LITTLE BEAR CREEK
LINEAR PARK
MASTER PLAN

CITY OF WOODINVILLE PARKS AND RECREATION
April 2004
Revised October 2009 (Ord. 480)

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EXECUTIVE SUMMARY

The Little Bear Creek Linear Park Master Plan is a small and defined part of an ambitious vision for the City of Woodinville. It is an effort to define, protect, enhance, and manage a significant ecosystem within the Woodinville city limits. When adopted in final form, the Plan will assist the City in providing transportation and recreation benefits to the citizens of Woodinville, it will provide guidance in land use and zoning decisions, and will shape the visual and environmental resources of Woodinville for years to come.

It will also play a role in the economic development of the Little Bear Creek Corridor and thus, contribute to a vibrant and pedestrian-oriented downtown that is described in the City's Comprehensive Plan.

Like many of the visions discussed in the downtown planning process, the park can only be realized through collaboration between the private and public sectors. Few of the goals and objectives for the park can be achieved without active and enthusiastic participation by educators, citizen groups, business owners, landowners, and residents in the area.

The goals for the park that have been identified by the public reflect the complex nature of Little Bear Creek. Preservation of an endangered species and promotion of economic development appear to be at odds, however, this Plan reflects the desire to accomplish both. Relaxation and reflection alongside an important link in a regional trail system appear to be contradictory goals, yet this Plan seeks to accomplish both.

The public has defined goals to achieve a variety of complex objectives within a relatively small and constrained area of land. With this Plan as a guide, new policies, regulations, and design standards can be developed that encourage and promote the vision. If successful, the City will be on track to harness the beauty and tranquility of Little Bear Creek and make it part of the signature that sets Woodinville apart as a unique and innovative City.

ACKNOWLEDGEMENTS

The members of the Woodinville City Council, the Woodinville Parks and Recreation Commission and many citizens have worked together to learn about this Creek, collect public opinion, and analyze the results of reports and environmental studies. The citizens listed below have brought their technical expertise, policy guidance, passion for protecting environmental resources, interest in promoting economic development, and strong belief in the benefits of parks and recreation to bear on the document.

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Bob Wuotila, Park Planner

Carl Smith, City Planner

INTRODUCTION

Shortly after it was incorporated in March, 1993, the City of Woodinville began to plan and develop park and recreation facilities to meet the goals of the Comprehensive Plan. In 1998, the City adopted a detailed inventory of existing facilities and a plan to meet future needs. This plan, the Parks, Recreation and Open Space Plan (PRO Plan) recommends a variety of open spaces, trails, and recreation areas, among them the development of a linear trail system along the length of Little Bear Creek from the Sammamish River to the City limits at NE 205th Street. The PRO Plan also recommends that land adjacent to the Creek be purchased for resource conservancy purposes and that certain features be enhanced and developed, including trail links, within the Creek corridor.

The Little Bear Creek Linear Park Master Plan seeks to bring into focus this linear park by delineating the trail system and proposing features within the park environs. In addition, it seeks to coordinate the park with adjacent land use and circulation within the Central Business District (C.B.D.) as they evolve in the development of the Downtown-Little Bear Creek Corridor Master Plan and other current planning efforts that seek to define and give character to the development of this young City.

While the Comprehensive Plan lays out the long-term direction and intent of the City, the Downtown-Little Bear Creek Corridor Master Plan addresses the core land use and objectives intended to bring about vibrant economic, social, and recreational objectives. The role of the Little Bear Creek Linear Park Master Plan is to provide a greater level of detail to the role of recreation within the area surrounding Little Bear Creek.

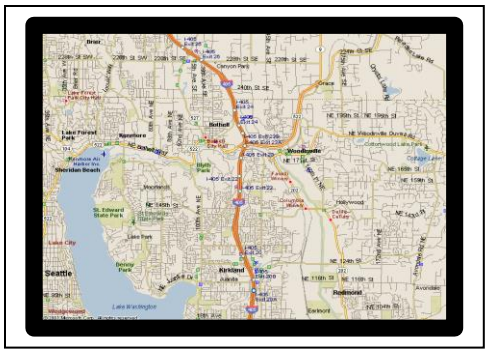
Interest in the Little Bear Creek Linear Park was heightened when the City purchased 17 acres of land at NE 195th Street and 7 acres of land at NE 134th Street for resource conservancy and resource activity use. These purchases triggered the need for greater understanding of the interplay between public and private development and the environmental and social networks that could potentially transform a narrow, constricted land mass between a major highway and a rail line into a vibrant and economically vital part of the City's core.

Along with the Sammamish River, Little Bear Creek is one of Woodinville's primary ecological resources. It has value to the citizens of Woodinville as fish and wildlife habitat, as a passive and active recreation amenity, as a surface water conduit for surrounding hillside and valley land use and as an ecological, visual and physical celebration of life. It also has the potential to provide a

practical and pleasing recreation amenity to support the current and future land uses that line the Creek and to provide a transportation conduit for connecting the neighborhoods to the C.B.D. Unification of the Park into a linear system of recreation and visual amenities is essential to making the City of Woodinville a place with identity; a place where people like to live, work, and play.

REGIONAL CONTEXT

The Little Bear Creek corridor, for purposes of this study, consists of the 2.2 miles of Little Bear Creek from its mouth at the Sammamish River to the crossing under N.E. 205th Street, along the northern City limits of Woodinville and the King and Snohomish County line. The Master Plan study area includes parcels of land adjoining the Creek, road rights of way that adjoin those parcels, and rights of ways that have been identified as trails in an adopted plan for Woodinville. In addition, City owned land and recreation sites within ¼ mile of the Creek are included as are the transportation routes connecting them to Little Bear Creek (See Figure 1). The area is generally characterized as a narrow (1,000 - 1,500 feet wide), north/south trending valley, enclosed by gently rolling 70 to 100 feet high rolling hills and slopes on the east and west until it coincides with downtown Woodinville where the narrow valley becomes a broad plain about ½ to ¾ mile wide. The broad plain is associated with the confluence of Little Bear Creek and the Sammamish River.



Little Bear Creek is the largest natural surface drainage system for the City of Woodinville. The entire watershed drains about 15 square miles of land area, 80 percent of which is in Snohomish County. Woodinville's contribution is about 1,920 acres. The mainstem length is approximately 7.7 miles, 2.2 miles of which are in the City of Woodinville. The Creek's overall gradient is very gradual with an average slope of 0.8 percent. The drainage basin was originally dominated by forested wetlands, and still contains a large amount of riparian wetlands, despite strong development pressures extending from urban areas.

The land use in the upper basin is primarily rural with numerous horse farms throughout the sub basin. The upper mainstem of the Creek has a predominantly young, deciduous riparian forest with several riparian wetlands. Below midstream, near Maltby Road, land use is predominantly suburban with the riparian zone narrow and broken throughout. The lower mainstem of the stream runs parallel to State Route 522, a major 4-lane commuter highway. The Creek is heavily impacted with a poor quality riparian corridor and extensive commercial development. The lower portion of the Creek, within this Master Plan area, runs through the commercial portion of downtown Woodinville before flowing into the Sammamish River.

EXISTING CONDITIONS

Land Use. The natural and cultural conditions along the Little Bear Creek have changed dramatically in the last several decades. Agricultural use replaced wetland forests at the turn of the 20th century and commercial-industrial uses replaced agriculture in the 1970s and 80s. Today the corridor contains a variety of retail, transportation, distribution, light-industrial and vacant land. Many businesses in the area are outdoor-storage oriented and do not take advantage of creekside views or protect streamside buffers. Some uses are of a nature that has the potential to present ground and water pollution concerns. Much of the land adjacent to the Creek is barren except for buildings and parking and is dominated by non-native invasive vegetation.

The area is fairly level and has good access to a major transportation route (SR 522). All major public services are available to the parcels within the corridor including water, sewer, power, and communications. As part of a dynamic investment plan to reduce congestion and promote development, the City Council adopted a utility tax that dedicates funds to the infrastructure of the Little Bear Creek Parkway, which runs parallel with the Creek and serves the businesses along NE 177th Street. Significant public investments are beginning to bridge the physical barriers that once prevented Little Bear Creek corridor parcels from being considered part of the urban core. These changes are expected to bring about more architecturally designed and landscaped development as is commonly seen in the Central Business District to the east.

Transportation. Roads in the study area that affect the Master Plan for the linear park are:

- 130th Ave. N.E.
- 131st Ave. N.E.
- 132nd Ave. N.E.
- 134th Ave. N.E.
- 136th Ave. N.E.
- 139th Ave. N.E. (a.k.a. 177th Pl. N.E./Little Bear Creek Parkway)
- 140th Ave. N.E.
- Woodinville-Snohomish Road
- N.E.177th Street
- N.E.178th Street
- N.E. 190th Street

- N.E. 190th Place
- N.E. 195th Street
- North Woodinville Way
- State Route 522

All of these roads and rights of way link the residential neighborhoods of Woodinville to the retail and service core of the City and to the Little Bear Creek Linear Park.

Water quality and habitat. The stream channel has current problems with water quality, riparian quality and quantity, bank structural problems, and with habitat quality and quantity that have Federal and State legal ramifications. Nine species of resident and anadromous species of fish utilize Little Bear Creek. A more complete study of the Creek habitat was undertaken as the Little Bear Creek Habitat Assessment Plan conducted by David Evan and Associates, Inc. in July of 2002.

SITE CONDITIONS

Surficial Geology. About 13,000 years ago, during the end of the Pleistocene Era, the melting of glaciers left the landforms that we find today in the lower Little Bear Creek valley. The uplands surrounding the Master Plan study area are composed of glacier till up to 50 feet thick, a cemented conglomeration of sands and gravels bound in clay, and compressed from the 2,000 feet thick glacial ice that once covered the area. In these areas drainage is poor, runoff is high and development potential is good due to the structural integrity of the surficial materials. On the hillsides overlooking the creek valley advance and recessional outwash sands and gravels are to be found. These are the best materials for both plant production and for urban development. Drainage is good, the land is easily workable and water infiltration is fast.

Recent alluvium, sands and silts fill the bottom of the valley and lie adjacent to the stream. These areas have a generally high water table, are locally unstable requiring creative structural engineering prior to building and are subject to flooding. The broad plain lying east of the confluence of Little Bear Creek and the Sammamish River is an area containing transitional beds where mostly sands were deposited at glacial recession and during the recent period when alluvial, erosional and depositional processes occurred. This transitional bed area is very good for urban development having stable materials, good runoff, and good infiltration capacity. The central business district of Woodinville is underlain by this material.

Hydrology. Eighty percent of the Little Bear Creek watershed is in Snohomish County. The remainder of the watershed transports runoff directly to the Creek or by entering four unnamed tributaries, mostly channelized and put into pipes (see Figure 3). These tributaries traverse residential, commercial and industrial land uses and transport pollutants to the Creek. Industrial land use adjacent to the Creek and elsewhere in the drainage basin are a cause of concern for the water quality of the Creek.

Wetlands and floodplains, associated with the Creek pose environmental constraints to adjacent development. Many of these constraints have been surveyed and mapped by King County and others. Another wetland, Woodin Glen Pond, in the Wedge Neighborhood, is several acres in size and feeds a tributary to Little Bear Creek in a culvert under SR 522. Other mapped wetlands include the land between N.E. 195th Street and N.E. 205th Street, west of SR 522.

Much of the Little Bear Creek channel between the mouth and N.E. 178th Street extended (river mile 0.70) has undergone human improvements to straighten and control the channel. The Creek is approximately 10 to 25 feet wide between the mouth and 134th Street. Between river mile 0.70 and a point where it crosses

under SR 522 a wide riparian wetland exists with several side channels that store runoff during high flows. From there the Creek is piped under the freeway and meanders in its natural, approximate 50 feet wide corridor all the way to the northern City limits at N.E. 205th Street, except that it is piped under N.E. 195th Street. For purposes of later discussion Little Bear Creek is divided into three reaches. Reach one includes the length from the mouth to the downstream side of the 131st Street overpass. Reach two extends to the upstream side of the culvert under SR 522. Reach three ends at N.E. 205th Street. See Figure 3.

Creek hydrology is discussed in detail in the Little Bear Creek Corridor Habitat Assessment, referenced in Appendix A of this Report.

Soils. The soils of the study area were formed by glacial processes and consist of mostly sandy, good draining, building suitable materials except for the valley alluvial soil adjacent to Little Bear Creek Parcels of land adjacent to the Creek are generally overlain with a Norma soil having a high water table which is a severe constraint to low buildings. The south and east side of parcels adjacent to the Creek generally between N.E. 131st and N.E. 179th extended are the exception to the poor alluvial soils. These sites consist of sandy Indianola soil. The central business district is also Indianola as is the Wedge Neighborhood. The Woodin Glen Pond area is a mucky peat called Seattle. Further north around Woodinville High School the gravelly Everett soil covers the east facing slopes.

Plant Ecology. The forest in this area has changed considerably over time. The intrinsic plant nature of the study area in late stages is that of a Hemlock-Cedar dominant coniferous forest. Today, because of human intervention in the landscape, there are no examples of the late stage coniferous forests. But, several parcels of land on the slopes and upland terraces west of SR 522 and north of N.E. 195th Street consists of a mixed deciduous/coniferous native forest in mid-successional stages. The riparian areas adjacent to the Creek, having been logged by the early 1920s, contain only a few vestiges of a coniferous forest and generally resemble a riparian habitat of poor quality. Many sites

along the Creek contain noxious invasive species that prohibit the natural evolution of the native forest and have negative consequences for native fish and wildlife habitat. The Woodin Glen Pond area contains forested wetland species, together with introduced ornamental trees and shrubs. All other parts of the corridor are urbanized as commercial and industrial sites and as such have mostly been cleared, containing small amounts of ornamental landscaping. A complete inventory of the vegetation in the study area can be found in Appendix B of this Report.

Fish and Animal Ecology. At least eight resident and anadromous species of fish utilize Little Bear Creek. This includes anadromous and resident salmonids, sulpins and lampreys. At least 40 different non-native species of fish have been introduced into the Lake Washington watershed, but only 24 species currently remain and adversely affect salmonids. A complete list of these fish is found in Appendix B of this Report.

Biologists recorded bird, mammal, reptile and amphibian species along Little Bear Creek for the Little Bear Creek Corridor Habitat Assessment. Elsewhere in the study area, potential species presence can be extrapolated from vegetation types. The creek riparian area contains thirty-nine species of birds, ten species of mammals and four reptile and amphibian species, all of which have been documented and observed through site visits. It is likely that restoration of vegetative habitat abundance and quality will measurably increase the numbers and diversity of species.

History and Culture. The first record of human settlement in Woodinville was during the 1870s when a few families logged the local forests and established homesteads. By 1897 four families owned most of the land along Little Bear Creek. The railroad reached Woodinville in 1877 and was used for timber and coal transport. By the 1890s several stores, hotels, sawmills, meat markets and other enterprises were established.

Logging the old growth forest was the primary occupation during this period and the local rivers were used to transport timber prior to the arrival of the railroad. The disappearance of the first-growth trees gave way to farming so that by the early 1920s stump farms could be seen throughout the valleys. When the stumps were burned out and removed, farming became the primary occupation in the valley.

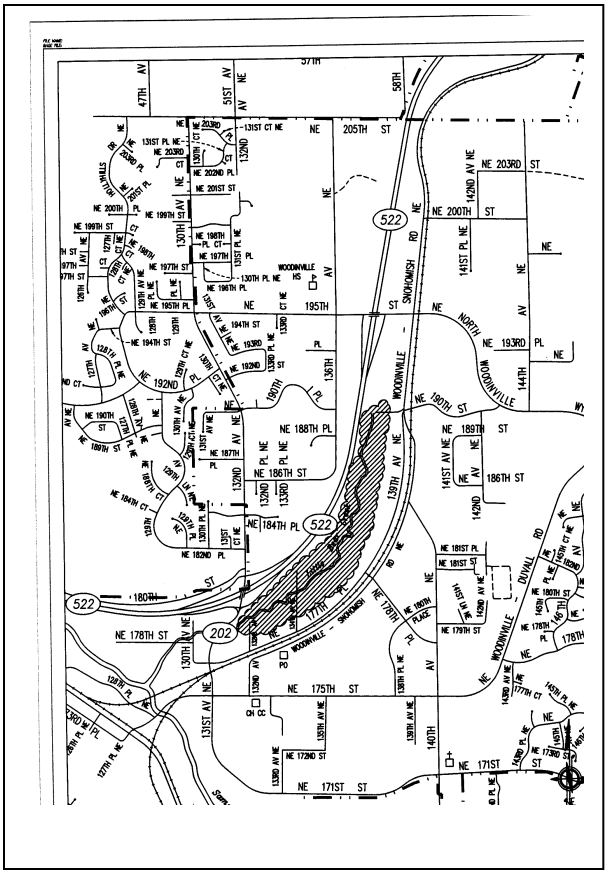
By the 1930s records indicate that the riparian zone of Little Bear Creek had been cleared and farming occurred right up to the banks of the Creek.

The population in the Woodinville area expanded rapidly after World War II. The post-war baby boom years between the 1950s and the 1970s and the creation of Interstate 405 and SR 522 led to an expansion of building and subdivision

development in to the valley. When the 1980s arrived Woodinville looked much as it does today. The once rural area of Woodinville with its uncontrolled land use pattern had become the greater Seattle metropolitan urban fringe accompanied by a new aesthetic with sophisticated urban problems.

Existing Land Use. Most of the present land use in the study area precedes the incorporation of Woodinville in 1993. The Comprehensive Plan for the City of Woodinville currently recognizes Little Bear Creek corridor as an area for General Business, a designation that encourages auto-oriented retail and business services and outdoor storage. Residential and office uses are not permitted in the General business land use category.

Properties adjacent to the general business area are designated a combination of Central Business District (retail), Multi-family and Office and Single-family residential (west of SR-522). Near the mouth of the Creek, several parcels are designated as Industrial (See Figure 2). Current planning underway on the Downtown-Little Bear Creek Corridor Master Plan has identified a need to encourage additional uses with emphasis on those uses that are more compatible with the Creek, such as office uses. Although current uses may be continued, the public has indicated a preference for new uses that through design review or incentives will protect and enhance Little Bear Creek.



Parcels adjacent to Little Bear Creek contain most of the high intensity and large-scale development, as well as parcels adjacent to Woodinville-Snohomish Road between 140th Ave. N.E. and N.E. 195th Street. Land uses along the Creek and west of 131st Ave. N.E. to the Sammamish River are a mix of large buildings used for industrial/warehouse and outside storage activity, small one-story office buildings, freeway services and retail stores. Land uses along the Creek and east of 131st Ave. N.E. are mostly a combination of retail, industrial warehousing and distribution, and auto repair, sales and rental. In addition, the City owns a 6.5 acre vacant, potential future park site just north of 134th Ave. N.E. and west of the Creek. Parcels west of SR 522 are vacant or contain single-family residential homes, except for

Woodinville High School and a 17 acre, city-owned, resource-conservancy park, north of N.E. 195th Street. See Figures 4 and 5 for existing land use.

There is a total of 89 acres of land adjacent to the Creek within the Little Bear Creek corridor north of 131st Ave. N.E. Of that acreage, business services utilize 42 percent, 33 percent is vacant and retail services use 18 percent. Business services include auto leasing, trucking, equipment rental, construction trade and storage yards, warehousing and wholesale trade. Uses in this category are outdoor-oriented businesses. Retail services include stores that sell goods to the public and tend to have more investments in the buildings than in the site. The area adjacent to Little Bear Creek, the focus of this Master Plan, contains much land that is either vacant or is outside use oriented, or that does not have a major structure on it. This is also true for parcels west of SR 522 and north of N.E. 195th Street.

Land Valuation. The land value of parcels in the study area follows the pattern of the land use breakdown, where the highest valued land is currently used as business service, and the second highest value is in the retail use category, followed by residential properties. The highest valued properties are found at the northern end of the study area, near the 522 freeway ramps at N.E. 195th Street, and at the southern extreme study area near the mouth of Little Bear Creek. The land near the creek mouth derives it value mainly from buildings while the value of land near N.E. 195th is due mainly to location.

Land Use Controls. As with all areas throughout the region experiencing development and urbanization, the Little Bear Creek corridor master plan area has land use regulations that have become more complex and more prescriptive over time. In addition, as population density and development increases, the public has become more sensitive to the value of the natural environment and has sought greater land use controls to protect these values. The City of Woodinville realizes it is subject to the same permit review processes as the private sector and will submit to appropriate local, regional and state authorities as required during development of this plan.

In 1999 the Federal government included Chinook salmon in the list of endangered species. Since Little Bear Creek was known to support Chinook spawning, this had the effect of placing a physically constrained area with major development challenges into even more challenging regulatory and political environment. Thus, new development in the study area is subject to design guidelines, critical area regulations, height and density parameters, zoning, and regulatory recommendations or guidelines for responding to the ESA. The combination presents complex challenges to landowners and developers as they attempt to redevelop or maximize their land investments. Only through the most collaborative processes with the owners can the City achieve common goals, economic vitality, recreation and aesthetics that enhance livability and property values, and protection and enhancement of the Creek.

West of SR 522, Woodinville has adopted single-family zoning. On the eastern side of the study area, along the Woodinville-Snohomish Road, there is industrial zoning. At the southern end of the Creek, industrial and retail can be found. The remainder of the corridor, on parcels adjacent to the Creek, the general business zone is used. A description of these zoning classifications is located in Appendix C of this Report.

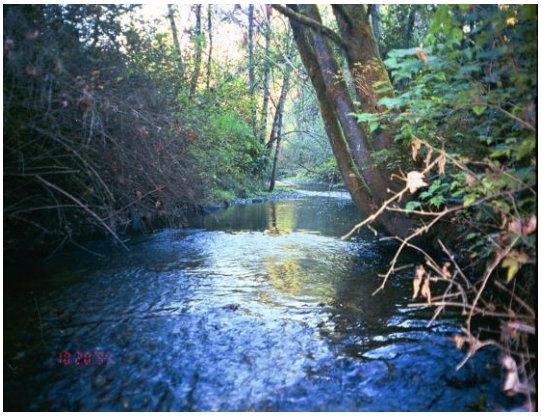
Roads. Motorized access to Little Bear Creek Linear Park is from 177th Place N.E./139th Ave. N.E. (Little Bear Creek Parkway). This is currently classified as a minor arterial in the City and is proposed to be developed with a 74 foot cross section. Additional right of way will need to be purchased to accommodate those dimensions. This road carries the major amount of traffic in the study area. From Little Bear Creek Parkway, 134th Ave. N.E. provides a direct link to the linear park. N.E. 195th Street and 136th Ave. N.E. are also directs link to the Park. Other roads in the study area are not less important but are indirect routes to the Park and Little Bear Creek itself. Little Bear Creek Parkway and other roads in the area are discussed in the Transportation section of Appendix D of this Report.

Railroad. The Seattle Lake Shore and Eastern Railroad tracks (now Burlington Northern) run parallel to Little Bear Creek Parkway. This route is an element of the Little Bear Creek Linear Park Master Plan. Currently, these tracks are not used for commercial purposes, but they are seen as a future potential asset. The route runs between the City of Renton in the south and Snohomish County in the north. The right of way is 100 feet wide.

Utilities. The study area contains sewer, power and water, all of the necessary utilities required by intensive development.

PUBLIC INVOLVEMENT

Public Meetings. During the summer of 2001**,** the Woodinville Parks and Recreation Commission requested the Parks and Recreation Department begin the development of a Little Bear Creek Linear Park in response to two issues at the time. One was to coordinate parks planning with the transportation planning on 177th Place N.E. The other was to integrate the newly City-purchased parcels of land adjacent to Little Bear Creek into the linear park plan recommendations of the adopted PRO Plan.



The Parks and Recreation Commission held several public meetings throughout 2001 reviewing data developed by staff and developing visions of what the park would be. In October of 2001 the Planning Commission also began to review Little Bear Creek Linear Park data.

In the fall of 2001, the City began to work on the development of a plan for downtown Woodinville. These planning efforts continued during 2002 and included a joint public meeting with the Parks and Recreation Commission and the Planning Commission. During the remainder of 2002 several more public meetings with the Parks and Recreation Commission, with the Planning Commission, and at open-houses were held. Park concepts and features were being generated at this time for discussion at these meetings. A mailer was also sent out to the general public soliciting responses to plan proposals. See Appendix E of this Report for record of public meetings and a compilation of questionnaire results.

The public meetings generated a set of goals and design objectives to guide the development of a schematic master plan. The Little Bear Creek Linear Park Master Plan since has been taken into the community, presented at open-house meetings, and also to individual stakeholders and groups on an on-call basis.

Goals and Objectives.

Land Use

- To create a variety of recreational and public education opportunities within the corridor including Little Bear Creek.
- To protect, enhance and preserve valley vistas in and above the corridor area.
- To create a dynamic and visually pleasing link between the corridor and adjacent areas.
- To promote a viable economic future for the corridor.

Open Space

- To preserve, protect and enhance environmentally sensitive areas with a focus on wildlife habitat and mature vegetation within the corridor.
- To preserve and protect the mature trees that provide a visual and noise buffer along SR 522.

Circulation

- To define and develop gateways of the corridor from the entrance to Woodinville at the west end to the transition between King and Snohomish Counties.
- To ensure infrastructure improvements that meet the needs for development capacity.

Design Objectives. (Parks and Recreation Commission)

I. Education-Preservation

- Provide ¼ mile markers for information and rest stops along the trail.
- Provide an interpretive trail system.
- Restore Little Bear Creek and adjacent wildlife habitat.
- Provide for human access to the Creek.

II. Economic Development

- Redevelop general business zone.
- Examine zoning to facilitate land use conversion and parkway improvements.
- Insure high quality aesthetics in building development.
- Provide for a wide range of land use.

III. Accessibility-Transportation (Bicycle & Pedestrian)

- Continue the Wood-Snoh. Road design to Snohomish County.
- Enhance landscape quality of the S.L.S. & E. railroad right of way.

ANALYSIS AND EVALUATION

Recreation Suitability. The study area was reviewed for its suitability for the various types of recreation activities defined in the PRO Plan. There are 5 basic broad categories of recreation activity in Woodinville**:**

- Playgrounds, fields and courts
- Walking and hiking trails
- Bicycle trails
- Environmental resource parks, and
- Resource conservancy parks

The first three categories are considered to be active recreation where physical activity occurs, and the last two are more or less passive recreation amenities where physical exercise is not required to enjoy the park. The natural factor maps were reviewed for the above recreation activities.

Good soils, permeability and drainage, presence of mature trees, favorable slope and land workability make the upland sites west of SR 522 suitable for some types of recreation. The large, 20-acre site directly north of the high school could be a good candidate for active recreation if it could be combined with environmentally sensitive development. However, Woodinville High School provides many types of active recreation for the area and demand for more space does not exist at this time.

The downtown area is built on Indianola soil, which for the same reasons as above is the best soil in the region for any type of land use activity, especially recreation. But here land is generally more valuable for commercial use.

The Woodin Glen Pond area in the Wedge neighborhood is not suitable for structural development due to peat soil but could be used for a trail or boardwalk element if sensitive design parameters were followed. Some parts of this site consist of Indianola soil.

The valley sites adjacent to Little Bear Creek consist of Norma soils, which have severe limitations for most development due to high water table, poor drainage, and low structural stability. Some of the valley parcels partially contain Indianola soil. These parcels are located southeast of 140th Ave. N.E. and east of 130th Ave. N.E. on both sides of the Creek, and including the newly purchased City park site. This park site would be suitable for active recreation based on the presence of favorable natural factors.

Even when natural factors offer constraints to active recreation development, they can provide opportunities for passive, interpretive/educational activities and sensitive trail construction.

Many parcels adjacent to the Creek involve the 100-year floodplain and wetlands. Those parcels or parts of them may also be good candidates for environmental education or other passive recreation activities.

A continuous, uninterrupted Little Bear Creek Linear Park will need to traverse what is currently private and public property adjacent to the Creek, some of which is owned by the State of Washington for freeway right of way. All of these parcels adjacent to the Creek and north of the Creek between Wood-Snoh. Road to the northern city limits have commercial and industrial value. However, this value may be tempered by the adoption of restrictive creek buffers in response to the federal Endangered Species Act (ESA) mandates to protect fish habitat. The City is pursuing Best Available Science to determine how best to regulate and encourage development in light of the ESA.

Recreation is permitted throughout all of the City's zone classifications, and even in buffer areas, some recreation of a passive nature may be allowed, especially if doing so would promote stewardship of the resources.

