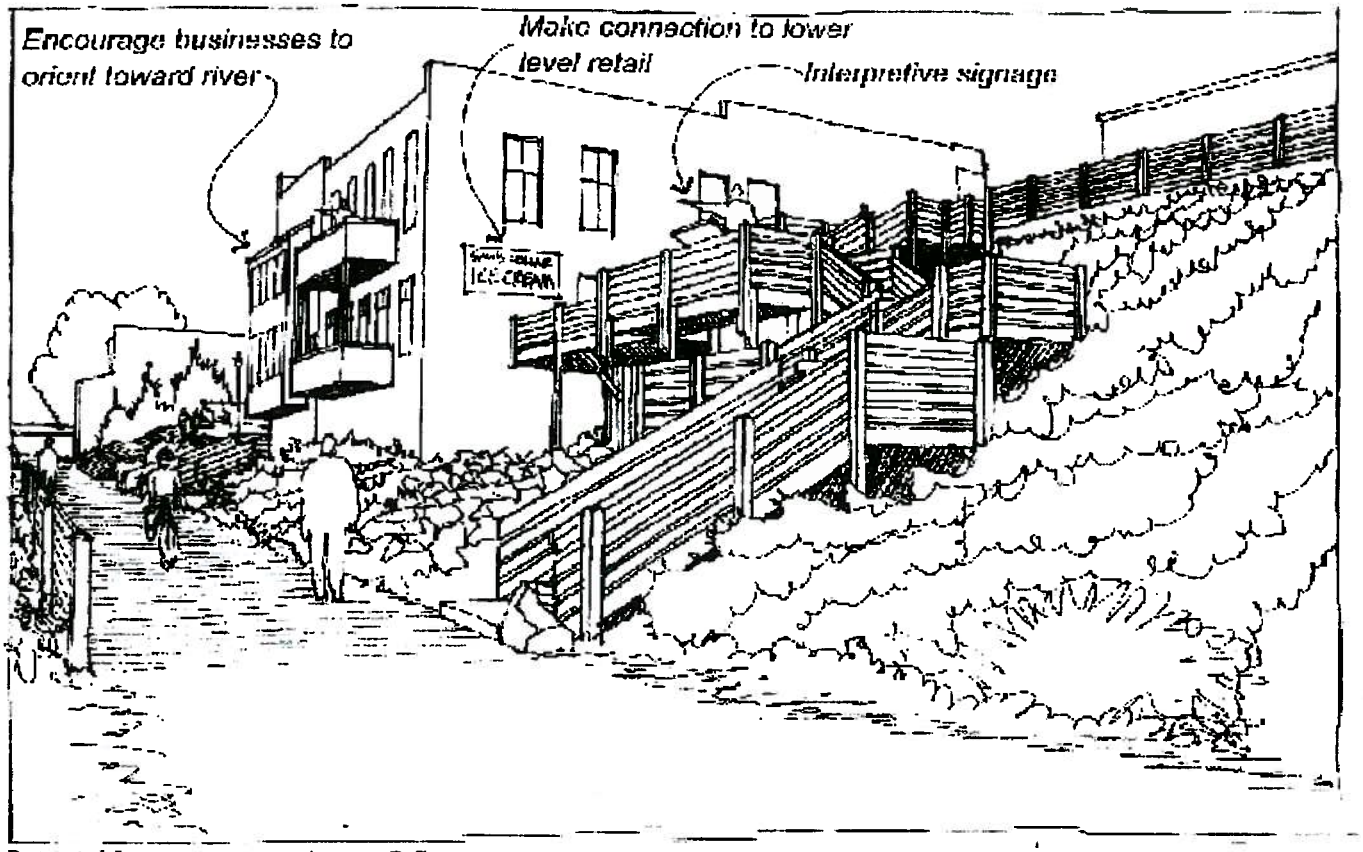
Kla Ha Ya Park improvements will make this the primary connection to the riverfront from First Street. The expanded sidewalk/overlook provides an opportunity for reinforcing the visual connection to the river and incorporating interpretive signage and/or public art. The stairs at either end and ramps through the park provide much improved physical connections. The placement of the stairs adjacent to the buildings framing the park provides the opportunity for lower level commercial uses to spill out into the park, providing a functional extension of the downtown toward the riverfront. Such lower level commercial spaces could start to orient downtown toward the river, providing an intermediate level of uses that would help draw trail users up into downtown. Street level businesses should be encouraged to provide a riverfront face as well, with balconies and decks overlooking the trail and river




*Section at Kla Ha Ya Park/Silver King Bldg.*

*Avevue B Stairs*

The stairway recently built behind the public restrooms provides another valuable connection between First Street and the riverfront. As at Kla Ha Ya Park, interpretive signage could enhance the stairs as a visual link to the river. Also the potential for linking the stairs to lower level uses in the Silver King Cafe building should be explored.



*Potential Improvements at Avenue B Stairway*

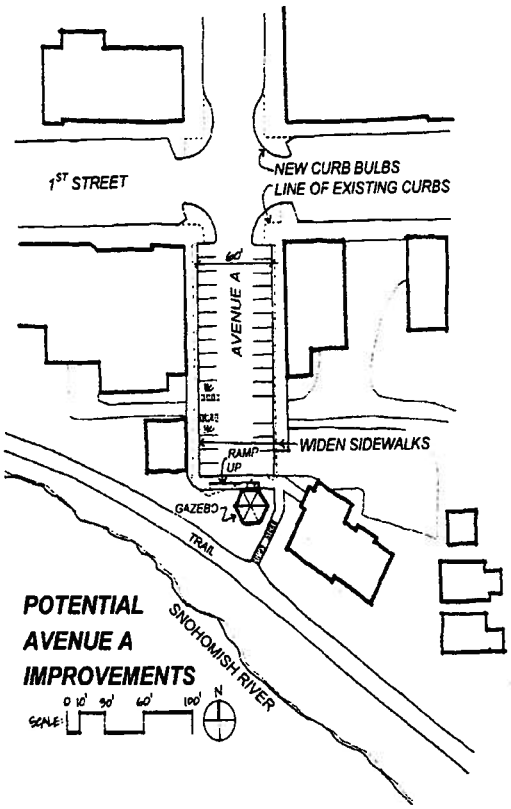
*Avenue A Gazebo and Stairs*

The gazebo and stairs at the end of Avenue A form another important link to the riverfront, and one which could be strengthened considerably. The gazebo not only forms a protected overlook to the riverfront, it also serves a recognizable landmark and visual link from the riverfront to the town (albeit somewhat obscured by vegetation).

The pedestrian connection from First Street is quite weak. The sidewalks along Avenue A are narrow, and with head-in parking the available width is often reduced by overhanging car bumpers and, in some cases, dumpsters. Furthermore, the sidewalk does not extend to the gazebo from either side of Avenue A, forcing pedestrians to walk through the street to reach the entrance to the gazebo. The vehicular turnaround space at the end of Avenue A is not well defined. Finally, the gazebo itself is in need of some renovation, which should include provisions for handicap accessibility.


*Avenue A gazebo*

A number of improvements could be made to enhance this




Avenue A to prevent parked cars from encroaching on the sidewalks. A more permanent solution would be to reconfigure the street to widen the sidewalks, provide a pedestrian connection to the gazebo (including an accessible ramp), and a better defined vehicle turn-around. This could be done with minimal impact to the parking, and would result in a much more pleasant streetscape and significantly stronger link to the riverfront.

In the process of further developing these street-end improvements, consideration should be given to potential improvements to the gazebo. These could be as modest as simply refurbishing the existing structure, or as ambitious as rebuilding it to create a more generous space and a stronger landmark from both the riverfront and First Street.

*First Street Improvements*

Extending the curbs on Avenue A would also create an opportunity to "complete" the curb extensions on First Street, as shown on the plan. The existing curb extensions do help define the angled parking along First Street, but expanding them into full curb bulbs would increase the room for street furniture and landscaping, extend the sidewalks to create a more generous pedestrian environment, reduce the crosswalk width, provide an opportunity to install curb ramps, and better define vehicular lanes. Constructing curb bulbs along First Street would also create an opportunity for other streetscape improvements, such as upgrading and unifying landscaping and street furnishings including lighting, benches and trash receptacles. Although these improvements are only shown at First Street and Avenue A, similar improvements could be made all along First Street, in conjunction with the development of the Riverfront Trail or as separate projects.

*Urban Design Elements*

As plans for the trail are developed and elements such as lighting and street furniture are being chosen, consideration should be given to integrating these elements with existing and potential new street furniture along First Street. While there may be good reasons to have the furnishings for the trail somewhat distinct from those in downtown and more compatible with the rest of the trail, there is an opportunity to develop some thematic link between down-

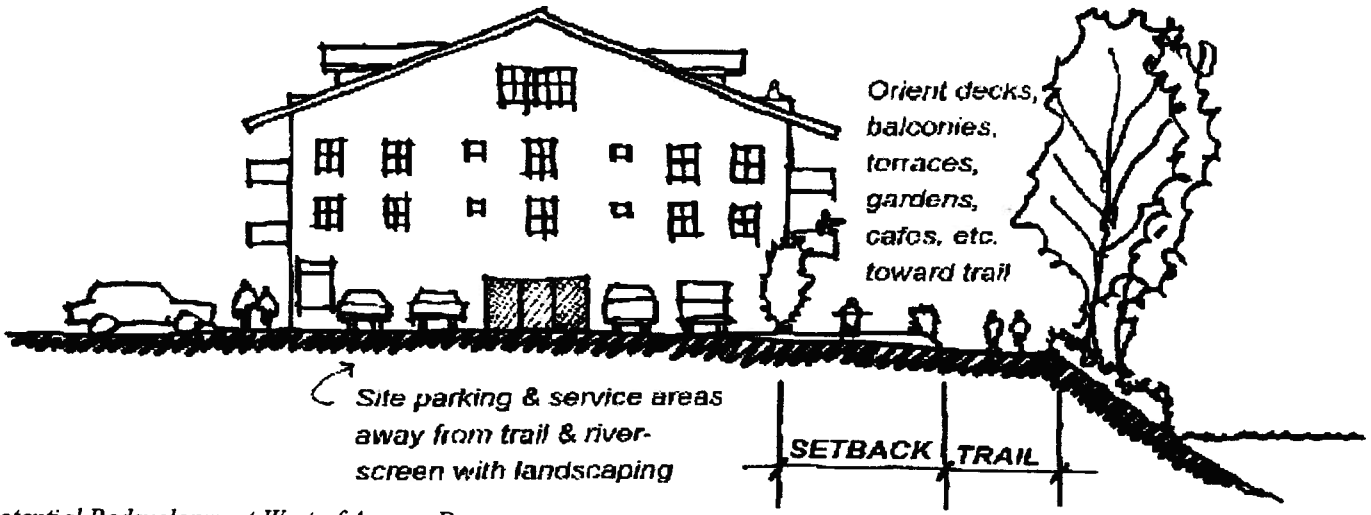
town and this portion of the trail that parallels First Street.

*West Of Avenue D*

The area west of Avenue D presents some interesting urban design challenges and opportunities. Currently zoned industrial, the historical uses here and lack of easements make trail alignment along the riverbank impractical at the present time. The recent rezone of this area could create an incentive for redevelopment that would require public access to the riverfront through the State Shoreline Management Act.

The attractiveness of the new zoning to potential developers could increase the pressure to redevelop these properties and hasten the opportunity to implement the final plan, with the trail following the riverbank.

Consideration should be given to allowing and attracting the types of development that would enhance both the trail and Downtown Snohomish. Commercial retail development could work well with the trail, but might also detract from the "critical mass" of retail needed in the downtown core. Other types of commercial development that may not




*Potential Redevelopment West of Avenue D*

fit in the existing commercial core, such as hotel or convention facilities, could also have a mutual benefit with the trail. Consideration should also be given to medium to high density mixed-use and single-use residential development that would benefit from the trail and provide an important population base for the downtown.

Whatever the type of development, design guidelines could be developed to ensure that new construction in this area would enhance the trail. Such guidelines could expand on the Shoreline Management provisions for public access by requiring well designed access to and along the riverfront, pedestrian-oriented development, siting of compatible uses toward the river and trail and incompatible uses, such as service areas, away from the trail, and possibly even granting development bonuses for projects that provide public amenities and/or open space beyond the requirements for a trail easement.

In any case, development regulations for this area should provide a minimum 25' wide trail easement along the river to allow for trail development and landscaping, and 15' wide access easements from First Street to the trail at appropriate locations.

## *Economic Benefit*

*General*

Trails are typically more expansive and flexible than traditional parks, and can provide for the linear forms of outdoor recreation that an increasing number of Americans are engaged in today, such as: hiking, jogging, bicycling, rollerblading, horseback riding, cross country skiing, or just plain strolling. Trails can also stimulate the economy by providing an array of economic and quality of life benefits. Bike trails, such as the one envisioned in the City of Snohomish, have a multitude of potential benefits, including:

- increased tourism,
- improved property values,
- enhanced commercial uses, and,
- the improved quality of life for users and citizens.

Studies of other bike trails serve as the basis for the following discussion. Direct estimate of economic impacts was not undertaken in the study.

*First Street*

*Increased Tourism*

Spending by residents on trail-related activities helps support recreation-oriented businesses and employment, as well as other businesses that are patronized by users. In addition, under certain circumstances, trails can provide new business opportunities for lodging, retail, eating and drinking establishments and related businesses.

*Benefits to businesses*

A detailed assessment of user expenditures at trails in three areas was conducted by the US Department of Interior in 1992. The three locations consisted of Heritage Trail (Dubuque, Iowa), St Mark's Trail (Tallahassee, Florida) and the Lafayette/Moraga Trail (East Bay area of San Francisco). The average daily expenditures ranged from $3.97 to $11.02 per visit. Total annual expenditures ranged from $1.2 to $1.9 million, with a significant amount coming from non-county residents. (See Table 1 on page 52).

**Table 1 - Summary of Estimated Expenditures Made by Trail Users**

| Category | Heritage Trail | St Marks Trail | Lafayette/ Moraga Trail |
|---|---|---|---|
| Average Daily Visit Expenditures | $ 9.21 | $ 11.02 | $ 3.97 |
| Total Visits* | 135,000 | 170,000 | 400,000 |
| Total Visit Expenditures* | $ 1,243,350 | $ 1,873,400 | $ 1,588,000 |
| Total spent in County* | $ 818,000 | $ 789,000 | $ 656,000 |
| Total New Money Spent Within County by Non-county Residents* | $ 630,000 | $ 400,000 | $ 294,000 |

*Annually

Source: The Impacts of Rail-Trails, US Department of the Interior, 1992, Page III-10

Visitor's expenditures focused on the following sectors:

- transportation (auto expenses, ranging from 23% to 34% of total per visit),
- lodging (4% to 16%),
- restaurants (20% to 36%),
- retail expenditures (5% to 13%),
- food/beverage (9% to 18%), and,
- other (7% to 10%).

In addition, trail users buy a variety of durable goods (such as clothing, equipment, accessories and other items) specifically for their trail use. These expenditures can range from $132 to $250 per year.

Per visit expenditures would likely occur at the City of Snohomish. Durable goods expenditures could also occur in the City, if properly marketed.

*Improved Property Values*

Several other studies have demonstrated that linear parks can increase nearby property values, which can in turn increase local tax revenues.

1 A survey of knowledgeable real estate agents esti-

mated that proximity to the Burke-Gilman Trail increased property values by 6.5 percent within two blocks from the trail. (*The Effect of the Burke-Gilman Upon Property Values of Adjacent and Nearby Properties and Upon the Property Crime Rate in the Vicinity of the Trail, Seattle Engineering Department, 1986*).

2 Another study found that the Illinois Prairie Path: "definitely enhances the value of adjacent real estate." An informal 1985 survey of 40 experienced real estate professionals found that all agreed that the 40-mile Illinois Prairie Path made properties easier to sell and often created a price premium. (*"Old Plank Trail – Community Impacts," Openlands Project, Chicago, 1985*).

3 On the Santa Ana River Corridor in California, there was an estimated premium of $139 million to $201 million in property values for properties within one-eighth mile of the trail. (*Santa Ana River Corridor Master Plan*).