Recreation is a land use that requires a visually pleasing and aesthetic environment. Park usage depends on this. People go to parks for enjoyment, relaxation and rest. Many parcels within the linear park corridor are not visually compatible with the notion of a park-like atmosphere. Land use conversion or implementation of visual mitigation measures such as landscaping would be necessary to make them compatible with the purposes of recreation activity.

Physical factors within the study area offer both opportunities and constraints for recreation. The railroad can be a vehicle for amusement and enjoyment but brings with it an odor and noise. Tree-lined streets provide shade and visual relief and reduce glare and particulate matter. SR 522 is adjacent to the linear park and will be noisy and a source of pollution, light and glare.

Obviously, vacant parcels of land and parcels that have low improvement value or inexpensive structures will be the best choices for purchase as recreation opportunities than will parcels that have big buildings and large parking lots.

Circulation Suitability. The basic motorized transportation system for the Little Bear Creek Linear Park area is established. However, additional right of ways need to be acquired to effect long-range circulation goals in and adjacent to the downtown area and the linear park study area.

Several streets linking various parts of the City with the Little Bear Creek study area are good candidates to carry pedestrians and bicyclists as well as motor traffic to park sites, the C.B.D. and residential neighborhoods. It will be important to make these routes a pleasant and safe traveling experience. Trees for shade and interest, separated walks from traffic lanes and wide, delineated bike lanes are needed to make these linkages functional. See the Road Cross Sections in Appendix D of this Report for design and location recommendations.

Trails are relatively inexpensive to develop and add immeasurable opportunities to any recreation experience. Trails can be hard or soft depending on the location and the nature of the ground surface where they are to be built. Within wetland buffers trails need to be as sensitive to their environment as possible, and synthetic, permeable grid structures that anchor soil particles and allow water infiltration can be functional and environmentally friendly. If done properly, trail development can be consistent with restrictive regulatory parameters regarding materials and location.

Scenic views are important to any travel experience. Places of interest, destinations and scenic qualities and benefits can create incentives to travel. It is important to identify and pursue those elements and features in the study area prior to designing the trail system.

Land Use Suitability. A large percentage of land within the study area is either vacant or involves uses that have relatively small investments in permanent structures. These are generally located between Little Bear Creek/SR 522 and Little Bear Creek Parkway. Development on these parcels may be hindered by the presence of structurally poor alluvial soils, high water table, wetlands or floodplains. Some parcels adjacent to the Creek and between 131st Ave. N.E. and 140th Ave. N.E. have soil conditions good for development. Some parcels are developmentally restricted because of their narrowness, existence of creek buffer zone and street setback requirements. Other parcels are sufficiently large to have flexibility in redevelop. Generally, a high building valuation on a small parcel means a low potential to redevelop. Large parcel size and low building value increases the redevelopment propensity. So, it is reasonable to assume that many pieces of property in the study area will remain static for some time, while others will be prime for development or redevelopment as soon as demand for building space catches up with the supply in Woodinville.

Except for land use on parcels adjacent to Little Bear Creek, most buildings and uses in the study area are in harmony with their surroundings. Mainly due to native vegetation and ornamental landscaping, much of downtown Woodinville and the residential neighborhoods in the Wedge and the west side hills overlooking downtown have a positive visual quality about them. Creek side parcels have little riparian vegetation and little street side landscaping. This causes an aesthetic disparity with their neighbors on all sides.

Many of the land parcels in the vicinity of the Creek, particularly near the 195th Street N.E./SR 522 ramps are potential soil and water pollution sources and could be contributing to the degradation of the Little Bear Creek environment leading to a loss of fish and wildlife and a potential quality recreation resource. See Figure 3 and the David Evans & Associates, Corridor Habitat Assessment referenced in Appendix A of this Report.

Much of the Little Bear Creek environment is in need of habitat improvement due to land use in the study area. Roads contribute polluting runoff and sediment causing water quality to be poor, stream bank erosion and deposition. Lack of riparian habitat causes negative temperature modification to stream waters resulting in decreased quality of salmonid habitat and less diversity in wildlife habitat.

Conversion of land use, application of design guidelines, improvements to and creation of riparian habitat is needed to restore health and environmental quality to the Little Bear Creek environs and set the stage for the creation of a new environmental, recreational and human activity system that is the Little Bear Creek Linear Park for the City of Woodinville.

SCHEMATIC MASTER PLAN

The Schematic Master Plan (Figure 1) for the Little Bear Creek Linear Park shows the 2.2 mile long Little Bear Creek as it begins at the Sammamish River and meanders through downtown Woodinville under the freeway and up through residential neighborhoods, past the high school, and up to the city limits at N.E. 205th Street.

This Master Plan Report proposes many changes to the existing conditions within its study area. These future proposals are outlined and described below.

Land Use. The City's Comprehensive Plan identifies the study area as having the potential for more intensive uses. As the need for additional office space increases, the demand for office-zoned land in Woodinville and parcels in the Little Bear Creek corridor are considered to be prime candidates for this type of land use development.

Proposed changes to the land use classifications in the study area are located, exclusively, in the general business zone east of SR 522. To enhance the flexibility in commercial use of properties within this zone, the Downtown-Little Bear Creek Corridor Master Plan proposes to retain most currently permitted General Business uses, and add most uses permitted in the Office Zone. Parcel development shall be in harmony with the Little Bear Creek natural environment. See Figure 6.

The intent of proposed Comprehensive Plan changes for these areas is to accommodate uses that have not been adequately provided for by the City such as high-tech companies and other employee or visitor intense uses, making the area an active pedestrian oriented center. In addition to encouraging greater economic vitality these land use changes can lead to new opportunities to realize other comprehensive plan goals, such as restoration activities and public access to Little Bear Creek. Improved development aesthetics may also result from the application of design standards and regulations during development approval. The City's Design Guidelines attempt to ensure that new development or redevelopment will be sensitive to the goals and objectives of the Little Bear Creek Linear Park Master Plan.

Circulation. Once development of the linear park is implemented, the overall circulation system will become an important element, transporting park users within and to the park from activity centers or living environments.

This Master Plan accounts for existing and future transportation considerations related to land use, trails and transit. It is also coordinated with the Downtown-

Little Bear Creek Corridor Master Plan being developed concurrently with this plan. The new transportation recommendations rely on existing infrastructure including projects that are scheduled for funding.

The Master Plan for the Linear Park recommends improvements to the motorized circulation network, to the transit network and to the non-motorized circulation network.

The motorized element recommendations include:

- SR 522 access ramps
- Mill Place intersection enhancements
- 132nd Ave. N.E. at-grade RR Crossing
- Little Bear Creek Parkway right of way and amenities
- Woodinville-Snohomish Road right of way and amenities

Street design concepts are illustrated in Appendix D of this report.

The transit element recommendations include:

- S.L.S.& E. Railroad improvements (structures and amenities)

Rail corridor design concepts are illustrated in Appendix D of this report.

The non-motorized element recommendations include:

- Integration with the downtown and neighborhood trails
- N.E. 195th Street pedestrian/bike route
- 136th Ave. N.E. pedestrian/bike route
- N.E. 190th Street pedestrian/bike route
- N.E. 190th Street extended (Wood-Snoh. Rd. to the Creek, with footbridge)
- N.E. 190th Pl. to Woodin Glen Pond pedestrian/bike route
- 140th Ave. N.E. pedestrian/bike route
- 140th Ave N.E. extended (Wood-Snoh. Rd to the Creek, with footbridge)
- Mill Place pedestrian/bike route
- Mill Place extended (Wood-Snoh. Rd. to the Creek, with footbridge)
- 134th Ave. N.E. pedestrian/bike route (vehicle bridge to remain)
- 132nd Ave. N.E. pedestrian/bike route and footbridge over the Creek
- 131st Ave. N.E. pedestrian/bike route
- A pedestrian/bike SR 522 overpass at the intersection of N.E. 186th Street & 136th Ave. N.E.
- 131st Ave. N.E. pedestrian/bike underpass
- Wood-Snoh. Rd. east side pedestrian/bike route
- Little Bear Creek Parkway west side pedestrian/bike route
- A pedestrian soft trail along the Little Bear Creek 100’ buffer on the north and west side of the Creek between the Sammamish River and 190th Street extended

- A hard surface/pervious material trail within the Little Bear Creek 100' buffer on the northwest side of the Creek between 132nd Ave. N.E. and N.E. 190th Street extended

Some trail design concepts are illustrated in Appendix D of this report, and a general discussion of trail location and design parameters is discussed under Recreation below.

Non-motorized trails, located within multi-modal right of way, are proposed to be striped, and tree-lined for safety, security, comfort and aesthetics. Design details for the landscape treatment and features within these routes is beyond the scope of this Master Plan.

Where trails meander into or along creek buffer zones, earth mounds, fencing and/or vegetative plantings are proposed to provide for the privacy, security, safety and visual serenity for adjacent lands, both private and public. Proposals for trail surfaces will provide for the most current environmentally safe products and materials. And, trail locations will be situated so as to take advantage of interesting vegetation, naturally significant features in the Creek and other environmental and sensory features in the landscape.

Environment. The central environmental feature of the Master Plan study area is Little Bear Creek. It has been studied considerably and recommendations for improvements are not lacking. This Master Plan is confirming many of those recommendations by proposing measures for habitat in-stream improvements, riparian habitat improvements and off-site mitigation projects. See Figure 3 for locations and descriptions of habitat improvement recommendations associated with this Master Plan; and see the Little Bear Creek Corridor Habitat Assessment for detailed proposals adopted herein by reference.

Recreation. A survey conducted for the PRO Plan in 1998 revealed the recreation preferences of the citizens of Woodinville. The Little Bear Creek Linear Park was considered a major recreation resource to be conserved in areas of environmental sensitivity, but also developed as a trail system linked to park sites and activity centers.

PRO Plan land and facility demand analysis of the park planning area for Woodinville indicates that there is a deficiency in trail miles, active recreation activities, in resource conservancy land and in resource activities.

PRO Plan recommendations for acquiring additional trail miles are as follows:

Local Park Walking Trails	1.5 miles of soft trail
	5.5 miles of hard trail

Separate Corridor Trails:		
	Walking	6.7 miles of soft trail
		13.2 miles of hard trail
	Bicycle	4.5 miles of soft trail
		5.7 miles of hard trail
On-Road Bicycle Trail		7.5 miles of improved bike lanes

The PRO Plan recommends developing active recreation activities as follows:

3 outdoor volleyball courts
4 outdoor basketball courts
6 tennis courts
128 picnic tables
9 picnic shelters

The PRO Plan recommends the acquisition of 98.8 acres of resource conservancy land. The City has recently acquired through fee simple purchase and donation approximately 65 acres, leaving 35 needed acres to sustain the existing level of service to meet demand.

The PRO Plan also recommends developing an additional 19 acres for resource park activities such as picnicking, camping and open grassy playfields.

The documented needs in the PRO Plan for acquisition and development of additional active and passive recreation lands can be partially achieved by implementing the proposed features within the Schematic Master Plan for Little Bear Creek.

Features. While the original concept of a Little Bear Creek Linear Park was born in the PRO Plan, most of the features proposed for the park were derived by consensus of the Parks and Recreation Commission, Parks department staff and citizen workshops.

The proposed features are delineated on the Schematic Master Plan (Figure 1) and explained below.

Foot Trails. These are walking and hiking trails, and may be hard or soft surfaced, depending on their location. Foot trails that are part of dedicated right of way will be hard surface paths. In separate trail corridors, not on sensitive lands, foot trails may also be hard surface. On sensitive lands, foot trails should be of a soft surface. Sensitive land trails in the study area will be built on the north and west side of Little Bear Creek, meandering along the edge of the 100 foot creek buffer. See Figure 1 for locations of walking and hiking trails.

Bike Trails. Bike trails require hard surfaces for safety and efficiency reasons. On road rights of way, these trails will be hard surfaced. In sensitive areas such as creek buffers synthetic, water-permeable, structural, grid systems may be used. The Master Plan envisions a synthetic surface trail on the west side of Little Bear Creek, meandering along the 100 foot buffer zone linking business uses with other business uses in the corridor and with the recreation and visual resources associated with the Linear Park. The location and design details of this east side trail must consider the existing and future land uses on adjacent parcels to find the right fit. See Figure 1 for locations of bicycle trails.

Railroad. The old S.L.S. & E. Railroad (now Burlington-Northern) is projected to provide a future multipurpose trail with amenities through Woodinville with the possibility of future connections to trails in Snohomish County (See Figure 7). Although commuter rail and a train station appear to be dependent on cooperation with Sound Transit and other agencies, the City should preserve the potential for active rail service that might enhance commuter or tourist potential in the Corridor.

Bridges & Tunnels. A future pedestrian and bicycle overpass is proposed over SR 522 at 136th Ave. N.E. and N.E. 186th Street that will connect the Wedge neighborhood with the linear park and downtown. See Figure 8 and Downtown Little Bear Creek Corridor Master Plan Section 5.3.

A direct connection is needed at 131st Avenue NE to provide uninterrupted creek-side trail passage along Little Bear Creek between reaches one and two. This could be accomplished via an underpass or constructed at-grade as part of proposed roadway improvements to the intersection of SR 202 and SR 522.

Other, less prominent non-motorized bridges (footbridges) are proposed to cross the Creek at 132nd Ave. N.E., at Mill Place extended on or over property lines, at 140th Ave. N.E. extended and at N.E. 190th Street extended. See Figure 1 for locations of these Master Plan features.

Lookouts/Interpretive Sites/Environmental Interest. Throughout the length of the Creek are places of significant vegetation, and in-stream features such as riffles, pools and glides that salmon and other fish may find functional and that provide visual and educational interest to humans. Many of these places are identified in the Schematic Master Plan as the Confluence overlook, interpretive sites, or viewing platforms. These sites will be developed with decks for viewing, interpretive and educational signage, picnic tables if space permits and trail furniture. Some of these locations have been identified on the Schematic Master Plan, Figure 1.

Picnic & Social Areas. Several areas are proposed for development as picnic sites or gathering areas. These are: the proposed confluence park where Little Bear Creek empties into the Sammamish River; north of 131st Ave. N.E. on

State-owned land; at the proposed City-owned park north of 134th Street N.E; and on City-owned land in the Wedge neighborhood, near Woodin Glen Pond.

Active Recreation areas. Active recreation and associated parking is proposed at the 6.5 acre City-owned park site at 134th Ave N.E. On-site investigations will have to be performed prior to design development studies. But, Master Plan inventory data suggests that part of the property is suitable for game courts and structural development. These activities would be combined with passive and resource conservancy activities as shown on Figure 1. The skate park and 17 acre resource conservancy park located north of N.E. 195th Street is also part of the Little Bear Creek Linear Park but, is not mentioned here as a proposed active recreation feature because it is currently under construction.

Woodin Glen Pond/Park is proposed for semi-active recreation features of a small scale. If neighborhood demographics are suitable, this 1-acre site might be developable for some components of a neighborhood park such as a Children's play structure and an open lawn games area. Interpretive facilities such as a boardwalk for birdwatching on the pond should also be considered.

Water Features. There are several natural water features associated with the existing Little Bear Creek. The Master Plan proposes to take advantage of these as areas of human interest where a trail and viewing platform may be developed. But this plan also proposes to create new water features that may be mitigation sites for private developers to purchase for projects requiring wetland mitigation, or as sites for public development as educational resources. The nature of these areas, referred to on the Master Plan map as Ox Bow Ponds, may range from a shallow pothole to a creek diversion. The locations, design decisions and details are beyond the scope of this document.

Quarter Mile Markers. The Schematic Master Plan map indicates locations for markers every ¼ mile along the walking trail on the west side of the Creek from the mouth of Little Bear Creek to the City limits. It is proposed that these be river stone pillar with pre-cast concrete bear-holding-fish sculpture on top.

Trailheads. Trailheads are proposed for points of access to Little Bear Creek from arterials in the study area. Signage will indicate where to go and what the feature(s) are at the destinations. Proposed trailheads are shown on Figure 1.

Gateways. There are several places in the City where upon arrival the perception of the traveling public is one of confusion and disorientation caused by the nature of the road network, heterogeneous land use, signage and a general lack of structural elements in the landscape that serve to unify and harmonize the visual character of the City. The lack of visual acuity at important nodes in the City can be changed to reflect the nature of a place that is safe, comfortable and prosperous. The Master Plan proposes entry treatments at the following locations:

1. Wood-Snoh. Road at the northern City limits on State right of way.
2. SR 522 ramps and N.E. 195th Street on the north side (industrial district).
3. Mill Place and Little Bear Creek Parkway entrance to C.B.D.
4. S.E. corner of SR 202 (131st) and Little Bear Creek Parkway.

A system of arbor/trellis structures is proposed for these locations. Design development of these features is beyond the scope of this Plan and should be coordinated with efforts to promote tourism, “way finding” signs that direct out of town visitors, and the park signage system.

IMPLEMENTATION

The Master Plan for the Little Bear Creek Linear Park has examined the potential for recreational resource development along the Little Bear Creek and within the Linear Park study area. Discussions with Woodinville citizens, public meetings with the Parks and Recreation Commission and the Planning Commission indicate the need and desire of trail and recreational development that integrates Little Bear Creek Linear Park with residential neighborhoods and downtown Woodinville.

The implementation phase of this Report will discuss steps to bring the proposed use concepts contained herein to reality.

Comprehensive Plan – Land Use. There is a diversity of land use designations within the Master Plan study area. Reach number one contains industrial and central business plan classified parcels. Reach number two is classified as general business (auto/general commercial). Reach number three parcels are classified as moderate density residential.

Reach one and reach three are considered to have Comprehensive Plan classifications that are consistent with Linear Park objectives, and are not proposed for change as a result of this Master Plan. The Master Plan recognizes the need to reclassify lands within reach two so that the goals and objectives of the public participation process of this plan are met. That is, to promote environmental quality for fish and wildlife habitat, to promote a viable economic future for land use, provide for a wide range of land use, insure high quality aesthetics and provide for an interpretive trail system and human access to the Creek.

Realizing these goals and recognizing the constraints to fulfilling them will require consideration of a wide range of planning tools. Sensitive area constraints, parcel size and shape will require creative site planning in order for development and redevelopment to be compatible with an aesthetically pleasing linear park and associated uses. This is true for development of the trail system and park sites as well as development of parcel land use.

Compatibility must work both ways. Sensitivity to environmental features, privacy and access are important considerations. Reclassification of lands adjacent to the Creek will attempt to encourage employment, increase the economic base of the City, and promote human access to the trail and the Creek. Encouraging office uses, retaining current uses that are economically viable, and sharing

infrastructure development will be part of the palette of plan implementation features in the Little Bear Creek Linear Park Master Plan.

Developing the trail system will also require creative solutions. Much of the proposed soft trail on the west side of the Creek will be over publicly owned land. Where the City does not own such lands, acquisition may occur in a variety of ways. Where fee simple purchases are not feasible other means of acquisition could include the purchase or granting of easements.

The trail proposed on the east side of the Creek would be over private property. This location would be in sensitive area buffers. Acquisition alternatives would be similar to those discussed for the west side trail. In addition, easements or donation of lands on these private parcels could benefit property owners by reducing property taxes on affected areas. Finally, development bonuses for granting trail easements will be considered as implementation methods. These could include tradeoffs for landscape requirements and parking requirements.

Trail Implementation Schedule
The west side trail and key access points from NE 177th Place would be developed as phase I of the plan implementation. The second stage of trail development on the east side would not occur until such time as the land use and redevelopment warranted the need to connect buildings, and provide non-motorized transportation access through the corridor on the east side. Trail demand would be documented prior to implementation of phase II. This alternative preserves the dual nature of the facilities as originally conceived, but focuses resources on the west side trail at this time. It also avoids conflicts that could occur with current land use, where trail development may not be compatible. The trails and their implementation are distinguished through color code on the Master Plan.

Sensitive Areas. Habitat improvements to Little Bear Creek are a major part of this Master Plan. Much of the work on the identified improvement needs will occur on private lands. The City will find that the tools available to perform this work will be the same as for acquiring trail rights of way. Fee simple purchase of the Creek, easements and development bonuses will be the preferred methods to work to improve habitat.

Funding. Funding for the plan elements is competitively available through a variety of sources. Outside of fee simple and less than fee simple acquisition funding sources include:

- IAC grants: Washington Wildlife & Recreation Program (WWRP); Aquatic Lands Enhancement Account (ALEA);
- Land & Water Conservation Fund (LWCF); and Urban Wildlife Habitat (UWH).
- Inter-modal Surface Transportation Enhancement Act (ISTEA) for using RR right of way for pedestrian and bicycle use and landscape improvements.

- Use Park Impact Fees for property acquisition and/or development.
- Develop a parks general obligation bond.

Capital Program. The capital improvement program will outline the sequence for acquisition, renovation and development; identify specific projects, project phasing, associated costs and dates.

ACTION PLAN

1. Pursue development of City owned parcels for purposes of providing needed recreation benefits and promoting awareness of Little Bear Creek and the Plan.

2. Research opportunities to achieve public and private objectives such as stormwater management in ways that promote Plan objectives.

3. Continue habitat restoration and protections as described in the Little Bear Creek Corridor Habitat Assessment.

4. Create or employ methods of encouraging land donations and granting of easements through tax benefit reduction programs, where appropriate.

5. Seek grants and donations that can supplement City funds for acquisition and development.

6. Work collaboratively with the private landowners to develop design standards that can promote compatible land uses along the Creek.

7. Develop interpretive signage and facilities in conjunction with school officials.

8. Conduct volunteer activities in the area that promote stewardship and awareness and assist in restoration of damaged creek habitat.

9. Use environmentally supportable construction methods and techniques to reduce trail development impacts in the area.

10. Promote pedestrian friendly connectivity to new or existing businesses where employees and businesses would benefit from recreation amenities.

11. Explore buffers, screening, and other methods of access management where connectivity is not yet feasible or is still undesirable.

12. Employ incentives that help to preserve significant trees and other significant natural features.

13. Explore reduction of currently required greenrows in favor of flexibility that would promote Plan objectives.

14. Explore shared or reduced parking concepts and technological improvements to reduce impervious surfaces and impacts to habitat.

15. Encourage additional heights where this would encourage compatible land uses along the Creek.

16. Consider Transfer of Development Rights if such a system would promote compatible development or achieve other Plan goals.

APPENDIX A

LITTLE BEAR CREEK HABITAT ASSESSMENT

(Excerpted Portion due to Report size)

LITTLE BEAR CREEK CORRIDOR HABITAT ASSESSMENT

Woodinville, Washington

Prepared for:

THE CITY OF WOODINVILLE
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EXECUTIVE SUMMARY

The City of Woodinville is bisected by several creeks, the largest of which is Little Bear Creek. Little Bear Creek is recognized as an important salmon-bearing stream within the Lake Washington – Cedar – Sammamish Basin (Water Resource Inventory Area 8). With the listing of chinook salmon as a threatened species under the Endangered Species Act (ESA), numerous cities, including the City of Woodinville, have undergone stream inventories to document existing habitat conditions in streams within their jurisdiction. The City of Woodinville contracted with David Evans and Associates, Inc. (DEA) to prepare this Little Bear Creek Corridor Habitat Assessment. The project goals were to document existing fish and wildlife habitat conditions and utilization, and identify potential restoration opportunities along Little Bear Creek within the City of Woodinville. This assessment provides a detailed analysis of stream and riparian habitat conditions, fish and wildlife utilization, and includes data that assisted in the determination of limiting factors as they relate to ESA listed salmon.

Because of project specific goals, and a desire to have the results comparable to other on-going stream inventory efforts, DEA utilized the *Inventory Methods for Wadable Streams in King County* (King County, 2001a) as the primary methodology. Both the King County 1991 (Appendix B) and 2001a (Appendix C) protocols are based on the methods defined in the *USDA Forest Service Stream Habitat Classification and Inventory Procedures for Northern California* (McCain et al., 1990) as modified by King County staff. Additional data as outlined in the United States Forest Service (USFS) – *Stream Inventory Handbook for Region 6, Version 2.1* (USFS, 2001) was included.

Existing stream and watershed conditions were quantified by using watershed and habitat parameters as defined by the "Matrix of Pathways and Indicators" developed by the National Marine Fisheries Service (NMFS) (Table S-1). The "Matrix of Pathways and Indicators" summarizes important parameters for six major pathways that are vital for the continued survival of salmon including:

- Water Quality;
- Habitat Access;
- Habitat Elements;
- Channel Condition and Dynamics;
- Flow/Hydrology; and
- Watershed Conditions.

These six major pathways are further broken down into a total of 18 "indicators." As an example, the water quality pathway is composed of three indicators: temperature, sediment/turbidity, and chemical contamination/nutrients. Scientifically sound data was collected during this assessment to accurately assign the appropriate "condition" to each indicator as defined by the NMFS. The indicator conditions are classified as either: "properly functioning," "at risk," or "not properly functioning." Criteria for each condition is defined by a range or goal based on the best available scientific data available, but criteria are not absolute, and may be adjusted for unique watersheds (NMFS, 1996). Within this report, definitions and determinations of an indicators status are distinguishable by font. Definitions are italicized and determinations are in bold font. Existing conditions were documented to a level of detail that would allow for future trend analysis. Should

the criteria for the Matrix of Pathways and Indicators change, an appropriate condition for each indicator could be assigned based on the results presented in this report.

This report has also consolidated numerous supporting references such as salmon spawning survey data from the Washington Department of Fish and Wildlife (WDFW), and presents all the raw data for ease of record keeping and as an aid to future researchers. Furthermore, opportunities for restoration have been listed and prioritized based on the findings present within this report.

Little Bear Creek is currently utilized by at least nine species of fish including resident, adfluvial, and anadromous species. Resident fish spend their entire life in a specific stream. Adfluvial fish spawn and sometimes rear in a stream, but migrate to a lake to mature before returning to a stream to spawn. Anadromous fish spawn and rear in freshwater, but reach maturity at sea prior to returning to freshwater to start the process over again. Resident species documented in Little Bear Creek include coast range sculpins (*Cottus aleuticus*), western brook lampreys (*Lampretra richardsoni*), and cutthroat trout (*Oncorhynchus clarki*). Cutthroat trout are somewhat unique in that resident, adfluvial, and anadromous forms may utilize the same stream depending upon watershed conditions, life history type, and access to the ocean. Species that utilize the adfluvial life history include cutthroat trout and kokanee salmon (*O. nerka* [freshwater sockeye]). Anadromous species documented in Little Bear Creek include chinook salmon (*O. tshawytscha*), coho salmon (*O. kisutch*), and sockeye salmon (*O. nerka*). Some species such as pink (*O. gorbuscha*) and chum (*O. keta*) salmon have rarely been observed in Little Bear Creek. However, due to their scarcity, they are not part of an established population, rather, they are strays from another watershed. Undocumented species such as steelhead trout (*O. mykiss*) could potentially utilize Little Bear Creek.

The results of this assessment indicate that Little Bear Creek is very similar to most urbanized Puget Sound lowland streams in that it has been severely impacted by past and current land-use activities. The percentage of total impervious surface has increased to about 37 percent and road density to 5.9 kilometers per square kilometer (km/km^2) (2.28 mi/mi^2) in the past 12 years (Purser and Simmonds, Snohomish County Surface Water Management, unpublished data as reported by Kerwin, 2001). Out of the 18 indicators examined, one was found to be partially **properly functioning** (temperature). Three were found to range from **not properly functioning** to **at risk** (varied by reach), three were **at risk**, while the remaining 11 were **not properly functioning**. The results are summarized below.

Although the existing habitat conditions reflect those frequently associated with an urbanized basin, Little Bear Creek is still an important salmon-bearing stream. Little Bear Creek possess numerous opportunities for enhancement and restoration that could significantly improve conditions for salmonids. The City of Woodinville is currently undertaking several stream restoration projects along the Little Bear Creek Corridor. Appendix R outlines current habitat enhancement projects along the corridor.

Little Bear Creek was segmented into three reaches based on land use and permanent landmarks. Reach 1 is defined as extending from the mouth to the SR 202 culvert crossing. Reach 2 is defined as extending from the SR 202 culvert crossing to the SR 522 culvert crossing. Reach 3 is defined as extending from the SR 522 culvert crossing to the NE 205th Street culvert crossing.

The majority of Reach 1 is developed up to the banks. The banks are armored with riprap and there are signs of localized erosion. This riprap should be removed. It is recommended that the banks be restored and stabilized using bioengineering methods. Improvements to the mouth such as the installation of large woody debris and create scour pools would also improve existing habitat conditions.

The amount of bank armoring (riprap) in Reach 2 is significantly less than in Reach 1. However, there are opportunities for riprap removal, and bank restoration and stabilization using bioengineering methods. There are areas of riparian habitat between Little Bear Creek and SR 522 that are candidates for acquisition. Connectivity between these areas and Little Bear Creek could be improved. In this reach there are culverted outfalls from regional and private storm drainage systems, and tributaries that could be used to create off-channel habitat.

There are similar opportunities in Reach 3, especially in the lowermost section. Riprap removal, bank restoration and stabilization using bioengineering methods, installation of large woody debris, and improved connectivity between remaining riparian habitat would improve existing conditions in Reach 3.

The majority of the Little Bear Creek corridor is privately owned. The City has acquired four parcels along the corridor. The Washington State Department of Transportation owns one parcel, and the SR 522 right-of-way through which segments of Little Bear Creek flow. It is recommended that the City look for opportunities to partner with residents, property owners, business owners, and other agencies on habitat enhancement projects. As redevelopment occurs along this corridor, an evaluation of potential habitat improvement opportunities should be undertaken to determine what could be done to restore and enhance the habitat. Potential improvements are outlined later in this report.

The following properties are outside the Little Bear Creek corridor, but within the watershed, that the City should evaluate for possible acquisition to preserve undeveloped upland forest habitat:

- North of Woodinville High School and west of 136th Avenue NE
- Northeast of 144th Avenue NE and NE 195th Street
- Southwest of North Woodinville Way and NE Woodinville Duvall Road

Purchase of these properties would help to maintain the amount of impervious area within the watershed, provide areas for groundwater recharge, and provide water quality benefits.

Table S-1:
Matrix of Pathway and Indicators Summary

PATHWAY	INDICATORS	BASELINE CONDITIONS
Water Quality	Temperature	Juvenile Migration and Rearing = Not Properly Functioning to At Risk Adult Migration and Spawning = Properly Functioning
	Sediment	Not Properly Functioning
	Chemical Contamination & Nutrients	Not Properly Functioning
Habitat Access	Physical Barriers	At Risk
Habitat Elements	Substrate	At Risk
	Large Woody Debris	Not Properly Functioning
	Pool Frequency	Not Properly Functioning
	Pool Quality/Depth	At Risk (not properly functioning in Reach 1)
	Off-Channel Habitat	Not Properly Functioning
	Refugia	Not Properly Functioning
Channel Conditions and Dynamics	Width/Depth Ratio	Reach 1: Not Properly Functioning Reach 2 and 3: At Risk
	Streambank Condition	Not Properly Functioning
	Floodplain Connectivity	Not Properly Functioning
Flow/Hydrology	Change in Peak/Base Flows	At Risk
	Increase in Drainage Network	Not Properly Functioning
Watershed Conditions	Road Density and Location	Not Properly Functioning
	Disturbance History	Not Properly Functioning
	Riparian Reserve/Conservation Areas	Not Properly Functioning (at risk in Reach 3)

Based on the results of this assessment, several additional actions have been outlined that could potentially improve existing habitat conditions in Little Bear Creek. These recommended actions include:

1. Obtain, preserve, and enhance land along Little Bear Creek to minimize further habitat degradation from continued development along the Little Bear Creek corridor. Undeveloped properties along the corridor with quality riparian habitat should be high priority acquisitions, such as, the properties to the north of the City's "Lumpkin" property (east of 134th Avenue NE crossing). Another area to consider would be the properties to the west of 134th Avenue NE as described in item 7.
2. Immediately initiate a program to reestablish conifers within the riparian zone throughout the Little Bear Creek corridor.
3. Restore hardened rip/rap banks along Little Bear Creek. Include creation of pool, and addition of large woody debris as part of the restoration plan.
4. Retrofit potential pollution-generating sites such as large parking lots and roadways with pollution prevention and storm flow retention facilities where such facilities are presently absent.
5. Reforest upland areas dominated by introduced species such as reed canarygrass and Himalayan blackberry.

6. Create off-channel habitat at each culverted tributary confluence with Little Bear Creek. This can be accomplished by daylighting the maximum extent of culverted tributary possible at each confluence.
7. The City of Woodinville should investigate the feasibility of purchasing the wrecking yard on 134th Avenue NE along the west side of Little Bear Creek. If this lot could be purchased several stream enhancement opportunities could occur. The first goals would be to remove soil contaminants within the lot and remove all structures. The second goal would be to use this crossing for enhancement efforts between Little Bear Creek and Highway 522 within Reach 2. Once these actions were completed the 134th Avenue NE crossing could be permanently removed, or replaced with a bridge.
8. The newly purchased city property immediately upstream of NE 195th Street is an ideal site for intensive in-stream, riparian, and upland habitat restoration activities. Actions that would benefit Little Bear Creek at this site include removal of bank armoring, creation of pool habitat, removal of impervious surface (pavement) and non-native vegetation, and installation of large woody debris, and riparian and upland vegetation.
9. Maintain regular street sweeping, storm drainage system cleaning, and add sediment traps where feasible. This will reduce the amount of sediment entering Little Bear Creek.

5.0 RESTORATION POTENTIAL

The Little Bear Creek watershed has changed significantly since the arrival of European settlers in the late 1800s. Although the Little Bear Creek corridor is still utilized by numerous species of fish and wildlife the quality of instream and riparian habitat has been impacted by changes in land use. Throughout this report the existing status of numerous pathways and indicators as defined by the NMFS (1996) have been documented. The determination of *properly functioning*, *at risk*, and *not properly functioning* for each "indicator" was used as a basis for the prioritization of restoration efforts. Baseline conditions determined to be *not properly functioning* are likely the most limiting conditions for salmonids and are therefore considered the highest priority for restoration followed by the conditions determined to be *at risk*. Table 21 represents a summary of the baseline conditions in Little Bear Creek as they pertain to listed salmonids. Other important considerations in prioritizing possible restoration opportunities are cost, feasibility, and probability of success.

Table 21:
Little Bear Creek Environmental Baseline Condition Summary

PATHWAY	INDICATORS	BASELINE CONDITIONS
Water Quality	Temperature	Juvenile Migration and Rearing = Not Properly Functioning to At Risk Adult Migration and Spawning = Properly Functioning
	Sediment	Not Properly Functioning
	Chemical Contamination & Nutrients	Not Properly Functioning
Habitat Access	Physical Barriers	At Risk
Habitat Elements	Substrate	At Risk
	Large Woody Debris	Not Properly Functioning
	Pool Frequency	Not Properly Functioning
	Pool Quality/Depth	At Risk (not properly functioning in Reach 1)
	Off-Channel Habitat	Not Properly Functioning
	Refugia	Not Properly Functioning
Channel Conditions and Dynamics	Width/Depth Ratio	Reach 1: Not Properly Functioning Reach 2 and 3: At Risk
	Streambank Condition	Not Properly Functioning
	Floodplain Connectivity	Not Properly Functioning
Flow/Hydrology	Change in Peak/Base Flows	At Risk
	Increase in Drainage Network	Not Properly Functioning
Watershed Conditions	Road Density and Location	Not Properly Functioning
	Disturbance History	Not Properly Functioning
	Riparian Reserve/Conservation Areas	Not Properly Functioning (at risk in Reach 3)

The NMFS matrix of pathways and indicators is divided into six major pathways each having several indicators. The following discussion on stream and riparian habitat restoration possibilities and prioritization follows this habitat component approach. Many of these indicators are interwoven in that correcting one will also improve another. An example of this is that large woody debris, riparian reserve, refugia, pool frequency and quality, streambank conditions, and substrate are all related. Another important consideration is that no single action will fully restore Little Bear Creek, and that improving existing conditions will be the result of a multitude of efforts taken over an extended period of time.

The City of Woodinville has already begun undertaking numerous restoration measures along the Little Bear Creek corridor (Appendix R). This includes land acquisition, culvert removal, fish passage improvements, and non-native plant removal. These measures, in addition to those outlined below, will help improve fish and wildlife habitat along the Little Bear Creek corridor.

5.1 WATER QUALITY

Temperature: The temperature indicator ranges from **properly functioning** to **not properly functioning** depending on time of year and life cycle of the species under consideration (see Section 4.4.7 and Table 16). Stream temperature increases as Little Bear Creek flows towards the Sammamish River. Based on the results of data collected from two hobo temperature data loggers installed at the downstream and upstream extremes of Little Bear Creek within the City of Woodinville, stream temperature typically increases by 0.4 degree Celsius within the city.

Additional data documenting the contribution tributaries and ambient air temperature makes to the overall increase of stream temperature would be beneficial in analyzing potential mitigating measures. However, increasing shade by planting conifer trees along the mainstem and tributaries to Little Bear Creek is the primary action the City of Woodinville could undertake to address this issue. The simplistic step of drastically increasing the abundance of conifers along both banks of Little Bear Creek would help increase shade and thereby reduce the rate of increase in stream temperature. Furthermore, planting conifer trees along both banks would help increase bank stability, reduce the abundance of invasive species such as reed canarygrass, provide wildlife habitat, reduce sedimentation, and eventually provide LWD and habitat complexity.

Sediment: The sediment indicator is **not properly functioning** due to a high percentage of fines within the substrate. Primary sources of sediment include stormwater runoff from upland sources such as roads and disturbed areas that directly enter Little Bear Creek or its tributaries, eroding and sloughing banks, and upstream sources. Remedies to reduce the percent of fines within the substrate include best management practices (BMPs) associated with construction projects, bank stabilization efforts, stormwater impact reduction measures, and isolated sediment removal measures from potential spawning areas or introduction of quality spawning gravel (typically not practicable). The most practicable measures the City of Woodinville could undertake to address this issue include bank stabilization efforts utilizing native vegetation, increasing the enforcement and use of BMPs, and working with Snohomish County to address upstream sources.

Chemical Contamination and Nutrients: The chemical contamination and nutrients indicator is **not properly functioning** (Table 21). This determination was based primarily on high fecal

coliform levels (a 1998 303[d] listing), the presence of pesticides, and the presence of metals in sediment samples collected in Reach 1.

The presence of high fecal coliform levels in Little Bear Creek is likely the result of failing septic tanks and runoff from fields with livestock. Both of these potential sources appear to be restricted to the upper portions of Little Bear Creek in Snohomish County and therefore not within the jurisdiction of the City of Woodinville to correct. The source of pesticides in Little Bear Creek may also be the result of actions occurring in the upper watershed.

The presence of metals is likely the result of road runoff entering Little Bear Creek through stormwater runoff in tributaries and direct discharge of stormwater from retention/detention facilities throughout the watershed. However, no existing data on metal concentrations from various potential sources exists. Therefore, identification of priority sites that contribute the highest metal concentrations to Little Bear Creek would need to be initiated prior to the initiation of corrective actions. Junk and construction yards located in Reach 2 and 3, and immediately north of King County may also contribute to the high metal concentrations in Little Bear Creek. An alternative to investing money and time into additional data collection is to insert catch-basin filters in high capacity parking lots that have the highest probability of contributing pollutants. Existing stormwater catch basins can be fitted with filter systems designed to capture priority pollutants such as soluble metals. The overall cost of installing and maintaining catch basin filters depends on the quantity of systems installed. The installation of catch basins would not eliminate existing contamination, but would reduce the rate of future accumulation.

5.2 HABITAT ACCESS

Habitat Access is **at risk**, and therefore not an imminent concern (Table 21). Both the City of Woodinville and Snohomish County are currently addressing habitat access concerns at 132nd Avenue NE and NE 205th Street (Appendix R). The predominance of the culverts identified as potential barriers to fish passage by the Adopt-A-Stream foundation are in Snohomish County and therefore outside of the jurisdiction of the City of Woodinville to correct.

Although the 134th Avenue NE crossing is not currently a fish passage barrier to migrating adult salmonids, they do stack-up immediately downstream of the crossing. The City of Woodinville should investigate the feasibility of purchasing the wrecking yard on the west side of Little Bear Creek serviced by this crossing. If this lot could be purchased several stream enhancement opportunities could occur. The first goals would be to remove soil contaminants within the lot and remove all structures. The second goal would be to use this crossing for enhancement efforts between Little Bear Creek and Highway 522 within Reach 2. Once these actions were completed the crossing could be permanently removed.

5.3 HABITAT ELEMENTS

Four of six indicators of the Habitat Elements pathway are **not properly functioning** (Table 21). Indicators that are **not properly functioning** include LWD, pool frequency, off-channel habitat, and refugia. Although the substrate indicator is **at risk** versus **not properly functioning**, the status of this indicator is also a concern due to its impact on salmonid reproduction.

The lack of LWD plays a major role in decreasing pool frequency and the availability of refugia. The importance of LWD in creating and maintaining pool frequency and refugia is so vital that this may be the single most important habitat element requiring immediate attention in Little Bear Creek. Furthermore, because the riparian zone along Little Bear Creek does not contain adequate numbers of large conifers for LWD recruitment, this indicator will remain **not properly functioning**. The addition of LWD by mechanical means in itself is simplistic and only moderately expensive. However, streamside access and uncertainty in obtaining desired results can create problems. These facts limit the applicability of installing LWD or creating pool habitat. However, some areas with good access are present, and careful design and implementation can increase the probability of success. Sites where access is good include most of Reach 1, within Reach 2 near 132nd Avenue NE and 134th Avenue NE, and within Reach 3 immediately upstream of NE 195th Street. Additional sections of stream could be accessed along Highway 522.

Another important issue is the availability of future recruitment of LWD. Large conifer trees that could potentially add to the presence of instream LWD are lacking along the Little Bear Creek corridor. The only way to address this issue is to plant thousands of conifers along the riparian corridor. Although the time-delay between planting conifer saplings and achieving LWD recruitment would be many decades, this action is necessary for the long-term interest of Little Bear Creek. Because of this time-delay, the planting of conifers is of the highest priority. Additional actions associated with this effort include the removal of non-native and invasive species to facilitate conifer establishment, and long-term monitoring. Additional value is created by this action since planting conifers along the riparian zone will increase bank stability, shade, and wildlife habitat. The entire remaining vegetated corridor along Little Bear Creek is in need of immediate and intensive planting of conifer saplings.

Restoring or improving pool frequency above what would result from the placement of LWD in accessible locations is problematic and costly. Two sites where stream restoration efforts could be undertaken include the lowermost section of Reach 1 and within Reach 3 immediately upstream of NE 195th Street (Appendix G). Both of these sites are fully armored, linear, lack LWD, and consist of low-gradient riffle habitat. Because these sites are degraded, owned by the city, and accessible, they are deemed the best candidates for intensive site specific restoration efforts that could address a multitude of the indicators for the Habitat Elements pathway that are not properly functioning. Primary actions that could occur at these sites include removal of bank armoring, creation of refugia and off-channel habitat, creation of pool habitat, revegetation, and installation of LWD.

Off-channel habitat can also be used as refugia by juvenile salmonids. Off-channel habitat could be created as part of the site specific restoration plan that would be developed for the two stream restoration sites mentioned above. Another simplistic and relatively inexpensive measure that would create additional off-channel habitat and refugia would be to reduce the length of two or three culverts that currently extend into the active stream channel located in Reach 2 (Appendix D – Reach 2 Photos 10, 12, 17, 20, and 21). These culverts drain the unnamed tributaries within the City of Woodinville as shown on Figure 3. The idea here is to cut each culvert back as far as possible into the adjacent uplands for a distance of at least 6 meters (>20 feet) so that new off-channel habitat (and wetlands) is created where culverts and their associated fill material currently exists. The newly exposed area would need to be graded to the stream's

base-flow level and planted with native hydrophytic vegetation. LWD could also be installed at these sites to increase their overall functionality.

5.4 CHANNEL CONDITIONS AND DYNAMICS

Two indicators of the Channel Conditions and Dynamics pathway that are **not properly functioning** include streambank condition and floodplain connectivity. Streambank conditions can be improved by replacing non-native and invasive species with conifers as mentioned previously. Extensive sections of the streambank, especially between Little Bear Creek and Highway 522 could be greatly improved. The removal of armoring in conjunction with revegetation in the lower section of Reach 1 near the mouth and immediately upstream of NE 195th Street will also help to improve streambank conditions.

Floodplain connectivity relates to hydrologic linkage between Little Bear Creek and adjacent off-channel areas, wetlands, riparian vegetation, and succession. No connectivity occurs where stream armoring is present or the stream is abutted by development. No other areas were identified where floodplain connectivity could be increased except as where previously mentioned.

5.5 FLOW/HYDROLOGY

The Flow/Hydrology pathway includes two indicators that were identified as **not properly functioning**. The percent impervious surface within the watershed and abundance of man-made drainage networks are the primary factors influencing this pathway. The two actions that can improve this pathway include reducing the percent of impervious surface, and improving or creating retention/detention facilities within the watershed. The preservation and restoration of existing habitat are critical in protecting against the continued degradation of this pathway. These issues are watershed-wide problems that extend far beyond the Little Bear Creek corridor. Because of the scale of this issue, it is most appropriately dealt with through the implementation of the Growth Management Act (GMA), Shoreline regulations, and city and county codes throughout the Little Bear Creek watershed. However, retrofitting of stormwater retention/detention facilities and elimination of impervious surface should be undertaken whenever the opportunity arises. Actions that reduce the speed at which stormwater travels through existing ditch networks to Little Bear Creek will further reduce the flashy conditions of the existing hydrographs (Figures 5a through 5c).

5.6 WATERSHED CONDITIONS

All indicators for the Watershed Conditions pathway including road density and location, disturbance history, and riparian reserve/conservation areas are **not properly functioning**. With the exception of the riparian reserve/conservation areas indicator (previously addressed), the remaining indicators are influenced primarily by the total amount of impervious surface within the watershed. As was the case with the Flow/Hydrology pathway, this issue is most appropriately dealt with through the implementation of the GMA, Shoreline regulations, and city and county codes throughout the watershed.

Table 22 below summarizes the pathway, indicator, priority, and action for each baseline condition identified as *not properly functioning*. Included in Table 22 are indicators that may have been partially *properly functioning* or *at risk* in one reach or for a specific life history (adult

migration/spawning) but otherwise *not properly functioning*. The priority of each indicator was determined based on time required to achieve desired results, degree of additional benefit, potential for success, and feasibility. Several of the indicators will benefit from the same basic action (e.g. installation of LWD and planting conifers). Although prioritized, the actions required to address these conditions in Little Bear Creek should occur simultaneously.

Table 22:
Not Properly Functioning Baseline Conditions Summary

PATHWAY	INDICATORS	Priority	Basic Action
Water Quality	Temperature	Medium	Plant conifers in riparian zone to increase shading.
	Sediment	Medium	Stabilize problem areas (e.g. LB of Reach 2), stabilize banks, reduce/eliminate upland sources, clean substrate (not practicable).
	Chemical contamination and nutrients	Medium	Identify key sources and implement corrective actions at sources.
Habitat Elements	Large Woody Debris	High	Install LWD and plant conifers for future recruitment.
	Pool Frequency	Medium	Will increase through installation of LWD
	Off-Channel Habitat	High	Create through LWD and retracting culverts
	Refugia	High	Create through LWD and retracting culverts
Channel Conditions and Dynamics	Width/Depth Ratio	Low	Remove armoring and taper back, and address incision resulting from changes in hydrology.
	Streambank Condition	High	Remove non-natives & plant > 10,000 conifers
	Floodplain Connectivity	Medium	Protect and restore corridor
Flow/Hydrology	Increase in Drainage Network	Medium	Reduce ditching and impervious area.
Watershed Conditions	Road Density and Location	Medium	Limit new roads and remove unnecessary ones
	Disturbance History	Medium	Protect and restore corridor
	Riparian Reserve/Conservation Areas	High	Remove non-natives, plant > 10,000 conifers, preserve existing habitat, and acquire more.

In summary, several key actions could potentially improve existing habitat conditions in Little Bear Creek. These recommended actions include:

1. Obtain, preserve, and enhance land along Little Bear Creek to minimize further habitat degradation from continued development along the Little Bear Creek corridor. Undeveloped properties along the corridor with quality riparian habitat should be high priority acquisitions, such as, the properties to the north of the City's "Lumpkin" property (east of 134th Avenue NE crossing). Another area to consider would be the properties to the west of 134th Avenue NE as described in item 7.
2. Immediately initiate a program to reestablish conifers within the riparian zone throughout the Little Bear Creek corridor.
3. Restore hardened rip/rap banks along Little Bear Creek. Include creation of pool habitat, and addition of large woody debris as part of the restoration plan.
4. Retrofit potential pollution-generating sites such as large parking lots and roadways with pollution prevention and storm flow retention facilities where such facilities are presently absent.

5. Reforest upland areas dominated by introduced species such as reed canarygrass and Himalayan blackberry.
6. Create off-channel habitat at each culverted tributary confluence with Little Bear Creek. This can be accomplished by daylighting the maximum extent of culverted tributary possible at each confluence.
7. The City of Woodinville should investigate the feasibility of purchasing the wrecking yard on 134th Avenue NE along the west side of Little Bear Creek. If this lot could be purchased several stream enhancement opportunities could occur. The first goals would be to remove soil contaminants within the lot and remove all structures. The second goal would be to use this crossing for enhancement efforts between Little Bear Creek and Highway 522 within Reach 2. Once these actions were completed the 134th Avenue NE crossing could be permanently removed, or converted to a bridged crossing.
8. The newly purchased city property immediately upstream of NE 195th Street is an ideal site for intensive in-stream, riparian, and upland habitat restoration activities. Actions that would benefit Little Bear Creek at this site include removal of bank armoring, creation of pool habitat, removal of impervious surface (pavement) and non-native vegetation, and installation of large woody debris, riparian vegetation, and upland vegetation.
9. Maintain regular street sweeping, storm drainage system cleaning, and add sediment traps where feasible. This will reduce the amount of sediment entering Little Bear Creek.

5.7 WILDLIFE HABITAT

The Little Bear Creek corridor was originally dominated by large expanses of old-growth forest composed of primarily conifers. These forests were extensively logged throughout the late 1800s and early 1900s and subsequently converted to agricultural land. More recently, agricultural land has rapidly been replaced with an urban landscape. Wetlands adjacent to the Sammamish River were historically extensive but were later filled to reduce flooding and create more developable land. Habitat features such as snags, downed wood, large conifers with a multi-canopy understory, and large wetland complexes are now uncommon or absent along the Little Bear Creek corridor.

Because the existing landscape has been significantly degraded from native conditions, numerous wildlife habitat enhancement opportunities exist. Based on our survey results, five primary actions that would improve wildlife habitat have been identified including:

1. Replacement of existing reed canarygrass, Himalayan blackberry, and scotch broom expanses with native vegetation.
2. Addition of conifers and mast (food) producing shrubs within existing deciduous dominated forest habitat.
3. Addition of downed woody debris to the forest floor.
4. Wetland creation within the corridor.
5. Installation of bird boxes for cavity nesting species.

The first four actions would help create more natural conditions conducive to native wildlife species. These four actions would benefit wildlife by creating suitable habitat, and Little Bear Creek by improving buffer functions. The installation of bird boxes is presented as a temporary measure to provide habitat for cavity nesters until other restoration efforts are able to reestablish suitable cavity nesting sites.

Numerous opportunities for wildlife habitat enhancement exist along the Little Bear Creek corridor in the City of Woodinville. Non-native plant removal opportunities exist along all reaches of the creek. The south end of Reach 1 is highly disturbed and in need of restoration. Little cover exists and non-native plants, which generally provide poor wildlife habitat, are common. The creek in the remainder of Reach 1 is closely bordered by development and would also benefit from restoration, as the existing vegetation provides little cover for wildlife.

The south end of Reach 2 in the vicinity of 132nd Avenue NE also has habitat enhancement opportunities. Shrub habitat on the left bank between 132nd Avenue NE and 134th Avenue NE is heavily infested with Himalayan blackberry, reed canarygrass, and other invasive species and is in need of weed removal and enhancement. Large areas of Himalayan blackberry and Scotch broom exist on the right bank beyond the riparian strip. The area from 134th Avenue NE to the north end of Reach 2 would benefit from the removal of reed canarygrass and other exotics, followed by restoration and enhancement. Although it is highly disturbed, the corridor is relatively wide in the middle stretch of Reach 2 and could potentially provide habitat for birds and mammals. Access to the right bank is difficult because of thick blackberry. The riparian zone becomes very narrow and shade and cover decrease from south to north. The north end of Reach 2 in particular would benefit from habitat restoration, as there is currently only sparse tree cover.

The portion of Reach 3 below NE 195th Street is bordered by private property on the right bank and Highway 522 on the left bank, and accessibility is poor. The area along Highway 522 is densely vegetated with Himalayan blackberry, and intensive clearing would be necessary to access and enhance this area. Private ownership along the left bank (east side) could hinder restoration attempts along this segment.

A shrub area accessed by a gravel lot off of 136th Avenue NE immediately north of NE 195th Street has good access and potential to provide wildlife habitat. The area is adjacent to a stand of mixed forest, which supports scattered large conifers and could provide a corridor for wildlife using the shrub area. Restoration of the gravel lot and adjacent areas would likely provide additional habitat for wildlife using the corridor north of this point.

Wildlife habitat improves with the increase of forest in the northern portion of Reach 3. Abundance of potential nesting and perching trees increases northward, and the corridor increases in width. The middle of Reach 3 is accessible from 136th Avenue NE, and this area provides opportunities for habitat improvement. Weed removal and the addition of native trees and shrubs to upland clearings outside of the riparian zone would enhance habitat in this area. While much of the forested area is young deciduous trees, larger trees increase in number to the north. This area might benefit most from the preservation of large conifers and tracts of forest.

APPENDIX B

VEGETATION, FISH & WILDLIFE INVENTORY

4.4.6 Riparian Habitat

Riparian habitat is defined as the land adjoining the stream that influences stream habitat and its processes. The composition and quantity of riparian habitat directly influences temperature, sedimentation, productivity, habitat complexity, and the streams disturbance regime. An "intact" riparian zone buffers the stream from outside elements. One issue today is how large does a buffer have to be to protect a stream from anthropogenic influences. A buffer of 30.5 meters (100 feet) is often used for salmonid-bearing streams. However, many researchers have documented that a 30.5-meter (100-foot) buffer is not sufficient in protecting a stream and its processes from all anthropogenic influences, especially when the quality of the existing buffer is low. Some researchers have suggested that if the goal is to truly protect a valuable resource, than buffer width should be at least 100 meters (328 feet). However, this width can be adjusted downward depending on the maturity and overall percentage of the existing riparian habitat. Furthermore, it is also recognized that the composition of the entire watershed plays a vital role in a stream's overall health. On the watershed scale, the percent or fraction of total impervious area has been found to have a direct correlation with a stream's productivity (May et al., 1997).

This report will focus on a linear corridor adjacent to the stream, 61 meters (200 feet) from each bank or 122 meters (400 feet) total width. Site specific conditions within the City of Woodinville based on aerial photographs from 1999 indicate the width of the Little Bear Creek vegetated riparian buffer varies considerably by reach (Appendix G).

The width of the vegetated riparian buffer in Reach 1 averages about 7.6 meters (25 feet) wide and is abutted by development along both banks. The overall 121.9-meter (400-foot) wide corridor

within Reach 1 was composed of 64.36 percent impervious surface, 27.97 percent shrub/grass habitat, 5.11 percent forest habitat, and 2.59 percent gravel area.

The width of the vegetated buffer in Reach 2 varied between the left and right banks. The left bank ranges from 7.6 to 22.9 meters (25 to 75 feet) wide (average width about 7.6 meters [25 feet]) and is abutted by businesses. The right bank ranges from 15.2 to >61 meters (50 to >200 feet) wide (average width about 45.7 meters [150 feet]) and is abutted by Highway 522. The overall 122-meter (400-foot) wide corridor within Reach 2 was composed of 19.38 percent impervious surface, 46.46 percent shrub/grass habitat, 21.63 percent forest habitat, and 12.52 percent gravel area.

The width of the vegetated riparian buffer along both banks of Reach 3 varies from 15.2 to >61 meters (50 to >200 feet). The right bank is relatively unconstrained while the left bank is defined by Highway 522. The overall 122-meter (400-foot) corridor in Reach 3 was composed of 17.12 percent impervious surface, 1.55 percent gravel area, 45.76 percent forested habitat, and 35.56 percent shrub/grass habitat (Table 11).