*Burke-Gilman Trail*

These benefits come largely from the enhanced access to the trail and its perceived improvements on quality of life. However, the proposed project in Snohomish also has the potential of riverbank stabilization, which will provide a definite improvement for property owners located along the banks of the Snohomish River. This area has been prone to flooding and requires a regional approach for bank stabilization. The opportunities for public funding create an excellent way to accomplish multiple objectives that would be out of the reach of the public or private sector, if either side acted alone.

*Enhanced Commercial Opportunities*

The proximity of the trail could also have a positive impact by enhancing commercial business opportunities. These benefits, which are more difficult to quantify, include:

- **improved access & exercise opportunities.** The amenity of nearness to a trail has an important effect on prospective business owners and employees. The value of nearby recreational opportunities has long been recognized in the newer business and office parks. The proposed trail offers the opportunity for owners/ employees to commute to work via the trail as well as

*Exercise and enjoyment*

to exercise during the day, as time permits. This amenity will benefit all neighboring properties.

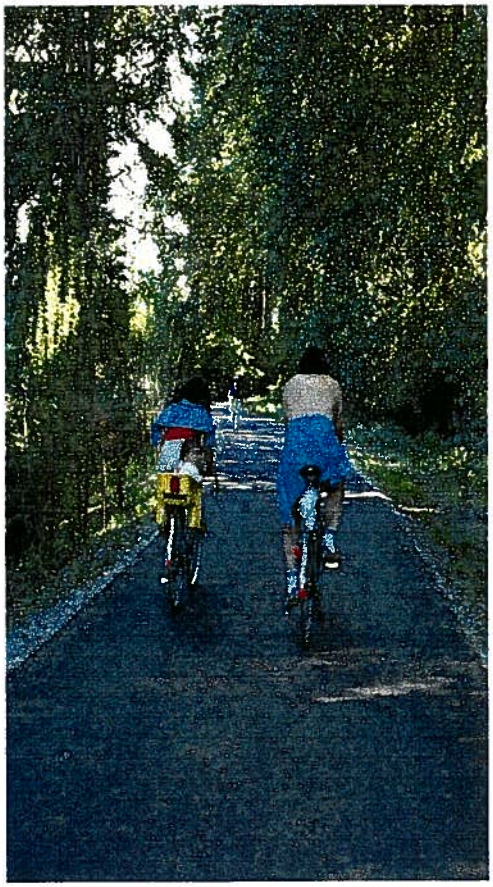
- **return visitors.** The income and demographic profile of trail users is similar to the profile of consumers of durable goods, like antiques. While the visitor cannot take most articles home on the bike trail, a return visit could be expected for some trail users.
- **redevelopment opportunities** - There is an opportunity for business owners to redevelop their property to take better advantage of the trail. This would include development of new retail and service businesses catering to trail users in portions of the downtown buildings which are unused or under-used. Of course, this decision must be weighed against the potential loss of storage that might occur in some buildings.

Several other studies have demonstrated that linear parks can increase nearby property values, which can in turn increase local tax revenues.

*Economic Impact Methodology*

The study of the Snohomish River Trail did not include an in depth assessment of the economic impacts of the trail. Readers might find the following scope of work to be useful, if such an assessment were to be conducted in the future. "The methodology used for quantifying the economic impacts from the Trail involved survey interviews with all groups of respondents (users, property owners, and businesses alike). Figures provided by these interviews were used as the basis for assessing both the direct, indirect and induced economic impacts of purchases directly attributable to the Trail. On the most basic level, snowcone and drink stands are now located throughout the Trail, and as the investigation probed deeper, broad economic inputs consistent with typical trail user spending - both for soft and hard good purchases, were discovered. Calculations derived from this data were then applied to the IMPLAN input-output economic modeling system developed by the U.S.D.A. Forest Service, Land Management Planning Staff. The IMPLAN input-output (I/O) model included appropriate multipliers for the Baltimore area and thus provided accurate data for total direct, indirect and induced spending inputs." (*Analysis of Economic Impacts of the Northern Central Rail Trail, June 1994, for the Maryland Greenways Commission, Maryland Department of Natural Resources by PKF Consulting*).

*Safety/Security*



Proposed trail development often raises concerns among trail neighbors about potential safety and security problems associated with trails.

Numerous studies, however, clearly have documented that trails do not contribute to increases in crime and vandalism. In fact, they are generally cleaner and safer than the corridor prior to development:

- A study (1980) by the Minnesota Department of Natural Resources compared landowners attitudes on two proposed trails with attitudes on a similar pair of trails already established. Seventy-five (75%) percent of owners on the proposed trails thought that the trail would result in more vandalism and crime, while virtually none of the owners on the built trails knew of any trail-related crimes.

- A 1987 study of Seattle's Burke-Gilman Trail found little or no crime or vandalism experienced by adjacent property owners. Nearly two-thirds of owners believed that the trail "increased the quality of life in the neighborhood." (*Evaluation of the Burke-Gilman Trails Effect on Property Values and Crime, Seattle Engineering Department, 1987*).

- A 1988 survey of Greenways in several states has found that concerns of problems such as crime, trespass and vandalism have not materialized. (*A Feasibility Study for Proposed Linear Park, Oregon DOT, 1988*).

- A 1992 study by the National Park Service of the impacts of trails on nearby property owners found that "a majority of landowners reported no increase in the problems since the trails opened, that living near the trails was better than they expected it to be, and that living near trails was better than living near the (corridors) before the trails were opened." Comments from the survey include: "Vandalism, robbery and safety concerns I originally had were unfounded," and "I was very opposed at first...but I am very pleased. It gives me a safe and comfortable place for my

walks." (*Impacts of Rail-Trails, National Park Service, 1992*).

Clearly, trail experiences in other communities, both locally and around the country, have been positive. Similar results can reasonably be expected in Snohomish, as trail development expands recreational opportunities for its' residents and enhances the quality of life in the community.

*Riverfront Trail*

***Permitting/Environmental***

*Regulatory Implications*

The proposed riverfront trail for the City of Snohomish is located along the northern banks of the Snohomish River and its immediate environs. Resource areas which are regulated by the City, and various state and federal agencies include the shoreline of the river, potential wetland areas on the Stocker site, southeast of the City, and wetland areas at the City Shops site near the western edge of the City, adjacent to State Route 9.

The following discussion does not include the regulatory implications of building and/or construction within the floodway or floodplain of the river. Portions of this trail located within the Historic Business District will require Design Review Board approval.

As developed within the current Final master plan, the following regulations may be triggered by the proposed trail:

- City of Snohomish Code: Critical Areas
- City of Snohomish Code: Shorelines Management
- Washington State Department of Fish and Wildlife: Hydraulic Permit Approval
- Washington State Department of Ecology: Section 401 Water Quality Certification
- U.S. Army Corps of Engineers: Section 404, Clean Water Act
- U.S. Coast Guard: Section 10, Rivers and Harbors Act

*City of Snohomish Code: Critical Areas*

Any impact to wetlands within the trail alignment will have to be reviewed by the City to determine whether it meets the intention of the City's code. Wetlands are assumed to be present to the west of the existing City Shops and are assumed likely on the Stocker property and at Cady Park. Wetland impacts may have to be compensated for by restoration or enhancement of at the least, the equivalent wetland acreage.

*City of Snohomish Code: Shorelines Management*

Work within the floodplain, or within 200 feet of the ordinary high water mark of the river or within any associated with the river will trigger the need for a Shoreline Substantial Development Permit from the City. The Shorelines

*Stocker property*

Program is a state mandated program which is carried out by the City. The nature of the Shoreline Program is that permits issued by the City are sent to Ecology for review and approval, therefore anything proposed within the Shoreline Zone will have to meet the approval of both the City staff and the Ecology Shoreline Section.

*Washington State Department of Fish and Wildlife: Hydraulic Permit Application*

Any work within the ordinary high water limits of the river will require an Hydraulic Permit Application (HPA) from the State Department of Fish and Wildlife. In addition any project which creates 5,000 sq. ft. of new impervious surface can also trigger the need for an HPA. Projects will be reviewed from the context of their potential impacts or benefits to fish resources within the river. Projects which stabilize the bank and reduce bank failure and projects which increase habitat diversity within the channel will likely be reviewed as beneficial by the WDFW.

*Washington State Department of Ecology: Section 401 Water Quality Certification*

A water quality certification is required by Ecology for projects which require an Individual Permit from the Corps of Engineers (Section 404) or for a project which exceeds certain minimum thresholds of wetland fill and still qualify for a Nationwide permit (Section 404). The 401 Certification can be best thought of as a tool that Ecology uses to oversee the permit conditions on federal 404 permits to assure that those federal conditions match the state standards, which may be more restrictive.

U.S. Army Corps of Engineers: Section 404, Clean Water Act

The Clean Water Act, Section 404 is the regulatory tool which the Army Corps of Engineers (the Corps) uses to regulate alteration of 'waters of the U.S.' including wetlands. For large rivers, like the Snohomish, and the wetlands which are adjacent to those rivers, any amount of wetland fill can trigger the need for an Individual Permit from the Corps. (Boardwalks built on piles above the wetland surface may not be counted as fill in some instances). This does not imply that the activities won't be permitted, it just means that a long application and review process must be conducted. An Individual Permit process

is similar to a SEPA process in that it has managed public comment periods and allows comment and input from any applicable federal, state, local agency or tribe, as well as environmental organizations and interested citizens. An Individual Permit also requires an Alternative Analysis which illustrates other trail alignments which were considered, and a discussion of why the preferred alternative alignment was chosen. The purpose of the Alternatives Analysis is to disclose whether an alignment exists which would result in less wetland impacts while still meeting all the objectives of the trail design.

Compensation for wetland impacts will be required through an Individual Permit. The ratios for wetland compensation may follow the guidance of the City or can rely upon the state recommendations, usually depending upon the quality of the wetlands expected to be impacted by the project.

*U.S. Coast Guard: Section 10, Rivers and Harbors Act*

Any work below the ordinary high water mark within navigable waters requires a Section 10 permit from the Coast Guard. These permits are closely coordinated with the Corps permitting process. The purpose of the permit is to assure that any proposed actions would not pose a risk to continued navigation of the river channel.

The proposed trail alignment along the river will involve some fill or abutment placement within the floodplain of the river which would trigger the need for a Shoreline Permit, an Hydraulic Permit, and a Section 10. Any fill or alteration of wetlands associated with the river would trigger a Section 404 Individual permit from the Army Corps of Engineers. If a Section 404 permit is required, then it is likely that a Section 401 water quality permit, which is administered by the Washington State Department of Ecology will also be required.

Work within the floodplain or along the shores of the river, if approved by Ecology, will require compensation either immediately along the waterfront, where feasible, or within the immediate vicinity. Given the precipitous nature of the shoreline where the trail is proposed, there are few opportunities to provide enhancement of the riparian

*Oversteepened riverbank at American Legion Building*

corridor in the immediate trail alignment. The lack of opportunity for riverside restoration is due to historic filling and stabilization of the river bank, as well as building placement in town which has left no riparian area of any extent which is physically feasible for planting. The velocity of the current, the extent of rock stabilization and the outside curve positions of the shoreline results in a condition which is not conducive to vegetation establishment at the toe of the slope for the main portion of trail along the river channel, below town.

There may be some opportunity for restoration plantings within or upstream of Cady Park depending upon final park configurations. The large black cottonwood trees which are present within the Park in existing conditions are growing up above the river bank on old revetment fill. These black cottonwoods are more than 5 feet above existing ordinary high water of the river bank. If Cady Park is redesigned, the design will dictate what opportunities there are for recreation or expansion of a riparian zone along the river's margin.

*Riverbank at Cady Park*

There are existing wetlands on the west end of the trail alignment, to the west of the City Shop location. Configuration of trail heads and parking in this location should take the extent and condition of these wetlands into consideration to avoid unnecessary impacts. It may be possible that these wetlands provide some opportunity for enhancement to increase their habitat functions by increasing the vegetative diversity and structural complexity over existing conditions. It may be possible to provide limited compensatory mitigation in this location for some riverside impacts.

The east end of the proposed alignment runs through the Stocker property which likely also contains some wetland. This area appears to have far less diverse and productive wetlands than the Shop area, therefore, there may be a greater opportunity for increasing wetland functions here. It may also be possible to increase the value of the riparian zone along this reach by increasing plant species diversity and reintroducing conifers such as Western red cedar (*Thuja plicata*) which are greatly preferred as sources of large woody debris within the river channel for fish resources (when the trees mature and fall into the river many decades in the future).

*Possible enhancement site at Stocker property*

## *Riverbank Engineering and Stabilization*

*General*

In the course of trail and park planning, a number of factors were evaluated relating to the impacts to the riverbank. Permitting, stability, flooding, environmental impacts, aesthetics, maintenance and construction cost, as well as other factors, were balanced to provide a reasonable cost with tolerable maintenance and risk. The information presented in this section discusses the concepts and key factors considered in the development of the plan.

*Flood elevations at Silver King Cafe*

*Floodways*

Encroachment of infrastructure development in a flood plain can lead to a reduction in flood-carrying capacity, increased flood elevations, and increased flood hazards. The Federal Emergency Management Agency (FEMA) investigated the existence and severity of flood hazards in the City of Snohomish. This publication divides the 100-year flood plain into two components, the Floodway and the Floodway fringe. The FEMA publication details the allowable increase in flood heights which are acceptable assuming development occurs within the Floodway Fringe. If increases are less than 1.0 foot and do not produce hazardous velocities, the Floodway Fringe may be developed.

This Riverfront Plan proposes development of a trail and other improvements within the 100 year flood plain. The majority of trail construction will be within the Floodway Fringe. The manner of construction proposed in most cases minimizes impacts within the Floodway Fringe or increases the cross-sectional area of the river by excavating for construction of the trail in the riverbank, thus limiting or reducing the water surface elevation during the 100 year flood. Additional evaluation of impacts may be required by permitting agencies during the design phase.


*1995 emergency repair site*

*Risk Factors*

The consultant team evaluated many factors prior to looking at development options for each section of the corridor. Some of the factors used in the evaluation process included:

- Attending public meetings to obtain input.
- Attending meetings with City staff and Task Force

members.

- Meetings and research with Federal and State Agencies on hydraulic and flood conditions.
- Gathering historic data available from agencies and City staff.
- Physical evaluation of topography, previous slides and repairs.
- Visual assessment of each route corridor.

Much of the trail will be constructed along the Snohomish River bank. It will be located within the 100-year flood plain where it will be susceptible to overtopping, erosion, scour, flood debris damage and slope instability risks. This may result in trail damage or failure. It should be noted that the preferred solutions minimize risk for the majority of these potential hazards.

Soil stability evaluation is generally associated with two types of failure: 1) shallow or surficial failures, and 2) deep seated failures. In all cases factors which must be considered include: soil type, soil horizon inclination, shear strength, surface water, groundwater, water level fluctuation and other factors. A deep-seated failure was not considered in evaluation of the alternatives. This type of failure is similar to the failure of the riverbank in 1995 adjacent to Avenue A. In a report by AGRA it was stated: "The existing bank has an approximate factor of safety against static failure of 0.9 to 1.3". Engineering publications indicate factors of safety of 1.3 to 1.5 for static stability and 1.0 to 1.3 for seismic stability are suitable for most structures depending on the risk to the public. Many engineering publications use a factor of safety of 1.3 or greater as minimum for static stability. Additional geotechnical information is needed to thoroughly evaluate the risk of a potential massive stability failure. In the event the entire riverbank would need to be reconstructed to achieve a suitable factor of safety it would not be economically justifiable to construct the trail adjacent to the river. The risk of a massive failure of the entire riverbank is not likely. It is more likely that isolated sections of the riverbank may collapse similar to what occurred near Avenue A. Since trail use after a flood is typically low due to the debris and other conditions and since the most likely period of failure is during a recession of flood waters, it appears more cost effective to construct the trail and make isolated repairs to

these type of failures if they occur.

The alternatives presented in the following sections balance the economy of construction and maintenance with the potential environmental concerns, risk of future failures and impacts to bank stability. In evaluation of these alternatives the following criteria were used:

- Enhance or improve the stability of the existing bank where possible to minimize the chance of a shallow or deep-seated stability failure.
- Improve flood conveyance through sections where the trail is proposed along the riverfront.
- Use bioengineering techniques to enhance stability and minimize erosion where appropriate.

*Risk Assessment*

In order to determine actual risk it is normally necessary to perform a geologic/geotechnical study of an area to verify surface and groundwater conditions, stratigraphy, soil conditions and other factors. Therefore the following risk assessment should be considered preliminary until an actual study is performed to verify conditions.

Risk categories are described below:

**1. Low Risk**

These are areas where all of the following conditions apply:

- Riverbank has a relatively gentle slope or minimal slope height.
- Improvements are located a sufficient distance from the edge of riverbank that the potential risk of a slope stability failure is considered low.
- Surface and/or groundwater runoff is controlled in a manner which minimizes potential surficial or deep seated slope failures.

Construction Techniques:

Construction at these locations would typically involve placement of fill at-grade with minimal disruption to surface water flow and minimal modification to existing topography.

## 2. Medium Risk

These are areas where one or more of the following conditions apply:

- Riverbank has a moderately steep slope and moderate slope height.
- There are rapid fluctuations in river levels during flooding.
- Surface water is uncontrolled and erosive in nature.
- Possible shallow or deep-seated slope failures may occur depending on soil and groundwater conditions.

Construction Techniques

Construction at these locations would consist of control of surface water and construction of trails and other improvements using engineering and/or bioengineering techniques to minimize risk.

## 3. High Risk

These are areas where one or more of the following conditions apply:

- Riverbank has a steep slope and a high slope height.
- There are rapid fluctuations in river levels during flooding.
- There is substantial surface water and groundwater that may impact stability of the slope.
- Possible shallow or deep-seated slope failures are likely to occur without engineered solutions or may occur even with engineered solutions.

Construction Techniques

Construction at these locations will require geotechnical engineered and possibly bioengineering solutions.

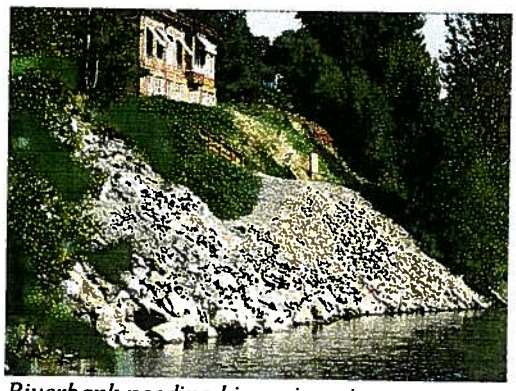
The following table details the risk assessment of trail or structure construction along the riverfront.

| FROM | TO | TRAIL STABILITY CATEGORY |
|---|---|---|
| New boat launch | 600 feet west of BN trestle | Low risk |
| 600 Feet West of BN trestle | Avenue B | High risk |
| Avenue B | American Legion building | Moderate risk |
| American Legion building | West end of Avenue D bridge | High risk |
| West end of Avenue D bridge | Sewage Lagoon | Low to moderate risk* |

*Depending on actual trail location adjacent to riverbank

*General Bank Stabilization/Bioengineering*

Bioengineering is an approach to bank stabilization, erosion control, water quality improvement, wetland restoration and habitat enhancement which uses live planting and organic structural elements and materials in construction for streambank and shore stabilization. The term "bioengineering" is used to encompass the many methods of establishing vegetative cover using a combination of live, dormant and/or decaying plant materials.



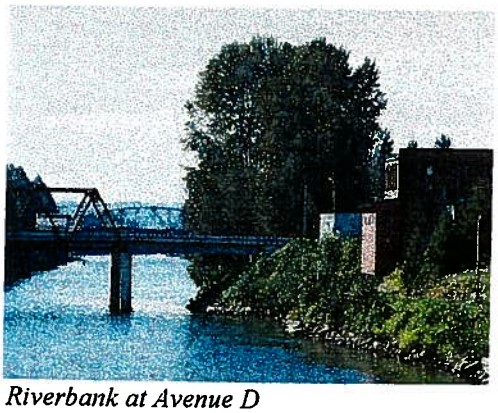
*Riverbank needing bioengineering*

The bioengineering techniques employed strive to minimize the use of "hard" barriers such as armor rock and rock revetments, concrete revetments, retaining walls and other objects of this type to a practical minimum. These techniques provide benefits such as bank stabilization, habitat enhancement (providing shade, food source and temperature control), filtration of surficial runoff into streams and aesthetically provide a more natural setting for wildlife and human habitat.

Bioengineering will be used in areas where "hard" surfaces are currently present or in isolated areas requiring additional erosion protection. Plant types will be local native species suitable for the slope inclination, climatic conditions, shade and other factors at this site.

*Retaining wall and bank stabilization under Avenue D Bridge*

This type of construction consists of an "L-shaped" concrete retaining wall and trail (see Figure 12). It would be used between the American Legion building and extend west under the Avenue D Bridge. Construction would require excavating into the existing slope to create a bench for trail and the wall structure. The trail would be posi-



*Riverbank at Avenue D*

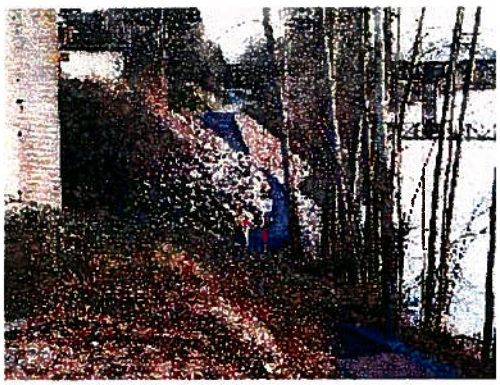
tioned as close as possible to the building and bridge abutment to minimize flood impacts. The retaining wall would also be treated to provide a vandal resistant surface. Bio-engineered landscaping will minimize erosion both at the upstream and downstream ends of the wall.

The minimum vertical clearance would be 10-feet between the low chord elevation of the Avenue D Bridge and the top of trail. The trail width would be 12 feet and the profile grade should be less than 5%.

Vegetation from rivers edge to the outer edge of trail would be maintained and there are no plans to modify the existing vegetation through this area. Some revegetation would be required above the retaining wall at each end of the bridge and extending to the American Legion Building. In addition, washed rock may be used directly adjacent to the top edge of the retaining wall, in areas where plantings may not thrive, to prevent erosion due to run-off.

This design recommendation has a number of advantages:

- The trail is constructed high on the river bank which minimizes the frequency of trail inundation.
- Construction by excavation of existing soils will result in increased hydraulic flow capacity through this section during flood events.
- Excavation of soil near the top of bank results in a net decrease in load acting on the slope. This helps to improve slope stability.
- There is minimal disturbance to the adjacent riverbank during construction.
- The 10-foot clear distance beneath the bridge provides access for maintenance vehicles.



*1995 emergency repair site*

*Retaining wall and modifications to emergency slope repair at Avenue A Street end*

The evaluation of and recommendations for improvements to this area are based on site observations, review of the plans for construction, and discussions with the City of Snohomish Public Works Department. It is our understanding that this bank failure resulted in a near vertical face adjacent to the existing building at this location. The City has constructed an armor rock slope for which AGRA has estimated a factor of safety of 1.3 against future static

failures. A narrow paved maintenance access has been constructed which does not meet AASHTO or ADA trail standards.

The oversteepened slopes of this bank repair may result in some future damage. Additionally, placement of a "hard" surface typically results in bank erosion downstream of the location during flooding. The recommendation would be to use bioengineering techniques to modify the existing armored slope. This could be accomplished by placement of topsoil in voids between existing stones or by removing individual stones where this is not possible to allow sufficient topsoil to be placed to establish a root system. Individual live plantings would be installed in the topsoil-filled voids both above and below the existing trail system. As the plantings become established, the rock face of the slope would be obscured and the root mass would help to stabilize the slope.


*Existing trail at repair site*

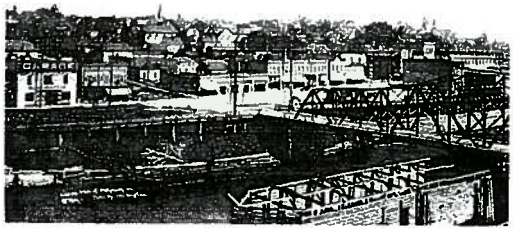
The existing trail will need to be removed and reconstructed at the 12-foot width. The oversteepened slope in this area will most likely require that a concrete retaining wall system be constructed to provide the necessary trail width. The trail would be constructed in a similar manner to the retaining wall system discussed for the Avenue D Bridge retaining wall. See Figure **12**.

The advantages of this design recommendation include:

- Improved stability of the repair area (minimizing undercutting and downstream bank erosion).
- Improved safety through widening and regrading the trail surface.
- Riverbank enhancements.
- Improved aesthetics.
- Minimal cost to enhance existing emergency repairs.

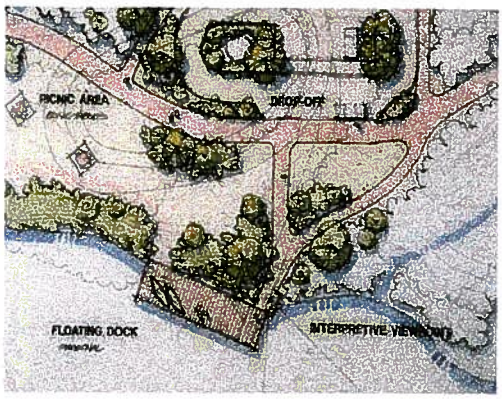
*Boardwalk at Kla Ha Ya Park*

A boardwalk is proposed at Kla Ha Ya Park which will provide a 12 to 20-foot trail and viewing platform at this location. As currently proposed, the boardwalk would be supported with steel piles and the deck constructed of wood.



*Historic Snohomish*

*Kla Ha Ya Park riverbank*




*Floating dock at Cady Park*

The boardwalk will be constructed as close as possible to the existing trail grade to minimize impact to the stream capacity during floods. This will mean the boardwalk will be overtopped during periods of flooding. For this reason it must be designed to minimize damage during flooding. Horizontal slats (similar to historical construction) will be used to prevent flood debris from lodging in the pile bents. Slat width will be large enough to allow flood waters to drain from beneath the boardwalk. The railing will be removable to allow repair or replacement.

The advantages of this design include:

- Increased usable park area especially during periods of high water.
- Minimal impact to Floodway hydraulic capacity.
- Boardwalk construction will provide historical context and opportunities for interpretive display.

Disadvantages are:

- Higher cost than standard at-grade trail system.

*Floating Docks*

Floating docks have been proposed in a number of areas as a means to provide more access to the river. The size float system required, fender system and whether dredging would be necessary are dependent on the vessel size and bathymetry in the area of the proposed dock. The plan and cost estimates reflect a small platform dock with driven steel piles. The piles would be left in year round and the floating dock system would be removed for winter storage.

The float system will consist of concrete encapsulated floatation billets. A fender system would be used to accommodate small vessels. In the event larger vessels are proposed a larger fender system or other techniques may be necessary to accommodate the vessels.

*Single Lane Boat Launch, Stocker Property*

A single-lane boat launch facility is proposed at the Stocker property as a replacement for the Cady Park boat launch. The Cady Park boat launch is in poor condition and has been recommended for demolition.

The plan includes a single-lane concrete boat ramp capable of launching boats to 26 foot maximum length, a float and ramp system, paved parking facility and paved access road.

The new boat launch facility would provide the following:

- ADA access to the float.
- Concrete pre-cast launch ramp system capable of launching recreational boats to 26 feet in length.
- Paved parking to accommodate approximately 15 vehicles/trailer combinations.
- Single-lane paved access road to facility.

*Surface drainage effects on riverbank stabilization*

A significant amount of stormwater is being piped from roof and street drainage across the trail and onto riverbank slopes. In some areas the stormwater is ponding in level areas (under buildings), increasing the possibility of more slope failure. As part of trail construction and slope stabilization, these drainage problems should be addressed and corrected to minimize surface and groundwater and enhance stability of the slopes.

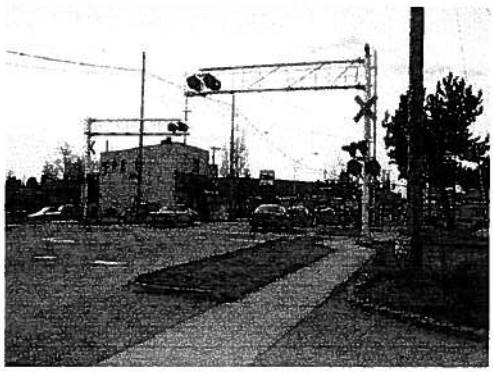
*Storm drainage and impacts*

## *Traffic and Crossings*

*General*

The following is an evaluation and recommendations for crossing treatments at the two major intersections that occur between the trail and vehicular traffic. In addition there are recommendations for crossing improvements at one major intersection that will have increased pedestrian and bicycle traffic as a result of the trail being located nearby.

*Lincoln Avenue and Second Street*



*BNSF Railroad Spur Line crossing at Union Avenue*

Lincoln Avenue/BNSF Railroad Spur at Second Street

Nonmotorized crossing of Second Street at either an abandoned railroad crossing (the existing Burlington Northern-Santa Fe railroad crossing) or at Lincoln Avenue is a unique situation. Existing traffic volumes do not warrant, at this time, the installation of a traffic signal at the Lincoln Avenue intersection. Adequate gaps in traffic from signals located at Maple and Second Street and at Pine and Second Street allow for critical left turning movements at this intersection. The north leg of this intersection is an unimproved access into a gravel parking lot for a ball field/ recreation area. Existing cross-section of Second Street allows for three (3) travel lanes (which includes a center-lane two-way left turn lane) and parking on the south side of the street. If nonmotorized crossings on Second Street were accommodated at Lincoln Avenue, a pedestrian actuated traffic signal is recommended. The signal should be designed and installed to control all vehicular movements at the intersection during pedestrian and bicycle crossing as an interim measure and with control systems to ultimately allow full signal control.

As an interim measure, once the pedestrian/bicycle signal phase is completed, minimal green phases should cycle to allow for the westbound left turns and northbound movements to clear prior to allowing full vehicular movement. When the signal is in standby mode (waiting for pedestrian/ bicycle actuation), signal indicators for eastbound and westbound movements should be flashing green with signage to allow permitted left turns off of Second Street, and flashing red beacons towards Lincoln Avenue indicating stop and proceed as gaps in traffic permit on Lincoln Avenue. When pedestrian actuation occurs, indicators on Second Street would turn from flashing green to steady amber

*Advance warning sign*


*Avenue D at First Street*

*Lincoln Avenue and Stocker property*

and then red; flashing red indicators on Lincoln Avenue would change to steady red.

Driveway access/egress on the north leg of this intersection should be restricted to entrance only with no exits allowed. Raised channelization and signage should be installed to eliminate this potential movement. Egress from the parking lot would be provided with a one-way internal driveway system to Third Street.

Major crossing locations should occur on Second Street west of Lincoln Avenue and across Lincoln Avenue. Textured pavement or standard thermoplastic crosswalk markings should indicate locations. Pedestrian no crossing signs should be placed on other intersection corners. Actuated buttons would be placed on either side of Second Street. Crossing Lincoln Avenue would be accommodated by yield and stop controlled vehicle movements that conflict with this crossing.

Lincoln Avenue at Stocker Property

The proposed at-grade crossing of Lincoln Avenue at the Stocker property would require a fairly capital intensive treatment given the average travel speed and volumes of existing and future traffic on Lincoln Avenue. Observed travel speeds ranged between 35 mph and 40 mph. Future traffic on Lincoln Avenue is estimated at approximately 8,100 daily vehicles by the year 2002. Given these parameters in the context of trail usage (peak summer day of 1,500 users or more) and vehicular speeds in the area, it is recommended that a pedestrian-actuated amber flashing signal warning system be installed to accommodate non-motorized crossings.

This flashing beacon system would flash amber when activated as a cautionary measure. Advanced signage to identify crossing as well as a restrictive "yield to pedestrians and bicyclists" sign should be installed at the crossing for vehicular traffic. Advanced treatments to warn vehicles should also include rumble strips or pavement buttons within the travel lane. This would also serve as an audible warning for pedestrians and bicycles that a vehicle is approaching. Pavement treatment at the crossing location itself should involve at the minimum a standard thermoplastics hatched crosswalk. Other treatments could include

texture pavement or brick to delineate the crossing location.

Vegetation along Lincoln Avenue should be cleared and maintained to allow for adequate stopping sight distance for vehicles, and crossing sight distance for pedestrians.