Table 11:
Land Use Based on 1999 Aerial Photograph
Along Little Bear Creek, Woodinville

Land Use	Reach 1	Reach 2	Reach 3	Total
Developed Impervious	64.36%	19.38%	17.12%	24.05%
Gravel - cleared impervious	2.59%	12.52%	1.55%	6.56%
Forested Habitat	5.11%	21.63%	45.76%	29.94%
Shrub/Grass Habitat	27.97%	46.46%	35.56%	39.45%

Based on the photo interpretation of the 1999 aerial photographs (Appendix G), two trends are apparent. The percentage of developed impervious (developed and gravel [cleared impervious]) surface is significantly higher along the lower reaches while the percentage of forested habitat significantly decreases. The high percentage (12.52 percent) of cleared gravel area along Reach 2 may be an indicator that more development is planned and that the percentage of developed impervious surface will continue to increase within potential buffer habitat.

The remaining riparian buffer and upland forest habitat is of vital importance to the continued functionality of Little Bear Creek. However, the composition of the buffer along Little Bear Creek is varied, and typically dominated by deciduous trees and non-native species of grasses and shrubs. Red alder (*Alnus rubra*), Himalayan blackberry (*Rubus procerus*), bittersweet nightshade (*Solanum dulcamara*), and reed canarygrass (*Phalaris arundinacea*) are abundant throughout Reaches 1 and 2, and the lowermost section of Reach 3. Japanese knotweed (*Polyonum cuspidatum*), another introduced species is also present and locally abundant, but not as widespread as the other aforementioned invasive species.

A continuous 61-meter (200-foot) riparian buffer along each bank composed of mature coniferous forest with numerous adjoining wetlands should be the goal along the Little Bear Creek corridor. Based on our survey results, these target conditions are absent, but scattered sections along the left bank of Reach 3 do possess some of the desired traits.

The remaining buffer is composed of primarily deciduous trees, shrubs, and grasses. A detailed list of the species observed along Little Bear Creek is contained in Tables 12, 13, 14, and 15 below. As mentioned previously, red alder is the most abundant tree species along Little Bear Creek, followed by black cottonwood (*Populus balsamifera*), big-leaf maple (*Acer macrophyllum*), and willow (*Salix* spp). Other species such as Douglas fir and western red-cedar become more prevalent in Reach 3. Two Pacific yew (*Taxus brevifolia*) trees were observed along Reach 2. These are long-lived small conifer trees that were used extensively by native Americans and are a source of the cancer fighting drug taxol. The two observed along Little Bear Creek are remnants from pre-settlement. Once gone, Pacific yews will likely not become reestablished because of the absence of mature coniferous forest.

Table 12:
Tree Composition Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	2, 3.	Vine maple	*Acer circinatum*	Native.
2.	1, 2, 3.	Big-leaf maple	*Acer macrophyllum*	Native.
3.	1, 2, 3.	Red alder	*Alnus rubra*	Native.
4.	2, 3.	Black hawthorne	*Crataegus douglasii*	Native.
5.	1, 3.	Oregon ash	*Fraxinus latifolia*	Native.
6.	1, 2, 3.	Sitka spruce	*Picea sitchensis*	Native.
7.	1	Shore pine	*Pinus contorta*	Native.
8.	1, 2, 3.	Black cottonwood	*Populas balsamifera*	Native.
9.	1, 2, 3.	Bitter cherry	*Prunus emarginata*	Native.
10.	1, 2, 3.	Douglas fir	*Pseudotsuga menziesii*	Native.
11.	2, 3.	Cascara buckthorn	*Rhamnus purshiana*	Native.
12.	1, 2, 3.	Pacific willow	*Salix lasiandra*	Native.
13.	2, 3.	Scouler willow	*Salix scouleriana*	Native.
14.	1, 2, 3.	Sitka willow	*Salix sitchensis*	Native.
15.	2.	Pacific yew	*Taxus brevifolia*	Native.
16.	2, 3.	Western red cedar	*Thuja plicata*	Native.
17.	2, 3.	Western hemlock	*Tsuga heterophylla*	Native.

Shrubs and vines are abundant along Little Bear Creek. The most common along the stream bank include Himalayan blackberry, bittersweet nightshade, and Pacific ninebark (*Physocarpus capitatus*). Others such as Scotch broom (*Cytisus scoparius*) are also abundant, but typically occur beyond the riparian zone, especially within the disturbed areas between Little Bear Creek and Highway 522 along Reaches 2 and 3.

Table 13:
Shrub and Vine Composition Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	1, 2, 3.	Red-twig dogwood	*Cornus sericea*	Native.
2.	2	Beaked hazelnut	*Corylus cornuta*	Native.
3.	1, 2, 3.	Scotch broom	*Cytisus scoparius*	Introduced, invasive.
4.	2	Salal	*Gaultheria shallon*	Native.
5.	3.	Black twinberry	*Lonicera involucrata*	Native.
6.	2, 3.	Indian plum	*Oemleria cerasiformis*	Native.
7.	3.	Devil's club	*Oplopanax horridus*	Native.
8.	1, 2, 3.	Pacific ninebark	*Physocarpus capitatus*	Native.
9.	2, 3.	Sword fern	*Polysticum munitum*	Native.
10.	3.	Stink currant	*Ribes bracteosum*	Native.
11.	2	Wild rose	*Rosa spp.*	Native.
12.	1, 2, 3.	Evergreen blackberry	*Rubus laciniatus*	Introduced, invasive.
13.	2, 3.	Thimble berry	*Rubus parviflorus*	Native.
14.	1, 2, 3.	Himalayan blackberry	*Rubus procera*	Introduced, invasive.
15.	1, 2	Salmonberry	*Rubus spectabilis*	Native.
16.	2, 3.	Trailing blackberry	*Rubus ursinus*	Native.
17.	2	Red elderberry	*Sambucus racemosa*	Native.
18.	2, 3.	Douglas spirea	*Spiraea douglasii*	Native.
19.	3.	Highbush-cranberry	*Viburnum edule*	Native.

Herbs represent the most diverse subset of plants encountered along Little Bear Creek. The most common groups include the grasses and weeds. The herb category also contains the largest percentage of introduced species, many of which are invasive. They typically are the first group of species to colonize disturbed areas and once present are difficult to remove. Some of these species such as reed canarygrass and bittersweet nightshade can be extremely abundant, and have established extensive monocultures within the riparian zone. Others such as purple loosestrife and yellow flag iris are present but sparse.

Table 14:
Herb Composition Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	2	Creeping bentgrass	*Agrostis stolonifera*	Introduced.
2.	3.	Pearly everlasting	*Anaphalis margaritacea*	Native.
3.	1, 2, 3.	Lady fern	*Athyrium felix-femina*	Native.
4.	2, 3.	Canada thistle	*Cirsium arvense*	Introduced, invasive.
5.	3	Poison hemlock	*Conium maculatum*	Introduced.
6.	1, 2, 3.	Morning glory	*Convolvulus arvensis*	Introduced, invasive.
7.	2	Bristly hawksbeard	*Crepis setosa 'Haller'*	Introduced.
8.	2	Orchard grass	*Dactylis glomerata*	Introduced.
9.	2	Bleeding heart	*Dicentra formosa*	Native.
10.	1, 2	Fireweed	*Epilobium sp.*	Introduced.
11.	2	Field horsetail	*Equisetum arvense*	Native.
12.	1, 2	Giant horsetail	*Equisetum telmateia*	Native.

Table 14 continued

#	Reach #	Common Name	Scientific Name	Comment
13.	2	Tall fescue	*Festuca arundinacea*	Introduced.
14.	2, 3.	Bedstraw	*Galium aparine*	Native.
15.	2, 3.	Robert geranium	*Geranium robertianum*	Introduced, invasive.
16.	3.	Big-leaf avens	*Geum macrophyllum*	Native.
17.	1	St. John's-wort	*Hypericum perforatum*	Introduced, invasive, noxious.
18.	1, 2	Yellow touch-me-not	*Impatiens noli-tangere*	Introduced.
19.	1, 2	Yellow-flag iris	*Iris pseudacorus*	Introduced, invasive.
20.	1, 2,	Soft rush	*Juncus effusus*	Native.
21.	2	Daggerleaf rush	*Juncus ensifolius*	Native.
22.	3	Duck weed	*Lemna minor*	Native.
23.	2, 3.	Birdsfoot trefoil	*Lotus corniculatus*	Introduced, invasive.
24.	3	Skunk cabbage	*Lysichitum americanum*	Native.
25.	2, 3.	Purple loosestrife	*Lythrum salicaria*	Introduced, invasive.
26.	2	False lily-of-the-valley	*Maianthemum dilatatum*	Native.
27.	2, 3.	Small water forget-me-not	*Myosotis laxa*	Native.
28.	2	Common evening primrose	*Oenothera biennis*	Introduced – N.E. USA.
29.	1, 2, 3.	Reed canarygrass	*Phalaris arundinacea*	Introduced, invasive.
30.	1	English plantain	*Plantago major*	Introduced.
31.	1, 2, 3.	Japanese knotweed	*Polygonum cuspidatum*	Introduced, invasive.
32.	2, 3.	Bracken fern	*Pteridium aquilinum*	Native.
33.	2, 3.	Creeping buttercup	*Ranunculus repens*	Introduced, invasive.
34.	2	Water cress	*Rorippa nasturtium-aquaticum*	Introduced.
35.	2	Red sorrel	*Rumex acetosella*	Introduced.
36.	2, 3.	Curly dock	*Rumex crispus*	Introduced.
37.	2, 3.	Bitter dock	*Rumex obtusifolius*	Introduced.
38.	1, 2, 3.	Small-fruited bulrush	*Scirpus microcarpus*	Native.
39.	1, 2, 3.	Bittersweet nightshade	*Solanum dulcamara*	Introduced, invasive.
40.	2, 3.	Hedge nettle	*Stachys cooleyae*	Native.
41.	1	Tansy	*Tanacetum vulgare*	Introduced, invasive.
42.	1	Dandelion	*Taraxacum officinale*	Introduced, invasive.
43.	2, 3.	Piggy-back plant	*Tolmeia menziesii*	Native.
44.	2	White clover	*Trifolium repens*	Introduced.
45.	2, 3.	Stinging nettle	*Urtica dioica*	Introduced.

Ornamentals represent introduced species that were typically planted in private yards or businesses. They are usually not invasive, except for English ivy (*Hedera helix*), which can choke trees. Most do not represent a threat and are unable to naturally propagate. Others such as English holly (*Liex aquifolium*) are distributed by bird droppings, but are not problematic.

Table 15:
Ornamental Composition Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	3	Norway maple	*Acer platanoides*	Introduced.
2.	3	Red maple	*Acer rubrum*	Introduced.
3.	1	Butterfly bush	*Buddleia davidii*	Introduced.
4.	3	Parneyi cotoneaster	*Cotoneaster lacteus*	Introduced.
5.	3	Crocosmia	*Crocosmia* sp.	Introduced.
6.	1	Buning bush	*Euonymus alaalatus*	Introduced.
7.	1, 2	English ivy	*Hedera helix*	Introduced, invasive.
8.	3	Blue star juniper	*Juniperus squamata*	Introduced.
9.	2	English holly	*Liex aquifolium*	Introduced.
10.	1	Apple fruit tree	*Malus* sp.	Introduced.
11.	1	Scotch pine	*Pinus sylvestris*	Introduced.
12.	3	Thundercloud plum tree	*Prunus cerasifera*	Introduced.
13.	1	Otto-luyken laurel	*Prunus laurocerasus*	Introduced.
14.	1	Plum fruit tree	*Prunus* sp.	Introduced.
15.	3	Flowering cherry tree	*Prunus* sp.	Introduced.
16.	1	Rhododendron species	*Rhododendron* sp.	Introduced.
17.	1, 2, 3.	Locust tree	*Robinia* sp.	Introduced.
18.	1	Weeping willow	*Salix babylonica*	Introduced.
19.	2	European mountain ash	*Sorbus acuparia*	Introduced.

Table 2:
Fish Species Documented in Little Bear Creek

#	Common Name	Scientific Name	Source
1.	Coast Range Sculpin	*Cottus aleuticus*	DEA
2.	Western Brook Lamprey	*Lampretra richardsoni*	DEA
3.	Cutthroat Trout	*Oncorhynchus clarki*	DEA
4.	Pink Salmon	*Oncorhynchus gorbuscha*	WDFW
5.	Chum Salmon	*Oncorhynchus keta*	WDFW
6.	Coho Salmon	*Oncorhynchus kisutch*	WDFW, King County, & DEA.
7.	Sockeye Salmon	*Oncorhynchus nerka*	WDFW & King County, & DEA
8.	Kokanee	*Oncorhynchus nerka*	WDFW & King County, & DEA
9.	Chinook Salmon	*Oncorhynchus tshawytscha*	WDFW, NMFS, & King County.

At least 40 different non-native species of fish have been introduced into the Lake Washington watershed since the arrival of the first European settlers. However, many of these introduced species did not survive and today approximately 24 species remain (Kerwin, 2001). A listing of 21 species of native and non-native fish that have been documented within the greater Lake Washington watershed are included in Table 3 below. Introduced species have become prevalent in both Lake Washington and Lake Sammamish, and continue to adversely impact native salmonids. Although the list presented in Table 3 below is not all-inclusive, it provides evidence of the shear abundance of non-native species of fish that still inhabit the Lake Washington watershed. Some of these species listed in Table 3 likely utilize the Sammamish River and therefore potentially the lowermost reach of Little Bear Creek. The likelihood of any of these additional undocumented species being present in Little Bear Creek varies by species.

Table 3:
Additional Fish Species Documented in the Greater Lake Washington Watershed

#	Common Name	Scientific Name	Native or Introduced	Resident or Anadromous	Status
1.	White sturgeon	*Acipenser transmontanus*	Locks created access	Anadromous	Rare visitor
2.	Largescale sucker	*Catostomus macrocheilus*	Native	Resident	Unknown
3.	Lake whitefish	*Coregonus clupeaformis*	Introduced in 1899	Resident	No longer present
4.	Prickly sculpin	*Cottus asper*	Native	Resident	Abundant
5.	Shorthead sculpin	*Cottus confusus*	Native	Resident	Abundant
6.	Carp	*Cyprinus carpio*	Introduced	Resident	Locally abundant
7.	Three-spine stickleback	*Gasterosteus aculeatus*	Native	Both	Unknown
8.	Brown bullhead	*Ictalurus nebulosus*	Introduced	Resident	Unknown
9.	Pumpkinseed	*Lepomis gibbosus*	Introduced	Resident	Sparse
10.	Pacific staghorn sculpin	*Leptocottus armatus*	Native	Both	Sparse
11.	Smallmouth bass	*Micropterus dolomieui*	Introduced	Resident	Abundant
12.	Largemouth bass	*Micropterus salmoides*	Introduced	Resident	Abundant
13.	Peamouth	*Mylocheilus caurinus*	Native	Resident	Unknown
14.	Olympic mudminnow	*Novumbra hubbsi*	Unknown	Resident	Rare: one siting
15.	Steelhead trout	*Oncorhynchus mykiss*	Native	Both	Stock depressed
16.	Yellow perch	*Perca flavescens*	Introduced	Resident	Abundant
17.	Black crappie	*Pomoxis nigromaculatus*	Introduced	Resident	Sparse
18.	Northern Squawfish	*Ptychocheilus oregonensis*	Native	Resident	Unknown
19.	Bull trout	*Salvelinus confluentus*	Native	Both	Rare
20.	Longfin smelt	*Spirinchus thaleichthys*	Native	Resident	Unknown
21.	Tench	*Tinca tinca*	Introduced	Resident	Unknown

4.5 WILDLIFE

Biologists recorded bird, mammal, reptile, and amphibian species along Little Bear Creek both during surveys and incidentally during other site visits. Additional species to those observed likely use the area but remain undocumented by this study, as field visits were limited to spring and summer of a single year. A list of additional wildlife species that could potentially be present along the Little Bear Creek corridor but were not documented during these surveys is included in Appendix S.

4.5.1 Bird Observations

Thirty-nine bird species were observed along Little Bear Creek during site visits and surveys (Table 18). The majority of these species likely breed in the area, as most males were observed singing during the breeding season. One species, willow flycatcher (*Empidonax traillii*), is a federally designated species-of-concern. Five singing males were identified on three survey plots. The WDFW Priority Habitat and Species (PHS) program classifies great blue heron rookeries as vulnerable aggregations (Criterion 2) and are protected. Although no rookeries are documented within 2 miles of the corridor (WDFW, 2001b), suitable foraging habitat exists within the creek and adjacent wetlands, and biologists observed one individual during stream surveys.

Table 18:
Bird Observations Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	S Rank	Comment
1.	2, 3	Mallard	*Anas platyrhynchos*	S5B	
2.	2, 3	Great blue heron	*Ardea herodias*	S4S5	
3.	1, 2, 3	Cedar waxwing	*Bombycilla cedrorum*	S4N	NMBS*
4.	1, 2	Canada goose	*Branta canadensis*	S5B	
5.	2, 3	Red-tailed hawk	*Buteo jamaicensis*	S5B	
6.	3	Pine siskin	*Carduelis pinus*	S5B	
7.	1, 2, 3	American goldfinch	*Carduelis tristis*	S5B	
8.	1, 2, 3	House finch	*Carpodacus mexicanus*	S5	
9.	3	Swainson's thrush	*Catharus ustulatus*	S5B	NMBS
10.	1, 2, 3	Belted kingfisher	*Ceryle alcyon*	S5	NMBS
11.	1, 2	Killdeer	*Charadrius vociferus*	S5B	
12.	2, 3	Northern flicker	*Colaptes auratus*	S5	
13.	1, 2, 3	American crow	*Corvus brachyrhynchos*	S5	
14.	2, 3	Steller's jay	*Cyanocitta stelleri*	S5	
15.	2, 3	Willow flycatcher	*Empidonax traillii*	S5B	NMBS; Federal Species of Concern.
16.	3	Brewer's blackbird	*Euphagus cyanocephalus*	S5	
17.	3	Dark-eyed junco	*Junco hyemalis oreganus*	S5B	
18.	1	California gull	*Larus californicus*	S4B	Flying over creek.
19.	1, 2, 3	Song sparrow	*Melospiza melodia*	S5B	

Table 18 continued

#	Reach #	Common Name	Scientific Name	S Rank	Comment
20.	1, 2, 3	Brown-headed cowbird	*Molothrus ater*	S4N	
21.	1	House sparrow	*Passer domesticus*	SE	
22.	2, 3	Black-headed grosbeak	*Pheucticus melanocephalus*	S5B	NMBS
23.	1, 3	Downy woodpecker	*Picoides pubescens*	S5	
24.	3	Hairy woodpecker	*Picoides villosus*	S4S5	
25.	2, 3	Spotted towhee	*Pipilo erythrophthalmus*	S5B	Nest observed in Reach 3.
26.	1, 2, 3	Black-capped chickadee	*Poecile atricapilla*	S5	Nest observed in Reach 2.
27.	2, 3	Chestnut-backed chickadee	*Poecile rufescens*	S5	
28.	1, 2, 3	Bushtit	*Psaltriparus minimus*	S5	Nest observed in Reach 3.
29.	3	Golden-crowned kinglet	*Regulus satrapa*	S5B	NMBS
30.	3	Red-breasted sapsucker	*Sphyrapicus ruber*	S4S5	
31.	1, 2, 3	European starling	*Sturnus vulgaris*	SE	Nest observed in Reach 2.
32.	1, 2, 3	Violet-green swallow	*Tachycineta thalassina*	S5B	NMBS
33.	1, 2, 3	Bewick's wren	*Thryomanes bewickii*	S5	
34.	1, 2, 3	American robin	*Turdus migratorius*	S5B	
35.	3	Warbling vireo	*Vireo gilvus*	S5B	NMBS
36.	3	Hutton's vireo	*Vireo huttoni*	S5	
37.	2, 3	Wilson's warbler	*Wilsonia pusilla*	S5B	NMBS
38.	1	Mourning dove	*Zenaidura macroura*	S5B	NMBS
39.	1, 2, 3	White-crowned sparrow	*Zonotrichia leucophrys*	S5B	NMBS

*NMBS = neotropical migrant bird species

The WDFW PHS program maintains a list of species for which it has occurrence and status information. A global rank (GRank) describes the species' relative rarity or endangerment worldwide, and a state rank (SRank) describes the status within Washington State. Most bird species observed in the study area have a GRank of G5, which signifies that they are demonstrably secure globally. Most species have an SRank of S5 or S4 (Table 18), defining them as "demonstrably secure in state" or "apparently secure, with many occurrences", respectively. SRanks may include the qualifiers "B" and "N", which indicate breeding and nonbreeding status, respectively, of migrant species. The breeding status of these species may differ greatly from their nonbreeding status in the state. SE indicates an established exotic species. Two codes for any one species indicates an intermediate rank.

Eleven of the species recorded along Little Bear Creek are neotropical migrant bird species. Neotropical migrants breed in North America and winter in Mexico, Central America, the Caribbean, and South America. The publication of results from long-term survey programs confirms that populations of many neotropical migrants are declining, in some cases precipitously. Habitat loss and related problems are key issues in the causes of the declines. Therefore, these species may be of interest, particularly if they are breeding in the area. The area could potentially provide breeding habitat for several of these species, including Swainson's thrush, black-headed grosbeak, willow flycatcher, warbling vireo, Wilson's warbler, mourning dove, and white-crowned sparrow (Table 18). In addition, neotropical migrant species not detected during surveys and field visits may use the corridor (Appendix S).

4.5.2 Mammal Observations

Biologists documented ten mammal species in the Little Bear Creek corridor (Table 19). None of the species observed have federal or state special status. Other mammal species that may utilize the corridor include mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*). Appendix S contains a complete list of mammals that could potentially be present based on habitat types and historic range.

Table 19:
Mammal Observations Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	2	Beaver	*Castor canadensis*	Chewed shrubs and trails.
2.	3	Opossum	*Didelphis marsupialis*	Introduced, dead in stream.
3.	3	River otter	*Lutra canadensis*	Tracks, scat, and eaten salmon.
4.	2	Longtail weasel	*Mustela frenata*	Crossing stream on log.
5.	1, 2, 3	Myotis bat	*Myotis* spp.	
6.	2, 3	Black-tailed deer	*Odocoileus heminonus columbianus*	Tracks along stream bank; pellets.
7.	2, 3	Raccoon	*Procyon lotor*	Tracks along stream bank.
8.	2	Norway rat	*Rattus norvegicus*	Introduced.
9.	2, 3	Eastern gray squirrel	*Sciurus carolinensis*	Introduced.
10.	1, 2	Eastern cottontail	*Sylvilagus floridanus*	Introduced, dead young in nest (Reach 2).

4.5.3 Reptile and Amphibian Observations

Four reptile and amphibian species were observed in and along Little Bear Creek during field visits and surveys (Table 20). None of the species have state or federal special status. Other reptiles and amphibians not documented during this survey that could potentially be present along the Little Bear Creek corridor include: northern alligator lizard (*Elgaria coerulea*), painted turtle (*Chrysemys picta*), red eared slider (*Trachemys scripta*), common garter snake (*Thamnophis sirtalis*), western terrestrial garter snake (*Thamnophis elegans*), long-toed salamander (*Ambystoma macrodactylum*), rough-skinned newt (*Taricha granulosa*), western red-backed salamander (*Plethodon vehiculum*), ensatina (*Ensatina eschscholtzii*), western toad (*Bufo boreas*), and red-legged frog (*Rana aurora*). Both species of turtles were included due to the close proximity of several lakes to the study area.

Table 20:
Amphibian and Reptile Observations Along Little Bear Creek, Woodinville

#	Reach #	Common Name	Scientific Name	Comment
1.	3	Pacific Tree frog	*Hyla regilla*	3 in wetland near reach end.
2.	2	Bull frog	*Rana catesbeiana*	Introduced species captured next to stream.
3.	Tributary D	Northwestern salamander	*Ambystoma gracile*	Larva in small tributary.
4.	3	Northwestern garter snake	*Thamnophis ordinoides*	Near barricades at NE 195th.

APPENDIX C

ZONING CLASSIFICATIONS

Zoning

The existing zoning along the corridor comprises of five different zones. The General Business (GB) zone runs the length of Little Bear Creek Parkway (177th Street) and abuts to the west side of Woodinville-Snohomish Hwy. The Central Business District and Industrial zones are located at the southerly end of the corridor and 131st Street. Little Bear Creek crosses Hwy 522, and runs along the east side of the Woodinville High School (Public/Institutional) and Residential development that is the north westerly section of the corridor. Listed below include the various zones and descriptions located in the Little Bear Creek corridor.

*General Business: *The purpose of the general business zone (GB) is to provide auto-oriented retail services for local and regional service areas that exceed the daily convenience needs of residential neighborhoods but that cannot be served conveniently by the central business district, and to provide retail and business services in locations within the city that are appropriate for extensive outdoor storage and auto related and commercial uses. These purposes are accomplished by: providing a wide range of the retail, recreation, and business services that are found in neighborhood business areas; allowing for commercial uses with extensive outdoor storage or auto related and industrial use; and limiting residential, institutional, personal services and office to those necessary to directly support commercial activity. Use of this zone is appropriate in commercial areas that are designated by the Comprehensive Plan and are served at the time of development by adequate public sewers, water supply, roads and other needed public facilities and services.*

*Note that all General Business zone permitted uses are also allowed in at least one other zone of the City.

Central Business District: *The purpose of the central business district (CBD) is to provide for the broadest mix of comparison retail, higher density residential (R-12 through R-48), wholesale, service and recreation/cultural uses with compatible storage and fabrication uses, serving regional market areas and offering significant employment and housing opportunities. These purposes are accomplished by: encouraging compact development that is supportive of transit and pedestrian travel, through higher nonresidential building heights and floor area ratios that those found in other business areas; allowing for outdoor sales and storage, regional shopping areas and limited fabrication use; and concentrating large scale commercial and office uses to facilitate the efficient provision of public facilities and services. Use of this zone is appropriate in the urban center as designated by the Comprehensive Plan that is served at the time of development by adequate public sewers, water supply, roads and other needed public facilities and services.*

Industrial: *The purpose of the industrial zone (I) is to provide for the location and grouping of industrial enterprises and activities involving manufacturing, assembly, fabrication, processing, bulk handling and storage, research facilities, warehousing and heavy trucking. It is also a purpose of this zone to protect the industrial land base for industrial economic development and employment opportunities. These purposes are accomplished by: allowing for a wide range of industrial and manufacturing uses; establishing appropriate development standards and public review procedures for industrial activities with the greatest potential for adverse impacts; and limiting residential, institutional, service, office and other non-industrial uses to those necessary*

to directly support industrial activities. Use of this zone is appropriate in industrial areas designated by the Comprehensive Plan which are served at the time of development by adequate public sewers, water supply, roads and other needed public facilities and services.

Public/Institutional: The purpose of the public/institutional zone (P/I) is to provide and protect properties devoted to public and semi-public uses and uses providing social and physical services to the Woodinville Community. This purpose is accomplished by: providing a zone in which uses serving public needs may be located; limiting residential and privately owned operations; and protecting adjacent properties from potential impacts of public uses. Use of this zone is appropriate on properties designated by the Comprehensive Plan to be public and/or institutional, such as schools, government facilities, social services, hospitals, libraries, utilities, etc.

R-6 (residential): The purpose of the urban residential zones (R) is to implement Comprehensive Plan Goals and Policies for housing quality, diversity and affordability, and to effectively use residential land, public services and energy. These purposes are accomplished by: providing in the moderate density zones (R-5 to R-8), for a mix of predominantly single-family attached and detached dwelling units. Other development types, such as apartments, duplexes, and townhomes would be allowed so long as they contribute to Woodinville's small town atmosphere as articulated in the vision statement found in the City's Comprehensive Plan and conform to all applicable regulations.