Signage should also control pedestrian and bicycle movements. Advanced warning signs of an actuated crossing and of a cautionary nature should be placed along the trail on either side of Lincoln Avenue to identify safety measures that the pedestrian or bicyclists must observe when attempting a crossing. Directional signage should also point towards other trail elements within the City of Snohomish (e.g., the Centennial Trail, Lowell-Snohomish Trail). Street lighting should also be installed to accommodate early morning and late evening activities at the crossing location.

*Avenue D at First Street*

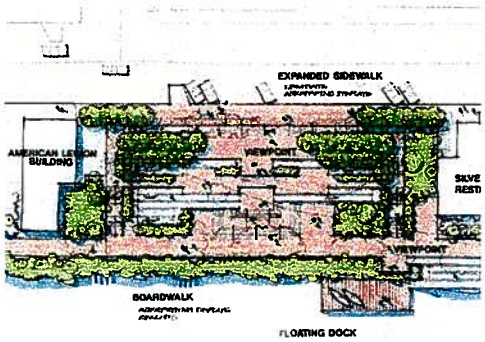
The proposed undercrossing of the Avenue D bridge would not require significant upgrades to crossing treatments at this intersection. However, with the completion of the Riverfront Trail, the Lowell Snohomish Trail and the Centennial Trails, there will likely be a greater volume of pedestrians and bicyclists in the vicinity. Some will want to access First Avenue from the west side of Avenue D, so minor improvements to this at-grade crossing are recommended. Re-striping or installation of new thermoplastic stop bars and crosswalks on all intersection legs may be necessary to improve the visibility for both motorists and pedestrians/bicyclists.

## Phasing

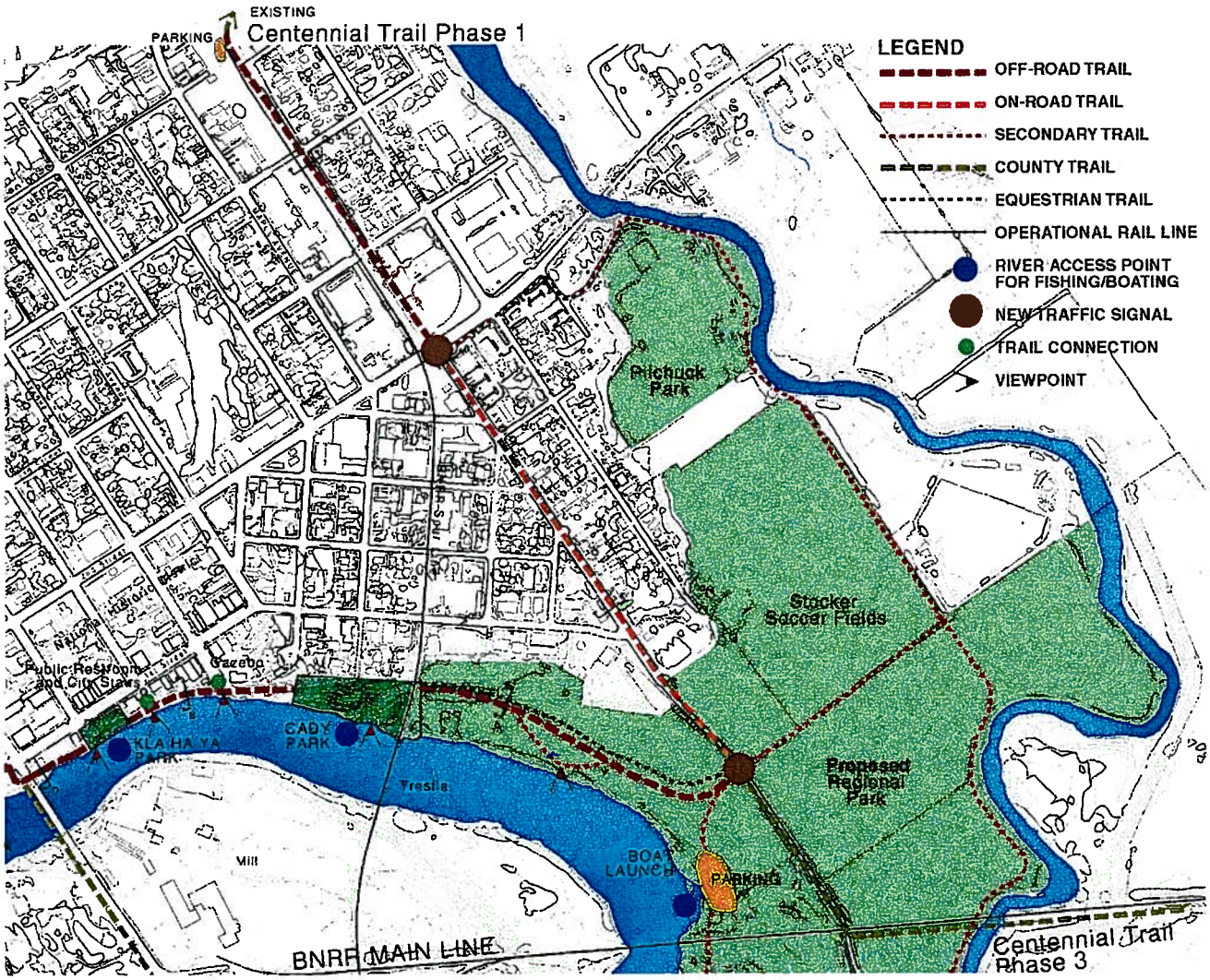
### *Phasing*

The Interim Plan is divided into two phases.

Phase 1 constructs the trail from the north side of the Avenue D bridge, under the bridge and along the riverfront to Lincoln Avenue. It includes construction of Kla Ha Ya Park improvements. Phase 1 also includes bike lane and trail construction on Lincoln Avenue from the new signal planned at the Stocker property to the connection at the south end of the Phase 1 of Centennial Trail. Phase 1 would make the connections between the Phase 1 and Phase 3 of the Centennial Trail. It would also provide the bank stabilization and enhancement along the riverfront in the HBD.

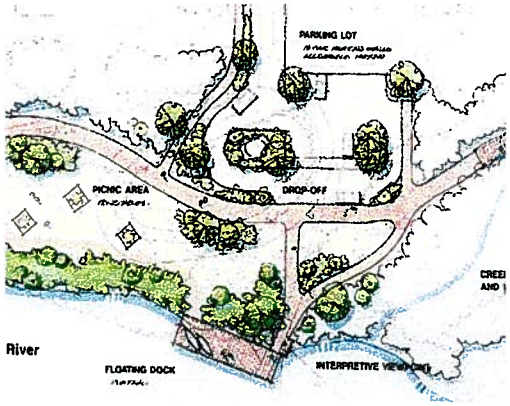



*Phase 1, Kla Ha Ya Park*




*Phase 1*

Phase 2 includes construction of Cady Park improvements and the trail from Avenue D to the Wastewater Treatment Plant. It includes the Tour Boat Dock and minor improvements to the City Shops site such as trailhead parking, fencing and planting. The boat launch facility will be developed as part of Pilchuck Regional Park.

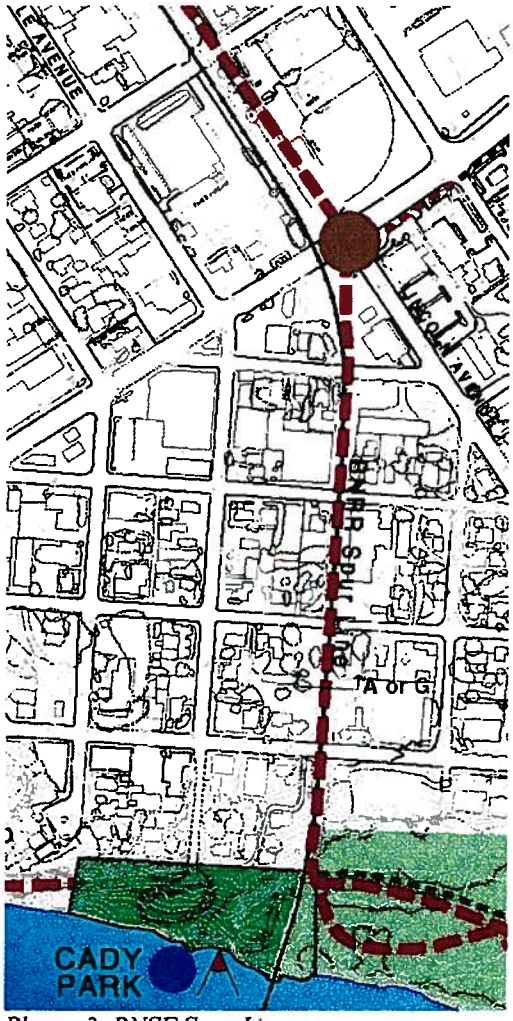



*Phase 2, Cady Park*

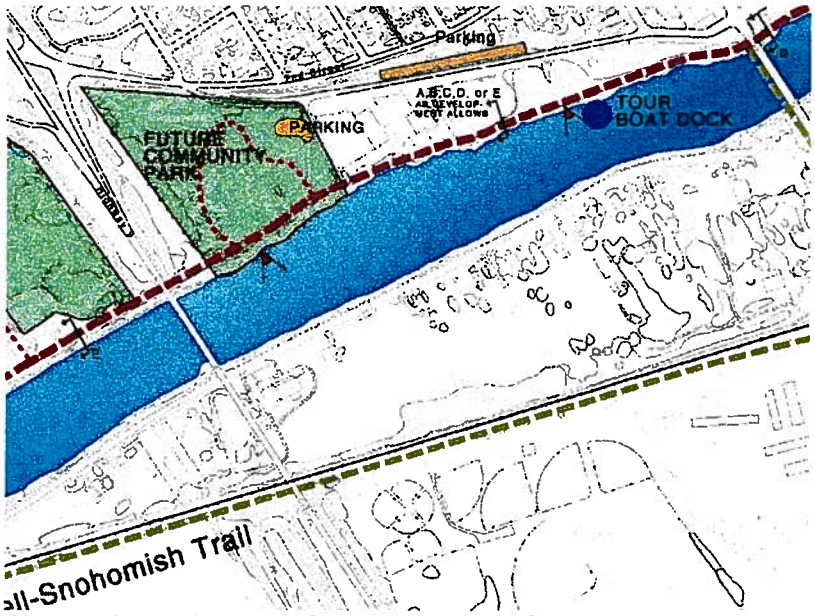

*Phase 2, Avenue D to Treatment Plant*

The Final Plan essentially constitutes phases 3 and 4. With the acquisition of the BNSF Railroad spur line, Phase 3 would include trail development along that corridor and a ramp structure connecting Cady Park to the trestle grade.

Phase 4 would include development of the riverfront trail between Avenue D and the City Shop. This final phase might be accomplished piecemeal as these properties are redeveloped and the costs associated with trail construction might be included in the redevelopment.




*Phase 3, BNSF Spur Line*




*Phase 4, Avenue D to New Community Park at City Shops*

***Schedule***

An estimated schedule for completion of Phase 1 of the project is provided below.

| | |
|---|---|
| Acquisition/condemnation (Stocker) concurrent with survey | 6 months |
| Design, review and (City) approval | 12 months |
| Permit review and approval | 12 months |
| Bidding and contract award | 3 months |
| Construction | 9 months |
| TOTAL | 3 years, 6 months |

## Implementation Strategy

In order to implement first the Interim Plan and ultimately the Final Plan, it will be necessary to seek funding from a variety ofsources, including bonds, taxes, grants and private donations. The phasing plan should be adjusted to reflect funding available from year to year and the cost estimates should be adjusted to reflect significantly larger or smaller portions of work accomplished in each phase.

## Cost Estimate

The cost estimate for the Interim and Final plans is summarized on the following page. A more specific breakdown of costs, by segment, is provided in the pages that follow the summary. Costs assume a 1999 construction date. A reasonable inflation factor to add for construction after 1999 would be approximately 2% per year.

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Snohomish Riverfront
Date: 6-24-98

Summary

| | |
|---|---|
| Phase 1 | |
| Avenue D Undercrossing to Kla Ha Ya Park | 555,214 |
| Kla Ha Ya to Cady Park | 965,624 |
| Cady Park to Lincoln Street | 388,840 |
| Kla Ha Ya Park | 1,234,376 |
| Centennial Trail North to Centennial Trail South via Lincoln Avenue | 616,440 |
| Subtotal | 3,760,494 |
| Phase 2 | |
| Cady Park | 443,960 |
| Avenue D to Treatment Plant on First Street | 626,175 |
| Subtotal | 1,070,135 |
| SUBTOTAL INTERIM PLAN (Phases 1& 2) | 4,830,629 |
| Phase 3 | |
| BNSF Spur from Second Street to Cady Park | 691,900 |
| Phase 4 | |
| Avenue D to Treatment Plant on Riverfront | 100,000 * |
| Boat Launch Facility at Pilchuck Regional Park | 200,000 |
| SUBTOTAL FINAL PLAN (Phases 3 & 4 & Boat Launch) | 991,900 |
| TOTAL CONSTRUCTION COST ** | 5,822,529 |
| Construction Contingency | 1,164,506 |
| A & E Fees | 1,164,506 |
| TOTAL PROJECT COST ** | 8,151,541 |

*This estimate is based on a typical unit price for trail construction, exclusive of major structures or riverbank stabilization. Actual costs for construction in this section of the project are difficult to estimate because of the potential for change in zoning and land use and because of the range of development options that are available.

**Estimates do not include:
- -Major utility relocation (including lift station)
- -Property acquisition
- -Permit required enhancements (habitat enhancement figure is an allowance and not based on permit review)
- -Lighting
- -Survey
- -Sales tax

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase: Interim Master Plan
Date: 6-24-98 By: CR

Trail Segment: Avenue D Undercrossing to Kla Ha Ya Park
Phase1

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 50,474 | |
| Demolition | | LS | | 3,000 | |
| Clearing | 0.3 | Acres | 6,000 | 1,800 | |
| Grading | 0.3 | Acres | 1,800 | 540 | |
| Trail (Concrete under bridge) | 5,800 | SF | 6 | 34,800 | |
| Retaining Wall | | LS | | 409,000 | |
| Traffic/Directional Signs | | LS | | 2,500 | |
| Trail Signs | 6 | EA | 200 | 1,200 | |
| Striping (rechannelize) | 800 | LF | 7 | 5,600 | |
| Habitat Enhancement | | LS | | 45,000 | |
| Seeding | 0.5 | Acres | 2,600 | 1,300 | |
| Subtotal | | | | | 555,214 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase: Interim Master Plan
Date: 6-24-98 By: CR

Trail Segment: Kla Ha Ya Park to Cady Park
Phase 1

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 87,784 | |
| Demolition | | LS | | 90,000 | |
| Clearing | 0.8 | Acres | 6,000 | 4,800 | |
| Grading | 0.8 | Acres | 1,800 | 1,440 | |
| Storm Drainage | | LS | | 6,000 | |
| Surface Drainage | | LS | | 5,000 | |
| Trail (Asphalt) | 1,400 | LF | 42 | 58,800 | |
| Trail (Concrete) | 1,000 | SF | 6 | 6,000 | |
| Trail (Boardwalk) | 250 | LF | 1,400 | 350,000 | |
| Retaining Wall | | LS | | 220,000 | |
| Traffic Barriers | | LS | | 60,000 | |
| Traffic/Directional Signs | | LS | | 15,000 | |
| Interpretive Sign | 1 | EA | 5,000 | 5,000 | |
| Trail Signs | 5 | EA | 200 | 1,000 | |
| Striping (Parking) | 500 | LF | 7 | 3,500 | |
| Habitat Enhancement | | LS | | 50,000 | |
| Seeding | 0.5 | Acres | 2,600 | 1,300 | |
| Subtotal | | | | | 965,624 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase:Interim Master Plan
Date: 6-24-98 By: CR

Trail Segment: Cady Park to Lincoln Street
Phase 1

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 35,160 | |
| Demolition | | LS | | 5,000 | |
| Clearing | 1.0 | Acre | 6,000 | 6,000 | |
| Grading | 1.0 | Acre | 1,800 | 1,800 | |
| Fill | 1,200 | CY | 12 | 14,400 | |
| Storm Drainage | | LS | | 3,000 | |
| Trail (Asphalt) | 1,700 | LF | 42 | 71,400 | |
| Road (Asphalt) | 1,000 | LF | 55 | 55,000 | |
| Parking (Trailhead) | 20 | Spaces | 1,500 | 30,000 | |
| Traffic Barriers | | LS | | 5,000 | |
| Interpretive Sign | 1 | EA | 5,000 | 5,000 | |
| Trailhead/Bulletin Board Sign | 1.0 | EA | 5,000 | 5,000 | |
| Habitat Enhancement | | LS | | 150,000 | |
| Seeding | 0.8 | Acre | 2,600 | 2,080 | |
| Subtotal | | | | | 388,840 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase: Interim Master Plan
Date: 6-24-98 By: CR

Park: Kla Ha Ya (exluding waterfront trail)
Phase 1

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 112,216 | |
| Demolition | | LS | | 5,000 | |
| Clearing | 0.4 | Acre | 6,000 | 2,400 | |
| Grading | 0.4 | Acre | 1,800 | 720 | |
| Fill | 1,000 | CY | 12 | 12,000 | |
| Trail (Concrete) | 3,800 | SF | 6 | 25,000 | |
| Stairs (Inc. ramps) | | LS | | 530,000 | |
| Floating Dock & Ramp | | LS | | 100,000 | |
| Retaining Wall | | LS | | 246,000 | |
| Interpretive Signs | 5 | EA | 5,000 | 25,000 | |
| Park Furniture | | LS | | 100,000 | |
| Trees/Shrubs | | LS | | 75,000 | |
| Seeding | 0.4 | Acre | 2,600 | 1,040 | |
| Subtotal | | | | | 1,234,376 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase: Interim Master Plan
Date: 6-24-98 By: CR

Trail Segment: Centennial Trail North to
Centennial Trail South via Lincoln Avenue
Phase 1

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 56,040 | |
| Demolition | | LS | | 49,000 | |
| Clearing | 3.0 | Acres | 6,000 | 18,000 | |
| Grading | 3.0 | Acres | 1,800 | 5,400 | |
| Storm Drainage | | LS | | 30,000 | |
| Trail (Asphalt) | 2,500 | LF | 42 | 105,000 | |
| Road (Asphalt) | 1,600 | LF | 55 | 88,000 | |
| Traffic Barriers | | LS | | 30,000 | |
| Traffic/Directional Signs | | LS | | 25,000 | |
| Trail Sign | 8 | EA | 200 | 1,600 | |
| Striping (rechannelize) | 2,500 | LF | 7 | 17,500 | |
| Control Signals (Lincoln & 2nd) | | LS | | 100,000 | |
| Control Signals (Lincoln & Stocker) | | LS | | 12,000 | |
| Trees/Shrubs | | LS | | 75,000 | |
| Seeding | 1.5 | Acres | 2,600 | 3,900 | |
| Subtotal | | | | | 616,440 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase:Interim Master Plan
Date: 6-24-98 By: CR

Park: Cady (excluding waterfront trail)
Phase 2

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 40,360 | |
| Demolition | | LS | | 7,000 | |
| Clearing | 2 | Acres | 6,000 | 12,000 | |
| Grading | 2 | Acres | 1,800 | 3,600 | |
| Storm Drainage | | LS | | 40,000 | |
| Surface Drainage | | LS | | 10,000 | |
| Trail (Loop) | 400 | LF | 42 | 16,800 | |
| Road (Improvements) | 300 | LF | 55 | 16,500 | |
| Parking (Trailhead) | 15 | Spaces | 1,500 | 22,500 | |
| Floating Dock | 1 | EA | 65,000 | 65,000 | |
| Interpretive Signs | 1 | EA | 5,000 | 5,000 | |
| Park Furniture | | LS | | 100,000 | |
| Habitat Enhancement | | LS | | 100,000 | |
| Seeding | 2.0 | Acres | 2,600 | 5,200 | |
| Subtotal | | | | | 443,960 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase: Interim Master Plan
Date: 6-24-98 By: CR

Trail Segment: Avenue D to Treatment Plant on First Street
Phase 2

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 56,925 | |
| Demolition | | LS | | 20,000 | |
| Clearing | 1.5 | Acres | 6,000 | 9,000 | |
| Grading | 1.5 | Acres | 1,800 | 2,700 | |
| Fill | 2,000 | CY | 12 | 24,000 | |
| Storm Drainage | | LS | | 25,000 | |
| Surface Drainage | | LS | | 15,000 | |
| Trail (Asphalt) | 1,900 | LF | 42 | 79,800 | |
| Road | 1,750 | LF | 55 | 96,250 | |
| Parking (Road) | | LS | | 20,000 | |
| Parking (trailhead) | 20 | Spaces | 1,500 | 30,000 | |
| Retaining Wall (Ironworks) | | LS | | 15,000 | |
| Floating Dock | 1 | EA | 65,000 | 65,000 | |
| Traffic Barriers | | LS | | 75,000 | |
| Traffic/Directional Signs | | LS | | 10,000 | |
| Trail Signs | 6 | EA | 200 | 1,200 | |
| Habitat Enhancement | | LS | | 50,000 | |
| Trees/Shrubs | | LS | | 30,000 | |
| Seeding | 0.5 | Acres | 2,600 | 1,300 | |
| Subtotal | | | | | 626,175 |

# MacLeod Reckord

Landscape Architects

# Cost Estimate

Project: Snohomish Riverfront
Phase:Final Master Plan
Date: 6-24-98 By: CR

Trail Segment: BNSF Spur from Second Street to Cady Park
Phase 3

| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Mobilization (10%) | | LS | | 62,900 | |
| Demolition | | LS | | 9,500 | |
| Clearing | 3.0 | Acres | 6,000 | 18,000 | |
| Grading | 3.0 | Acres | 1,800 | 5,400 | |
| Storm Drainage | | LS | | 30,000 | |
| Trail (Asphalt) | 1,500 | LF | 42 | 63,000 | |
| Trail (Elevated Ramp) | | LS | | 390,000 | |
| Traffic Barriers | | LS | | 40,000 | |
| Traffic/Directional Signs | | LS | | 10,000 | |
| Interpretive Sign | 1 | EA | 5,000 | 5,000 | |
| Trail Signs | 8 | EA | 200 | 1,600 | |
| Trees/Shrubs | | LS | | 50,000 | |
| Seeding | 2.5 | Acres | 2,600 | 6,500 | |
| Subtotal | | | | | 691,900 |

# VI. SUMMARY

The Final Riverfront master plan encompasses changes to both public and private lands that may take many years to negotiate and implement. The importance of the Interim plan is that it identifies a goal that, given adequate funding, is achievable in the immediate future. It is one that can be developed by phases, with the assurance that the community's and the City's ultimate goals will be achieved. The phases as they are identified in this report help to define what the current priorities are for the community, but even these may change over time as the project evolves and the community grows.

The plan offers a schematic level of design for the parks, one that attempts to represent the public's vision of how the Snohomish Riverfront should look and be used. In the next stages of development, the plans should be refined to respond to a more specific program, one that is formulated by the City and the community. One of the keys to the success of a long-range plan such as this is in its flexibility of specific elements while still achieving the long-term goals.

This plan will be most effective if implementation is coordinated with Snohomish County and their planning efforts. The connections to the regional trails and to the on-street improvements should be made as a combined effort with the safety of trail users in mind.