APPENDIX D

TRANSPORTATION ANALYSIS
&
STREET & TRAIL DESIGN CONCEPTS

earth tech for the planet.
engineering and technology

Final Report

Little Bear Creek Corridor Redevelopment Alternatives Traffic Impact Analysis

Prepared for:
City of Woodinville, Washington

Prepared by:
Earth Tech
10800 NE 8th Street
Bellevue, WA 98004

April 22, 2002

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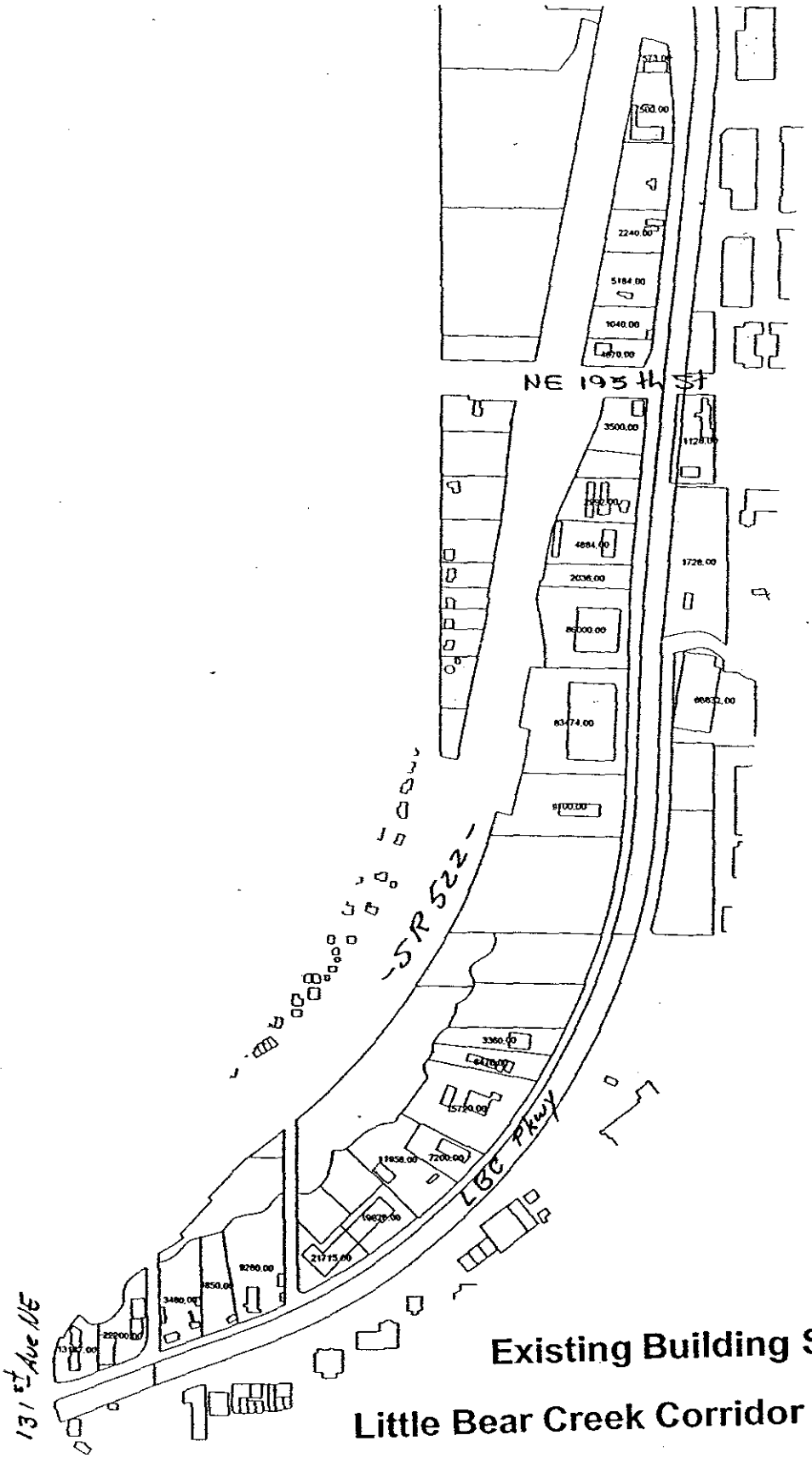
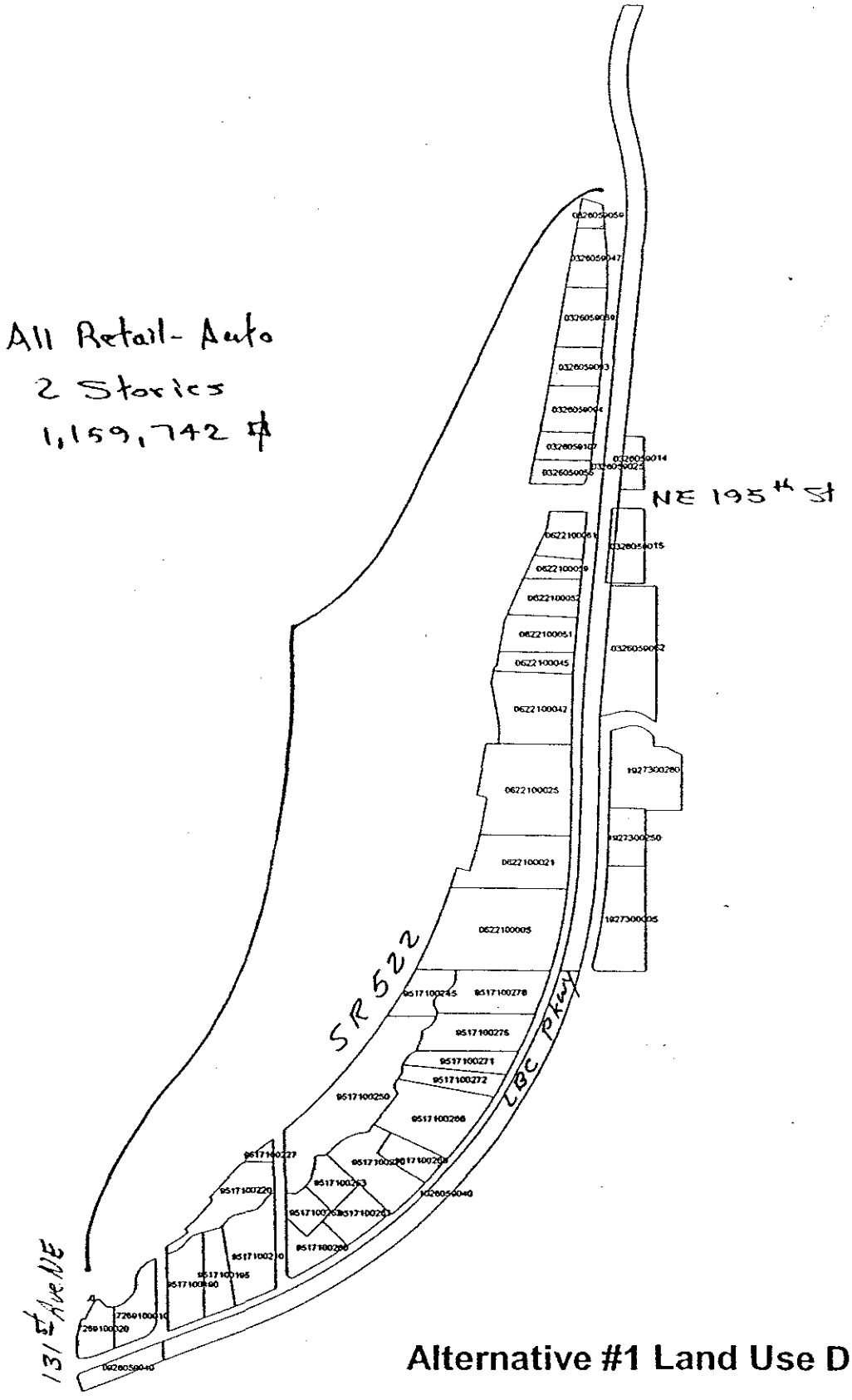
Appendices

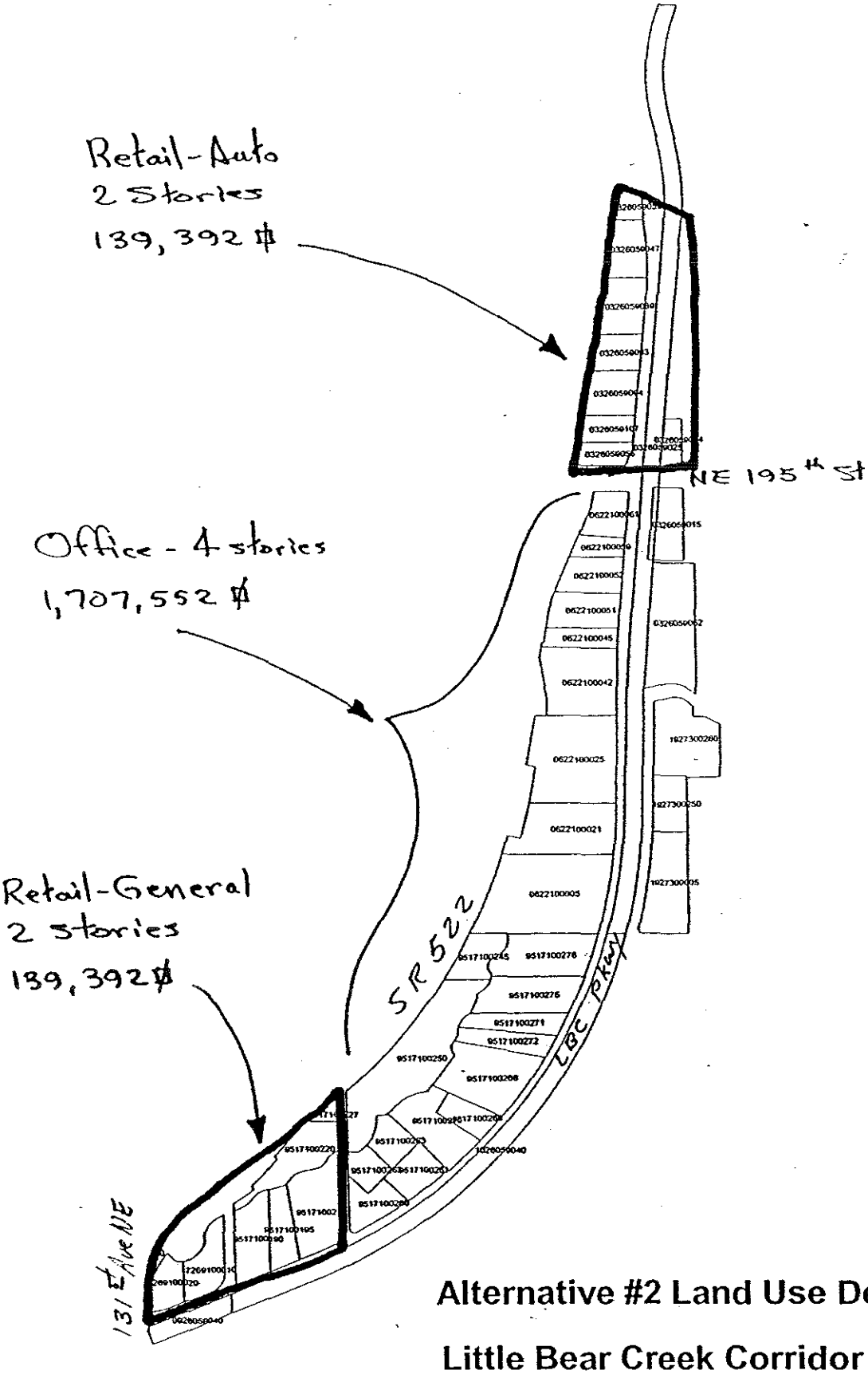


Existing Building Sizes in the Little Bear Creek Corridor Study Area



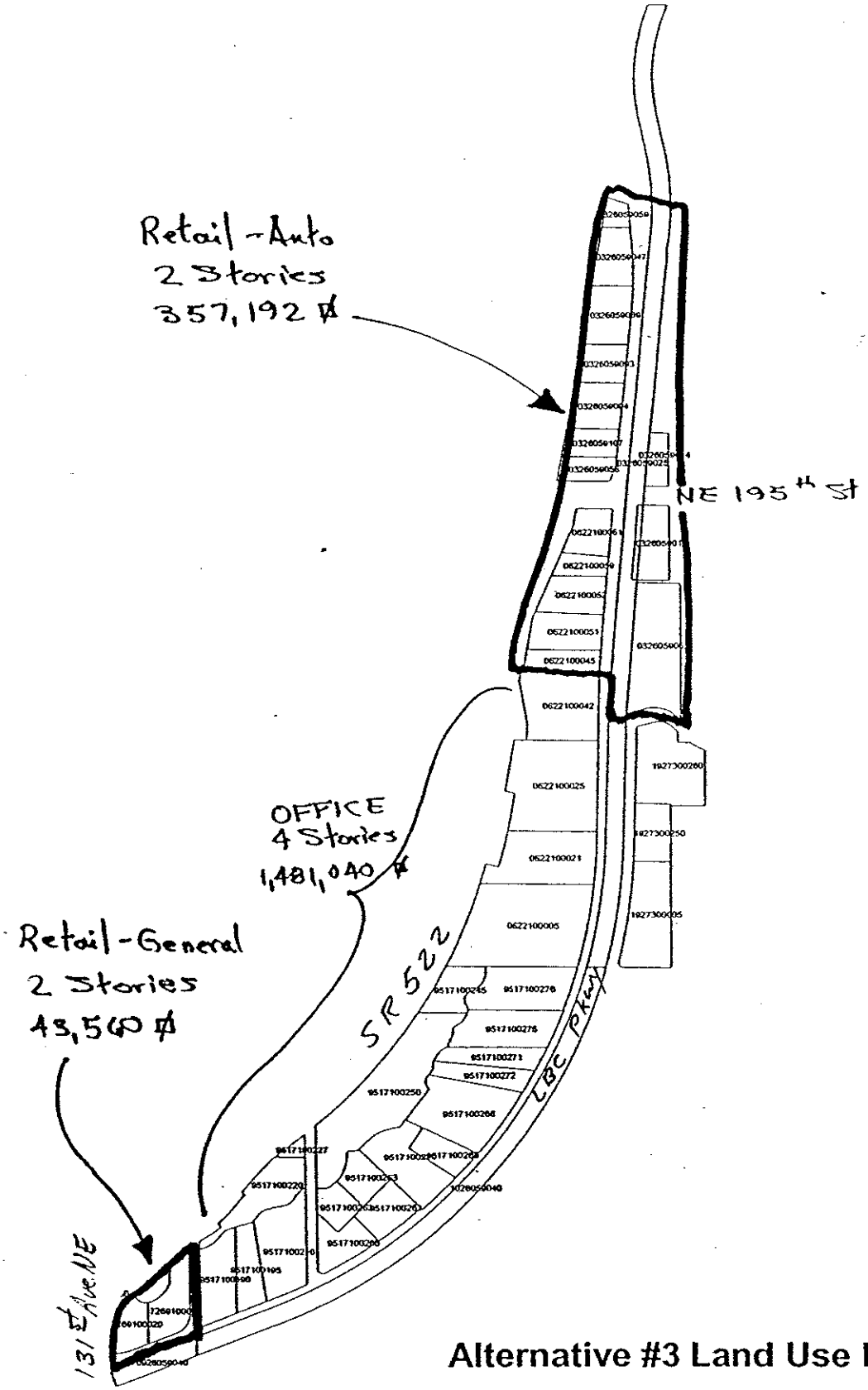
Alternative #1 Land Use Designations

Little Bear Creek Corridor Study Area



Alternative #2 Land Use Designations

Little Bear Creek Corridor Study Area



Alternative #3 Land Use Designations

Little Bear Creek Corridor Study Area

Trip Generation

Trip generation for existing and future conditions in the study area was calculated from land use data using trip rates found in Trip Generation, 6th edition (1998) published by the Institute of Transportation Engineers. The afternoon peak hour was evaluated, because that time period generally has the most congested traffic conditions.

The future land uses permitted under the City's proposed zoning classifications correspond to a wide range of example land use categories documented in the ITE reference. Since the future developments are not now known, an average trip rate was calculated for each zoning classification as follows, and the average rate was used uniformly throughout the study area.

Land Use Class	PM Peak Hour Trip Rate	Outbound Directional Split
General Retail :	4.5 trips / 1,000 sq. ft.	54% outbound
Auto Retail :	3.5 trips / 1,000 sq. ft.	54% outbound
Office :	1.4 trips / 1,000 sq. ft.	84% outbound
Warehouse, Utilities, and Industrial :	0.6 trips / 1,000 sq. ft.	66% outbound

The last category was used to represent existing developments in the baseline scenario, and is not part of the forecasting scenarios for the City's land use alternatives.

A table of the various ITE trip rates used to develop these average rates is in the appendix.

The study area includes 43 land parcels, for which the existing development is known, and the proposed future land use under each alternative is estimated on the assumption that all land parcels would eventually be developed or redeveloped to the maximum density provided for each land use zoning alternative. Full conversion and redevelopment may or may not occur on some existing parcels with substantial buildings of recent construction. Therefore, this planning analysis represents a "worst case" scenario that exceeds the amount of development likely to occur in the corridor in any short-range future time period. A brief description of the trip generation for each alternative follows.

Existing Conditions (Baseline)

Solely for purposes of establishing a baseline of reference and for calibrating the traffic model, the existing as-built condition of the corridor in 2001/2002 was documented from the City of Woodinville GIS inventory, and trip generation was modeled from that data, as detailed in tables found in the appendix. A summary description follows:

Total Land Use :	444,100 sq. ft.
Total Trip Generation :	688 trips (PM Peak Hour)

Alternative 1- Auto Retail

This alternative considers most land in the study corridor to be redeveloped as auto-oriented retail activity. The average development potential per acre of this type of activity was estimated from ITE source data to be approximately 15,000 square feet of building area per acre, or 33% land coverage on average. Trip generation was modeled from those assumptions, as detailed in tables found in the appendix. A summary description follows:

Total Land Use :	1,159,000 sq. ft.
Total Trip Generation :	4,089 trips (PM Peak Hour)

Alternative 2- Office and Less Retail

This alternative classifies the majority of the land in the study corridor as office buildings, with a small amount of general retail activity at each end of the corridor. The average development potential per acre of the office land use was prescribed by the City to be approximately 27,000 square feet of building area per acre, all as two-story buildings, with 30% land coverage on average. Trip generation was modeled from those assumptions, as detailed in tables found in the appendix. A summary description follows:

Total Land Use :	1,986,000 sq. ft.
Total Trip Generation :	3,504 trips (PM Peak Hour)

Alternative 3- Office and More Retail

This alternative classifies the majority of the land in the study corridor as office buildings, with a moderate amount of general retail activity at each end of the corridor. There is less office development and more retail development, compared to Alternative 2. The average development potential per acre of the office land use was prescribed by the City to be approximately 27,000 square feet of building area per acre, all as two-story buildings, with 30% land coverage on average. Trip generation was modeled from those assumptions, as detailed in tables found in the appendix. A summary description follows:

Total Land Use :	1,882,000 sq. ft.
Total Trip Generation :	3,520 trips (PM Peak Hour)

Traffic Forecasts

The Woodinville Traffic Model consists of a road network model and a trip table derived from land use, for a base year of 1998 and a forecast year of 2020. The current version of the model uses Tmodel2 software; however, this is a translation to Tmodel2 of an earlier model created using emme2 software, which was itself based on the PSRC four-county regional traffic forecasting system. The conversion to Tmodel2 included a major simplification of the model from the regional zone structure of 1220 Traffic Analysis Zones to the current structure of 243 zones, and a corresponding simplification of the road network from 19,000 links to just 4,000 links.

The emme2 trip tables were derived from trip tables of the PSRC regional traffic model, and only indirectly account for local land use details. There is no independent capability in Woodinville at this time to recalculate trip generation and trip distribution directly from local land use. Adjusting the future 2020 trip table for the proposed study area land use changes was accomplished indirectly and awkwardly rather than straightforwardly and simply.

Traffic Network Revisions

The existing Tmodel network represents the study corridor with just three Traffic Analysis Zones (TAZ's). To accurately simulate all of the 43 land parcels in the study, and account for all the variations of existing and proposed land uses, a total of nine TAZ's were created for this study. The existing and future road networks were correspondingly updated to account for those TAZ's and their access locations along Little Bear Creek Parkway (nee 177th Avenue NE).

To better match the traffic model's simulation of existing counts in the study area, revisions were made to improve the accuracy of trip loading on the road network for three TAZ's physically located outside the study area but routing considerable traffic through the study area.

First, to represent the significant flow of retail traffic through the south end of the LBC Parkway corridor between the downtown's new retail centers and the SR 202 interchange, the access points for TAZ 44 were rebalanced to emphasize that path rather than the path via 175th Street to/from SR 202. Also, the trip volumes at TAZ 41 (Target Store) were tripled to reflect current reality. It is not known how those volumes were previously estimated in the 1998 calibration effort, but a large increase was appropriate for present needs. The same TAZ's future volumes were doubled in the future scenarios for consistency. In addition, the running speed of Little Bear Creek Parkway was increased in the model while the speed of 175th Street was reduced. These changes greatly increased the accuracy of the modeled turns at the 131st / LBC Pkwy intersection, and also improved the accuracy of modeled volumes on 175th Street.

Next, the loading point of industrial park TAZ 9 was shifted fromWoodinville – Duvall Way (195th) to 200th Street / 244th Avenue NE. This greatly improved the simulation of turns to/from the north leg of the 195th / LBC Pkwy intersection.

Future Network Assumptions

The future road network includes the improvements currently planned or proposed by the City of Woodinville. This includes in particular the completion of the downtown area street grid, completion of the 195th Street Interchange as a four-legged diamond, and the addition of an overpass across SR 522 effectively extending SR 202 northward to 120th Avenue NE in Bothell across the freeway. The latter proposed overcrossing diverts a significant volume of traffic away from the congested SR 202 interchange with SR 522. It reduces future volumes on 131st Avenue NE below the existing volumes, through the intersection with LBC Parkway.

The proposed overcrossing is a very significant assumption for the analysis of future conditions for the study corridor. Similarly, the addition of the north legs of the 195th Street interchange significantly affects the routing of traffic to, from, and through the study corridor.

Trip Generation/Distribution

Due to the fact that an independent trip generation model does not exist for Woodinville, the trip distribution for each study area TAZ was estimated by analogy to the nearest TAZ with traffic patterns representing the assumed land use type. The applicable row and column of the origin-destination matrix for the "pattern" TAZ was copied to the study area TAZ, then scaled to match the expected trip generation of that TAZ. For general retail and auto retail land use alternatives, the pattern zone was a TAZ in the existing retail core area of Woodinville. For office and industrial land uses, the distribution pattern was patterned after a TAZ representing the existing industrial park area near the north end of the study corridor. A similar pattern methodology was used in the recent Traffic Impact Fee Study, to estimate the travel patterns for all development land use types in each part of the city.

Traffic Forecasts

The traffic forecasting model was run once for each of four scenarios: the existing baseline case and three future alternatives. The baseline model was run solely to determine that the representation of existing conditions was consistent with actual traffic counts. The traffic model refinements described previously were identified and executed in order to improve that consistency. Based on that calibration effort, the future model volumes were deemed suitable for analysis without further adjustment or post-processing in the study corridor. No analysis of other areas has been made.

Following pages depict the results of the traffic forecasting effort. Depicted are three types of information, in three series of plots for the four model runs. All data represents PM peak hour conditions.

- Total traffic volumes on the road network (numeric data, by direction)
- LBC Study Subarea-generated traffic volumes (numeric data, by direction)
- LBC Study Subarea-generated traffic volumes (bandwidth data, by direction)

The bandwidth data provides a good visual representation of the total impact of development in the study corridor. The width of the dark bands corresponds to the directional traffic volumes in the numeric plots. It is apparent that the major impact is that of growth in the corridor, from present to future. The differences between the three alternatives are relatively minor in comparison to the fact of growth from the present.

The numeric data is useful to identify directional flow volumes in absolute terms, and to calculate proportional shares of the total volumes at any location that are attributable to the study area.

Traffic Impacts of Land Use Alternatives

Based on the attached maps of total volumes and subarea volumes, the contributions of study area developments are directly stated below for the north and south ends of the corridor. For simplicity, only the two-way total volume on LBC Parkway is tabulated here. For a more detailed consideration of traffic impacts by direction, see the next section on Level of Service.

The existing conditions for land use and traffic modeling represent 1998, while the comparison traffic counts were from 2000. It is therefore not surprising that the "existing" traffic model volumes are lower than the "existing" counts, even after the relatively adjustments described previously. The future traffic model is nominally associated with the year 2020 for regional background growth, and assumes full development of the land parcels within the study area. For the most basic description of relative impacts between land use policy alternatives, only net changes need to be considered, based on the data below.

Volumes on LBC Parkway north of 131st Avenue NE

Land Use Alternative	Total Volumes	Study Area Trips
Actual Traffic Counts (2000):	745	unknown
Traffic Model Results:		
Existing Land Use (1998):	603	227
Future Alternative #1:	1902	1267
Future Alternative #2:	1899	1316
Future Alternative #3:	1698	1095

Volumes on LBC Parkway south of NE 195th Street

Land Use Alternative	Total Volumes	Study Area Trips
Actual Traffic Counts (2000):	1803	unknown
Traffic Model Results:		
Existing Land Use (1998):	1404	171
Future Alternative #1:	2528	974
Future Alternative #2:	2423	789
Future Alternative #3:	2440	808

Level of Service

For a more detailed analysis of the traffic impacts of the land use policy alternatives, the operating conditions of the two anchor intersections at each end of the corridor were examined, again using the traffic model outputs for data. For intersection analysis, the individual turning movements were used, which add up to the directional and two-way total volumes previously tabulated and mapped. Intersection worksheets are in the appendix.

Letter grades from "A" to "F" are used to describe level of service, by analogy to the common meaning of school grades. LOS "A" represents free flowing conditions with near-zero delay, while LOS "E" represents considerable delays, and full use of available capacity but without breakdown of traffic flow. LOS "F" is reserved for breakdown conditions where the traffic demand exceeds the available capacity, and stop-and-go operations result.

The American Association of State Highway and Transportation Officials (AASHTO) in its authoritative publication, A Policy on Design of Highways and Streets, 2001 ed., states that LOS "C" is the most desirable design goal. Woodinville, like many jurisdictions, regards LOS "D" as an acceptable design goal, in a compromise between traffic performance and other adverse costs to society of building larger transportation facilities to achieve a higher level of service. Some highly urbanized jurisdictions regard LOS "E" as acceptable.

Two methods of calculating intersection level of service are presented in parallel. The two methods differ in absolute ratings, but tend to show similar trends when comparing the net changes between alternatives.

The first definition of Level of Service is based on the Highway Capacity Manual ("HCM") - National Academy of Sciences, Transportation Research Board, Special Report #209, 1998 Update. HCM bases LOS on delay, and calculates the average of all delays for all vehicles using the location at hand under the given circumstances of traffic volumes, physical lane configuration, and traffic signal operational controls.

Future delay at signalized intersections is highly sensitive to signal control settings, which are presently unknown and must be estimated. The future settings were therefore set to represent a mid-range of the cycle lengths and other control settings likely to occur if the corridor to/from SR 522 has interconnected signals and saturated flow conditions. This assumption allowed the analysis of each intersection to be completed without further reference to the remainder of each corridor. This is sufficient for the purposes of comparing the land use plan alternatives.

The second method presented is Intersection Capacity Utilization ("ICU"), which utilizes most of the same assumptions as the HCM method except that signal control details are entirely omitted. The emphasis is on the capacity provided by the available lanes, at an "average" level of signal control settings and efficiencies. The LOS scale for ICU is measured by percentage consumption of capacity. This has some appeal when evaluating growth impacts and relating impact mitigation to development size in quantitative terms.

The following LOS results are all based on the counted or modeled total volumes that use the intersections at hand. Cycle lengths of 130 seconds (131st Ave intersection) and 100 seconds (195th St intersection) match the present cycle lengths at those intersections as obtained from King County traffic operations personnel. The Synchro analysis of each case was set to optimize the phase splits within the given cycle length without changing the cycle length. Longer cycle lengths would reduce the delays in the future cases, but the difference would not be enough to change any LOS ratings, nor change the relative comparisons between the alternatives.

The future results indicate clearly that the existing intersections cannot accommodate the projected travel increases without substantial expansion for more lanes through the intersections, in all directions.

Level of Service on LBC Parkway north of 131st Avenue NE

	Existing Lanes		With Added Lanes	
Land Use Alternative	HCM	ICU	HCM	ICU
Actual Traffic Counts (2000):	C 35s	F 108%	na	na
Traffic Model Results:				
Existing Land Use (1998):	C 31s	F 100%	na	na
Future Alternative #1:	F 176s	H 177%	C 30s	E 92%
Future Alternative #2:	F 192s	H 183%	C 36s	E 98%
Future Alternative #3:	F 185s	H 172%	C 33s	E 97%

Hypothetical improvements considered for the intersection of LBC Parkway at 131st Avenue NE are the addition of one lane eastbound and two lanes westbound on the east leg (only) of LBC Parkway, and the addition of two lanes southbound on 131st Avenue NE (north leg only), to support high turn volumes in most directions.