# VII. APPENDIX

**Alternative Plans and Costs**

**Public Involvement/Response**

**Bibliography**

# ALTERNATIVE PLANS AND COSTS

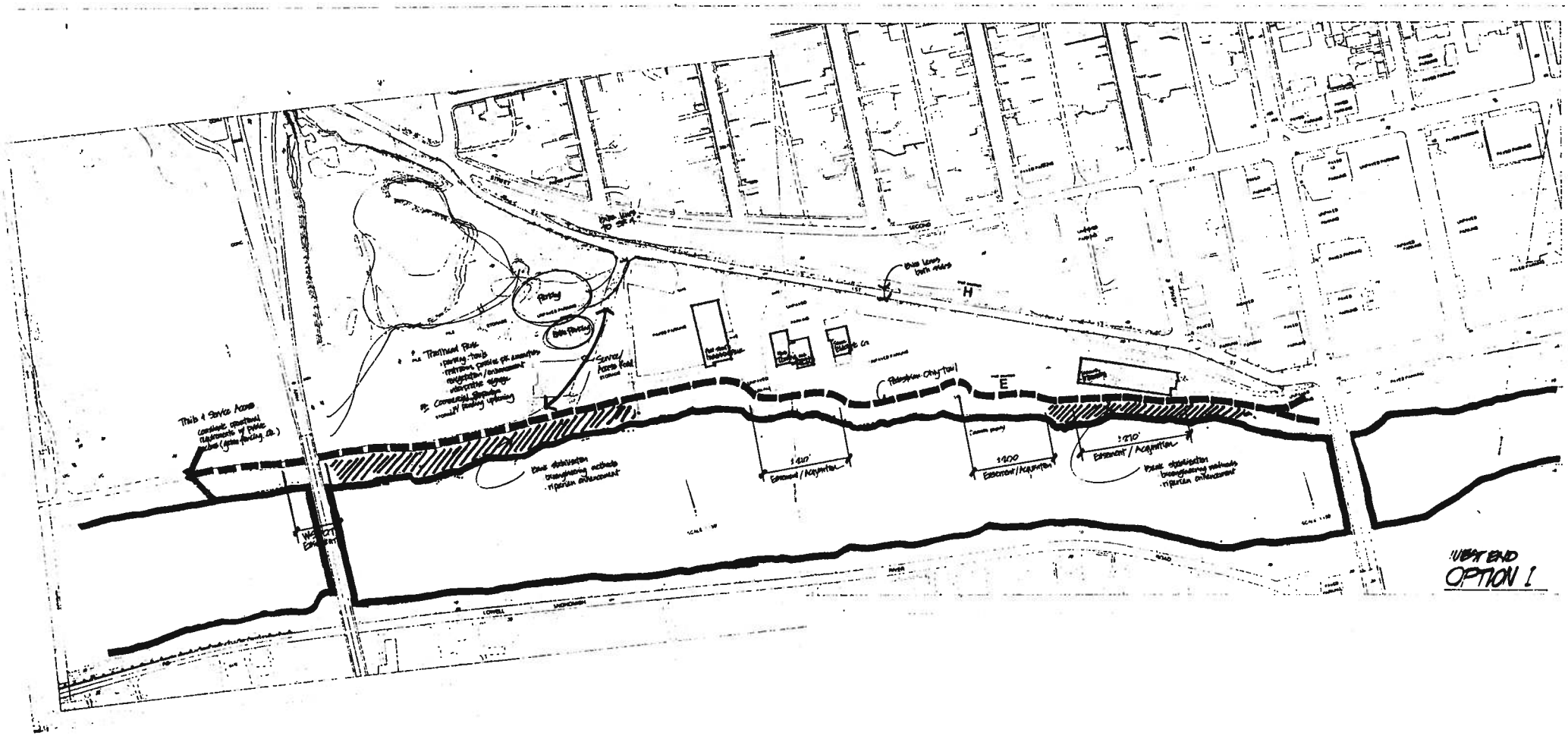
# MacLeod Reckord

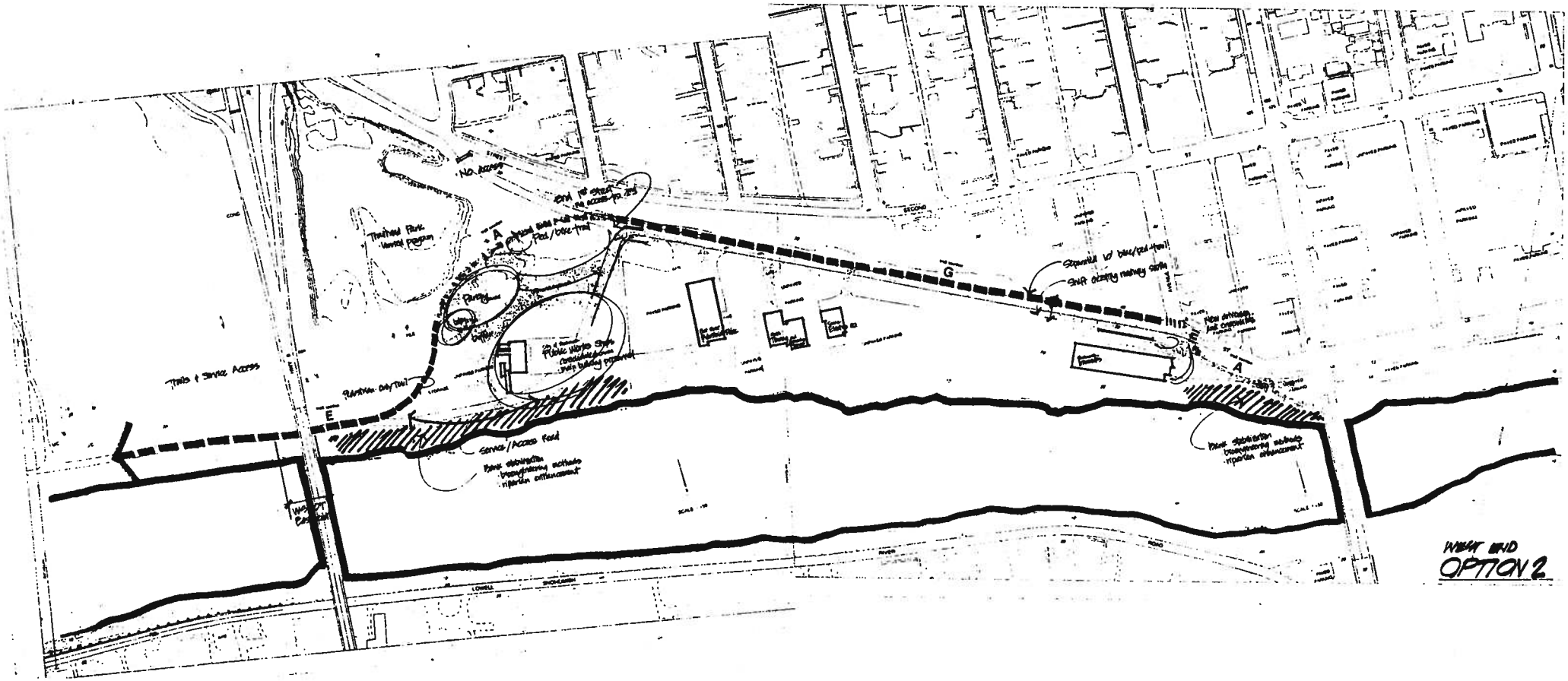
Landscape Architects

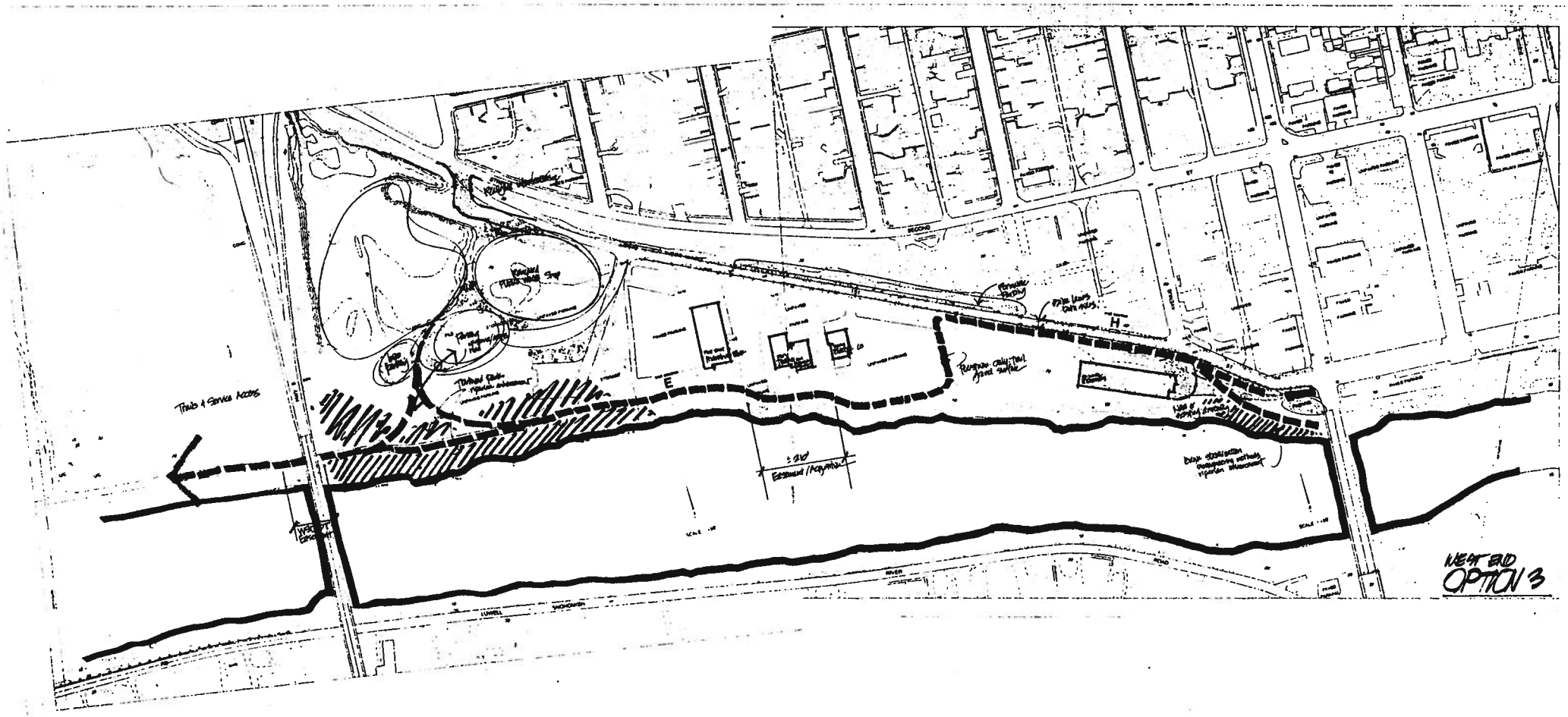
# Cost Estimate

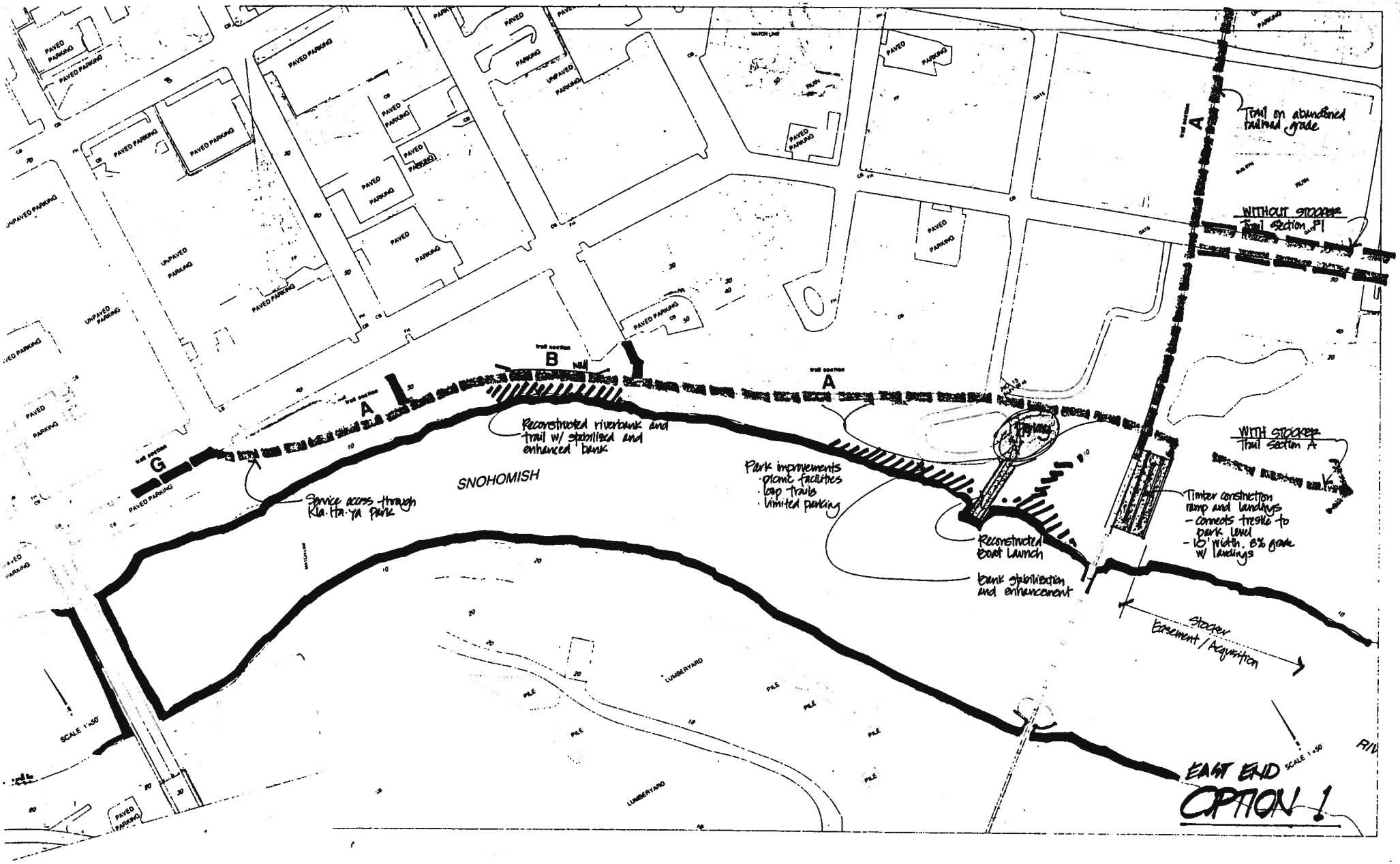
Project: Snohomish Riverfront Trail
No.
Phase: Schematic Alternatives
Date: 4-15-98 By: CR

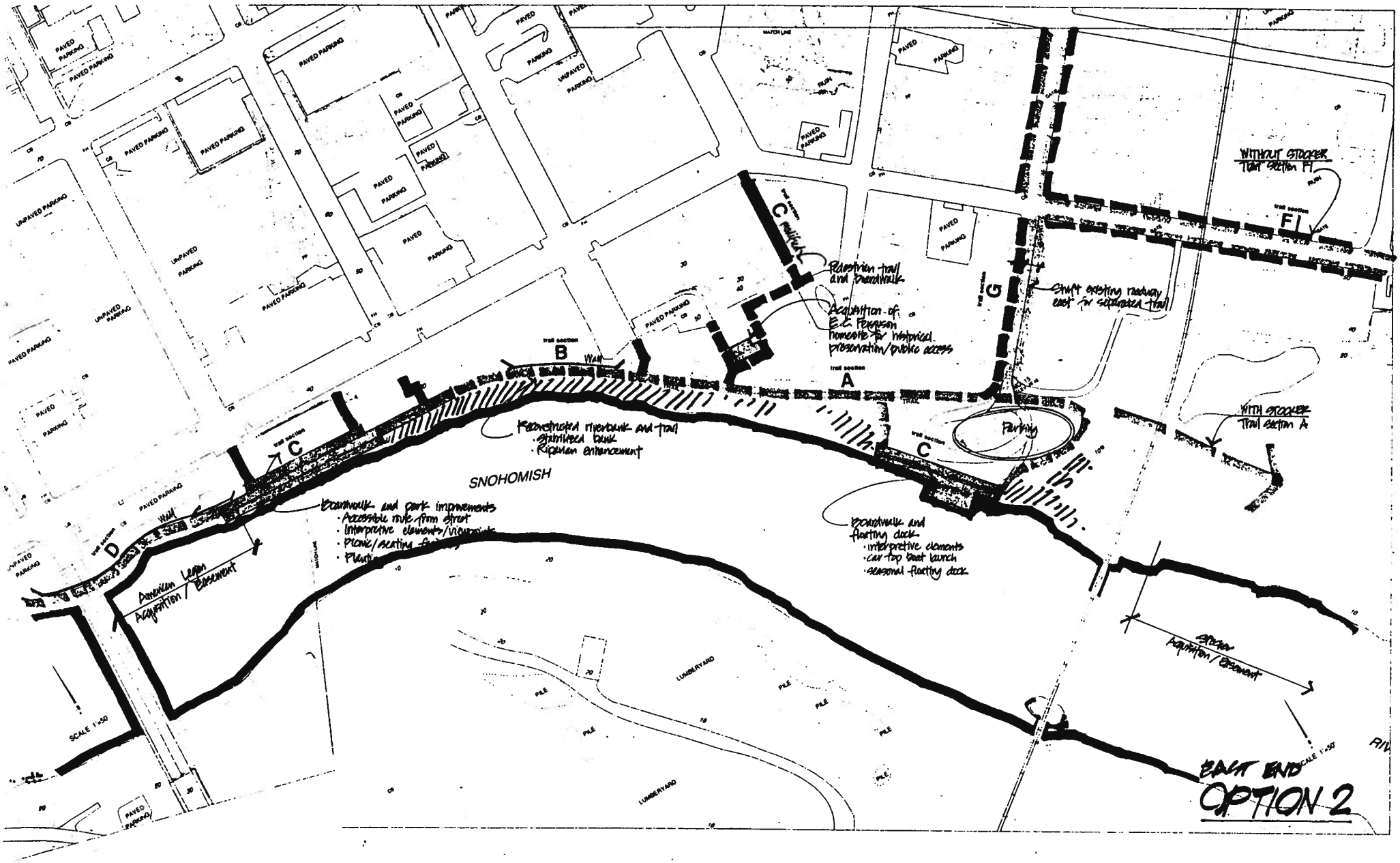
| ITEM & DESCRIPTION | QUANTITY | UNIT | UNIT COST | ITEM TOTAL | SUBTOTAL |
|---|---|---|---|---|---|
| Costs include 7% mobilization and 10% estimating contingency | | | | | |
| **Centennial Trail Connection** | | | | | |
| BNRR Abandoned | | | | | |
| with Stocker | | | | | 520,000 |
| without Stocker | | | | | 475,000 |
| On-street | | | | | |
| with Stocker | | | | | 510,000 |
| without Stocker | | | | | 415,000 |
| **West End (includes P/W site park)** | | | | | |
| Option 1 | | | | | 890,000 |
| Option 2 | | | | | 695,000 |
| Option 3 | | | | | 1,000,000 |
| **East End (inc. KHY & Cady Parks)** | | | | | |
| Option 1 | | | | | 1,750,000 |
| Option 2 | | | | | 3,650,000 |
| Option 3 | | | | | 2,030,000 |
| **Avenue D Crossing** | | | | | |
| Option 1 | | | | | 685,000 |
| Option 2 | | | | | 610,000 |
| Option 3 | | | | | 375,000 |

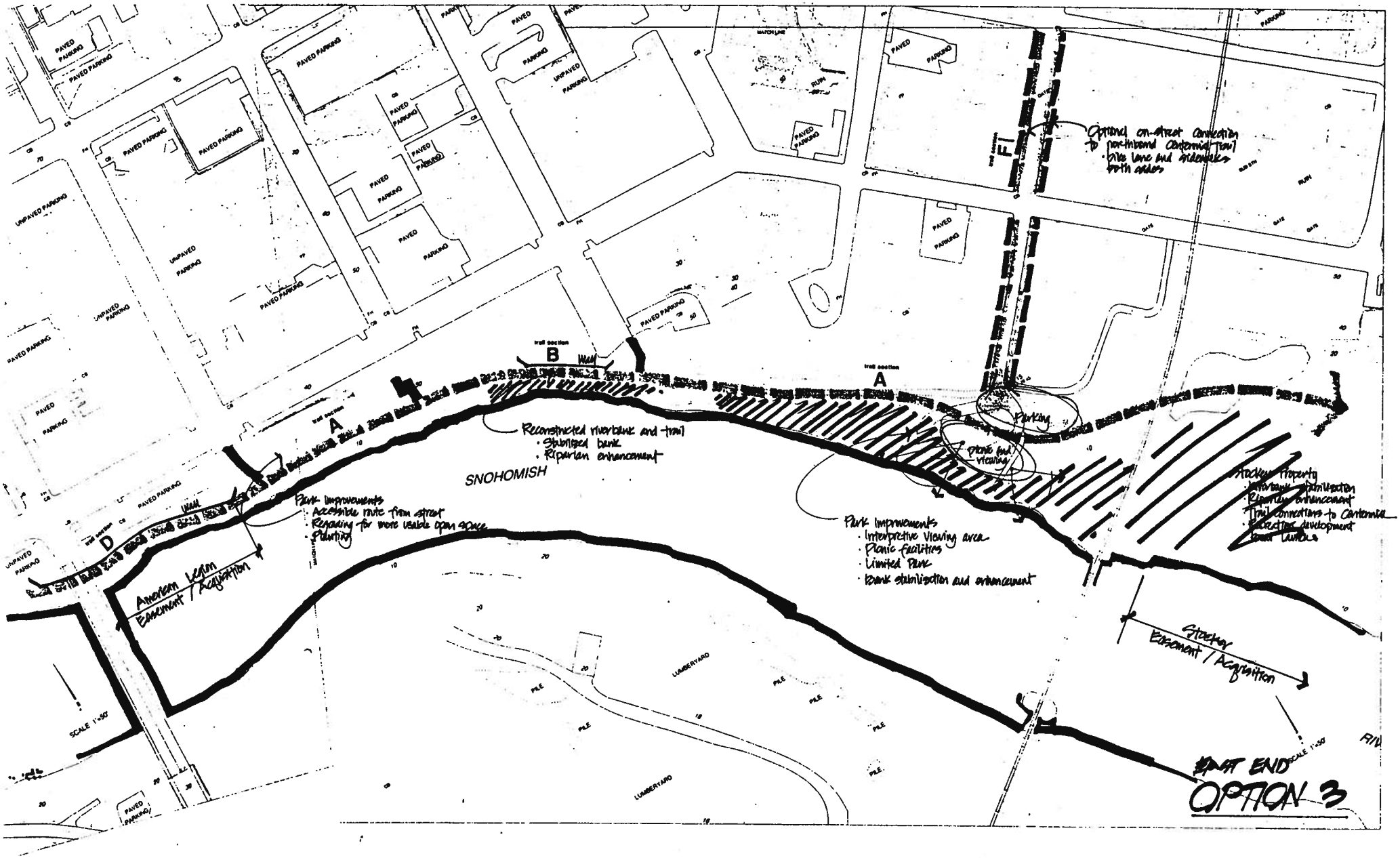

Parking
Bike Parking
Trailhead Park
Service Access Road
Pedestrian Only Trail
E
H
1400'
Easement / Acquisition
1200
Easement / Acquisition
1210'
Easement / Acquisition
WEST END
OPTION I

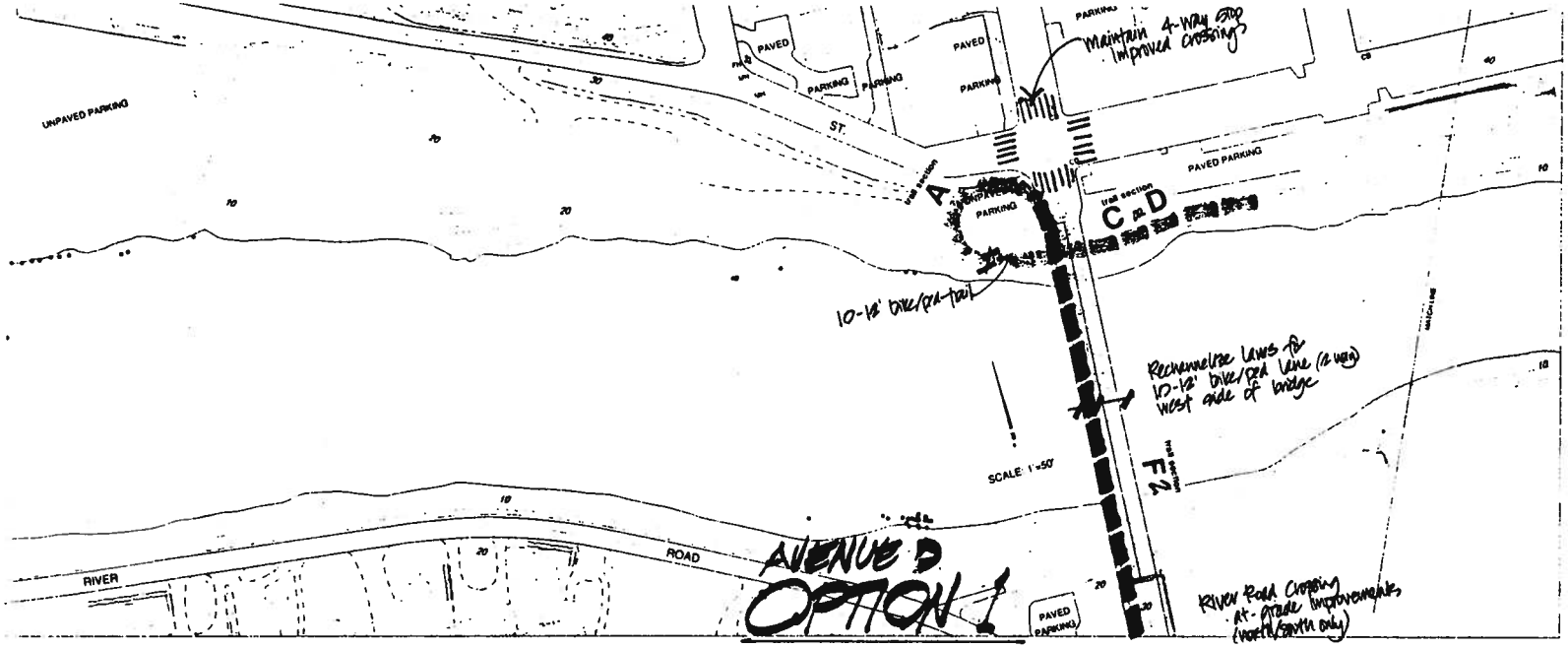

NO ACCESS
Trailhead Park
Parking
Public Works Shop
Trails + Service Access
Service/Access Road
WEST END
OPTION 2

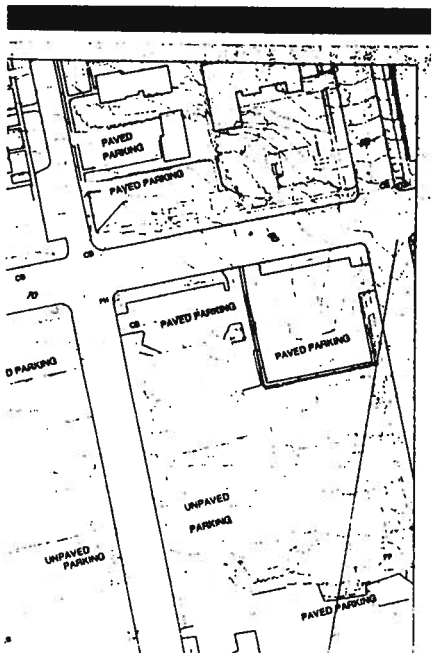

Trails & Service Access
E
H
± 210'
Easement / Acquisition
WEST END
OPTION 3

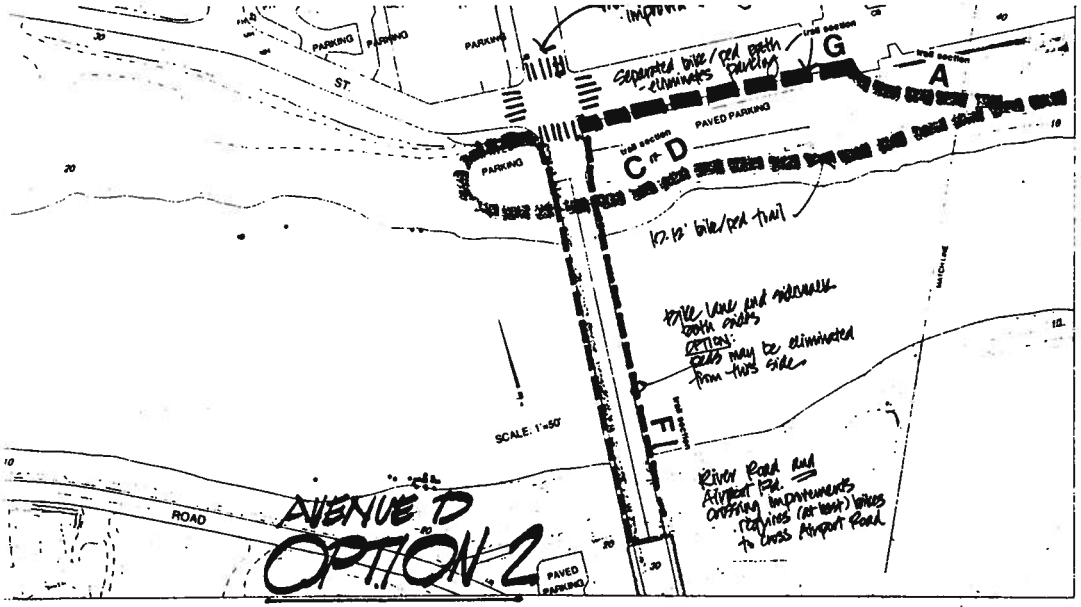

Trail on abandoned railroad grade
WITHOUT STOCKADE
Trail section "B"
WITH STOCKADE
Trail section A
Reconstructed riverbank and trail w/ stabilized and enhanced bank
SNOHOMISH
Park improvements
· picnic facilities
· loop trails
· limited parking
Service access through Kla-Ha-Ya Park
Timber construction ramp and landings
- connects trestle to park level
- 10' width, 8% grade w/ landings
Reconstructed Boat Launch
bank stabilization and enhancement
Stockade Easement / Acquisition
LUMBERYARD
PILE
SCALE 1"=50'
EAST END
OPTION 1

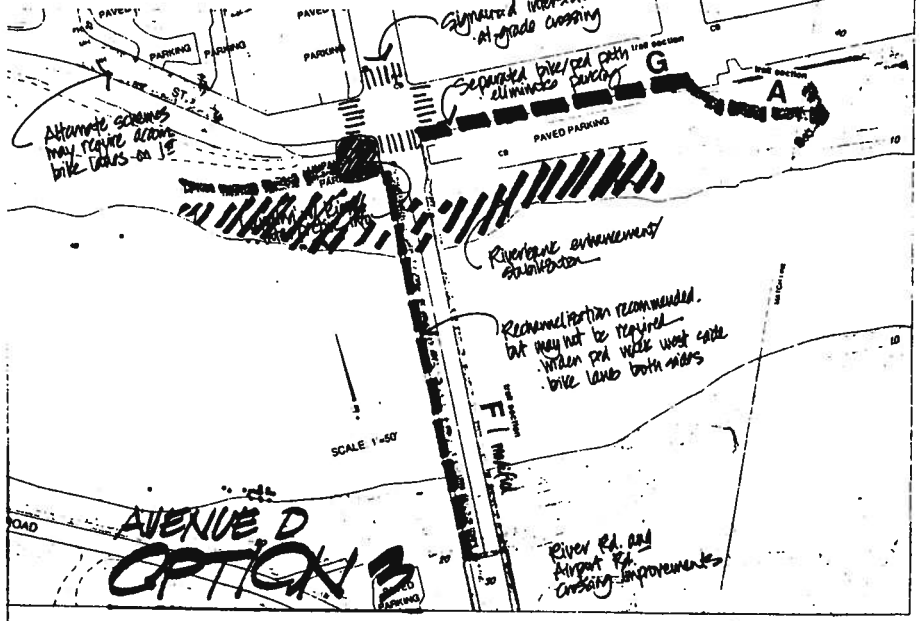

WITHOUT STOCKER
Trail section F1
F1
Pedestrian trail and boardwalk
Acquisition of E.C. Ferguson homesite for historical preservation/public access
Shift existing roadway east to separate trail
WITH STOCKER
Trail section A
Reconstructed riverbank and trail
· Stabilized bank
· Riparian enhancement
SNOHOMISH
Boardwalk and park improvements
· Accessible route from street
· Interpretive elements/viewpoints
· Picnic/seating
· Plantings
Boardwalk and floating dock
· Interpretive elements
· Car-top boat launch
· Seasonal floating dock
Parking
American Legion Acquisition / Easement
Stocker Acquisition / Easement
LUMBERYARD
PILE
SCALE 1"=50'
EAST END
OPTION 2

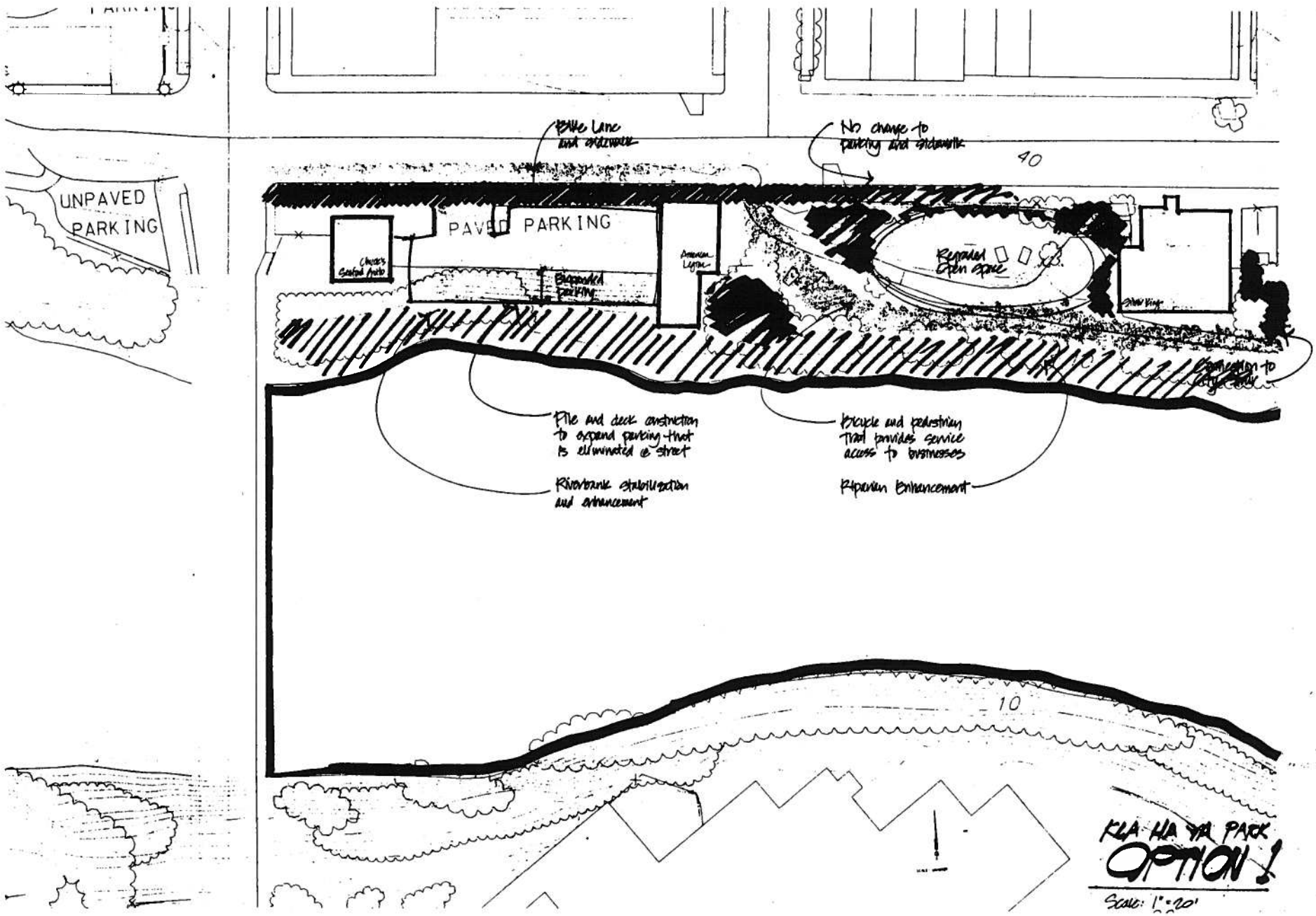

Optional on-street connection to northbound Centennial Trail
· Bike lane and sidewalks both sides
Reconstructed riverbank and trail
· Stabilized bank
· Riparian enhancement
SNOHOMISH
Park Improvements
· Accessible route from street
· Repaving for more usable open space
· Planting
Park Improvements
· Interpretive viewing area
· Picnic facilities
· Limited Parking
· Bank stabilization and enhancement
Parking
picnic and viewing
Stockon Property
· Riverbank stabilization
· Riparian enhancement
· Trail connections to Centennial
· Selective development
American Legion Easement / Acquisition
Stockon Easement / Acquisition
LUMBERYARD
PILE
SCALE 1"=50'
EAST END
OPTION 3

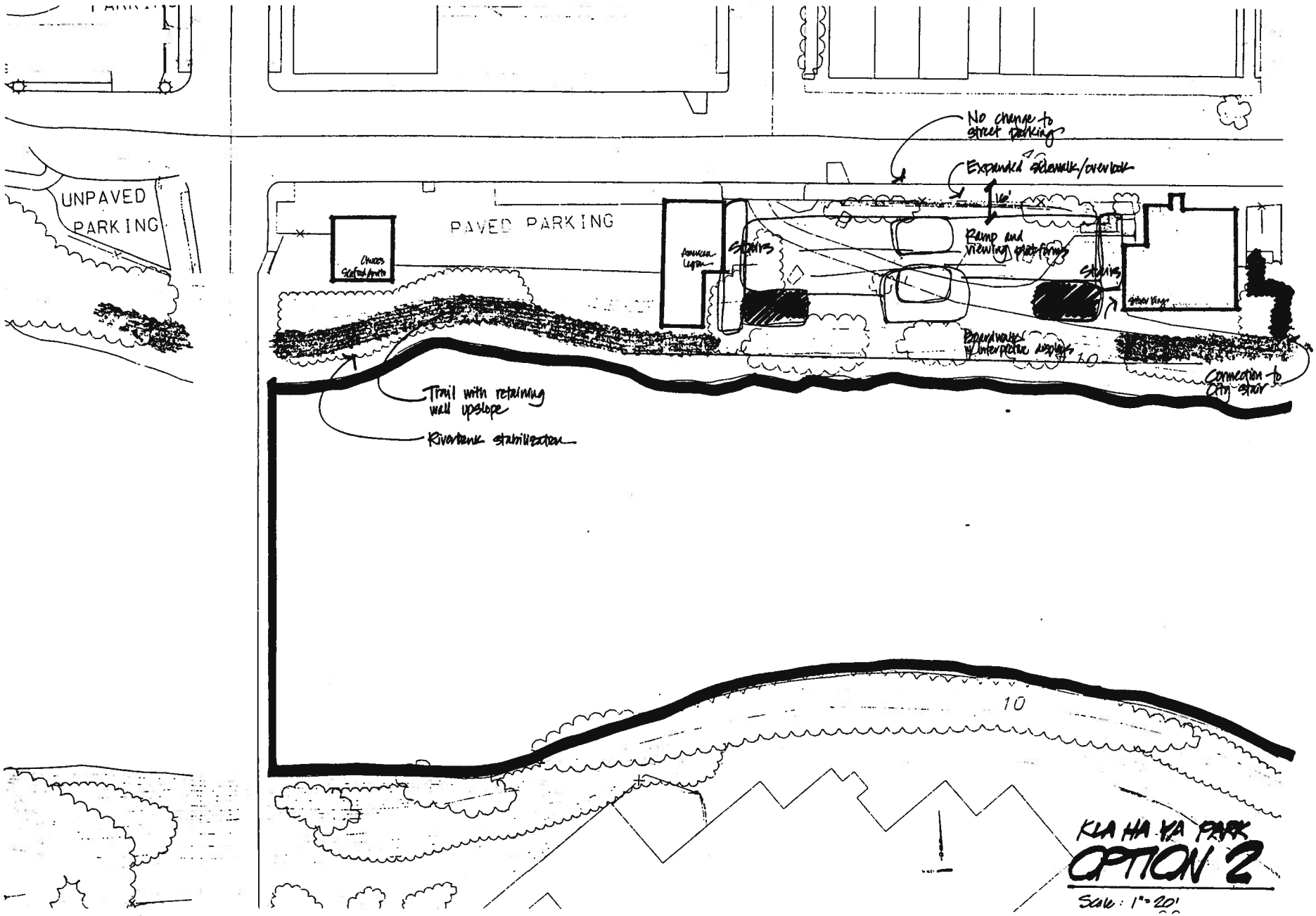

Maintain 4-way stop
Improved crossing
UNPAVED PARKING
PAVED PARKING
ST.
10-12' bike/ped trail
Reconnect/re-lane to
10-12' bike/ped lane (2 way)
west side of bridge
SCALE 1"=50'
RIVER
ROAD
AVENUE D
OPTION 1
River Road Crossing
At-grade improvements
(north/south only)