Level of Service on LBC Parkway south of NE 195th Street

	Existing Lanes		With Added Lanes	
Land Use Alternative	HCM	ICU	HCM	ICU
Actual Traffic Counts (2000):	C 31s	D 88%	na	na
Traffic Model Results:				
Existing Land Use (1998):	D 36s	E 92%	na	na
Future Alternative #1:	F 146s	H 146%	E 56s	G 113%
Future Alternative #2:	F 149s	H 145%	E 67s	G 116%
Future Alternative #3:	F 147s	H 144%	E 62s	G 113%

Hypothetical improvements considered for the intersection of LBC Parkway at NE 195th Street are the addition of one lane eastbound and westbound on the west leg (only) of 195th Street, and the addition of one lane northbound and southbound on LBC Parkway (Woodinville-Snohomish Road), to support high turn volumes to/from the west (SR522 interchange).

Discussion of Results

The primary finding is that all three land use alternatives will produce approximately the same future level of service, with rather minor distinctions between the three cases. This outcome is true whether the assumed road conditions are only the existing built network, or the assumptions include substantial future improvements to accommodate future growth. Alternative 2 has slightly higher loadings, higher delay, and more congestion, than the other two alternatives, but the differences are not great enough to change any level of service ratings.

The analysis of future conditions with "existing lanes" represents the case of adding the forecast traffic volumes, with no improvements to the existing intersections. The result is a predictable extreme level of overloading in all future cases, indicating that the assumed level of future growth cannot be served by existing facilities.

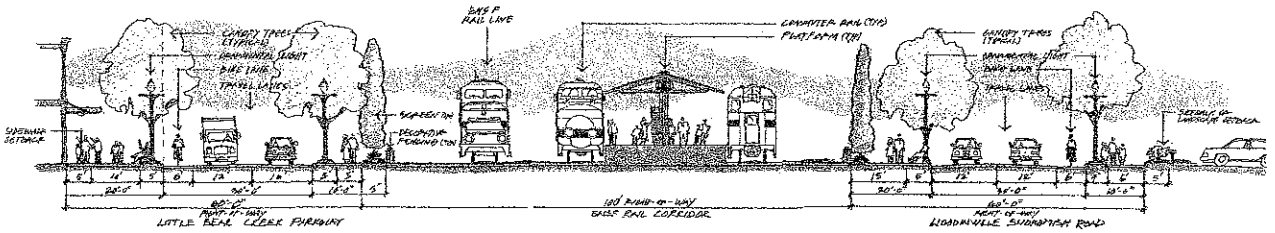
The alternative set of analyses "With Added Lanes" documents the results for a hypothetical set of improvements to each intersection to overcome the deficiencies observed with the existing lanes. The hypothetical improvements described are not the only solution available, and serve only to represent the degree of capacity improvements necessary to meet the forecast travel demand at a minimally acceptable level of service. The cases calculated with the hypothetical improvements are in some particulars still not a fully satisfactory solution, but adding still more lanes to achieve a mathematically better result does not appear to be a practical option in reality.

The relatively low future travel demand on 131st Avenue NE is dependent on the existence of the proposed overpass above SR 522 connecting SR 202 to 120th Avenue NE. Without that overpass, much more demand would occur on 131st Avenue NE, and still more lanes would be needed in that corridor.

Without the completion of the 195th Street interchange's north ramps, the volumes on 195th Street would be less, but the users of those ramps would need to be accommodated somewhere else. Volumes on LBC Parkway would be affected both positively and negatively. The situation has not been modeled that combines future travel demand with the existing half-diamond interchange.

3.3 Little Bear Creek Corridor Motorized Circulation Plan

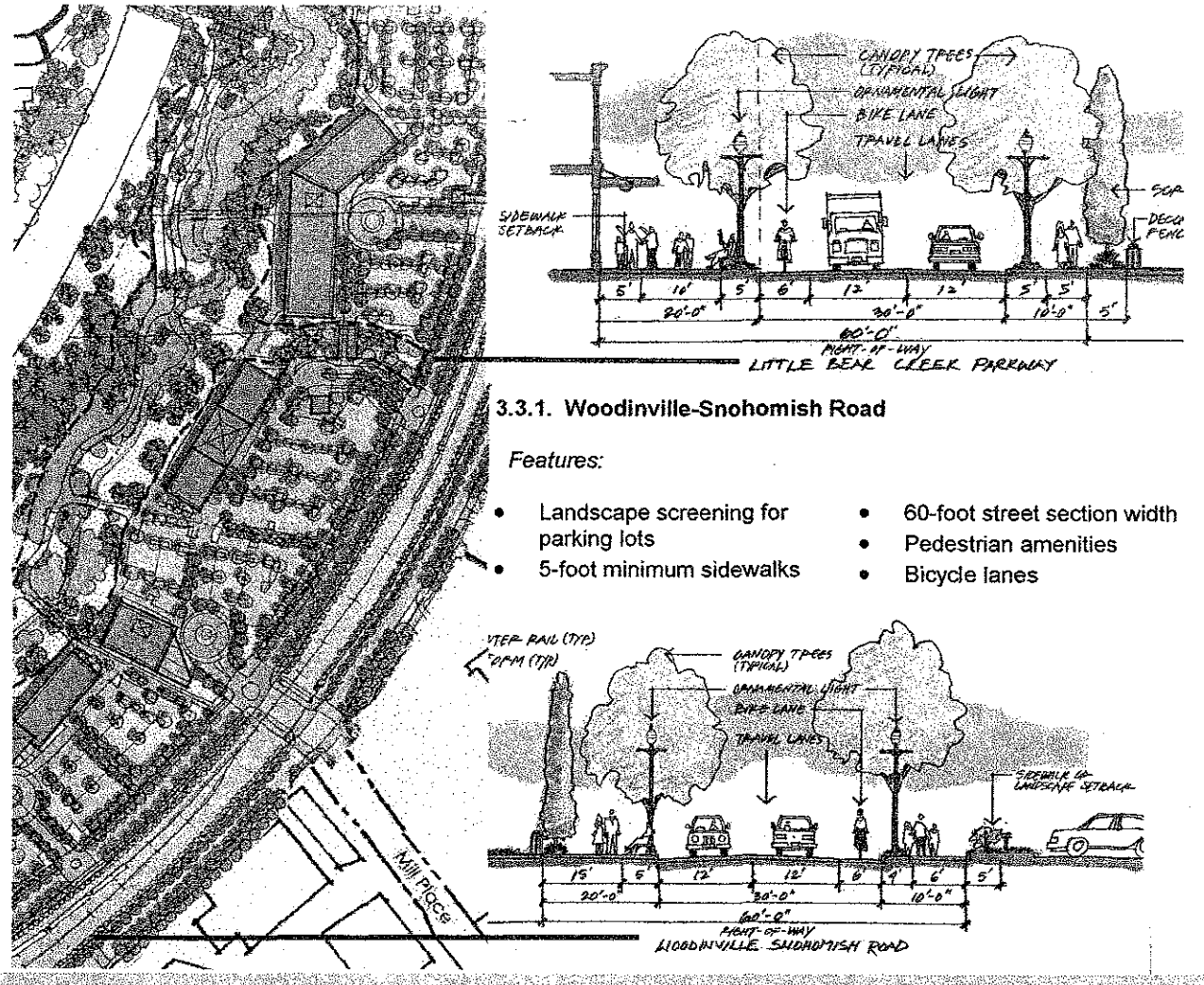
3.3.1 CORRIDOR STREET DESIGN CONCEPTS



3.3.1. Little Bear Creek Parkway

Features:

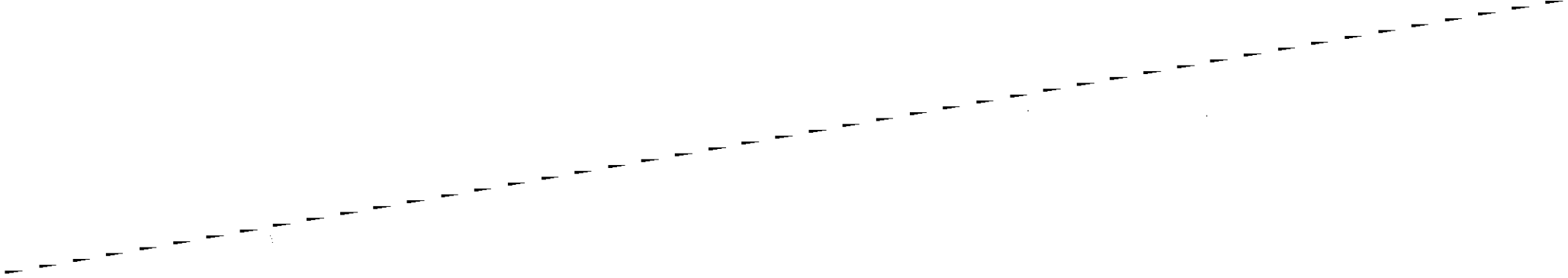
- Significant landscaping and tree canopy
- 5-foot minimum sidewalks
- 60-foot street section width
- Pedestrian amenities
- Bicycle lanes



3.3.1. Woodinville-Snohomish Road

Features:

- Landscape screening for parking lots
- 5-foot minimum sidewalks
- 60-foot street section width
- Pedestrian amenities
- Bicycle lanes



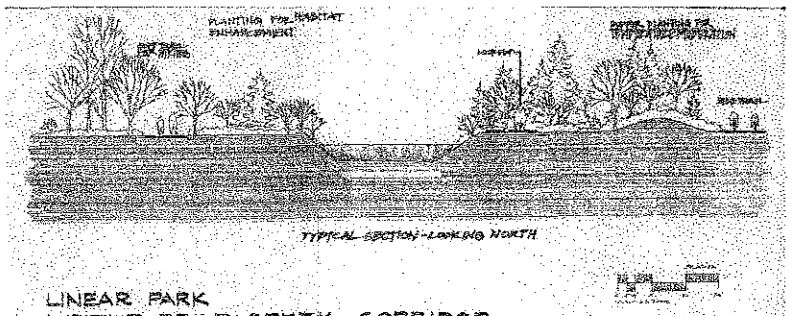
4.2 Little Bear Creek Corridor Parks, Open Space, and and Trail Plan

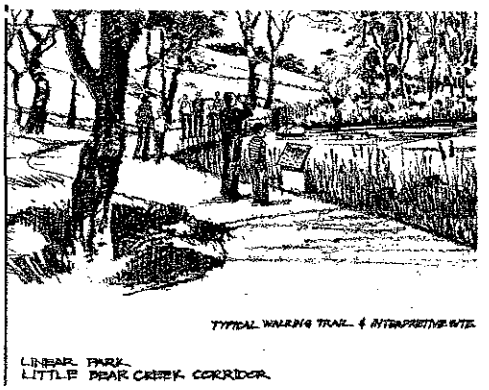
4.2.1 Linear Park

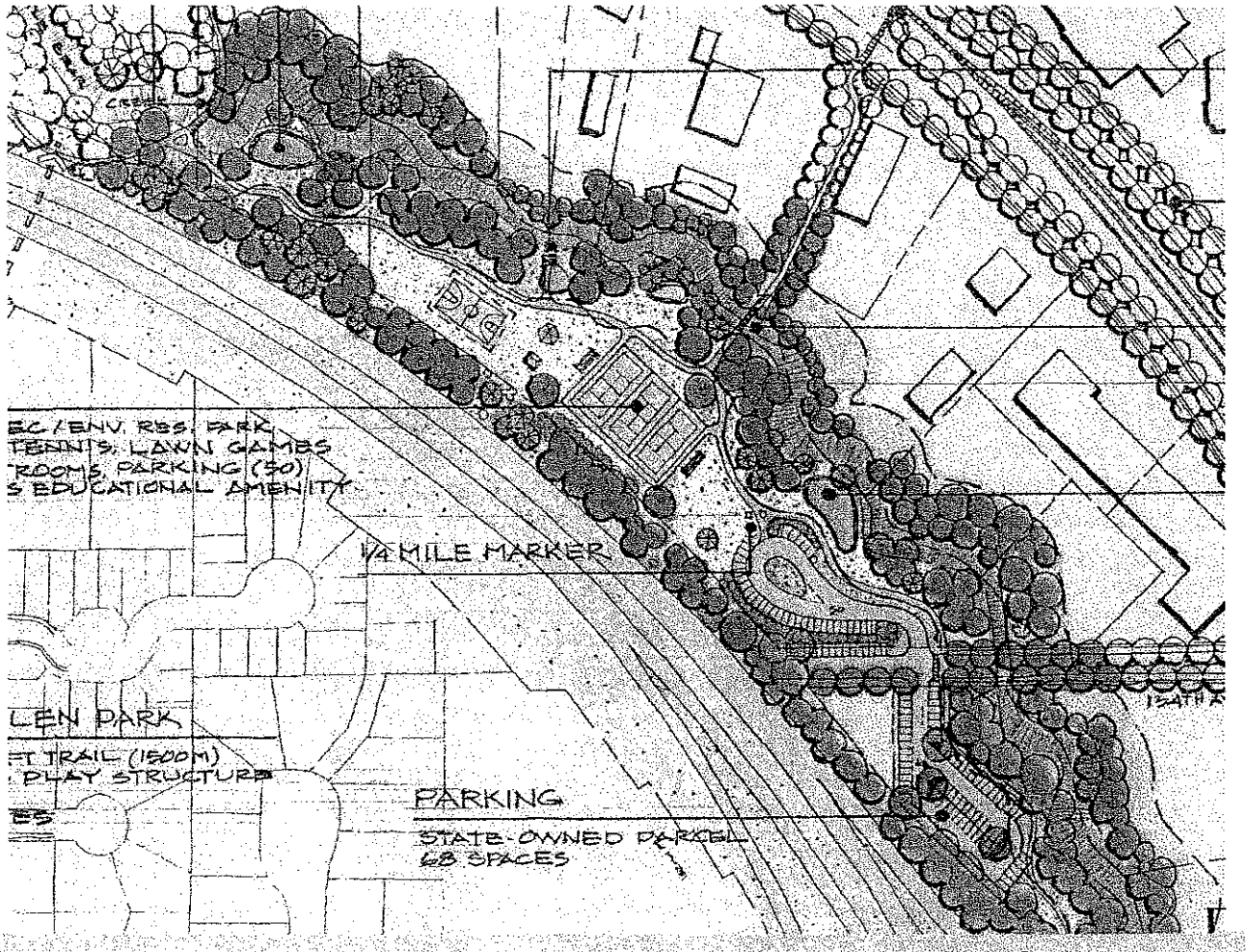
The City owns four parcels within the corridor study area. The three parcels located west of SR522 and north of NE 195th are planned under a separate master plan to be developed as a skate park and a resource conservation park. The parcel situated adjacent to the north side of 134th Ave. NE between SR 522 and Little Bear Creek will also serve as both active and passive recreation to help address the overall recreational needs of the City.

Access to the linear park will be via the lineal trail system along the creek, 134th Ave. NE, and additional points obtained over private property along Little Bear Creek Parkway.

Active recreation will be situated outside the 100-foot required stream buffer and consist of tennis courts, basketball court, area for lawn games, and picnic amenities with associated parking. Passive recreation will focus on educational opportunities including sensitive area interpretive signage and look-out points to highlight wildlife and vegetation.







APPENDIX E

RECORD OF PUBLIC MEETINGS
&
PUBLIC WORKSHOP RESULTS

Planning Process

2.1 Record of Public Meetings

April 2001	
4/18/01 Identified Corridor issues, items, and concepts to be addressed in the visioning process	⇒ Planning Commission
May 2001	
5/15/01 Public Open House Kick – off meeting for road improvements project and corridor study concept	⇒ Public ⇒ Corridor Property Owners
June 2001	
6/15/01 Identified possibility of land use changes including allowed uses and development regulations within the GB Zone. PC requested tour of corridor and building height examples.	⇒ Planning Commission
August 2001	
8/02/01 Reviewed Work Program for Park Department	⇒ Parks & Recreation Commission
8/15/01 Tour of Corridor Area and building height examples	⇒ Planning Commission
September 2001	
9/05/01 Developed Draft Corridor Master Plan Goals and reviewed Master Plan Work Program	⇒ Planning Commission
9/06/01 Developed Draft Corridor Master Plan Goals and reviewed Study Area boundaries	⇒ Parks & Recreation Commission
9/19/01 Reviewed revised Draft Corridor Master Plan Goals and Study Area boundaries	⇒ Planning Commission
October 2001	
10/4/01 Reviewed Corridor Natural Systems Data presented by staff	⇒ Parks & Recreation Commission
10/17/01 Reviewed Corridor Natural Systems Data presented by staff	⇒ Planning Commission
November 2001	
11/01/01 Reviewed Social Systems Data presented by staff	⇒ Parks & Recreation Commission
11/11/01 Joint meeting between the City Council, Planning Commission, and Parks Commission to discuss the vision for the Downtown Master Plan	⇒ Council and Commissions
11/28/01 Reviewed Social Systems Data presented by staff	⇒ Planning Commission
December 2001	
12/06/01 Reviewed presentation by University of Washington Students on corridor concepts.	⇒ Parks & Recreation Commission
12/12/01 Identified specific key features to be in the Corridor Master Plan	⇒ **JOINT COMMISSION MEETING**
January 2002	
1/29/02 First Downtown Master Plan Meeting. Questions asked: What improvements would you like to see in Dwtn Woodinville? What are your top two improvements	⇒ Public ⇒ Commissions ⇒ City Council
March 2002	
3/28/02 Second Downtown Master Plan Meeting. Evaluate and comment on alternative development concepts.	⇒ Public ⇒ Commissions ⇒ City Council
April 2002	
4/11/02 Itemized Corridor feature priorities	⇒ **JOINT COMMISSION MEETING**
May 2002	
5/23/02 Third Downtown Master Plan Meeting (First integrated DT and LBCC mtg). Evaluate and comment on refined concepts.	⇒ Public ⇒ Commissions ⇒ City Council

APPENDIX

June 2002	
6/10/02 Received update on Master Plan progress and approved integration with Downtown Master Plan	⇒ City Council
6/25/02 Presentation of land use concepts	⇒ Corridor Property Owners
6/25/02 Introduction of Plan integration with Downtown Plan and draft concepts of Corridor	⇒ Public ⇒ Commissions ⇒ City Council
July 2002	
7/11/02 Fourth Downtown Master Plan Meeting (2nd ST and LBCC mtg). Evaluate and comment on refined concepts	⇒ Public ⇒ Commissions ⇒ City Council
7/25/02 Final workshop to identify preferred concepts of circulation, land use, and parks/open space	⇒ Public ⇒ Commissions ⇒ City Council
August 2002	
8/01/02 Parks and Recreation Commission. Purpose: To discuss features of the plan and mailer	⇒ Staff ⇒ Parks & Recreation Commission
8/07/02 Planning Commission meeting. Purpose: To discuss features of the plan and mailer	⇒ Staff ⇒ Planning Commission
September 2002	
9/04/02 Planning Commission meeting. Purpose:	⇒ Staff ⇒ Planning Commission
9/05/02 Parks and Recreation meeting. Purpose:	⇒ Staff ⇒ Parks & Rec Commission
October 2002	
10/02/04 (proposed) Draft Plan Distribution to Planning Commission 10/03/02 (proposed) Draft Plan Distribution to Parks & Recreation Commission	⇒ Staff ⇒ Parks & Rec Commission ⇒ Planning Commission
10/18/02 (proposed) *Open House 5-7* Joint Commission Meeting – Plan Presentation	⇒ Public ⇒ Staff ⇒ Planning Commission
November 2002	
11/06/002 (proposed) Planning Commission Public Hearing	⇒ Public ⇒ Planning Commission ⇒ Staff
11/18/02 (proposed) City Council Study Session	⇒ City Council ⇒ Staff
December 2002	
12/2/02 (proposed) City Council first reading of adopting ordinance	⇒ City Council ⇒ Staff
12/9/02 (proposed) City Council second reading of adopting ordinance	⇒ City Council ⇒ Staff

2.5 Downtown/Little Bear Creek Integrated Workshop 4

Summary

Approximately 50 people interested in contributing to the design and future development of Downtown Woodinville met for Work Session #4 of the Downtown Master Plan Study. Work Session 4 took place on the evening of July 11, 2002 at City Hall. The purpose of the meeting was to present the Draft Land Use & Circulation Plan, and to evaluate and comment on project phasing, essential street designations, and building heights. In addition, a financial strategy for implementing the plan was presented. The preferences indicated by citizens on the Response Sheet 4 ballot are summarized below.

RESPONSE SHEET 4

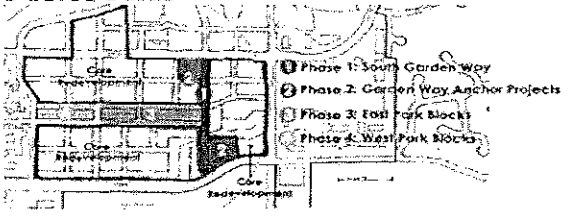
Woodinville Downtown Master Plan **July 11, 2002**

40 Response Sheets were submitted. In addition, 6 sheets responding to 1 of the 4 questions were submitted and are included in the tallies below. In some cases, respondents did not indicate a response to all 4 questions. The figure for percentage of "Yes" votes reflects the total number of respondents to that specific question.

CATALYST PROJECT PHASING PROPOSAL

Do you support the proposal?

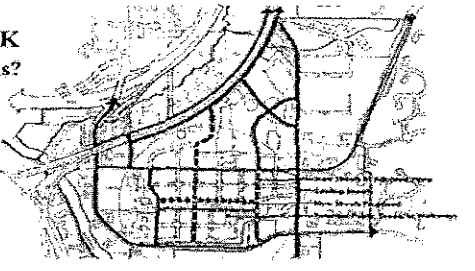
% "Yes"	Yes	No	Other
70	28	6	6



ESSENTIAL STREET FRAMEWORK

Do you support the essential street designations?

% "Yes"	Yes	No	Other
76	29	3	6

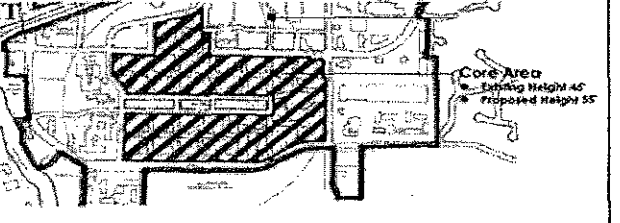


CORE AREA BUILDING HEIGHT

Do you support the 55' proposal?

% supporting height increase*	Yes	No	Other
78	25	12	8

*3 of the "No" and 7 of the "Other" votes commented that height should be greater than 55', allow for architectural projections, and/or expand to area north of 175th.

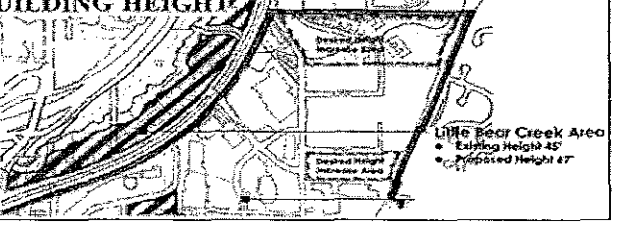


LITTLE BEAR CREEK AREA BUILDING HEIGHT

Do you support the 67' proposal?

% supporting height increase*	Yes	No	Other
68	22	6	9

*3 of the "Other" votes commented that height should be greater than 67'.



Summary

Participants worked in groups of two to six people at 8 discussion tables to determine their preferences for Plan Concepts. Their responses and observations are summarized below:

Table 1

- Yes for the soft and hard trails.
- Not yet clear about City Park.
- Concerned about security on the passage proposal.
- We support 522 crossing.
- We support land use and phasing.
- Concerned for displaced office workers.

Table 2

- The height of buildings will be exceeded over time by tall trees.
- Water table and expense are concerns for parking structure.
- When planning trail locations, think about avoiding dissection of properties.
- Trails are good for both office workers and the public.
- Property Owner - We own 12 acres in the area. We can't develop on the west side. On the east side, height may be necessary. We try to work with people and understand the facts of the circumstances. Over the time we have owned the property, the 25' setback from Little Bear Creek was expanded to 50'. Recent discussion has talked about expanding to as far as 300'.

Table 3

- Not informed enough to comment on trails.
- Not informed enough to comment regarding the passage.
- 522 crossing, yes.
- For land use, office seems OK.
- Not informed enough to comment on phasing.

Table 4

- I like the proposal.
- Prefer to direct growth.
- As a business, you have to invest. Each time I invest, it has come back.. This proposal generates an income.

Table 5

- Generally agreed with parks proposal.
- Definitely passive use for City Park, especially with salmon.
- Overpass is good and goes well with the park.
- Concerned with buildings. Water table and underground parking an issue.
- Concerned with congestion from office development – especially around the High School. Improving roads around High School is a major issue.
- Where is mitigation for new streets from new housing? This is not addressed in proposal.

Table 6

- Office development may have to precede development in downtown core.
- I live here because I like to live close to work and do not have to use the freeway.
- Parks are important in a city
- Many businesses may have to move from the core. They can go to (proposed office area?)

Table 7

- I represent perhaps the largest property owner in the Little Bear Creek Corridor area. I'm pleased with the number of people here.
- I like a lot of the plans.
- A big concern is the High School. Look at it – it's part of our city.
- Regarding the creek, we need to acknowledge legal setbacks. My property legally has not addressed this.
- There are some really good ideas here and it needs to be sold to the public who will actually do this.

Table 8

- Trails, yes.

- City Park – no concensus.
- Passage – cost concerns.
- SR-522 crossing – need input from the wedge area. Would it be used?
- Office land use, yes.
- Height – pretty adamant about 55'.
- Office use should probably extend up into GB.
- Provide a little entry park at the north.

Written Responses

The following written comments were included on the 21 Response Sheets submitted.

Respondent 4.

City Park Preference **Respondent indicated "Passive" and "Active" with comments:** ***Each use.***

Respondent 5.

General Comments: ***I would like to see the plan reworked more closely to the CBD Plan and the Parks & Recreation Commission Plan for Little Bear Corridor.***

Respondent 6.

City Park Preference **Respondent indicated "Passive" with comments:** ***Need to have picnic and open space but no "organized" recreation area.***
Passage Proposal **Respondent indicated "Yes" with comments:** ***Great idea.***
Encouraging Office Uses **Respondent indicated "No" and "Other" with comments:** ***Should be more mixed use – housing, office. Leave general business with 45' height.***
Increasing Height for Office Uses **Respondent indicated "No" with comments:** ***No No No No.***
Implementation **Respondent indicated "Yes" with comments:** ***Has to be.***

Respondent 7.

General Comments: ***Go higher in "O". Underground, 2 stories may not work. May require more open parking.***

Respondent 8.

Passage Proposal **Respondent indicated "No" with comments:** ***? Don't understand the passage proposal.***
SR-522 Crossing **Respondent indicated "Other" with comments:** ***With ADA lift.***
General Comments: ***Not related question: Where is the Woodinville Senior Center that we voted on? Why not use the full 45' – what are the costs and why was it not presented? Why was the flyer not put in Woodinville Weekly. Make a tryfold, prestamped, return flyer for lot more response. Why not do underpass to cross rivers? All trails should be able to provide firm ground for***

all wheelchairs, etc.!!! Most definitely tennis courts and lots of basketball! The river does not show up very well, which is hard to follow what's what. Is there going to be extra parking in the business lots for people that want to go to the park during the day? How wide are the roads going to be that are goin in? Will all the streets have a two-way center lane? If need more parking, put it in the center of the building with offices around, so parking is hid. Why can't a parking lot be put along the edge of the west area park to ease school parking and add parking for the park. Why do the land owners have to continue to pay land taxes when the city takes the land? (Please call or write answer).

Respondent 9.

SR-522 Crossing **Respondent indicated "No" with comments:** ***Combine with a road crossing makes more sense.***

Increasing Height for Office Use **Respondent indicated "Yes" with comments:** ***But only with enough supporting road development.***

Implementation **Respondent gave no indication with comments:** ***Development of Little Bear Creek Corridor should precede any park development.***

General Comments: ***The Park Block planned for the center of Woodinville S/B located and planned for development with the future sale of Canterbury Mobile Home Park. Displacing 30+ businesses does not make sense and would be much more costly than locating the park block along the northern boundary of the mobile home park Perhaps the stream that runs along the southern boundary of the mobile home park could be relocated to the south side of the south bypass to give more land room for the future development of the mobile home park.***

Respondent 8.