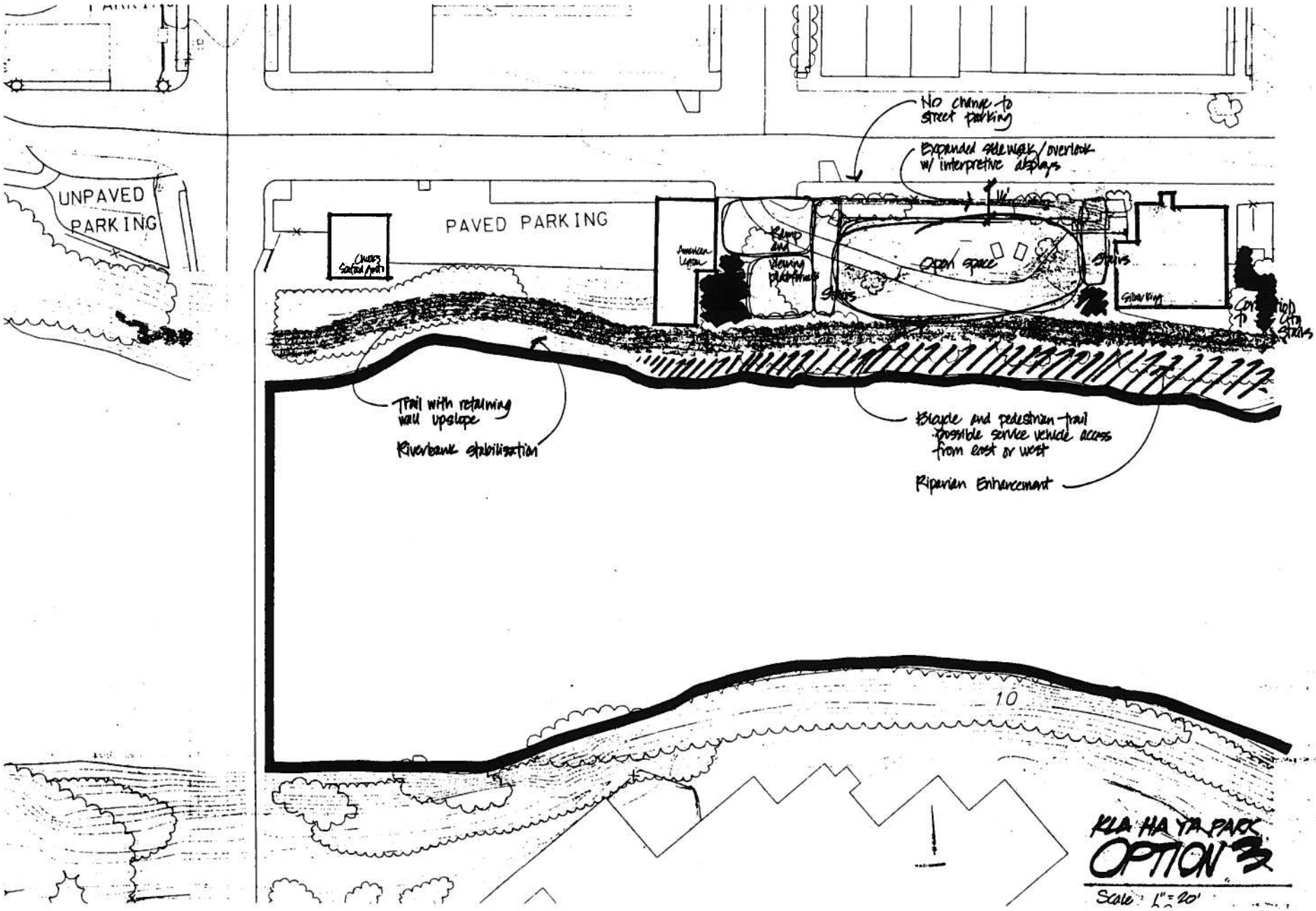

PAVED PARKING
UNPAVED PARKING


Separated bike/ped path
eliminates parking
PAVED PARKING
ST.
12-15' bike/ped trail
Bike lane and sidewalk
both sides
Parking may be eliminated
from this side
SCALE 1"=50'
River Road and
Airport Rd.
crossing improvements
(at least) likely
to cross Airport Road
ROAD
AVENUE D
OPTION 2


Signalized intersection
at-grade crossing
Separated bike/ped path
eliminates parking
Alternate schemes
may require acquisition
bike lanes on 1st
PAVED PARKING
ST.
Riverbank enhancement
stabilization
Reconstruction recommended,
but may not be required
when ped width west side
bike lanes both sides
SCALE 1"=50'
River Rd. and
Airport Rd.
crossing improvements
ROAD
AVENUE D
OPTION 3


UNPAVED PARKING
PAVED PARKING
Bike Lane and sidewalk
No change to parking and sidewalk
40
Repaired Open space
Pile and deck construction to expand parking that is eliminated @ street
Riverbank stabilization and enhancement
Bicycle and pedestrian Trail provides service access to businesses
Riparian Enhancement
10
KLA HA YA PACK
OPTION 1
Scale: 1" = 20'


No change to street parking
Expanded sidewalk/overlook
UNPAVED PARKING
PAVED PARKING
Ramp and viewing platforms
Stairs
Boardwalk w/ interpretive displays
Connection to City stair
Trail with retaining wall upslope
Riverbank stabilization
10
KLAHANA PARK
OPTION 2
Scale: 1" = 20'


No change to street parking
Expanded sidewalk / overlook w/ interpretive displays
UNPAVED PARKING
PAVED PARKING
Open space
Stairs
Trail with retaining wall upslope
Riverbank stabilization
Bicycle and pedestrian trail possible service vehicle access from east or west
Riparian Enhancement
10
KLAHAYA PARK
OPTION 3
Scale 1"=20'

# PUBLIC INVOLVEMENT RESPONSE

# CITY OF SNOHOMISH

*Founded 1859, Incorporated 1890*

116 UNION AVENUE • SNOHOMISH, WASHINGTON 98290 • TEL (360) 568-3115 FAX (360) 568-1375


## SNOHOMISH RIVERFRONT MASTER PLAN

**Questionnaire**

**February 1998**

The City of Snohomish is in the process of Master Planning development on the Snohomish Riverfront, including a non-motorized trail from the wastewater treatment plant on the west side of town to the Pilchuck River connecting to the County's trail system. Your help in answering the following questions will greatly assist the City in this process.

1. How close do you live to the proposed trail corridor? (check one)
   - ☐ My property borders the corridor
   - ☐ I am within one or two blocks of the corridor
   - ☐ I am three blocks or further from the corridor

2. How would you envision using this trail? (check all that apply)
   - ☐ Walking
   - ☐ Bicycling
   - ☐ Other _____

3. What would your primary use of the trail be? (check one)
   - ☐ Exercise
   - ☐ Recreation
   - ☐ Transportation
   - ☐ Commuting to and from work
   - ☐ Other _____

4. If you answered transportation, for which of the following activities? (check all that apply)
   - ☐ Shopping
   - ☐ Going out to eat
   - ☐ Visiting
   - ☐ Other _____

5. How often are you likely to use the trail? (check one)
   - ☐ Once or more a day
   - ☐ Once or twice a week
   - ☐ Once or twice a month
   - ☐ Occasionally
   - ☐ Never

6. Do you use the County's regional trail system (Centennial Trail)? (check one)
   - ☐ Never
   - ☐ Sometimes
   - ☐ Often
   - ☐ Daily

7. What is the most important characteristic of the trail? (check one)
   - ☐ Aesthetics
   - ☐ Safety
   - ☐ Convenience
   - ☐ Location
   - ☐ Other_____

8. Would you support a bond issue to qualify for grants to build the Riverfront Trail Project?
   - ☐ Yes
   - ☐ No

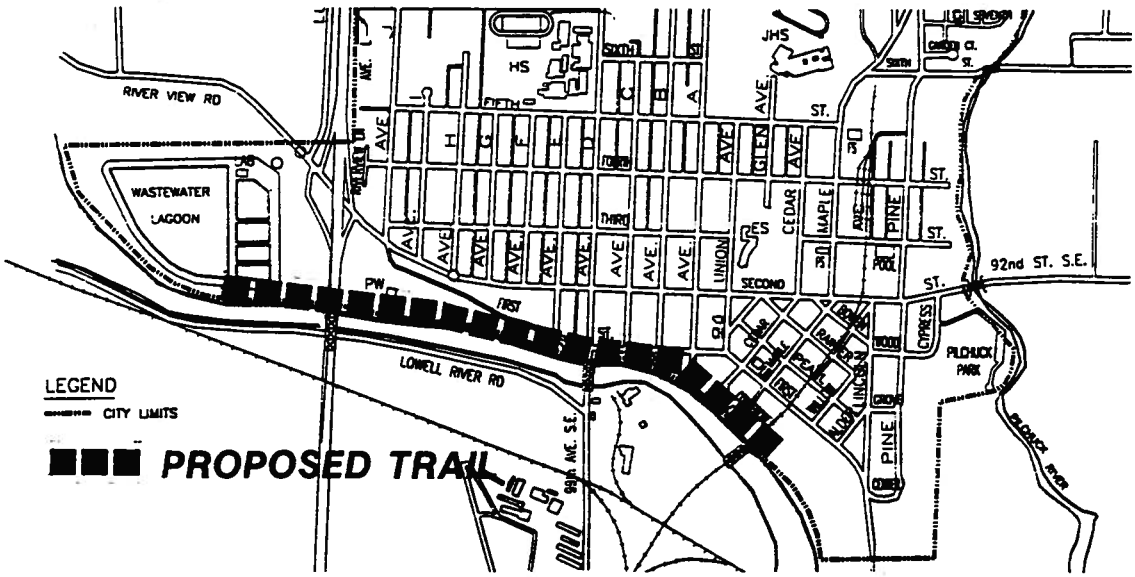
9. How did you hear about this project? (check all that apply)
   - ☐ Flyer
   - ☐ Newspaper
   - ☐ Word of mouth
   - ☐ Other_____

10. Other

Comments_____

_____

_____




Return to: Riverfront Task Force; c/o Ann Caley; City of Snohomish; 116 Union Avenue Snohomish, WA 98290. Best if received before April 4, 1998

# Riverfront Questionnaire

total questionnaires returned: 269 6/12/98

| | | borders | | 1-2 bocks | | 3+ blocks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | How close do you live to the proposed trail corridor? | 9 | 3.30% | 44 | 16.35% | 206 | 76.57% | | | | |
| | | walking | | bicycling | | none | | | | | |
| 2 | How would you envision using this trail? | 208 | 77.32% | 108 | 40.14% | 36 | 13.38% | | | | |
| | | exercise | | recreation | | trans | | commuting | | other | |
| 3 | What would your primary use of the trail be? | 146 | 54.27% | 122 | 45.35% | 11 | 4.08% | 3 | 1.11% | 18 | 6.69% |
| | | shopping | | going/eat | | visiting | | other | | | |
| 4 | If you answered "Transportation" to question three, for which of the following activities? | 17 | 6.31% | 24 | 8.92% | 21 | 7.80% | 4 | 1.48% | | |
| | | 1+ a day | | 1 or 2 a week | | 1 or 2 a month | | occasionally | | never | |
| 5 | How often are you likely to use the trail? | 16 | 5.94% | 93 | 34.57% | 57 | 21.18% | 42 | 15.61% | 48 | 17.84% |
| | | never | | sometimes | | often | | daily | | | |
| 6 | Do you use the County's regional trail? (Centennial Trail?) | 55 | 20.44% | 127 | 47.21% | 85 | 31.59% | 6 | 2.23% | | |
| | | aesthetics | | safety | | convenience | | location | | other | |
| 7 | What is the most important characteristic of the trail? | 70 | 26.02% | 70 | 26.02% | 65 | 24.16% | 64 | 23.79% | 12 | 4.46% |
| | | yes | | no | | | | | | | |
| 8 | Would you support a bond issue allowing the City to qualify for State and Federal grants to build the Riverfront Trail? | 158 | 58.73% | 77 | 28.62% | | | | | | |
| | | flyer | | newspaper | | word of mouth | | other | | | |
| 9 | How did you hear about this project? | 164 | 60.09% | 70 | 26.02% | 73 | 27.13% | 61 | 22.67% | | |

# SNOHOMISH RIVERFRONT MASTER PLAN - DEVELOPMENT OPTIONS
## SUMMARY OF RESPONSES (10)
**Includes phone vote by Greg & Kathy Prince**

(votes)

### CENTENNIAL CONNECTION ROUTE

**COMMENTS:**

(5) 1. ❑ Railroad right-of-way

2. ❑ Lincoln

3. ❑ Maple

(3) 4. ❑ Pilchuck River

*Choice if river not available: Trail overpass @ Second -- Least disruptive*
*Imp. Trail not along streets if possible (parking, ped. overpass @ Second preferable to signal). If RR ROW can be acquired; otherwise, Lincoln.*

*This is a beautiful route that would follow the east side of the Pilchuck.*
*Most scenic, least traffic, easy access to Pilchuck Park and restrooms.*

### WEST END: WASTEWATER TREATMENT PLANT TO AVENUE D

**COMMENTS:**

(2) 1. ❑
- Pedestrian only along river
- Bikes on First Street
- Relocate Public Works shop

*"I think this whole part of project should be put on a back burner--once trail connections are made, there may be more $ and interest in this part."*

(3) 2. ❑
- No riverfront trail along private property
- Retain shop site
- Add parking at shop site

*"I really can't understand a trail around sewer pond. If so, walk between 1st & 2nd & cross 1st to City Shops & pond."*

(1) 3. ❑ Combination:
- West half of private properties have riverfront trail
- Add parking along First Street

### FIRST STREET AND AVENUE D INTERSECTION:

**COMMENTS:**

(7) 1. ❑
- Underpass with cloverleaf
- All non-motorized traffic on west side of bridge
- Remove one sidewalk

*"safest and least disruptive"*
*Look into a foot/bike only bridge*

(1) 2. ❑
- Leave bridge unchanged
- East-bound trail: First Street to Kla Ha Ya Park
- West-bound trail: Under Avenue D bridge and loop up to west side of bridge
- Relocate nine parking stalls

(1) 3. ❑
- Cross on the street with new traffic signal
- Use First Street to access Kla Ha Ya Park
- Relocate nine parking stalls

*seems like a bad idea -- the four-way stop works very effectively.*

### EAST OF AVENUE D

**COMMENTS:**

(1) 1. ❑
- Keep vehicle access through Kla Ha Ya
- Reconstruct boat launch, parking
- Ramp up to railroad bridge elevation

*(no) This would make for lots of congestion at the D St. bridge.*

*Please write any additional comments on the back of this page, and return the form to City Hall, 116 Union Avenue, Snohomish, WA 98290, no later than May 1, 1998.*

**EAST OF AVENUE D (continued)**

**COMMENTS:**

| | | | | |
|---|---|---|---|---|
| (1) | 2. | ❑ | • Kla Ha Ya: Widen sidewalk on First Street<br>• Add ramps and landings, boardwalk<br>• City purchase E.C. Ferguson house<br>• Walkway, boardwalk between Cedar and Union/First St.<br>• Floating dock at Cady Park | *Y I like this idea*<br>*Y*<br>*Not important*<br>*Not practical for neighborhood* |
| (4) | 3. | ❑ | • Kla Ha Ya: Ramps up west side, grass in center<br>• Cady Park: riverbank restoration/interpretation, picnic, parking only | *Y Try to find better boat launch location*<br>*Y* |

**Comments:**

*I have concerns about any great expenditure of funds for a floating dock--either at Maple or downstream. SnoCo Parks expects to purchase a part of John Misich farm as a fishing area and potential small boat marina.*

*Where would City shop go? How much would City receive, from whom, to relocate? Move to Bonneville Power property and turn shops area into parking and park and trails. Make First Street dead-end at City shop.*

*I think if river were riprapped and raised to 26' with a trail on top there might be some support for river trail?*

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