Trail Options **Respondent indicated "Yes" with comments:** ***Why do we have to have 2 trails though. Paved trail would be fine.***

Passage Proposal **Respondent made no indication with comments:** ***Need a passage somewhere. 131st may or may not be best place.***

SR-522 Crossing **Respondent indicated "Yes" with comments:** ***Actually, really should have an actual road overpass.***

Increasing Height for Office Use **Respondent indicated "Yes" with comments:** ***Not really but guess we have to.***

General Comments: ***Agree that "Office" should extend up to "GB" area also. Want to connect this green space with trails – Burke-Gilman on up to Snohomish. Need to develop railroad right-of-way into a linear park. Need access to water somewhere in Woodinville. (We need a beach somewhere.) Also need to have street front requirements: nice sidewalks with landscaping between street and sidewalk.***

Respondent 8.

Trail Options Respondent indicated "Other" with comments: Soft trail on both

City Park Preference **Respondent indicated "Other" with comments:** ***No City Park..***

Passage Proposal **Respondent indicated "Yes" with comments:** ***In 50 years.***

General Comments: ***Needs to be extended out for a longer period of time. In***

fact, you could have soft trails directly adjacent to the buffer area without having to purchase that much land adjacent to business.

Respondent 14.

Passage Proposal **Respondent indicated "No" with comments:** ***No tunnels.***
Implementation **Respondent indicated "Other" with comments:** ***See General Comments***
General Comments: 1) The north porders of Little Bear Creek Study Area should be clarified to extend up to the City Limits to keep the city design continuous and cohesive. 2) The zoning of the land in Little Bear Creek Corridor should be "O" in its entirety. The design currently shows very northern tip of the Little Bear Creek Study Area as being "GB". This should be changed to "O". 3) Little Bear Creek development should be phased first for development. A) It is largely vacant or has temporary or interim users and is ready for immediate development. B) It is Woodinville's "northern gateway" and should be improved.

Respondent 15.

Passage Proposal **Respondent indicated "No" with comments:** ***Security issue.***
Implementation **Respondent indicated "Other" with comments:** ***Little Bear Creek development should be done first. That way displaced office workers from downtown would have a place to go.***

Respondent 16.

Passage Proposal **Respondent indicated "Other" with comments:** ***Over. No tunnel. Safety issue.***
Implementation **Respondent indicated "Other" with comments:** ***Move ahead of some of CBD development.***

Respondent 17.

Trail Options **Respondent indicated "Yes" with comments:** ***Paved or groomed trail..***
Passage Proposal **Respondent indicated "No" with comments:** ***Security issues. Only do it if you have no other option***
Implementation: **Respondent indicated "Other" with comments:** ***Yes, if we are talking about phasing "within" Little Bear Creek..***

Respondent 18.

Trail Options/Park Character **Respondent gave no indication for the 3 questions with comments:** ***Park should be passive use only. Woodinville has other sites for active use recreation. A business locale is more conducive to passive recreation.***
Increasing Height for Office Use **Respondent indicated "Yes" with comments:** ***Absolutely necessary for both recreation and commercial uses.***
General Comments: To have recreation and open space at LBC, you need to do commercial must build vertically (especially at north end of town) – not enough parking even with 1.5 dpsvrd; probably additional parking should be considered with a 5-story garage. Business needs to trust government in order to implement this or any other enhanced park/business plan. Perhaps government should begin any new program by starting with business considerations first before recreation, when and where feasible. It is

imperative that the business community come on board first – the rec land will always be there. People first!!!

Respondent 19.
No Comments.

Respondent 20.
General Comments: **Continue the "O" zoning north through the "GB" zoning to the northern city limits.**

Respondent 21.
General Comments: *1) Need to understand what the cost is and how it will be funded. 2) Conditional cost crossing on NE 70 and ? seldom used as is one NE 12th in Bellevue. 3) Also retail uses; food services.. 4) Max should be 55'. 5) "GB" on land Use Framework (Draft) should be "O". Max should be 55'. 5) parcel west of letter "GB" should be "park".*

Respondent 22.
Passage Proposal **Respondent indicated "Yes" with comments:** *Cost?*
City Park Preference **Respondent indicated "Passive" with comments:** *No (active)! The tennis courts on the Sammamish Trail not used now.*
SR-522 Crossing **Respondent indicated "Yes" with comments:** *Would like to know what people living in the 'wedge' think.*
Encouraging Office Uses **Respondent indicated "Yes" with comments:** *Possibly should include retail uses. Also printing/deli, Starbucks, etc.*
Increasing Height for Office Uses **Respondent indicated "No" with comments:** *4 floors, 55' – 56'.*
General Comment: *All office and other buildings in Little Bear Creek Corridor must have 2 faces – one facing freeway and other facing Little Bear Creek Parkway and/or Woodinville-Snohomish Road. GB (Woodinville Auto Auction) and north etc. should be rezoned "O" – as rest of Little Bear Creek Area is. Note: Northeast corner of 195th (small parcel) should be acquired by Parks. Signage, passive park, landscpaed "GATEWAY".*

Respondent 23.
General Comment: *I am coming into the process late so I may have missed a lot. I would like to know what you have planned for all of the new kids that will be in the schools after all of this growth. What is going to happen to all of the people living in the downtown area. Wouldn't it be prudent to fix all of the problems created by the city and all of the developers to this point before embarking on more growth?*

Respondent 24.
General Comment: *Phasing agreement is qualified: Need to put revegetation/reforestation of parkland and riparian zone on front burner. Trail system later is fine. But need salmon habitat restoration to begin soonest. Trees, shrubs to provide shade to water temperature in creek and food web for juvenile/pairing fish need years to grow before providing benefit as intended. Salmon programs in rest of watershed depend in part on successful transit of this reach of Little Bear for trip upstream to spawn, and downstream for early life cycle rearing and lake time Needed. This must take salmon (Chinook –*

ESA endangered specie) viability/safety into account. This is the "gateway" into the rest of our salmon rearing watershen upstream for 17 square miles of stream habitat.

Respondent 25.

Trail Options/Park Character **Respondent indicated "No" with comments:** ***One is enough.***

Encouraging Office Uses **Respondent indicated "Other" with comments:** ***Some fine businessess exist in concrete tilt-ups. Leave attractive business buildings alone.***

General Comments: ***Don not consider using 132 Avenue NE for trail access. Do use 134 Avenue NE for trail access. Here's why: 132nd Avenue NE: Public benefit – 5 parking spaces. That's it! Private Benefit – None. Entirely adverse. 134the Avenue NE: Public Benefit: Unlimited parking, rest rooms, water, garbage, lights, unlimited future expansion, located in the open flat park; "a signature park entry"; "an active park" is possible using this street access; It can be made into a freeway crossing. Private benefit – no businesses are disturbed. Problems at 132 Avenue NE: Will eliminate street parking for business traffic congestion; no place to turn around 40' trucks use the street; cars often have to be moved; conflict with businesses and the public; no bathrooms; no parking; it is fenced on both sides of the street; the street ends at a 20' bank (culvert will be removed); street vacation will be sought by abutting owners.***

Respondent 26.

Increasing Height for Office Uses **Respondent indicated "Yes" with comments:** ***With underground parking with low impact development, permeable paving.***

Implementation **Respondent indicated "Other" with comments:** ***Vegetation should be done at outset in buffer area.***

General Comments: ***Preserving habitat in and along Little Bear Creek is critical. Adequate shade, undisturbed stream flow, and avoidance of all pollution must be observed to protect this habitat which is key to our fish stocks.***

2.7 Downtown/Little Bear Creek Integrated Workshop 5

Summary

Approximately 40 people interested in contributing to the design and future development of the Little Bear Creek Corridor Area met for the Final Work Session. The Work Session took place on the evening of July 25, 2002 at City Hall. The purpose of the meeting was to evaluate and comment on refined circulation, open space, land use and phasing concepts. The preferences indicated by citizens on the Response Sheet ballot are summarized below.

RESPONSE SHEET

Little Bear Creek Corridor Master Plan — July 25, 2002

21 Response Sheets were submitted. In some cases, respondents may not have indicated a response to all questions, or may have indicated 2 responses to a single question.

TRAIL OPTIONS/PARK CHARACTER

	Yes	No	Other
Do you agree with a natural "soft trail" on the west, and a groomed "paved trail" on the east sides of Little Bear Creek?	18	2	1
	Passive	**Active**	**Other**
Indicate your preference for City Park:*	15	4	3
	Yes	**No**	**Other**
Do you support the 131st Avenue Little Bear Creek trail passage proposal?	9	6	4

*Active - Tennis and basketball courts and lawn games.
Passive - Picnic, interpretive and natural areas

SR-522 CROSSING

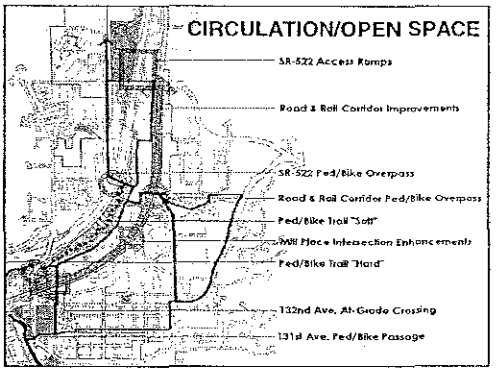
	Yes	No	Other
Do you support the pedestrian and bicycle overpass connection?	16	3	2

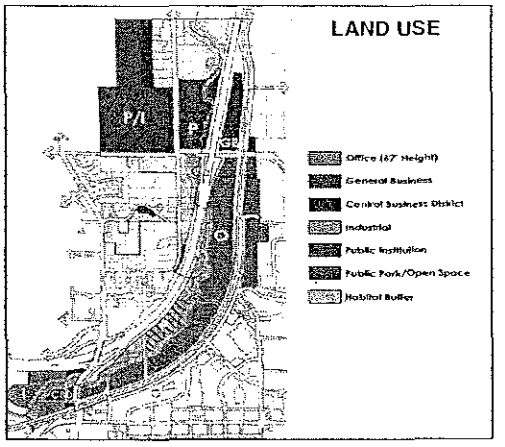
LAND USE

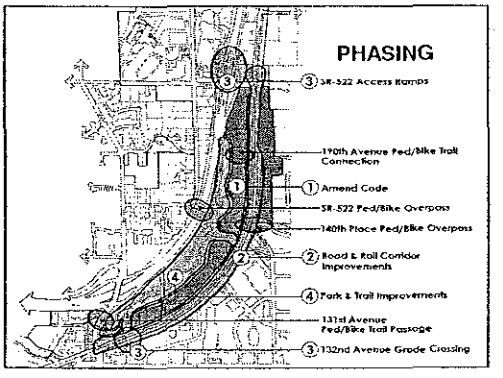
	Yes	No	Other
Do you agree with the policy of encouraging office uses (amend codes)?	17	3	2
Do you agree with increasing the allowable building height from 45' to 67' (3 floors to 5 floors) for office uses only?	13	7	1

IMPLEMENTATION

	Yes	No	Other
Do you agree with the project phasing proposal?	9	3	6







Small Group Presentations

Participants worked in groups of two to six people at 8 discussion tables to determine their preferences for Plan Concepts. Their responses and observations are summarized below:

Table 1

- Yes for the soft and hard trails.
- Not yet clear about City Park.
- Concerned about security on the passage proposal.
- We support 522 crossing.
- We support land use and phasing.
- Concerned for displaced office workers.

Table 2

- The height of buildings will be exceeded over time by tall trees.
- Water table and expense are concerns for parking structure.
- When planning trail locations, think about avoiding dissection of properties.
- Trails are good for both office workers and the public.
- Property Owner - We own 12 acres in the area. We can't develop on the west side. On the east side, height may be necessary. We try to work with people and understand the facts of the circumstances. Over the time we have owned the property, the 25' setback from Little Bear Creek was expanded to 50'. Recent discussion has talked about expanding to as far as 300'.

Table 3

- Not informed enough to comment on trails.
- Not informed enough to comment regarding the passage.
- 522 crossing, yes.
- For land use, office seems OK.
- Not informed enough to comment on phasing.

Table 4

- I like the proposal.
- Prefer to direct growth.
- As a business, you have to invest.
  Each time I invest, it has come back..
  This proposal generates an income.

Table 5

- Generally agreed with parks proposal.
- Definitely passive use for City Park, especially with salmon.
- Overpass is good and goes well with the park.
- Concerned with buildings. Water table and underground parking an issue.
- Concerned with congestion from office development – especially around the High School. Improving roads around High School is a major issue.
- Where is mitigation for new streets from new housing? This is not addressed in proposal.

Table 6

- Office development may have to precede development in downtown core.
- I live here because I like to live close to work and do not have to use the freeway.
- Parks are important in a city
- Many businesses may have to move from the core. They can go to (proposed office area?)

Table 7

- I represent perhaps the largest property owner in the Little Bear Creek Corridor area. I'm pleased with the number of people here.
- I like a lot of the plans.
- A big concern is the High School. Look at it – it's part of our city.
- Regarding the creek, we need to acknowledge legal setbacks. My property legally has not addressed this.
- There are some really good ideas here and it needs to be sold to the public who will actually do this.

Table 8

- Trails, yes.
- City Park – no concensus.

- Passage – cost concerns.
- SR-522 crossing – need input from the wedge area. Would it be used?
- Office land use, yes.
- Height – pretty adamant about 55'.
- Office use should probably extend up into GB.
- Provide a little entry park at the north.

Written Responses

The following written comments were included on the 21 Response Sheets submitted.

Respondent 10.

City Park Preference **Respondent indicated "Passive" and "Active" with comments:** *Each use.*

Respondent 11.

General Comments: *I would like to see the plan reworked more closely to the CBD Plan and the Parks & Recreation Commission Plan for Little Bear Corridor.*

Respondent 12.

City Park Preference **Respondent indicated "Passive" with comments:** *Need to have picnic and open space but no "organized" recreation area.*
Passage Proposal **Respondent indicated "Yes" with comments:** *Great idea.*
Encouraging Office Uses **Respondent indicated "No" and "Other" with comments:** *Should be more mixed use – housing, office. Leave general business with 45' height.*
Increasing Height for Office Uses **Respondent indicated "No" with comments:** *No No No No.*
Implementation **Respondent indicated "Yes" with comments:** *Has to be.*

Respondent 13.

General Comments: *Go higher in "O". Underground, 2 stories may not work. May require more open parking.*

Respondent 14.

Passage Proposal **Respondent indicated "No" with comments:** *? Don't understand the passage proposal.*
SR-522 Crossing **Respondent indicated "Other" with comments:** *With ADA lift.*
General Comments: *Not related question: Where is the Woodinville Senior Center that we voted on? Why not use the full 45' – what are the costs and why was it not presented? Why was the flyer not put in Woodinville Weekly. Make a tryfold, prestamped, return flyer for lot more response. Why not do underpass to cross rivers? All trails should be able to provide firm ground for all wheelchairs, etc.!!! Most definitely tennis courts and lots of basketball! The river does not show up very well, which is hard to follow what's what. Is there going to be extra parking in the business lots for people that want to go to the park during the day? How wide are the roads going to be that are goin in? Will all the streets have a two-way center lane? If need more parking, put it in the center of the building with offices around, so parking is hid. Why can't a parking lot be put along the edge of the west area park to ease school parking and add parking for the park. Why do the land owners have to continue to pay land taxes when the city takes the land? (Please call or write answer).*

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SR-522 Crossing **Respondent indicated "No" with comments:** *Combine with a road crossing makes more sense.*
Increasing Height for Office Use **Respondent indicated "Yes" with comments:** *But only with enough supporting road development.*

Implementation **Respondent gave no indication with comments:** *Development of Little Bear Creek Corridor should precede any park development.*
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Trail Options **Respondent indicated "Yes" with comments:** *Why do we have to have 2 trails though. Paved trail would be fine.*
Passage Proposal **Respondent made no indication with comments:** *Need a passage somewhere. 131st may or may not be best place.*
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Trail Options Respondent indicated "Other" with comments: Soft trail on both
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General Comments: *Needs to be extended out for a longer period of time. In fact, you could have soft trails directly adjacent to the buffer area without having to purchase that much land adjacent to business.*

Respondent 27.
Passage Proposal **Respondent indicated "No" with comments:** *No tunnels.*
Implementation **Respondent indicated "Other" with comments:** *See General Comments*
General Comments: 1) The north porders of Little Bear Creek Study Area should be clarified to extend up to the City Limits to keep the city design continuous and cohesive. 2) The zoning of the land in Little Bear Creek Corridor should be "O" in its entirety. The design currently shows very northern tip of the Little Bear Creek Study Area as being "GB". This should be changed to "O". 3) Little Bear Creek development should be phased first for development. A) It is largely vacant or has temporary or interim users and is ready for immediate development. B) It is Woodinville's "northern gateway" and should be improved.

Respondent 28.
Passage Proposal **Respondent indicated "No" with comments:** *Security issue.*
Implementation **Respondent indicated "Other" with comments:** *Little Bear Creek development should be done first. That way displaced office workers from downtown would have a place to go.*

Respondent 29.

Passage Proposal **Respondent indicated "Other" with comments:** *Over. No tunnel. Safety issue.*

Implementation **Respondent indicated "Other" with comments:** *Move ahead of some of CBD development.*

Respondent 30.

Trail Options **Respondent indicated "Yes" with comments:** *Paved or groomed trail..*

Passage Proposal **Respondent indicated "No" with comments:** *Security issues. Only do it if you have no other option*

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Respondent 31.

Trail Options/Park Character **Respondent gave no indication for the 3 questions with comments:** *Park should be passive use only. Woodinville has other sites for active use recreation. A business locale is more conducive to passive recreation.*

Increasing Height for Office Use **Respondent indicated "Yes" with comments:** *Absolutely necessary for both recreation and commercial uses.*

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Respondent 32.

No Comments.

Respondent 33.

General Comments: **Continue the "O" zoning north through the "GB" zoning to the northern city limits.**

Respondent 34.

General Comments: *1) Need to understand what the cost is and how it will be funded. 2) Conditional cost crossing on NE 70 and ? seldom used as is one NE 12th in Bellevue. 3) Also retail uses; food services.. 4) Max should be 55'. 5) "GB" on land Use Framework (Draft) should be "O". Max should be 55'. 5) parcel west of letter "GB" should be "park".*

Respondent 35.

Passage Proposal **Respondent indicated "Yes" with comments:** *Cost?*

City Park Preference **Respondent indicated "Passive" with comments:** *No (active)! The tennis courts on the Sammamish Trail not used now.*

SR-522 Crossing **Respondent indicated "Yes" with comments:** *Would like to know what people living in the 'wedge' think.*

Encouraging Office Uses **Respondent indicated "Yes" with comments:** *Possibly should include retail uses. Also printing/deli, Starbucks, etc.*

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Respondent 37.

General Comment: *Phasing agreement is qualified: Need to put revegetation/reforestation of parkland and riparian zone on front burner. Trail system later is fine. But need salmon habitat restoration to begin soonest. Trees, shrubs to provide shade to water temperature in creek and food web for juvenile/pairing fish need years to grow before providing benefit as intended. Salmon programs in rest of watershed depend in part on successful transit of this reach of Little Bear for trip upstream to spawn, and downstream for early life cycle rearing and lake time Needed. This must take salmon (Chinook – ESA endangered specie) viability/safety into account. This is the "gateway" into the rest of our salmon rearing watershen upstream for 17 square miles of stream habitat.*

Respondent 38.

Trail Options/Park Character **Respondent indicated "No" with comments:** *One is enough.*

Encouraging Office Uses **Respondent indicated "Other" with comments:** *Some fine businessess exist in concrete tilt-ups. Leave attractive business buildings alone.*

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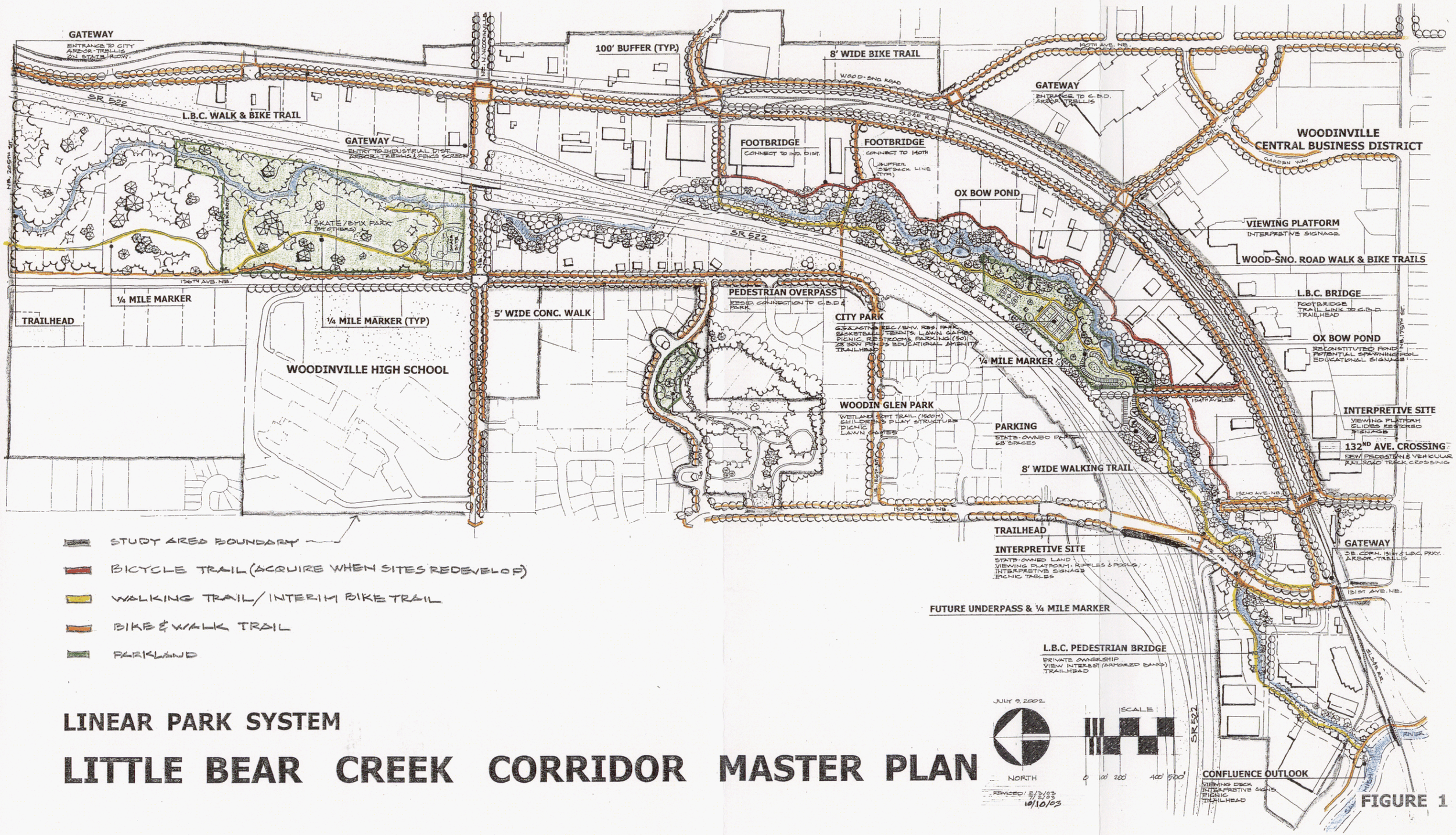
Respondent 39.

Increasing Height for Office Uses **Respondent indicated "Yes" with comments:** *With underground parking with low impact development, permeable paving.*

Implementation **Respondent indicated "Other" with comments:** *Vegetation should be done at outset in buffer area.*

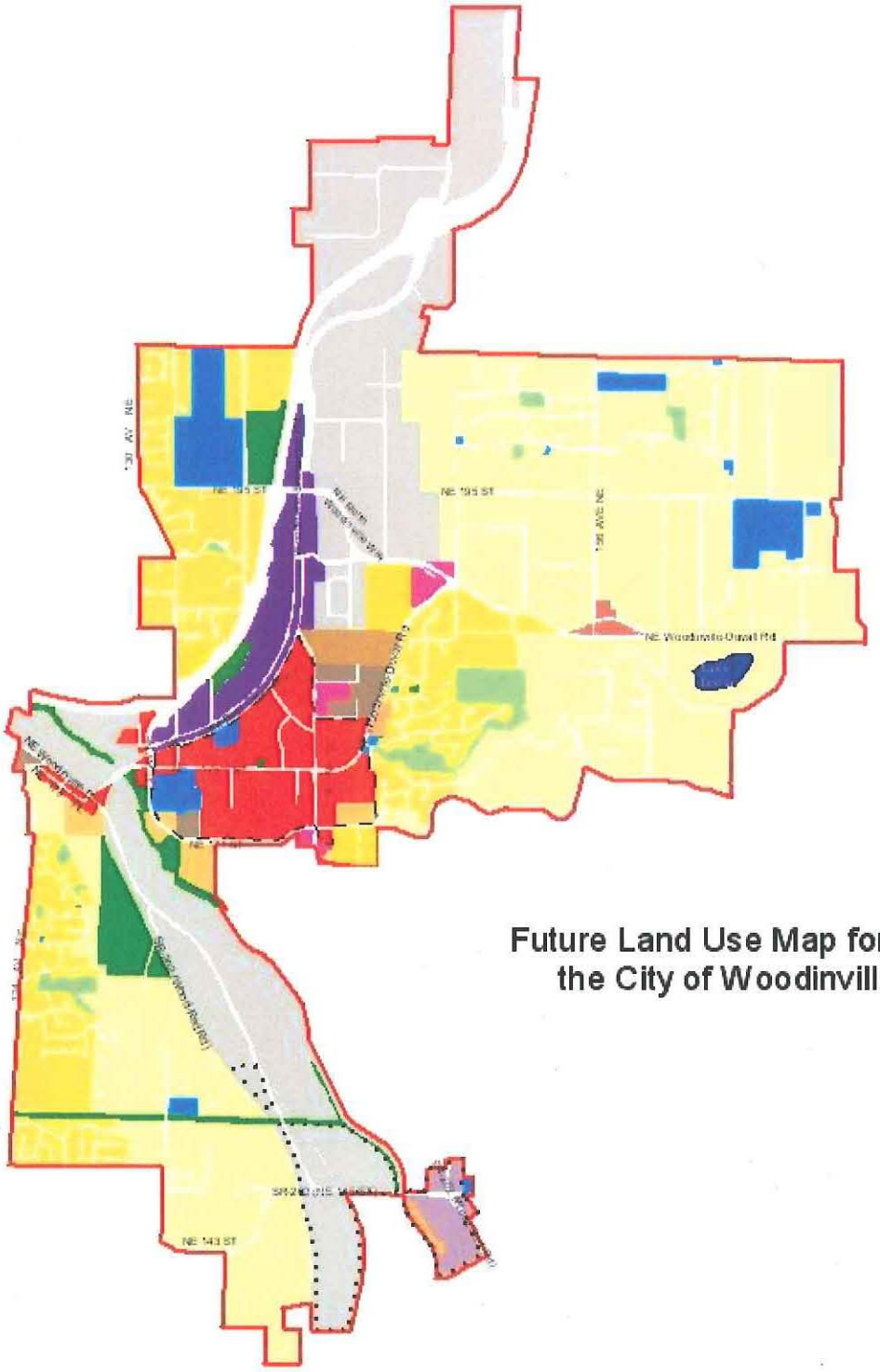
General Comments: *Preserving habitat in and along Little Bear Creek is critical. Adequate shade, undisturbed stream flow, and avoidance of all pollution must be observed to protect this habitat which is key to our fish stocks.*



LINEAR PARK SYSTEM

LITTLE BEAR CREEK CORRIDOR MASTER PLAN

FIGURE 1



Future Land Use Map for the City of Woodinville

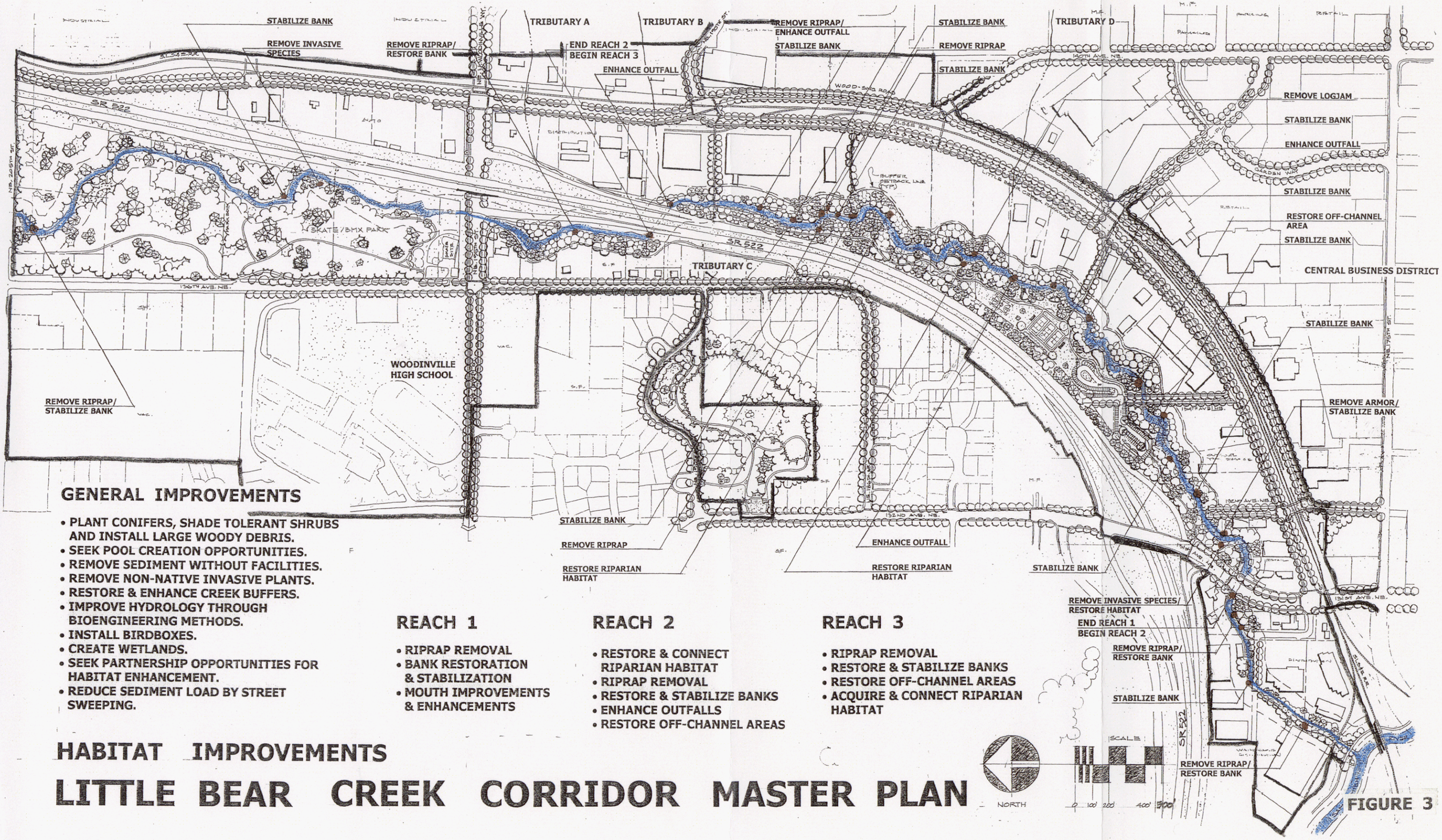
- Low Density Residential
- Moderate Density Residential
- Medium Density Residential
- High Density Residential
- High Density Residential/Office
- Neighborhood Business
- Tourist Business
- Office
- Central Business
- Auto/General Commercial
- Industrial
- Public/ Institutional
- Public Parks
- Openspace
- Mixed-Use Area
- Tourist District
- Urban Growth Boundary

0 0.3 0.6 0.9 Miles

N

NOTE: This comp plan map is a pictorial representation and the City does not warrant its accurate depiction. dc 7/27/04

Figure 2



GENERAL IMPROVEMENTS

- PLANT CONIFERS, SHADE TOLERANT SHRUBS AND INSTALL LARGE WOODY DEBRIS.
- SEEK POOL CREATION OPPORTUNITIES.
- REMOVE SEDIMENT WITHOUT FACILITIES.
- REMOVE NON-NATIVE INVASIVE PLANTS.
- RESTORE & ENHANCE CREEK BUFFERS.
- IMPROVE HYDROLOGY THROUGH BIOENGINEERING METHODS.
- INSTALL BIRDBOXES.
- CREATE WETLANDS.
- SEEK PARTNERSHIP OPPORTUNITIES FOR HABITAT ENHANCEMENT.
- REDUCE SEDIMENT LOAD BY STREET SWEEPING.

REACH 1

- RIPRAP REMOVAL
- BANK RESTORATION & STABILIZATION
- MOUTH IMPROVEMENTS & ENHANCEMENTS

REACH 2

- RESTORE & CONNECT RIPARIAN HABITAT
- RIPRAP REMOVAL
- RESTORE & STABILIZE BANKS
- ENHANCE OUTFALLS
- RESTORE OFF-CHANNEL AREAS

REACH 3

- RIPRAP REMOVAL
- RESTORE & STABILIZE BANKS
- RESTORE OFF-CHANNEL AREAS
- ACQUIRE & CONNECT RIPARIAN HABITAT

HABITAT IMPROVEMENTS

LITTLE BEAR CREEK CORRIDOR MASTER PLAN

FIGURE 3

CITY OF WOODINVILLE
GENERAL BUSINESS ZONE
2000 LAND USE SURVEY

Parcel #	TaxpayerName	Acres	Land Value ($)	Zone	Land Use	Land Use Category	
0326059015	EGGE RICHARD C	1.4873	$ 471,798.96	GB	Construction / Auto Body	Business	
0326059059	KELLY WILLIAM RAY	0.4646	$ 953,406.71	GB	One Way Plumbing	Business	
0326059062	JARVIS TERRY J	4.2947	$ 261,205.09	GB	Steel Craft	Business	
0326059094	SUZUKI FAMILY PARTNERSHIP	1.6395	$ 559,258.49	GB	Del's Truck Rental(Multi-purpose vehicular rental)	Business	
0622100021	CONSOLIDATED FREIGHTWAYS	3.694	$ 392,286.15	GB	Consolidated Freightways	Business	
0622100025	GREENBAUM ASSOCIATES PART	5.446	$ 917,247.89	GB	Greenbaum/Sasco	Business	
0622100042	MONEY SAVER WOODINVILL ASSC	3.6675	$ 985,007.41	GB	Moneysaver Mini Storage	Business	
0622100051	HOWDY PARTNERS III LP	1.8019	$ 552,517.73	GB	BIC, Inc.	Business	
0622100061	STUART ANDERSON PROPERTIES	1.3048	$ 559,254.40	GB	Super Rents/Coast Crane (Small machinery rental)	Business	
9517100190	KALMBACH JOHN G+DONNA J+	2.0536	$ 289,692.83	GB	Anchor Fencing	Business	
9517100195	WHITESCARVER BILL P	1.4537	$ 310,115.45	GB	Coral Construction	Business	
9517100210	GONZALES DONALD W	2.9233	$ 275,507.60	GB	Boring service	Business	
9517100227	SHANNON PAUL M + JEAN	0.2465	$ 135,875.47	GB	Mac's Towing	Business	
9517100268	LAKEPOINTE INC	1.1387	$ 350,310.98	GB	Ryder Truck Rental	Business	
9517100270	DEYOUNG LOWELL	2.5867	$ 325,467.92	GB	Lowell DeYoung Co.	Business	
9517100271	BDM-LLC	1.3496	$ 249,706.22	GB	Familion	Business	
9517100272	BDM-LLC	1.2651	$ 294,199.44	GB	Familion	Business	
0326059093	SUZUKI FAMILY PARTNERSHIP	1.266	$ 577,870.33	GB	Lees Auto Rebuild (Mechanic)	General	
9517100266	SMICO DEVELOPMENTAL CO	3.6165	$ 329,375.25	GB	Checkride driving	General-Education	
7269100010	COGAN JOHN P	1.6201	$ 863,257.85	GB	The Bindery	Manufacturing	
0326059047	HIGHWAY 9 LLC	1.4587	$ 563,586.35	GB	Prime Power Sales/Service Generators	Retail	
0326059056	MERCER SCOTT+COLLEEN M	0.9212	$ 561,684.58	GB	Woodinville Public Auto Auction	Retail	
0326059089	JARVIS TERRY ET AL	1.8098	$ 563,717.08	GB	Park 'n' Sell (Auto dealer)	Retail	
0326059107	MERCER SCOTT+COLLEEN M	1.051	$ 574,873.52	GB	Woodinville Public Auto Auction	Retail	
0622100052	BURLEY JEROME	1.61	$ 567,462.89	GB	Woodinville Truss	Retail	
0622100059	ANDERSON MALCOLM D&MARY JO	0.7844	$ 568,054.37	GB	Woodinville Truss	Retail	
1927300250	CLEARWATER RONALD D	1.4437	$ 219,568.92	GB	Clearwater Spa's	Retail	
1927300280	CLEARWATER RONALD D	3.4377	$ 895,392.88	GB	Clearwater Spa's	Retail	
7269100020	ASIAN-AMERICAN ENTERPRISES	1.1587	$ 942,690.47	GB	China Cottage, Silver Shears, Boiling Kitchen, US Marine Corps.	Retail	
9517100260	WOODINVILLE BUSINESS CTR 1	1.4044	$ 1,182,969.56	GB	vacant/retail/Art Works/Symmetry Elect. Woodinville Concrete Tools/National Credit Services	Retail	

Figure 4

CITY OF WOODINVILLE
GENERAL BUSINESS ZONE
2000 LAND USE SURVEY

Parcel #	TaxpayerName	Acres	Land Value ($)	Zone	Land Use	Land Use Category
9517100261	WOODINVILLE BUSINESS CTR 1	1.3674	$ 918,249.91	GB	retail/restraunt/electronics/vacant/office/Pool Tables & Games/Symetry Elect./The Patchworks/TPA/Krazan Eng./Western Tool Supply/Cabot Stairs/Jet City Pizza Office	Retail
0326059014	MACKINNON KINNON O+BRENDA K	0.7697	$ 195,525.79	GB	Vacant	Vacant
0326059126	KING COUNTY	0.0203	$ -	GB	Vacant	Vacant
0622100005	PLYWOOD SUPPLY INC	7.0026	$ 307,356.96	GB	Vacant	Vacant
0622100045	WOLF RICHARD M	1.0446	$ 546,215.14	GB	Vacant	Vacant
1927300005	BINCKLEY WILLIAM/FIRST WOOD	3.1938	$ 176,875.48	GB	Vacant	Vacant
9517100220	STATE OF WASHINGTON	2.2795	$ -	GB	Vacant	Vacant
9517100245	SWANSON RALPH L JR	1.3488	$ 31,287.74	GB	Vacant	Vacant
9517100250	WOODINVILLE CITY OF	6.4195	$ 37,619.53	GB	Vacant	Vacant
9517100262	WOODINVILLE BUSINESS CTR 1	0.9156	$ 139,148.21	GB	Vacant	Vacant
9517100263	WOODINVILLE BUSINESS CTR 1	1.127	$ 131,593.87	GB	Vacant	Vacant
9517100275	PLYWOOD SUPPLY INC	2.5627	$ 199,050.41	GB	Vacant	Vacant
9517100276	PLYWOOD SUPPLY INC	2.8715	$ 189,794.30	GB	Vacant	Vacant
TOTALS		89.3227	$ 19,166,080.15			

USE CATEGORY	ACRES	VALUE	PARCELS
Business Services	36.8175	$ 7,882,858.76	17
General Services	4.8825	$ 907,245.58	2
Retail	16.447	$ 7,558,250.53	11
Manufacturing	1.6201	$863,257.85	1
Vacant	29.5556	$ 1,954,467.44	12
	89.3227	**$ 19,166,080.16**	**43**

Little Bear Creek Study Area

Taxpayer, Business Name and Total Assessed Valuation

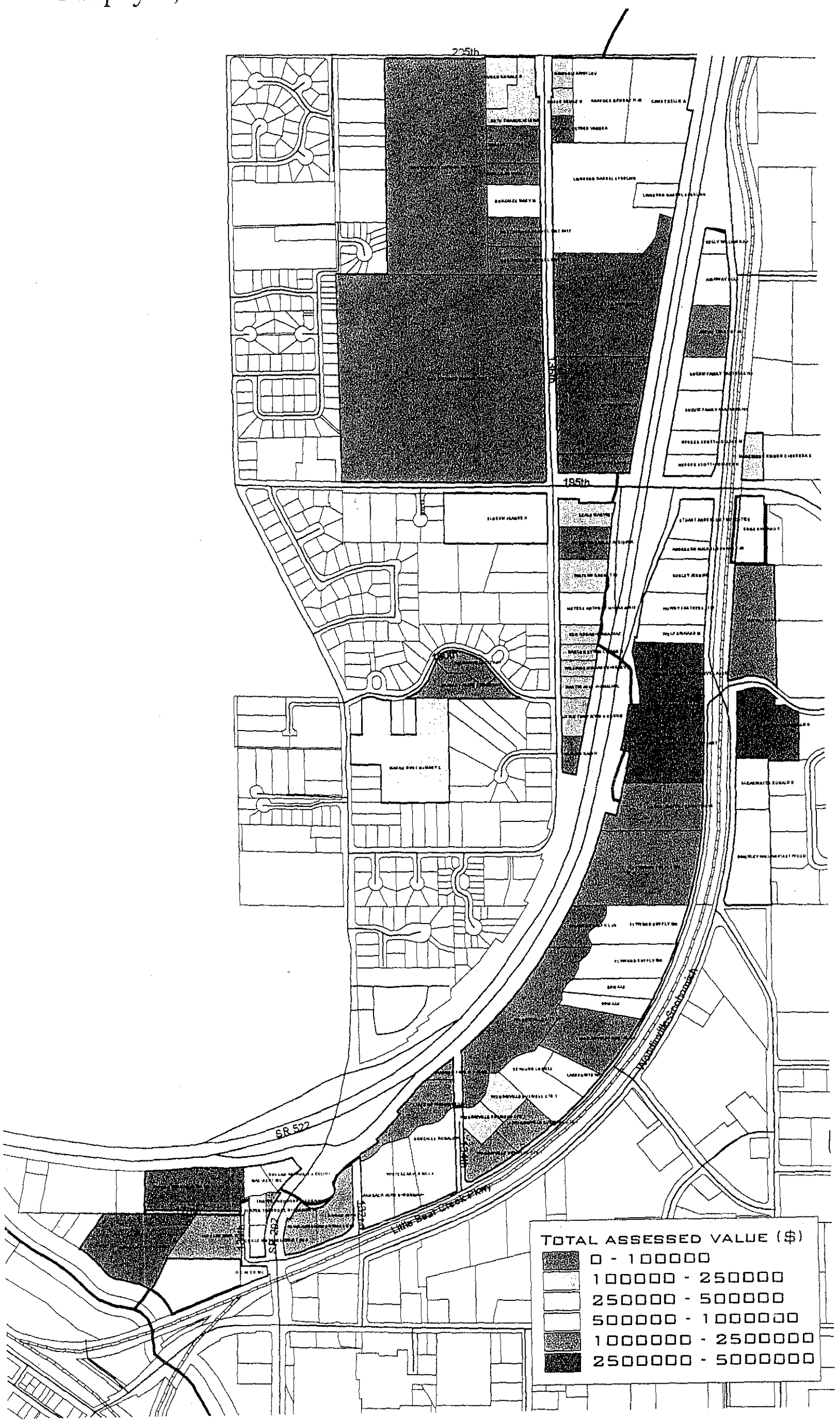


Figure 5

City of Woodinville
Downtown - Little Bear Creek Corridor Master Plan

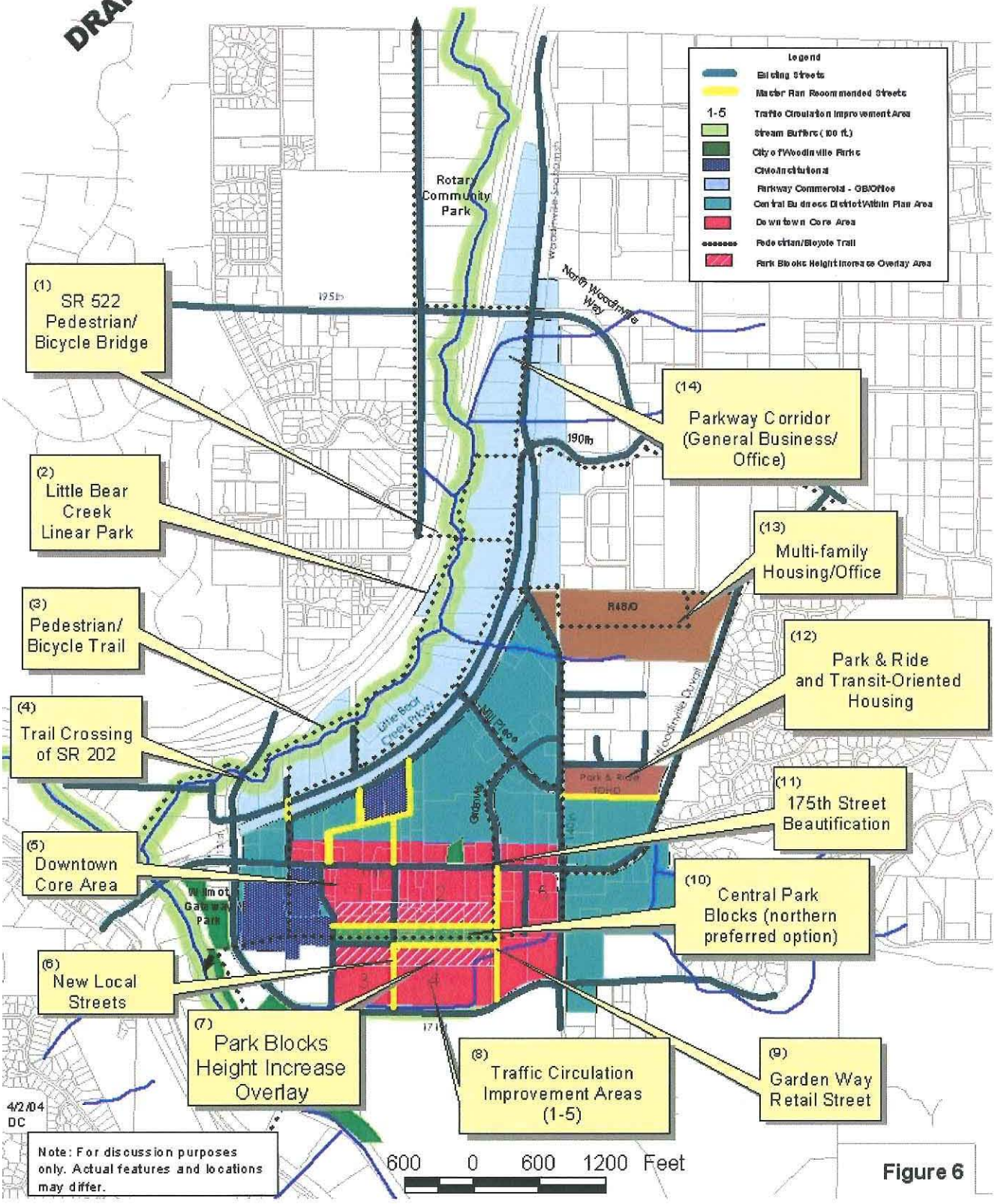
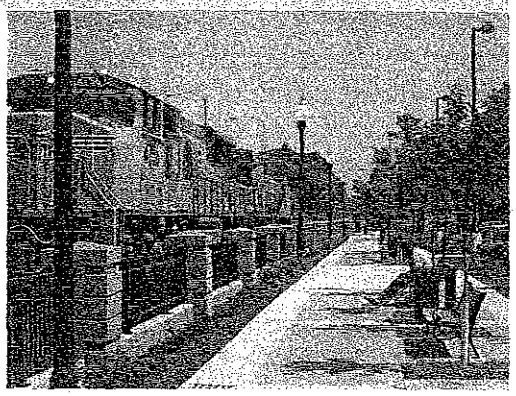


Figure 6

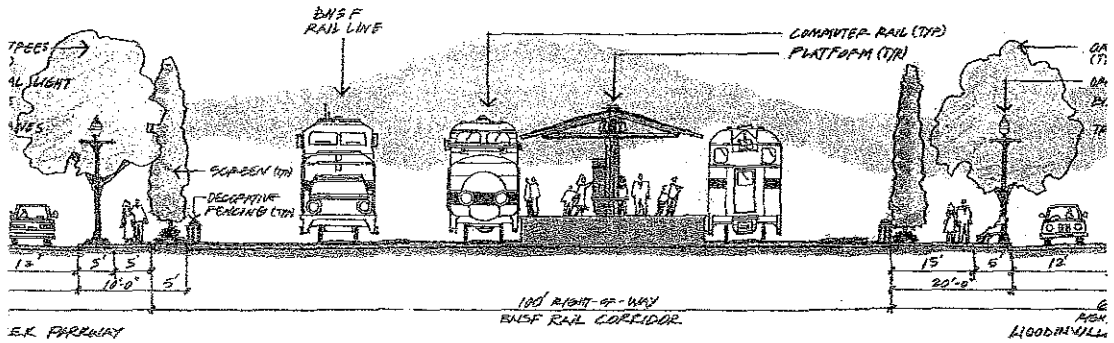
3.3 Little Bear Creek Corridor Motorized Circulation Plan



3.3.1.C Rail Line Improvements

Features:

- Decorative safety fencing
- Landscape screening
- Pedestrian amenities
- Rail line platform
- Separation of rail line and commuter rail
- Weather canopy



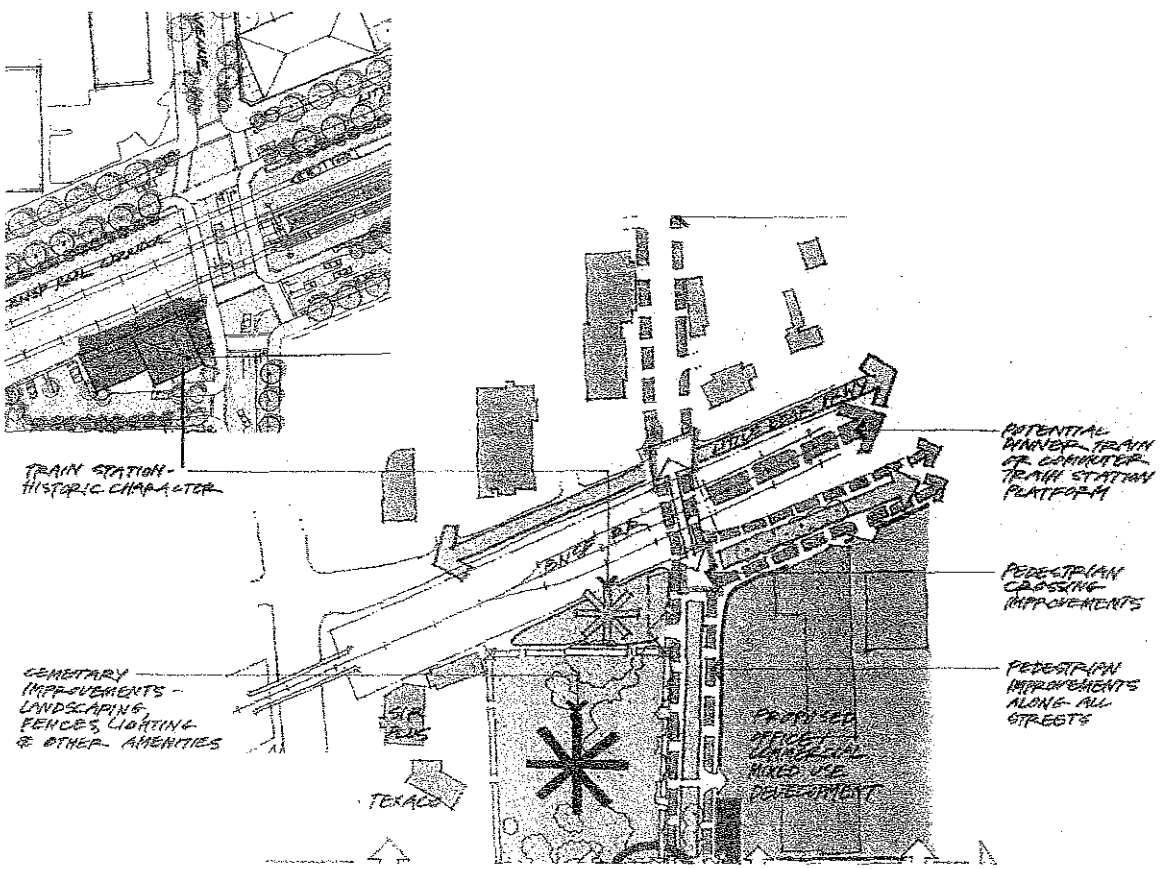
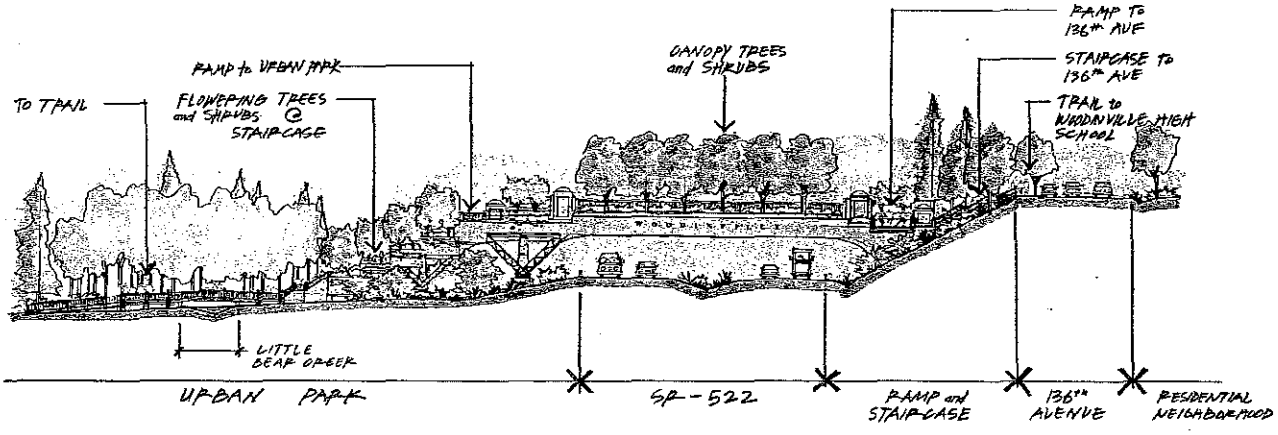


FIGURE 7

5.3 SR-522 Pedestrian/Bike Gateway Overpass

The SR-522 Pedestrian/Bicycle overpass will provide an important link in the trail system by providing an alternative route for people in the Wedge Neighborhood, regional trail system, downtown and employment centers. It will also provide a safe, non-motorized connection between downtown and other residential neighborhoods to the Rotary Community Park and Woodinville High School.

Looking South



The pedestrian/bicycle overpass will connect to the area of 186th street and 136th Avenue NE in the Wedge Neighborhood and span SR-522 to a connection on the east side of SR-522 and west side of Little Bear Creek at approximately the 141st block. From this point, users may access Little Bear Creek Linear Park and Little Bear Creek Parkway. The overpass can be designed to provide a pleasant pedestrian experience with planters, landscaping and other architectural features. From the perspective of a motorist on SR-522, this bridge can be an important "gateway" symbol of the City. The design of the bridge can take advantage of this opportunity with attractive features and signage. Conceptual views of the overpass are shown on page 54.

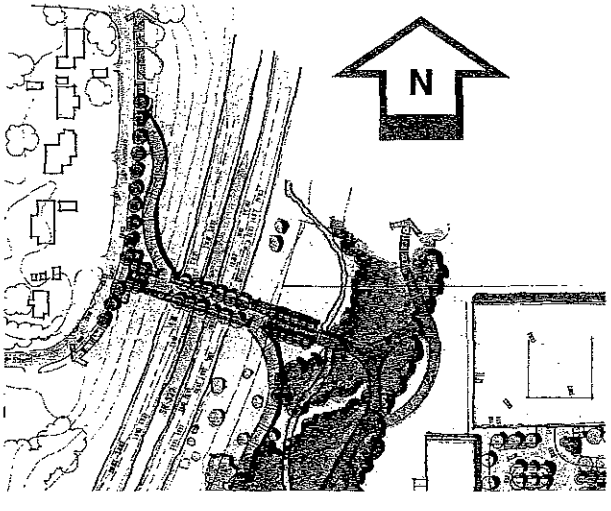


FIGURE 8